format
professional quality

Guaranteed
High Measure of Quality

In our function as FORMAT partner and with our good reputation, we stand for the outstanding quality of all FORMAT products.

As only those products which have proved in severe daily use are included in the FORMAT product range.

FORMAT tools of all areas are manufactured by approved industrial partners according to our strict quality requirements

FORMAT tools

High productivity thanks to reliable quality!

Guaranteed –

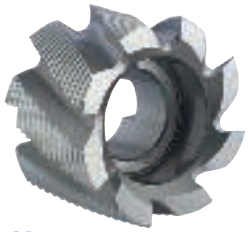
at any time



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format
professional quality

Guaranteed High Measure of Quality

As a specialty trader we stand for the outstanding quality of all FORMAT tools with our good reputation. As only those products which have proved in severe daily use are included in the FORMAT product range.

All FORMAT tools are produced by approved manufacturers according to our severe quality requirements.

FORMAT hand tools

Sturdy and reliable!

Guaranteed –

at any time.




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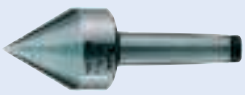

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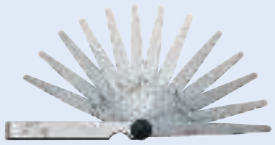

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NEW


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NEW


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NEW


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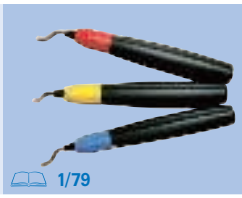

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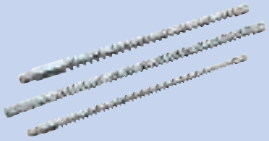

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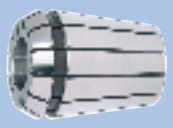

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Drills, Circular Cutters, Facing/Boring Heads, Countersinks, Reamers, Tapping Jigs, Thread Milling Cutters, Chisels, Bits and Deburring Tools
1 Cutting Tools


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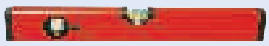
NEW
2/131
Milling Tools, Saws, Broaching Tools, Lathe Tools, Knurling Tools, Indexable Inserts for Milling, Drilling, Turning, Engraving and Tapping
2 Cutting Tools


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Lathe Chucks, Lathe Centres, Tool Holders, Drill Chucks, Vices, Clamping Systems, Magnetic Clamping Equipment
3 Clamping Systems


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Vernier Calliper Gauges, Micrometers, Dial Gauges, Stands, Gauge Blocks, Gauges, Magnifiers, Tape Measures, Laser Measuring Equipment, Levels, Marking Tools, Measuring and Control Equipment
4 Measuring Equipment


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NEW
5/97
Vices and Screw Clamps, Electrician's Pliers, Water Pump Pliers, Grip Pliers, Cable Knives, Stripping and Crimping Tools, Voltage and Continuity Testers, Bolt Cutters, Socket Wrenches, Hock Wrenches, Hexagon Wrenches and TORX® Wrenches, Free Running Ratchets
5 Hand tools


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NEW
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Socket Wrenches and Sets, Tools Kits, Tool Trolleys, Mobile and Folding Workbenches, Impact Sockets, Torque Wrenches, Screwdrivers and Sets, Bits and Accessories, Tweezers, Files, Scrapers, Metal Saws, Hammers, Chisels, Pin Punches, Centre Punches, Pullers and Automotive Tools
6 Hand tools


7/34

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Wire Brushes, Paint Brushes, Sheet Metal Shears and Punches, Pipe Wrenches, Pipe Cleaning and Checking Devices, Pipe Cutters, Pipe Benders, Installation Tools, Wood Working and Masonry Tools, Knives, Glass Cutters, Tool Boxes and Cases
7 Hand tools


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Grinding, Cutting and Roughing Wheels, Diamond Grinding and Cutting Wheels, Diamond Grinding Points, Abrasive Sheets, Non-woven, Grinding Points and Files, Dressing Tools, Hand Apparatuses, Polishing Tools, Grinding and Polishing Paste
8 Abrasives


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Cable Drums, Current Distributors, Hand and Site Lamps, Electric Soft Soldering and Propane Soldering Sets, Soldering Lamps and Irons, Welding Accessories and Shields, Blind Rivets and Blind Riveting Tools, Compressed Air Fittings, Coolant Systems, Labelling Tools, Pencils, Chalk, Chemical Products and Protective Equipment
9 Soldering/Welding/ Workshop Materials


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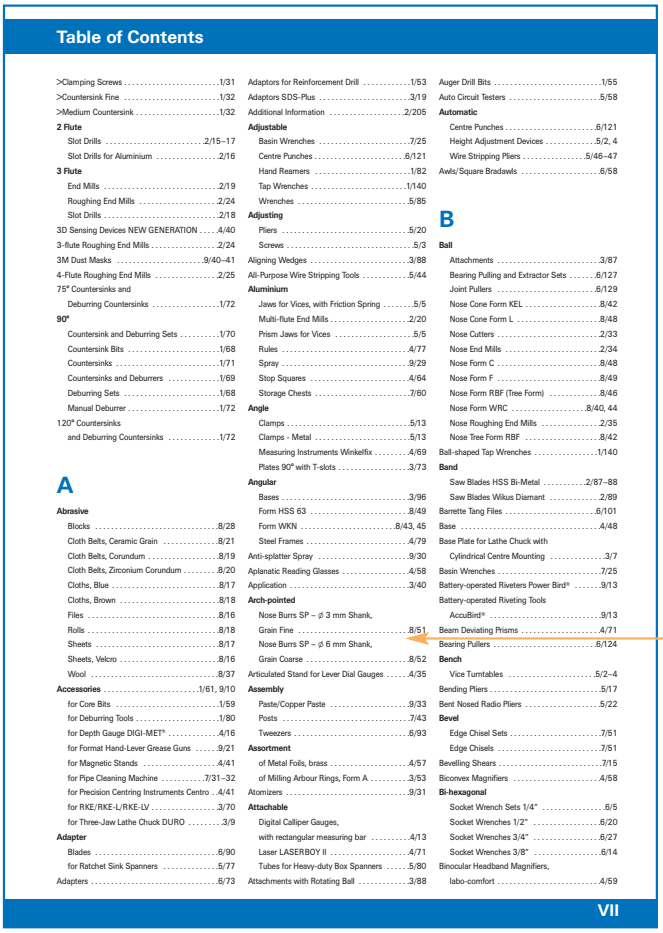
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Technical Appendix
10 Technical Appendix



The product groups:
Our main catalogue includes a vast tool assortment.
In order to facilitate product search, the catalogue is divided into 10 product groups.

For quick orientation an overview with figures illustrating the contents of the respective sub-group is printed before each product group.





The part numbers:
Each article in the FORMAT plus catalogue is identified by a clear part number. The part number is composed of a 4-digit main number, which is printed left to the article designation, and the 4-digit final number, which defines the different designs or sizes of the respective article.

3 Flute Slot Drills

2145
2151

Application: HSS Co8, type N, with centre cutting.

Design: HSS Co8, TiAlN, type N, with centre cutting.

Cutting speed approx. 50 % compared with uncoated tools. Dry machining possible.

Part No.	ø d_1 = e 8 mm	2145	2151
0150	1.5*	5.87 (208)	–
0200	2.0	4.32 (206)	7.48 (208)
0250	2.5	4.80 (206)	7.72 (208)
0300	3.0	4.17 (206)	7.72 (208)
0350	3.5*	5.24 (206)	7.75 (208)
0400	4.0	4.17 (206)	7.75 (208)

The table of contents as alphabetical index.

Explanations for using this tool catalogue

Edition 2008/09

I. Tool Catalogue FORMAT PLUS TOOLS

On more than 1,000 pages of this catalogue we offer a well-balanced product range of highest quality to meet your specific requirements.

The product range has been established by the specialists within the FORMAT PLUS TOOLS GROUP and is based on many years of experience and on the results of ongoing rewarding discussions with our customers.

II. Contents

The catalogue is divided into **9 product groups and the Technical Appendix** to facilitate the handling in your daily routine. Apart from the alphabetical index, the overviews of the product groups will help you to find the required article in no time at all.

All necessary technical details, descriptions and material characteristics, as well as recommended applications are indicated for each individual product. Illustrations, drawings and technical data refer to the DIN/ISO standards applicable at the time of printing this catalogue.

The range of products shown in this catalogue has been prepared in close collaboration with all partners in the FORMAT PLUS TOOLS GROUP in order to meet the respective requirements.

All articles in the catalogue indicating from stock delivery will be delivered within 24 hours using UPS Express Service, with the exception of those articles not suitable for delivery by parcel service due to weight and volume.

Articles not in stock will be delivered at short notice, if required.

Articles or assortments in this catalogue are subject to technical modifications. We accept no liability for any printing errors and deficiencies or any incorrect information in illustrations, descriptions, specifications, prices, etc. We reserve the right to execute changes/amendments without prior notice.

III. Price, Terms and Conditions of Sale, Delivery and Payment

The prices shown in this catalogue are **net prices exclusive of VAT** and are deemed unit prices, any trade discounts or rebates are already considered in the price unless other quantities are indicated.

Surcharges for alloy finish of HSS (-E) cutting tools as well as surcharges for raw material such as to solid carbide and others (e.g. cobalt, tungsten, tantalum, manganese, etc.) dependent on the market price will be charged according to the respective current price.
VAT will be charged additionally at the rate applicable on the day of delivery.
Our prices are without engagement. In case of changing conditions on the market, we reserve the right to charge the price applicable on the day of delivery. All deliveries are subject to our current general conditions of sale and terms of payment.

IV. Purchase Orders

Each individually defined article bears an **8-digit catalogue number.**

It is sufficient to indicate the order number and catalogue number in your order. However, to avoid receipt of the wrong articles, in case of printing errors in your order, we recommend you add the designation of the article and, if applicable, the dimensions.

Your purchase orders will be processed in accordance with our applicable terms and conditions.

V. Customer Support

The quality products contained in the catalogue are intended for use in industry and craft trade. As your **partner in the FORMAT PLUS TOOLS GROUP,** we consider sustained quality and precision of the product and the support we provide to our customers our greatest commitment.

We are proud of our **competent and highly qualified staff** who can boast expert knowledge in all product areas. They will be delighted to offer you solutions which satisfy the highest demands at any time. **Why not make use of this service!**

VI. General

This catalogue and its content remain our property, the return of which can be requested at any time. The catalogue is intended for your sole use. Any disclosure to third parties is not permitted. Any reprint or reproduction of whatsoever kind – in whole or in part – is not permitted.

Brand names used in this catalogue

Trademarks	Companies
Phillips-Recess	Phillips Screw Company
ACR® Torq Set®	Phillips Screw Company
ACR® Tri-Wing®	Phillips Screw Company
Pozidriv-Supadriv	European Industrial Services Ltd.
Ribe-CS	Richard Bergner
Ribe-CV	Richard Bergner
SDS-plus	Robert Bosch GmbH
TORX®	Camcar Textron Inc.
TORX PLUS®	Camcar Textron Inc.
TORX® BO	Camcar Textron Inc.
Male TORX®	Camcar Textron Inc.
XZN	Bauer + Schauerte
WELDON	The Weldon Tool Company

Notice: For all machines with electrical connections apply different prices, designs and lead times.

FORMAT PLUS TOOLS –
Your dedicated dealer and partner

All prices indicated in the previous catalogue become invalid upon issue of this new catalogue.

Legal Notice:

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John Greaves, designer of tools
Wincor Nixdorf International GmbH, Paderborn

“Top quality, top service”

Painstakingly planned production processes demand maximum quality and reliability in each step of production. Leading companies in Europe therefore trust on professional FORMAT tools, which are distinguished by first-rate quality, high precision and fast availability. FORMAT tools are exclusively sold by approved traders. Immediate delivery or within 24 hours in Germany. Guaranteed.

format
professional quality

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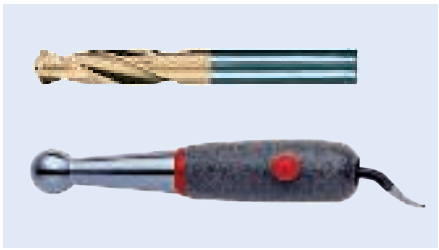
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Overview – Group 1

New in the product range:

Extension of range of drilling and deburring tools



In order to satisfy highest demands regarding quality and performance, our range of milling tools has been extended by the following products:

- Gühring twist drill GU 500 DZ
- EXACT deburrer



RT 800 WP
After positive feedback we would like to highlight our drilling system RT 800 WP. This system features high cutting performance and profitability.

Your FORMAT plus partner will inform you about the performance of these and further cutting tools.



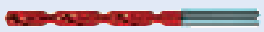

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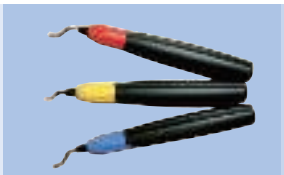
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Excerpt Pictograms

Material

e.g. HSS — High-speed steel

HSS Co5 — High speed steel with 5 % cobalt

VHM K10/ K20 — Carbide type K10/K20

Standard

e.g. DIN 208-B — Corresponds to DIN 208 form B – helical flute

DIN 338 — Corresponds to DIN 338

EN 22568 — In accordance with European standard 22568

Type

e.g. Type N — For cutting materials with normal strength and hardness

Type NR — Milling tool with roughing teeth (round profile)

Type HR — Milling tool with fine roughing teeth (fine round profile)

No. of cutting edges

e.g. Z 4 — 4 cutting edges

Thread

e.g. M — Metric thread



With 60° angle of screw

Tolerance

e.g. H7 — Tolerance range H7

ISO 2 6H — Metric ISO coarse thread, application class 2, medium tolerance 6H

Shank design

e.g. 

Parallel shank with drive face to DIN 1835 B


Parallel shank

Point angle

e.g. 

Countersink with point angle 90°



Point angle 130°

Helix angle

e.g. 

25° to 30° right-hand helix



Approx. 7° left-hand helix

Application

e.g.  — For through and blind hole taps

 — Feed directions

 — Dry cutting

Taper

e.g. 

Tool with taper 1 : 50

Selecting the optimum tools

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1004	●	◐	○								◐	◐	●

● recommended ◐ suitable ○ partially suitable

Coating – Surface Finish

Due to their good basic properties, tools made of rapid-cutting steel or carbide metal are delivered without additional surface finish, i.e. with blank surfaces.

For specific applications however, a special surface finish is recommended to increase wear resistance, reduce slipping resistance and pick-up behaviour.

A broad array of coatings is available.

Hard material coating: TiN; TiN2, TiAIN2, TiCN, Fire.

Each layer provides true advantages for certain fields of application.

TiN coating (titanium nitride)

Optical feature: Gold colour
Proven, favourably priced all-round layer for increased efficiency.

TiN2 coating (titanium nitride)

Optical feature: Gold colour
High cutting speeds, wet and dry cutting, significantly improved performance, higher productivity.
TiN2 distinguishes by extreme toughness of the coating material and by high thermal and chemical stability.

TiAIN coating (titanium aluminium nitride)

Optical feature: Black-purple
Special coating for cutting operations on abrasive material (cast iron, AlSi) and/or when exposed to high temperatures, i.e. in applications without cooling or limited cooling, in the event of deep holes or small diameters. This means that only at high cutting rates, the TiAIN coating will lead to significantly improved performance.

TiCN coating (titanium carbon nitride)

Optical feature: Grey-purple
Multi-layer coating with laminate structure. Obtains true advantages in the machining of steel, in continuous cutting operations, materials that are difficult to machine or in general: where above-average requirements to hardness and toughness are set.

TiAIN2 – Fire coating

Optical feature: Red-purple
Multi-layer TiAIN coating with gradient structure. All-round coating, its efficiency is twice as high as TiN, TiAIN and TiCN.
Excellent, almost “fire-proof” heat insulation.
High toughness.

Further surface finish procedures

The surface finish procedures mentioned below are gradually losing ground. Much better results are obtained with tools with hard material layers (see above).

1. Nitration-hardened

Nitration-hardening is another possibility to improve the wear-resistance of tools. It is recommended for the machining of grey cast iron, aluminium with high Si content, plastics, steels with high pearlite iron content etc.

2. Hard-chrome plating

Tools with this finish reduce the slipping resistance of the tool and thereby the cutting forces. These advantages are however lost again, if the temperature in the cutting process exceeds 250 °C.

3. Steam-tempered

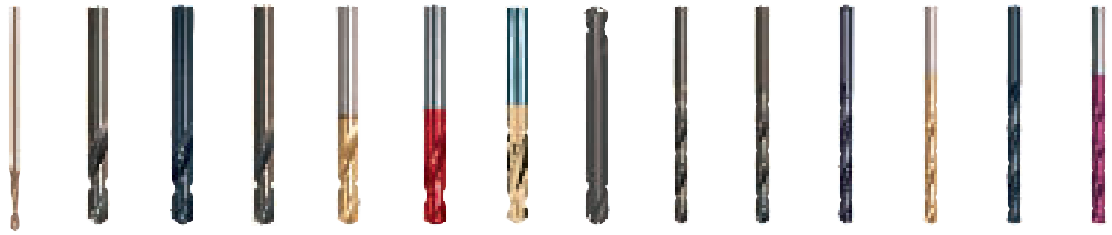
Slipping resistance is also lower when using steam-tempered tools. Cold sets, often occurring in the machining of low carbon steels, can be avoided at low costs. Steam-tempered tools are suitable for the machining of ferrous products only.

4. Bronzing

Bronzing is effected in watery solutions at temperatures just over 100 °C. The solutions contain oxidizing substances such as nitrides and/or substances for colouring (e.g. phosphates). The low process temperatures do not affect the strength of steel with even low annealing stability.

Oxide layers are only few micrometers thick. In contrast to the basic material, they have exhibited a non-metallic feature. The most important characteristics are a reduced friction coefficient and good corrosion and wear resistance. In particular, the tendency to adhesive wear is reduced, consequently pick-ups with the material to be chipped are prevented.

Overview – HSS Jobber Drills



Part No.	1040	1055	1056	1058	1061	1062	1063	1064	1007	1001	1002	1004	1005	1020
∅ mm from–to	0.1–1.45	1–12	1–12	1–20	1–20	1–20	1–14	2.5–6	1–16	0.2–16	0.2–16	1–16	0.2–13	1–13
DIN	1899-A	1897	1897	1897	1897	1897	1897	1897	338	338	338	338	338	338
Material	HSS Co5	HSS	HSS	HSS Co5	HSS Co5	HSS Co5	HSCo	HSS	HSS Rolled	HSS	HSS	HSS	HSS Co5	M42
Drill type	N	N	N	INOX	INOX	INOX	GU500		N	N	N	N	N	N
Coating					TiN	TiAlN	TiN					TiN		TiAlCrN
Point angle	118°	118°	118°	130°	130°	130°	118°	118°	118°	118°	118°	118°	118°	135°
Pointed				A	A	A		A				A	A	Cross pointed
Page	1/8	1/9	1/9	1/9	1/9	1/9	1/9	1/11	1/12	1/12	1/12	1/12	1/12	1/12

Material group

Steels up to 850 N/mm²		●	●	●	●	○	◐	●	◐	◐	◐	◐	●	●	●
Steels up to 1,000 N/mm²		●	◐	◐	●	◐	●	●	◐	○	◐	◐	●	●	●
Steels up to 1,400 N/mm²		●	○	○	●	●	●	◐	○		○	○	◐	◐	●
Steels up to 42 HRc		○					○	○						○	●
Steels up to 52 HRc															◐
Stainless and acid-resistant steels (INOX)		◐			●	●	●	●							○
Ti steels, Ti alloys, special steels					○	○	○	●						◐	●
Cast iron		◐	◐	◐	◐	●	●	●	◐	○	◐	◐	●	●	◐
Al, Al and Mg alloys		◐						●					●		◐
Copper, brass, bronze		●			◐	◐	◐	●	○				●		○

● recommended ◐ suitable ○ partially suitable

Overview – HSS Jobber Drills



Part No.	1035	1010	1013	1014	1016	1017	1018	1022	1025	1026	1048	1045	1046	1051
∅ mm from–to	10.5–16	1–13	1–13	1–13	1–13	1–13	1–13	1–13	1–13	1–12	1–13	1–13	1–13	1–13
DIN	338	338	338	338	338	338	338	338	338	338	340	340	340	340
Material	HSS Rolled	HSS	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSCo	HSS Co5	HSS Co5	HSS Co5	HSS Rolled	HSS	HSS	HSS Co5
Drill type	N	W	Ti	Ti	Ti	Ti	GU500	TF	INOX	INOX	N	N	N	TF
Coating					TiN	Dim	TiN							
Point angle	118°	130°	130°	130°	130°	130°	118°	130°	130°	130°	118°	118°	118°	130°
Pointed			C	C	C	C		A						A
Page	1/15	1/16	1/17	1/17	1/17	1/17	1/17	1/20	1/21	1/21	1/22	1/22	1/22	1/22

Material group

Steels up to 850 N/mm²		◐		◐	◐	◐	◐	●	●			○	◐	◐	●
Steels up to 1,000 N/mm²		○		◐	◐	◐	◐	●	◐			○	◐	◐	●
Steels up to 1,400 N/mm²				○	○	◐	◐	◐	●				○	○	●
Steels up to 42 HRc						●	●	○	○						○
Steels up to 52 HRc						○	◐								
Stainless and acid-resistant steels (INOX)				●	●	●	○	●	◐	●	●				◐
Ti steels, Ti alloys, special steels				●	●	●	◐	●		○	○				
Cast iron		○		○	○	◐	●	●	◐	○	○	◐	◐	◐	◐
Al, Al and Mg alloys			●	●	●	◐		●	○	●	●				○
Copper, brass, bronze			◐	◐	◐	◐	◐	●	●	●	●				◐

● recommended ◐ suitable ○ partially suitable

Overview – HSS Jobber Drills



Part No.	1067	1068	1071	1052	1083	1080	1081	1082	1085	1089	1092	1093–1097
∅ mm from–to	3–12	3–10	3.5–10.2	2.5–12	10–50	10–50	10–50	10–35	7.8–30	10–50	8–30	16–40.5
DIN	1869	1869	1869	1898/1	345	345	345	345	343	341	1870	
Material	HSS	HSS	HSS Co5	HSS	HSS Rolled	HSS	HSS Co5	HSS	HSS	HSS	HSS	carbide (plate)
Drill type	TF	TF	TF	N	N	N	N	INOX	N	N	TF	
Coating		TiN	TiAlN									PCD
Point angle	130°	130°	130°	118°	118°	118°	118°	130°	120°	118°	130°	140°
Pointed	A	A	A	A		A	A			A	A	Special
Page	1/23	1/23	1/23	1/24	1/25	1/25	1/25	1/25	1/27	1/28	1/29	1/30+31

Material group

Steels up to 850 N/mm²	●	●	●	●	◐	●	●	○	●	◐	●	●
Steels up to 1,000 N/mm²	●	●	●		○	●	●	◐	◐	◐	●	●
Steels up to 1,400 N/mm²	○	○	◐			◐	◐			◐	◐	◐
Steels up to 42 HRc												◐
Steels up to 52 HRc												◐
Stainless and acid-resistant steels (INOX)	○	○	○					●			○	◐
Ti steels, Ti alloys, special steels			◐					◐				◐
Cast iron	◐	◐	●		◐	●	●	○	○	◐	●	●
Al, Al and Mg alloys	○	○						●	○		●	○
Copper, brass, bronze	◐	◐	◐		○			●			●	◐

● recommended ◐ suitable ○ partially suitable

Overview



Part No.	1100–1106	1109–1115	1120–1132	1140	1143	1146	1149	1152	1155	1156	1158
∅ mm from–to	M3–M12	M3–M12	0.5–10	3–20	3–20	5–20	5–20	5–20	5–20	6–12	6–12
DIN		8374–8378	333	NC spot drill							
Material	HSS	HSS	HSS	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co5
Drill type	N	N	Centre drill	N	N	N	N	N	N	N	N
Coating						TiN	TiN	TiCN	TiCN	TiCN	TiCN
Point angle	118°	118°	60°/120°	90°	120°	90°	120°	90°	120°	long 90°	long 120°
Pointed	A	A									
Page	1/32	1/33	1/34+35	1/36	1/36	1/36	1/36	1/36	1/36	1/36	1/36

Material group

Steels up to 850 N/mm²		◐	◐	●	●	●	●	●	●	●	●
Steels up to 1,000 N/mm²		◐	◐	◐	●	●	●	●	●	●	●
Steels up to 1,400 N/mm²		○	○	○	◐	◐	◐	◐	◐	◐	◐
Steels up to 42 HRc								○	○	○	○
Steels up to 52 HRc											
Stainless and acid-resistant steels (INOX)		○		◐	○	○	◐	◐	●	●	●	●
Ti steels, Ti alloys, special steels				○	○	○	●	●	●	●	●	●
Cast iron		◐	◐	◐	●	●	●	●	●	●	●	●
Al, Al and Mg alloys		◐		◐	●	●	◐	◐				
Copper, brass, bronze		◐	○	◐	●	●	●	●	●	●	●	●

● recommended ◐ suitable ○ partially suitable

Micro Drills

Design: Special drill with reinforced shaft, high concentricity and precisely ground point.

ø tolerance: 0/–0.004 mm at spiral tip.

HSS Co5 | Type N | DIN 1899-A | 118° | 25–30°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1040	●	◐									◐	◐	●

Part No.	ø mm	1040 mm	Twist length mm	Total length mm	ø h 8 shaft mm
0010	0.10	3.27	0.5	25	1.0
0015	0.15	3.20	0.8	25	1.0
0020	0.20	2.51	1.5	25	1.0
0025	0.25	2.24	1.9	25	1.0
0030	0.30	2.13	1.9	25	1.0
0035	0.35	1.92	2.4	25	1.0
0040	0.40	1.61	3.0	25	1.0
0045	0.45	1.78	3.0	25	1.0
0050	0.50	1.56	3.4	25	1.0
0055	0.55	1.65	3.9	25	1.0
0060	0.60	1.50	3.9	25	1.0
0065	0.65	1.76	4.2	25	1.0
0070	0.70	1.44	4.8	25	1.0
0075	0.75	1.61	4.8	25	1.0
		(100)			

Part No.	ø mm	1040 mm	Twist length mm	Total length mm	ø h 8 shaft mm
0080	0.80	1.53	5.3	25	1.0
0085	0.85	1.65	5.3	25	1.0
0090	0.90	1.53	6.0	25	1.0
0095	0.95	1.70	6.0	25	1.0
0100	1.00	1.53	6.8	25	1.0
0105	1.05	1.71	6.8	25	1.0
0110	1.10	1.76	7.6	25	1.0
0115	1.15	1.83	7.6	25	1.0
0120	1.20	1.61	8.5	25	1.0
0125	1.25	1.85	8.5	25	1.0
0130	1.30	1.61	8.5	25	1.0
0135	1.35	1.72	9.5	25	1.0
0140	1.40	1.65	9.5	25	1.0
0145	1.45	1.78	9.5	25	1.0
		(100)			

Other dimensions and left-hand cutting or solid carbide available on request.

Drilling Speed and Feed Calculator

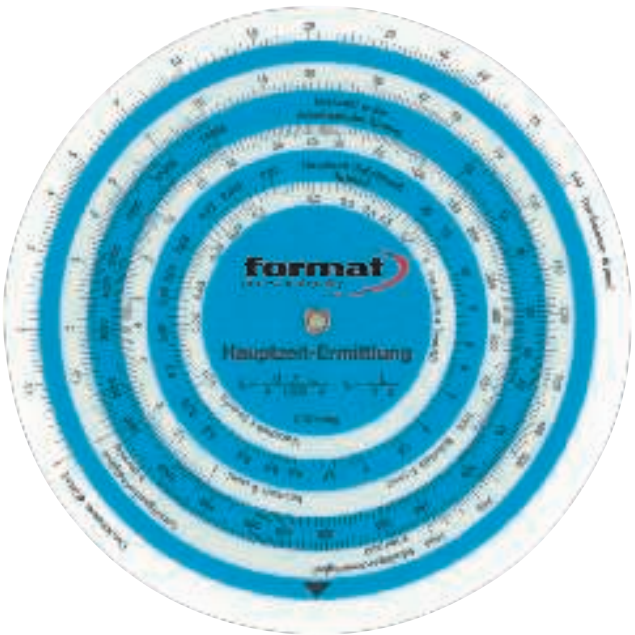
Design: Disk made of plastic, glazed on both sides ø 130 mm, transparent plastic running disks, circumference and centre of the 3 disks punched, with precision compression rivet, in case.

Application: For determining individual parameters such as cutting speed, feed and RPM as well as time – other side for determining cutting performance of individual materials.

Part No.	1042 mm
0100	4.02
	(100)

format professional quality





All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Stub Drills

Design: Especially suitable for use on automatic drilling machines and turret lathes. Ideal for short-depth drilling. Standard rake angle, core thickness and core pitch.

HSS | Type N | DIN 1897 | 118° | 25–30°

1055 Profile ground, bright, from ⌀ 2.4 mm steam finish.



1055 format professional quality

1056 Profile ground, bright, from ⌀ 2.4 mm steam finish.



1056 ALPHA INOX

Design: Standard rake angle, greater core thickness and standard core pitch. Very robust twist drill, good hardness when exposed to heat.

HSS Co5 | Type INOX | DIN 1897 | 130° | 25–30°

1058 Profile ground, bright, from ⌀ 2.4 mm steam finish.



1058 format professional quality

1061 TiN Profile cut, TiN coated.



1061 TiN format professional quality

1062 FIRE Profile ground, FIRE coated.



1062 FIRE ALPHA INOX

1063 TiN

Design: HSS Co5, type GU 500 DZ, DIN 1897. Profile ground, TiN coated, right-hand cutting, with precisely ground tip and distinctive heat hardness. With special point. Rake angle larger than normal, core thickness and core pitch normal.

Application: Especially suitable for use on automatic machines and turret lathes. Suitable for non-ferrous metals, structural steel and carbon steel, high-alloy steel, cast iron and casting alloys, plastic materials and aluminium.

HSS Co5 | Type GU 500DZ | DIN 1897 | 118° | 38°



1063 TiN ALPHA INOX

Part. No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1055	●	◐	○								◐		
1056	●	◐	○								◐		
1058	●	●	●						●	○	◐		◐
1061	○	◐	●						●	○	●		◐
1062	◐	●	●	○					●	◐	●		◐
1063	●	●	◐	○					●	●	●	●	●

Part No.	⌀ h 8 mm	1055 mm	1056 mm	1058 mm	1061 TiN mm	1062 FIRE mm	1063 TiN mm	Twist length mm	Total length mm
0100	1.00	0.46	0.97	0.50	2.40	6.14	3.30	6	26
0110	1.10	–	–	0.50	2.50	6.00	3.30	7	28
0120	1.20	–	–	0.47	2.50	6.00	3.38	8	30
0130	1.30	–	–	0.47	2.50	6.00	3.57	8	30
0140	1.40	–	–	0.47	2.50	6.00	3.26	9	32
0150	1.50	0.42	0.87	0.47	2.51	5.91	3.11	9	32
0160	1.60	–	–	0.55	2.76	5.76	3.21	10	34
0170	1.70	–	–	0.55	2.76	5.76	3.26	10	34
0180	1.80	–	–	0.55	2.76	5.76	3.21	11	36
0190	1.90	–	–	0.55	2.51	5.76	3.21	11	36
0200	2.00	0.50	0.64	0.55	2.23	5.57	2.71	12	38
0210	2.10	–	–	0.54	2.23	5.76	3.30	12	38
0220	2.20	–	–	0.55	2.51	5.91	3.30	13	40
		(100)	(101)	(100)	(100)	(103)	(115)		

Continued overleaf

Articles marked ◊ are not held in stock, procurement is effected at short notice.

Stub Drills

Continued

Part No.	∅ h 8 mm	1055	1056	1058	1061	1062	1063	Twist length mm	Total length mm
0230	2.30	–	–	0.55	2.57	5.91	2.79	13	40
0240	2.40	–	–	0.55	2.57	6.00	3.33	14	43
0250	2.50	0.50	0.75	0.55	2.50	5.67	2.93	14	43
0260	2.60	–	–	0.55	2.57	6.00	3.43	14	43
0270	2.70	–	–	0.55	2.57	6.14	3.67	16	46
0280	2.80	–	–	0.55	2.57	6.14	3.38	16	46
0290	2.90	–	–	0.55	2.57	6.14	3.62	16	46
0300	3.00	0.50	0.75	0.55	2.36	5.76	3.08	16	46
0310	3.10	0.50	0.97	0.55	2.57	6.14	3.26	18	49
0320	3.20	0.50	0.95	0.55	2.52	6.00	3.11	18	49
0330	3.30	0.50	0.97	0.55	2.52	6.23	3.11	18	49
0340	3.40	0.50	1.21	0.55	2.57	6.14	3.57	20	52
0350	3.50	0.50	0.87	0.55	2.40	6.14	3.11	20	52
0360	3.60	–	–	0.63	2.74	6.23	3.85	20	52
0370	3.70	–	–	0.63	2.74	6.32	3.52	20	52
0380	3.80	–	–	0.63	2.74	6.23	3.75	22	55
0390	3.90	–	–	1.76	2.74	6.32	4.31	22	55
0400	4.00	0.62	0.87	0.91	2.51	6.32	3.48	22	55
0410	4.10	0.66	1.06	0.91	2.60	6.47	4.04	22	55
0420	4.20	0.66	1.05	0.91	2.60	6.32	3.48	22	55
0430	4.30	–	–	0.91	2.74	6.55	3.99	24	58
0440	4.40	–	–	1.93	2.74	6.66	4.31	24	58
0450	4.50	0.75	1.06	1.02	2.58	6.47	3.99	24	58
0460	4.60	–	–	1.02	3.26	6.79	4.04	24	58
0470	4.70	–	–	1.02	3.26	6.89	4.31	24	58
0480	4.80	–	–	1.02	3.26	7.04	4.53	26	62
0490	4.90	–	–	1.02	3.26	7.36	4.59	26	62
0500	5.00	0.82	1.13	1.02	2.79	6.66	3.85	26	62
0510	5.10	0.89	1.69	1.02	3.36	7.68	4.26	26	62
0520	5.20	1.02	1.69	1.17	3.36	8.38	4.59	26	62
0530	5.30	–	–	1.16	3.36	8.95	4.77	26	62
0540	5.40	–	–	1.16	3.36	9.27	5.08	28	66
0550	5.50	1.02	1.49	1.16	3.03	7.54	4.34	28	66
0560	5.60	–	–	1.21	3.38	9.83	5.22	28	66
0570	5.70	1.02	1.97	1.29	3.38	10.07	5.55	28	66
0580	5.80	1.02	1.97	1.21	3.38	10.07	5.30	28	66
0590	5.90	–	–	1.42	3.38	10.55	5.59	28	66
0600	6.00	1.03	1.49	1.23	3.19	7.54	4.68	28	66
0610	6.10	–	–	1.34	3.94	10.55	5.49	31	70
0620	6.20	–	–	1.44	3.94	11.70	5.49	31	70
0630	6.30	–	–	1.55	3.94	13.10	5.77	31	70
0640	6.40	–	–	1.42	3.94	14.27	5.77	31	70
0650	6.50	1.16	1.77	1.42	3.94	11.95	5.49	31	70
0660	6.60	–	–	1.44	5.12	16.14	6.04	31	70
0670	6.70	–	–	1.76	5.12	16.39	6.23	31	70
0680	6.80	1.29	2.79	1.58	5.12	16.62	6.68	34	74
0690	6.90	–	–	1.70	5.12	16.62	6.60	34	74
0700	7.00	1.29	2.13	1.58	4.73	12.88	6.14	34	74
0710	7.10	–	–	1.92	4.93	16.86	7.42	34	74
0720	7.20	–	–	2.01	4.93	17.33	7.60	34	74
0730	7.30	–	–	2.36	4.93	17.33	7.60	34	74
0740	7.40	–	–	1.83	4.93	17.55	7.70	34	74
0750	7.50	–	–	1.78	4.93	13.57	6.41	34	74
0760	7.60	–	–	2.71	–	–	8.15	37	79
0770	7.70	–	–	2.51	5.50	18.26	8.23	37	79
0780	7.80	–	–	2.23	5.50	18.96	8.23	37	79
0790	7.90	–	–	2.60	5.50	18.96	8.15	37	79
0800	8.00	1.58	2.46	2.12	5.12	13.10	7.60	37	79
0810	8.10	–	–	2.57	6.13	19.43	9.71	37	79
0820	8.20	–	–	2.36	6.13	19.90	10.16	37	79
0830	8.30	–	–	2.73	6.13	20.60	10.26	37	79
0840	8.40	–	–	2.71	6.13	21.30	10.26	37	79
0850	8.50	1.76	3.56	2.31	6.13	14.27	8.88	37	79
0860	8.60	–	–	2.63	6.20	21.77	–	40	84
0870	8.70	–	–	2.93	6.20	22.47	–	40	84
0880	8.80	–	–	2.84	6.20	22.95	11.18	40	84
0890	8.90	–	–	3.13	–	–	–	40	84
0900	9.00	2.01	3.26	2.57	6.20	14.74	9.07	40	84
0910	9.10	–	–	3.33	7.57	23.40	–	40	84
0920	9.20	–	–	2.98	7.57	24.35	–	40	84
0930	9.30	–	–	3.19	7.57	24.82	10.26	40	84
0940	9.40	–	–	3.62	–	–	–	40	84
0950	9.50	–	–	2.79	8.51	15.21	9.98	40	84
		(100)	(101)	(100)	(100)	(103)	(115)		

Continued overleaf

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Stub Drills

Continued

Part No.	ø h 8 mm	1055	1056	1058	1061	1062	1063	Twist length mm	Total length mm
0960	9.60	–	–	3.46	8.51	24.82	–	43	89
0970	9.70	–	–	3.42	8.51	25.74	–	43	89
0980	9.80	–	–	3.26	8.51	25.74	11.90	43	89
0990	9.90	–	–	4.61	8.51	26.22	–	43	89
1000	10.00	2.40	3.93	3.11	7.57	16.62	9.79	43	89
1020	10.20	–	–	3.29	7.78	21.77	12.45	43	89
1050	10.50	–	–	3.49	8.39	22.95	11.81	43	89
1080	10.80	–	–	4.53	–	–	–	47	95
1100	11.00	2.67	7.22	3.97	8.61	24.35	13.09	47	95
1120	11.20	–	–	4.93	–	–	–	47	95
1150	11.50	–	–	4.43	10.05	26.22	15.11	47	95
1180	11.80	–	–	4.88	6.46	42.14	–	47	95
1200	12.00	3.38	9.17	4.82	10.84	29.49	14.74	51	102
1250	12.50	–	–	5.39	10.84	29.96	16.22	51	102
1280	12.80	–	–	6.67	–	–	–	51	102
1300	13.00	–	–	5.61	16.85	30.91	16.22	51	102
1350	13.50	–	–	6.30	22.80	34.64	17.23	54	107
1380	13.80	–	–	8.17	19.38	54.78	–	54	107
1400	14.00	–	–	6.29	22.80	33.23	21.52	54	107
1450	14.50	–	–	7.31	27.59	39.79	–	56	111
1480	14.80	–	–	14.95	–	–	–	56	111
1500	15.00	–	–	7.40	26.46	38.39	–	56	111
1550	15.50	–	–	7.51	32.71	46.82	–	58	115
1575	15.75	–	–	–	20.87	40.74	–	58	115
1600	16.00	–	–	8.58	38.91	40.74	–	58	115
1650	16.50	–	–	23.39	42.14	60.39	–	60	119
1700	17.00	–	–	19.59	35.43	53.37	–	60	119
1750	17.50	–	–	19.49	35.06	60.39	–	62	123
1775	17.75	–	–	–	21.75	71.63	–	62	123
1800	18.00	–	–	18.57	33.42	57.13	–	62	123
1850	18.50	–	–	29.94	53.85	59.44	–	64	127
1900	19.00	–	–	23.76	42.77	60.39	–	64	127
1950	19.50	–	–	39.42	70.96	71.63	–	66	131
1975	19.75	–	–	–	25.91	71.63	–	66	131
2000	20.00	–	–	37.16	66.94	61.79	–	66	131
		(100)	(101)	(100)	(100)	(103)	(115)		

Continued overleaf

Extra-short Sheet Metal Drills, Parallel Shank

Design: Length similar to DIN 1897, double-sided.
Short flute and high web strength. Small chisel edge and cylindrically ground circumference (without lands). Surface steam tempered. Profile ground. Bore holes round and precise (important for riveted joints). Particularly suitable for automotive and metal work, for rivet holes, screw holes etc. For drilling of thin workpieces. Centre punching not necessary for positioning of bit.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1064	◐	◐	○								◐		○

Part No.	ø h 8 mm	1064	Twist length mm	Total length mm
0250	2.5	0.75	9.5	43
0300	3.0	0.64	11	46
0310	3.1	0.66	11	49
0320	3.2	0.66	11	49
0330	3.3	0.66	11	49
0350	3.5	0.70	12	52
0400	4.0	0.86	14	55
0410	4.1	0.86	14	55
		(100)		

Part No.	ø h 8 mm	1064	Twist length mm	Total length mm
0420	4.2	0.86	14	55
0450	4.5	0.89	16	58
0480	4.8	1.02	17	62
0500	5.0	0.96	17	62
0510	5.1	1.10	17	62
0520	5.2	1.10	17	62
0600	6.0	1.26	19	66
		(100)		

Other dimensions available on request.

Twist Drills Parallel Shank

Design: Rake angle, normal core thickness and core pitch.

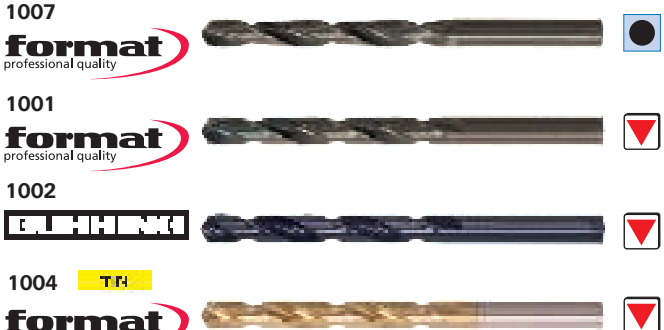
HSS | Type N | DIN 338 | 118° | 25–30°

1007 Rolled. Elastic, suitable for robust drilling jobs (e.g. hand drilling machines, for assembly work, repairs etc.).

1001 Profile ground, blank, from ø 2.4 mm steam treated.

1002 Profile ground, blank, from ø 2.4 mm steam treated.

1004 TiN
Profile ground, TiN coated.



HSS Co5 | Type N | DIN 338 | 118° | 25–30°

1005 Profile ground, blank, from ø 2.4 mm steam treated.

M 42 | Type N | DIN 338 | 135° | 35°

1020 TiAlN2
Profile ground. High concentricity and pitch accuracy as well as precision ground point.
M 42: Increased heat-hardness stability, suitable for machining of materials that are difficult to chip.
TiAlN2 coated.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1007	◐	○									○		
1001	◐	◐	○								◐		
1002	◐	◐	○								◐		
1004	●	●	◐								●	●	●
1005	●	●	◐	○						◐	●		
1020	●	●	●	●	◐				○	●	◐	◐	○

Part. No.	ø h 8 mm	1007	1001	1002	1004 TiN	1005	1020 TiAlN2	Twist length mm	Total length mm
0020	0.2	–	1.43	2.30	–	5.06	–	2.5	19
0030	0.3	–	1.02	1.66	–	4.18	–	3	19
0040	0.4	–	0.84	1.42	–	3.20	–	5	20
0050	0.5	–	0.66	1.11	–	2.76	–	6	22
0060	0.6	–	0.64	1.11	–	2.82	–	7	24
0070	0.7	–	0.62	0.97	–	2.53	–	9	28
0080	0.8	–	0.59	0.95	–	2.36	–	10	30
0090	0.9	–	0.55	0.89	–	2.33	–	11	32
0100	1.0	0.11	0.62	0.86	1.43	2.02	3.06	12	34
0110	1.1	0.12	0.54	0.85	1.39	2.07	–	14	36
0120	1.2	0.12	0.62	0.86	1.44	2.29	–	16	38
0130	1.3	0.12	0.53	0.84	1.35	2.15	–	16	38
0140	1.4	0.12	0.55	0.79	1.30	2.04	–	18	40
0150	1.5	0.12	0.49	0.73	1.21	1.88	2.89	18	40
0160	1.6	0.14	0.46	0.69	1.16	2.04	–	20	43
0170	1.7	0.14	0.49	0.69	1.16	2.09	–	20	43
0180	1.8	0.14	0.46	0.64	1.02	2.04	–	22	46
0190	1.9	0.14	0.46	0.66	1.07	2.09	–	22	46
0200	2.0	0.14	0.34	0.53	0.87	1.71	2.76	24	49
0210	2.1	0.14	0.46	0.63	1.03	2.20	–	24	49
0220	2.2	0.14	0.42	0.66	1.07	2.20	–	27	53
0230	2.3	0.14	0.42	0.68	1.07	2.20	–	27	53
0240	2.4	0.14	0.47	0.66	1.08	2.24	–	30	57
0250	2.5	0.14	0.47	0.66	1.44	1.81	2.81	30	57
0260	2.6	0.14	0.46	0.69	1.16	2.33	–	30	57
0270	2.7	0.14	0.46	0.69	1.16	2.33	–	33	61
0280	2.8	0.14	0.49	0.69	1.16	2.34	–	33	61
0290	2.9	0.14	0.49	0.69	1.16	2.34	–	33	61
0300	3.0	0.14	0.42	0.60	0.96	1.81	2.81	33	61
		(102)	(100)	(105)	(100)	(107)	(100)		

Continued overleaf

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Twist Drills Parallel Shank

Continued

Part No.	∅ h 8 mm	1007	1001	1002	1004	1005	1020	Twist length mm	Total length mm
0310	3.1	0.14	0.50	0.76	1.21	2.36	3.21	36	65
0320	3.2	0.14	0.50	0.76	1.21	2.04	3.06	36	65
0330	3.3	0.15	0.50	0.76	1.23	2.07	3.06	36	65
0340	3.4	0.15	0.50	0.76	1.22	2.53	–	39	70
0350	3.5	0.14	0.47	0.66	1.08	2.02	3.06	39	70
0360	3.6	0.16	0.50	0.81	1.32	2.62	–	39	70
0370	3.7	0.16	0.54	0.85	1.39	2.62	–	39	70
0380	3.8	0.16	0.62	0.86	1.44	2.62	–	43	75
0390	3.9	0.16	0.57	0.89	1.49	2.82	–	43	75
0400	4.0	0.16	0.47	0.69	1.16	2.18	3.13	43	75
0410	4.1	0.18	0.62	0.97	1.58	2.82	3.49	43	75
0420	4.2	0.18	0.54	0.85	1.39	2.82	3.49	43	75
0430	4.3	0.18	0.62	0.97	1.59	2.82	–	47	80
0440	4.4	0.18	0.62	0.97	1.59	2.85	–	47	80
0450	4.5	0.18	0.55	0.89	1.44	2.82	3.49	47	80
0460	4.6	0.18	0.62	1.02	1.59	2.95	–	47	80
0470	4.7	0.18	0.63	1.05	1.62	3.00	–	47	80
0480	4.8	0.18	0.63	1.02	1.65	3.05	–	52	86
0490	4.9	0.18	0.64	1.11	1.76	3.14	–	52	86
0500	5.0	0.18	0.62	0.86	1.43	2.67	3.43	52	86
0510	5.1	0.21	0.66	1.11	1.78	3.14	3.80	52	86
0520	5.2	0.21	0.66	1.12	1.80	3.20	3.80	52	86
0530	5.3	0.21	0.66	1.12	1.80	3.22	–	52	86
0540	5.4	0.21	0.78	1.32	1.99	3.52	–	57	93
0550	5.5	0.21	0.75	1.22	1.99	3.77	4.21	57	93
0560	5.6	0.22	0.80	1.34	2.03	3.62	–	57	93
0570	5.7	0.22	0.82	1.34	2.09	3.62	–	57	93
0580	5.8	0.22	0.84	1.34	2.10	3.62	4.07	57	93
0590	5.9	0.22	0.84	1.40	2.10	3.62	–	57	93
0600	6.0	0.22	0.75	1.22	1.97	3.52	3.97	57	93
0610	6.1	0.26	0.90	1.51	2.36	4.00	–	63	101
0620	6.2	0.26	0.90	1.51	2.36	4.05	–	63	101
0630	6.3	0.26	0.90	1.53	2.40	4.05	–	63	101
0640	6.4	0.26	0.97	1.62	2.63	4.39	–	63	101
0650	6.5	0.26	0.90	1.49	2.40	3.95	6.16	63	101
0660	6.6	0.30	1.02	1.66	2.71	4.39	–	63	101
0670	6.7	0.30	1.05	1.69	2.79	4.39	–	63	101
0680	6.8	0.30	1.22	2.01	3.29	4.81	6.82	69	109
0690	6.9	0.30	1.22	2.01	3.29	4.81	–	69	109
0700	7.0	0.30	1.10	1.80	2.89	4.15	6.32	69	109
0710	7.1	0.36	1.23	2.08	3.33	5.72	–	69	109
0720	7.2	0.36	1.29	2.17	3.40	5.72	–	69	109
0730	7.3	0.36	1.29	2.19	3.40	5.72	–	69	109
0740	7.4	0.36	1.32	2.30	3.57	5.72	–	69	109
0750	7.5	0.36	1.22	2.01	3.25	4.47	6.56	69	109
0760	7.6	0.43	1.42	2.37	3.80	6.90	–	75	117
0770	7.7	0.43	1.42	2.37	3.80	6.90	–	75	117
0780	7.8	0.43	1.43	2.30	3.80	6.90	–	75	117
0790	7.9	0.43	1.44	2.42	3.84	6.90	–	75	117
0800	8.0	0.43	1.22	2.01	3.25	5.49	7.31	75	117
0810	8.1	0.43	1.65	2.57	3.97	6.90	–	75	117
0820	8.2	0.43	1.70	2.57	4.05	7.33	–	75	117
0830	8.3	0.43	1.83	2.76	4.31	7.33	–	75	117
0840	8.4	0.43	1.83	2.76	4.37	7.67	–	75	117
0850	8.5	0.43	1.58	2.57	4.17	5.49	7.31	75	117
0860	8.6	0.53	1.88	3.03	4.73	8.13	–	81	125
0870	8.7	0.53	1.88	3.03	4.73	8.13	–	81	125
0880	8.8	0.53	1.93	3.14	4.73	8.66	–	81	125
0890	8.9	0.53	2.01	3.26	4.76	9.18	–	81	125
0900	9.0	0.53	1.78	2.81	4.53	7.09	8.40	81	125
0910	9.1	0.60	2.01	3.26	5.24	9.52	–	81	125
0920	9.2	0.60	2.01	3.32	5.24	10.23	–	81	125
0930	9.3	0.60	2.23	3.37	5.28	10.48	–	81	125
0940	9.4	0.60	2.23	3.37	5.28	11.20	–	81	125
0950	9.5	0.60	2.19	3.22	5.24	8.33	–	81	125
0960	9.6	0.73	2.23	3.67	5.57	11.68	–	87	133
0970	9.7	0.73	2.23	3.75	5.57	11.68	–	87	133
0980	9.8	0.73	2.72	3.94	5.76	11.68	–	87	133
0990	9.9	0.73	2.72	3.94	5.76	11.68	–	87	133
1000	10.0	0.73	2.10	3.37	5.50	7.91	9.14	87	133
1010	10.1	–	–	–	7.62	–	–		133
1020	10.2	0.80	2.67	4.27	6.46	11.20	11.44	87	133
1050	10.5	0.80	2.99	4.34	6.46	11.68	11.59	87	133
		(102)	(100)	(105)	(100)	(107)	(100)		

Continued overleaf

Twist Drills Parallel Shank

Continued

Part No.	⌀ h 8 mm	1007	1001	1002	1004 TiN	1005	1020	Twist length mm	Total length mm
1080	10.8	–	3.91	6.16	10.59	23.59	–	94	142
1100	11.0	0.90	3.19	5.03	7.17	12.86	12.50	94	142
1120	11.2	–	3.97	6.29	11.15	26.21	–	94	142
1150	11.5	1.01	3.49	5.49	7.46	16.44	15.21	94	142
1180	11.8	–	4.50	7.08	13.26	28.58	–	94	142
1200	12.0	1.17	3.91	6.16	7.96	18.58	16.64	101	151
1220	12.2	–	5.24	8.32	15.48	29.53	–	101	151
1250	12.5	1.18	4.37	6.89	8.71	22.15	18.95	101	151
1280	12.8	–	5.87	9.27	17.31	34.31	–	101	151
1300	13.0	1.35	4.77	7.57	8.90	23.59	20.39	101	151
1320	13.2	–	6.26	9.84	–	–	–	–	151
1350	13.5	2.01	5.55	8.70	–	–	–	–	160
1380	13.8	–	8.06	12.66	–	–	–	–	160
1400	14.0	2.01	6.14	9.84	16.98	–	–	108	160
1420	14.2	–	9.17	14.40	–	–	–	–	169
1450	14.5	2.28	6.62	10.40	18.48	–	–	114	169
1480	14.8	–	9.77	15.12	–	–	–	–	169
1500	15.0	2.41	7.09	11.34	19.97	–	–	114	169
1520	15.2	–	16.67	18.94	–	–	–	–	178
1550	15.5	2.71	7.80	12.11	22.95	–	–	120	178
1580	15.8	–	17.87	20.44	–	–	–	–	178
1600	16.0	2.71	8.39	13.24	23.54	–	–	120	178
		(102)	(100)	(105)	(100)	(107)	(100)		

Twist Drill Sets

Design: Twist Drill Set.

HSS | DIN 338 | Type N | 118° | 25–30°

format professional quality

1031 HSS rolled, type 1007 in metal case

1031–0170 Twist Drill Set (170 pieces)
HSS rolled, containing 10 of type 1007,
⌀ 1–8 mm and 5 of ⌀ 8.5–10 in metal case.

1028 HSS profile ground, type 1001 in plastic case.

1002 HSS profile ground, type 1002 in metal case.

1029 TiN HSS, profile ground, TiN coated, type 1004 in plastic case.



1031 0170



1028



1002



1029 TiN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1031	◐	○									○		
1028	◐	◐	○								◐		
1002	◐	◐	○								◐		
1029	●	●	◐								●	●	●

Part No.	⌀ h 8 mm	1031	1028	1002	1029 TiN	Number of drills	Increments mm
0001	1.00– 5.90	17.29	36.79	57.14	83.51	50	0.1
0003	6.00–10.00	41.10	79.23	120.34	188.78	41	0.1
0005	1.00–10.00	7.83	22.99	34.82	59.16	19	0.5
0007	1.00–10.50	16.65	34.82	50.70	93.36	24	0.5 + K.B*)
0009	1.00–13.00	17.94	35.87	77.94	126.74	25	0.5
0170	1.00–10.00	65.24	–	–	–	170	0.5
		(102)	(100)	(105)	(100)		

*) With intermediate sizes for tapping holes. 1 of ⌀ 3.3 – 4.2 – 6.8 – 10.2 mm each.

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Jobber Drills, Parallel Shank

Design: Rolled, standard rake angle, core thickness and core pitch, **with stepped shank.** Elastic and suitable for robust drilling jobs (e.g. hand drilling machines, assembly work, repairs etc.).

HSS | Type N | DIN 338 | 118° | 25–30°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1035	◐	○									○		

Part No.	ø h 8 mm	1035	Twist length mm	Total length mm	Shank ø mm
1050	10.5	1.26	87	133	10
1100	11.0	1.35	94	142	10
1150	11.5	1.48	94	142	10
1200	12.0	1.64	101	151	10
1250	12.5	1.65	101	151	10
1300	13.0	1.92	101	151	10
1350	13.5	2.67	108	151	10
1351	13.5	2.55	108	160	13
1400	14.0	2.67	108	160	10
		(102)			

Part No.	ø h 8 mm	1035	Twist length mm	Total length mm	Shank ø mm
1401	14.0	2.67	108	160	13
1450	14.5	2.85	114	169	10
1451	14.5	2.94	114	169	13
1500	15.0	2.99	114	169	10
1501	15.0	2.95	114	169	13
1550	15.5	3.26	120	178	10
1551	15.5	3.36	120	178	13
1600	16.0	3.26	120	178	10
1601	16.0	3.35	120	178	13
		(102)			

High-quality Case

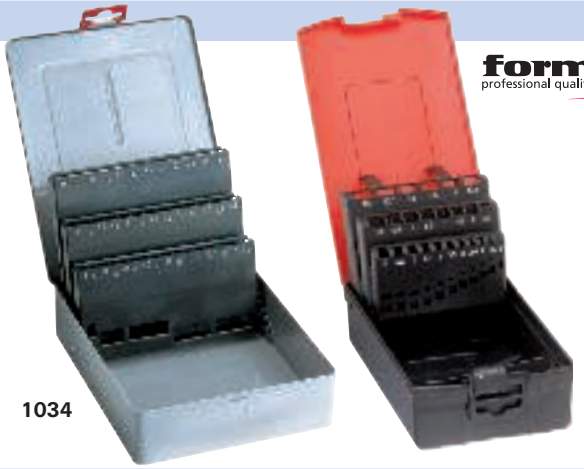
Design: Sturdy, high-quality case with automatic upright setting of the drills when opening the case.

1034 In metal case.

1036 In plastic case.

Part No.	For drills ø mm	1034	1036	Number of drills	Increments mm
0001	1.00– 5.90	9.44	8.99	50	0.1
0003	6.00–10.00	17.04	16.18	41	0.1
0005	1.00–10.00	5.07	4.80	19	0.5
0007	1.00–10.50	9.44	8.98	24	0.5 + K.B*)
0009	1.00–13.00	7.09	6.76	25	0.5
		(100)	(100)		

*) With intermediate sizes for threaded core holes: per unit ø 3.3 – 4.2 – 6.8 – 10.2 mm.



1034 1036

format professional quality

Plastic Cases, empty

Design: For twist drills DIN 338, ø 1.0–13.0 mm x 0.5 mm increments + core hole drills 3.3, 4.2, 6.8, 10.2 mm.
Twist drills measure and align – in one operation.

Function:
1. Insert drill point end into gauge slot.
2. Draw drill downwards through the gauge slot until it stops.
3. Finally slide the drill to the left of the gauge slot until it stops.
4. The drill has now been measured and can be stored in the sized hole above.

format professional quality



Part No.	Capacity mm		1037
0001	up to 4.0	3 drills each	19.15
	4.2– 8.0	2 drills each	
	8.5–13.0	1 drill each	
			(100)

Plastic Drill Store, empty

Design: For storing twist drills.



Part No.	For drills ø mm	1037	For no. of drills	Increments mm
0005	1.00– 5.00	2.01	41	0.1
0010	5.10–10.00	2.44	50	0.1
0015	1.00–13.00	1.58	25	0.5
		(100)		

Jobber Drills, Parallel Shank

Design: Standard rake angle, greater core thickness, standard core pitch with stepped shank. Broad, ground chucking grooves with narrow twist. Profile ground, bright surface. For drilling of soft and long-chipping materials.

HSS | Type W | DIN 338 | 130° | 35–40°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1010												●	◐

Part No.	∅ h 8 mm	1010 mm	Twist length mm	Total length mm
0100	1.0	1.23	12	34
0110	1.1	1.18	14	36
0120	1.2	1.18	16	38
0130	1.3	1.18	16	38
0140	1.4	1.18	18	40
0150	1.5	1.18	18	40
0160	1.6	1.07	20	43
0170	1.7	1.10	20	43
0180	1.8	1.07	22	46
0190	1.9	1.07	22	46
0200	2.0	0.86	24	49
0210	2.1	1.02	24	49
0220	2.2	1.02	27	53
0230	2.3	1.02	27	53
0240	2.4	1.07	30	57
0250	2.5	0.87	30	57
0260	2.6	1.07	30	57
0270	2.7	1.10	33	61
0280	2.8	1.22	33	61
0290	2.9	1.22	33	61
0300	3.0	0.96	33	61
0310	3.1	1.22	36	65
0320	3.2	1.10	36	65
0330	3.3	1.10	36	65
0340	3.4	1.22	39	70
0350	3.5	1.16	39	70
0360	3.6	1.22	39	70
0370	3.7	1.23	39	70
0380	3.8	1.35	43	75
0390	3.9	1.35	43	75
0400	4.0	1.18	43	75
0410	4.1	1.35	43	75
0420	4.2	1.22	43	75
0430	4.3	1.65	47	80
0440	4.4	1.65	47	80
0450	4.5	1.48	47	80
0460	4.6	1.65	47	80
0470	4.7	1.65	47	80
0480	4.8	1.65	52	86
0490	4.9	1.65	52	86
0500	5.0	1.58	52	86
0510	5.1	1.78	52	86
0520	5.2	1.83	52	86
		(100)		

Part No.	∅ h 8 mm	1010 mm	Twist length mm	Total length mm
0530	5.3	1.83	52	86
0540	5.4	1.97	57	93
0550	5.5	1.80	57	93
0560	5.6	2.13	57	93
0570	5.7	2.13	57	93
0580	5.8	2.13	57	93
0590	5.9	2.13	57	93
0600	6.0	2.13	57	93
0610	6.1	2.13	63	101
0620	6.2	2.13	63	101
0630	6.3	2.31	63	101
0640	6.4	2.31	63	101
0650	6.5	2.18	63	101
0660	6.6	2.61	63	101
0670	6.7	2.63	63	101
0680	6.8	2.79	69	109
0690	6.9	2.79	69	109
0700	7.0	2.51	69	109
0710	7.1	3.46	69	109
0720	7.2	3.46	69	109
0730	7.3	3.46	69	109
0740	7.4	3.46	69	109
0750	7.5	2.87	69	109
0760	7.6	3.80	75	117
0770	7.7	3.80	75	117
0780	7.8	3.80	75	117
0790	7.9	4.44	75	117
0800	8.0	3.21	75	117
0820	8.2	4.73	75	117
0850	8.5	3.70	75	117
0880	8.8	5.55	81	125
0900	9.0	3.97	81	125
0920	9.2	6.25	81	125
0950	9.5	4.70	81	125
0980	9.8	7.24	87	133
1000	10.0	4.96	87	133
1020	10.2	7.51	87	133
1050	10.5	6.07	87	133
1100	11.0	7.24	94	142
1150	11.5	8.17	94	142
1200	12.0	8.85	101	151
1250	12.5	8.85	101	151
1300	13.0	10.43	101	151
		(100)		

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Twist Drills Parallel Shank

Design: Robust high-performance twist drill with distinct heat-hardness stability and wide rake angle. Profile ground. With special point.

HSS Co5 | Type Ti | DIN 338 | 130° | 35°

1013 Blank

1014 Blank

1016 TiN coated

1017 Fire coated

1018 **Design:** HSS Co5, type GU 500 DZ, DIN 338. Sturdy design, profile ground, right-hand cutting, with precisely ground tip as well as special point thinning and distinctive heat hardness. Rake angle larger than normal (38°), core thickness and core pitch normal. ∅ tolerance: h8

Application: Especially suitable for titanium and titanium alloys. Also for high-tensile and short-chipping steel in case of short drilling depths up to 3 x D. TiN coated. Rake angle larger than normal (38°). Core thickness normal.

HSS Co5 | Type GU 500DZ | DIN 338 | 118° | 38°



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1013	◐	◐	○						●	●	○	●	◐
1014	◐	◐	○						●	●	○	●	◐
1016	◐	◐	◐	●	○				●	●	◐	◐	◐
1017	◐	◐	◐	●	◐				○	◐	●		◐
1018	●	●	◐	○					●	●	●	●	●

Part No.	∅ h 8 mm	1013	1014	1016 TiN	1017 Fire	1018 TiN	Twist length mm	Total length mm
0100	1.0	0.90	2.07	3.03	6.00	2.61	12	34
0110	1.1	0.82	2.13	3.03	–	2.84	14	36
0120	1.2	0.82	2.33	3.19	–	2.79	16	38
0130	1.3	0.82	2.20	3.13	–	2.84	16	38
0140	1.4	0.82	2.09	3.03	–	2.89	18	40
0150	1.5	0.76	1.92	2.89	5.76	2.71	18	40
0160	1.6	0.82	2.09	3.03	–	2.71	20	43
0170	1.7	0.82	2.13	3.03	–	2.93	20	43
0180	1.8	0.82	2.09	3.03	–	2.89	22	46
0190	1.9	0.82	2.13	3.03	–	2.89	22	46
0200	2.0	0.76	1.73	2.78	5.57	2.79	24	49
0210	2.1	0.78	2.26	3.13	–	2.93	24	49
0220	2.2	0.78	2.26	3.13	–	3.08	27	53
0230	2.3	0.78	2.26	3.13	–	2.98	27	53
0240	2.4	0.82	2.29	3.19	–	2.79	30	57
0250	2.5	0.84	1.86	2.81	5.67	2.84	30	57
0260	2.6	0.89	2.34	3.19	–	2.98	30	57
0270	2.7	0.94	2.34	3.19	–	3.15	33	61
0280	2.8	0.94	2.37	3.26	–	3.11	33	61
0290	2.9	0.96	2.37	3.26	–	3.15	33	61
0300	3.0	0.90	1.86	2.81	5.67	3.03	33	61
0310	3.1	0.94	2.44	3.26	6.32	3.33	36	65
0320	3.2	0.94	2.09	3.03	6.00	3.26	36	65
0330	3.3	0.96	2.13	3.03	6.00	3.33	36	65
0340	3.4	1.10	2.57	3.38	–	3.57	39	70
0350	3.5	1.07	2.07	3.03	6.00	3.62	39	70
0360	3.6	1.07	2.62	3.38	–	3.67	39	70
0370	3.7	1.07	2.67	3.46	–	3.67	39	70
0380	3.8	1.17	2.71	3.46	–	3.85	43	75
0390	3.9	1.21	2.85	3.53	–	3.94	43	75
0400	4.0	1.13	2.24	3.13	6.14	3.75	43	75
0410	4.1	1.18	2.85	3.53	6.79	3.85	43	75
		(100)	(107)	(100)	(103)	(115)		

Continued overleaf

Twist Drills Parallel Shank

Continued

Part No.	∅ h 8 mm	1013	1014	1016	1017	1018	Twist length mm	Total length mm
0420	4.2	1.17	2.85	3.53	6.79	3.85	43	75
0430	4.3	1.23	2.85	3.53	–	4.12	47	80
0440	4.4	1.23	2.90	3.61	–	4.12	47	80
0450	4.5	1.21	2.85	3.53	6.79	4.04	47	80
0460	4.6	1.22	3.05	3.68	–	4.26	47	80
0470	4.7	1.22	3.05	3.77	–	4.26	47	80
0480	4.8	1.22	3.14	3.77	–	4.34	52	86
0490	4.9	1.23	3.20	3.83	–	4.41	52	86
0500	5.0	1.23	2.76	3.46	6.66	4.31	52	86
0510	5.1	1.29	3.20	3.83	7.22	4.41	52	86
0520	5.2	1.29	3.29	3.83	7.22	4.41	52	86
0530	5.3	1.29	3.29	3.89	–	4.85	52	86
0540	5.4	1.65	3.62	4.10	–	5.30	57	93
0550	5.5	1.58	3.80	4.23	7.91	5.12	57	93
0560	5.6	1.72	3.67	4.10	–	5.40	57	93
0570	5.7	1.72	3.67	4.10	–	5.40	57	93
0580	5.8	1.72	3.67	4.10	7.68	5.40	57	93
0590	5.9	1.72	3.67	4.10	–	5.49	57	93
0600	6.0	1.62	3.58	3.97	7.54	5.22	57	93
0610	6.1	1.93	4.11	6.26	–	5.86	63	101
0620	6.2	1.93	4.11	6.26	–	5.77	63	101
0630	6.3	1.93	4.11	6.26	–	5.67	63	101
0640	6.4	2.09	4.47	6.48	–	5.77	63	101
0650	6.5	1.92	4.05	6.20	11.95	6.23	63	101
0660	6.6	2.09	4.47	6.48	–	6.41	63	101
0670	6.7	2.09	4.47	6.48	–	6.51	63	101
0680	6.8	2.23	4.97	6.84	12.88	7.05	69	109
0690	6.9	2.23	4.97	6.84	–	7.15	69	109
0700	7.0	2.03	4.25	6.35	12.17	7.05	69	109
0710	7.1	2.73	5.82	7.49	–	7.79	69	109
0720	7.2	2.73	5.82	7.49	–	7.79	69	109
0730	7.3	2.73	5.82	7.49	–	8.15	69	109
0740	7.4	2.73	5.82	7.49	–	8.15	69	109
0750	7.5	2.13	4.57	6.57	12.42	7.42	69	109
0760	7.6	3.29	7.20	8.48	–	8.88	75	117
0770	7.7	3.29	7.20	8.48	–	8.70	75	117
0780	7.8	3.29	7.20	8.48	–	8.79	75	117
0790	7.9	3.29	7.20	8.48	–	9.25	75	117
0800	8.0	2.52	5.62	7.32	13.81	8.42	75	117
0810	8.1	3.14	7.20	–	–	9.15	75	117
0820	8.2	3.14	7.53	8.61	–	9.07	75	117
0830	8.3	3.29	7.53	–	–	9.07	75	117
0840	8.4	3.29	7.81	–	–	9.52	75	117
0850	8.5	2.61	5.62	7.32	13.81	8.60	75	117
0860	8.6	3.86	8.33	–	–	–	81	125
0870	8.7	3.86	8.33	–	–	–	81	125
0880	8.8	3.97	8.92	9.60	–	10.08	81	125
0890	8.9	3.97	9.44	–	–	–	81	125
0900	9.0	3.38	7.33	8.48	15.45	9.52	81	125
0910	9.1	4.32	9.77	–	–	–	81	125
0920	9.2	4.32	10.48	10.73	–	–	81	125
0930	9.3	4.71	10.73	–	–	10.26	81	125
0940	9.4	4.71	11.68	–	–	–	81	125
0950	9.5	3.43	8.58	9.44	–	9.98	81	125
0960	9.6	4.82	12.14	–	–	–	87	133
0970	9.7	4.82	12.14	–	–	–	87	133
0980	9.8	4.93	12.14	11.73	–	11.63	87	133
0990	9.9	4.93	12.14	–	–	–	87	133
1000	10.0	3.86	8.24	9.19	16.62	11.26	87	133
1010	10.1	6.64	14.30	10.73	–	–	87	133
1020	10.2	5.46	11.68	11.58	20.36	13.01	87	133
1050	10.5	5.46	12.14	11.73	20.60	13.09	87	133
1080	10.8	11.04	25.25	15.81	–	–	94	142
1100	11.0	6.88	13.10	12.58	22.00	13.56	94	142
1120	11.2	12.17	25.25	17.31	–	–	94	142
1150	11.5	8.03	16.91	15.26	26.22	15.01	94	142
1180	11.8	13.30	30.01	19.68	–	–	94	142
1200	12.0	8.17	19.06	16.66	28.56	16.03	101	151
1220	12.2	13.79	30.48	16.70	–	–	101	151
1250	12.5	10.56	22.39	19.18	32.30	16.67	101	151
1280	12.8	16.06	24.30	25.90	–	–	101	151
1300	13.0	11.82	24.30	20.32	33.70	17.77	101	151
		(100)	(107)	(100)	(103)	(115)		

Twist Drill Sets

HSS Co5 | Type Ti | DIN 338 | 130° | 35°

Design: HSS Co5, type Ti, DIN 338.
Profile ground, right-hand cutting, blank, with precisely ground tip as well as special point thinning and distinctive heat hardness. Rake angle larger than normal (35°), greater core thickness and normal core pitch.

1030 Set includes (part no. 1013).
Supplied in sturdy, high-quality plastic case with automatic upright setting of the drills when opening the case.

1014 Set includes (part no. 1014). In sturdy, high-quality metal case with automatic upright setting of the drills when opening the case.



1030 format professional quality



1014

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1030	◐	◐	○						●	●	○	●	◐
1014	◐	◐	○						●	●	○	●	◐

Part No.	∅ h 8 mm	1030	1014	Number of drills	Increments mm
0001	1.00– 5.90	72.24	161.97	50	0.1
0003	6.00–10.00	148.39	347.74	41	0.1
0005	1.00–10.00	41.53	91.47	19	0.5
0007	1.00–10.50	65.14	140.06	24	0.5 + K.B*)
0009	1.00–13.00	91.15	231.51	25	0.5
		(100)	(107)		

*) With intermediate sizes for tapping holes: 1 of ∅ 3.3 – 4.2 – 6.8 – 10.2 mm each.

Twist Drills, Parallel Shank

Design: Especially robust twist drill with distinct heat-hardness stability and wide rake angle. Ideal for drilling depths above 3 x D, due to chamfer nitration (from 2.4 mm). Profile ground.

HSS Co5 | Type TF | DIN 338 | 130° | 38°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1022	●	●	●	○					◐		◐	○	●

Part No.	ø h 8 mm	1022 mm/mm	Twist length mm	Total length mm
0100	1.0	1.70	12	34
0110	1.1	1.76	14	36
0120	1.2	1.76	16	38
0130	1.3	1.72	16	38
0140	1.4	1.76	18	40
0150	1.5	1.58	18	40
0160	1.6	1.59	20	43
0170	1.7	1.59	20	43
0180	1.8	1.59	22	46
0190	1.9	1.59	22	46
0200	2.0	1.44	24	49
0210	2.1	1.58	24	49
0220	2.2	1.58	27	53
0230	2.3	1.58	27	53
0240	2.4	1.58	30	57
0250	2.5	1.48	30	57
0260	2.6	1.58	30	57
0270	2.7	1.69	33	61
0280	2.8	1.72	33	61
0290	2.9	1.72	33	61
0300	3.0	1.55	33	61
0310	3.1	1.69	36	65
0320	3.2	1.76	36	65
0330	3.3	1.82	36	65
0340	3.4	2.03	39	70
0350	3.5	1.69	39	70
0360	3.6	1.97	39	70
0370	3.7	2.03	39	70
0380	3.8	2.14	43	75
0390	3.9	2.26	43	75
0400	4.0	1.83	43	75
0410	4.1	2.26	43	75
0420	4.2	2.13	43	75
		(100)		

Part No.	ø h 8 mm	1022 mm/mm	Twist length mm	Total length mm
0430	4.3	2.37	47	80
0440	4.4	2.37	47	80
0450	4.5	2.18	47	80
0460	4.6	2.51	47	80
0470	4.7	2.51	47	80
0480	4.8	2.51	52	86
0490	4.9	2.58	52	86
0500	5.0	2.28	52	86
0510	5.1	2.58	52	86
0520	5.2	2.72	52	86
0530	5.3	2.72	52	86
0540	5.4	2.92	57	93
0550	5.5	2.72	57	93
0560	5.6	2.94	57	93
0570	5.7	2.94	57	93
0580	5.8	2.99	57	93
0590	5.9	3.20	57	93
0600	6.0	2.99	57	93
0610	6.1	3.20	63	101
0620	6.2	3.36	63	101
0630	6.3	3.74	63	101
0640	6.4	3.74	63	101
0650	6.5	3.29	63	101
0660	6.6	3.80	63	101
0670	6.7	3.80	63	101
0680	6.8	3.95	69	109
0690	6.9	4.17	69	109
0700	7.0	3.51	69	109
0710	7.1	5.50	69	109
0720	7.2	5.50	69	109
0730	7.3	5.50	69	109
0740	7.4	5.50	69	109
0750	7.5	4.13	69	109
		(100)		

Part No.	ø h 8 mm	1022 mm/mm	Twist length mm	Total length mm
0760	7.6	6.03	75	117
0770	7.7	6.03	75	117
0780	7.8	6.03	75	117
0790	7.9	6.03	75	117
0800	8.0	4.65	75	117
0810	8.1	6.42	75	117
0820	8.2	6.64	75	117
0830	8.3	7.09	75	117
0840	8.4	7.09	75	117
0850	8.5	5.27	75	117
0860	8.6	7.91	81	125
0870	8.7	7.91	81	125
0880	8.8	7.91	81	125
0890	8.9	8.10	81	125
0900	9.0	6.07	81	125
0910	9.1	8.55	81	125
0920	9.2	9.29	81	125
0930	9.3	9.29	81	125
0940	9.4	9.29	81	125
0950	9.5	6.57	81	125
0960	9.6	9.76	87	133
0970	9.7	10.66	87	133
0980	9.8	10.66	87	133
0990	9.9	10.66	87	133
1000	10.0	7.49	87	133
1020	10.2	10.37	87	133
1050	10.5	9.43	87	133
1100	11.0	11.55	94	142
1150	11.5	13.57	94	142
1200	12.0	14.33	101	151
1250	12.5	17.68	101	151
1300	13.0	17.68	101	151
		(100)		

Twist Drill Sets

Design: In sturdy, high-quality plastic case.
Twist Drill Sets HSS-E profile ground, type 1022.

HSS Co5 | Type TF | DIN 338 | 130° | 38°

format professional quality

Part No.	ø h 8 mm	1032 mm/mm	Number of drills	Increments mm
0007	1.00–10.50	97.74	24	0.5 + K.B*)
0009	1.00–13.00	152.50	25	0.5
		(100)		

*) With intermediate sizes for threaded core holes: per unit ø 3.3 – 4.2 – 6.8 – 10.2 mm.



All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Twist Drills, Parallel Shank

Design: Especially robust twist drill with distinct heat-hardness stability and wide rake angle, without point. Profile ground.

HSS Co5 | Type INOX | DIN 338 | 130° | 35°

1025 Blank



1025 format professional quality

1026 Blank



1026 DIHINOX

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1025									●	○	○	●	●
1026									●	○	○	●	●

Part No.	∅ h 8 mm	1025	1026	Twist length mm	Total length mm
0100	1.0	0.86	2.76	12	34
0110	1.1	–	2.82	14	36
0120	1.2	–	3.05	16	38
0130	1.3	–	2.95	16	38
0140	1.4	–	2.82	18	40
0150	1.5	1.02	2.57	18	40
0160	1.6	–	2.82	20	43
0170	1.7	–	2.85	20	43
0180	1.8	–	2.82	22	46
0190	1.9	–	2.85	22	46
0200	2.0	0.84	2.34	24	49
0210	2.1	–	3.00	24	49
0220	2.2	–	3.00	27	53
0230	2.3	–	3.00	27	53
0240	2.4	–	3.05	30	57
0250	2.5	0.84	2.47	30	57
0260	2.6	–	3.14	30	57
0270	2.7	–	3.14	33	61
0280	2.8	–	3.20	33	61
0290	2.9	–	3.20	33	61
0300	3.0	0.87	2.47	33	61
0310	3.1	1.07	3.29	36	65
0320	3.2	1.03	2.82	36	65
0330	3.3	1.07	2.82	36	65
0340	3.4	–	3.42	39	70
0350	3.5	0.94	2.76	39	70
0360	3.6	–	3.58	39	70
0370	3.7	–	3.58	39	70
0380	3.8	–	3.67	43	75
0390	3.9	–	3.77	43	75
0400	4.0	1.05	2.95	43	75
0410	4.1	1.30	3.77	43	75
0420	4.2	1.21	3.80	43	75
0430	4.3	–	3.80	47	80
0440	4.4	–	3.86	47	80
0450	4.5	1.23	3.77	47	80
0460	4.6	–	4.05	47	80
0470	4.7	–	4.15	47	80
0480	4.8	–	4.15	52	86
0490	4.9	–	4.39	52	86
0500	5.0	1.30	3.67	52	86
0510	5.1	1.61	4.39	52	86
0520	5.2	1.53	4.39	52	86
0530	5.3	–	4.47	52	86
0550	5.5	1.55	5.19	57	93
0560	5.6	–	4.97	57	93
0570	5.7	–	4.97	57	93
0580	5.8	1.70	4.97	57	93
		(100)	(107)		

Part No.	∅ h 8 mm	1025	1026	Twist length mm	Total length mm
0590	5.9	–	4.97	57	93
0600	6.0	1.71	4.81	57	93
0610	6.1	–	5.49	63	101
0620	6.2	–	5.49	63	101
0630	6.3	–	5.49	63	101
0640	6.4	–	6.04	63	101
0650	6.5	1.85	5.38	63	101
0660	6.6	–	6.04	63	101
0670	6.7	–	6.04	63	101
0680	6.8	2.23	6.57	69	109
0690	6.9	–	6.57	69	109
0700	7.0	1.96	5.72	69	109
0710	7.1	–	7.76	69	109
0720	7.2	–	7.76	69	109
0730	7.3	–	7.76	69	109
0740	7.4	–	7.76	69	109
0750	7.5	2.36	6.14	69	109
0770	7.7	–	9.44	75	117
0780	7.8	–	9.44	75	117
0790	7.9	–	9.44	75	117
0800	8.0	2.53	7.53	75	117
0810	8.1	–	9.44	75	117
0820	8.2	–	10.00	75	117
0830	8.3	–	10.00	75	117
0840	8.4	–	10.48	75	117
0850	8.5	2.79	7.43	75	117
0860	8.6	–	10.95	81	125
0870	8.7	–	10.95	81	125
0880	8.8	–	11.91	81	125
0890	8.9	–	12.38	81	125
0900	9.0	2.99	9.52	81	125
0910	9.1	–	13.57	81	125
0920	9.2	–	14.05	81	125
0950	9.5	–	11.20	81	125
0970	9.7	–	16.44	87	133
0980	9.8	–	16.44	87	133
1000	10.0	3.21	10.73	87	133
1010	10.1	–	18.33	87	133
1020	10.2	5.75	15.26	87	133
1050	10.5	5.30	16.19	87	133
1080	10.8	–	32.87	94	142
1100	11.0	5.75	17.37	94	142
1120	11.2	–	33.83	94	142
1150	11.5	6.13	22.39	94	142
1180	11.8	–	39.06	94	142
1200	12.0	7.17	25.25	101	151
1250	12.5	17.72	–	101	151
1300	13.0	19.52	–	101	151
		(100)	(107)		

Twist Drill Sets

Design: In case.

HSS Co5 | Type INOX | DIN 338 | 130° | 35°

1033 Set includes (part no. 1025).
Supplied in sturdy, high-quality plastic case with automatic upright setting of the drills when opening the case.

1026 Set includes (part no. 1026). In sturdy, high-quality metal case with automatic upright setting of the drills when opening the case.

Part No.	⌀ h 8 mm	1033 Set	1026 Set	Number of drills	Increments mm
0007	1.00–10.50	112.24	154.53	24	0.5 + K.B*)
0009	1.00–13.00	176.98	253.55	25	0.5
		(100)	(107)		

*) With intermediate sizes for tapping drill holes. 1 of ⌀ 3.3 – 4.2 – 6.8 – 10.2 mm each.



1033 format professional quality



1026 DIN NK

Long Series Twist Drills, Parallel Shank

Design: Standard drill for drilling deep holes. Standard rake angle, greater core thickness, standard core pitch.

HSS | Type N | DIN 340 | 118° | 25–30°

1048 Rolled. For robust drilling jobs (e.g. hand drilling machines, for assembly work, repairs etc.).



1048 format professional quality

1045 Profile ground, bright, from ⌀ 2.5 mm steam tempered.



1045 format professional quality

1046 Profile ground, bright, from ⌀ 2.5 mm steam tempered.



1046 DIN NK

HSS Co5 | Type TF | DIN 340 | 130° | 38°

1051 Profile ground. Greater rake angle, extremely greater core thickness, no core pitch. Robust jobber drill, retains hardness when exposed to heat. Large chipping range, bright, from ⌀ 2.5 mm chamfer nitration.



1051 format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1048	○	○									◐		
1045	◐	◐	○								◐		
1046	◐	◐	○								◐		
1051	●	●	●	○					◐		◐	○	◐

Part No.	⌀ h 8 mm	1048	1045	1046	1051	Twist length mm	Total length mm
0100	1.0	0.36	1.59	2.58	3.91	33	56
0150	1.5	0.38	1.13	1.85	3.74	45	70
0200	2.0	0.41	0.76	1.26	2.92	56	85
0250	2.5	0.41	0.80	1.32	3.06	62	95
0300	3.0	0.42	0.84	1.33	3.20	66	100
0310	3.1	0.46	1.03	1.66	3.91	69	106
0320	3.2	0.46	0.87	1.44	3.80	69	106
0330	3.3	0.46	0.97	1.62	4.13	69	106
0350	3.5	0.46	0.96	1.59	4.65	73	112

Continued overleaf

Long Series Twist Drills, Parallel Shank

Continued

Part No.	∅ h 8 mm	1048	1045	1046	1051	Twist length mm	Total length mm
0400	4.0	0.50	1.07	1.76	4.04	78	119
0410	4.1	0.55	1.26	2.04	4.36	78	119
0420	4.2	0.55	1.07	1.77	4.49	78	119
0450	4.5	0.55	1.21	1.98	4.77	82	126
0500	5.0	0.57	1.34	2.20	4.77	87	132
0510	5.1	0.63	1.76	2.42	5.65	87	132
0520	5.2	0.63	1.49	2.46	5.88	87	132
0550	5.5	0.63	1.56	2.53	5.72	91	139
0580	5.8	0.70	1.56	2.58	6.42	91	139
0600	6.0	0.70	1.69	2.74	5.94	91	139
0650	6.5	0.74	1.80	2.95	6.71	97	148
0680	6.8	0.87	2.60	4.22	8.23	102	156
0700	7.0	0.87	2.13	3.46	7.49	102	156
0750	7.5	1.08	2.51	4.09	8.85	102	156
0800	8.0	1.30	2.51	4.09	8.23	109	165
0850	8.5	1.37	2.89	4.71	10.37	109	165
0900	9.0	1.48	3.06	4.92	10.21	115	175
0950	9.5	1.82	3.68	5.92	14.04	115	175
1000	10.0	2.07	3.61	5.84	15.26	121	184
1050	10.5	2.40	5.11	8.33	20.72	121	184
1100	11.0	2.40	5.28	8.55	23.00	128	195
1150	11.5	2.94	5.87	9.60	28.03	128	195
1200	12.0	2.99	6.67	10.84	28.20	134	205
1250	12.5	3.42	6.67	10.84	31.61	134	205
1300	13.0	3.42	7.05	11.47	33.27	134	205
		(102)	(100)	(101)	(100)		

Further dimensions available on request.

Extra-long Twist Drills, Parallel Shank

Design: Increased rake angle, much greater core thickness, no core pitch. Wide flutes with rounded heel. Surface with nitrided lands, bright ground flutes. Special drill bit for drilling of extremely deep holes, in case of little chip removal and poor cooling. For bore holes up to 10 x D. Profile ground.

HSS | Type TF | DIN 1869 | 130° | 38°

1067 Bright, from ∅ 2.4 mm with chamfer nitration.



1067 format professional quality

1068 TiN coated.



1068 TiN

HSS Co5 | Type TF | DIN 1869 | 130° | 38°

1071 TiAlN-2 coated.



1071 TiAlN-2 format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1067	●	●	○						○		◐	○	◐
1068	●	●	○						○		◐	○	◐
1071	●	●	◐						○	◐	●		◐

Part No.	∅ h 8 x Total length mm	1067	1068	1071	Twist length mm	Series
0001	3.0 x 150	4.52	16.40	–	100	1
0003	3.0 x 190	6.08	–	–	130	2
0005	3.5 x 165	4.52	16.40	–	115	1
0007	3.5 x 210	6.16	–	17.31	145	2
		(100)	(111)	(100)		

Continued overleaf

Long Series Twist Drills, Parallel Shank

Continued

Part No.	∅ h 8 x Total length mm	1067	1068	1071	Twist length mm	Series
0009	4.0 x 175	4.61	16.40	7.01	120	1
0011	4.0 x 220	6.57	–	17.66	150	2
0013	4.0 x 280	8.26	–	22.67	190	3
0015	4.5 x 185	4.98	17.33	15.47	125	1
0017	4.5 x 235	6.96	–	18.21	160	2
0019	5.0 x 195	5.30	17.77	7.86	135	1
0021	5.0 x 245	6.96	–	18.91	170	2
0023	5.0 x 315	10.00	–	25.66	210	3
0025	5.5 x 205	5.78	18.46	9.41	140	1
0027	5.5 x 260	8.61	–	20.49	180	2
0029	6.0 x 205	5.78	18.46	9.14	140	1
0031	6.0 x 260	8.42	–	15.31	180	2
0033	6.0 x 330	11.47	–	26.84	225	3
0035	6.5 x 215	8.88	32.36	–	150	1
0037	6.5 x 275	9.71	–	23.00	190	2
0038	6.8 x 225	9.84	36.45	14.56	155	1
0039	7.0 x 225	8.26	32.80	15.09	155	1
0040	7.5 x 225	9.17	34.64	23.51	155	1
0041	7.0 x 290	10.62	–	24.03	200	2
0042	7.5 x 290	12.07	–	25.68	200	2
0043	8.0 x 240	10.32	36.45	16.37	165	1
0045	8.0 x 305	12.35	–	28.37	210	2
0047	8.0 x 390	18.47	–	31.54	265	3
0049	8.5 x 240	13.30	41.01	18.65	165	1
0051	8.5 x 305	19.43	–	27.88	210	2
0053	9.0 x 250	14.19	42.83	25.43	175	1
0054	9.0 x 320	18.26	–	30.88	220	2
0055	10.0 x 265	14.69	43.29	25.68	185	1
0056	9.5 x 320	21.04	–	32.16	220	2
0057	10.0 x 340	20.00	–	33.38	235	2
0059	10.0 x 430	29.36	–	42.97	295	3
0060	10.2 x 340	–	–	35.68	235	2
0061	10.5 x 340	29.47	–	–	235	2
0063	12.0 x 375	35.61	–	–	260	2
0065	12.0 x 480	44.28	–	–	330	3
		(100)	(111)	(100)		

Taper Pin Hole Drills, Parallel Shank

Design: For conical holes 1:50 in a single work step for tapered pins according to ISO 2339 (DIN 1) and ISO 8736 (DIN 7978). From ∅ 2.5 mm steam tempered.

HSS | Type N | DIN 1898/1 | 118° | 1:50



Part No.	∅ h 8 mm	1052	Twist length mm	Total length mm
0250	2.5	15.57	52	86
0300	3.0	18.24	63	100
0400	4.0	19.70	74	112
0500	5.0	24.08	81	122
		(109)		

Part No.	∅ h 8 mm	1052	Twist length mm	Total length mm
0600	6.0	26.76	114	160
0800	8.0	43.30	157	207
1000	10.0	57.89	190	245
1200	12.0	72.99	228	290
		(109)		

Other dimensions available on request.

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Morse Taper Shank Drills

Design: Standard rake angle, greater core thickness, standard core pitch.

1083 Rolled. Standard helix angle core thickness and web suitable for robust drilling work (e.g. assembly, repairs etc.).

1080 Profile ground, high concentricity and pitch accuracy, precisely ground point. Surface steam tempered.

1081 Profile ground, high concentricity and pitch accuracy, precisely ground point. Surface steam tempered.

1082 Profile ground. Robust twist drill, outstanding heat resistance and great rake angle, no pointing. Bright surface.

HSS | Type N | DIN 345 | MK 1–4 | 118° | 25–30°



1083 format professional quality



1080 format professional quality



1081

HSS Co5 | Type INOX | DIN 345 | MK 1–4 | 130° | 38°



1082

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1083	◐	○									◐		○
1080	●	●	◐								●		
1081	●	●	◐								●		
1082	○	◐							●	◐	○	●	●

Part No.	⌀ h 8 mm	1083	1080	1081	1082	Twist length mm	Total length mm	MT
1000	10.00	2.20	6.42	9.81	28.58	87	168	1
1020	10.20	–	–	–	29.53	87	168	1
1025	10.25	–	9.35	15.01	–	87	168	1
1050	10.50	2.25	6.62	10.21	29.53	87	168	1
1075	10.75	–	9.22	14.40	–	94	168	1
1080	10.80	–	–	–	38.12	94	175	1
1100	11.00	2.37	6.82	10.63	30.48	94	175	1
1120	11.20	–	–	–	40.49	94	175	1
1125	11.25	–	8.66	14.80	–	94	175	1
1150	11.50	2.41	7.86	12.10	37.63	94	175	1
1175	11.75	–	9.09	14.59	–	94	175	1
1180	11.80	–	–	–	35.25	94	175	1
1200	12.00	2.37	7.09	10.84	32.39	101	182	1
1220	12.20	–	–	–	44.31	101	182	1
1225	12.25	–	9.22	15.85	–	101	182	1
1250	12.50	2.65	7.48	11.47	33.83	101	182	1
1275	12.75	–	9.22	14.80	–	101	182	1
1300	13.00	2.78	7.76	11.89	36.68	101	182	1
1325	13.25	–	9.49	15.44	–	108	189	1
1350	13.50	3.03	8.81	13.36	42.88	108	189	1
1375	13.75	–	10.02	16.06	–	108	189	1
1380	13.80	–	–	–	48.59	108	189	1
1400	14.00	3.09	8.17	12.51	39.06	108	189	1
1425	14.25	–	8.96	19.39	58.12	114	212	2
1450	14.50	3.26	8.55	13.14	45.74	114	212	2
1475	14.75	–	13.10	21.26	57.65	114	212	2
1500	15.00	3.62	9.09	13.97	46.68	114	212	2
1525	15.25	–	12.13	19.60	59.54	120	218	2
1550	15.50	3.75	9.76	15.01	44.78	120	218	2
1575	15.75	–	11.11	18.76	50.01	120	218	2
1600	16.00	3.59	9.76	15.01	48.59	120	218	2
1625	16.25	–	14.94	23.35	65.74	125	223	2
1650	16.50	4.23	10.56	16.28	50.01	125	223	2
1675	16.75	–	14.94	20.44	53.35	125	223	2
1700	17.00	4.09	10.94	16.88	46.68	125	223	2
1725	17.25	–	13.77	22.10	–	130	228	2
		(102)	(100)	(101)	(107)			

Continued overleaf

Morse Taper Shank Drills

Continued

Part No.	ø h 8 mm	1083	1080	1081	1082	Twist length mm	Total length mm	MT
1750	17.50	4.23	11.25	17.30	51.45	130	228	2
1775	17.75	–	13.90	21.26	46.68	130	228	2
1800	18.00	4.65	11.76	18.14	52.89	130	228	2
1825	18.25	–	14.18	24.18	62.41	135	233	2
1850	18.50	5.06	9.49	19.60	51.45	135	233	2
1875	18.75	–	14.89	23.35	65.26	135	233	2
1900	19.00	4.57	12.70	19.60	54.78	135	233	2
1925	19.25	–	15.90	27.11	70.03	140	238	2
1950	19.50	5.39	14.72	22.52	59.54	140	238	2
1975	19.75	–	16.57	26.26	72.88	140	238	2
2000	20.00	4.86	13.51	20.65	59.07	140	238	2
2025	20.25	–	18.16	30.45	83.86	145	243	2
2050	20.50	5.96	14.31	22.10	63.84	145	243	2
2075	20.75	–	16.25	29.61	80.98	145	243	2
2100	21.00	5.80	15.23	23.35	70.03	145	243	2
2125	21.25	–	20.52	32.10	–	150	248	2
2150	21.50	6.68	17,51	26.69	71.95	150	248	2
2175	21.75	–	19.77	30.02	104.80	150	248	2
2200	22.00	6.53	16.94	25.85	74.79	150	248	2
2225	22.25	–	20.32	32.10	–	150	248	2
2250	22.50	7.25	18.30	28.36	91.94	155	253	2
2275	22.75	–	20.83	32.10	–	155	253	2
2300	23.00	7.51	19.92	30.45	81.95	155	253	2
2325	23.25	–	25.11	36.29	–	155	276	3
2350	23.50	8.15	19.77	30.02	91.47	155	276	3
2375	23.75	–	27.27	42.13	–	160	281	3
2400	24.00	8.15	20.72	32.10	94.81	160	281	3
2425	24.25	–	30.84	45.04	–	160	281	3
2450	24.50	8.55	21.51	32.94	87.18	160	281	3
2475	24.75	–	29.95	45.87	–	160	281	3
2500	25.00	7.99	22.86	35.45	124.81	160	281	3
2525	25.25	–	33.17	46.70	–	165	286	3
2550	25.50	9.78	23.77	36.29	124.81	165	286	3
2575	25.75	–	31.02	47.55	–	165	286	3
2600	26.00	9.78	26.32	40.45	112.43	165	286	3
2625	26.25	–	35.76	50.46	–	165	286	3
2650	26.50	9.95	25.38	39.20	126.71	165	286	3
2675	26.75	–	40.08	61.30	–	170	291	3
2700	27.00	10.59	26.20	40.45	123.86	170	291	3
2725	27.25	–	39.24	57.14	–	170	291	3
2750	27.50	10.59	27.01	41.28	131.49	170	291	3
2775	27.75	–	38.40	59.22	–	170	291	3
2800	28.00	10.59	28.85	44.21	138.14	170	291	3
2825	28.25	–	43.04	60.88	–	175	296	3
2850	28.50	12.23	35.56	54.63	164.83	175	296	3
2875	28.75	–	40.08	67.55	–	175	296	3
2900	29.00	11.90	31.25	47.95	138.14	175	296	3
2925	29.25	–	44.49	65.05	–	175	296	3
2950	29.50	12.64	32.07	49.62	154.35	175	296	3
2975	29.75	–	40.93	62.98	–	175	296	3
3000	30.00	12.40	31.25	47.95	131.49	175	296	3
3025	30.25	–	45.38	64.22	–	180	301	3
3050	30.50	14.68	38.23	58.79	168.65	180	301	3
3075	30.75	–	48.28	68.39	–	180	301	3
3100	31.00	14.02	37.06	57.14	162.91	180	301	3
3125	31.25	–	49.42	77.15	–	180	301	3
3150	31.50	15.90	42.24	65.05	173.40	180	301	3
3175	31.75	–	47.68	67.55	–	185	306	3
3200	32.00	15.90	39.09	60.06	183.87	185	334	4
3250	32.50	18.75	44.91	68.81	–	185	334	4
3300	33.00	18.75	41.91	64.64	183.87	185	334	4
3350	33.50	19.58	46.43	71.72	–	185	334	4
3400	34.00	18.91	49.11	75.48	177.22	190	339	4
3450	34.50	21.85	54.29	83.40	–	190	339	4
3500	35.00	19.08	49.92	76.72	218.19	190	339	4
3550	35.50	22.03	57.80	89.25	–	190	339	4
3600	36.00	20.55	53.76	82.56	–	195	344	4
3650	36.50	23.81	60.45	92.58	–	195	344	4
3700	37.00	21.20	58.80	90.08	–	195	344	4
3750	37.50	25.45	66.31	101.76	–	195	344	4
3800	38.00	23.33	62.30	95.92	–	200	349	4
3850	38.50	29.35	74.81	115.10	–	200	349	4
3900	39.00	24.78	68.14	105.92	–	200	349	4
		(102)	(100)	(101)	(107)			

Continued overleaf

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

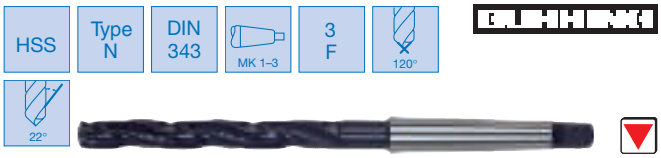
Morse Taper Shank Drills

Continued

Part No.	∅ h 8 mm	1083	1080	1081	1082	Twist length mm	Total length mm	MT
3950	39.50	30.98	85.51	131.78	–	200	349	4
4000	40.00	26.09	70.80	109.25	–	200	349	4
4100	41.00	30.98	76.14	116.77	–	205	354	4
4200	42.00	32.13	82.84	128.45	–	205	354	4
4300	43.00	35.23	88.15	135.12	–	210	359	4
4400	44.00	35.71	92.19	142.62	–	210	359	4
4500	45.00	37.82	96.19	147.62	–	210	359	4
4600	46.00	38.49	100.21	153.46	–	215	364	4
4700	47.00	40.78	106.87	165.15	–	215	364	4
4800	48.00	44.03	109.56	168.48	–	220	369	4
4900	49.00	44.84	114.89	175.99	–	220	369	4
5000	50.00	46.14	117.55	181.81	–	220	369	4
		(102)	(100)	(101)	(107)			

Morse Taper Shank Core Drills

Design: For core drilling of pre-drilled, pre-cast and pre-punched holes. The stable construction and 3 cutting edges enable the correction of any misalignment and concentricity deviation of the prepared bore holes. In addition, the bore wall surface is improved as to enable the further treatment with a reamer. Please see column "Smallest ∅ of the pre-drilled hole". Steam tempered.



Part No.	∅ h 8 mm	1085	Twist length mm	Total length mm	Smallest ∅ pre-drilled hole mm	MT
0780	7.80	17.02	75	156	5.6	1
0880	8.80	19.70	81	162	6.3	1
0980	9.80	18.74	87	168	7	1
1000	10.00	17.52	87	168	7	1
1075	10.75	22.14	94	175	7.7	1
1100	11.00	18.74	94	175	7.7	1
1175	11.75	21.16	101	182	8.4	1
1200	12.00	18.74	101	182	8.4	1
1275	12.75	24.34	101	182	9.1	1
1300	13.00	20.68	101	182	9.1	1
1375	13.75	24.34	108	189	9.8	1
1400	14.00	20.92	108	189	9.8	1
1475	14.75	26.76	114	212	10.5	2
1500	15.00	23.35	114	212	10.5	2
1575	15.75	27.25	120	218	11.2	2
1600	16.00	24.08	120	218	11.2	2
1675	16.75	30.17	125	223	11.9	2
1700	17.00	25.78	125	223	11.9	2
1775	17.75	29.68	130	228	12.6	2
1800	18.00	26.26	130	228	12.6	2
1870	18.70	31.62	135	233	13.3	2
1900	19.00	29.19	135	233	13.3	2
1970	19.70	31.14	140	238	14	2
2000	20.00	29.19	140	238	14	2
2070	20.70	36.98	145	243	14.6	2
2100	21.00	34.54	145	243	14.6	2
2170	21.70	36.98	150	248	15.3	2
2200	22.00	34.54	150	248	15.3	2
2270	22.70	38.93	155	253	16	2
2300	23.00	38.43	155	253	16	2
2370	23.70	42.33	160	281	16.6	3
2400	24.00	39.89	160	281	16.6	3
2470	24.70	43.30	160	281	17.3	3
2500	25.00	42.33	160	281	17.3	3
2570	25.70	47.19	165	286	18	3
2600	26.00	45.26	165	286	18	3
2670	26.70	57.89	170	291	18.6	3
2700	27.00	51.58	170	291	18.6	3
2770	27.70	53.51	170	291	19.3	3
2800	28.00	52.06	170	291	19.3	3
2870	28.70	64.22	175	296	20	3
2900	29.00	57.89	175	296	20	3
2970	29.70	60.82	175	296	20.5	3
3000	30.00	59.84	175	296	20.5	3
		(109)				

Other dimensions or HSS-E versions or solid carbide/carbide tip or long core drills in accordance with DIN 1864 available on request.

Bushing Drills with Morse Taper Shank

Design: Standard rake angle, core thickness and core pitch. Profile ground. Surface steam tempered. For drilling through drill bushes and for deep holes.

HSS | Type N | DIN 341 | MK 1–4 | 118° | 25–30°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1089	◐	◐	◐								◐		

Part No.	ø h 8 mm	1089	Twist length mm	Total length mm	MT
1000	10.0	10.02	116	197	1
1050	10.5	10.29	116	197	1
1100	11.0	10.53	125	206	1
1150	11.5	10.53	125	206	1
1200	12.0	10.53	134	215	1
1250	12.5	10.67	134	215	1
1300	13.0	10.67	134	215	1
1350	13.5	11.90	142	223	1
1400	14.0	12.02	142	223	1
1450	14.5	15.23	147	245	2
1500	15.0	15.09	147	245	2
1550	15.5	14.69	153	251	2
1600	16.0	15.76	153	251	2
1650	16.5	16.56	159	257	2
1700	17.0	16.43	159	257	2
1750	17.5	18.83	165	263	2
1800	18.0	18.68	165	263	2
1850	18.5	22.53	171	269	2
1900	19.0	20.59	171	269	2
1950	19.5	23.61	177	275	2
2000	20.0	22.57	177	275	2
2050	20.5	28.28	184	282	2
2100	21.0	25.74	184	282	2
		(100)			

Part No.	ø h 8 mm	1089	Twist length mm	Total length mm	MT
2150	21.5	30.44	191	289	2
2200	22.0	28.03	191	289	2
2250	22.5	30.98	198	296	2
2300	23.0	29.13	198	296	2
2400	24.0	35.76	206	327	3
2500	25.0	36.08	206	327	3
2600	26.0	41.41	214	335	3
2700	27.0	44.35	222	343	3
2800	28.0	49.40	222	343	3
2900	29.0	57.12	230	351	3
3000	30.0	56.86	230	351	3
3100	31.0	75.07	239	360	3
3200	32.0	79.37	248	397	4
3300	33.0	79.37	248	397	4
3400	34.0	99.56	257	406	4
3500	35.0	96.70	257	406	4
3600	36.0	111.15	267	416	4
3700	37.0	125.57	267	416	4
3800	38.0	119.80	277	426	4
3900	39.0	128.44	277	426	4
4000	40.0	134.22	277	426	4
4500	45.0	225.16	298	447	4
5000	50.0	225.16	321	470	4
		(100)			

Overlength Twist Drills with Morse Taper Shank

Design: Increased rake angle, much greater core thickness, no core pitch. No pointing. Profile ground. Flutes with rounded heels. Up to ⌀ 16 mm with nitrided lands, above this value surface steam treated. For very deep holes.

HSS | Type TF | DIN 1870 | MK 1–3 | 130° | 38°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1092	●	●	◐						○		●	●	●

Part No.	⌀ h 8 x Total length mm	1092	Twist length mm	MT	Series
1080	8.0 x 265	20.87	165	1	1
2080	8.0 x 330	31.94	210	1	2
2085	8.5 x 330	35.63	210	1	2
1090	9.0 x 275	22.80	175	1	1
2090	9.0 x 345	35.97	220	1	2
1100	10.0 x 285	24.07	185	1	1
2100	10.0 x 360	36.35	235	1	2
1105	10.5 x 285	29.35	185	1	1
2105	10.5 x 360	45.49	235	1	2
1110	11.0 x 300	28.05	195	1	1
2110	11.0 x 375	41.63	250	1	2
1115	11.5 x 300	29.49	195	1	1
2115	11.5 x 375	44.12	250	1	2
1120	12.0 x 310	29.83	205	1	1
2120	12.0 x 395	50.45	260	1	2
1125	12.5 x 310	30.79	205	1	1
1130	13.0 x 310	31.12	205	1	1
2130	13.0 x 395	52.92	260	1	2
1135	13.5 x 325	35.92	220	1	1
2135	13.5 x 410	56.45	275	1	2
1140	14.0 x 325	34.93	220	1	1
2140	14.0 x 410	56.45	275	1	2
1145	14.5 x 340	36.24	220	2	1
2145	14.5 x 425	56.82	275	2	2
1150	15.0 x 340	38.19	220	2	1
2150	15.0 x 425	57.12	275	2	2
1155	15.5 x 355	41.68	230	2	1
2155	15.5 x 445	59.63	295	2	2
1160	16.0 x 355	39.77	230	2	1
2160	16.0 x 445	58.56	295	2	2
1165	16.5 x 355	40.10	230	2	1
2165	16.5 x 445	67.06	295	2	2

(100)

Part No.	⌀ h 8 x Total length mm	1092	Twist length mm	MT	Series
1170	17.0 x 355	41.04	230	2	1
2170	17.0 x 445	63.16	295	2	2
1175	17.5 x 370	42.99	245	2	1
2175	17.5 x 465	68.11	310	2	2
1180	18.0 x 370	44.57	245	2	1
2180	18.0 x 465	70.94	310	2	2
1185	18.5 x 370	46.89	245	2	1
2185	18.5 x 465	70.94	310	2	2
1190	19.0 x 370	50.03	245	2	1
2190	19.0 x 465	77.63	310	2	2
1195	19.5 x 385	54.20	260	2	1
2195	19.5 x 490	88.21	325	2	2
1200	20.0 x 385	57.43	260	2	1
2200	20.0 x 490	87.15	325	2	2
1205	20.5 x 385	72.79	260	2	1
1210	21.0 x 385	66.06	260	2	1
2210	21.0 x 490	93.49	325	2	2
1220	22.0 x 405	69.28	270	2	1
2220	22.0 x 515	111.15	345	2	2
1230	23.0 x 405	81.80	270	2	1
2230	23.0 x 515	112.91	345	2	2
1240	24.0 x 440	91.41	290	3	1
2240	24.0 x 555	127.01	365	3	2
1250	25.0 x 440	93.01	290	3	1
2250	25.0 x 555	128.78	365	3	2
1260	26.0 x 440	99.43	290	3	1
2260	26.0 x 555	149.96	365	3	2
1280	28.0 x 460	115.45	305	3	1
2280	28.0 x 580	176.44	385	3	2
1300	30.0 x 460	133.12	305	3	1
2300	30.0 x 580	204.66	385	3	2

(100)

Removable Plate Holders RT 800

Design: High-quality, solid tool steel. Surface nickel-plated. Twisted design with inside cooling for optimal chip removal. Shank with clamping surface to DIN 6535-HE (3 x D and 5 x D), additionally with collar to DIN 6595 (7 x D).

1093 3 x D
1095 5 x D
1096 7 x D



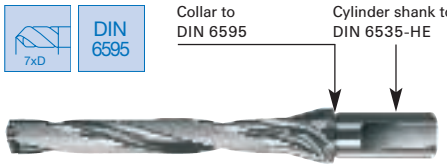




1093

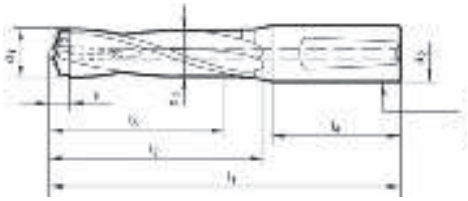


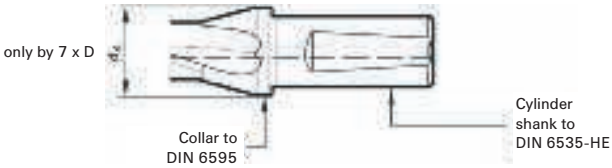
1095



1096

Part No.	Holder size	Cutting edge ∅ range d_1 mm	1093	1095	1096	WP seat width b mm	Holder ∅ d_3 mm	Shank ∅ d_{2h6} mm	Shank length l_4 mm
0001	0.1	16.00–17.00	183.65	196.42	212.38	4.5	15.7	20	50
0002	0.2	17.01–17.99	183.65	196.42	212.38	4.5	16.7	20	50
0011	1.1	18.00–19.00	196.42	212.38	226.76	5.0	17.7	20	50
0012	1.2	19.01–20.00	196.42	212.38	226.76	5.0	18.7	20	50
0021	2.1	20.01–21.00	196.42	212.38	226.76	5.5	19.7	25	56
0022	2.2	21.01–22.50	196.42	212.38	226.76	5.5	20.7	25	56
0031	3.1	22.51–24.00	212.38	226.76	258.69	6.3	22.2	25	56
0032	3.2	24.01–25.50	212.38	226.76	258.69	6.3	23.7	25	56
0041	4.1	25.51–27.50	226.76	258.69	300.21	7.3	25.2	32	60
0042	4.2	27.51–29.50	226.76	258.69	300.21	7.3	27.2	32	60
0051	5.1	29.51–32.00	226.76	258.69	300.21	8.5	29.2	32	60
0052	5.2	32.01–34.50	226.76	258.69	300.21	8.5	31.7	32	60
0061	6.1	34.51–37.50	249.12	282.64	324.17	10.0	34.0	32	60
0062	6.2	37.51–40.50	249.12	282.64	324.17	10.0	37.0	32	60
			(113)	(113)	(113)				





Holder size	1093 3 x D Total length incl. WP l_1 mm	Flute length l_2 mm	Effective drill depth l_3 mm	1095 5 x D Total length incl. WP l_1 mm	Flute length l_2 mm	Effective drill depth l_3 mm	1096 7 x D Bund- ∅ d_4 mm	Total length incl. WP l_1 mm	Flute length l_2 mm	Effective drill depth l_3 mm
0.1	130	76	54	166	112	90	25	202	148	126
0.2	130	76	54	166	112	90	25	202	148	126
1.1	138	84	60	178	124	100	25	218	164	140
1.2	138	84	60	178	124	100	25	218	164	140
2.1	153	93	66	197	137	110	31	241	181	154
2.2	153	93	66	197	137	110	31	241	181	154
3.1	161	101	72	209	149	120	31	257	197	168
3.2	170	110	78	222	162	130	31	274	214	182
4.1	182	118	84	238	174	140	38	294	230	196
4.2	190	126	90	250	186	150	38	310	246	210
5.1	198	134	96	262	198	160	38	326	262	224
5.2	206	142	102	274	210	170	38	342	278	238
6.1	218	154	114	292	228	190	38	366	302	266
6.2	231	167	120	311	247	200	38	391	327	280

Clamping Screws

Design: Clamping screw for drill system RT 800 WP with removable plate.



with special filament lock

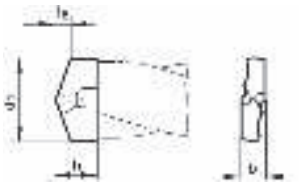
Part No.	For holder size	1096	Thread d_1 mm	Length l_1 mm	For TORX®
3006	0.1–0.2	1.71	M 3 x 0.35	6	T 6
3007	1.1–1.2–2.1–2.2	1.71	M 3 x 0.35	7	T 6
3508	3.1–3.2	1.71	M 3.5 x 0.35	8	T 6
		(113)			

Part No.	For holder size	1096	Thread d_1 mm	Length l_1 mm	For TORX®
4009	4.1–4.2	1.71	M 4 x 0.50	9	T 8
4510	5.1–5.2	1.71	M 4.5 x 0.50	10	T 8
5011	6.1–6.2	1.71	M 5 x 0.50	11	T 10
		(113)			

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Removable Plate RT 800 WP

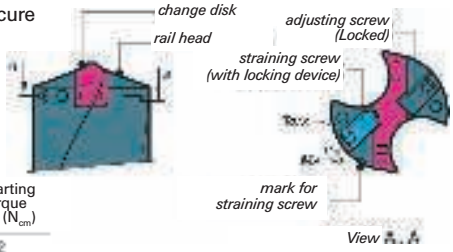
Design: Two geometries, FIRE-coated. High tenacity and bending strength, ground cone, 140° point angle and ratio pointing result in a self-centring cutting edge geometry. Cutting edge tolerance h7, compatible with holders with straight grooves.



Solid carbide UF



Form-locking tension of the change disk assures a secure tension in the carrier.



Size Torx	∅ Range mm	Starting Torque M_d (N_{cm})
T8	≥16.0 - 25.5	72
T8	>25.5 - 34.5	180
T10	>34.5 - 40.5	345

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1097	●	●	◐	◐	◐	○			◐	◐	●	○	◐

Part No.	For holder size	Nominal ∅ d_1 h7 mm	1097	Cutting edge tip l_5 mm	Width b mm	Height h mm
0160	0.1	64.30	16.00	2.9	4.5	8.0
0165	0.1	64.30	16.50	3.0	4.5	8.0
0170	0.1	64.30	17.00	3.1	4.5	8.0
0175	0.2	64.30	17.50	3.2	4.5	8.0
0180	1.1	64.30	18.00	3.3	5.0	8.0
0185	1.1	64.30	18.50	3.4	5.0	8.0
0190	1.1	64.30	19.00	3.5	5.0	8.0
0195	1.2	64.30	19.50	3.5	5.0	8.0
0200	1.2	64.30	20.00	3.6	5.0	8.0
0205	2.1	67.22	20.50	3.7	5.5	8.8
0210	2.1	67.22	21.00	3.8	5.5	8.8
0215	2.2	67.22	21.50	3.9	5.5	8.8
0220	2.2	67.22	22.00	4.0	5.5	8.8
0225	2.2	67.22	22.50	4.1	5.5	8.8
0230	3.1	77.93	23.00	4.2	6.3	10.0
0235	3.1	77.93	23.50	4.3	6.3	10.0
0240	3.1	77.93	24.00	4.4	6.3	10.0
0245	3.2	77.93	24.50	4.5	6.3	10.0
0250	3.1	77.93	25.00	4.5	6.3	10.0
0254	3.2	77.93	25.40	4.6	6.3	10.0
0255	3.2	77.93	25.50	4.6	6.3	10.0
0260	4.1	103.26	26.00	4.7	7.3	11.6
0265	4.1	103.26	26.50	4.8	7.3	11.6
0270	4.1	103.26	27.00	4.9	7.3	11.6

(113)

Part No.	For holder size	Nominal ∅ d_1 h7 mm	1097	Cutting edge tip l_5 mm	Width b mm	Height h mm
0275	4.1	103.26	27.50	5.0	7.3	11.6
0280	4.2	103.26	28.00	5.1	7.3	11.6
0285	4.2	103.26	28.50	5.2	7.3	11.6
0290	4.2	103.26	29.00	5.3	7.3	11.6
0295	4.2	103.26	29.50	5.4	7.3	11.6
0300	5.1	117.88	30.00	5.5	8.5	13.6
0305	5.1	117.88	30.50	5.6	8.5	13.6
0310	5.1	117.88	31.00	5.6	8.5	13.6
0315	5.1	117.88	31.50	5.7	8.5	13.6
0320	5.1	117.88	32.00	5.8	8.5	13.6
0325	5.2	117.88	32.50	5.9	8.5	13.6
0330	5.2	117.88	33.00	6.0	8.5	13.6
0335	5.2	117.88	33.50	6.1	8.5	13.6
0340	5.2	117.88	34.00	6.2	8.5	13.6
0345	5.2	117.88	34.50	6.3	8.5	13.6
0350	6.1	137.34	35.00	6.4	10.0	16.0
0360	6.1	137.34	36.00	6.6	10.0	16.0
0370	6.1	137.34	37.00	6.7	10.0	16.0
0375	6.1	137.34	37.50	6.8	10.0	16.0
0380	6.2	137.34	38.00	6.9	10.0	16.0
0390	6.2	137.34	39.00	7.1	10.0	16.0
0400	6.2	137.34	40.00	7.3	10.0	16.0
0405	6.2	137.34	40.50	7.4	10.0	16.0

(113)

TORX® Screwdrivers

Design: With grip, blade bronze.

format professional quality

Part No.	Size	5879	Blade length mm
0002	T 6	1.26	40
0004	T 8	1.26	40
0010	T 10	1.11	35

(528)



Dynamometric Screwdrivers for Clamping Screws

Design: Dynamometric screwdrivers for right/left tightening for use with 1/4" hexagon bits according to C 6.3 DIN 3126 or 1/4" insert sockets according to DIN 3124. No overrunning of values due to automatic slip-through system. Uninterrupted working possible. Ergonomic rubber grip for comfort of user.

RAHSOL DREMOTEC

Easy and precise setting through micro-meter scale ring. Set value further secured through locking function which prevents unintended adjustment.

Constant repeatability with a tolerance of ± 6 % of set value, incl. test certificate to DIN EN ISO 6789.

Part No.	Measured value N/m	6230	Graduation N/m
0050	1–6	278.65	0.1

(540)



Step Drills, Parallel Shank

Design: Extremely solid short drill according to DIN 1897.
Aligned hole and countersink are produced in a single operation.
Profile ground.

HSS | Type N | Factory standard | 118° | DIN 1897

format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1100	◐	◐	○						○		◐	◐	◐
1103	◐	◐	○						○		◐	◐	◐
1106	◐	◐	○						○		◐	◐	◐

Step Drills 90° for Clearance Holes, Countersink Fine

Design: For clearance holes according to DIN EN 20273 and 90° screw head countersunk, form A and B to DIN 74, part 1, fine. For DIN 963 and DIN 964 screws.





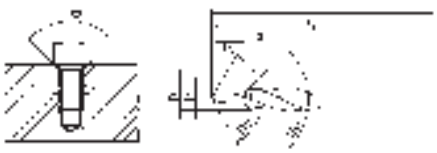
Part No.	For thread	1100	Bit ⌀ h 8 (d_1) x countersink ⌀ h 6 (d_2) mm	Drill step length (l_3) mm	Twist length (l_2) x total length (l_1) mm
0030	M 3	6.26	3.2 x 6	9	28 x 66
0040	M 4	7.14	4.3 x 8	11	37 x 79
0050	M 5	8.96	5.3 x 10	13	43 x 89
0060	M 6	10.50	6.4 x 11.5	15	47 x 95
0080	M 8	12.08	8.4 x 15	19	56 x 111
0100	M 10	18.24	10.5 x 19	23	64 x 127

(104)

Step Drills 90° for Tapping Bore Holes

Design: For tapping bore holes according to DIN 336, part 1 and 90° countersunk screw heads in accordance with clearance holes DIN EN 20273.





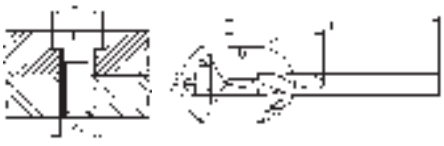
Part No.	For thread	1103	Bit ⌀ h 8 (d_1) x countersink ⌀ h 6 (d_2) mm	Drill step length (l_3) mm	Twist length (l_2) x total length (l_1) mm
0030	M 3	5.88	2.5 x 3.4	8.8	20 x 52
0040	M 4	6.07	3.3 x 4.5	11.4	24 x 58
0050	M 5	6.56	4.2 x 5.5	13.6	28 x 66
0060	M 6	6.76	5 x 6.6	16.5	31 x 70
0080	M 8	8.06	6.8 x 9.0	21	40 x 84
0100	M 10	10.37	8.5 x 11	25.5	47 x 95
0120	M 12	13.30	10.2 x 13.5	30	54 x 107

(104)

Step Drills 180° for Clearance Holes, Medium Countersink

Design: For clearance holes according to DIN EN 20273 and screw head countersinks 180°, form H, J and K, DIN 74, part 2. For screws DIN 84, DIN 912, DIN 6912, DIN 7513 and DIN 7984.





Part No.	For thread	1106	Bit ⌀ h 8 (d_1) x countersink ⌀ h 6 (d_2) mm	Drill step length (l_3) mm	Twist length (l_2) x total length (l_1) mm
0030	M 3	6.05	3.4 x 6	9	28 x 66
0040	M 4	8.42	4.5 x 8	11	37 x 79
0050	M 5	10.39	5.5 x 10	13	43 x 89
0060	M 6	9.92	6.6 x 11	15	47 x 95
0080	M 8	12.50	9 x 15	19	56 x 111
0100	M 10	18.85	11 x 18	23	62 x 123

(104)

Subland Drills Parallel Shank

Design: Aligned hole and countersink are produced in a single operation. Surface steam tempered. Countersink profile ground. Core hole and countersink ⌀ h8 = shank ⌀.

HSS | Type N | 118° | 25–30°

format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1109	◐	◐	○								◐		○
1112	◐	◐	○								◐		○
1115	◐	◐	○								◐		○

Subland Drills 90° for Core Drilling

DIN 8378

Design: For tapping drill holes to DIN 336, part 1 and 90° free countersink in accordance with clearance holes to DIN EN 20273.

Part No.	For thread	1109 mm/mm	Bit ⌀ h 9 (d_1) x countersink ⌀ h 8 (d_2) mm	Drill step length (l_3) mm	Twist length (l_2) x total length (l_1) mm
0030	M 3	7.59	2.5 x 3.4	8.8	39 x 70
0040	M 4	8.28	3.3 x 4.5	11.4	47 x 80
0050	M 5	8.48	4.2 x 5.5	13.6	57 x 93
0060	M 6	15.37	5 x 6.6	16.5	63 x 101
0080	M 8	14.10	6.8 x 9	21	81 x 125
0100	M 10	17.33	8.5 x 11	25.5	94 x 142
0120	M 12	18.04	10.2 x 13.5	30	108 x 160
		(104)			

With morse taper shank DIN 8379 or solid carbide design available on request.



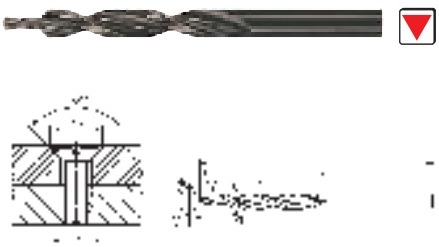
Subland Drills 90° for Clearance Holes, Countersink Fine

DIN 8374

Design: For clearance holes to DIN EN 20273 and 90° screw head countersink, form A and B to DIN 74, part 1. For DIN 963 and DIN 964 screws.

Part No.	For thread	1112 mm/mm	Bit ⌀ h 9 (d_1) x countersink ⌀ h 8 (d_2) mm	Drill step length (l_3) mm	Twist length (l_2) x total length (l_1) mm
0030	M 3	8.98	3.2 x 6	9	57 x 93
0040	M 4	10.42	4.3 x 8	11	75 x 117
0050	M 5	13.14	5.3 x 10	13	87 x 133
0060	M 6	14.72	6.4 x 11.5	15	94 x 142
0080	M 8	24.45	8.4 x 15	19	114 x 169
0100	M 10	37.69	10.5 x 19	23	135 x 198
		(104)			

With morse taper shank DIN 8375 available on request.



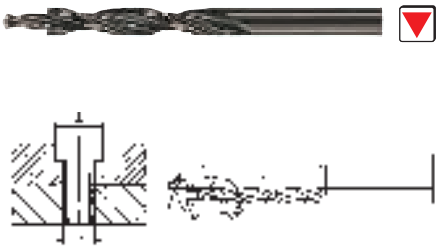
Subland Drills 180° for Clearance Holes, Countersink Fine

DIN 8376

Design: For clearance holes according to DIN EN 20273 and 180° screw head countersunk, form H, J and K to DIN 74, part 2. For screws to DIN 84, DIN 912, DIN 6912, DIN 7513 and DIN 7984.

Part No.	For thread	1115 mm/mm	Bit ⌀ h 9 (d_1) x countersink ⌀ h 8 (d_2) mm	Drill step length (l_3) mm	Twist length (l_2) x total length (l_1) mm
0030	M 3	9.02	3.4 x 6	9	57 x 93
0040	M 4	10.46	4.5 x 8	11	75 x 117
0050	M 5	12.67	5.5 x 10	13	87 x 133
0060	M 6	14.65	6.6 x 11	15	94 x 142
0080	M 8	18.41	9 x 15	19	114 x 169
0100	M 10	38.29	11 x 18	23	130 x 191
		(104)			

With morse taper shank DIN 8377 or solid carbide design available on request.



Centre Drills

Design: Ground and relief-ground, steam tempered flutes.
For drilling of centre holes without safety countersink.

HSS | DIN 333-A | 60° A

1120 Bright

1120 format professional quality



1121 Bright

1121



1123 TiN-coated

1123 format professional quality



HSS Co5 | DIN 333-A | 60° A

1126 Bright

1126 format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1120	●	◐	○						○	○	◐	●	◐
1121	●	◐	○						○	○	◐	●	◐
1123	●	●	○						◐	○	●	◐	●
1126	●	●	○						◐	○	●	●	●

Part No.	Drill ⌀ k 12 mm	1120	1121	1123	1126	Length of shank h 8 mm	Total length mm	For workpiece ⌀ mm
0050	0.50*	–	3.38	–	–	3.15	25	up to 4
0080	0.80*	–	3.26	–	–	3.15	25	4– 6
0100	1.00	0.90	2.95	2.71	1.65	3.15	31.5	6– 8
0125	1.25	0.90	3.51	2.71	–	3.15	31.5	8– 10
0160	1.60	0.95	2.95	2.85	1.65	4	35.5	10– 15
0200	2.00	1.07	2.89	3.00	1.80	5	40	15– 20
0250	2.50	1.26	3.38	3.15	2.10	6.3	45	20– 30
0315	3.15	1.64	4.75	3.61	2.71	8	50	30– 40
0400	4.00	2.33	6.79	4.36	3.75	10	56	40– 63
0500	5.00	3.25	9.81	–	5.25	12.5	63	63–100
0630	6.30	4.32	14.40	–	6.46	16	71	100–150
0800	8.00	7.05	22.52	–	–	20	80	150–250
1000	10.00	14.79	44.62	–	–	25	100	>250
		(106)	(101)	(106)	(106)			

* ⌀ 0.5 mm and 0.8 mm one-side cuttting.

Centre Drills

Design: Ground and relief-ground, steam tempered flutes, form R – with radius, bright.

HSS | DIN 333-R | 60° R

format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1129	●	◐	○						○	○	●	●	●

Part No.	Drill ⌀ k 12 mm	1129	Length of shank h 8 mm	Total length mm	For workpiece ⌀ mm
0100	1.00	1.05	3.15	31.5	6– 8
0125	1.25	1.05	3.15	31.5	8– 10
0160	1.60	1.29	4	35.5	10– 15
0200	2.00	1.35	5	40	15– 20
0250	2.50	1.48	6.3	45	20– 30
0315	3.15	2.01	8	50	30– 40
0400	4.00	2.53	10	56	40– 63
0500	5.00	3.97	12.5	63	63–100
0630	6.30	5.67	16	71	100–150
		(106)			



Centre Drills

Design: Ground and relief-ground, steam tempered flutes.
Form B with additional 120° safety countersink. Bright.

HSS | DIN 333-B | 120° 60° B

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1132	●	◐	○						○	○	○		◐

Part No.	Drill ∅ k 12 mm	1132	Length of shank h 8 mm	Total length mm	For workpiece ∅ mm
0100	1.00	2.18	4	35.5	6– 8
0125	1.25	2.18	5	40	8– 10
0160	1.60	1.51	6.3	45	10– 15
0200	2.00	1.69	8	50	15– 20
0250	2.50	2.19	10	56	20– 30
0315	3.15	2.40	11.2	60	30– 40
0400	4.00	4.04	14	67	40– 63
0500	5.00	5.20	18	75	63–100
0630	6.30	7.99	20	80	100–150
		(106)			

NC Spotting Drills, Parallel Shank

HSS Co5 | DIN 1835-B | 90° | 120°

format professional quality

Design: Precision ground point centre with narrow chisel edge ensures ease of centring and precise form of the centring hole. Very stable due to short flutes and length design. **From ∅ 6 mm with drive face, DIN 1835B.** With 90° point angle for centring and countersinking, if a twist drill with small diameter follows. With 120° point angle for engagement of the main cutting edges of the following twist drill.

Faster centring with NC spotting drills due to short drill travel.

1140 90°, bright

1143 120°, bright

1146 TiN 90°, TiN-coated

1149 TiN 120°, TiN-coated

1152 TiCN 90°, TiCN-coated

1155 TiCN 120°, TiCN-coated



1140/1143



1146/1149 TiN



1152/1155 TiCN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1140	●	●	◐						○	○	○	◐	●
1143	●	●	◐						○	○	○	◐	●
1146	●	●	◐						◐	●	●	◐	●
1149	●	●	◐						◐	●	●	◐	●
1152	●	●	◐	○					●	●	●		●
1155	●	●	◐	○					●	●	●		●

Part No.	∅ h 8 mm	1140	1143	1146 TiN	1149 TiN	1152 TiCN	1155 TiCN	Flute length mm	Total length mm
0300	3	0.90	0.90	–	–	–	–	12	46
0400	4	1.08	1.08	–	–	–	–	12	55
0500	5	1.43	1.43	2.63	2.63	3.22	3.22	15	60
0600	6	2.18	2.18	3.46	3.46	4.05	4.05	20	66
0800	8	3.22	3.22	4.43	4.43	5.03	5.03	25	79
1000	10	4.65	4.65	5.86	5.86	6.46	6.46	25	89
1200	12	6.53	6.53	8.03	8.03	8.93	8.93	30	102
1600	16	12.61	12.61	14.11	14.11	15.01	15.01	35	115
2000	20	19.37	19.37	20.87	20.87	21.77	21.77	40	131
		(106)	(106)	(106)	(106)	(106)	(106)		

NC Spotting Drills, Parallel Shank, Long Design

DIN 1835-B | 90° | 120°

format professional quality

Design: Precision ground point centre with narrow chisel edge ensures ease of centring and precise form of the centring hole. Very stable due to short flutes and length design. With 90° point angle for centring and countersinking, if a twist drill with small diameter follows. With 120° point angle for engagement of the main cutting edges of the following twist drill.

Faster centring with NC spotting drills due to short drill travel.

1156 TiCN 90°, TiCN-coated

1158 TiCN 120°, TiCN-coated



1156 TiCN



1158 TiCN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1156	●	●	◐	○					●	●	●		●
1158	●	●	◐	○					●	●	●		●

Part No.	∅ h 8 mm	1156 TiCN	1158 TiCN	Flute length mm	Total length mm
0600	6	10.71	10.71	20	140
0800	8	11.48	11.48	25	140
1000	10	15.04	15.04	25	170
1200	12	18.75	18.75	30	170
		(106)	(106)		

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Overview – Solid Carbide Jobber Drill Range



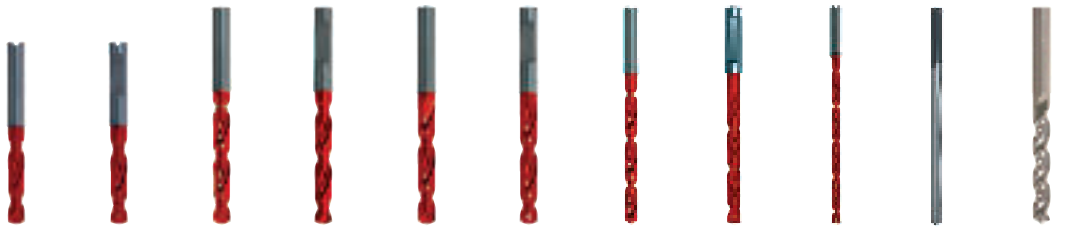
Part No.	1180	1170	1172	1174	1176	1191	1185	1188	1200	1203
∅ mm from–to	1–6.3	3–20	6–16	4–20	6–16	2–16	1–12	1–12	3–16	3–16
DIN		NC spot drill				8037	6539	338	6537 short	6537 short
Material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	HM	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Drill type	Centre drill	N	N	N	N	N	N	N	RT100U	RT100U
Coating			TiAlN		TiAlN				Dlm	Dlm
Point angle	60°	90°	90°	142°	142°	118°	118°	118°	140°	140°
Pointed						A			Special	Special
Drilling depth							3 x D	5 x D	3 x D	3 x D
Shank design		up to 5 mm HA from 6 mm HB	HB	up to 5 mm HA from 6 mm HB	HB				HA	HE
Cooling ducts IK										
Page	1/39	1/39	1/39	1/39	1/39	1/40	1/41	1/41	1/42	1/42

Material group

Steels up to 850 N/mm²		●	◐	●	●	●		●	●	●	●
Steels up to 1,000 N/mm²		●	●	●	●	●	○	●	●	●	●
Steels up to 1,400 N/mm²		●	◐	●	◐	●	○	●	●	◐	◐
Steels up to 42 HRc		◐		○		○	◐	◐	◐	◐	◐
Steels up to 52 HRc		○					○	○	○	○	○
Stainless and acid-resistant steels (INOX)		◐	○	◐	○	◐		◐	◐	●	●
Ti steels, Ti alloys, special steels		◐	○	◐	○	◐		◐	◐	○	○
Cast iron		●	●	●	●	●	◐	●	●	●	●
Al, Al and Mg alloys		◐	●	◐	●	◐	◐	●	●	○	○
Copper, brass, bronze		●	●	●	●	●	◐	○	○	◐	◐

● recommended ◐ suitable ○ partially suitable

Overview – Solid Carbide Jobber Drill Range



Part No.	1206	1209	1212	1215	1218	1221	1224	1227	1228	1230	1233
∅ mm from–to	3–20	3–20	3–16	3–16	3–20	3–20	5–20	5–20	4–20	3–16	3–20
DIN	6537 short	6537 short	6537 long	6537 long	6537 long	6537 long					6537 long
Material	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide	Solid carbide
Drill type	RT100U	RT100U	RT100U	RT100U	RT100U	RT100U	RT100U	RT100U	RT100	RT150GG	FT200
Coating	TiN	TiN	TiN	TiN	TiN	TiN	TiN	TiN	TiN		
Point angle	140°	140°	140°	140°	140°	140°	140°	140°	140°	120°	130°
Pointed	Special	Special	Special	Special	Special	Special	Special	Special	Special	Special	Special
Drilling depth	3 x D	3 x D	5 x D	5 x D	5 x D	5 x D	7 x D	7 x D	12 x D	10 x D	5 x D
Shank design	HA	HE	HA	HE	HA	HE	HA	HE	HA	HA	HA
Cooling ducts IK	IK	IK			IK	IK	IK	IK	IK	IK	
Page	1/42	1/42	1/44	1/44	1/44	1/44	1/46	1/46	1/47	1/48	1/49

Material group

Steels up to 850 N/mm²		●	●	●	●	●	●	●	●	●		
Steels up to 1,000 N/mm²		●	●	●	●	●	●	●	●	●		
Steels up to 1,400 N/mm²		●	●	◐	◐	●	●	◐	●	●		
Steels up to 42 HRc		◐	◐	◐	◐	◐	◐	◐	◐	○		
Steels up to 52 HRc		○	○	○	○	○	○	○	○			
Stainless and acid-resistant steels (INOX)		●	●	●	●	●	●	◐	◐	◐		
Ti steels, Ti alloys, special steels		◐	◐	○	○	◐	◐	◐	◐	◐		
Cast iron		●	●	●	●	●	●	●	●	●	●	●
Al, Al and Mg alloys		○	○	○	○	○	○	○	○	○	●	●
Copper, brass, bronze		◐	◐	◐	◐	◐	◐	◐	◐	◐	○	◐

● recommended ◐ suitable ○ partially suitable

Solid Carbide Centre Drills

Design: Ground from solid round bar. Helical flute.

Solid carbide K10/K20 | Factory standard | 60° A

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1180	●	●	●	◐	○				◐	◐	●	◐	●

Part No.	Drill ⌀ mm	1180 mm/min	Shank ⌀ h 9 mm	Total length mm	For work-piece ⌀ mm
0100	1.00	14.48	3.15	31.5	6– 8
0125	1.25	15.95	3.15	31.5	8–10
0160	1.60	15.34	4	35.5	10–15
0200	2.00	16.65	5	40	15–20
0250	2.50	18.79	6	45	20–30
		(108)			

Part No.	Drill ⌀ mm	1180 mm/min	Shank ⌀ h 9 mm	Total length mm	For work-piece ⌀ mm
0315	3.15	25,06	8	50	30– 40
0400	4.00	27,89	10	56	40– 63
0500	5.00	48,60	12.5	63	63–100
0630	6.30	70,78	16	71	100–150
		(108)			

NC Solid Carbide Spotting Drills, Parallel Shank

Design: Precision ground point centre with narrow chisel edge ensures ease of centring and precise form of the centring hole. Very stable due to short flutes and length design. From ⌀ 6 mm with drive face to DIN 6535-HB. With 90° point angle for centring and countersinking, if a twist drill with small diameter follows. With 142° point angle for engagement of the main cutting edges of the following twist drill.

Faster centring with NC spotting drills due to short drill travel.

1170 90°, bright

1172 90°, TiAlN-2-coated

1174 142°, bright

1176 142°, TiAlN-2-coated

Solid carbide K10/K20 | DIN 6535-HA | DIN 6535-HB | 90° | 142°

format professional quality

1170



1172



1174



1176



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1170	●	●	◐						○	○	●	●	●
1172	●	●	●	○					◐	◐	●	◐	●
1174	●	●	◐						○	○	●	●	●
1176	●	●	●	○					◐	◐	●	◐	●

Part No.	⌀ h 6 mm	1170 mm/min	1172 mm/min	1174 mm/min	1176 mm/min	Flute length mm	Total length mm
0300	3	7.85	–	–	–	12	46
0400	4	8.54	–	7.85	–	12	55
0500	5	9.75	–	8.54	–	14	62
0600	6	10.31	13.50	9.30	12.56	16	66
0800	8	16.02	21.95	12.78	18.78	21	79
1000	10	23.01	30.22	15.10	22.37	25	89
1200	12	30.66	39.60	17.88	26.87	30	102
1600	16	43.13	54.13	48.28	59.35	37	115
2000	20	67.33	–	64.53	–	45	131
		(108)	(108)	(108)	(108)		

Carbide Tipped Jobber Drills, Parallel Shank

Design: With solid carbide cutting edge to DIN 8010, shank with drive from 3 mm to DIN 1809. Steam tempered flutes, bright surface.

HM K10 | Type N | DIN 8037 | 118°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1191		○	○	◐	○						◐	◐	◐

Part No.	ø h 8 mm	1191 mm	Twist length mm	Total length mm
0200	2.0	6.03	18	45
0220	2.2	7.14	18	45
0250	2.5	6.03	18	45
0260	2.6	7.14	20	50
0280	2.8	7.14	20	50
0290	2.9	7.14	20	50
0300	3.0	5.93	20	50
0310	3.1	6.94	25	56
0320	3.2	6.94	25	56
0330	3.3	6.94	25	56
0340	3.4	6.94	25	56
0350	3.5	5.28	25	56
0360	3.6	6.07	25	65
0370	3.7	6.07	25	56
0380	3.8	6.07	25	56
0390	3.9	6.07	25	56
0400	4.0	5.28	25	56
0410	4.1	6.14	28	63
0420	4.2	6.14	28	63
0430	4.3	6.14	28	63
0440	4.4	6.14	28	63
0450	4.5	5.50	28	63
0480	4.8	6.14	28	63
0500	5.0	5.39	28	63
0510	5.1	6.14	32	71
		(110)		

Part No.	ø h 8 mm	1191 mm	Twist length mm	Total length mm
0520	5.2	6.71	32	71
0540	5.4	6.71	32	71
0550	5.5	5.72	32	71
0580	5.8	6.71	32	71
0600	6.0	5.72	32	71
0650	6.5	6.07	32	71
0680	6.8	6.14	40	80
0700	7.0	6.48	40	80
0750	7.5	6.71	40	80
0800	8.0	6.71	40	80
0850	8.5	8.24	50	90
0900	9.0	7.26	50	90
0950	9.5	8.80	50	90
1000	10.0	9.23	56	100
1020	10.2	14.08	56	100
1050	10.5	10.46	56	100
1100	11.0	9.23	56	100
1150	11.5	12.33	63	112
1200	12.0	10.66	63	112
1250	12.5	14.08	63	112
1300	13.0	13.22	63	112
1350	13.5	17.39	71	125
1400	14.0	16.94	71	125
1500	15.0	19.59	71	125
1600	16.0	22.43	80	140
		(110)		

Solid Carbide Jobber Drills

Design: Ground from solid bar. From ⌀ 4 mm with pointed transverse cutting edge.

Key requirements for effective use:

- Stable conditions (machine, tool mounting, workpiece and clamping)
- High speeds
- High coolant pressure

1185 Short, DIN 6539.

1188 Normal jobber length, similar to DIN 338.

Solid carbide K10/K20 | Type N | DIN 6539 | DIN 338 | 118° | 25–30°

format professional quality



1185



1188

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1185	●	●	●	◐	○				◐	◐	●	●	◐
1188	●	●	●	◐	○				◐	◐	●	●	◐

Part No.	⌀ h 8 mm	1185	1188	Twist length mm 1185	Twist length mm 1188	Total length mm 1185	Total length mm 1188
0100	1.0	1.92	2.65	6	12	26	34
0110	1.1	1.92	2.65	7	14	28	36
0120	1.2	2.07	3.00	8	16	30	38
0130	1.3	2.07	3.00	8	16	30	38
0140	1.4	2.07	3.00	9	18	32	40
0150	1.5	2.07	3.00	9	18	32	40
0160	1.6	2.17	4.09	10	20	34	43
0170	1.7	2.17	4.09	10	20	34	43
0180	1.8	2.17	4.09	11	22	36	46
0190	1.9	2.17	4.09	11	22	36	46
0200	2.0	2.52	4.09	12	24	38	49
0210	2.1	2.28	3.78	12	24	38	49
0220	2.2	2.28	3.78	13	27	40	53
0230	2.3	2.28	3.78	13	27	40	53
0240	2.4	2.28	3.78	14	30	43	57
0250	2.5	2.28	3.78	14	30	43	57
0260	2.6	3.00	5.11	14	30	43	57
0270	2.7	3.00	5.11	16	33	46	61
0280	2.8	3.00	5.11	16	33	46	61
0290	2.9	3.00	5.11	16	33	46	61
0300	3.0	3.00	5.11	16	33	46	61
0310	3.1	4.15	5.82	18	36	49	65
0320	3.2	4.15	5.82	18	36	49	65
0330	3.3	4.15	5.82	18	36	49	65
0340	3.4	4.15	5.82	20	39	52	70
0350	3.5	4.15	5.82	20	39	52	70
0360	3.6	4.75	6.61	20	39	52	70
0370	3.7	4.75	6.61	20	39	52	70
0380	3.8	4.75	6.61	22	43	55	75
0390	3.9	4.75	6.61	22	43	55	75
0400	4.0	4.75	6.61	22	43	55	75
0410	4.1	5.17	6.84	22	43	55	75
		(110)	(110)				

Part No.	⌀ h 8 mm	1185	1188	Twist length mm 1185	Twist length mm 1188	Total length mm 1185	Total length mm 1188
0420	4.2	5.17	6.84	22	43	55	75
0430	4.3	5.40	9.13	24	47	58	80
0440	4.4	5.40	9.13	24	47	58	80
0450	4.5	5.40	8.28	24	47	58	80
0460	4.6	5.82	9.55	24	47	58	80
0470	4.7	5.82	9.55	24	47	58	80
0480	4.8	5.82	9.55	26	52	62	86
0490	4.9	5.82	9.55	26	52	62	86
0500	5.0	5.82	9.13	26	52	62	86
0510	5.1	7.69	13.26	26	52	62	86
0520	5.2	7.69	13.26	26	52	62	86
0530	5.3	8.40	13.26	26	52	62	86
0540	5.4	8.40	13.26	28	57	66	93
0550	5.5	7.69	13.26	28	57	66	93
0560	5.6	8.88	14.18	28	57	66	93
0570	5.7	8.88	14.18	28	57	66	93
0580	5.8	8.11	14.18	28	57	66	93
0590	5.9	8.88	14.18	28	57	66	93
0600	6.0	8.11	12.91	28	57	66	93
0650	6.5	9.97	15.79	31	63	70	101
0680	6.8	12.07	18.01	34	69	74	109
0700	7.0	11.65	18.74	34	69	74	109
0750	7.5	14.11	18.01	34	69	74	109
0800	8.0	15.87	22.39	37	75	79	117
0850	8.5	19.93	26.18	37	75	79	117
0900	9.0	20.41	26.60	40	81	84	125
0950	9.5	22.46	29.48	40	81	84	125
1000	10.0	23.29	32.78	43	87	89	133
1020	10.2	27.38	39.87	43	87	89	133
1050	10.5	27.38	37.82	43	87	89	133
1100	11.0	30.32	46.47	47	94	95	142
1200	12.0	35.30	54.04	51	101	102	151
		(110)	(110)				

Solid Carbide Ratio Drills, SuperLine, 3 x D

Design: Increased core thickness, with special grinding and pointing. Excellent self-centring, short chips also in case of long-chipping materials.
For highest cutting performance. Precision-aligned holes with tight diameter tolerances and high-quality surfaces.

Solid carbide application group: K/P – multi-purpose use. (Ultra-fine grain K05-K50/P05-P50)

1200 DIN 6535-HA, no inside cooling.

1203 DIN 6535-HE, no inside cooling.

1206 DIN 6535-HA.
Inside cooling twisted, due to webs.

1209 DIN 6535-HE.
Inside cooling twisted, due to webs.



Twisted inside cooling. The coolant reaches the cutting edges and flushes the chips out of the hole.

Solid carbide UF | Type RT 100 U | DIN 6537 | DIN 6535-HA | DIN 6535-HE | 140° | 3xD

1200 mm



1203 mm



1206 mm



With inside cooling.

1209 mm



With inside cooling.

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1200	●	●	◐	◐	○				●	○	●	○	◐
1203	●	●	◐	◐	○				●	○	●	○	◐
1206	●	●	●	◐	○				●	◐	●	○	◐
1209	●	●	●	◐	○				●	◐	●	○	◐

Part No.	ø m 7 mm	1200 mm	1203 mm	1206 mm	1209 mm	Twist length mm	Total length mm	Shank ø h 6 mm
0300	3.00	18.31	19.06	23.16	23.90	20	62	6
0317	3.17	18.31	19.06	23.16	23.90	20	62	6
0325	3.25	18.31	20.92	23.16	23.90	20	62	6
0330	3.30	18.31	19.06	23.16	23.90	20	62	6
0350	3.50	18.31	19.06	23.16	23.90	20	62	6
0357	3.57	18.31	19.06	23.16	23.90	20	62	6
0370	3.70	18.31	19.06	–	–	20	62	6
0380	3.80	18.31	19.06	23.16	23.90	24	66	6
0397	3.97	18.31	19.06	23.16	23.90	24	66	6
0400	4.00	18.31	19.06	25.03	26.15	24	66	6
0420	4.20	18.31	19.06	25.03	26.15	24	66	6
0437	4.37	18.31	19.06	25.03	26.15	24	66	6
0450	4.50	18.31	19.06	25.03	26.15	24	66	6
0460	4.60	18.31	19.06	25.03	26.15	24	66	6
0465	4.65	18.31	–	25.03	–	24	66	6
0476	4.76	18.31	19.06	25.03	26.15	28	66	6
0480	4.80	18.31	19.06	25.03	26.15	28	66	6
0500	5.00	18.31	19.06	25.03	26.15	28	66	6
0516	5.16	18.31	19.06	25.03	26.15	28	66	6
0550	5.50	18.31	19.06	25.03	26.15	28	66	6
0555	5.55	18.31	–	25.03	–	28	66	6
0556	5.56	18.31	19.06	25.03	26.15	28	66	6
0570	5.70	18.31	19.06	25.03	26.15	28	66	6
0580	5.80	18.31	19.06	25.03	26.15	28	66	6
0595	5.95	18.31	19.06	25.03	26.15	28	66	6
0600	6.00	18.31	19.06	25.03	26.15	28	66	6
0635	6.35	18.31	19.06	34.00	35.49	34	79	8
0650	6.50	18.31	19.06	34.00	35.49	34	79	8
0675	6.75	18.31	19.06	34.00	35.49	34	79	8
0680	6.80	18.31	19.06	34.00	35.49	34	79	8
0700	7.00	18.31	19.06	34.00	35.49	34	79	8
0714	7.14	18.31	19.06	34.00	35.49	41	79	8
		(112)	(112)	(112)	(112)			

Continued overleaf

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Solid Carbide Ratio Drills, SuperLine, 3 x D

Continued

Part No.	∅ m 7 mm	1200	1203	1206	1209	Twist length mm	Total length mm	Shank ∅ h 6 mm
0740	7.40	18.31	19.06	34.00	35.49	41	79	8
0750	7.50	18.31	19.06	34.00	35.49	41	79	8
0754	7.54	18.31	19.06	34.00	35.49	41	79	8
0780	7.80	18.31	19.06	34.00	35.49	41	79	8
0794	7.94	18.31	19.06	34.00	35.49	41	79	8
0800	8.00	18.31	19.06	34.00	35.49	41	79	8
0833	8.33	20.55	21.30	38.09	39.60	47	89	10
0850	8.50	20.55	21.30	38.09	39.60	47	89	10
0873	8.73	20.55	21.30	38.09	39.60	47	89	10
0880	8.80	20.55	21.30	38.09	39.60	47	89	10
0900	9.00	20.55	21.30	38.09	39.60	47	89	10
0913	9.13	20.55	21.30	38.09	39.60	47	89	10
0925	9.25	20.55	–	38.09	–	47	89	10
0930	9.30	20.55	21.30	38.09	39.60	47	89	10
0950	9.50	20.55	21.30	38.09	39.60	47	89	10
0952	9.52	20.55	21.30	38.09	39.60	47	89	10
0980	9.80	–	–	38.09	39.60	47	89	10
0992	9.92	20.55	21.30	38.09	39.60	47	89	10
1000	10.00	20.55	21.30	38.09	39.60	47	89	10
1020	10.20	30.64	31.98	54.55	56.79	55	102	12
1032	10.32	–	–	54.55	56.79	55	102	12
1050	10.50	30.64	31.98	54.55	56.79	55	102	12
1070	10.70	–	–	54.55	56.79	55	102	12
1100	11.00	30.64	31.98	54.55	56.79	55	102	12
1111	11.11	–	–	54.55	56.79	55	102	12
1120	11.20	30.64	31.98	54.55	56.79	55	102	12
1150	11.50	30.64	31.98	54.55	56.79	55	102	12
1170	11.70	–	–	54.55	56.79	55	102	12
1191	11.91	–	–	54.55	56.79	55	102	12
1200	12.00	30.64	31.98	54.55	56.79	55	102	12
1250	12.50	41.09	42.59	76.22	79.21	60	107	14
1270	12.70	–	–	76.22	79.21	60	107	14
1300	13.00	41.09	42.59	76.22	79.21	60	107	14
1350	13.50	41.09	42.59	76.22	79.21	60	107	14
1370	13.70	–	–	76.22	79.21	60	107	14
1400	14.00	41.09	42.59	76.22	79.21	60	107	14
1429	14.29	–	–	93.03	96.76	65	115	16
1450	14.50	53.05	55.30	93.03	96.76	65	115	16
1470	14.70	–	–	93.03	96.76	65	115	16
1500	15.00	53.05	55.30	93.03	96.76	65	115	16
1550	15.50	53.05	55.30	93.03	96.76	65	115	16
1570	15.70	–	–	93.03	96.76	65	115	16
1600	16.00	53.05	55.30	93.03	96.76	65	115	16
1650	16.50	–	–	149.44	155.41	73	123	18
1700	17.00	–	–	149.44	155.41	73	123	18
1750	17.50	–	–	149.44	155.41	73	123	18
1800	18.00	–	–	149.44	155.41	73	123	18
1850	18.50	–	–	163.28	169.61	79	131	20
1900	19.00	–	–	163.28	169.61	79	131	20
1950	19.50	–	–	163.28	169.61	79	131	20
2000	20.00	–	–	163.28	169.61	79	131	20
		(112)	(112)	(112)	(112)			

Solid Carbide Ratio Drills, SuperLine, 5 x D

Design: Increased core thickness with special grinding and pointing. Excellent self-centring, short chips also in case of long-chipping material. For drilling with best cutting results. Exact alignment of bore holes with close diameter tolerances and fine surfaces.

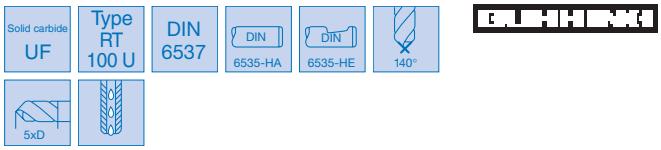
Solid carbide application group: K/P – multi-purpose use. (Ultra-fine grain K05-K50/P05-P50)

1212 DIN 6535-HA, no inside cooling.

1215 DIN 6535-HE, no inside cooling.

1218 DIN 6535-HA, Inside cooling twisted, due to webs.

1221 DIN 6535-HE, Inside cooling twisted, due to webs.




1212


1215


1218

With inside cooling.



Twisted inside cooling. The coolant reaches the cutting edges and flushes the chips out of the hole.


1221

With inside cooling.

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1212	●	●	◐	◐	○				●	○	●	○	◐
1215	●	●	◐	◐	○				●	○	●	○	◐
1218	●	●	●	◐	○				●	◐	●	○	◐
1221	●	●	●	◐	○				●	◐	●	○	◐

Part No.	ø m 7 mm	1212	1215	1218	1221	Twist length mm	Total length mm	Shank ø h 6 mm
0300	3.00	20.92	22.06	29.89	30.64	28	66	6
0317	3.17	20.92	22.06	29.89	30.64	28	66	6
0325	3.25	20.92	22.06	29.89	30.64	28	66	6
0330	3.30	20.92	22.06	29.89	30.64	28	66	6
0350	3.50	20.92	22.06	29.89	30.64	28	66	6
0357	3.57	20.92	22.06	29.89	30.64	28	66	6
0370	3.70	20.92	22.06	–	–	28	66	6
0380	3.80	20.92	22.06	29.89	30.64	36	74	6
0397	3.97	20.92	22.06	29.89	30.64	36	74	6
0400	4.00	20.92	22.06	32.13	33.63	36	74	6
0420	4.20	20.92	22.06	32.13	33.63	36	74	6
0437	4.37	20.92	22.06	32.13	33.63	36	74	6
0450	4.50	20.92	22.06	32.13	33.63	36	74	6
0460	4.60	20.92	22.06	32.13	33.63	36	74	6
0465	4.65	20.92	–	32.13	–	36	74	6
0476	4.76	20.92	22.06	32.13	33.63	44	82	6
0480	4.80	20.92	22.06	32.13	33.63	44	82	6
0500	5.00	20.92	22.06	32.13	33.63	44	82	6
0516	5.16	20.92	22.06	32.13	33.63	44	82	6
0550	5.50	20.92	22.06	32.13	33.63	44	82	6
0555	5.55	20.92	–	32.13	–	44	82	6
0556	5.56	20.92	22.06	32.13	33.63	44	82	6
0580	5.80	20.92	22.06	32.13	33.63	44	82	6
0595	5.95	20.92	22.06	32.13	33.63	44	82	6
0600	6.00	20.92	22.06	32.13	33.63	44	82	6
0635	6.35	21.30	22.79	35.49	36.99	53	91	8
0650	6.50	21.30	22.79	35.49	36.99	53	91	8
0675	6.75	21.30	22.79	35.49	36.99	53	91	8
0680	6.80	21.30	22.79	35.49	36.99	53	91	8
0700	7.00	21.30	22.79	35.49	36.99	53	91	8
0714	7.14	21.30	22.79	35.49	36.99	53	91	8
0740	7.40	21.30	22.79	35.49	36.99	53	91	8
		(112)	(112)	(112)	(112)			

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All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Solid Carbide Ratio Drills, SuperLine, 5 x D

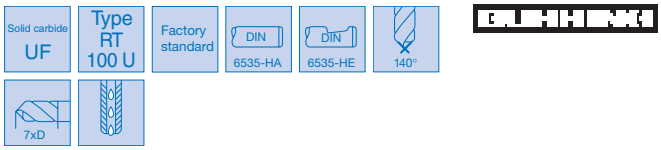
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Part No.	∅ m 7 mm	1212	1215	1218	1221	Twist length mm	Total length mm	Shank ∅ h 6 mm
0750	7.50	21.30	22.79	35.49	36.99	53	91	8
0754	7.54	21.30	22.79	35.49	36.99	53	91	8
0780	7.80	21.30	22.79	35.49	36.99	53	91	8
0794	7.94	21.30	22.79	35.49	36.99	53	91	8
0800	8.00	21.30	22.79	35.49	36.99	53	91	8
0833	8.33	23.53	25.42	40.72	42.59	61	103	10
0850	8.50	23.53	25.42	40.72	42.59	61	103	10
0873	8.73	23.53	25.42	40.72	42.59	61	103	10
0880	8.80	23.53	25.42	40.72	42.59	61	103	10
0900	9.00	23.53	25.42	40.72	42.59	61	103	10
0913	9.13	23.53	25.42	40.72	42.59	61	103	10
0925	9.25	23.53	–	40.72	–	61	103	10
0930	9.30	23.53	25.42	40.72	42.59	61	103	10
0950	9.50	23.53	25.42	40.72	42.59	61	103	10
0952	9.52	23.53	25.42	40.72	42.59	61	103	10
0980	9.80	23.53	25.42	40.72	42.59	61	103	10
0992	9.92	23.53	25.42	40.72	42.59	61	103	10
1000	10.00	23.53	25.42	40.72	42.59	61	103	10
1020	10.20	35.11	37.35	59.40	61.64	71	118	12
1032	10.32	–	–	59.40	61.64	71	118	12
1050	10.50	35.11	37.35	59.40	61.64	71	118	12
1070	10.70	–	–	59.40	61.64	71	118	12
1100	11.00	35.11	37.35	59.40	61.64	71	118	12
1111	11.11	–	–	59.40	61.64	71	118	12
1120	11.20	–	–	59.40	61.64	71	118	12
1150	11.50	35.11	37.35	59.40	61.64	71	118	12
1170	11.70	–	–	59.40	61.64	71	118	12
1191	11.91	–	–	59.40	61.64	71	118	12
1200	12.00	35.11	37.35	59.40	61.64	71	118	12
1250	12.50	46.33	49.68	79.95	83.31	77	124	14
1270	12.70	–	–	79.95	83.31	77	124	14
1300	13.00	46.33	49.68	79.95	83.31	77	124	14
1350	13.50	46.33	49.68	79.95	83.31	77	124	14
1370	13.70	–	–	79.95	83.31	77	124	14
1400	14.00	46.33	49.68	79.95	83.31	77	124	14
1429	14.29	–	–	98.63	102.74	83	133	16
1450	14.50	60.15	64.26	98.63	102.74	83	133	16
1470	14.70	–	–	98.63	102.74	83	133	16
1500	15.00	60.15	64.26	98.63	102.74	83	133	16
1550	15.50	60.15	64.26	98.63	102.74	83	133	16
1570	15.70	–	–	98.63	102.74	83	133	16
1600	16.00	60.15	64.26	98.63	102.74	83	133	16
1650	16.50	–	–	158.04	164.38	93	143	18
1700	17.00	–	–	158.04	164.38	93	143	18
1750	17.50	–	–	158.04	164.38	93	143	18
1800	18.00	–	–	158.04	164.38	93	143	18
1850	18.50	–	–	171.86	178.57	101	153	20
1900	19.00	–	–	171.86	178.57	101	153	20
1950	19.50	–	–	171.86	178.57	101	153	20
2000	20.00	–	–	171.86	178.57	101	153	20
		(112)	(112)	(112)	(112)			

Solid Carbide Ratio Drills, SuperLine, 7 x D

Design: Increased core thickness with special grinding and pointing. Excellent self-centring, short chips also in case of long-chipping material. For drilling with best cutting results. Exact alignment of bore holes with close diameter tolerances and fine surfaces.

Solid carbide application group: K/P – multi-purpose use. (Ultra-fine grain K05-K50/P05-P50)



1224 DIN 6535-HA.
Twisted inside cooling, due to webs.



1224 **With inside cooling.**

1227 DIN 6535-HE.
Twisted inside cooling, due to webs.



1227 **With inside cooling.**



Twisted inside cooling. The coolant reaches the cutting edges and flushes the chips out of the hole.

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1224	●	●	◐	◐	○				◐	◐	●	○	◐
1227	●	●	●	◐	○				◐	◐	●	○	◐

Part No.	∅ m 7 mm	1224	1227	Twist length mm	Total length mm	Shank ∅ h 6 mm
0500	5.00	66.14	67.62	50	90	6
0550	5.50	66.14	67.62	57	97	6
0600	6.00	66.14	67.62	57	97	6
0635	6.35	76.58	78.08	66	106	8
0650	6.50	76.58	78.08	66	106	8
0680	6.80	76.58	78.08	66	106	8
0700	7.00	76.58	78.08	76	116	8
0750	7.50	76.58	78.08	76	116	8
0780	7.80	76.58	78.08	76	116	8
0800	8.00	76.58	78.08	76	116	8
0850	8.50	92.65	94.51	87	131	10
0900	9.00	92.65	94.51	87	131	10
0950	9.50	92.65	94.51	95	139	10
0952	9.52	92.65	94.51	95	139	10
1000	10.00	92.65	94.51	95	139	10
1020	10.20	122.16	124.40	106	155	12
1050	10.50	122.16	124.40	106	155	12
1100	11.00	122.16	124.40	106	155	12
1150	11.50	122.16	124.40	114	163	12
1200	12.00	122.16	124.40	114	163	12
1250	12.50	172.60	175.95	133	182	14
1270	12.70	172.60	175.95	133	182	14
1300	13.00	172.60	175.95	133	182	14
1350	13.50	172.60	175.95	133	182	14
1400	14.00	172.60	175.95	133	182	14
1450	14.50	216.32	220.42	152	204	16
1500	15.00	216.32	220.42	152	204	16
1550	15.50	216.32	220.42	152	204	16
1600	16.00	216.32	220.42	152	204	16
1650	16.50	270.47	276.83	171	223	18
1700	17.00	270.47	276.83	171	223	18
1750	17.50	270.47	276.83	171	223	18
1800	18.00	270.47	276.83	171	223	18
1850	18.50	317.55	324.29	190	244	20
1900	19.00	317.55	324.29	190	244	20
1905	19.05	317.55	324.29	190	244	20
1950	19.50	317.55	324.29	190	244	20
2000	20.00	317.55	324.29	190	244	20
		(112)	(112)			

Solid Carbide Ratio Drills, SuperLine, 12 x D

Design: Increased core thickness with special grinding and pointing. Excellent self-centring, short chips also in case of long-chipping material. For drilling with best cutting results. Exact alignment of bore holes with close diameter tolerances and fine surfaces.

Solid carbide application group: K/P – multi-purpose use. (Ultra-fine grain K05-K50/P05-P50)

DIN 6535-HA.
Twisted inside cooling, due to webs.

Solid carbide UF | Type RT 100 | Factory standard | DIN 6535-HA | 12xD | 140°



Twisted inside cooling. The coolant is directed to the cutting edges removing the chips from the bore hole.



With inside cooling.

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1228	●	●	●	○					◐	◐	●	○	◐

Part No.	∅ m 7 mm	1228	Twist length mm	Total length mm	Shank ∅ h 6 mm
0400	4.00	88.54	64	102	6
0420	4.20	88.54	64	102	6
0430	4.30	88.54	64	102	6
0450	4.50	88.54	64	102	6
0500	5.00	88.54	78	116	6
0550	5.50	88.54	78	116	6
0600	6.00	88.54	78	116	6
0635	6.35	103.86	108	146	8
0650	6.50	103.86	108	146	8
0680	6.80	103.86	108	146	8
0700	7.00	103.86	108	146	8
0750	7.50	103.86	108	146	8
0800	8.00	103.86	108	146	8
0850	8.50	131.50	120	162	10
0900	9.00	131.50	120	162	10
0950	9.50	131.50	120	162	10
0952	9.52	131.50	120	162	10
1000	10.00	131.50	120	162	10
1020	10.20	172.22	156	204	12
1050	10.50	172.22	156	204	12
1100	11.00	172.22	156	204	12
1150	11.50	172.22	156	204	12
1200	12.00	172.22	156	204	12
1250	12.50	214.44	182	230	14
1270	12.70	214.44	182	230	14
1300	13.00	214.44	182	230	14
1350	13.50	214.44	182	230	14
1400	14.00	214.44	182	23	14
1450	14.50	304.10	208	260	16
1500	15.00	304.10	208	260	16
1600	16.00	304.10	208	260	16
1650	16.50	338.85	234	285	18
1700	17.00	338.85	234	285	18
1800	18.00	338.85	234	285	18
1900	19.00	483.05	258	310	20
1905	19.05	483.05	258	310	20
2000	20.00	483.05	258	310	20

Solid Carbide 4-chamfer Drills, SuperLine, 10 x D

Design: Increased core thickness. Excellent self-centring. Rake angle 0° – straight-fluted, bright surface. Special flute form with double lands. Special pointing. For drilling at high cutting speeds, very close diameter tolerances (up to H 7), fine surface. Ideal for diecasting.

Solid carbide application group: K

Solid carbide UF | Type RT 150 GG | Factory standard | DIN 6535-HA | 120° | 10xD



With inside cooling.



Coolant supply through webs.

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1230											●	●	○

Part No.	∅ m 7 mm	1230	Twist length mm	Total length mm	Shank ∅ h 6 mm
0300	3.00	36.61	42	91	6
0317	3.17	36.61	42	91	6
0325	3.25	36.61	42	91	6
0330	3.30	36.61	42	91	6
0350	3.50	36.61	48	91	6
0357	3.57	36.61	48	91	6
0380	3.80	36.61	77	121	6
0397	3.97	36.61	77	121	6
0400	4.00	36.61	77	121	6
0420	4.20	36.61	77	121	6
0450	4.50	36.61	77	121	6
0500	5.00	36.61	82	121	6
0550	5.50	36.61	82	121	6
0600	6.00	36.61	82	121	6
0635	6.35	47.82	106	146	8
0650	6.50	47.82	106	146	8
0680	6.80	47.82	106	146	8
0700	7.00	47.82	106	146	8
0750	7.50	47.82	106	146	8
0780	7.80	47.82	106	146	8
0800	8.00	47.82	106	146	8
0850	8.50	60.15	130	175	10
0900	9.00	60.15	130	175	10
0950	9.50	60.15	130	175	10
0952	9.52	60.15	130	175	10
1000	10.00	60.15	130	175	10
1020	10.20	74.72	159	209	12
1050	10.50	74.72	159	209	12
1100	11.00	74.72	159	209	12
1150	11.50	74.72	159	209	12
1200	12.00	74.72	159	209	12
1250	12.50	99.38	183	233	14
1270	12.70	99.38	183	233	14
1300	13.00	99.38	183	233	14
1350	13.50	99.38	183	233	14
1400	14.00	99.38	183	233	14
1450	14.50	125.90	207	260	16
1500	15.00	125.90	207	260	16
1550	15.50	125.90	207	260	16
1600	16.00	125.90	207	260	16

(112)

Solid Carbide Ratio Drills, SuperLine, 5 x D

Design: 3 cutting edges with pointed lathe centre, surface bright. For drilling of accurately positioned and shaped holes. Centring generally not necessary.

Solid carbide application group: K

Solid carbide UF | Type FT 200 | DIN 6535-HA | DIN 6537 | 3 F | 130° | 5xD



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1233											●	●	◐

Part No.	ø m 7 mm	1233	Twist length mm	Total length mm	Shank ø h 6 mm
0300	3.00	23.53	28	66	6
0310	3.10	23.53	28	66	6
0320	3.20	23.53	28	66	6
0330	3.30	23.53	28	66	6
0350	3.50	23.53	28	66	6
0370	3.70	23.53	28	66	6
0380	3.80	23.53	36	74	6
0400	4.00	23.53	36	74	6
0410	4.10	23.53	36	74	6
0420	4.20	23.53	36	74	6
0450	4.50	23.53	36	74	6
0480	4.80	23.53	44	82	6
0500	5.00	23.53	44	82	6
0510	5.10	23.53	44	82	6
0520	5.20	23.53	44	82	6
0530	5.30	23.53	44	82	6
0550	5.50	23.53	44	82	6
0580	5.80	23.53	44	82	6
0600	6.00	23.53	44	82	6
0610	6.10	28.40	53	91	8
0620	6.20	28.40	53	91	8
0640	6.40	28.40	53	91	8
0650	6.50	28.40	53	91	8
0670	6.70	28.40	53	91	8
0680	6.80	28.40	53	91	8
0700	7.00	28.40	53	91	8
0710	7.10	28.40	53	91	8
0740	7.40	28.40	53	91	8
0750	7.50	28.40	53	91	8
0780	7.80	28.40	53	91	8
0800	8.00	28.40	53	91	8
0810	8.10	32.50	61	103	10
0820	8.20	32.50	61	103	10
0840	8.40	32.50	61	103	10
0850	8.50	32.50	61	103	10

(112)

Part No.	ø m 7 mm	1233	Twist length mm	Total length mm	Shank ø h 6 mm
0860	8.60	32.50	61	103	10
0870	8.70	32.50	61	103	10
0880	8.80	32.50	61	103	10
0900	9.00	32.50	61	103	10
0910	9.10	32.50	61	103	10
0950	9.50	32.50	61	103	10
0980	9.80	32.50	61	103	10
1000	10.00	32.50	61	103	10
1010	10.10	47.82	71	118	12
1020	10.20	47.82	71	118	12
1030	10.30	47.82	71	118	12
1050	10.50	47.82	71	118	12
1100	11.00	47.82	71	118	12
1120	11.20	47.82	71	118	12
1150	11.50	47.82	71	118	12
1180	11.80	47.82	71	118	12
1200	12.00	47.82	71	118	12
1210	12.10	62.77	77	124	14
1250	12.50	62.77	77	124	14
1300	13.00	62.77	77	124	14
1350	13.50	62.77	77	124	14
1400	14.00	62.77	77	124	14
1450	14.50	77.33	83	133	16
1500	15.00	77.33	83	133	16
1550	15.50	77.33	83	133	16
1600	16.00	77.33	83	133	16
1650	16.50	114.70	93	143	18
1700	17.00	114.70	93	143	18
1750	17.50	114.70	93	143	18
1800	18.00	114.70	93	143	18
1850	18.50	155.41	101	153	20
1900	19.00	155.41	101	153	20
1950	19.50	155.41	101	153	20
2000	20.00	155.41	101	153	20

(112)

Masonry Drills, Chisels, Bits

Hammer Drills SDS-plus

Design: Hammer drill with SDS-plus-shank holder and carbide cutting edge with brad point. Due to the specially formed helixes, the swarf is removed quickly and thoroughly from the hole. Low breakage risk due to hardened surface. Long life.

For concrete, brickwork, natural stone, tiles, marble, klinker.

SDS plus

format professional quality



Part No.	ø mm	1250 mm	Total length mm	Twist length mm
0411	4	1.35	110	50
0511	5	1.08	110	50
0516	5	1.24	160	100
0611	6	1.10	110	50
0616	6	1.18	160	100
0621	6	2.03	210	150
0626	6	1.92	260	200
0716	7	1.59	160	100
0811	8	1.48	110	50
0816	8	1.49	160	100
0821	8	1.75	210	150
0826	8	2.04	260	200
0846	8	5.09	460	400
1016	10	1.75	160	100
1021	10	2.07	210	150
1026	10	2.47	260	200
1031	10	2.94	310	250
1046	10	4.15	460	400*
1121	11	2.78	210	150
1216	12	1.96	160	100
1221	12	2.25	210	150
1226	12	2.89	260	200
1246	12	4.96	460	400*
		(120)		

Part No.	ø mm	1250 mm	Total length mm	Twist length mm
1260	12**	7.26	600	550*
1321	13	3.35	210	150
1416	14	2.89	160	100
1421	14	3.06	210	150
1426	14	3.68	260	200
1431	14	3.95	310	250
1446	14	5.98	460	400*
1460	14**	8.79	600	550*
1516	15	3.53	160	100
1526	15	3.96	260	200
1621	16	4.01	210	150
1630	16**	6.40	300	250
1645	16	8.07	450	400*
1660	16**	9.25	600	550*
1820	18**	6.77	200	150
1845	18**	8.79	450	400*
2020	20**	8.38	200	150
2045	20**	10.50	450	400*
2245	22**	15.55	450	400*
2445	24**	17.37	450	400*
2645	26**	18.69	450	400*
2845	28	22.49	450	400*
3045	30	24.36	450	400*
		(120)		

* With short drill bit, same diameter, pre-drill at least 150 mm deep.
** Hammer drill version, 1 helix.

SDS-plus Hammer Drill Sets

Design: In plastic case.

Part No.	Set	1253 mm	Contents mm
0010	5-piece	8.55	5 x 110, 6 x 110, 6 x 160, 8 x 160, 10 x 160
		(120)	

SDS plus



1253 0010

SDS-plus Hammer Drill Sets

Design: In all-steel case.

Part No.	Set	1253 mm	Contents mm
0005	7-piece	13.14	5 x 110, 6 x 110, 6 x 160, 8 x 160, 10 x 160, 12 x 160
		(120)	



1253 0005

SDS-plus Chisel Bits

Design: Forged from single piece, robust and regrindable, long life, with SDS-plus-shank holder.

Part No.	Design	1256 mm	Thickness mm	Length mm
0005	Pointed chisel	4.65	–	250
0010	Flat chisel	4.65	20	250
0015	Hollow chisel	7.56	22	250
0020	Spade chisel	7.64	35	250
		(120)		

SDS plus

format professional quality



1256 0005



1256 0010



1256 0015



1256 0020

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Masonry Drills, Chisels, Bits

Masonry Drills

Design: Robust drill with round shank for concrete applications. Up to 50 % more holes than with conventional masonry drills, high-performance soldering of carbide plates for very long tool life. Due to the specially formed helixes, the swarf is removed quickly and thoroughly from the hole, with fast transfer of impact energy. Low risk of breakage due to hardened surface and higher strength for drilling of reinforced material.

For concrete, stone, brickwork, klinker, light construction material, granite, marble.

format professional quality



Part No.	ø mm	1259	Twist length mm	Total length approx. mm	Shank ø mm
0300	3	1.02	40	70	3
0400	4	0.94	40	75	4
0500	5	0.97	50	85	5
0600	6	1.05	60	100	6
0700	7	1.24	60	100	7
0800	8	1.21	80	120	8
		(120)			

Part No.	ø mm	1259	Twist length mm	Total length approx. mm	Shank ø mm
0900	9	1.43	80	120	9
1000	10	1.76	80	120	10
1200	12	2.04	90	150	12
1400	14	3.26	90	150	12
1600	16	4.23	100	160	12
		(120)			

Masonry Drill Sets

Design: In all-steel case. Set includes (part no. 1259).

Application: For concrete, stone, brickwork, klinker, light construction material, granite, marble.



Part No.	Set	1268	Contents mm
0010	7-piece	5.64	4, 5, 6, 6, 8, 10, 12
		(120)	

Masonry Drill Sets

Design: Percussion drill with round shank. Rolled spiral for normal use. Tipped with carbide plates for standard drilling performance. Supplied in plastic case.

Application: For stone, brickwork, klinker, light construction material.

format professional quality



Part No.	Set	1268	Contents mm
0005	5-piece	2.61	4, 5, 6, 8, 10
		(120)	

Multi-purpose Drills Allmat

Design: Multi-purpose drill with round shank. Easy spot drilling on smooth and hard surfaces due to diamond-ground carbide transverse cutting edge. Ground outer diameter for precise bore holes. Long life.

Application: For brickwork, wall tiles, marble, plastics, light-weight construction material, metal, non-ferrous metals, coated chipboard. Also suitable for slight impact drilling.

heller get a bit more



Part No.	ø mm	1261	Total length mm	Twist length mm
0030	3	2.04	70	30
0040	4	1.98	75	40
0050	5	2.05	85	50
0060	6	2.25	100	60
0061	6	3.43	150	110
0080	8	2.71	120	80
		(119)		

Part No.	ø mm	1261	Twist length mm	Total length mm
0081	8	4.16	200	135
0100	10	3.22	120	80
0101	10	5.01	200	135
0120	12	4.33	150	90
0121	12	6.53	220	150
0140	14	8.19	250	200
		(119)		

Multi-purpose Drills Set

Design: In plastic case.



heller get a bit more

Part No.	Set	1261	Contents mm
1000	4-piece	9.36	5, 6, 8, 10
		(119)	

Glass Drills CeramicMaster

Design: With pointed transverse cutting edge and finished surface for low friction and long service life. Precise spot drilling on smooth and sensitive surfaces. Regrindable cutting edges. **With 1/4" hexagon shank.**

Application: Glass and tile drill for rotary drilling. Due to the geometry of the transverse cutting edge, precise holes are drilled also on sensitive and smooth surfaces. For ceramics, tiles, klinker, glass, acrylic glass, polished glass etc.

Note: Use only for rotary operation (at low speed) and cool sufficiently.



Part No.	ø mm	1263	Total length mm
0030	3	2.30	60
0040	4	2.35	60
0050	5	2.55	60
		(119)	

Part No.	ø mm	1263	Total length mm
0060	6	2.65	60
0080	8	3.67	75
0100	10	4.85	80
		(119)	

Glass Drill Sets CeramicMaster

Design: Supplied in sturdy metal case with automatic upright setting of the drills when opening the case. Set includes (part no. 1263).



Part No.	Design	1263	Contents mm
1000	5-piece	15.82	4, 5, 6, 8, 10
		(119)	

Granite Drills SDS-plus GraniteMaster

Design: Computed cutting head, with lathe centre and optimized helix. The special geometry of the drill ensures optimized energy throughput.

Application: Due to the special cutting edge geometry, precise bore holes are drilled in extremely hard material without crack-off. Low-vibration operation. The special helix provides for quick transport of boring dust. For granite and other hard slide blocks.



Part No.	ø mm	1264	Total length mm	Twist length mm
0040	4	1.71	110	50
0060	6	1.34	110	50
0080	8	1.78	110	50
0100	10	2.05	110	50
		(119)		

Reinforcement Drill Bits RebarCutter

Design: With countersunk and individually soldered carbide teeth. Furthermore, the drill is fitted with an integrated ejector for easy removal of the reinforcement. The shank is fitted with a thread for quick change between reinforcement drill and hammer drill.

Application: 100 % compatible with hammer drill. Ideal for reinforced concrete with the usual reinforcements. The hammer drill hits a reinforcement. The reinforcement drill is used and a hole is drilled in the reinforcement. Then the hammer drill is used again.

Note: Cut reinforcements only after consent of the stress analyst.



Part No.	ø mm	1266	Total length mm	Drilling depth mm
0120	12	47.80	230	190
0140	14	47.80	230	190
0160	16	57.71	230	190
0180	18	61.78	230	190
		(119)		

Part No.	ø mm	1266	Total length mm	Drilling depth mm
0200	20	63.02	230	190
0250	25	71.77	230	190
0280	28	73.67	230	190
0300	30	77.89	230	190
		(119)		

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

SDS-max Hammer Drills and Chisels/Drill Bits

Adapters for Reinforcement Drill

Application: For reinforcement drills Rebar Cutter (part no. 1266) in SDS-plus or SDS-max drilling machines.

Part No.	Drive arbor	1267	Length mm
0010	SDS-plus	18.20	108
0020	SDS-max	18.20	185
		(119)	



Hammer Drills SDS-max

Design: With SDS-max. shank holder. High drilling speed, computed helix ensures optimized impact energy throughput, ergonomical design – gentle to joints and muscles, hardened surface for increased breaking strength in hammer drill operations and increased strength for drilling of reinforced material.

Application: For concrete, stone, masonry, marble, klinker.



Part No.	ø mm	1265	Total length mm	Twist length mm
1234	12	21.56	340	200
1434	14	23.70	340	200
1454	14	28.50	540	400*
1634	16	24.52	340	200
1654	16	29.14	540	400*
1834	18	24.70	340	200
1854	18	30.15	540	400*
1894	18	37.05	940	800*
2032	20	25.45	320	200
2052	20	31.12	520	400*
2092	20	36.13	920	800*
2232	22	27.49	320	200
2252	22	32.28	520	400*
2432	24	27.99	320	200
		(120)		

Part No.	ø mm	1265	Total length mm	Twist length mm
2452	24	32.60	520	400*
2532	25	28.81	320	200
2552	25	32.94	520	400*
2592	25	46.25	920	800*
2837	28	33.76	370	250
2857	28	37.05	570	450*
2867	28	39.50	670	550*
3057	30	37.87	570	450*
3257	32	41.15	570	450*
3557	35	44.88	570	450*
3837	38	44.63	370	250
3857	38	56.31	570	450*
4057	40	65.87	570	450*
		(120)		

* With short drill bit, same diameter, pre-drill at least 150 mm.

SDS-max Chisel Bits

Design: Forged from single piece, robust and regrindable, long life, with SDS max-shank holder.

Part No.	Design	1262	Thickness mm	Length mm
0002	Pointed chisel	6.12	–	280
0005	Pointed chisel	6.78	–	400
0010	Pointed chisel	9.12	–	600
0012	Flat chisel	6.52	25	280
0015	Flat chisel	6.78	25	400
0020	Flat chisel	9.34	25	600
0025	Hollow chisel	13.86	26	300
0030	Spade chisel	10.57	50	400
0035	Spade chisel	16.66	80	300
0040	Spade chisel	19.74	115	350
		(120)		



1262 0002/0005/0010



1262 0012/0015/0020



1262 0025



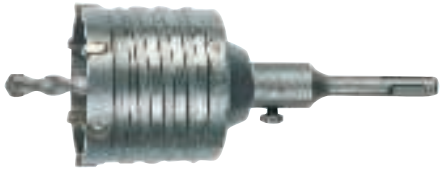
1262 0030/0035/0040

Carbide Tipped Core Drills

Design: High-quality soldering ensures long service life in any material, optimal concentricity for clean holes. Enhanced durability due to hardened steel body with M16 female thread, low wear carbide teeth with slot soldering for maximum stability. Complete with removable centre drill.

Application: For concrete, stone, masonry, klinker, bricks, light-weight construction material.

Part No.	ø mm	1271	Applications	Shank
0650	68	27.66	Switch boxes	Hexagon SW 12 mm
0800	80	32.66	Distributor boxes	Hexagon SW 12 mm
0651	68	28.77	Switch boxes	SDS-plus
0801	80	32.66	Distributor boxes	SDS-plus
		(120)		



Masonry Drills, Chisels, Bits

Diamond Bits

Design: Diamond bore bit, high-performance diamond cutting edges for outstanding chip removal, high drilling speed, low wear, precise and clean drilling results also in wet limestone. Optimal for installation, **accurate cut in dry drilling applications.**

Application: For limestone, masonry.

Part No.	⌀ mm	1274	Applications	Number of segments
0680	68	56.82	Switch boxes	3
0820	82	62.22	Distributor boxes	4
		(120)		



Shank Holders

Fits diamond bits 1274 0680 and 1274 0820.

Part No.	Shank holder	1274	Length mm
0005	Hexagon SW 12	5.75	78
		(120)	



Carbide Tipped Centre Drills

Fits shank holder 1274 0005.

Part No.	⌀ mm	1274	Length mm
0008	9	1.55	120
		(120)	



Multi-purpose Hole Saws Allmat

Design: High drill bit with sturdy base and carbide teeth ground all-over and regrindable. The chipping range is large and thus ensures the quick removal of the boring dust without any problems. Furthermore, boring dust residuals can be removed easily. Max. drilling depth 65 mm.

Application: For mounting wall outlets and junction boxes. Due to the high and sturdy drill bit, wall sockets are countersunk in one step and **torsion-free drilling** is ensured. The ground teeth prevent burning when drilling wood. Suitable for a number of materials, such as aluminium, insulation, gas concrete, gypsum plaster, wood and chalky sandstone. Can be used on machines with SDS-plus and hexagon shank.

Part No.	⌀ mm	1275	Applications
0680	68	19.79	Switch boxes
0820	82	25.45	Distribution boxes
		(119)	



Shank Holders

Application: For multi-purpose hole saws Allmat (part no. 1275).

Part No.	Shank holder	1275
0050	Hexagon	6.20
0055	SDS-plus	6.20
		(119)



1275 0050



1275 0055

Centre Drills

Design: Sturdy centre drill for quick and safe spot drilling on all surfaces. Suitable for shank holder (part no. 1275).

Part No.	⌀ mm	1275	Length mm
0010	9	2.81	115
		(119)	



Forstner Wood Boring Bits

Design: According to DIN 7483 G, with precision-ground brad point for precise spot drilling. Two circumferential cutting edges and two main cutting edges ensure accurate holes also on border of workpiece. Suitable for soft and hard wood, plastic-coated boards.

Part No.	⌀ mm	1285	Length mm	Shank ⌀ mm	Max. speed (RPM) Soft wood	Hard wood
1000	10	3.40	90	8	1200–1400	1000–1200
1500	15	3.96	90	8	1200–1400	1000–1200
2000	20	4.76	90	8	1200–1400	1000–1200
2500	25	5.11	90	8	1000–1200	800–1000
3000	30	5.98	90	8	1000–1200	800–1000
3200	32	6.60	90	10	800–1000	600– 800
3500	35	6.90	90	10	800–1000	600– 800
4000	40	9.63	90	10	800–1000	600– 800
		(122)				



All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Wood Bits

Lip and Spur Drills for Wood

Design: Precise spot drilling and clean holes due to ground brad point. Hard-wearing, hardened steel with brad point and two cutting edges made of low-wear CV steel, fast chip removal. Also suitable for use on rechargeable battery driven drilling machines.

format professional quality

1288



Part No.	⌀ mm	1288 mm	Flute length mm	Total length mm	Shank ⌀ mm
0300	3	0.80	33	61	3
0400	4	0.80	43	75	4
0500	5	0.87	52	86	5
0600	6	0.90	57	93	6
0700	7	0.96	69	109	7
0800	8	1.14	75	117	8
0900	9	1.23	81	125	9
1000	10	1.28	87	133	10
1100	11	1.38	94	142	8
1200	12	1.37	101	151	8
		(122)			

Lip and Spur Drills for Wood

Design: In plastic case.

1289



Part No.	Set	1289 mm	Content mm
0005	5-piece	4.85	4 – 5 – 6 – 8 – 10
		(122)	

Auger Drill Bits

Design: With self-retracting threaded pilot for precision holes, very stable, hardened pre-cutting and main cutting edge ensure long service life, Lewis helix for speedy chip removal, hex. shank. For hard and soft woods, beams.

format professional quality



Part No.	⌀ mm	1291 mm	Total length mm	Twist length mm
0845	8	6.26	450	360
1045	10	6.26	450	360
1245	12	6.88	450	360
1445	14	7.73	450	360
		(122)		

Part No.	⌀ mm	1291 mm	Total length mm	Twist length mm
1645	16	8.40	450	360
1845	18	9.22	450	360
2045	20	9.88	450	360
		(122)		

Boarding Drills

Design: Optimal chip removal also in deep holes, stepped shank with open helix runout prevents jamming of bit, excellent concentricity for accurate holes, high load and break resistance. Suitable for drilling in boarding and control panels, soft and hard wood, insulation material.

1294 **Overall length 400 mm.**
1295 **Overall length 600 mm.**

format professional quality



Part No.	⌀ mm	1294 mm	1295 mm	Shank ⌀ mm
0800	8	3.13	3.16	6
1000	10	3.43	3.74	8
1200	12	4.38	4.75	8
1400	14	5.24	5.66	8
1600	16	6.40	6.68	10
1800	18	8.54	9.25	10
		(122)	(122)	

Part No.	⌀ mm	1294 mm	1295 mm	Shank ⌀ mm
2000	20	9.98	10.73	10
2200	22	11.04	12.13	10
2400	24	14.64	15.57	11
2600	26	–	18.52	11
2800	28	–	19.93	11
3000	30	–	22.51	11
		(122)	(122)	

Shell End Countersinks

Design: For drilling and countersinking in one operation, 5 flutes for accurate countersinking also in hard material, countersink angle 90°, also used as bit stop. **Delivery without bit.**

Application: For soft and hard wood, veneer wood, plastic-coated boards and plywood.

format professional quality



Countersink



Bit stop

Part No.	Counterbore ⌀ mm	1297 mm	For drills ⌀ mm
0300	16	4.65	3
0400	16	4.65	4
0500	16	4.65	5
0600	16	4.65	6
0800	20	5.18	8
1000	20	5.40	10
		(122)	

Precision Conical Drills

Conical Drills for Sheet Metal

HSS

format professional quality

Design: CBN deep-ground, flute with laser ∅ scale. The special shaft allows firm hold by the drill chuck. For burr-free drilling and reaming of sheet metal, tubes and sectional material. Burr-free and chatter-free operation; for use in hand and column-type drilling machines. Perfect fit for steel sheet 0.1–2 mm. Nirosta sheet steel (V2A) 0.1–1 mm, plastics up to 10 mm, non-ferrous metals 0.1–5 mm. Surface hardened, resulting in increased hardness of over 1,000 HV.

1300 Surface hardened.

1301 Spiral flutes, TiAlN coated.

1303 TiN2 coated.



1300



1301



1303

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1300	●											○	
1301	●	●							●			○	
1303	●	●							●			○	

Part No.	Dimensions mm	1300	1301	1303	Drilling range mm	Total length mm	Shank length mm	Shank ∅ mm
0010	3–14	4.26	–	7.56	1	58	20	6
0015	4–20	–	24.35	–	2A	67	20	8
0020	6–20	7.05	–	10.63	2	66	22	8
0030	16–30.5	12.28	–	22.16	3	72	22	9
0040	24–40	23.06	–	46.97	4	86	30	10
0050	36–50	42.06	–	67.41	5	87	30	12
0060	40–61	71.51	–	103.96	6	91	30	12
0070	4–31	16.71	–	24.65	7	104	25	10
0080	5–31	–	48.38	–	2A	103	24	10
		(124)	(124)	(124)				

Precision Conical Drill Sets

HSS

Design: Supplied in sturdy, high-quality plastic case with automatic upright setting of the drills when opening the case incl. tube of cutting paste.

1306 Straight fluted, surface hardened to more than 1,000 HV. Set includes (part no. 1300).

1307 Spiral flutes, TiAlN coated. Set includes (part no. 1301).

1309 Straight fluted, TiN2 coated. Set includes (part no. 1303).



1306



1309



1307

Part No.	Drilling range mm	1306	1307	1309	Shank ∅ mm
0100	3–30.5	32.53	–	48.74	–
0100	4–31	–	80.03	–	8
		(124)	(124)	(124)	

Please note: To extend the service life we recommend the use of the cutting paste included in the set (part no. 1312 0005, page 1/61).

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Stepped Drills

Universal Stepped Drills

Design: With 2 cutting edges, cross ground, flute marked with laser ∅ scale. The special shaft ensures firm hold by the drill chuck. For burr-free drilling and reaming of sheet metal, tubes and sectional material. Perfect fit for material of max. 6 mm wall thickness. CBN ground.

1315 Straight fluted.

1314 Spiral flutes, blank.

1316 TiAlN With spiral flutes for deburring on both sides in a single step. TiAlN coated.

HSS

format professional quality

1315



1314



1316 TiAlN



Part Nr.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1315	●	○							○			●	
1314	●	○							○			●	
1316	●	●							●			○	

Part No.	Diameter of drill steps mm	1315 mm	1314 mm	1316 TiAlN mm	Length of steps mm	Total length mm	Shank ∅ h 8 mm
0010	4, 5, 6, 7, 8, 9, 10, 11, 12	10.11	15.76	22.37	5	80	6
0015	4, 6, 8, 10, 12, 14, 16, 18, 20	–	20.07	30.01	4	67	8
0020	4, 6, 8, 10, 12, 14, 16, 18, 20	11.85	–	–	4	67	8
0030	6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30	20.00	31.91	42.45	4	98	10
0035	6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36	–	–	67.57	3	82	12
0038	Thread clearance holes for cable fittings: 7–10.5 (M12 x 1,5) – 14.5 (M16 x 1.5) – 18.5 (M20 x 1.5) – 23.5 (M25 x 1.5) – 30.5 (M32 x 1.5) – 38.5 (M40 x 1.5), Thread clearance holes for cable fittings: 7–12.5 (M12 x 1.5) – 16.5 (M16 x 1.5) 20.5 (M20 x 1.5) – 25.5 (M25 x 1.5) – 32.5 (M32 x 1,5) – 40.5 (M40 x 1,5)	–	–	54.71	6 (core hole) – 3 (clearance hole)	110	12
0040	For Pg clearance hole 12.5 (Pg7), 15.2 (Pg9), 18.6 (Pg11), 20.4 (Pg13,5), 22.5 (Pg16), 28.3 (Pg21), 33.0, 37.0 (Pg29)	34.10	–	–	4	92	12
0050	For Pg clearance hole 12.5 (Pg7), 15.2 (Pg9), 18.6 (Pg11), 20.4 (Pg13.5), 22.5 (Pg16), 28.3 (Pg21), 30.5	25.90	–	–	4	85	12
0060	For Pg-Core holes11.4 (Pg7), 14 (Pg9), 17.25 (Pg11), 19 (Pg13.5), 21.25 (Pg16), 26.75 (Pg21)	25.90	–	–	6	92	12
0070	For general machine engineering 9, 12, 15, 18, 21, 24, 27, 30, 33, 36	26.12 (124)	– (124)	– (124)	3	86	12

Universal Drill Step Sets

Design: In plastic case.

1318 Straight fluted.
Set includes (part no. 1315).

1317 Spiral flutes, blank.
Set includes (part no. 1314).

1319 TiAlN With spiral flutes for deburring on both sides in a single step. TiAlN coated.
Set includes (part no. 1316).

HSS

Part No.	Drill steps mm	1318 mm	1317 mm	1319 TiAlN mm	Shank ∅ mm
0100	4–30	50.02	–	–	8
0100	4–31	–	71.90	–	8
0100	4–30	– (124)	– (124)	97.05 (124)	8



1318



1319 TiAlN



1317

Please note: To extend the service life we recommend the use of cutting paste part no. 1312 0005 (page 1/56).

Stepped Drill

Cutting Paste

(cooling lubricator)

Application: For conical drills, stepped drills, countersinks.

format professional quality

Part No.	Cutting paste	1312 mm/m²
0005	18 g rotary pin	2.45 (124)



Spot Weld Cutters

Design: Exchangeable milling crown with two-sided milling capability. Hexagonal shank with setting screw for precise setting of cutting depth.

Application: For loosening spot-welded metal sheet parts. No tearing or deforming of the sheet.

HSS

format professional quality

Part No.	Article	1321 mm/m²
0050	Spot weld cutter, compl., cutter ∅ 10 mm, overall length 72 mm	6.30
0100	Spare cutting bits ∅ 10 mm, ground	2.79
0150	Spare centre pin	0.34 (124)



Universal Drill Saws, Parallel Shank

Design: Short twist drill, point angle 118°, cutting incl. chip breakers. For drilling and subsequent milling of thin-walled workpieces made of ferrous and non-ferrous materials, stainless and acid resistant steels, alloys and non-ferrous metals, wood and plastic.

HSS 118°

format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1323	●	●									○	○	◐

Part No.	∅ mm	1323 mm/m²	Total length mm	Shank ∅ mm
0600	6	2.93 (124)	90	6



Spot Weld Stub Drills with Parallel Shank

Design: The special ground point with 90° centre point guarantees easy centring, spot drilling and precise circular drilling. For clean and burr-free drilling out of spot welds in short to long chipping materials such as steel up to approx. 1,000 N/mm², electrolytic copper, AlSi alloys, for non-ferrous metals.

HSS-E

format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1325	●	●									○	○	◐

Part No.	∅ mm	1325 mm/m²	Twist length mm	Total length mm
0600	6	2.82	28	66
0800	8	3.67 (124)	37	79



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Core Bits HSS-Co-Eco

Application: The core bit chips only a thin material ring. The remaining core is ejected by means of a solid pilot and an ejector pin using spring power. Upward chip removal with minimal risk of fracture. Even large drill diameters need only little energy. For use in magnetic pillar or upright drilling machines with MK retainer. With Weldon shank ⌀ 19 mm. CBN-ground.

HSS Co5





1326 **25 mm cutting depth.**



1327 **50 mm cutting depth.**



1328 **Core bit set in plastic case.**
Contains: 1 of each ⌀ 12.0, 14.0, 16.0, 18.0, 20.0, 22.0 mm incl. ejector pin with 25 mm cutting depth.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1326	●	◐		●	○	○			●	○	◐	◐	◐
1327	●	◐		●	○	○			●	○	◐	◐	◐

Part No.	Drill ⌀ mm	1326	1327	1328
0100	–	–	–	99.88
0120	12	11.60	16.43	–
0130	13	11.60	16.43	–
0140	14	11.60	16.43	–
0150	15	13.62	19.63	–
0160	16	14.03	20.91	–
0170	17	14.59	22.25	–
0180	18	14.96	23.51	–
0190	19	16.07	25.03	–
0200	20	16.82	25.57	–
0210	21	17.57	26.90	–
0220	22	16.24	25.22	–
0230	23	18.86	28.19	–
0240	24	19.63	28.94	–
0250	25	20.38	29.51	–
0260	26	20.91	30.97	–
0270	27	21.48	32.32	–
0280	28	22.25	33.59	–
0290	29	22.96	34.92	–
0300	30	23.12	37.34	–
		(125)	(125)	(125)

Part No.	Drill ⌀ mm	1326	1327	1328
0310	31	26.14	38.45	–
0320	32	28.94	41.06	–
0330	33	31.38	43.67	–
0340	34	34.92	46.49	–
0350	35	38.27	47.24	–
0360	36	41.42	50.84	–
0370	37	42.96	51.79	–
0380	38	44.43	53.22	–
0390	39	45.76	54.65	–
0400	40	47.04	56.54	–
0410	41	48.95	58.45	–
0420	42	50.84	60.83	–
0430	43	52.74	62.72	–
0440	44	55.59	64.62	–
0450	45	57.98	66.53	–
0460	46	60.83	68.89	–
0470	47	63.68	71.76	–
0480	48	65.57	74.14	–
0490	49	67.95	76.03	–
0500	50	69.36	77.46	–
		(125)	(125)	(125)

Accessories for Core Bits

1326 Guide pin for core bit.

1327 Adapter for core drill. Tool holder AMK2/AMK3 morse taper 2 or 3 for core bit with **Weldon shank** ⌀ 12–60 mm and automatic inside cooling and nipple for coolant tube, fits any machine with drill spindle MK2 or MK3.

1327 Quick-change tool holder Rota-Quick.
The quick clamping receptacle **Rota-Quick** allows a very quick tool change without any additional tools.
Function: Turn ring clockwise and hold – insert core bit into receptacle – release ring – locks automatically.
To be used for core bit type 1326/1327.

Part No.	Design	1326	1327	1327
1001	⌀ 6,35 x 77 mm	3.32	–	–
1002	⌀ 6,35 x 102 mm	3.32	–	–
2019	Weldon/MT2*	–	77.67	–
3019	Weldon/MT3*	–	77.67	–
4019	Rota-Quick/MT2*	–	–	117.67
5019	Rota-Quick/MT3*	–	–	117.67
		(125)	(125)	(125)

* including coolant connecting nipple.



1326



1327 2019
1327 3019



1327 4019
1327 5019

Circular Cutters

By means of the GFS circular cutters, sheet metals with a thickness of up to 5 mm as well as plastics and sealing material etc. with a thickness of up to 30 mm can be cut. When using special blades, materials with greater thickness can also be machined. The diameter can be set easily by moving the clamping devices.

1330 **Design:** Liliput incl. 1 cutter no. 122 made of HSS-E for thin sheet metals with 1 support each for drawing cuts and straight cuts no. 2 and no. 3.



1330

Part No.	Type	1330	Cutting range mm	Shank design mm
0005	Liliput	70.74 (126)	18–80	10

1331 **Design:** Type 00+00a, incl. 1 cutter no. 422 made of HSS-E with drawing cut for sheet metals and 1 support for no. 422 and no. 422-00a.



1331

Part No.	Type	1331	Cutting range mm	Shank design mm
0005	00	119.43	30–200	parallel shank ⌀ 12
0010	00	119.43	30–200	Morse taper 2
0015	00	126.18	30–200	Morse taper 3
0020	00a	164.01 (126)	30–400	Morse taper 3

Steel Supports for Circular Cutter

Part No.	Order designation	1332	For cutter
0005	00	36.83	422
0010	00	34.47	5 and 6
0015	00	42.21	7
0020	00a	47.58 (127)	422

Part No.	Order designation	1332	For cutter
0025	00a	44.04	5 and 6
0030	00a	52.34	7
0035	00a	52.34 (127)	8



Spare Cutters for Circular Cutters

For type Liliput



122 | 122 / TiN | 2 | 3 | 3 / TiN
122 HM | 3 HM

For type 00 and 00a



422 | 422 / TiN | 5 | 6 | 6 / TiN | 7HM
422 HM | 6 HM

For type 00a only



8 | 8 / TiN
8 HM

Part No.	For type	1333 HM	1334 HSS-E	1335 HM	Type	Application
0001	122	23.47	12.23	23.87	Liliput	For sheet, steel and non-ferrous metals, cutting depth 5 mm
0003	2	–	11.73	–	Liliput	For non-rigid plastics, rubber, sealing material + leather, cutting depth 5 mm
0005	3	23.47	12.82	27.57	Liliput	For rigid PVC, plexiglass and polyamide. Cutting depth 15 mm
0007	422	23.47	11.53	23.27	00+00a	For sheet, steel and non-ferrous metals, cutting depth 5 mm
0009	5	–	10.94	–	00+00a	For non-rigid plastics, rubber, sealing materal and leather, cutting depth 5 mm
0011	6	23.47	12.34	27.17	00+00a	For rigid PVC, plexiglass and polyamide. Cutting depth 15 mm
0013	7	28.28	–	–	00+00a	For rigid PVC and pressed material, cutting depth 20 mm
0015	8 (only for 00a)	28.28 (127)	22.26 (127)	40.51 (127)	00a	For stronger sheet metals up to 12 mm and ⌀ 150 mm

PU = 5 units (size 8 = 2 units)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

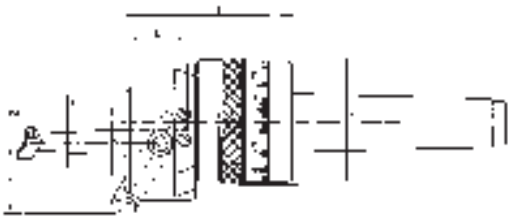
Boring Heads and Accessories

Finely-adjustable Micro Boring Heads and Accessories

Design: Precise adjustment of the boring diameter thanks to a large and legible scale. It is adjusted to the respective steel without using a key but by turning the knurled micrometer drum. Convenient slide adjustment. Large boring range. Holes can be bored precisely using the centric steel receptacle for small-sized holes and the inclined steel receptacle for large-sized holes. Minimal unbalance in case of increased speed due to the lightweight construction of the slide. Minimal vibration due to short construction. No adjustment during machining, as the fitted clamping mechanism acts upon the scale drum and the slide.

Feed accuracy 0.01 mm ⌀.
For drilling precise holes on gauges, boring machines, drilling machines, turret lathes, turning lathes, milling machines etc.





With shank MT2 and fastening thread

Part No.	Dimensions	1350 $ - ›·	Bore range for steel receptacles mm axial a ⌀	inclined b ⌀	Adjusting range V mm	Head ⌀ K mm	Head length without shank L mm	Steel retainer S ⌀ mm	Positioning depth of steel E mm	Wooden case size
0201	1	765.82 ◊	0.5–30	30– 45	8	25	40	6	13	2
0202	2	861.82 ◊	0.5–40	40– 65	11	35	50	8	19	2
0203	3	951.82 ◊	0.5–55	50–100	15	50	65	10	25	3
		(130)								

With shank MK3 and fastening thread

Part No.	Dimensions	1350 $ - ›·	Bore range for steel receptacles mm axial a ⌀	inclined b ⌀	Adjusting range V mm	Head ⌀ K mm	Head length without shank L mm	Steel retainer S ⌀ mm	Positioning depth of steel E mm	Wooden case size
0301	1	802.95 ◊	0.5–30	30– 45	8	25	40	6	13	3
0302	2	887.06 ◊	0.5–40	40– 65	11	35	50	8	19	3
0303	3	951.82 ◊	0.5–55	50–100	15	50	65	10	25	3
0304	4	1,318.59 ◊	0.5–80	75–170	25	75	90	14	31	4
		(130)								

With shank SK 40 DIN 2080/ring groove

Part No.	Dimensions	1350 $ - ›·	Bore range for steel receptacles mm axial a ⌀	inclined b ⌀	Adjusting range V mm	Head ⌀ K mm	Head length without shank L mm	Steel retainer S ⌀ mm	Positioning depth of steel E mm	Wooden case size
0401	1	903.02 ◊	0.5–30	30– 45	8	25	40	6	13	4
0402	2	1,014.87 ◊	0.5–40	40– 65	11	35	50	8	19	4
0403	3	1,182.06 ◊	0.5–55	50–100	15	50	65	10	25	4
0404	4	1,451.61 ◊	0.5–80	75–170	25	75	90	14	31	4
		(130)								

With shank SK 40 DIN 69871/ring groove

Part No.	Dimensions	1350 $ - ›·	Bore range for steel receptacles mm axial a ⌀	inclined b ⌀	Adjusting range V mm	Head ⌀ K mm	Head length without shank L mm	Steel retainer S ⌀ mm	Positioning depth of steel E mm	Wooden case size
0501	1	935.97 ◊	0.5–30	30– 45	8	25	40	6	13	4
0502	2	1,046.67 ◊	0.5–40	40– 65	11	35	50	8	19	4
0503	3	1,213.76 ◊	0.5–55	50–100	15	50	65	10	25	4
0504	4	1,479.91 ◊	0.5–80	75–170	25	75	90	14	31	4
		(130)								

Further shaft designs available on request.

Accessories

1351 Universal boring steels for micro boring heads.
1352 Universal boring steels for micro boring heads, carbide tipped.
1353 Wooden case for micro boring heads.

Part No.	Suitable for size	1351 $ - ›·	1352 $ - ›·	1353 $ - ›·
0001	1	36.45 ◊	36.45 ◊	–
0002	2	39.28 ◊	39.28 ◊	25.58 ◊
0003	3	42.11 ◊	42.11 ◊	31.13 ◊
0004	4	48.79 ◊	48.90 ◊	63.74 ◊
		(131)	(131)	(131)

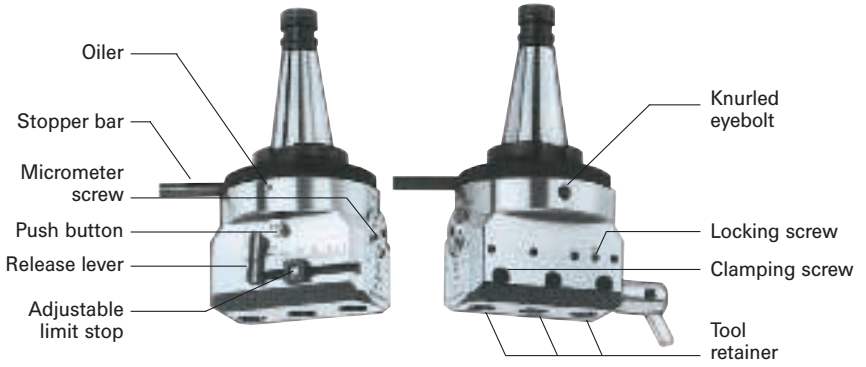


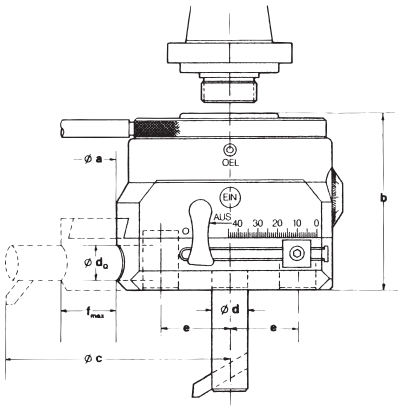


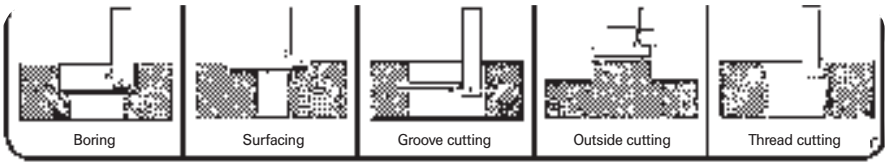
Universal Facing/Boring Heads and Accessories

Design: Including accessories (universal lathe tool HSS, boring bar with horizontal steel receptacle including insert made of HSS, boring bar with inclined steel receptacle including insert made of HSS), wooden case, bumper bar, Allen key, **without shank.** The tool can be used for precise workpiece machining such as facing, boring, turning on lathe, plunging, tapping and forming by turning.
The tool slide is provided with an automatic transverse feed and is released automatically by an adjustable limit stop.
An advantage of the construction is the steel feed which is directly effected by a threaded spindle. The tool slide is thus adjusted without any intermediates such as toothed wheels or worm wheels. This means that the tool is less susceptible to failures and works precisely. The feed spindle is largely protected against impurities and chips.
The scale engraved at the side enables the quick finding of various already turned diameters. The boring heads are precise and extremely solid due to their compact design. Exchangeable tool shanks are of course available for these types. The parts which are subject to wear are hardened and ground.

Application: On jig drilling machines, horizontal drilling machines, milling machines, radial drilling machines and other machine tools.
An automatic transverse movement of the slide is required for facing and plunging. This can easily be effected by pressing the push button and stopping the knurled eyebolt using the bumper bar.
The transverse movement of the slide is effected only from the inside to the outside. The feed is stopped by means of the release lever, the push button is ejected and the facing movement is finished. The quick return motion to the initial position is effected by actuating the adjusting spindle. The tool is set for clockwise rotation. In case of boring and turning the outside diameter, the respective dimension of the tool slide is adjusted and the locking screw is tightened. This clamping by means of the adjustable V-ledge ensures high rigidity for clean and vibration-free operation. The locking screw must be released for facing.







			1354 UBS F1	1355 UBS F2	1356 UBS F3
			1,774.24 ◊	2,139.19 ◊	2,818.54 ◊
Part No.			0200	0300	0400
Facing and boring range	c	ø mm	200	300	400
Max. slide adjustability	$f_{max.}$	mm	35	45	62
Automatic slide feed		mm	0.05	0.05	0.05
Fine-adjustment		ø mm	0.01	0.01	0.01
Quick return motion per revolution of the spindle		ø mm	2	2	2
ø of the tool retainer	d	mm	16	18	18
Head height	b	mm	83	90	104
ø head	a	mm	80	120	150
ø d_a		mm	16	18	20
e		mm	25	35	50
			(130)	(130)	(130)

Shanks

Design: Shank for model UBS F size 1–3.

Part No.	Taper thread	1357	Shank design
0904	MT 4/M16	165.95 ◊	With drive surface
0030	SK 30/M12	190.75 ◊	DIN 2080
0040	SK 40/M16	230.71 ◊	DIN 2080
		(131)	

Part No.	Taper thread	1357	Shank design
0041	SK 40/M16	257.88 ◊	DIN 69871 A
0050	SK 50/M24	263.76 ◊	DIN 2080
0051	SK 50/M24	285.49 ◊	DIN 69871 A
		(131)	

Please indicate the size in your purchase order, UBS F1, F2 or F3.

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Universal Lathe Tools

HSS Carbide

1358 **Design:** Universal lathe tools, HSS, for model UBS F.

1359 **Design:** Universal lathe tools, carbide tipped, for model UBS F.



Part No.	Dimensions	1358	1359
0005	1	69.62 ◊	77.43 ◊
0010	2	73.47 ◊	81.51 ◊
0015	3	75.39 ◊	83.09 ◊
		(131)	(131)

Boring Bars

HSS Carbide

Design: With horizontal steel receptacle, including insert, for model UBS F.

1360 HSS

1361 Carbide-tipped



Part No.	Dimensions	1360	1361
0005	1	62.37 ◊	70.19 ◊
0010	2	66.68 ◊	75.50 ◊
0015	3	69.62 ◊	77.54 ◊
		(131)	(131)

Boring Bars

HSS Carbide

Design: With inclined steel receptacle, including insert, for model UBS F.

1362 HSS

1363 Carbide-tipped



Part No.	Dimensions	1362	1363
0005	1	72.79 ◊	80.48 ◊
0010	2	75.39 ◊	83.32 ◊
0015	3	80.03 ◊	87.95 ◊
		(131)	(131)

Reducing Bushes

Design: For model UBS F.



Part No.	Type	1365	Dimensions
1608	F1	45.28 ◊	16 x 8
1610	F1	45.28 ◊	16 x 10
1612	F1	45.28 ◊	16 x 12
1808	F2/F3	47.32 ◊	18 x 8
1810	F2/F3	47.32 ◊	18 x 10
1812	F2/F3	47.32 ◊	18 x 12
1814	F2/F3	47.32 ◊	18 x 14
		(131)	

Wooden Cases

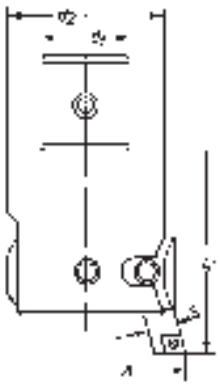
Design: For model UBS F.

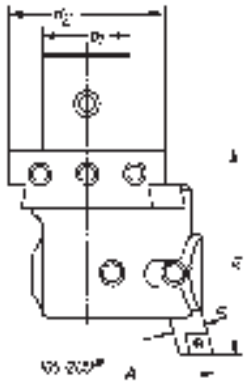


Part No.	Dimensions	1367
0001	1	63.62 ◊
0002	2	69.51 ◊
0003	3	110.72 ◊
		(131)

Fine-adjustable Incise Boring Heads for Tool Systems ∅ 24–200 mm





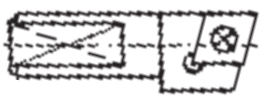


Part No.	Boring range A mm	1370	Pin ∅ d_1 mm	∅ d_2 mm	x_1 mm	∅ s mm	Fine adjustment 1 stroke mm
0005	24– 30	642.77 ◊	11	20	35	6	0.02
0010	29– 37	656.92 ◊	14	25	40	6	0.02
0015	36– 46	688.73 ◊	18	32	45	8	0.02
0020	45– 58	731.07 ◊	22	40	45	8	0.01
0025	57– 76	794.69 ◊	28	50	55	10	0.01
0030	72–108	820.61 ◊	36	63	60	10	0.01
0035	95–155	877.10 ◊	36	80	60	16	0.01
0040	105–200	1,185.58 ◊	36	80	100	16	0.01

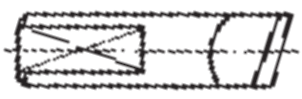
(131)

Inside coolant supply on request.

Fine Bore Bits for Incise Boring Head









Part No.	Boring range A mm	1372	Holder No.	∅ s mm	Suitable carbide indexable inserts types
0005	24– 30	89.21 ◊	WPH 680	6	CCMT 0602..
	29– 37		WPH 680	6	CCMT 0602..
0010	36– 46	89.21 ◊	WPH 880	8	CCMT 0602..
	45– 58		WPH 880	8	CCMT 0602..
0015	57– 76	89.21 ◊	WPH 1080	10	CCMT 0602..
	72–108		WPH 1080	10	CCMT 0602..
0020	95–155	89.21 ◊	WPH 1680	16	CCMT 09T30..
	105–200		WPH 1680	16	CCMT 09T30..

(131)

Part No.	Boring range A mm	1374	∅ s mm	HSS type no.
0005	24– 30	28.41 ◊	6	619
	29– 37		6	619
0010	36– 46	28.41 ◊	8	826
	45– 58		8	826
0015	57– 76	30.56 ◊	10	1038
	72–108		10	1038
0020	95–155	49.70 ◊	16	1635
	105–200		16	1635

(131)

Indexable Inserts for Incise Boring Head



M-...



Alu-A20



M-M10

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metal	Corner radius	Precision sintered	Ground
9600	CCMT 060204 M M10	3.12*	●	–	●	–	0.4	●	–
9603	CCMT 060204 M T20	3.12*	●	–	●	–	0.4	●	–
9606	CCMT 060204 M T35	3.12*	●	●	●	–	0.4	●	–
9609	CCGT 060204 Alu A20	6.49*	–	–	●	●	0.4	–	●
9612	CCMT 060208 M M10	3.12*	●	–	●	–	0.8	●	–
9615	CCMT 060208 M T20	3.12*	●	–	●	–	0.8	●	–
9618	CCMT 060208 M T35	3.12*	●	●	●	–	0.8	●	–
9621	CCMT 09T304 M M10	3.65*	●	–	●	–	0.4	●	–
9624	CCMT 09T304 M T20	3.65*	●	–	●	–	0.4	●	–
9627	CCMT 09T304 M T35	3.65*	●	●	●	–	0.4	●	–
9630	CCGT 09T304 Alu A20	7.23*	–	–	●	●	0.4	–	●

* PU 10 units

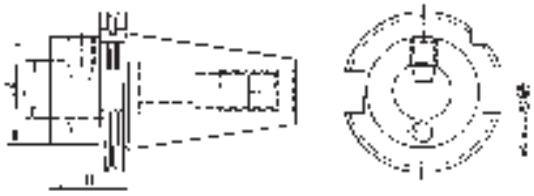
(282)

Boring Heads and Accessories

Receiving Shanks DIN 69871 A



Figure shows DIN 69871



Part No.	Taper thread	1376 $ - ?	d1 mm	d2 mm	l1 mm
4020	SK40/M16	234.90	11	20	60
4025	SK40/M16	234.90	14	25	60
4032	SK40/M16	234.90	18	32	60
		(131)			

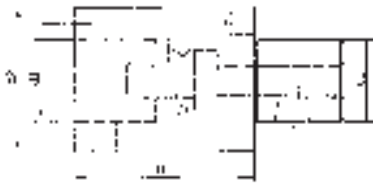
Part No.	Taper thread	1376 $ - ?	d1 mm	d2 mm	l1 mm
4040	SK40/M16	234.90	22	40	60
4050	SK40/M16	234.90	28	50	60
4063	SK40/M16	234.90	36	63	60
		(131)			

SK 45 or SK 50 available on request. Receiving shanks according to DIN 69871 form B, DIN 2080, JIS B 6339 (MAS 403 BT) or ANSI/CAT on request.
Also other projection lengths (l_1) available ($l_1 = 40$ or $l_1 = 80$ mm). To achieve higher boring depths, extensions or reducers can be used.

Extensions

Design: For extending the receiving shanks, in order to machine deep holes.





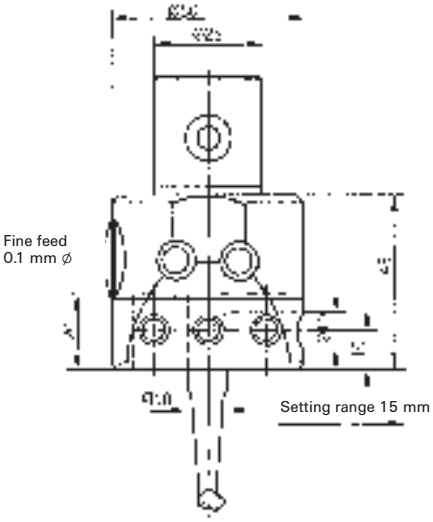
Part No.	Type No.	1378 $ - ?	d1 mm	d2 mm	l1 mm
0005	V 1140	140.15	11	20	40
0010	V 1440	143.09	14	25	40
0015	V 1460	146.60	14	25	60
0020	V 1840	147.16	18	32	40
0025	V 1860	153.05	18	32	60
0030	V 2240	153.05	22	40	40
0035	V 2260	157.13	22	40	60
		(131)			

Part No.	Type No.	1378 $ - ?	d1 mm	d2 mm	l1 mm
0040	V 2280	164.26	22	40	80
0045	V 2840	156.56	28	50	40
0050	V 2860	169.58	28	50	60
0055	V 2880	176.03	28	50	80
0060	V 3660	178.97	36	63	60
0065	V 3680	187.81	36	63	80
0070	V 36100	201.96	36	63	100
		(131)			

Precision Boring Heads for Tool System ∅ 3–80 mm

Design: The boring range 3–80 mm is achieved by using different boring tools. Due to 3 vertical location holes and 1 horizontal with a ∅ of 10 mm the tool is suitable for multi-purpose use.
Chamfering tools can also be clamped in this receptacle in order to chamfer or debur holes.





Part No.	Boring range mm	1368 $ - ?	Retainer ∅ mm	Tool retainer ∅ mm
0010	3–80	792.31	28	10
0016	3–80	792.31	28	16*
* centric hole		(130)		

Counterbores, Parallel Shank

Design: Three-flute counterbore with solid point.
For countersinking of hexagon socket screws DIN 912, 6912, 7984 and cheese head screws ISO 1207 (DIN 84) in all iron and non-ferrous metals and plastics.

HSS | DIN 373 | 3 F

format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1400	●	○										●	
1403	●	○										●	
1406	●	○										●	

Grade fine, for clearance hole

Part No.	For thread	1400 mm/min	Counter-bore ø mm	Pilot ø mm	Shank ø mm	Total length mm
0300	M 3	5.44	6	3.2	5.0	71
0400	M 4	4.80	8	4.3	5.0	71
0500	M 5	5.09	10	5.3	8.0	80
0600	M 6	5.46	11	6.4	8.0	80
0800	M 8	7.91	15	8.4	12.5	100
1000	M 10	9.89	18	10.5	12.5	100
1200	M 12	10.99	20	13.0	12.5	100
		(134)				



Grade medium, for clearance hole

Part No.	For thread	1403 mm/min	Counter-bore ø mm	Pilot ø mm	Shank ø mm	Total length mm
0300	M 3	5.44	6	3.4	5.0	71
0400	M 4	4.80	8	4.5	5.0	71
0500	M 5	5.09	10	5.5	8.0	80
0600	M 6	5.46	11	6.6	8.0	80
0800	M 8	7.91	15	9.0	12.5	100
1000	M 10	9.89	18	11.0	12.5	100
1200	M 12	10.99	20	13.5*	12.5	100
		(134)				

* not standardised



For core hole

Design: The solid pilot of the counterbore fits only in threaded core holes.
The thread is cut after countersinking.

Part No.	For thread	1406 mm/min	Counter-bore ø mm	Pilot ø mm	Shank ø mm	Total length mm
0300	M 3	5.44	6	2.5	5.0	71
0400	M 4	4.80	8	3.3	5.0	71
0500	M 5	5.09	10	4.2	8.0	80
0600	M 6	5.46	11	5.0	8.0	80
0800	M 8	7.91	15	6.8	12.5	100
1000	M 10	9.89	18	8.5	12.5	100
1200	M 12	10.99	20	10.2	12.5	100
		(134)				



Counterbore Sets

Design: In plastic case, 6-piece. M 3–M 10.
Three-flute counterbore. For countersinking of hexagon socket screws DIN 912, 6912, 7984 and cheese head screws ISO 1207 (DIN 84) in all iron and non-ferrous metals and plastics.

HSS | DIN 373 | 3 F

format professional quality

1409 0005 Set includes (part no. 1400).
1409 0010 Set includes (part no. 1403).
1409 0015 Set includes (part no. 1406).

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1409	●	○										●	

Part No.	Design	1409 mm Set
0005	For clearance hole, grade fine	46.72
0010	For clearance hole, grade medium	46.72
0015	For tapping drill hole	46.72
		(134)



Counterbores with Morse Taper Shank

Design: Three-flute counterbore with solid point. For countersinking of hexagon socket screws DIN 912, 6912, 7984 and cheese head screws ISO 1207 (DIN 84) in all iron and non-ferrous metals and plastics.

HSS | MK 2–3 | 3 F

format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1412	●	○										●	
1415	●	○										●	

Grade fine, for clearance hole

Part No.	For thread	1412 mm	Counter-bore ⌀ mm	Pilot ⌀ mm	Shank MK	Total length mm
1000	M 10	19.47	18	10.5	2	150
1200	M 12	19.93	20	13	2	150
1400	M 14	23.53	24	15	2	160
1600	M 16	26.70	26	17	3	190
1800	M 18	31.93	30	19	3	190
2000	M 20	36.98	33	21	3	190
2200	M 22	49.38	36	23	3	205
2400	M 24	53.17	40	25	3	205
		(134)				



Grade medium, for clearance hole

Part No.	For thread	1415 mm	Counter-bore ⌀ mm	Pilot ⌀ mm	Shank MK	Total length mm
1000	M 10	21.48	18	11	2	150
1200	M 12	21.79	20	13.5	2	150
1400	M 14	26.48	24	15.5	2	160
1600	M 16	29.03	26	17.5	3	190
1800	M 18	34.66	30	20	3	190
2000	M 20	40.48	33	22	3	190
2200	M 22	51.38	36	24	3	205
2400	M 24	58.41	40	26	3	205
		(134)				



Further dimensions on request. Counterbore with morse taper shank for core hole available on request.

90° Countersink Bits

Design: Due to hexagon shank (1/4" bit shank, DIN 2126) firm hold in any drill chuck.

Application: For countersinking, chamfering and deburring.

HSS | DIN 335-C | 90° | 3 F

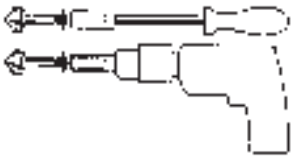
format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1420	●	○										●	

Part No.	Nominal ∅ mm	1420 mm	Smallest ∅ mm	Total length mm	For countersink screws
0630	6.3	2.30	1.5	31	M 3
0830	8.3	2.71	2.0	31	M 4
1040	10.4	3.11	2.5	34	M 5
1240	12.4	4.18	2.8	35	M 6
1650	16.5	6.07	3.2	40	M 8
2050	20.5	7.17	3.5	41	M 10

(134)







90° Countersink Bit Sets

Design: In plastic case, 9-piece incl. universal holder, solid handle and cutting paste.

Part No.	Nominal ∅ mm	1422 mm Set
0005	6.3–20.5	38.67

(134)

Deburring Countersinks

Design: With parallel shank. Due to the inclined hole, chips are removed in direction of the shank and will not damage the countersink. For easy and vibration-free deburring of bore holes.

HSS-E | 90° | 1 F

format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1425	●	○							○			●	

Part No.	Head ∅ mm	1425 mm	Total length mm	Shank ∅ mm	Countersink range mm
0100	10	3.21	45	6	2– 5
0140	14	4.15	48	8	5–10
0210	21	7.19	65	10	10–15
0275	28	13.15	84	12	15–20
0350	35	17.56	102	12	20–25
0440	44	22.87	115	15	25–30
0480	48	32.78	127	15	30–35
0530	53	62.29	136	15	35–40
0640	60	73.75	166	20	40–50

(134)





90° Deburring Sets

Design: In plastic case, 4-piece.

Part No.	Nominal ∅ mm	1427 mm Set
0005	10–28	40.25

(134)

Counterboring Tools

90° Countersinks and Deburrers

Design: Three-flute countersink, axially and radially ground. With parallel shank. For universal, vibration- and burr-free countersinking and deburring for countersunk screws ISO 2009, 2010, 7046, 7047 (DIN 963, 964, 965, 966) + DIN 7991.

HSS | HSS-E | DIN 335-C | 90° | 3 F

format professional quality

1430 HSS

1433 TiN2 HSS, TiN2 coated

1436 HSS-E

1430



1433 TiN2



1436



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1430	●											●	
1433	●	○							○			●	
1436	●	○							○			○	○

Part No.	Nominal ø mm	1430 mm	1433 TiN2 mm	1436 mm	Smallest ø mm	Total length mm	Shank ø mm
0430	4.3	2.74	4.36	–	1.3	40	4
0500	5.0	2.74	4.36	–	1.5	40	4
0600	6.0	2.74	4.36	–	1.5	45	5
0630	6.3	2.74	4.36	3.83	1.5	45	5
0730	7.3	2.95	4.73	–	1.8	50	6
0800	8.0	2.95	4.73	–	2	50	6
0830	8.3	2.95	4.73	4.00	2	50	6
1000	10.0	3.15	5.24	–	2.5	50	6
1040	10.4	3.15	5.24	4.10	2.5	50	6
1150	11.5	3.59	–	–	2.8	56	8
1240	12.4	3.59 (134)	6.07 (134)	4.59 (134)	2.8	56	8

Part No.	Nominal ø mm	1430 mm	1433 TiN2 mm	1436 mm	Smallest ø mm	Total length mm	Shank ø mm
1340	13.4	4.49	–	–	2.9	56	8
1500	15.0	4.49	6.98	5.13	3.2	60	10
1650	16.5	4.49	7.53	5.13	3.2	60	10
1900	19.0	6.30	9.57	–	3.5	63	10
2050	20.5	6.30	10.02	6.92	3.5	63	10
2300	23.0	9.14	–	–	3.8	67	10
2500	25.0	9.14	13.31	9.51	3.8	67	10
3000	30.0	11.37	16.83	–	4.2	71	12
3100	31.0	11.37	16.83	11.80	4.2	71	12
4000	40.0	19.84 (134)	28.79 (134)	– (134)	5	80	15

90° Countersinks and Deburrers ASP

Design: Three-flute countersink, axially and radially ground. With parallel shank.

Application: Especially suitable for VA steel, stainless steel and high-alloy HARDOX to meet the highest demands.

For universal, vibration- and burr-free pre-countersinking, countersinking and deburring in a single operation. Best suitable for countersunk screws ISO 2009, 2010, 7046, 7047 (DIN 963, 964, 965, 966) + DIN 7991.

90° | HSS-E ASP30 | DIN 335-C | 3 F

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1448	●	●	○						●			○	

Part No.	Nominal ø mm	1448 mm	Smallest ø mm	Total length mm	Shank ø mm
0630	6.3	6.71	1.5	45	5
0830	8.3	7.69	2	50	6
1040	10.4	8.82	2.5	50	6
1240	12.4	11.42 (134)	2.8	56	8

Part No.	Nominal ø mm	1448 mm	Smallest ø mm	Total length mm	Shank ø mm
1650	16.5	14.95	3.2	60	10
2050	20.5	20.27	3.5	63	10
2500	25.0	28.47 (134)	3.8	67	10

90° Countersink and Deburring Sets

Design: In plastic case, 6-piece. 1 of size 6.3; 8.3; 10.4; 12.4; 16.5; 20.5.

HSS | HSS-E | DIN 335-C | 90° | 3 F

format professional quality

1440 HSS

1442 HSS, TiN-2 coated

TIN2

1444 HSS-E



1440



1442

TIN2



1444

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1440	●											●	
1442	●	○							○			●	
1444	●	○							○			○	○

Part No.	Nominal ∅ mm	1440 Set	1442 TIN2 Set	1444 Set
0005	6.3–20.5	31.20 (134)	45.93 (134)	36.57 (134)

Other set combinations available on request.

Countersinks and Deburring Countersinks 90°, long/extra long

Design: Three-flute countersink, axially and radially ground. With parallel shank. For universal, vibration- and burr-free countersinking and deburring for countersunk screws ISO 2009, 2010, 7046, 7047 (DIN 963, 964, 965, 966) + DIN 7991.

HSS | DIN 335-C | 90° | 3 F

format professional quality

1445 Long, 100 mm shank.

1446 Extra long, 150 mm shank.

1445



Long

1446



Extra long

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1445	●	○										●	
1446	●	○										●	

Part No.	Nominal ∅ mm	1445	1446	Smallest ∅ mm	Shank ∅ mm
0630	6.3	14.80	18.51	1.5	5
0830	8.3	15.54	19.24	2	6
1040	10.4	17.02	21.45	2.5	6
1240	12.4	17.77	24.52	2.8	8
1650	16.5	22.20	28.88	3.2	10
2050	20.5	31.11 (134)	39.97 (134)	3.5	10

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

90° Countersinks

Design: Three-flute countersink, axially and radially ground. With morse taper shank. For universal, vibration- and burr-free countersinking and deburring for countersunk screws ISO 2009, 2010, 7046, 7047 (DIN 963, 964, 965, 966) + DIN 7991.

DIN 335-D | 90° | HSS | MK 1–4 | 3 F

format professional quality

1450 HSS

1453 TiN-2 coated

1450



1453 TiN2



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1450	●											●	
1453	●	○							○			●	

Part No.	Nominal ø mm	1450	1453 TiN2	Smallest ø mm	Total length mm	Shank MT
1650	16.5	15.84	–	3.2	85	1
2050	20.5	18.30	–	3.5	100	2
2500	25.0	18.74	22.22	3.8	106	2
3000	30.0	21.23	–	4.2	112	2
3100	31.0	21.83	29.11	4.2	112	2
3400	34.0	21.83	–	4.5	118	2
3700	37.0	25.18	41.75	4.8	118	2
4000	40.0	31.81	41.68	10	140	3
4500	45.0	39.98	–	12	145	3
5000	50.0	39.58	62.52	14	150	3
6300	63.0	64.89	100.58	16	180	4
8000	80.0	74.58	115.60	22	190	4
		(134)	(134)			

Countersinks and Deburring Countersinks 60°

Design: Three-flute countersink, axially and radially ground. With parallel shank. For universal, vibration- and burr-free countersinking and deburring for countersunk screws ISO 2009, 2010, 7046, 7047 (DIN 963, 964, 965, 966) + DIN 7991.

HSS | DIN 334-C | 60° | 3 F

format professional quality

1456 HSS

1459 TiN-2 coated

1456



1459 TiN2



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1456	●	○										●	
1459	●	○							○			●	

Part No.	Nominal ø mm	1456	1459 TiN2	Smallest ø mm	Total length mm	Shank ø mm
0630	6.3	3.80	5.75	1.6	45	5
0800	8.0	3.95	6.00	2	50	6
1000	10.0	4.86	7.44	2.5	53	6
1250	12.5	5.12	8.07	3.2	56	8
1600	16.0	6.36	9.88	4	63	10
2000	20.0	8.88	13.46	5	67	10
2500	25.0	12.27	17.93	6.3	71	10
3150	31.5	20.52	27.97	10	76	12
4000	40.0	33.64	–	10	91	15
		(134)	(134)			

75° Countersinks and Deburring Countersinks

Design: Three-flute countersink, axially and radially ground. With parallel shank. For universal, vibration- and burr-free countersinking and deburring for countersunk screws ISO 2009, 2010, 7046, 7047 (DIN 963, 964, 965, 966) + DIN 7991.

HSS | Factory standard | 75° | 3 F

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1462	●	○										●	

Part No.	Nominal ø mm	1462 mm/rev	Smallest ø mm	Total length mm	Shank ø mm
0630	6.3	5.03	1.5	45	5
0830	8.3	5.23	2	50	6
1040	10.4	6.25	2.5	51	6
1240	12.4	6.60	3	55	8
		(134)			

Part No.	Nominal ø mm	1462 mm/rev	Smallest ø mm	Total length mm	Shank ø mm
1650	16.5	8.40	3.5	61	10
2050	20.5	12.16	4	65	10
2500	25.0	16.23	5	69	10
		(134)			

120° Countersinks and Deburring Countersinks

Design: Three-flute countersink, axially and radially ground. With parallel shank. For universal, vibration- and burr-free countersinking and deburring for countersunk screws ISO 2009, 2010, 7046, 7047 (DIN 963, 964, 965, 966) + DIN 7991.

HSS | Factory standard | 120° | 3 F

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1465	●	○										●	

Part No.	Nominal ø mm	1465 mm/rev	Smallest ø mm	Total length mm	Shank ø mm
0630	6.3	5.03	1.5	44	5
0830	8.3	5.23	2	48.5	6
1040	10.4	6.25	2.5	50	6
1240	12.4	6.60	3	53	8
		(134)			

Part No.	Nominal ø mm	1465 mm/rev	Smallest ø mm	Total length mm	Shank ø mm
1650	16.5	8.40	3.5	56	10
2050	20.5	12.16	4	59	10
2500	25.0	16.23	5	61	10
		(134)			

90° Manual Deburrer

Design: Suitable for precise manual deburring and countersinking of holes, with plastic handle.

HSS | DIN 335-D | 90° | 3 F

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1468	●	○							○			●	○

Part No.	Nominal ø mm	1468 mm/rev
1250	12.5	6.88
1650	16.5	8.27
		(134)

Part No.	Nominal ø mm	1468 mm/rev
2050	20.5	10.32
2500	25.0	12.94
		(134)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Counterbore Combination Systems

Design: Including holder, countersink, solid pilot. The GFS counterbore combination system covers a broad range of boring/countersinking combinations as the holder can be combined with the countersinks and solid pilots within one size as desired. **From diameter 8.5 mm on, all sizes are provided with an inside coolant supply,** the system is thus suitable for operation on modern machine tools.

Application: When changing the countersinks or the solid pilot, the holder remains in the machine. The countersinks and solid pilots are clamped by means of a hexagon screwdriver according to DIN 911. Appropriate cooling is absolutely required during operation.

Advantages:

1. Four holder sizes are required for the countersinking range 5–85 mm.
2. Solid pilot "RK" available rotating and cooled for size 1 and 2 from a diameter of 8.5 mm on.
3. Counterbore HSS (type "U"), HSS-TIN and with soldered carbide cutting edges (delivery from stock).
4. From diameter 32 mm on also fitted with indexable insert (on request).
5. Within one size any combination of elements possible.
6. Change of solid pilot possible without removing the countersink.

HSS





Counter Bore Combination Set in Wooden Board

Part No.	0005	0010	0015	0020	0025	0030	0035
Dimensions	**01**	**0**	**0**	**1**	**1**	**2**	**2**
1470 Set	291.72	252.44	252.44	352.89	352.89	549.22	549.22
Countersink range mm	5–9	8.5–16.5		14.5–24.5		26–36	
Content: 1 counter bore	5 – 5.5 – 6 – 6.5 – 7 8 – 9	8.5 – 9.5 – 10.5 – 11.5 – 13.5 – 16.5		14.5 – 16.5 – 18.5 – 20.5 – 22.5 – 24.5		26 – 28 – 30 – 32 – 33 – 34 – 36	
1 solid pilot	2.4 – 2.5 – 2.7 – 3 – 3.3 – 3.5 – 4 – 4.5	4 – 4.5 – 5 –5.5 – 6 – 6.5 – 7 – 7.5 – 8 – 8.5 – 9 – 9.5 – 10 – 10.5		7 – 7.5 – 8 – 8.5 – 9 – 9.5 – 10 – 10.5 – 11 – 11.5 – 12 – 13 – 14 – 15		12 – 13 – 14 – 15 – 16 – 17 – 18 – 19 – 20 – 21 – 22 – 23 – 24 – 25	
1 holder shank	**10 mm cyl.**	**10 mm cyl.**	**MK 1**	**12 mm cyl.**	**MK 2**	**MK 2**	**MK 3**

(138)

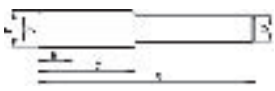
Counter Bore Holders

HSS

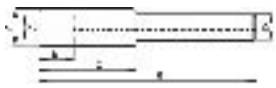
Part No.	Dimensions	**1473**	Shank	Total length mm	Head length mm	Hole
0005	01	46.07	cyl. 10 ⌀ x 41	86	45	7
0010	0	39.82	cyl. 10 ⌀ x 50	92	42	10
0015	0	40.81	MK 1	111	42	10
0020	1	48.42	cyl. 12 ⌀ x 65	120	55	14
0025	1	50.86	MK 2	135	55	14
0030	2	57.52	MK 2	155	75	22
0035	2	57.52	MK 3	174	75	22

(138)







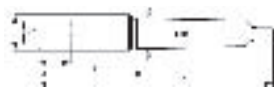


Counter Bore Holders with Inside Cooling

Part No.	Dimensions	**1475**	Shank cyl. Driving face DIN 1835 B	Total length mm	Head length mm	Hole
0005	1	50.86	20	105	55	14
0010	2	57.52	25	135	75	22

(138)





Counter Bores – Size 01

Countersink ⌀ 5.0 to 9.5 mm

HSS | 2 F

Shank ⌀ D 1 mm: 7.0
Total length L mm: 28.0
Head length L1 mm: 11.0
Shank length mm: 17.0
Hole ⌀ mm: 2.4

Part No.	0500	0550	0600	0650	0700	0750	0800	0850	0900	0950
Countersink ⌀ (K 8) D mm	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.5	
1477	24.84	24.84	24.84	24.84	24.84	24.84	24.84	24.84	24.84	24.84

(138)





Solid Pilot – Size 01

Solid pilot ⌀ 2.4 up to 4.5 mm – stationary without inside cooling.
Shank ⌀ mm: 2.4
Total length mm: 40.0
Head length mm: 6.0

Part No.	0240	0250	0260	0270	0280	0290	0300	0310	0320	0330	0340
Solid pilot ⌀ (e 8) D mm	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4
1479	9.04	9.04	9.04	9.04	9.04	9.04	9.04	9.04	9.04	9.04	9.04

Part No.	0350	0360	0370	0380	0390	0400	0410	0420	0430	0440	0450
Solid pilot ⌀ (e 8) D mm	3.5	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5
1479	9.04	9.04	9.04	9.04	9.04	9.04	9.04	9.04	9.04	9.04	9.04

(138)



Counter Bore – Size 0

Countersink ⌀ 8.0 to 16.5 mm
Shank ⌀ mm: 10.0
Total length mm: 40.0
Head length mm: 19.0

Shank length mm: 21.0
Hole ⌀ mm: 4.0

⌀ **8.0– 0.5 two cutting edges.**
⌀ **10.0–16.5 three cutting edges.**

HSS | 2 F | 3 F

Part No.	0800	0850	0900	0950	1000	1050	1100	1150	1200	1250
Countersink ⌀ (K 8) D mm	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5
1481	15.27	15.27	17.39	17.39	17.39	17.39	18.95	18.95	18.95	18.95

Part No.	1300	1350	1400	1450	1500	1550	1600	1650
Countersink ⌀ (K 8) D mm	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5
1481	22.17	22.17	22.17	22.17	24.30	24.30	24.30	24.30

(138)





Solid Pilot – Size 0

Solid pilot ⌀ 4.0 to 11.5 mm – stationary without inside cooling.
Shank ⌀ mm: 4.0
Total length mm: 59.0
Head length mm: 9.0

Part No.	0400	0410	0420	0430	0450	0480	0490	0500	0530	0550
Solid pilot ⌀ (e 8) D mm	4.0	4.1	4.2	4.3	4.5	4.8	4.9	5.0	5.3	5.5
1483	5.93	5.93	5.93	5.93	5.93	5.93	5.93	5.93	5.93	6.52

Part No.	0580	0590	0600	0610	0640	0650	0660	0670	0680	0690	0700	0740	0750	0760
Solid pilot ⌀ (e 8) D mm	5.8	5.9	6.0	6.1	6.4	6.5	6.6	6.7	6.8	6.9	7.0	7.4	7.5	7.6
1483	6.52	6.52	6.52	6.52	6.52	6.52	6.52	6.52	6.52	6.52	6.61	6.61	6.61	6.61

Part No.	0780	0790	0800	0820	0840	0850	0900	0950	0990	1000	1020	1050	1100	1150
Solid pilot ⌀ (e 8) D mm	7.8	7.9	8.0	8.2	8.4	8.5	9.0	9.5	9.9	10.0	10.2	10.5	11.0	11.5
1483	6.61	6.61	6.61	6.61	6.61	6.61	6.61	6.85	6.85	6.85	6.85	6.85	6.85	6.85

(138)



Counter Bore – Size 1

Countersink ⌀ 14.0 to 27.5 mm
Shank ⌀ mm: 14.0
Total length mm: 50.0

Head length mm: 22.0
Shank length mm: 28.0
Hole ⌀ mm: 6.0

HSS | 3 F

Part No.	1400	1450	1500	1550	1600	1650	1700	1750	1800	1850
Countersink ⌀ (K 8) D mm	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5
1485	23.19	23.19	23.19	23.19	25.84	25.84	25.84	25.84	28.99	28.99

Part No.	1900	1950	2000	2050	2100	2150	2200	2250	2300	2350
Countersink ⌀ (K 8) D mm	19.0	19.5	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5
1485	28.99	28.99	32.10	32.10	32.10	32.10	34.79	34.79	34.79	34.79

Part No.	2400	2450	2500	2550	2600	2650	2700	2750
Countersink ⌀ (K 8) D mm	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.5
1485	37.90	37.90	37.90	37.90	40.58	40.58	40.58	40.58

(138)



Solid Pilot – Size 1

Solid pilot ⌀ 6.6 to 18.0 mm –
From ⌀ 6.6 to 8.4 stationary without inside cooling.
From ⌀ 8.5 mm rotating and with inside cooling.

Shank ⌀ mm: 6.0
Total length mm: 79.0
Head length mm: 15.0



Part No.		0660	0670	0680	0690	0700	0740	0750	0760	0780	0790	0800
Solid pilot ⌀ (e 8) D	mm	6.6	6.7	6.8	6.9	7.0	7.4	7.5	7.6	7.8	7.9	8.0
1487		6.61	6.61	6.61	6.61	6.61	6.61	6.61	6.61	6.61	6.61	7.43

Part No.		0820	0840	0850	0900	0950	0990	1000	1020	1050	1100	1150	1200
Solid pilot ⌀ (e 8) D	mm	8.2	8.4	8.5	9.0	9.5	9.9	10.0	10.2	10.5	11.0	11.5	12.0
1487		7.43	7.43	8.21	8.21	8.21	8.43	8.43	8.43	8.43	8.43	8.43	8.43

Part No.		1250	1300	1350	1400	1450	1500	1550	1600	1650	1700	1750	1800
Solid pilot ⌀ (e 8) D	mm	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0
1487		9.20	9.20	9.20	9.20	9.20	9.20	9.70	9.70	9.70	9.70	9.70	9.70

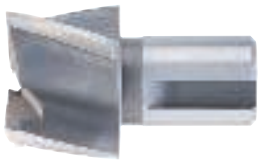
(138)

Counter Bore – Size 2

Countersink ⌀ 24.0 to 66.0 mm
⌀ 24.0–33.0 three cutting edges.
⌀ 34.0–66.0 four cutting edges.

Shank ⌀ mm: 22.0
Total length mm: 60.0
Head length mm: 27.0
Shank length mm: 33.0
Hole ⌀ mm: 10.0

HSS | 3 F | 4 F





Part No.		2400	2450	2500	2550	2600	2650	2700	2750	2800	2850
Countersink ⌀ (K 8) D	mm	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.5	28.0	28.5
1489		39.20	39.20	39.20	39.20	43.87	43.87	43.87	43.87	44.99	44.99

Part No.		2900	2950	3000	3050	3100	3200	3300	3400	3500	3600
Countersink ⌀ (K 8) D	mm	29.0	29.5	30.0	30.5	31.0	32.0	33.0	34.0	35.0	36.0
1489		44.99	44.99	46.01	46.01	46.01	46.01	48.12	48.12	48.12	48.12

Part No.		3700	3800	3900	4000	4100	4200	4300	4400	4500	4600	4700	4800
Countersink ⌀ (K 8) D	mm	37.0	38.0	39.0	40.0	41.0	42.0	43.0	44.0	45.0	46.0	47.0	48.0
1489		58.23	58.23	58.23	58.23	79.39	79.39	79.39	79.39	81.97	81.97	81.97	81.97

Part No.		4900	5000	5100	5200	5300	5400	5500	5600	5700	5800	6000	6200	6400	6500	6600
Countersink ⌀ (K 8) D	mm	49.0	50.0	51.0	52.0	53.0	54.0	55.0	56.0	57.0	58.0	60.0	62.0	64.0	65.0	66.0
1489		104.69	104.69	104.69	104.69	115.92	115.92	115.92	115.92	133.30	133.30	133.30	133.30	133.30	133.30	133.30

(138)

Up to ⌀ 85 mm available on request.

Solid Pilot – Size 2

Solid pilot ⌀ 10.0 to 40.0 mm –
From ⌀ 10.0–13.5 mm stationary without inside cooling.
From ⌀ 14.0 mm rotating and with inside cooling.

Shank ⌀ mm: 10.0
Total length mm: 105.0
Head length mm: 18.0



Part No.		1000	1020	1050	1100	1150	1200	1250	1300	1350	1400
Solid pilot ⌀ (e 8) D	mm	10.0	10.2	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0
1491		11.04	11.04	11.04	11.04	11.04	11.04	11.04	11.04	11.04	12.77

Part No.		1450	1500	1550	1600	1650	1700	1750	1800	1850	1900	1950	2000
Solid pilot ⌀ (e 8) D	mm	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0
1491		12.77	12.77	12.77	12.77	13.29	13.29	13.29	13.29	13.29	13.71	13.71	13.71

Part No.		2050	2100	2150	2200	2250	2300	2350	2400	2450	2500	2550	2600
Solid pilot ⌀ (e 8) D	mm	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0
1491		13.71	13.71	14.40	14.40	14.40	14.40	14.40	15.48	15.48	15.48	20.76	20.76

Part No.		2650	2700	2750	2800	2850	2900	2950	3000	3300	3500	3800	4000
Solid pilot ⌀ (e 8) D	mm	26.5	27.0	27.5	28.0	28.5	29.0	29.5	30.0	33.0	35.0	38.0	40.0
1491		20.76	20.76	20.76	20.76	20.76	20.76	20.76	20.76	26.18	26.18	29.03	29.03

(138)

For technical information see appendix group 10.

Universal Core Drill Set B – EL 1100

Design: Universal handle EL 1000 with blade magazine, longitudinally adjustable (6–125 mm) blade holder EL 0100 for all blades type "B" and 1 HSS blade B 10/B 20 each, shank ⌀ 2.6 mm.

Universal deburring tool for fine and medium deburring of holes as well as straight, convex and concave edges. Perfectly suitable for fine deburring operations and deburring of small bore holes.





Part No.	6704 GRATTEC
0010	7.94 (554)

Universal Core Drill Set E – EL 1200

Design: Universal handle EL 1000 with blade magazine, longitudinally adjustable (6–125 mm) blade holder EL 0200 for all blades type "E" and 1 HSS blade E 100, E 200 as well as E 300 each, shank ⌀ 3.2 mm.

Most common universal deburring tool for medium and heavy deburring of holes as well as straight, convex and concave edges.





Part No.	6705 GRATTEC
0010	9.63 (554)

Deburring Countersinks EL 1300

Design: Universal handle EL 1000 with blade magazine, longitudinally adjustable (6–125 mm) blade holder EL 0300 for all countersinks type "C", 1 HSS countersunk head C 20.

Solid universal deburring countersink for bore holes with a ⌀ of more than 4 mm. Fitted with longitudinally adjustable blade holder to reach also low positioned holes. For HSS countersunk heads with a ⌀ of up to 30 mm.





Part No.	6706 GRATTEC
0010	23.04 (554)

Maxi Three Square Scrapers EL 1601

Design: Universal handle EL 1000 with blade magazine, longitudinally adjustable blade holder EL 0602 for all scrapers type "T", 1 three square scraper T 60 and protective cap.

Solid three square scraper with longitudinally adjustable blade holder. For scraping material and deburring of areas which are difficult to reach.





Part No.	6707 GRATTEC
0010	15.91 (554)

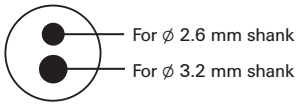
Softgrip Core Drills SG 1000

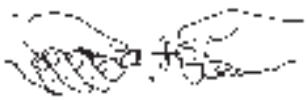
Design: Softgrip handle SG 3000, 1 blade Plus B 10 S and E 100 S each for long tool life travel.

Unique handle with twin receptacle for all blades with shank ⌀ 2.6 mm and 3.2 mm.
The ergonomic, handy and robust tool is suitable for fine, medium and heavy deburring.









Part No.	6708 GRATTEC
0010	10.10 (554)

Softgrip Core Drills SG 1500

Design: Softgrip handle SG 3000, crank-operated countersunk head ⌀ 16.5 mm BC 1650 (patented).

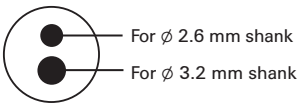
Unique handle with twin receptacle for all blades with shank ⌀ 2.6 mm and 3.2 mm. The connection with the HSS countersunk head allows quick and fatigue-free countersinking and chamfering of holes with a ⌀ of up to 16 mm.



GRATTEC



Part No.	6709 GRATTEC
0010	20.56 (554)

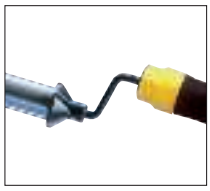


For ⌀ 2.6 mm shank
For ⌀ 3.2 mm shank

Softgrip Chamfering Tools SG 1100

Design: Softgrip handle SG 3000, crank-operated bell-shaped countersunk head EX 2000 (patented).

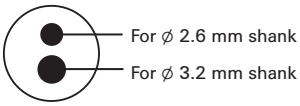
Unique handle with twin receptacle for all blades with shank ⌀ 2.6 mm and 3.2 mm. The connection with the HSS bell-shaped head allows deburring and chamfering of round work pieces with a ⌀ of up to 18 mm.



GRATTEC



Part No.	6710 GRATTEC
0010	16.79 (554)



For ⌀ 2.6 mm shank
For ⌀ 3.2 mm shank

Softgrip Recess Core Drills SG 1200

Design: Softgrip handle SG 3000, crank-operated recess countersink B01000 (patented).

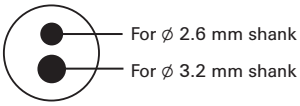
Unique handle with twin receptacle for all blades with shank ⌀ 2.6 mm and 3.2 mm. Inside recesses and flutes for O rings, retaining rings can easily be deburred by means of the patented blades.



GRATTEC



Part No.	6711 GRATTEC
0010	13.70 (554)



For ⌀ 2.6 mm shank
For ⌀ 3.2 mm shank

Double Core Drills for Sheet Metals DB 2000

Design: Solid handle, 2 HSS cutting disks N 80, hand protection.

Simultaneous deburring on both sides of sheet metals and webs with a thickness of up to 12 mm. Cutting disks N 80 M available for Niro sheet metals.



GRATTEC

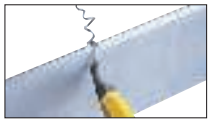


Part No.	6712 GRATTEC
0010	15.00 (554)

Quick Core Drills RB 1000

Design: 12 mm hexagon handle with blade receptacle made of steel, 1 HSS blade E 100.

Reasonably priced, handy deburring tool for occasional deburring. With exchangeable blade.



GRATTEC



Part No.	6713 GRATTEC
0010	5.91 (554)

Keramicut Core Drills with Ceramic Blade CR 1100

Design: Ergonomic handle with fixed, non-exchangeable ceramic blade CR 2200. The answer to difficulties occurring when deburring plastics and light metals: no damage, no scrap thanks to the ceramic blade with negative angle of the cutting edges. Almost unlimited service life. Precise removal of material (patent filed).

Application: Place the blade in the area to be deburred at an angle of 60° to 80° and continuously move the blade along the work piece. Do not apply too much pressure!

Part No.	6713 GRATTEC
0050	26.84 (554)



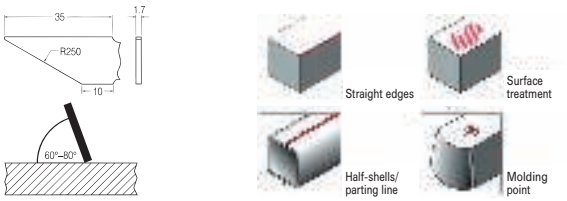




Application: Place the blade in the area to be deburred at an angle of 60° to 80° and continuously move the blade along the workpiece. Do not apply too much pressure!

Advantages:
- Extremely solid ceramic blade easily deburs plastics and other soft materials.
- Damage-free deburring without scrap.
- No risk of injury due to obtuse cutting angle of 90°.
- Deburring of straight, convex and almost all other surfaces.
- No damage of the workpiece due to spherical cutting edge (r = 250 mm).
- Long service life as the ceramic blade is resistant to wear.
- Convenient handling due to ergonomic handle.
- Solid blade thickness.





Keramicut Core Drills with Ceramic Blade CR 1100

Design: Oval handle with exchangeable ceramic blade CR 2200, otherwise identical to type 6713.

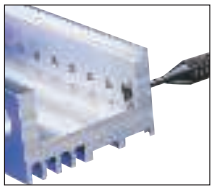
Part No.	6700 GRATTEC
0010	18.94 (554)



Core Drills RC 1000 for Backward Drilling

Design: Aluminium handle, HSS blade BR 1000, key for changing the blade in the hollow handle.

By pressing the rear button the blade moves into the shank and the tool can be guided through the hole (see drawing). The blades cut on both sides. For holes with a ⌀ 3–5.5 mm.



Part No.	6714 GRATTEC
0005	23.08 (554)



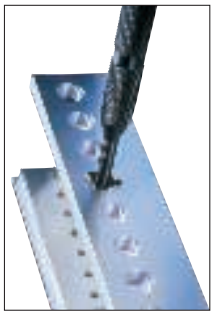


Core Drills for Backward Drilling

Design: By pressing the rear button the blade moves into the shank and the tool can be guided through the hole (see drawing). The blades cut on both sides.

6715 RC 2000. Aluminium handle, HSS blade BR 2000, key for blade exchange in hollow handle. For holes with a ⌀ 5.5–10 mm.

6716 RC 2220. Aluminium handle, HSS blade BR 2200, key for blade exchange in hollow handle. For holes with a ⌀ 10–22 mm.



Part No.	6715 GRATTEC	6716 GRATTEC
0005	25.88	–
0010	–	34.07
	(554)	(554)



6715



6716

Core Drill Box EL 2000

GRATTEC

Design: This reasonably priced set includes a broad range of deburring tools for all deburring operations.

Double core drill DB 2000, universal handle EL 1000, blade holder for blades B/E, blade holder for scraper/countersink, blade holder for groove blade/cross hole deburring blade, appropriate blades B 10, B 20, C12, E 100, E 200, E 300, N 80 (2x), N 80 K, C 20, D 50, D 66.



Part No.	6717 GRATTEC Set
0010	78.97 (554)

Softgrip Set SG 2000/SG 2001

GRATTEC

Design: Unique handle with twin receptacle for all blades with shank ∅ 2.6 mm and 3.2 mm. The ergonomic, handy and robust tool is suitable for fine, medium and heavy deburring. The Plus blades feature a long tool life travel and are suitable for stainless steel. Softgrip handle

67180010:
Softgrip handle, 1 Plus blade B 10 S, 21 Plus blades E 100

67180015:
Softgrip handle, 11 Plus blades B 10 S, 11 Plus blades E 100 S

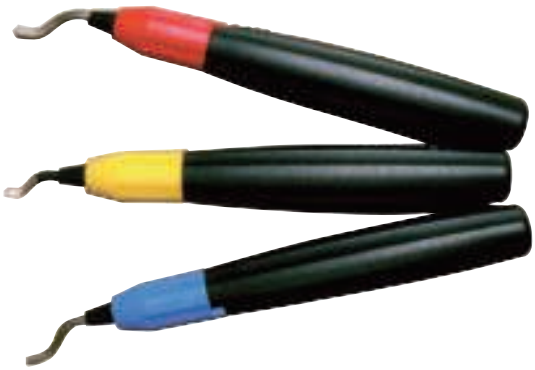


Part No.	6718 GRATTEC Set
0010	26.20
0015	24.64 (554)

Universal 3-piece Core Drill Set

GRATTEC

Design: 3 complete deburring tools with solid handles.
- Blue: with HSS-Co blade E 100 S for steel, stainless steel and aluminium.
- Red: with HSS blade E 200 for cast iron and brass.
- Yellow: with HSS blade E 150 for fine deburring operations.



Part No.	6718 GRATTEC Set
0021	11.24 (554)

Compact Set Primus

GRATTEC

Design: This ideal, reasonably priced deburrer set contains the most usual blades. Stable plastic case (106 x 150 x 45 mm), with compartments and zip fastener.

Content: 1 Softgrip handle, 1 HSS crank-operated countersink BC 1040, 4 HSS-Co blades B 10 S, 1 HSS blade B 20, 1 HSS blade B 30, 5 HSS-Co blades E 100 S, 1 HSS blade E 150, 1 HSS blade E 200, 1 HSS blade E 300, 1 HSS blade E 350, 1 HSS blade E 600, 1 patented HSS crank-operated blade BC 1000, 1 patented HSS crank-operated blade BO 1000, three square shaper SC 8000.



Part No.	6718 GRATTEC Set
0020	59.36 (554)

Accessories for Deburring Tools

Part No.	Article	6719 GRATTEC	Description
0010	Handle EL 1000	4.65	Universal plastic handle for all GRATTEC blade holders, blade magazine in the hollow handle
0020	SG 3000	7.63	Ergonomic shape with hollow for the fingers. Due to the twin receptacle, all B blades with shank of 2.6 mm as well as all E blades with shank of 3.2 mm can be used
0100	Blade holder EL 0100	5.35	Longitudinally adjustable blade holder B, for all type "B" blades. Blade shaft ø 2.6 mm, length 131 mm
0110	EL 0200	5.35	Longitudinally adjustable blade holder E, for all type "E" blades. Blade shaft ø 3.2 mm, length 131 mm
0120	EL 0602	5.35	Longitudinally adjustable blade holder T, for scraper T40 and T60
0130	EL 0300	5.35	Longitudinally adjustable blade holder C, for all type "C" countersinks. Thread M7

Spare Blades for Deburring Tools

0200	B 10	0.82	HSS blade B 10 for normal deburring of steel, aluminium and plastic (ø 2.6 mm)
0210	B 10 S	0.86	Blade Plus B 10 S made of high-alloy HSSI for especially long tool life travel
0220	B 20	0.82	HSS blade B 20 for normal deburring of brass and cast iron
0230	B 30	1.04	HSS blade B 30 for simultaneous removal of inside and outside burr
0240	E 100	0.92	HSS blade E 100 for heavy deburring of steel, aluminium and plastic (ø 3.2 mm)
0250	E 100 S	1.44	HSS Co blade E 100 S for wear resistance
0260	E 200	0.96	HSS blade E 200 for heavy deburring of brass and cast iron
0270	E 300	1.11	HSS blade E 300 for simultaneous removal of excessive inside and outside burr from holes in sheet metals and tubes
0280	E 350	1.24	HSS blade E 350 for excessive burrs at straight edges
0290	E 600	3.21	HSS blade E 600 for excessive burrs at cross holes
0300	BO 1000	5.43	Patented HSS blade BO 1000 for O ring grooves up to 3 mm at the inner diameter (ø 3.2 mm)
0400	T 40	5.59	HSS three-square scraper T40, 5 x 40 mm. Fits in the holder EL 0602
0410	T 60	8.29	HSS three-square scraper T60, 7 x 60 mm. Fits in the holder EL 0602
0500	BC 1650	15.12	Patented HSS crank-operated countersink BC 1650 with ø 16.5 mm (shank ø 3.2 mm)
0510	EX 2000	9.37	Patented HSS crank-operated countersink EX 2000 for outer diameter 4–18 mm (shank ø 3.2 mm)
0520	C 12	10.02	HSS 90° countersink C 12, ø 12 mm
0530	C 20	13.60	HSS 90° countersink C 12, ø 20 mm
0540	C 30	19.37	HSS 90° countersink C 30, ø 30 mm
0600	N 80	3.76	Round HSS cutting disks N 80 for double core drill. The cutting edge runs along the entire circumference on both sides. Long tool life
0610	N 80 M 42	4.95	As above, but N 80 M 42 HRc 68 hardened. For stainless steel
0700	BR 1000	11.76	HSS blade BR 1000 with screw for core drill RC 1000
0710	BR 2000	12.71	HSS blade BR 2000 with screw for core drill RC 2000
0720	BR 2200	14.64	HSS blade BR 2200 with screw for core drill RC 2200
0810	CR 2200	13.70	Ceramic blade straight design for Keramicut II
0820	CR 2500	15.05	Ceramic blade convex form for Keramicut II

(554)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Handle and Blade ProfiGrat

Design: Set includes:
1 2-component handle from stainless steel with blade locking as well as optimized centre of gravity for precise guiding.
1 HSS blade, type C-10, ⌀ 3.2 mm, turnable, exchangeable.
1 HSS blade, type 101, ⌀ 3.2 mm, turnable, exchangeable.

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
6713	●	○							◐		◐	●	◐

Part No.	Designation	6713 EXACT
0100	INOX 14	11.31
0200	INOX 16	15.08 (554)





Handles

Design: Ergonomic handle from plastic with blade locking, fluted, anti-slip gripping surfaces as well as optimized centre of gravity for precise guiding.

Application: To receive blades type R.

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
6713	●	○							◐		◐	●	◐

Part No.	Designation	6713 EXACT
0300	"R"	8.29 (554)



Blades Type "R"

Design: The first "R"obust blade from 6 mm HSS steel.

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
6713	●	○							◐		◐	●	◐

Part No.	Designation	6713 EXACT
0400	R-10	3.77 (554)



0400

Spare Blades

Design: Suitable for (part no. 6713 0100 and 6713 0200).

Part No.	Type	6713 EXACT
0500	C-10	0.86
0600	C-101	0.98 (554)



0500



0600

Reamer

Hand Reamers

Design: Vibration-free and precise bore hole is achieved by irregular tooth pitch. Parallel shank with square.

Application: For clearance holes. Due to the long, conical chamfer not suitable for machining of blind holes. For drilling with continuous cutting.

HSS | DIN 206-B | H7 | ca. 7°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1500	●	●	○						○	○	◐	◐	◐

Part No.	ø mm	1500 mm	Cut length mm	Total length mm	Square mm
0200	2.0	6.83	25	50	1.6
0250	2.5	6.95	29	58	2.1
0300	3.0	6.87	31	62	2.1
0350	3.5	8.05	35	71	2.7
0400	4.0	6.20	38	76	3.0
0450	4.5	7.43	41	81	3.4
0500	5.0	7.24	44	87	3.8
0550	5.5	7.96	47	93	4.3
0600	6.0	7.11	47	93	4.3
0650	6.5	8.15	50	100	4.9
0700	7.0	7.80	54	107	5.5
0750	7.5	8.88	54	107	5.5
0800	8.0	8.05	58	115	6.2
0850	8.5	9.67	58	115	6.2
0900	9.0	9.17	62	124	7.0
0950	9.5	9.91	62	124	7.0
1000	10.0	9.51	66	133	8.0
		(140)			

Part No.	ø mm	1500 mm	Cut length mm	Total length mm	Square mm
1100	11.0	10.62	71	142	9.0
1200	12.0	11.39	76	152	10.0
1300	13.0	16.80	76	152	10.0
1400	14.0	18.26	81	163	11.0
1500	15.0	19.26	81	163	11.0
1600	16.0	20.04	87	175	12.0
1700	17.0	21.26	87	175	12.0
1800	18.0	23.49	93	188	14.5
1900	19.0	25.24	93	188	14.5
2000	20.0	24.72	100	201	16.0
2200	22.0	28.67	107	215	18.0
2400	24.0	33.11	115	231	20.0
2500	25.0	33.89	115	231	20.0
2600	26.0	36.09	115	231	20.0
2800	28.0	46.24	124	247	22.0
3000	30.0	48.70	124	247	22.0
3200	32.0	53.88	133	265	24.0
		(140)			

Other dimensions and straight flutes available on request.

Adjustable Hand Reamers

Design: Parallel shank with square. The body of the reamer is slit, the nominal ø can be increased up to approx. 1/100 by screwing in the face screw.

Any fits can be set and worn areas can be levelled. The reamers are set to the nominal dimension. Store in slackened condition.

HSS | DIN 859 | H7 | ca. 7°



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1503	●	●	○	○	○				○	○	◐	◐	◐

Part No.	Nominal ø mm	1503 mm	Cut length mm	Total length mm	Square mm
0400	4*	23.39	24	76	3
0500	5*	25.85	30	87	3.8
0600	6	27.50	33	93	4.3
0700	7	33.23	38	107	5.5
0800	8	33.23	42	115	6.2
0900	9	35.28	46	124	7
1000	10	35.70	50	133	8
1100	11	43.90	51	142	9
1200	12	41.45	56	152	10
1300	13	47.61	56	152	10
		(142)			

Part No.	Nominal ø mm	1503 mm	Cut length mm	Total length mm	Square mm
1400	14	48.83	61	163	11
1500	15	50.07	61	163	11
1600	16	62.78	67	175	12
1800	18	66.07	68	188	14.5
1900	19	67.70	68	188	14.5
2000	20	69.75	75	201	16
2200	22	82.88	82	215	18
2400	24	91.11	85	231	20
2500	25	91.11	85	231	20
3000	30	118.18	94	247	22
		(142)			

* ø 4 and 5 mm straight-fluted – **from ø 6 mm on spiral-fluted.** Further dimensions on request.

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Quick Adjustment Reamers with Exchangeable HSS Cutters

Design: With adjustable HSS cutters and parallel shank with square. The fine adjustment can only be effected by micrometer or ring gauge. Uneven scale division of cutter.

Application: For clearance holes. Ideal for repairs. Continuous adjustment of the reamer within the indicated adjusting range (1 pitch line = 0.01 mm modification of the diameter).

HSS | Factory standard



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1505	●	●	○	○	○				○	○	◐	◐	◐

Part No.	Adjusting range mm	1505 mm	Cut length mm	Length mm	No. of cutters	Square mm
0005	6.4– 7.2	45.23	32	110	4	3
0010	7.2– 8.0	45.23	32	110	4	3.5
0015	8.0– 9.0	45.23	34	115	5	4.3
0020	9.0–10.0	49.90	34	115	5	4.3
0025	10.0–11.0	49.90	34	115	5	4.9
0030	11.0–12.0	49.90	35	125	5	6.2
0035	12.0–13.5	56.14	41	135	5	6.2
0040	13.5–15.5	62.36	50	146	5	7
		(142)				

Part No.	Adjusting range mm	1505 mm	Cut length mm	Length mm	No. of cutters	Square mm
0045	15.5–18.0	63.93	60	166	5	8
0050	18.0–21.0	70.18	65	178	5	9
0055	21.0–24.0	84.20	76	195	5	10
0060	24.0–27.5	89.92	82	218	5	11
0065	27.5–31.5	103.96	86	245	5	12
0070	31.5–37.0	114.07	98	280	6	14.5
0075	37.0–45.0	147.72	108	325	6	16
0080	45.0–55.0	209.27	118	370	6	20
		(142)				

Hand Taper Pin Reamers

Application: For manual reaming of holes for taper pins according to DIN 1, 258, 1447, 7977 und 7978.

HSS | DIN 9 | 1:50 | ca. 7°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1508	●	●	○	○	○				○	○	◐	◐	◐

Part No.	Nominal ø mm	1508 mm	Small/large size ø mm	Cut length mm	Total length mm	Square mm
0300	3	8.06	2.90/ 4.06	58	80	3.0
0400	4	9.17	3.90/ 5.26	68	93	3.8
0500	5	9.63	4.90/ 6.36	73	100	4.9
0600	6	11.64	5.90/ 8.00	105	135	6.2
0800	8	18.03	7.90/10.80	145	180	8.0
1000	10	25.46	9.90/13.40	175	215	10.0
		(140)				

Part No.	Nominal ø mm	1508 mm	Small/large size ø mm	Cut length mm	Total length mm	Square mm
1200	12	32.39	11.80/16.00	210	255	11.0
1300	13	37.68	12.80/17.00	210	255	12.0
1400	14	39.79	13.80/18.00	210	255	12.0
1600	16	44.96	15.80/20.40	230	280	14.5
2000	20	58.34	19.80/24.80	250	310	18.0
		(140)				

Machine Taper Pin Reamers

Application: For reaming conical holes for taper pins according to DIN 1, 258, 1447, 7977, and 7978.

HSS-E | DIN 2179 | 1:50 | ca. 45°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1510	●	●	○	○	○				○	○	◐	◐	◐

Part No.	Nominal ø mm	1510 mm	Small/large size ø mm	Cut length mm	Total length mm	Square mm
0200	2.0	10.35	1.9/2.86	48	86	3.15
0250	2.5	12.35	2.4/3.36	48	86	3.15
0300	3.0	11.25	2.9/4.06	58	100	4
0400	4.0	11.34	3.9/5.26	68	112	5
0500	5.0	12.10	4.9/6.36	73	122	6.3
		(140)				

Part No.	Nominal ø mm	1510 mm	Small/large size ø mm	Cut length mm	Total length mm	Square mm
0600	6.0	13.87	5.9/ 8.0	105	160	8
0800	8.0	20.68	7.9/10.8	145	207	10
1000	10.0	26.46	9.9/13.4	175	245	12.5
1200	12.0	33.05	11.8/16	210	290	16
		(140)				

Reamer

Bridge Reamers

Application: Tapered shank. For reworking on inadequately sized or out of line holes. Long, tapered chamfer 1:10. 4 teeth max. 13 mm, 5 teeth 14–30 mm.

HSS | DIN 311 | ca. 25° | MK 1–3

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1512	●	●	○	○	○				○	○	◐	◐	◐

Part No.	Nominal ø k 11 mm	1512 mm	Small ø mm	Flute length mm	Chamfer length mm	Total length mm	MT
1000	10	20.93	7	95	30	171	1
1200	12	22.71	8.4	105	39	199	2
1300	13	22.71	9.1	105	39	199	2
1400	14	23.22	9.8	115	42	209	2
1500	15	24.45	10.5	125	45	219	2
1600	16	25.70	11.2	135	48	229	2
1700	17	30.27	11.9	135	51	251	3
		(140)					

Part No.	Nominal ø k 11 mm	1512 mm	Small ø mm	Flute length mm	Chamfer length mm	Total length mm	MT
1800	18	32.78	12.6	145	58	261	3
2000	20	36.08	14	155	62	271	3
2100	21	37.55	14.7	155	62	271	3
2200	22	39.84	15.4	165	66	281	3
2500	25	45.65	17.5	180	72	296	3
2800	28	55.49	19.6	195	78	311	3
3000	30	63.55	21	195	78	311	3
		(140)					

Shell Reamers

Application: For reaming of clearance or blind holes. For attaching to holders DIN 217 (type 1520).

HSS-E | DIN 219 | H7 | ca. 7°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1517	●	●	○	○	○				○	○	◐	◐	◐

Part No.	Nominal ø mm	1517 mm	Cut length mm	Total length mm	Hole ø mm
2500	25	40.32	32	45	13
2600	26	41.91	32	45	13
2700	27	54.85	32	45	13
2800	28	43.55	32	45	13
2900	29	57.73	32	45	13
3000	30	42.71	32	45	13
3200	32	47.82	36	50	16
3400	34	52.09	36	50	16
3500	35	52.09	36	50	16
3600	36	54.50	40	56	19
		(140)			

Part No.	Nominal ø mm	1517 mm	Cut length mm	Total length mm	Hole ø mm
3700	37	69.28	40	56	19
3800	38	56.61	40	56	19
4000	40	56.61	40	56	19
4200	42	58.75	40	56	19
4400	44	79.57	45	63	22
4500	45	79.57	45	63	22
4600	46	86.00	45	63	22
4700	47	86.00	45	63	22
4800	48	82.58	45	63	22
5000	50	76.38	45	63	22
		(140)			

Shell Holders Morse Taper Shank

Design: With locking nut, clutch drive ring and DIN 6888 Woodruff key. For shell reamers, type 1517.

DIN 217 | MK 1–4

format professional quality



Part No.	Nominal ø mm	1520 mm	MT	Total length mm	For DIN 219 mm
0013	13	59.25	3	250	25–30
0016	16	64.73	3	261	31–35
		(142)			

Part No.	Nominal ø mm	1520 mm	MT	Total length mm	For DIN 219 mm
0019	19	77.69	4	298	36–42
0022	22	96.62	4	312	44–50
		(142)			

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Bridge Reamer Set

Design: Made of special tool steel, inductively hardened and ground, tapered form, 5-edged with square tang and metal holder, in oval nickel-plated metal sleeve. Assortment of 12 reamers from ⌀ 0.6–1.9 mm, 1 nickel-plated metal holder

TURNUS



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1513	○								○			●	○

Part No.	1513 Set
0050	13.26
	(175)



Machine Reamers, Quick Spiral, Form E

Design: Parallel shank, tapered chamfer, approx. 1/6 of cutting length. For clearance holes. Due to the special geometry, the overmeasure of the hole should be extended by approx. 50 to 100 %. The feed rate should be approx. 50 % higher than in case of all other reamers.

HSS-E | DIN 212-E | H7 | ca. 45°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1525	●	●	○	○	○						◐	◐	◐

Part No.	Nominal ⌀ mm	1525	Cut length mm	Total length mm	Shank ⌀ h 9 mm
0200	2.0*	6.94	11	49	2
0250	2.5*	7.31	14	57	2.5
0300	3.0*	8.18	15	61	3
0350	3.5*	9.60	18	70	3.5
0400	4.0	8.18	19	75	4
0450	4.5	9.60	21	80	4.5
0500	5.0	8.96	23	86	5

* not standardized.

(140)

Part No.	Nominal ⌀ mm	1525	Cut length mm	Total length mm	Shank ⌀ h 9 mm
0600	6.0	8.82	26	93	5.6
0700	7.0	9.95	31	109	7.1
0800	8.0	9.95	33	117	8
0900	9.0	13.38	36	125	9
1000	10.0	12.61	38	133	10
1100	11.0	16.16	41	142	10
1200	12.0	15.12	44	151	10

(140)

Machine Reamers, Form C

Design: Parallel shank, tapered chamfer, approx. 1/6 of cutting length. For clearance holes. Due to the special geometry, the overmeasure of the hole should be extended by approx 50 to 100 %. The feed rate should be approx. 50 % higher than in case of all other reamers.

HSS-E | DIN 208-C | H7 | ca. 45°

ALPHA



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1528	●	●	○	○	○				○	○	◐	◐	◐

Part No.	Nominal ⌀ mm	1528	Cut length mm	Total length mm	MT
0800	8	24.84	33	156	1
1000	10	20.86	38	168	1
1100	11	23.60	41	175	1
1200	12	21.61	44	182	1
1300	13	25.34	44	182	1
1400	14	25.34	47	189	1
1500	15	27.32	50	204	2
1600	16	27.32	52	210	2
1700	17	30.29	54	214	2
1800	18	30.29	56	219	2

(142)

Part No.	Nominal ⌀ mm	1528	Cut length mm	Total length mm	MT
1900	19	33.78	58	223	2
2000	20	31.30	60	228	2
2200	22	35.76	64	237	3
2400	24	44.72	68	268	3
2500	25	44.72	68	268	3
2600	26	47.69	70	273	3
2800	28	52.65	71	277	3
3000	30	55.63	73	281	3
3200	32	75.00	77	317	4

(142)

Machine Reamers

Design: Parallel shank, with long cutting edge, short chamfer and uneven tooth pitch – for achieving perfect and precise holes. Suitable for clearance holes (to a certain extent also for blind holes) in hole tolerance range H 7.

HSS-E | DIN 212-B/D | H7 | ca. 7°

format professional quality

1531 HSS-E

1534 TiN coated

1531



1534 TiN



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1531	●	●	○	○					○	○	◐	◐	◐
1534	●	●	●	●	●				○	○	◐	◐	◐

Part No.	Nominal ø mm	1531 mm	1534 TiN mm	Cut length mm	Total length mm	Shank ø h 9 mm
0100	1.0*	7.49	–	5.5	34	1.0
0120	1.2*	7.32	–	7.5	38	1.2
0140	1.4*	6.82	–	8.0	40	1.4
0150	1.5*	5.82	–	8.0	40	1.5
0160	1.6*	6.44	–	9.0	43	1.6
0180	1.8*	6.44	–	10.0	46	1.8
0200	2.0*	5.46	–	11.0	49	2.0
0220	2.2*	6.80	–	12.0	53	2.2
0250	2.5*	5.46	–	14.0	57	2.5
0280	2.8*	7.05	–	15.0	61	2.8
0300	3.0*	4.90	11.54	15.0	61	3.0
0320	3.2*	6.68	–	16.0	65	3.2
0350	3.5*	5.72	–	18.0	70	3.5
0400	4.0	5.46	12.30	19.0	75	4.0
0450	4.5	5.72	–	21.0	80	4.5
0500	5.0	5.82	13.62	23.0	86	5.0
0550	5.5	6.62	–	26.0	93	5.6
0600	6.0	5.93	14.45	26.0	93	5.6
		(140)	(140)			

* Form B

Part No.	Nominal ø mm	1531 mm	1534 TiN mm	Cut length mm	Total length mm	Shank ø h 9 mm
0650	6.5	7.01	–	28.0	101	6.3
0700	7.0	7.01	–	31.0	109	7.1
0750	7.5	7.79	–	31.0	109	7.1
0800	8.0	7.24	18.42	33.0	117	8.0
0850	8.5	9.17	–	33.0	117	8.0
0900	9.0	9.17	–	36.0	125	9.0
0950	9.5	9.23	–	36.0	125	9.0
1000	10.0	8.55	21.91	38.0	133	10.0
1100	11.0	12.61	–	41.0	142	10.0
1200	12.0	13.10	31.55	44.0	151	10.0
1300	13.0	14.56	–	44.0	151	10.0
1400	14.0	15.09	–	47.0	160	12.5
1500	15.0	15.55	–	50.0	162	12.5
1600	16.0	16.32	–	52.0	170	12.5
1700	17.0	19.02	–	54.0	175	14.0
1800	18.0	19.53	–	56.0	182	14.0
1900	19.0	22.99	–	58.0	189	16.0
2000	20.0	21.21	–	60.0	195	16.0
		(140)	(140)			

Machine Reamers

Design: Parallel shank, with long cutting edge, short chamfer and uneven tooth pitch – for achieving perfect and precise holes. Suitable for clearance holes (to a certain extent also for blind holes) in hole tolerance range H 7.

HSS-E | DIN 208-B | H7 | ca. 7° | MK 1–4

format professional quality

1537 HSS-E

1540 TiN coated

1537



1540 TiN



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1537	●	●	○	○					○	○	◐	◐	◐
1540	●	●	●	●	●				○	○	◐	◐	◐

Part No.	Nominal ø mm	1537 mm	1540 TiN mm	Cut length mm	Total length mm	MT
1000	10	12.88	31.54	38	168	1
1100	11	14.11	–	41	175	1
1200	12	13.84	34.05	44	182	1
1300	13	14.56	–	44	182	1
1400	14	14.83	40.59	47	189	1
1500	15	18.03	45.39	50	204	2
1600	16	18.26	46.65	52	210	2
1700	17	19.53	–	54	214	2
1800	18	20.28	51.46	56	219	2
		(140)	(140)			

Part No.	Nominal ø mm	1537 mm	1540 TiN mm	Cut length mm	Total length mm	MT
1900	19	21.51	–	58	223	2
2000	20	21.51	54.50	60	228	2
2200	22	24.18	–	64	237	2
2400	24	28.67	–	68	268	3
2500	25	29.41	–	68	268	3
2600	26	31.61	–	70	273	3
2800	28	34.86	–	71	277	3
3000	30	36.09	–	73	281	3
3200	32	47.47	–	77	317	4
		(140)	(140)			

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

NC Machine Reamers

Design: For clearance and blind holes (from 3.8 mm due to short chamfer). Dimension similar to DIN 212. Centring up to ⌀ 3.70 mm with 90° ext. centre on both ends, above with female centres, parallel shank, **with straight shank** ⌀ for standard fit in **hydro-expansion chucks** and **high precision jaw chucks.** The fine shank tolerance of h 6 improves the clamping precision.

Production tolerance: Full-number diameter as well as 1/10 mm dimensions H 7, 1/100 mm dimensions from ⌀ 1.01 to 5.03 mm 0.000/+0.004 mm, above ⌀ 5.03 mm 0.000/+0.005 mm.

HSS-E | ≈DIN 212

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1545	●	●	○	○					○	○	◐	◐	◐

Part No.	Nominal ⌀ mm	1545 mm	Cutting edge length mm	Total length mm	Shank ⌀ h 6 mm
0100	1.00	10.31	6	35	1
0101	1.01	10.31	6	35	1
0102	1.02	10.31	6	35	1
0103	1.03	10.31	6	35	1
0150	1.50	7.62	8	40	2
0151	1.51	8.90	9	43	2
0152	1.52	8.90	9	43	2
0153	1.53	8.90	9	43	2
0160	1.60	8.65	9	43	2
0170	1.70	8.65	9	43	2
0180	1.80	8.65	10	46	2
0190	1.90	8.65	10	46	2
0197	1.97	9.41	11	49	2
0198	1.98	9.41	11	49	2
0199	1.99	9.41	11	49	2
0200	2.00	7.65	11	49	2
0201	2.01	9.61	11	49	2
0202	2.02	9.61	11	49	2
0203	2.03	9.61	11	49	2
0210	2.10	8.80	11	49	2
0220	2.20	8.80	12	53	2
0230	2.30	8.80	12	53	3
0240	2.40	8.80	14	57	3
0247	2.47	9.61	14	57	3
0248	2.48	9.61	14	57	3
0249	2.49	9.61	14	57	3
0250	2.50	7.49	14	57	3
0251	2.51	9.61	14	57	3
0252	2.52	9.61	14	57	3
0253	2.53	9.61	14	57	3
0260	2.60	9.15	14	57	3
0270	2.70	9.15	15	61	3
0280	2.80	9.15	15	61	3
0290	2.90	9.15	15	61	3
0297	2.97	9.97	15	61	3
0298	2.98	9.97	15	61	3
0299	2.99	9.97	15	61	3
0300	3.00	6.87	15	61	3
0301	3.01	9.97	16	65	4
0302	3.02	9.97	16	65	4
0303	3.03	9.97	16	65	4
0310	3.10	8.65	16	65	4
0320	3.20	8.65	16	65	4
0330	3.30	8.65	16	65	4
0340	3.40	8.65	18	70	4
0350	3.50	7.49	18	70	4
0360	3.60	9.61	18	70	4
0370	3.70	9.61	18	70	4
0380	3.80	9.61	19	75	4
0390	3.90	9.61	19	75	4
0397	3.97	10.50	19	75	4
0398	3.98	10.50	19	75	4
0399	3.99	10.50	19	75	4
0400	4.00	7.32	19	75	4

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Part No.	Nominal ⌀ mm	1545 mm	Cutting edge length mm	Total length mm	Shank ⌀ h 6 mm
0401	4.01	10.50	19	75	4
0402	4.02	10.50	19	75	4
0403	4.03	10.50	19	75	4
0410	4.10	9.41	19	75	4
0420	4.20	9.41	19	75	4
0430	4.30	9.41	21	80	5
0440	4.40	9.41	21	80	5
0450	4.50	7.96	21	80	5
0460	4.60	9.44	21	80	5
0470	4.70	9.44	21	80	5
0480	4.80	9.44	23	86	5
0490	4.90	9.44	23	86	5
0497	4.97	10.67	23	86	5
0498	4.98	10.67	23	86	5
0499	4.99	10.67	23	86	5
0500	5.00	7.51	23	86	5
0501	5.01	10.67	23	86	5
0502	5.02	10.67	23	86	5
0503	5.03	10.67	23	86	5
0510	5.10	9.81	23	86	5
0520	5.20	9.81	23	86	5
0530	5.30	9.81	23	86	5
0540	5.40	9.81	26	93	6
0550	5.50	8.80	26	93	6
0560	5.60	9.44	26	93	6
0570	5.70	9.44	26	93	6
0580	5.80	9.44	26	93	6
0590	5.90	9.44	26	93	6
0597	5.97	10.67	26	93	6
0598	5.98	10.67	26	93	6
0599	5.99	10.67	26	93	6
0600	6.00	8.15	26	93	6
0601	6.01	10.94	28	101	6
0602	6.02	10.94	28	101	6
0603	6.03	10.94	28	101	6
0610	6.10	10.03	28	101	6
0620	6.20	10.02	28	101	6
0630	6.30	10.02	28	101	6
0640	6.40	10.02	28	101	6
0650	6.50	10.02	28	101	6
0660	6.60	10.02	28	101	6
0670	6.70	10.02	28	101	6
0680	6.80	10.02	31	109	8
0690	6.90	10.02	31	109	8
0700	7.00	10.02	31	109	8
0710	7.10	10.78	31	109	8
0720	7.20	10.78	31	109	8
0730	7.30	10.78	31	109	8
0740	7.40	10.78	31	109	8
0750	7.50	10.78	31	109	8
0760	7.60	11.26	33	117	8
0770	7.70	11.26	33	117	8
0780	7.80	11.26	33	117	8
0790	7.90	11.26	33	117	8

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Continued overleaf

Articles marked ◊ are not held in stock, procurement is effected at short notice.

NC Machine Reamers

Continued

Part No.	Nominal ø mm	1545	Cutting edge length mm	Total length mm	Shank ø h 6 mm
0797	7.97	10.94	33	117	8
0798	7.98	10.94	33	117	8
0799	7.99	10.94	33	117	8
0800	8.00	9.61	33	117	8
0801	8.01	10.94	33	117	8
0802	8.02	10.94	33	117	8
0803	8.03	10.94	33	117	8
0810	8.10	13.31	33	117	8
0820	8.20	13.31	33	117	8
0830	8.30	13.31	33	117	8
0840	8.40	13.31	33	117	8
0850	8.50	12.08	33	117	8
0860	8.60	12.58	36	125	10
0870	8.70	12.58	36	125	10
0880	8.80	12.58	36	125	10
0890	8.90	12.58	36	125	10
0900	9.00	11.42	36	125	10
0901	9.01	13.94	36	125	10
0902	9.02	13.94	36	125	10
0903	9.03	13.94	36	125	10
0910	9.10	12.71	36	125	10
0920	9.20	12.71	36	125	10
0930	9.30	12.71	36	125	10
0940	9.40	12.71	36	125	10
0950	9.50	12.70	36	125	10

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Part No.	Nominal ø mm	1545	Cutting edge length mm	Total length mm	Shank ø h 6 mm
0960	9.60	12.71	38	133	10
0970	9.70	13.02	38	133	10
0980	9.80	13.02	38	133	10
0990	9.90	13.02	38	133	10
0997	9.97	13.94	38	133	10
0998	9.98	13.94	38	133	10
0999	9.99	13.94	38	133	10
1000	10.00	12.08	38	133	10
1001	10.01	13.94	38	133	10
1002	10.02	13.94	38	133	10
1003	10.03	13.94	38	133	10
1100	11.00	16.66	41	142	10
1197	11.97	21.36	44	151	10
1198	11.98	21.36	44	151	10
1199	11.99	21.36	44	151	10
1200	12.00	17.19	44	151	10
1300	13.00	18.21	44	151	10
1400	14.00	18.91	47	160	14
1500	15.00	19.58	50	162	14
1600	16.00	20.14	52	170	14
1700	17.00	23.72	54	175	14
1800	18.00	24.45	56	182	14
1900	19.00	28.61	58	189	16
2000	20.00	27.48	60	195	16

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List of fits for 1/100 mm machine reamers see appendix in group 10.

Carbide Machine Reamers

Design: For through holes (occasionally also for blind holes).
With long cutting edge and short taper lead with extremely unequal tooth pitch – to give a clean and precise hole.
Solid carbide up to 9.0 mm, carbide tip from 10.0 mm.

Carbide K10 | DIN 8093 | H7 | ca. 7°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1546	●	●	●	●	○				●	●	●	●	●

Part No.	Nominal ø mm	1546	Cut length mm	Total length mm	Shank ø h 9 mm
0100	1.0	10.58	5.5	34	1.0
0120	1.2	11.20	7.5	38	1.2
0140	1.4	11.20	8	40	1.4
0150	1.5	9.41	8	40	1.5
0160	1.6	11.85	9	43	1.6
0180	1.8	13.38	9	46	1.8
0200	2.0	10.93	11	49	2.0
0220	2.2	14.26	12	53	2.2
0250	2.5	12.61	14	57	2.5
0280	2.8	14.73	15	61	2.8
0300	3.0	12.98	15	61	3.0
0320	3.2	15.27	16	65	3.2

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Part No.	Nominal ø mm	1546	Cut length mm	Total length mm	Shank ø h 9 mm
0350	3.5	14.53	18	70	3.5
0400	4.0	14.99	19	75	4.0
0450	4.5	17.56	21	80	4.5
0500	5.0	18.06	23	86	5.0
0600	6.0	21.90	26	93	5.6
0700	7.0	26.22	31	109	7.1
0800	8.0	27.72	33	117	8.0
0900	9.0	31.55	36	125	9.0
1000	10.0	22.64	38	133	10.0
1100	11.0	28.24	41	142	10.0
1200	12.0	25.95	44	151	10.0

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All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Carbide Machine Reamers

Design: For through holes (occasionally also for blind holes). With long cutting edge and short taper lead with extremely unequal tooth pitch – to give a clean and precise hole. With carbide tip.

Carbide K10 | DIN 8094 | H7 | ca. 7° | MK 1–3

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1549	●	●	●	●	○				●	●	●	●	●

Part No.	Nominal ∅ mm	1549 mm/mm	Cut length mm	Total length mm	MT
1000	10	27.75	38	168	1
1100	11	29.77	41	175	1
1200	12	27.99	44	182	1
1300	13	30.27	44	182	1
1400	14	32.53	47	189	1
1500	15	35.82	50	204	2
1600	16	37.06	52	210	2
1700	17	40.59	54	214	2
1800	18	38.07	56	219	2

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Part No.	Nominal ∅ mm	1549 mm/mm	Cut length mm	Total length mm	MT
1900	19	45.39	58	223	2
2000	20	42.38	60	228	2
2200	22	48.64	64	237	2
2400	24	60.51	68	268	3
2500	25	60.51	68	268	3
2600	26	66.56	70	273	3
2800	28	83.95	71	277	3
3000	30	78.68	73	281	3

(146)

Solid Carbide NC Machine Reamers

Design: For clearance and blind holes (from 3.8 mm due to short chamfer). Dimension similar to DIN 212. Centring up to ∅ 3.70 mm with 90° ext. centre on both ends, above with female centres, parallel shank, **with straight shank** ∅ for standard fit in hydro-expansion chucks and **high precision jaw chucks.** The fine shank tolerance of h 6 improves the **clamping precision.**

Production tolerance: Full-number diameter as well as 1/10 mm dimensions H 7, 1/100 mm dimensions from ∅ 1.98 to 5.03 mm 0.000/+0.004 mm, above ∅ 5.03 mm 0.000/+0.005 mm.

Solid carbide UF | ≈DIN 212 | ca. 7°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1581	●	●	●	●	○				●	●	●	●	●

Part No.	Nominal ∅ mm	1581 mm/mm	Cut length mm	Total length mm	Shank ∅ h 6 mm
0098	0.98	19.85	6	50	4
0099	0.99	19.85	6	50	4
0100	1.00	19.85	6	50	4
0101	1.01	19.85	6	50	4
0102	1.02	19.85	6	50	4
0103	1.03	19.85	9	50	4
0148	1.48	23.07	9	50	4
0149	1.49	23.07	9	50	4
0150	1.50	23.07	9	50	4
0151	1.51	23.07	9	50	4
0152	1.52	23.07	9	50	4
0198	1.98	23.07	12	50	4
0199	1.99	23.07	12	50	4
0200	2.00	23.07	12	50	4
0201	2.01	23.07	12	50	4
0202	2.02	23.07	12	50	4
0203	2.03	23.07	12	50	4
0240	2.40	23.07	16	60	4
0250	2.50	23.07	16	60	4

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Part No.	Nominal ∅ mm	1581 mm/mm	Cut length mm	Total length mm	Shank ∅ h 6 mm
0297	2.97	23.07	17	64	4
0298	2.98	23.07	17	64	4
0299	2.99	23.07	17	64	4
0300	3.00	23.07	17	64	4
0301	3.01	23.07	17	64	4
0302	3.02	23.07	17	64	4
0303	3.03	23.07	17	64	4
0310	3.10	23.07	18	68	4
0320	3.20	23.07	18	68	4
0330	3.30	23.07	18	68	4
0340	3.40	23.07	20	74	4
0350	3.50	23.07	20	74	4
0360	3.60	23.07	20	74	4
0370	3.70	23.07	20	74	4
0380	3.80	23.07	21	77	4
0390	3.90	23.07	21	77	4
0397	3.97	23.07	21	77	4
0398	3.98	23.07	21	77	4
0399	3.99	23.07	21	77	4

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Continued overleaf

Solid Carbide NC Machine Reamers

Continued

Part No.	Nominal ø mm	1581	Cut length mm	Total length mm	Shank ø h 6 mm
0400	4.00	23.07	21	77	4
0401	4.01	23.07	21	77	4
0402	4.02	23.07	21	77	4
0403	4.03	23.07	21	77	4
0410	4.10	28.50	21	77	4
0420	4.20	28.50	21	82	6
0430	4.30	28.50	23	82	6
0440	4.40	28.50	23	82	6
0450	4.50	28.50	23	82	6
0460	4.60	28.50	23	82	6
0470	4.70	28.50	23	82	6
0480	4.80	28.50	26	93	6
0490	4.90	28.50	26	93	6
0497	4.97	28.50	26	93	6
0498	4.98	28.50	26	93	6
0499	4.99	28.50	26	93	6
0500	5.00	28.50	26	93	6
0501	5.01	28.50	26	93	6
0502	5.02	28.50	26	93	6
0503	5.03	28.50	26	93	6
0510	5.10	28.50	26	93	6
0520	5.20	28.50	26	93	6
0530	5.30	28.50	26	93	6
0540	5.40	28.50	26	93	6
0550	5.50	28.50	26	93	6
0560	5.60	28.50	26	93	6
0570	5.70	28.50	26	93	6
0580	5.80	28.50	26	93	6
0590	5.90	28.50	26	93	6
0597	5.97	28.50	26	93	6
0598	5.98	28.50	26	93	6
0599	5.99	28.50	26	93	6
0600	6.00	28.50	26	93	6
0601	6.01	28.50	26	93	6
0602	6.02	28.50	26	93	6
0603	6.03	28.50	26	93	6
0610	6.10	35.44	28	101	8
0620	6.20	35.44	28	101	8
0630	6.30	35.44	28	101	8
0640	6.40	35.44	28	101	8
0650	6.50	35.44	28	101	8
0660	6.60	35.44	28	101	8
0670	6.70	35.44	28	101	8
0680	6.80	35.44	31	109	8
0690	6.90	35.44	31	109	8
0700	7.00	35.44	31	109	8
0710	7.10	35.44	31	109	8
0720	7.20	35.44	31	109	8
		(145)			

Part No.	Nominal ø mm	1581	Cut length mm	Total length mm	Shank ø h 6 mm
0730	7.30	35.44	31	109	8
0740	7.40	35.44	31	109	8
0750	7.50	35.44	31	109	8
0760	7.60	35.44	31	109	8
0770	7.70	35.44	33	117	8
0780	7.80	35.44	33	117	8
0790	7.90	35.44	33	117	8
0797	7.97	35.44	33	117	8
0798	7.98	35.44	33	117	8
0799	7.99	35.44	33	117	8
0800	8.00	35.43	33	117	8
0801	8.01	35.44	33	117	8
0802	8.02	35.44	33	117	8
0803	8.03	35.44	33	117	8
0810	8.10	43.48	33	117	10
0820	8.20	43.48	33	117	10
0830	8.30	43.48	33	117	10
0840	8.40	43.48	33	117	10
0850	8.50	43.48	33	117	10
0860	8.60	43.48	33	117	10
0870	8.70	43.48	36	125	10
0880	8.80	43.48	36	125	10
0890	8.90	43.48	36	125	10
0900	9.00	43.48	36	125	10
0910	9.10	43.48	36	125	10
0920	9.20	43.48	36	125	10
0930	9.30	43.48	36	125	10
0940	9.40	43.48	36	125	10
0950	9.50	43.48	36	125	10
0960	9.60	43.48	36	125	10
0970	9.70	43.48	41	133	10
0980	9.80	43.48	41	133	10
0990	9.90	43.48	41	133	10
0997	9.97	43.48	41	133	10
0998	9.98	43.48	41	133	10
0999	9.99	43.48	41	133	10
1000	10.00	43.48	41	133	10
1001	10.01	43.48	41	133	10
1002	10.02	43.48	41	133	10
1003	10.03	43.48	41	150	10
1197	11.97	57.00	44	150	12
1198	11.98	57.00	44	150	12
1199	11.99	57.00	44	150	12
1200	12.00	57.00	44	150	12
1201	12.01	57.00	44	150	12
1202	12.02	57.00	44	150	12
1203	12.03	57.00	44	150	12
		(145)			

Further dimensions available on request.
List of fits for 1/100 mm machine reamers see appendix in group 10.

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- User-friendly cutting operation thanks to distinct conical form
- Dry-machining possible due to TiAlN coating

format
professional quality



1/56

format professional quality / Band colour classification / Thread type	Application	Metric thread M	Metric left-handed thread M-LH	Metric fine thread MF	Cylindrical conduit thread G
Standards		DIN 352 · DIN 371 · DIN 376	DIN 352 · DIN 371	DIN 2181 · DIN 374	DIN 5156 · DIN 5157
Steel up to 850 N/mm² - unhardened, long-chipping steel - copper and copper alloys - brass, long-chipping - aluminium alloys - thermoplastics		1673 M2...M20 1676 M1...M10 1677 M1...M10 1679 M3...M30 1680 M12...M30	1737 M3...M10	1753 M3...M30 1754 M3...M30	1763 G 1/8...G1 1/2 1764 G 1/8...G1 1/2
		1681 M2...M30 1682 M2...M30 1738 M3...M20		1755 M4...M30 1751 M4...M30	1765 G 1/8...G1 1/2 1767 G 1/8...G1 1/2
		1604 M1...M30 Set 1600 M1...M30 V 1601 M1...M30 M 1603 M1...M30 F	1612 M3...M20 Set	1627 M2...M52 Set 1625 M2...M52 V 1626 M2...M52 F	1640 G 1/8...G2 Set 1638 G 1/8...G2 V 1639 G 1/8...G2 F
Universal, up to 1000 N/mm² - easy-chipping steel up to 1000 N/mm² - stainless steel up to 750 N/mm² - copper and copper alloys, hard - brass, long-chipping - aluminium alloys		1683 M2...M24		1760 M3...M30	
		1684 M2...M30 1685 M3...M20 1700 M3...M20		1761 M3...M24	
					
Steel up to 1400 N/mm² - solid and tempered steel - fine-grain structural steel - short-chipping tool steel - copper and copper alloys, hard		1705 M3...M20 1706 M3...M20 1710 M2...M20 1728 M3...M20AZ			
		1712 M3...M20 1713 M3...M20 1718 M3...M20		1762 M3...M24	
INOX 2 / INOX 4 - stainless steel - acid-resistant steel (INOX 4) - copper and copper alloys, unhardened - bronze, long-chipping - injection moulded aluminium (e.g. AlSi9Mg)		1686 M2...M20 1687 M2...M20 1694 M3...M12 1698 M3...M20		1757 M4...M24 1758 M4...M24	
		1688 M3...M20 1690 M3...M20 1691 M3...M20 1692 M3...M20		1752 M3...M24 1759 M3...M24	1766 G 1/8...G1
		1618 M2...M20 Set			
Cast iron - grey cast iron and spheroidal cast iron - bronze and brass, short-chipping - magnesium and magnesium alloys - plastics, hard		1731 M3...M20 1732 M3...M20		1756 M4...M24	
Brass - short-chipping		1734 M3...M10 1735 M3...M10			
Aluminium - long-chipping		1722 M3...M20 1723 M3...M20			
		1725 M1,6...M24 1726 M1,6...M24			
Coatings/surface		ground/black steam tempered nitration TiN coating TiCN coating			

Whitworth thread BSW	Unified coarse thread UNC	Unified fine thread UNF	Steel conduit thread Pg	Conical conduit thread NPT	Application	format professional quality / BLANK Thread type / Band colour classification
DIN 2184	DIN 2184	DIN 2184	DIN 40432	Werk-norm		Standards
	1768 ⬭ UNC 2-56..1-8	1772 ⬭ UNF 10-32...1-12	1777 ⬭ PG 7...PG 36			**Steel up to 850 N/mm²** - unhardened, long-chipping steel - copper and copper alloys - brass, long-chipping - aluminium alloys - thermoplastics
	1770 ⬭ UNC 4-40...1-8	1774 ⬭ UNF 10-32...1-12				
1635 Set ⬭ W 1/8...W1	1647 Set ⬭ UNC 1-64...1-8	1650 Set ⬭ UNF 0-80...1-12		1670 ⬭ NPT 1/16...1		
						**Universal, up to 1000 N/mm²** - easy-chipping steel up to 1000 N/mm² - stainless steel up to 750 N/mm² - copper and copper alloys, hard - brass, long-chipping - aluminium alloys
						
						
						**Steel up to 1400 N/mm²** - solid and tempered steel - fine-grain structural steel - short-chipping tool steel - copper and copper alloys, hard
						
						**INOX 2 / INOX 4** - stainless steel - acid-resistant steel (INOX 4) - copper and copper alloys, unhardened - bronze, long-chipping - injection moulded aluminium (e.g. AlSi9Mg)
						
						
						**Cast iron** - grey cast iron and spheroidal cast iron - bronze and brass, short-chipping - magnesium and magnesium alloys - plastics, hard
						**Brass** - short-chipping
						**Aluminium** - long-chipping
						

Overview – Hand and Machine Taps



Thread type	M	M-LH	M	MF	BSW	G	UNC	UNF	M
Colour band									
Part No.	**1604**	**1612**	**1618**	**1627**	**1635**	**1640**	**1647**	**1650**	**1651**
Thread range	M 1–M 30	M 3–M 20	M 2–M 20	M 2–M 52	W 1/8"–W 1"	G 1/8"–G 2"	Nr. 1–84"–1–8"	Nr. 0–80"–1–12"	M 3–M 10
For through hole threads	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 1 x D
For blind hole threads	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	
Type/form	N	N	INOX	N	N	N	N	N	
Material	HSS	HSS	HSS-E	HSS	HSS	HSS	HSS	HSS	HSS
Tolorance class	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	medium	ISO 228/1	2 B	2 B	ISO 2 6H
Surface	blank	blank	blank	blank	blank	blank	blank	blank	blank
Page	**1/103**	**1/104**	**1/104**	**1/105**	**1/106**	**1/107**	**1/107**	**1/108**	**1/110**

Material group

Steels up to 850 N/mm²		●	●	●	●	●	●	●	●	
Steels up to 1,000 N/mm²		●	●	●	●	●	●	●	●	
Steels up to 1,400 N/mm²		◐	◐	◐	◐	◐	◐	◐	◐	
Steels up to 42 HRc		○	○	○	○	○	○	○	○	
Stainless and acid-resistant steels (INOX)		◐	◐	●	◐	◐	◐	◐	◐	
Ti steels, Ti alloys, special steels		○	○	○	○	○	○	○	○	
Cast iron		◐	◐	◐	◐	◐	◐	◐	◐	
Al, Al and Mg alloys		●	●	●	●	●	●	●	●	●
Copper, brass, bronze		●	●	●	●	●	●	●	●	●

● recommended ◐ suitable ○ partially suitable

Overview – Hand and Machine Taps



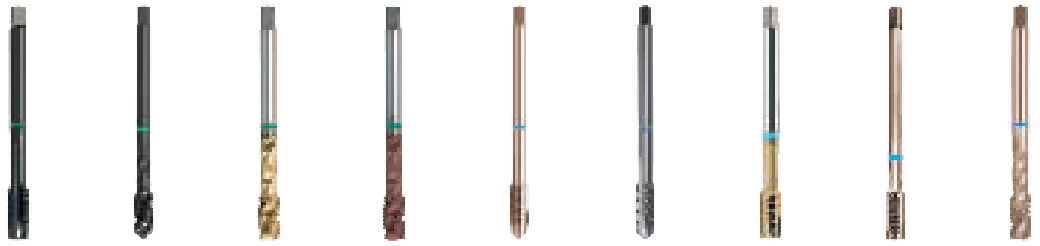
Thread type	NPT	M	M	M	M	M	M	M	M
Colour band				yellow	yellow	yellow	yellow	yellow	yellow
Part No.	**1670**	**1673**	**1738**	**1676**	**1677**	**1679**	**1680**	**1682**	**1681**
Thread range	1/16"–1"	M 2–M 20	M 3–M 20	M 1–M 10	M 1–M 10	M 3–M 30	M 12–M 30	M 2–M 30	M 2–M 30
For through hole threads	≤ 1,5 x D	≤ 3 x D		≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D		
For blind hole threads	≤ 1,5 x D		≤ 1,5 x D					≤ 3 x D	≤ 3 x D
Type/form	N/C	N/B	NR 15/C	N/B	N/B	N/B	N/B	NR 40/C	NR 40/C
Material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Tolerance class		ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H
Surface	blank	blank	blank	steam tempered	steam tempered	steam tempered	steam tempered	steam tempered	steam tempered
Page	**1/111**	**1/111**	**1/111**	**1/113**	**1/113**	**1/113**	**1/113**	**1/114**	**1/114**

Material group

Steels up to 850 N/mm²		●	●	●	●	●	●	●	●
Steels up to 1,000 N/mm²		●	◐	◐	○	○	○	○	
Steels up to 1,400 N/mm²									
Steels up to 42 HRc									
Stainless and acid-resistant steels (INOX)					○	○	○	○	
Ti steels, Ti alloys, special steels									
Cast iron		◐	◐	◐	◐	◐	◐	◐	○	○
Al, Al and Mg alloys		●	●	●					
Copper, brass, bronze		●	●	●	◐	◐	◐	◐	○	○

● recommended ◐ suitable ○ partially suitable

Overview – Machine Taps



Thread type	M	M	M	M	M	M	M	M	M
Colour band	green	green	green	green	blue	blue	blue	blue	blue
Part No.	1683	1684	1700	1685	1686	1687	1698	1694	1690
Thread range	M 2–M 24	M 2–M 30	M 3–M 20	M 3–M 20	M 2–M 20	M 2–M 20	M 3–M 20	M 3–M 12	M 3–M 20
For through hole threads	≤ 3 x D				≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	
For blind hole threads		≤ 3 x D	≤ 3 x D	≤ 3 x D					≤ 3 x D
Type/form	N/B	NR 40/C	NR 40/C	NR 40/C	INOX/B	INOX/B	INOX/B	INOX/B	INOX R 40/C
Material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E PM	HSS-E
Tolerance class	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H
Surface	steam tempered	steam tempered	TiN	TiCN	blank	blank	TiN	blank	blank
Page	**1/115**	**1/116**	**1/116**	**1/116**	**1/117**	**1/117**	**1/117**	**1/117**	**1/118**

Material group

Steels up to 850 N/mm²		●	●	●	●					
Steels up to 1,000 N/mm²		●	●	●	●					
Steels up to 1,400 N/mm²										
Steels up to 42 HRc										
Stainless and acid-resistant steels (INOX)		◐	◐	◐	◐	●	●	●	●	●
Ti steels, Ti alloys, special steels										
Cast iron		◐	◐	◐	◐					
Al, Al and Mg alloys				●	●					
Copper, brass, bronze		●	●	●	●					

● recommended ◐ suitable ○ partially suitable

Overview – Machine Taps



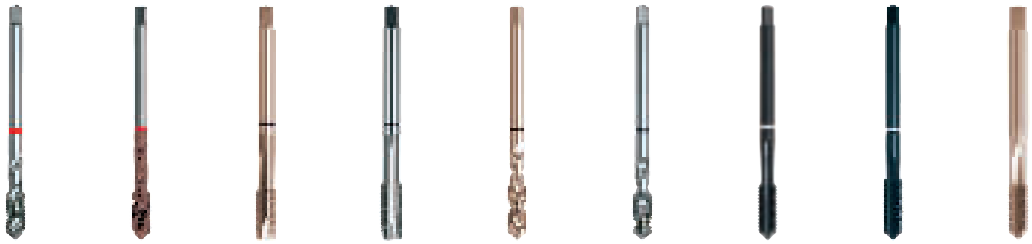
Thread type	M	M	M	M	M	M	M	M
Colour band	blue	blue	blue	red	red	red	red	red
Part No.	**1688**	**1691**	**1692**	**1705**	**1706**	**1710**	**1728**	**1712**
Thread range	M 3–M 20	M 3–M 20	M 3–M 20	M 3–M 20	M 3–M 20	M 2–M 20	M 3–M 20	M 3–M 20
For through hole threads				≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	
For blind hole threads	≤ 3 x D	≤ 3 x D	≤ 3 x D					≤ 3 x D
Type/form	INOX R 40/C	INOX R 40/C	INOX R 40/C	H/B	H/B	H/B	H AZ/B	HR 40/C
Material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Tolerance class	ISO 2 6H	ISO 3 6G	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H
Surface	blank tempered	steam	TiCN	blank	blank	TiCN	blank	blank
Page	**1/118**	**1/118**	**1/118**	**1/119**	**1/119**	**1/119**	**1/119**	**1/120**

Material group

Steels up to 850 N/mm²								
Steels up to 1,000 N/mm²					●	●	●	●	●
Steels up to 1,400 N/mm²					◐	◐	●	○	◐
Steels up to 42 HRc							◐	○	
Stainless and acid-resistant steels (INOX)		●	●	●					
Ti steels, Ti alloys, special steels									
Cast iron								◐	
Al, Al and Mg alloys									
Copper, brass, bronze								○	

● recommended ◐ suitable ○ partially suitable

Overview – Machine Taps



Thread type	M	M	M	M	M	M	M	M	M
Colour band	red	red	black	black	black	black	white	white	
Part No.	**1713**	**1718**	**1722**	**1723**	**1725**	**1726**	**1731**	**1732**	**1734**
Thread range	M 3–M 20	M 3–M 20	M 3–M 20	M 3–M 20	M 1.6–M 24	M 1.6–M 24	M 3–M 20	M 3–M 20	M 3–M 10
For through hole threads			3 x D	3 x D			≤ 3 x D	≤ 3 x D	≤ 3 x D
For blind hole threads	≤ 3 x D	≤ 3 x D			≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D
Type/form	HR 40/C	HR 40/C	W/B	W/B	WR 45/C	WR 45/C	GG/C	GG/C	Ms/C
Material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Tolerance class	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6HX	ISO 2 6HX	ISO 2 6H
Surface	blank	TiN	blank	blank	blank	blank	steam tempered	steam tempered	blank
Page	**1/120**	**1/120**	**1/120**	**1/120**	**1/121**	**1/121**	**1/121**	**1/121**	**1/122**

Material group

Steels up to 850 N/mm²									
Steels up to 1,000 N/mm²		●	●						
Steels up to 1,400 N/mm²		◐	●						
Steels up to 42 HRc			◐						
Stainless and acid-resistant steels (INOX)									
Ti steels, Ti alloys, special steels									
Cast iron							●	●	
Al, Al and Mg alloys				●	●	●	●		○
Copper, brass, bronze									●

● recommended ◐ suitable ○ partially suitable

Overview – Machine Taps



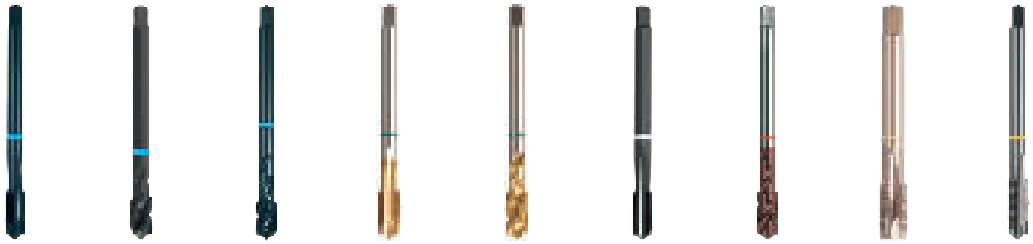
Thread type	M	M-LH	M	MF	MF	MF	MF	MF
Colour band		yellow		yellow	yellow	yellow	yellow	blue
Part No.	**1735**	**1737**	**1750**	**1753**	**1754**	**1755**	**1751**	**1757**
Thread range	M 3–M 10	M 3–M 10	M 3–M 16	M 3–M 30	M 3–M 30	M 4–M 30	M 4–M 30	M 4–M 24
For through hole threads	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D			≤ 3 x D
For blind hole threads	≤ 3 x D					≤ 3 x D	≤ 3 x D	
Type/form	Ms/C	N/B	N	N/B	N/B	NR 40/C	NR 40/C	INOX/B
Material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Tolerance class	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H
Surface	blank	blank	blank	steam tempered	steam tempered	steam tempered	steam tempered	steam tempered
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Material group

Steels up to 850 N/mm²			●	●	●	●	●	●	
Steels up to 1,000 N/mm²			○	◐	○	○	○	○	
Steels up to 1,400 N/mm²									
Steels up to 42 HRc									
Stainless and acid-resistant steels (INOX)					○	○	○	○	●
Ti steels, Ti alloys, special steels									○
Cast iron					◐	◐	◐	◐	
Al, Al and Mg alloys		○	◐	◐					
Copper, brass, bronze		●		◐	◐	◐	◐	◐	

● recommended ◐ suitable ○ partially suitable

Overview – Machine Taps



Thread type	MF	MF	MF	MF	MF	MF	MF	G	G
Colour band	blue	blue	blue	green	green	white	red	yellow	yellow
Part No.	**1758**	**1759**	**1752**	**1760**	**1761**	**1756**	**1762**	**1763**	**1764**
Thread range	M 4–M 24	M 3–M 24	M 3–M 24	M 3–M 30	M 3–M 24	M 4–M 24	M 3–M 24	G 1/8–G 1.1/2	G 1/8–G 1.1/2
For through hole threads	≤ 3 x D			≤ 3 x D		≤ 3 x D		≤ 3 x D	≤ 3 x D
For blind hole threads		≤ 3 x D	≤ 3 x D		≤ 3 x D	≤ 3 x D	≤ 3 x D		
Type/form	INOX/B	INOX R 40/C	INOX R 40/C	N/B	NR 40/C	GG/C	HR 40/C	N/B	N/B
Material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Tolerance class	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6H	ISO 2 6HX	ISO 2 6H	ISO 228	ISO 228
Surface	steam tempered	steam tempered	steam tempered	TiN	TiN	steam tempered	TiCN	blank	blank
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Material group

Steels up to 850 N/mm²					●	●			●	●
Steels up to 1,000 N/mm²					●	●		●	○	○
Steels up to 1,400 N/mm²								●		
Steels up to 42 HRc								◐		
Stainless and acid-resistant steels (INOX)		●	●	●	◐	◐				
Ti steels, Ti alloys, special steels		○	○	○						
Cast iron					◐	◐	●			
Al, Al and Mg alloys						●			◐	◐
Copper, brass, bronze					●	●				

● recommended ◐ suitable ○ partially suitable

Overview – Machine Taps



Thread type	G	G	G	UNC	UNC	UNF	UNF	Pg
Colour band	yellow	yellow	blue	yellow	yellow	yellow	yellow	
Part No.	**1765**	**1767**	**1766**	**1768**	**1770**	**1772**	**1774**	**1777**
Thread range	G 1/8–G 1.1/2	G 1/8–G 1.1/2	G 1/8–G 1	Nr. 2–56"–1–8"	Nr. 4–40"–1–8"	Nr. 10–32"–1–12"	Nr. 10–32"–1–12"	7–36
For through hole threads				≤ 3 x D		≤ 3 x D		≤ 1.5 x D
For blind hole threads	≤ 3 x D	≤ 3 x D	≤ 3 x D		≤ 3 x D		≤ 3 x D	≤ 1.5 x D
Type/form	NR 40/C	NR 40/C	VA R 40/C	N/B	NR 40/C	N/B	NR 40/C	N/C
Material	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Tolerance class	ISO 228	ISO 228	ISO 228	2 B	2 B	2 B	2 B	
Surface	blank	blank	TiN	blank	blank	blank	blank	blank
Page	**1/128**	**1/128**	**1/129**	**1/129**	**1/130**	**1/130**	**1/131**	**1/131**

Material group

Steels up to 850 N/mm²		●	●		●	●	●	●	●
Steels up to 1,000 N/mm²		○	○		○	○	○	○	●
Steels up to 1,400 N/mm²									
Steels up to 42 HRc									
Stainless and acid-resistant steels (INOX)				●					
Ti steels, Ti alloys, special steels									
Cast iron									
Al, Al and Mg alloys		◐	◐		◐	◐	◐	◐	◐
Copper, brass, bronze									◐

● commended ◐ suitable ○ partially suitable

Overview – Machine Taps



Thread type	M	M	M	M	MF	MF	MF
Colour band							
Part No.	**1780**	**1783**	**1784**	**1787**	**1785**	**1788**	**1789**
Thread range	M 3–M 16	M 3–M 12	M 3–M 16	M 3–M 16	M 6–M 20	M 6–M 20	M 6–M 20
For through hole threads	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D
For blind hole threads	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D
Type/form	N/C	N/C	N/C	INOX/C	N/C	N/C	INOX/C
Material	HSS-E	HSS-E	HSS-E	HSS-E PM	HSS-E	HSS-E	HSS-E PM
Tolerance class	6 HX	6 GX	6 HX	6 HX	6 HX	6 HX	6 HX
Surface	TiN	TiN	TiCN	TiN	TiN	TiCN	TiN
Page	**1/132**	**1/132**	**1/132**	**1/132**	**1/133**	**1/133**	**1/133**

Material group

Steels up to 850 N/mm²		●	●	●	●	●	●	●
Steels up to 1,000 N/mm²		●	●	●	●	●	●	●
Steels up to 1,400 N/mm²								
Steels up to 42 HRc								
Stainless and acid-resistant steels (INOX)		●	●	●	●	●	●	●
Ti steels, Ti alloys, special steels								
Cast iron								
Al, Al and Mg alloys		●	●	●	●	●	●	●
Copper, brass, bronze		◐	◐	◐	◐	◐	◐	◐

● recommended ◐ suitable ○ partially suitable

Hand Taps

For ISO standard metric thread DIN 13.
Bottoming tap with chamfer lead form C.

1600 Taper Tap
1601 Second Tap
1603 Bottoming Tap
1604 3-piece Set

M | HSS | DIN 352 | ISO 2 6H | Type N | 60° | ≤ 3xd

format professional quality

Taper Tap



Second Tap



Bottoming Tap



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1600	●	●	◐	○					◐	○	◐	●	●
1601	●	●	◐	○					◐	○	◐	●	●
1603	●	●	◐	○					◐	○	◐	●	●
1604	●	●	◐	○					◐	○	◐	●	●

Part No.	Thread	1600	1601	1603	1604	Pitch mm	Total length mm	Shank square mm	Tapped hole ∅ mm
0010	M 1	5.86	5.86	5.86	17.51	0.25	32	2.1	0.75
0012	M 1.2	5.46	5.46	5.46	16.33	0.25	32	2.1	0.95
0014	M 1.4	4.96	4.96	4.96	14.90	0.30	32	2.1	1.10
0016	M 1.6	4.58	4.58	4.58	13.78	0.35	32	2.1	1.25
0017	M 1.7	4.70	4.70	4.70	14.08	0.35	32	2.1	1.30
0020	M 2	3.49	3.49	3.49	10.46	0.40	36	2.1	1.60
0022	M 2.2	3.84	3.84	3.84	11.52	0.45	36	2.1	1.75
0023	M 2.3	3.84	3.84	3.84	11.52	0.40	36	2.1	1.90
0025	M 2.5	2.89	2.89	2.89	8.71	0.45	40	2.1	2.05
0026	M 2.6	3.33	3.33	3.33	10.00	0.45	40	2.1	2.10
0030	M 3	1.59	1.59	1.59	4.82	0.50	40	2.7	2.50
0035	M 3.5	3.14	3.14	3.14	9.34	0.60	45	3	2.90
0040	M 4	1.59	1.59	1.59	4.82	0.70	45	3.4	3.30
0045	M 4.5	3.96	3.96	3.96	11.95	0.75	50	4.9	3.70
0050	M 5	1.71	1.71	1.71	5.11	0.80	50	4.9	4.20
0060	M 6	1.71	1.71	1.71	5.11	1.00	50	4.9	5.00
0070	M 7	3.70	3.70	3.70	11.11	1.00	50	4.9	6.00
0080	M 8	1.92	1.92	1.92	5.75	1.25	56	4.9	6.80
0090	M 9	4.86	4.86	4.86	14.58	1.25	63	5.5	7.80
0100	M 10	2.26	2.26	2.26	6.78	1.50	70	5.5	8.50
0110	M 11	6.56	6.56	6.56	19.63	1.50	70	6.2	9.50
0120	M 12	2.84	2.84	2.84	8.51	1.75	75	7	10.20
0140	M 14	4.53	4.53	4.53	13.62	2.00	80	9	12.00
0160	M 16	5.61	5.61	5.61	16.83	2.00	80	9	14.00
0180	M 18	9.67	9.67	9.67	28.92	2.50	95	11	15.50
0200	M 20	10.26	10.26	10.26	30.77	2.50	95	12	17.50
0220	M 22	12.30	12.30	12.30	36.94	2.50	100	14.5	19.50
0240	M 24	13.01	13.01	13.01	38.97	3.00	110	14.5	21.00
0270	M 27	19.17	19.17	19.17	57.46	3.00	110	16	24.00
0300	M 30	23.24	23.24	23.24	69.76	3.50	125	18	26.50
		(160)	(160)	(160)	(160)				

Hand Taps

Design: 3-piece set.
For ISO standard metric thread DIN 13.
Bottoming tap with chamfer lead form C.

M | HSS-E | DIN 352 | ISO 2 6H | Type INOX | 60° | ≤ 3xd

format professional quality

Taper tap



Second tap



Bottoming tap



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1618	●	●	◐	○					●	○	◐	●	●

Part No.	Thread	1618 mm	Pitch mm	Total length mm	Shank square mm	Tapped hole ø mm
0020	M 2	21.40	0.40	36	2.1	1.60
0025	M 2.5	18.91	0.45	40	2.1	2.05
0030	M 3	13.98	0.50	40	2.7	2.50
0035	M 3.5	17.31	0.60	45	3	2.90
0040	M 4	13.98	0.70	45	3.4	3.30
0050	M 5	14.80	0.80	50	4.9	4.20
0060	M 6	15.64	1.00	50	4.9	5.00
0080	M 8	17.31	1.25	56	4.9	6.80
0100	M 10	21.40	1.50	70	5.5	8.50
0120	M 12	26.75	1.75	75	7	10.20
0140	M 14	37.04	2.00	80	9	12.00
0160	M 16	28.79	2.00	80	9	14.00
0200	M 20	43.61	2.50	95	12	17.50
		(160)				

Hand Taps

Design: 3-piece set, HSS, left.
For metric ISO thread to DIN 13.
Bottoming tap with chamfer, form C.

M-LH | HSS | DIN 352 | ISO 2 6H | Type N | 60° | ≤ 3xd

format professional quality

Taper Tap



Second Tap



Bottoming Tap



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1612	●	●	◐	○					◐	○	◐	●	●

Part No.	Thread	1612 mm	Pitch mm	Total length mm	Shank square mm	Tapped hole ø mm
0030	M 3	15.21	0.50	40	2.7	2.50
0040	M 4	15.36	0.70	45	3.4	3.30
0050	M 5	15.36	0.80	50	4.9	4.20
0060	M 6	15.68	1.00	50	4.9	5.00
0080	M 8	19.04	1.25	56	4.9	6.80
0100	M 10	23.60	1.50	70	5.5	8.50
0120	M 12	27.80	1.75	75	7	10.20
0140	M 14	39.50	2.00	80	9	12.00
0160	M 16	44.89	2.00	80	9	14.00
0180	M 18	61.94	2.50	95	11	15.50
0200	M 20	55.69	2.50	95	12	17.50
		(160)				

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Hand Taps

For metric ISO fine thread, DIN 13.
Bottoming tap with chamfer, form C.

1625 Taper tap
1626 Bottoming tap
1627 2-piece set

MF | HSS | DIN 2181 | ISO 2 6H | Type N | 60° | ≤ 3xd

format professional quality

Taper tap



Bottoming tap



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1625	●	●	◐	○					◐	○	◐	●	●
1626	●	●	◐	○					◐	○	◐	●	●
1627	●	●	◐	○					◐	○	◐	●	●

Part No.	Thread x Pitch mm	1625	1626	1627	Total length mm	Shank square mm	Tapped hole ∅ mm
0001	M 2 x 0.25	7.57	7.57	15.12	36	2.1	1.75
0003	M 2.5 x 0.35	5.04	5.04	10.08	40	2.1	2.15
0005	M 2.6 x 0.35	5.04	5.04	10.08	40	2.1	2.25
0007	M 3 x 0.35	3.36	3.36	6.69	40	2.7	2.65
0009	M 4 x 0.35	3.36	3.36	6.69	45	3.4	3.65
0011	M 4 x 0.50	3.36	3.36	6.69	45	3.4	3.5
0013	M 5 x 0.50	3.36	3.36	6.69	50	4.9	4.5
0015	M 6 x 0.50	3.36	3.36	6.69	50	4.9	5.5
0017	M 6 x 0.75	3.27	3.27	6.57	50	4.9	5.2
0019	M 7 x 0.75	4.10	4.10	8.17	50	4.9	6.2
0021	M 8 x 0.50	4.32	4.32	8.61	50	4.9	7.5
0023	M 8 x 0.75	4.02	4.02	8.06	50	4.9	7.2
0025	M 8 x 1.00	3.83	3.83	7.65	56	4.9	7
0027	M 9 x 1.00	5.46	5.46	13.79	63	5.5	8
0029	M 10 x 0.75	5.41	5.41	10.83	63	5.5	9.2
0031	M 10 x 1.00	4.37	4.37	8.76	63	5.5	9
0033	M 10 x 1.25	4.37	4.37	8.76	70	5.5	8.8
0035	M 11 x 1.00	5.67	5.67	11.39	63	6.2	10
0037	M 12 x 1.00	5.28	5.28	10.52	70	7	11
0039	M 12 x 1.25	5.28	5.28	10.52	70	7	10.8
0041	M 12 x 1.50	5.12	5.12	10.26	70	7	10.5
0043	M 14 x 1.00	7.25	7.25	14.51	70	9	13
0045	M 14 x 1.25	7.10	7.10	14.20	70	9	12.8
0047	M 14 x 1.50	6.44	6.44	12.87	70	9	12.5
0049	M 15 x 1.00	9.22	9.22	18.42	70	9	14
0051	M 15 x 1.50	8.11	8.11	16.23	70	9	13.5
0053	M 16 x 1.00	8.45	8.45	16.91	70	9	15
0055	M 16 x 1.50	7.85	7.85	15.70	70	9	14.5
0057	M 18 x 1.00	10.32	10.32	20.65	80	11	17
0059	M 18 x 1.50	9.29	9.29	18.57	80	11	16.5
0061	M 18 x 2.00	11.95	11.95	23.87	80	11	16
0063	M 20 x 1.00	10.75	10.75	21.50	80	12	19
0065	M 20 x 1.50	10.10	10.10	20.22	80	12	18.5
0067	M 20 x 2.00	14.29	14.29	28.61	80	12	18
0069	M 22 x 1.00	15.49	15.49	31.02	80	14.5	21
0071	M 22 x 1.50	12.61	12.61	25.22	80	14.5	20.5
0073	M 22 x 2.00	13.22	13.22	26.41	80	14.5	20
0075	M 24 x 1.50	10.21	10.21	20.41	90	14.5	22.5
0077	M 24 x 2.00	15.50	15.50	31.03	90	14.5	22
0079	M 25 x 1.50	19.20	19.20	38.40	90	14.5	23.5
0081	M 26 x 1.50	19.36	19.36	38.69	90	14.5	24.5
0083	M 27 x 1.50	19.85	19.85	39.66	90	16	25.5
0085	M 27 x 2.00	22.03	22.03	44.04	90	16	25
0087	M 28 x 1.50	20.62	20.62	41.20	90	16	26.5
0089	M 30 x 1.00	27.40	27.40	54.77	90	18	29
0091	M 30 x 1.50	22.57	22.57	45.15	90	18	28.5
0093	M 30 x 2.00	26.27	26.27	52.49	90	18	28
0095	M 32 x 1.50	26.22	26.22	52.41	90	18	30.5
0097	M 33 x 1.50	30.04	30.04	60.02	100	20	31.5
0099	M 33 x 2.00	34.98	34.98	70.00	100	20	31
		(160)	(160)	(160)			

Continued overleaf

Hand Taps

Continued

Part No.	Thread x Pitch mm	1625	1626	1627	Total length mm	Shank square mm	Tapped hole ø mm
0101	M 34 x 1.50	29.97	29.97	59.96	100	22	32.5
0103	M 35 x 1.50	32.39	32.39	64.75	100	22	33.5
0105	M 36 x 1.50	34.27	34.27	68.52	100	22	34.5
0107	M 36 x 2.00	37.20	37.20	74.37	125	22	34
0109	M 36 x 3.00	39.09	39.09	78.22	125	22	33
0111	M 38 x 1.50	37.20	37.20	74.39	110	22	36.5
0113	M 39 x 2.00	52.60	52.60	105.22	125	24	37
0115	M 39 x 3.00	52.29	52.29	104.60	125	24	36
0117	M 40 x 1.50	47.67	47.67	95.31	110	24	38.5
0119	M 42 x 2.00	58.13	58.13	116.23	125	24	40
0121	M 42 x 3.00	57.25	57.25	114.51	125	24	39
0123	M 45 x 1.50	57.84	57.84	115.68	110	29	43.5
0125	M 45 x 2.00	60.92	60.92	121.82	125	29	43
0127	M 48 x 1.50	63.71	63.71	127.42	140	29	46.5
0129	M 48 x 3.00	72.62	72.62	145.32	140	29	45
0131	M 50 x 1.50	69.87	69.87	139.70	140	29	48.5
0133	M 52 x 2.00	75.46	75.46	150.86	140	32	50
		(160)	(160)	(160)			

Hand Taps

Design: 3-piece set.
For Whitworth thread, DIN 11.
Bottoming thread with chamfer form C.

BSW | HSS | DIN 2184 | Type N | 55° | ≤ 3xd

format professional quality

Taper tap



Second tap



Bottoming tap



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1635	●	●	◐	○					◐	○	◐	●	●

Part No.	Thread inches	1635	Threads per inch	Thread ø mm	Total length mm	Shank square mm	Tapped hole ø mm
0001	W 1/8	8.96	40	3.175	45	3	2.50
0003	W 5/32	10.16	32	3.969	45	3.4	3.20
0005	W 3/16	9.25	24	4.762	50	4.9	3.60
0007	W 7/32	11.52	24	5.556	50	4.9	4.50
0009	W 1/4	9.55	20	6.350	50	4.9	5.10
0011	W 5/16	11.74	18	7.938	56	4.9	6.50
0013	W 3/8	12.76	16	9.525	70	5.5	7.90
0015	W 7/16	18.10	14	11.113	70	6.2	9.20
0017	W 1/2	19.01	12	12.700	75	7	10.50
0019	W 9/16	29.25	12	14.287	80	9	12
0021	W 5/8	26.55	11	15.876	80	9	13.50
0023	W 3/4	37.04	10	19.051	95	12	16.50
0025	W 7/8	49.34	9	22.226	100	14.5	19.20
0027	W 1.	61.70	8	25.401	125	18	24.7
		(160)					

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Hand Taps

For threads DIN ISO 228/1 (DIN 259).
Bottoming thread with chamfer form C.

1638 Taper tap
1639 Bottoming tap
1640 2-piece set

G | HSS | DIN 5157 | Type N | 55° | ≤ 3xd

format professional quality

Taper Tap



Bottoming Tap



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1638	●	●	◐	○					◐	○	◐	●	●
1639	●	●	◐	○					◐	○	◐	●	●
1640	●	●	◐	○					◐	○	◐	●	●

Part No.	Thread inches	1638 mm	1639 mm	1640 mm	Threads per inch	Thread ø mm	Total length mm	Shank square mm	Tapped hole ø mm
0001	G 1/8	4.37	4.37	8.76	28	9.728	63	5.5	8.80
0003	G 1/4	5.33	5.33	10.66	19	13.157	70	9	11.80
0005	G 3/8	7.00	7.00	14.04	19	16.662	70	9	15.25
0007	G 1/2	10.19	10.19	20.38	14	20.955	80	12	19.00
0009	G 5/8	13.62	13.62	27.29	14	22.911	80	14.5	21.00
0011	G 3/4	16.89	16.89	33.78	14	26.441	90	16	24.50
0013	G 7/8	23.39	23.39	46.79	14	30.201	90	18	28.25
0015	G 1	28.25	28.25	56.52	11	33.249	100	20	30.75
0017	G 1 1/4	66.48	66.48	132.36	11	41.910	125	24	39.50
0019	G 1 1/2	82.82	82.82	166.26	11	47.803	140	29	45.25
0021	G 2	121.72	121.72	241.53	11	59.614	160	35	57.00
		(160)	(160)	(160)					

Hand Taps

Design: 3-piece set.
For UNC thread, Unified National Coarse Threads, AINSI B1.1.
Bottoming tap with chamfer form C.

UNC | HSS | DIN 2184 | Type N | 60° | ≤ 3xd

format professional quality



Taper Tap



Second Tap



Bottoming Tap

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1647	●	●	◐	○					◐	○	◐	●	●

Part No.	Thread	Threads per inch	1647 mm	Thread ø mm	Total length mm	Shank square mm	Tapped hole ø mm
0001	UNC No.	1 – 64	14.41	1.854	36	2.1	1.50
0003	UNC No.	2 – 56	14.41	2.184	36	2.1	1.80
0005	UNC No.	3 – 48	12.13	2.515	40	2.1	2.10
0007	UNC No.	4 – 40	11.01	2.845	40	2.7	2.30
0009	UNC No.	5 – 40	10.89	3.175	45	3	2.60
0011	UNC No.	6 – 32	10.69	3.505	45	3	2.85
0013	UNC No.	8 – 32	11.01	4.166	45	4.9	3.50
0015	UNC No.	10 – 24	11.41	4.826	50	4.9	3.90
0017	UNC No.	12 – 24	12.23	5.486	56	4.9	4.50
0019	UNC	1/4 – 20	9.81	6.350	56	4.9	5.20
0021	UNC	5/16 – 18	12.97	7.938	63	4.9	6.60
0023	UNC	3/8 – 16	14.96	9.525	70	5.5	8.00
0025	UNC	7/16 – 14	17.58	11.113	70	6.2	9.40
0027	UNC	1/2 – 13	20.97	12.700	75	7.0	10.70
0029	UNC	9/16 – 12	29.63	14.288	80	9	12.20
0031	UNC	5/8 – 11	27.34	15.875	80	9	13.50
0033	UNC	3/4 – 10	39.49	19.050	95	12	16.50
0035	UNC	7/8 – 9	49.75	22.225	100	14.5	19.50
0037	UNC	1 – 8	63.79	25.400	110	16	22.20
			(160)				

Hand Taps

Design: 2-piece set.
For UNF thread, Unified National Fine Threads, AINSI B1.1.
Bottoming tap with chamfer form C.

UNF | HSS | DIN 2184 | Type N | 60° | ≤ 3xd

format professional quality

Taper Tap



Bottoming Tap



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1650	●	●	◐	○					◐	○	◐	●	●

Part No.	Thread	Threads per inch	1650 mm	Thread ⌀ mm	Total length mm	Shank square mm	Tapped hole ⌀ mm
0001	UNF No.	0 – 80	12.03	1.524	32	2.1	1.30
0003	UNF No.	1 – 72	10.83	1.854	36	2.1	1.60
0005	UNF No.	2 – 64	10.25	2.184	36	2.1	1.90
0007	UNF No.	3 – 56	9.44	2.515	40	2.1	2.10
0009	UNF No.	4 – 48	8.32	2.845	40	2.7	2.40
0011	UNF No.	5 – 44	7.99	3.175	40	3	2.70
0013	UNF No.	6 – 40	7.99	3.505	45	3	3.00
0015	UNF No.	8 – 36	7.64	4.166	45	4.9	3.50
0017	UNF No.	10 – 32	7.99	4.826	50	4.9	4.10
0019	UNF No.	12 – 28	8.50	5.486	56	4.9	4.70
0021	UNF	1/4 – 28	7.40	6.350	56	4.9	5.50
0023	UNF	5/16 – 24	9.34	7.938	63	4.9	6.90
0025	UNF	3/8 – 24	10.03	9.525	63	5.5	8.50
0027	UNF	7/16 – 20	12.82	11.113	70	6.2	9.90
0029	UNF	1/2 – 20	13.87	12.700	70	9	11.50
0031	UNF	9/16 – 18	20.08	14.288	70	9	12.90
0033	UNF	5/8 – 18	18.64	15.875	70	9	14.50
0035	UNF	3/4 – 16	26.41	19.050	80	12	17.50
0037	UNF	7/8 – 14	31.55	22.225	80	14.5	20.40
0039	UNF	1 – 12	44.74	25.400	90	14.5	23.20

(160)

 All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Tapping Jig Sets

Design: Hand taps in plastic case.

M | HSS | DIN 352 | DIN 338 | EN 22568 | 60°

format professional quality

Part No.	Contents sizes	1795 mm	Contents
0100	M 3–M 12	20.77	1 hand tap set HSS each, 3-piece, type 1604, DIN 352 M3 – M4 – M5 – M6 – M8 – M10 – M12

(162)

Part No.	Contents sizes	1795 mm	Contents
0120	M 3–M 12	40.08	1 3-piece hand tap set, type 1604 each DIN 352 M3 – M4 – M5 – M6 – M8 – M10 – M12 1 tapped hole twist drill HSS, DIN 338 RN, type 1007 each ⌀ 2.5 – 3.3 – 4.2 – 5 – 6.8 – 8.5 – 10.2 mm 1 adjustable tap wrench, DIN 1814, size 1 1/2

(162)



1795 0100

1795 0120

Tapping Jig Sets

Design: Assortment in steel plate case.

M | HSS | DIN 352 | DIN 338 | EN 22568 | 60°

format professional quality



1795 0200



1795 0220

Part No.	Contents sizes	1795 mm	Contents
0200	M 3–M 20	126.18	1 3-piece hand tap set DIN 352, HSS of each: M3 – M4 – M5 – M6 – M8 – M10 – M12 – M14 – M16 – M18 – M20 1 cutting die DIN EN 22568, HSS of each: M3 – M4 – M5 – M6 – M8 – M10 – M12 – M14 – M16 – M18 – M20 1 cutting die DIN 225 of each: 20 x 5 mm, 20 x 7 mm, 25 x 9 mm, 30 x 11 mm, 38 x 14 mm, 45 x 18 mm 1 adjustable cutting die DIN 1814, size 1 and size 3 1 screw driver 4.5 mm 1 screw pitch gauge, metric

(162)

Part No.	Contents sizes	1795 mm	Contents
0220	M 3–M 12	57.88	1 3-piece hand tap set DIN 352, HSS of each: M3 – M4 – M5 – M6 – M8 – M10 – M12 1 tapped hole drill DIN 338 RN, type 1007, HSS of each: ⌀ 2.5 – 3.3 – 4.2 – 5.0 – 6.8 – 8.5 – 10.2 mm 1 cutting die DIN EN 22568, HSS of each: M3 – M4 – M5 – M6 – M8 – M10 – M12 1 cutting die DIN 225 of each: 20 x 5 mm, 20 x 7 mm, 25 x 9 mm, 30 x 11 mm, 38 x 14 mm 1 adjustable cutting die DIN 1814, size 1 and size 2 1 screw driver 4.5 mm 1 screw pitch gauge, metric

(162)

Combination Bits

Design: For drilling tapping holes, tapping and deburring in a single operation with 1/4" hexagon shank, for metric ISO standard pitch DIN 13.

Combined bits are construed for tapping by means of battery-operated drilling machines with right/left-hand motion. They are however also suitable for tapping on stationary drilling machines. Only clearance holes with a thread depth of max. 1 x D can be produced. Perfectly suitable for assembly work and small series. Make sure the axis of the tool and of the hole are in alignment and use appropriate cutting oil.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1651												●	●

Part No.	Thread	1651	Pitch mm	Drill ∅ mm	Total length mm
0001	M 3	3.46	0.5	2.5	36
0003	M 4	3.46	0.7	3.3	39
0005	M 5	3.46	0.8	4.2	41
		(161)			

Part No.	Thread	1651	Pitch mm	Drill ∅ mm	Total length mm
0007	M 6	3.46	1	5	44
0009	M 8	4.75	1.25	6.8	50
0011	M 10	5.70	1.5	8.5	59
		(161)			

Combination Bit Sets

Part No.	Set contents	1651 Set
0020	1 combination bit set M 3–M 10 and 1 bit holder in plastic case	24.71
		(161)



Bit Repair Kits V-Coil

Design: In plastic case.

Application:

Drilling: Core drill the damaged thread by means of a conventional twist drill. No core drilling is necessary for threads of spark plugs; instead use the drill/cut combination tool. Please note that for machine taps larger bore holes are required.

Control: Check tap and bolt for same thread and lead.

Thread: Cut the thread seat in the opened hole with the special V-coil tool.

Install thread insert: Place the insert on the tool and make sure that the driving tenon is seated in the aperture of the groove, then adjust with the set collar. Afterwards, by slightly pushing, screw in the thread insert in direction of the thread.

Do not turn against moving direction, the tenon may break off.

Break off tenon: After the installation, remove the screwing tool and break the driving tenon by means of the breaking tool. In case of large dimensions and threads of spark plugs, remove the tenon with a pair of pointed pliers. After finishing these work steps and due to the tight and precise tolerances and the forming of the spring thread a thread is produced, which is often better and stronger than the original thread.



Part No.	Set contents	1652
0050	M 5–M 12	92.33
0100	M 6–M 14	106.98
		(161)

 All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Machine Taps, Short/Single Tooth Tap

Design: Machine tap with 4–5 thread taper lead, form B, **(helical lead taper)** for clearance holes. For ISO standard metric hole DIN 13.

M | HSS-E | DIN 352 | ISO 2 6H | Type N

60° | ≤ 3xd

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1673	●	◐									◐	●	●

Part No.	Thread	1673	Pitch mm	Total length mm	Shank ⌀ mm	Shank square mm	Tapped hole ⌀ mm
0020	M 2	7.43	0.40	36	2.8	2.1	1.60
0030	M 3	3.11	0.50	40	3.5	2.7	2.50
0040	M 4	3.11	0.70	45	4.5	3.4	3.30
0050	M 5	3.20	0.80	50	6	4.9	4.20
0060	M 6	3.40	1	56	6	4.9	5.00
0080	M 8	3.96	1.25	63	6	4.9	6.80
0100	M 10	5.12	1.50	70	7	5.5	8.50
0120	M 12	7.11	1.75	75	9	7	10.20
0160	M 16	16.23	2	80	12	9	14
0200	M 20	26.20	1	95	16	12	17.5

(164)

Machine Taps, Short/Single Tooth Tap

Design: Machine taps for blind holes, chamfer form C (2–3) thread. For ISO standard metric hole DIN 13.

M | HSS-E | DIN 352 | ISO 2 6H | Type N

15° | 60° | ≤1,5xd

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1738	●	◐									◐	●	●

Part No.	Thread	1738	Pitch mm	Total length mm	Shank ⌀ mm	Shank square mm	Tapped hole ⌀ mm
0030	M 3	1.55	0.5	40	3.5	2.7	2.50
0040	M 4	1.55	0.7	45	4.5	3.4	3.30
0050	M 5	1.61	0.8	50	6	4.9	4.20
0060	M 6	1.69	1	50	6	4.9	5.00
0080	M 8	2.20	1.25	56	6	4.9	6.80
0100	M 10	2.89	1.5	70	7	5.5	8.50
0120	M 12	3.77	1.75	75	9	7	10.20
0160	M 16	20.01	2	80	12	9	14
0200	M 20	30.04	2.5	95	16	12	17.5

(164)

Machine Taps, Short/Single Tooth Tap

Design: Chamfer form C (2–3 thread). For NPT thread.

NPT | HSS-E | Type N | 60° | ≤ 1,5xd

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1670	●	●									◐	●	●

Part No.	Thread inches	1670	Threads per inch	Thread ⌀ mm	Total length mm	Shank ⌀ mm	Shank square mm	Tapped hole ⌀ mm
0001	NPT 1/16	8.17	27	8.190	56	6	4.9	6.3
0003	NPT 1/8	9.68	27	10.620	63	7	5.5	8.5
0005	NPT 1/4	12.21	18	14.140	63	11	9	11.1
0007	NPT 3/8	14.41	18	17.570	70	12	9	14.5
0009	NPT 1/2	19.63	14	21.900	80	16	12	17.7
0011	NPT 3/4	26.46	14	27.230	100	20	16	23
0013	NPT 1*	37.04	11.5	34.180	110	25	20	29

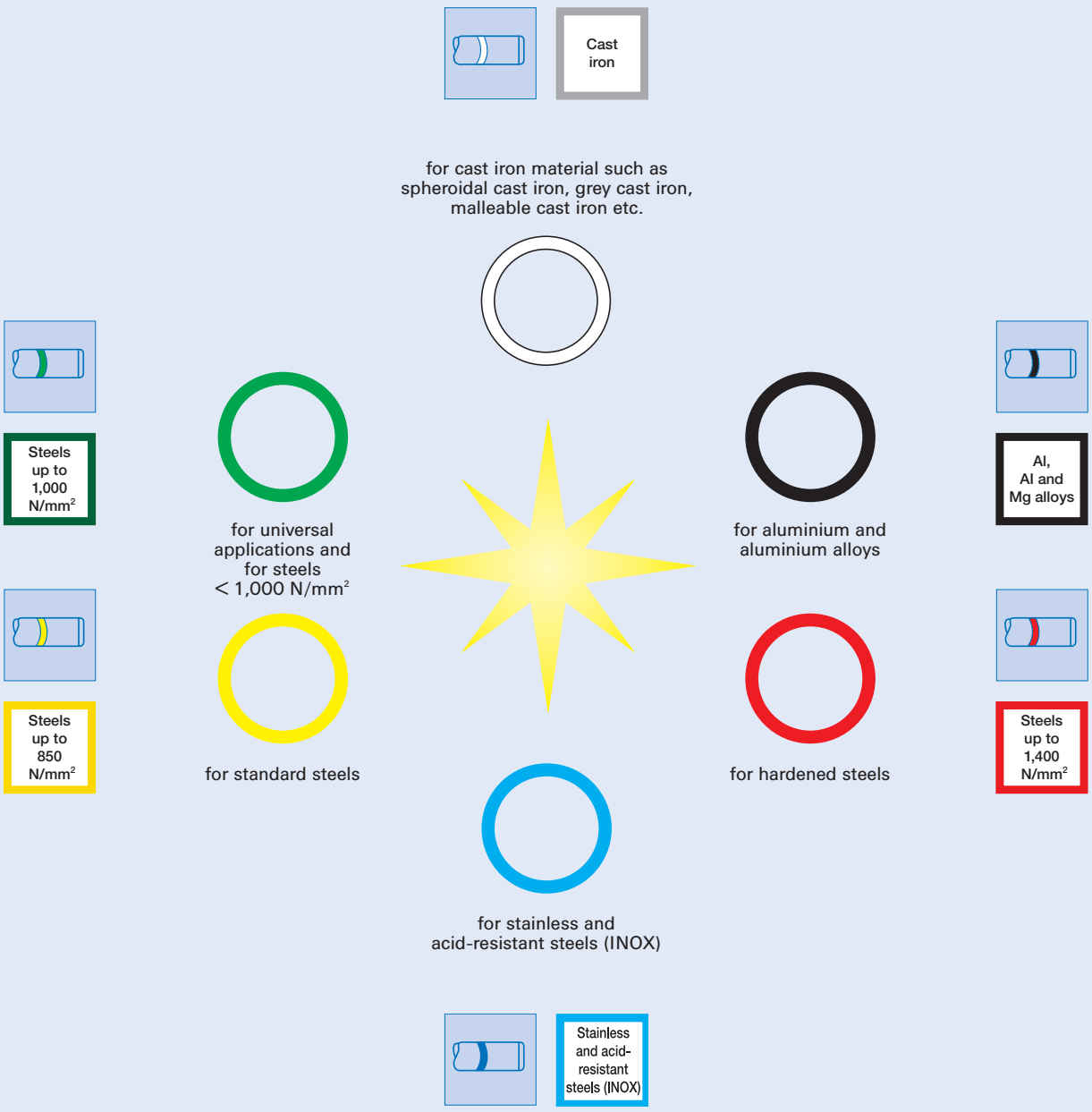
* = HSS

(164)

Tapping Tool Guide

Guide to selecting the most suitable tap for the specific material.

Please note: The colour of the band around the shank indicates the type of material to be machined!



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
	●	◐	○								◐	◐	●

● recommended ◐ suitable ○ partially suitable

Through Hole Spiral Point Machine Taps

Design: 4–5 thread chamfer, form B **with helical lead taper.**
Surface steam tempered against cold shuts.
For ISO standard metric thread DIN 13.

M | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | Type N | 60° | ≤ 3xd

1676 DIN 371 M 1–M 10 with reinforced shank.

1679 DIN 376 M 3–M 30 with tapper shank.

1677 DIN 371 M 2–M 10 with reinforced shank.

1680 DIN 367 M 3–M 30 with tapper shank.

1676 format professional quality



1679 format professional quality



1677 DIN



1680 DIN



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1676	●	○							○		◐		◐
1679	●	○							○		◐		◐
1677	●	○							○		◐		◐
1680	●	○							○		◐		◐

Part No.	Thread	1676	1679	1677	1680	Pitch mm	Total length mm	Shank ∅ mm DIN 371	Shank ∅ mm DIN 376	Shank square mm DIN 371	Shank square mm DIN 376	Tapped hole ∅ mm
0010	M 1	14.86	–	11.28	–	0.25	40	2.5	–	2.1	–	0.75
0012	M 1.2	14.27	–	11.28	–	0.25	40	2.5	–	2.1	–	0.95
0014	M 1.4	11.25	–	10.66	–	0.30	40	2.5	–	2.1	–	1.10
0016	M 1.6	10.03	–	10.35	–	0.35	40	2.5	–	2.1	–	1.25
0018	M 1.8	10.03	–	8.47	–	0.35	40	2.5	–	2.1	–	1.45
0020	M 2	5.66	–	7.22	–	0.40	45	2.8	–	2.1	–	1.60
0025	M 2.5	5.54	–	7.22	–	0.45	50	2.8	–	2.1	–	2.00
0030	M 3	4.13	4.82	5.96	–	0.50	56	3.5	2.2	2.7	1.8	2.50
0040	M 4	4.25	4.82	6.19	–	0.70	63	4.5	2.8	3.4	2.1	3.30
0050	M 5	4.38	5.01	6.42	–	0.80	70	6	3.5	4.9	2.7	4.20
0060	M 6	4.38	5.01	6.42	–	1.00	80	6	4.5	4.9	3.4	5.00
0080	M 8	5.09	6.08	7.37	–	1.25	90	8	6	6.2	4.9	6.80
0100	M 10	6.30	7.40	9.24	–	1.50	100	10	7	8	5.5	8.50
0120	M 12	–	8.61	–	12.54	1.75	110	–	9	–	7	10.20
0140	M 14	–	11.95	–	17.24	2.00	110	–	11	–	9	12.00
0160	M 16	–	12.34	–	18.19	2.00	110	–	12	–	9	14.00
0180	M 18	–	19.33	–	27.89	2.50	125	–	14	–	11	15.50
0200	M 20	–	19.20	–	27.89	2.50	140	–	16	–	12	17.50
0220	M 22	–	25.09	–	36.35	2.50	140	–	18	–	14.5	19.50
0240	M 24	–	25.79	–	37.62	3.00	160	–	18	–	14.5	21.00
0270	M 27	–	32.08	–	46.38	3.00	160	–	20	–	16	24.00
0300	M 30	–	39.97	–	59.23	3.50	180	–	22	–	18	26.50
		(164)	(164)	(165)	(165)							

Through Hole Spiral Point Machine Tap Sets

Design: Supplied in sturdy, high-quality case with automatic upright setting of the drills when opening.

1790 In plastic case.
M 3–M 10 DIN 371 with reinforced shank. M 12 DIN 376 with tapper shank.

1792 In metal case.
M 3–M 10 DIN 371 with reinforced shank. M 12 DIN 376 with tapper shank.

Part No.	Content sizes	1790 Set	1792 Set	Set contents
1000	M 3–M 12	48.49	–	6 taps (part no. 1676) M 3; 4; 5; 6; 8; 10 1 tap (part no. 1679) M 12
1000	M 3–M 12	–	50.13	6 taps (part no. 1677) M 3; 4; 5; 6; 8; 10 1 tap (part no. 1680) M 12
1500	M 3–M 12	64.37	–	6 taps (part no. 1676) M 3; 4; 5; 6; 8; 10 1 tap (part no. 1679) M 12 7 twist drills (part no. 1001), ∅ 2.5; 3.3; 4.2; 6.8; 8.5; 10.2 mm
1500	M 3–M 12	–	67.06	6 taps (part no. 1677) M 3; 4; 5; 6; 8; 10 1 tap (part no. 1680) M 12 7 twist drills (part no. 1002), ∅ 2.5; 3.3; 4.2; 6.8; 8.5; 10.2 mm
		(164)	(165)	



1792 DIN

1790 format professional quality

Blind Hole Spiral Flute Machine Taps

Design: 2–3 thread chamfer, form C.
Surface steam tempered against cold shuts.
For ISO standard metric hole DIN 13.

M | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | Type N | 60° | 40° | ≤3xd

1682 DIN 371 M 2 –M 10 with reinforced shank,
DIN 376 M 12–M 30 with tapper shank.



1682 format professional quality

1681 DIN 371 M 2 –M 10 with reinforced shank,
DIN 376 M 12–M 30 with tapper shank.



1681 GUHRING

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1682	●										○		○
1681	●										○		○

Part No.	Thread	1682	1681	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0020	M 2	5.33	9.08	0.40	45	2.8	2.1	1.60
0025	M 2.5	5.20	8.47	0.45	50	2.8	2.1	2.00
0030	M 3	3.95	7.37	0.50	56	3.5	2.7	2.50
0040	M 4	4.02	7.37	0.70	63	4.5	3.4	3.30
0050	M 5	4.11	7.68	0.80	70	6	4.9	4.20
0060	M 6	4.11	7.68	1.00	80	6	4.9	5.00
0080	M 8	4.91	9.08	1.25	90	8	6.2	6.80
0100	M 10	6.34	10.82	1.50	100	10	8	8.50
0120	M 12	8.37	13.94	1.75	110	9	7	10.20
0140	M 14	11.82	18.79	2.00	110	11	9	12.00
0160	M 16	13.35	19.74	2.00	110	12	9	14.00
0180	M 18	17.34	29.75	2.50	125	14	11	15.50
0200	M 20	18.83	29.75	2.50	140	16	12	17.50
0220	M 22	24.20	42.93	2.50	140	18	14.5	19.50
0240	M 24	23.86	39.18	3.00	160	18	14.5	21.00
0270	M 27	32.14	53.89	3.00	160	20	16	24.00
0300	M 30	39.81	64.55	3.50	180	22	18	26.50
		(164)	(165)					

Blind Hole Spiral Flute Machine Tap Sets

Design: Supplied in sturdy, high-quality case with automatic upright setting of the drills when opening.

1790 In plastic case.
M 3–M 10 DIN 371 with reinforced shank. M 12 DIN 376 with tapper shank.

1792 In metal case.
M 3–M 10 DIN 371 with reinforced shank. M 12 DIN 376 with tapper shank.

Part No.	Content Sizes	1790 Set	1792 Set	Set contents
2000	M 3–M 12	48.49	–	Tap type 1682 M 3–M 10, type 1682 M 12
2500	M 3–M 12	63.02	–	1 x type 1682 DIN 371 M 3–M 10 each, 1 x type 1682 DIN 376 M 12 each, 1x type 1001, DIN 338: ø 2.5 – 3.3 – 4.2 – 5 – 6.8 – 8.5 – 10.2 mm each
2000	M 3–M 12	–	50.13	Tap type 1681 M 3–M 10, type 1681 M 12
2500	M 3–M 12	–	67.06	Tap type 1681 M 3–M 10, type 1681 M 12 Twist drill type 1002, ø 2.5 – 3.3 – 4.2 – 5 – 6.8 – 8.5 – 10.2 mm
		(164)	(165)	



1792 GUHRING

1790 format professional quality

Blind Hole Spiral Point Machine Taps

Design: 4–5 thread chamfer, form B **with helical lead taper.**
Surface steam tempered against cold shuts.

For ISO standard metric thread DIN 13.

DIN 371 M 2 –M 10 with reinforced shank.

DIN 376 M 12–M 24 with tapper shank.

M | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | Type N

ISO DIN 13 | 60° | ≤ 3xd

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1683	●	●							◐		◐		●

Part No.	Thread	1683	Pitch mm	Total length mm	Shank ∅ mm	Shank square mm	Tapped hole ∅ mm
0020	M 2	7.08	0.40	45	2.8	2.1	1.60
0030	M 3	5.82	0.50	56	3.5	2.7	2.50
0040	M 4	6.02	0.70	63	4.5	3.4	3.30
0050	M 5	6.20	0.80	70	6	4.9	4.20
0060	M 6	6.20	1.00	80	6	4.9	5.00
0080	M 8	7.25	1.25	90	8	6.2	6.80
0100	M 10	8.96	1.50	100	10	8	8.50
0120	M 12	12.23	1.75	110	9	7	10.20
0140	M 14	16.91	2.00	110	11	9	12.00
0160	M 16	17.60	2.00	110	12	9	14.00
0180	M 18	27.28	2.50	125	14	11	15.50
0200	M 20	27.28	2.50	140	16	12	17.50
0220	M 22	35.54	2.50	140	18	14.5	19.50
0240	M 24	36.57	3.00	160	18	14.5	21.00
		(164)					

NEW

ProfiGrat Handle and blade

- Precise guiding thanks to optimised centre of gravity
- Convenient guiding of blade due to two-component handle
- Non-corrosive handle from stainless steel with blade locking

Further deburring tools see page 1/76.

EXACT
FRÄZISCHNEIDWERKZEUGE

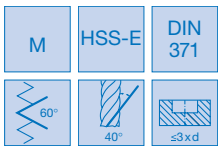


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Blind Hole Spiral Flute Machine Taps

Design: 2–3 thread chamfer, form C.
For ISO standard metric hole DIN 13.
DIN 371 M 2 –M 10 with reinforced shank.
DIN 376 M 12–M 30 with tapper shank.

M | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | Type N



format professional quality

1684 Steam tempered.

1684



1700 TiN coated.

1700 TiN



1685 TiCN coated.

1685 TiCN



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1684	●	●							◐		◐		●
1700	●	●							◐		◐	●	●
1685	●	●							◐		◐	●	●

Part No.	Thread	1684	1700 TiN	1685 TiCN	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0020	M 2	8.80	–	–	0.40	45	2.8	2.1	1.60
0022	M 2.2	9.34	–	–	0.45	45	2.8	2.1	1.75
0023	M 2.3*	9.84	–	–	0.40	45	2.8	2.1	1.90
0025	M 2.5	8.26	–	–	0.45	50	2.8	2.1	2.05
0026	M 2.6*	9.17	–	–	0.45	50	2.8	2.1	2.10
0030	M 3	7.25	6.35	9.67	0.50	56	3.5	2.7	2.50
0035	M 3.5	7.59	–	–	0.60	56	4	3	2.90
0040	M 4	7.25	6.78	9.84	0.70	63	4.5	3.4	3.30
0050	M 5	7.43	6.98	10.00	0.80	70	6	4.9	4.20
0060	M 6	7.43	8.61	10.36	1.00	80	6	4.9	5.00
0080	M 8	8.80	9.44	11.92	1.25	90	8	6.2	6.80
0100	M 10	10.52	11.81	14.51	1.50	100	10	8	8.50
0120	M 12	13.62	18.51	17.96	1.75	110	9	7	10.20
0140	M 14	18.26	–	25.18	2.00	110	11	9	12.00
0160	M 16	19.33	25.45	25.03	2.00	110	12	9	14.00
0180	M 18	28.98	–	–	2.50	125	14	11	15.50
0200	M 20	28.98	37.79	37.95	2.50	140	16	12	17.50
0220	M 22	41.75	–	–	2.50	140	18	14.5	19.50
0240	M 24	38.29	–	–	3.00	160	18	14.5	21.00
0270	M 27	52.42	–	–	3.00	160	20	16	24.00
0300	M 30	63.14	–	–	3.50	180	22	18	26.50
* not included in DIN 13.		(164)	(166)	(166)					

Blind Hole Spiral Flute Machine Tap Sets

format professional quality

Design: Tap set in plastic case, 7-piece.
TiN coated.



Part No.	Content Sizes	1791 TiN Set	Set contents
2000	M 3–M 12	99.69 (166)	tap type 1700, M 3–M 10, type 1700 M 12

Blind Hole Spiral Flute Machine Taps

Design: 4–5 thread chamfer, form B with helical lead taper.

For ISO standard metric thread DIN 13.

DIN 371 M 2 – M 10 with reinforced shank.

DIN 376 M 12 – M 20 with tapper shank.

M | HSS-E | HSS-E PM | DIN 371 | DIN 376 | ISO 2 6H | ISO DIN 13 | Type INOX | 60° | ≤ 3xd

1686 Bright.

1686 format professional quality



1687 Bright.

1687 TiCN



1698 TiN coated.

1698 TiN format professional quality



1694 Powder-metallic high-speed steel.

1694 format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1686									●				
1687									●				
1698									●				
1694									●				

Part No.	Thread	1686	1687	1698 TiN	1694	Pitch mm	Total length mm	Shank ∅ mm	Shank square mm	Tapped hole ∅ mm
0020	M 2	4.05	8.47	–	–	0.40	45	2.8	2.1	1.60
0030	M 3	4.73	6.89	8.26	5.09	0.50	56	3.5	2.7	2.50
0040	M 4	4.86	7.06	9.20	5.27	0.70	63	4.5	3.4	3.30
0050	M 5	4.86	7.06	9.43	5.65	0.80	70	6	4.9	4.20
0060	M 6	4.98	7.22	11.53	5.72	1.00	80	6	4.9	5.00
0080	M 8	5.67	8.29	12.39	6.41	1.25	90	8	6.2	6.80
0100	M 10	6.78	9.87	16.85	7.31	1.50	100	10	8	8.50
0120	M 12	8.61	12.54	18.89	8.18	1.75	110	9	7	10.20
0140	M 14	12.61	18.48	–	–	2.00	110	11	9	12.00
0160	M 16	12.90	18.79	17.83	–	2.00	110	12	9	14.00
0200	M 20	19.47 (164)	28.20 (165)	30.17 (166)	– (164)	2.50	140	16	12	17.50

Blind Hole Spiral Flute Machine Tap Sets

format professional quality

Design: Tap set in plastic case, 7-piece.

1793 Bright.

1791 TiN coated.



1793

1791

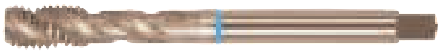
Part No.	Content Sizes	1793 Set	1791 TiN Set	Set contents
1000	M 3–M 12	70.88	–	tap type 1686 M 3–M 10, type 1686 M 12
1000	M 3–M 12	– (164)	99.69 (166)	tap type 1698 M 3–M 10, type 1698 M 12

Blind Hole Spiral Flute Machine Taps

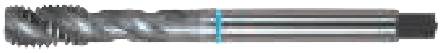
Design: 2–3 thread chamfer, form C.
For ISO standard metric thread DIN 13.
DIN 371 M 3 –M 10 with reinforced shank,
DIN 376 M 12–M 20 with tapper shank.

M | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | ISO 3 6G | ISO DIN 13 | Type INOX | 60° | 40° | ≤3xd

1690 Bright, ISO 2/6H.



1688 Bright, ISO 2/6H.



1691 Steam tempered, ISO 3/6G with oversize.



1692 TiCN coated, ISO 2/6H.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1690									●				
1688									●				
1691									●				
1692									●				

Part No.	Thread	1690	1688	1691	1692	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0030	M 3	4.65	7.22	7.08	12.61	0.50	56	3.5	2.7	2.50
0040	M 4	4.77	7.37	7.25	12.23	0.70	63	4.5	3.4	3.30
0050	M 5	4.97	7.68	7.43	12.61	0.80	70	6	4.9	4.20
0060	M 6	4.97	7.84	7.59	12.61	1.00	80	6	4.9	5.00
0080	M 8	5.27	9.24	8.96	13.97	1.25	90	8	6.2	6.80
0100	M 10	6.69	11.12	10.85	17.60	1.50	100	10	8	8.50
0120	M 12	7.52	14.09	10.69	24.36	1.75	110	9	7	10.20
0140	M 14	10.58	20.06	14.85	–	2.00	110	11	9	12.00
0160	M 16	14.26	20.68	20.01	27.97	2.00	110	12	9	14.00
0200	M 20	21.40 (164)	31.02 (165)	30.37 (164)	41.41 (166)	2.50	140	16	12	17.50

Blind Hole Spiral Flute Machine Taps, Metric Thread, Blue Band

Design: Tap set in plastic case, 7-piece.
Blank.



Part No.	Content Sizes	1793 Set	Set contents
2000	M 3–M 12	76.99 (164)	tap type 1690 M 3–M 10, type 1690 M 12

 All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Through Hole Spiral Point Machine Taps

Design: 4–5 thread chamfer, form B **with helical lead taper.**

For ISO standard metric thread DIN 13.

DIN 371 M 2 –M 10 with reinforced shank.
DIN 376 M 12–M 20 with tapper shank.

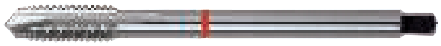
1705 Bright.
1706 Bright.
1710 TiCN coated.

M | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | Type H | 60° | ≤ 3xd

1705 format professional quality



1706



1710 TiCN format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1705		●	◐										
1706		●	◐										
1710		●	●	◐									

Part No.	Thread	1705	1706	1710 TiCN	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0020	M 2	–	–	18.57	0.40	45	2.8	2.1	1.60
0025	M 2.5	–	–	18.41	0.45	50	2.8	2.1	2.05
0026	M 2.6*	–	–	18.41	0.45	50	2.8	2.1	2.10
0030	M 3	4.65	6.73	9.19	0.50	56	3.5	2.7	2.50
0040	M 4	4.65	6.73	8.18	0.70	63	4.5	3.4	3.30
0050	M 5	4.91	7.06	8.39	0.80	70	6	4.9	4.20
0060	M 6	4.91	7.06	9.19	1.00	80	6	4.9	5.00
0080	M 8	5.64	8.13	10.29	1.25	90	8	6.2	6.80
0100	M 10	6.84	9.87	12.49	1.50	100	10	8	8.50
0120	M 12	8.93	13.01	20.97	1.75	110	9	7	10.20
0140	M 14	11.26	16.30	38.61	2.00	110	11	9	12.00
0160	M 16	12.61	18.48	40.67	2.00	110	12	9	14.00
0180	M 18	18.37	26.63	–	2.50	125	14	11	15.50
0200	M 20	18.51	26.96	50.18	2.50	140	16	12	17.50

* not included in DIN 13. (164) (165) (166)

Through Hole Spiral Point Machine Taps

Design: 4–5 thread chamfer, form B **with helical lead taper** and intermittent teeth.

For ISO standard metric thread DIN 13.

DIN 371 M 3 –M 10 with reinforced shank.

DIN 376 M 12–M 20 with tapper shank.

M | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | Type H | 60°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1728		●	○	○							◐		○

Part No.	Thread	1728	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0030	M 3	7.40	0.50	56	3.5	2.7	2.50
0040	M 4	7.40	0.70	63	4.5	3.4	3.30
0050	M 5	6.84	0.80	70	6	4.9	4.20
0060	M 6	6.95	1.00	80	6	4.9	5.00
0080	M 8	7.76	1.25	90	8	6.2	6.80
0100	M 10	9.29	1.50	100	10	8	8.50
0120	M 12	11.55	1.75	110	9	7	10.20
0140	M 14	16.92	2.00	110	11	9	12.00
0160	M 16	16.46	2.00	110	12	9	14.00
0180	M 18	26.07	2.50	125	14	11	15.50
0200	M 20	25.30	2.50	140	16	12	17.50

(164)

Blind Hole Spiral Flute Machine Taps

Design: 2–3 thread chamfer, form C.
For ISO standard metric thread DIN 13.
DIN 371 M 3 –M 10 with reinforced shank.
DIN 376 M 12–M 20 with tapper shank.

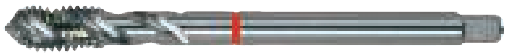
1712 Bright.
1713 Bright.
1718 TiCN coated.

M | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | Type H | 60° | 40° | ≤3xd

1712 format professional quality



1713



1718 format professional quality TiCN



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1712		●											
1713		●											
1718		●	●	◐									

Part No.	Thread	1712	1713	1718 TiCN	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0030	M 3	4.96	7.37	17.47	0.50	56	3.5	2.7	2.50
0040	M 4	5.09	7.68	18.00	0.70	63	4.5	3.4	3.30
0050	M 5	5.30	7.84	18.36	0.80	70	6	4.9	4.20
0060	M 6	5.30	7.99	18.69	1.00	80	6	4.9	5.00
0080	M 8	5.61	9.24	21.71	1.25	90	8	6.2	6.80
0100	M 10	7.11	11.12	26.30	1.50	100	10	8	8.50
0120	M 12	9.88	14.41	32.82	1.75	110	9	7	10.20
0140	M 14	13.84	20.06	–	2.00	110	11	9	12.00
0160	M 16	13.71	19.74	53.96	2.00	110	12	9	14.00
0180	M 18	19.63	32.58	–	2.50	125	14	11	15.50
0200	M 20	20.27 (164)	30.71 (165)	69.16 (166)	2.50	140	16	12	17.50

Through Hole Spiral Point Machine Taps

Design: 4–5 thread chamfer, form B **with helical lead taper.**
For ISO standard metric thread DIN 13.
DIN 371 M 3 –M 10 with reinforced shank.
DIN 376 M 12–M 20 with tapper shank.

1722 Bright.
1723 Bright.

M | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | Type W | 60°

1722 format professional quality



1723



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1722												●	
1723												●	

Part No.	Thread	1722	1723	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0030	M 3	4.73	6.04	0.50	56	3.5	2.7	2.50
0040	M 4	4.73	6.26	0.70	63	4.5	3.4	3.30
0050	M 5	4.86	6.42	0.80	70	6	4.9	4.20
0060	M 6	4.86	6.42	1.00	80	6	4.9	5.00
0080	M 8	5.67	7.37	1.25	90	8	6.2	6.80
0100	M 10	6.78	9.24	1.50	100	10	8	8.50
0120	M 12	9.75	11.76	1.75	110	9	7	10.20
0140	M 14	11.38	16.61	2.00	110	11	9	12.00
0160	M 16	13.46	16.61	2.00	110	12	9	14.00
0180	M 18	18.10	26.32	2.50	125	14	11	15.50
0200	M 20	19.72 (164)	25.69 (165)	2.50	140	16	12	17.50

 All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Blind Hole Spiral Flute Machine Taps

Design: 2–3 thread chamfer, form C.
For ISO standard metric thread DIN 13.
DIN 371 M 1.6 –M 10 with reinforced shank.
DIN 376 M 12 –M 24 with tapper shank.

1725 Bright.
1726 Bright.

M | HSS-E | DIN 371 | DIN 376 | ISO 2 6H | Type W | 60° | 45° | ≤3xd

1725 format professional quality



1726 ALHINOX



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1725												●	
1726												●	

Part No.	Thread	1725	1726	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0016	M 1.6	8.11	9.87	0.35	40	2.5	2.1	1.25
0020	M 2	7.08	8.29	0.40	45	2.8	2.1	1.60
0025	M 2.5	6.69	7.84	0.45	50	2.8	2.1	2.05
0030	M 3	4.34	6.89	0.50	56	3.5	2.7	2.50
0040	M 4	4.37	6.89	0.70	63	4.5	3.4	3.30
0050	M 5	4.44	7.06	0.80	70	6	4.9	4.20
0060	M 6	4.44	7.06	1.00	80	6	4.9	5.00
0080	M 8	4.91	8.29	1.25	90	8	6.2	6.80
0100	M 10	6.30	9.87	1.50	100	10	8	8.50
0120	M 12	9.35	14.09	1.75	110	9	7	10.20
0140	M 14	11.55	16.61	2.00	110	11	9	12.00
0160	M 16	12.90	19.43	2.00	110	12	9	14.00
0180	M 18	18.10	26.32	2.50	125	14	11	15.50
0200	M 20	19.72	28.83	2.50	140	16	12	17.50
0240	M 24	30.71 (164)	34.79 (165)	3.00	160	18	14.5	21.00

Through Hole and Blind Hole Spiral Point Machine Taps

Design: 2–3 thread chamfer, form C.
For ISO standard metric thread DIN 13.
DIN 371 M 3 –M 10 with reinforced shank.
DIN 376 M 12–M 20 with tapper shank.

1731 Steam nitration.
1732 Steam nitration.

M | HSS-E | DIN 371 | DIN 376 | ISO 2 6HX | Type GG | 60° | ≤ 3xd

1731 format professional quality



1732 ALHINOX



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1731											●		
1732											●		

Part No.	Thread	1731	1732	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0030	M 3	4.04	6.26	0.50	56	3.5	2.7	2.50
0040	M 4	4.13	6.42	0.70	63	4.5	3.4	3.30
0050	M 5	4.13	6.58	0.80	70	6	4.9	4.20
0060	M 6	4.13	6.58	1.00	80	6	4.9	5.00
0080	M 8	4.61	7.68	1.25	90	8	6.2	6.80
0100	M 10	5.86	9.40	1.50	100	10	8	8.50
0120	M 12	8.80	11.43	1.75	110	9	7	10.20
0140	M 14	10.63	17.24	2.00	110	11	9	12.00
0160	M 16	11.52	16.61	2.00	110	12	9	14.00
0180	M 18	16.65	26.63	2.50	125	14	11	15.50
0200	M 20	18.10 (164)	26.32 (165)	2.50	140	16	12	17.50

Through and Blind Hole Spiral Point Machine Taps

Design: 2–3 thread chamfer, form C.
For ISO standard metric thread DIN 13.
DIN 371 M 3–M 10 with reinforced shank.

M | HSS-E | DIN 371 | ISO 2 6H | Type MS | 60° | ≤ 3xd

1734 Bright.
1735 Bright.

1734 format professional quality



1735



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1734												○	●
1735												○	●

Part No.	Thread	1734 mm	1735 mm	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0030	M 3	3.77	5.46	0.50	56	3.5	2.7	2.50
0040	M 4	3.91	5.67	0.70	63	4.5	3.4	3.30
0050	M 5	3.91	5.67	0.80	70	6	4.9	4.20
0060	M 6	4.17	6.04	1.00	80	6	4.9	5.00
0080	M 8	4.45	6.42	1.25	90	8	6.2	6.80
0100	M 10	5.41 (164)	7.84 (165)	1.50	100	10	8	8.50

Through Hole Spiral Point Machine Taps, Left-hand Thread, Yellow Band

Design: 4–5 thread chamfer, form B **with helical lead taper.**
For ISO standard metric thread DIN 13.
DIN 371 M 3–M 10 with reinforced shank.

M-LH | HSS-E | DIN 371 | ISO 2 6H | Type N | 60° | ≤ 3xd

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1737	●	○										◐	

Part No.	Thread	1737 mm	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0030	M 3	5.99	0.50	56	3.5	2.7	2.50
0040	M 4	5.99	0.70	63	4.5	3.4	3.30
0050	M 5	6.35 (164)	0.80	70	6	4.9	4.20

Part No.	Thread	1737 mm	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0060	M 6	6.35	1.00	80	6	4.9	5.00
0080	M 8	7.26	1.25	90	8	6.2	6.80
0100	M 10	9.06 (164)	1.50	100	10	8	8.50

Through Hole Spiral Point Machine Taps (nut tap), Metric Thread

Design: Extra long. Chamfer approx. 2/3 of thread length.
For ISO standard metric thread DIN 13.
DIN 357 M 3–M 16.

M | HSS-E | DIN 357 | ISO 2 6H | Type N | 60°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1750	●	◐										◐	◐

Part No.	Thread	1750 mm	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0030	M 3	6.71	0.50	70	2.2	–	2.50
0035	M 3.5	7.79	0.60	80	2.5	2.1	2.90
0040	M 4	6.71	0.70	90	2.8	2.1	3.30
0050	M 5	7.26	0.80	100	3.5	2.7	4.20
0060	M 6	7.52 (164)	1.00	110	4.5	3.4	5.00

Part No.	Thread	1750 mm	Pitch mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0080	M 8	9.75	1.25	125	6	4.9	6.80
0100	M 10	10.94	1.50	140	7	5.5	8.50
0120	M 12	14.53	1.75	180	9	7	10.20
0140	M 14	18.64	2.00	200	11	9	12.00
0160	M 16	21.13 (164)	2.00	200	12	9	14.00

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Through Hole Spiral Point Machine Taps

Design: 4–5 thread chamfer, form B **with helical lead taper.**
For ISO standard metric fine thread DIN 13.

MF | HSS-E | DIN 374 | ISO 2 6H | Type N | 60° | ≤ 3xd

1753 Steam-tempered.

1753 format professional quality



1754 Steam-tempered.

1754



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1753	●	○							○		◐		◐
1754	●	○							○		◐		◐

Part No.	Thread x Pitch mm	1753	1754	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	M 3 x 0.35	7.67	11.12	56	2.2	–	2.65
0003	M 4 x 0.50	7.52	10.96	63	2.8	2.1	3.50
0005	M 5 x 0.50	7.40	10.82	70	3.5	2.7	4.50
0007	M 6 x 0.50	6.34	10.96	80	4.5	3.4	5.50
0009	M 6 x 0.75	6.29	10.82	80	4.5	3.4	5.20
0011	M 8 x 0.50	8.42	15.20	80	6	4.9	7.50
0013	M 8 x 0.75	7.31	11.91	80	6	4.9	7.20
0015	M 8 x 1.00	6.84	10.82	90	6	4.9	7.00
0017	M 10 x 0.75	10.08	15.20	90	7	5.5	9.20
0019	M 10 x 1.00	7.67	11.12	90	7	5.5	9.00
0021	M 10 x 1.25	8.28	14.41	100	7	5.5	8.80
0023	M 12 x 1.00	9.06	13.17	100	9	7	11.00
0025	M 12 x 1.25	9.63	14.73	100	9	7	10.80
0027	M 12 x 1.50	8.61	12.54	100	9	7	10.50
0029	M 14 x 1.00	11.95	17.24	100	11	9	13.00
0031	M 14 x 1.25	11.38	16.61	100	11	9	12.80
0033	M 14 x 1.50	11.26	16.30	100	11	9	12.50
0035	M 16 x 1.00	13.57	19.74	100	12	9	15.00
0037	M 16 x 1.50	12.90	18.79	100	12	9	14.50
0039	M 18 x 1.50	15.48	22.26	110	14	11	16.50
0041	M 20 x 1.00	19.72	28.83	125	16	12	19.00
0043	M 20 x 1.50	18.10	26.32	125	16	12	18.50
0045	M 22 x 1.50	19.04	36.67	125	18	14.5	20.50
0047	M 24 x 1.50	20.70	35.09	140	18	14.5	22.50
0049	M 27 x 1.50	32.62	63.30	140	20	16	25.50
0051	M 30 x 1.50	32.88	59.23	150	22	18	28.50
		(164)	(165)				

Blind Hole Machine Taps

Design: Taper lead form C (2–3 thread).
For ISO standard metric fine thread DIN 13.

MF | HSS-E | DIN 374 | ISO 2 6H | Type N | 60° | 40° | ≤3xd

1755 Steam-tempered.

1755 format professional quality



1751 Steam-tempered.

1751



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1755	●	○							○		◐		◐
1751	●	○							○		◐		◐

Part No.	Thread x Pitch mm	1755	1751	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	M 4 x 0.50	7.92	10.96	63	2.8	2.1	3.50
0003	M 5 x 0.50	7.79	11.28	70	3.5	2.7	4.50
0005	M 6 x 0.50	6.34	11.43	80	4.5	3.4	5.50
0007	M 6 x 0.75	6.29	11.12	80	4.5	3.4	5.20
0009	M 8 x 0.50	8.42	15.97	80	6	4.9	7.50
0011	M 8 x 0.75	7.31	12.38	80	6	4.9	7.20
0013	M 8 x 1.00	6.84	11.12	90	6	4.9	7.00
0015	M 10 x 0.75	10.08	15.50	90	7	5.5	9.20
0017	M 10 x 1.00	7.67	12.23	90	7	5.5	9.00
0019	M 10 x 1.25	8.28	14.89	100	7	5.5	8.80
0021	M 12 x 1.00	9.63	14.58	100	9	7	11.00
0023	M 12 x 1.25	9.63	18.79	100	9	7	10.80
0025	M 12 x 1.50	8.96	13.47	100	9	7	10.50
0027	M 14 x 1.00	11.55	18.79	100	11	9	13.00
0029	M 14 x 1.25	11.79	19.43	100	11	9	12.80
0031	M 14 x 1.50	11.01	17.55	100	11	9	12.50
0033	M 16 x 1.00	13.78	21.94	100	12	9	15.00
0035	M 16 x 1.50	13.65	21.62	100	12	9	14.50
0037	M 18 x 1.50	17.68	23.81	110	14	11	16.50
0039	M 20 x 1.00	20.14	30.39	125	16	12	19.00
0041	M 20 x 1.50	18.64	27.89	125	16	12	18.50
0043	M 22 x 1.50	21.95	36.04	125	18	14.5	20.50
0045	M 24 x 1.50	26.57	46.68	140	18	14.5	22.50
0047	M 27 x 1.50	43.08	56.40	140	20	16	25.50
0049	M 30 x 1.50	44.35	63.30	150	22	18	28.50
		(164)	(165)				

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Through Hole Machine Taps

Design: 4–5 thread taper lead, form B with **helical lead taper.**
For metric ISO fine thread DIN 13.

MF | HSS-E | DIN 374 | ISO 2 6H | Type INOX | 60° | ≤ 3xd

1757 Steam-tempered.



1757 format professional quality

1758 Steam-tempered.



1758 DIN 374 HH INOX

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1757									●	○			
1758									●	○			

Part No.	Thread x Pitch mm	1757	1758	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	M 4 x 0.50	7.79	9.87	63	2.8	2.1	3.50
0003	M 5 x 0.50	7.91	10.35	70	3.5	2.7	4.50
0005	M 6 x 0.75	8.85	11.43	80	4.5	3.4	5.20
0007	M 8 x 0.75	9.62	12.54	80	6	4.9	7.20
0009	M 8 x 1.00	9.29	12.23	90	6	4.9	7.00
0011	M 10 x 1.00	9.43	12.38	90	7	5.5	9.00
0013	M 12 x 1.00	10.94 (164)	14.41 (165)	100	9	7	11.00

Part No.	Thread x Pitch mm	1757	1758	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0015	M 12 x 1.50	12.91	13.47	100	9	7	10.50
0017	M 14 x 1.50	13.57	17.87	100	11	9	12.50
0019	M 16 x 1.50	16.46	21.62	100	12	9	14.50
0021	M 18 x 1.50	18.90	24.74	110	14	11	16.50
0023	M 20 x 1.50	23.12	28.83	125	16	12	18.50
0025	M 22 x 1.50	25.06	33.54	125	18	14.5	20.50
0027	M 24 x 1.50	27.00 (164)	43.24 (165)	140	18	14.5	22.50

Blind Hole Machine Taps

Design: Taper lead form C (2–3 thread).
For metric ISO fine thread DN 13.

MF | HSS-E | DIN 374 | ISO 2 6H | Type INOX | 60° | 40° | ≤3xd

1759 Steam-tempered.



1759 format professional quality

1752 Steam-tempered.



1752 DIN 374 HH INOX

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1759									●	○			
1752									●	○			

Part No.	Thread x Pitch mm	1759	1752	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	M 3 x 0.35	14.48	12.23	56	2.2	–	2.65
0003	M 4 x 0.50	10.00	10.96	63	2.8	2.1	3.50
0005	M 5 x 0.50	9.87	11.28	70	3.5	2.7	4.50
0007	M 6 x 0.50	8.00	11.76	80	4.5	3.4	5.50
0009	M 6 x 0.75	7.92	11.91	80	4.5	3.4	5.20
0011	M 8 x 0.50	10.63	12.23	80	6	4.9	7.50
0013	M 8 x 0.75	9.50	12.23	80	6	4.9	7.20
0015	M 8 x 1.00	9.29	12.23	90	6	4.9	7.00
0017	M 10 x 1.00	9.91 (164)	13.01 (165)	90	7	5.5	9.00

Part No.	Thread x Pitch mm	1759	1752	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0019	M 12 x 1.00	12.78	16.61	100	9	7	11.00
0021	M 12 x 1.50	12.03	15.66	100	9	7	10.50
0023	M 14 x 1.50	15.52	20.06	100	11	9	12.50
0025	M 16 x 1.50	18.24	23.81	100	12	9	14.50
0027	M 18 x 1.50	22.73	29.75	110	14	11	16.50
0029	M 20 x 1.50	24.71	32.28	125	16	12	18.50
0031	M 22 x 1.50	28.18	40.10	125	18	14.5	20.50
0033	M 24 x 1.50	31.55 (164)	47.63 (165)	140	18	14.5	22.50

Through Hole Spiral Point Machine Taps

Design: 4–5 thread chamfer, form B **with helical lead taper.**
Surface steam tempered against cold shuts.

For ISO standard metric thread DIN 13.

TiN coated.

MF | HSS-E | DIN 374 | ISO 2 6H | Type N

60° | ≤ 3xd

format professional quality

TiN



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1760	●	●							◐		◐		●

Part No.	Thread x Pitch mm	1760 TiN	Total length mm	Shank Ø mm	Shank square mm	Tapped hole Ø mm
0001	M 3 x 0.35	12.76	56	2.2	–	2.65
0003	M 4 x 0.50	12.61	63	2.8	2.1	3.50
0005	M 5 x 0.50	12.43	70	3.5	2.7	4.50
0007	M 6 x 0.50	15.50	80	4.5	3.4	5.50
0009	M 6 x 0.75	15.34	80	4.5	3.4	5.20
0013	M 8 x 0.75	16.39	80	6	4.9	7.20
0015	M 8 x 1.00	15.34	90	6	4.9	7.00
0017	M 10 x 1.00	18.63	90	7	5.5	9.00
0019	M 12 x 1.00	20.70	100	9	7	11.00
0021	M 12 x 1.50	20.01	100	9	7	10.50
0023	M 14 x 1.50	25.52	100	11	9	12.50
0025	M 16 x 1.50	27.97	100	12	9	14.50
0027	M 18 x 1.50	37.27	110	14	11	16.50
0029	M 20 x 1.50	44.88	125	16	12	18.50
0031	M 22 x 1.50	46.59	125	18	14.5	20.50
0033	M 24 x 1.50	48.63	140	18	14.5	22.50
0035	M 26 x 1.50	57.64	140	18	14.5	24.50
0037	M 28 x 1.50	65.23	140	20	16	26.50
0039	M 30 x 1.50	65.90	150	22	18	28.50

(166)

Blind Hole Spiral Point Machine Taps

Design: 2–3 thread chamfer, form C.

For ISO standard metric fine thread DIN 13.

TiN coated.

MF | HSS-E | DIN 374 | ISO 2 6H | Type N

60° | 40° | ≤3xd

format professional quality

TiN



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1761	●	●							◐		◐	●	●

Part No.	Thread x Pitch mm	1761 TiN	Total length mm	Shank Ø mm	Shank square mm	Tapped hole Ø mm
0001	M 3 x 0.35	13.79	56	2.2	–	2.65
0003	M 4 x 0.50	8.82	63	2.8	2.1	3.50
0005	M 5 x 0.50	9.29	70	3.5	2.7	4.50
0007	M 6 x 0.50	9.29	80	4.5	3.4	5.50
0009	M 6 x 0.75	9.49	80	4.5	3.4	5.20
0013	M 8 x 0.75	16.91	80	6	4.9	7.20
0015	M 8 x 1.00	15.70	90	6	4.9	7.00
0017	M 10 x 1.00	19.68	90	7	5.5	9.00
0019	M 12 x 1.00	21.75	100	9	7	11.00
0021	M 12 x 1.50	21.04	100	9	7	10.50
0023	M 14 x 1.50	26.57	100	11	9	12.50
0025	M 16 x 1.50	30.71	100	12	9	14.50
0027	M 18 x 1.50	36.93	110	14	11	16.50
0029	M 20 x 1.50	46.93	125	16	12	18.50
0031	M 22 x 1.50	51.06	125	18	14.5	20.50
0033	M 24 x 1.50	53.80	140	18	14.5	22.50

(166)

 All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Through and Blind Hole Spiral Point Machine Taps

Design: 2–3 thread chamfer, form C.
For ISO standard metric fine thread DIN 13.
Steam nitration.

MF | HSS-E | DIN 374 | ISO 2 6HX | Type GG

60° | ≤ 3xd

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1756											●		

Part No.	Thread x Pitch mm	1756	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0003	M 4 x 0.50	10.69	63	2.8	2.1	3.50
0005	M 5 x 0.50	10.52	70	3.5	2.7	4.50
0009	M 6 x 0.75	10.52	80	4.5	3.4	5.20
0013	M 8 x 0.75	11.55	80	6	4.9	7.20
0015	M 8 x 1.00	10.69	90	6	4.9	7.00
0017	M 10 x 1.00	10.85	90	7	5.5	9.00
0019	M 12 x 1.00	12.76	100	9	7	11.00
0021	M 12 x 1.50	12.43	100	9	7	10.50
0023	M 14 x 1.50	15.89	100	11	9	12.50
0025	M 16 x 1.50	18.26	100	12	9	14.50
0027	M 18 x 1.50	21.75	110	14	11	16.50
0029	M 20 x 1.50	25.86	125	16	12	18.50
0031	M 22 x 1.50	26.57	125	18	14.5	20.50
0033	M 24 x 1.50	29.33	140	18	14.5	22.50

(164)

Blind Hole Spiral Flute Machine Taps

Design: 2–3 thread chamfer, form C.
For ISO standard metric fine thread DIN 13.
TiCN coated.

MF | HSS-E | DIN 374 | ISO 2 6H | Type H

60° | 40° | ISO DIN 13 | ≤3xd

format professional quality

TiCN



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1762		●	●	◐									

Part No.	Thread x Pitch mm	1762 TiCN	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	M 3 x 0.35	13.83	56	2.2	–	2.65
0003	M 4 x 0.50	13.83	63	2.8	2.1	3.50
0005	M 5 x 0.50	14.14	70	3.5	2.7	4.50
0007	M 6 x 0.50	14.41	80	4.5	3.4	5.50
0009	M 6 x 0.75	14.68	80	4.5	3.4	5.20
0013	M 8 x 0.75	15.26	80	6	4.9	7.20
0015	M 8 x 1.00	15.26	90	6	4.9	7.00
0017	M 10 x 1.00	15.82	90	7	5.5	9.00
0019	M 12 x 1.00	19.20	100	9	7	11.00
0021	M 12 x 1.50	19.20	100	9	7	10.50
0023	M 14 x 1.50	23.72	100	11	9	12.50
0025	M 16 x 1.50	29.05	100	12	9	14.50
0027	M 18 x 1.50	32.74	110	14	11	16.50
0029	M 20 x 1.50	43.19	125	16	12	18.50
0031	M 22 x 1.50	44.04	125	18	14.5	20.50
0033	M 24 x 1.50	49.12	140	18	14.5	22.50

(166)

Through Hole Spiral Point Machine Taps

Design: 4–5 thread chamfer, form B **with helical lead taper.**
For pipe thread DIN ISO 228 (DIN 259).

G | HSS-E | DIN 5156 | Type N | 55° | ≤ 3xd

1763 Bright.

1763 format professional quality



1764 Bright.

1764 DIHMA



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1763	●	○										◐	
1764	●	○										◐	

Part No.	Thread inches	1763 mm	1764 inches	Thread per inch	Thread ø mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	G 1/8	8.10	11.76	28	9.728	90	7	5.5	8.80
0003	G 1/4	10.69	15.97	19	13.157	100	11	9	11.80
0005	G 3/8	13.57	20.68	19	16.662	100	12	9	15.25
0007	G 1/2	18.10	27.57	14	20.955	125	16	12	19.00
0009	G 3/4	28.79	42.93	14	26.441	140	20	16	24.50
0011	G 1*	40.32	60.16	11	33.249	160	25	20	30.75
0015	G 1 1/4*	66.67	96.52	11	41.910	170	32	24	39.50
0017	G 1 1/2*	91.87	132.88	11	47.803	190	36	29	45.25
* = HSS		(164)	(165)						

Blind Hole Spiral Point Machine Taps

Design: 2–3 thread chamfer, form C.
For pipe thread DIN-ISO 228 (DIN 259).

G | HSS-E | DIN 5156 | Type N | 55° | 40° | ≤3 x d

1765 Bright.

1765 format professional quality



1767 Bright.

1767 DIHMA



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1765	●	○										◐	
1767	●	○										◐	

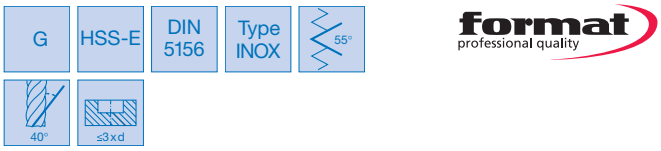
Part No.	Thread inches	1765 mm	1767 inches	Thread per inch	Thread ø mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	G 1/8	8.93	13.01	28	9.728	90	7	5.5	8.80
0003	G 1/4	11.81	17.24	19	13.157	100	11	9	11.80
0005	G 3/8	13.01	21.62	19	16.662	100	12	9	15.25
0007	G 1/2	19.20	29.45	14	20.955	125	16	12	19.00
0009	G 3/4	31.00	45.11	14	26.441	140	20	16	24.50
0011	G 1*	46.88	67.68	11	33.249	160	25	20	30.75
0015	G 1 1/4*	107.54	109.04	11	41.910	170	32	24	39.50
0017	G 1 1/2*	148.15	152.92	11	47.803	190	36	29	45.25
* = HSS		(164)	(165)						

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Tapping Jigs

Blind Hole Spiral Flute Machine Taps

Design: 2–3 thread chamfer, form C.
For pipe thread DIN ISO 228 (DIN 259).
TiCN coated.



format professional quality

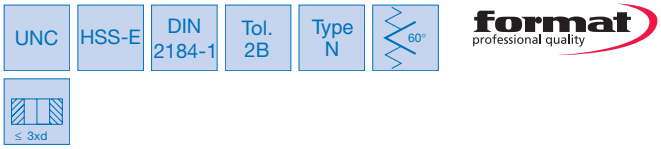


Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1766									●				

Part No.	Threads inches	1766 TiCN	Thread per inch	Thread ø mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	G 1/8	13.62	28	9.728	90	7	5.5	8.80
0003	G 1/4	19.32	19	13.157	100	11	9	11.80
0005	G 3/8	23.80	19	16.662	100	12	9	15.25
0007	G 1/2	31.06	14	20.955	125	16	12	19.00
0009	G 3/4	48.30	14	26.441	140	20	16	24.50
0011	G 1	73.83	11	33.249	160	25	20	30.75
		(166)						

Through Hole Spiral Point Machine Taps

Design: 4–5 thread chamfer, form B **with helical lead taper.**
For UNC threads, Unified National Coarse Threads, ANSI B1.1.
UNC no. 2–56 to 3/8"–16 with reinforced shank.
UNC 7/16"–14 to 1"–8 with tapper shank.



format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1768	●	○										◐	

Part No.	Thread	Threads per inch	1768	Thread ø mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	UNC No.	2 – 56	7.52	2.184	45	2.8	2.1	1.80
0003	UNC No.	3 – 48	6.32	2.515	50	2.8	2.1	2.10
0005	UNC No.	4 – 40	5.55	2.845	56	3.5	2.7	2.30
0007	UNC No.	5 – 40	5.28	3.175	56	3.5	2.7	2.60
0009	UNC No.	6 – 32	5.12	3.505	56	4	3	2.85
0011	UNC No.	8 – 32	4.98	4.166	63	4.5	3.4	3.50
0013	UNC No.	10 – 24	5.55	4.826	70	6	4.9	3.90
0015	UNC No.	12 – 24	6.35	5.486	80	6	4.9	4.50
0017	UNC	1/4 – 20	5.67	6.350	80	7	5.5	5.20
0019	UNC	5/16 – 18	6.53	7.938	90	8	6.2	6.60
0021	UNC	3/8 – 16	7.40	9.525	100	9	8	8.00
0023	UNC	7/16 – 14	9.19	11.113	100	8	6.2	9.40
0025	UNC	1/2 – 13	10.00	12.700	110	9	7	10.70
0027	UNC	5/8 – 11	13.01	15.875	110	12	9	13.50
0029	UNC	3/4 – 10	16.85	19.050	125	14	11	16.50
0031	UNC	7/8 – 9	20.97	22.225	140	18	14.5	19.50
0033	UNC	1 – 8	27.43	25.400	160	18	14.5	22.20
			(164)					

Blind Hole Spiral Flute Machine Taps

Design: 2–3 thread chamfer, form C.
For UNC threads, Unified National Coarse Threads, ANSI B1.1.
UNC no. 4–40 to 3/8"–16 with reinforced shank.
UNC 7/16"–14 to 1"– 8 with tapper shank.

UNC | HSS-E | DIN 2184-1 | Tol. 2B | Type N | 60° | 40° | ≤3xd

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1770	●	○										◐	

Part No.	Thread	Threads per inch	1770 mm	Thread ø mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	UNC No.	4 – 40	6.32	2.845	56	3.5	2.7	2.30
0003	UNC No.	5 – 40	6.20	3.175	56	3.5	2.7	2.60
0005	UNC No.	6 – 32	5.88	3.505	56	4	3	2.85
0007	UNC No.	8 – 32	6.20	4.166	63	4.5	3.4	3.50
0009	UNC No.	10 – 24	6.32	4.826	70	6	4.9	3.90
0011	UNC No.	12 – 24	7.52	5.486	80	6	4.9	4.50
0013	UNC	1/4 – 20	7.09	6.350	80	7	5.5	5.20
0015	UNC	5/16 – 18	7.52	7.938	90	8	6.2	6.60
0017	UNC	3/8 – 16	8.55	9.525	100	9	7	8.00
0019	UNC	7/16 – 14	11.74	11.113	100	8	6.2	9.40
0021	UNC	1/2 – 13	11.55	12.700	110	9	7	10.70
0023	UNC	9/16 – 12	16.46	14.288	110	11	9	12.20
0025	UNC	5/8 – 11	16.32	15.875	110	12	9	13.50
0027	UNC	3/4 – 10	20.12	19.050	125	14	11	16.50
0029	UNC	7/8 – 9	24.52	22.225	140	18	14.5	19.50
0031	UNC 1	– 8	32.88	25.400	160	18	14.5	22.20

(164)

Through Hole Spiral Point Machine Taps

Design: 4–5 thread chamfer, form B **with helical lead taper.**
For UNF threads, Unified National Fine Threads, ANSI B1.1.
Bright.

UNF | HSS-E | DIN 2184-1 | Tol. 2B | Type N | 60° | ≤ 3xd

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1772	●	○										◐	

Part No.	Thread	Threads per inch	1772 mm	Thread ø mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	UNF No.	10 – 32	6.25	4.826	70	3.5	2.7	4.10
0003	UNF No.	12 – 28	7.52	5.486	80	4	3	4.70
0005	UNF	1/4 – 28	7.79	6.350	80	4.5	3.4	5.50
0007	UNF	5/16 – 24	7.67	7.938	90	6	4.9	6.90
0009	UNF	3/8 – 24	7.96	9.525	90	7	5.5	8.50
0011	UNF	7/16 – 20	10.14	11.113	100	8	6.2	9.90
0013	UNF	1/2 – 20	10.14	12.700	100	9	7	11.50
0015	UNF	5/8 – 18	13.71	15.875	100	12	9	14.50
0017	UNF	3/4 – 16	17.83	19.050	110	14	11	17.50
0019	UNF	7/8 – 14	22.32	22.225	125	18	14.5	20.40
0021	UNF 1	– 12	29.63	25.400	140	18	14.5	23.25

(164)

 All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Blind Hole Spiral Point Machine Taps

Design: 2-3 thread chamfer, form C.
For UNF threads, Unified National Fine Threads, ANSI B1.1.
Bright.

UNF | HSS-E | DIN 2184-1 | Tol. 2B | Type N | 60° | 40° | ≤3xd

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1774	●	○										◐	

Part No.	Thread	Threads per inch	1774 mm	Thread ø mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	UNF	No. 10 – 32	7.52	4.826	70	3.5	2.7	4.10
0003	UNF	No. 12 – 28	8.55	5.486	80	4	3	4.70
0005	UNF	1/4 – 28	9.17	6.350	80	4.5	3.4	5.50
0007	UNF	5/16 – 24	9.62	7.938	90	6	4.9	6.90
0009	UNF	3/8 – 24	9.91	9.525	90	7	5.5	8.50
0011	UNF	7/16 – 20	11.74	11.113	100	8	6.2	9.90
0013	UNF	1/2 – 20	11.90	12.700	100	9	7	11.50
0015	UNF	9/16 – 18	17.68	14.288	100	11	9	12.90
0017	UNF	5/8 – 18	16.32	15.875	100	12	9	14.50
0019	UNF	3/4 – 16	20.72	19.050	110	14	11	17.50
0021	UNF	7/8 – 14	25.73	22.225	125	18	14.5	20.40
0023	UNF	1 – 12	36.25	25.400	140	18	14.5	23.25

(164)

Machine Taps, Short

Design: 2–3 thread chamfer, form C.
For steel conduit thread DIN 40430.
Bright.

PG | HSS-E | DIN 40432 | Type N | 80° | ≤ 1,5xd

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1777	●	●										◐	◐

Part No.	Thread	1777 inch	Thread per mm	Thread ø mm	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø
0001	PG 7	13.71	20	12.5	70	9	7	11.50
0003	PG 9	17.41	18	15.2	70	12	9	14.00
0005	PG 11	14.62	18	18.6	80	14	11	17.25
0007	PG 13.5	14.53	18	20.4	80	16	12	19.00
0009	PG 16	26.46	18	22.5	80	18	14.5	21.25
0011	PG 21	38.40	16	28.3	90	22	18	27.00
0013	PG 29	51.84	16	37	100	28	22	35.50
0015	PG 36	93.22	16	47	140	36	29	45.50

(164)

Fluteless Taps (with lubrication flutes)

Design: Fluteless taps with lubrication flutes. Pitch length 2–3 thread. Form C.

Suitable for all formable materials.

For ISO standard metric thread DIN 13.

DIN 371 M 3–M 10 with reinforced shank.

DIN 376 M 12–M 16 with tapper shank.

M | HSS-E | DIN 371 | DIN 376 | ISO 2 6HX | ISO 3 6GX | Type N | 60° | ≥1,0xd

1780 TiN — TiN coated, ISO 6HX.

1780 TiN



1783 TiN — TiN coated, ISO 3/6GX, with oversize.

1783 TiN



1784 TiCN — TiN coated, ISO 2/6HX.

1784 TiCN



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1780	●	●							●			●	◐
1783	●	●							●			●	◐
1784	●	●							●			●	◐

Part No.	Thread	1780 TiN	1783 TiN	1784 TiCN	Pitch mm	Total length mm	Shank ∅ mm	Shank square mm	Tapped hole ∅ mm
0001	M 3	7.67	12.30	13.94	0.50	56	3.5	2.7	2.80
0003	M 4	7.67	12.30	12.23	0.70	63	4.5	3.4	3.70
0005	M 5	8.10	12.82	12.70	0.80	70	6	4.9	4.65
0007	M 6	8.10	12.78	16.30	1.00	80	6	4.9	5.55
0009	M 8	9.46	15.52	18.19	1.25	90	8	6.2	7.40
0011	M 10	12.21	19.81	22.57	1.50	100	10	8	9.25
0013	M 12	14.69	23.59	26.32	1.75	110	9	7	11.20
0015	M 16	24.14 (170)	– (170)	39.79 (165)	2.00	110	12	9	15.00

Fluteless Taps

Design: With lubrication flutes. Pitch length 2–3, form C.

Suitable for all formable materials.

DIN 371 M 3–M 10 with reinforced shank.

DIN 376 M 12–M 16 with tapper shank.

PM = Powder-metallurgical high speed steel.

M | HSS-E PM | DIN 371 | DIN 376 | ISO 2 6HX | Type INOX | 60° | ≥1,0xd

TiN



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1787	●	●							●			●	◐

Part No.	Thread	1787 TiN	Lead mm	Total length mm	Shank ∅ mm	Shank square mm	Tapped hole ∅ mm
0001	M 3	18.48	0.5	56	3.5	2.7	2.80
0003	M 4	19.12	0.7	63	4.5	3.4	3.70
0005	M 5	20.68	0.8	70	6	4.9	4.65
0007	M 6	24.74	1	80	6	4.9	5.55
0009	M 8	27.57	1.25	90	8	6.2	7.40
0011	M 10	35.72	1.5	100	10	8	9.25
0013	M 12	41.98	1.75	110	9	7	11.20
0015	M 16	68.94 (165)	2	110	12	9	15.10

 All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Tapping Jigs

Machine Taps

Design: With oil grooves. Feed length 2–3 action, form C.
Suitable for all formable materials.
For metric and ISO thread DIN 13.

MF | HSS-E | DIN 374 | ISO 2 6HX | Type N | 60° | ≥1,0xd

1785 TiN coated.

1785 TiN



1788 TiCN coated.

1788 TiCN



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1785	●	●							●			●	◐
1788	●	●							●			●	◐

Part No.	Thread x Pitch mm	1785 TiN	1788 TiCN	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	M 6 x 0.75	22.06	24.13	80	4.5	3.4	5.65
0003	M 8 x 0.75	22.06	24.44	80	6	4.9	7.65
0005	M 8 x 1.00	23.12	22.57	90	6	4.9	7.55
0007	M 10 x 1.00	23.80	24.44	90	7	5.5	9.55
0009	M 10 x 1.25	28.02	32.28	100	7	5.5	9.40
0011	M 12 x 1.00	29.13	29.45	100	9	7	11.55
0013	M 12 x 1.25	29.73	–	100	9	7	11.40
0015	M 12 x 1.50	29.83	30.08	100	9	7	11.30
0017	M 16 x 1.50	38.10	43.24	100	12	9	15.30
0019	M 18 x 1.50	45.26	48.26	110	14	11	17.30
0021	M 20 x 1.50	51.51 (170)	59.54 (165)	125	16	12	19.30

Fluteless Taps

Design: With oil grooves. Feed length 2–3 action, form C.
Suitable for all formable materials.
For metric and ISO thread DIN 13.
PM = Powder-metallurgical high speed steel.

MF | HSS-E PM | DIN 374 | ISO 2 6HX | Type INOX | 60° | ≥1,0xd

TiN



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1789	●	●							●			●	◐

Part No.	Thread x Pitch mm	1789 TiN	Total length mm	Shank ø mm	Shank square mm	Tapped hole ø mm
0001	M 6 x 0.75	32.90	80	4.5	3.4	5.65
0003	M 8 x 0.75	36.35	80	6	4.9	7.65
0005	M 8 x 1.00	33.22	90	6	4.9	7.55
0007	M 10 x 1.00	37.28	90	7	5.5	9.55
0009	M 10 x 1.25	37.62	100	7	5.5	9.40
0011	M 12 x 1.00	45.75	100	9	7	11.55
0015	M 12 x 1.50	43.88	100	9	7	11.30
0017	M 16 x 1.50	72.70	100	12	9	15.30
0019	M 18 x 1.50	85.25	110	14	11	17.30
0021	M 20 x 1.50	87.10 (165)	125	16	12	19.30

Cutting Dies

Design: Enclosed, pre-slotted form.

For ISO-standard metric thread DIN 13.

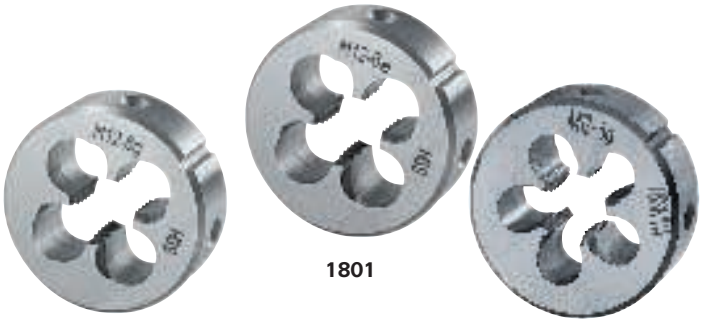
M | HSS | HSS-E PM | EN 22568 | 60°

format professional quality

1800 HSS, from M 3 spiral point on both sides, tolerance 6g.

1801 HSS, from M 3 spiral point on both sides, tolerance 6e (0.03 mm smaller).

1804 PM = Sintered high-speed steel, lapped, nitrided from M 3, with helical lead taper at both ends, tolerance 6g.



1800 1801 1804

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1800	●												
1801	●												
1804	●	●	○						●	○	○		

Part No.	Thread	1800 mm	1801 mm	1804 mm	Pitch mm	Outer ø x height mm
0020	M 2	8.48	–	22.49	0.40	16 x 5
0025	M 2.5	7.89	–	19.36	0.45	16 x 5
0030	M 3	7.19	15.64	14.77	0.50	20 x 5
0040	M 4	7.19	14.83	13.99	0.70	20 x 5
0050	M 5	7.19	13.19	13.01	0.80	20 x 7
0060	M 6	7.19	13.19	13.01	1.00	20 x 7
0070	M 7	12.74	–	–	1.00	25 x 9
0080	M 8	7.83	14.52	15.61	1.25	25 x 9
0090	M 9	16.73	–	–	1.25	25 x 9
0100	M 10	9.70	17.37	18.65	1.50	30 x 11
0120	M 12	12.65 (174)	23.06 (174)	24.88 (174)	1.75	38 x 14

Part No.	Thread	1800 mm	Pitch mm	Outer ø x height mm
0140	M 14	12.98	2.00	38 x 14
0160	M 16	16.93	2.00	45 x 18
0180	M 18	17.79	2.50	45 x 18
0200	M 20	17.79	2.50	45 x 18
0220	M 22	26.09	2.50	55 x 22
0240	M 24	26.09	3.00	55 x 22
0270	M 27	40.83	3.00	65 x 25
0300	M 30	40.83 (174)	3.50	65 x 25

Cutting die for the machining of brass available on request.

Cutting Dies

For left-hand threads.

Design: Solid form, gun nosed on both sides, nitrided from M 3, with helical lead taper at both ends.

For ISO metric left-hand thread DIN 13.

M-LH | HSS | EN 22568 | DIN 13 6g | 60°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1808	●												

Part No.	Thread	1808 mm	Pitch mm	Outer ø x height mm
0030	M 3	15.90	0.50	20 x 5
0040	M 4	15.07	0.70	20 x 5
0050	M 5	13.99	0.80	20 x 7
0060	M 6	13.99	1.00	20 x 7
0080	M 8	15.39 (174)	1.25	25 x 9

Part No.	Thread	1808 mm	Pitch mm	Outer ø x height mm
0100	M 10	18.62	1.50	30 x 11
0120	M 12	24.63	1.75	38 x 14
0160	M 16	32.21	2.00	45 x 18
0200	M 20	32.21 (174)	2.50	45 x 18

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Tapping Jigs

Cutting Dies

Design: Hexagon wiithout helical lead taper.

For ISO-standard metric thread DIN 13.

M | HSS | DIN 382 | 60°



format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1831	●	◐	○						○		○	◐	◐

Part No.	Thread	1831 mm	Pitch mm	Wrench size x height mm
0040	M 4	11.26	0.70	18 x 5
0050	M 5	11.04	0.80	18 x 7
0060	M 6	11.04	1.00	18 x 7
0080	M 8	11.87	1.25	21 x 9
		(174)		

Part No.	Thread	1831 mm	Pitch mm	Wrench size x height mm
0100	M 10	14.80	1.50	27 x 11
0120	M 12	19.68	1.75	36 x 14
0160	M 16	25.46	2.00	41 x 18
0200	M 20	26.70	2.50	41 x 18
		(174)		

Cutting Dies

Design: Enclosed, pre-slotted form, with helical lead taper at both ends.

For ISO metric fine thread DIN 13.

MF | HSS | EN 22568 | 60°



format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1811	●												

Part No.	Thread x Pitch mm	1811 mm	Outer ⌀ x height mm
0001	M 3 x 0.35	13.02	20 x 5
0003	M 4 x 0.35	13.02	20 x 5
0005	M 4 x 0.5	11.71	20 x 5
0007	M 5 x 0.5	11.71	20 x 5
0009	M 6 x 0.5	11.71	20 x 5
0011	M 6 x 0.75	10.31	20 x 7
0012	M 7 x 0.75	13.97	25 x 9
0013	M 8 x 0.5	15.77	25 x 9
0015	M 8 x 0.75	11.73	25 x 9
0017	M 8 x 1	11.21	25 x 9
0018	M 9 x 1	15.47	25 x 9
		(174)	

Part No.	Thread x Pitch mm	1811 mm	Outer ⌀ x height mm
0019	M 10 x 0.75	13.83	30 x 11
0021	M 10 x 1	13.06	30 x 11
0023	M 10 x 1.25	13.99	30 x 11
0025	M 12 x 1	17.28	38 x 10
0027	M 12 x 1.25	18.69	38 x 10
0029	M 12 x 1.5	15.85	38 x 10
0031	M 14 x 1	18.31	38 x 10
0033	M 14 x 1.25	18.69	38 x 10
0035	M 14 x 1.5	15.85	38 x 10
0037	M 16 x 1	26.02	45 x 14
0039	M 16 x 1.5	22.03	45 x 14
		(174)	

Part No.	Thread x Pitch mm	1811 mm	Outer ⌀ x height mm
0041	M 18 x 1	31.65	45 x 14
0043	M 18 x 1.5	22.01	45 x 14
0045	M 20 x 1	26.02	45 x 14
0047	M 20 x 1.5	22.03	45 x 14
0049	M 22 x 1	42.19	55 x 16
0051	M 22 x 1.5	32.08	55 x 16
0053	M 24 x 1.5	32.08	55 x 16
0055	M 27 x 1.5	47.71	65 x 18
0057	M 30 x 1.5	47.71	65 x 18
		(174)	

Further dimensions available on request.

Cutting Dies

Design: Closed form, pre-grooved form with progressive cut on both sides.

For Whitworth pipe thread DIN ISO 228 tolerance class A.

G | HSS | EN 24231 | 55°



format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1817	●												

Part No.	Thread inch	1817 mm	Pitch per inch	Outer ⌀ x height mm
0001	G 1/8	13.99	28	30 x 11
0003	G 1/4	14.74	19	38 x 10
0005	G 3/8	19.80	19	45 x 14
0007	G 1/2	19.80	14	45 x 14
		(174)		

Part No.	Thread inch	1817 mm	Pitch per inch	Outer ⌀ x height mm
0009	G 5/8	28.07	14	55 x 16
0011	G 3/4	31.88	14	55 x 16
0013	G 7/8	42.18	14	65 x 18
0015	G 1	43.62	11	65 x 18
		(174)		

Cutting Dies

Design: External hexagon without progressive cut.

For Whitworth pipe thread DIN ISO 228 tolerance class A.

G | HSS | DIN 382 | 55°



format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1834	●	◐	○						○		○	◐	◐

Part No.	Thread inch	1834 mm	Pitch per inch	Wrench size x height mm
0001	G 1/8	17.74	28	27 x 11
0003	G 1/4	20.14	19	36 x 10
0005	G 3/8	26.48	19	41 x 14
0007	G 1/2	26.48	14	41 x 14
		(174)		

Part No.	Thread inch	1834 mm	Pitch per inch	Wrench size x height mm
0009	G 3/4	46.78	14	50 x 16
0011	G 1	57.44	11	60 x 18
0013	G 1 1/4	79.37	11	70 x 20
0015	G 1 1/2	107.19	11	85 x 22
		(174)		

Cutting Dies

Design: Enclosed, pre-slotted form, with helical lead taper at both ends.

For Whitworth thread DIN 11, medium tolerance range.

BSW | HSS | EN 22568 | 55°



format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1814	●												

Part No.	Thread inch	1814 mm	Pitch per inch	Outer ø x height mm
0001	BSW 1/8	12.40	40	20 x 5
0003	BSW 5/32	13.23	32	20 x 7
0005	BSW 3/16	11.39	24	20 x 7
0007	BSW 7/32	13.49	24	20 x 7
0009	BSW 1/4	10.96	20	20 x 7
0011	BSW 5/16	12.40	18	25 x 9
0013	BSW 3/8	14.77	16	30 x 11
		(174)		

Part No.	Thread inch	1814 mm	Pitch per inch	Outer ø x height mm
0015	BSW 7/16	15.52	14	30 x 11
0017	BSW 1/2	18.62	12	38 x 14
0019	BSW 9/16	20.27	12	38 x 14
0021	BSW 5/8	24.49	11	45 x 18
0023	BSW 3/4	24.49	10	45 x 18
0025	BSW 7/8	40.17	9	55 x 22
0027	BSW 1	40.17	8	55 x 22
		(174)		

Cutting Dies

Design: Enclosed, pre-slotted form, with helical lead taper at both ends.

For steel conduit threads DIN 40430.

PG | HSS | DIN 40434 | 80°



format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1825	●												

Part No.	Thread inch	1825 mm	Pitch per inch	Outer ø x height mm
0001	PG 7	26.18	20	38 x 10
0003	PG 9	26.18	18	38 x 10
0005	PG 11	31.16	18	45 x 14
0007	PG 13.5	31.16	18	45 x 14
		(174)		

Part No.	Thread inch	1825 mm	Pitch per inch	Outer ø x height mm
0009	PG 16	41.70	18	55 x 16
0011	PG 21	61.61	16	65 x 18
0013	PG 29	61.61	16	65 x 18
0015	PG 36	137.63	16	90 x 22
		(174)		

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Cutting Dies

Design: Enclosed, pre-slotted form, from no. 5 with helical lead taper at both ends.

1820 For UNC threads.

1822 For UNF threads.

UNC | UNF | HSS | EN 22568 | 60° | Tol. 2 A

format professional quality



1820



1822

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1820	●												
1822	●												

Part No.	Thread UNC inch	Thread UNF inch	1820 mm	1822 mm	UNC lead per inch	UNF lead per inch	UNC outer ∅ x height mm	UNF outer ∅ x height mm
0001	No. 1–64	–	16.14	–	64	–	16 x 5	–
0003	No. 2–56	–	16.01	–	56	–	16 x 5	–
0005	No. 3–48	–	15.41	–	48	–	16 x 5	–
0007	No. 4–40	–	14.25	–	40	–	16 x 5	–
0009	No. 5–40	–	13.01	–	40	–	20 x 5	–
0011	No. 6–32	–	12.55	–	32	–	20 x 7	–
0013	No. 8–32	–	11.95	–	32	–	20 x 7	–
0015	No. 10–24	No. 10–32	11.95	11.71	24	32	20 x 7	20 x 7
0017	No. 12–24	No. 12–28	12.48	12.30	24	28	20 x 7	20 x 7
0019	1/4–20	1/4–28	11.47	11.47	20	28	20 x 7	20 x 7
0021	5/16–18	5/16–24	13.01	13.01	18	24	25 x 9	25 x 9
0023	3/8–16	3/8–24	15.52	15.52	16	24	30 x 11	30 x 11
0025	7/16–14	7/16–20	15.52	15.52	14	20	30 x 11	30 x 11
0027	1/2–13	1/2–20	19.50	19.50	13	20	38 x 14	38 x 10
0029	9/16–12	–	20.27	–	12	–	38 x 14	–
0031	5/8–11	5/8–18	25.78	25.78	11	18	45 x 18	45 x 14
0033	3/4–10	3/4–16	25.78	25.78	10	16	45 x 18	45 x 14
0035	7/8– 9	7/8–14	41.77	38.01	9	14	55 x 22	55 x 16
0037	1– 8	1–12	41.77	39.19	8	12	55 x 22	55 x 16
			(174)	(174)				

Further dimensions available on request.

Cutting Dies

Design: Enclosed, pre-slotted, with helical lead taper at one end.

For NPT threads.

NPT | HSS | 60°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1828	●												

Part No.	Thread inch	1828 mm	Pitch per inch	Outer ∅ x height mm
0001	NPT 1/16	27.45	27	25 x 9
0003	NPT 1/8	27.45	27	30 x 11
0005	NPT 1/4	28.02	18	38 x 14
0007	NPT 3/8	36.96	18	45 x 14
		(174)		

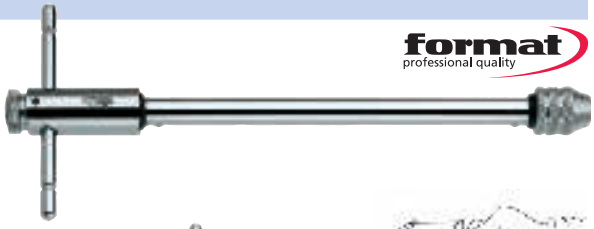
Part No.	Thread inch	1828 mm	Pitch per inch	Outer ∅ x height mm
0009	NPT 1/2	36.96	14	45 x 18
0011	NPT 3/4	61.13	14	55 x 22
0013	NPT 1	78.26	11.5	65 x 25
		(174)		

Screw Extractors

Tool Holders

Design: Chromium-plated, all-steel design, ratchet can be set for clockwise, anti-clockwise or firm operation, with hardened, parallel clamped jaws, adjustable transverse handle.

Application: For clamping of square shafts. Particularly suitable for working in confined areas.







Part No.	Range square mm	1850	For tap shanks according to DIN	For tap shanks according to ISO	Total length mm
0001	2.0–5.0	5.66	M 3– 8	M 1– 6	85
0003	2.6–5.5	8.71	M 3– 8	M 1– 6	250
0005	4.6–8.0	7.48	M 5–12	M 6–12	110
0007	4.6–8.0	10.48	M 5–12	M 6–12	300
		(176)			

Screw Extractors

Design: Chrome vanadium steel, heat-treated, rolled thread, with fine left-hand helix, shank ground, with square for use in tap wrenches and tool holders.

Application: For removing broken-off screws with right-hand thread. Use the jobber drill of the recommended size to drill a hole in the centre of the part to be removed, position the screwdriver and twist evenly anti-clockwise to release the rest of the part.





Part No.	Dimensions	1855	For screws	Drill ⌀ mm	d1 ≈ d2 mm	Square mm	Total length mm
0001	1	0.63	M 4	1.8	1.4– 3.6	2.7	50
0002	2	0.63	M 5 – 7	3.2	2.1– 4.9	3.8	57
0003	3	0.76	M 8 –10	4.5	3.1– 6.5	4.9	64
0004	4	0.95	M 11–14	6.5	4.8– 8.8	7.0	71
0005	5	1.16	M 16–18	8.5	6.2–11.0	9.0	79
0006	6	1.78	M 18–24	12.0	9.4–15.0	12.0	85
0007	7	2.81	M 24–33	15.3	12.7–19.0	14.5	92
0008	8	4.39	M 33–45	20.0	17.5–24.0	18.0	100
		(176)					



Screw Extractor Sets

In plastic case.

Part No.	Content Sizes	1856	For screws
0005	1–6	7.03	M 4–24
0010	1–5	5.00	M 4–18
		(176)	

Screw Extractors Hi-Trac

Design: Chrome vanadium steel, heat-treated, 54–56 HRC. For removing broken-off screws, threaded bolts and tube ends.

Due to the new geometry, features have been improved significantly and operation eased:
Lower extraction torque due to new cross-section geometry.
Lower drill depth due to optimised thread length. Higher safety for user and component.
Large range of applications, time-saving.

Application: Similar to type 1855.



Part No.	Dimensions	1857	For screws	Twist drill ⌀ mm	d1 ≈ d2 mm	Square mm	Total length mm
0001	1	0.81	M 4	1.8	1.6– 3.6	2.7	49
0002	2	0.84	M 5 – 7	3.2	2.7– 4.9	3.8	54
0003	3	1.00	M 8 –11	4.5	4.0– 6.5	4.9	59
0004	4	1.21	M 12–14	6.5	5.8– 8.8	7.0	65
0005	5	1.56	M 16–20	8.5	7.5–11.0	9.0	69
0006	6	2.62	M 20–24	12.0	10 –15.0	12.0	77
		(177)					



Set of Screw Extractors Hi-Trac

In plastic case.

Part No.	Content Sizes	1858	For screws
0005	1–6	9.22	M 4–24
0010	1–5	6.62	M 4–18
		(177)	

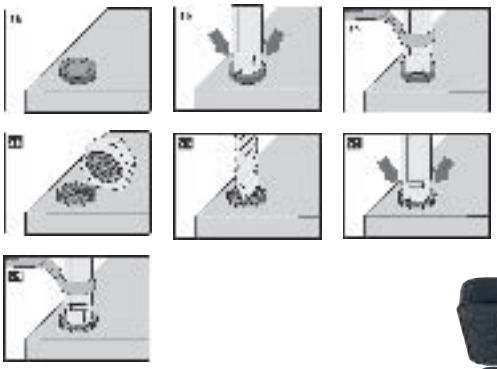
Screw Extractors/Tap Removers

Screw Extractor Sets

Design: 16-piece set, with twist drill.

For removing damaged or broken-off screws, in particular, worn hexagon socket screws. Extractor made of molybdenum steel, HSS twist drill, bronze.

Application: The worn hexagon socket screws are removed directly with the appropriate extractor, without spot drilling. In case of broken off screw heads, spot drilling with the twist drill is effected, and subsequently the screw is removed with the matching extractor.



1a/2a: Damaged or worn hexagon socket screw or broken-off screw head.
2b: Spot drill with twist drill.
1b/2c: Drive in screw extractor by means of a hammer.
1c/2d: Slip on ring wrench down to bottom and twist out without jamming.



Part No.	Dimensions	1851	Contents
0050	16-piece	40.01	Screw extractor (hex.) wrench sizes 2.0 – 2.5 – 3.0 – 4.0 – 5.0 – 6.0 – 8.0 – 10.0 mm Twist drill: ⌀ 2.3 – 2.8 – 3.4 – 4.5 – 5.7 – 6.8 – 9.0 – 11.0 mm
		(176)	

Tap Removers

Design: For releasing and removing of broken-off taps.

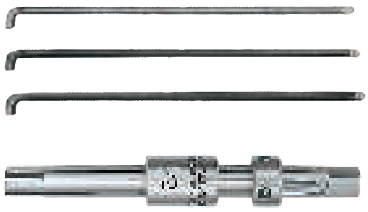
Very robust tool, fingers are cold-hammered. For releasing and removing of broken-off taps with 3 or 4 flutes.

Longitudinally sliding guiding sleeve for receiving the torsion force.

Application: The fingers are inserted in the flutes of the tap by shifting of the top adjusting ring and is then secured with the guiding sleeve. The broken-off piece of the tap is then moved with the aid of a cutting die until it is loosened and subsequently removed.

Scope of supply:
Tap remover complete with 3 or 4 fingers.





Part No.	Thread	1848 WALTON	1852 WALTON	Execution 1848	Execution 1852
0030	M 3	–	14.35	–	3-finger
0040	M 4	14.35	14.35	4-finger	3-finger
0050	M 5	14.35	14.35	4-finger	3-finger
0060	M 6	14.69	14.69	4-finger	3-finger
0080	M 8	15.45	15.45	4-finger	3-finger
		(178)	(178)		

Part No.	Thread	1848 WALTON	1852 WALTON	Execution 1848	Execution 1852
0100	M 10	15.45	15.45	4-finger	3-finger
0120	M 12	17.24	17.24	4-finger	3-finger
0140	M 14	–	23.77	–	3-finger
0160	M 16	25.82	25.82	4-finger	3-finger
0200	M 20	31.76	–	4-finger	–
		(178)	(178)		

Spare Finger

Part No.	Thread	1849 WALTON	1853 WALTON	Execution 1849	Execution 1853
0030	M 3	–	0.68	–	3-piece
0040	M 4	0.68	0.68	4-piece	3-piece
0050	M 5	0.85	0.85	4-piece	3-piece
0060	M 6	1.11	1.11	4-piece	3-piece
0080	M 8	1.28	1.28	4-piece	3-piece
		(178)	(178)		

Part No.	Thread	1849 WALTON	1853 WALTON	Execution 1849	Execution 1853
0100	M 10	1.28	1.28	4-piece	3-piece
0120	M 12	1.61	1.61	4-piece	3-piece
0140	M 14	–	1.87	–	3-piece
0160	M 16	2.29	2.29	4-piece	3-piece
0200	M 20	2.55	–	4-piece	–
		(178)	(178)		

Tap Remover Sets

In case.

Part No.	Content of set	1854 WALTON	Thread size
0010	M 4–12 for hand taps, 3 flutes	104.01	M 4, M 5, M 6, M 8, M 10, M 12
0020	M 3–20 for hand taps, 3 flutes	205.46	M 3, M 4, M 5, M 6, M 8, M 10, M 12, M 14, M 16, M 20
0030	M 4–12 for hand taps, 4 flutes	104.01	M 4, M 5, M 6, M 8, M 10, M 12
0040	M 4–12 for hand taps, 4 flutes	225.48	M 4, M 5, M 6, M 8, M 10, M 12, M 14, M 16, M 20, M 22
		(178)	



Tab Wrenches

Adjustable Tap Wrenches

1860 **Design:** Housing made of 0–5 fine zinc diecast ZL 0410, jaws case-hardened and phosphatized. Steel handle zinc coated, one handle detachable.

1861 **Design:** Forged steel housing 0–2, housing 3–7/8 made of steel ST 37, welded construction. Jaws case-hardened and phosphatized. Steel handle zinc coated, one handle detachable.

DIN 1814

format professional quality



1860



1861

Part No.	Dimensions	1860	1861	For tap size DIN 352	DIN 5157	DIN 2184	Range square mm	Length mm
0001	0	2.41	–	M 1 –8	–	BSW 1/16"–1/4"	2.0– 5.0	125
0003	1	2.50	–	M 1 –10	G 1/8"	BSW 1/16"–3/8"	2.0– 6.0	180
0005	1 1/2	2.58	8.33	M 1 –12	G 1/8"	BSW 1/16"–1/2"	2.0– 8.0	200
0007	2	4.07	10.64	M 4 –12	G 1/8"–1/4"	BSW 3/16"–1/2"	4.0– 9.0	280
0009	3	6.76	16.43	M 5 –20	G 1/8"–1/2"	BSW 7/32"–3/4"	4.9–12.0	375
0011	4	11.89	23.32	M 9 –27	G 1/8"–3/4"	BSW 3/8" –1"	5.5–16.0	480
0013	5	19.56	35.25	M 12–33	G 1/4"–1"	BSW 1/2" –11/4"	7.0–20.0	700
0015	6	–	35.47	M 20–42	G 1/4"–1.1/4"	BSW 9/16"–15/8"	9.0–25.0	1000
0017	7/8	–	73.78	M 27–86	G 3/4"–3"	BSW 1" –21/2"	16.0–44.0	1000
		(176)	(176)					

Ball-shaped Tap Wrenches

Design: With 4 retainer squares, made of steel, detachable handles.

RITTER



Part No.	Dimensions	1863 RITTER	For square mm	M	For tap Ww/BSW	G	Length mm
0001	0	3.13	2.1 – 2.7 – 3 – 3.4	1 – 4	1/16" – 5/32"	–	200
0003	1	3.13	3 – 3.4 – 4.3 – 4.9	3.5– 8	5/32" – 5/16"	–	200
0005	2	3.56	3.4 – 4.3 – 4.9 – 5.5	4 –10	5/32" – 3/8"	1/8	250
0007	3	4.16	4.9 – 5.5 – 6.2 – 7	5 –12	3/16" – 1/2"	–	295
0009	4	5.00	5.5 – 6.2 – 7 – 9	10 –16	3/8" – 5/8"	1/8–3/8	340
0011	5	9.13	7 – 9 – 11 – 12	12 –20	1/2" – 3/4"	1/4–1/2	450
0013	6	17.87	11 – 12 – 14.5 – 16	18 –27	3/4" – 1"	1/2–3/4	645
		(176)					

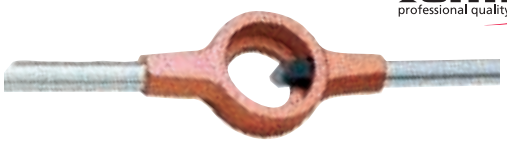
Die Stocks without Tightening Screw

Design: Housing made of fine zinc diecast ZL 0410, steel handle zinc coated, detachable. **Without tightening screws:** The cutting die is locked above the flute with an adjustable clamp, as with tap wrenches. The special design of the jaw and the small tolerances ensure that the dies are seated firmly in the die stock.

Application: For clamping and solid cutting of cutting dies of EN 22 568 and EN 24 231/DIN 40434.

≈EN 22568

format professional quality



Part No.	For cutting dies ∅ x height mm	1866	For cutting dies Size mm	Metric-fine	Whitworth pipes	Withworth	UNC	UNF	Length mm
0001	16 x 5**	1.56	M 1 – 2.6	M 2 –2.5	–	1/16"–3/32"	No. 1 –3	No. 0 –3	160
0003	20 x 5	1.69	M 3 – 4	M 3 –4	–	1/8" –5/32"	No. 4 –5	No. 4 –5	180
0005	20 x 7	1.69	M 4.5 – 6	M 5* –6*	–	3/16"–1/4"	No. 6 –1/4"	No. 8 –1/4"	180
0007	25 x 9	1.80	M 7 – 9	M 7 –9	–	5/16"	5/16"	5/16"	210
0009	30 x 11	2.63	M 10 –11	M 10–11	G 1/8"	3/8" –7/16"	3/8"–7/16"	3/8"–7/16"	270
0011	38 x 10	3.56	–	M 12–15	G 1/4"	–	–	1/2"–9/16"	310
0013	38 x 14	3.56	M 12 –14	–	–	1/2" –9/16"	1/2"–9/16"	–	310
0015	45 x 14	5.50	–	M 16–20	G 3/8"–1/2"	–	–	5/8"–3/4"	440
0017	45 x 18	5.50	M 16 –20	–	–	5/8" –3/4"	5/8"–3/4"	–	440
0019	55 x 16	5.98	–	M 22–25	G 5/8"–3/4"	–	–	7/8" –1"	490
0021	55 x 22	5.98	M 22 –24	–	–	7/8" –1"	7/8"–1"	–	490
0023	65 x 18	12.60	–	M 26–36	G 7/8"–1"	–	–	1 1/8"–1 3/8"	630
0025	65 x 25	12.60	M 27 –36	–	–	1 1/8" –1 3/8"	1 1/8"–1 3/8"	–	630
		(176)							

* 0.75 lead

** with 4 tightening screws and fixed handles.

Tap Extension Bars

Design: Hardened, ground and zinc coated (corrosion protected).
Same size of external and internal square.

DIN 377

format professional quality



Part No.	Square mm	1870	Length mm	For cutting dies DIN 352	For cutting dies DIN 5157
0210	2.1	1.43	60	M 1 – 2.6	–
0270	2.7	1.43	80	M 3	–
0340	3.4	1.43	95	M 4	–
0430	4.3	1.86	105	–	–
0490	4.9	1.55	110	M 4.5– 8	–
0550	5.5	1.55	115	M 9 –10	G 1/8“
0620	6.2	2.01	120	M 11	–
0700	7.0	2.01	125	M 12	–
0800	8.0	2.37	125	–	–
0900	9.0	2.37	130	M 13/16	G 1/4“ + 3/8“
1100	11.0	3.81	150	M 18	–
1200	12.0	3.97	155	M 20	G 1/2“
1450	14.5	5.68	175	M 22–24	G 5/8“
1600	16.0	8.53	180	M 27	G 3/4“
1800	18.0	10.36	200	M 30	G 7/8“
2000	20.0	13.31	220	M 33	G 1“

(176)

NEW

Stub drills GU 500 DZ

- High performance and productivity
- Distinctive heat hardness
- Special point and precisely ground tip
- Ideally suited for use on automatic machines and turret lathes
- Suitable for various material such as steel, cast iron, aluminium and plastics

GUHRING



1/9

Solid Carbide Milling Cutters for female threads with inside cooling, 2 x d

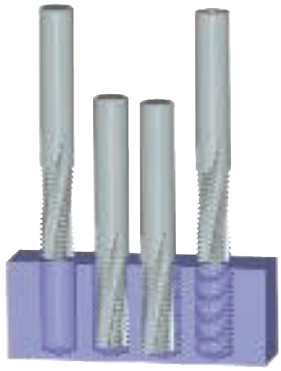
Design: 27° right-handed helical flutes to obtain optimal cutting conditions.

Precise thread depth for blind hole threads; exceptionally high surface quality of the thread; reliable machining of materials that are difficult to chip, dimensional accuracy of the thread can be influenced; thread can be produced to almost reach the bottom.

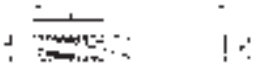
For metric and ISO Thread DIN 13.



Work steps
1 Tool moves on start position above centre of hole
2 Start milling the thread by driving in at 180°
3 Finish milling by driving out at 180°
4 Travel on start position and finish machining operation



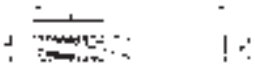
1880 Bright.





1880

1881 TiCN coated.





1881 TiCN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1880												●	●
1881	●	●	◐	◐	○	○			○	○	●		

Part No.	Thread	1880	1881 TiCN	Lead mm	Cutter length l_1 mm	Total length l_2 mm	Shank ⌀ d_2 mm	Number of flutes
0060	M 6	103.36	111.89	1.00	13.5	54	6	3
0080	M 8	112.66	123.70	1.25	18.1	54	6	3
0100	M 10	125.38	136.31	1.50	21.7	64	8	4
0120	M 12	159.27	168.61	1.75	25.4	74	10	4
0140	M 14	182.15	204.17	2.00	31.0	74	10	4
0160	M 16	207.57	214.31	2.00	35.0	80	12	4
		(175)	(175)					

For technical information see appendix in group 10.

 All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

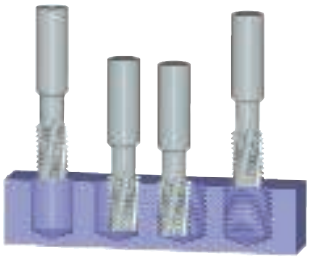
Solid Carbide Milling Cutters GFM for internal thread, with inside cooling

Design: 15° right-handed helical flutes to obtain optimal cutting conditions.

Precise thread depth for blind hole threads; exceptionally high surface quality of the thread; reliable machining of materials that are difficult to chip, dimensional accuracy of the thread can be influenced; thread can be produced to almost reach the bottom; wide range of diameters machinable with same lead.

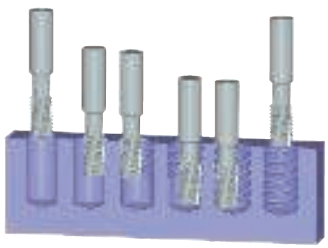
For metric and ISO thread DIN 13.





Work steps
1 Tool moves on start position above centre of hole
2 Start milling the thread by driving in at 90°
3 Finish milling by driving out at 90°
4 Travel on start position and finish machining operation

Wide range of diameters machinable with same lead. Low tool costs – large threads.



Work steps
1 Tool moves on start position above centre of hole
2 Start milling the thread by driving in at 90°
3 Finish milling by driving out at 90°
4 Start second milling by driving in at 90°
5 Finish second milling by driving out at 90°
6 Travel on start position and finish machining operation

By the taper between cutting element and shank, a notably deeper thread can be produced with this tool compared to milling without taper.

1882 Bright.





1882

1884 TiCN coated.





1884 TiCN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1882												●	●
1884	●	●	◐	◐	○	○			○	○	●		

Part No.	∅ d_1 mm	1882	1884 TiCN	Lead mm	Cutter length l_1 mm	d for thread ∅ mm	Useful length l_4 mm	Total length l_2 mm	Shank ∅ d_2 mm	Number of flutes
0080	8	146.57 ◊	164.35 ◊	0.50	16	10	16	64	8	4
0100	10	185.54 ◊	203.32 ◊	0.75	16	14	25	70	10	4
0103	10	177.06 ◊	194.86 ◊	1.00	16	14	25	70	10	4
0120	12	210.10 ◊	232.13 ◊	1.00	20	18	31	80	12	4
0123	12	189.78 ◊	196.97 ◊	1.50	20	18	31	80	12	4
0160	16	238.07 ◊	245.82 ◊	1.50	25	24	40	90	16	5
0163	16	251.50 ◊	253.70 ◊	2.00	25	24	40	90	16	5
0200	20	345.65 ◊	349.03 ◊	1.50	33	30	50	105	20	5
0203	20	368.54 ◊	370.32 ◊	2.00	33	30	50	105	20	5
0204	20	–	387.99 ◊	3.00	33	30	50	105	20	5
0206	20	358.37 ◊ (175)	– (175)	3.00	33	30	50	105	20	5

For technical information see appendix group 10.

Solid Carbide Milling Cutters for internal thread, with inside cooling, 1.5 x d

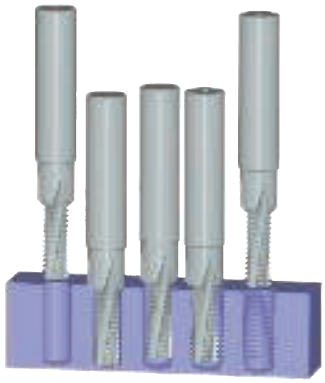
Design: 27° right-handed helical flutes, 45° countersunk chamfer, from M4 with cooling duct.

Precise thread depth for blind hole threads; exceptionally high surface quality of the thread; reliable machining of materials that are difficult to chip, dimensional accuracy of the thread can be influenced; thread can be produced to almost reach the bottom.

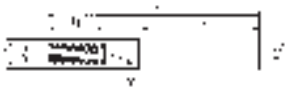
For metric and ISO Thread DIN 13.



Work steps
1 Tool moves on start position
2 Countersinking of 90° chamfer
3 Start milling the thread by driving in at 180°
4 Finish milling by driving out at 180°
5 Travel on start position and finish machining operation



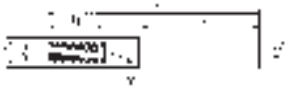
1886 Bright.





1886

1888 TiCN coated.





1888 TiCN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1886												●	●
1888	●	●	◐	◐	○	○			○	○	●		

Part No.	Thread	1886	1888 TiCN	Lead mm	Cutter length l_1 mm	Total length l_2 mm	Shank ∅ d_2 mm	l_3 mm	Number of flutes
0020	M 2	138.48 ◊	151.62 ◊	0.40	3.4	48	6	36	2
0030	M 3	114.82 ◊	127.96 ◊	0.50	5.2	48	6	36	3
0040	M 4	99.04 ◊	114.80 ◊	0.70	7.3	48	6	36	3
0050	M 5	101.67 ◊	117.44 ◊	0.80	9.2	54	6	36	3
0060	M 6	111.01 ◊	119.96 ◊	1.00	10.5	62	8	36	3
0080	M 8	137.30 ◊	143.99 ◊	1.25	13.7	74	10	40	3
0100	M 10	160.67 ◊	169.80 ◊	1.50	17.2	80	12	45	4
0120	M 12	212.98 ◊	221.69 ◊	1.75	20.1	90	14	45	4
0140	M 14	262.93 ◊	290.10 ◊	2.00	25.0	102	16	48	4
0160	M 16	321.64 ◊	347.64 ◊	2.00	27.0	102	18	48	4
		(175)	(175)						

For technical information see appendix in group 10.

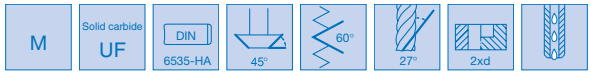
All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Solid Carbide Milling Cutters GFS for internal thread, with inside cooling, 2 x d

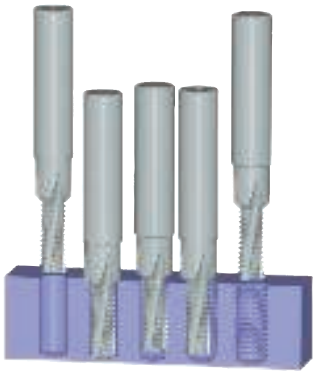
Design: 27° right-handed helical flutes, 45° countersunk chamfer, from M 4 with cooling duct.

Precise thread depth for blind hole threads; exceptionally high surface quality of the thread; reliable machining of materials that are difficult to chip, dimensional accuracy of the thread can be influenced; thread can be produced to almost reach the bottom.

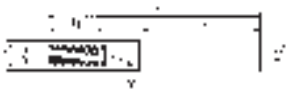
For metric and ISO thread DIN 13.



Work steps
1 Tool moves on start position
2 Countersinking of 90° chamfer
3 Start milling the thread by driving in at 180°
4 Finish milling by driving out at 180°
5 Travel on start position and finish machining operation



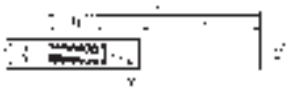
1890 Bright.





1890

1891 TiCN coated.





1891 TiCN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1890												●	●
1891	●	●	◐	◐	○	○			○	○	●		

Part No.	Thread	1890	1891 TiCN	Lead mm	Cutter length l_1 mm	Total length l_2 mm	Shank ⌀ d 2 mm	l_3 mm	Number of flutes
0020	M 2	138.48 ◊	151.62 ◊	0.40	4.6	48	6	36	2
0030	M 3	114.82 ◊	127.96 ◊	0.50	6.7	48	6	36	3
0040	M 4	99.04 ◊	114.80 ◊	0.70	8.7	48	6	36	3
0050	M 5	101.67 ◊	117.44 ◊	0.80	10.8	54	6	36	3
0060	M 6	111.01 ◊	119.96 ◊	1.00	13.5	62	8	36	3
0080	M 8	137.30 ◊	143.99 ◊	1.25	18.1	74	10	40	3
0100	M 10	160.67 ◊	169.80 ◊	1.50	21.7	80	12	45	4
0120	M 12	212.98 ◊	221.69 ◊	1.75	25.4	90	14	45	4
0140	M 14	262.93 ◊	290.10 ◊	2.00	31.0	102	16	48	4
0160	M 16	321.64 ◊	347.64 ◊	2.00	35.0	102	18	48	4
		(175)	(175)						

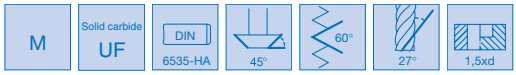
For technical information see appendix in group 10.

Solid Carbide Milling Cutters BGF for internal thread, 1.5 x d

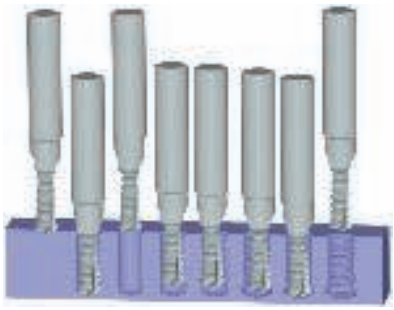
Design: 27° right-handed helical flutes to obtain optimal cutting conditions, 45° countersunk chamfer.

Precise thread depth for blind hole threads; exceptionally high surface quality of the thread; dimensional accuracy of the thread can be influenced.

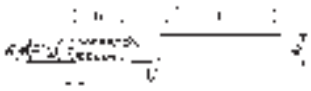
For metric and ISO thread DIN 13.



Work steps
1 Tool moves on start position
2 Start milling the core hole and countersinking
3 Withdraw the tool from the hole for relaxing
4 Travel on start position of the thread milling cycle
5 Start milling the thread by driving in at 180°
6 Thread milling 360°
7 Finish thread milling operation by driving out at 180°
8 Travel on start position and finish machining operation



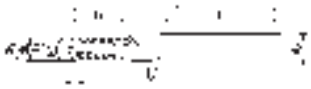
1892 Bright.





1892

1893 TiCN coated.





1893 TiCN

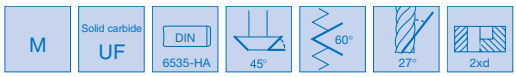
Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1892												●	●
1893											●		

Part No.	Thread	1892	1893 TiCN	Lead mm	Cutter length l_1 mm	Total length l_2 mm	Shank ∅ d_2 mm	l_3 mm	l_6 mm	ds mm	dk mm	Number of flutes
0030	M 3	184.04 ◊	197.18 ◊	0.50	5.4	48	6	36	0.50	3.4	2.5	2
0040	M 4	160.38 ◊	175.28 ◊	0.70	6.9	48	6	36	0.70	4.5	3.3	2
0050	M 5	156.01 ◊	171.79 ◊	0.80	8.7	54	6	36	0.80	5.5	4.2	2
0060	M 6	150.74 ◊	172.65 ◊	1.00	10.9	62	8	36	1.00	6.6	5.0	2
0080	M 8	187.55 ◊	210.35 ◊	1.25	13.7	74	10	40	1.25	9.0	6.8	2
0100	M 10	226.12 ◊	249.79 ◊	1.50	18.0	80	12	45	1.50	11.0	8.5	2
0120	M 12	319.88 ◊	344.43 ◊	1.75	20.8	90	14	45	1.50	13.5	10.2	2
0140	M 14	437.32 ◊	464.50 ◊	2.00	23.6	102	16	48	1.50	15.5	12.0	2
0160	M 16	475.90 ◊ (175)	503.06 ◊ (175)	2.00	26.0	102	18	48	1.50	17.5	14.0	2

For technical information see appendix in group 10.

 All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Solid Carbide Milling Cutters BGF for internal thread, 2 x d



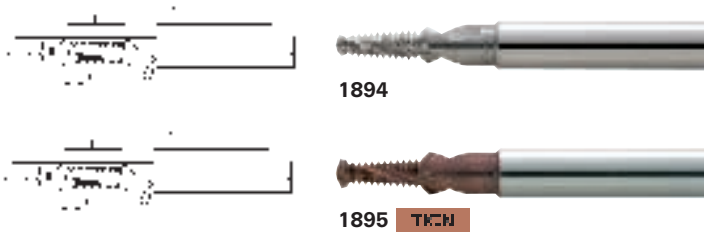
Design: 27° right-handed helical flutes, to obtain optimal cutting conditions, 45° countersunk chamfer.

Precise thread depth for blind hole threads; exceptionally high surface quality of the thread; dimensional accuracy of the thread can be influenced.

For metric and ISO thread DIN 13.

1894 Bright.

1895 TiCN coated.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1894												●	●
1895											●		

Part No.	Thread	1894	1895 TiCN	Lead mm	Cutter length l_1 mm	Total length l_2 mm	Shank Ø d_2 mm	l_3 mm	l_6 mm	ds mm	dk mm	Number of flutes
0030	M 3	184.04 ◊	197.18 ◊	0.50	6.9	48	6	36	0.50	3.4	2.5	2
0040	M 4	160.38 ◊	175.28 ◊	0.70	9.0	48	6	36	0.70	4.5	3.3	2
0050	M 5	156.01 ◊	171.79 ◊	0.80	11.1	54	6	36	0.80	5.5	4.2	2
0060	M 6	140.19 ◊	160.56 ◊	1.00	13.9	62	8	36	1.00	6.6	5.0	2
0080	M 8	174.42 ◊	195.62 ◊	1.25	18.7	74	10	40	1.25	9.0	6.8	2
0100	M 10	210.29 ◊	232.29 ◊	1.50	22.5	80	12	45	1.50	11.0	8.5	2
0120	M 12	297.50 ◊	320.33 ◊	1.75	26.1	90	14	45	1.50	13.5	10.2	2
0140	M 14	437.32 ◊	464.50 ◊	2.00	31.6	102	16	48	1.50	15.5	12.0	2
0160	M 16	475.90 ◊ (175)	503.06 ◊ (175)	2.00	36.0	102	18	48	1.50	17.5	14.0	2

Solid Carbide Milling Cutters BGF for internal thread, with inside cooling, 1.5 x d



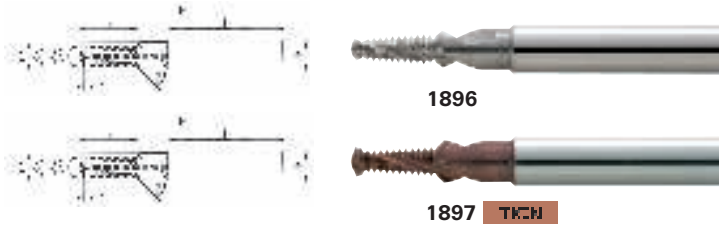
Design: 27° right-handed helical flutes, to obtain optimal cutting conditions, 45° countersunk chamfer.

Precise thread depth for blind hole threads; exceptionally high surface quality of the thread; dimensional accuracy of the thread can be influenced.

For metric and ISO thread DIN 13.

1896 Bright.

1897 TiCN coated.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1896												●	●
1897											●		

Part No.	Thread	1896	1897 TiCN	Lead mm	Cutter length l_1 mm	Total length l_2 mm	Shank Ø d_2 mm	l_3 mm	l_6 mm	ds mm	dk mm	Number of flutes
0040	M 4	212.98 ◊	227.86 ◊	0.70	6.9	48	6	36	0.70	4.5	3.3	2
0050	M 5	208.59 ◊	224.36 ◊	0.80	8.7	54	6	36	0.80	5.5	4.2	2
0060	M 6	203.32 ◊	226.12 ◊	1.00	10.9	62	8	36	1.00	6.6	5.0	2
0080	M 8	242.76 ◊	266.42 ◊	1.25	13.7	74	10	40	1.25	9.0	6.8	2
0100	M 10	284.83 ◊	308.49 ◊	1.50	18.0	80	12	45	1.50	11.0	8.5	2
0120	M 12	370.73 ◊	395.26 ◊	1.75	20.8	90	14	45	1.50	13.5	10.2	2
0140	M 14	476.76 ◊	503.06 ◊	2.00	23.6	102	16	48	1.50	15.5	12.0	2
0160	M 16	540.74 ◊ (175)	567.91 ◊ (175)	2.00	26.0	102	18	48	1.50	17.5	14.0	2

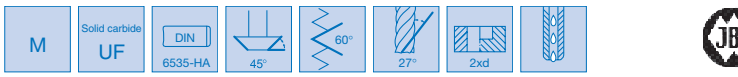
For technical information see appendix in group 10.

Solid Carbide Milling Cutters BGF for internal thread, with inside cooling, 2 x d

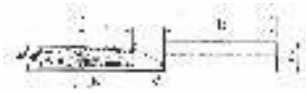
Design: 27° right-handed helical flutes, to obtain optimal cutting conditions, 45° countersunk chamfer.

Precise thread depth for blind hole threads; exceptionally high surface quality of the thread; dimensional accuracy of the thread can be influenced.

For metric and ISO thread DIN 13.



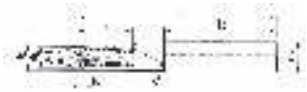
1898 Bright.





1898

1899 TiCN coated.





1899 TiCN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
1898												●	●
1899											●		

Part No.	Thread	1898	1899 TiCN	Lead mm	Cutter length l_1 mm	Total length l_2 mm	Shank Ø d_2 mm	l_3 mm	l_6 mm	ds mm	dk mm	Number of futes
0040	M 4	212.98 ◊	227.86 ◊	0.70	9.0	48	6	36	0.70	4.5	3.3	2
0050	M 5	208.59 ◊	224.36 ◊	0.80	11.1	54	6	36	0.80	5.5	4.2	2
0060	M 6	189.09 ◊	210.29 ◊	1.00	13.9	62	8	36	1.00	6.6	5.0	2
0080	M 8	225.77 ◊	247.78 ◊	1.25	18.7	74	10	40	1.25	9.0	6.8	2
0100	M 10	264.90 ◊	286.90 ◊	1.50	22.5	80	12	45	1.50	11.0	8.5	2
0120	M 12	344.78 ◊	367.60 ◊	1.75	26.1	90	14	45	1.50	13.5	10.2	2
0140	M 14	476.76 ◊	503.06 ◊	2.00	31.6	102	16	48	1.50	15.5	12.0	2
0160	M 16	540.74 ◊	567.91 ◊	2.00	36.0	102	18	48	1.50	17.5	14.0	2
		(175)	(175)									

For technical information see appendix in group 10.

format
professional quality



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NEW

Set of universal stepped drills

Optimum drilling results with FORMAT stepped drills

- Longer tool life
- Uniform cut and improved chip removal
- Drill set in sturdy, high-quality plastic case with automatic upright position of the drills when opening the case

Further universal stepped drills see page 1/57.

Overview – Group 2

New in the product range:

Extension of range of milling tools



In order to satisfy highest demands regarding quality and performance, our range of milling tools has been extended by the following products:

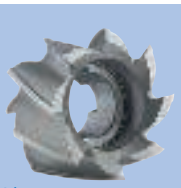
- Komet machine saw blades
- Wikus band saw blades

Thanks to this extension of our product range, the ideal tool is now available for all conventional sawing operations.



After successful launch, we have adjusted and optimised our range of indexable inserts according to your requirements.

Your FORMAT plus partner will inform you about the performance of these and further cutting tools.


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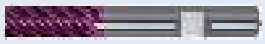

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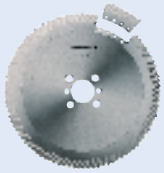

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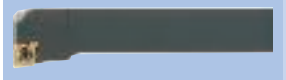

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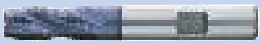

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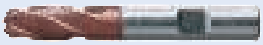

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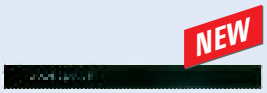

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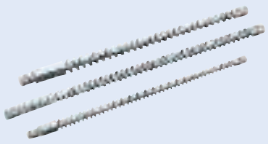

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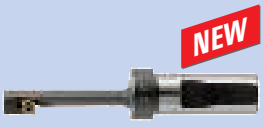

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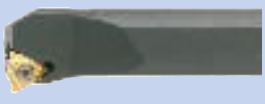
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Material

e. g. HSS — High-speed steel
HSS Co — High-speed steel with cobalt
HSS-E PM — Powder metallurgical high-speed steel

e. g. Solid carbide K10/K20 — Fine grain carbide type K10/K20
Solid carbide UF — Ultra-fine grain solid carbide

Standard

e. g. DIN 844-K — Corresponds to DIN 884, short design
DIN 6527 — Corresponds to DIN 6527
Certificate — Factory standard

Type

e. g. Type W — Finishing teeth for soft materials up to approx. 600 N/mm²
Type N — Finishing teeth for normal materials
Type H — Finishing teeth for hard materials

e. g. Type NF — Roughing-finishing teeth for normal materials
Type NRf — Fine roughing teeth for materials with higher strength

e. g. Type WR — Coarse roughing teeth for soft materials up to approx. 600 N/mm²
Type NR — Normal roughing teeth for normal materials
Type HR — Fine roughing teeth for hard materials

Number of cutting edges

e. g. 6-8 F — 6–8 cutting edges

Shank design

e. g. DIN 1835-B — Parallel shank with drive face to DIN 1835 B
DIN 6535-HA — Standard parallel shank
DIN 6535-HB — Standard parallel shank with drive face

Angle

e. g. 

45° right-hand helix

Rake angle

Application

e. g.  Feed directions
 Dry cutting possible

Selecting the optimum tool

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2384	●	●	●	●	○				○	●	●	●	○

● recommended ◐ suitable ○ partially suitable

Coating – Surface Finish

Due to their basic properties, tools made of rapid-cutting steel or carbide metal are delivered without additional surface finish, i.e. with blank surfaces. For specific applications however, a special surface finish is recommended to increase wear resistance, reduce slipping resistance and pick-up behaviour.

A broad array of coatings is available

Hard material coating: TiN, TiN2, TiAIN 2, TiCN, Fire, Vallorbinox, Granit Al, Granit Dry PM.

Each layer provides true advantages for certain fields of application.

TiN coating (titanium nitride)

Optical feature: Gold colour

Proven, favourably-priced all-round layer for increased efficiency.

TiN2 coating (titanium nitride)

Optical feature: Gold colour

High cutting speeds, wet and dry cutting, significantly improved performance, higher productivity. TiN2 distinguishes by extreme toughness of the coating material and by high thermal and chemical stability.

TiAIN coating (titanium aluminium nitride)

Optical feature: Black-purple

Special coating for cutting operations on abrasive material (cast iron, AlSi) and/or when exposed to high temperatures, i.e. in applications without cooling or limited cooling, in the event of deep holes or small diameters. This means that only at high cutting rates, the TiAIN coating will lead to significantly improved performance.

TiCN coating (titanium carbon nitride)

Optical feature: Grey-purple

Multi-layer coating with laminate structure. Obtains true advantages in the machining of steel, in continuous cutting operations, materials that are difficult to machine or in general: where above-average requirements to hardness and toughness are set.

TiAIN2 – Fire coating

Optical feature: Red-purple

Multi-layer TiAIN coating with gradient structure. All-round coating, its efficiency is twice as high as TiN, TiAIN and TiCN. Excellent almost “fire-proof“ heat insulation. High toughness.

Ti2N coating (Vallorbinox)

Optical feature: Light grey

Vallorbe milling cutter recommendation for machining of stainless and acid-resistant steels, titanium and Hasteloy.

MoS2 coating (Granit Al)

Optical feature: Dark grey

Vallorbe milling cutter recommendation for machining of aluminium, Al alloys and plastic materials.

Ti2CN coating (Granit Dry PM)

Optical feature: Gold colour

Vallorbe milling cutter recommendation for machining of tool steels up to 1,300 N/mm^2, alloyed steels, Inconel, titanium alloys and Hardox.

Overview – HSS/HSS-E Milling Tool Range



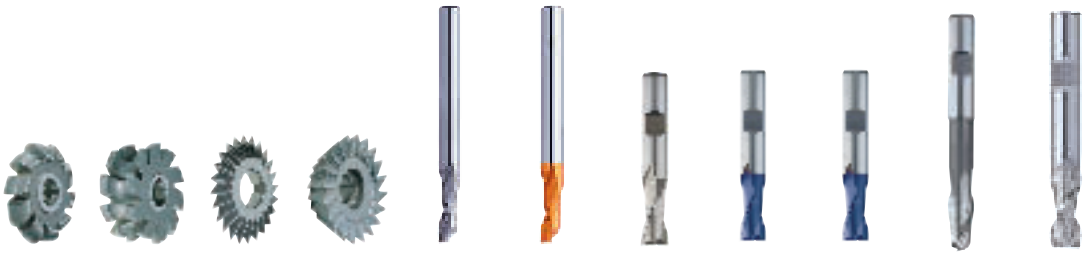
Description	Shell end mills								Cylindrical milling cutters	Narrow cyl. milling cutters
No. of flutes	8–12	8–12	6	7–12	7–12	7–12	7–12	7–12	12–18	28–44
DIN	1880	1880	1880	1880	1880	1880	1880	1880	885-A	1834-A
Tool type	N	N	W	NF	NR	NR	HR	HR	N	N
Cutting material	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co5
Coating		TiCN				TiCN		TiCN		
Part No.	2010	2013	2016	2019	2022	2025	2028	2031	2049	2043
Page	2/11	2/11	2/11	2/11	2/11	2/11	2/12	2/12	2/12	2/13

Material group

Steels up to 850 N/mm²		●	●		●	●	●	●	●	●	●
Steels up to 1,000 N/mm²		●	●		◐	●	●	●	●	○	●
Steels up to 1,400 N/mm²			◐			○	◐	●	●		○
Steels up to 42 HRc											
Steels up to 52 HRc											
Stainless and acid-resistant steels (INOX)			○		○	◐	◐	○	◐		
Ti steels, Ti alloys, special steels					○		○	○	◐		
Cast iron			◐			◐	◐	◐	●		●
Al, Al and Mg alloys				●		◐	○				○
Copper, brass, bronze				◐		◐	○				○

● recommended ◐ suitable ○ partially suitable

Overview – HSS/HSS-E Milling Tool Range



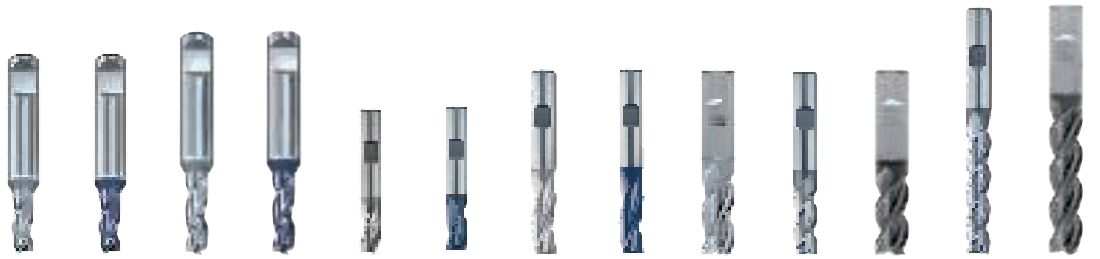
Description	Shaping mills				Single-flute milling cutters		2-flute slotdrills				
No. of flutes	12–14	10–14	18–26	16–22	1	1	2	2	2	2	2
DIN	856	855	847	842-A	WN	WN	327-D	327-D	327-D	WN-Lang	844-K
Tool type			H	H	W	W	N	N	N	N	W
Cutting material	HSS	HSS	HSS	HSS	HSS Co5	HSS Co5	HSS Co8	HSS Co8	HSS Co8	HSS Co8	HSS Co8
Coating						TIN2		TiAlN	TiAlN		
Part No.	2052	2055	2058	2061	2100	2103	2106	2112	2113	2115	2116
Page	2/13	2/13	2/14	2/14	2/14	2/14	2/15	2/15	2/15	2/16	2/16

Material group

Steels up to 850 N/mm²		●	●	●	●			●	●	●	●	○
Steels up to 1,000 N/mm²		◐	◐	◐	◐			●	●	●	●	
Steels up to 1,400 N/mm²								◐	●	●	●	
Steels up to 42 HRc												
Steels up to 52 HRc												
Stainless and acid-resistant steels (INOX)								○	○	◐		
Ti steels, Ti alloys, special steels								○	○	○		◐
Cast iron		●	●	●	●			●	●	●	○	○
Al, Al and Mg alloys		○	○	○	○	●	●	◐	◐	◐	◐	●
Copper, brass, bronze		○	○	○	○			●	●	●	◐	●

● recommended ◐ suitable ○ partially suitable

Overview – HSS/HSS-E Milling Tool Range



Description	Miniature milling cutters				3-flute milling cutters				End mills				
No. of flutes	3	3	3	3	3	3	3	3	3	3–4	3	3–4	3
DIN	WN-K	WN-K	WN-L	WN-L	327	327	844-K	844-K	844-K	844-K	844-K	844-L	844-L
Tool type	N	N	N	N	N	N	N	N	VA	W	W	W	W
Cutting material	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co8	HSS Co8	HSS Co8	HSS-E PM	HSS Co8	HSS Co8	HSS Co5	HSS Co8	HSS Co5
Coating		TiAlN		TiAlN		TiAlN		TiAlN	TiN		AlTiN		AlTiN
Part No.	2127	2131	2133	2137	2145	2151	2154	2155	2161	2160	2162	2163	2167
Page	2/17	2/17	2/17	2/17	2/18	2/18	2/19	2/19	2/19	2/20	2/20	2/21	2/21

Material group

Steels up to 850 N/mm²		●	●	●	●	●	●	●	●				
Steels up to 1,000 N/mm²		●	●	●	●	●	●	●	●				
Steels up to 1,400 N/mm²		○	◐	○	◐	○	◐	○	◐				
Steels up to 42 HRc													
Steels up to 52 HRc													
Stainless and acid-resistant steels (INOX)		◐	◐	○	◐		◐	○	◐	●			
Ti steels, Ti alloys, special steels		○	◐	○	◐	○	○	○	◐	●	○		○	
Cast iron		●	●	●	●	●	●	●	●		○		○	
Al, Al and Mg alloys		●	●	●	●	○	◐	◐	○		●	●	●	●
Copper, brass, bronze		●	●	●	●	●	●	●	●		●	●	●	●

● recommended ◐ suitable ○ partially suitable

Overview – HSS/HSS-E Milling Tool Range



Description	End mills – finishing							End mills – roughing/ finishing		
No. of flutes	4–6	4	4–5	4–5	4–6	4–5	4–5	3	4	4
DIN	844-K	844-K	844-K	844-K	844-L	844-L	844-L	844-K	844-K	844-L
Tool type	N	N	N	N	N	N	N	NF	NF	NF
Cutting material	HSS Co8	HSS Co8	HSS-E PM	HSS-E PM	HSS Co8	HSS-E PM	HSS-E PM	HSS Co8	HSS Co5	HSS Co5
Coating		TiAlN	TiAlN	TiN/TiCN		TiAlN	TiN/TiCN	TiAlN		
Part No.	2169	2175	2176	2168	2178	2179	2180	2158	2184	2187
Page	2/22	2/22	2/22	2/23	2/23	2/23	2/24	2/24	2/25	2/25

Material group

Steels up to 850 N/mm²		●	●	●	●	●	●	●	●	●	●
Steels up to 1,000 N/mm²		●	●	●	●	◐	●	●	●	●	●
Steels up to 1,400 N/mm²		◐	●	●	●	◐	●	●	●	●	●
Steels up to 42 HRc											
Steels up to 52 HRc											
Stainless and acid-resistant steels (INOX)			◐	◐	●	○	◐	●		◐	◐
Ti steels, Ti alloys, special steels			○	○	●			●	○		
Cast iron		●	●	●		●	●		●	●	●
Al, Al and Mg alloys		◐	◐	◐					○		
Copper, brass, bronze		◐	◐	◐					○		

● recommended ◐ suitable ○ partially suitable

Overview – HSS/HSS-E Milling Tool Range



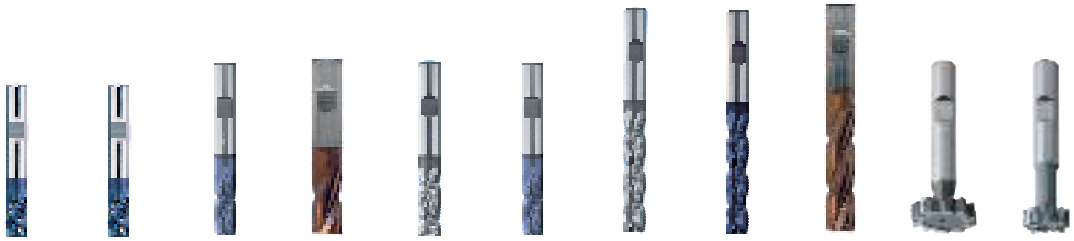
Description	Trapezoidal tooth cutters		End mills – roughing								
No. of flutes	4–6	4–6	3	3	3	3	3	3	4	4	4
DIN	844-K	844-L	844-K	844-K	844-K	844-K	844-K	844-L	844-K	844-K	844-L
Tool type	NF	NF	NR	NR	NR	WR	WR	WR	NR	NR	NR
Cutting material	HSS-E PM	HSS-E PM	HSS Co8	HSS Co8	HSS Co8	HSS Co8	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co5
Coating	TiAlN	TiAlN		TiAlN	TiN		AlCrN	AlCrN		TiAlN	
Part No.	2188	2191	2164	2165	2170	2159	2152	2153	2190	2196	2199
Page	2/25	2/25	2/26	2/26	2/26	2/26	2/27	2/27	2/27	2/27	2/28

Material group

Steels up to 850 N/mm²				●	●					●	●	●
Steels up to 1,000 N/mm²		●	●	●	●					●	●	●
Steels up to 1,400 N/mm²		●	●	●	●					◐	●	◐
Steels up to 42 HRc												
Steels up to 52 HRc												
Stainless and acid-resistant steels (INOX)		●	●		●	●				○	◐	◐
Ti steels, Ti alloys, special steels		●	●		●	●						
Cast iron		●	●		○					●	●	●
Al, Al and Mg alloys					◐		●	●	●			
Copper, brass, bronze					◐		●	●	●			

● recommended ◐ suitable ○ partially suitable

Overview – HSS/HSS-E Milling Tool Range



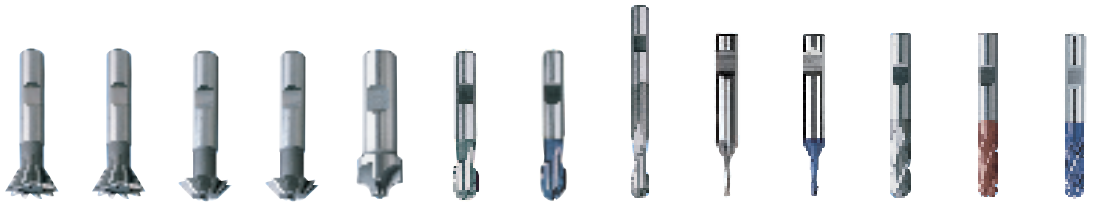
Description	End mills – roughing extra short		End mills – roughing							Woodruff cutters	T-slot cutters
No. of flutes	4	4	4–6	4–6	4–6	4–6	4–6	4	4–6	8–12	6–10
DIN	= 327	= 327	844-K	844-K	844-K	844-K	844-L	844-L	844-L	850-D	851-AB
Tool type	HR	HR	HR	HR	HR	HR	HR	HR	HR	N	N
Cutting material	HSS Co8	HSS-E PM	HSS-E PM	HSS-E PM	HSS Co10	HSS Co10	HSS Co10	HSS-E PM	HSS-E PM	HSS Co5	HSS Co5
Coating	TiAlN	TiAlN	TiAlN	TiCN/TiN		TiAlN		TiAlN	TiCN/TiN		
Part No.	2200	2208	2214	2218	2217	2223	2226	2227	2228	2250	2253
Page	2/28	2/28	2/29	2/29	2/29	2/29	2/30	2/30	2/30	2/31	2/31

Material group

Steels up to 850 N/mm²		●	●		●					●	●
Steels up to 1,000 N/mm²		●	●	●	●	●	●	●	●	◐	●
Steels up to 1,400 N/mm²		●	●	●	●	●	●	◐	●	●	○	◐
Steels up to 42 HRc											
Steels up to 52 HRc											
Stainless and acid-resistant steels (INOX)		●	●	●	●	◐	●	○	◐	●		
Ti steels, Ti alloys, special steels		◐	◐	◐	●	○	◐			●		
Cast iron		●	●	●		●	●	●	●		●	●
Al, Al and Mg alloys												
Copper, brass, bronze												

● recommended ◐ suitable ○ partially suitable

Overview – HSS/HSS-E Milling Tool Range



Description	Dovetail cutters				Ball nose cutters				Ball nose cutters short		Ball nose end mills		Ball nose end mills roughing
No. of flutes	6–16	6–16	6–16	6–16	4–6	2	2	2	3	3	4–6	4–6	4
DIN	1833-C/ 45°	1833-C/ 60°	1833-D/ 45°	1833-D/ 60°	6518–B	1835-B	1835-B	≈ 844-B	1835-B	1835-B	1889-K	1889-K	844-K
Tool type	N	N	N	N	N	N	N	N	N	N	H	H	HR
Cutting material	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co5	HSS Co8	HSS Co8	HSS Co8	HSS Co5	HSS Co5	HSS Co8	HSS Co8	HSS-E
Coating							TiAlN			TiAlN		TiCN	TiAlN
Part No.	2256	2257	2258	2259	2262	2118	2122	2124	2139	2143	2232	2235	2144
Page	2/32	2/32	2/32	2/32	2/32	2/33	2/33	2/33	2/34	2/34	2/34	2/34	2/35

Material group

Steels up to 850 N/mm²		●	●	●	●	●	●	●	●	●	●	●	●	●
Steels up to 1,000 N/mm²		●	●	●	●	●	◐	●	●	●	●	●	●	●
Steels up to 1,400 N/mm²							○	◐	◐	◐	●	◐	●	◐
Steels up to 42 HRc														
Steels up to 52 HRc														
Stainless and acid-resistant steels (INOX)							○	◐		◐	◐	◐	◐	◐
Ti steels, Ti alloys, special steels														
Cast iron		◐	◐	◐	◐	●	●	●	●	●	●	●	●	●
Al, Al and Mg alloys							◐	○	○					
Copper, brass, bronze							●	●	○					

● recommended ◐ suitable ○ partially suitable

Shell End Mills

HSS Co5 | Type N | Type W | DIN 1880 | DIN 138 | 25° | 30° | 10°

format professional quality

2010 Type N
Design: HSS Co5, type N, 25°.
Face and side cutting, relief ground.

2013 Type N TiCN
Design: HSS Co5, TiCN, type N, 25°.
Face and side cutting, relief ground.

2016 Type W
Design: HSS Co5, type W, 25°.
Face and side cutting, relief ground.

Application: Suitable as plain and square shoulder milling cutter.



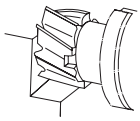
2010



2013 TiCN



2016





Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2010	●	●											
2013	●	●	◐						○		◐		
2016	○											●	◐

Part No.	∅ x width d_1 k 10 x b_1 k 16 mm	2010 mm/min	2013 TiCN mm/min	2016 mm/min	Bore d_2 H7 mm	Flutes 2010/2013	Flutes 2016
0001	40 x 32	30.42	43.55	45.59	16	8	6
0004	50 x 36	40.03	57.27	52.27	22	8	6
0007	63 x 40	55.30	86.34	66.94	27	8	6
0010	80 x 45	82.81	126.87	108.07	27	10	6
0013	100 x 50	131.35	187.44	–	32	12	–
		(200)	(202)	(200)			

Shell End Mills

HSS Co5 | Type NF | Type NR | DIN 1880 | DIN 138 | 25° | 12°

format professional quality

2019 Type NF
Design: HSS Co5, type NF, 25°, slightly roughened teeth.
Face and side cutting, relief ground.

2022 Type NR
Design: HSS Co5, type NR, 25°, teeth roughened.
Face and side cutting, relief ground.

2025 Type NR TiCN
Design: HSS Co5, TiCN, type NR, 25°, teeth roughened.
Face and side cutting, relief ground.

Application: Suitable for surface milling cutter, corner milling cutter and roll milling cutter.





2019



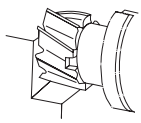


2022





2025 TiCN







Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2019	●	◐							○	○			
2022	●	●	○						◐		◐	◐	◐
2025	●	●	◐						◐	○	◐	○	○

Part No.	∅ x width d_1 js 14 x b_1 k 16 mm	2019 mm/min	2022 mm/min	2025 TiCN mm/min	Bore d_2 H7 mm	Flutes
0001	40 x 32	36.98	36.98	56.15	16	7
0004	50 x 36	49.35	49.35	74.86	22	8
0007	63 x 40	60.39	60.10	90.70	27	8
0010	80 x 45	87.39	91.83	122.19	27	10
0013	100 x 50	134.96	134.64	187.39	32	12
		(200)	(200)	(202)		

Shell End Mills

2028
Type HR

Design: HSS Co8, type HR, 25°, fine sinusoidal tooth form. Face and side cutting, relief ground.

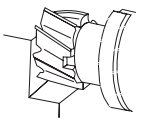
2031
Type HR
TiCN

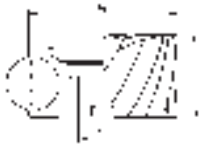
Design: HSS Co8, TiCN, type HR, 25°, fine sinusoidal tooth form. Face and side cutting, relief ground.

Application: Suitable as plain, corner and cylindrical cutter.

HSS Co8 | Type HR | DIN 1880 | DIN 138 | 25° | 10°

format professional quality







2028



2031
TiCN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2028	●	●	●						○	○	◐		
2031	●	●	●						◐	◐	●		

Part No.	∅ x width d_1 js 14 x b_1 k 16 mm	2028 mm/z	2031 TiCN mm/z	Bore d_2 H7 mm	Flutes
0001	40 x 32	47.98	65.78	16	7
0004	50 x 36	64.00	84.79	22	8
0007	63 x 40	86.18	116.33	27	8
0010	80 x 45	119.84	144.79	27	10
0013	100 x 50	164.87	206.28	32	12
		(200)	(202)		

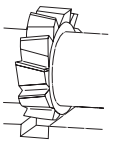
Side and Face Milling Cutters

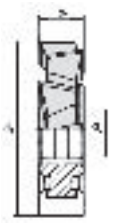
Design: HSS Co5, type N, crossed toothing.

Application: Suitable as plain, angular or cylindrical milling cutter.

HSS Co5 | Type N | DIN 885-A | DIN 138 | 12°

format professional quality









Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2049	●	○											

Part No.	∅ x width d_1 js 16 x b_1 k 11 mm	2049 mm/z	Bore d_2 H7 mm	Flutes
0001	50 x 4	39.15	16	10
0004	50 x 5	40.45	16	10
0007	50 x 6	41.09	16	10
0010	50 x 8	46.29	16	10
0013	50 x 10	48.91	16	10
0019	63 x 5	46.29	22	12
0022	63 x 6	46.29	22	12
0025	63 x 8	50.86	22	12
0028	63 x 10	57.40	22	12
0031	63 x 12	63.92	22	12
0040	80 x 5	59.35	27	14
0043	80 x 6	60.64	27	14
0046	80 x 8	64.56	27	14
0049	80 x 10	65.89	27	14
0052	80 x 12	75.00	27	14
0058	80 x 16	92.61	27	14
0067	100 x 6	80.23	32	16
0070	100 x 8	87.40	32	16
0073	100 x 10	93.26	32	16
		(204)		

Part No.	∅ x width d_1 js 16 x b_1 k 11 mm	2049 mm/z	Bore d_2 H7 mm	Flutes
0076	100 x 12	99.78	32	16
0079	100 x 14	112.17	32	16
0082	100 x 16	118.04	32	16
0085	100 x 18	139.56	32	16
0088	100 x 20	138.26	32	16
0094	125 x 8	116.08	32	16
0097	125 x 10	125.88	32	16
0100	125 x 12	135.65	32	16
0103	125 x 14	152.62	32	16
0106	125 x 16	161.76	32	16
0109	125 x 18	176.09	32	16
0112	125 x 20	186.53	32	16
0115	160 x 10	186.53	40	18
0118	160 x 12	208.69	40	18
0121	160 x 14	220.41	40	18
0124	160 x 16	236.10	40	18
0127	160 x 18	263.47	40	18
0130	160 x 20	268.70	40	18
		(204)		

Narrow Side and Face Cutters

Design: HSS Co5, type N, form A, crossed toothing.

Application: For cutting of slots and grooves. High accuracy and excellent milling performance.



HSS Co5 | Type N | DIN 1834-A | DIN 138 | 12°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2043	●	●	○								●	○	○

Part No.	ø x width js 16 k 11 d_1 b_1 mm	2043 mm/min	Bore d_2 H7 mm	Flutes
0001	63 x 1.6	40.33	22	28
0004	63 x 2.0	40.33	22	28
0007	63 x 2.5	40.33	22	28
0010	63 x 3.0	40.33	22	28
0013	63 x 4.0	40.33	22	28
0016	80 x 1.6	40.33	27	32
0019	80 x 2.0	40.33	27	32
0022	80 x 2.5	40.33	27	32
0025	80 x 3.0	40.33	27	32
0028	80 x 4.0	40.33	27	32

(204)

Part No.	ø x width js 16 k 11 d_1 b_1 mm	2043 mm/min	Bore d_2 H7 mm	Flutes
0031	100 x 1.6	59.48	32	36
0034	100 x 2.0	56.77	32	36
0037	100 x 2.5	58.35	32	36
0040	100 x 3.0	59.94	32	36
0043	100 x 4.0	65.14	32	36
0046	100 x 5.0	70.28	32	36
0049	125 x 1.6	73.37	32	40
0052	125 x 2.0	73.37	32	40
0055	125 x 2.5	75.51	32	40
0058	125 x 3.0	78.53	32	40

(204)

Part No.	ø x width js 16 k 11 d_1 b_1 mm	2043 mm/min	Bore d_2 H7 mm	Flutes
0061	125 x 4.0	83.77	32	40
0064	125 x 5.0	92.03	32	40
0067	125 x 6.0	100.25	32	40
0070	160 x 2.0	122.73	40	48
0073	160 x 2.5	122.73	40	48
0076	160 x 3.0	125.30	40	48
0079	160 x 4.0	132.48	40	48
0082	160 x 5.0	139.99	40	48
0085	160 x 6.0	148.36	40	48
0088	160 x 8.0	173.11	40	36

(204)

Convex Milling Cutters

Design: HSS, **convex** relieved milling cutter.

Application: For cutting of semicircular grooves.

HSS | DIN 856 | 8° | DIN 138

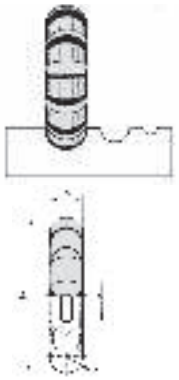
format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2052	●	◐									●	○	○

Part No.		0001	0004	0007	0010	0013	0016	0019	0022	0025
Radius r H 11	mm	1	1.5	2	2.5	3	3.5	4	4.5	5
2052	mm/min	37.28	37.69	41.71	43.29	47.56	55.05	50.13	62.46	61.46
ø d_1	mm	50	50	50	63	63	63	63	63	63
Width b	mm	2	3	4	5	6	7	8	9	10
Bore d_2 H7	mm	16	16	16	22	22	22	22	22	22
Flutes		14	14	14	12	12	12	12	12	12

Part No.		0028	0031	0034	0037	0040	0043	0046	0049	0052
Radius r H 11	mm	5.5	6	6.5	7	7.5	8	8.5	9	10
2052	mm/min	77.97	71.35	94.60	95.04	80.15	100.82	130.65	131.01	137.23
ø d_1	mm	80	80	80	80	80	80	100	100	100
Width b	mm	11	12	13	14	15	16	17	18	20
Bore d_2 H7	mm	27	27	27	27	27	27	32	32	32
Flutes		12	12	12	12	12	12	12	12	12

(204)





Concave Milling Cutters

Design: Concave relieved milling cutter, HSS.

Application: For cutting of semicircular grooves and rounding off edges.

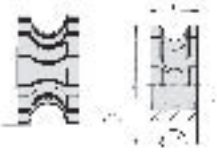
HSS | DIN 855 | 8° | DIN 138

format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2055	●	◐									●	○	○

Part No.		0001	0004	0007	0010	0013	0016	0019	0022
Radius r H 11	mm	1	2	3	4	5	6	8	10
2055	mm/min	51.38	54.33	61.76	68.55	74.15	93.07	121.34	154.94
ø d_1	mm	50	50	63	63	63	80	80	100
Width b	mm	6	9	12	16	20	24	32	36
Bore d_2 H7	mm	16	16	22	22	22	27	27	32
Flutes		14	14	12	12	12	12	12	12

(204)





Bore Mills

Double Equal-Angle Milling Cutters

Design: HSS, type H, straight fluting, cuts peripherally.

Application: For milling prism-shaped openings, notches etc.

HSS | Type H | DIN 847 | 0° | DIN 138

format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2058	●	◐									●	○	○

Part No.		0001	0004	0007	0010	0013	0016
Angle α	°	45	45	45	45	60	60
2058	mm/min	40.35	46.95	64.60	94.25	40.35	46.95
∅ d_1	mm	50	63	80	100	50	63
Width b	mm	8	10	12	18	10	14
Bore d_2 H7	mm	16	22	27	32	16	22
Number of teeth		22	24	26	28	18	20

Part No.		0019	0022	0025	0028	0031	0034
Angle α	°	60	60	90	90	90	90
2058	mm/min	64.60	100.90	41.01	50.45	69.99	109.73
∅ d_1	mm	80	100	50	63	80	100
With b	mm	18	25	14	20	22	32
Bore d_2 H7	mm	27	32	16	22	27	32
Number of teeth		22	24	16	18	20	24

(204)





Single Angle Milling Cutters

Design: HSS, type H, straight fluting, cuts peripherally and on front edge.

Application: Suitable for milling angled openings to DIN 69052 in tool and machine construction.

HSS | Type H | DIN 842A | 0° | DIN 138

format professional quality

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2061	●	◐									●	○	○

Part No.		0001	0004	0007	0010	0013	0016	0019	0022
Angle α	°	45	45	45	45	60	60	60	60
2061	mm/min	39.02	47.84	61.93	90.88	47.84	61.93	90.88	136.72
∅ d_1	mm	40	50	63	80	50	63	80	100
With b	mm	10	13	18	22	16	20	25	32
Bore d_2 H7	mm	10	13	16	22	13	16	22	27
Number of teeth		14	16	18	20	16	18	20	22

(204)





Single Flute Milling Cutters

2100 **Design:** HSS Co5, type W, with one cutting edge, outer diameter and face cutting.

For duplication lathes, e.g. Elu, Haffner, Rotox, Striffler, Wegoma etc.

2103 TiN2 **Design:** HSS Co5, TiN2, type W, with one cutting edge, outer diameter and face cutting.

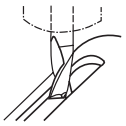
For duplication lathes, e.g. Elu, Haffner, Rotox, Striffler, Wegoma etc.

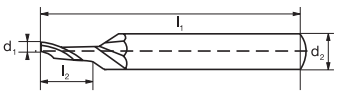
Application: For milling slots and grooves on windows and doors and other aluminium and plastic profiles.

HSS Co5 | Type W | 1 F | Factory standard

30°

format professional quality





2100



2103 TiN2



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2100												●	
2103												●	

Part No.	Cutting ∅ j 16 mm	2100 mm/min	2103 TiN2 mm/min	Cut length mm	Total length mm	Length of shank mm
0300	3	5.98	9.13	12	60	8
0400	4	5.98	9.13	12	60	8
0500	5	5.98	9.13	12	60	8
		(206)	(208)			

Part No.	Cutting ∅ j 16 mm	2100 mm/min	2103 TiN2 mm/min	Cut length mm	Total length mm	Length of shank mm
0600	6	6.30	9.35	14	60	8
0700	8	6.68	9.83	14	80	8
0800	10	9.28	11.32	14	80	8
		(206)	(208)			

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

2 Flute Slot Drills

2106 **Design:** HSS Co8, type N, with centre cut.

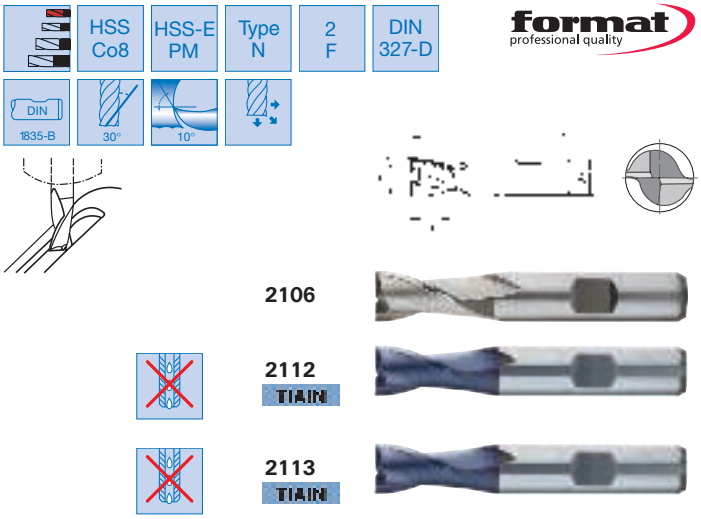
2112 TiAlN **Design:** HSS Co8, TiAlN, type N, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

2113 TiAlN **Design:** HSS-E PM, TiAlN, type N, with centre cut.

HSS-E-PM distinguishes through high tenacity (increased edge stability and wear resistance) and longer service life.

Application: Suitable for milling wedge and feather key grooves ∅ e8 for fit P9.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2106	●	●	◐						○	○	●	◐	●
2112	●	●	●						○	○	●	◐	●
2113	●	●	●						◐	○	●	◐	●

Part No.	∅ d_1 = e 8 mm	2106 mm	2112 TiAlN mm	2113 TiAlN mm	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 mm
0100	1.0*°	7.62	–	–	2.5	47	6
0150	1.5*°	7.17	–	–	3	47	6
0200	2.0	3.51	8.40	9.78	4	48	6
0250	2.5	3.51	9.01	10.99	5	49	6
0280	2.8*	3.91	9.08	–	5	49	6
0300	3.0	3.21	6.35	9.78	5	49	6
0350	3.5*	3.47	8.40	10.99	6	50	6
0380	3.8*	3.95	9.47	–	7	51	6
0400	4.0	3.47	6.35	9.78	7	51	6
0450	4.5*	3.21	7.24	10.99	7	51	6
0480	4.8*	4.66	9.47	–	8	52	6
0500	5.0	3.47	6.73	9.78	8	52	6
0550	5.5*	3.95	7.24	10.99	8	52	6
0575	5.75*	4.32	9.47	–	8	52	6
0600	6.0	3.40	6.73	10.63	8	52	6
0650	6.5*	4.57	10.51	–	10	60	10
0675	6.75*	4.93	–	–	10	60	10
0700	7.0	4.76	10.51	–	10	60	10
0750	7.5*	4.76	10.51	–	10	60	10
0775	7.75	4.76	11.46	–	11	61	10
0800	8.0	4.65	8.82	13.15	11	61	10
0850	8.5*	5.19	11.52	–	11	61	10
0870	8.7*	5.19	–	–	11	61	10
0900	9.0*	6.19	11.52	–	11	61	10
0950	9.5*	6.19	–	–	11	61	10
0970	9.7*	6.19	13.10	–	13	63	10
		(206)	(208)	(208)			

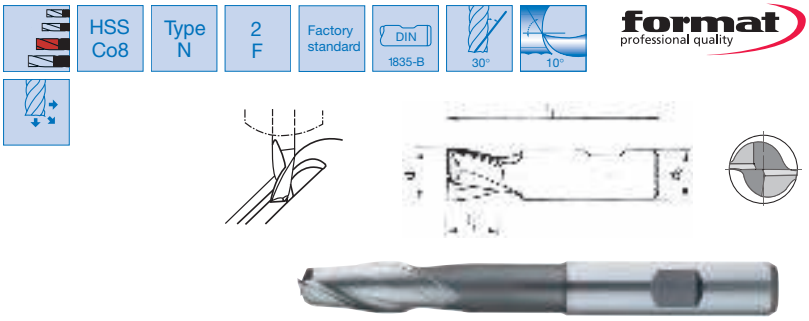
Part No.	∅ d_1 = e 8 mm	2106 mm	2112 TiAlN mm	2113 TiAlN mm	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 mm
1000	10.0	5.04	13.10	15.52	13	63	10
1050	10.5*	8.21	16.97	–	13	70	12
1100	11.0*	7.48	16.97	–	13	70	12
1170	11.7*	8.21	18.08	–	16	73	12
1200	12.0	6.67	12.14	20.68	16	73	12
1270	12.7*	9.98	–	–	16	73	12
1300	13.0*	9.41	14.89	–	16	73	12
1370	13.7*	11.59	–	–	16	73	12
1400	14.0	8.74	14.74	24.84	16	73	12
1450	14.5	13.45	–	–	16	73	12
1500	15.0*	10.59	21.51	–	16	73	12
1570	15.7*	14.35	–	–	19	79	16
1600	16.0	9.76	18.78	27.64	19	79	16
1650	16.5	14.77	–	–	19	79	16
1700	17.0*	12.88	25.79	–	19	79	16
1770	17.7*	16.37	–	–	19	79	16
1800	18.0	13.29	24.86	33.70	19	79	16
1900	19.0*	14.46	–	–	19	79	16
1970	19.7*	18.76	–	–	22	88	20
2000	20.0	14.40	26.48	43.79	22	88	20
2170	21.0*	25.18	–	–	22	88	20
2200	22.0	19.02	–	–	22	88	20
2370	23.7*	26.55	–	–	26	102	25
2400	24.0	23.65	–	–	26	102	25
2500	25.0	23.65	–	–	26	102	25
		(206)	(208)	(208)			

* = Cutting ∅ Tolerance h 10
° = Factory standard

2 Flute Slot Drills

Design: HSS Co8, type N. Total length similar to DIN 844-L. Cutting edge length according to DIN 844 short, with centre cut.

Application: Suitable for milling wedge and feather key grooves ⌀ e8 for fit P9.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2115	●	●	●								○	◐	◐

Part No.	⌀ d_1 = e 8 mm	2115	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0200	2.0	8.54	7	54	6
0250	2.5	7.28	8	54	6
0300	3.0	6.14	8	56	6
0350	3.5*	7.25	10	59	6
0400	4.0	6.42	11	63	6
0450	4.5*	7.48	11	63	6
0500	5.0	6.19	13	68	6
0550	5.5*	7.40	13	68	6
0600	6.0	6.76	13	68	6
0650	6.5*	8.99	16	80	10
0700	7.0	9.01	16	80	10
0750	7.5*	9.08	16	80	10
0800	8.0	7.84	19	88	10
0850	8.5*	10.25	19	88	10
0900	9.0*	9.20	19	88	10

* = Cutting ⌀ Tolerance h 10

(206)

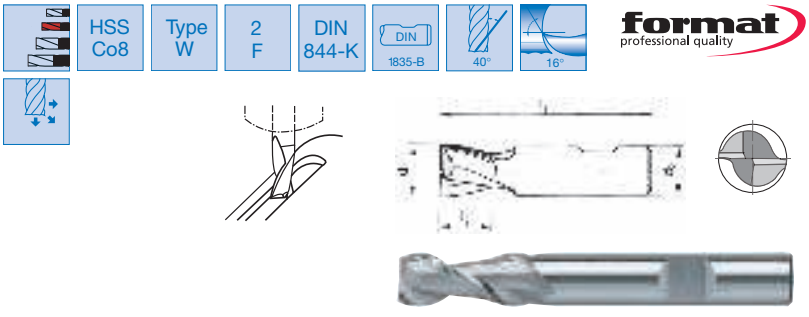
Part No.	⌀ d_1 = e 8 mm	2115	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0950	9.5*	8.95	19	88	10
1000	10.0	8.55	22	95	10
1100	11.0*	10.56	22	102	12
1200	12.0	9.22	26	110	12
1300	13.0*	14.04	26	110	12
1400	14.0	12.43	26	110	12
1500	15.0*	15.98	26	110	12
1600	16.0	15.68	32	123	16
1700	17.0*	18.35	32	123	16
1800	18.0	18.09	32	123	16
1900	19.0*	19.64	32	123	16
2000	20.0	19.60	38	141	20
2200	22.0	31.64	38	141	20
2400	24.0	39.72	45	166	25
2500	25.0	39.72	45	166	25

(206)

2 Flute Slot Drills for Aluminium

Design: HSS Co8, type W. Dimensions according to DIN 844 short, with centre cut.

Application: For plunge, groove and profile milling.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2116	○									◐	○	●	●

Part No.	⌀ d_1 = e 8 mm	2116	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0200	2.0	7.48	7	51	6
0250	2.5	7.48	8	52	6
0300	3.0	7.48	8	52	6
0350	3.5	7.48	10	54	6
0400	4.0	7.48	11	55	6
0450	4.5	7.48	11	55	6
0500	5.0	7.48	13	57	6
0550	5.5	7.48	13	57	6
0600	6.0	7.48	13	57	6
0650	6.5	9.84	16	66	10
0700	7.0	9.84	16	66	10

(206)

Part No.	⌀ d_1 = e 8 mm	2116	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0750	7.5	9.84	16	66	10
0800	8.0	9.84	19	69	10
0850	8.5	9.84	19	69	10
0900	9.0	9.84	19	69	10
1000	10.0	9.84	22	72	10
1200	12.0	12.29	26	83	12
1400	14.0	15.21	26	83	12
1600	16.0	17.05	32	92	16
1800	18.0	21.08	32	92	16
2000	20.0	24.44	38	104	20

(206)

2-Flute Slot Drills

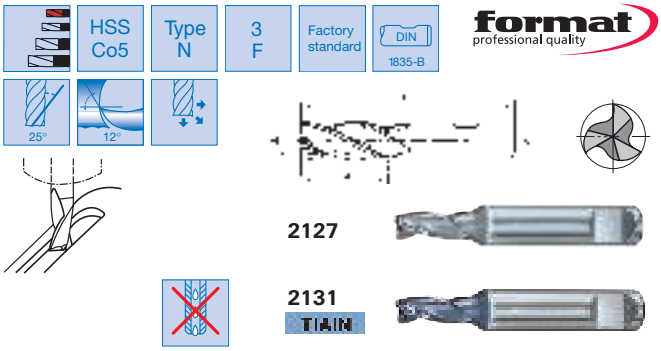
2127 **Design:** HSS Co5, type N, with cutting geometry for universal use and centre cutting, very short.

2131 TiAlN **Design:** HSS Co5, TiAlN, type N, universally applicable blade geometry and centre cutting, extra short.

Cutting speed approx. 50 % higher compared to uncoated tools. Dry machining possible.

Application: For machining keyways to fit P9 and for general milling applications in normal to hard materials.

HSS Co5 | Type N | 3 F | Factory standard | DIN 1835-B | format professional quality



Note: Not suitable for regrinding.

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2127	●	●	○						◐	○	●	●	●
2131	●	●	◐						◐	◐	●	●	●

Part No.	∅ d_1 = e 8 mm	2127	2131 TiAlN	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0100	1.0	8.87	–	2	34	6
0150	1.5	4.21	6.74	3	34	6
0180	1.8	4.21	–	3	34	6
0200	2.0	3.69	6.74	4	35	6
0230	2.3	3.69	–	4	36	6
0250	2.5	3.69	6.74	5	36	6
0280	2.8	3.69	6.74	5	36	6
0300	3.0	3.69	6.74	5	36	6
0330	3.3	3.69	–	5	36	6
0350	3.5	3.69	–	6	37	6
0380	3.8	3.69	–	7	38	6
0400	4.0	3.69	6.74	7	38	6
0430	4.3	3.69	–	7	38	6
		(206)	(208)			

Part No.	∅ d_1 = e 8 mm	2127	2131 TiAlN	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0450	4.5	3.69	–	7	38	6
0480	4.8	3.69	–	8	39	6
0500	5.0	3.69	6.74	8	39	6
0530	5.3	3.69	–	8	39	6
0550	5.5	3.69	–	8	39	6
0575	5.75	3.69	–	8	39	6
0600	6.0	3.69	6.74	8	39	6
0700	7.0	4.86	–	10	42	8
0750	7.5	4.86	–	10	42	8
0800	8.0	4.86	8.37	11	43	8
0900	9.0	5.45	–	11	48	10
1000	10.0	5.45	8.37	13	50	10
		(206)	(208)			

Slot Drills

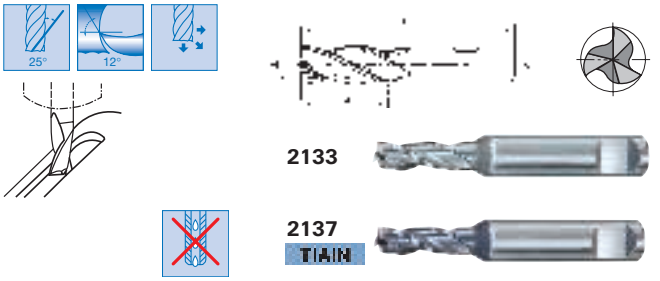
2133 **Design:** HSS Co5, type N, universally applicable blade geometry and centre cutting, extra short.

2137 TiAlN **Design:** HSS Co5, TiAlN, type N, universally applicable blade geometry and centre cutting, short.

Cutting speed approx. 50 % higher compared to uncoated tools. Dry machining possible.

Application: For machining keyways ∅ e8 to fit P9.

HSS Co5 | Type N | 3 F | Factory standard | DIN 1835-B | format professional quality



Note: Not suitable for regrinding operations.

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2133	●	●	○						○	○	●	●	●
2137	●	●	◐						◐	◐	●	●	●

Part No.	∅ d_1 = e 8 mm	2133	2137 TiAlN	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0200	2.0	4.21	7.21	7	38	6
0250	2.5	4.21	7.21	8	39	6
0300	3.0	4.21	7.21	8	39	6
0350	3.5	4.21	–	10	41	6
0400	4.0	4.21	7.21	11	42	6
0450	4.5	4.21	–	11	42	6
0500	5.0	4.21	7.21	13	44	6
		(206)	(208)			

Part No.	∅ d_1 = e 8 mm	2133	2137 TiAlN	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0550	5.5	4.21	–	13	44	6
0600	6.0	4.21	7.21	13	44	6
0700	7.0	5.28	–	16	48	8
0800	8.0	5.28	8.99	19	51	8
0900	9.0	6.03	–	19	56	10
1000	10.0	6.03	10.36	22	59	10
		(206)	(208)			

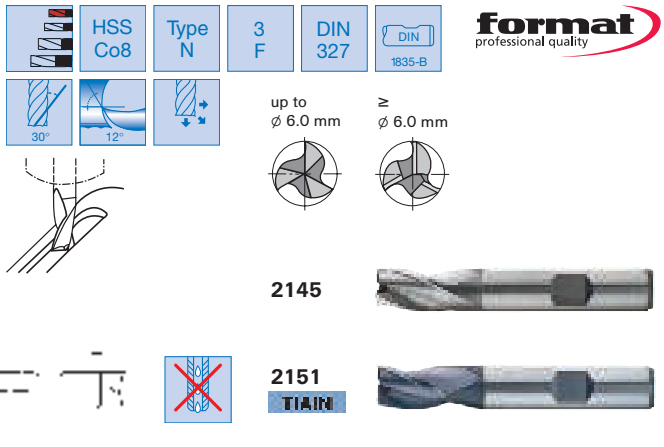
3 Flute Slot Drills

2145 **Application:** HSS Co8, type N, with centre cutting.

2151 TiAlN **Design:** HSS Co8, TiAlN, type N, with centre cutting.

Cutting speed approx. 50 % compared with uncoated tools. Dry machining possible.

Application: Suitable for milling wedge and feather key grooves ⌀ e8 for fit P9 or for profile milling.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2145	●	●	●							○	●	○	●
2151	●	●	●						◐	○	●	◐	●

Part No.	⌀ d_1 = e 8 mm	2145	2151 TiAlN	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0150	1.5*	5.87 (208)	–	3	47	6
0200	2.0	4.32 (206)	7.48 (208)	4	48	6
0250	2.5	4.80 (206)	7.72 (208)	5	49	6
0300	3.0	4.17 (206)	7.72 (208)	5	49	6
0350	3.5*	5.24 (206)	7.75 (208)	6	50	6
0400	4.0	4.17 (206)	7.75 (208)	7	51	6
0450	4.5*	4.80 (206)	7.75 (208)	7	51	6
0500	5.0	4.31 (206)	8.44 (208)	8	52	6
0550	5.5*	5.24 (206)	7.94 (208)	8	52	6
0600	6.0	4.31 (206)	8.44 (208)	8	52	6
0650	6.5*	6.98 (206)	9.98 (208)	10	60	10
0700	7.0	6.84 (206)	9.57 (208)	10	60	10
0750	7.5*	6.98 (206)	–	10	60	10
0800	8.0	6.09 (206)	10.40 (208)	11	61	10
0850	8.5*	7.16 (206)	12.64 (208)	11	61	10
0900	9.0*	7.52 (206)	11.98 (208)	11	61	10
0950	9.5*	7.48 (206)	–	11	61	10
1000	10.0	5.81 (206)	10.62 (208)	13	63	10
1100	11.0*	8.55 (206)	14.80 (208)	13	70	12
1200	12.0	7.62 (206)	12.97 (208)	16	73	12
1300	13.0*	11.14 (206)	20.70 (208)	16	73	12
1400	14.0	10.83 (206)	18.30 (208)	16	73	12
1500	15.0*	11.60 (206)	19.81 (208)	16	73	12
1600	16.0	10.43 (206)	18.41 (208)	19	79	16
1800	18.0	14.64 (206)	27.22 (208)	19	79	16
2000	20.0	16.44 (206)	27.22 (208)	22	88	20
2200	22.0	25.57 (206)	–	22	88	20
2400	24.0	29.74 (206)	–	26	102	25
2500	25.0	29.61 (206)	–	26	102	25
2600	26.0*	42.59 (206)	–	26	102	25
2800	28.0	43.14 (206)	–	26	102	25
3000	30.0*	49.55 (206)	–	26	102	25
3200	32.0	53.02 (206)	–	32	112	32

* = Cutting ⌀ Tolerance h 10

3 Flute End Mills

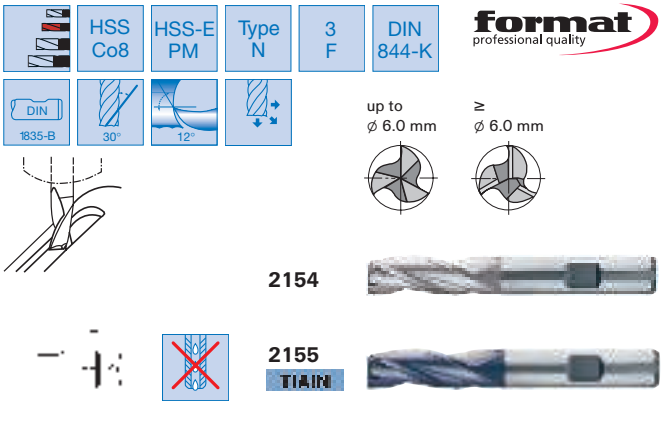
2154 **Design:** HSS Co8, type N, with centre cutting.

2155 TiAlN **Design:** HSS-E-PM, TiAlN, type N, with centre cutting.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

HSS-E-PM distinguishes through high tenacity (increased edge stability and wear resistance) and longer service life.

Application: Suitable for milling wedge and feather key grooves ∅ e8 for fit P9 or for profile milling.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2154	●	●	●						○	○	●	◐	●
2155	●	●	●						◐	◐	●	○	●

Part No.	∅ d_1 = e 8 mm	2154 mm/min	2155 TiAlN mm/min	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0300	3.0	5.86	10.43	8	52	6
0350	3.5*	5.86	10.64	10	54	6
0400	4.0	5.86	10.43	11	55	6
0450	4.5*	5.86	10.64	11	55	6
0500	5.0	5.86	10.43	13	57	6
0550	5.5*	5.86	10.64	13	57	6
0600	6.0	5.86	10.43	13	57	6
0650	6.5*	7.84	15.01	16	66	10
0700	7.0	7.84	15.37	16	66	10
0750	7.5*	7.84	–	16	66	10
0800	8.0	7.84	15.09	19	69	10
0850	8.5*	7.84	16.65	19	69	10
0900	9.0	7.84	15.55	19	69	10
0950	9.5*	7.84	–	19	69	10
		(206)	(208)			

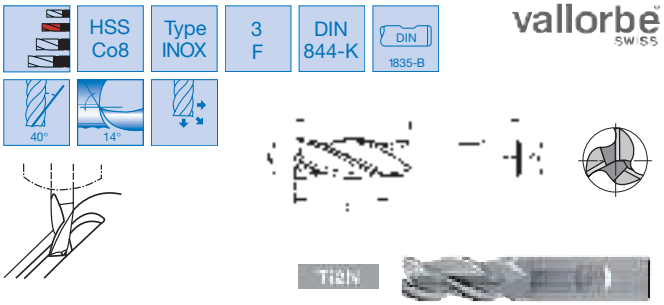
Part No.	∅ d_1 = e 8 mm	2154 mm/min	2155 TiAlN mm/min	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
1000	10.0	7.84	16.70	22	72	10
1100	11.0*	–	21.99	22	79	12
1200	12.0	10.39	21.34	26	83	12
1300	13.0*	–	26.70	26	83	12
1400	14.0	11.60	26.47	26	83	12
1500	15.0*	–	27.99	26	83	12
1600	16.0	13.66	28.53	32	92	16
1800	18.0	17.51	34.85	32	92	16
2000	20.0	20.89	42.93	38	104	20
2200	22.0	23.29	–	38	104	20
2500	25.0	33.58	–	45	121	25
2800	28.0	52.89	–	45	121	25
3000	30.0*	56.64	–	45	121	25
3200	32.0	63.91	–	53	133	32
		(206)	(208)			

* = Cutting ∅ Tolerance h 10

3 Flute End Mills for INOX

Design: HSS Co8, type VA, **"Vallorbinox"**, with centre cutting.

Application: Suitable for milling wedge and feather key grooves ∅ e8 for fit P9 or for profile milling, for all stainless steels and for processing of titanium alloys.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2161									●	●			

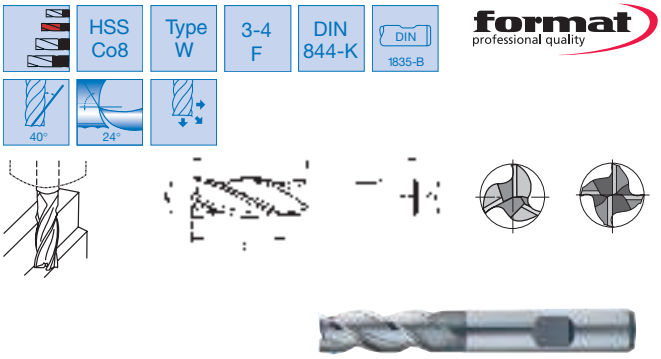
Part No.	∅ d_1 = e 8 mm	2161 TiAlN mm/min	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0200	2.0	12.61	7	51	6
0300	3.0	12.61	8	52	6
0400	4.0	12.61	11	55	6
0500	5.0	12.61	13	57	6
0600	6.0	17.41	13	57	6
0800	8.0	25.35	19	69	10
		(209)			

Part No.	∅ d_1 = e 8 mm	2161 TiAlN mm/min	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
1000	10.0	28.28	22	72	10
1200	12.0	32.20	26	83	12
1400	14.0	38.42	26	83	12
1600	16.0	43.79	32	92	16
2000	20.0	52.70	38	104	20
2500	25.0	78.91	45	121	25
		(209)			

End Mills for Aluminium

Design: HSS Co8, type W, with special cutting geometry and centre cutting.

Application: Suitable for profile and slot milling of soft to hard, long-chipping material such as aluminium, Cu alloys and thermoplastics.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2160										○	○	●	●

Part No.	∅ d_1 = k 10 mm	2160	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
0300	3.0	7.05	8	52	6	3
0400	4.0	7.28	11	55	6	3
0500	5.0	7.56	13	57	6	3
0600	6.0	7.73	13	57	6	3
0700	7.0	7.94	16	66	10	3
0800	8.0	8.40	19	69	10	3
0900	9.0	8.95	19	69	10	3
1000	10.0	9.19	22	72	10	3

(206)

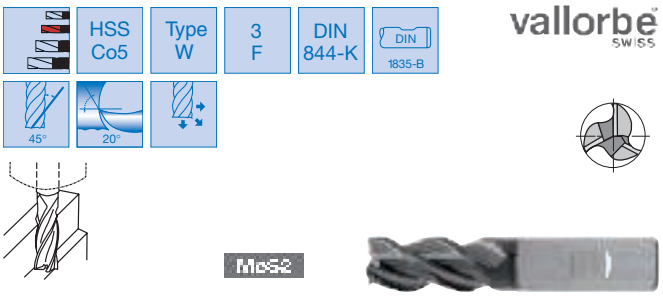
Part No.	∅ d_1 = k 10 mm	2160	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
1200	12.0	10.46	26	83	12	3
1400	14.0	11.89	26	83	12	3
1600	16.0	12.30	32	92	16	3
1800	18.0	21.77	32	92	16	3
2000	20.0	21.35	38	104	20	3
2200	22.0	25.43	38	104	20	3
2400	24.0	30.31	45	121	25	3
2500	25.0	31.44	45	121	25	4

(206)

Aluminium Multi-flute End Mills

Design: HSS Co5, **"Granit-Al"**, type W, centre cutting.

Application: Suitable for profile and slot milling of soft material such as aluminium alloys with low silicone content, copper, bronze, brass and plastics.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2162												●	●

Part No.	∅ d_1 = k 10 mm	2162	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0200	2.0	13.38	7	51	6
0300	3.0	13.38	8	52	6
0400	4.0	13.38	11	55	6
0500	5.0	13.38	13	57	6
0600	6.0	21.40	13	57	6
0800	8.0	28.28	19	69	10
1000	10.0	30.00	22	72	10

(209)

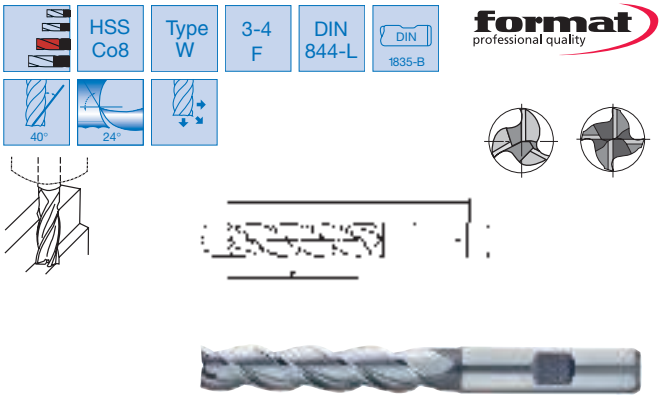
Part No.	∅ d_1 = k 10 mm	2162	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
1200	12.0	38.99	26	83	12
1400	14.0	49.40	26	83	12
1600	16.0	52.70	32	92	16
1800	18.0	64.88	32	92	16
2000	20.0	77.84	38	104	20
2500	25.0	112.08	45	121	25

(209)

End Mills for Aluminum

Design: HSS Co8, type W, with special cutting geometry and centre cutting.

Application: Suitable for profile and slot milling of soft to hard, long-chipping material such as aluminium, Cu alloys and thermoplastics.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2163										○	○	●	●

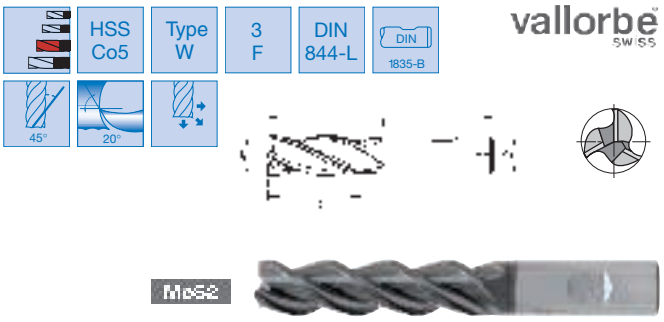
Part No.	∅ d_1 = k 10 mm	2163 mm	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
0600	6.0	9.07	24	68	6	3
0800	8.0	9.88	38	88	10	3
1000	10.0	10.79	45	95	10	3
1200	12.0	12.26	53	110	12	3
1400	14.0	13.90	53	110	12	3
1600	16.0	14.40	63	123	16	3
		(206)				

Part No.	∅ d_1 = k 10 mm	2163 mm	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
1800	18.0	18.89	63	123	16	3
2000	20.0	23.05	75	141	20	3
2200	22.0	31.82	75	141	20	3
2400	24.0	33.89	90	166	25	3
2500	25.0	41.60	90	166	25	4
		(206)				

End Mills for Aluminium

Design: HSS Co5, **"Granit-Al"**, type W, centre cutting.

Application: Suitable for profile and slot milling of soft material such as aluminium alloys with low silicone content, copper, bronze, brass and plastics.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2167												●	●

Part No.	∅ d_1 = k 10 mm	2167 mm	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0600	6.0	26.64	24	68	6
0800	8.0	35.68	38	88	10
1000	10.0	37.52	45	95	10
1200	12.0	48.89	53	110	12
		(209)			

Part No.	∅ d_1 = k 10 mm	2167 mm	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
1400	14.0	61.49	53	110	12
1600	16.0	66.10	63	123	16
2000	20.0	97.16	75	141	20
2500	25.0	139.92	90	166	25
		(209)			

End Mills

2169 **Design:** HSS Co8, type N, up to 28 mm with centre cutting.

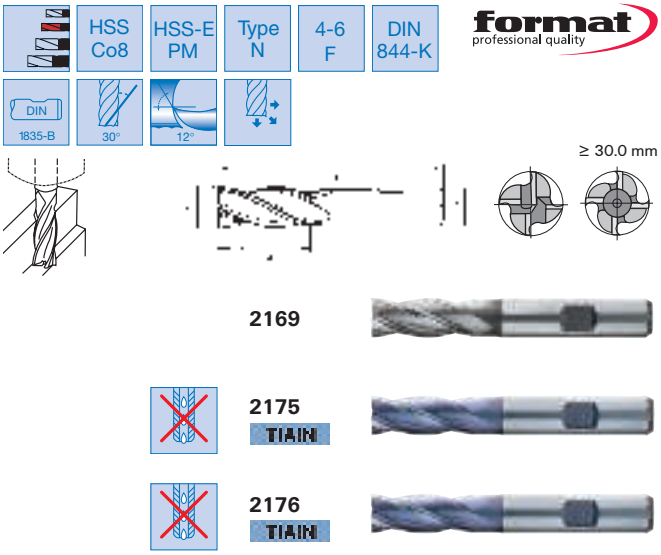
2175 TiAlN **Design:** HSS Co8, TiAlN, type N, up to 28 mm with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools.

2176 TiAlN **Design:** HSS-E PM, TiAlN, type N, up to 28 mm with centre cut.

HSS-E-PM distinguishes by high tenacity (increased edge stability and wear resistance) and longer service life.

Application: Finishing mill for profile and face milling.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2169	●	●	◐								●	◐	◐
2175	●	●	●						◐	○	●	◐	◐
2176	●	●	●						◐	○	●	◐	◐

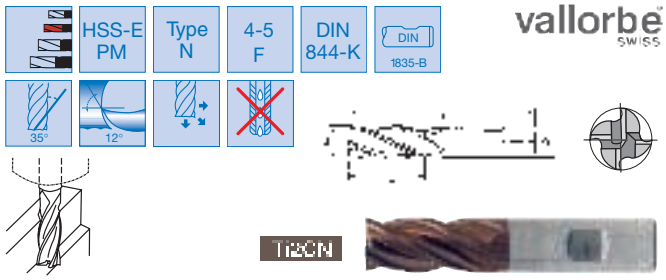
Part No.	∅ d_1 = k 10 mm	2169	2175 TiAlN	2176 TiAlN	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
0300	3.0	4.25	7.30	9.82	8	52	6	4
0350	3.5	4.25	–	–	10	54	6	4
0400	4.0	3.86	7.30	9.82	11	55	6	4
0450	4.5	4.25	–	–	11	55	6	4
0500	5.0	3.86	7.30	9.82	13	57	6	4
0550	5.5	4.25	–	–	13	57	6	4
0600	6.0	3.61	7.30	9.82	13	57	6	4
0650	6.5	5.00	–	–	16	66	10	4
0700	7.0	5.00	8.40	–	16	66	10	4
0750	7.5	5.00	–	–	16	66	10	4
0800	8.0	4.42	8.40	13.66	19	69	10	4
0850	8.5	5.41	–	–	19	69	10	4
0900	9.0	5.44	10.39	–	19	69	10	4
0950	9.5	5.41	–	–	19	69	10	4
1000	10.0	5.12	9.62	14.40	22	72	10	4
1050	10.5	7.40	–	–	22	79	12	4
1100	11.0	7.40	–	–	22	79	12	4
1150	11.5	7.40	–	–	22	79	12	4
1200	12.0	7.10	12.01	17.02	26	83	12	4
1300	13.0	10.71	18.97	–	26	83	12	4
1400	14.0	9.54	18.97	23.13	26	83	12	4
1500	15.0	10.83	19.79	–	26	83	12	4
1600	16.0	9.88	18.36	26.30	32	92	16	4
1800	18.0	12.44	23.80	34.37	32	92	16	4
2000	20.0	13.35	24.97	38.92	38	104	20	4
2200	22.0	19.12	–	–	38	104	20	5
2400	24.0	23.33	–	–	45	121	25	5
2500	25.0	23.33	–	57.87	45	121	25	5
2600	26.0	25.31	–	–	45	121	25	5
2800	28.0	26.78	–	–	45	121	25	5
3000	30.0	35.40	–	–	45	121	25	5
3200	32.0	33.62	–	–	53	133	32	6
		(206)	(208)	(208)				

End Mills

Design: HSS-E PM, Ti2CN, type N, **"Granit-Dry-PM"**, with centre cut.

HSS-E-PM distinguishes through high tenacity (increased edge stability and wear resistance) and longer service life.

Application: Especially suitable for finishing of steels > 1,000 N/mm².



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2168	●	●	●						●	●			

Part No.	⌀ d_1 = k 10 mm	2168 vallorbe DIN	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm	Flutes mm
0500	5.0	13.89	13	57	6	4
0600	6.0	13.89	13	57	6	4
0800	8.0	18.47	19	63	8	4
1000	10.0	19.44	22	72	10	4
1200	12.0	23.32	26	83	12	4
		(209)				

Part No.	⌀ d_1 = k 10 mm	2168 vallorbe DIN	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm	Flutes mm
1400	14.0	33.99	26	83	12	4
1600	16.0	32.36	32	92	16	4
2000	20.0	47.25	38	104	20	4
2500	25.0	75.22	45	121	25	5
		(209)				

End Mill, long type

2178 **Design:** HSS Co8, type N, up to 28 mm with centre cut.

2179 **Design:** HSS-E-PM, TiAlN, type N, up to 28 mm with centre cut.

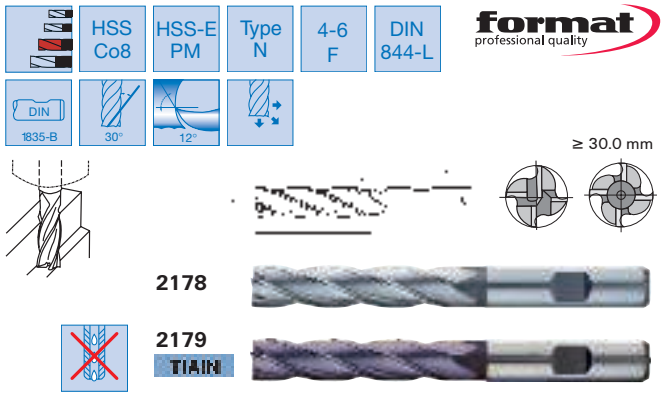
HSS-E PM

TiAlN

Cutting speed approx. 50 % higher compared with uncoated tools.

HSS-E-PM distinguishes through high tenacity (increased edge stability and wear resistance) and longer service life.

Application: Finishing mill for profile and face milling.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2178	●	◐	◐						○		●		
2179	●	●	●						◐		●		

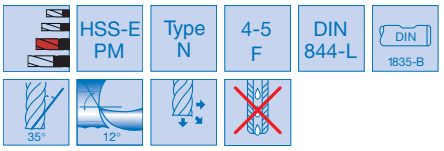
Part No.	⌀ d_1 = k 10 mm	2178	2179 TiAlN	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm	Flutes
0500	5.0	5.28	–	24	68	6	4
0600	6.0	5.27	14.77	24	68	6	4
0700	7.0	6.87	–	30	80	10	4
0800	8.0	6.69	20.24	38	88	10	4
0900	9.0	7.36	–	38	88	10	4
1000	10.0	6.87	21.29	45	95	10	4
1100	11.0	9.47	–	45	102	12	4
1200	12.0	8.66	25.19	53	110	12	4
1400	14.0	11.14	34.26	53	110	12	4
1600	16.0	12.35	38.92	63	123	16	4
1800	18.0	15.23	50.88	63	123	16	4
2000	20.0	17.73	57.64	75	141	20	4
2200	22.0	21.21	–	75	141	20	5
2400	24.0	32.34	–	90	166	25	5
2500	25.0	32.34	88.77	90	166	25	5
2600	26.0	39.89	–	90	166	25	5
2800	28.0	38.16	–	90	166	25	5
3000	30.0	40.41	–	90	166	25	5
3200	32.0	39.78	–	106	186	32	6
		(206)	(208)				

End Mills

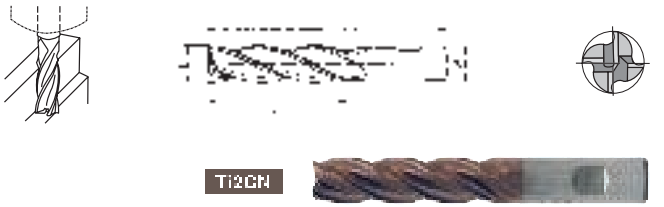
Design: HSS-E-PM, Ti2CN, type N, **"Granit-Dry-PM"**, with centre cut.

HSS-E-PM distinguishes through high tenacity (increased edge stability and wear resistance) and longer service life.

Application: Especially suitable for finishing of steels > 1,000 N/mm².



vallorbe SWISS



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2180	●	●	●						●	●			

Part No.	∅ d_1 = e 8 mm	2180 Ti2CN	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
1200	12.0	26.89	53	110	12	4
1400	14.0	39.19	53	110	12	4
1600	16.0	37.27	63	123	16	4
2000	20.0	54.37	75	141	20	4
2500	25.0	86.60	90	166	25	5

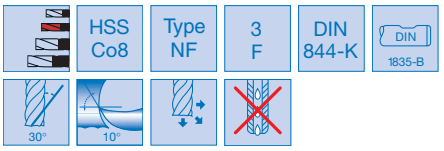
(209)

3-flute Roughing End Mills

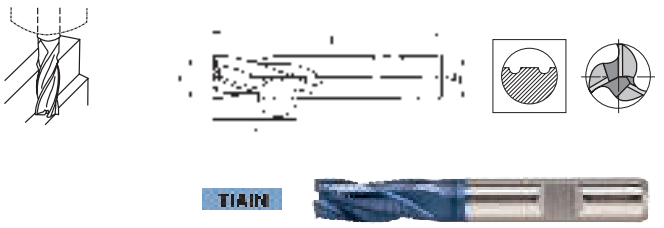
Design: HSS Co8, TiAlN, type NF, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools.

Application: Suitable for profile and slot milling.



format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2158	●	●	●							○	●	○	○

Part No.	∅ d_1 = k 12 mm	2158 TiAlN	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0600	6.0	9.65	13	57	6
0700	7.0	10.63	16	66	10
0800	8.0	10.75	19	69	10
0900	9.0	11.85	19	69	10
1000	10.0	12.75	22	72	10
1100	11.0	16.57	22	79	12
1200	12.0	15.10	26	83	12
1400	14.0	17.80	26	83	12
1500	15.0	20.54	26	83	12
1600	16.0	20.54	32	92	16
1800	18.0	28.25	32	92	16
2000	20.0	29.27	38	104	20

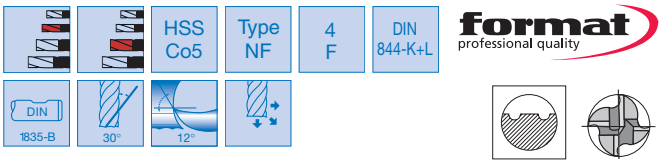
(208)

4-Flute Roughing End Mills

2184 **Design:** HSS Co5, type NF, with centre cut, short.

2187 **Design:** HSS Co5, type NF, with centre cut, long.

Application: Suitable for profile and slot milling.







Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2184	●	●	●						◐		●		
2187	●	●	●						◐		●		

Part No.	∅ d_1 = k 12 mm	2184	2187	Cutting length l_2 mm 2184	2187	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0600	6.0	8.74	11.94	13	24	57	6
0700	7.0	10.18	–	16	–	66	10
0800	8.0	9.17	13.87	19	38	69	10
0900	9.0	11.05	–	19	–	69	10
1000	10.0	9.17	14.77	22	45	72	10
1100	11.0	12.67	–	22	–	79	12
1200	12.0	10.73 (206)	16.60 (206)	26	53	83	12

Part No.	∅ d_1 = k 12 mm	2184	2187	Cutting length l_2 mm 2184	2187	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
1400	14.0	13.39	18.52	26	53	83	12
1600	16.0	15.23	21.82	32	63	92	16
1800	18.0	17.07	25.24	32	63	92	16
2000	20.0	18.69	28.60	38	75	104	20
2200	22.0	23.55	–	38	–	104	20
2500	25.0	24.97 (206)	38.54 (206)	45	90	121	25

Trapezoidal Tool Cutters

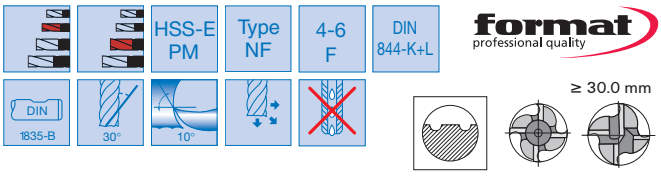
2188 **Design:** HSS-E-PM, TiAlN, type NF, up to 28 mm with centre cut, short design.

2191 **Design:** HSS-E-PM, TiAlN, type NF, up to 28 mm with centre cut, long design.

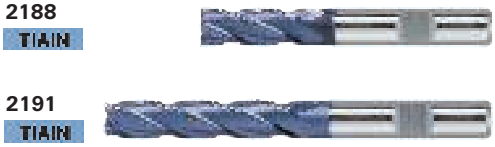
Application: Roughing-finishing end mill for profile and slot milling.

Cutting speed approx. 50 % higher compared to uncoated tools. Dry machining possible.

HSS-E-PM distinguishes through high tenacity (increased edge stability and wear resistance) and longer service life.







Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2188		●	●						●	●	●		
2191		●	●						●	●	●		

Part No.	∅ k 10 mm	2188 short TiAlN	2191 long TiAlN	Cutting length l_2 mm 2188	2191	Total length l_1 mm 2188	2191	Shank ∅ d_2 = h 6 mm	Flutes
0400	4.0	15.15	24.38	11	19	55	63	6	4
0500	5.0	15.12	24.38	13	24	57	68	6	4
0600	6.0	15.15	24.38	13	24	57	68	6	4
0700	7.0	18.37	–	16	–	66	–	10	4
0800	8.0	15.95	26.42	19	38	69	88	10	4
0900	9.0	18.37	–	19	–	69	–	10	4
1000	10.0	15.37	29.41	22	45	72	95	10	4
1200	12.0	20.75	36.63	26	53	83	110	12	4
1400	14.0	21.18	47.91	26	53	83	110	12	4
1600	16.0	24.09	44.22	32	63	92	123	16	4
1800	18.0	28.51	65.03	32	63	92	123	16	4
2000	20.0	35.54	65.69	38	75	104	141	20	4
2200	22.0	48.06	–	38	–	104	–	20	4
2500	25.0	51.46	109.44	45	90	121	166	25	4
2800	28.0	63.14	–	45	–	121	–	25	6
3000	30.0	65.71 (208)	143.90 (208)	45	90	121	166	25	6

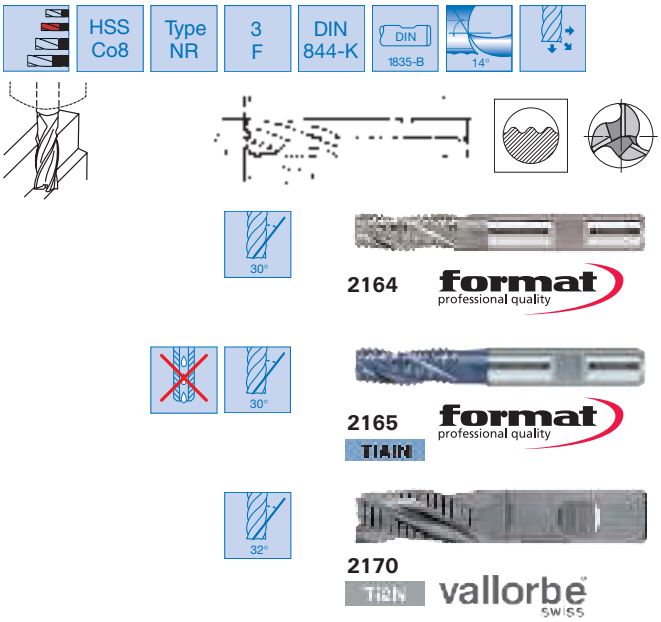
Bore Mills

3 Flute Roughing End Mills

2164 **Design:** HSS Co8, type NR, with centre cut.

2165 **HSS Co5** TiAlN **Design:** HSS Co8, TiAlN, type NR, with centre cut.
Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.
Application: Roughing mill for profile milling.

2170 **HSS Co8** TiAlN **Design:** HSS Co8, type NR, **"Vallorbinox"**, with centre cut.
Application: Especially suitable for roughing of stainless steel and for titanium alloys.



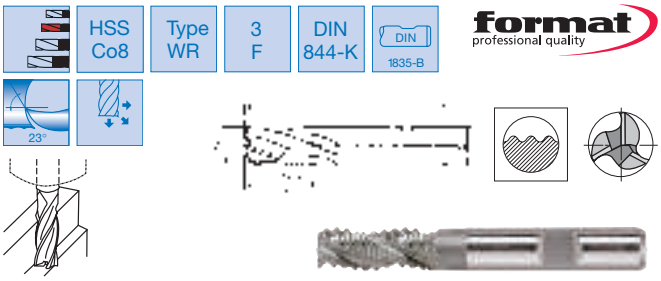
Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2164	●	●	●										
2165	●	●	●						●	●	○	◐	◐
2170									●	●			

Part No.	ø d 1 = k 12 mm	2164 mm	2165 TiAlN mm	2170 TiAlN mm	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
0600	6.0	10.36	24.47	–	13	57	6
0700	7.0	13.66	25.67	–	16	66	10
0800	8.0	12.49	26.86	–	19	69	10
0900	9.0	15.02	28.04	–	19	69	10
1000	10.0	13.29	29.22	–	22	72	10
1100	11.0	16.78	30.42	–	22	79	12
1200	12.0	14.25 (206)	31.64 (208)	40.29 (209)	26	83	12

Part No.	ø d 1 = k 12 mm	2164 mm	2165 TiAlN mm	2170 TiAlN mm	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
1400	14.0	16.59	32.78	48.11	26	83	12
1500	15.0	19.53	34.00	–	26	83	12
1600	16.0	18.95	35.17	54.88	32	92	16
1800	18.0	23.80	36.37	–	32	92	16
2000	20.0	26.16	37.55	65.99	38	104	20
2500	25.0	– (206)	– (208)	98.61 (209)	45	121	25

3 Flute Roughing End Mills for Aluminium

Design: HSS Co8, type WR, with centre cut.
Application: Roughing mill for profile milling.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2159												●	●

Part No.	ø d_1 = k 12 mm	2159 mm	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
0600	6.0	11.41	13	57	6
0800	8.0	14.06	19	69	10
1000	10.0	15.70	22	72	10
1200	12.0	16.53	26	83	12
1400	14.0	20.01 (206)	26	83	12

Part No.	ø d_1 = k 12 mm	2159 mm	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
1600	16.0	22.03	32	92	16
1800	18.0	26.90	32	92	16
2000	20.0	28.95	38	104	20
2500	25.0	43.62 (206)	45	121	25

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Roughing End Mills for Aluminium

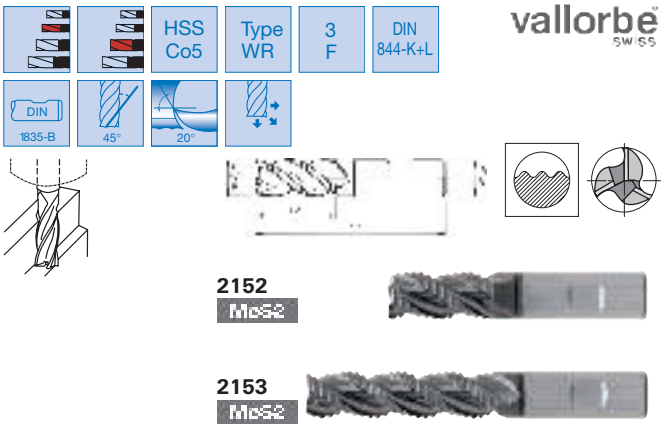
2152 MoS2

Design: HSS Co5, type WR, **"Granit-AL"**, with centre cut, short design.

2153 MoS2

Design: HSS Co5, type WR, **"Granit-AL"**, with centre cut, long design.

Application: Suitable for roughing of soft material such as aluminium alloys with low silicone content, copper, bronze, brass and plastics.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2152												●	●
2153												●	●

Part No.	∅ js 14 mm	2152 vallorbe MoS2	2153 vallorbe MoS2	Cut length l_2 mm 2152	Cut length l_2 mm 2153	Total length l_1 mm 2152	Total length l_1 mm 2153	Shank ∅ d_2 = h 6 mm
0600	6.0	28.78	31.36	13	24	57	68	6
0800	8.0	33.91	34.98	19	38	69	88	10
1000	10.0	37.52	39.28	22	45	72	95	10
1200	12.0	42.96	44.95	26	53	83	110	12
1400	14.0	54.37	58.47	26	53	83	110	12
1600	16.0	58.00	59.78	32	63	92	123	16
2000	20.0	89.42	97.16	38	75	104	141	20
2500	25.0	128.89 (209)	140.86 (209)	45	90	121	166	25

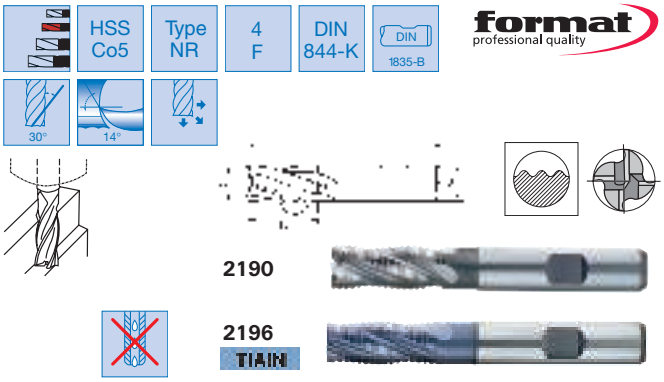
Roughing End Mills

2190 **Design:** HSS Co5, type NR, with centre cut.

2196 TiAlN **Design:** HSS Co5, TiAlN, type NR, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Roughing mill for profile milling.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2190	●	●	◐						○		●		
2196	●	●	●						◐		●		

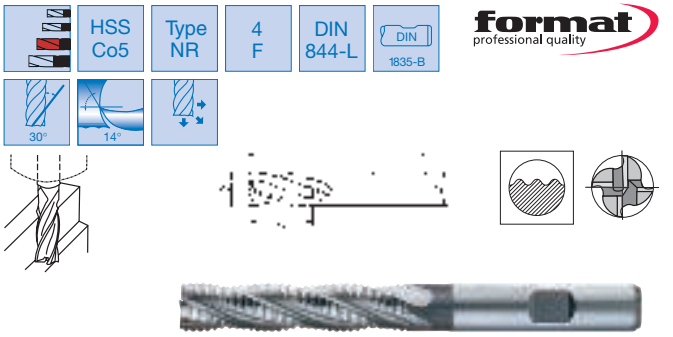
Part No.	∅ d_1 = k 12 mm	2190	2196 TiAlN	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0600	6.0	7.91	11.17	13	57	6
0700	7.0	9.91	16.65	16	66	10
0800	8.0	8.60	13.90	19	69	10
0900	9.0	11.60	16.65	19	69	10
1000	10.0	9.19	13.90	22	72	10
1100	11.0	12.71	18.88	22	79	12
1200	12.0	9.75	17.20	26	83	12
1300	13.0	15.33	24.77	26	83	12
1400	14.0	12.51 (206)	21.93 (208)	26	83	12

Part No.	∅ d_1 = k 12 mm	2190	2196 TiAlN	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
1500	15.0	15.96	24.49	26	83	12
1600	16.0	15.09	23.94	32	92	16
1700	17.0	20.28	–	32	92	16
1800	18.0	16.24	22.33	32	92	16
1900	19.0	22.53	–	32	92	16
2000	20.0	17.42	26.21	38	104	20
2200	22.0	22.41	32.74	38	104	20
2400	24.0	25.78	–	45	121	25
2500	25.0	25.61 (206)	31.03 (208)	45	121	25

Roughing End Mills

Design: HSS Co5, type NR, with centre cut.

Application: Roughing mill for profile milling.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2199	●	●	◐						◐		●		

Part No.	⌀ d_1 = k 12 mm	2199 mm	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0600	6.0	11.48	24	68	6
0800	8.0	11.89	38	88	10
1000	10.0	12.62	45	95	10
1200	12.0	15.13	53	110	12
1400	14.0	17.07	53	110	12
		(206)			

Part No.	⌀ d_1 = k 12 mm	2199 mm	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
1600	16.0	19.17	63	123	16
1800	18.0	22.27	63	123	16
2000	20.0	26.12	75	141	20
2500	25.0	37.47	90	166	25
		(206)			

Roughing End Mills

2200 TiAlN

Design: HSS Co8, TiAlN, similar to DIN 327, with centre cut.

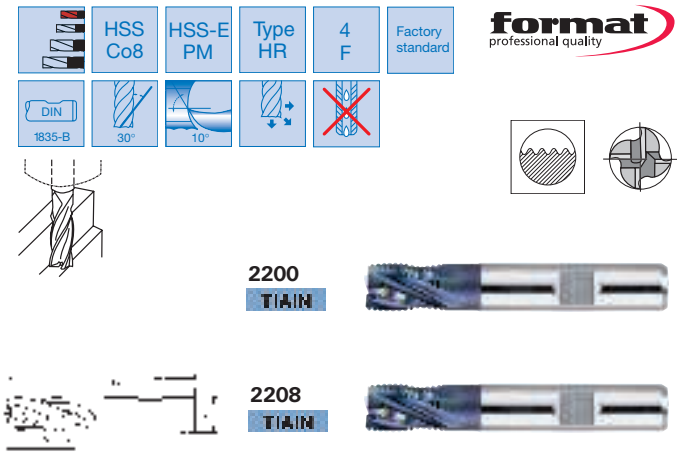
Cutting speed approx. 50 % higher compared to uncoated tools. Dry machining possible.

2208 HSS-E PM TiAlN

Design: HSS-E-PM, TiAlN, type HR, similar to DIN 327, with centre cut.

HSS-E-PM distinguishes through high tenacity (increased edge stability and wear resistance) and longer service life.

Application: Roughing-finishing end mill for profile and slot milling.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2200	●	●	●						●	◐	●		
2208	●	●	●						●	◐	●		

Part No.	⌀ d_1 = k 12 mm	2200 mm TiAlN	2208 mm TiAlN	Cutting length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0600	6.0	15.31	–	8	52	6
0800	8.0	16.08	22.90	11	61	10
1000	10.0	16.56	24.71	13	63	10
1200	12.0	17.67	26.57	16	73	12
1400	14.0	19.45	–	16	73	12
1600	16.0	28.18	33.63	19	79	16
1800	18.0	30.16	–	19	79	16
2000	20.0	36.51	46.34	22	88	20
		(208)	(208)			

Roughing End Mills

2217

Design: HSS Co10, type HR up to 28 mm with centre cut, 30°.

2223 TiAlN

Design: HSS Co10, TiAlN, type HR up to 28 mm with centre cut, 30°.

Cutting speed approx. 50 % higher compared to uncoated tools. Dry machining possible.

2214 TiAlN

Design: HSS-E-PM, TiAlN, Typ HR, with centre cut, 30°.

High tenacity (increased edge stability and wear resistance) and longer service life are strong features of HSS-E-PM.

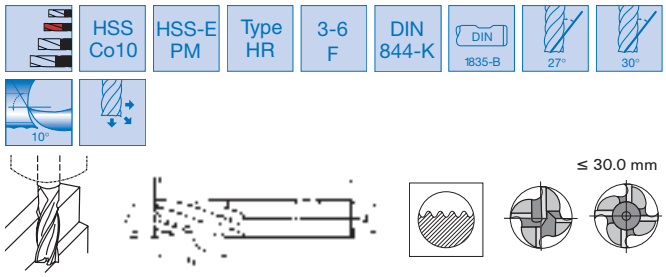
Application: Roughing end mill with fine sinusoidal tooth form for profile and slot milling.

2218 Ti2CN

Design: HSS-E-PM, Ti2CN, type HR, **"Granit-Dry-PM"**, with centre cut 27°.

High tenacity (increased edge stability and wear resistance) and longer service life are strong features of HSS-E-PM.

Application: Perfectly suitable for roughing of steels > 1,000 N/mm².











Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2217		●	●						◐	○	●		
2223		●	●						●	◐	●		
2214		●	●						●	◐	●		
2218	●	●	●						●	●			

Part No.	∅ d_1 = k 12 mm	2217	2223 TiAlN	2214 TiAlN	2218 Ti2CN	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
0400	4.0	–	13.33	16.09	–	11	55	6	3
0500	5.0	–	13.33	16.09	–	13	57	6	3
0600	6.0	8.26	11.58	15.22	–	13	57	6	4
0700	7.0	–	–	27.64	–	16	66	10	4
0800	8.0	9.55	12.01	20.00	–	19	69	10	4
0900	9.0	–	–	22.05	–	19	69	10	4
1000	10.0	10.31	14.08	21.16	32.05	22	72	10	4
1100	11.0	–	–	28.19	–	22	79	10	4
1200	12.0	11.42	16.40	25.32	38.46	26	83	12	4
1300	13.0	–	–	36.99	–	26	83	12	4
1400	14.0	12.56	19.47	35.63	56.10	26	83	12	4
1500	15.0	–	–	48.31	–	26	83	12	4
1600	16.0	13.51	20.82	42.67	53.40	32	92	16	4
1800	18.0	17.14	24.22	49.75	72.12	32	92	16	4
2000	20.0	19.98	27.22	55.97	77.91	38	104	20	4
2200	22.0	–	37.65	71.64	–	38	104	20	4
2500	25.0	26.78	53.98	82.58	124.09	45	121	25	4
2800	28.0	–	57.60	–	–	45	121	25	5
3000	30.0	–	57.60	117.23	–	45	121	25	5
3200	32.0	37.65	–	142.60	178.92	53	133	32	6
		(206)	(208)	(208)	(209)				

Articles marked ◊ are not held in stock, procurement is effected at short notice.

Bore Mills

Roughing End Mills

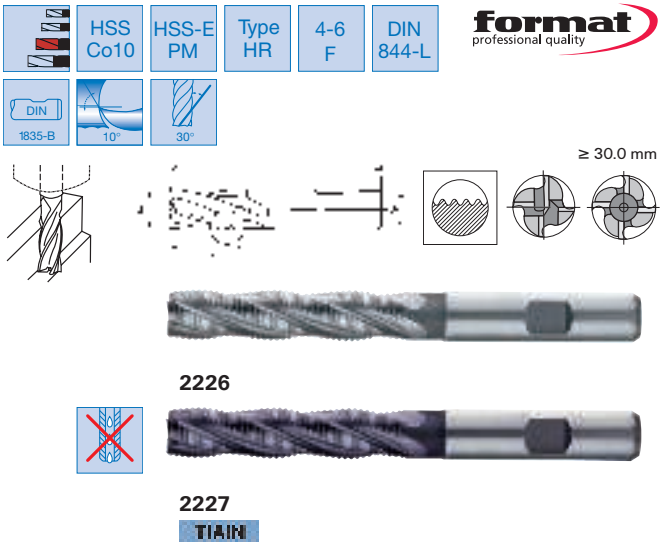
2226 **Design:** HSS Co10, type HR, up to 28 mm with centre cut.

2227 TiAlN **Design:** HSS-E-PM, TiAlN, type HR, from 28 mm with centre cut.

Cutting speed approx. 50 % higher compared to uncoated tools. Dry machining possible.

High tenacity (increased edge stability and wear resistance) and longer service life are strong features of HSS-E-PM.

Application: Roughing end mill with fine sinusoidal tooth form for profile and slot milling.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2226		●	◐						○		●		
2227		●	●						◐		●		

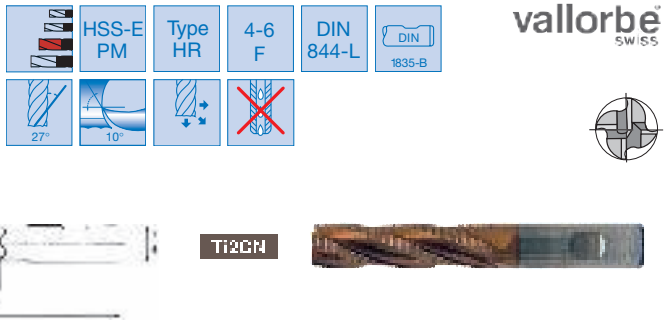
Part No.	∅ d_1 = k 12 mm	2226	2227 TiAlN	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
0600	6.0	13.06	–	24	68	6	4
0800	8.0	15.12	–	38	88	10	4
1000	10.0	16.29	30.79	45	95	10	4
1200	12.0	18.12	34.13	53	110	12	4
1400	14.0	19.68	40.80	53	110	12	4
1600	16.0	23.63	42.93	63	123	16	4
1800	18.0	27.49	58.96	63	123	16	4
2000	20.0	32.46	63.79	75	141	20	4
2500	25.0	44.16	102.01	90	166	25	4
3200	32.0	60.71	–	106	186	32	6
		(206)	(208)				

Roughing End Mills

Design: HSS-E-PM, Ti2CN, type HR, **"Granit-Dry-PM"**, with centre cut, 27°.

High tenacity (increased edge stability and wear resistance) and longer service life are strong features of HSS-E-PM.

Application: Perfectly suitable for roughing of steels > 1,000 N/mm².



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2228	●	●	●						●	●			

Part No.	∅ d_1 = k 12 mm	2228 Ti2CN	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
1200	12.0	49.27	53	110	12	4
1400	14.0	71.82	53	110	12	4
1600	16.0	68.34	63	123	16	4
2000	20.0	99.75	75	141	20	4
2500	25.0	158.80	90	166	25	4
3200	32.0	229.03	106	186	32	6
		(209)				

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

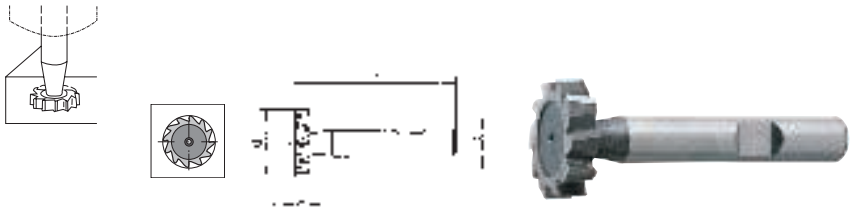
Woodruff Cutters

Design: HSS Co5, type N, staggered teeth, right-hand cutting, facing surfaces are relief-ground.

Application: For milling keyways for Woodruff keys, DIN 6888 or for cutting small slots.



format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2250	●	◐	○								●		

Part No.	∅ x width d_1 = h11/ b = e 8 mm	2250 mm/inch	For keyways mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
0001	13.5 x 2.0	17.60	2.0 x 5	56	10	8
0004	13.5 x 2.5	17.60	2.5 x 5	56	10	8
0007	13.5 x 3.0	17.60	3.0 x 5	56	10	8
0010	13.5 x 4.0	17.60	4.0 x 5	56	10	8
0013	16.5 x 2.5	25.15	2.5 x 6.5	56	10	8
0016	16.5 x 3.0	25.15	3.0 x 6.5	56	10	8
0019	16.5 x 4.0	25.15	4.0 x 6.5	56	10	8
0022	16.5 x 5.0	25.15	5.0 x 6.5	56	10	8
0025	19.5 x 3.0	26.81	3.0 x 7.5	63	10	10
0028	19.5 x 4.0	26.81	4.0 x 7.5	63	10	10
0031	19.5 x 5.0	26.81	5.0 x 7.5	63	10	10
0034	22.5 x 4.0	30.17	4.0 x 9	63	10	10
		(204)				

Part No.	∅ x width d_1 = h11/ b = e 8 mm	2250 mm/inch	For keyways mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
0037	22.5 x 5.0	30.17	5.0 x 9	63	10	10
0040	22.5 x 6.0	30.17	6.0 x 9	63	10	10
0043	25.5 x 5.0	31.02	5.0 x 10	63	10	10
0046	25.5 x 6.0	31.02	6.0 x 10	63	10	10
0052	25.5 x 8.0	31.02	8.0 x 10	63	10	10
0055	28.5 x 5.0	36.04	5.0 x 11	63	10	10
0058	28.5 x 6.0	36.04	6.0 x 11	63	10	10
0064	28.5 x 8.0	36.04	8.0 x 11	63	10	10
0067	32.5 x 5.0	43.58	5.0 x 13	71	12	12
0070	32.5 x 6.0	43.58	6.0 x 13	71	12	12
0073	32.5 x 8.0	43.58	8.0 x 13	71	12	12
		(204)				

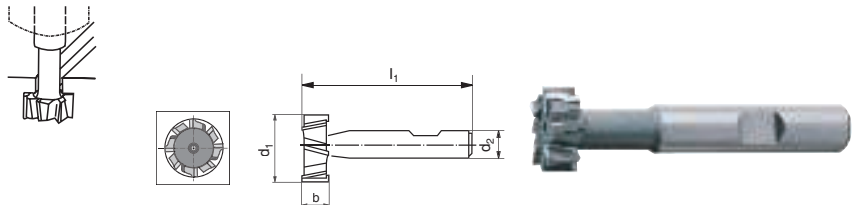
T-slot Cutters

Design: HSS Co5, type N, staggered teeth, right-hand cutting, facing surfaces are relief-ground.

Application: For milling T-slots according to DIN 650.



format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2253	●	●	◐								●		

Part No.	∅ x width d_1 = h 11/b = d 11 mm	2253 mm/inch	For T-slots DIN 650	Of neck bearing mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
0001	12.5 x 6.0	20.12	6	5.0	57	10	6
0004	16.0 x 8.0	22.60	8	7.0	62	10	6
0007	18.0 x 8.0	26.81	10	7.2	70	12	6
0010	21.0 x 9.0	31.84	12	10.0	74	12	8
0013	25.0 x 11.0	39.39	14	12.0	82	16	8
0016	28.0 x 12.0	45.26	16	13.0	85	16	8
0019	32.0 x 14.0	53.62	18	14.8	90	16	8
0022	36.0 x 16.0	77.94	20	17.0	103	25	8
0025	40.0 x 18.0	96.36	22	18.8	108	25	8
0028	45.0 x 20.0	117.31	24	22.0	113	25	10
0031	50.0 x 22.0*	134.08	28	25.0	124	32	10
		(204)					

* Factory standard

Dovetail Cutters

2256 **Design:** HSS Co5, type N, form C, 45°, right-hand cutting, cutting edges.

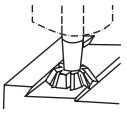
2257 **Design:** HSS Co5, type N, form C, 60°, right-hand cutting, cutting edges.

2258 **Design:** HSS Co5, type N, form D, 45°, right-hand cutting, cutting edges.

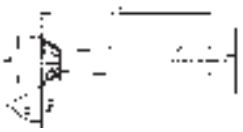
2259 **Design:** HSS Co5, type N, form D, 60°, right-hand cutting, cutting edges.

Application: For milling dovetails.
Angle tolerance 0° ± 15′.

HSS Co5 | Type N | DIN 1833 C/D | DIN 1835-B | 45–60° | 45–60° | 0° | format professional quality



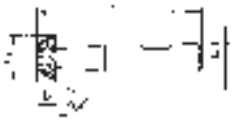






Form: C







Form: D

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2256	●	●									◐		
2257	●	●									◐		
2258	●	●									◐		
2259	●	●									◐		

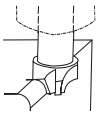
Part No.	∅ d_1 = js 16 mm	2256 mm	2257 mm	2258 mm	2259 mm	Cutting width mm 45° 60° b = js 14	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
0160	16.0	19.27	19.27	19.27	19.27	4.0	60	12	6
0200	20.0	22.60	22.60	22.57	22.60	5.0	63	12	8
0220	22.0	25.15	25.15	25.15	25.15	6.0	67	12	8
0250	25.0	31.02	31.02	31.02	31.02	6.3	67	12	10
0280	28.0	36.04	36.04	36.04	36.04	7.5	80	16	10
0320	32.0	42.73	42.73	42.73	42.73	8.0	80	16	12
0380	38.0	65.36	65.36	65.36	65.36	10.0	80	16	14
0500	50.0*	98.88	98.88	98.88	98.88	12.5	100	25	16
* Factory standard		(204)	(204)	(204)	(204)				

Corner-Rounding Cutters

Design: HSS Co5, type N, concave.

Application: Suitable for rounding corner edges.

HSS Co5 | Type N | DIN 6518-B | DIN 1835-B | 0° | format professional quality









Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2262	●	●									●		

Part No.	Radius r H 11 mm	2262 mm	Largest ∅ d_1 mm	Smallest ∅ d_3 = js 14 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
0100	1.0	12.56	8	6	60	10	4
0150	1.5	12.56	9	6	60	10	4
0200	2.0	12.56	10	6	60	10	4
0250	2.5	13.42	11	6	60	10	4
0300	3.0	13.83	12	6	60	12	4
0400	4.0	15.09	14	6	60	12	4
0500	5.0	16.35	16	6	67	16	4
0600	6.0	21.78	20	8	67	16	4
0800	8.0	26.81	24	8	71	16	4
1000	10.0	35.19	28	8	85	25	4
1200	12.0	49.45	34	10	90	25	4
1600	16.0	88.00	48	16	100	25	6
		(204)					

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Ball Nose Cutters

2118 **Design:** HSS Co8, type N, similar to DIN 327 D, with centre cut.

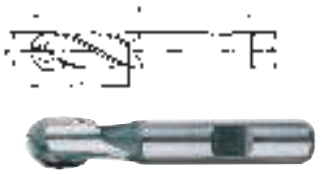
2122 TiAlN **Design:** HSS Co8, TiAlN, type N, similar to DIN 327 D, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Can be used as profile cutter for semi-circular grooves and for duplication and traverse milling in mould construction.

HSS Co8 | Type N | 2 F | Factory standard | DIN 1835-B | 30° | 10°

format professional quality



2118



2122 TiAlN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2118	●	◐	○						○		●	◐	●
2122	●	●	◐						◐		●	○	●

Part No.	⌀ d_1 = h 10 mm	2118 mm	2122 TiAlN mm	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0200	2.0	6.69	–	4	48	6
0300	3.0	6.46	10.29	5	49	6
0400	4.0	6.46	10.29	7	51	6
0500	5.0	6.46	10.29	8	52	6
0600	6.0	6.46	10.29	8	52	6
0700	7.0	10.05	14.37	10	60	10
0800	8.0	9.22	12.28	11	61	10
0900	9.0	10.05	–	11	61	10
1000	10.0	9.63	13.14	13	63	10
1100	11.0	12.56	–	13	70	12
1200	12.0	11.73	18.48	16	73	12
1300	13.0	15.91	–	16	73	12
		(206)	(208)			

Part No.	⌀ d_1 = h 10 mm	2118 mm	2122 TiAlN mm	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
1400	14.0	14.25	21.57	16	73	12
1500	15.0	15.09	–	16	73	12
1600	16.0	15.09	24.38	19	79	16
1700	17.0	20.94	–	19	79	16
1800	18.0	20.94	–	19	79	16
1900	19.0	20.94	–	19	79	16
2000	20.0	20.94	33.31	22	88	20
2200	22.0	41.90	–	22	88	20
2400	24.0	45.26	–	26	102	25
2500	25.0	41.06	–	26	102	25
3000	30.0	65.36	–	26	102	25
		(206)	(208)			

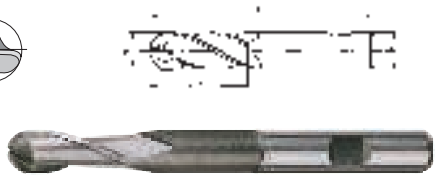
Ball Nose Cutters

Design: HSS Co8, type N, long, to DIN 844, with centre cut.

Application: Can be used as profile cutter for semi-circular grooves and for duplication and traverse milling in mould construction.

HSS Co8 | Type N | 2 F | DIN ≈844-B | DIN 1835-B | 30° | 10°

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2124	●	●	◐								●	○	○

Part No.	⌀ d_1 = h 10 mm	2124 mm	Cutting length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0300	3.0	6.69	8	56	6
0400	4.0	6.46	11	63	6
0500	5.0	6.46	13	68	6
0600	6.0	6.46	13	68	6
0700	7.0	9.63	16	80	10
0800	8.0	9.63	19	88	10
0900	9.0	10.05	19	88	10
1000	10.0	10.05	22	95	10
1100	11.0	12.56	22	102	12
1200	12.0	12.56	26	110	12
1300	13.0	15.49	26	110	12
		(206)			

Part No.	⌀ d_1 = h 10 mm	2124 mm	Cutting length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
1400	14.0	15.49	26	110	12
1500	15.0	15.91	26	110	12
1600	16.0	16.35	32	123	16
1700	17.0	21.78	32	123	16
1800	18.0	21.78	32	123	16
1900	19.0	22.60	32	123	16
2000	20.0	22.60	38	141	20
2200	22.0	42.77	38	141	20
2400	24.0	50.29	45	166	25
2500	25.0	50.29	45	166	25
3000	30.0	73.74	45	166	25
		(206)			

Miniature Ball Nose Slot Drills

2139 **Design:** HSS Co5, similar to DIN 327 D, with centre cut.

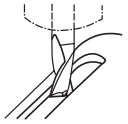
2143 TiAlN **Design:** HSS Co5, TiAlN, similar to DIN 327 D, with centre cut.

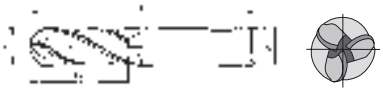
Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Can be used as profile cutter for semi-circular grooves and for duplication and traverse milling in mould construction.

Note: Not suitable for regrinding.









2139





2143 TiAlN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2139	●	●	◐						◐		●		
2143	●	●	●						◐		●		

Part No.	∅ d_1 = e 8 mm	2139	2143 TiAlN	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0200	2.0	5.45	10.25	7	38	6
0250	2.5	5.45	10.25	8	39	6
0300	3.0	5.45	10.25	8	39	6
0400	4.0	5.45	10.25	11	42	6
0500	5.0	5.45	10.25	13	44	6
0600	6.0	5.45	10.25	13	44	6
		(206)	(208)			

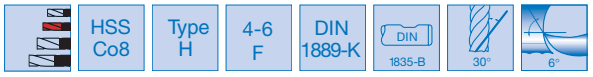
Ball Nose End Mills

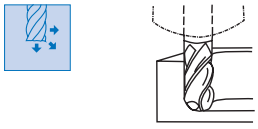
2232 **Design:** HSS Co8, type N, DIN 1889 BK, with centre cut, 30°.

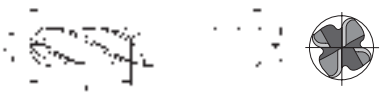
2235 TiCN **Design:** HSS Co8, TiCN, type H, DIN 1889 BK, with centre cut, 30°.

Cutting speed approx. 50 % higher compared with uncoated tools.

Application: Suitable for duplication and traverse profile milling and, under certain conditions, for plunging.









2232



2235 TiCN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2232	●	●	◐						◐		●		
2235	●	●	●						◐		●		

Part No.	∅ d_1 = k 12 mm	2232	2235 TiCN	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flutes
0600	6.0	13.36	17.67	13	57	6	4
0800	8.0	14.90	19.17	19	69	10	4
1000	10.0	15.90	20.11	22	72	10	4
1200	12.0	18.65	22.31	26	83	12	4
1600	16.0	23.72	29.62	32	92	16	4
2000	20.0	27.49	37.07	38	104	20	4
2500	25.0	46.88	59.16	45	121	25	5
3200	32.0	73.34	93.64	53	133	32	6
		(206)	(208)				

Ball Nose Roughing End Mills

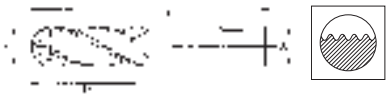
Design: HSS Co8, TiAlN, type HR, 30°.

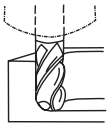
Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Can be used as profile cutter for semi-circular grooves and for duplication and traverse milling in mould construction.



format professional quality





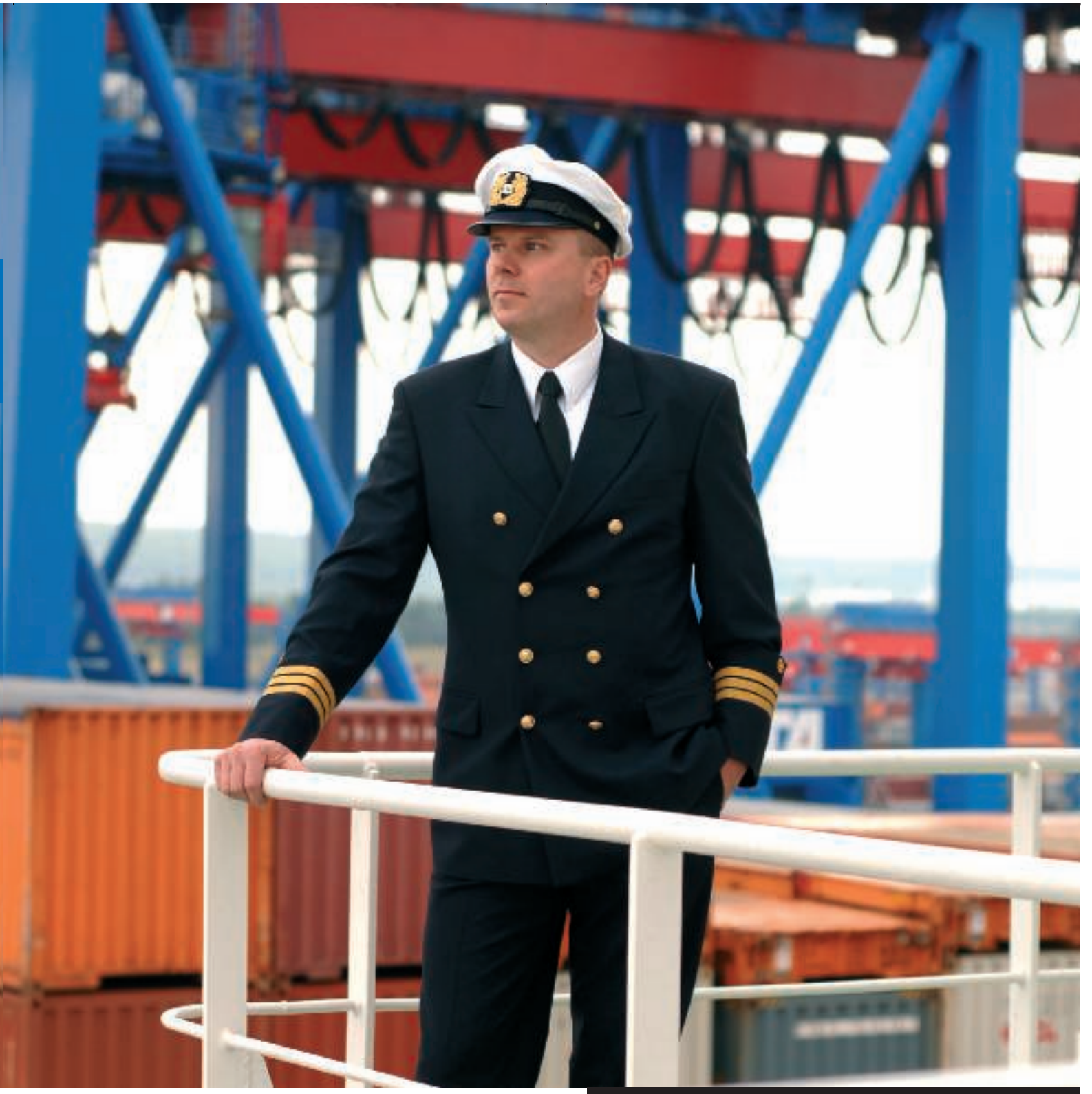
TiAlN



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2144	●	●	◐						◐		●		

Part No.	∅ d_1 = js 14 mm	2144 TiAlN	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0800	8.0	25.32	19	69	10
1000	10.0	27.23	22	72	10
1200	12.0	33.63	26	83	12
1600	16.0	42.84	32	92	16
2000	20.0	105.40	38	104	20
2500	25.0	76.50	45	121	25

(208)



Ralf Kühne, Chief Engineer – CMS Colombo Express
Hapag-Lloyd Container Linie GmbH, Hamburg

"Reliability of 100 %. It goes without saying that this also applies to the tool."

Professional quality of the entire technical equipment is indispensible on the high seas.
This is why Hapag-Lloyd Container Linie globally uses FORMAT products.
In case of FORMAT tools, reliability includes more than just product quality. The exclusive distribution by selected speciality retailers ensures competent expert advice and availability of products at short notice.
In Germany, FORMAT tools arrive at their destination within 24 hours.
This is guaranteed.

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Overview – Solid Carbide Milling Tool Range



Discription	Single flute milling cutters	Miniature milling cutters	Milling cutters		End mills						
No. of flutes	1	2	3	3	2	2	2	2	2	2	2
DIN	WN	WN	WN	WN	6527	6527	6527	6527	6527	6527	6527
Tool type	N	N	N-short	N-long	N-short	N-short	N-short	N-long	N-long	N-long	N-long
Cutting material	K10–20	K10–20	UF	UF	K10–20	K10–20	K10–20	UF	UF	UF	UF
Coating			Fire	Fire							Fire
Shank design	HA	HA	HB	HB	HA	HB	HB	HA	HB	HB	HB
Part No.	2310	2300	2472	2474	2315	2321	2339	2327	2333	2342	2466
Page	2/45	2/45	2/46	2/46	2/47	2/47	2/47	2/48	2/48	2/48	2/48

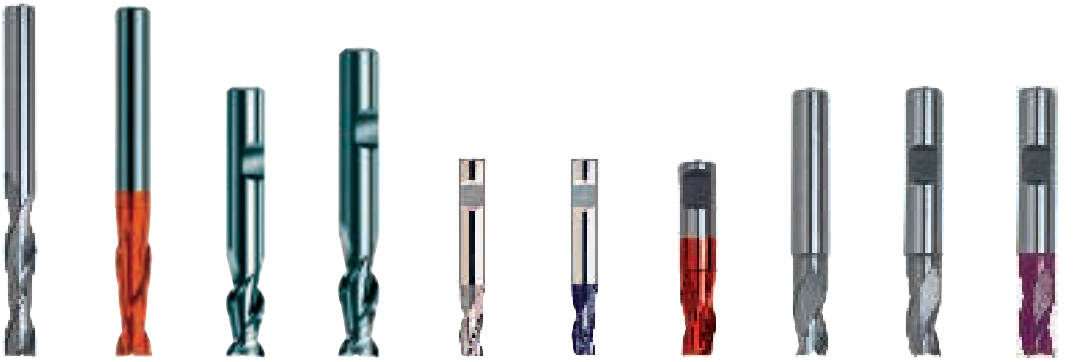
Material group

Steels up to 850 N/mm²			●	●	●	●	●	●	●	●	●	●
Steels up to 1,000 N/mm²			●	●	●	●	●	●	●	●	●	●
Steels up to 1,400 N/mm²			◐	●	●	○	○	●	○	○	●	●
Steels up to 42 HRc			◐	●	●	○	○	●	○	○	●	●
Steels up to 52 HRc			○	●	○			○			○	○
Steels up to 56 HRc												
Steels up to 62 HRc												
Hard machining over 60 HRc												
Stainless and acid-resistant steels (INOX)			○	○	◐	●	●	○	●	●	○	○
Ti steels, Ti alloys, special steels				●	○			○			○	○
Cast iron			●	●	●	○	○	●	○	○	●	●
Al, Al and Mg alloys		●	◐	○	◐	○	○	○	○	○	○	○
Copper, brass, bronze		◐	●	◐	◐	○	○	○	○	○	○	○

WN = Factory standard

● recommended ◐ suitable ○ partially suitable

Overview – Solid Carbide Milling Tool Range



Description	End mills				Miniature milling cutters			End mills		
No. of flutes	2	2	2	2	3	3	3	3	3	3
DIN	WN	WN	6527	6527	WN	WN	WN	6527	6527	6527
Tool type	N-extra long	N-extra long	W-short	W-long	N-short	N-short	N-short	N-short	N-short	N-short
Cutting material	UF	UF	UF	UF	K10–20	K10–20	UF	K10–20	K10–20	K10–20
Coating		Fire					Fire			
Shank design	HA	HA	HB	HB	HB	HB	HB	HA	HB	HB
Part No.	2354	2482	2478	2480	2351	2352	2353	2318	2324	2345
Page	2/49	2/49	2/49	2/50	2/50	2/50	2/50	2/51	2/51	2/51

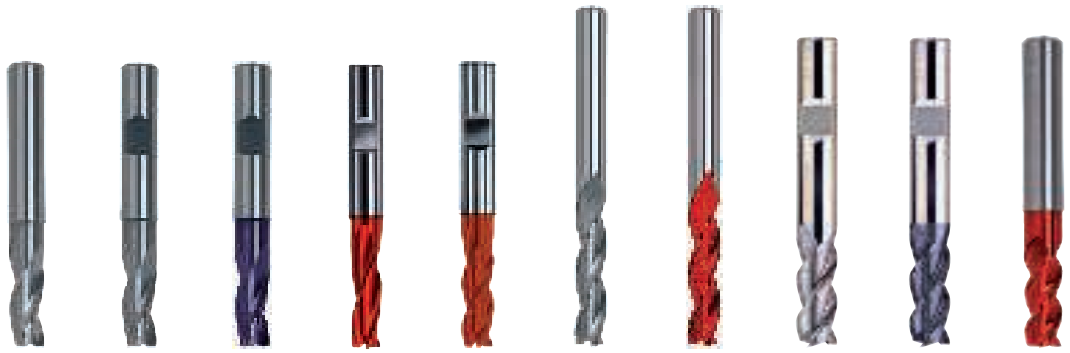
Material group

Steels up to 850 N/mm²		●	●			●	●	●	●	●	●
Steels up to 1,000 N/mm²		●	●			●	●	●	●	●	●
Steels up to 1,400 N/mm²		○	●			●	●	●	○	○	●
Steels up to 42 HRc		○	●			●	●	●	○	○	●
Steels up to 52 HRc			○			●	●	●			○
Steels up to 56 HRc											
Steels up to 62 HRc											
Hard machining over 60 HRc											
Stainless and acid-resistant steels (INOX)		○	○			◐	●	○	○	○	○
Ti steels, Ti alloys, special steels			○					○			○
Cast iron		○	●			●	●	●	○	○	●
Al, Al and Mg alloys		◐	◐	●	●	●	●	◐	◐	◐	◐
Copper, brass, bronze		◐	◐	●	●	●	●	◐	◐	◐	◐

WN = Factory standard

● recommended ◐ suitable ○ partially suitable

Overview – Solid Carbide Milling Tool Range



Description	End mills									
No. of flutes	3	3	3	3	3	3	3	3	3	3
DIN	6527	6527	6527	6527	6527	WN	WN	6527	6527	6527
Tool type	N-long	N-long	N-long	N-long	N-long	N-extra long	N-extra long	W-long	W-long	W-long
Cutting material	K10–20	K10–20	K10–20	UF	UF	K10–20	UF	K10–20	K10–20	UF
Coating				Fire	Fire		Fire			Fire
Shank design	HA	HB	HB	HB	HB	HA	HA	HB	HB	HB
Part No.	2330	2336	2348	2468	2476	2357	2355	2360	2361	2362
Page	2/52	2/52	2/52	2/52	2/53	2/53	2/53	2/54	2/54	2/54

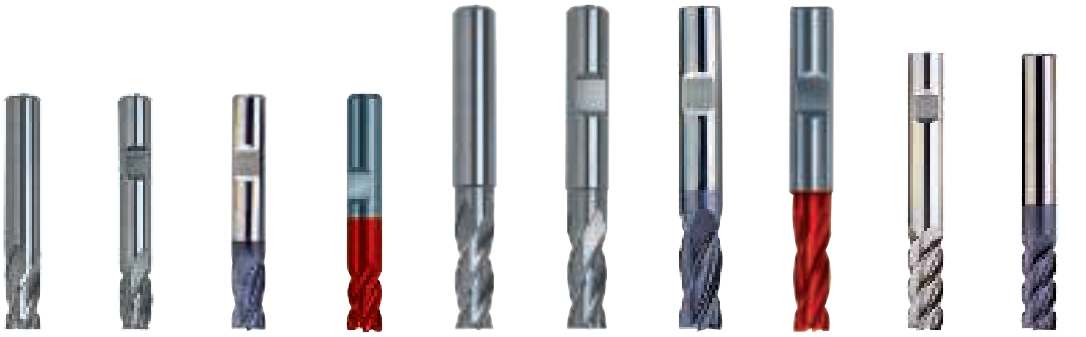
Material group

Steels up to 850 N/mm²		●	●	●	●	●	●	●	●	●	●
Steels up to 1,000 N/mm²		●	●	●	●	●	●	●	●	●	●
Steels up to 1,400 N/mm²		○	○	●	●	●	○	●	●	●	●
Steels up to 42 HRc		○	○	●	●	●	○	●	●	●	●
Steels up to 52 HRc					●	●		○	◐	●	●
Steels up to 56 HRc											
Steels up to 62 HRc											
Hard machining over 60 HRc											
Stainless and acid-resistant steels (INOX)		○	○	○	○	●	○	○	◐	●	●
Ti steels, Ti alloys, special steels				○	○	●		◐	◐	●	●
Cast iron		○	○	●	●	●	○	●			●
Al, Al and Mg alloys		◐	◐	◐	◐	◐	◐	◐	◐	●	◐
Copper, brass, bronze		◐	◐	◐	◐		◐	◐			

WN = Factory standard

● recommended ◐ suitable ○ partially suitable

Overview – Solid Carbide Milling Tool Range



Description	End mills									
No. of flutes	4	4	4	4	4	4	4	4	4	4
DIN	6527	6527	6527	6527	6527	6527	6527	6527	6527	6527
Tool type	N-short	N-short	N-short	Ratio-N-short	N-long	N-long	N-long	N-long	N-long	N-long
Cutting material	K10–20	K10–20	K10–20	UF	K10–20	K10–20	K10–20	UF	K10–20	K10–20
Coating			T-H	Fire			T-H	Fire		T-H
Shank design	HA	HB	HB	HB	HA	HB	HB	HB	HB	HA
Part No.	2363	2369	2375	2460	2366	2372	2378	2470	2379	2405
Page	2/55	2/55	2/55	2/55	2/56	2/56	2/56	2/56	2/57	2/57

Material group

Steels up to 850 N/mm²		●	●	●	●	●	●	●	●	●	●
Steels up to 1,000 N/mm²		●	●	●	●	●	●	●	●	●	●
Steels up to 1,400 N/mm²		○	○	●	●	○	○	●	●	◐	●
Steels up to 42 HRc		○	○	●	●	○	○	●	●		●
Steels up to 52 HRc				●	●			●	○		
Steels up to 56 HRc											
Steels up to 62 HRc											
Hard machining over 60 HRc											
Stainless and acid-resistant steels (INOX)		○	○	◐	●	○	○	◐	○		●
Ti steels, Ti alloys, special steels					●				○	◐	◐
Cast iron		○	○	●	●	○	○	●	●	●	
Al, Al and Mg alloys		○	○	◐	◐	○	○	◐	○	●	○
Copper, brass, bronze		◐	◐	◐	◐	◐	◐	◐	◐	●	○

WN = Factory standard

● recommended ◐ suitable ○ partially suitable

Overview – Solid Carbide Milling Tool Range



Description	End mills							
No. of flutes	4	4	6–8	6–8	6–8	6–8	6–8	6
DIN	6527	WN	6527	6527	6527	6527	WN	WN
Tool type	Ratio-N-long	N-extra long	N-long	N-long	NH-long	H-long	H-extra long	H-extra long
Cutting material	UF	UF	K10–20	K10–20	UF	UF	UF	UF
Coating	Fire	Fire			Fire	Fire	Fire	Fire
Shank design	HB	HA	HB	HB	HB	HA	HA	HA
Part No.	2462	2471	2381	2384	2484	2385	2386	2388
Page	2/58	2/58	2/59	2/59	2/59	2/59	2/60	2/60

Material group

Steels up to 850 N/mm²		●	●	●	●	●			
Steels up to 1,000 N/mm²		●	●	●	●	●			
Steels up to 1,400 N/mm²		●	●	○	●	●			
Steels up to 42 HRc		●	●	○	●	●			
Steels up to 52 HRc		●	○		○	●	○	○	○
Steels up to 56 HRc							●	●	●
Steels up to 62 HRc							●	●	●
Hard machining over 60 HRc							●	●	●
Stainless and acid-resistant steels (INOX)		●	○	○	○	●			
Ti steels, Ti alloys, special steels		●	○		●	●			
Cast iron		●	●	○	●	●			
Al, Al and Mg alloys		○	○	○	●	●			
Copper, brass, bronze		○	◐	◐	○	◐			

WN = Factory standard

● recommended ◐ suitable ○ partially suitable

Overview – Solid Carbide Milling Tool Range



Description	End mills – roughing – finishing		End mills – roughing					Ball nose slot drills		
No. of flutes	2	2	3	3	4	4	4	2	2	2
DIN	6527	6527	6527	6527	6527	6527	6527	WN	WN	6527
Tool type	NF-short	NF-long	WR-short	WR-long	NRF-long	NRF-long	HR-long	N-short	N-short	N-long
Cutting material	K10–20	K10–20	K10–20	UF	UF	UF	K10–20	K10–20	K10–20	UF
Coating					Fire	Fire				Fire
Shank design	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB
Part No.	2343	2344	2358	2469	2389	2391	2393	2410	2413	2464
Page	2/60	2/61	2/61	2/61	2/62	2/62	2/62	2/63	2/63	2/63

Material group

Steels up to 850 N/mm²		●	●	◐	◐	●	●	◐	●	●	●
Steels up to 1,000 N/mm²		●	●			●	●	◐	●	●	●
Steels up to 1,400 N/mm²						●	●	◐	●	●	●
Steels up to 42 HRc						●	●	●	●	●	●
Steels up to 52 HRc						◐	◐	●	○	●	●
Steels up to 56 HRc						○	○	●		◐	
Steels up to 62 HRc											
Hard machining over 60 HRc											
Stainless and acid-resistant steels (INOX)		○	○			●	●	●	○	◐	○
Ti steels, Ti alloys, special steels		○	○			●	●	●	○	◐	○
Cast iron						○	○	●	●	●	●
Al, Al and Mg alloys		●	●	●	●				◐	◐	○
Copper, brass, bronze		●	●	●	●				◐	◐	○

WN = Factory standard

● recommended ◐ suitable ○ partially suitable

Overview – Solid Carbide Milling Tool Range



Description	Ball nose slot drills		Spherical cutters		Radius cutters			Profiling cutters	
No. of flutes	4	4	2	2	2	2	4	4	4
DIN	6527	6527	WN	WN	WN	WN	6527	WN	WN
Tool type	N-long	N-long	H-long	H-extra long	N-long	N-extra long	N-long	N-long	N-extra long
Cutting material	K10–20	K10–20	K10–20	K10–20	K05–10	K05–10	K10–20	UF	UF
Coating								Fire	Fire
Shank design	HB	HB	HA	HA	HA	HA	HA	HA	HA
Part No.	2416	2419	2422	2425	2428	2431	2433	2434	2435
Page	2/64	2/64	2/64	2/65	2/65	2/66	2/66	2/67	2/67

Material group

Steels up to 850 N/mm²		●	●			●	●	●		
Steels up to 1,000 N/mm²		●	●			●	●	●		
Steels up to 1,400 N/mm²		○	●			●	●	●		
Steels up to 42 HRc		○	●	◐	◐	●	●	●	◐	◐
Steels up to 52 HRc			○	●	●	●	●	◐	●	●
Steels up to 56 HRc				●	●				●	●
Steels up to 62 HRc				●	●				●	●
Hard machining over 60 HRc				●	●				●	●
Stainless and acid-resistant steels (INOX)		○	○							
Ti steels, Ti alloys, special steels		○	●							
Cast iron			●	●	●	●	●	●	●	●
Al, Al and Mg alloys								○		
Copper, brass, bronze						○	○	○		

WN = Factory standard

● recommended ◐ suitable ○ partially suitable

Overview – Solid Carbide Milling Tool Range



Description	Corner round. cut.	Deburring cutters				Engraving cutters	End mills – diamond toothing	
No. of flutes	4	4	4	4	4	1	120° point angle	2
DIN	WN	WN	WN	WN	WN	WN	WN	WN
Tool type	N-short	N-90°	N-90°	N-60°	N-60°	N		
Cutting material	K10–20	K10–20	K10–20	K10–20	K10–20	K10–20	K10–20	K10–20
Coating	TiN		TiN		TiN			
Shank design	HA	HB	HB	HB	HB	HA	HA	HA
Part No.	2451	2440	2441	2442	2443	2444	2445	2447
Page	2/67	2/68	2/68	2/68	2/68	2/68	2/69	2/69

Material group

Steels up to 850 N/mm²		●	●	●	●	●	◐	
Steels up to 1,000 N/mm²		●	○	●	○	●	◐	
Steels up to 1,400 N/mm²		●	○	●	○	●		
Steels up to 42 HRc		●		○		○		
Steels up to 52 HRc		●		○		○		
Steels up to 56 HRc				○		○		
Steels up to 62 HRc				○		○		
Hard machining over 60 HRc				○		○		
Stainless and acid-resistant steels (INOX)		●		○		○		
Ti steels, Ti alloys, special steels		○						
Cast iron		○	●		●			
Al, Al and Mg alloys		○	●		●		●	
Copper, brass, bronze		○	●		●		●	

WN = Factory standard

● recommended ◐ suitable ○ partially suitable

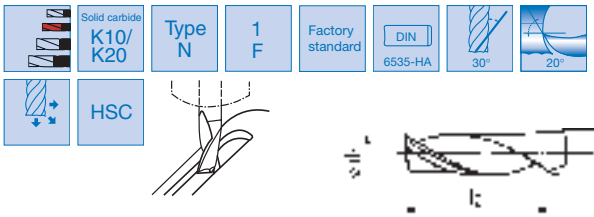
Solid Carbide Single Flute Milling Cutters

Design: Solid carbide, type N.
Ultra-fine-ground flute (mirror finish).

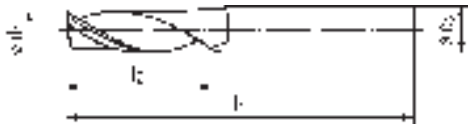
Application: For contour and plunge milling, especially suitable for milling in plastic and aluminium.

Limited use with other non-ferrous materials.

Also suitable for HSC milling operations.



format professional quality





Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2310												●	◐

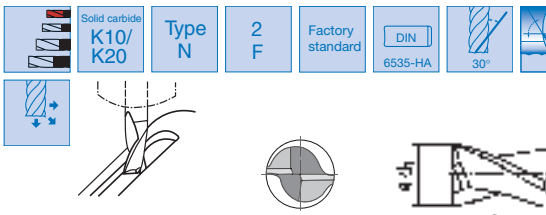
Part No.	∅ d_1 = h 10 mm	2310	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0200	2.0	8.15	10	40	2
0300	3.0	8.69	12	40	3
0400	4.0	10.57	15	40	4
0500	5.0	13.56	16	50	5
0600	6.0	14.36	20	57	6
0800	8.0	22.80	22	63	8
1000	10.0	35.26	25	72	10
1200	12.0	45.27	35	83	12

(210)

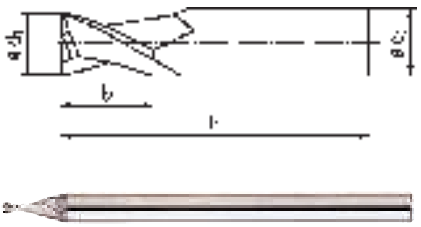
Solid Carbide Miniature Milling Cutters

Design: Solid carbide, type N,
with centre cutting.

Application: Suitable for plunging and traverse milling, also for aluminium and abrasive plastic material.



format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2300	●	●	◐	◐	○				○		●	◐	●

Part No.	∅ d_1 = h 10 mm	2300	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0020	0.2	22.05	0.4	38	3
0030	0.3	17.66	0.6	38	3
0040	0.4	15.43	0.8	38	3
0050	0.5	13.23	1.0	38	3
0060	0.6	13.23	1.2	38	3
0070	0.7	12.70	1.4	38	3
0080	0.8	12.38	1.6	38	3
0090	0.9	12.38	1.8	38	3
0100	1.0	11.04	2.0	38	3
0150	1.5	10.23	3.0	38	3
0200	2.0	11.04	6.0	38	3

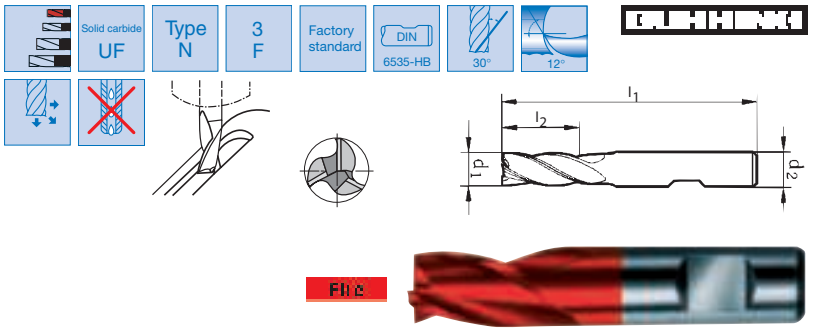
(210)

Solid Carbide Miniature Milling Cutters

Design: Solid carbide UF, Fire, type N, with centre cutting, short design.

Application: Suitable for milling keyways and feather key grooves and for universal milling.

Note: Not suitable for regrinding applications.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2472	●	●	●	●	○				◐	○	●	◐	◐

Part No.	ø d_1 = h 10 mm	2472	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
0050	0.50*	9.52	1.5	38	3
0060	0.60*	9.52	1.5	38	3
0080	0.80*	7.69	2	38	3
0100	1.00*	6.36	2	38	3
0120	1.20*	9.89	2	38	3
0150	1.50*	6.36	2	38	3
0180	1.80*	9.89	2	38	3
0200	2.00	8.43	4	35	6
0250	2.50	8.79	5	36	6
0300	3.00	8.43	5	36	6
0350	3.50	8.79	6	37	6
0400	4.00	8.43	7	38	6
0450	4.50	9.89	8	38	6
0500	5.00	9.52	8	39	6
0550	5.50	9.89	8	39	6

(220)

Part No.	ø d_1 = h 10 mm	2472	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
0575	5.75	10.99	8	39	6
0600	6.00	9.52	8	39	6
0675	6.75	14.65	10	42	8
0700	7.00	13.18	10	42	8
0775	7.75	13.55	10	42	8
0800	8.00	13.18	11	43	8
0870	8.70	20.51	11	48	10
0900	9.00	19.40	11	48	10
0970	9.70	20.51	11	48	10
1000	10.00	19.06	13	50	10
1200	12.00	22.71	15	55	12
1400	14.00	31.14	15	58	14
1600	16.00	40.30	18	62	16
1800	18.00	48.36	20	70	18
2000	20.00	64.48	22	75	20

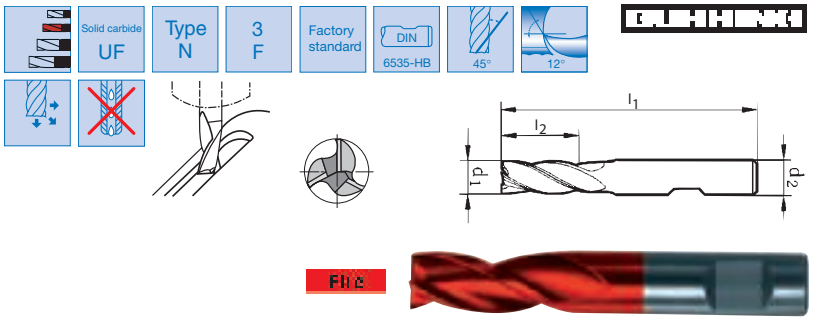
(220) * Parallel shank without clamping face, form HA

Solid Carbide Miniature Milling Cutters

Design: Solid carbide UF, Fire, type N, with centre cutting, long design.

Application: Suitable for keyways and key grooves and for universal milling.

Note: Not suitable for regrinding.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2474	●	●	●	●	●				○	●	●	○	◐

Part No.	ø d_1 = h 10 mm	2474	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
0100	1.00*	7.69	2	38	3
0120	1.20*	9.52	2	38	3
0150	1.50*	7.69	3	38	3
0180	1.80*	9.52	3	38	3
0200	2.00	10.63	4	45	6
0250	2.50	10.99	5	45	6
0300	3.00	10.63	6	45	6
0350	3.50	10.63	6	45	6
0400	4.00	10.63	7	45	6
0450	4.50	11.36	8	45	6
0500	5.00	10.63	8	45	6

(220)

Part No.	ø d_1 = h 10 mm	2474	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
0550	5.50	11.36	8	45	6
0575	5.75	11.36	10	45	6
0600	6.00	10.63	10	45	6
0675	6.75	15.01	10	55	8
0700	7.00	14.65	12	55	8
0775	7.75	14.65	12	55	8
0800	8.00	14.65	13	55	8
0870	8.70	19.77	14	55	10
0900	9.00	18.68	14	55	10
0970	9.70	20.14	16	55	10
1000	10.00	19.40	16	55	10

(220) * Parallel shank without clamping face, form HA

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Solid Carbide End Mills

2315 **Design:** Solid carbide, type N, DIN 6527, short, HA shank, with centre cut.

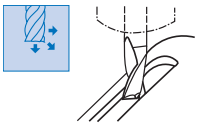
2321 **Design:** Solid carbide, type N, DIN 6527 short, HB shank, with centre cut.

2339 TiAlN-2 **Design:** Solid carbide, TiAlN-2, type N, DIN 6527, short, HA shank, with centre cut.

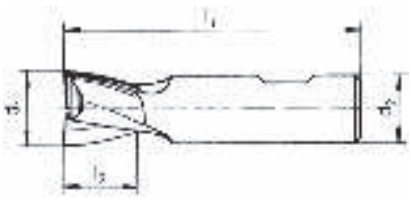
Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for milling keyways and key grooves and for universal milling. Extra short robust design for machining depths of max. 1 x d.









2315



2321



2339 TiAlN-2





Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2315	●	●	○	○					●		○	○	○
2321	●	●	○	○					●		○	○	○
2339	●	●	●	●	○				○	○	●	○	○

Part No.	⌀ d_1 = h 10 mm	2315	2321	2339 TiAlN-2	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0200	2.0	7.89	9.09	11.22	3	50	6
0300	3.0	6.98	8.17	10.90	4	50	6
0400	4.0	6.54	7.74	10.52	5	54	6
0500	5.0	6.54	7.74	10.52	6	54	6
0600	6.0	6.48	7.51	10.16	7	54	6
0800	8.0	7.74	8.87	13.70	9	58	8
1000	10.0	12.78	14.32	19.94	11	66	10
1200	12.0	18.39	19.94	28.36	12	73	12
1400	14.0	25.23	27.11	39.26	14	75	14
1600	16.0	30.54	33.66	46.11	16	82	16
1800	18.0	44.23	47.35	68.55	18	84	18
2000	20.0	51.75	54.85	72.91	20	92	20
		(210)	(210)	(212)			

Solid Carbide End Mills

2327 **Design:** Solid carbide, UF, type N, DIN 6527 long, shank HA, with centre cut.

2333 **Design:** Solid carbide, UF, type N, DIN 6527 long, shank HB, with centre cut.

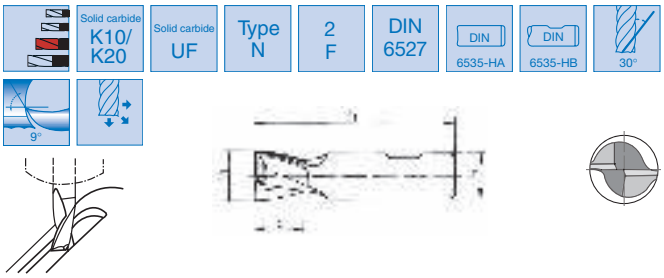
2342 TiAlN-2 **Design:** Solid carbide, UF,TiAlN-2, type N, DIN 6527 long, shank HB, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

2466 Fire **Design:** Solid carbide, UF, type N, Fire, DIN 6527, shank HB, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for milling keyways and key grooves and for universal milling. For machining depths of max. 1.5 x d, or several regrinding operations.





2327 format professional quality



2333 format professional quality



2342 TiAlN-2 format professional quality



2466 Fire

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2327	●	●	○	○					●		○	○	○
2333	●	●	○	○					●		○	○	○
2342	●	●	●	●	○				○	○	●	○	○
2466	●	●	●	●	○				○	○	●	○	○

Part No.	∅ d_1 = h 10 mm	2327 mm/inch	2333 mm/inch	2342 TiAlN-2 mm/inch	2466 Fire mm/inch	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0200	2.00	10.22	–	14.03	13.90	6	57	6
0250	2.50	–	–	14.03	–	7	57	6
0280	2.80	10.22	–	15.58	–	7	57	6
0300	3.00	9.02	–	13.70	13.90	7	57	6
0380	3.80	10.09	–	15.58	–	8	57	6
0400	4.00	8.48	–	13.09	13.18	8	57	6
0480	4.80	10.09	–	15.58	–	10	57	6
0500	5.00	8.48	–	13.09	13.18	10	57	6
0575	5.75	10.09	–	15.58	–	10	57	6
0600	6.00	8.28	9.48	12.78	12.44	10	57	6
0675	6.75	12.45	–	–	–	13	63	8
0700	7.00	11.22	–	21.19	20.51	13	63	8
0775	7.75	12.45	–	20.27	–	16	63	8
0800	8.00	9.85	11.03	17.14	16.86	16	63	8
0900	9.00	18.71	–	29.91	29.30	16	72	10
0970	9.70	20.55	–	29.91	–	19	72	10
1000	10.00	16.54	18.07	24.93	24.90	19	72	10
1100	11.00	25.87	–	–	–	22	83	12
1170	11.70	34.27	–	43.63	–	22	83	12
1200	12.00	23.36	24.93	35.51	35.15	22	83	12
1370	13.70	35.51	–	–	–	22	83	14
1400	14.00	32.42	34.27	48.60	48.36	22	83	14
1600	16.00	39.26	42.38	57.95	58.59	26	92	16
1800	18.00	56.08	59.20	86.00	84.24	26	92	18
2000	20.00	65.41	68.55	90.98	87.90	32	104	20
		(210)	(210)	(212)	(220)			

Solid Carbide End Mills

2354

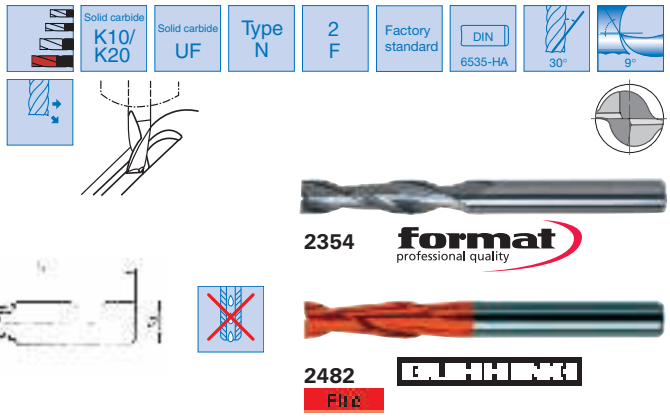
Design: Solid carbide, UF, type N, extra long, with centre cut.

2482
Fine

Design: Solid carbide, UF, type N, extra long, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for milling keyways and key grooves and for universal milling. For machining depths of max. 3 x d, thus perfectly suitable for mould construction.



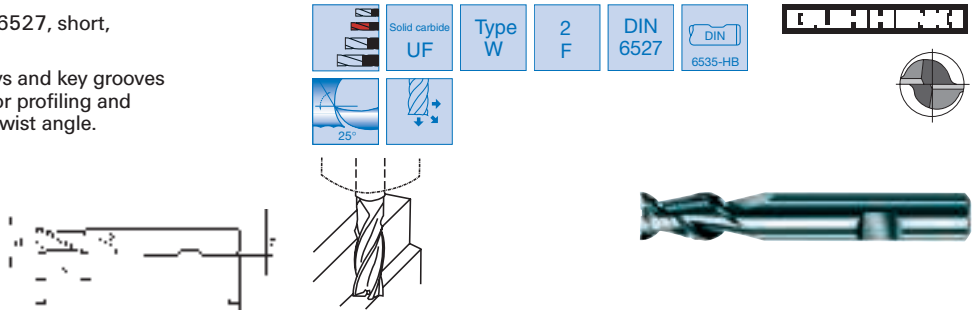
Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2354	●	●	○	○					○		○	◐	◐
2482	●	●	●	●	○				○	○	●	◐	◐

Part No.	⌀ d_1 = h 10 mm	2354	2482 Fine	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0300	3.0	12.40	13.90	20	75	3
0400	4.0	13.70	15.39	25	75	4
0500	5.0	15.27	16.12	30	75	5
0600	6.0	19.32	16.12	30	75	6
0800	8.0	24.93	31.50	40	100	8
1000	10.0	34.90	38.08	40	100	10
1200	12.0	54.85	58.59	45	150	12
1400	14.0	–	71.80	45	–	14
1600	16.0	97.83	95.24	65	150	16
1800	18.0	–	113.54	65	–	18
2000	20.0	130.86 (210)	128.19 (220)	65	150	20

Solid Carbide Slot Cutters for Aluminium

Design: Solid carbide, UF, type W, DIN 6527, short, with centre cut.

Application: Suitable for milling keyways and key grooves and for universal milling. Also suitable for profiling and finishing. Smooth running due to large twist angle.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2478												●	●

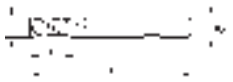
Part No.	⌀ d_1 = e 8 mm	2478	Cutting length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0300	3.0	9.52	5	50	6
0400	4.0	9.52	8	50	6
0500	5.0	9.52	9	54	6
0600	6.0	9.52	10	54	6
0800	8.0	10.99	12	58	8
1000	10.0	14.65	14	66	10
1200	12.0	22.71	16	73	12
1400	14.0	30.04	18	75	14
1600	16.0	34.43	22	82	16
1800	18.0	45.42	24	84	18
2000	20.0	60.06 (220)	26	92	20

Bore Mills

Solid Carbide Slot Cutters for Aluminium

Design: Solid carbide, UF, type W, DIN 6527 long, with centre cut.

Application: Suitable for milling keyways and key grooves and for universal milling. Also suitable for profiling and finishing. Smooth running due to large twist angle.





Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2480												●	●

Part No.	⌀ d_1 = e 8 mm	2480	Cutting length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0300	3.0	11.71	7	57	6
0400	4.0	11.71	8	57	6
0500	5.0	11.71	10	57	6
0600	6.0	11.71	10	57	6
0800	8.0	13.18	16	63	8
1000	10.0	22.71	19	72	10
		(220)			

Part No.	⌀ d_1 = e 8 mm	2480	Cutting length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
1200	12.0	32.96	22	83	12
1400	14.0	39.55	22	83	14
1600	16.0	54.20	26	92	16
1800	18.0	61.52	26	92	18
2000	20.0	84.24	32	104	20
		(220)			

Solid Carbide Miniature End Mills

2351

Design: Solid carbide, type N, extra short, shank HB, with centre cut.

Note: Not suitable for regrinding.

2352 TiAlN

Design: Solid carbide, TiAlN, type N, extra short, HB shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Note: Not suitable for regrinding.

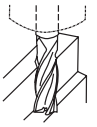
2353 FIRE

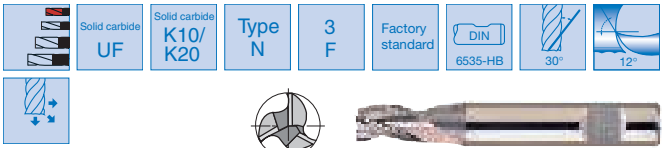
Design: Solid carbide, UF, type N, HB shank, with centre cut. With tolerance e8 also suitable for key grooves, tolerance P9 in one cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Note: Not suitable for regrinding.

Application: Suitable for milling keyways and key grooves and for general milling applications. The feed is approx. 50 % longer than in case of a 2-flute cutter.





2351





2352 TiAlN

format professional quality



2353 FIRE

ALTIN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2351	●	●	◐	●	●				◐		●	●	●
2352	●	●	●	●	●				●		●	●	●
2353	●	●	●	●	●				○	○	●	◐	◐

Part No.	⌀ d_1 = h 10 mm	2351	2352 TiAlN	2353 FIRE	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0030	0.3*	–	–	15.77	1	38	3
0040	0.4*	–	–	14.43	1	38	3
0050	0.5*	7.63	9.15	12.16	1.5	38	3
0060	0.6*	9.19	10.75	12.16	1.5	38	3
0080	0.8*	8.10	9.65	9.92	2	38	3
0100	1.0*	5.82	7.37	8.32	2	38	3
0120	1.2*	8.00	9.52	12.82	2	38	3
0150	1.5*	5.82	7.37	8.32	2	38	3
0180	1.8*	8.00	9.52	12.82	2	38	3
0200	2.0	7.24	8.78	11.01	4	35	6
0250	2.5	7.63	9.15	11.28	5	36	6
0300	3.0	7.24	8.78	11.01	5	36	6
0350	3.5	8.00	9.52	11.28	6	37	6
0400	4.0	7.24	8.78	11.01	7	38	6
0450	4.5	8.00	9.52	12.82	8	38	6
0500	5.0	7.24	8.78	12.43	8	39	6
		(210)	(212)	(221)			

* Shank ⌀ 3.0 mm, parallel shank, form HA (Gühring)

Continued overleaf

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Solid Carbide Miniature End Mills

Continued

Part No.	∅ d_1 = h 10 mm	2351	2352 TiAlN	2353 TiAlN-2	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0550	5.5	8.00	9.52	12.82	8	39	6
0575	5.75	8.00	9.52	14.09	8	39	6
0600	6.0	7.24	8.78	12.43	8	39	6
0675	6.75	9.79	11.89	19.13	10	42	8
0700	7.0	8.92	10.97	16.78	10	42	8
0775	7.75	9.79	11.89	17.46	10	42	8
0800	8.0	9.69	11.78	17.12	11	43	8
0870	8.7	16.24	18.57	26.51	11	48	10
0900	9.0	14.76	17.07	25.17	11	48	10
0970	9.7	16.24	18.57	26.85	11	48	10
1000	10.0	18.59	20.88	24.50	13	50	10
1200	12.0	18.78	21.43	29.55	15	55	12
1400	14.0	–	–	40.28	15	58	14
1600	16.0	–	–	51.69	18	62	16
1800	18.0	–	–	62.45	20	70	18
2000	20.0	–	–	83.26	22	75	20
		(210)	(212)	(221)			

Solid Carbide End Mills

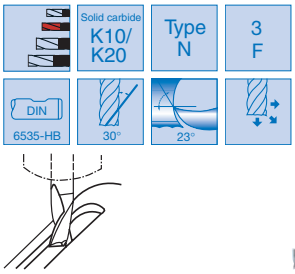
2318 **Design:** Solid carbide, type N, DIN 6527, short, HA shank, with centre cut.

2324 **Design:** Solid carbide, type N, DIN 6527, HB shank, with centre cut.

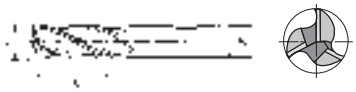
2345 TiAlN-2 **Design:** Solid carbide, TiAlN-2, type N, DIN 6527, HB shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for milling keyways and key grooves and for general milling operations. Extra short robust design for machining depths of max. 1 x d. The feed is approx. 50 % longer than in case of a 2-flute cutter.



format professional quality





2318



2324



2345 TiAlN-2

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2318	●	●	○	○					○		○	◐	◐
2324	●	●	○	○					○		○	◐	◐
2345	●	●	●	●	○				○	○	●	◐	◐

Part No.	∅ d_1 = h 10 mm	2318	2324	2345 TiAlN-2	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0200	2.0	7.87	9.02	10.90	3	50	6
0250	2.5	8.54	–	–	3	50	6
0300	3.0	7.87	9.02	10.90	4	50	6
0350	3.5	8.54	–	–	4	50	6
0400	4.0	7.68	8.79	10.52	5	54	6
0500	5.0	7.68	8.79	10.52	6	54	6
0600	6.0	7.45	8.68	10.16	7	54	6
0700	7.0	9.71	–	–	8	58	8
0800	8.0	8.79	9.99	13.70	9	58	8
0900	9.0	15.91	–	–	10	66	10
1000	10.0	14.32	15.91	19.94	11	66	10
1200	12.0	20.86	22.45	28.36	12	73	12
1400	14.0	28.36	30.23	37.41	14	75	14
1600	16.0	34.27	37.41	46.11	16	82	16
1800	18.0	49.86	52.97	68.55	18	84	18
2000	20.0	57.94	61.07	72.91	20	92	20
		(210)	(210)	(212)			

Solid Carbide End Mills

2330 **Design:** Solid carbide, type N, DIN 6527 long, HA shank, with centre cut.

2336 **Design:** Solid carbide, type N, DIN 6527 long, HB shank, with centre cut.

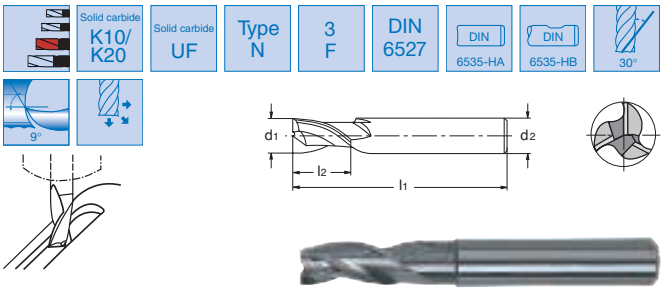
2348 TiAlN-2 **Design:** Solid carbide, TiAlN-2, type N, DIN 6527 long, HB shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

2468 FIRE **Design:** Solid carbide, Fire, type N, DIN 6527 long, HB shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for milling keyways and key grooves and for general milling operations. For machining depths of max. 1.5 x d. The feed is approx. 50 % longer than in case of a 2-flute cutter.



2330 format professional quality



2336 format professional quality



2348 TiAlN-2 format professional quality



2468 FIRE

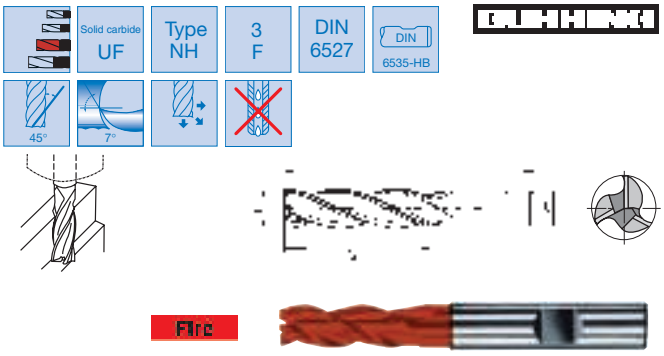
Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2330	●	●	○	○					○		○	◐	◐
2336	●	●	○	○					○		○	◐	◐
2348	●	●	●	●					○	○	●	◐	◐
2468	●	●	●	●	●				○	○	●	◐	◐

Part No.	∅ d_1 = h 10 mm	2330	2336	2348 TiAlN-2	2468 FIRE	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 ml
0200	2.0	10.16	–	–	13.90	6	57	6
0300	3.0	10.16	–	13.70	13.90	7	57	6
0400	4.0	9.79	–	13.09	13.18	8	57	6
0500	5.0	9.79	–	13.09	13.18	10	57	6
0600	6.0	9.65	11.53	12.78	12.44	10	57	6
0700	7.0	12.45	–	–	20.51	13	63	8
0800	8.0	11.22	15.91	17.14	16.86	16	63	8
0900	9.0	20.55	–	–	29.30	16	72	10
1000	10.0	18.39	23.36	24.93	24.90	19	72	10
1100	11.0	28.97	–	–	–	22	83	12
1200	12.0	26.48	33.66	35.51	35.15	22	83	12
1400	14.0	36.13	44.23	46.11	48.36	22	83	14
1600	16.0	42.99	54.85	57.94	58.59	26	92	16
1800	18.0	62.96	82.88	86.00	84.24	26	92	18
2000	20.0	73.53	87.24	90.98	87.90	32	104	20
		(210)	(210)	(212)	(220)			

Solid Carbide Universal End Mills

Design: Solid carbide, UF, Fire, type N, DIN 6527 long, HB shank, with centre cut.

Application: Suitable for milling grooves and roughing, as well as for general milling operations. Also suitable for profile milling and finishing. Very smooth running due to large twist angle.
The feed is approx. 50 % longer than in case of a 2-flute cutter.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2476	●	●	●	●	●				●	●	●	◐	

Part No.	⌀ d_1 = h 10 mm	2476	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0300	3.0	12.44	7	57	6
0400	4.0	12.44	8	57	6
0500	5.0	12.44	10	57	6
0600	6.0	12.44	10	57	6
0700	7.0	16.86	13	63	8
0800	8.0	16.12	16	63	8
0900	9.0	24.90 (220)	16	72	10

Part No.	⌀ d_1 = h 10 mm	2476	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
1000	10.0	23.44	19	72	10
1200	12.0	35.15	22	83	12
1400	14.0	43.95	22	83	14
1600	16.0	60.06	26	92	16
1800	18.0	73.26	26	92	18
2000	20.0	95.24 (220)	32	104	20

Solid Carbide End Mills

2357

Design: Solid carbide, type N, extra long, HA shank, with centre cut.

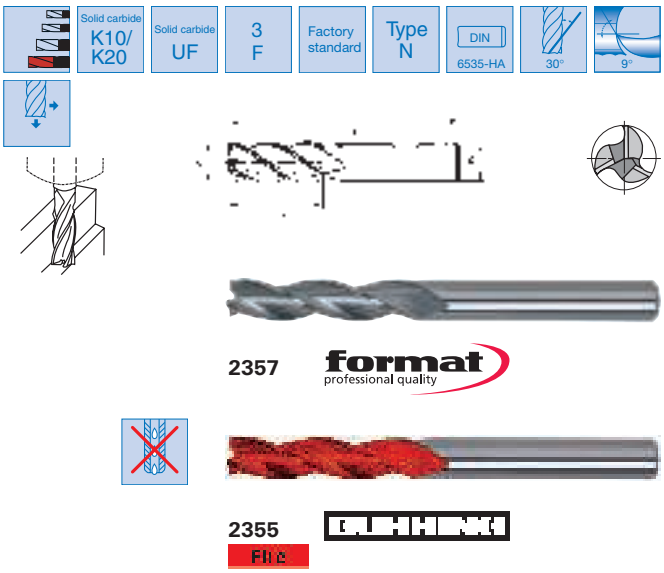
Application: Suitable for milling keyways and key grooves and for universal milling. For machining depths of max. 3 x d, thus optimal for mould construction. The feed is approx. 50 % longer than in case of a 2-flute cutter.

2355
Fire

Design: Solid carbide, type N, extra long, HA shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for milling keyways and key grooves and for universal milling. For machining depths of max. 3 x d, thus optimal for mould construction. The feed is approx. 50 % longer than in case of a 2-flute cutter.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2357	●	●	○	○					○		○	◐	◐
2355	●	●	●	●	○				○	◐	●	◐	◐

Part No.	⌀ d_1 = h 10 mm	2357	2355	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0300	3.0	13.09	23.83	20	75	3
0400	4.0	14.63	26.51	25	75	4
0500	5.0	15.91	29.21	30	75	5
0600	6.0	20.55 (210)	37.60 (221)	30	75	6

Part No.	⌀ d_1 = h 10 mm	2357	2355	Cut length l_2 mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0800	8.0	26.48	48.34	40	100	8
1000	10.0	36.75	63.80	40	100	10
1200	12.0	57.94	91.31	45	150	12
1600	16.0	103.42 (210)	170.54 (221)	65	150	16

Solid Carbide End Mills

2360

Design: Solid carbide, type N, DIN 6527, long, HB shank, with centre cut.

2361 TiAlN

Design: Solid carbide, TiAlN, type N, DIN 6527, long, HB shank, with centre cut.

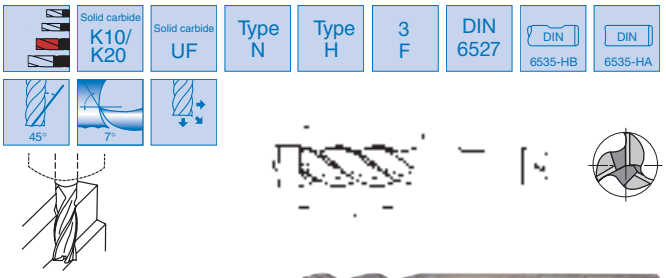
Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

2362 Fire

Design: Solid carbide, UF, Fire, type N, DIN 6527, long, HA shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible. Less deformation due to solid, shorter cutting edge, resulting in improved feed and longer tool life.

Application: Suitable for milling grooves, roughing and for general milling operations. Also suitable for profiling and finishing. Smooth running due to large twist angle. The feed is approx. 50 % longer than in case of a 2-flute cutter.





2360 format professional quality





2361 TiAlN format professional quality





2362 Fire

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2360	●	●	◐	●	◐				◐	◐		◐	
2361	●	●	●	●	●				●	●		●	
2362	●	●	●	●	●				●	●	●	◐	

Part No.	∅ d_1 = h 10 mm	2360	2361 TiAlN	2362 Fire	Cutting length l_2 mm 2360/2361	Cutting length l_2 mm 2362	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0300	3.0	9.94	11.29	14.77	8	7	57	6
0400	4.0	9.94	11.29	14.43	11	8	57	6
0500	5.0	9.94	11.29	14.43	13	10	57	6
0600	6.0	9.63	10.95	15.11	13	10	57	6
0700	7.0	12.26	14.07	19.47	16	13	63	8
0800	8.0	11.53	13.35	19.47	19	16	63	8
0900	9.0	18.57	20.56	29.21	19	16	72	10
1000	10.0	19.49	21.47	27.87	22	19	72	10
1200	12.0	28.04	30.36	42.97	26	22	83	12
1400	14.0	35.26	37.90	53.04	26	22	83	14
1600	16.0	46.57	49.92	71.16	32	26	92	16
1800	18.0	56.10	62.26	87.96	32	26	92	18
2000	20.0	70.34	76.46	114.82	38	32	104	20
		(210)	(212)	(221)				

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Solid Carbide End Mills

2363 **Design:** Solid carbide 30°, DIN 6527, short, HA shank, with centre cut.

2369 **Design:** Solid carbide, type N, 30°, DIN 6527, short, HB shank, with centre cut.

2375 TiAlN **Design:** Solid carbide, type N, 30°, DIN 6527 short, HB shank, with centre cut.

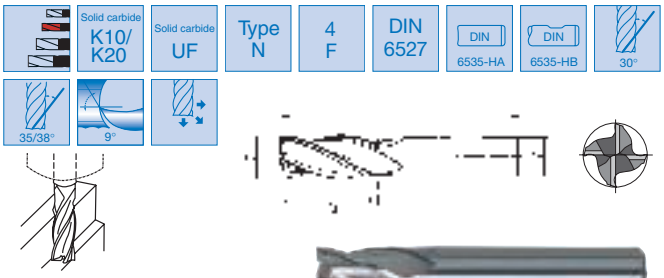
Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for profile milling, edge planing and finishing, as well as for general milling operations. Very short, stable design for milling depths of 1 x d.

2460 Fire **Design:** Solid carbide, UF, Fire, type N, 35°/38°, DIN 6527, short, HB shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for profile milling and finishing as well as slot cutting and roughing. Irregular twist pitch 35°/38° and vibration-free operation result in fine surfaces of the workpiece. Much longer service life than in case of conventional tools.



2363 format professional quality



2369 format professional quality



2375 TiAlN format professional quality



2460 Fire ALTHIN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2363	●	●	○	○					○		○	○	◐
2369	●	●	○	○					○		○	○	◐
2375	●	●	●	●	●				◐		●	◐	◐
2460	●	●	●	●	●				●	●	●	◐	◐

Part No.	∅ d_1 = h 10 mm	2363	2369	2375 TiAlN	2460 Fire	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0200	2.0	10.41	11.53	11.43	–	4	50	6
0300	3.0	9.30	10.45	11.43	–	5	50	6
0400	4.0	7.74	8.92	11.43	–	8	54	6
0500	5.0	7.74	8.92	11.32	–	9	54	6
0600	6.0	7.51	8.79	11.32	13.90	10	54	6
0800	8.0	8.95	10.16	15.30	19.77	12	58	8
1000	10.0	14.96	16.54	19.17	27.83	14	66	10
1200	12.0	21.51	23.07	26.16	36.62	16	73	12
1400	14.0	29.28	31.16	42.39	45.42	18	75	14
1600	16.0	35.51	38.65	48.76	60.06	22	82	16
1800	18.0	51.11	54.23	59.52	87.90	24	84	18
2000	20.0	59.85	62.96	76.11	91.56	26	92	20
		(210)	(210)	(212)	(220)			

Solid Carbide End Mills

2366 **Design:** Solid carbide, type N, DIN 6527 long, HA shank, with centre cut.

2372 **Design:** Solid carbide, type N, DIN 6527 long, HB shank, with centre cut.

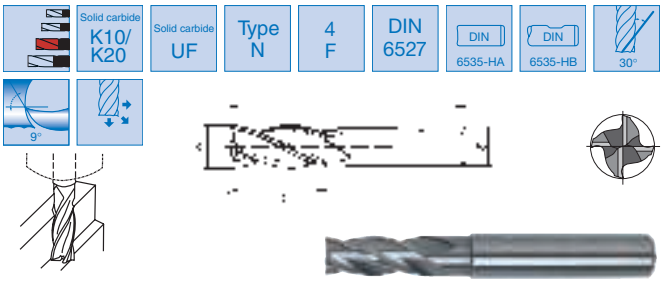
2378 TiAlN **Design:** Solid carbide,TiAlN, type N, DIN 6527 long, HB shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

2470 Fire **Design:** Solid carbide, UF, Fire, type N, DIN 6527 long, HB shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for profile milling, edge planing and finishing, as well as for general milling operations. Suitable for milling depths of 2 x d or regular regrinding.



2366 format professional quality



2372 format professional quality



2378 TiAlN format professional quality



2470 Fire

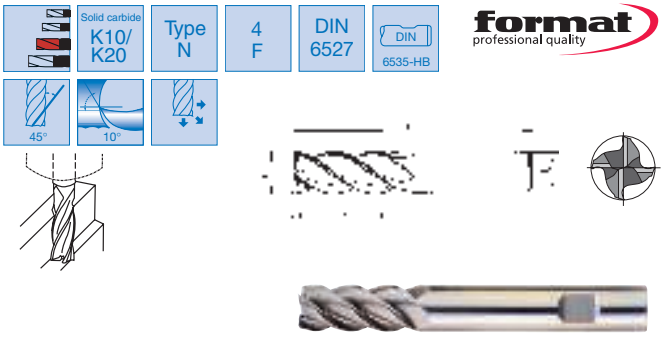
Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2366	●	●	○	○					○		○	○	◐
2372	●	●	○	○					○		○	○	◐
2378	●	●	●	●	●				◐		●	◐	◐
2470	●	●	●	●	○				○	○	●	○	◐

Part No.	∅ d_1 = h 10 mm	2366	2372	2378 TiAlN	2470 Fire	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0200	2.0	12.40	–	–	15.39	7	57	6
0300	3.0	11.15	–	–	16.12	8	57	6
0400	4.0	9.30	–	–	16.12	11	57	6
0500	5.0	9.30	–	–	16.86	13	57	6
0600	6.0	9.09	10.22	11.95	16.86	13	57	6
0700	7.0	12.20	–	–	19.77	16	63	8
0800	8.0	10.78	11.99	16.16	19.77	19	63	8
0900	9.0	20.27	–	–	25.64	19	72	10
1000	10.0	17.78	19.32	22.39	31.50	22	72	10
1100	11.0	28.36	–	–	–	26	83	12
1200	12.0	25.56	27.11	31.23	42.49	26	83	12
1400	14.0	34.90	36.75	44.97	54.20	26	83	14
1600	16.0	42.38	45.51	55.27	71.80	32	92	16
1800	18.0	61.07	64.21	73.30	91.56	32	92	18
2000	20.0	71.03	74.16	94.03	113.54	38	104	20
		(210)	(210)	(212)	(220)			

Solid Carbide End Mills

Design: Solid carbide, type W, DIN 6527 long, HB shank, with centre cut.

Application: Suitable for cutting slots and profile milling. The 45° helix provides a soft, peeling cut and ensures high surface quality; no burring of cut edges.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2379	●	●	◐							◐	●	●	●

Part No.	∅ d_1 = h 10 mm	2379 mm²	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0300	3.0	14.81	8	57	6
0400	4.0	14.81	11	57	6
0500	5.0	14.81	13	57	6
0600	6.0	14.81	13	57	6
0800	8.0	15.90	19	63	8
1000	10.0	23.86	22	72	10
1200	12.0	36.88	26	83	12
1400	14.0	44.08	26	83	14
1600	16.0	59.27	32	92	16
1800	18.0	75.84	32	92	18
2000	20.0	92.91	38	104	20
		(210)			

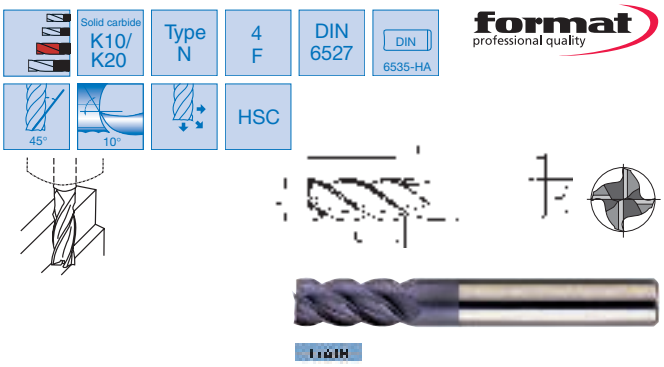
Solid Carbide End Mills for HSC

Design: Solid carbide, TiAlN, type N, 45°, DIN 6527 long, HA shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools.

Contraction-strain or in hydro-expansion chucks should be used for HSC milling.

Application: Suitable for profile and slot milling. The 45° helix provides a soft, peeling cut and ensures high surface quality; no burring of cut edges.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2405	●	●	●	●					●	◐		○	○

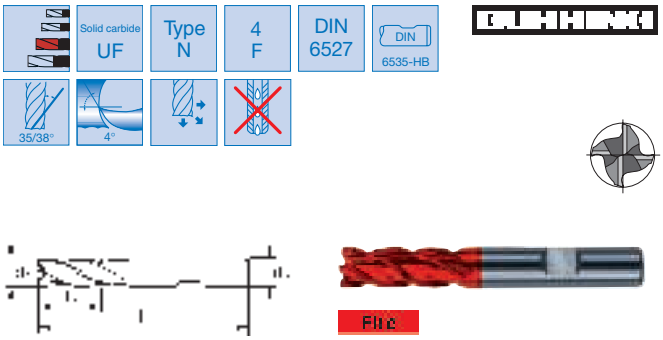
Part No.	∅ d_1 = h 10 mm	2405 mm² TiAlN	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0300	3.0	14.71	8	57	6
0400	4.0	14.71	11	57	6
0500	5.0	14.71	13	57	6
0600	6.0	14.36	13	57	6
0800	8.0	16.61	19	63	8
1000	10.0	26.33	22	72	10
1200	12.0	37.70	26	83	12
1600	16.0	60.32	32	92	16
2000	20.0	95.66	38	104	20
		(212)			

Solid Carbide Ratio Milling Cutters

Design: Solid carbide, UF, Fire, type N, 35°/38°, DIN 6527 short, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: RF 100 – Gühring ratio milling cutter. Suitable for roughing, milling of grooves and finishing operations. Irregular twist pitches 35°/38° result in smooth running and fine surfaces of the workpiece. Much longer service life than in case of conventional tools.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2462	●	●	●	●	●				●	●	●	○	○

Part No.	∅ d_1 = h 10 mm	2462	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0600	6.0	16.86	13	57	6
0800	8.0	23.44	19	63	8
1000	10.0	34.43	22	72	10
1200	12.0	43.95	26	83	12
1400	14.0	58.59	26	83	14
1600	16.0	76.92	32	92	16
1800	18.0	106.21	32	92	18
2000	20.0	117.20	38	104	20

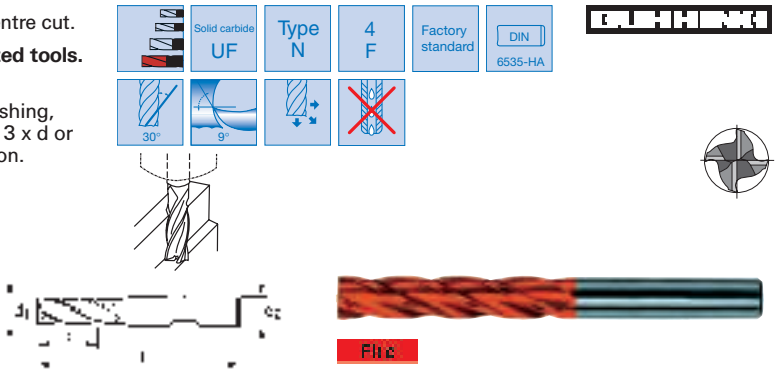
(220)

Solid Carbide End Mills

Design: Solid carbide UF, Fire, type N, 30°, HA shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for profile milling, edge planing and finishing, as well as for general milling operations. For milling depths of 3 x d or regular regrinding, perfect fit for mould construction application.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2471	●	●	●	●	○				○	○	●	○	◐

Part No.	∅ d_1 = h 10 mm	2471	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0300	3.0	16.12	20	75	3
0400	4.0	18.32	25	75	4
0500	5.0	19.77	30	75	5
0600	6.0	24.90	30	75	6
0800	8.0	25.64	40	100	8
1000	10.0	36.62	40	100	10
1200	12.0	58.59	45	150	12
1400	14.0	70.33	45	150	14
1600	16.0	87.90	65	150	16
1800	18.0	98.89	65	150	18
2000	20.0	115.89	65	150	20

(220)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Solid Carbide End Mills

2381

Design: Solid carbide, type N, DIN 6527 long, HB shank, with centre cut.

2384

Design: Solid carbide, type N, TiAlN-2, DIN 6527 long, HB shank, with centre cut.

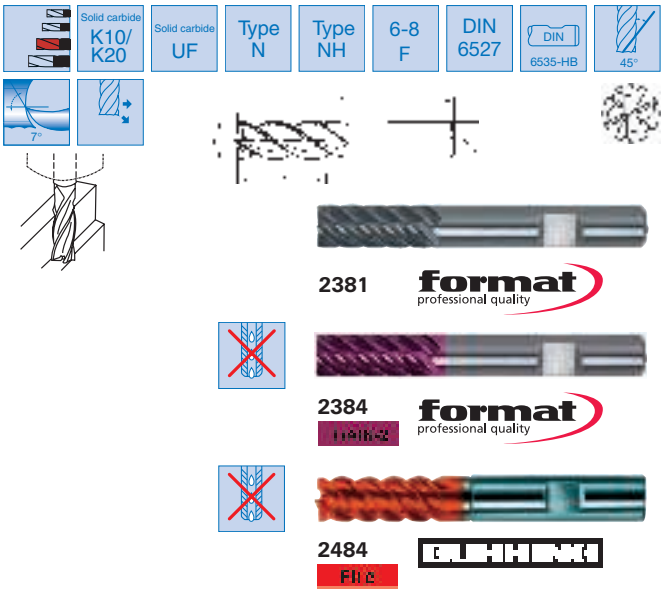
Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

2484

Design: Solid carbide, UF, Fire, type NH, DIN 6527 long, HB shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for fine milling, profile milling, edge planing. Particularly smooth running due to reinforced core and strong twist, resulting in low deformation and high-quality surface of the workpiece.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2381	●	●	○	○					○		○	○	◐
2384	●	●	●	●	○				○	●	●	●	○
2484	●	●	●	●	●				●	●	●	●	◐

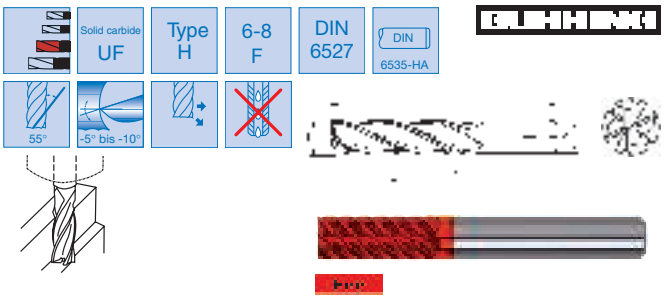
Part No.	∅ d_1 = h 10 mm	2381	2384	2484	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flute
0600	6.0	14.03	16.54	16.12	13	57	6	6
0800	8.0	16.19	19.32	19.06	19	63	8	6
1000	10.0	26.48	30.85	29.30	22	72	10	6
1200	12.0	34.90	41.13	39.55	26	83	12	6
1400	14.0	–	–	54.20	26	83	14	6
1600	16.0	62.33	73.53	71.80	32	92	16	8
1800	18.0	–	–	84.24	32	92	18	8
2000	20.0	89.12 (210)	105.33 (212)	98.89 (220)	38	104	20	8

Solid Carbide End Mills for Hard Machining

Design: Solid carbide UF (ultra-fine grain K 50), Fire, type H, DIN 6527 long, shank HA, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for fine milling, profile milling, edge planing. Particularly smooth running due to reinforced core and strong twist, resulting in low deformation and high-quality surface of the workpiece. Suitable for HSC machining up to 62 HRc.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2385					○	●	●	●					

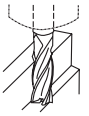
Part No.	∅ d_1 = h 10 mm	2385	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flute
0600	6.0	24.43	13	57	6	6
0800	8.0	28.21	19	63	8	6
1000	10.0	48.34	22	72	10	6
1200	12.0	65.80	26	83	12	6
1600	16.0	116.16	32	92	16	6
2000	20.0	166.51 (221)	38	104	20	8

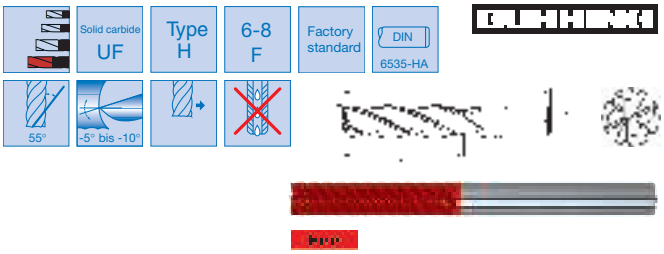
Solid Carbide End Mills for Hard Machining

Design: Solid carbide UF (ultra-fine grain K50), Fire, type H, extra long, shank HA, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for fine milling, profile milling, edge planing. Particularly smooth running due to reinforced core and strong twist, resulting in low deformation and high-quality surface of the workpiece.
For HSC machining up to 62 HRc. For machining depths of max. 3 x d, therefore perfectly suitable for mould construction.





Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2386					○	●	●	●					

Part No.	∅ d_1 = h 10 mm	2386	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flute
0600	6.0	28.54	30	75	6	6
0800	8.0	32.56	40	100	8	6
1000	10.0	55.06	40	100	10	6
		(221)				

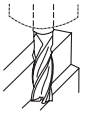
Part No.	∅ d_1 = h 10 mm	2386	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm	Flute
1200	12.0	77.21	45	150	12	6
1600	16.0	145.02	65	150	16	6
2000	20.0	213.51	65	150	20	8
		(221)				

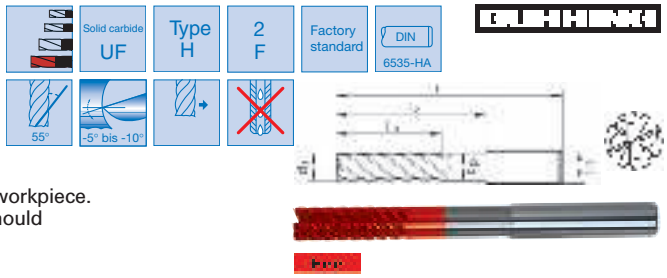
Solid Carbide Radius Cutters with Edge Radius for Hard Machining

Design: Solid carbide UF (ultra-fine grain K50), Fire, type H, extra long with edge radius, shank HA, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for fine milling, profile milling, edge planing. Particularly smooth running due to reinforced core and strong twist, resulting in low deformation and high-quality surface of the workpiece.
For HSC machining up to 62 HRc. Perfectly suitable for forging, die and mould construction.





Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2388					○	●	●	●					

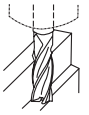
Part No.	∅ d_1 = h 10 mm	2388	Edge radius r mm	∅ d_3 mm	Cut length l_3 mm	Length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0600	6.0	23.83	0.5	5.7	13	39	75	6
0800	8.0	27.87	0.5	7.7	19	64	100	8
1000	10.0	49.02	0.5	9.5	22	60	100	10
1200	12.0	68.48	1.0	11.5	26	105	150	12
1600	16.0	122.20	1.0	15.5	32	102	150	16
		(221)						

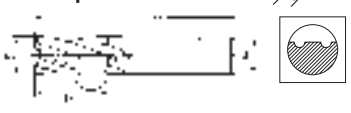
Solid Carbide Roughing and Finishing End Mills

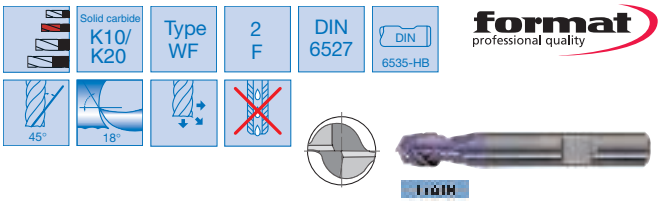
Design: Solid carbide, TiAlN, type WF, DIN 6527 short, HB shank, with relief-ground rough toothing, with chip divider and centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for profile and slot milling.







Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2343	●	●							●	●		●	●

Part No.	∅ d_1 = h 10 mm	2343	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0400	4.0	26.82	8	54	6
0500	5.0	26.82	9	54	6
0600	6.0	26.82	10	54	6
0800	8.0	31.03	12	58	8
		(212)			

Part No.	∅ d_1 = h 10 mm	2343	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
1000	10.0	39.59	14	66	10
1200	12.0	59.12	16	73	12
1600	16.0	81.28	22	82	16
2000	20.0	138.12	26	92	20
		(212)			

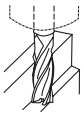
All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

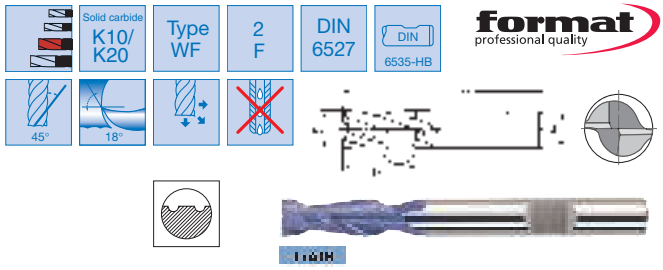
Solid Carbide Roughing and Finishing End Mills for Aluminium

Design: Solid carbide, TiAlN, type WF, DIN 6527, long, HB shank, with relief-ground rough toothing, with chip divider and centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for profile and slot milling.





Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2344												●	●

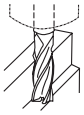
Part No.	ø d_1 = h 10 mm	2344 TiAlN	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
0400	4.0	30.24	11	57	6
0500	5.0	30.24	13	57	6
0600	6.0	30.24	13	57	6
0800	8.0	36.10	19	63	8
		(212)			

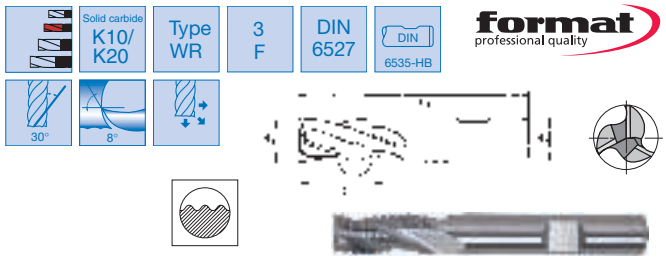
Part No.	ø d_1 = h 10 mm	2344 TiAlN	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
1000	10.0	52.56	22	72	10
1200	12.0	72.96	26	83	12
1600	16.0	113.27	32	92	16
2000	20.0	186.61	38	104	20
		(212)			

Solid Carbide End Mills for Aluminium Machining

Design: Solid carbide, type WR, DIN 6527, short, shank HB, with centre cutting.

Application: Suitable for roughing and groove milling. Gross knurled section produces small chips which are easy to remove.





Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2358	◐											●	●

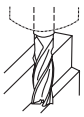
Part No.	ø d_1 = h 10 mm	2358	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
0600	6.0	24.93	10	57	6
0800	8.0	27.11	16	63	8
1000	10.0	32.42	19	72	10
		(210)			

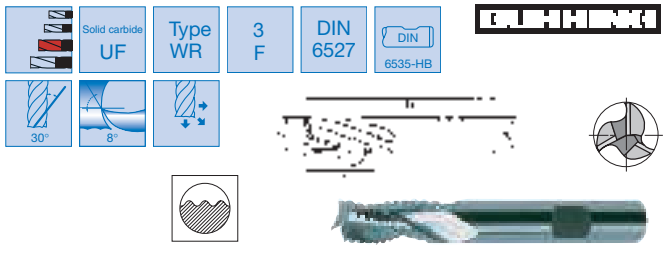
Part No.	ø d_1 = h 10 mm	2358	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
1200	12.0	40.51	22	83	12
1600	16.0	61.68	26	92	16
2000	20.0	114.67	32	104	20
		(210)			

Solid Carbide SL Roughing End Mills for Aluminium

Design: Solid carbide UF, type WR, DIN 6527, long, shank HB, with centre cut.

Application: Suitable for roughing and cutting of slots. Gross knurled section produces small chips which are easy to remove.





Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2469	◐											●	●

Part No.	ø d_1 = h 10 mm	2469	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
0800	8.0	26.38	16	63	8
1000	10.0	32.23	19	72	10
1200	12.0	39.55	22	83	12
		(220)			

Part No.	ø d_1 = h 10 mm	2469	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
1600	16.0	60.06	26	92	16
2000	20.0	113.54	32	104	20
		(220)			

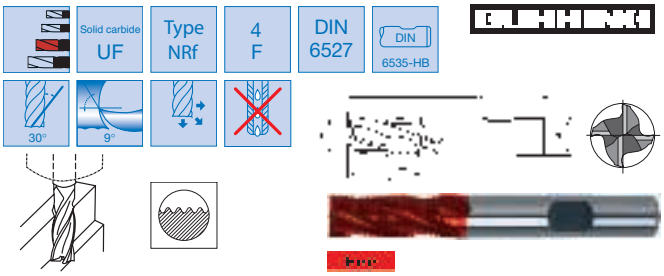
Bore Mills

Solid Carbide End Mills – Roughing

Design: Solid carbide UF, Fire, type NRf, DIN 6527, long, shank HB, with centre cutting.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for roughing and groove milling. Fine knurled section produces small chips which are easy to remove. A longer service life as well as a better surface quality are thereby achieved.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2389	●	●	●	●	○				○	○			

Part No.	ø d_1 = h 10 mm	2389	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
0600	6.0	42.97	13	57	6
0800	8.0	52.37	19	63	8
1000	10.0	57.07	22	72	10
		(221)			

Part No.	ø d_1 = h 10 mm	2389	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
1200	12.0	67.81	26	83	12
1600	16.0	107.43	32	92	16
2000	20.0	161.14	38	104	20
		(221)			

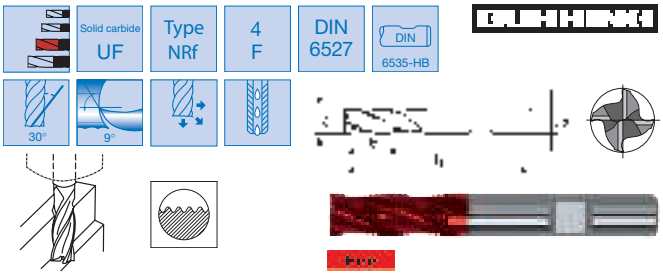
Solid Carbide SL Roughing End Mills with Inside Cooling

Design: Solid carbide, Fire, type NRf, DIN 6527, long, shank HB, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools.

Tool life can be extended significantly through inside cooling, as chip accumulation is reduced.

Application: Suitable for roughing and cutting of slots. Fine knurled section produces small chips which are easy to remove. A longer service life as well as a better surface quality are thereby achieved.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2391	●	●	●	●	○				●	●			

Part No.	ø d_1 = h 10 mm	2391	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
0600	6.0	59.09	13	57	6
0800	8.0	65.80	19	63	8
1000	10.0	71.84	22	72	10
		(221)			

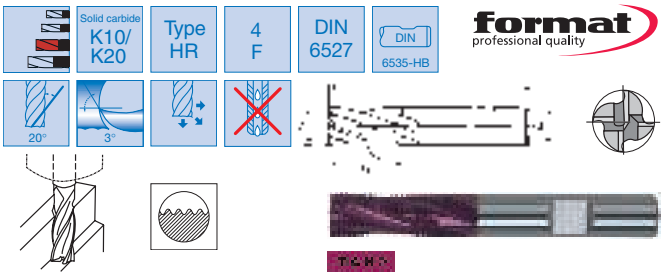
Part No.	ø d_1 = h 10 mm	2391	Cut length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
1200	12.0	85.27	26	83	12
1600	16.0	135.63	32	92	16
2000	20.0	201.41	38	104	20
		(221)			

Solid Carbide Roughing End Mills

Design: Solid carbide, TiAlN-2, type HR, DIN 6527, long, shank HB, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for roughing and groove milling. Fine knurled section produces small chips which are easy to remove. A longer service life as well as a better surface quality is thereby achieved.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2393	◐	◐	◐	●	●	●			●	●	●		

Part No.	ø d_1 = h 10 mm	2393	Cutting edge length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
0600	6.0	41.13	13	57	6
0800	8.0	47.35	19	63	8
1000	10.0	51.75	22	72	10
		(212)			

Part No.	ø d_1 = h 10 mm	2393	Cutting edge length l_2 mm	Total length l_1 mm	Shank ø d_2 = h 6 mm
1200	12.0	61.07	26	83	12
1600	16.0	97.21	32	92	16
2000	20.0	145.83	38	104	20
		(212)			

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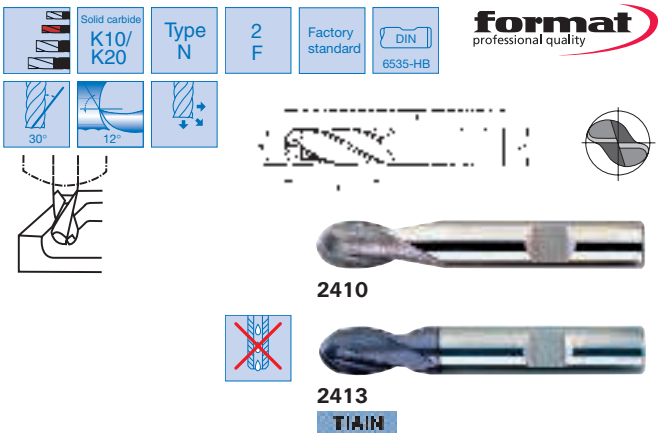
Solid Carbide Ball Nose Cutters

2410 **Design:** Solid carbide, type N, (similar to) DIN 6527, short, with centre cut.

2413 **Design:** Solid carbide, type N, (similar to) DIN 6527, short, with centre cut.

Cutting speed approx. 50 % higher compared to uncoated tools. Dry machining possible.

Application: Universal milling cutter for copy milling. Under certain conditions also suitable for plunging (drilling), traverse and profile milling as well as profile milling.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2410	●	●	◐	●	○				○	○	●	◐	◐
2413	●	●	●	●	●	◐			◐	◐	●	◐	◐

Part No.	∅ d_1 = h 10 mm	2410	2413 TiAlN	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0100	1.0*	14.33	15.85	2	38	3
0120	1.2*	14.33	–	2.2	38	3
0150	1.5*	14.33	15.85	2.5	38	3
0200	2.0*	12.71	14.96	3	38	3
0300	3.0	12.48	15.60	5	50	6
0400	4.0	11.24	14.26	8	54	6
0500	5.0	11.24	14.26	9	54	6
0600	6.0	11.24	14.26	10	54	6
0800	8.0	13.32	17.00	12	58	8
1000	10.0	17.04	22.05	14	66	10
1200	12.0	25.19	30.70	16	73	12
1400	14.0	31.10	40.34	18	75	14
1600	16.0	41.78	47.33	22	82	16
1800	18.0	50.42	55.99	24	84	18
2000	20.0	73.39	81.52	26	92	20

* with parallel shank

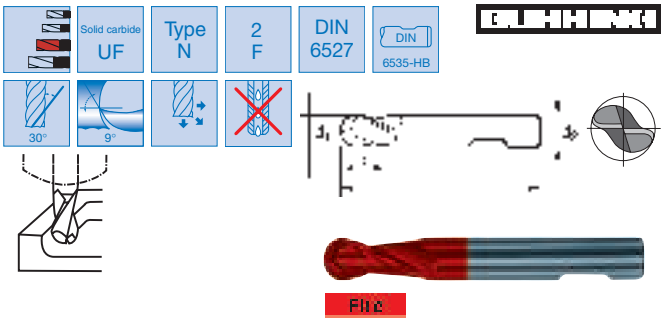
(210) (212)

Solid Carbide SL Ball Nose Cutters

Design: Solid carbide UF, Fire, type N, DIN 6527, long, shank HB, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for profiling and cutting of slots as well as universal milling.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2464	●	●	●	●	●				○	○	●	○	○

Part No.	∅ d_1 = h 10 mm	2464 Fire	Cut length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0400	4.0	19.77	8	57	6
0500	5.0	19.77	10	57	6
0600	6.0	19.77	10	57	6
0800	8.0	24.90	16	63	8
1000	10.0	32.96	19	72	10
1200	12.0	43.95	22	83	12

(220)

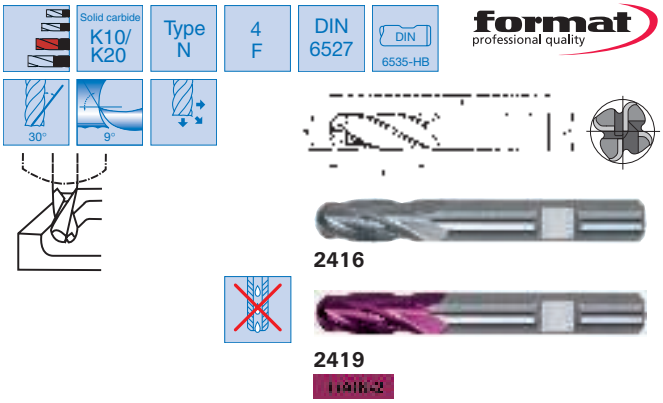
Solid Carbide Ball Nose Cutters

2416 **Design:** Solid carbide, type N, DIN 6527, long, HB shank, with centre cut.

2419 TiAlN-2 **Design:** Solid carbide, TiAlN-2, type N, DIN 6527, long, HB shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Suitable for duplication and finishing, as well as traverse and profile milling.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2416	●	●	○	○					○	○			
2419	●	●	●	●	○				○	●	●		

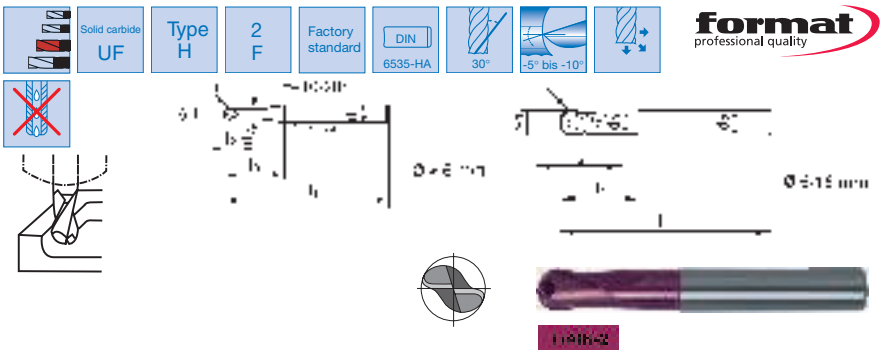
Part No.	∅ d_1 = h 10 mm	2416 mm/min	2419 TiAlN-2 mm/min	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0300	3.0	14.63	–	8	57	6
0400	4.0	14.32	–	11	57	6
0500	5.0	14.63	–	13	57	6
0600	6.0	14.32	16.83	13	57	6
0800	8.0	16.83	19.65	19	63	8
1000	10.0	21.51	24.93	22	72	10
1200	12.0	32.42	37.41	26	83	12
1400	14.0	–	47.77	26	83	14
1600	16.0	51.11	58.58	32	92	16
2000	20.0	81.00	–	38	104	20
		(210)	(212)			

Solid Carbide Spherical Cutters

Design: Solid carbide, UF, type N, TiAlN-2, long, HA shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Can be used for HSC duplication milling of hardened material up to 62 HRc. The tapered neck enables optimal range of the tool, making it a perfect fit for mould construction. The service life increases with MMS or air cooling. The tool may optionally be used with swivelled or straight milling spindles.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2422				◐	○	●	●	●			●		

Part No.	Size ∅ d_1 = h 8 mm	2422 TiAlN-2 mm/min	Radius r mm	∅ d_3 mm	Cutting length l_2 mm	Total length l_1 mm	Free l_4 mm	Shank ∅ d_2 = h 6 mm
0050	0.5	19.94	0.25	0.4	0.75	38	10	3
0080	0.8	19.94	0.4	0.7	1.2	38	10	3
0100	1.0	18.71	0.5	0.9	1.5	38	10	3
0150	1.5	18.07	0.75	1.4	2.25	38	10	3
0200	2.0	18.07	1.0	1.9	3	57	21	6
0300	3.0	18.71	1.5	2.7	5	57	21	6
0400	4.0	19.32	2.0	3.7	6	57	21	6
0500	5.0	19.32	2.5	4.7	8	57	21	6
0600	6.0	19.94	3.0	5.7	9	57	21	6
0800	8.0	24.93	4.0	7.7	12	63	27	8
1000	10.0	33.66	5.0	9.6	15	72	32	10
1200	12.0	45.51	6.0	11.5	18	83	38	12
1600	16.0	76.04	8.0	15.5	24	92	44	16
		(212)						

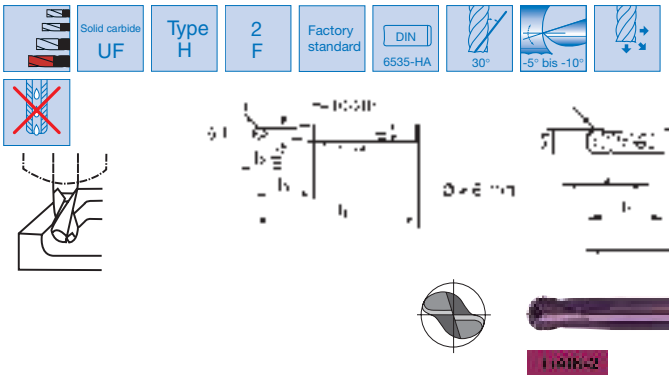
All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Solid Carbide Spherical Cutters

Design: Solid carbide, UF, type H, TiAlN-2, extra long, HA shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Can be used for HSC duplication milling of hardened material up to 62 HRc. The tapered neck enables optimal range of the tool, making it a perfect fit for mould construction. The service life increases with MMS or air cooling. The tool may optionally be used with swivelled or straight milling spindles.



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2425		●	●	◐	○	●	●	●			●		

Part No.	Size ∅ d_1 = h 8 mm	2425 TiAlN	Radius r mm	Neck ∅ d_3 mm	Cut length l_2 mm	Total length l_1 mm	Free zone l_3 mm	Shank ∅ d_2 = h 6 mm
0300	3.0	29.91	1.5	2.7	5	75	39	6
0400	4.0	33.00	2.0	3.7	6	75	39	6
0500	5.0	34.27	2.5	4.7	8	75	39	6
0600	6.0	36.13	3.0	5.7	9	75	39	6
0800	8.0	44.23	4.0	7.6	12	100	64	8
1000	10.0	57.32	5.0	9.5	15	100	60	10
1200	12.0	86.00	6.0	11.5	18	150	105	12
1600	16.0	132.11	8.0	15.5	24	150	102	16

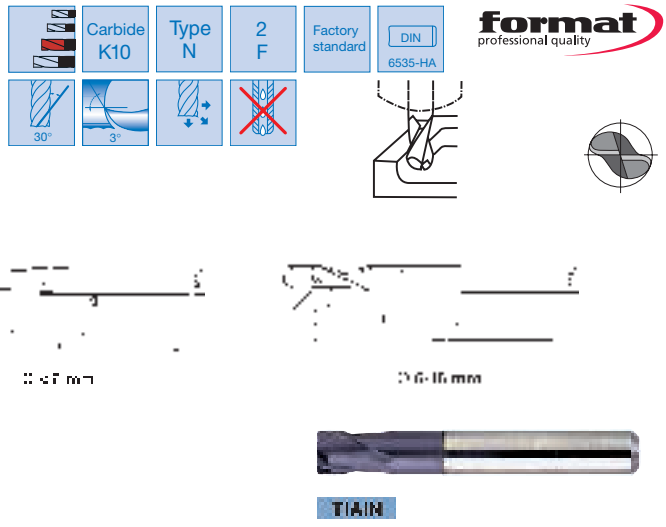
(212)

Solid Carbide Radius Cutters

Design: Solid carbide, UF, type N, TiAlN, long, HA shank, with centre cut. **Tapered neck – see dimension l_3/l_4 (free zone).**

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.
Tool life can be extended significantly through air cooling or well-dosed lubrication. These tools should only be used in hydro-expansion chucks. Dry machining possible.

Application: Can be used for duplication milling, profile and groove milling. **(Not with swivelled milling spindle).**



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2428		●	●	●	●	●	◐				●		

Part No.	Size ∅ d_1 ± 0.02 mm	2428 TiAlN	Edge radius r mm	Neck ∅ d_3 mm	Cut length l_2 mm	Total length l_1 mm	Free zone l_3/l_4 mm	Shank ∅ d_2 = h 6 mm
0200	2.0	41.36	0.5	1.8	3	57	8/20	6
0300	3.0	38.98	0.5	2.8	3.5	57	10/20	6
0400	4.0	37.14	1.0	3.8	4	57	12/20	6
0500	5.0	41.66	1.5	4.7	5	57	14/20	6
0600	6.0	49.50	2.0	5.6	6	57	–/20	6
0800	8.0	52.83	2.0	7.6	7	63	–/25	8
1000	10.0	55.88	3.0	9.6	8	72	–/30	10
1200	12.0	81.25	4.0	11.5	10	83	–/35	12

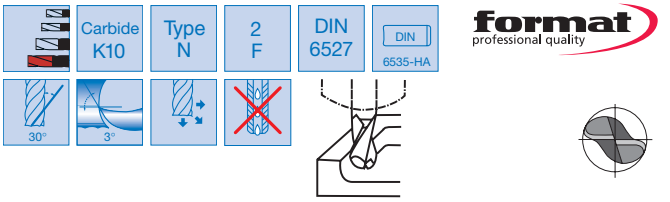
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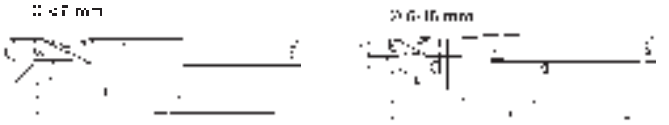
Solid Carbide Radius Cutters with radius bearing for machining HSC, 2 flutes, extra long

Design: Solid carbide, TiAlN, type N, DIN 6527, extra long, HA shank, with centre cut.
Tapered neck – see dimension l_3/l_4 (free zone).

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.
Tool life can be extended significantly through air cooling or well-dosed lubrication. These tools should only be used in hydro-expansion chucks. Dry machining possible.

Application: Can be used for duplication milling, profile and groove milling.
(Not with swivelled milling spindle).







Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2431		●	●	●	●	●					●		

Part No.	Size ⌀ d_1 ± 0.02 mm	2431 TiAlN	Edge radius r mm	⌀ of neck bearing d_3 mm	Cut length l_2 mm	Total length l_1 mm	Free zone l_3/l_4 mm	Shank ⌀ d_2 = h 6 mm
0100	1.0	46.73	0.25	0.95	2	80	4/40	6
0200	2.0	48.65	0.5	1.8	3	80	8/40	6
0300	3.0	46.30	0.5	2.8	3.5	80	12/40	6
0400	4.0	43.96	1.0	3.8	4	80	20/40	6
0500	5.0	48.11	1.5	4.7	5	80	25/40	6
0601	6.0	49.62	1.0	5.6	6	80	–/40	6
0600	6.0	57.71	2.0	5.6	6	80	–/40	6
0801	8.0	65.37	1.0	7.6	7	100	–/60	8
0800	8.0	62.74	2.0	7.6	7	100	–/60	8
1001	10.0	90.58	1.5	9.6	8	120	–/75	10
1000	10.0	69.81	3.0	9.6	8	120	–/75	10
1201	12.0	137.05	1.5	11.5	10	160	–/70	12
1200	12.0	115.45	4.0	11.5	10	160	–/70	12

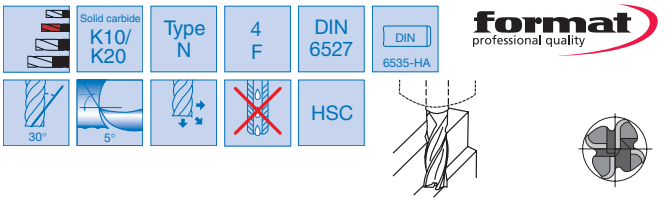
(212)

Solid Carbide Radius Cutters with edge radius for machining HSC

Design: Solid carbide, type N, TiAlN, DIN 6527, long, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: For plunging, cutting slots and contour milling with edge radius for reducing notching on the workpiece – less corner wear during plunging and cutting of slots.





Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2433	●	●	◐	●	◐						●	○	○

Part No.	⌀ d_1 = h 10 mm	2433 TiAlN	Edge radius r mm	Cutting length l_2 mm	l_A mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
0605	6.0	23.56	0.5	13	21	57	6
0610	6.0	23.56	1.0	13	21	57	6
0615	6.0	24.20	1.5	13	21	57	6
0805	8.0	36.45	0.5	19	27	63	8
0810	8.0	36.45	1.0	19	27	63	8
0815	8.0	38.33	1.5	19	27	63	8
0820	8.0	38.33	2.0	19	27	63	8
1005	10.0	45.88	0.5	22	32	72	10

(212)

Part No.	⌀ d_1 = h 10 mm	2433 TiAlN	Edge radius r mm	Cutting length l_2 mm	l_A mm	Total length l_1 mm	Shank ⌀ d_2 = h 6 mm
1010	10.0	45.88	1.0	22	32	72	10
1015	10.0	47.75	1.5	22	32	72	10
1020	10.0	47.75	2.0	22	32	72	10
1210	12.0	60.32	1.0	26	38	83	12
1215	12.0	62.21	1.5	26	38	83	12
1220	12.0	62.21	2.0	26	38	83	12
1620	16.0	103.07	2.0	32	44	92	16
2025	20.0	104.32	2.5	38	54	104	20

(212)

Solid Carbide Radius Profiling Cutters with Edge Radius

2434 Fire

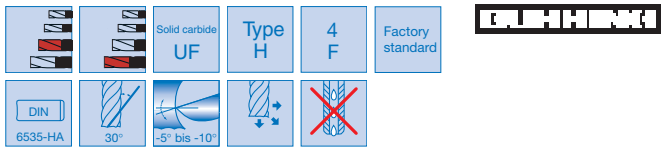
Design: Solid carbide, Fire, type H, long, HA shank, with centre cut.

2435 Fire

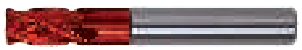
Design: Solid carbide, UF, Fire, type H, extra long, HA shank, with centre cut.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

Application: Can be used for HSC duplication milling of hardened material up to 62 HRc.
The tapered neck enables optimal range of the tool, making it a perfect fit for mould construction.
The service life increases with MMS or air cooling.
The tool may optionally be used with swivelled or straight milling spindles.







2434
Fire



2435
Fire

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2434				◐	○	●	●	●			●		
2435				◐	○	●	●	●			●		

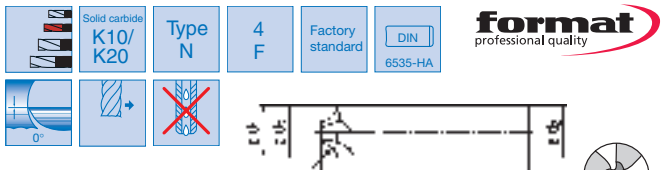
Part No.	Size ⌀ d_1 = h 8 mm	2434 Fire	2435 Fire	Edge radius r mm	Neck ⌀ d_3 mm	Cut length l_2 mm	Total length l_1 mm 2434	Total length l_1 mm 2435	Free zone l_2 mm 2434	Free zone l_2 mm 2435	Shank ⌀ d_2 = h 6 mm
0305	3.0	23.83	–	0.5	2.7	5.0	57	–	21	–	6
0405	4.0	24.16	–	0.5	3.7	6.0	57	–	21	–	6
0505	5.0	24.16	–	0.5	4.7	8.0	57	–	21	–	6
0610	6.0	26.20	47.67	1.0	5.7	9.0	57	75	21	39	6
0810	8.0	32.56	58.41	1.0	7.7	12.0	63	100	27	64	8
1015	10.0	44.32	75.19	1.5	9.5	15.0	72	100	32	60	10
1215	12.0	59.76	112.13	1.5	11.5	18.0	83	150	38	105	12
1620	16.0	99.37	174.57	2.0	15.5	24.0	92	150	44	102	16
		(221)	(221)								

Solid Carbide Corner-Rounding Cutters (concave cutter)

Design: Solid carbide, TiAlN, type N, short, HA shank.

Cutting speed approx. 50 % higher compared with uncoated tools.

Application: Suitable for rounding and deburring edges with contours.



format professional quality





TiAlN

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2451	●	◐		◐	●	●					○		

Part No.	⌀ r = H 11 mm	2451 TiAlN	Largest ⌀ d_1 mm	Smallest ⌀ d_3 mm	Total length l_1 mm	Shank ⌀ d_2 mm
0050	0.5	54.02	10	9	75	10
0100	1.0	54.02	10	8	75	10
0150	1.5	54.02	10	7	75	10
0200	2.0	54.02	10	6	75	10
		(212)				

Part No.	⌀ r = H 11 mm	2451 TiAlN	Largest ⌀ d_1 mm	Smallest ⌀ d_3 mm	Total length l_1 mm	Shank ⌀ d_2 mm
0250	2.5	55.95	10	5	75	10
0300	3.0	55.95	10	4	75	10
0400	4.0	60.43	12	4	75	12
0500	5.0	86.17	16	6	75	16
		(212)				

Solid Carbide Deburring and Chamfering Cutters

2440 **Design:** Solid carbide, type N, 90°, similar to DIN 6527, short HB shank.

2441 TiAlN **Design:** Solid carbide, TiAlN, type N, 90°, similar to DIN 6527, short HB shank.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

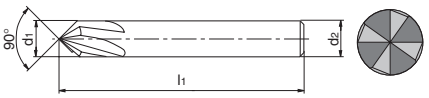
2442 **Design:** Solid carbide, type N, 60°, similar to DIN 6527, short, HB shank.

2443 TiAlN **Design:** Solid carbide, type N, 60°, similar to DIN 6527, short, HB shank.

Cutting speed approx. 50 % higher compared with uncoated tools. Dry machining possible.

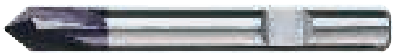
Application: Robust, short milling cutter for contour milling and for deburring and chamfering of edges.

Solid carbide K10/K20 | Type N | 4 F | Factory standard | DIN 6535-HB | format professional quality





2440



2441 TiAlN



2442



2443 TiAlN

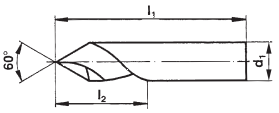
Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2440	●	○	○								●	●	●
2441	●	●	●	○	○	○	○	○	○				
2442	●	○	○								●	●	●
2443	●	●	●	○	○	○	○	○	○				

Part No.	∅ d_1 = h 11 mm	2440	2441 TiAlN	2442	2443 TiAlN	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 = h 6 mm
0400	4.0	10.84	14.26	10.84	14.26	8	54	4
0600	6.0	15.69	18.83	15.69	18.83	10	57	6
0800	8.0	18.69	24.24	18.69	24.24	12	63	8
1000	10.0	23.67	30.23	23.67	30.23	14	72	10
1200	12.0	32.39 (210)	39.93 (212)	32.39 (210)	39.93 (212)	16	83	12

Solid Carbide Engraving Cutters

Design: Solid carbide, type N, 60°, short HA shank. Relief ground, milling width (width of lettering) 0.1 mm.

Application: For burr-free engraving in plastic and non-ferrous metals.



Solid carbide K10/K20 | Type N | 1 F | Factory standard | DIN 6535-HA | format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2444	◐	◐										●	●

Part No.	∅ d_1 = h 11 mm	2444	Cutting length l_2 mm	Total length l_1 mm	Shank ∅ d_2 mm
0300	3.0	14.69	15	40	3
0400	4.0	16.25	15	40	4
0600	6.0	23.11 (210)	15	40	6

Solid Carbide End Cutters

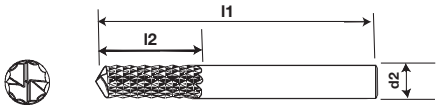
2445 **Design:** Solid carbide, right-hand cutting, diamond toothed and point angle 120°.

2447 **Design:** Solid carbide, right-hand cutting, diamond toothed, with double cutting faces.

Application: Particularly for machining of hard rubber, Plexiglas and all types of synthetic material (e.g. duroplastics, Kevlar and fibreglass reinforced plastics etc.).

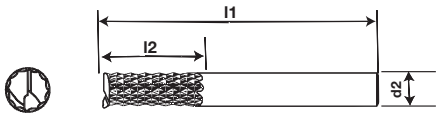


format professional quality





2445





2447

Part No.	Size ∅ mm	2445 mm/inch	2447 mm/inch	Cutting length l2 mm	Total length l1 mm	Shank ∅ d2 = h 8 mm
0200	2.0	9.84	9.84	10	40	2
0300	3.0	9.98	9.98	12	40	3
0400	4.0	12.13	12.13	15	40	4
0500	5.0	15.69	15.69	16	50	5
0600	6.0	20.12	20.12	25	60	6
0800	8.0	24.97 (210)	24.97 (210)	25	60	8

HSS Metal Circular Saw Blades

Design: Accuracy according to DIN 1840 tolerances. Rake angle to type N, standard steel.

HSS | DIN 1837 | DIN 1838

2655 **Application Form A:** Finely toothed to DIN 1837 A (angular tooth), for thin-walled materials and short cutting depths, for machining of short-chipping material.

2656 **Application Form B:** Coarse toothed to DIN 1838 B (curved tooth), for thick-walled material and large cutting depths.

2657 **Application Form C:** Coarse toothed to DIN 1838 C (curved tooth with rougher and shaver), high cutting performance due to spacing. For medium to large cutting depths.





Angular tooth A



Curved tooth B



Curved tooth C

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2655	●												
2656	●												
2657	●												

Part No.	ø d_1 j 15 mm	2655 Form A	Width b j 11 mm	Hole d_2 H 7 mm	No. of teeth Form A
0001	20	7.33 ◊	0.2	5	80
0004	20	7.33 ◊	0.25	5	64
0007	20	6.69 ◊	0.3	5	64
0010	20	6.69 ◊	0.4	5	64
0013	20	6.32 ◊	0.5	5	48
0016	20	6.32 ◊	0.6	5	48
0019	20	6.32 ◊	0.8	5	48
0022	20	6.32 ◊	1.0	5	40
0025	20	6.96 ◊	1.2	5	40
0028	20	7.62 ◊	1.6	5	40
0031	20	7.89 ◊	2.0	5	32
0034	20	8.33 ◊	2.5	5	32
0037	20	9.07 ◊	3.0	5	32
0040	20	10.45 ◊	4.0	5	24
0043	20	12.18 ◊	5.0	5	24
0046	20	13.93 ◊	6.0	5	24
0049	25	7.62 ◊	0.2	8	80
0052	25	7.62 ◊	0.25	8	80
0055	25	7.06 ◊	0.3	8	80
0058	25	7.06 ◊	0.4	8	64
0061	25	6.78 ◊	0.5	8	64
0064	25	6.78 ◊	0.6	8	64
0067	25	6.78 ◊	0.8	8	48
0070	25	6.78 ◊	1.0	8	48
0073	25	7.25 ◊	1.2	8	48
0076	25	7.79 ◊	1.6	8	40
0079	25	8.24 ◊	2.0	8	40
0082	25	8.88 ◊	2.5	8	40
0085	25	9.71 ◊	3.0	8	32
0088	25	11.54 ◊	4.0	8	32
0091	25	13.47 ◊	5.0	8	32
0094	25	15.12 ◊	6.0	8	24
0097	32	8.07 ◊	0.2	8	100
0100	32	8.07 ◊	0.25	8	100
0103	32	7.33 ◊	0.3	8	80
0106	32	7.33 ◊	0.4	8	80
0109	32	7.06 ◊	0.5	8	80
0112	32	7.06 ◊	0.6	8	64
0115	32	7.06 ◊	0.8	8	64
0118	32	7.06 ◊	1.0	8	64
0121	32	7.79 ◊	1.2	8	48
0124	32	8.07 ◊	1.6	8	48
0127	32	8.70 ◊	2.0	8	48
0130	32	9.44 ◊	2.5	8	40
0133	32	10.08 ◊	3.0	8	40
0136	32	12.83 ◊	4.0	8	40
0139	32	14.47 ◊	5.0	8	32
0142	32	15.76 ◊	6.0	8	32
0145	40	8.80 ◊	0.2	10	128
0148	40	8.80 ◊	0.25	10	100
		(240)			

Part No.	ø d_1 j 15 mm	2655 Form A	2656 Form B	2657 Form C	Width b j 11 mm	Hole d_2 H 7 mm	No. of teeth Form A	Form B	Form C
0151	40	8.43 ◊	–	–	0.3	10	100	–	–
0154	40	8.43 ◊	–	–	0.4	10	100	–	–
0157	40	7.89 ◊	–	–	0.5	10	80	–	–
0160	40	7.89 ◊	–	–	0.6	10	80	–	–
0163	40	7.89 ◊	–	–	0.8	10	80	–	–
0166	40	7.89 ◊	–	–	1.0	10	64	–	–
0169	40	7.89 ◊	–	–	1.2	10	64	–	–
0172	40	8.33 ◊	–	–	1.6	10	64	–	–
0175	40	9.07 ◊	–	–	2.0	10	48	–	–
0178	40	10.08 ◊	–	–	2.5	10	48	–	–
0181	40	11.54 ◊	–	–	3.0	10	48	–	–
0184	40	13.84 ◊	–	–	4.0	10	40	–	–
0187	40	17.14 ◊	–	–	5.0	10	40	–	–
0190	40	18.88 ◊	–	–	6.0	10	40	–	–
0193	50	10.36 ◊	–	–	0.2	13	128	–	–
0196	50	10.36 ◊	–	–	0.25	13	128	–	–
0199	50	9.44 ◊	–	–	0.3	13	128	–	–
0202	50	9.44 ◊	–	–	0.4	13	100	–	–
0205	50	8.88 ◊	8.88 ◊	–	0.5	13	100	48	–
0208	50	8.88 ◊	8.88 ◊	–	0.6	13	100	48	–
0211	50	8.88 ◊	8.88 ◊	–	0.8	13	80	40	–
0214	50	8.88 ◊	8.88 ◊	11.54 ◊	1.0	13	80	40	40
0217	50	8.88 ◊	8.88 ◊	11.28 ◊	1.2	13	80	40	40
0220	50	9.71 ◊	9.71 ◊	12.18 ◊	1.6	13	64	32	32
0223	50	10.45 ◊	10.45 ◊	12.83 ◊	2.0	13	64	32	32
0226	50	11.28 ◊	11.28 ◊	13.66 ◊	2.5	13	64	32	32
0229	50	12.83 ◊	12.83 ◊	14.11 ◊	3.0	13	48	24	24
0232	50	14.84 ◊	14.84 ◊	17.87 ◊	4.0	13	48	24	24
0235	50	19.52 ◊	19.52 ◊	22.17 ◊	5.0	13	48	24	24
0238	50	22.17 ◊	22.17 ◊	24.28 ◊	6.0	13	40	20	20
0241	63	11.28 ◊	–	–	0.25	16	160	–	–
0244	63	10.82 ◊	–	–	0.3	16	128	–	–
0247	63	10.82 ◊	–	–	0.4	16	128	–	–
0250	63	10.36 ◊	10.36 ◊	–	0.5	16	128	64	–
0253	63	10.36 ◊	10.36 ◊	–	0.6	16	100	48	–
0256	63	10.36 ◊	10.36 ◊	–	0.8	16	100	48	–
0259	63	10.36 ◊	10.36 ◊	13.02 ◊	1.0	16	100	48	48
0262	63	10.08 ◊	10.08 ◊	12.37 ◊	1.2	16	80	40	40
0265	63	11.28 ◊	11.28 ◊	14.11 ◊	1.6	16	80	40	40
0268	63	12.10 ◊	12.10 ◊	14.47 ◊	2.0	16	80	40	40
0271	63	12.83 ◊	12.83 ◊	15.12 ◊	2.5	16	64	32	32
0274	63	14.11 ◊	14.11 ◊	16.69 ◊	3.0	16	64	32	32
0277	63	17.87 ◊	17.87 ◊	21.16 ◊	4.0	16	64	32	32
0280	63	22.54 ◊	22.54 ◊	25.29 ◊	5.0	16	48	24	24
0283	63	25.29 ◊	25.29 ◊	28.23 ◊	6.0	16	48	24	24
0286	80	12.74 ◊	–	–	0.3	22	160	–	–
0289	80	12.74 ◊	–	–	0.4	22	160	–	–
0292	80	12.28 ◊	12.28 ◊	–	0.5	22	128	64	–
0295	80	12.28 ◊	12.28 ◊	–	0.6	22	128	64	–
0298	80	12.28 ◊	12.28 ◊	–	0.8	22	128	64	–
		(240)	(240)	(240)					

Continued overleaf

HSS Metal Circular Saw Blades

Continued

Part No.	⌀ d_1 j 15 mm	2655 Form A	2656 Form B	2657 Form C	Width b j 11 mm	Hole d_2 H 7 mm	No. of teeth Form A	Form B	Form C
0301	80	12.28 ◊	12.28 ◊	15.12 ◊	1.0	22	100	48	48
0304	80	11.91 ◊	11.91 ◊	15.29 ◊	1.2	22	100	48	48
0307	80	12.65 ◊	12.65 ◊	15.76 ◊	1.6	22	100	48	48
0310	80	13.93 ◊	13.93 ◊	16.32 ◊	2.0	22	80	40	40
0313	80	16.69 ◊	16.69 ◊	19.80 ◊	2.5	22	80	40	40
0316	80	18.14 ◊	18.14 ◊	21.43 ◊	3.0	22	80	40	40
0319	80	22.17 ◊	22.17 ◊	25.84 ◊	4.0	22	64	32	32
0322	80	27.32 ◊	27.32 ◊	30.34 ◊	5.0	22	64	32	32
0325	80	30.60 ◊	30.60 ◊	34.91 ◊	6.0	22	64	32	32
0328	100	14.40 ◊	14.40 ◊	–	0.5	22	160	80	–
0331	100	14.40 ◊	14.40 ◊	–	0.6	22	160	80	–
0334	100	14.40 ◊	14.40 ◊	–	0.8	22	128	64	–
0337	100	14.40 ◊	14.40 ◊	16.69 ◊	1.0	22	128	64	64
0340	100	13.93 ◊	13.93 ◊	16.87 ◊	1.2	22	128	64	64
0343	100	16.87 ◊	16.87 ◊	19.80 ◊	1.6	22	100	48	48
0346	100	18.60 ◊	18.60 ◊	20.91 ◊	2.0	22	100	48	48
0349	100	20.91 ◊	20.91 ◊	22.17 ◊	2.5	22	100	48	48
0352	100	22.54 ◊	22.54 ◊	24.56 ◊	3.0	22	80	40	40
0355	100	30.60 ◊	30.60 ◊	33.71 ◊	4.0	22	80	40	40
0358	100	34.27 ◊	34.27 ◊	37.01 ◊	5.0	22	80	40	40
0361	100	40.05 ◊	40.05 ◊	42.71 ◊	6.0	22	64	32	32
0364	125	21.99 ◊	21.99 ◊	–	0.6	22	160	80	–
0367	125	21.99 ◊	21.99 ◊	–	0.8	22	160	80	–
0370	125	21.99 ◊	21.99 ◊	23.83 ◊	1.0	22	160	80	80
0373	125	20.62 ◊	20.62 ◊	24.56 ◊	1.2	22	128	64	64
0376	125	21.43 ◊	21.43 ◊	24.92 ◊	1.6	22	128	64	64
0379	125	22.54 ◊	22.54 ◊	25.57 ◊	2.0	22	128	64	64
0382	125	23.83 ◊	23.83 ◊	25.84 ◊	2.5	22	100	48	48
0385	125	26.58 ◊	26.58 ◊	29.24 ◊	3.0	22	100	48	48
0388	125	39.78 ◊	39.78 ◊	44.08 ◊	4.0	22	100	48	48
0391	125	46.45 ◊	46.45 ◊	48.38 ◊	5.0	22	80	40	40
0394	125	51.86 ◊	51.86 ◊	55.53 ◊	6.0	22	80	40	40
0397	160	30.40 ◊	30.40 ◊	29.78 ◊	1.0	32	160	80	80
0400	160	28.51 ◊	28.51 ◊	29.78 ◊	1.2	32	160	80	80
0403	160	29.24 ◊	29.24 ◊	31.86 ◊	1.6	32	160	80	80
0406	160	30.15 ◊	30.15 ◊	32.13 ◊	2.0	32	128	64	64
0409	160	33.75 ◊	33.75 ◊	36.10 ◊	2.5	32	128	64	64
0412	160	38.43 ◊	38.43 ◊	41.05 ◊	3.0	32	128	64	64
0415	160	53.96 ◊	53.96 ◊	58.02 ◊	4.0	32	100	48	48
0418	160	63.97 ◊	63.97 ◊	65.95 ◊	5.0	32	100	48	48
0421	160	72.91 ◊	72.91 ◊	77.51 ◊	6.0	32	100	48	48
0424	200	42.34 ◊	–	–	1.0	32	200	–	–
0427	200	39.78 ◊	39.78 ◊	–	1.2	32	200	100	–
0430	200	42.71 ◊	42.71 ◊	46.73 ◊	1.6	32	160	80	80
0433	200	45.45 ◊	45.45 ◊	47.74 ◊	2.0	32	160	80	80
0436	200	51.50 ◊	51.50 ◊	54.81 ◊	2.5	32	160	80	80
0439	200	57.55 ◊	57.55 ◊	61.58 ◊	3.0	32	128	64	64
0442	200	81.38 ◊	81.38 ◊	86.78 ◊	4.0	32	128	64	64
0445	200	96.86 ◊	96.86 ◊	103.00 ◊	5.0	32	128	64	64
0448	200	111.70 ◊	111.70 ◊	117.76 ◊	6.0	32	100	48	48
0451	250	56.66 ◊	56.66 ◊	59.73 ◊	1.6	32	200	100	100
0454	250	61.99 ◊	61.99 ◊	65.31 ◊	2.0	32	200	100	100
0457	250	70.92 ◊	70.92 ◊	74.16 ◊	2.5	32	160	80	80
0460	250	78.13 ◊	78.13 ◊	82.10 ◊	3.0	32	160	80	80
0463	250	113.33 ◊	113.33 ◊	117.29 ◊	4.0	32	160	80	80
0466	250	134.53 ◊	134.53 ◊	139.84 ◊	5.0	32	128	64	64
0469	250	158.26 ◊	158.26 ◊	163.58 ◊	6.0	32	128	64	64
0472	315	112.35 ◊	112.35 ◊	119.13 ◊	2.5	40	200	100	100
0475	315	126.47 ◊	126.47 ◊	133.97 ◊	3.0	40	200	100	100
0478	315	162.84 ◊	162.84 ◊	167.15 ◊	4.0	40	160	80	80
0481	315	198.49 ◊	198.49 ◊	201.88 ◊	5.0	40	160	80	80
0484	315	235.43 ◊	235.43 ◊	242.19 ◊	6.0	40	160	80	80
		(240)	(240)	(240)					

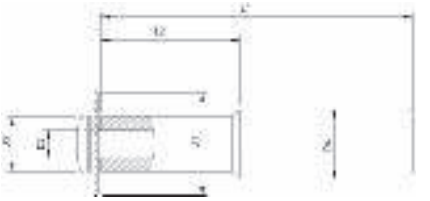
Saw Blade Receiver

Design: Pin and clamping chuck made of 16MnCr 5–62 HRc, guiding screw of 42 CrMo 4.
Concentricity tolerance 0.01 mm. Shank design according to DIN 1835 B.

Application: For precise securing, clamping or receiving of metal circular saw blades, DIN 1837/1838, with a blade diameter of 20–100 mm.

Scope of supply: Receiving pin, 1 clamping nut with left-hand thread and guiding screw.

DIN 1835-B





Part No.		0005	0010	0015	0020	0025	0030	0035	0040
For saw blade ∅	mm	20	25	32	40	50	63	80	100
2658		50.29	50.29	50.29	50.29	50.29	50.29	71.86	71.86
L1	mm	94	104	110	114	141	141	160	160
L2	mm	40	50	55	60	80	80	80	80
D1	mm	20	25	32	40	50	63	80	100
D2	mm	5	8	8	10	13	16	22	22
D3	mm	10	13	16	19.5	24.5	24.5	34	39.5
D4	mm	20	20	20	20	25	25	40	40

(239)

NEW

KOMET Ko-Bi High-performance Saw Blade

- High breakage resistance thanks to back made of flexible spring steel and welded HSS steel
- Universal sawing of steel, cast iron and aluminium

For further saw blades see page 2/86.

KOMET



2/86

HSS/HSS-E Metal Circular Saw Blades

Design: According to DIN 1840, concave ground. Basic material laser-cut, with steam tempered surface (blue/black).
Hard, tough and wear resistant 3–5 µm thick oxide layer (Fe304). Protects against pick-up, ensures longer service life and good absorption of cooling liquid.

2670 Steam tempered, hardened and multi-tempered to **63–65 HRC.**

2672 Steam tempered, cobalt alloy and multi-tempered to **65–66 HRC.**

2674 TIN **TiN coated.** Exceptional wear resistance with significantly reduced friction and enhanced temperature stability.

Application:

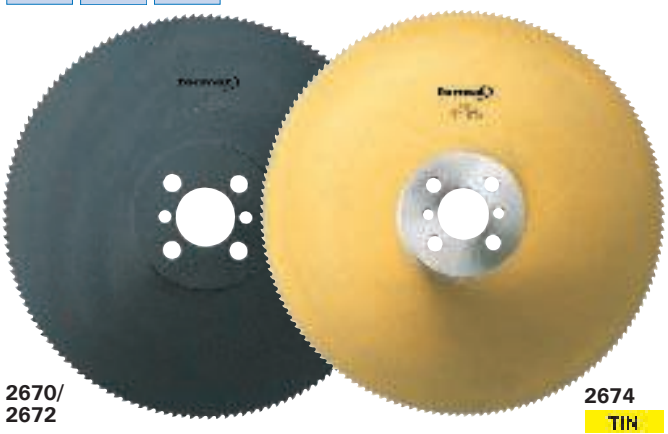
2670: For cutting of structural steel and unalloyed tool steel with strengths up to 850 N/mm². Cutting speeds: 20–80 m/min.

2672: Ideal for cutting of tough and tough-hard materials (V2A, V4A), cutting speeds: 6–12 m/min.

2674: Particularly suitable for automatic sawing machines and if spray/cooling devices are used. Cutting speeds: 40–120 m/min. Due to high wear-resistant coating and better anti-friction characteristics, especially suitable for continuous operation/series cuts. Enables higher cutting speeds and feed rates, combined with longer service life.

HSS-DMo5 | HSS-E | H7

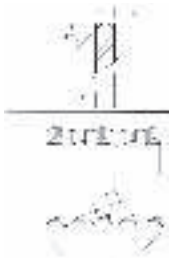
format professional quality



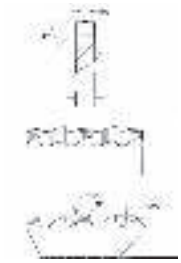
2670/ 2672

2674 TIN

Toothing BW



Toothing HZ



Toothing:
BW = curved tooth with alternating chamfer up to 4 mm tooth pitch
HZ = curved tooth with rougher and shaver for all tooth pitches above 4 mm

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2670	●												
2672	◐								●				
2674	●	◐											

Part No.	Dimensions mm	2670	2672	2674 TIN	Quantity ø reference circle mm	Teeth Tooth profile
0001	225 x 2.0 x 32	35.62	50.92	–	–	120 HZ
0003	225 x 2.0 x 32	35.62	50.92	–	–	180 BW
0005	250 x 2.0 x 32	37.65	53.08	82.52	2/8/45 + 2/11/63	128 HZ
0007	250 x 2.0 x 32	37.65	53.08	82.52	2/8/45 + 2/11/63	200 BW
0009	275 x 2.0 x 32	43.99	64.27	85.52	2/8/45 + 2/9/50 + 2/12/64	144 HZ
0011	275 x 2.0 x 32	43.99	64.27	85.52	2/8/45 + 2/9/50 + 2/12/64	220 BW
0013	275 x 2.5 x 40	42.91	61.95	84.39	2/8/55 + 4/12/64	110 HZ
0015	275 x 2.5 x 40	42.91	61.95	84.39	2/8/55 + 4/12/64	144 HZ
0017	275 x 2.5 x 40	42.91	61.95	84.39	2/8/55 + 4/12/64	180 HZ
0019	275 x 2.5 x 40	42.91	61.95	84.39	2/8/55 + 4/12/64	220 BW
0021	300 x 2.5 x 32	61.61	83.75	110.55	2/8/45 + 2/9/50 + 2/12/64	120 HZ
0023	300 x 2.5 x 32	61.61	83.75	110.55	2/8/45 + 2/9/50 + 2/12/64	160 HZ
0025	300 x 2.5 x 32	61.61	83.75	110.55	2/8/45 + 2/9/50 + 2/12/64	240 BW
0027	300 x 2.5 x 40	61.61	83.75	110.55	2/8/55 + 4/12/64	120 HZ
0029	300 x 2.5 x 40	61.61	83.75	110.55	2/8/55 + 4/12/64	160 HZ
0031	300 x 2.5 x 40	61.61	83.75	110.55	2/8/55 + 4/12/64	240 BW
0033	315 x 2.5 x 32	72.73	93.60	132.46	2/8/45 + 2/9/50 + 2/12/64	120 HZ
0035	315 x 2.5 x 32	72.73	93.60	132.46	2/8/45 + 2/9/50 + 2/12/64	160 HZ
0037	315 x 2.5 x 32	72.73	93.60	132.46	2/8/45 + 2/9/50 + 2/12/64	250 BW
0039	315 x 3.0 x 40	78.20	106.25	140.04	2/8/55 + 4/12/64	120 HZ
0041	315 x 3.0 x 40	78.20	106.25	140.04	2/8/55 + 4/12/64	160 HZ
0043	315 x 3.0 x 40	78.20	106.25	140.04	2/8/55 + 4/12/64	250 BW
0045	350 x 3.0 x 40	94.32	129.49	–	2/8/55 + 4/12/64	110 HZ
0047	350 x 3.0 x 40	94.32	129.49	–	2/8/55 + 4/12/64	140 HZ
0049	350 x 3.0 x 40	94.32	129.49	–	2/8/55 + 4/12/64	180 HZ
0051	400 x 3.5 x 50	158.69	226.97	–	4/15/80	100 HZ
0053	400 x 3.5 x 50	158.69	226.97	–	4/15/80	140 HZ
0055	400 x 3.5 x 50	158.69	226.97	–	4/15/80	180 HZ
0057	450 x 4.0 x 50	317.36	433.79	–	4/15/80	100 HZ
0059	450 x 4.0 x 50	317.36	433.79	–	4/15/80	140 HZ
		(242)	(242)	(243)		

Precision Reducer Ring for Metal Circular Saw Blade

Application: For tight fit, milled at the outer edge, surface-ground, **bore with H7 fit.**

H7

format professional quality



Part No.	Dimension mm	2675 mm	Thickness mm
0005	40/32	4.84	2.0
0010	40/32	4.84	2.5
0015	40/32	4.84	3.0
		(243)	

Technical information see Appendix Group 10.

Segment Circular Saw Blades

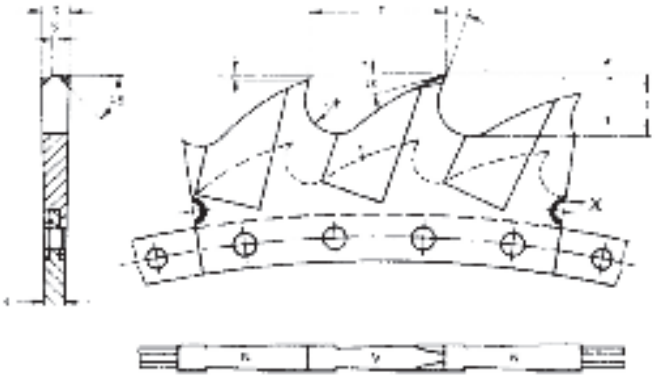
Design: Main blade made of hardened and tempered special steel with a strength of approx. 1400 N/mm^2.
Segments made of HSS-DMo5.
The distinct conical ground relief of the segments in conjunction with the ground cooling grooves provides optimum coolant supply of the cutting zone, thereby ensuring best machining performance.

Tooth form HZ = curved tooth with rougher and shaver.

HSS-DMo5

format professional quality





V = Roughing tooth
N = Shaving tooth
S = Saw blade width
e = Saw blade thickness
T = Tooth pitch
γ = Rake angle
α = Clearance angle
h = Tooth height difference
t = Tooth depth ≈ (0.4 x T)
r = Tooth radius ≈ (0.25 x T)
S^1 = Rougher width

$$(S^1 = \frac{S}{3} - h)$$

X = Resharpening limit

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2677	●												

Part No.	Dimensions mm	2677 mm	Quantity/ Ø reference circle mm	Flutes
0001	275 x 3.0 x 40	118.22	2/8/55 + 4/12/64	96
0004	275 x 3.0 x 40	118.22	2/8/55 + 4/12/64	120
0007	275 x 3.0 x 40	118.22	2/8/55 + 4/12/64	144
0010	315 x 3.6 x 40	146.55	2/8/55 + 4/12/64	70
0013	315 x 3.6 x 40	146.55	2/8/55 + 4/12/64	84
0016	315 x 3.6 x 40	146.55	2/8/55 + 4/12/64	112
0019	315 x 3.6 x 40	146.55	2/8/55 + 4/12/64	140
0022	360 x 3.6 x 40	159.20	2/8/55 + 4/12/64	96
0025	360 x 3.6 x 40	159.20	2/8/55 + 4/12/64	128
0028	360 x 3.6 x 40	159.20	2/8/55 + 4/12/64	160
		(242)		

Part No.	Dimensions mm	2677 mm	Quantity/ Ø reference circle mm	Flutes
0031	360 x 3.6 x 50	159.20	4/15/80 + 4/14/ 85	96
0034	360 x 3.6 x 50	159.20	4/15/80 + 4/14/ 85	128
0037	360 x 3.6 x 50	159.20	4/15/80 + 4/14/ 85	160
0040	400 x 4.0 x 50	177.74	4/15/80 + 4/14/ 85	80
0043	400 x 4.0 x 50	177.74	4/15/80 + 4/14/ 85	96
0046	400 x 4.0 x 50	177.74	4/15/80 + 4/14/ 85	128
0049	450 x 4.0 x 50	268.37	4/15/80 + 4/18/100	90
0052	450 x 4.0 x 50	268.37	4/15/80 + 4/18/100	108
0055	450 x 4.0 x 50	268.37	4/15/80 + 4/18/100	144
		(242)		

HM Circular Saw Blades, Trapezoidal Flat Tooth

2680 **Design: Trapezoidal flat tooth, positive.**

For aluminium, the cutting speed must not be less than 50 m/sec and for solid material not be less than 30–40 m/sec.

Application: Particularly suitable for circular saw benches operating in opposite direction of the feed. For profiles and solid material, format, mitre and longitudinal cuts in aluminium and other non-ferrous metals and for cutting synthetic resins, mainly large cross-sections.

2683 **Design: Trapezoidal flat tooth, negative.**

For aluminium, the cutting speed must not be less than 50 m/sec and for solid material not be less than 30–40 m/sec.

Application: Particularly suitable for mitre-box saws with swinging saw blade or other circular saw benches operating in opposite direction of the feed. For thin-walled aluminium and plastic profiles, particularly anodised profiles.

Carbide

format professional quality





Toothing = trapezoid flat positive 5°



Toothing = trapezoid flat negative -4°

Part No.	Dimensions mm	2680 ⌀	Quantity/ ⌀ reference circle mm	Flutes
0001	250 x 3.4 x 30	51.57	2/10/60	60
0004	250 x 3.4 x 30	59.11	2/10/60	80
0007	250 x 3.4 x 32	51.57	2/8/45 + 4/12/64	60
0010	250 x 3.4 x 32	59.11	2/8/45 + 4/12/64	80
0016	275 x 3.4 x 40	63.23	2/8/55 + 4/12/64	72
0019	300 x 3.4 x 30	61.28	2/10/60	72
0031	300 x 3.4 x 40	70.80	2/8/55 + 4/12/64	96
0034	350 x 3.6 x 30	71.56	2/10/60	84
0037	350 x 3.6 x 32	71.56	2/8/45 + 4/12/64	84
0040	350 x 3.6 x 32	78.54	2/8/45 + 4/12/64	108
0043	350 x 3.6 x 40	71.56	2/8/55 + 4/12/64	84
0046	350 x 3.6 x 40	78.54	2/8/55 + 4/12/64	108
0055	400 x 3.6 x 40	89.79	2/8/55 + 4/12/64 + 2/12/80	96
0061	420 x 4.0 x 40	96.16	2/8/55 + 4/12/64 + 2/12/80	96
0064	500 x 4.0 x 30	127.00 (242)	–	120

Part No.	Dimensions mm	2683 ⌀	Quantity/ ⌀ reference circle mm	Flutes
0001	250 x 3.2 x 30	51.57	2/7/42 + 2/10/60	60
0004	250 x 3.2 x 30	59.11	2/7/42 + 2/10/60	80
0007	250 x 3.2 x 32	51.57	2/8/45 + 4/12/64	60
0010	250 x 3.2 x 32	59.11	2/8/45 + 4/12/64	80
0016	275 x 3.2 x 40	63.23	2/8/55 + 4/12/64	72
0019	300 x 3.2 x 30	61.28	–	72
0022	300 x 3.2 x 30	70.80	–	96
0028	300 x 3.2 x 32	70.80	2/8/45 + 4/12/64	96
0031	300 x 3.2 x 40	70.80	2/8/55 + 4/12/64	96
0034	330 x 3.2 x 32	80.90	2/8/45 + 4/12/64	100
0037	350 x 3.4 x 30	71.56	–	84
0040	350 x 3.4 x 32	71.56	2/8/45 + 4/12/64	84
0043	350 x 3.4 x 32	78.54	2/8/45 + 4/12/64	108
0046	350 x 3.4 x 40	71.56	2/8/55 + 4/12/64	84
0049	350 x 3.4 x 40	78.54	2/8/55 + 4/12/64	108
0052	350 x 3.4 x 50	71.56	4/15/80	84
0055	400 x 3.4 x 30	101.54	–	120
0058	400 x 3.4 x 40	89.79	2/8/55 + 4/12/64 + 2/12/80	96
0067	500 x 4.0 x 30	127.00 (242)	–	120

Circular Saw Blades, Carbide-tipped

Design: High-quality carbide-tipped saw blades for JEPSON cold circular saws, can be used for many purposes (see speeds indicated in table).

Application: Saw blades especially suitable for dry cutting in metal. Fast, burr-free cutting without cooling of stainless steel, steel, non-ferrous metal, composite material and plastic. Best cutting performance and long service life. All blades can be reground several times.

Carbide



JEPSON

Part No.	Dimensions mm	2685	Speed saw blade U/min	Number of teeth	Application
0055	192 x 2.0 x 20.0	71.32	4.000	40	Steel, non-ferrous metals, composite material, plastics
0060	192 x 2.0 x 20.0	79.24	4.000	48	Steel, non-ferrous metals, composite material, plastics – thin-walled
0005	305 x 2.2 x 25.4	126.79	1.500	60	Steel, non-ferrous metals, composite material, plastics
0010	305 x 2.2 x 25.4	156.50	1.500	80	Steel, non-ferrous metals, composite material, plastics – thin-walled
0015	305 x 2.2 x 25.4	126.79	1.500	60	Cast iron
0020	355 x 2.2 x 25.4	160.47	1.800	60	Stainless steel, non-ferrous metals, composite material, plastics – thick-walled
0025	355 x 2.2 x 25.4	179.29	1.800	72	Stainless steel, non-ferrous metals, composite material, plastics – medium-sized walls
0030	355 x 2.2 x 25.4	197.12	1.800	90	Stainless steel, non-ferrous metals, composite material, plastics – thin-walled
0035	355 x 2.2 x 25.4	171.37	1.800	108	Aluminium
0040	355 x 2.2 x 25.4	160.47	1.800	60	Cast iron
0045	355 x 2.2 x 25.4	170.37	1.800	66	Steel
0050	405 x 2.2 x 25.4	296.17 (241)	1.800	100	Steel, non-ferrous metals, composite material, plastics

Keyhole Saws HSS Bi-metal

HSS Bi-Metal





2700 format professional quality

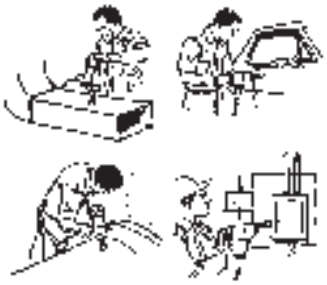
2701 LENOX

Design: From HSS bi-metal for excellent cutting results. The bi-metal design provides maximum safety and combines wear resistance with long service life and high precision. No breakage when subjected to increased stress.
With solid base plate, thereby more turns, higher concentricity and less wobble.
The side slots facilitate core removal. Cutting depth: 38 mm.
Supply without shank and drills.

2700 With combination toothing 4/6 teeth per inch for low vibration run in material from 2 mm.

2701 With unique geometry of toothing, each single tooth works independently during the cutting process. This ensures high cutting results, long service life, low vibration cutting and reduced tooth wear when machining high-quality materials such as stainless steel.

Application: For metals such as unalloyed steel, tool steel and stainless steel, cast iron, nonferrous heavy metal and aluminium as well as plastics, wood and gypsum plaster boards. Can be used with portable electric or pneumatic tools, upright drilling machines, lathes, deep-hole drilling systems, milling and other machine tools.
The only requirement is that the machines provide the correct spindle speed for the respective keyhole saw size and the workpiece material.
Compatible with the following makes: B. + D., Bahco, Greenlee, Nicholson, Starrett etc.



Note: In case of upright drilling machines, please only use manual feed.
When sawing metal, we recommend to use a cutting oil in order to increase the service life of the keyhole saw. When sawing wood, the sawdust is to be removed regularly, as otherwise the tooth tips burn down and thereby blunt.

Part No.	Saw ∅ mm	2700	2701	Steel	Cast iron	Recommended speed (RPM) Tool & stainless steel	Brass	Aluminium	Wood
0140	14	2.34	7.79	580	400	300	790	900	3000
0160	16	2.13	6.23	550	365	275	730	825	3000
0170	17	2.19	6.23	500	330	250	665	750	3000
0190	19	2.24	6.23	460	300	230	600	690	3000
0200	20	2.24	–	440	390	220	580	660	3000
0210	21	2.30	6.23	425	280	210	560	630	3000
0220	22	2.33	6.23	390	260	195	520	585	3000
0240	24	2.41	6.23	370	245	185	495	555	3000
0250	25	2.65	6.61	350	235	175	470	525	2700
0270	27	2.74	6.61	325	215	160	435	480	2700
0290	29	2.93	6.61	300	200	150	400	450	2700
0300	30	3.11	6.61	285	190	145	380	425	2400
0320	32	3.19	6.61	275	180	140	360	410	2400
0330	33	3.27	6.68	260	175	135	345	390	2400
0350	35	3.27	6.98	250	165	125	330	375	2400
0370	37	3.43	6.98	240	160	120	315	360	2400
0380	38	3.48	6.98	230	150	115	300	345	2400
0400	40	3.43	6.98	220	145	110	290	330	2100
0410	41	3.43	6.98	210	140	105	280	315	2100
0430	43	3.49	6.98	205	135	100	270	305	2100
0440	44	3.51	8.75	195	130	95	250	295	2100
0460	46	3.59	8.75	190	125	95	250	285	2100
0480	48	3.62	8.75	180	120	90	240	270	2100
0510	51	3.64	8.75	170	115	85	230	255	2000
0520	52	3.68	10.78	165	110	80	220	245	2000
0540	54	3.70	10.78	160	105	80	210	240	2000
0570	57	3.86	10.78	150	100	75	200	225	2000
0590	59	4.18	10.78	140	95	70	190	220	2000
0600	60	4.22	10.78	140	95	70	190	220	2000
0640	64	4.25	11.62	135	90	65	180	205	1800
0650	65	4.28	11.62	130	85	65	175	200	1800
0670	67	4.36	11.62	130	85	65	170	195	1800
0680	68	4.61	11.62	130	85	65	170	195	1800
0700	70	4.61	11.62	125	80	60	160	185	1800
0730	73	4.69	11.62	120	80	60	160	180	1800
0760	76	4.82	12.01	115	75	55	150	170	1500
0790	79	5.06	12.11	110	70	55	140	165	1500
0830	83	5.33	12.11	105	70	50	140	155	1500
0860	86	5.54	12.11	100	65	50	130	150	1200
0890	89	5.76	12.11	95	65	45	130	145	1200
0920	92	6.03	13.99	95	60	45	120	140	1200
0950	95	6.26	16.54	90	60	45	120	135	1200
0980	98	6.47	17.36	85	55	40	110	130	1200
1020	102	6.77	18.20	85	55	40	110	130	1000
1050	105	7.42	19.74	80	55	40	110	120	1000
1140	114	8.31	35.68	75	50	35	100	105	900
1270	127	9.39	44.05	65	40	30	85	90	800
1400	140	10.59	52.70	60	35	25	80	85	800
1520	152	16.03 (244)	61.56 (252)	55	35	25	75	75	800

Keyhole Saw Set HSS Bi-metal

HSS Bi-Metal

format professional quality

Design: Format keyhole saws are fitted with a welded tooth edge from high-performance high-speed steel ensuring excellent cutting results. The bi-metal design provides maximum safety and combines wear resistance with long service life and high precision.
No breakage when subjected to increased stress. Welded seams make Format keyhole saws more precise and easier to handle, particularly when used with portable drilling machines.
Side slots facilitate core removal.
Furthermore, the keyhole saws feature a **combination toothing 4/6 teeth per inch** for low vibration run in materials from 2 mm. With solid base plate, thereby more turns, higher stability and concentricity and less wobbles. Set includes (part no. 2700).

In plastic case:

2713 0007
7 keyhole saws ⌀ 22, 29, 35, 44, 51, 64, 68 mm (part no. 2700)
2 mounting shanks (part no. 2703 0005 and 2703 0010)
2 centre drills (part no. 2709)

2713 0008
8 keyhole saws ⌀ 16, 19, 24, 29, 38, 44, 57, 67 mm (part no. 2700)
2 mounting shanks (part no. 2703 0005 and 2703 0010)
2 centre drills (part no. 2709)

2713 0009
9 keyhole saws ⌀ 16, 19, 22, 29, 35, 44, 52, 57, 67 mm (part no. 2700)
2 mounting shanks (part no. 2703 0005 and 2703 0010)
2 centre drills (part no. 2709)

2713 0012
12 keyhole saws ⌀ 16, 19, 22, 25, 29, 32, 35, 38, 44, 51, 64, 76 mm (part no. 2700)
2 mounting shanks (part no. 2703 0005 and 2703 0010)
2 centre drills (part no. 2709)



Part No.	Contents of set	2713
0007	11 pcs.	41.20
0008	12 pcs.	41.06
0009	13 pcs.	44.75
0012	16 pcs.	52.20

(244)

Hole Saw Set HSS-Bi-Metal

HSS Bi-Metal

LENOX

Design: LENOX keyhole saws feature a unique tooth configuration ensuring excellent cutting results, long service life as well as optimised cutting properties. Each tooth works independently during the cutting process. Vibration and tooth wear are thereby reduced, notably when machining high-quality material such as stainless steel. The bi-metal design provides maximum safety and combines wear resistance with long service life and high precision.
No breakage when subjected to increased stress. Side slots facilitate core removal.
With solid base plate which prevents damage and increases the service life.
Set includes (part no. 2701).

In plastic case:

2714 0007
5 keyhole saws ⌀ 19, 22, 38, 44, 68 mm (part no. 2701)
2 mounting shanks 2L (part no. 2704 0010), 5L
2 centre drills 2L (part no. 2710 0640), 5L

2714 0008
12 keyhole saws ⌀ 16, 19, 22, 25, 29, 32, 35, 38, 44, 51, 68, 76 mm (part no. 27001)
2 mounting shanks 1L (part no. 2704 0005), 2L (part no. 2704 0010)
2 centre drills 1L, 2L (part no. 2710 0640)

2714 0009
7 keyhole saws ⌀ 16, 20, 25, 32, 41, 51, 64 mm (part no. 2701)
2 mounting shanks 1L (part no. 2704 0005), 2L (part no. 2704 0010)
2 centre drills 1L, 2L (part no. 2710 0640)

2714 0012
12 keyhole saws ⌀ 19, 22, 29, 35, 44, 51, 64, 68, 76, 92, 105, 121 mm (part no. 2701)
2 mounting shanks 2L (part no. 2704 0010), 5L
2 centre drills 2L (part no. 2710 0640), 5L



Part No.	Contents of set	2714
0007	9 pcs.	70.56
0008	16 pcs.	121.96
0009	11 pcs.	80.52
0012	16 pcs.	178.70

(252)

Keyhole Saws

Keyhole Saw Arbor

Scope of supply: Complete with centre drill.

Part No.	To fit hole saw ∅ mm	2703	Hexagonal holder mm	To fit drill chuck ∅ mm
0005	14– 30	3.16	9.5	10
0010	32–152	6.53	9.5	10
0015	32–152	6.53	11.1	13
		(244)		

format professional quality



SDS Arbors

Scope of supply: Complete with centre drill.

Part No.	To fit hole saw ∅ mm	2706	Shank
0005	14– 30	7.31	SDS-plus
0010	32–152	9.55	SDS-plus
		(244)	

SDS plus Lizenz Bosch

format professional quality



LENOX

Keyhole Saw Arbor

Scope of supply: Complete with centre drill.

LENOX keyhole saw arbor: Type 6L: with quick coupling
Type 7L: with quick coupling and bolt ejector

LENOX provides the keyhole saw arbor type 7L with which chips can be removed quite easily. Two long pins at the arbor are pushed through two openings at the base of the keyhole saw with which the chips are ejected. Result: Quick and effortless operation.
All LENOX accessories are designed for heavy-duty use.

Part No.	To fit hole saw ∅ mm	2704	For type	Hexagonal holder mm	To fit drill chuck ∅ mm	Shank ∅ mm
0005	14– 30	8.87	1L	11/Hollow shank	13	12.5
0010	32–152	15.00	2L	11/Hollow shank	13	12.5
0015	32–152	15.21	3L	11/Carbide shank	13	12.5
0020	32–152	13.83	6L	9/Carbide shank	10	10.0
0025	32–152	26.18	7L	9/Carbide shank	10	10.0
		(252)				

0005



0010



0015



0020



0025



Spare Keyhole Saw Centre Drills HSS

HSS

Part No.	To fit adaptor shank	2709	2710	∅ mm	Total length mm
0635	Type 3L/6L/7L	–	2.69	6.35	79
0640	Type 1L/2L	–	3.03	6.35	103
0635	2703/2706	1.14	–	6.35	80
		(244)	(252)		

2709



format professional quality

2710



LENOX

Extension shanks

Part No.	To fit adaptor shank	2712	2711	∅ mm	Length mm
0005	2703	5.86	–	10	300
0001	Type 1L/2L/3L	–	9.82	13	140
0003	Type 6L/7L	–	11.59	10	250
0005	Type 1L/2L/3L	–	10.11	10	300
0007	Type 1L/2L/3L	–	13.98	13	450
		(244)	(252)		

2712



format professional quality

2711



LENOX

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Carbide Keyhole Saw

Design: The rigid design of the FORMAT carbide-tipped hole saws for manual and upright drilling machines ensures excellent concentricity. The special axial and radial grinding ensures optimum cutting results. The carbide-tipped hole saws have a long tool life and can be reground. Tapered centre drills, precise spot-drilling (no centre punching required).

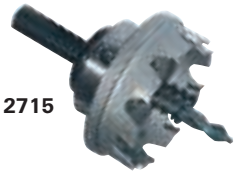
2715 **Flat cut:** All carbide hole saws up to ⌀ 100 mm with ejector spring. For material thickness up to 4 mm, stainless steel up to 2 mm. Between 16.0 and 30.0 mm, the hole saw is made from a single piece, above 31.0 mm we use specially hardened arbors which absorb torsional forces. From 61.0 mm we recommend MK2/MK3.

2722 **MBS:** All carbide hole saws have an ejector spring. Max. material thickness 10 mm without spring. Manual drills up to 4 mm material thickness, upright drilling machines up to 10 mm. From 6 mm we recommend unclamping. From 37 mm we recommend using specially hardened arbors. From 37 mm we recommend MK2/3.

2728 **Deep cut:** For material thickness up to 4 mm, stainless steel up to 2 mm. Particularly suitable for tubes and convex surfaces. From 61.0 mm we recommend MK2/MK3.

Carbide

format professional quality



2715

Cylinder height: 12 mm
Flat cut:
⌀ 16.0– 50 mm corresponds to 10 mm shank
⌀ 51.0–100 mm corresponds to 13 mm shank



2722

Cylinder height: 22 mm
MBS:
⌀ 18– 36 mm corresponds to 10 mm shank
⌀ 37–100 mm corresponds to 13 mm shank



2728

Cylinder height 35 mm = ⌀ 20–55 mm
Cylinder height 60 mm = ⌀ 60 mm

Deep cut:
⌀ 20– 50 mm = 10 mm shank
⌀ 51–100 mm = 13 mm shank

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2715	●	○							◐		○	◐	◐
2722	●	◐							◐	○	○	◐	◐
2728	●	○							◐		○	◐	◐

Part No.	Saw ⌀ mm	2715 Flat cut	2722 MBS	2728 Deep cut	PG/ metric
0160	16	13.45	–	–	M 16
0170	17	13.45	–	–	–
0180	18	13.45	23.65	–	–
0190	19	–	23.65	–	–
0200	20	13.92	24.52	21.42	M 20
0210	21	13.92	24.47	20.95	–
0220	22	13.92	24.47	20.95	–
0230	23	14.32	25.19	20.95	–
0240	24	14.53	25.68	20.95	–
0250	25	14.53	25.68	20.95	M 25
0260	26	15.22	26.74	27.66	–
0270	27	15.22	26.74	–	–
0280	28	16.59	27.56	27.66	–
0290	29	16.59	27.56	–	–
0300	30	16.59	27.56	27.66	–
0310	31	20.13	32.46	–	–
0320	32	20.13	32.46	31.94	M 32
0330	33	20.40	33.62	–	–
0340	34	20.40	33.99	31.94	–
0350	35	20.40	33.99	31.94	–
0360	36	20.60	34.34	–	–
0370	37	21.96	34.34	35.34	PG 29
0380	38	21.96	34.34	–	–
0390	39	21.96	34.72	35.34	–
0400	40	21.96	34.72	35.34	M 40
0410	41	21.95	39.56	–	–
0420	42	22.79	40.03	40.80	–
0430	43	22.92	40.29	–	–
0440	44	22.92	40.29	–	–
0450	45	22.92	40.29	40.80	–
0460	46	24.42	42.93	45.95	–
0470	47	25.10	43.74	45.95	PG 36
0480	48	25.10	43.74	–	–
0490	49	25.10	44.16	–	–
0500	50	26.41	44.16	45.95	M 50
0510	51	26.41	46.39	–	–
0520	52	27.23	47.84	–	–
0530	53	27.43	48.22	–	–
		(246)	(246)	(246)	

Part No.	Saw ⌀ mm	2715 Flat cut	2722 MBS	2728 Deep cut	PG/ metric
0540	54	27.70	48.65	–	PG 42
0550	55	27.70	48.65	51.82	–
0560	56	29.81	52.39	–	–
0570	57	30.43	53.49	–	–
0580	58	30.43	53.49	–	–
0590	59	30.70	54.03	–	–
0600	60	30.70	54.03	73.09	PG 48
0610	61	–	56.11	–	–
0620	62	–	56.11	–	–
0630	63	–	56.68	–	M 63
0640	64	–	56.68	–	–
0650	65	33.22	58.48	–	–
0660	66	–	60.19	–	–
0670	67	–	61.22	–	–
0680	68	34.87	61.22	–	–
0690	69	–	61.22	–	–
0700	70	34.87	61.22	–	–
0710	71	–	74.49	–	–
0720	72	–	76.67	–	–
0730	73	–	76.67	–	–
0740	74	–	76.67	–	–
0750	75	43.61	76.67	–	–
0760	76	–	77.31	–	–
0770	77	–	78.04	–	–
0780	78	–	80.87	–	–
0790	79	–	80.87	–	–
0800	80	46.33	81.49	–	–
0810	81	–	82.04	–	–
0820	82	–	83.04	–	–
0830	83	–	83.04	–	–
0840	84	–	87.22	–	–
0850	85	49.60	87.22	–	–
0860	86	–	87.22	–	–
0870	87	–	87.87	–	–
0880	88	–	87.87	–	–
0890	89	–	93.69	–	–
0900	90	52.93	93.69	–	–
0910	91	–	93.69	–	–
		(246)	(246)	(246)	

Continued overleaf

Carbide Keyhole Saw

Continued

Part No.	Saw ø mm	2715 Flat cut	2722 MBS	2728 Deep cut	PG/ metric
0920	92	–	93.69	–	–
0930	93	–	94.59	–	–
0940	94	–	94.59	–	–
0950	95	57.11	100.96	–	–
0960	96	–	100.96	–	–
0970	97	–	102.78	–	–
		(246)	(246)	(246)	

Part No.	Saw ø mm	2715 Flat cut	2722 MBS	2728 Deep cut	PG/ metric
0980	98	–	103.69	–	–
0990	99	–	103.69	–	–
1000	100	58.61	103.69	–	–
1100	110	115.10	–	–	–
1150	115	115.10	–	–	–
1200	120	115.10	–	–	–
		(246)	(246)	(246)	

Technical information see Appendix Group 10.

Spare Hole Saw Centre Drills HSS

2717 **For flat cut**

2724 **MBS**

2730 **For deep cut**

HSS

format professional quality



Part No.	ø x length mm	2717 Flat cut	2724 MBS	2730 Deep cut	For hole saws ø mm 2717	2724	2730
0600	6 x 50	1.55	1.55	1.96	15.2–100.0	18.0– 60.0	20.0–23.0
0800	8 x 80	1.99	2.31	2.72	101.0–120.0	61.0–100.0	24.0–55.0
1000	8 x 100	–	–	2.72	–	–	60.0
		(246)	(246)	(246)			

Morse Taper Adaptor

Design: Incl. HSS centre drill ø 8 x 80 mm.

format professional quality

Part No.	Shank MT	2726	for hole saws ø mm
0002	MT 2	36.25	up to 100
0003	MT 3	41.71	up to 150
		(246)	



Jigsaw Blades/Sabre Blades

Saw blade quality

HCS: Carbon steel for use in soft materials such as wood, fibre board or synthetic materials.

HSS: Fully hardened high-performance quick-cutting steel for use in harder materials such as metal, aluminium and non-ferrous metals.

BiM: Highly flexible, almost unbreakable connection made from HCS and HSS. Suitable for wood, metal, non-ferrous metals and aluminium.

Carbide-tipped: The HSC support is equipped with carbide-tipped teeth and is therefore suitable for abrasive materials such as glass fibre-reinforced plastics, asbestos cement, hardwood and gas concrete.

Tuff Toothing®: Bi-Metal sabre saw blades with Tuff Tooth®. This innovative tooth system reduces the risk of tooth breaks, particularly when cutting hard material such as stainless steel.

Master-Grit®: Bi-Metal sabre saw blades with tungsten carbide, suitable for cutting abrasive material such as fibre glass, granite cement or plywood.

Teeth type

Cut teeth, waved free cut. Blade with fine result for straight cuts in plywood, mild steel, aluminium, non-ferrous metal and synthetic materials.

Ground teeth, crossed free cut. Blade for clean, quick cuts in wood and plastic.

Ground teeth, free angle free cut. Blade with tapered ground back for free cut; for precise, fine and clean cuts in wood and plastic.

Toothing

Small toothing for fine, slow cuts in hard and/or thin materials such as metal and non-ferrous-metal.

Large toothing for coarse, quick cuts in soft and/or thick materials such as wood or plastic.

Application

Saw blades are subjected to high mechanical and thermal stresses. The use of suitable cooling agents such as cutting oil (for steel, metal), turpentine (for aluminium) or water (for synthetic materials, plexi etc.) is therefore recommended in order to increase the wear resistance of the saw blade.

Jigsaw Blades

2735 **Design:** 5 blades on cardboard backing pack (2735 0110; 1 blade in a pack).

Suitable for: Milwaukee, Bosch, ELU, Festo, Hitachi, Holz-Her, Mafell, Makita, Metabo, Protool.

2736 **Design:** 5 blades on cardboard backing pack (2736 0045; 2736 0107; 2736 0108; 2736 0109; 2736 0111; 3 blades in a pack).

Suitable for: Milwaukee, ELU, Festo, Hitachi, Holz-Her, Mafell, Makita, Metabo, Protool.

format professional quality

BOSCH

Part No.	Similar to Bosch no.	2735 Card	2736 Card	Cutting length mm	Tooth pitch mm	Metal mm	Aluminium mm	Wood mm	Plastic mm	Material	Teeth type
0005	T 101 B	2.73	2.85	74	Progressive	–	–	3–30	–	HCS	Ground; ground clearance angle
0006	T 101 BF	5.00	5.24	74	Progressive	–	–	3–30	–	BiM	Ground; ground clearance angle
0010	T 301 CD	2.95	3.10	91	3	–	–	10–65	–	HCS	Ground; clearance angle ground
0015	T 101 D	2.73	2.85	74	Progressive	–	–	10–45	–	HCS	Ground; clearance angle ground
0020	T 101 BR	2.94	3.27	74	2.5	–	–	3–30	–	HCS	Ground; clearance angle ground
0026	T 144 DP	2.95	3.10	74	4	–	–	5–50	–	HCS	Ground; crossed
0027	T 119 B	–	1.48	67	Progressive	–	–	2–15	–	HCS	Milled; corrugated
0028	T 119 BO	–	2.13	56	2	–	–	2–15	–	HCS	Milled; corrugated
0030	T 344 DP	4.90	–	126	4	–	–	5–100	–	HCS	Ground; crossed


For straight, fine cuts, fibre plates (3–30 mm), plastics/epoxy (ø < 30 mm), with dipping tip.


For straight, fine cuts, coated plates/HPL (3–30 mm), plastics/epoxy (ø < 30 mm), with dipping tip.


For straight, fine cuts.


For straight, fine cutting, with dipping tip.


For straight, fine cutting, chipless sawing due to reversed toothing.


For straight, exact cutting, with dipping tip.


For straight cutting.


For narrow curved cuts.

For straight, parallel cutting.

(248) (247)

Continued overleaf

Jigsaw/Sabre Saw Blades

Part No.	Similar to Bosch no.	2735 format Card	2736 BOSCH Card	Cutting length mm	Tooth pitch mm	Metal mm	Alu-minium mm	Wood mm	Plastic mm	Mate-rial	Teeth type
0035	T 111 C	1.42	1.48	74	3	–	–	4–50	–	HCS	Milled; crossed
0040	T 144 D	1.92	2.01	74	Progressive	–	–	5–50	–	HCS	Ground; crossed
0041	T 234 X	–	4.05	91	Progressive	–	–	2–65	–	HCS	Ground; clearance angle ground
0045	T 344 D	4.02	2.56	126	4	–	–	5–100	–	HCS	Ground; crossed
0047	T 101 AO	–	2.13	56	1.4	–	–	1.5–15	–	BiM	Ground; pointed teeth
0050	T 244 D	2.10	2.46	74	Progressive	–	–	5–50	–	HCS	Ground; crossed
0051	T 101 AIF	–	5.24	77	1.7	–	–	2–30	–	BiM	Ground; pointed teeth
0052	T 301 CDF	–	6.31	91	3	–	–	4–65	–	BiM	Ground; crossed
0053	T 101 AOF	–	5.11	57	1.4	–	–	1.5–15	–	BiM	Ground; pointed teeth
0054	T 101 BRF	–	5.24	74	2.5	–	–	3–30	–	BiM	Ground; clearance angle ground
0055	T 118 G	2.73	2.85	67	0.7	0.5–1.5	–	–	–	HSS	Milled; corrugated
0060	T 118 A	2.73	2.85	67	Progressive	1–3	–	–	–	HSS	Milled; corrugated
0065	T 218 A	3.09	3.65	67	Progressive	1–3	–	–	–	HSS	Milled; corrugated
0066	T 118 EOF	–	4.41	57	1.5	1.5–4	–	–	–	BiM	Milled; corrugated
0070	T 118 B	2.73	2.85	67	Progressive	2.5–6	–	–	–	HSS	Milled, corrugated
0071	T 101 A	–	4.53	74	2	–	–	–	2–20*	HSS	Ground; clearance angle ground
0075	T 127 D	2.95	3.10	74	3	3–15	< 30	–	–	HSS	Milled; crossed
0085	T 118 AF	3.57	3.85	67	Progressive	1–3	–	–	–	BiM	Milled; corrugated
0086	T 318 A	–	5.11	106	1.2	1–3	1–3	–	–	HSS	Milled; corrugated

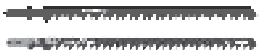
format professional quality

BOSCH


For straight, fast, rough cutting.


For straight, fast, rough cutting, with dipping tip.


For straight cutting, with dipping tip.


For straight, fast, rough cuts.


For curved cutting.


For fast, rough curved cutting, with dipping tip.


For straight cutting, plastic/epoxy (ø < 30 mm).


For straight cutting.


For curved cuts.


For straight, fine cuts, chipless sawing due to reversed toothing. Plates 3–45 mm.


For very thin material, straight cutting.


For thin material, straight cuts, with dipping tip.


For curved cuts, thin material, with dipping tip.

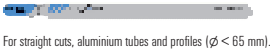

For curved cuts, thin material.


For medium-sized material, straight cuts, with dipping tip.


For fine, straight cuts, ideal for plexiglass and polycarbonate.


For fast, straight cuts, ideal for aluminium, aluminium/plastic/epoxy tubes and profiles (ø < 30 mm).


For thin material, straight cuts, with dipping tip.


For straight cuts, aluminium tubes and profiles (ø < 65 mm).

* Perspex

(248) (247)

Continued overleaf

Jigsaw/Sabre Saw Blades

Part No.	Similar to Bosch no.	2735 format Card	2736 BOSCH Card	Cutting length mm	Tooth pitch mm	Metal mm	Alu-minium mm	Wood mm	Plastic mm	Mate-rial	Teeth type
0090	T 318 AF	5.23	6.15	106	1.1	1–3	< 65	–	–	BiM	Milled; corrugated
0091	T 318 B	–	5.11	106	2	2.5–6	2.5–6	–	–	HSS	Milled; corrugated
0095	T 318 BF	5.23	6.15	106	1.8	2.5–6	< 65	–	< 65	BiM	Milled; crossed
0100	T 118 BF	3.57	3.85	67	Progressive	2.5–6	–	–	–	BiM	Milled; corrugated
0101	T 123 X	–	3.69	74	Progressive	1.5–10	< 30	–	–	HSS	Milled; corrugated
0105	T 144 DF	3.84	4.53	74	Progressive	–	–	5–50	–	BiM	Milled; crossed
0106	T 345 XF	–	5.24	106	Progressive	3–10	–	5–65	3–10	BiM	Milled; crossed
0107	T 341 HM	–	12.99	106	4.3	–	–	–	5–50	HM	Tipped; crossed
0108	T 118 AHM	–	8.61	59	1.1	1.5–3	–	–	–	HM	Tipped; ground
0109	T 118 EHM	–	8.61	59	1.4	2–5	–	–	–	HM	Tipped; ground
0110	T 141 HM	4.64	–	74	4.3	–	–	–	5–20	HM	Fitted; crossed
0111	T 130 Riff	–	4.90	59	K30	–	–	–	5–15	HM	Coated
		(248)	(247)								

format professional quality

BOSCH



For thin material, straight cuts, sandwich material (< 65 mm), aluminium tubes + profiles (ø < 65 mm).



For straight cuts, aluminium pipes + profiles (ø < 65 mm), exact cut.



For medium-sized material, straight cuts, sandwich material (< 65 mm), aluminium/epoxy pipe +profiles (ø < 65 mm).



For medium-sized material, straight cuts, with dipping tip.



For fast, straight cuts, thin to thick material, aluminium pipes + profiles (ø < 30 mm), with dipping tip.



For straight, quick, rough cuts, with dipping tip.



For fast cuts, wood with nails (< 65 mm), aluminium/plastic pipes + profiles (ø 3–10 mm), with dipping tip.

For fast, straight cuts, ideal for glass-fibre reinforced plastics. Cement fibre plates, gypsum plaster board (< 80 mm).



For straight cuts, ideal for stainless steel 1.5–3 mm, reduction of no. of strokes, cooling, without pendulum swinging.



For straight cuts, ideal for stainless steel 2–5 mm, reduction of no. of strokes, cooling, without pendulum swinging.



For fibreglass-reinforced plastics and cement-bonded chipboards. Fast rough cut.



For straight cuts, for soft ceramic tiles, glass-fibre reinforced plastics (5–15 mm).

Jigsaw Blades

Design: 5 pcs. on card.

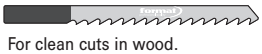
Suitable for: Fine.

format professional quality

Part No.	Bosch no.	2741 format Card	Cutting length mm	Tooth pitch mm	Metal mm	Wood mm	Material	Teeth type
0005	F 18 G	2.66	50	0.7	0.5–1.5	–	HSS	Milled; corrugated
0020	F 1 D	2.66	60	4	–	10–45	HCS	Ground; crossed
0025	F 18 AF	3.57	60	1.2	1 –3	–	BiM	Milled; corrugated
0030	F 18 BF	4.21	60	2	2.5–6	–	BiM	Milled; corrugated
		(248)						



For very thin sheet metal.



For clean cuts in wood.



For thin sheet metal.



For medium sheet metal.

Jigsaw/Sabre Saw Blades

Jigsaw Blades in Storage Box

Design: 25 pcs. in plastic box.

Suitable for: Milwaukee, Bosch, ELU, Festo, Hitachi, Holz-Her, Mafell, Makita, Metabo, Protool.

Part No.	Bosch no.	2738 Box	Cutting length mm	Tooth pitch mm	Metal mm	Alu-minium mm	Wood mm	Plastic mm	Material	Teeth type
0005	T101B	11.92	74	Progressive	–	–	3–30	–	HCS	Ground; clearance angle ground. For straight, fine cuts, fibre plates (3–30 mm), plastic/epoxy (⌀ < 30 mm), with dipping tip.
0010	T101D	11.92	74	Progressive	–	–	10–45	–	HCS	Ground; clearance For straight cuts, with dipping tip.
0015	T111C	6.82	74	3	–	–	4–50	–	HCS	Milled; crossed. For straight, fast, rough cuts.
0020	T144D	8.51	74	Progressive	–	–	5–50	–	HCS	Ground; crossed. For straight, fast, rough cuts, with dipping tip.
0025	T118A	11.92	67	Progressive	1–3	–	–	–	HSS	Milled; corrugated. For thin material, straight cuts, with dipping tip.
0030	T118B	11.92	67	Progressive	2.5–6	–	–	–	HSS	Milled; corrugated. For medium material, straight cuts, with dipping tip.

(248)



Sabre Saw Blades

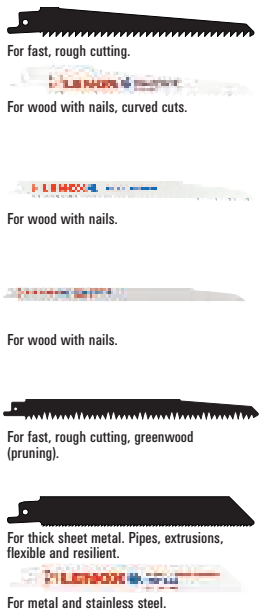
Design: 5 blades each bag.
5 blades each card (2745 0120; 2 each card).

Suitable for: All sabre reciprocal, compass, tiger jig saws with standard retainer.

Part No.	Similar to Bosch no.	2744 Wallet	2745 Card	Cutting length mm	Tooth pitch mm	Metal mm	Alu-minium mm	Wood mm	Plastic mm	Material	Teeth type
0010	S 644 D	4.16	–	150	4.3	–	–	6–100	6–100	HCS	Ground; crossed
0010	20572-656 R	–	12.28	150	4.2	5–15	5–15	6–100	6–100	BiM	Milled; crossed
0013	20582-956 R	–	16.21	225	4.2	5–15	5–15	6–175	6–175	BiM	Milled; crossed
0016	20585-156 R	–	19.56	300	4.2	5–15	5–15	6–225	6–225	BiM	Milled; crossed
0020	S 1531 L	7.04	–	240	5	–	–	15–190	–	HCS	Milled; crossed
0025	S 922 BF	4.97	–	150	1.8	3–8	–	–	–	BiM	Milled; crossed
0025	20564-614 R	–	9.98	150	1.8	2–6	2–6	–	2–6	BiM	Tuff Toot®

(248) (252)

Continued overleaf



All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Sabre Saw Blades

Continued

Part No.	Similar to Bosch No.	2744 Wallet	2745 Card	Cutting length mm	Tooth pitch mm	Metal mm	Alu-minium mm	Wood mm	Plastic mm	Material	Teeth type
0030	20552-418 R	–	8.03	100	1.4	1.5–5	1.5–5	–	1.5–5	BiM	Tuff Tooth®
0035	S 922 EF	4.97	–	150	1.4	1.5–4	1.5–4	–	–	BiM	Milled; crossed
0035	20566-618 R	–	9.98								Tuff Tooth®
0040	S 1122 EF	7.51	–	225	1.4	1.5–4	1.5–4	–	–	BiM	Milled; crossed
0040	20578-818 R	–	13.01								Tuff Tooth®
0045	S 922 AF	4.97	–	150	1	0.7–3	0.7–3	–	–	BiM	Milled; corrugated
0045	20568-624 R	–	9.98								Tuff Tooth®
0050	S 922 HF	5.00	–	150	2.5	3–12	3–12	5–100	–	BiM	Milled; corrugated
0050	20562-610 R	–	9.98								Tuff Tooth®
0056	S 1222 VF	8.23	–	300	1.8–2.6	–	3–10	5–250	3–250	BiM	Milled; crossed
0061	S 123 XF	5.82	–	150	Progressive	1–8	–	–	–	BiM	Milled; crossed
0066	S 3456 XF	7.94	–	200	Progressive	3–18	3–18	5–150	–	BiM	Milled; crossed
0075	S 922 VF	4.97	–	150	1.8–2.6	3–10	3–10	5–100	3–100	BiM	Milled; crossed
0078	20580-810 R	–	13.01	200	2.5	3–8	3–8	1.5–150	1.5–150	BiM	Tuff Tooth®
0080	S 1122 VF	7.51	–	225	1.8–2.6	3–10	3–10	5–175	3–175	BiM	Milled; crossed
0080	20583-110 R	–	19.56								Tuff Tooth®
0100	20371-966 R5	–	26.18	225	4.2	5–15	5–15	6–175	6–175	BiM	Milled; crossed
0110	20372-960 R5	–	26.18	225	2.5	3–8	3–8	1.5–175	1.5–175	BiM	Tuff Tooth®
0120	20576-800 RG	–	11.42	200	*	–	–	–	–	BiM	Master Grit®



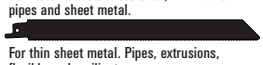
For metal and stainless steel, thin-walled pipes and sheet metal.



For thin sheet metal. Pipes, extrusions, flexible and resilient.



For metal and stainless steel, thin-walled pipes and sheet metal.



For thin sheet metal. Pipes, extrusions, flexible and resilient.



For metal and stainless steel, thin-walled pipes and sheet metal.



For thin sheet metal. Pipes, flexible and resilient.



For metal and stainless steel, extremely thin-walled pipes and sheet metal.



For wood with nails/metal, flexible and resilient.



For metal and wood.



For wood with nails/metal, flexible and resilient.



For thin sheet metal. Extrusion, multi-purpose use, fast.



For wood with nails/metal, multi-purpose use on sites, fast.



For wood with nails/metal, flexible and resilient.



For metal and wood.



For thin sheet metal. Extrusions, universal use, fast.



For metal and stainless steel, as well as wood with nails.



For heavy-duty wood working (wood with nails).



For heavy-duty metal and wood working.



For abrasive materials such as tiles 4–10 mm, brick red 10–175 mm, gas concrete, cast iron 1.5–8 mm, GFK 3–175 mm, Eternit, Fermacell etc.

* Tungsten-Carbide

(248) (252)

Machine Saw Blades

2752 **Design:** Fully hardened, precision blades, outstanding hardness combined with high flexibility. The blades provide straight cuts and excellent cutting performance and are universally applicable through short cutting times and long service life.

Application: For sawing of tubes, sections, solid material of a tensile strength of 1,400 N/mm².

2753 **Design:** Fully hardened, precision blades, outstanding hardness combined with high flexibility. With positive rake angle of 7°.

Application: Ideal for sawing long-chipping and tough material, such as stainless steel with a tensile strength of max. 800 N/mm².

2754 **Design:** Fully hardened, precision blades. The back is made of flexible spring steel, while the teeth are made of high-alloy high-speed steel.

Application: For multi-purpose use, two different steels ensure breakage resistance.

HSS-DMo5



2752 format professional quality

HSS-DMo5



2753 KOMET

HSS Bi-Metal



2754 KOMET

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2752	●								◐		◐	◐	◐
2753	●								◐		◐	◐	◐
2754	●	●								◐	◐	◐	

Part No.	Length mm	2752 mm	2753 KOMET	2754 KOMET	Width mm	Thickness mm	Teeth per inch 2752/2753	Teeth per inch 2754	Rake angle 2752/2753	Type in centre mm	Clamping hole ø mm Type offset/Kasto 2752/2753	Clamping hole ø mm Type offset/Kasto 2754
0001	350	5.64	5.88	–	30	2.0	4	–	0°	8.5	–	–
0004	350	5.64	5.88	–	30	2.0	6	–	0°	8.5	–	–
0007	350	5.64	5.88	–	30	2.0	8	–	0°	8.5	–	–
0010	350	5.64	5.88	–	30	2.0	10	–	0°	8.5	–	–
0013	350	6.15	6.76	–	36	2.0	4	–	0°	8.5	–	–
0016	350	6.15	6.76	–	36	2.0	6	–	0°	8.5	–	–
0019	350	6.15	6.76	–	36	2.0	8	–	0°	8.5	–	–
0022	350	6.15	6.76	–	36	2.0	10	–	0°	8.5	–	–
0025	400	4.97	5.64	5.64	30	1.5	6	6	0°	8.5	–	–
0028	400	4.97	5.64	–	30	1.5	8	–	0°	8.5	–	–
0031	400	4.97	5.64	5.64	30	1.5	10	10	0°	8.5	–	–
0034	400	4.97	5.64	–	30	1.5	14	–	0°	8.5	–	–
0037	400	4.97	5.64	–	30	1.5	18	–	0°	8.5	–	–
0040	400	6.15	7.06	–	30	2.0	4	–	0°	8.5	–	–
0043	400	6.15	7.06	–	30	2.0	6	–	0°	8.5	–	–
0046	400	6.15	7.06	–	30	2.0	8	–	0°	8.5	–	–
0049	400	6.15	7.06	–	30	2.0	10	–	0°	8.5	–	–
0052	400	6.15	7.06	–	30	2.0	14	–	0°	8.5	–	–
0053	400	7.58	–	–	35	2.0	4	–	7°	10.5	–	–
0054	400	–	8.58	–	35	2.0	4–7	–	7°	10.5	–	–
0055	450	7.86	7.92	–	35	2.0	4	–	0°	10.5	–	–
0058	450	7.86	7.92	–	35	2.0	6	–	0°	10.5	–	–
0061	450	7.86	7.92	–	35	2.0	8	–	0°	10.5	–	–
0062	450	–	11.87	–	40	2.0	4–7	–	7°	–	8.5	–
0063	450	10.30	–	–	40	2.0	4	–	7°	–	8.5	–
0064	450	7.86	7.92	–	35	2.0	10	–	0°	10.5	–	–
0065	450	10.30	–	9.71	40	2.0	4	4	7°	10.5	–	–
0066	450	–	11.87	9.71	40	2.0	4–7	6	7°	10.5	–	8.5
0067	500	14.21	13.97	–	48	2.5	4	–	0°	–	10.5	–
0070	500	14.21	13.97	–	48	2.5	6	–	0°	–	10.5	–
0073	500	14.81	17.20	17.20	50	2.5	4	4	0°	10.5	–	–
0076	500	14.81	17.20	17.20	50	2.5	6	6	0°	10.5	–	–
0079	550	12.21	13.03	–	45	2.0	4	–	0°	10.5	–	–
0082	550	12.21	13.03	–	45	2.0	6	–	0°	–	10.5	–
0085	550	12.21	13.03	–	45	2.0	10	–	0°	–	10.5	–
0088	575	16.24	16.34	16.34	50	2.5	4	4	0°	–	10.5	10.5
0091	575	16.24	16.34	–	50	2.5	6	–	0°	–	10.5	–
0094	600	18.22	17.33	17.33	50	2.5	4	4	0°	13	–	–
0097	600	18.22	17.33	–	50	2.5	6	–	0°	13	–	–
0100	650	18.62	22.32	22.32	50	2.5	4	4	0°	13	–	–
0103	650	18.62	22.32	–	50	2.5	6	–	0°	13	–	–
		(250)	(251)	(251)								

Machine saw blades in HSS-Co and special dimensions up to 1,500 mm available on request.

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Band Saw Blades HSS-Bi-Metal

Design: High-performance metal band saw blade with supporting band made of spring steel and cutting edge made of HSS M 42 cobalt. High productivity due to reduced need for blade change when cutting different material sections due to variable toothing of the combination bands.

Application: For sawing of material of diverse quality, ranging from alloy tool steel and high-speed steel to corrosion-proof and acid-proof steel.

HSS Bi-Metal

format professional quality



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2760	●	●	○	○					○	○	◐	◐	◐

Part No.	Length mm	2760	Thickness mm	Dimension mm	Teeth per inch
0001	1138	7.42	13	0.6	8–12
0002	1440	8.81	13	0.6	8–12
0003	1440	8.81	13	0.6	10–14
0004	1138	7.42	13	0.6	10–14
0005	1470	8.96	13	0.6	6–10
0006	1470	8.96	13	0.6	8–12
0007	1325	8.28	13	0.6	8–12
0008	1470	8.96	13	0.6	10–14
0009	1638	9.73	13	0.6	6–10
0010	1325	8.28	13	0.6	10–14
0011	1330	8.29	13	0.6	8–12
0012	1330	8.29	13	0.6	10–14
0013	2000	11.48	20	0.9	5– 8
0014	1745	10.29	19	0.9	5– 8
0015	1745	10.29	19	0.9	8–12
0016	2000	11.48	20	0.9	8–12
0017	1638	9.73	13	0.6	8–12
0018	1638	9.73	13	0.6	10–14
0019	2140	12.13	20	0.9	5– 8
0020	2360	13.15	20	0.9	6–10
0021	2360	13.15	20	0.9	8–12
0022	2140	12.13	20	0.9	8–12
0023	2360	13.15	20	0.9	10–14
0024	2700	15.54	27	0.9	4– 6
0025	2375	13.23	20	0.9	5– 8
0026	2700	15.54	27	0.9	5– 8
0027	2700	15.54	27	0.9	6–10
0028	2375	13.23	20	0.9	8–12
0029	2465	13.66	19	0.9	5– 8
0030	2465	13.66	19	0.9	8–12
0031	2750	15.79	27	0.9	4– 6
0032	2700	15.54	27	0.9	8–12
0033	2700	15.54	27	0.9	10–14
0034	2750	15.79	27	0.9	5– 8
0037	2750	15.79	27	0.9	6–10
0040	2750	15.79	27	0.9	8–12
0043	2750	15.79	27	0.9	10–14
0046	2835	16.21	27	0.9	4– 6
0049	2835	16.21	27	0.9	5– 8
0052	2835	16.21	27	0.9	6–10
0055	2835	16.21	27	0.9	8–12
0058	2835	16.21	27	0.9	10–14
0061	2950	16.78	27	0.9	3– 4
0064	2950	16.78	27	0.9	4– 6
		(260)			

Part No.	Length mm	2760	Thickness mm	Dimension mm	Teeth per inch
0067	2950	16.78	27	0.9	5– 8
0070	2950	16.78	27	0.9	6–10
0073	2950	16.78	27	0.9	8–12
0076	2950	16.78	27	0.9	10–14
0079	3150	17.78	27	0.9	3– 4
0082	3150	17.78	27	0.9	4– 6
0085	3150	17.78	27	0.9	5– 8
0088	3150	17.78	27	0.9	6–10
0091	3150	17.78	27	0.9	8–12
0094	3150	17.78	27	0.9	10–14
0095	3320	18.62	27	0.9	4– 6
0096	3320	18.62	27	0.9	5– 8
0097	3660	20.30	27	0.9	3– 4
0098	3320	18.62	27	0.9	6–10
0099	3320	18.62	27	0.9	8–12
0100	3660	20.30	27	0.9	4– 6
0103	3660	20.30	27	0.9	5– 8
0106	3660	20.30	27	0.9	6–10
0109	3660	20.30	27	0.9	8–12
0112	3660	20.30	27	0.9	10–14
0115	3830	21.15	27	0.9	3– 4
0118	3830	21.15	27	0.9	4– 6
0121	3830	21.15	27	0.9	5– 8
0124	3830	21.15	27	0.9	6–10
0127	3830	21.15	27	0.9	8–12
0130	3830	21.15	27	0.9	10–14
0133	4200	27.02	34	1.1	2– 3
0135	4200	27.02	34	1.1	3– 4
0137	4200	27.02	34	1.1	4– 6
0139	4400	28.19	34	1.1	2– 3
0141	4400	28.19	34	1.1	3– 4
0143	4400	28.19	34	1.1	4– 6
0145	4640	29.61	34	1.1	2– 3
0147	4640	29.61	34	1.1	3– 4
0149	4640	29.61	34	1.1	4– 6
0200	4115	38.23	41	1.3	2– 3
0203	4115	38.23	41	1.3	3– 4
0206	4115	38.23	41	1.3	4– 6
0209	4640	42.76	41	1.3	2– 3
0212	4640	42.76	41	1.3	3– 4
0215	4640	42.76	41	1.3	4– 6
0218	5334	48.73	41	1.3	2– 3
0221	5334	48.73	41	1.3	3– 4
0224	5334	48.73	41	1.3	4– 6
		(260)			

Technical information see Appendix Group 10.

Band Saw Blades HSS Bi-Metal

Design: Wear-resistant cutting edge from HSS in M 42 quality combined with high tooth tip hardness. Tooth pitch up to 4–6 teeth per inch WIKUS MARATHON® M 42, tooth pitch from 5–8 teeth per inch VARIO® M42.

Application:
WIKUS MARATHON® M 42: For sawing of steel up to 45 HRc, for cutting of layers and bundles of large-sized workpieces, for large profiles and solid materials as well as non-ferrous metals.
WIKUS VARIO® M 42: For sawing steel up to 45 HRc, for cutting profiles and bundles, series cuts and for small and medium-sized workpieces.

HSS Bi-Metal



Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2761	●	●	◐	○					◐	◐	◐	●	●

Part No.	Length mm	2761	Thickness mm	Dimension mm	Teeth per inch
0001	1138*	7.58	13	0.65	8–12
0004	1138*	7.58	13	0.65	10–14
0007	1325*	8.45	13	0.65	8–12
0010	1325*	8.45	13	0.65	10–14
0013	1330*	8.47	13	0.65	8–12
0016	1330*	8.47	13	0.65	10–14
0019	1440*	9.01	13	0.65	8–12
0022	1440*	9.01	13	0.65	10–14
0025	1470*	9.14	13	0.65	6–10
0028	1470*	9.14	13	0.65	8–12
0031	1470*	9.14	13	0.65	10–14
0034	1638*	9.94	13	0.65	6–10
0037	1638*	9.94	13	0.65	8–12
0040	1638*	9.94	13	0.65	10–14
0043	1745	11.48	20	0.9	5– 8
0046	1745	11.48	20	0.9	8–12
0049	2000	12.85	20	0.9	5– 8
0052	2000	12.85	20	0.9	8–12
0055	2140	13.58	20	0.9	5– 8
0058	2140	13.58	20	0.9	8–12
0061	2360	14.77	20	0.9	6–10
0064	2360	14.77	20	0.9	8–12
0067	2360	14.77	20	0.9	10–14
0070	2375	14.84	20	0.9	5– 8
0073	2375	14.84	20	0.9	8–12
0076	2465	15.33	20	0.9	5– 8
0079	2465	15.33	20	0.9	8–12
0082	2700	18.88	27	0.9	4– 6
0085	2700	18.88	27	0.9	5– 8
0088	2700	18.88	27	0.9	6–10
0091	2700	18.88	27	0.9	8–12
0094	2700	18.88	27	0.9	10–14
0097	2750	19.17	27	0.9	4– 6
0100	2750	19.17	27	0.9	5– 8
0103	2750	19.17	27	0.9	6–10
0106	2750	19.17	27	0.9	8–12
0109	2750	19.17	27	0.9	10–14
0112	2835	19.69	27	0.9	4– 6
0115	2835	19.69	27	0.9	5– 8
0118	2835	19.69	27	0.9	6–10
0121	2835	19.69	27	0.9	8–12
0124	2835	19.69	27	0.9	10–14
0127	2950	20.41	27	0.9	3– 4
0130	2950	20.41	27	0.9	4– 6
0133	2950	20.41	27	0.9	5– 8
0136	2950	20.41	27	0.9	6–10
0139	2950	20.41	27	0.9	8–12
0142	2950	20.41	27	0.9	10–14
0145	3150	21.66	27	0.9	3– 4
0148	3150	21.66	27	0.9	4– 6
0151	3150	21.66	27	0.9	5– 8
0154	3150	21.66	27	0.9	6–10
0157	3150	21.66	27	0.9	8–12
0160	3150	21.66	27	0.9	10–14
0163	3320	22.69	27	0.9	4– 6
0166	3320	22.69	27	0.9	5– 8
0169	3320	22.69	27	0.9	6–10
0172	3320	22.69	27	0.9	8–12
0175	3660	24.79	27	0.9	3– 4
0178	3660	24.79	27	0.9	4– 6
0181	3660	24.79	27	0.9	5– 8
0184	3660	24.79	27	0.9	6–10
0187	3660	24.79	27	0.9	8–12
0190	3660	24.79	27	0.9	10–14
0193	3830	25.84	27	0.9	3– 4
0196	3830	25.84	27	0.9	4– 6
0199	3830	25.84	27	0.9	5– 8
0202	3830	25.84	27	0.9	6–10
0205	3830	25.84	27	0.9	8–12
0208	3830	25.84	27	0.9	10–14
0211	4200	32.69	34	1.1	2– 3
0214	4200	32.69	34	1.1	3– 4
0217	4200	32.69	34	1.1	4– 6
0220	4400	34.15	34	1.1	2– 3
0223	4400	34.15	34	1.1	3– 4
0226	4400	34.15	34	1.1	4– 6
0229	4640	35.87	34	1.1	2– 3
0232	4640	35.87	34	1.1	3– 4
0235	4640	35.87	34	1.1	4– 6
0238	4115	45.31	41	1.3	2– 3
0241	4115	45.31	41	1.3	3– 4
0244	4115	45.31	41	1.3	4– 6
0247	4640	50.71	41	1.3	2– 3
0250	4640	50.71	41	1.3	3– 4
0253	4640	50.71	41	1.3	4– 6
0256	5334	57.87	41	1.3	2– 3
0259	5334	57.87	41	1.3	3– 4
0262	5334	57.87	41	1.3	4– 6

* PU 5 pieces

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Technical information see Appendix Group 10.

Band Saw Blades Wikus Diamant

Design: From alloyed tool steel with PIN-POINT structure from hard cementites ensuring high resistance to wear of the tooth tips as well as the body. Furthermore, the saw blade is fitted with a specially tempered back featuring high resistance and low wear and thereby allowing higher cutting parameters. **Supplied in 30, 50 m rolls.**

Application: For standard sawing operations of steel and low-alloy steels.
Preferable for small and medium-sized cross-sections up to 70 mm working length.



N = Standard tooth, with a **rake angle of 0°.** For materials with high carbon content (e.g. cast iron), for workpieces with small cross-sections as well as for sawing of thin-walled profiles and pipes.

H = Claw tooth, with a **rake angle of 10°.** For high-alloy materials as well as for sawing of solid materials and thick-walled profiles and pipes.

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2767	●										◐		

Part No.	Thickness mm	2765 mm	Dimension mm	No. of teeth per inch
0001	6	40.08	0.65	6 N
0004	6	40.08	0.65	8 N
0007	6	40.08	0.65	10 N
0010	6	40.08	0.65	14 N
0013	6	40.08	0.65	18 N
0016	6	40.08	0.65	24 N
0019	8	40.08	0.65	8 N
0022	8	40.08	0.65	10 N
0025	8	40.08	0.65	14 N
		(262)		

Part No.	Thickness mm	2765 inch	Dimension mm	No. of teeth per inch
0028	8	40.08	0.65	18 N
0031	8	40.08	0.65	24 N
0034	10	40.08	0.65	4 H
0037	10	40.08	0.65	6 H
0040	10	40.08	0.65	8 N
0043	10	40.08	0.65	10 N
0046	10	40.08	0.65	14 N
0049	10	40.08	0.65	18 N
0052	10	40.08	0.65	24 N
		(262)		

Part No.	Thickness mm	2765 mm	Dimension mm	No. of teeth per inch
0055	13	45.07	0.65	4 H
0058	13	45.07	0.65	6 H
0061	13	45.07	0.65	8 N
0064	13	45.07	0.65	10 N
0067	13	45.07	0.65	14 N
0070	13	45.07	0.65	18 N
0073	13	45.07	0.65	24 N
		(262)		

Further dimensions available on request.

Hand Saw Blades

2749 **Design:** Double-sided hacksaw blade, fully hardened, with tooth edge made of high-performance high-speed steel.

Application: Preferred because of its good cut stability.

2750 **Design:** Bi-metal hacksaw blade, with tooth edge made of high-performance high-speed steel. The toothing is electronically welded in a vacuum to the backing material made of spring steel. Without having to change the blade; long service life. Reduced vibration for thin materials during the taper lead.

Application: These blades combine maximum performance with breakage resistance and are universally applicable.

2751 **Design:** Non-splintering Bi-metal saw blade with precision ground tooth edge from high-performance high-speed steel and **progressive toothing,** descending from 32 to 18 teeth per inch. The toothing is electronically welded in a vacuum to the backing material made of spring steel. Without having to change the blade; long service life. Reduced vibration for thin materials during the taper lead.

Application: Efficient in universal applications.
High cutting performance also in case of coarse materials.

Note: For metal saw bows see page 6/111.



HSS **2749**



HSS Bi-Metal **2750**



HSS Bi-Metal **2751**

Part No.	Steels up to 850 N/mm²	Steels up to 1,000 N/mm²	Steels up to 1,400 N/mm²	Steels up to 42 HRc	Steels up to 52 HRc	Steels up to 56 HRc	Steels up to 62 HRc	Hard machining over 60 HRc	Stainless and acid-resistant steels (INOX)	Ti steels, Ti alloys, special steels	Cast iron	Al, Al and Mg alloys	Copper, brass, bronze
2749	●										◐		
2750	●										◐		
2751	●										◐		

Part No.	Length mm	2749 mm	2750 mm	2751 mm	Thickness mm	Dimension mm	Teeth per inch
0001	300	–	–	0.48	13	0.65	32–18
0005	300	–	0.48	–	13	0.65	18
0010	300	–	0.48	–	13	0.65	24
0015	300	–	0.48	–	13	0.65	32
0020	300	1.35	–	–	25	0.70	24
		(250)	(250)	(250)			

Tool Bits, Form A, Round

Design: According to DIN 4964/ISO 5421, hardened, annealed, true-to-gauge and ground finish. The ends are straight and unfinished. The length tolerance for all forms is ± 2 mm; the cross section tolerances are: Form A h8, for forms B and D h13/14. Hardness: Approx. 63–68 HRc.

Application: By grinding into the required shape to be used as shaping, parting or grooving tool.

HSS Co10 | DIN 4964

format professional quality



Part No.	Size = ∅ h 8 mm	2780	Total length mm
0001	3	1.66	63
0004	4	1.70	63
0007	4	1.97	80
0010	4	2.28	100
0013	5	2.19	80
0016	5	2.58	100
0019	6	2.50	80
0022	6	2.88	100
0025	8	3.22	80
0028	8	3.77	100
0031	8	4.76	125
0034	8	5.99	160

(266)

Part No.	Size = ∅ h 8 mm	2780	Total length mm
0037	10	4.80	100
0040	10	5.82	125
0043	10	7.09	160
0046	10	8.61	200
0049	12	8.05	125
0052	12	9.81	160
0055	12	11.81	200
0058	16	15.79	160
0061	16	19.65	200
0064	20	21.78	160
0067	20	27.03	200

(266)

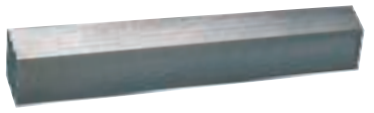
Tool Bits, Form B, Square

Design: According to DIN 4964/ISO 5421, hardened, annealed, true-to-gauge and ground finish. The ends are straight and unfinished. The length tolerance for all forms is ± 2 mm; the cross section tolerances are: Form A h8, for forms B and D h13/14. Hardness: Approx. 63–68 HRc.

Application: By grinding into the required shape to be used as shaping, parting or grooving tool.

HSS Co10 | DIN 4964

format professional quality



Part No.	□ h 13/h 14 mm	2782	Total length mm
0001	4 x 4	2.76	80
0004	5 x 5	2.67	80
0007	6 x 6	2.36	80
0010	6 x 6	2.67	100
0013	8 x 8	3.49	63
0016	8 x 8	3.94	80
0019	8 x 8	4.50	100
0022	8 x 8	5.07	125
0025	8 x 8	6.08	160
0028	8 x 8	7.17	200
0031	10 x 10	4.42	63
0034	10 x 10	5.25	80
0037	10 x 10	6.30	100
0040	10 x 10	7.04	125
0043	10 x 10	8.75	160
0046	10 x 10	11.15	200

(266)

Part No.	□ h 13/h 14 mm	2782	Total length mm
0049	12 x 12	5.73	63
0052	12 x 12	6.47	80
0055	12 x 12	7.65	100
0058	12 x 12	9.06	125
0061	12 x 12	11.25	160
0064	12 x 12	13.70	200
0067	16 x 16	11.15	100
0070	16 x 16	13.52	125
0073	16 x 16	16.85	160
0076	16 x 16	20.48	200
0079	18 x 18	25.94	200
0082	20 x 20	25.72	160
0085	20 x 20	31.67	200
0088	25 x 25	37.18	160
0091	25 x 25	45.93	200

(266)

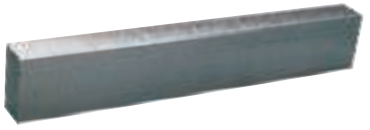
Tool Bits Form D, Flat

Design: According to DIN 4964/ISO 5421, hardened, annealed, true-to-gauge and ground finish. The ends are straight and unfinished. The length tolerance for all forms is ± 2 mm; the cross section tolerances are: Form A h8, for forms B and D h13/14. Hardness: Approx. 63–68 HRc.

Application: By grinding into the required shape to be used as shaping, parting or grooving tool.

HSS Co10 | DIN 4964

format professional quality



Part No.	▭ h 13/h 14 mm	2784	Total length mm
0001	8 x 4	3.86	100
0004	16 x 4	5.73	80
0007	16 x 4	6.51	100
0010	16 x 4	8.48	160
0013	16 x 4	11.50	200
0016	10 x 5	4.86	100
0019	10 x 5	7.36	160
0022	10 x 6	4.48	100
0025	10 x 6	6.69	160
0028	12 x 6	7.31	160
0031	12 x 6	9.06	200

(266)

Part No.	▭ h 13/h 14 mm	2784	Total length mm
0034	25 x 6	14.69	160
0037	25 x 6	17.85	200
0040	12 x 8	8.96	160
0043	12 x 8	10.63	200
0046	16 x 10	9.33	100
0049	16 x 10	13.25	160
0052	16 x 10	15.92	200
0055	20 x 5	13.09	200
0058	20 x 12	18.76	160
0061	20 x 12	22.53	200
0064	25 x 12	25.27	200

(266)

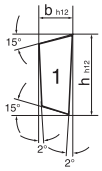
Tool Bits, Factory Standard (Form L 1) Dual Trapezoidal

Design: According to DIN 4964/ISO 5421, hardened, annealed, true-to-gauge and ground finish. The ends are straight and unfinished. The length tolerance for all forms is ± 2 mm; the cross section tolerance for both forms is h12. Hardness: 63–68 HRc.

Application: By grinding into the required shape to be used as shaping, parting or grooving tool.

HSS Co10

format professional quality





Part No.	h 12 mm	2786	Total length mm
0001	12 x 3	6.68	85
0004	12 x 3	9.81	120
0007	12 x 3	12.48	160
0010	12 x 5	13.36	120
0013	12 x 5	17.37	160
0016	16 x 4	13.79	120
0019	16 x 4	17.80	160
		(266)	

Part No.	h 12 mm	2786	Total length mm
0022	16 x 4	21.82	200
0025	18 x 4	19.37	160
0028	18 x 4	23.38	200
0031	20 x 3	20.48	140
0034	20 x 3	28.04	200
0037	25 x 6	29.83	160
0040	25 x 6	36.96	200
		(266)	

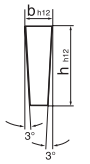
Tool Bits, Form E, Trapezoidal

Design: Hardened, annealed, true-to-gauge and ground finish. The ends are unfinished. The length tolerance for both forms is ± 2 mm; the cross section tolerances for both forms is h12. Hardness: Approx. 63–68 HRc.

Application: By grinding into the required shape to be used as shaping, parting or grooving tool.

HSS Co10 | DIN 4964

format professional quality





Part No.	h 12 mm	2788	Total length mm
0001	12 x 3	3.16	80
0004	12 x 3	3.88	100
0007	12 x 3	4.80	125
0010	16 x 4	8.72	100
		(266)	

Part No.	h 12 mm	2788	Total length mm
0013	16 x 4	13.49	160
0016	16 x 4	17.80	200
0019	20 x 5	15.92	160
0022	25 x 6	27.61	200
		(266)	

Engraving Tools

Design: One side pre-ground, form A (bisection with 0.2 mm allowance), with straight cutting edge (length 1.5 x D).

Application: Engraving tools are mainly used for engraving lettering and contours, as well as for profiling and duplication milling in forging, die and mould construction. The pre-ground section can quickly be adjusted to the required application.

HSS Co10

format professional quality



Part No.	ø h 8 mm	2790	Cut length mm	Total length mm
0001	2	2.89	3.5	40
0004	2.5	3.13	3.7	40
0007	3	2.58	4.5	63
0010	4	2.81	6	63
0013	4	4.55	6	100
0016	5	4.55	7.5	80
0019	6	4.55	9	80
0022	6	5.12	9	100
0025	8	4.98	12	90
		(266)		

Part No.	ø h 8 mm	2790	Cut length mm	Total length mm
0028	8	6.36	12	125
0031	10	6.46	15	100
0034	10	7.36	15	125
0037	12	9.67	18	125
0040	12	12.43	18	160
0043	16	19.85	24	160
0046	20	38.91	30	160
0049	20	44.43	30	200
		(266)		

Solid Carbide Precision Round Bars/Engraving Tools

Solid Carbide Precision Round Bars/Engraving Tools

Design: Cylindrically ground or with straight cutting edge.

Precision cylindrically ground (bisection pre-ground, 0.02–0.05 mm allowance).

Material: Universal carbide, fine grade.

Application: For engraving and duplication work in tool and mould construction.

Solid carbide K10/ K20

format professional quality

2792 Solid Carbide Round Bars

2794 Solid Carbide Engraving Tools, Form A, one side pre-ground.

2792



2794



Part No.	Size = ∅ h 6 mm	2792	2794	Cutting edge length mm	Total length mm
0001	2.0	1.93	3.61	3.5	50
0004	2.5	2.14	3.77	3.7	50
0007	3.0	2.14	4.39	4.5	50
0010	3.0	3.25	5.34	4.5	75
0013	4.0	2.94	5.34	6	50
0016	4.0	4.42	6.64	6	75
0019	5.0	5.68	8.26	7.5	75
0022	6.0	5.03	10.48	9	75
		(267)	(267)		

Part No.	Size = ∅ h 6 mm	2792	2794	Cutting edge length mm	Total length mm
0025	6.0	10.14	12.88	9	100
0028	8.0	11.27	16.83	12	75
0031	8.0	15.01	20.16	12	100
0034	10.0	16.37	22.09	15	75
0037	10.0	21.71	26.80	15	100
0040	12.0	21.90	31.40	18	75
0043	12.0	28.99	36.29	18	100
0046	16.0	50.22	74.28	24	100
		(267)	(267)		

Solid Carbide Half-Round Engraving Tools (2-half tool)

Design: Half-round halves.

Material: Universal carbide in fine grain quality.

Application: For engraving and duplication work in tool and mould construction.

Solid carbide K10/ K20

WILKE



Part No.	Size = ∅ h 7 mm	2796 WILKE Price per half	Total length mm
0001	3	9.20	50
0004	4	12.03	50
0007	5	16.28	50
0010	8	19.39	50
		(267)	

Part No.	Size = ∅ h 7 mm	2796 WILKE Price per half	Total length mm
0013	8	32.55	75
0016	10	52.36	75
0019	12	69.34	75
		(267)	

HSS-E Lathe Tools 1.3207 (EW 9Co10)

Design: 6 und 8 mm HSS-E solid steel; 10 mm shanks and above HSS-E head butt-welded, cutting edge ground ready-to-use. Breakage resistant for deep and intermittent cuts, even in highly tensile materials.

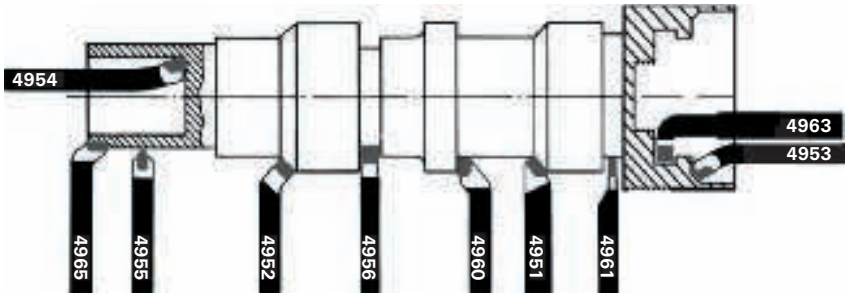
HSS-E

format professional quality

Application: For high cutting performance in one-off and series production.

Note: For solid carbide lathe tools see page 2/96.

Various shapes:



Straight Lathe Tools

Design: HSS-E, DIN 4951.

HSS-E DIN 4951

format professional quality

2826 Right.

2828 Left.



Part No.	0001	0003	0005	0007	0009	0011
Shank ■ mm	**8 x 8**	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**
2826	10.02	11.12	12.16	13.63	18.03	22.79
2828	10.02	11.12	12.16	13.63	18.03	22.79
Total length mm	100	100	110	140	160	200

(266)



2826



2828

Cranked Lathe Tools

Design: HSS-E, DIN 4952.

HSS-E DIN 4952

format professional quality

2830 Right.

2832 Left.



Part No.	0001	0003	0005	0007	0009	0011
Shank ■ mm	**8 x 8**	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**
2830	10.69	11.58	12.74	17.89	20.48	25.47
2832	10.69	11.58	12.74	17.89	20.48	25.47
Total length mm	100	100	110	140	160	200

(266)



2830



2832

Internal Lathe Tools

Design: HSS-E, DIN 4953, right.

HSS-E | DIN 4953



format professional quality

2838 Shank ■

2840 Shank ●

Part No.		0001	0003	0005	0007	0009	0011	0013
Shank ■	**mm**	**8 x 8**	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**	–
Shank ●	**mm**	**6**	**8**	**10**	**12**	**16**	**20**	**25**
2838		9.81	11.98	14.15	16.73	23.91	34.45	–
2840		8.01	8.90	10.69	12.48	14.68	20.48	29.83
Total length ■	mm	140	160	180	180	220	250	–
Total length ●	mm	125	140	160	180	220	250	315
Smallest hole ∅ ■	mm	14	18	21	27	34	43	–
Smallest hole ∅ ●	mm	16	18	20	22	30	36	44

(266)



2838



2840

Internal Corner Lathe Tools

Design: HSS-E, DIN 4954, right.

HSS-E | DIN 4954



format professional quality

2846 Shank ■

2848 Shank ●

Part No.		0001	0003	0005	0007	0009	0011	0013
Shank ■	**mm**	**8 x 8**	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**	–
Shank ●	**mm**	**6**	**8**	**10**	**12**	**16**	**20**	**25**
2846		9.81	11.98	14.15	16.73	23.91	35.95	–
2848		8.01	8.90	10.69	12.48	14.68	20.48	29.83
Total length ■	mm	140	160	180	180	220	250	–
Total length ●	mm	125	140	160	180	220	250	315
Smallest hole ∅ ■	mm	14	18	21	27	34	43	–
Smallest hole ∅ ●	mm	16	18	20	22	30	36	44

(266)



2846



2848

Tapered Lathe Tools

Design: HSS-E, DIN 4955, straight.

HSS-E | DIN 4955



format professional quality

Part No.		0001	0003	0005	0007	0009
Shank ■	**mm**	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**
2854		11.58	12.48	16.92	21.36	31.17
Total length	mm	100	110	140	160	200

(266)

straight



Wide Lathe Tools

Design: HSS-E, DIN 4956, straight.

HSS-E | DIN 4956



format professional quality

Part No.		0001	0003	0005	0007	0009
Shank ■	**mm**	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**
2860		12.28	13.18	17.80	22.71	32.95
Total length	mm	100	110	140	160	200

(266)

straight



Offset Lathe Tools

Design: HSS-E, DIN 4965.

HSS-E | DIN 4965

2870 Right.

2872 Left.

Part No.		0001	0003	0005	0007
Shank ■	**mm**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**
2870		12.01	15.13	18.88	26.27
2872		12.01	15.13	18.88	26.27
Total length	mm	110	140	160	200

(266)





2870



2872

Offset Cranked Knife Lathe Tools

Design: HSS-E, DIN 4960.

HSS-E | DIN 4960

2890 Right.

2892 Left.

Part No.		0001	0003	0005	0007	0009
Shank ■	**mm**	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**
2890		11.58	12.64	16.12	19.95	25.20
2892		11.58	12.64	16.12	19.95	25.20
Total length	mm	100	110	140	160	200

(266)





2890



2892

Parting Lathe Tools

Design: HSS-E, DIN 4961.

HSS-E | DIN 4961

2902 Right.

2904 Left.

Part No.		0001	0003	0005	0007	0009
Shank ■	**mm**	**12 x 8**	**16 x 10**	**20 x 12**	**25 x 16**	**32 x 20**
2902		13.52	15.58	17.10	25.54	37.85
2904		13.52	15.58	17.10	25.54	37.85
Total length	mm	100	125	140	180	220
Parting width	mm	2,5	3	4	5	6

(266)





2902



2904

Tapered Lathe Tools

Design: HSS-E, DIN 4963, right.

HSS-E | DIN 4963

2910 Shank ■

2912 Shank ●

Part No.		0001	0003	0005	0007	0009	0011	0013
Shank ■	**mm**	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**	**–**	**–**
Shank ●	**mm**	**6**	**8**	**10**	**12**	**16**	**20**	**25**
2910		17.80	21.36	23.15	30.28	34.27	–	–
2912		13.09	14.88	16.29	19.23	20.83	28.40	32.95
Total length ■	mm	160	180	180	220	250	–	–
Total length ●	mm	125	140	160	180	220	250	315
Smallest hole ø ■	mm	20	22	25	32	40	–	–
Smallest hole ø ●	mm	13	16	20	25	32	40	50
Parting width ■	mm	3	3	3	4	5	–	–
Parting width ●	mm	3	3,5	4	5	6	8	9

(266)





2910



2912

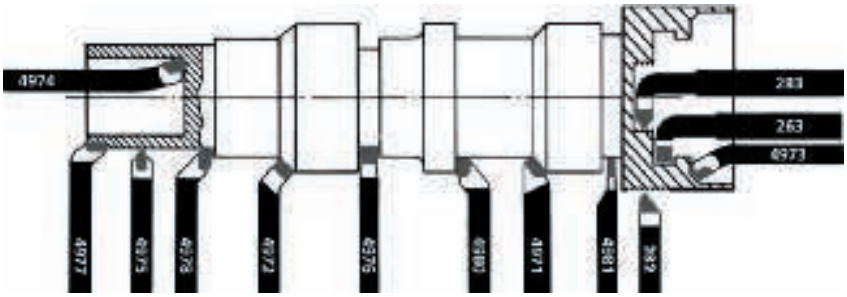
Carbide Lathe Tools

Design: DIN 4971/DIN 4981 and/or company standards DIN 263/282 and 283. All steel shanks have a strength of approx. 750 N/mm^2 and a flat ground supporting face.
All lathe tools are provided with a brazed and precision-ground carbide cutting edge.
Overall length tolerance: max. ± 5 %.
Material/cutting edges:
Carbide types ISO range P 25/30 and K 10/20.

Application: For general turning work.

P 25/30 is suitable for steel, cast steel, long-chipping ferrous material and malleable cast iron.
K 10/20 is preferably used for short-shipping ferrous material (e.g. grey cast iron up to 220 HB) and non-ferrous metal (such as copper, brass and light metal).
All lathe tools are also available in carbide types P 10, P 20, P 40, M 10/20 on request.

Various shapes:



Straight Lathe Tools

Design: Carbide, DIN 4971/ISO 1.

Carbide | DIN 4971



format professional quality

2810 K 10/20, right.
2812 K 10/20, left.
2814 P 25/30, right.
2816 P 25/30, left.

Part No.	0003	0005	0007	0009	0011	0013
Shank y mm	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**	**32 x 32**
2810	2.03	2.28	2.63	3.41	4.91	7.37
2812	2.03	2.28	2.63	3.41	4.91	7.37
2814	2.03	2.28	2.63	3.41	4.91	7.37
2816	2.03	2.28	2.63	3.41	4.91	7.37
Total length mm	90	100	110	125	140	170

(266)



2810/2814



2812/2816

Cranked Lathe Tools

Design: Carbide, DIN 4972/ISO 2.

Carbide | DIN 4972



format professional quality

2818 K 10/20, right.
2820 K 10/20, left.
2822 P 25/30, right.
2824 P 25/30, left.

Part No.	0003	0005	0007	0009	0011	0013
Shank y mm	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**	**32 x 32**
2818	2.17	2.36	2.73	3.47	4.93	7.42
2820	2.17	2.36	2.73	3.47	4.93	7.42
2822	2.17	2.36	2.73	3.47	4.93	7.42
2824	2.17	2.36	2.73	3.47	4.93	7.42
Total length mm	90	100	110	125	140	170

(266)



2818/2822



2820/2824

Internal Lathe Tools

Design: Carbide, DIN 4973/ISO 8, right.

Carbide | DIN 4973



format professional quality

2834 K 10/20.

2836 P 25/30.

Part No.		0001	0003	0005	0007	0009	0011	0013
Shank ■	**mm**	**8 x 8**	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**	**32 x 32**
2834		2.12	2.36	2.78	3.41	4.13	5.67	8.54
2836		2.12	2.36	2.78	3.41	4.13	5.67	8.54
Total length	mm	125	150	180	210	250	300	355
Smallest drill ⌀	mm	14	18	21	27	34	43	52

(266)



2834/2836

Internal Corner Lathe Tools

Design: Carbide, DIN 4974/ISO 9, right.

Carbide | DIN 4974



format professional quality

2842 K 10/20.

2844 P 25/30.

Part No.		0001	0003	0005	0007	0009	0011	0013
Shank ■	**mm**	**8 x 8**	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**	**32 x 32**
2842		2.12	2.36	2.78	3.41	4.13	5.67	8.54
2844		2.12	2.36	2.78	3.41	4.13	5.67	8.54
Total length	mm	125	150	180	210	250	300	355
Smallest drill ⌀	mm	14	18	21	27	34	43	52

(266)



2842/2844

Tapered Lathe Tools

Design: Carbide, DIN 4975/ISO 10, straight.

Carbide | DIN 4975



format professional quality

2850 K 10/20.

2852 P 25/30.

Part No.		0001	0003	0005	0007
Shank ■■	**mm**	**16 x 10**	**20 x 12**	**25 x 16**	**32 x 20**
2850		2.18	2.55	3.09	4.09
2852		2.18	2.55	3.09	4.09
Total length	mm	110	125	140	170

(266)

straight



2850/2852

Wide Lathe Tools

Design: Carbide, DIN 4976/ISO 4, straight.

Carbide | DIN 4976



format professional quality

2856 K 10/20.

2858 P 25/30.

Part No.		0001	0003	0005	0007	0009	0011
Shank ■	**mm**	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**	**32 x 32**
2856		2.28	2.79	3.33	4.53	7.09	12.19
2858		2.28	2.79	3.33	4.53	7.09	12.19
Total length	mm	90	100	110	125	140	170

(266)

straight



2856/2858

Offset Lathe Tools

Design: Carbide, DIN 4977/ISO 5.

Carbide | DIN 4977



format professional quality

2862 K 10/20, right.

2864 K 10/20, left.

2866 P 25/30, right.

2868 P 25/30, left.

Part No.		0001	0003	0005	0007
Shank ■	**mm**	**16 x 16**	**20 x 20**	**25 x 25**	**32 x 32**
2862		2.79	3.59	5.00	7.62
2864		2.79	3.59	5.00	7.62
2866		2.79	3.59	5.00	7.62
2868		2.79	3.59	5.00	7.62
Total length	mm	110	125	140	170

(266)



2862/2866



2864/2868

Offset Corner Lathe Tools ISO 3

Design: Carbide, DIN 4978/ISO 3.

Carbide | DIN 4978

2874 K 10/20, right.
2876 K 10/20, left.
2878 P 25/30, right.
2880 P 25/30, left.

Part No.		0001	0003	0005	0007
Shank ■	mm	16 x 10	20 x 12	25 x 16	32 x 20
2874		2.46	2.79	3.11	4.26
2876		2.46	2.79	3.11	4.26
2878		2.46	2.79	3.11	4.26
2880		2.46	2.79	3.11	4.26
Total length	mm	110	125	140	170

(266)





2874/2878



2876/2880

Offset Cranked Knife Lathe Tools

Design: Carbide, DIN 4980/ISO 6.

Carbide | DIN 4980

2882 K 10/20, right.
2884 K 10/20, left.
2886 P 25/30, right.
2888 P 25/30, left.

Part No.		0001	0003	0005	0007	0009	0011
Shank ■	mm	10 x 10	12 x 12	16 x 16	20 x 20	25 x 25	32 x 32
2882		2.09	2.28	2.76	3.43	4.70	7.17
2884		2.09	2.28	2.76	3.43	4.70	7.17
2886		2.09	2.28	2.76	3.43	4.70	7.17
2888		2.09	2.28	2.76	3.43	4.70	7.17
Total length	mm	90	100	110	125	140	170

(266)





2882/2886



2884/2888

Parting Lathe Tools

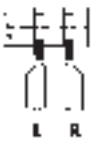
Design: Carbide, DIN 4981/ISO 7.

Carbide | DIN 4981

2894 K 10/20, right.
2896 K 10/20, left.
2898 P 25/30, right.
2900 P 25/30, left.

Part No.		0001	0003	0005	0007	0009
Shank ■	mm	12 x 8	16 x 10	20 x 12	25 x 16	32 x 20
2894		2.03	2.24	2.71	3.47	4.80
2896		2.03	2.24	2.71	3.47	4.80
2898		2.03	2.24	2.71	3.47	4.80
2900		2.03	2.24	2.71	3.47	4.80
Total length	mm	100	110	125	140	170
Parting width	mm	3	4	5	6	8

(266)





2894/2898



2896/2900

Tapered Lathe Tools

Design: Carbide, according to company standard, right, 60°.

Carbide | Factory standard

2906 K 10/20.
2908 P 25/30.

Part No.		0001	0003	0005	0007	0009	0011
Shank ■	mm	10 x 10	12 x 12	16 x 16	20 x 20	25 x 25	32 x 32
2906		5.88	6.26	7.37	8.23	10.02	12.78
2908		5.88	6.26	7.37	8.23	10.02	12.78
Total length ■	mm	140	160	180	210	250	300
Smallest hole ⌀ ■	mm	20	22	25	32	40	–
Parting width	mm	3	4	5	6	8	10

(266)





2906/2908

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Female Thread Lathe Tools

Design: Carbide, according to company standard, right, 60°.

Carbide | Factory standard

2913 K 10/20.

2914 P 25/30.



format professional quality

Part No.		0001	0003	0005	0007	0009	0011
Shank ■	**mm**	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**	**32 x 32**
2913		5.88	6.26	7.37	8.23	10.02	12.78
2914		5.88	6.26	7.37	8.23	10.02	12.78
Total length ■	mm	140	160	180	210	250	300
Smallest hole ∅ ■	mm	24	30	36	45	55	70

(266)



2913/2914

Male Thread Lathe Tools

Design: Carbide, according to company standard, right, 60°.

Carbide | Factory standard

2915 Carbide type K 10/20 right, square shank.

2916 Carbide type P 25/30 right, square shank.



format professional quality

Part No.		0001	0003	0005	0007	0009	0011
Shank ■	**mm**	**10 x 10**	**12 x 12**	**16 x 16**	**20 x 20**	**25 x 25**	**32 x 32**
2915		4.39	4.63	5.60	6.39	7.40	9.22
2916		4.39	4.63	5.60	6.39	7.40	9.22
Total length ■	mm	100	110	125	140	160	180

(266)



2915/2916

Lathe Tool Holders

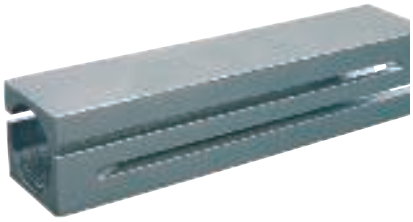
Design: The holder ensures a firm grip of round shanks, even under low pressure.

Application: For holding lathe tools with round shank and tool bits (round).
Cut depths can be precisely adjusted using this steel holder.

format professional quality

Part No.	For shank ∅ mm	**2920**	Height/Width x Length mm
0006	**6**	16.22	10 x 70
0008	**8**	17.56	12 x 80
0010	**10**	19.27	14 x 85
0012	**12**	21.50	16 x 90
0016	**16**	25.50	20 x 100
0020	**20**	31.73	25 x 110

(268)

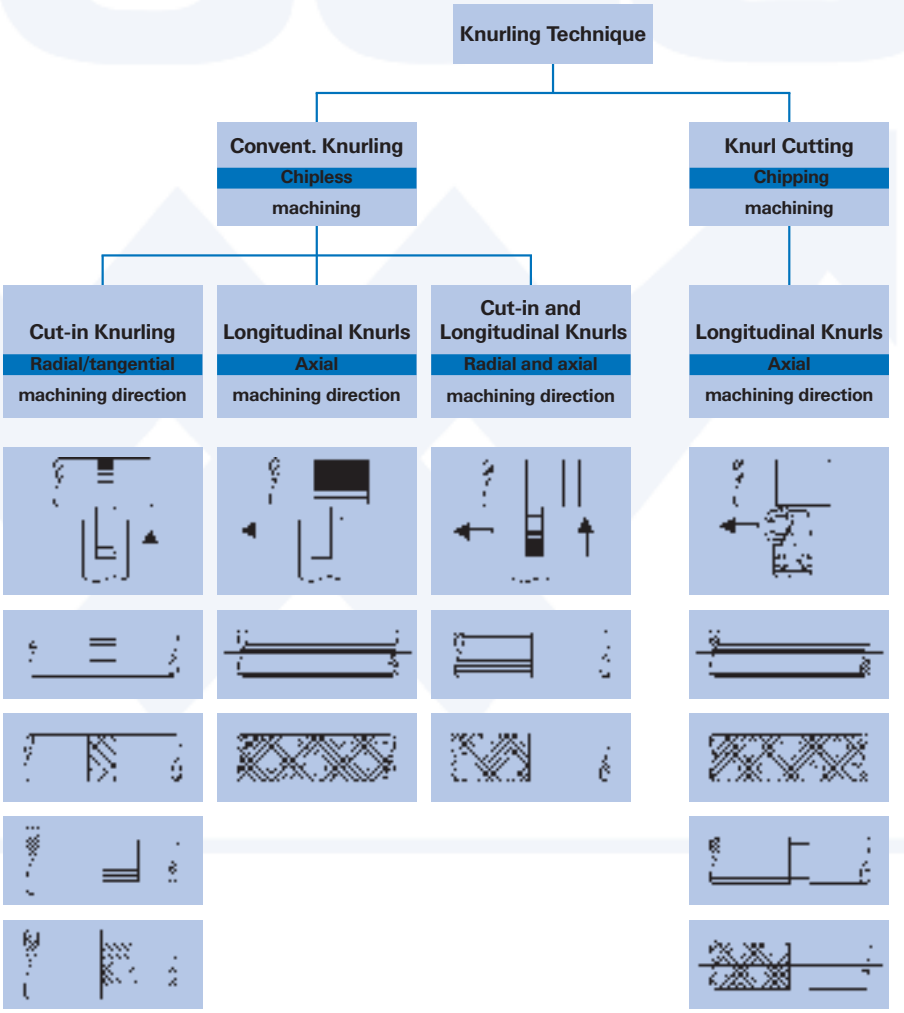


Knurling Technique – Characteristics

	Conventional knurling	Knurl cutting

Application	• Machining of cold forming materials.
	• Knurling on thin-walled work pieces is problematic.
	• Broad spectrum of applications
	  • All knurl forms and profiles can be realized.
	  • Convenient for face and internal knurling.
	  • Knurling possible up to the collar.
	  • Tool can be positioned at any position of the workpiece.
		• Almost any material can be machined.
		• Machining of thin-walled workpieces possible.
		• Suitable for visible knurls – high knurling quality.
		• Limited range of application:
		  • Only knurl profiles RAA and RGE can be produced.
		  • Only the machining of cylindrical workpieces in axial machining direction is possible.
		• One punch is necessary for positioning the tool in the centre of the workpiece.

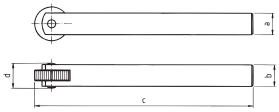
Characteristics	• The external diameter of the workpiece is increased by drawing-back the material. • Compression of the surface. • Higher machine load than in case of knurl cutting.	• No significant change in the external diameter of the workpiece. • Slight compression of the surface. • High precision and surface quality of the knurl. • Low machine load.
Handling	• In general, no preparation of the workpiece necessary. • Very easy handling of the tool.	• Precise tool adjustment and fine adjustment required. • Precise preparation of the workpiece required.



Knurling Tools without Knurl Wheel

Application: Knurling (chipless).
Machining: Single-stroke knurls (longitudinal knurls RAA, RBL and RBR possible).
Knurl pattern: Suitable for all knurl patterns and inscriptions.
Knurl wheels: Suitable for all types of knurls.
Machine type: Lathes/automatic lathes – conventional – centre height can be adjusted.

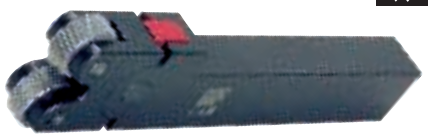


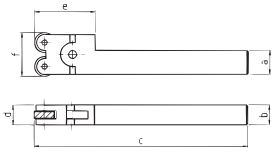


Part No.	Model	2935	Machining range Ø mm	Shank a x b mm	Shank length c mm	d mm	Required knurls mm
0100	830-16U 250 806	11.14 (270)	15–200	16 x 16	130.5	18	20 + 25 x 8 x 6

Knurling Tools without Knurl Wheel

Application: Knurling (chipless).
Machining: Single-stroke knurls/longitudinal knurls.
Knurl pattern: For knurls on the workpiece according to DIN 82 RAA, RGE 30°, RGE 45°.
Knurl wheels: RAA – 2 AA, RGE 30° – 1 BL 30°/1 BR 30°, RGE 45° – 1 BL 45°/1 BR 45°.
Machine type: Lathes/automatic lathes – conventional – centre height can be adjusted.



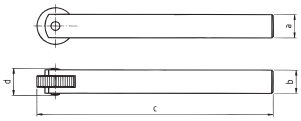


Part No.	Model	2936	Machining range Ø mm	Shank a x b mm	Shank length c mm	f mm	e mm	Required knurls mm
0100	840-25U 200 806	31.51 (270)	10–80	25 x 18	184	42	57	20 x 8 x 6

Knurling Tools without Knurl Wheel

Application: Knurling (chipless).
Machining: Single-stroke knurls (longitudinal knurls RAA, RBL and RBR possible).
Knurl pattern: Suitable for all knurling patterns, profiles and inscriptions.
Knurl wheels: Suitable for all types of knurls.
Machine type: Lathes/automatic lathes – conventional – centre height can be adjusted.
Features: Surface hardened – for increased wear resistance, solid carbide pins: higher speed, faster machining, longer service life.





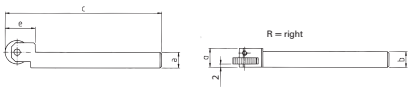
Part No.	Model	2937	Machining range Ø mm	Shank a x b mm	Shank length c mm	Required knurls mm
0100	130-12U150404	26.78	3– 20	12 x 12	129	10 x 4 x 4/15 x 4 x 4
0105	130-14U150604	26.78	3– 20	14 x 14	129	10 x 6 x 4/15 x 6 x 4
0110	130-14U250606	26.78 (270)	15–200	14 x 14	130.5	20 x 6 x 6/25 x 6 x 6

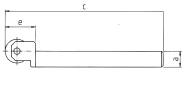
Knurling Tools without Knurl Wheel

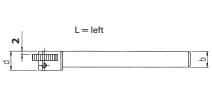
Application: Knurling (chipless).
Machining: Single-stroke knurls (longitudinal knurls RAA, RBL and RBR possible).
Knurl pattern: Suitable for all knurling patterns, profiles and inscriptions.
Knurl wheels: Suitable for all types of knurls.
Machine type: Lathes/automatic lathes – conventional – centre height can be adjusted.
Features: Surface hardened – for increased wear resistance, solid carbide pins (pin incl. face secured by means of screw), higher speed, faster machining, longer service life.

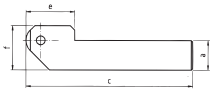
CNC

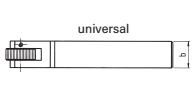












Part No.	Model	2938	Design	Machining range Ø mm	Shank a x b mm	Shank length c mm	e mm	f mm	Required knurls mm
0100	131-10L150404	54.15	left	3– 50	10 x 10	99	19	–	10 x 4 x 4/15 x 4 x 4
0105	131-10R150404	54.15	right	3– 50	10 x 10	99	19	–	10 x 4 x 4/15 x 4 x 4
0110	131-20U250806	74.84 (270)	Universal	8–200	20 x 20	119.5	29.5	32.5	20 x 8 x 6/25 x 8 x 6

Knurling Tools without Knurl Wheel

CNC

Application: Knurling (chipless).

Machining: Single-stroke and longitudinal knurls.

Knurl pattern: For knurls on the workpiece according to DIN 82: RAA, RGE 30°, RGE 45°.

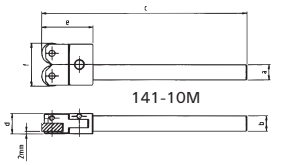
Knurl wheels: RAA – 2 AA
RGE 30° – 1 BL 30°/1 BR 30°
RGE 45° – 1 BL 45°/1 BR 45°

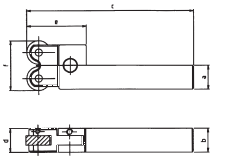
Machine type: Long turning automatic screw machine and small lathes (model 141-10/15M), lathes and automatic lathes (model 141-20M) – CNC and conventional – centre height integrated in tool holder.

Features: With flexible centring; modular construction: Tool can be used for right-hand and left-hand application; retrofitting by turning the knurling head; pins and hinge bolts with face – secured by means of screw for quick changing of knurling wheels/knurling head; surface hardened – for increased resistance to wear, solid carbide pins:

- high speed
- faster machining
- longer service life







Part No.	Model	2940	Range of use mm	Shank a x b mm	Shank length c mm	d mm	e mm	f mm	Required knurls mm
0100	141-10M100404	100.39	3–12	10 x 10	105.5	12	25.5	21	10 x 4 x 4
0105	141-16M150604	105.27	8–15	16 x 16	129	16	39	33	15 x 6 x 4
0110	141-20M200806	114.40 (270)	10–80	20 x 20	140	20	50	42	20 x 8 x 6

Knurl Wheels form AA/BL/BR

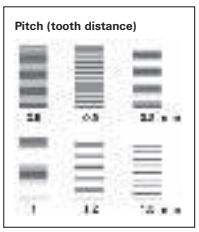
HSS DIN 403

Design: With land for knurling.

- Faces and bore hole ground
- Teeth precisely milled to pitch
- Hardened (HRc 61 ± 1)

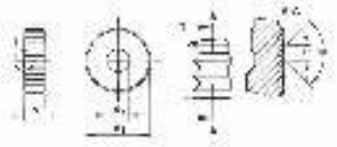
2945 **Form AA** parallel to axis (straight)
2946 **Form BL** left-hand helix (30°)
2947 **Form BR** right-hand helix (30°)

Part No.	Knurl d_1 x width b x bore hole d_2 ∅ mm	2945 AA	2946 BL 30°	2947 BR 30°	Pitch mm
0001	10 x 4 x 4	10.58	–	–	0.6
0003	10 x 4 x 4	10.58	10.58	10.58	0.8
0005	10 x 4 x 4	10.58	10.58	10.58	1.0
0009	15 x 4 x 4	11.98	–	–	0.5
0011	15 x 4 x 4	11.98	11.98	11.98	0.6
0013	15 x 4 x 4	11.98	11.98	–	0.8
0017	15 x 4 x 4	–	11.98	11.98	1.2
0019	15 x 4 x 4	11.98	–	–	1.5
0021	15 x 6 x 4	11.98	11.98	11.98	0.5
0023	15 x 6 x 4	11.98	11.98	11.98	0.6
0025	15 x 6 x 4	–	11.98	11.98	0.8
0027	15 x 6 x 4	11.98	–	–	1.0
0033	20 x 6 x 6	13.45	–	–	0.5
0035	20 x 6 x 6	13.45	–	–	0.6
0037	20 x 6 x 6	13.45	–	–	0.8
0039	20 x 6 x 6	13.45	13.45	13.45	1.0
0041	20 x 6 x 6	13.45	13.45	13.45	1.2
0043	20 x 6 x 6	13.45	–	–	1.5
0045	20 x 8 x 6	13.45	13.45	13.45	0.5
0047	20 x 8 x 6	13.45	13.45	13.45	0.6
0049	20 x 8 x 6	13.45	13.45	13.45	0.8
0051	20 x 8 x 6	13.45	13.45	13.45	1.0
0053	20 x 8 x 6	13.45	13.45	13.45	1.2
0055	20 x 8 x 6	13.45	13.45	13.45	1.5
0063	25 x 8 x 6	16.98	–	–	1.0
0065	25 x 8 x 6	–	16.98	16.98	1.2
0067	25 x 8 x 6	16.98	16.98	–	1.5
		(270)	(270)	(270)	



AA **AA knurl wheel with grooves parallel to the axis**





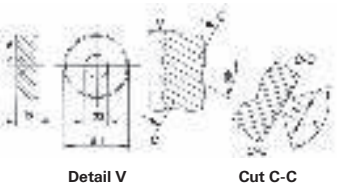
BL 30° **BL left-hand knurl wheel**





BR 30° **BR knurl wheels**





Knurl Wheels GE/GV

HSS | DIN 403

Design: With land for knurling.

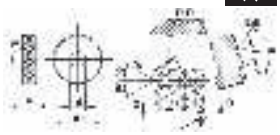
- Faces and bore hole ground
- Hardened (HRc 61 ± 1)

2948 **Form GE,** left-/right-hand helix, tips raised (30°), milled teeth.

2949 **Form GV,** left-/right-hand helix, tips recessed (30°), rolled teeth.



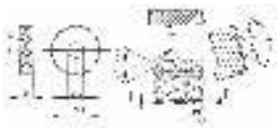
GE



Detail W Cut D-D Cut E-E



GV



Detail X Cut F-F

Part No.	Knurl d_1 x width b x bore hole d_2 ∅ mm	2948 GE	2949 GV	Pitch mm
0003	20 x 8 x 6	–	22.22	0.6
0005	20 x 8 x 6	21.90	22.22	0.8
0007	20 x 8 x 6	21.90	–	1.0
0009	20 x 8 x 6	21.90	–	1.2
		(270)	(270)	

Tools for Knurl Cutting without Wheel

CNC

Design: Knurl cutting (chipping).

Machining: Longitudinal knurls.

Knurl pattern: For knurls on the workpiece according to DIN 82: RAA.

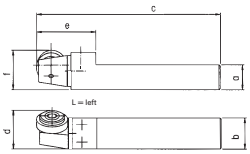
Knurl wheels: RAA – 1 BL 30° or 1 BR 30°; RBL – 1 AA.

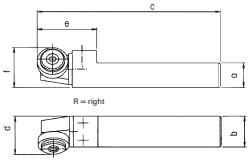
Machine type: Long turning automatic screw machine (model 231-10), lathes and small lathes – CNC and conventional – centre height integrated in tool holder.

Features: Modular construction (for type 231-20/25 R/L), top for knurling by cutting for right- and left-hand version can be exchanged, adjustment of clearance angle by means of headless pin at the shank, fine adjustment for knurls parallel to the axis through adjustable knurling head, surface hardened for increased resistance to wear, solid carbide bushes:

- higher speed
- faster machining
- longer service life







Part No.	Model	2952	Design	Machining range ∅ mm	Shank a x b mm	c mm	d mm	e mm	f mm	Required knurls mm
0100	231-10L150408	179.07	left	1.5– 15	10 x 10	98	15	17	20.5	10 x 3 x 6
0105	231-10R150408	180.90	right	1.5– 15	10 x 10	98	15	17	20.5	10 x 3 x 6
0110	231-20L250608	214.79	left	10 –300	20 x 25	129	31	49	32	25 x 6 x 8
0115	231-20R250608	214.79	right	10 –300	20 x 25	129	31	49	32	25 x 6 x 8
0120	231-25L250608	214.79	left	10 –300	25 x 25	129	31	49	37.5	25 x 6 x 8
0125	231-25R250608	214.79	right	10 –300	25 x 25	129	31	49	37.5	25 x 6 x 8
		(270)								

Tools for Knurl Cutting without Wheel

Design: Knurl cutting (chipping).

Machining: Longitudinal knurls.

Knurl pattern: For knurls on the workpiece according to DIN 82: RGE 30°/RGE 45°.

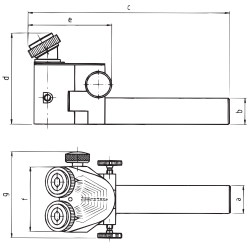
Knurl wheels: RGE 30° – 2 AA, RGE 45° – 1 BL 15°/1 BR 15°.

Machine type: Lathes and automatic lathes – conventional – centre height integrated in tool holder.

Features: Easy adjustment, synchronous setting of retainer to workpiece diameter by means of central adjusting screw, scale, fine adjustment for positioning of knurling head – for even knurling depth, surface hardened – increased wear resistance, solid carbide bushes:

- higher speed
- faster machining
- longer service life





Part No.	Model	2953	Machining range ∅ mm	Shank a x b mm	Shank length c mm	Required knurls mm
0100	240-16M150408	406.46	3– 50	16 x 14	115	15 x 4 x 8
0105	240-20M250608	452.09	10–250	20 x 20	152	25 x 6 x 8
		(270)				

Tools for Knurl Cutting without Wheel

Tools for Knurl Cutting without Wheel

Design: Knurl cutting (chipping).

Machining: Longitudinal knurls.

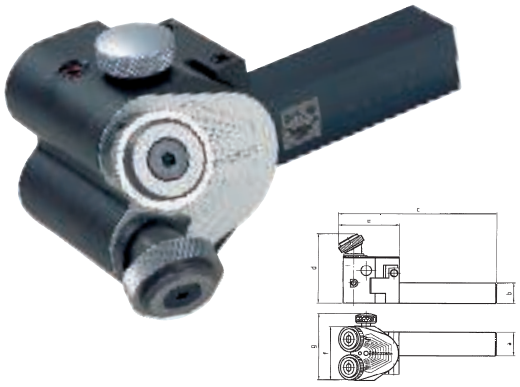
Knurl pattern: For knurls on the workpiece according to DIN 82: RGE 30°/RGE 45°.

Knurl wheels: RGE 30° – 2 AA, RGE 45° – 1 BL 15°/1 BR 15°.

Machine type: Lathes and automatic lathes – CNC and conventional – centre height integrated in tool holder.

Features: Easy adjustment, synchronous setting of retainer to workpiece diameter by means of central adjusting screw, scale, fine adjustment for positioning of knurling head – for even knurling depth, modular construction:
tool suitable for right- and left-hand version, removable adjusting aid for optical pre-adjustment, retrofitting through turning of knurl head, surface hardened – for increased wear resistance, solid carbide bushes:

- higher speed
- faster machining
- longer service life



Part No.	Model	2955	Machining range ∅ mm	Shank a x b mm	c mm	d mm	e mm	f mm	g mm	Required knurls mm
0100	241-16M150408	497.72	3– 50	16 x 20	115	40	35	34	39	15 x 4 x 8
0105	241-20M250608	543.36	10–250	20 x 20	138	70	58	58	64	25 x 6 x 8
0110	241-25M250608	543.36	10–250	25 x 25	138	70	58	58	64	25 x 6 x 8
		(270)								

Wheels for Knurl Cutting Form BL/BR

Design: Without lands for knurl cutting, faces and bore hole ground, teeth milled to pitch, hardened (HRc 61 ± 1), for knurls parallel to the axis (RAA).

HSS | DIN 403

For RAA: catalogue no. 2960/2961.
For RGE 45°: catalogue no. 2965/2966.

Part No.	Knurl x width x bore hole ∅ mm	2960 BR 30°	2961 BL 30°	2965 BR 15°	2966 BL 15°	Pitch mm
0001	14.5 x 3 x 5	11.43	11.43	–	–	0.8
0002	15.0 x 4 x 8	11.98	11.98	–	–	0.6
0003	14.5 x 3 x 5	11.43	11.43	–	–	1.0
0004	15.0 x 4 x 8	11.98	11.98	–	–	1.0
0005	21.5 x 5 x 8	13.45	13.45	–	–	0.8
0006	15.0 x 4 x 8	11.98	11.98	–	–	1.2
0007	21.5 x 5 x 8	13.45	13.45	–	–	1.0
0009	25.0 x 6 x 8	16.98	16.98	–	–	0.6
0011	25.0 x 6 x 8	16.98	16.98	–	–	0.8
0013	25.0 x 6 x 8	16.98	16.98	–	–	1.0
0015	25.0 x 6 x 8	16.98	16.98	16.98	16.98	1.2
0017	25.0 x 6 x 8	16.98	16.98	16.98	16.98	1.5
		(270)	(270)	(270)	(270)	

2960 **Form:** BR 30°
2961 **Form:** BL 30°
2965 **Form:** BR 15° (knurl RGE 45°)
2966 **Form:** BL 15° (knurl RGE 45°)



BR 30° BL 30° BR 15° BL 15°

HSS Wheels for Knurl Cutting Form AA

Design: Without lands for knurl cutting, faces and bore hole ground, teeth milled, hardened (HRc 61 ± 1).
For left-right knurls (RGE 30°, according to DIN 82).

Form: AA

HSS | DIN 403



Part No.	Knurl x width x bore hole ∅ mm	2964	Pitch mm
0009	14.5 x 3 x 5	11.43	0.8
0011	14.5 x 3 x 5	11.43	1.0
0013	15.0 x 4 x 8	11.98	0.6
0015	15.0 x 4 x 8	11.98	0.8
0017	15.0 x 4 x 8	11.98	1.2
0019	21.5 x 5 x 8	13.45	0.8
		(270)	

Part No.	Knurl x width x bore hole ∅ mm	2964	Pitch mm
0021	21.5 x 5 x 8	13.45	1.0
0023	25.0 x 6 x 8	16.98	0.8
0025	25.0 x 6 x 8	16.98	1.0
0027	25.0 x 6 x 8	16.98	1.2
0029	25.0 x 6 x 8	16.98	1.5
		(270)	

Knurl Tool Set

Set including:

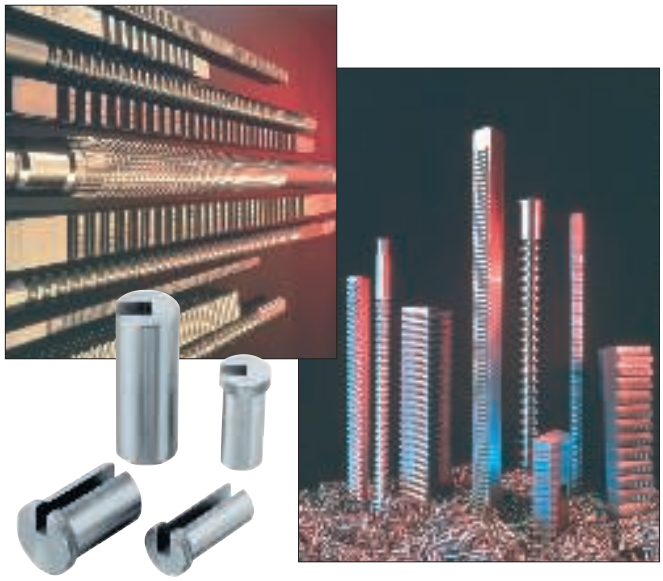
Case, 1 knurl tool no. 29360100,
1 knurl tool no. 29350100,
1 knurl wheel each no. 10 AA + BL + BR,
pitch 0.8 – 1.0 – 1.2 mm, made of HSS,
3 spare pins, knurling instructions.

Part No.	Model	2959
0081	800-01	176.15
		(270)

Spare parts and accessories available on request.

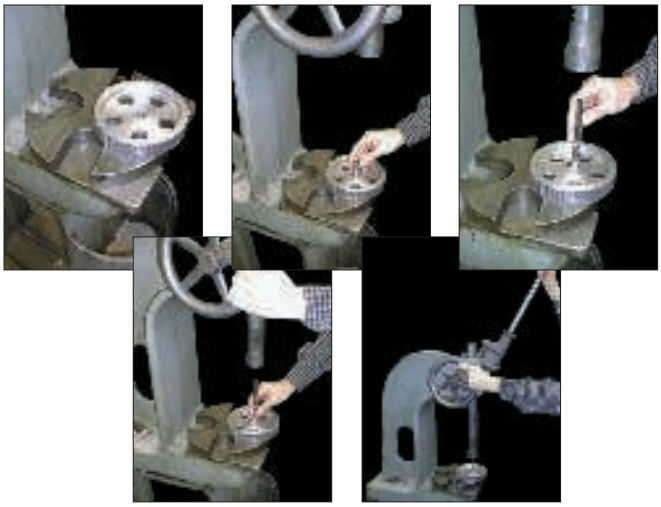


Broaches



Easy application:
Only a press is required (arbor press).

IBT



6 different back widths I to VI engraved in the broach and the guide bushes are available for broaches used for groove widths 2 to 25 mm. A broach marked with "I" fits in a bush marked with "I", a broach "II" fits in a bush "II" etc. The most common diameters from 6 to 100 mm are available for any back width.

Take a guide bush corresponding to the bore diameter in the workpiece. Then select a broach with a tooth width corresponding to the groove (available in tolerance JS9 and in tolerance P9 against surcharge) and push it into the guiding groove of the bush. It must slide easily until the first tooth touches the workpiece.

Now place the unit including workpiece/bush/broach below the ram. Make sure that the broach is upright and at right angles, then push the broach through the workpiece.

Do not try to remove the broach backwards through the workpiece. Larger broaches require several cycles in order to achieve the respective groove depth. That is why inserts are delivered with these broaches. Make the first move as described above and remove chips from the broach. Then place the insert in the guiding groove and push the broach again through the workpiece.

Lubrication is very important. The broach must be provided with high-quality cutting oil during the entire broaching process. When broaching rectangular or hexagonal breakouts, an initial bore hole is required. In case of the standard rectangular broaches, the initial bore hole is slightly larger (0.3–1.0 mm) than the side edge.

This is why the side edge has a radius in the middle.

Keyway Broaches

2970 **Design:** Sets in plastic box.

2971 **Design:** Sets in wooden box, tolerance JS9.

HSS

IBT



2970

Part No.	0005	0010	0015
Design	**7 pcs.**	**13 pcs.**	**20 pcs.**
2970 IBT	224.10 ◊	587.81 ◊	906.95 ◊
Set contents	**4 broaches** 2I, 3I **5 guide bushes** ⌀ 6, 7, 8, 9, 10 mm	**4 broaches** 4II, 5II, 6III, 8III **9 guide bushes** ⌀ 12, 14, 15, 16, 18, 20, 22, 24, 25 mm	**6 broaches** 2I, 3I, 4II, 5II, 6III, 8III **14 guide bushes** ⌀ 8, 10, 12, 14, 15, 16, 18, 19, 20, 22, 24, 25, 28, 30 mm

(274)



2971

Part No.	0020	0025	0030
Design	**13 pcs.**	**24 pcs.**	**11 pcs.**
2971 IBT	612.01 ◊	905.50 ◊	846.33 ◊
Set contents	**4 broaches** 4II, 5II, 6III, 8III **9 guide bushes** ⌀ 12, 14, 15, 16, 18, 20, 22, 24, 25 mm	**6 broaches** 2I, 3I, 4II, 5II, 6III, 8III **13 guide bushes** ⌀ 8, 10, 12, 14, 15, 16, 18, 20, 22, 24, 25, 28, 30 mm	**3 broaches** 10IV, 12IV,14IV, **7 guide bushes** ⌀ 32, 35, 38, 40, 42, 45, 50 mm

(274)

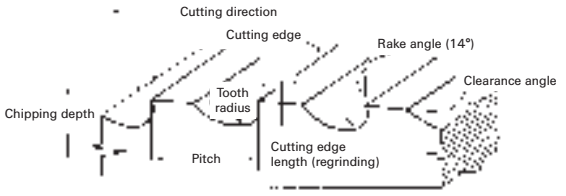
HSS Keyway Broaches

Design: Keyways according to DIN 6865 are easily broached using the push-type broaches made of HSS. No special machines required or no adjusting time. Precisely dimensioned keyways (tolerance JS9) are manufactured on an arbor press or a workshop press. Due to the short broach, no large stroke is required. The required chip removal is achieved by several cycles (see table). Tooth shape and relief grinding ensure a clean surface. The respective guide bushes are available for all bore holes with a diameter of 6–75 mm and tolerance H7. The guiding groove of the bush must correspond to the back width of the broach which is marked with I up to VI. A broach marked with "III" requires a guide bush "III". Guide bushes I, II and III are provided with a supporting collar.

The number of cycles to be effected is dependent upon the size. In case of several cycles, the calibrated inserts must be pushed between the guide bush and the broach.

Application: For manufacturing machine elements, templates, welding, drilling and clamping devices, the rake angle is dimensioned for steel, but is also suitable for cast iron, bronze and aluminium.

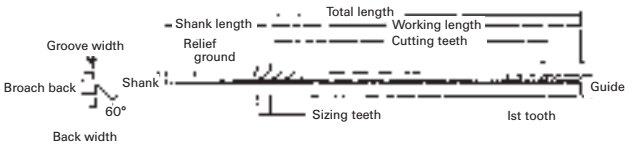
The inserts are included in the scope of supply.



HSS

IBT





Broaches 2–3 mm I

Part No.	Keyway width mm	2973 IBT	Tolerance JS9 mm	Groove size mm	Back width x length mm	Cycles	Inserts	Broaching length mm	perf. kN
0005	2 I	81.79 ◊	+ 0 + 0.011	2 x 2	3.17 x 133	1	0	6–30	2.25
0010	3 I	81.79 ◊	+ 0 + 0.012	3 x 3	3.17 x 133	2	1	6–30	3.25
		(274)							

Guide bushes with collar for broaches 2–3 mm I

Part No.	ø H 7 mm	2974 IBT	Length mm
0005	6 I	17.31 ◊	32
0010	7 I	17.31 ◊	32
0015	8 I	17.31 ◊	32
		(274)	

Part No.	ø H 7 mm	2974 IBT	Length mm
0020	9 I	17.31 ◊	32
0025	10 I	17.31 ◊	32
		(274)	

Spare Inserts

Part No.	Dimensions	2975 IBT	Thickn. mm
0005	3 I	5.28 ◊	0.787
		(274)	

Broaches 4–5 mm II

Part No.	Keyway width mm	2976 IBT	Tolerance JS9 mm	Groove size mm	Back width x length mm	Cycles	Inserts	Broaching length mm	perf. kN
0005	4 II	95.98 ◊	+ 0 + 0.013	4 x 4	6.35 x 178	2	1	8–43	5.1
0010	5 II	95.98 ◊	+ 0 + 0.011	5 x 5	6.35 x 178	2	1	8–43	9.1
		(274)							

Guide bushes with collar for broaches 4–5 mm II

Part No.	ø H 7 mm	2977 IBT	Length mm
0005	11 II	18.77 ◊	46
0010	12 II	18.77 ◊	46
0015	13 II	18.77 ◊	46
0020	14 II	18.77 ◊	46
0025	15 II	18.77 ◊	46
		(274)	

Part No.	ø H 7 mm	2977 IBT	Length mm
0030	16 II	18.77 ◊	46
0035	17 II	18.77 ◊	46
0040	18 II	18.77 ◊	46
0045	19 II	18.77 ◊	46
		(274)	

Spare Inserts

Part No.	Dimensions	2978 IBT	Thickn. mm
0005	4 II	5.28 ◊	0.965
0010	5 II	5.28 ◊	1.270
		(274)	

Broaches 5–8 mm III

Part No.	Keyway width mm	2980 IBT	Tolerance JS9 mm	Groove size mm	Back width x length mm	Cycles	Inserts	Broaching length mm	perf. kN
0005	5 III	116.74 ◊	+ 0 + 0.011	5 x 5	9.53 x 302	2	1	10–64	7.5
0010	6 III	116.74 ◊	+ 0 + 0.012	6 x 6	9.53 x 302	2	1	10–64	8.4
0015	8 III	116.74 ◊	+ 0 + 0.013	8 x 7	9.53 x 302	2	1	10–64	18.65
		(274)							

Guide bushes with collar for broaches 5–8 mm III

Part No.	ø H 7 mm	2981 IBT	Length mm
0005	18 III	20.64 ◊	65
0010	20 III	20.64 ◊	65
0015	22 III	20.64 ◊	65
0020	24 III	20.64 ◊	65
0025	25 III	20.64 ◊	65
0030	26 III	20.64 ◊	65
		(274)	

Part No.	ø H 7 mm	2981 IBT	Length mm
0035	28 III	24.64 ◊	65
0040	30 III	24.64 ◊	65
0045	32 III	24.64 ◊	65
0050	34 III	24.64 ◊	65
0055	36 III	24.64 ◊	65
		(274)	

Spare Inserts

Part No.	Dimensions	2982 IBT	Thickn. mm
0005	5 III	5.28 ◊	1.194
0010	6 III	5.28 ◊	1.448
0015	8 III	5.28 ◊	1.879
		(274)	

Broaches 10–14 mm IV

HSS

IBT

Broaches 10–14 mm IV

Part No.	Keyway width mm	2983 IBT	Tolerance JS9 mm	Groove size mm	Back width x length mm	Cycles	Inserts	Broaching length mm	Broaching perf. kN
0005	10 IV	166.03 ◊	+ 0 + 0.012	10 x 8	14.29 x 340	3	2	20–150	35.3
0010	12 IV	166.03 ◊	+ 0 + 0.014	12 x 8	14.29 x 340	3	2	20–150	47.1
0015	14 IV	166.03 ◊	+ 0 + 0.018	14 x 9	14.29 x 340	3	2	20–150	49.0

(274)

Guide bushes for broaches 10–14 mm IV

Part No.	ø H 7 mm	2984 IBT	Length mm
0005	32 IV	32.27 ◊	102
0010	34 IV	32.27 ◊	102
0015	35 IV	32.27 ◊	102
0020	36 IV	32.27 ◊	102
0025	38 IV	32.27 ◊	102
0030	40 IV	38.14 ◊	102
0035	42 IV	38.14 ◊	102
0040	44 IV	38.14 ◊	102

(274)

Part No.	ø H 7 mm	2984 IBT	Length mm
0045	45 IV	38.14 ◊	127
0050	46 IV	38.14 ◊	127
0055	48 IV	38.14 ◊	127
0060	50 IV	38.14 ◊	127
0065	52 IV	38.14 ◊	127
0070	54 IV	38.14 ◊	127
0075	55 IV	38.14 ◊	127
0080	56 IV	38.14 ◊	127

(274)

Spare Inserts

Part No.	Dimensions	2985 IBT	Thickn. mm
0005	10 IV	5.87 ◊	1.422
0010	12 IV	5.87 ◊	1.524
0015	14 IV	5.87 ◊	1.778

(274)

Broaches 16–18 mm V

Part No.	Keyway width mm	2986 IBT	Tolerance JS9 mm	Groove size mm	Back width x length mm	Cycles	Inserts	Broaching length mm	Broaching perf. kN
0005	16 V	291.58 ◊	+ 0 + 0.016	16 x 10	19.05 x 387	4	3	20–150	51.0
0010	18 V	291.58 ◊	+ 0 + 0.0016	18 x 11	19.05 x 387	4	3	20–150	53.9

(274)

Guide bushes for broaches 16–18 mm V

Part No.	ø H 7 mm	2987 IBT	Length mm
0005	52 V	87.42 ◊	127
0010	54 V	87.42 ◊	127
0015	55 V	87.42 ◊	127
0020	56 V	87.42 ◊	127
0025	58 V	89.17 ◊	127
0030	60 V	89.17 ◊	154
0035	62 V	89.17 ◊	154

(274)

Part No.	ø H 7 mm	2987 IBT	Length mm
0040	64 V	89.17 ◊	154
0045	65 V	94.45 ◊	154
0050	66 V	94.45 ◊	154
0055	68 V	94.45 ◊	154
0060	70 V	99.15 ◊	154
0065	72 V	99.15 ◊	154

(274)

Spare Inserts

Part No.	Dimensions	2988 IBT	Thickn. mm
0005	16 V	5.87 ◊	1.549
0010	18 V	5.87 ◊	1.587

(274)

Broaches 20–25 mm VI

Part No.	Keyway width mm	2989 IBT	Tolerance JS9 mm	Groove size mm	Back width x length mm	Cycles	Inserts	Broaching length mm	Broaching perf. kN
0005	20 VI	506.27 ◊	+ 0 + 0.022	20 x 12	25.4 x 489	5	4	20–150	49.0
0010	22 VI	506.27 ◊	+ 0 + 0.022	22 x 14	25.4 x 489	5	4	20–150	50.0
0015	24 VI	506.27 ◊	+ 0 + 0.022	24 x 14	25.4 x 489	5	4	20–150	56.8
0020	25 VI	506.27 ◊	+ 0 + 0.021	25 x 14	25.4 x 489	5	4	20–150	59.8

(274)

Guide bushes for broaches 20–25 mm VI

Part No.	ø H 7 mm	2990 IBT	Length mm
0005	70 VI	322.64 ◊	154
0010	75 VI	328.52 ◊	154
0015	80 VI	334.39 ◊	154
0020	85 VI	340.24 ◊	154

(274)

Part No.	ø H 7 mm	2990 IBT	Length mm
0025	90 VI	349.64 ◊	154
0030	95 VI	384.82 ◊	154
0035	100 VI	357.86 ◊	154

(274)

Spare Inserts

Part No.	Dimensions	2991 IBT	Thickn. mm
0005	20 VI	7.04 ◊	1.587
0010	22 VI	7.04 ◊	1.346
0015	24 VI	7.04 ◊	1.587
0020	25 VI	7.04 ◊	1.587

(274)

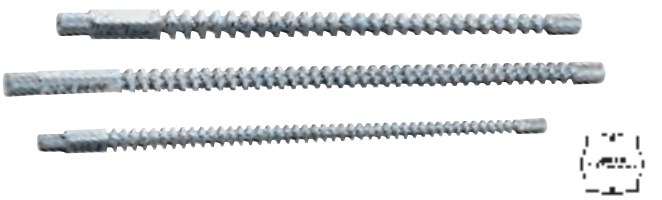
HSS Square Broaches

Design: These broaches are provided with a solid pilot at the lower end. This pilot is placed in the initial bore hole of the workpiece ensuring perpendicular alignment of the square inner profile. No special machines required and no adjusting time. In order to ensure that only one cycle is necessary in case of short workpieces, the initial bore hole (tolerance H8) must be larger. The cutting edges are ground all over ensuring a clean surface.

Application: For manufacturing machine elements, templates, welding, drilling and clamping devices. The rake angle is dimensioned for steel, but is also suitable for cast iron, bronze and aluminium.

HSS

IBT



Part No.	SW ⎅ mm	2992 IBT	Tolerance JS9 mm	Dimension diagonal mm	Bore hole H 8 ⌀	Total length mm	Broaching length min.	Broaching length max.	Broaching performance kN
0005	4	229.97 ◊	4.01– 4.02	5.28– 5.31	4.2	141	8	16	3.3
0010	5	263.99 ◊	5.01– 5.03	6.72– 6.74	5.2	174	9.5	19	4.9
0015	6	275.71 ◊	6.01– 6.04	8.37– 8.38	6.35	178	9.5	19	6.5
0020	8	287.45 ◊	8.01– 8.04	11.19–11.20	8.3	208	11	22	11.8
0025	10	336.74 ◊	10.01–10.04	13.80–13.83	10.3	276	13	25.5	19.5
0030	12	486.91 ◊	12.01–12.04	16.61–16.64	12.5	317	16	32	21.6
0035	14	577.25 ◊	14.01–14.04	19.56–19.58	15.0	378	19	38	22.5
0040	16	665.26 ◊	16.02–16.05	22.30–22.32	17.0	427	22	44	27.5
0045	18	864.72 ◊	18.01–18.04	25.09–25.12	20.0	470	22	44	28.4
0050	20	1.107.57 ◊	20.01–20.04	27.91–27.94	22.0	479	22	44	29.4
0055	22	1.155.68 ◊	22.01–22.04	30.76–30.78	24.0	590	22	44	41.2
0060	24	1.316.41 ◊	24.01–24.04	33.45–33.47	26.0	624	22	44	44.1
0065	25	1.316.41 ◊	25.01–25.04	34.87–34.89	27.0	624	22	44	48.0

(274)

Inside and Outside Machining

KOMET has developed an extensive range of tools for inside and outside machining.

The standard tools are included in this catalogue. Within this range, it is also possible to supply custom-made tools at any time according to customer drawings or the workpieces to be machined.

KOMET tools for inside and outside machining are used on standard turning lathes, turret lathes, automatic and special machines, as well as on boring heads and milling machines.

Due to their clear design, high precision and premium quality, KOMET lathe tools have proved successful at home and abroad. Based on the experience gained in many years, KOMET is able to supply true quality tools which always meet the requirements of the customers.

The quality of the steel and solid carbide used is subjected to constant and in-depth controls in the company's own testing department.

KOMET tools are quality tools fulfilling the highest requirements.

Quick steel quality

KOMET tools are made from high-speed steel in qualities HSS Co5 (5 % cobalt, 12 % tungsten) and HSS Co10 (10 % cobalt, 11 % tungsten).

Solid carbide quality

KOMET solid carbide tools are supplied in standard solid carbide groups P20 (for steel and cast steel) and K10 (for cast iron, non-ferrous metals and low-strength steel).

Cutting speed – standard values

Please note: As the use of KOMET tools is diverse and versatile and must be adapted to the machines and their application range, only standard values can be provided. They can however be modified depending on the feed applied and the diameter of the workpiece to be machined.

Please note: The indicated application parameters are dependent on conditions as to ambience and use (e.g. machine ambient temperature, lubricant and coolant and desired machining result): they require appropriate conditions, proper use and observance of the indicated speed limits of the tools.

Material	Cutting speed in M/min			
	Quality F	Quality H	Solid carbide roughing	Solid carbide finishing
Steel, low-strength	40–100	50–120	40–230	120– 400
Steel, medium strength	20– 60	50– 70	20–190	80– 250
Steel, high-strength	< 14	20– 25	10– 50	20– 100
Grey cast iron	25– 60	50– 70	60– 90	90– 180
Cast bronze	60– 80	70–100	150–300	200– 400
Red bronze	60– 80	70–100	150–400	200– 500
Brass	60– 80	70–100	150–600	350–1000
Aluminium	60– 80	70–100	200–350	250– 450

Parting Tool Support

Design: Slit housing with locking screw in clamping head.

Application: To hold parting tools size A00 and A0-R.

Part No.	Type	2993	A mm	B mm	C mm	D mm
0005	A00	35.52	16	11	100	12
0010	A0	43.60	18	11	125	14
		(275)				



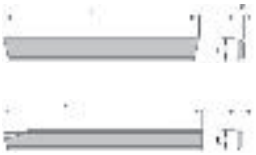


Knurl Tool Set

Design: Available quality:
F = 5 % cobalt, 12 % tungsten (right-hand and left-hand)
K10/P20 = Carbide tipped (only right-hand)

Application: For recessing and truncating.

HSS Co5 | Carbide K10 | Carbide P20





Part No.	Type	2993	Quality	E mm	F mm	L mm	Suitable for parting tool supports
0050	A00	17.31	HSS Co5	8	2.2	75	A00
0065	A0-R	40.56	K10	10	2.7	100	A0
0060	A0-R	40.56	P20	10	2.7	100	A0
		(275)					

Parting Tool Support

Design: Slit housing with clamping screw in clamping head.

Application: To hold parting tools size A0.9-R to A5.15-R.

Part No.	Model	2993	A mm	B mm	C mm	D mm
0020	AE	54.95	18	11.0	125	14
0025	A1/2A	85.41	22	14.5	170	20
0030	A3A	112.38	27	18.0	210	25
		(275)				





Insert

Design: Suitable for parting tool supports A1/2A.

Application: To hold recessing tools A0.9-R to A2.15-R in parting tool support A1/2A.

Part No.	Type	2993	Height mm	Length mm
0035	A1/2A	19.46	15	40
		(275)		



Parting Tools

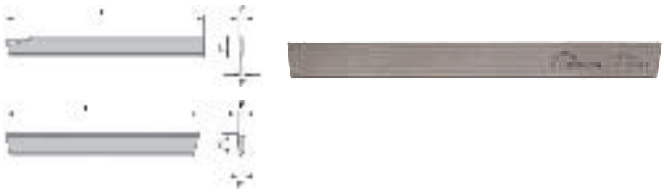
Design: Widths for circlips adjusted to tolerance H11.
Regrinding of tool only necessary on face.
Suitable for (part no. 2993 0020, 2993 0025 and 2993 0010).

Available in the quality:
HSS Co5 = 5 % cobalt, 12 % tungsten (right-hand and left-hand).
K10/P20 = Carbide tipped (only for right-hand).

Application: For truncating, e.g. for circlips.

Carbide P20 | HSS Co5

KOMET



Part No.	Type	2993 more	Quality	For Seeger circlip ring width mm	E mm	F mm	F1 mm	L mm	Suitable for parting tool supports
0070	A1/2A	25.61	HSS Co5	–	16	4	3	150	A1/2A
0076	A1/2A-R	55.96	P20	–	16	4	3	100	A1/2A
0079	A3A	30.42 (275)	HSS Co5	–	18.5	5	4	150	A3A

Parting Tools

Design: Widths for circlips adjusted to tolerance H11.
Regrinding of tool only necessary on face.
Suitable for (part no. 2993 0020, 2993 0025 and 2993 0010).

Available in the quality:
HSS Co5 = 5 % cobalt, 12 % tungsten (right-hand and left-hand).

Application: For recessing, e.g. for producing recesses within the tolerances for circlips.

HSS Co5

KOMET



Part No.	Type	2993 more	Quality	For Seeger circlip ring width mm	E mm	F mm	F1 mm	L mm	Suitable for parting tool supports
0085	A0,9-R	34.28	HSS Co5	0.8	11	0.9	–	80	A1/A2 with grinding application A1/2A and AE
0088	A1.1-R	34.28	HSS Co5	1.0	11	1.1	–	80	A1/A2 with grinding application A1/2A and AE
0091	A1.3-R	34.28	HSS Co5	1.2	11	1.3	–	80	A1/A2 with grinding application A1/2A and AE
0094	A1.6-R	34.28	HSS Co5	1.5	11	1.6	–	80	A1/A2 with grinding application A1/2A and AE
0097	A1.85-R	34.28	HSS Co5	1.75	11	1.85	–	80	A1/A2 with grinding application A1/2A and AE
0100	A2.15-R	34.28	HSS Co5	2.0	11	2.15	–	80	A1/A2 with grinding application A1/2A and AE
0103	A2.65-R	38.60	HSS Co5	2.5	16	2.65	–	150	A1/2A
0106	A3.15-R	38.60	HSS Co5	3.0	16	3.15	–	150	A1/2A
0109	A4.15-R	38.60	HSS Co5	4.0	16	4.15	–	150	A1/2A
0112	A5.15-R	44.13 (275)	HSS Co5	5.0	16	5.15	–	150	A1/2A

Threading Tool Holder

Design: Spring-supported and swivelling.

Application: To hold thread cutters FG. Due to swivelling head adjustable to any pitch angle. The spring-supported design of the head avoids interlocking of the thread cutter.





Part No.	Type	2994	A mm	B mm	C mm	D mm
0005	FG1	142.72	10	22	145	15
0010	FG2	167.45	13	29	175	20
0015	FG3	203.41	16	37	220	25
		(275)				

Threading Tools FG1

Design: Size FG1 for 55°, 60° and trapezoidal thread.

HSS Co5 | Carbide P20

Available in the quality:
F = 5 % cobalt, 12 % tungsten
P20 = carbide tipped

Application: For cutting external threads of different pitch.
Quick and easy regrinding over clamping surface or shoulder.
Due to corrugated clamping surface easy centre height adjustment.
To avoid profile deformation utilisation of the grinding gauge included in the scope of supply is recommended.



Part No.	Type	2994	Execution	Quality	Suitable for pitch	Suitable for threading tool support
0050	FG1-55	43.18	55°	HSS Co5	Up to 3 mm/rev or 8 threads/inch	FG1
0053	FG1-60	43.18	60°	HSS Co5	Up to 3 mm/rev or 8 threads/inch	FG1
0056	FG1-60	54.84	60°	P20	Up to 3 mm/rev or 8 threads/inch	FG1
0059	FG1TR-2.0	59.99	Trapezoidal	HSS Co5	2 mm	FG1
0062	FG1TR-3.0	59.99	Trapezoidal	HSS Co5	3 mm	FG1
0065	FG1TR-4.0	59.99	Trapezoidal	HSS Co5	4 mm	FG1
		(275)				

Threading Tools FG2

Design: Size FG2 for 55°, 60° and trapezoidal thread.

Available in the quality:
F = 5 % cobalt, 12 % tungsten

Application: For cutting external threads of different pitch.
Quick and easy regrinding over clamping surface or shoulder.
Due to corrugated clamping surface easy centre height adjustment.
To avoid profile deformation utilisation of the grinding gauge included in the scope of supply is recommended.



Part No.	Type	2994	Execution	Quality	Suitable for pitch	Suitable for threading tool support
0100	FG2-55	50.50	55°	HSS Co5	Up to 4 mm/rev or 6.5 threads/inch	FG2
0103	FG2-60	50.50	60°	HSS Co5	Up to 4 mm/rev or 6.5 threads/inch	FG2
0106	FG2TR-3.0	73.35	Trapezoidal	HSS Co5	3 mm	FG2
0109	FG2TR-4.0	73.35	Trapezoidal	HSS Co5	4 mm	FG2
0112	FG2TR-5.0	73.35	Trapezoidal	HSS Co5	5 mm	FG2
		(275)				

Threading Tools FG3

Design: Size FG3 for 55°, 60° and trapezoidal thread.

Available in the quality:
F = 5 % cobalt, 12 % tungsten

Application: For cutting external threads of different pitch.
Quick and easy regrinding over clamping surface or shoulder.
Due to corrugated clamping surface easy centre height adjustment.
To avoid profile deformation utilisation of the grinding gauge included in the scope of supply is recommended.



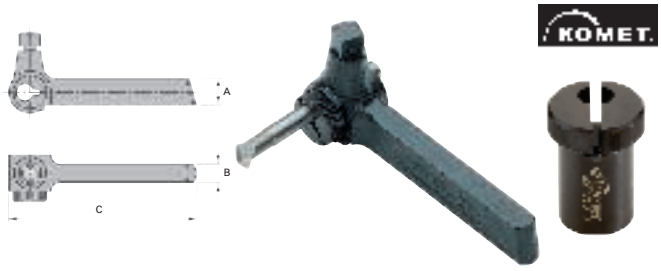
Part No.	Type	2994	Execution	Quality	Suitable for pitch	Suitable for threading tool support
0150	FG3-55	62.54	55°	HSS Co5	Up to 5 mm/rev or 5 threads/inch	FG3
0153	FG3-60	62.54	60°	HSS Co5	Up to 5 mm/rev or 5 threads/inch	FG3
0156	FG3TR-5.0	85.38	Trapezoidal	HSS Co5	5 mm	FG3
0159	FG3TR-6.0	85.38	Trapezoidal	HSS Co5	6 mm	FG3
		(275)				

 All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Drilling Tool Holder

Design: With eccentric bushes ⌀ 8 and 10 mm for quick and easy adjustment of the desired centre height.

Application: To hold reboring, parting and threading tools with a shank diameter of 8 and 10 mm.



Part No.	Type	2995	A	B	C	Cutting edge height – min./max. mm
0005	B0-8/10	144.96 (275)	22	12	150	7.5–14.5

Drilling Tool Holders

Design: Slit on both sides.

Application: To hold reboring, parting and threading tools with a shank diameter of 8 and 10 mm.



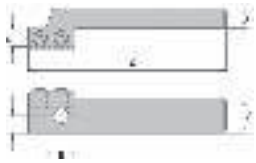


Part Mo.	Type	2995	A mm	B mm	C mm	D mm	E mm	Cutting edge height – min./max. mm
0010	B8-8	27.43	12	12	100	8	8	6.0
0015	B10-8/10	37.53 (275)	15	15	125	8	10	7.5

Drilling Tool Holders

Design: With round and square adaptor.

Application: To hold reboring, parting and threading tools with a shank diameter or square of 8 and 10 mm.





Part No.	Type	2995	A mm	B mm	C mm	□ D mm	E mm	F mm
0020	KD 8-8/8	64.05	21	12	120	8	8	10.5
0025	KD 10-10/10	64.05 (275)	21	12	120	10	10	10.5

Reboring Tools, Form F

Design: Form F normal, cutting edge profile can be reground several times.

Available in the qualities:
HSS Co10 = 10 % cobalt, 11 % tungsten
K10/P20 = carbide tipped

Application: For reboring blind and clearance hole with diameters from 2.5 mm.

HSS Co10 | Carbide K10 | Carbide P20





Part No.	Type	2995	A – for ⌀ mm	Quality	B mm	C mm	D mm	d mm	R mm	Suitable for holders
0103	B00F	21.38	2.5	HSS Co10	10	50	8	1.5	1.2	B0/B8/B10/KD8
0109	B01F	21.38	3.0	HSS Co10	20	60	8	2.0	1.6	B0/B8/B10/KD8
0112	B01F	51.69	3.0	P20	16	60	8	2.0	1.6	B0/B8/B10/KD8
0115	B01F	51.69	3.0	K10	16	60	8	2.0	1.6	B0/B8/B10/KD8
0121	B02F	22.37	5.0	HSS Co10	24	60	8	3.0	2.8	B0/B8/B10/KD8
0124	B02F	56.08	5.0	P20	19	60	8	3.0	2.8	B0/B8/B10/KD8
0127	B02F	56.08	5.0	K10	19	60	8	3.0	2.8	B0/B8/B10/KD8
0133	B03F	23.12	7.0	HSS Co10	26	65	8	4.0	3.8	B0/B8/B10/KD8
0136	B03F	51.47	7.0	P20	26	65	8	4.0	3.8	B0/B8/B10/KD8
0139	B03F	51.47 (275)	7.0	K10	26	65	8	4.0	3.8	B0/B8/B10/KD8

Reboring Tools, Form F, Long Design

Design: Form F long, cutting edge profile can be reground several times.

Available in the qualities:
HSS Co10 = 10 % cobalt, 11 % tungsten
K10/P20 = carbide tipped

Application: For reboring blind and clearance hole with diameters from 3 mm.

HSS Co10 | Carbide K10 | Carbide P20

KOMET





Part No.	Type	2995 More	A – for ø mm	Quality	B mm	C mm	D mm	d mm	R mm	Suitable for holders
0203	B01FLG	32.14	3.0	HSS Co10	20	125	8	2.0	1.6	B0/B8/B10/KD8
0206	B01FLG	57.31	3.0	P20	16	125	8	2.0	1.6	B0/B8/B10/KD8
0209	B01FLG	57.31	3.0	K10	16	125	8	2.0	1.6	B0/B8/B10/KD8
0215	B02FLG	34.13	5.0	HSS Co10	24	125	8	3.0	2.8	B0/B8/B10/KD8
0218	B02FLG	60.69	5.0	P20	19	125	8	3.0	2.8	B0/B8/B10/KD8
0221	B02FLG	60.69	5.0	K10	19	125	8	3.0	2.8	B0/B8/B10/KD8
0227	B03FLG	35.11	7.0	HSS Co10	26	125	8	4.0	3.8	B0/B8/B10/KD8
0230	B03FLG	57.31	7.0	P20	26	125	8	4.0	3.8	B0/B8/B10/KD8
0233	B03FLG	57.31	7.0	K10	26	125	8	4.0	3.8	B0/B8/B10/KD8
0239	B04FLG	37.32	9.0	HSS Co10	30	125	8	5.8	5.0	B0/B8/B10/KD8
0242	B04FLG	58.45	9.0	P20	30	125	8	5.8	5.0	B0/B8/B10/KD8
0245	B04FLG	58.45	9.0	K10	30	125	8	5.8	5.0	B0/B8/B10/KD8
0252	B05FLG	44.13	12.0	HSS Co10	50	125	8	7.2	6.5	B0/B8/B10/KD8
0251	B05FLG	67.43	12.0	P20	50	125	8	7.2	6.5	B0/B8/B10/KD8
0254	B05FLG	67.43	12.0	K10	50	125	8	7.2	6.5	B0/B8/B10/KD8
0260	B06FLG	55.88	14.0	HSS Co10	60	125	10	9.2	7.6	B0/B10/KD10
0263	B06FLG	75.29	14.0	P20	60	125	10	9.2	7.6	B0/B10/KD10
0266	B06FLG	75.29 (275)	14.0	K10	60	125	10	9.2	7.6	B0/B10/KD10

Reboring Roughing Tools, Form G

Design: Form G normal, cutting edge profile can be reground several times.

Available in the qualities:
HSS Co10 = 10 % cobalt, 11 % tungsten
K10/P20 = carbide tipped

Application: For reboring blind holes with diameters from 2.5 mm.

HSS Co10 | Carbide K10 | Carbide P20

KOMET





Part No.	Type	2995 More	A – for ø mm	Quality	B mm	C mm	D mm	d mm	R mm	Suitable for holders
0300	B00G	21.38	2.5	HSS Co10	10	50	8	1.5	1.2	B0/B8/B10/KD8
0306	B01G	21.38	3.0	HSS Co10	20	60	8	2.0	1.6	B0/B8/B10/KD8
0309	B01G	51.69	3.0	P20	16	60	8	2.0	1.6	B0/B8/B10/KD8
0312	B01G	51.69	3.0	K10	16	60	8	2.0	1.6	B0/B8/B10/KD8
0318	B02G	22.37	5.0	HSS Co10	24	60	8	3.0	2.8	B0/B8/B10/KD8
0321	B02G	56.08	5.0	P20	19	60	8	3.0	2.8	B0/B8/B10/KD8
0324	B02G	56.08	5.0	K10	19	60	8	3.0	2.8	B0/B8/B10/KD8
0330	B03G	23.12	7.0	HSS Co10	26	65	8	4.0	3.8	B0/B8/B10/KD8
0333	B03G	51.47	7.0	P20	26	65	8	4.0	3.8	B0/B8/B10/KD8
0336	B03G	51.47 (275)	7.0	K10	26	65	8	4.0	3.8	B0/B8/B10/KD8

Reboring Roughing Tool, Form G, Long Design

Design: Form G long, cutting edge profile can be reground several times.

Available in the quality:
HSS Co10 = 10 % cobalt, 11 % tungsten
P20 = carbide tipped

Application: For reboring blind holes with diameters from 3 mm.

HSS Co10 | Carbide P20

KOMET





Part No.	Type	2995	A – for ø mm	Quality	B mm	C mm	D mm	d mm	R mm	Suitable for holders
0406	B02GLG	34.13	5.0	HSS Co10	24	125	8	3.0	2.8	B0/B8/B10/KD8
0412	B03GLG	35.11	7.0	HSS Co10	26	125	8	4.0	3.8	B0/B8/B10/KD8
0415	B03GLG	57.31	7.0	P20	26	125	8	4.0	3.8	B0/B8/B10/KD8
0421	B04GLG	37.32	9.0	HSS Co10	30	125	8	5.8	5.0	B0/B8/B10/KD8
0424	B04GLG	58.45	9.0	P20	30	125	8	5.8	5.0	B0/B8/B10/KD8
0430	B05GLG	44.13	12.0	HSS Co10	50	125	8	7.2	6.5	B0/B8/B10/KD8
0433	B05GLG	67.43	12.0	P20	50	125	8	7.2	6.5	B0/B8/B10/KD8
0439	B06GLG	55.88	14.0	HSS Co10	60	125	10	9.2	7.6	B0/B10/KD10
0442	B06GLG	75.29	14.0	P20	60	125	10	9.2	7.6	B0/B10/KD10
		(275)								

Internal Recessing Tools, Form H

Design: Form H normal, cutting edge profile can be reground several times.

Available in the quality:
HSS Co10 = 10 % cobalt, 11 % tungsten
P20 = carbide tipped

Application: For recessing and relieving bore holes as well as recessing grooves for circlips with diameters from 3.0 mm, width 1.1 mm.

HSS Co10 | Carbide P20

KOMET





Part No.	Type	2996	A – for ø mm	Quality	B mm	C mm	D mm	d mm	R mm	Suitable for holders
0004	B01H	22.00	3.0	HSS Co10	20	60	8	2.0	1.6	B0/B8/B10/KD8
0010	B02H	23.61	5.0	HSS Co10	24	60	8	3.0	2.8	B0/B8/B10/KD8
0016	B03H	24.10	7.0	HSS Co10	26	65	8	4.0	3.8	B0/B8/B10/KD8
0019	B03H	60.69	7.0	P20	26	65	8	4.0	3.8	B0/B8/B10/KD8
		(275)								

Inside Recessing Tools, Form H, Long Design

Design: Form H normal, cutting edge profile can be reground several times.

Available in the quality:
HSS Co10 = 10 % cobalt, 11 % tungsten

Application: For recessing and relieving bore holes as well as recessing grooves for circlips with diameters from 3.0 mm, width 1.1 mm.

HSS Co10

KOMET





Part No.	Type	2996	A – for ø mm	Quality	B mm	C mm	D mm	d mm	R mm	Suitable for holders
0100	B01HLG	33.99	3.0	HSS Co10	20	125	8	2.0	1.6	B0/B8/B10/KD8
0103	B02HLG	35.97	5.0	HSS Co10	24	125	8	3.0	2.8	B0/B8/B10/KD8
0106	B03HLG	36.71	7.0	HSS Co10	26	125	8	4.0	3.8	B0/B8/B10/KD8
0109	B04HLG	39.81	9.0	HSS Co10	30	125	8	5.8	5.0	B0/B8/B10/KD8
0112	B05HLG	46.35	12.0	HSS Co10	50	125	8	7.2	6.5	B0/B8/B10/KD8
0115	B06HLG	58.60	14.0	HSS Co10	60	125	10	9.2	7.6	B0/B10/KD10
		(275)								

Tapping Tools 60°

Design: Normal, for 60° threads, cutting edge profile can be reground several times.

Available in the qualities:
HSS Co10 = 10 % cobalt, 11 % tungsten
K10/P20 = carbide tipped

Application: For cutting threads of different pitch with bore hole diameters from 3.0 mm.

HSS Co10 | Carbide K10 | Carbide P20

KOMET





Part No.	Type	2997 Page	A – for ø mm	Lead mm	Quality	B mm	C mm	D mm	d mm	R mm	Suitable for holders
0004	B0160	22.00	3.0	1.0	HSS Co10	20	60	8	2.0	1.6	B0/B8/B10/KD8
0007	B0160	54.84	3.0	1.0	P20	16	60	8	2.0	1.6	B0/B8/B10/KD8
0013	B0260	23.61	5.0	1.0	HSS Co10	24	60	8	3.0	2.8	B0/B8/B10/KD8
0016	B0260	60.69	5.0	1.0	P20	19	60	8	3.0	2.8	B0/B8/B10/KD8
0019	B0260	60.69	5.0	1.0	K10	19	60	8	3.0	2.8	B0/B8/B10/KD8
0025	B0360	24.10	7.0	1.5	HSS Co10	26	65	8	4.0	3.8	B0/B8/B10/KD8
0028	B0360	60.69	7.0	1.5	P20	26	65	8	4.0	3.8	B0/B8/B10/KD8
0031	B0360	60.69	7.0	1.5	K10	26	65	8	4.0	3.8	B0/B8/B10/KD8
0037	B0460	27.44	9.0	1.5	HSS Co10	30	75	8	5.8	5.0	B0/B8/B10/KD8
0040	B0460	66.31	9.0	1.5	P20	30	75	8	5.8	5.0	B0/B8/B10/KD8
0043	B0460	66.31	9.0	1.5	K10	30	75	8	5.8	5.0	B0/B8/B10/KD8
0049	B0560	33.87	12.0	2.0	HSS Co10	50	80	8	7.2	6.5	B0/B8/B10/KD8
0050	B0560	68.55	12.0	2.0	P20	50	80	8	7.2	6.5	B0/B8/B10/KD8
0056	B0660	45.36	14.0	3.0	HSS Co10	60	95	10	9.2	7.6	B0/B10/KD10
0059	B0660	78.65 (275)	14.0	3.0	P20	60	95	10	9.2	7.6	B0/B10/KD10

Tapping Tool 60°, Long Design

Design: Long, for 60° threads, cutting edge profile can be reground several times.

Available in the quality:
HSS Co10 = 10 % cobalt, 11 % tungsten

Application: For cutting threads of different pitch with bore hole diameters from 7.0 mm.

HSS Co10

KOMET





Part No.	Type	2997 Page	A – for ø mm	Lead mm	Quality	B mm	C mm	D mm	d mm	R mm	Suitable for holders
0103	B0360LG	36.71	7.0	1.5	HSS Co10	26	125	8	4.0	3.8	B0/B8/B10/KD8
0109	B0460LG	39.81	9.0	1.5	HSS Co10	30	125	8	5.8	5.0	B0/B8/B10/KD8
0115	B0560LG	46.35	12.0	2.0	HSS Co10	50	125	8	7.2	6.5	B0/B8/B10/KD8
0118	B0660LG	58.60 (275)	14.0	3.0	HSS Co10	60	125	10	9.2	7.6	B0/B10/KD10

Tapping Tools 55°

Design: Normal, for 55° threads, cutting edge profile can be reground several times.

Available in the qualities:
HSS Co10 = 10 % cobalt, 11 % tungsten
P20 = carbide tipped

Application: For cutting threads of different pitch with bore hole diameters from 7.0 mm.

HSS Co10 | Carbide P20

KOMET





Part No.	Type	2997 Page	A – for ⌀ mm	Pitch threads – per inch	Quality	B mm	C mm	D mm	d mm	R mm	Suitable for holders
0203	B0355	24.10	7.0	16–50	HSS Co10	26	65	8	4.0	3.8	B0/B8/B10/KD8
0206	B0355	60.69	7.0	16–50	P20	26	65	8	4.0	3.8	B0/B8/B10/KD8
0212	B0455	27.44	9.0	16–50	HSS Co10	30	75	8	5.8	5.0	B0/B8/B10/KD8
0215	B0455	66.31	9.0	16–50	P20	30	75	8	5.8	5.0	B0/B8/B10/KD8
0221	B0555	33.87	12.0	12–40	HSS Co10	50	80	8	7.2	6.5	B0/B8/B10/KD8
0224	B0555	68.55	12.0	12–40	P20	50	80	8	7.2	6.5	B0/B8/B10/KD8
0230	B0655	45.36 (275)	14.0	8–30	HSS Co10	60	95	10	9.2	7.6	B0/B10/KD10

Drilling Tool Holders

Design: With two-sided, prism-shaped clamping surfaces.

Application: To hold drilling bars.

KOMET





Part No.	Type	2998 Page	A mm	B mm	C mm	D mm	E mm	Suitable drilling bar
0005	B1	27.08	20	19	110	10.0	10	B1
0010	B2	35.52	27	23	150	14.0	13	B1A, B2
0015	B3	57.31 (275)	40	30	180	20.0	20	B2A, B2B, B3, B3A

Drilling Bars

Design: With thread.

Application: To hold drilling heads provided with screw thread.

KOMET





Part No.	Type	2998 Page	E mm	F mm	G	Suitable drilling heads
0100	B1-STG	12.14	10	180	M 6	B1
0105	B1A-STG	15.50	13	220	M 8	B1A
0110	B2-STG	15.50	13	250	M10	B2
0115	B2A-STG	21.14	20	275	M12	B2A
0120	B2B-STG	21.14	20	300	M14	B2B
0125	B3-STG	21.14	20	325	M15	B3
0130	B3A-STG	21.14 (275)	20	350	M15	B3A

Reboring Tool, Form F, provided with screw thread

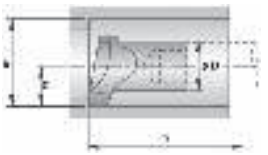
Design: Form F, cutting edge profile can be reground several times.

Available in the qualities:
HSS Co5 = 5 % cobalt, 12 % tungsten
P20 = carbide tipped

Application: For reboring blind and clearance holes with diameters from 15.5 mm.

HSS Co5 | Carbide P20

KOMET





Part No.	Type	2998 KOMET	A – for ø mm	Quality	B mm	C mm	D mm	Suitable for dilling bars
0200	B1 F	24.29	15.5	HSS Co5	80	9.0	11.5	B1
0203	B1 F	42.37	15.5	P20	80	9.0	11.5	B1
0206	B1A F	30.30	17.5	HSS Co5	85	10.3	12.5	B1A
0209	B1A F	48.88	17.5	P20	85	10.3	12.5	B1A
0212	B2 F	35.00	20.5	HSS Co5	115	12.0	16.0	B2
0215	B2 F	51.13	20.5	P20	115	12.0	16.0	B2
0218	B2A F	41.23	23.5	HSS Co5	120	13.5	18.0	B2A
0221	B2A F	58.45	23.5	P20	120	13.5	18.0	B2A
0224	B2B F	50.27	27.5	HSS Co5	140	15.5	20.2	B2B
0227	B2B F	64.05	27.5	P20	140	15.5	20.2	B2B
0230	B3 F	57.12	29.5	HSS Co5	165	16.8	21.5	B3
0233	B3 F	75.29	29.5	P20	165	16.8	21.5	B3
0236	B3A F	64.94	32.5	HSS Co5	195	18.5	22.5	B3A
0239	B3B F	72.15 (275)	37.0	HSS Co5	200	21.5	25.0	B3B

Reboring Roughing Tool, Form G, provided with screw thread

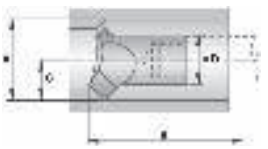
Design: Form G, cutting edge profile can be reground several times.

Available in the qualities:
HSS Co5 = 5 % cobalt, 12 % tungsten
P20 = carbide tipped

Application: For reboring clearance holes with diameters from 16.0 mm.

HSS Co5 | Carbide P20

KOMET





Part No.	Type	2998 KOMET	A – for ø mm	Quality	B mm	C mm	D mm	Suitable for dilling bars
0300	B1 G	24.29	16.0	HSS Co5	80	9.0	11.5	B1
0303	B1 G	42.37	16.0	P20	80	9.0	11.5	B1
0306	B1A G	30.30	18.0	HSS Co5	85	10.3	12.5	B1A
0309	B1A G	48.88	18.0	P20	85	10.3	12.5	B1A
0312	B2 G	35.00	20.5	HSS Co5	115	12.0	15.0	B2
0315	B2 G	51.13	20.5	P20	115	12.0	15.0	B2
0318	B2A G	41.23	24.0	HSS Co5	120	13.5	18.0	B2A
0321	B2A G	58.45	24.0	P20	120	13.5	18.0	B2A
0324	B2B G	50.27	28.0	HSS Co5	140	15.5	20.2	B2B
0327	B2B G	64.05	28.0	P20	140	15.5	20.2	B2B
0330	B3 G	57.12	30.0	HSS Co5	165	16.8	21.5	B3
0333	B3 G	75.29	30.0	P20	165	16.8	21.5	B3
0336	B3B G	72.15 (275)	38.0	HSS Co5	200	21.5	25.0	B3B

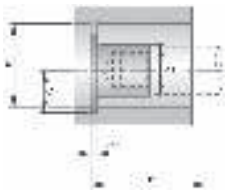
Recessing Tools, Form H, provided with screw thread

Design: Form H, cutting edge profile can be reground several times.

Available in the qualities:
HSS Co5 = 5 % cobalt, 12 % tungsten
P20 = carbide tipped

Application: For recessing and relieving bore holes as well as recessing grooves for circlips with diameters from 16.0 mm, width from 1.1 mm.

HSS Co5 | Carbide P20





Part No.	Type	2998	A – for ø mm	M – for groove width	Quality	B mm	C mm	D mm	Suitable for dilling bars
0400	B1 H	25,61	16	1.1	HSS Co5	80	9.0	11.5	B1
0403	B1 H	58,45	16	1.1	P20	80	9.0	11.5	B1
0406	B1A H	31,62	18	1.3	HSS Co5	85	10.3	12.5	B1A
0409	B2 H	36,56	21	1.3	HSS Co5	115	12.0	15.0	B2
0412	B2 H	67,43	20	1.3	P20	115	11.3	15.0	B2
0415	B2A H	43,41	24	1.6	HSS Co5	120	13.5	17.0	B2A
0418	B2A H	83,15	23	1.6	P20	120	13.0	17.0	B2A
0421	B2B H	52,68	28	1.85	HSS Co5	140	15.5	20.2	B2B
0424	B2B H	89,91	27	1.85	P20	140	15.0	20.2	B2B
0427	B3 H	59,99	30	2.15	HSS Co5	165	16.8	21.5	B3
0430	B3 H	95,51	29	2.15	P20	165	16.3	21.5	B3
0433	B3A H	68,54	33	2.65	HSS Co5	195	18.5	22.5	B3A
0436	B3B H	79,37	38	2.65	HSS Co5	200	21.5	25.0	B3B
0439	B4 H	119,04	43	3.15	HSS Co5	225	24.0	30.0	B4

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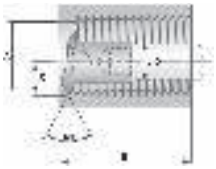
Tapping Tools 60°, provided with screw thread

Design: For 60° threads, cutting edge profile can be reground several times.

Available in the qualities:
HSS Co5 = 5 % cobalt, 12 % tungsten
P20 = carbide tipped

Application: For cutting threads of different pitch with bore hole diameters from 16.0 mm.

HSS Co5 | Carbide P20





Part No.	Type	2998	A – for ø mm	Lead mm	Quality	B mm	C mm	D mm	Suitable for dilling bars
0500	B1 60	25.61	16	4	HSS Co5	80	9.0	11.5	B1
0503	B1 60	44.50	16	4	P20	80	9.0	11.5	B1
0506	B1A 60	31.62	18	5	HSS Co5	85	10.3	12.5	B1A
0509	B2 60	36.56	21	6	HSS Co5	115	12.0	15.0	B2
0512	B2 60	53.73	21	6	P20	115	12.0	15.0	B2
0515	B2A 60	43.41	24	7	HSS Co5	120	13.5	17.0	B2A
0518	B2A 60	61.81	24	7	P20	120	13.5	17.0	B2A
0521	B2B 60	52.68	28	8	HSS Co5	140	15.5	20.2	B2B
0524	B2B 60	67.43	28	8	P20	140	15.5	20.2	B2B
0527	B3 60	59.99	30	9	HSS Co5	165	16.8	21.5	B3
0530	B3B 60	79.37	38	12	HSS Co5	200	21.5	25.0	B3B

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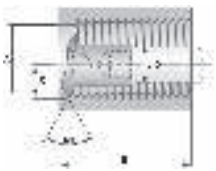
Tapping Tools 55°, provided with screw thread

Design: For 55° threads, cutting edge profile can be reground several times.

Available in the quality:
HSS Co5 = 5 % cobalt, 12 % tungsten

Application: For cutting threads of different pitch with bore hole diameters from 16.0 mm.

HSS Co5





Part No.	Type	2998	A – for ø mm	Pitch per inch	Quality	B mm	C mm	D mm	Suitable for dilling bars
0600	B1 55	25.61	16	6.5	HSS Co5	80	9.0	11.5	B1
0603	B1A 55	31.62	18	5	HSS Co5	85	10.3	12.5	B1A
0606	B2 55	36.33	21	4	HSS Co5	115	12.0	15.0	B2
0609	B2A 55	43.41	24	3.5	HSS Co5	120	13.5	17.0	B2A
0612	B2B 55	52.68	28	3	HSS Co5	140	15.5	20.2	B2B
0615	B3 55	59.99	30	2.5	HSS Co5	165	16.8	21.5	B3

(275)

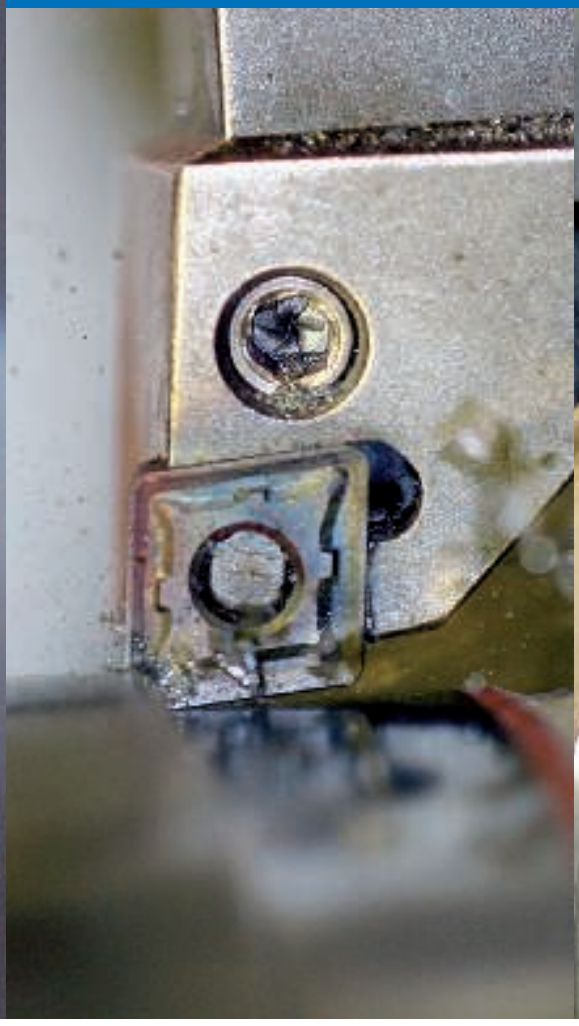


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				P Steel	M VA/INOX	K GG	N Non-ferrous metal	
				Recommended cutting values				
Facing Cutters 45° with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 0100 – 2966 0125	⌀ 40–125 mm	SEHT 1204…	2/130	v_c 120–200	v_c 120–180	v_c 120–180	v_c 200–350	●
		SEHW 1204…		f_z 0.2–0.4	f_z 0.2–0.4	f_z 0.2–0.5	f_z 0.2–0.4	
Facing Cutters 45° with Cartridge								
Part No.	Dimension	Indexable insert	Page					
2966 0160 – 2966 0180	⌀ 63–160 mm	SEKN 1203…	2/131	v_c 120–200	v_c 120–180	v_c 120–180	v_c 200–350	
		SEKR 1203…		f_z 0.2–0.4	f_z 0.2–0.4	f_z 0.2–0.5	f_z 0.2–0.4	
End Mills 75°, Parallel, with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 0193 – 2966 0195	⌀ 25–40 mm	APKT 1003…	2/132	v_c 120–180	v_c 160–180	v_c 100–120	v_c 110–350	●
		APHX 1003…	2/132	f_z 0.12–0.2	f_z 0.1–0.15	f_z 0.2–0.25	f_z 0.1–0.2	
Facing Cutters 75° with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 0196 – 2966 0198	⌀ 50–80 mm	APKT 1003…	2/133	v_c 120–180	v_c 160–180	v_c 100–120	v_c 110–350	●
		APHX1003…		f_z 0.12–0.2	f_z 0.1–0.15	f_z 0.2–0.25	f_z 0.1–0.2	
Mill Ends 90° with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 0200 – 2966 0305	⌀ 9.7–32 mm	APKT 1003…	2/134	v_c 100–200	v_c 100–140	v_c 100–130	v_c 180–400	●
		APHX 1003…		f_z 0.08–0.15	f_z 0.08–0.15	f_z 0.08–0.15	f_z 0.08–0.15	
Right-angle Milling Heads 90° with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 0400 – 2966 0420	⌀ 40–100 mm	APKT 1003…	2/136	v_c 100–200	v_c 100–140	v_c 100–130	v_c 180–400	●
		APHX 1003…		f_z 0.08–0.15	f_z 0.08–0.15	f_z 0.08–0.15	f_z 0.08–0.15	
Right-angle Milling Heads 90° (Screw-in Cutters) with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 0500 – 2966 0535	⌀ 15.7–32 mm	APKT 1003…	2/137	v_c 100–200	v_c 100–140	v_c 100–130	v_c 180–400	●
		APHX 1003…		f_z 0.08–0.15	f_z 0.08–0.15	f_z 0.08–0.15	f_z 0.08–0.15	
Facing Cutters 75° with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 0550 – 2966 0570	⌀ 50–125 mm	APKT 1604…	2/139	v_c 120–180	v_c 160–180	v_c 100–120	v_c 110–350	●
		APHX 1604…		f_z 0.12–0.2	f_z 0.1–0.15	f_z 0.2–0.25	f_z 0.1–0.2	
End Mills 90° with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 0575 – 2966 0595	⌀ 25–40 mm	APKT 1604…	2/140	v_c 110–170	v_c 110–140	v_c 100–120	v_c 140–400	●
		APHX1604…		f_z 0.12–0.15	f_z 0.1–0.15	f_z 0.1–0.15	f_z 0.1–0.15	
Right-angle Milling Heads 90° with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 0700 – 2966 0720	⌀ 40–100 mm	APKT 1604…	2/141	v_c 120–200	v_c 120–180	v_c 120–180	v_c 200–350	●
		APHX 1604…		f_z 0.15–0.3	f_z 0.15–0.3	f_z 0.15–0.4	f_z 0.15–0.4	
Roughing End Mills Parallel and SK with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 0900 – 2966 0915	⌀ 20–40 mm cyl.	APKT 1003…	2/138	v_c 100–140	v_c 80–120	v_c 100–140	v_c 180–350	●
2966 0920 – 2966 0925	⌀ 32–40 mm SK	APHX 1003…	2/138	f_z 0.08–0.12	f_z 0.08–0.12	f_z 0.08–0.12	f_z 0.08–0.12	●

● = with Internal Cooling

				P Steel	M VA/INOX	K GG	N Non-ferrous metal	
				Recommended cutting values				
Shell End Mills with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 1100 – 2966 1110	⌀ 25–40 mm cyl.	APKT 1604…	2/143	v_c 100–140	v_c 100–140	v_c 100–140	v_c 100–140	●
2966 1115 – 2966 1125	⌀ 50–63 mm	APHX 1604…	2/143	f_z 0.15–0.25	f_z 0.15–0.25	f_z 0.15–0.25	f_z 0.15–0.25	●
2966 1130	⌀ 63 mm SK	APKT 1604…	2/143					●
		APHX 1604…	2/143					
Profiling Cutters with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 1200 – 2966 1235	⌀ 15–25 mm cyl.	RDHX 07/10/12T…	2/144	v_c 100–200	v_c 80–180	v_c 100–200	v_c 180–350	●
		RDLT 10/12T…		f_z 0.08–0.15	f_z 0.08–0.15	f_z 0.08–0.15	f_z 0.08–0.15	
2966 1500 – 2966 1525	⌀ 42–125 mm	RDHX 10/12T/16…	2/145	v_c 100–200	v_c 80–180	v_c 100–200	v_c 180–350	●
		RDLT 10/12T/16…		f_z 0.08–0.2	f_z 0.08–0.2	f_z 0.08–0.2	f_z 0.08–0.2	
Profiling Cutters with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 1600 – 2966 1620	⌀ 15–35 mm	RDHX 07/10/12T…	2/146	v_c 100–200	v_c 80–180	v_c 100–200	v_c 180–350	●
		RDLT 10/12T…		f_z 0.08–0.15	f_z 0.08–0.15	f_z 0.08–0.15	f_z 0.08–0.2	
Extension for Screw-in Cutters with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 1715 – 2966 1755	⌀ 10–32 mm kon.	–	2/147					●
2966 1810 – 2966 1825	⌀ 16–20 mm cyl.	–	2/147					●
Steel Extension, Modular, with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 1830 – 2966 1862	M 8–M 16	–	2/147					●
Retainer for Steel Extension with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 1870 – 2966 1875	SK 40/SK 50	–	2/147					●
2966 1880 – 2966 1885	BT 40/BT 50	–	2/147					●
Disk Milling Cutters								
Part No.	Dimension	Indexable insert	Page					
2966 1900 – 2966 2045	⌀ 63–160 mm	SNHX 11/12…	2/148	v_c 120–200	v_c 120–180	v_c 80–140	v_c 180–400	
Disk Milling Cutters with Collar and Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 3000 – 2966 3065	⌀ 63–160 mm	SNHX 11/12…	2/150	f_z 0.1–0.3	f_z 0.1–0.25	f_z 0.1–0.3	f_z 0.1–0.3	●
T-slot Cutters with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 4000 – 2966 4010	⌀ 25–40 mm	SPLT 0603…	2/152	v_c120–180	v_c 100–140	v_c 100–140	v_c180–350	●
		SDHT 09T…		f_z 0.1–0.25	f_z 0.1–0.25	f_z 0.1–0.25	f_z 0.1–0.28	

● = with Internal Cooling

				P Steel	M VA/INOX	K GG	N Non-ferrous metal	
				Recommended cutting values				
Chamfering and Centring Cutters 45° with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 5000	⌀ 0–20 mm	TCMX 16T3...	2/153	v_c 120–180	v_c 100–160	v_c 100–180	v_c 180–350	●
		TCGX 16T3...		f_z 0.05–0.2	f_z 0.05–0.25	f_z 0.05–0.25	f_z 0.05–0.25	



Chamfering Countersinks 15°, 30°, 45°, 60°, 75° with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 6000 – 2966 6015	15°	TCMT 1102...	2/154	v_c 120–180	v_c 100–160	v_c 100–180	v_c 180–350	●
2966 6100 – 2966 6115	30°	TCMT 16T3...	2/154	f_z 0.1–0.25	f_z 0.1–0.25	f_z 0.1–0.25	f_z 0.1–0.25	●
2966 6200 – 2966 6225	45°		2/154					●
2966 6300 – 2966 6325	60°		2/154					●
2966 6400 – 2966 6425	75°		2/154					●





Cutters 45° with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 7000 – 2966 7040	⌀ 2–28 mm	CPMT 05T...	2/156	v_c 120–180	v_c 100–160	v_c 100–180	v_c 180–350	●
		SPLT 0603...		f_z 0.1–0.25	f_z 0.1–0.25	f_z 0.1–0.25	f_z 0.1–0.25	
		SCMT 09T3...						



Chamfering Cutters 15°, 30°, 45°, 60°, 75° with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 8000 – 2966 8020	⌀ 35 mm	APKT 1604...	2/157	v_c 120–200	v_c 120–180	v_c 120–180	v_c 200–350	●
		APHX 1604...		f_z 0.15–0.3	f_z 0.15–0.3	f_z 0.15–0.4	f_z 0.15–0.4	



Chamfering Cutters with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 9000	⌀ 25 mm	TCMT 16T3...	2/158	v_c 120–180	v_c 100–160	v_c 100–180	v_c 180–350	●
2966 9200	⌀ 25 mm	SCMT 1204...	2/159	f_z 0.1–0.25	f_z 0.1–0.25	f_z 0.1–0.25	f_z 0.1–0.25	●





Chamfering Countersinks with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 9400 – 2966 9515	⌀ 10–33 mm	CCMT 0602...	2/160	v_c 120–180	v_c 100–160	v_c 100–180	v_c 180–350	●
		CCMT 09T3...		f_z 0.08–0.25	f_z 0.08–0.25	f_z 0.08–0.25	f_z 0.08–0.25	



Cutters for Core Drilling with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 9700 – 2966 9766	⌀ 9,8–31.8 mm	CCMT 0602...	2/161	v_c 120–180	v_c 100–160	v_c 100–180	v_c 180–350	●
		CCMT 09T3...		f_z 0.08–0.25	f_z 0.08–0.25	f_z 0.08–0.25	f_z 0.08–0.25	



Reverse Milling Countersinks 180° with Internal Cooling								
Part No.	Dimension	Indexable insert	Page					
2966 9770 – 2966 9790	⌀ 15–48 mm	CPMT 05T...	2/162	v_c 100–120	v_c 90–100	v_c 80–100	v_c 100–400	●
		CCMT 0602...		f_z 0.1–0.15	f_z 0.1–0.15	f_z 0.1–0.15	f_z 0.1–0.15	
		CCMT 09T3...						



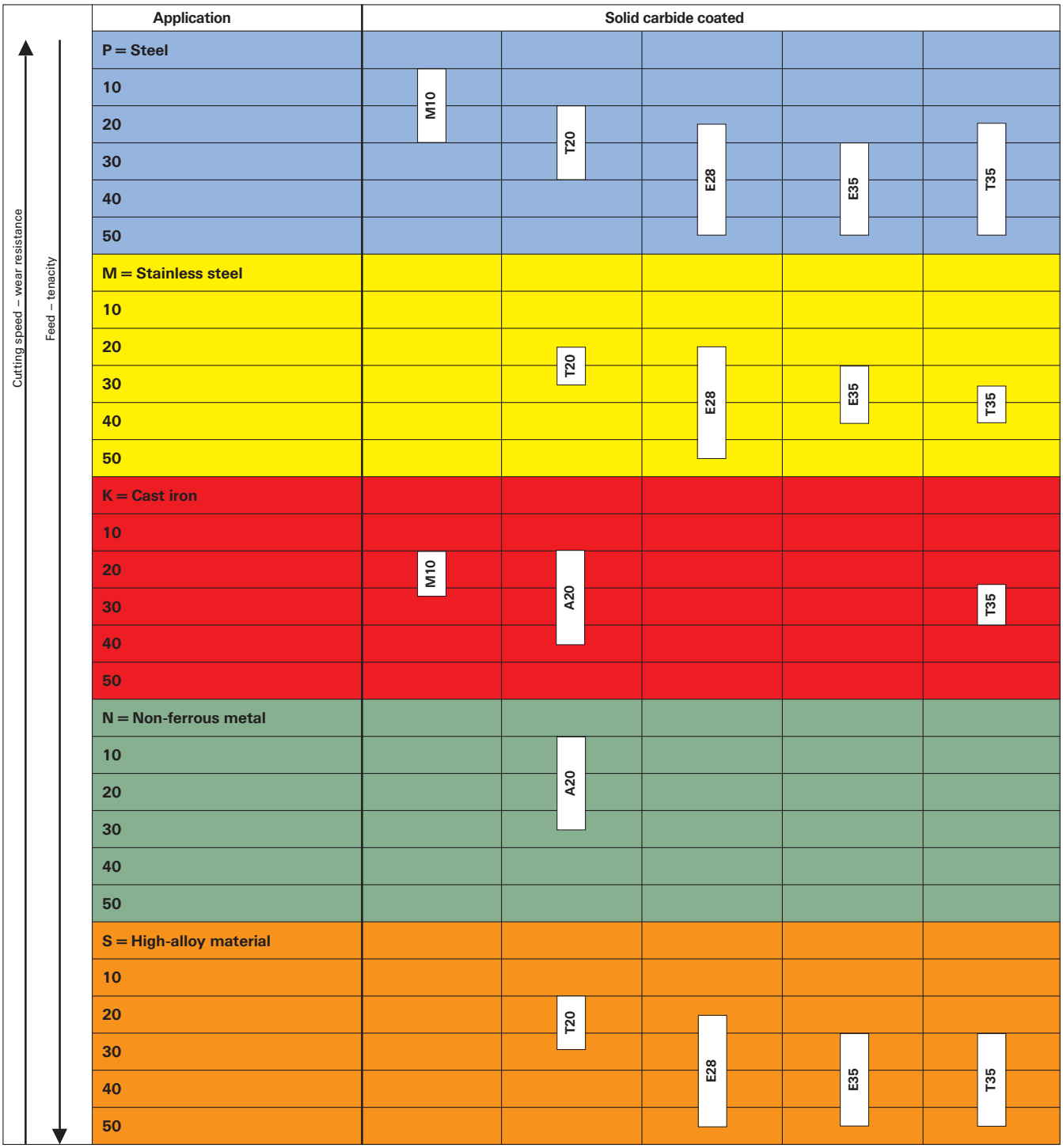
● = with Internal Cooling

	Part No.	Description	Price £/unit PU/ 10 units	P Steel		M VA/INOX		K GG		Non-ferrous metals	
	2966 0606	APHX 1003 FR Alu A20	8.64					●	●	●	●
	2966 0621	APHX 100308 Alu A20	10.14					●	●	●	●
	2966 0806	APHX 1604 FR Alu A20	9.76					●	●	●	●
	2966 0818	APHX 160412 FR Alu A20	11.64					●	●	●	●
	2966 0600	APKT 1003 PDSR T35	5.25	●	●	●	●	●			
	2966 0603	APKT 1003 PDSR E35	5.25	●	●	●	●				
	2966 0609	APKT 100308 PDSR E28	9.01	●	●	●	●				
	2966 0612	APKT 100316 PDSR E28	9.01	●	●	●	●				
	2966 0615	APKT 100320 PDSR E28	9.01	●	●	●	●				
	2966 0800	APKT 1604 PDER T35	6.61	●	●	●	●	●			
	2966 0803	APKT 1604 PDER E35	6.61	●	●	●	●				
	2966 0809	APKT 160412 PDER E28	10.14	●	●	●	●				
	2966 0812	APKT 160416 PDER E28	10.14	●	●	●	●				
	2966 0815	APKT 160424 PDER E28	10.14	●	●	●	●				
	2966 9609	CCGT 060204 Alu A20	6.49					●	●	●	●
	2966 9630	CCGT 09T304 Alu A20	7.23					●	●	●	●
	2966 9600	CCMT 060204 M M10	3.12	●	●			●			
	2966 9603	CCMT 060204 M T20	3.12	●	●			●			
	2966 9606	CCMT 060204 M T35	3.12	●	●	●	●	●			
	2966 9612	CCMT 060208 M M10	3.12	●	●			●			
	2966 9615	CCMT 060208 M T20	3.12	●	●			●			
	2966 9618	CCMT 060208 M T35	3.12	●	●	●	●	●			
	2966 9621	CCMT 09T304 M M10	3.65	●	●			●			
	2966 9624	CCMT 09T304 M T20	3.65	●	●			●			
	2966 9627	CCMT 09T304 M T35	3.65	●	●	●	●	●			
	2966 7100	CPMT 05T102 T35	4.07	●	●	●	●	●			
	2966 7103	CPMT 05T104 T35	4.07	●	●	●	●	●			
	2966 1300	RDHX 0702 MOT A20	4.88				●	●	●	●	
	2966 1303	RDHX 0702 MOT T35	4.88	●	●	●	●	●			
	2966 1306	RDHX 0702 MOT E35	4.88	●	●	●	●				
	2966 1309	RDHX 1003 MOT A20	5.25				●	●	●	●	
	2966 1312	RDHX 1003 MOT T35	5.25	●	●	●	●	●			
	2966 1315	RDHX 1003 MOT E35	5.25	●	●	●	●				
	2966 1318	RDHX 12T3 MOT A20	5.78				●	●	●	●	
	2966 1321	RDHX 12T3 MOT T35	5.78	●	●	●	●	●			

	Part No.	Description	Price £/unit PU/ 10 units	P Steel		M VA/INOX		K GG		Non-ferrous metals	
	2966 1324	RDHX 12T3 MOT E35	5.78	●	●	●	●				
	2966 1327	RDHX 1604 MOT A20	6.95				●	●	●	●	
	2966 1330	RDHX 1604 MOT T35	6.95	●	●	●	●	●			
	2966 1333	RDHX 1604 MOT E35	6.95	●	●	●	●				
	2966 1400	RDLT 1003 MOS A20	5.25					●	●	●	●
	2966 1403	RDLT 1003 MOS T35	5.25	●	●	●	●	●			
	2966 1406	RDLT 1003 MOS E35	5.25	●	●	●	●				
	2966 1409	RDLT 12T 3 MOS A20	5.78					●	●	●	●
	2966 1412	RDLT 12T 3 MOS T35	5.78	●	●	●	●	●			
	2966 1415	RDLT 12T 3 MOS E35	5.78	●	●	●	●				
	2966 1418	RDLT 1604 MOS A20	6.95					●	●	●	●
	2966 1421	RDLT 1604 MOS T35	6.95	●	●	●	●	●			
	2966 1424	RDLT 1604 MOS E35	6.95	●	●	●	●				
	2966 7139	SCGT 09T304 Alu A20	6.63					●	●	●	●
	2966 9318	SCGT 120408 Alu A20	7.29					●	●	●	●
	2966 7130	SCMT 09T304 M M10	3.52	●	●			●			
	2966 7133	SCMT 09T304 M T20	3.52	●	●			●			
	2966 7136	SCMT 09T304 M T35	3.52	●	●	●	●	●			
	2966 7142	SCMT 09T308 M M10	3.52	●	●			●			
	2966 7145	SCMT 09T308 M T20	3.52	●	●			●			
	2966 7148	SCMT 09T308 M T35	3.52	●	●	●	●	●			
	2966 9300	SCMT 120404 M M10	4.32	●	●			●			
	2966 9303	SCMT 120404 M T20	4.32	●	●			●			
	2966 9306	SCMT 120404 M T35	4.32	●	●	●	●	●			
	2966 9309	SCMT 120408 M M10	4.32	●	●			●			
	2966 9312	SCMT 120408 M T20	4.32	●	●			●			
	2966 9315	SCMT 120408 M T35	4.32	●	●	●	●	●			
	2966 4110	SDHT 09T3AE T35	4.82	●	●	●	●	●			
	2966 4115	SDHT 09T3AE E35	4.82	●	●	●	●				
	2966 0140	SEHT 1204AF T35	5.78	●	●	●	●	●			
	2966 0143	SEHT 1204AF E35	5.78	●	●	●	●				
	2966 0146	SEHT 1204AF Alu A20	9.76					●	●	●	●
	2966 0149	SEHW 1204AF T35	5.78	●	●	●	●	●			
	2966 0152	SEHW 1204AF E35	5.78	●	●	●	●				
	2966 0183	SEKN 1203AFSN E35	5.78	●	●	●	●				

	Part No.	Description	Price £/unit PU/ 10 units	P Steel		M VA/INOX		K GG		Non-ferrous metals	
	2966 0186	SEKN 1203AFSN T35	5.78	●	●	●	●	●			
	2966 0189	SEKR 1203AFEN E35	5.78	●	●	●	●				
	2966 0192	SEKR 1203AFEN T35	5.78	●	●	●	●	●			
	2966 3200	SNHX 1102T T35	7.51	●	●	●	●	●			
	2966 3203	SNHX 1102T E35	7.51	●	●	●	●				
	2966 3206	SNHX 1102T-90 R T35	8.82	●	●	●	●	●			
	2966 3209	SNHX 1102T-90 R E35	8.82	●	●	●	●				
	2966 3212	SNHX 1102T-90 L T35	8.82	●	●	●	●	●			
	2966 3215	SNHX 1102T-90 L E35	8.82	●	●	●	●				
	2966 3218	SNHX 1103T T35	8.13	●	●	●	●	●			
	2966 3221	SNHX 1103T E35	8.13	●	●	●	●				
	2966 3224	SNHX 1103T-90 R T35	10.95	●	●	●	●	●			
	2966 3227	SNHX 1103T-90 R E35	10.95	●	●	●	●				
	2966 3230	SNHX 1103T-90 L T35	10.95	●	●	●	●	●			
	2966 3233	SNHX 1103T-90 L E35	10.95	●	●	●	●				
	2966 3236	SNHX 1203T T35	8.45	●	●	●	●	●			
	2966 3239	SNHX 1203T E35	8.45	●	●	●	●				
	2966 3242	SNHX 1203T-90 R T35	11.58	●	●	●	●	●			
	2966 3245	SNHX 1203T-90 R E35	11.58	●	●	●	●				
	2966 3248	SNHX 1203T-90 L T35	11.58	●	●	●	●	●			
	2966 3251	SNHX 1203T-90 L E35	11.58	●	●	●	●				
	2966 3254	SNHX 1204T T35	8.76	●	●	●	●	●			
	2966 3257	SNHX 1204T E35	8.76	●	●	●	●				
	2966 3260	SNHX 1204T-90 R T35	12.20	●	●	●	●	●			
	2966 3263	SNHX 1204T-90 R E35	12.20	●	●	●	●				
	2966 3266	SNHX 1204T-90 L T35	12.20	●	●	●	●	●			
	2966 3269	SNHX 1204T-90 L E35	12.20	●	●	●	●				
	2966 3290	SNHX 12045T T35	8.76	●	●	●	●	●			
	2966 3293	SNHX 12045T E35	8.76	●	●	●	●				
	2966 3296	SNHX 12045T-90 R T35	12.83	●	●	●	●	●			
	2966 3299	SNHX 12045T-90 R E35	12.83	●	●	●	●				
	2966 3302	SNHX 12045T-90 L T35	12.83	●	●	●	●	●			
	2966 3305	SNHX 12045T-90 L E35	12.83	●	●	●	●				
	2966 3272	SNHX 1205T T35	8.76	●	●	●	●	●			
	2966 3275	SNHX 1205T E35	8.76	●	●	●	●				

	Part No.	Description	Price £/unit PU/ 10 units	P Steel		M VA/INOX		K GG		Non-ferrous metals	
	2966 3278	SNHX 1205T-90 R T35	13.45	●	●	●	●	●			
	2966 3281	SNHX 1205T-90 R E35	13.45	●	●	●	●				
	2966 3284	SNHX 1205T-90 L T35	13.45	●	●	●	●	●			
	2966 3287	SNHX 1205T-90 L E35	13.45	●	●	●	●				
	2966 3308	SNHX 1207T T35	9.38	●	●	●	●	●			
	2966 3311	SNHX 1207T E35	9.38	●	●	●	●				
	2966 3314	SNHX 1207T-90 R T35	14.08	●	●	●	●	●			
	2966 3317	SNHX 1207T-90 R E35	14.08	●	●	●	●				
	2966 3320	SNHX 1207T-90 L T35	14.08	●	●	●	●	●			
	2966 3323	SNHX 1207T-90 L E35	14.08	●	●	●	●				
	2966 4100	SPLT 060304 T35	4.38	●	●	●	●	●			
	2966 4105	SPLT 060304 E35	4.38	●	●	●	●				
	2966 7112	SPLT 0603AD T35	4.38	●	●	●	●	●			
	2966 7115	SPLT 0603AD E35	4.38	●	●	●	●				
	2966 6509	TCGT 110204 Alu A20	6.57					●	●	●	●
	2966 6530	TCGT 16T304 Alu A20	7.23					●	●	●	●
	2966 5105	TCGX 16T304 Alu A20	10.95					●	●	●	●
	2966 6500	TCMT 110204 M M10	3.06	●	●			●			
	2966 6503	TCMT 110204 M T20	3.06	●	●			●			
	2966 6506	TCMT 110204 M T35	3.06	●	●	●	●	●			
	2966 6512	TCMT 110208 M M10	3.06	●	●			●			
	2966 6515	TCMT 110208 M T20	3.06	●	●			●			
	2966 6518	TCMT 110208 M T35	3.06	●	●	●	●	●			
	2966 6521	TCMT 16T304 M M10	3.71	●	●			●			
	2966 6524	TCMT 16T304 M T20	3.71	●	●			●			
	2966 6527	TCMT 16T304 M T35	3.71	●	●	●	●	●			
	2966 6533	TCMT 16T308 M M10	3.71	●	●			●			
	2966 6536	TCMT 16T308 M T20	3.71	●	●			●			
	2966 6539	TCMT 16T308 M T35	3.71	●	●	●	●	●			
	2966 5100	TCMX 16T308 ZR E35	8.45	●	●	●	●				
	2967 0100	WCMT 030208 M T35	5.63	●	●	●	●	●			
	2967 0103	WCMT 040208 M T35	5.63	●	●	●	●	●			
	2967 0106	WCMT 050308 M T35	5.63	●	●	●	●	●			
	2967 0109	WCMT 06T308 M T35	6.25	●	●	●	●	●			
	2967 0112	WCMT 080408 M T35	6.25	●	●	●	●	●			
	2967 0115	WCMT 080412 M T35	6.25	●	●	●	●	●			



Solid carbide, coated

T20	TiN-Al_2O_3-TiCN	Wear resistant material for continuous cuts. For steel grey cast iron at very high cutting speed (multi-layer coating).
E35	TiALN (PVD)	Very tough material for dry and wet machining, best suitable in difficult and unstable conditions, as well as for stainless and tool steel (P30/P40).
T35	TiN-Al_2O_3-TiCN	Tough material, also suitable for wet cutting at medium cutting speed, best suitable in difficult and unstable conditions, as well as for stainless and tool steel (P30/P40 – M20/M30) – multi-layer coating.
A20	TiALN	Special material for aluminium, non-ferrous metals and plastics (K10/K20).
M10	TiN-AL_2O_3-TiCN	Extremely wear resistant material for continuous cuts. For steel and grey cast iron at very high cutting speed (multi-layer coating).
E28	TiALN (PVD)	Universal quality for steel and INOX at medium and high cutting speeds.

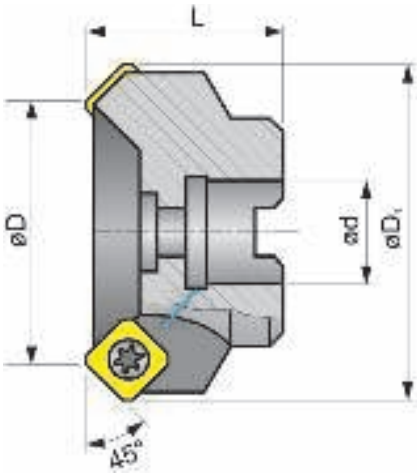
Facing Cutters

Facing Cutters 45° with Internal Cooling

Design: Ease-of-use facing cutter, low-vibration running due to positive cutting edge geometry.

Scope of Supply: Without indexable inserts, without screwdriver.

Application: For roughing and finishing, versatile use.





Part No.	ø D mm	2966	Number of cutting edges	Dimensions mm ø d	ø D_1	L	Cutting depth a_p mm	Indexable insert
0100	40	114.29	3	16	53	40	6	SEHT/SEHW 1204...
0105	50	126.10	4	22	63	48	6	SEHT/SEHW 1204...
0110	63	141.86	5	22	76	48	6	SEHT/SEHW 1204...
0115	80	173.39	6	27	93	50	6	SEHT/SEHW 1204...
0120	100	204.91	6	32	113	50	6	SEHT/SEHW 1204...
0125	125	244.32	7	40	138	63	6	SEHT/SEHW 1204...
		(280)						

Spare Parts for Facing Cutter 45° with Internal Cooling





Part No.	2966 TORX® screw for indexable inserts	5886 Screwdriver for TORX® T20 x 100 mm
0060	2.34*	–
0060	–	3.38
* PU 10 units	(281)	(526)

Indexable Inserts – Milling


SEHT AF T35


SEHT AF E35


SEHT AF Alu


SEHW AF T35


SEHW AF E35

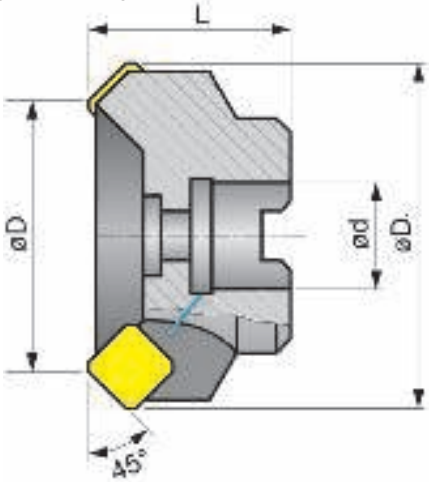
Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Precision sintered	Ground
0140	SEHT 1204AF T35	5.78*	●	●	●	–	●	–
0143	SEHT 1204AF E35	5.78*	●	●	–	–	●	–
0146	SEHT 1204AF Alu A20	9.76*	–	–	●	●	–	●
0149	SEHW 1204AF T35	5.78*	●	●	●	–	●	–
0152	SEHW 1204AF E35	5.78*	●	●	–	–	●	–
* PU 10 units		(282)						

Facing Cutters 45° with Cartridge

Design: Ease-of-use facing cutter, with cartridge, low-vibration running due to positive cutting edge geometry.

Scope of Supply: Without indexable inserts, without screwdriver.

Application: For roughing and finishing of all material, versatile use.





Part No.	ø D mm	2966	Number of cutting edges	Dimensions mm ø d	ø D_1	L	Cutting depth a_p mm	Indexable insert
0160	63	216.73	5	22	76	50	6	SEKN/SEKR 1203...
0165	80	240.38	6	27	93	50	6	SEKN/SEKR 1203...
0170	100	275.85	6	32	113	50	6	SEKN/SEKR 1203...
0175	125	342.83	7	40	138	50	6	SEKN/SEKR 1203...
0180	160	453.17 (280)	8	40	173	60	6	SEKN/SEKR 1203...

Spare Parts for Facing Cutter 45° with Cartridge








Part No.	2966 Cartridge	2966 Straining screw for cartridge	2966 TORX®-screw for indexable inserts	5886 Screwdriver for TORX® 15 x 80 mm	6233 Torque screwdriver 3.0 Nm TX15	5850 Hexagon wrench 4 x 100 mm
0072	23.42	–	–	–	–	–
0057	–	2.34*	–	–	–	–
0074	–	–	5.86*	–	–	–
0050	–	–	–	3.31	–	–
0030	–	–	–	–	20.45	–
0030	–	–	–	–	–	1.05
* PU 10 units	(281)	(281)	(281)	(526)	(539)	(528)

ISO Indexable Inserts – Milling – 20° Positive






AFSN E35 | AFSN T35 | AFEN E35 | AFEN T35

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Precision sintered	Ground
0183	SEKN 1203AFSN E35	5.78*	●	●	–	–	●	–
0186	SEKN 1203AFSN T35	5.78*	●	●	●	–	●	–
0189	SEKR 1203AFEN E35	5.78*	●	●	–	–	●	–
0192	SEKR 1203AFEN T35	5.78*	●	●	●	–	●	–
* PU 10 units		(282)						

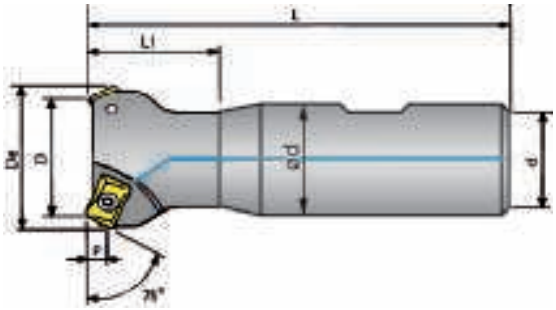
End Mills/Indexable Inserts – Milling

End Mills 75°, Parallel, with Internal Cooling

Design: End mill, parallel, 75°.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For roughing and finishing, versatile use.





Part No.	ø D mm	2966	Number of cutting edges	Dimensions mm ø d	ø D_1	L	Cutting depth a_p mm	Indexable insert
0193	25	105.08	2	20	95	25	3	APKT/APHX10...
0194	32	131.35	3	25	95	25	3	APKT/APHX10...
0195	40	157.62	4	25	100	25	3	APKT/APHX10...
		(280)						

Spare Parts for End Mill 75° with Internal Cooling





Part No.	2966 TORX® screw ø 25–40	5886 Screwdriver for TORX® T8 x 60 mm	6233 Torque screwdriver S 1.2 Nm TX8
0052	2.34*	–	–
0030	–	3.21	–
0015	–	–	17.79
* PU 10 units	(281)	(526)	(539)

Indexable Inserts – Milling





PDSR T35 | PDSR E35 | FR Alu

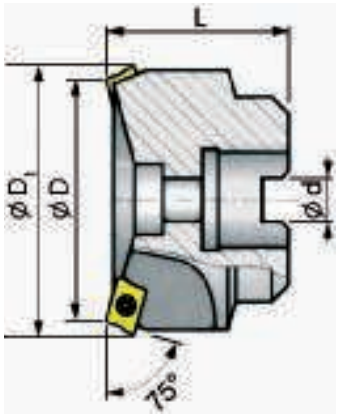
Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Precision sintered	Ground
0600	APKT 1003PDSR T35	5.25*	●	●	●	–	●	–
0603	APKT 1003PDSR E35	5.25*	●	●	–	–	●	–
0606	APHX 1003FR Alu A20	8.64*	–	–	●	●	–	●
* PU 10 units		(282)						

Facing Cutters 75° with Internal Cooling

Design: Ease-of-use facing cutter, low-vibration running due to positive cutting edge geometry, with internal cooling.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For roughing and finishing, versatile use.





Part No.	ø D mm	2966	Number of cutting edges	ø d	Dimensions mm ø D_1	L	Cutting depth a_p mm	Indexable insert
0196	50	146.36	5	22	54	40	3	APKT/APHX10...
0197	63	163.63	6	22	67	40	3	APKT/APHX10...
0198	80	243.94	7	27	87	50	3	APKT/APHX10...
		(280)						

Spare Parts for Facing Cutter 75° with Internal Cooling





Part No.	2966 TORX® screw for indexable inserts	5886 Screwdriver for TORX® T8 x 60 mm	6233 Torque screwdriver S 1.2 Nm TX8
0052	2.34*	–	–
0030	–	3.21	–
0015	–	–	17.79
* PU 10 units	(281)	(526)	(539)

Indexable Inserts – Milling





PDSR T35 | PDSR E35 | FR Alu

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Precision sintered	Ground
0600	APKT 1003PDSR T35	5.25*	●	●	●	–	●	–
0603	APKT 1003PDSR E35	5.25*	●	●	–	–	●	–
0606	APHX 1003FR Alu A20	8.64*	–	–	●	●	–	●
* PU 10 units		(282)						

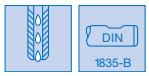
End Mills/Indexable Inserts – Milling

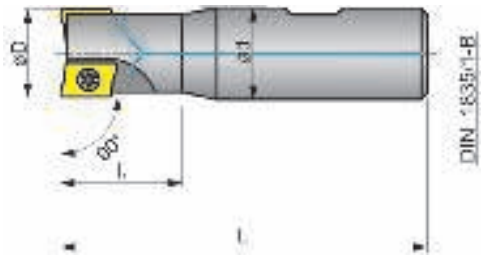
End Mills 90°, Parallel, with Internal Cooling

Design: End mill, parallel 90°.

Scope of Supply: Without indexable inserts, without screwdriver.

Application: Slot and corner cutting, universal use.







Part No.	∅ D mm	2966	Number of cutting edges	∅ d	Dimensions mm L	l_1	Cutting depth a_p mm	Indexable insert
0200	9.7	63.05	1	16	80	20	10	APKT/APHX10...
0205	10	47.29	1	16	80	24	10	APKT/APHX10...
0280	10	70.94	1	16	150	24	10	APKT/APHX10...
0210	11.7	70.94	1	16	80	20	10	APKT/APHX10...
0215	12	47.29	1	16	80	24	10	APKT/APHX10...
0285	12	70.94	1	16	150	24	10	APKT/APHX10...
0220	14	63.05	1	16	80	24	10	APKT/APHX10...
0225	15.7	70.94	2	16	80	25	10	APKT/APHX10...
0230	16	63.05	2	16	80	25	10	APKT/APHX10...
0290	16	78.81	2	16	150	25	10	APKT/APHX10...
0240	18	63.05	2	20	80	25	10	APKT/APHX10...
0235	19.7	94.57	3	20	90	25	10	APKT/APHX10...
0245	20	78.81	3	20	90	25	10	APKT/APHX10...
0295	20	94.57	3	20	150	25	10	APKT/APHX10...
0250	24.7	110.34	4	25	95	25	10	APKT/APHX10...
0255	25	94.57	4	25	95	25	10	APKT/APHX10...
0300	25	118.22	4	25	150	25	10	APKT/APHX10...
0260	30	110.34	4	25	95	25	10	APKT/APHX10...
0265	31.7	126.10	5	25	95	26	10	APKT/APHX10...
0270	32	110.34	5	25	95	26	10	APKT/APHX10...
0305	32	141.86	5	25	150	26	10	APKT/APHX10...
0275	40	149.75	6	32	110	26	10	APKT/APHX10...
		(280)						

Spare Parts for End Mills 90°, with Internal Cooling







Part No.	2966 TORX® screw ∅ 9.7–40	5886 Screwdriver for TORX® T8 x 60 mm	6233 Torque screwdriver 1.2 Nm TX8
0052	2.34*	–	–
0030	–	3.21	–
0015	–	–	17.79
* PU 10 units	(281)	(526)	(539)

Indexable Inserts – Milling



PDSR T35



PDSR E35



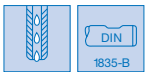
FR Alu

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Flanging radius	Precision sintered	Ground
0600	APKT 1003PDSR T35	5.25*	●	●	●	–	–	●	–
0603	APKT 1003PDSR E35	5.25*	●	●	–	–	–	●	–
0609	APKT 100308PDSR E28	9.01*	●	●	–	–	0.8	●	–
0612	APKT 100316PDSR E28	9.01*	●	●	–	–	1.6	●	–
0615	APKT 100320PDSR E28	9.01*	●	●	–	–	2.0	●	–
0606	APHX 1003FR Alu A20	8.64*	–	–	●	●	–	–	●
0621	APHX 100308 Alu A20	10.14*	–	–	●	●	0.8	–	●
* PU 10 units		(282)							

End Mill Set/Indexable Inserts – Milling

End Mill Set 90°, with Internal Cooling

Design: End mill set, parallel, 90° D 16/20/25 mm, in plastic case.
Application: Slot and corner cutting, versatile use.





Part No.	Contents of set	2966
0310	3 end mills, 1 TORX® screwdriver, 10 APKT 1003PDSR E35	247.69 (280)

Spare Parts for End Mills 90°, with Internal Cooling





Part No.	2966 TORX® screw for indexable inserts	5886 Screwdriver for TORX® T8 x 60 mm	6233 Torque screwdriver 1.2 Nm TX8
0052	2.34*	–	–
0030	–	3.21	–
0015	–	–	17.79
	(281)	(526)	(539)

* PU 10 units

Indexable Inserts – Milling





PDSR T35 PDSR E35 FR ALU

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Flanging radius	Precision sintered	Ground
0600	APKT 1003PDSR T35	5.25*	●	●	●	–	–	●	–
0603	APKT 1003PDSR E35	5.25*	●	●	–	–	–	●	–
0609	APKT 100308PDSR E28	9.01*	●	●	–	–	0.8	●	–
0612	APKT 100316PDSR E28	9.01*	●	●	–	–	1.6	●	–
0615	APKT 100320PDSR E28	9.01*	●	●	–	–	2.0	●	–
0606	APHX 1003FR Alu A20	8.64*	–	–	●	●	–	–	●
0621	APHX 100308 Alu A20	10.14*	–	–	●	●	0.8	–	●
		(282)							

* PU 10 units

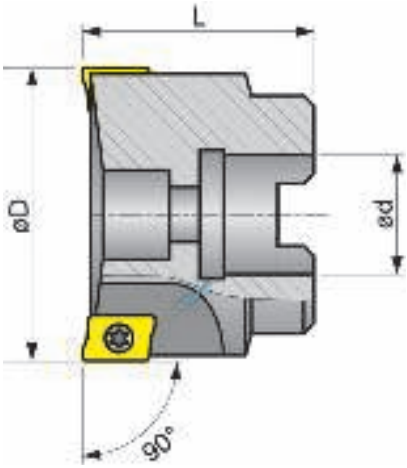
Right-angle Milling Head/Indexable Inserts

Right-angle 90° Milling Heads with Internal Cooling

Design: Corner cutter 90°.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For groove and corner milling, broad range of applications.





Part No.	ø D mm	2966	Number of cutting edges	Dimensions mm ø d	Dimensions mm L	Cutting depth a_p mm	Indexable insert
0400	40	157.62	6	22	40	10	APKT/APHX10...
0405	50	173.39	7	22	40	10	APKT/APHX10...
0410	63	236.43	8	22	40	10	APKT/APHX10...
0415	80	315.25	11	27	50	10	APKT/APHX10...
0420	100	551.68 (280)	13	32	50	10	APKT/APHX10...

Spare Parts for Right-angle 90° Milling Heads with Internal Cooling





Part No.	2966 TORX® screw	5886 Screwdriver for TORX® T8 x 60 mm	6233 Torque screwdriver 1.2 Nm TX8
0052	2.34*	–	–
0050	–	3.21	–
0030	–	–	17.79
* PU 10 units	(281)	(526)	(539)

Indexable Inserts – Milling





PDSR T35 | PDSR E35 | FR Alu

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Flanging radius	Precision sintered	Ground
0600	APKT 1003PDSR T35	5.25*	●	●	●	–	–	●	–
0603	APKT 1003PDSR E35	5.25*	●	●	–	–	–	●	–
0609	APKT 100308PDSR E28	9.01*	●	●	–	–	0.8	●	–
0612	APKT 100316PDSR E28	9.01*	●	●	–	–	1.6	●	–
0615	APKT 100320PDSR E28	9.01*	●	●	–	–	2.0	●	–
0606	APHX 1003FR Alu A20	8.64*	–	–	●	●	–	–	●
0621	APHX 100308 Alu A20	10.14*	–	–	●	●	0.8	–	●
* PU 10 units		(282)							

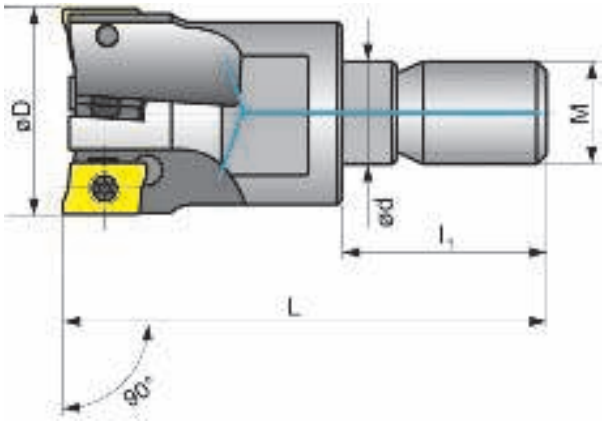
Right-angle Milling Head/Indexable Inserts

Right-angle 90° Milling Heads with Internal Cooling

Design: Corner milling cutters 90°.

Scope of supply: Without indexable inserts, without screwdriver.

Application: Universal use for groove and corner milling.





Part No.	ø D mm	2966	Number of cutting edges	Dimensions mm L	l_1	ø d	Cutting depth a_p mm	M	Indexable insert
0500	15.7	70.94	2	25	17.5	8.5	10	M 8	APKT/APHX10...
0505	16	70.94	2	25	17.5	8.5	10	M 8	APKT/APHX10...
0510	19.7	74.87	3	30	20	10.5	10	M 10	APKT/APHX10...
0515	20	74.87	3	30	20	10.5	10	M 10	APKT/APHX10...
0520	24.7	78.81	4	35	22	12.5	10	M 12	APKT/APHX10...
0525	25	78.81	4	35	22	12.5	10	M 12	APKT/APHX10...
0530	31.7	86.70	5	43	24	17.0	10	M 16	APKT/APHX10...
0535	32	86.70	5	43	24	17.0	10	M 16	APKT/APHX10...
		(280)							

Spare Parts for Right-angle 90° Milling Heads with Internal Cooling






Part No.	2966 TORX® screw ø 15.7 + 16	2966 TORX® screw ø 19.7–32	5886 Screwdriver for TORX® T8 x 60 mm	6233 Torque screwdriver 1.2 Nm TX8
0052	2.34*	–	–	–
0054	–	2.34*	–	–
0030	–	–	3.21	–
0015	–	–	–	17.79
* PU 10 units	(281)	(281)	(526)	(539)

ISO Indexable Inserts – Milling





PDSR T35 | PDSR E35 | FR Alu

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Flanging radius	Precision sintered	Ground
0600	APKT 1003PDSR T35	5.25*	●	●	●	–	–	●	–
0603	APKT 1003PDSR E35	5.25*	●	●	–	–	–	●	–
0609	APKT 100308PDSR E28	9.01*	●	●	–	–	0.8	●	–
0612	APKT 100316PDSR E28	9.01*	●	●	–	–	1.6	●	–
0615	APKT 100320PDSR E28	9.01*	●	●	–	–	2.0	●	–
0606	APHX 1003FR Alu A20	8.64*	–	–	●	●	–	–	●
0621	APHX 100308 Alu A20	10.14*	–	–	●	●	0.8	–	●
* PU 10 units		(282)							

Shell End Mills 90° with Internal Cooling

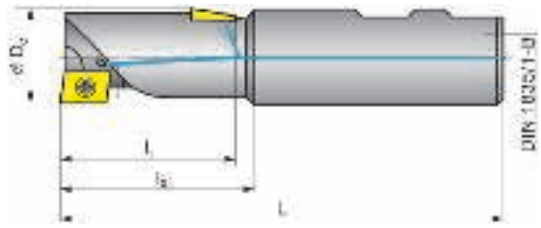
Design: Shell end mill.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For slot, corner and contour cutting, versatile use.

DIN 69871 ADB

DIN 1835-B







Part No.	∅ D_c mm	2966	z_c*	Number of indexable inserts	flutes	Adapter	Dimensions mm L	l_1	l_2	Indexable insert
0900	20	185.21	1	3	1	20	86	28	36	APKT/APHX10...
0905	25	220.67	2	8	2	25	100	36	44	APKT/APHX10...
0910	32	291.61	3	15	3	32	120	45	60	APKT/APHX10...
0915	40	409.82	3	18	3	32	130	54	70	APKT/APHX10...
0920	32	472.87	3	15	3	SK40	162	45	109	APKT/APHX10...
0925	40	591.09	3	18	3	SK40	171	54	119	APKT/APHX10...

(280)

* actual number of teeth for determining the feed

Spare Parts for Shell End Mills







Part No.	2966 TORX® screw	5886 Screwdriver for TORX® T8 x 60 mm	6233 Torque screwdriver 1.2 Nm TX8
0052	2.34*	–	–
0030	–	3.21	–
0015	–	–	17.79

* PU 10 units

(281) (526) (539)

Indexable Inserts – Milling



PDSR T35



PDSR E35



FR Alu

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Flanging radius	Precision sintered	Ground
0600	APKT 1003PDSR T35	5.25*	●	●	●	–	–	●	–
0603	APKT 1003PDSR E35	5.25*	●	●	–	–	–	●	–
0609	APKT 100308PDSR E28	9.01*	●	●	–	–	0.8	●	–
0612	APKT 100316PDSR E28	9.01*	●	●	–	–	1.6	●	–
0615	APKT 100320PDSR E28	9.01*	●	●	–	–	2.0	●	–
0606	APHX 1003FR Alu A20	8.64*	–	–	●	●	–	–	●
0621	APHX 100308 Alu A20	10.14*	–	–	●	●	0.8	–	●

* PU 10 units

(282)

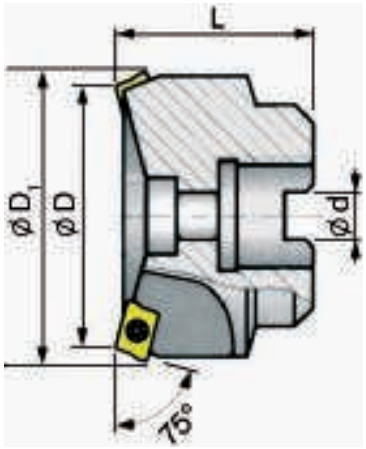
All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Facing Cutters 75° with Internal Cooling

Design: Ease-of-use facing cutter, low-vibration running due to positive cutting edge geometry, with internal cooling.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For roughing and finishing, versatile use.





Part No.	ø D mm	2966	Number of cutting edges	ø d	Dimensions mm ø D_1	L	Cutting depth a_p mm	Indexable insert
0550	50	114.09	3	16	54	40	6.5	APKT/APHX16...
0555	63	138.86	4	22	67	40	6.5	APKT/APHX16...
0560	80	161.38	5	27	84	50	6.5	APKT/APHX16...
0565	100	176.39	6	32	104	50	6.5	APKT/APHX16...
0570	125	228.93	7	40	129	63	6.5	APKT/APHX16...
		(280)						

Spare Parts for Right-angle 75° Milling Heads with Internal Cooling





Part No.	2966 TORX® screw for indexable inserts	5886 Screwdriver for TORX® T15 x 80 mm	6233 Torque screwdriver 3.0 Nm TX15
0057	2.34*	–	–
0050	–	3.31	–
0030	–	–	20.45
* PU 10 units	(281)	(526)	(539)

ISO Indexable Inserts – Milling





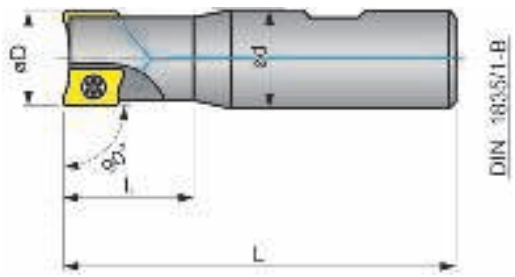
PDER T35 PDER E35 FR Alu

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Flanging radius	Precision sintered	Ground
0800	APKT 1604PDER T35	6.61*	●	●	●	–	–	●	–
0803	APKT 1604PDER E35	6.61*	●	●	–	–	–	●	–
0806	APHX 1604FR Alu A20	9.76*	–	–	●	●	–	–	●
* PU 10 units		(282)							

End Mills/Indexable Inserts – Milling

End Mills 90°, with Internal Cooling

Design: End mill, parallel, 90°.
Scope of supply: Without indexable inserts, without screwdriver.
Application: Slot and corner cutting, versatile use.





Part No.	ø D mm	2966	Number of cutting edges	Dimensions mm ø d	L	l_1	Cutting depth a_p mm	Indexable insert
0575	25	81.06	2	25	100	44	17	APKT/APHX16...
0580	25	146.36	2	25	200	60	17	APKT/APHX16...
0585	32	97.58	3	32	110	50	17	APKT/APHX16...
0590	32	161.38	3	32	200	60	17	APKT/APHX16...
0595	40	122.35	4	32	115	45	17	APKT/APHX16...
		(280)						

Spare Parts for Right-angle 90° Milling Heads with Internal Cooling





Part No.	2966 TORX® screw for indexable inserts	5886 Screwdriver for TORX® T15 x 80 mm	6233 Torque screwdriver 3.0 Nm TX15
0052	2.34*	–	–
0050	–	3.31	–
0030	–	–	20.45
* PU 10 units	(281)	(526)	(539)

ISO Indexable Inserts – Milling





PDER T35 **PDER E35** **FR Alu**

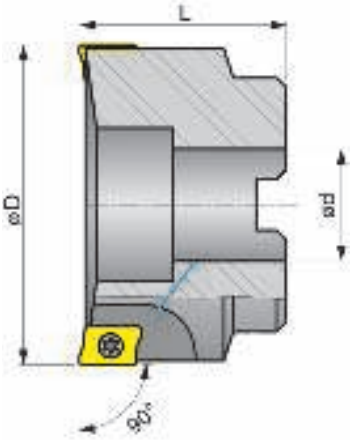
Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Flanging radius	Precision sintered	Ground
0800	APKT 1604PDER T35	6.61*	●	●	●	–	–	●	–
0803	APKT 1604PDER E35	6.61*	●	●	–	–	–	●	–
0809	APKT 160412PDER E28	10.14*	●	●	–	–	1.2	●	–
0812	APKT 160416PDER E28	10.14*	●	●	–	–	1.6	●	–
0815	APKT 160424PDER E28	10.14*	●	●	–	–	2.4	●	–
0806	APHX 1604FR Alu A20	9.76*	–	–	●	●	–	–	●
0818	APHX 160412FR Alu A20	11.64*	–	–	●	●	1.2	–	●
* PU 10 units		(282)							

Right-angle 90° Milling Heads with Internal Cooling

Design: Corner cutter 90°.

Scope of Supply: Without indexable inserts, without screwdriver.

Application: For corner cutting, large cutting depths, versatile use.





Part No.	∅ D mm	2966	Number of cutting edges	Dimensions mm ∅ d	Dimensions mm L	Cutting depth a_p mm	Indexable insert
0700	40	86.70	4	16	40	17	APKT/APHX16...
0705	50	102.46	5	22	40	17	APKT/APHX16...
0710	63	118.22	6	22	40	17	APKT/APHX16...
0715	80	157.62	7	27	50	17	APKT/APHX16...
0720	100	236.43 (280)	8	32	50	17	APKT/APHX16...

Spare Parts for Corner Cutters 90° with Internal Cooling





Part No.	2966 TORX® screw for indexable inserts	5886 Screwdriver for TORX® T15 x 80 mm	6233 Torque screwdriver 3.0 Nm TX15
0057	2.34*	–	–
0050	–	3.31	–
0030	–	–	20.45
* PU 10 units	(281)	(526)	(539)

ISO Indexable Inserts – Milling





PDER T35 PDER E35 FR Alu

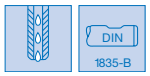
Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Flanging radius	Precision sintered	Ground
0800	APKT 1604PDER T35	6.61*	●	●	●	–	–	●	–
0803	APKT 1604PDER E35	6.61*	●	●	–	–	–	●	–
0809	APKT 160412PDER E28	10.14*	●	●	–	–	1.2	●	–
0812	APKT 160416PDER E28	10.14*	●	●	–	–	1.6	●	–
0815	APKT 160424PDER E28	10.14*	●	●	–	–	2.4	●	–
0806	APHX 1604FR Alu A20	9.76*	–	–	●	●	–	–	●
0818	APHX 160412FR Alu A20	11.64*	–	–	●	●	1.2	–	●
* PU 10 units		(282)							

Corner Cutter Set/Indexable Inserts – Milling

Corner Cutter Set 90°, with Internal Cooling

Design: Corner cutter set 90°, parallel, D 25 mm, D 63 mm, in plastic case.

Application: Slot and corner cutting, versatile use.





Part No.	Contents of set	2966
0730	Corner cutter set 90° D 25 mm, D 63 mm, 1 TORX® screwdriver, 10 APKT 1604PDER E35	217.67
		(280)

Spare Parts for Corner Cutters 90° with Internal Cooling





Part No.	2966 TORX® screw for indexable inserts	5886 Screwdriver for TORX® T15 x 80 mm	6233 Torque screwdriver 3.0 Nm TX15
0057	2.34*	–	–
0050	–	3.31	–
0030	–	–	20.45
* PU 10 units	(281)	(526)	(539)

ISO Indexable Inserts – Milling





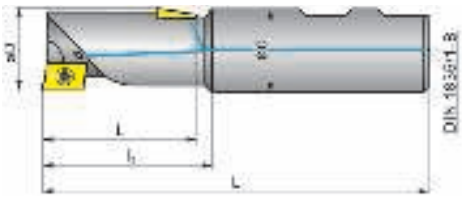
PDER T35 PDER E35 FR Alu

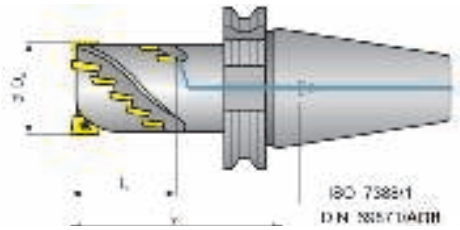
Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Flanging radius	Precision sintered	Ground
0800	APKT 1604PDER T35	6.61*	●	●	●	–	–	●	–
0803	APKT 1604PDER E35	6.61*	●	●	–	–	–	●	–
0809	APKT 160412PDER E28	10.14*	●	●	–	–	1.2	●	–
0812	APKT 160416PDER E28	10.14*	●	●	–	–	1.6	●	–
0815	APKT 160424PDER E28	10.14*	●	●	–	–	2.4	●	–
0806	APHX 1604FR Alu A20	9.76*	–	–	●	●	–	–	●
0818	APHX 160412FR Alu A20	11.64*	–	–	●	●	1.2	–	●
* PU 10 units		(282)							

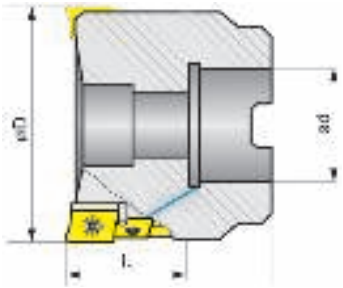
Shell End Mills 90° with Internal Cooling

Design: Shell end mill.
Scope of supply: Without indexable inserts, without screwdriver.
Application: For corner cutting, large cutting depths, versatile use.

DIN 69871 ADB | DIN 1835-B













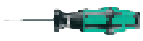
Part No.	⌀ D mm	2966	z_c*	Number of indexable inserts	flutes	Retainer	Dimensions mm ⌀ d	L	l_1	l_2	Indexable insert
1100	25	208.86	1	2	1	25	–	105	29	50	APKT/APHX 16...
1105	32	275.85	2	6	2	32	–	115	44	55	APKT/APHX 16...
1110	40	315.25	2	8	2	32	–	130	58	59	APKT/APHX 16...
1115	50	236.43	3	6	3	27	–	50	30	–	APKT/APHX 16...
1120	63	315.25	4	12	4	27	–	60	44	–	APKT/APHX 16...
1125	80	394.06	5	15	5	32	–	60	44	–	APKT/APHX 16...
1130	63	638.00	4	20	4	–	SK50	225	72	125	APKT/APHX 16...
		(280)									

• actual number of teeth for determining the feed

Spare Parts Shell End Mills 90°







Part No.	2966 TORX® screw	5886 Screwdriver for TORX® T15 x 80 mm	6233 Torque screwdriver 3.0 Nm TX15
0057	2.34*	–	–
0050	–	3.31	–
0030	–	–	20.45
	(281)	(526)	(539)

* PU 10 units

ISO Indexable Inserts – Milling



PDER T35



PDER E35



FR Alu

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Flanging radius	Precision sintered	Ground
0800	APKT 1604PDER T35	6.61*	●	●	●	–	–	●	–
0803	APKT 1604PDER E35	6.61*	●	●	–	–	–	●	–
0809	APKT 160412PDER E28	10.14*	●	●	–	–	1.2	●	–
0812	APKT 160416PDER E28	10.14*	●	●	–	–	1.6	●	–
0815	APKT 160424PDER E28	10.14*	●	●	–	–	2.4	●	–
0806	APHX 1604FR Alu A20	9.76*	–	–	●	●	–	–	●
0818	APHX 160412FR Alu A20	11.64*	–	–	●	–	1.2	–	●
		(282)							

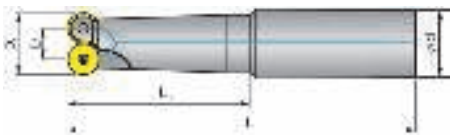
* PU 10 units

Profiling Cutters with Internal Cooling

Design: Facing and profiling cutter suitable for inclined and axial inserting.

Scope of supply: Without indexable inserts, without screwdriver.

Application: Widely used for facing and profiling cutting in tool and mould construction.





Part No.	ø D_1 mm	2966	Number of cutting edges	Dimensions mm ø D	ø d	L	L_1	Cutting depth a_p mm	Indexable insert
1200	15	67.00	2	8	16	140	40	3.5	RDHX/RDLT 07...
1205	15	74.87	2	8	20	180	80	3.5	RDHX/RDLT 07...
1210	15	74.87	2	8	25	220	120	3.5	RDHX/RDLT 07...
1215	20	74.87	2	10	20	140	40	5	RDHX/RDLT 10...
1220	20	78.81	2	10	25	180	80	5	RDHX/RDLT 10...
1225	20	86.70	2	10	25	220	120	5	RDHX/RDLT 10...
1230	25	98.52	2	13	25	200	100	6	RDHX/RDLT 12...
1235	25	110.34	2	13	25	250	150	6	RDHX/RDLT 12...
		(280)							

Spare Parts for Profiling Cutters with Internal Cooling



Part No.	2966 TORX® screw for ø D_1 20 + 25 mm	2966 TORX® screw for ø D_1 15 mm	2966 Straining screw for ø D_1 25 mm	5886 Screwdriver for TORX® T8 x 60 mm ø D_1 15 mm	6233 Torque screwdriver 1.2 Nm TX8 for ø D_1 15 mm	5886 Screwdriver for TORX® T15 x 80 mm für ø D_1 20 + 25 mm	6233 Torque screwdriver 3.0 Nm TX15 für ø D_1 20 + 25 mm
0054	2.34*	–	–	–	–	–	–
0056	–	2.34*	–	–	–	–	–
1244	–	–	2.98*	–	–	–	–
0030	–	–	–	3.21	–	–	–
0015	–	–	–	–	17.79	–	–
0050	–	–	–	–	–	3.31	–
0030	–	–	–	–	–	–	20.45
* PU 10 units	(281)	(281)	(281)	(526)	(539)	(526)	(539)

Round Indexable Inserts – Milling



MOT T35 | MOT E35 | MOS T35 | MOS A20

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Precision sintered	Ground
1300	RDHX 0702 MOT A20	4.88*	–	–	●	●	–	●
1303	RDHX 0702 MOT T35	4.88*	●	●	●	–	●	–
1306	RDHX 0702 MOT E35	4.88*	●	●	–	–	●	–
1309	RDHX 1003 MOT A20	5.25*	–	–	●	●	–	●
1312	RDHX 1003 MOT T35	5.25*	●	●	●	–	●	–
1315	RDHX 1003 MOT E35	5.25*	●	●	–	–	●	–
1318	RDHX 12T3 MOT A20	5.78*	–	–	●	●	–	●
1321	RDHX 12T3 MOT T35	5.78*	●	●	●	–	●	–
1324	RDHX 12T3 MOT E35	5.78*	●	●	–	–	●	–
1400	RDLT 1003 MOS A20	5.25*	–	–	●	●	–	●
1403	RDLT 1003 MOS T35	5.25*	●	●	●	–	●	–
1406	RDLT 1003 MOS E35	5.25*	●	●	–	–	●	–
1409	RDLT 12T3 MOS A20	5.78*	–	–	●	●	–	●
1412	RDLT 12T3 MOS T35	5.78*	●	●	●	–	●	–
1415	RDLT 12T3 MOS E35	5.78*	●	●	–	–	●	–
* PU 10 units		(282)						

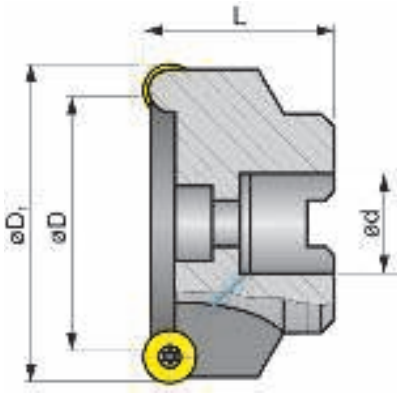
 All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Profiling Cutters with Internal Cooling

Design: Facing and profiling cutter suitable for inclined and axial inserting.

Scope of supply: Without indexable inserts, without screwdriver.

Application: Widely used for facing and profiling cutting in tool and mould construction.





Part No.	ø D_1 mm	2966	Number of cutting edges	Dimensions mm ø D	ø d	L	Cutting depth a_p mm	Indexable insert
1500	42	102.46	6	32	16	44	5	RDHX/RDLT 10...
1505	52	118.22	5	40	22	50	6	RDHX/RDLT 12...
1510	66	137.92	6	54	27	50	6	RDHX/RDLT 12...
1515	80	177.34	7	68	27	50	6	RDHX/RDLT 12...
1520	100	197.03	7	84	32	55	8	RDHX/RDLT 16...
1525	125*	236.43	8	109	40	55	8	RDHX/RDLT 16...
* without internal cooling		(280)						

Spare Parts for Profiling Cutters with Internal Cooling








Part No.	2966 TORX® screw for ø D_1 42–80 mm	2966 TORX® screw for ø D_1 100 + 125 mm	2966 Straining screw for ø D_1 52–80 mm	2966 Clamping claw for ø D_1 100 + 125 mm	5886 Screwdriver for TORX® T15 x 80 mm	6233 Torque screwdriver 3.0 Nm TX15
0056	2.34*	–	–	–	–	–
0059	–	2.34*	–	–	–	–
1244	–	–	2.98*	–	–	–
1248	–	–	–	3.96*	–	–
0050	–	–	–	–	3.31	–
0030	–	–	–	–	–	20.45
* PU 10 units	(281)	(281)	(281)	(281)	(526)	(539)

Round Indexable Inserts – Milling






MOT T35 | MOT E35 | MOS T35 | MOS A20

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Precision sintered	Ground
1309	RDHX 1003 MOT A20	5.25*	–	–	●	●	–	●
1312	RDHX 1003 MOT T35	5.25*	●	●	●	–	●	–
1315	RDHX 1003 MOT E35	5.25*	●	●	–	–	●	–
1318	RDHX 12T3 MOT A20	5.78*	–	–	●	●	–	●
1321	RDHX 12T3 MOT T35	5.78*	●	●	●	–	●	–
1324	RDHX 12T3 MOT E35	5.78*	●	●	–	–	●	–
1327	RDHX 1604 MOT E20	6.95*	–	–	●	●	●	–
1330	RDHX 1604 MOT T35	6.95*	●	●	●	–	●	–
1333	RDHX 1604 MOT E35	6.95*	●	●	–	–	●	–
1400	RDLT 1003 MOS A20	5.25*	–	–	●	●	–	●
1403	RDLT 1003 MOS T35	5.25*	●	●	●	–	●	–
1406	RDLT 1003 MOS E35	5.25*	●	●	–	–	●	–
1409	RDLT 12T3 MOS A20	5.78*	–	–	●	●	–	●
1412	RDLT 12T3 MOS T35	5.78*	●	●	●	–	●	–
1415	RDLT 12T3 MOS A35	5.78*	–	–	●	●	–	●
1418	RDLT 1604 MOS A20	6.95*	–	–	●	●	●	–
1421	RDLT 1604 MOS T35	6.95*	●	●	●	–	●	–
1424	RDLT 1604 MOS E35	6.95*	●	●	–	–	●	–
* PU 10 units		(282)						

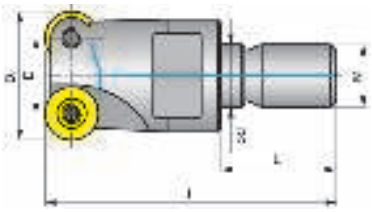
Profiling Cutters/Indexable Inserts – Milling

Profiling Cutters with Internal Cooling

Design: Facing and profiling cutter suitable for inclined and axial inserting.

Scope of supply: Without indexable inserts, without screwdriver.

Application: Widely used for facing and profile cutting in tool and mould construction.





Part No.	ø D_1 mm	2966	Number of cutting edges	Dimensions mm ø D	ø d	L	L_1	Cutting depth a_p mm	M	Indexable insert
1600	15	59.11	2	8	8.5	23	17.5	3.5	8	RDHX 07...
1605	20	98.52	4	13	10.5	30	20	3.5	10	RDHX 07...
1620	24	59.11	2	12	12.5	35	22	6	12	RDHX/RDLT 12...
1610	25	78.81	3	15	12.5	35	22	5	12	RDHX/RDLT 10...
1615	35	98.52 (280)	4	25	17	43	24	5	16	RDHX/RDLT 10...

Spare Parts for Profile Cutters with Internal Cooling









Part No.	2966 TORX® screw for ø D_1 15 + 20 mm	2966 TORX® screw for ø D_1 24–35 mm	2966 Straining screw for ø D_1 24 mm	5886 Screwdriver for TORX® T8 x 60 mm for ø D_1 15 + 20 mm	6233 Torque screwdriver 1.2 Nm TX8 for ø D_1 15 + 20 mm	5886 Screwdriver for TORX® T15 x 80 mm for ø D_1 24 + 35 mm	6233 Torque screwdriver 3.0 Nm TX15 for
0054	2.34*	–	–	–	–	–	–
0056	–	2.34*	–	–	–	–	–
1244	–	–	2.98*	–	–	–	–
0030	–	–	–	3.21	–	–	–
0015	–	–	–	–	17.79	–	–
0050	–	–	–	–	–	3.31	–
0030	–	–	–	–	–	–	20.45
					(539)	(526)	(539)

Round Indexable Inserts – Milling


MOT T35


MOT E35


MOS T35


MOS A20

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Precision sintered	Ground
1300	RDHX 0702 MOT A20	4.88*	–	–	●	●	–	●
1303	RDHX 0702 MOT T35	4.88*	●	●	●	–	●	–
1306	RDHX 0702 MOT E35	4.88*	●	●	–	–	●	–
1309	RDHX 1003 MOT A20	5.25*	–	–	●	●	–	●
1312	RDHX 1003 MOT T35	5.25*	●	●	●	–	●	–
1315	RDHX 1003 MOT E35	5.25*	●	●	–	–	●	–
1318	RDHX 12T3 MOT A20	5.78*	–	–	●	●	–	●
1321	RDHX 12T3 MOT T35	5.78*	●	●	●	–	●	–
1324	RDHX 12T3 MOT E35	5.78*	●	●	–	–	●	–
1400	RDLT 1003 MOS A20	5.25*	–	–	●	●	–	●
1403	RDLT 1003 MOS T35	5.25*	●	●	●	–	●	–
1406	RDLT 1003 MOS E35	5.25*	●	●	–	–	●	–
1409	RDLT 12T3 MOS A20	5.78*	–	–	●	●	–	●
1412	RDLT 12T3 MOS T35	5.78*	●	●	●	–	●	–
1415	RDLT 12T3 MOS A20	5.78*	–	–	●	●	–	●

* PU 10 units

(282)

Extension for Screw-in Cutters

Extension for Screw-in Cutters with Internal Cooling

Design: Seat cylindrical/tapered.





Part No.	Description	2966	d ∅ mm	M mm	∅ D_1 mm	L mm	L_1 mm	L_2 mm
1715	Tapered	74.87	16	8	13	135	80	–
1720	Tapered	74.87	16	8	13	155	100	–
1725	Tapered	74.87	16	8	13	175	120	–
1730	Tapered	78.81	20	10	18	160	100	–
1735	Tapered	78.81	20	10	18	200	140	–
1740	Tapered	82.76	25	12	21	165	100	–
1745	Tapered	82.76	25	12	21	215	150	–
1750	Tapered	86.70	32	16	29	170	100	–
1755	Tapered	86.70	32	16	29	220	150	–
1810	Cylindrical	67.00	16	8	13	80	30	25
1815	Cylindrical	67.00	16	8	13	125	75	70
1820	Cylindrical	70.94	20	10	18	100	50	45
1825	Cylindrical	70.94	20	10	18	130	80	75
		(280)						

Retainer for Steel Extension with Internal Cooling

Design: For retainer M 24 x 1.5 mm.

DIN 69871 ADB

DIN JISB 6339 (MAS-BT)

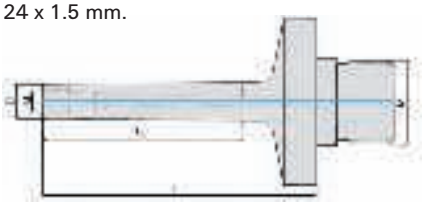


Part No.	M mm	2966	SK	BT	L mm
1870	24 x 1.5	142.61	40	–	35
1875	24 x 1.5	187.65	50	–	35
1880	24 x 1.5	142.61	–	40	35
1885	24 x 1.5	187.65	–	50	35
		(280)			

In HSK available on request.

Steel Extension, Modular, with Internal Cooling

Design: Seat M 24 x 1.5 mm.





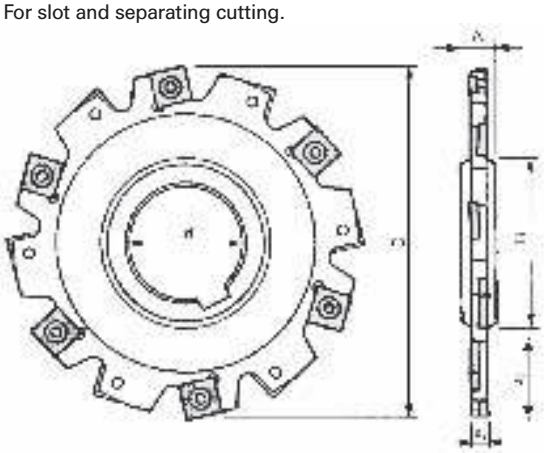
Part No.	L mm	2966	M mm	D mm	L mm	L_1 mm
1830	24 x 1.5	67.55	8	13	24 x 1.5	30
1832	24 x 1.5	67.55	8	13	24 x 1.5	60
1834	24 x 1.5	67.55	8	13	24 x 1.5	80
1836	24 x 1.5	67.55	8	13	24 x 1.5	100
1838	24 x 1.5	67.55	8	13	24 x 1.5	120
1840	24 x 1.5	73.56	10	16	24 x 1.5	40
1842	24 x 1.5	73.56	10	16	24 x 1.5	60
1844	24 x 1.5	73.56	10	16	24 x 1.5	100
1846	24 x 1.5	73.56	10	16	24 x 1.5	140
1848	24 x 1.5	81.06	12	21	24 x 1.5	40
1850	24 x 1.5	81.06	12	21	24 x 1.5	80
1852	24 x 1.5	81.06	12	21	24 x 1.5	100
1854	24 x 1.5	81.06	12	21	24 x 1.5	150
1856	24 x 1.5	90.07	16	29	24 x 1.5	40
1858	24 x 1.5	90.07	16	29	24 x 1.5	80
1860	24 x 1.5	90.07	16	29	24 x 1.5	100
1862	24 x 1.5	90.07	16	29	24 x 1.5	150
		(280)				

Disk Milling Cutters

Design: Disk milling cutter with screwed indexable inserts.
Axial angle 3° – radial angle 12°, three-side cutting.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For slot and separating cutting.





Part No.	⌀ D mm	2966	z_c*	Number of cutting edges	Cutting depth a_p mm	Dimensions mm ⌀ d	A	B	Cutting width a_e mm	Indexable insert
1900	63	170.76	3	6	14	22	8	34	4	SNHX 1102...
1905	63	170.76	3	6	14	22	8	34	5	SNHX 1103...
1910	63	170.76	3	6	14	22	8	34	6	SNHX 1203...
1915	80	193.75	4	8	22	22	8	34	4	SNHX 1102...
1920	80	193.75	4	8	22	22	8	34	5	SNHX 1103...
1925	80	193.75	4	8	22	22	8	34	6	SNHX 1203...
1930	100	236.43	6	12	27	27	12	45	4	SNHX 1102...
1935	100	236.43	6	12	27	27	12	45	5	SNHX 1103...
1940	100	236.43	5	10	27	27	12	45	6	SNHX 1203...
1945	100	243.01	5	10	27	27	12	45	7	SNHX 1204...
1950	100	243.01	5	10	27	27	12	45	8	SNHX 12045...
1955	100	243.01	5	10	27	27	12	45	9	SNHX 1205...
1960	100	243.01	5	10	27	27	12	45	10	SNHX 1205...
1965	125	272.56	7	14	33	32	12	58	4	SNHX 1102...
1970	125	272.56	7	14	33	32	12	58	5	SNHX 1103...
1975	125	272.56	6	12	33	32	12	58	6	SNHX 1203...
1980	125	285.69	6	12	33	32	12	58	7	SNHX 1204...
1985	125	285.69	6	12	33	32	12	58	8	SNHX 12045...
1990	125	285.69	6	12	33	32	12	58	9	SNHX 1205...
1995	125	285.69	6	12	33	32	12	58	10	SNHX 1205...
2000	125	285.69	6	12	33	32	12	58	12	SNHX 1207...
2005	160	318.54	9	18	45	40	12	68	4	SNHX 1102...
2010	160	318.54	9	18	45	40	12	68	5	SNHX 1103...
2015	160	318.54	8	16	45	40	12	68	6	SNHX 1203...
2020	160	318.54	8	16	45	40	12	68	7	SNHX 1204...
2025	160	318.54	8	16	45	40	12	68	8	SNHX 12045...
2030	160	334.95	8	16	45	40	12	68	9	SNHX 1205...
2035	160	334.95	8	16	45	40	12	68	10	SNHX 1205...
2040	160	344.81	8	16	45	40	12	68	12	SNHX 1207...
2045	160	344.81	5	15	45	40	14	68	14	SNHX 1205...
		(280)								

* number of teeth for determining the feed

Spare Parts for Disk Milling Cutters








Part No.	2966 TORX® screw for indexable inserts SNHX 1102...	2966 TORX® screw for indexable inserts SNHX 1103...	2966 TORX® screw for indexable inserts SNHX 1203...	2966 TORX® screw for indexable inserts SNHX 1204...	2966 TORX® screw for indexable inserts SNHX 1205...	2966 TORX® screw for indexable inserts SNHX 1207...
0062	2.98*	–	–	–	–	–
0063	–	2.98*	–	–	–	–
0064	–	–	2.98*	–	–	–
0065	–	–	–	2.98*	–	–
0066	–	–	–	–	2.98*	–
0067	–	–	–	–	–	2.98*
* PU 10 units	(281)	(281)	(281)	(281)	(281)	(281)

 All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Spare Parts for Disk Milling Cutters





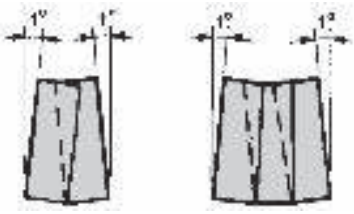

Part No.	5886 Screwdriver for TORX® T9 x 60 mm for indexable inserts SNHX 11…	6233 Torque screwdriver 1.4 Nm TX9 for indexable inserts SNHX 11…	5886 Screwdriver for TORX® T15 x 80 mm for indexable inserts SNHX 12…	6233 Torque screwdriver 3.0 Nm TX15 for indexable inserts SNHX 12…
0035	3.19	–	–	–
0020	–	18.79	–	–
0050	–	–	3.31	–
0030	–	–	–	20.45
	(526)	(539)	(526)	(539)

Indexable Inserts – Milling


T35

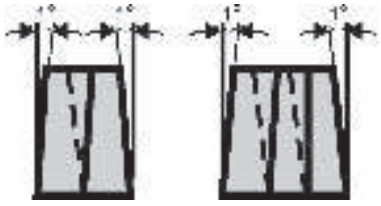

E35

Design: Neutral design of the indexable insert creates a slight roof shape at the bottom of the slot. Right-left design of the indexable insert results in an even bottom of the slot.


a_e 4–12 mm

a_e 14 mm

Normal design
SNHX..T SNHX..T


a_e 4–12 mm

a_e 14 mm

Even slot bottom
SNHX..T-90 R/L SNHX..T-90 R/L
SNHX..T

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Precision sintered	Ground
3200	SNHX 1102T T35	7.51*	●	●	●	–	–	●
3203	SNHX 1102T E35	7.51*	●	●	–	–	–	●
3206	SNHX 1102T–90 R T35	8.82*	●	●	●	–	–	●
3209	SNHX 1102T–90 R E35	8.82*	●	●	–	–	–	●
3212	SNHX 1102T–90 L T35	8.82*	●	●	●	–	–	●
3215	SNHX 1102T–90 L E35	8.82*	●	●	–	–	–	●
3218	SNHX 1103T T35	8.13*	●	●	●	–	–	●
3221	SNHX 1103T E35	8.13*	●	●	–	–	–	●
3224	SNHX 1103T–90 R T35	10.95*	●	●	●	–	–	●
3227	SNHX 1103T–90 R E35	10.95*	●	●	–	–	–	●
3230	SNHX 1103T–90 L T35	10.95*	●	●	●	–	–	●
3233	SNHX 1103T–90 L E35	10.95*	●	●	–	–	–	●
3236	SNHX 1203T T35	8.45*	●	●	●	–	–	●
3239	SNHX 1203T E35	8.45*	●	●	–	–	–	●
3242	SNHX 1203T–90 R T35	11.58*	●	●	●	–	–	●
3245	SNHX 1203T–90 R E35	11.58*	●	●	–	–	–	●
3248	SNHX 1203T–90 L T35	11.58*	●	●	●	–	–	●
3251	SNHX 1203T–90 L E35	11.58*	●	●	–	–	–	●
3254	SNHX 1204T T35	8.76*	●	●	●	–	–	●
3257	SNHX 1204T E35	8.76*	●	●	–	–	–	●
3260	SNHX 1204T–90 R T35	12.20*	●	●	●	–	–	●
3263	SNHX 1204T–90 R E35	12.20*	●	●	–	–	–	●
3266	SNHX 1204T–90 L T35	12.20*	●	●	●	–	–	●
3269	SNHX 1204T–90 L E35	12.20*	●	●	–	–	–	●
3272	SNHX 1205T T35	8.76*	●	●	●	–	–	●
3275	SNHX 1205T E35	8.76*	●	●	–	–	–	●
3278	SNHX 1205T–90 R T35	13.45*	●	●	●	–	–	●
3281	SNHX 1205T–90 R E35	13.45*	●	●	–	–	–	●
3284	SNHX 1205T–90 L T35	13.45*	●	●	●	–	–	●
3287	SNHX 1205T–90 L E35	13.45*	●	●	–	–	–	●
3290	SNHX 12045T T35	8.76*	●	●	●	–	–	●
3293	SNHX 12045T E35	8.76*	●	●	–	–	–	●
3296	SNHX 12045T–90 R T35	12.83*	●	●	●	–	–	●
3299	SNHX 12045T–90 R E35	12.83*	●	●	–	–	–	●
3302	SNHX 12045T–90 L T35	12.83*	●	●	●	–	–	●
3305	SNHX 12045T–90 L E35	12.83*	●	●	–	–	–	●
3308	SNHX 1207T T35	9.38*	●	●	●	–	–	●
3311	SNHX 1207T E35	9.38*	●	●	–	–	–	●
3314	SNHX 1207T–90 R T35	14.08*	●	●	●	–	–	●
3317	SNHX 1207T–90 R E35	14.08*	●	●	–	–	–	●
3320	SNHX 1207T–90 L T35	14.08*	●	●	●	–	–	●
3323	SNHX 1207T–90 L E35	14.08*	●	●	–	–	–	●

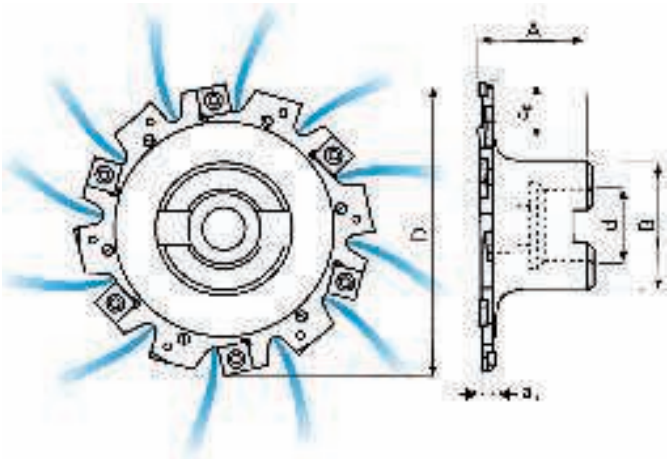
* PU 10 units (282)

Disk Milling Cutters with Collar and Internal Cooling

Design: Disk milling cutter with screwed indexable inserts.
Axial angle 3° – radial angle 12°, three-side cutting.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For slot and separating cutting.





Part No.	⌀ D mm	2966	z_c*	Number of cutting edges	Cutting depth a_p mm	Dimensions mm ⌀ d	A	B	Cutting width a_e mm	Indexable insert
3000	63	246.29	3	6	10.5	16	35	30	4	SNHX1102...
3005	63	246.29	3	6	10.5	16	35	30	5	SNHX1103...
3010	63	246.29	3	6	10.5	16	35	30	6	SNHX1203...
3015	80	361.22	4	8	20.2	22	50	40	4	SNHX1102...
3020	80	361.22	4	8	20.2	22	50	40	5	SNHX1103...
3025	80	361.22	4	8	20.2	22	50	40	6	SNHX1203...
3030	100	361.22	6	12	24.2	27	50	48	4	SNHX1102...
3035	100	361.22	6	12	24.2	27	50	48	5	SNHX1103...
3040	100	361.22	5	10	24.2	27	50	48	6	SNHX1203...
3045	100	361.22	5	10	24.2	27	50	48	10	SNHX1205...
3050	125	394.06	6	12	23.7	40	50	70	6	SNHX1203...
3055	125	394.06	6	12	23.7	40	50	70	10	SNHX1205...
3060	160	459.73	8	16	41.2	40	50	70	6	SNHX1203...
3065	160	459.73	8	16	41.2	40	50	70	10	SNHX1205...
		(280)								

* number of teeth for determining the feed

Spare Parts for Disk Milling Cutters with Collar and Internal Cooling








Part No.	2966 TORX® screw for indexable inserts SNHX 1102...	2966 TORX® screw for indexable inserts SNHX 1103...	2966 TORX® screw for indexable inserts SNHX 1203...	2966 TORX® screw for indexable inserts SNHX 1204...	2966 TORX® screw for indexable inserts SNHX 1205...	2966 TORX® screw for indexable inserts SNHX 1207...
0062	2.98*	–	–	–	–	–
0063	–	2.98*	–	–	–	–
0064	–	–	2.98*	–	–	–
0065	–	–	–	2.98*	–	–
0066	–	–	–	–	2.98*	–
0067	–	–	–	–	–	2.98*
* PU 10 units	(281)	(281)	(281)	(281)	(281)	(281)

 All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Spare Parts for Disk Milling Cutters with Collar and Internal Cooling





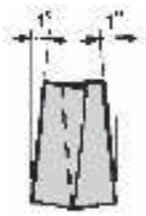

Part No.	**5886** Screwdriver for TORX® T9 x 60 mm for indexable inserts SNHX 11…	**6233** Torque screwdriver 1.4 Nm TX9 for indexable inserts SNHX 11…	**5886** Screwdriver for TORX® T15 x 80 mm for indexable inserts SNHX 12…	**6233** Torque screwdriver 3.0 Nm TX15 for indexable inserts SNHX 12…
0035	3.19	–	–	–
0020	–	18.79	–	–
0050	–	–	3.31	–
0030	–	–	–	20.45
	(526)	(539)	(526)	(539)

Indexable Inserts – Milling


T35


E35

Design: Neutral design of the indexable insert creates a slight roof shape at the bottom of the slot. Right-left design of the indexable insert results in an even bottom of the slot.


Normal design SNHX..T


Even slot bottom SNHX..T-90 R/L

Part No.	Product name	**2966**	P Steel	M VA/INOX	K GG	Non-ferrous metals	Precision sintered	Ground
3200	SNHX 1102T T35	7.51*	●	●	●	–	–	●
3203	SNHX 1102T E35	7.51*	●	●	–	–	–	●
3206	SNHX 1102T–90 R T35	8.82*	●	●	●	–	–	●
3209	SNHX 1102T–90 R E35	8.82*	●	●	–	–	–	●
3212	SNHX 1102T–90 L T35	8.82*	●	●	●	–	–	●
3215	SNHX 1102T–90 L E35	8.82*	●	●	–	–	–	●
3218	SNHX 1103T T35	8.13*	●	●	●	–	–	●
3221	SNHX 1103T E35	8.13*	●	●	–	–	–	●
3224	SNHX 1103T–90 R T35	10.95*	●	●	●	–	–	●
3227	SNHX 1103T–90 R E35	10.95*	●	●	–	–	–	●
3230	SNHX 1103T–90 L T35	10.95*	●	●	●	–	–	●
3233	SNHX 1103T–90 L E35	10.95*	●	●	–	–	–	●
3236	SNHX 1203T T35	8.45*	●	●	●	–	–	●
3239	SNHX 1203T E35	8.45*	●	●	–	–	–	●
3242	SNHX 1203T–90 R T35	11.58*	●	●	●	–	–	●
3245	SNHX 1203T–90 R E35	11.58*	●	●	–	–	–	●
3248	SNHX 1203T–90 L T35	11.58*	●	●	●	–	–	●
3251	SNHX 1203T–90 L E35	11.58*	●	●	–	–	–	●
3254	SNHX 1204T T35	8.76*	●	●	●	–	–	●
3257	SNHX 1204T E35	8.76*	●	●	–	–	–	●
3260	SNHX 1204T–90 R T35	12.20*	●	●	●	–	–	●
3263	SNHX 1204T–90 R E35	12.20*	●	●	–	–	–	●
3266	SNHX 1204T–90 L T35	12.20*	●	●	●	–	–	●
3269	SNHX 1204T–90 L E35	12.20*	●	●	–	–	–	●
3272	SNHX 1205T T35	8.76*	●	●	●	–	–	●
3275	SNHX 1205T E35	8.76*	●	●	–	–	–	●
3278	SNHX 1205T–90 R T35	13.45*	●	●	●	–	–	●
3281	SNHX 1205T–90 R E35	13.45*	●	●	–	–	–	●
3284	SNHX 1205T–90 L T35	13.45*	●	●	●	–	–	●
3287	SNHX 1205T–90 L E35	13.45*	●	●	–	–	–	●
3290	SNHX 12045T T35	8.76*	●	●	●	–	–	●
3293	SNHX 12045T E35	8.76*	●	●	–	–	–	●
3296	SNHX 12045T–90 R T35	12.83*	●	●	●	–	–	●
3299	SNHX 12045T–90 R E35	12.83*	●	●	–	–	–	●
3302	SNHX 12045T–90 L T35	12.83*	●	●	●	–	–	●
3305	SNHX 12045T–90 L E35	12.83*	●	●	–	–	–	●
3308	SNHX 1207T T35	9.38*	●	●	●	–	–	●
3311	SNHX 1207T E35	9.38*	●	●	–	–	–	●
3314	SNHX 1207T–90 R T35	14.08*	●	●	●	–	–	●
3317	SNHX 1207T–90 R E35	14.08*	●	●	–	–	–	●
3320	SNHX 1207T–90 L T35	14.08*	●	●	●	–	–	●
3323	SNHX 1207T–90 L E35	14.08*	●	●	–	–	–	●
* PU 10 units		(282)						

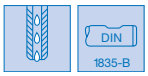
T-slot Cutters/Indexable Inserts – Milling

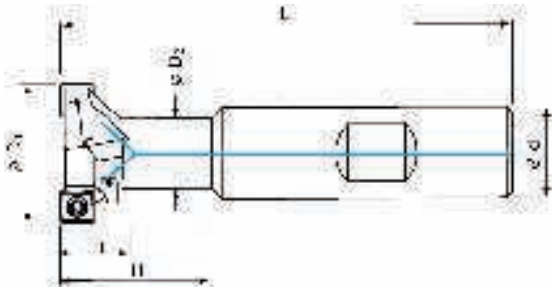
T-slot Cutters with Internal Cooling

Design: T-slot end mill.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For milling T-slots.







Part No.	ø D_1 mm	2966	z_c*	Number of cutting edges	ø D_2	L	ø d	H	H_1	Indexable insert
4000	25	164.20	2	4	13	82	16	31	11	SPLT0603...
4005	32	177.33	2	4	17	88	20	38	14	SDHT09T3...
4010	40	190.47	2	4	21	108	25	50	17	SDHT09T3...
		(280)								

Dimensions mm

* actual number of teeth for determining the feed

Spare Parts for T-slot Cutters with Internal Cooling



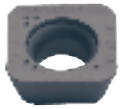





Part No.	2966 TORX® screw for ø D_1 25 mm	2966 TORX® screw for ø D_1 32 + 40 mm	5886 Screwdriver for TORX® T8 x 60 mm for ø D_1 25 mm	6233 Torque screwdriver 1.2 Nm TX8 for ø D_1 25 mm	5886 Screwdriver for TORX® T15 x 80 mm for ø D_1 32 + 40 mm	6233 Torque screwdriver 3.0 Nm TX15 for ø D_1 32 + 40 mm
0052	2.34*	–	–	–	–	–
0056	–	2.34*	–	–	–	–
0030	–	–	3.21	–	–	–
0015	–	–	–	17.79	–	–
0050	–	–	–	–	3.31	–
0030	–	–	–	–	–	20.45
* PU 10 units	(281)	(281)	(526)	(539)	(526)	(539)

Indexable Inserts – Milling



SPLT T35 SPLT E35 SDHT T35 SDHT E35

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Corner radius	Precision sintered	Ground
4100	SPLT 060304 T35	4.38*	●	●	●	–	0.4	●	–
4105	SPLT 060304 E35	4.38*	●	●	–	–	0.4	●	–
4110	SDHT 09T3AE T35	4.82*	●	●	●	–	–	●	–
4115	SDHT 09T3AE E35	4.82*	●	●	–	–	–	●	–
* PU 10 units		(282)							

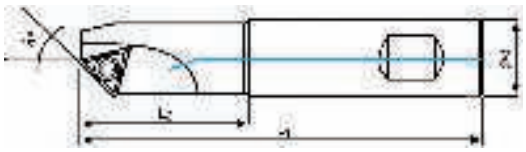
Chamfering and Centring Cutters 45° with Internal Cooling

Design: Chamfering and centring cutter 45° with parallel shank.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For centring, chamfer and edge cutting and V-slots.

DIN 1835-B







Part No.	⌀ D min./max. mm	2966	Number of cutting edges	Dimensions mm ⌀ d	L_1	L_2	K°	Indexable insert
5000	0–20	118.22 (280)	1	20	115	40	45°	TCGX/TCMX 16T3

Spare Parts for Chamfering and Centring Cutters 45° with Internal Cooling

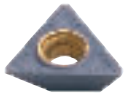






Part No.	2966 TORX® screw for indexable inserts TCGX/TCMX 16T3	5886 Screwdriver for TORX® T15 x 80 mm	6233 Torque screwdriver 3.0 Nm TX15
0057	2.34*	–	–
0050	–	3.31	–
0030	–	–	20.45
* PU 10 units	(281)	(526)	(539)

Indexable Inserts – Milling



ZR



Alu

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Corner radius	Precision sintered	Ground
5100	TCMX 16T308 ZR E35	8.45*	●	●	●	–	0.8	●	–
5105	TCGX 16T304 Alu A20	10.95*	–	–	–	●	0.4	–	●
* PU 10 units		(282)							

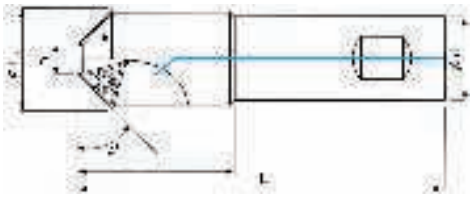
Milling Countersinks

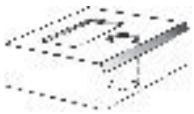
Milling Countersinks 15°, 30°, 45°, 60°, 75° with Internal Cooling

Design: Chamfering and milling countersink with parallel shank, also suitable for drilling small holes.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For chamfering and edge cutting.







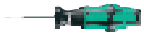
Part No.	ø D min./max. D_1	mm	D_2	2966	Number of cutting edges	K°	Dimensions mm ø d	L	l_1	Indexable insert
6000	16		34	65.68	3	15	20	85	30	TCMT1102...
6005	25		53	78.81	3	15	25	85	30	TCMT16T3...
6010	16*		34	78.81	3	15	20	200	30	TCMT1102...
6015	25*		53	98.52	3	15	25	200	30	TCMT16T3...
6100	16		32	65.68	3	30	20	85	30	TCMT1102...
6105	25		50	78.81	3	30	25	85	30	TCMT16T3...
6110	16*		32	78.81	3	30	20	200	30	TCMT1102...
6115	25*		50	98.52	3	30	25	200	30	TCMT16T3...
6200	1.2		16	39.41	1	45	12	70	20	TCMT1102...
6205	6.2		21	52.54	2	45	20	90	35	TCMT1102...
6210	10.4		32.5	85.38	2	45	25	95	39	TCMT16T3...
6215	1.2*		16	59.11	1	45	12	200	20	TCMT1102...
6220	6.2*		21	72.25	2	45	20	200	35	TCMT1102...
6225	10.4*		32.5	98.52	2	45	25	200	39	TCMT16T3...
6300	5.4		16	39.41	1	60	12	70	20	TCMT1102...
6305	15.8		26	55.83	2	60	20	90	35	TCMT1102...
6310	20		35.5	85.38	2	60	25	95	39	TCMT16T3...
6315	5.4*		16	59.11	1	60	12	200	20	TCMT1102...
6320	15.8*		26	72.25	2	60	20	200	35	TCMT1102...
6325	20*		35.5	98.52	2	60	25	200	39	TCMT16T3...
6400	17		22	72.25	2	75	20	85	30	TCMT1102...
6405	22		27	78.81	2	75	20	85	30	TCMT1102...
6410	27		35	85.38	2	75	25	85	30	TCMT16T3...
6415	17*		22	78.81	2	75	20	200	30	TCMT1102...
6420	22*		27	98.52	2	75	20	200	30	TCMT1102...
6425	27*		35	118.22	2	75	25	200	30	TCMT16T3...
* without internal cooling				(280)						

Spare Parts for Chamfering Countersinks with Internal Cooling













Part No.	2966 TORX® screw for indexable inserts TCMT1102...	2966 TORX® screw for indexable inserts TCMT16T3...	5886 Screwdriver for TORX® T8 x 60 mm for indexable inserts TCMT 1102...	6233 Torque screwdriver1.2 Nm TX8 for indexable inserts WSP TCMT 1102...	5886 Torque screwdriver for TORX® T15 x 80 mm for indexable inserts WSP TCMT 16T3...	6233 Torque screwdriver 3.0 Nm TX15 for indexable inserts WSP TCMT 16T3...
0052	2.34*	–	–	–	–	–
0057	–	2.34*	–	–	–	–
0030	–	–	3.21	–	–	–
0015	–	–	–	17.79	–	–
0050	–	–	–	–	3.31	–
0030	–	–	–	–	–	20.45
* PU 10 units	(281)	(281)	(526)	(539)	(526)	(539)

ISO Indexable Inserts – Milling


M-...


M-M10


Alu-A20

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Corner radius	Precision sintered	Ground
6500	TCMT 110204 M M10	3.06*	●	–	●	–	0.4	●	–
6503	TCMT 110204 M T20	3.06*	●	–	●	–	0.4	●	–
6506	TCMT 110204 M T35	3.06*	●	●	●	–	0.4	●	–
6509	TCGT 110204 Alu A20	6.57*	–	–	●	●	0.4	–	●
6512	TCMT 110208 M M10	3.06*	●	–	●	–	0.8	●	–
6515	TCMT 110208 M T20	3.06*	●	–	●	–	0.8	●	–
6518	TCMT 110208 M T35	3.06*	●	●	●	–	0.8	●	–
6521	TCMT 16T304 M M10	3.71*	●	–	●	–	0.4	●	–
6524	TCMT 16T304 M T20	3.71*	●	–	●	–	0.4	●	–
6527	TCMT 16T304 M T35	3.71*	●	●	●	–	0.4	●	–
6530	TCGT 16T304 Alu A20	7.23*	–	–	●	●	0.4	–	●
6533	TCMT 16T308 M M10	3.71*	●	–	●	–	0.8	●	–
6536	TCMT 16T308 M T20	3.71*	●	–	●	–	0.8	●	–
6539	TCMT 16T308 M T35	3.71*	●	●	●	–	0.8	●	–

* PU 10 units (282)

NEW

ISO Tool Holder 90° PTGNR/L

- Tool holder for longitudinal turning
- For indexable inserts 0° negative
- With toggle lever clamping



2/170

Accessories and spare parts see page 2/170.

Chamfer Cutters/Indexable Inserts – Milling

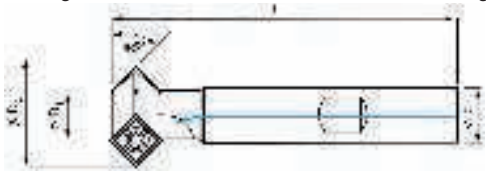
Cutters 45° with Internal Cooling

Design: Chamfering and milling cutter with parallel shank.

Scope of supply: Without indexable inserts, without screwdriver.

Application: Universal tool for milling chamfers, countersinks and deburring at 45° rake angle, as well as forward and backward deburring.

DIN 1835-B







Part No.	ø D min./max. D_1 mm D_2	2966	Number of cutting edges	K°	Dimensions mm ø d	L	Indexable insert
7000	2*° 5	59.11	1	45	12	80	CPMT 05T1...
7005	5 11	59.11	1	45	12	80	SPLT 0603/06AD...
7010	11 18	59.11	2	45	12	80	SPLT 0603/06AD...
7015	12 23.7	59.11	1	45	16	100	SCMT/SCGT 09T3...
7020	16 28.8	78.81	2	45	16	100	SCMT/SCGT 09T3...
7025	28 40.3	85.38	3	45	25	100	SCMT/SCGT 09T3...
7030	12* 23.7	59.11	1	45	16	200	SCMT/SCGT 09T3...
7035	16* 28.8	78.81	2	45	16	200	SCMT/SCGT 09T3...
7040	28* 40.3	85.38	3	45	25	200	SCMT/SCGT 09T3...
* without internal cooling		(280)					° only forward countersinking

Spare Parts for Chamfer Cutters 45° with Internal Cooling







Part No.	2966 TORX® screw for indexable inserts CPMT 05T1…	2966 TORX® screw for indexable inserts SPLT 06…	2966 TORX® screw for indexable insert SCMT 09T3…
0051	2.34*	–	–
0052	–	2.34*	–
0057	–	–	2.34*
* PU 10 units	(281)	(281)	(281)







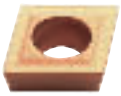






Part No.	5886 Screwdriver for TORX® T6 x 60 mm for indexable inserts CPMT 05T1…	6233 Torque screwdriver 0.6 Nm TX6 for indexable inserts CPMT 05T1…	5886 Screwdriver for TORX® T8 x 60 mm for indexable inserts SPLT 06…	6233 Torque screwdriver 1.2 Nm TX8 for indexable inserts SPLT 06…	5886 Screwdriver for TORX® T15 x 80 mm for indexable inserts SCMT 09T3…	6233 Torque screwdriver 3.0 Nm TX15 for indexable inserts SCMT 09T3…
0010	3.23	–	–	–	–	–
0005	–	17.36	–	–	–	–
0030	–	–	3.21	–	–	–
0015	–	–	–	17.79	–	–
0050	–	–	–	–	3.31	–
0030	–	–	–	–	–	20.45
	(526)	(539)	(526)	(539)	(526)	(539)

ISO Indexable Inserts – Milling



CPMT T35



M-M10



Alu-A20



SPLT E35



SPLT AD E35

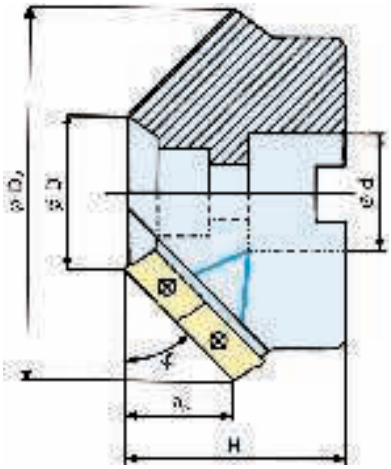
Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Corner radius	Precision sintered	Ground
7100	CPMT 05T102 T35	4.07*	●	●	●	–	0.2	●	–
7103	CPMT 05T104 T35	4.07*	●	●	●	–	0.4	●	–
4100	SPLT 060304 T35	4.38*	●	●	●	–	0.4	●	–
4105	SPLT 060304 E35	4.38*	●	●	–	–	0.4	●	–
7112	SPLT 0603AD T35	4.38*	●	●	●	–	–	●	–
7115	SPLT 0603AD E35	4.38*	●	●	–	–	–	●	–
7130	SCMT 09T304 M M10	3.52*	●	–	●	–	0.4	●	–
7133	SCMT 09T304 M T20	3.52*	●	–	●	–	0.4	●	–
7136	SCMT 09T304 M T35	3.52*	●	●	●	–	0.4	●	–
7139	SCGT 09T304 Alu A20	6.63*	–	–	●	●	0.4	–	●
7142	SCMT 09T308 M M10	3.52*	●	–	●	–	0.8	●	–
7145	SCMT 09T308 M T20	3.52*	●	–	●	–	0.8	●	–
7148	SCMT 09T308 M T35	3.52*	●	●	●	–	0.8	●	–
* PU 10 units		(282)							

Chamfer Cutters 15°, 30°, 45°, 60°, 75° with Internal Cooling

Design: Solid chamfer cutter, smooth running and low-vibration chipping due to positive cutting edge geometry.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For chamfering and edge cutting.







Part No.	∅ D min./max. D_1	mm	D_2	2966	K°	Cutting depth a_p mm	Dimensions mm ∅ d	H	z_c*	Number of indexable inserts	Indexable insert
8000	35		92	367.79	15	8	27	50	3	6	APKT/APHX 16...
8005	35		84	367.79	30	15	27	50	3	6	APKT/APHX 16...
8010	35		74	367.79	45	21.5	27	50	3	6	APKT/APHX 16...
8015	35		72	367.79	60	26.5	27	50	3	6	APKT/APHX 16...
8020	35		47	367.79	75	29.5	27	60	3	6	APKT/APHX 16...

(280)

• actual number of teeth for determining the feed

Spare Parts for Chamfer Cutters 15°, 30°, 45°, 60°, 75° with Internal Cooling







Part No.	2966 TORX® screw	5886 Screwdriver for TORX® T15 x 80 mm	6233 Torque screwdriver 3.0 Nm TX15
0057	2.34*	–	–
0050	–	3.31	–
0030	–	–	20.45
	(281)	(526)	(539)

* PU 10 units

ISO Indexable Inserts – Milling



PDER T35



PDER E35



FR Alu

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Precision sintered	Ground
0800	APKT 1604PDER T35	6.61*	●	●	●	–	●	–
0803	APKT 1604PDER E35	6.61*	●	●	–	–	●	–
0806	APHX 1604FR Alu A20	9.76*	–	–	●	●	–	●

* PU 10 units

(282)

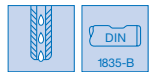
Chamfer Cutters/Indexable Inserts – Milling

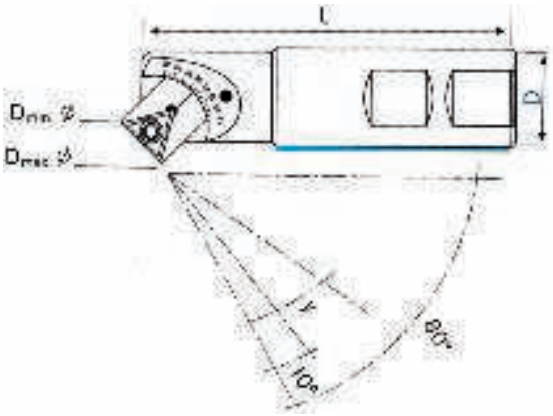
Chamfer Cutters 10–80° with Internal Cooling

Design: Adjustable chamfer cutter with parallel shank and cooling duct.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For deburring and chamfering.









Part No.	∅ D mm	2966	Dimensions ∅ D min.	∅ D max.	L	Y°	E	Number of cutting edges	Indexable insert
9000	25	131.35	5	32	100	10	–	1	TCMT/TCGT 16T3…
			6	33	100	20	–		
			7	34	100	30	–		
			10	33	100	40	–		
			11	33	100	45	–		
			13	32	100	50	–		
			16	31	100	60	–		
			19	29	100	70	–		
			23	27	100	80	–		
		(280)							

Spare Parts for Chamfer Cutter 10–80° with Internal Cooling













Part No.	2966 TORX® screw for indexable inserts	2966 Hex straining screw	2966 Cartridge	5886 Screwdriver for TORX® T15 x 80 mm	6233 Torque screwdriver 3.0 Nm TX15	5840 Hex socket offset screwdriver 4 mm
0057	2.34*	–	–	–	–	–
0068	–	5.67*	–	–	–	–
0070	–	–	63.05	–	–	–
0050	–	–	–	3.31	–	–
0030	–	–	–	–	20.45	–
0040	–	–	–	–	–	0.14
* PU 10 units	(281)	(281)	(281)	(526)	(539)	(528)

Indexable Inserts – Milling


M-...


M-M10


Alu-A20

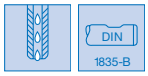
Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Corner radius	Precision sintered	Ground
6521	TCMT 16T304 M M10	3.71*	●	–	●	–	0.4	●	–
6524	TCMT 16T304 M T20	3.71*	●	–	●	–	0.4	●	–
6527	TCMT 16T304 M T35	3.71*	●	●	●	–	0.4	●	–
6530	TCGT 16T304 Alu A20	7.23*	–	–	●	●	0.4	–	●
6533	TCMT 16T308 M M10	3.71*	●	–	●	–	0.8	●	–
6536	TCMT 16T308 M T20	3.71*	●	–	●	–	0.8	●	–
6539	TCMT 16T308 M T35	3.71*	●	●	●	–	0.8	●	–
* PU 10 units		(282)							

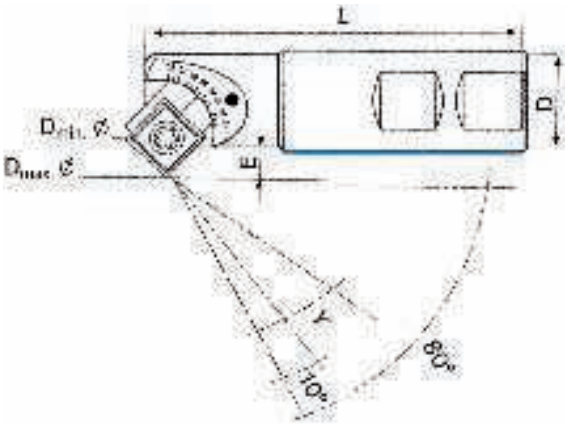
Chamfer Cutters 10–80° with Internal Cooling

Design: Adjustable chamfer cutter with parallel shank and cooling duct.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For deburring and chamfering.









Part No.	∅ D mm	2966	Dimensions mm ∅ D min.	∅ D max.	L	Y°	E	Number of cutting edges	Indexable insert
9200	25	131.35	7.5	30.0	100	10	2.7	1	SCMT/SCGT 1204…
			10.0	32.0	100	20	3.6		
			13.0	32.5	100	30	4.3		
			16.5	33.5	100	40	4.5		
			17.5	33.5	100	45	4.6		
			19.0	33.5	100	50	4.6		
			22.0	33.5	100	60	4.3		
			24.5	33.5	100	70	3.8		
			27.0	31.0	100	80	3.0		
		(280)							

Spare Parts for Chamfer Cutter 10–80° with Internal Cooling











Part No.	2966 TORX® screw for indexable inserts	2966 Hex straining screw	2966 Cartridge	5886 Screwdriver for TORX® T20 x 100 mm	5840 Hex socket offset screwdriver 4 mm
0061	2.34*	–	–	–	–
0068	–	5.67*	–	–	–
0069	–	–	63.05	–	–
0060	–	–	–	3.31	–
0040	–	–	–	–	0.14
* PU 10 units	(281)	(281)	(281)	(526)	(528)

ISO Indexable Inserts – Milling


M-...


M-M10


Alu-A20

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Corner radius	Precision sintered	Ground
9300	SCMT 120404 M M10	4.32*	●	–	●	–	0.4	●	–
9303	SCMT 120404 M T20	4.32*	●	–	●	–	0.4	●	–
9306	SCMT 120404 M T35	4.32*	●	●	●	–	0.4	●	–
9309	SCMT 120408 M M10	4.32*	●	–	●	–	0.8	●	–
9312	SCMT 120408 M T20	4.32*	●	–	●	–	0.8	●	–
9315	SCMT 120408 M T35	4.32*	●	●	●	–	0.8	●	–
9318	SCGT 120408 Alu A20	7.29*	–	–	●	●	0.8	–	●
* PU 10 units		(282)							

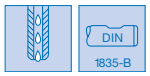
Countersink Cutters, Parallel Shank with Internal Cooling

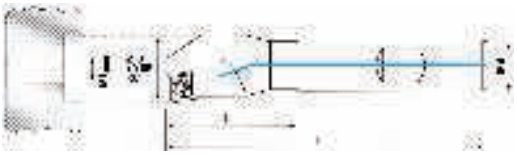
Countersink Cutters with Internal Cooling

Design: Countersink cutter with parallel shank.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For core drilling.







Part No.	ø D + 0.05/– 0.1 mm	2966	Dimensions mm ø F min.	L_1	L	ø d	Number of cutting edges	Indexable insert
9400	10	45.98	4	23	70	8	1	CCMT/CCGT 0602...
9405	11	45.98	4	24	75	10	1	CCMT/CCGT 0602...
9410	12	45.98	4	25	75	10	1	CCMT/CCGT 0602...
9415	13	45.98	5	27	85	12	1	CCMT/CCGT 0602...
9420	14	45.98	5	28	85	12	1	CCMT/CCGT 0602...
9425	15	45.98	5	29	90	12	1	CCMT/CCGT 0602...
9430	16	45.98	5	30	90	12	1	CCMT/CCGT 0602...
9435	17	45.98	5	30	95	16	1	CCMT/CCGT 09T3...
9440	18	59.11	5	40	95	16	1	CCMT/CCGT 09T3...
9445	19	59.11	5	40	95	16	1	CCMT/CCGT 09T3...
9450	20	59.11	5	40	95	16	1	CCMT/CCGT 09T3...
9455	21	65.68	5	42	100	20	1	CCMT/CCGT 09T3...
9460	22	65.68	6	42	100	20	1	CCMT/CCGT 09T3...
9465	23	65.68	6	42	100	20	1	CCMT/CCGT 09T3...
9470	24	65.68	6	42	100	20	1	CCMT/CCGT 09T3...
9475	25	65.68	8	42	100	20	1	CCMT/CCGT 09T3...
9480	26	65.68	8	56	120	25	1	CCMT/CCGT 09T3...
9485	27	65.68	8	56	120	25	1	CCMT/CCGT 09T3...
9490	28	65.68	10	56	120	25	1	CCMT/CCGT 09T3...
9495	29	72.25	10	56	120	25	1	CCMT/CCGT 09T3...
9500	30	72.25	10	56	120	25	1	CCMT/CCGT 09T3...
9505	31	72.25	12	56	120	25	1	CCMT/CCGT 09T3...
9510	32	72.25	12	56	120	25	1	CCMT/CCGT 09T3...
9515	33	72.25 (280)	12	56	120	25	1	CCMT/CCGT 09T3...

Spare Parts for Countersink Milling with Internal Cooling








Part No.	2966 TORX® screw ø 10–16 mm	2966 TORX® screw ø 17–33 mm	5886 Screwdriver for TORX® ø 10–16 mm T8 x 60 mm	6233 Torque screwdriver ø 10–16 mm 1.2 Nm TX8	5886 Screwdriver for TORX® ø 17–33 mm T15 x 80 mm	6233 Torque screwdriver ø 17–33 mm 3.0 Nm TX15
0052	2.34*	–	–	–	–	–
0057	–	2.34*	–	–	–	–
0030	–	–	3.21	–	–	–
0015	–	–	–	17.79	–	–
0050	–	–	–	–	3.31	–
0030	–	–	–	–	–	20.45
* PU 10 units	(281)	(281)	(526)	(539)	(526)	(539)

ISO Indexable Inserts – Milling





M-... M-M10 Alu-A20

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Corner radius	Precision sintered	Ground
9600	CCMT 060204 M M10	3.12*	●	–	●	–	0.4	●	–
9603	CCMT 060204 M T20	3.12*	●	–	●	–	0.4	●	–
9606	CCMT 060204 M T35	3.12*	●	●	●	–	0.4	●	–
9609	CCGT 060204 Alu A20	6.49*	–	–	●	●	0.4	–	●
9612	CCMT 060208 M M10	3.12*	●	–	●	–	0.8	●	–
9615	CCMT 060208 M T20	3.12*	●	–	●	–	0.8	●	–
9618	CCMT 060208 M T35	3.12*	●	●	●	–	0.8	●	–
9621	CCMT 09T304 M M10	3.65*	●	–	●	–	0.4	●	–
9624	CCMT 09T304 M T20	3.65*	●	–	●	–	0.4	●	–
9627	CCMT 09T304 M T35	3.65*	●	●	●	–	0.4	●	–
9630	CCGT 09T304 Alu A20	7.23*	–	–	●	●	0.4	–	●
* PU 10 units		(282)							

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Countersink Cutters, Parallel Shank with Internal Cooling

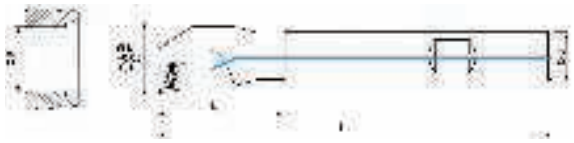
Cutters for Core Drilling with Internal Cooling

Design: Cutter for core drilling with parallel shank.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For core drilling.

DIN 1835-B





Part No.	⌀ D + 0.05/– 0.1 mm	2966	Dimensions mm ⌀ F min.	L_1	L	⌀ d	Number of cutting edges	Indexable insert
9700	9.8	59.11	8	23	90	8	1	CCMT/CCGT 0602...
9703	10.8	59.11	10	24	105	10	1	CCMT/CCGT 0602...
9706	11.8	59.11	10	25	105	10	1	CCMT/CCGT 0602...
9709	12.8	59.11	12	26	105	10	1	CCMT/CCGT 0602...
9712	13.8	59.11	12	27	110	12	1	CCMT/CCGT 0602...
9715	14.8	59.11	12	28	120	12	1	CCMT/CCGT 0602...
9718	15.8	65.68	12	29	125	12	1	CCMT/CCGT 0602...
9721	16.8	65.68	16	30	140	16	1	CCMT/CCGT 0602...
9724	17.8	65.68	16	31	140	16	1	CCMT/CCGT 0602...
9727	18.8	65.68	16	32	150	16	1	CCMT/CCGT 0602...
9730	19.8	65.68	16	33	150	16	1	CCMT/CCGT 0602...
9733	20.8	78.81	20	34	160	16	1	CCMT/CCGT 09T3...
9736	21.8	78.81	20	35	160	20	1	CCMT/CCGT 09T3...
9739	22.8	78.81	20	36	165	20	1	CCMT/CCGT 09T3...
9742	23.8	78.81	20	37	170	20	1	CCMT/CCGT 09T3...
9745	24.8	78.81	20	38	180	20	1	CCMT/CCGT 09T3...
9748	25.8	91.95	25	39	185	20	1	CCMT/CCGT 09T3...
9751	26.8	91.95	25	40	190	20	1	CCMT/CCGT 09T3...
9754	27.8	91.95	25	41	190	20	1	CCMT/CCGT 09T3...
9757	28.8	91.95	25	42	200	20	1	CCMT/CCGT 09T3...
9760	29.8	91.95	25	43	200	25	1	CCMT/CCGT 09T3...
9763	30.8	105.08	25	44	200	25	1	CCMT/CCGT 09T3...
9766	31.8	105.08 (280)	25	45	200	25	1	CCMT/CCGT 09T3...

Spare Parts for Core Drilling Cutters with Internal Cooling













Part No.	2966 TORX® screw ⌀ 9.8–19.8 mm	2966 TORX® screw ⌀ 20.8–31.8 mm	5886 Screwdriver for TORX® ⌀ 9.8–19.8 mm T8 x 60 mm	6233 Torque screwdriver ⌀ 9.8–19.8 mm 1.2 Nm TX8	5886 Screwdriver for TORX® ⌀ 20.8–31.8 mm T15 x 80 mm	6233 Torque screwdriver ⌀ 20.8–31.8 mm 3.0 Nm TX15
0052	2.34*	–	–	–	–	–
0057	–	2.34*	–	–	–	–
0030	–	–	3.21	–	–	–
0015	–	–	–	17.79	–	–
0050	–	–	–	–	3.31	–
0030	–	–	–	–	–	20.45
* PU 10 units	(281)	(281)	(526)	(539)	(526)	(539)

ISO Indexable Inserts – Milling



M-...



M-M10



Alu-A20

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Corner radius	Precision sintered	Ground
9600	CCMT 060204 M M10	3.12*	●	–	●	–	0.4	●	–
9603	CCMT 060204 M T20	3.12*	●	–	●	–	0.4	●	–
9606	CCMT 060204 M T35	3.12*	●	●	●	–	0.4	●	–
9609	CCGT 060204 Alu A20	6.49*	–	–	●	●	0.4	–	●
9612	CCMT 060208 M M10	3.12*	●	–	●	–	0.8	●	–
9615	CCMT 060208 M T20	3.12*	●	–	●	–	0.8	●	–
9618	CCMT 060208 M T35	3.12*	●	●	●	–	0.8	●	–
9621	CCMT 09T304 M M10	3.65*	●	–	●	–	0.4	●	–
9624	CCMT 09T304 M T20	3.65*	●	–	●	–	0.4	●	–
9627	CCMT 09T304 M T35	3.65*	●	●	●	–	0.4	●	–
9630	CCGT 09T304 Alu A20	7.23*	–	–	●	●	0.4	–	●
* PU 10 units		(282)							

Reverse Milling Countersinks

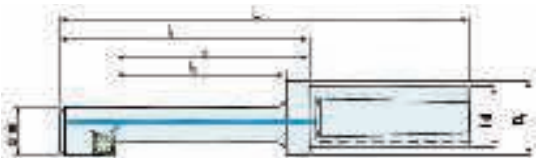
Reverse Milling Countersinks 180° with Internal Cooling

Design: Reverse milling countersink 180°, shank DIN 1835E.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For reverse countersinking 180°.

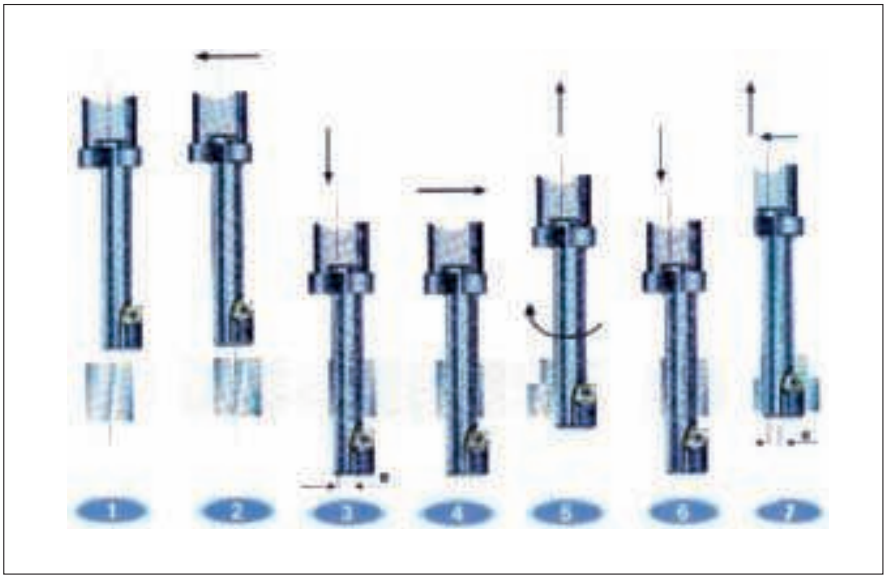
DIN 1835E





Part No.	∅ D	2966	Dimensions mm								Indexable insert
	mm		∅ d min.	∅ d	L	l_1	l_2	l_3	D_1	e	
9770	15*	78.19	8.5	20	105	55	42	35	25	3.5	CPMT05T1...
9772	18*	78.19	10.5	20	112	62	47	40	25	4.0	CCMT/CCGT06...
9774	20	87.57	13	20	117	67	52	45	25	3.75	CCMT/CCGT06...
9776	24	93.82	15	20	122	72	57	50	25	4.75	CCMT/CCGT06...
9778	26	93.82	17	20	132	82	67	60	25	5.0	CCMT/CCGT06...
9780	30	100.08	19	20	142	92	77	65	25	6.0	CCMT/CCGT09...
9782	33	118.84	21	20	152	102	82	75	25	6.6	CCMT/CCGT09...
9784	36	181.39	23	32	173	113	93	85	40	7.0	CCMT/CCGT09...
9786	40	206.41	25	32	183	123	103	95	40	8.0	CCMT/CCGT09...
9788	43	218.92	30	32	183	123	103	95	40	7.0	CCMT/CCGT09...
9790	48	237.69	33	32	223	163	143	135	40	8.0	CCMT/CCGT09...

* without internal cooling (280)



1. Position in the middle of the bore hole (Spindle orientation 0°)
2. Replace to clearance distance. Spindle orientation 0°
3. Shift the workpiece by dimension (e) – move out
4. Shift by programmed dimension (e)
5. Immerse to desired depth respecting a clearance distance (without speed)
6. Replace to middle of the bore hole by dimension (e)
7. Countersink to the desired depth

Spare Parts for Countersink Milling with Internal Cooling





Part No.	2966 TORX® screw for indexable inserts	2966 TORX® screw for indexable inserts	2966 TORX® screw for indexable inserts
0051	2.34*	–	–
0052	–	2.34*	–
0057	–	–	2.34*
* PU 10 units	(281)	(281)	(281)

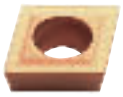







Part No.	5886 Screwdriver for TORX® T6 x 60 mm	6233 Torque screwdriver 0.6 Nm TX6	5886 Screwdriver for TORX® T8 x 60 mm	6233 Torque screwdriver 1.2 Nm TX8	5886 Screwdriver for TORX® T15 x 80 mm	6233 Torque screwdriver 3.0 Nm TX15
0010	3.23	–	–	–	–	–
0005	–	17.36	–	–	–	–
0030	–	–	3.21	–	–	–
0015	–	–	–	17.79	–	–
0050	–	–	–	–	3.31	–
0030	–	–	–	–	–	20.45
	(526)	(539)	(526)	(539)	(526)	(539)

ISO Indexable Inserts – Milling







CPMT T35 | M-M10 | Alu-A20 | SPLT E35 | SPLT AD E35

Part No.	Product name	2966	P Steel	M VA/INOX	K GG	Non-ferrous metals	Corner radius	Precision sintered	Ground
7100	CPMT 05T102 T35	4.07*	●	●	●	–	0.2	●	–
7103	CPMT 05T104 T35	4.07*	●	●	●	–	0.4	●	–
9600	CCMT 060204 M M10	3.12*	●	–	●	–	0.4	●	–
9603	CCMT 060204 M T20	3.12*	●	–	●	–	0.4	●	–
9606	CCMT 060204 M T35	3.12*	●	●	●	–	0.4	●	–
9609	CCGT 060204 Alu A20	6.49*	–	–	●	●	0.4	–	●
9621	CCMT 09T304 M M10	3.65*	●	–	●	–	0.4	●	–
9624	CCMT 09T304 M T20	3.65*	●	–	●	–	0.4	●	–
9627	CCMT 09T304 M T35	3.65*	●	●	●	–	0.4	●	–
9630	CCGT 09T304 Alu A20	7.23*	–	–	●	●	0.4	–	●
* PU 10 units		(282)							

	P Steel	M VA/INOX	K GG	N Non-ferrous metal	
	Recommended cutting values				

Indexable Inserts – Solid Carbide Bits with Internal Cooling

Part No.	Dimensions	Indexable insert	Page					
2966 9800 – 2966 9953	ø 16–57 mm	WCMT 0302...	2/165	v_c 120–180	v_c 90–120	v_c 100–250	v_c 200–450	●
		WCMT 0402...		f_z 0.01–0.35	f_z 0.01–0.3	f_z 0.01–0.35	f_z 0.01–0.35	
		WCMT 0503...						
		WCMT 06T3...						
		WCMT 0804...						

● = with Internal Cooling



Recommended Cutting Data

Material	Feed rate f_z (mm/n)					Cutting speed (m/min)
	ø 16–ø 17	ø 18–ø 23	ø 24–ø 30	ø 31–ø 48	> ø 48	
Non-Alloy Steel	0.05–0.15	0.08–0.15	0.08–0.20	0.10–0.25	0.10–0.30	120–180
Alloyed Steel	0.05–0.10	0.08–0.15	0.08–0.15	0.10–0.18	0.10–0.20	100–150
High Alloyed Steel	0.05–0.10	0.08–0.15	0.08–0.15	0.10–0.18	0.10–0.20	100–150
Stainless Steel	0.05–0.10	0.08–0.15	0.08–0.15	0.10–0.20	0.10–0.25	90–120
Pig Iron	0.05–0.10	0.08–0.15	0.08–0.20	0.10–0.25	0.10–0.25	100–250

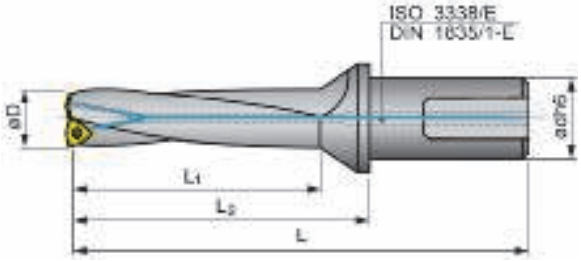
Solid Carbide Bits with Internal Cooling 3 x D

Design: Solid carbide bits with internal cooling.

Scope of supply: Without indexable inserts, without screwdriver.

Application: Solid carbide bit, for horizontal and vertical use, stand and/or rotating use.







Part No.	ø D	2966	Dimensions mm				Number of cutting edges	Indexable insert
	mm		L_1	L_2	L	ø dh 6		
9800	16.0	105.08	49	80	134	25	2	WCMT0302...
9803	17.0	105.08	52	83	137	25	2	WCMT0302...
9805	16.5	105.08	50.5	81.5	135.5	25	2	WCMT0302...
9806	17.5	105.08	54.5	84.5	138.5	25	2	WCMT0302...
9809	18.0	105.08	56	86	140	25	2	WCMT0302...
9812	18.5	105.08	57.5	87.5	141.5	25	2	WCMT0302...
9815	19.0	105.08	59	89	143	25	2	WCMT0302...
9818	19.5	105.08	60.5	90.5	144.5	25	2	WCMT0302...
9821	20.0	105.08	62	92	146	25	2	WCMT0302...
9824	20.5	105.08	63.5	93.5	147.5	25	2	WCMT0302...
9827	21.0	111.65	65	95	149	25	2	WCMT0402...
9830	21.5	111.65	66.5	96.5	150.5	25	2	WCMT0402...
9833	22.0	111.65	68	98	152	25	2	WCMT0402...
9836	22.5	111.65	69.5	99.5	153.5	25	2	WCMT0402...
9839	23.0	111.65	71	101	155	25	2	WCMT0402...
9842	23.5	111.65	72.5	102.5	156.5	25	2	WCMT0402...
9848	24.5	111.65	75.5	105.5	159.5	25	2	WCMT0402...
9851	25.0	111.65	77	107	161	25	2	WCMT0402...
9854	25.5	111.65	78.5	108.5	162.5	25	2	WCMT0402...
9857	26.0	118.22	80	110	164	25	2	WCMT0402...
9860	26.5	118.22	81.5	111.5	165.5	25	2	WCMT0503...
9863	27.0	118.22	83	113	167	25	2	WCMT0503...
9866	28.0	118.22	86	116	170	25	2	WCMT0503...
9869	29.0	118.22	89	119	173	25	2	WCMT0503...
9872	30.0	118.22	92	122	180	32	2	WCMT0503...
9875	31.0	137.93	95	125	183	32	2	WCMT0503...
9878	32.0	137.93	98	128	186	32	2	WCMT06T3...
9881	33.0	137.93	101	131	189	32	2	WCMT06T3...
9884	34.0	137.93	104	134	192	32	2	WCMT06T3...
9887	35.0	137.93	107	137	195	32	2	WCMT06T3...
9890	36.0	137.93	110	140	198	32	2	WCMT06T3...
9893	37.0	137.93	113	143	201	32	2	WCMT06T3...
9896	38.0	137.93	116	146	204	32	2	WCMT06T3...
9899	39.0	137.93	119	149	207	32	2	WCMT06T3...
9902	40.0	137.93	122	152	210	32	2	WCMT06T3...
9845	24.0	111.65	74	104	158	32	2	WCMT06T3...
9905	41.0	137.93	125	155	213	32	2	WCMT06T3...
9908	42.0	164.20	128	158	216	32	2	WCMT0804...
9911	43.0	164.20	131	161	219	32	2	WCMT0804...
9914	44.0	164.20	134	164	222	32	2	WCMT0804...
9917	45.0	177.33	137	172	240	40	2	WCMT0804...
9920	46.0	177.33	140	175	243	40	2	WCMT0804...
9923	47.0	177.33	143	178	246	40	2	WCMT0804...
9926	48.0	177.33	146	181	249	40	2	WCMT0804...
9929	49.0	229.87	149	184	252	40	2	WCMT0804...
9932	50.0	229.87	152	187	255	40	2	WCMT0804...
9935	51.0	229.87	155	190	258	40	2	WCMT0804...
9938	52.0	229.87	158	193	261	40	2	WCMT0804...
9941	53.0	229.87	161	196	264	40	2	WCMT0804...
9944	54.0	262.71	164	199	267	40	2	WCMT0804...
9947	55.0	262.71	167	202	270	40	2	WCMT0804...
9950	56.0	262.71	170	205	273	40	2	WCMT0804...
9953	57.0	262.71	173	208	276	40	2	WCMT0804...

(283)

Solid Carbide Bits/Indexable Inserts – Milling

Spare Parts for Solid Bits with Internal Cooling







Part No.	**2966** TORX® screw ø 16–20.5 mm	**2966** TORX® screw ø 21–25.5 mm	**2966** TORX® screw ø 26–30 mm	**2966** TORX® screw ø 31–41 mm	**2966** TORX® screw ø 42–57 mm
0053	2.98*	–	–	–	–
0052	–	2.34*	–	–	–
0055	–	–	2.98*	–	–
0056	–	–	–	2.34*	–
0058	–	–	–	–	2.98*
* PU 10 units	(281)	(281)	(281)	(281)	(281)







Part No.	**5886** Screwdriver for TORX® T8 x 60 mm ø 16–25.5 mm	**6233** Torque screwdriver 1,2 Nm TX8 ø 16–25.5 mm	**5886** Screwdriver for TORX® T15 x 80 mm ø 26–41 mm	**6233** Torque screwdriver 3,0 Nm TX15 ø 26–41 mm	**5886** Screwdriver for TORX® T20 x 100 mm ø 42–57 mm
0030	3.21	–	–	–	–
0015	–	17.79	–	–	–
0050	–	–	3.31	–	–
0030	–	–	–	20.45	–
0060	–	–	–	–	3.38
	(526)	(539)	(526)	(539)	(526)

Indexable Inserts for Solid Carbide Bits



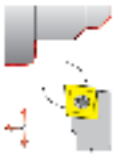
M-T35

Part No.	Product name	**2967**	P Steel	M VA/INOX	K GG	Non-ferrous metals	Corner radius	Precision sintered	Ground
0100	WCMT 030208 M T35	5.63*	●	●	●	–	0.8	●	–
0103	WCMT 040208 M T35	5.63*	●	●	●	–	0.8	●	–
0106	WCMT 050308 M T35	5.63*	●	●	●	–	0.8	●	–
0109	WCMT 06T308 M T35	6.25*	●	●	●	–	0.8	●	–
0112	WCMT 080408 M T35	6.25*	●	●	●	–	0.8	●	–
0115	WCMT 080412 M T35	6.25*	●	●	●	–	1.2	●	–
* PU 10 units		(284)							

Outside Turning

Tool Holders 95° for Indexable Inserts 7° Positive

Part No.	Type	Indexable inserts	Page
2968 0000 – 2968 0015	SCLCR/L	CCMT/CCGT 09T3...	2/174





Tool Holders 95° for Indexable Inserts 0° Negative

Part No.	Type	Indexable inserts	Page
2968 0400 – 2968 0415	PCLNR/L	CNMG 1204...	2/176





2968 0800 – 2968 0815	PWLNR/L	WNMG 0804...	2/179





Tool Holders 93° for Indexable Inserts 7° Positive

Part No.	Type	Indexable inserts	Page
2968 0200 – 2968 0225	SDJCR/L	DCMT/DCGT 11T3...	2/175





Tool Holders 93° for Indexable Inserts 0° Negative

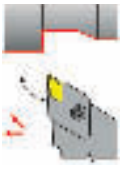
Part No.	Type	Indexable inserts	Page
2968 0600 – 2968 0615	PDJNR/L	DNMG 1506...	2/177





Tool Holders 93° for Indexable Inserts 0° Negative

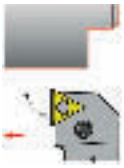
Part No.	Type	Indexable inserts	Page
2968 0850 – 2968 0865	CKJNR/L	KNUX 1604...	2/180





Tool Holders 93° for Indexable Inserts 0° Negative

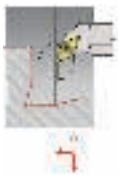
Part No.	Type	Indexable inserts	Page
2968 0650 – 2968 0665	PTGNR/L	TNMG 1604...	2/178





Inside Turning

Boring Bars 107.5° for Indexable Inserts 7° Positive, Internal Cooling



Part No.	Type	Indexable inserts	Page
2968 2000 – 2968 2045	A..-SDQCR/L	DCMT/DCGT 07/11T3...	2/185
2968 2050 – 2868 2055	Set-SDQCR/L	DCMT/DCGT 0702...	2/185



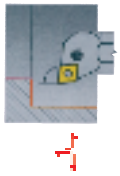
Boring Bars 95° for Indexable Inserts 7° Positive, Internal Cooling



Part No.	Type	Indexable inserts	Page
2968 1000 – 2968 1055	A..-SCLCR/L	CCMT/CCGT 06/09T3...	2/181
2968 1060 and 2868 1070	Set-SCLCR/L	CCMT/CCGT 0602...	2/181



Boring Bars 95° for Indexable Inserts 0° Negative, Internal Cooling



Part No.	Type	Indexable inserts	Page
2968 1200 – 2968 1215	A...-PCLNR/L	CNMG 1204...	2/190





2968 1800 – 2968 1815	A...-PWLNR/L	WNMG 0804...	2/192

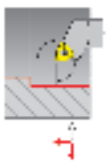


Boring Bars 93° for Indexable Inserts 7° Positive, Internal Cooling



Part No.	Type	Indexable inserts	Page
2968 1300 – 2968 1345	A...-SDUCR/L	DCMT/DCGT 07/11T3...	2/183
2968 1350 and 2968 1360	Set-SDUCR/L	DCMT/DCGT 0702...	2/183





2968 1700 – 2968 1715	A...-SWUCR/L	WCGT 0201...	2/187
2968 1720 and 2968 1730	Set-SWUCR/L	WCGT 0201...	2/187



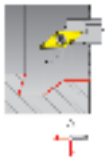
Boring Bars 93° for Indexable Inserts 0° Negative, Internal Cooling



Part No.	Type	Indexable inserts	Page
2968 1900 – 2968 1905	A...-PDUNR/L	DNMG 1506...	2/191



Boring Bars 52° for Indexable Inserts 7° Positive, Internal Cooling

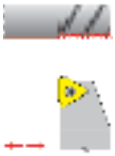


Part No.	Type	Indexable inserts	Page
2968 1500 – 2968 1525	A...-SVJCR/L	VCMT/VCGT 1103/1604...	2/188
2968 1530 and 2968 1540	Set-SVJCR/L	VCMT/VCGT 1103...	2/188



Thread Cutting Tools

Threaded Tool Holders (External)



Part No.	Type	Indexable inserts	Page
2969 0000 – 2969 0110	SER/L	TN16ER/L	2/194



Threaded Tool Holders (Internal)



Part No.	Type	Indexable inserts	Page
2969 0700 – 2969 0840	SIR/L	TN11/16/22NR/L...	2/196



Punching Tools

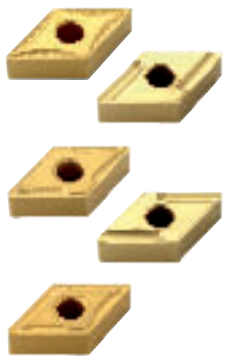
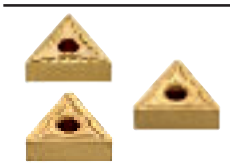
Holders for Punching and Slicing Blades

Part No.	Type	Description	Page
2969 3000 – 2969 3015	26/32 – DU	Holding system	2/199
2669 3100 – 2669 3115	XLCFN26/32...	Blade	2/199





	2968	Cutting geometry Description	£ PU/10 units	AL	F	M	R	R/L-EC	WM	WF Cermet
	Part No.	**Indexable Inserts 7° Positive**								
	1127	CCGT 060202 AL KNH 9010	5.04	●						
	1130	CCGT 060202 AL N 9020	3.82	●						
	1133	CCGT 060204 AL KNH 9010	4.78	●						
	1136	CCGT 060204 AL N 9020	3.67	●						
	0137	CCGT 09T302 AL KNH 9010	5.42	●						
	0139	CCGT 09T302 AL N 9020	4.14	●						
	0124	CCGT 09T304 AL KNH 9010	5.16	●						
	0127	CCGT 09T304 AL N 9020	3.94	●						
	0130	CCGT 09T308 AL KNH 9010	5.16	●						
	0133	CCGT 09T308 AL N 9020	3.94	●						
	1100	CCCMT 060202 F U 9035	2.29		●					
	1103	CCMT 060204 F PMK 9030	2.17		●					
	1106	CCMT 060204 F U 9035	2.17		●					
	1109	CCMT 060202 M PMK 9030	2.29			●				
	1112	CCMT 060202 M U 9035	2.29			●				
	1115	CCMT 060204 M PMK 9030	2.17			●				
	1118	CCMT 060204 M U 9035	2.17			●				
	1121	CCMT 060208 M PMK 9030	2.17			●				
	1124	CCMT 060208 M U 9035	2.17			●				
	0100	CCMT 09T304 F PMK 9030	2.55		●					
	0103	CCMT 09T304 F U 9035	2.55		●					
	0106	CCMT 09T308 F PMK 9030	2.55		●					
	0109	CCMT 09T308 F U 9035	2.54		●					
	0112	CCMT 09T304 M PMK 9030	2.54			●				
	0115	CCMT 09T304 M U 9035	2.54			●				
	0118	CCMT 09T308 M PMK 9030	2.54			●				
	0121	CCMT 09T308 M U 9035	2.54			●				
	1424	DCGT 070202 AL KNH 9010	4.99	●						
	1427	DCGT 070202 AL N 9020	3.94	●						
	1418	DCGT 070204 AL KNH 9010	4.78	●						
	1421	DCGT 070204 AL N 9020	3.76	●						
	0327	DCGT 11T302 AL KNH 9010	5.10	●						
	0330	DCGT 11T302 AL N 9020	3.56	●						
	0321	DCGT 11T304 AL KNH 9010	5.26	●						
	0324	DCGT 11T304 AL N 9020	4.14	●						
	1400	DCMT 070202 F PMK 9030	2.29		●					
	1403	DCMT 070204 F PMK 9030	2.17		●					
	1406	DCMT 070202 M PMK 9030	2.29			●				
	1409	DCMT 070202 M U 9035	2.29			●				
	1412	DCMT 070204 M PMK 9030	2.17			●				
	1415	DCMT 070204 M U 9035	2.17			●				
	0300	DCMT 11T304 F PMK 9030	2.97		●					
	0303	DCMT 11T308 F PMK 9030	2.97		●					
	0306	DCMT 11T304 M PMK 9030	2.97			●				
	0309	DCMT 11T304 M U 9035	2.97			●				
	0312	DCMT 11T308 M PMK 9030	2.97			●				
	0315	DCMT 11T308 M U 9035	2.97			●				
	0318	DCMT 11T312 M PMK 9030	2.97			●				
	1612	VCGT 110304 AL KNH 9010	6.86	●						
	1615	VCGT 110304 AL N 9020	5.31	●						
	1636	VCGT 160404 AL KNH 9010	7.13	●						
	1639	VCGT 160404 AL N 9020	5.63	●						
	1642	VCGT 160408 AL KNH 9010	7.13	●						
	1645	VCGT 160408 AL N 9020	5.63	●						
	1648	VCGT 160412 AL KNH 9010	7.13	●						
	1651	VCGT 160412 AL N 9020	5.63	●						
	1600	VCMT 110304 F PMK 9030	3.99		●					
	1603	VCMT 110304 F U 9035	3.99		●					
										

2968	Cutting geomety Description	£ PU/10 units	AL	F	M	R	R/L-EC	WM	WF Cermet
Part No.	**Indexable Inserts 7° Positive**								
									
1606	VCMT 110308 F PMK 9030	3.99		●					
1609	VCMT 110308 F U 9035	3.99		●					
1618	VCMT 160404 F PMK 9030	4.47		●					
1621	VCMT 160404 F U 9035	4.47		●					
1624	VCMT 160408 F PMK 9030	4.47		●					
1627	VCMT 160408 F U 9035	4.47		●					
1630	VCMT 160412 F PMK 9030	4.47		●					
1633	VCMT 160412 F U 9035	4.47		●					
1750	WCGT 020102 WF CT 29	8.62							●
	Indexable Inserts 0° Negative								
									
0500	CNMG 120404 F PMK 9030	3.40		●					
0503	CNMG 120408 M PMK 9030	3.40			●				
0506	CNMG 120408 R PMK 9030	3.40				●			
0545	CNMG 120408 M PMK 9040	3.40			●				
0548	CNMG 120408 R PMK 9040	3.40				●			
0509	CNMG 120412 M PMK 9030	3.40			●				
0512	CNMG 120412 R PMK 9030	3.40				●			
0515	CNMG 120404L EC PMK 9030	3.40					●		
0518	CNMG 120404L EC U 9035	3.40					●		
0521	CNMG 120408L EC PMK 9030	3.40					●		
0524	CNMG 120408L EC U 9035	3.40					●		
0527	CNMG 120404R EC PMK 9030	3.40					●		
0530	CNMG 120404R EC U 9035	3.40					●		
0533	CNMG 120408R EC PMK 9030	3.40					●		
0536	CNMG 120408R EC U 9035	3.40					●		
0539	CNMG 120408 WM PMK 9030	3.88						●	
0542	CNMG 120412 WM PMK 9030	3.88						●	
									
0700	DNMG 150604 F PMK 9030	4.89		●					
0733	DNMG 150604R EC PMK 9030	4.89					●		
0736	DNMG 150604R EC U 9035	4.89					●		
0721	DNMG 150604L EC PMK 9030	4.89					●		
0724	DNMG 150604L EC U 9035	4.89		●			●		
0703	DNMG 150608 F PMK 9030	4.89		●					
0706	DNMG 150608 M PMK 9030	4.89			●				
0712	DNMG 150608 R PMK 9030	4.89				●			
0739	DNMG 150608R EC PMK 9030	4.89					●		
0742	DNMG 150608R EC U 9035	4.89					●		
0727	DNMG 150608L EC PMK 9030	4.89					●		
0730	DNMG 150608L EC U 9035	4.89					●		
0709	DNMG 150612 M PMK 9030	4.89			●				
0715	DNMG 150612 R PMK 9030	4.89				●			
0718	DNMG 150616 R PMK 9030	4.89				●			
									
0750	TNMG 160404 F PMK 9030	2.92		●					
0753	TNMG 160404 F U 9035	2.92		●					
0756	TNMG 160408 M PMK 9030	2.92			●				
0759	TNMG 160408 M PMK 9040	2.92			●				
0762	TNMG 160408 R PMK 9030	2.92				●			
0765	TNMG 160408 R PMK 9040	2.92				●			
									
0900	WNMG 080404 F PMK 9030	3.61		●					
0903	WNMG 080408 F PMK 9030	3.61		●					
0909	WNMG 080408 R PMK 9030	3.61				●			
0915	WNMG 080408 WM PMK 9030	4.20						●	
0906	WNMG 080412 M PMK 9030	3.61			●				
0912	WNMG 080412 R PMK 9030	3.61				●			
0918	WNMG 080412 WM PMK 9030	4.20						●	
									
0950	KNUX 160405R M KP 9015	4.30			●				
0953	KNUX 160405R M PMK 9040	4.30			●				
0956	KNUX 160410R M KP 9015	4.30			●				
0959	KNUX 160410R M PMK 9040	4.30			●				
0962	KNUX 160405L M KP 9015	4.30			●				
0965	KNUX 160405L M PMK 9040	4.30			●				
0968	KNUX 160410L M KP 9015	4.30			●				
0971	KNUX 160410L M PMK 9040	4.30			●				

Overview Indexable Inserts – Turning

	P Steel			M INOX			K Cast iron		
Type of machining	**Finishing**	**Medium machining**	**Roughing**	**Finishing**	**Medium machining**	**Roughing**	**Finishing**	**Medium machining**	**Roughing**
Cutting depth (a_p) mm	0.2–2.0	1.5–4.0	4.0–10	0.2–2.0	1.5–4.0	4.0–10	0.2–2.0	1.5–4.0	4.0–10
Cutting depth (a_p) mm Cermet	0.1–0.8	–	–	–	–	–	0.1–0.8	–	–
Feed f (mm/U)	0.05–0.20	0.20–0.40	0.40–0.80	0.05–0.20	0.20–0.40	0.40–0.80	0.05–0.20	0.20–0.40	0.40–0.80

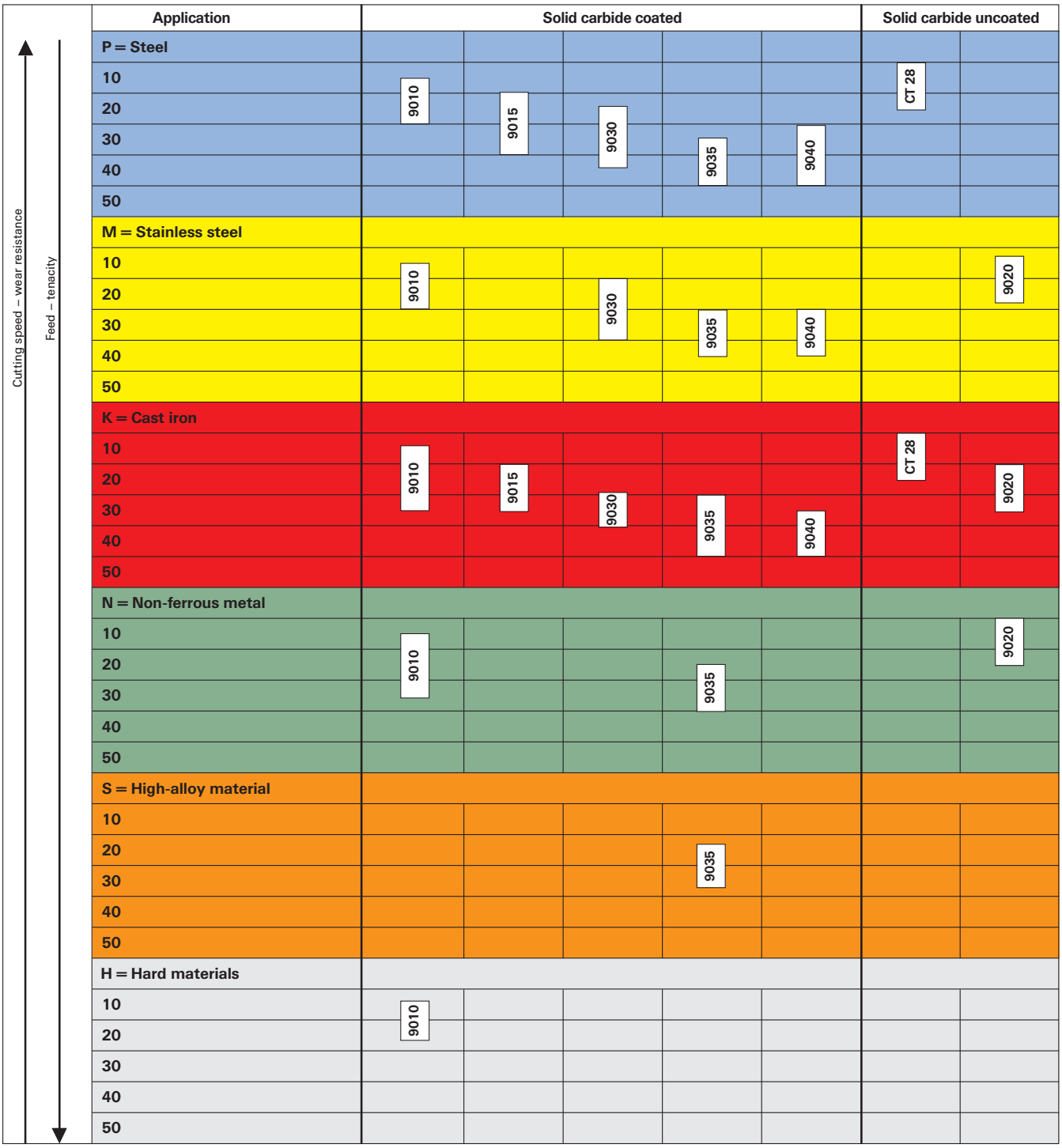
Geometry/Solid carbide	**Cutting speed (V_c) m/min**			**Cutting speed (V_c) m/min**			**Cutting speed (V_c) m/min**		
CCG./9020	–	–	–	–	–	–	–	–	–
CCG./9010	–	–	–	40–80	–	–	–	–	–
CCM., CNM./9030	300	235	165	225	160	115	265	205	245
CCM., CNM./9035	235	190	–	110	80	–	140	110	–
DCG./9020	–	–	–	–	–	–	–	–	–
DCG./9010	–	–	–	40–80	–	–	–	–	–
DCM., DNM./9030	280	220	155	210	150	100	250	195	135
DCM., DNM./9035	220	180	–	100	75	–	130	100	–
KNUX./9015	275	245	205	–	–	–	260	225	190
KNUX./9040	245	215	185	145	130	110	230	200	175
TNM./9030	250	230	200	145	130	95	250	230	200
TNM./9035	160	130	95	90	75	55	145	125	90
TNM./9040	–	220	140	–	130	80	–	205	130
VCG./9020	–	–	–	–	–	–	–	–	–
VCG./9010	–	–	–	–	–	–	–	–	–
VCM./9030	230	190	–	165	120	–	170	130	–
VCM./9035	205	165	–	95	70	–	125	90	–
WCGT/CT28 Cermet	100–300	–	–	–	–	–	150–300	–	–

	N Non-ferrous metals			S Super alloy			H 45–60 HRc		
Type of machining	**Finishing**	**Medium machining**	**Roughing**	**Finishing**	**Medium machining**	**Roughing**	**Finishing**	**Medium machining**	**Roughing**
Cutting depth (a_p) mm	0.2–2.0	1.5–4.0	4.0–10	0.2–2.0	1.5–4.0	4.0–10	0.2–2.0	1.5–4.0	4.0–10
Cutting depth (a_p) mm Cermet	–	–	–	–	–	–	–	–	–
Feed f (mm/U)	0.05–0.20	0.20–0.40	0.40–0.80	0.05–0.20	0.20–0.40	0.40–0.80	0.05–0.20	0.20–0.40	0.40–0.80

Geometry/Solid carbide	**Cutting speed (V_c) m/min**			**Cutting speed (V_c) m/min**			**Cutting speed (V_c) m/min**		
CCG./9020	600– 840	500–600	300–500	–	–	–	–	–	–
CCG./9010	840–1.200	600–840	300–600	40–80	–	–	–	–	–
CCM., CNM./9030	–	–	–	80	70	50	–	–	–
CCM., CNM./9035	–	–	–	55	–	–	30	–	–
DCG./9020	600– 840	500–600	300–500	–	–	–	–	–	–
DCG.9010	840–1.200	600–840	300–600	40–80	–	–	–	–	–
DCM., DNM./9030	–	–	–	75	65	45	–	–	–
DCM., DNM./9035	650	450	300	45	–	–	25	–	–
KNUX./9015	–	–	–	–	–	–	–	–	–
KNUX./9040	–	–	–	–	–	–	–	–	–
TNM./9030	–	–	–	–	–	–	–	–	–
TNM./9035	540	350	140	45	30	15	–	–	–
TNM./9040	–	–	–	–	–	–	–	–	–
VCG./9020	550	400	280	–	–	–	–	–	–
VCG./9010	700	500	300	60	–	–	30	–	–
VCM./9030	–	–	–	70	60	–	–	–	–
VCM./9035	600	400	280	40	–	–	20	–	–
WCGT/CT28 Cermet	–	–	–	–	–	–	–	–	–

Finishing	F	Geometry for finishing steel, cast and stainless steel material.
Medium machining	M	Geometry for medium machining, multi-purpose use. First choice for finishing of cast iron and forged products with little allowance.
Roughing	R	Geometry for roughing of medium and rough machining. Suitable for high feeds and large cutting depths.
NF machining	AL	Geometry for positive indexable inserts, especially suitable for machining AL alloys. The rake angles are polished and ground.
	EC	Geometry for roughing-finishing and medium machining, particularly for the machining of carbon steel, cast iron and alloys on Ni, Co, Fe and Ti basis. Ideal for long, thin workpieces (shafts) at low cutting forces – no vibrations.
	W M	Geometry for roughing-finishing and medium machining of carbon and stainless steel. Excellent surface quality at high feeds, no additional grinding required.
Finishing Cermet	W F	Geometry for finishing steel, cast iron and stainless steel.

ISO Turning Applications



Solid carbide, coated

9010 **PVD** coated, wear-resistant material for medium and fine machining of aluminium, finedressing of steel, INOX and hard materials

9015 **CVD** coated, highly abrasive solid material for fine and medium machining of cast iron and steel at high cutting speeds

9030 **CVD** coated, universally used material for medium machining of steel, cast iron and easy-to-cut materials

9035 **PVD** coated, tough, fine-grain material for medium machining of high temperature special alloys on Ni, Co, Fe and Ti basis as well as non-ferrous metals

9040 **CVD** coated, very tough material for medium and coarse rough-machining of steel, cast iron, stainless and high-alloy materials

Solid carbide, uncoated

HF 7 Uncoated material for finish turning of cast iron, malleable cast iron, spheroidal cast iron, corrosion resistant, high temperature steel and special alloys such as AL and Cu.

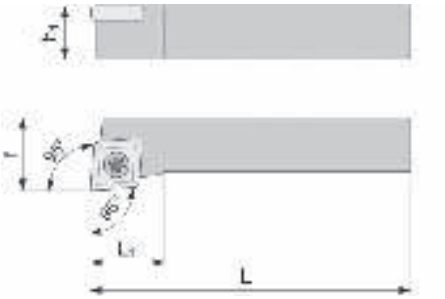
CT 28 **Cermet** for finishing steel, cast iron and easy-to-cut stainless steel.

ISO Tool Holders 95° SCLCR/L

Design: Tool holder for indexable inserts 7° positive, without screw clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For longitudinal turning and facing.



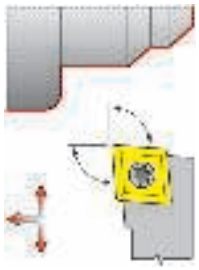




Fig.: Right-hand motion

Part No.	Designation	2968	Shank ■ mm	Dimensions mm L	L_1	f	h_1	Execution	Indexable insert
0000	SCLCR 1616 H09	25.43	16 x 16	100	29	20	16	Right	CCMT/CCGT 09T3...
0005	SCLCL 1616 H09	25.43	16 x 16	100	29	20	16	Left	CCMT/CCGT 09T3...
0010	SCLCR 2020 K09	28.01	20 x 20	125	29	25	20	Right	CCMT/CCGT 09T3...
0015	SCLCL 2020 K09	28.01 (285)	20 x 20	125	29	25	20	Left	CCMT/CCGT 09T3...

Spare Parts for ISO Tool Holder 95° SCLCR/L








Part No.	2968 Base plate	2968 Hex threaded bush	2968 Straining screws	5886 Screwdriver for TORX® T15 x 80 mm	6233 Torque screwdriver 3.0 Nm Gr. TX15	5840 Hexagon socket offset screwdrivers 3.5 mm
0038	1.72*	–	–	–	–	–
0047	–	3.11*	–	–	–	–
0043	–	–	2.88*	–	–	–
0050	–	–	–	3.31	–	–
0030	–	–	–	–	20.45	–
0035	–	–	–	–	–	0.12
* PU 10 units	(281)	(281)	(281)	(526)	(539)	(528)

ISO Indexable Inserts – Turning



F M AL-N AL-KNH

Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
0137	CCGT 09T302 AL KNH 9010	5.42*	–	–	–	●	–	–	0.2	–	●
0139	CCGT 09T302 AL N 9020	4.14*	–	–	–	●	–	–	0.2	–	●
0124	CCGT 09T304 AL KNH 9010	5.16*	●	●	–	●	●	–	0.4	–	●
0127	CCGT 09T304 AL N 9020	3.94*	–	●	–	●	–	–	0.4	–	●
0130	CCGT 09T308 AL KNH 9010	5.16*	●	●	–	●	●	–	0.8	–	●
0133	CCGT 09T308 AL N 9020	3.94*	–	●	–	●	–	–	0.8	–	●
0100	CCMT 09T304 F PMK 9030	2.55*	●	●	●	–	–	–	0.4	●	–
0103	CCMT 09T304 F U 9035	2.55*	●	●	●	–	●	–	0.4	●	–
0112	CCMT 09T304 M PMK 9030	2.54*	●	●	●	–	–	–	0.4	●	–
0115	CCMT 09T304 M U 9035	2.54*	●	●	●	–	●	–	0.4	●	–
0106	CCMT 09T308 F PMK 9030	2.55*	●	●	●	–	–	–	0.8	●	–
0109	CCMT 09T308 F U 9035	2.54*	●	●	●	–	●	–	0.8	●	–
0118	CCMT 09T308 M PMK 9030	2.54*	●	●	●	–	–	–	0.8	●	–
0121	CCMT 09T308 M U 9035	2.54* (286)	●	●	●	–	●	–	0.8	●	–

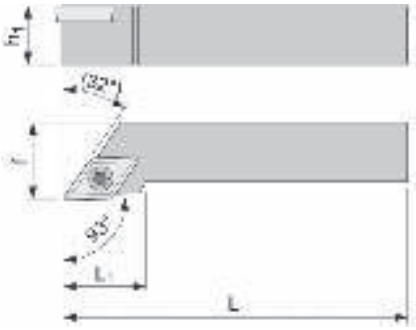
* PU 10 units

ISO Tool Holders 93° SDJCR/L

Design: Tool holder for indexable inserts 7° positive, without screw clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For longitudinal and copy turning.



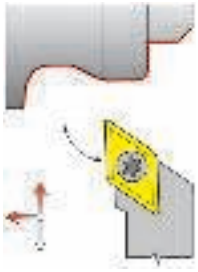




Fig.: Right-hand motion

Part No.	Designation	2968	Shank ■ mm	Dimensions mm L	L_1	f	h_1	Execution	Indexable insert
0200	SDJCR 1616 H11	25.43	16 x 16	100	29	20	16	Right	DCMT/DCGT 11T3...
0205	SDJCL 1616 H11	25.43	16 x 16	100	29	20	16	Left	DCMT/DCGT 11T3...
0210	SDJCR 2020 K11	28.01	20 x 20	125	29	25	20	Right	DCMT/DCGT 11T3...
0215	SDJCL 2020 K11	28.01	20 x 20	125	29	25	20	Left	DCMT/DCGT 11T3...
0220	SDJCR 2525 M11	31.74	25 x 25	150	33	32	25	Right	DCMT/DCGT 11T3...
0225	SDJCL 2525 M11	31.74	25 x 25	150	33	32	25	Left	DCMT/DCGT 11T3...
		(285)							

Spare Parts for ISO Tool Holder 93° SDJCR/L













Part No.	2968 Base plate	2968 Hex threaded bush	2968 Straining screw	5886 Screwdriver for TORX® T15 x 80 mm	6233 Torque screwdriver 3.0 Nm Gr. TX15	5840 Hexagon socket offset screwdrivers 3.5 mm
0040	2.00*	–	–	–	–	–
0047	–	3.11*	–	–	–	–
0043	–	–	2.88*	–	–	–
0050	–	–	–	3.31	–	–
0030	–	–	–	–	20.45	–
0035	–	–	–	–	–	0.12
* PU 10 units	(281)	(281)	(281)	(526)	(539)	(528)

ISO Indexable Inserts – Turning



F



M



AL-N



AL-KNH

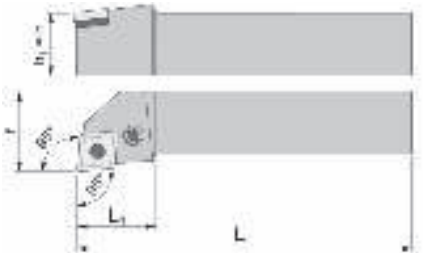
Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
0327	DCGT 11T302 AL KNH 9010	5.10*	–	–	–	●	–	–	0.2	–	●
0330	DCGT 11T302 AL N 9020	3.56*	–	–	–	●	–	–	0.2	–	●
0321	DCGT 11T304 AL KNH 9010	5.26*	–	●	–	●	●	–	0.4	–	●
0324	DCGT 11T304 AL N 9020	4.14*	–	●	–	●	–	–	0.4	–	●
0300	DCMT 11T304 F PMK 9030	2.97*	●	●	●	–	–	–	0.4	●	–
0306	DCMT 11T304 M PMK 9030	2.97*	●	●	●	–	–	–	0.4	●	–
0309	DCMT 11T304 M U 9035	2.97*	●	●	●	–	●	–	0.4	●	–
0303	DCMT 11T308 F PMK 9030	2.97*	●	●	●	–	–	–	0.8	●	–
0312	DCMT 11T308 M PMK 9030	2.97*	●	●	●	–	–	–	0.8	●	–
0315	DCMT 11T308 M U 9035	2.97*	●	●	●	–	●	–	0.8	●	–
0318	DCMT 11T312 M PMK 9030	2.97*	●	●	●	–	–	–	1.2	●	–
* PU 10 units		(286)									

ISO Tool Holders 95° PCLNR/L

Design: Tool holder for indexable inserts 0° negative, toggle levers clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For longitudinal turning and facing.



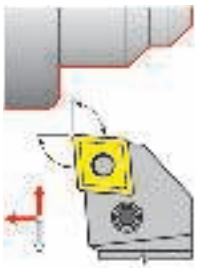




Fig.: Right-hand motion

Part No.	Designation	2968	Shank ■ mm	Dimensions mm L	L_1	f	h_1	Execution	Indexable insert
0400	PCLNR 2020 K12	28.01	20 x 20	125	28	25	20	Right	CNMG 1204...
0405	PCLNL 2020 K12	28.01	20 x 20	125	28	25	20	Left	CNMG 1204...
0410	PCLNR 2525 M12	31.74	25 x 25	150	33	32	25	Right	CNMG 1204...
0415	PCLNL 2525 M12	31.74 (285)	25 x 25	150	33	32	25	Left	CNMG 1204...

Spare Parts for ISO Tool Holder 95° PCLNR/L











Part No.	2968 Base plate	2968 Tube socket	2968 Toggle lever	2968 Straining screw	5850 Hexagon pin wrenche 3 x 100 mm
0039	2.75*	–	–	–	–
0036	–	1.75*	–	–	–
0033	–	–	3.37*	–	–
0044	–	–	–	2.50*	–
0015	–	–	–	–	0.92
* PU 10 units	(281)	(281)	(281)	(281)	(528)

ISO Indexable Inserts – Turning













F M R L-EC R-EC WM

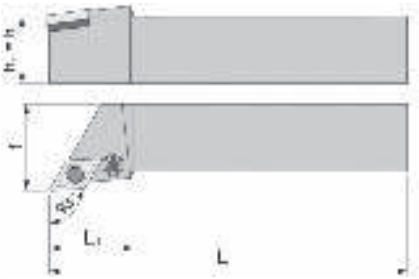
Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
0500	CNMG 120404 F PMK 9030	3.40*	●	●	●	–	–	–	0.4	●	–
0527	CNMG 120404R EC PMK 9030	3.40*	●	●	–	–	–	–	0.4	●	–
0530	CNMG 120404R EC U 9035	3.40*	●	●	–	–	●	–	0.4	●	–
0515	CNMG 120404L EC PMK 9030	3.40*	●	●	–	–	–	–	0.4	●	–
0518	CNMG 120404L EC U 9035	3.40*	●	●	–	–	●	–	0.4	●	–
0503	CNMG 120408 M PMK 9030	3.40*	●	●	●	–	–	–	0.8	●	–
0506	CNMG 120408 R PMK 9030	3.40*	●	●	●	–	–	–	0.8	●	–
0545	CNMG 120408 M PMK 9040	3.40*	●	●	●	–	●	–	0.8	●	–
0548	CNMG 120408 R PMK 9040	3.40*	●	●	●	–	●	–	0.8	●	–
0533	CNMG 120408R EC PMK 9030	3.40*	●	●	–	–	–	–	0.8	●	–
0536	CNMG 120408R EC U 9035	3.40*	●	●	–	–	●	–	0.8	●	–
0521	CNMG 120408L EC PMK 9030	3.40*	●	●	–	–	–	–	0.8	●	–
0524	CNMG 120408L EC U 9035	3.40*	●	●	–	–	●	–	0.8	●	–
0539	CNMG 120408 WM PMK 9030	3.88*	●	–	●	–	–	–	0.8	●	–
0509	CNMG 120412 M PMK 9030	3.40*	●	●	●	–	–	–	1.2	●	–
0512	CNMG 120412 R PMK 9030	3.40*	●	●	●	–	–	–	1.2	●	–
0542	CNMG 120412 WM PMK 9030	3.88*	●	–	●	–	–	–	1.2	●	–
* PU 10 units		(286)									

ISO Tool Holders 93° PDJNR/L

Design: Tool holder for indexable inserts 0° negative, toggle lever clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For longitudinal and copy turning.



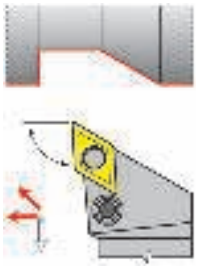




Fig.: Right-hand motion

Part No.	Designation	2968	Shank ■ mm	L	Dimensions mm L_1	f	h_1	Execution	Indexable insert
0600	PDJNR 2020 K15	28.01	20 x 20	125	35	25	20	Right	DNMG 1506...
0605	PDJNL 2020 K15	28.01	20 x 20	125	35	25	20	Left	DNMG 1506...
0610	PDJNR 2525 M15	31.74	25 x 25	150	39	32	25	Right	DNMG 1506...
0615	PDJNL 2525 M15	31.74	25 x 25	150	39	32	25	Left	DNMG 1506...
		(285)							

Spare Parts for ISO Tool Holder 93° PDJNR/L





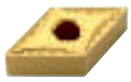




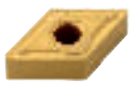


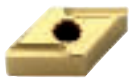
Part No.	2968 Base plate	2968 Tube socket	2968 Toggle lever	2968 Straining screw VT 05	5850 Hex pin wrench 3 x 100 mm
0041	3.25*	–	–	–	–
0036	–	1.75*	–	–	–
0034	–	–	5.88	–	–
0045	–	–	–	2.63*	–
0015	–	–	–	–	0.92
* PU 10 units	(281)	(281)	(281)	(281)	(528)

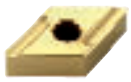
ISO Indexable Inserts – Turning











F M R R-EC L-EC

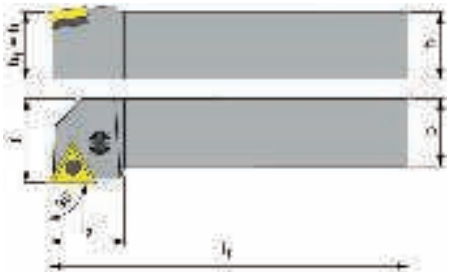
Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
0700	DNMG 150604 F PMK 9030	4.89*	●	●	●	–	–	–	0.4	●	–
0733	DNMG 150604R EC PMK 9030	4.89*	●	●	–	–	–	–	0.4	●	–
0736	DNMG 150604R EC U 9035	4.89*	●	●	–	–	●	–	0.4	●	–
0721	DNMG 150604L EC PMK 9030	4.89*	●	●	–	–	–	–	0.4	●	–
0724	DNMG 150604L EC U 9035	4.89*	●	●	–	–	●	–	0.4	●	–
0703	DNMG 150608 F PMK 9030	4.89*	●	●	●	–	–	–	0.8	●	–
0706	DNMG 150608 M PMK 9030	4.89*	●	●	●	–	–	–	0.8	●	–
0712	DNMG 150608 R PMK 9030	4.89*	●	●	●	–	–	–	0.8	●	–
0739	DNMG 150608R EC PMK 9030	4.89*	●	●	–	–	–	–	0.8	●	–
0742	DNMG 150608R EC U 9035	4.89*	●	●	–	–	●	–	0.8	●	–
0727	DNMG 150608L EC PMK 9030	4.89*	●	●	–	–	–	–	0.8	●	–
0730	DNMG 150608L EC U 9035	4.89*	●	●	–	–	●	–	0.8	●	–
0709	DNMG 150612 M PMK 9030	4.89*	●	●	●	–	–	–	1.2	●	–
0715	DNMG 150612 R PMK 9030	4.89*	●	●	●	–	–	–	1.2	●	–
0718	DNMG 150616 R PMK 9030	4.89*	●	●	●	–	–	–	1.6	●	–
* PU 10 units		(286)									

ISO Tool Holder 90° PTGNR/L

Design: Tool holder for indexable inserts 0° negative, toggle lever clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For longitudinal turning.



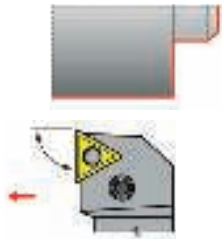




Fig.: Right-hand motion

Part No.	Product name	2968	Shank ■ mm	L	Dimension mm L_1	f	h_1	Execution	Indexable insert
0650	PTGNR 2020 K16	28.01	20 x 20	125	32	25	20	Right	TNMG1604...
0655	PTGNL 2020 K16	28.01	20 x 20	125	32	25	20	Left	TNMG1604...
0660	PTGNR 2525 M16	31.74	25 x 25	150	32	32	25	Right	TNMG1604...
0665	PTGNL 2525 M16	31.74	25 x 25	150	32	32	25	Left	TNMG1604...
		(285)							

Spare Part for ISO Tool Holder 90° PTGNR/L











Part No.	2968 Base plate	2968 Tube socket	2968 Toggle lever	2968 Straining screw	5850 Hexagon pin wrench 3 x 100 mm
0048	2.50*	–	–	–	–
0051	–	1.75*	–	–	–
0049	–	–	3.37*	–	–
0050	–	–	–	2.50*	–
0015	–	–	–	–	0.92
	(281)	(281)	(281)	(281)	(528)

ISO Indexable Inserts – Turning



F



M



R

Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
0750	TNMG 160404 F PMK 9030	2.92*	●	●	●	–	–	–	0.4	●	–
0753	TNMG 160404 F U 9035	2.92*	●	●	●	–	●	–	0.4	●	–
0756	TNMG 160408 M PMK 9030	2.92*	●	●	●	–	–	–	0.8	●	–
0759	TNMG 160408 M PMK 9040	2.92*	●	●	●	–	–	–	0.8	●	–
0762	TNMG 160408 R PMK 9030	2.92*	●	●	●	–	–	–	0.8	●	–
0765	TNMG 160408 R PMK 9040	2.92*	●	●	●	–	–	–	0.8	●	–
		(286)									

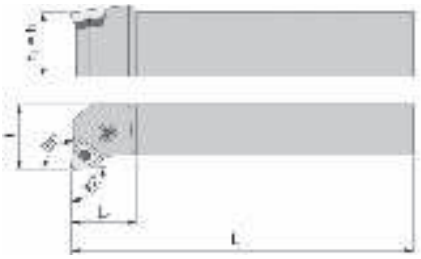
* PU 10 units

ISO Tool Holders 95° PWLNR/L

Design: Tool holder for indexable inserts 0° negative, toggle lever clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For longitudinal turning and facing.



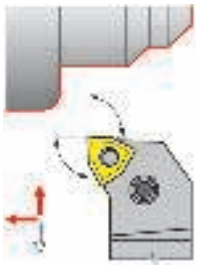




Fig.: Right-hand motion

Part No.	Product name	2968	Shank ■ mm	Dimensions mm L	L_1	f	h_1	Execution	Indexable insert
0800	PWLNR 2020 K08	28.01	20 x 20	125	28	25	20	Right	WNMG 0804...
0805	PWLNL 2020 K08	28.01	20 x 20	125	28	25	20	Left	WNMG 0804...
0810	PWLNR 2525 M08	31.74	25 x 25	150	33	32	25	Right	WNMG 0804...
0815	PWLNL 2525 M08	31.74 (285)	25 x 25	150	33	32	25	Left	WNMG 0804...

Spare Parts for ISO Tool Holder 95° PWLNR/L











Part No.	2968 Base plate	2968 Tube socket	2968 Toggle lever	2968 Straining screw	5850 Hex pin wrench 3 x 100 mm
0042	4.00*	–	–	–	–
0036	–	1.75*	–	–	–
0033	–	–	3.37*	–	–
0044	–	–	–	2.50*	–
0015	–	–	–	–	0.92
* PU 10 units	(281)	(281)	(281)	(281)	(528)

ISO Indexable Inserts – Turning



F



M



R



WM

Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
0900	WNMG 080404 F PMK 9030	3.61*	●	●	●	–	–	–	0.4	●	–
0903	WNMG 080408 F PMK 9030	3.61*	●	●	●	–	–	–	0.8	●	–
0909	WNMG 080408 R PMK 9030	3.61*	●	●	●	–	–	–	0.8	●	–
0915	WNMG 080408 WM PMK 9030	4.20*	●	–	●	–	–	–	0.8	●	–
0906	WNMG 080412 M PMK 9030	3.61*	●	●	●	–	–	–	1.2	●	–
0912	WNMG 080412 R PMK 9030	3.61*	●	●	●	–	–	–	1.2	●	–
0918	WNMG 080412 WM PMK 9030	4.20*	●	–	●	–	–	–	1.2	●	–
* PU 10 units		(286)									

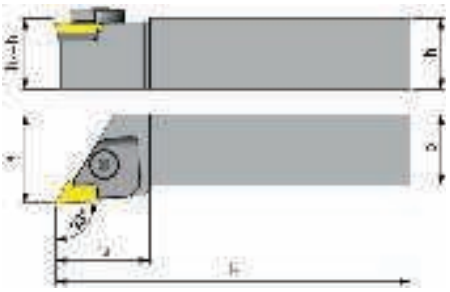
Tool Holders/Indexable Inserts – Copying

ISO Tool Holder 93° CKJNR/L

Design: Tool holder for indexable inserts 0° negative, toe dog clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For copy turning.



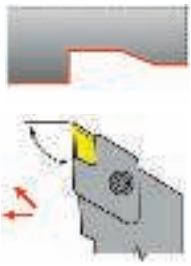




Fig.: Right-hand motion

Part No.	Product name	2968	Shank ■ mm	L	Dimensions mm L_1	f	h_1	Execution	Indexable insert
0850	CKJNR 2525 M16	60.80	25 x 25	125	34	25	20	Right	KNUX 1604...
0855	CKJNL 2525 M16	60.80	25 x 25	125	34	25	20	Left	KNUX 1604...
0860	CKJNR 3225 P16	64.77	32 x 25	150	34	32	25	Right	KNUX 1604...
0865	CKJNL 3225 P16	64.77 (285)	32 x 25	150	34	32	25	Left	KNUX 1604...

Spare Parts for ISO Tool Holder 93° PDJNR/L











Part No.	2968 Base plate right	2968 Base plate left	2968 Tube socket	2968 Spring	2968 Pin + spring
0052	3.08*	–	–	–	–
0053	–	3.08*	–	–	–
0054	–	–	1.94*	–	–
0055	–	–	–	0.34*	–
0056	–	–	–	–	3.89*
* PU 10 units	(281)	(281)	(281)	(281)	(281)









Part No.	2968 Toe dog right	2968 Toe dog left	2968 Straining screw	5850 Hexagon wrench 4 x 100 mm
0057	16.13	–	–	–
0058	–	16.13	–	–
0059	–	–	5.82	–
0030	–	–	–	1.05
	(281)	(281)	(281)	(528)

ISO Indexable Insert – Copying



M-R



M-L

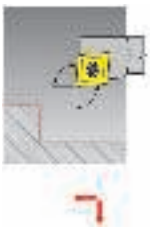
Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
0950	KNUX 160405R M PK 9015	4.30*	●	–	●	–	–	–	0.5	●	–
0953	KNUX 160405R M PMK 9040	4.30*	●	●	●	–	●	–	0.5	●	–
0956	KNUX 160410R M PK 9015	4.30*	●	–	●	–	–	–	1.0	●	–
0959	KNUX 160410R M PMK 9040	4.30*	●	●	●	–	●	–	1.0	●	–
0962	KNUX 160405L M PK 9015	4.30*	●	–	●	–	–	–	0.5	●	–
0965	KNUX 160405L M PMK 9040	4.30*	●	●	●	–	●	–	0.5	●	–
0968	KNUX 160410R M PK 9015	4.30*	●	–	●	–	–	–	1.0	●	–
0971	KNUX 160410L M PMK 9040	4.30*	●	●	●	–	●	–	1.0	●	–
* PU 10 units		(286)									

ISO Boring Bar 95° A..-SCLCR/L with Internal Cooling

Design: Boring Bar for indexable inserts 7° positive, screw clamping.

Scope of Supply: Without indexable inserts, without screwdriver.

Application: Inside turning.





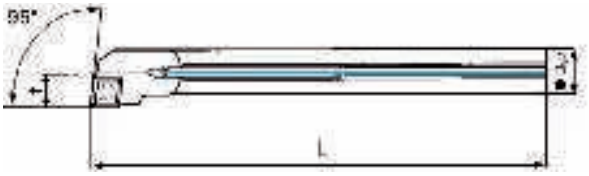




Fig.: Right-hand motion

Part No.	Product name	2968	Shank ● Dg7	⌀ D min.	Dimensions mm L	f	Execution	Indexable insert
1005	A08F SCLCR 06	45.98	8	12	80	6	Right	CCMT/CCGT 0602...
1000	A08F SCLCL 06	45.98	8	12	80	6	Left	CCMT/CCGT 0602...
1015	A10H SCLCR 06	45.98	10	14	100	7	Right	CCMT/CCGT 0602...
1010	A10H SCLCL 06	45.98	10	14	100	7	Left	CCMT/CCGT 0602...
1025	A12K SCLCR 06	45.98	12	18	125	9	Right	CCMT/CCGT 0602...
1020	A12K SCLCL 06	45.98	12	18	125	9	Left	CCMT/CCGT 0602...
1035	A16M SCLCR 09	55.83	16	22	150	11	Right	CCMT/CCGT 09T3...
1030	A16M SCLCL 09	55.83	16	22	150	11	Left	CCMT/CCGT 09T3...
1045	A20Q SCLCR 09	55.83	20	26	180	13	Right	CCMT/CCGT 09T3...
1040	A20Q SCLCL 09	55.83	20	26	180	13	Left	CCMT/CCGT 09T3...
1055	A25Q SCLCR 09	55.83	25	34	180	17	Right	CCMT/CCGT 09T3...
1050	A25Q SCLCL 09	55.83	25	34	180	17	Left	CCMT/CCGT 09T3...

(285)

Boring Bar Set 95° A..-SCLCR/L with Internal Cooling

Design: Boring Bar for indexable inserts 7° positive, screw clamping.

Scope of Supply: Without indexable inserts, without screwdriver.

Application: Inside turning.

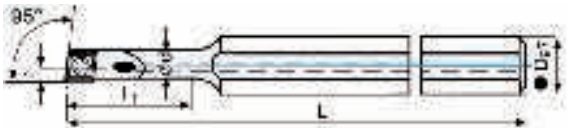






Fig.: Right-hand motion

Part No.	Set Content	2968	Shank ● Dg7	⌀ D min.	⌀ d	Dimensions mm L	L_1	f	Execution	Indexable insert
1060	A0608F SCLCR 06	111.65	8	8	9	100	25	4	Right	CCMT/CCGT 0602...
	A0810H SCLCR 06		10	12	8	110	32	6		
	A1012K SCLCR 06		12	14	10	125	38	7		
	A1216M SCLCR 06		16	18	12	150	50	9		
1070	A0608F SCLCL 06	111.65	8	8	6	100	25	4	Left	CCMT/CCGT 0602...
	A0810H SCLCL 06		10	12	8	110	32	6		
	A1012K SCLCL 06		12	14	10	125	38	7		
	A1216M SCLCL 06		16	18	12	150	50	9		

(285)

Spare Parts for ISO Boring Bar 95° A..-SCLCL/R with Internal Cooling








Part No.	2966 TORX® screw for WSP CCMT/CCGT 0602…	2966 TORX® screw for WSP CCMT/CCGT 09T3…	5886 Screwdriver for TORX® CCMT/CCGT 0602… T8 x 60 mm	6233 Torque screwdriver CCMT/CCGT 0602… 1.2 Nm TX8	5886 Screwdriver for TORX® CCMT/CCGT 09T3… T15 x 80 mm	6233 Torque screwdriver CCMT/CCGT 09T3… 3.0 Nm TX15
0052	2.34*	–	–	–	–	–
0057	–	2.34*	–	–	–	–
0030	–	–	3.21	–	–	–
0015	–	–	–	17.79	–	–
0050	–	–	–	–	3.31	–
0030	–	–	–	–	–	20.45
* PU 10 units	(281)	(281)	(526)	(539)	(526)	(539)

ISO Indexable Inserts – Turning 7° Positive


F

M

AL-N

AL-KNH

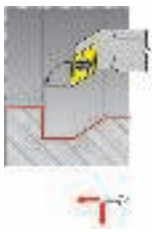
Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
1127	CCGT 060202 AL KNH 9010	5.04*	–	–	–	●	–	–	0.2	–	●
1130	CCGT 060202 AL N 9020	3.82*	–	–	–	●	–	–	0.2	–	●
1100	CCMT 060202 F U 9035	2.29*	●	●	●	–	–	–	0.2	●	–
1109	CCMT 060202 M PMK 9030	2.29*	●	●	●	–	–	–	0.2	●	–
1112	CCMT 060202 M U 9035	2.29*	●	●	●	–	–	–	0.2	●	–
1133	CCGT 060204 AL KNH 9010	4.78*	–	●	–	●	●	–	0.4	–	●
1136	CCGT 060204 AL N 9020	3.67*	–	●	–	●	–	–	0.4	–	●
1103	CCMT 060204 F PMK 9030	2.17*	●	●	●	–	–	–	0.4	●	–
1106	CCMT 060204 F U 9035	2.17*	●	●	●	–	●	–	0.4	●	–
1115	CCMT 060204 M PMK 9030	2.17*	●	●	●	–	–	–	0.4	●	–
1118	CCMT 060204 M U 9035	2.17*	●	●	●	–	●	–	0.4	●	–
1121	CCMT 060208 M PMK 9030	2.17*	●	●	●	–	–	–	0.8	●	–
1124	CCMT 060208 M U 9035	2.17*	●	●	●	–	●	–	0.8	●	–
0137	CCGT 09T302 AL KNH 9010	5.42*	–	–	–	●	–	–	0.2	–	●
0139	CCGT 09T302 AL N 9020	4.14*	–	–	–	●	–	–	0.2	–	●
0124	CCGT 09T304 AL KNH 9010	5.16*	–	●	–	●	●	–	0.4	–	●
0127	CCGT 09T304 AL N 9020	3.94*	–	●	–	●	–	–	0.4	–	●
0100	CCMT 09T304 F PMK 9030	2.55*	●	●	●	–	–	–	0.4	●	–
0103	CCMT 09T304 F U 9035	2.55*	●	●	●	–	●	–	0.4	●	–
0112	CCMT 09T304 M PMK 9030	2.54*	●	●	●	–	–	–	0.4	●	–
0115	CCMT 09T304 M U 9035	2.54*	●	●	●	–	●	–	0.4	●	–
0130	CCGT 09T308 AL KNH 9010	5.16*	–	●	–	●	●	–	0.8	–	●
0133	CCGT 09T308 AL N 9020	3.94*	–	–	–	●	–	–	0.8	–	●
0106	CCMT 09T308 F PMK 9030	2.55*	●	●	●	–	–	–	0.8	●	–
0109	CCMT 09T308 F U 9035	2.54*	●	●	●	–	●	–	0.8	●	–
0118	CCMT 09T308 M PMK 9030	2.54*	●	●	●	–	–	–	0.8	●	–
0121	CCMT 09T308 M U 9035	2.54*	●	●	●	–	●	–	0.8	●	–
* PU 10 units		(286)									

Boring Bar 93° A..-SDUCR/L with Internal Cooling

Design: Boring Bar for indexable inserts 7° positive, screw clamping.

Scope of Supply: Without indexable inserts, without screwdriver.

Application: Inside turning.



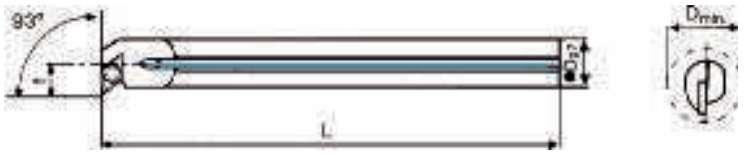




Fig.: Right-hand motion

Part No.	Product name	2968	Shank ● Dg7	⌀ D min.	Dimensions mm L	f	Execution	Indexable insert
1300	A10H SDUCR 07	42.70	10	13	100	8	Right	DCMT/DCGT 0702...
1305	A10H SDUCL 07	42.70	10	13	100	8	Left	DCMT/DCGT 0702...
1310	A12K SDUCR 07	45.98	12	18	125	9	Right	DCMT/DCGT 0702...
1315	A12K SDUCL 07	45.98	12	18	125	9	Left	DCMT/DCGT 0702...
1320	A16M SDUCR 07	45.98	16	22	150	11	Right	DCMT/DCGT 0702...
1325	A16M SDUCL 07	45.98	16	22	150	11	Left	DCMT/DCGT 0702...
1330	A20Q SDUCR 11	55.83	20	26	180	13	Right	DCMT/DCGT 11T3...
1335	A20Q SDUCL 11	55.83	20	26	180	13	Left	DCMT/DCGT 11T3...
1340	A25Q SDUCR 11	55.83	25	34	180	17	Right	DCMT/DCGT 11T3...
1345	A25Q SDUCL 11	55.83	25	34	180	17	Left	DCMT/DCGT 11T3...

(285)

Boring Bar Set 93° A..-SDUCR/L with Internal Cooling

Design: Boring Bar for indexable inserts 7° positive, screw clamping.

Scope of Supply: Without indexable inserts, without screwdriver.

Application: Inside turning.

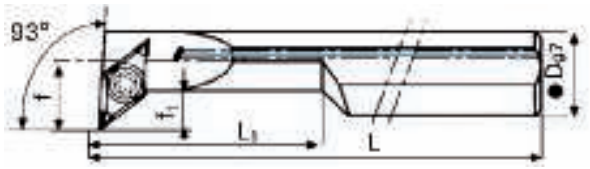




Fig.: Right-hand motion

Part No.	Set content	2968	Shank ● Dg7	⌀ D min.	Dimensions mm L	L_1	f	f_1	Execution	Indexable insert
1350	A0810H SDUCR 07	128.07	10	12.5	100	22	7	5	Right	DCMT/DCGT 0702...
	A1012K SDUCR 07		12	15.5	125	28	9	5		
	A1216M SDUCR 07		16	19.5	150	36	11	5		
1360	A0810H SDUCL 07	128.07	10	12.5	100	22	7	5	Left	DCMT/DCGT 0702...
	A1012K SDUCL 07		12	15.5	125	28	9	5		
	A1216M SDUCL 07		16	19.5	150	36	11	5		

(285)

Spare Parts for ISO Boring Bar 93° A..-SDUCR/L with Internal Cooling



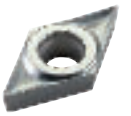





Part No.	2966 TORX® screw for WSP DCMT/DCGT 0702…	2966 TORX® screw for WSP DCMT/DCGT 11T3…	5886 Screwdriver for TORX® DCMT/DCGT 0702… T8 x 60 mm	6233 Torque screwdriver DCMT/DCGT 0702… 1.2 Nm TX8	5886 Screwdriver for TORX® DCMT/DCGT 11T3… T15 x 80 mm	6233 Torque screwdriver DCMT/DCGT 11T3… 3.0 Nm TX15
0052	2.34*	–	–	–	–	–
0057	–	2.34*	–	–	–	–
0030	–	–	3.21	–	–	–
0015	–	–	–	17.79	–	–
0050	–	–	–	–	3.31	–
0030	–	–	–	–	–	20.45
* PU 10 units	(281)	(281)	(526)	(539)	(526)	(539)

ISO Indexable Inserts – Turning






F M AL-N AL-KNH

Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
1400	DCMT 070202 F PMK 9030	2.29*	●	●	●	–	–	–	0.2	●	–
1406	DCMT 070202 M PMK 9030	2.29*	●	●	●	–	–	–	0.2	●	–
1409	DCMT 070202 M U 9035	2.29*	●	●	●	–	●	–	0.2	●	–
1424	DCGT 070202 AL KNH 9010	4.99*	–	–	–	●	–	–	0.2	–	●
1427	DCGT 070202 AL N 9020	3.94*	–	–	–	●	–	–	0.2	–	●
1418	DCGT 070204 AL KNH 9010	4.78*	–	●	–	●	●	–	0.4	–	●
1421	DCGT 070204 AL N 9020	3.76*	–	●	–	●	–	–	0.4	–	●
1403	DCMT 070204 F PMK 9030	2.17*	●	●	●	–	–	–	0.4	●	–
1412	DCMT 070204 M PMK 9030	2.17*	●	●	●	–	–	–	0.4	●	–
1415	DCMT 070204 M U 9035	2.17*	●	●	●	–	●	–	0.4	●	–
0327	DCGT 11T302 AL KNH 9010	5.10*	–	–	–	●	–	–	0.2	–	●
0330	DCGT 11T302 AL N 9020	3.56*	–	–	–	●	–	–	0.2	–	●
0321	DCGT 11T304 AL KNH 9010	5.26*	–	●	–	●	●	–	0.4	–	●
0324	DCGT 11T304 AL N 9020	4.14*	–	●	–	●	–	–	0.4	–	●
0300	DCMT 11T304 F PMK 9030	2.97*	●	●	●	–	–	–	0.4	●	–
0306	DCMT 11T304 M PMK 9030	2.97*	●	●	●	–	–	–	0.4	●	–
0309	DCMT 11T304 M U 9035	2.97*	●	●	●	–	●	–	0.4	●	–
0303	DCMT 11T308 F PMK 9030	2.97*	●	●	●	–	–	–	0.8	●	–
0312	DCMT 11T308 M PMK 9030	2.97*	●	●	●	–	–	–	0.8	●	–
0315	DCMT 11T308 M U 9035	2.97*	●	●	●	–	●	–	0.8	●	–
0318	DCMT 11T312 M PMK 9030	2.97*	●	●	●	–	–	–	1.2	●	–
* PU 10 units		(286)									

Boring Bar 107.5° A..-SDQCR/L with Internal Cooling

Design: Boring Bar for indexable inserts 7° positive, screw clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For inside turning.









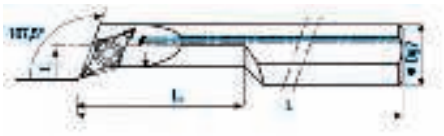
Part No.	Product name	2968	Shank ● Dg7	Dimensions mm ⌀ D min.	L	f	Execution	Indexable insert
2000	A12K SDQCR 07	43.78	12	18	125	9	Right	DCMT/DCGT 0702...
2005	A12K SDQCL 07	43.78	12	18	125	9	Left	DCMT/DCGT 0702...
2010	A16M SDQCR 07	50.04	16	22	150	11	Right	DCMT/DCGT 0702...
2015	A16M SDQCL 07	50.04	16	22	150	11	Left	DCMT/DCGT 0702...
2020	A20Q SDQCR 07	53.17	20	26	180	13	Right	DCMT/DCGT 0702...
2025	A20Q SDQCL 07	53.17	20	26	180	13	Left	DCMT/DCGT 0702...
2030	A20Q SDQCR 11	53.17	20	26	180	13	Right	DCMT/DCGT 11T3
2035	A20Q SDQCL 11	53.17	20	26	180	13	Left	DCMT/DCGT 11T3
2040	A25Q SDQCR 11	56.29	25	34	180	17	Right	DCMT/DCGT 11T3
2045	A25Q SDQCL 11	56.29	25	34	180	17	Left	DCMT/DCGT 11T3
		(285)						

Boring Bar Set 107.5° A..SDQCR/L with Internal Cooling

Design: Boring Bar for indexable inserts 7° positive, screw clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: For inside turning.







Part No.	Set content	2968	Shank ● Dg7	Dimensions mm ⌀ D min.	L	L_1	f	f_1	Execution	Indexable insert
2050	A0810H SDQCR 07	121.97	10	12.5	100	22	7	5	Right	DCMT/DCGT 0702...
	A1012H SDQCR 07		12	15.5	125	28	9	5		
	A1216H SDQCR 07		16	19.5	150	36	11	5		
2055	A0810H SDQCL 07	121.97	10	12.5	100	22	7	5	Left	DCMT/DCGT 0702...
	A1012H SDQCL 07		12	15.5	125	28	9	5		
	A1216H SDQCL 07		16	19.5	150	36	11	5		
		(285)								

Spare Parts for ISO Boring Bar 93° A..-SDUCR/L with Internal Cooling








Part No.	2966 TORX® screw for WSP DCMT/DCGT 0702…	2966 TORX® screw for WSP DCMT/DCGT 11T3…	5886 Screwdriver for TORX® DCMT/DCGT 0702… T8 x 60 mm	6233 Torque screwdriver DCMT/DCGT 0702… 1,2 Nm TX8	5886 Screwdriver for TORX® DCMT/DCGT 11T3… T15 x 80 mm	6233 Torque screwdriver DCMT/DCGT 11T3… 3,0 Nm TX15
0052	2.34*	–	–	–	–	–
0057	–	2.34*	–	–	–	–
0030	–	–	3.21	–	–	–
0015	–	–	–	17.79	–	–
0050	–	–	–	–	3.31	–
0030	–	–	–	–	–	20.45
* PU 10 units	(281)	(281)	(526)	(539)	(526)	(539)

ISO Indexable Inserts – Turning






F M AL-N AL-KNH

Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
1400	DCMT 070202 F PMK 9030	2.29*	●	●	●	–	–	–	0.2	●	–
1406	DCMT 070202 M PMK 9030	2.29*	●	●	●	–	–	–	0.2	●	–
1409	DCMT 070202 M U 9035	2.29*	●	●	●	–	●	–	0.2	●	–
1424	DCGT 070202 AL KNH 9010	4.99*	–	–	–	●	–	–	0.2	–	●
1427	DCGT 070202 AL N 9020	3.94*	–	–	–	●	–	–	0.2	–	●
1418	DCGT 070204 AL KNH 9010	4.78*	–	●	–	●	●	–	0.4	–	●
1421	DCGT 070204 AL N 9020	3.76*	–	●	–	●	–	–	0.4	–	●
1403	DCMT 070204 F PMK 9030	2.17*	●	●	●	–	–	–	0.4	●	–
1412	DCMT 070204 M PMK 9030	2.17*	●	●	●	–	–	–	0.4	●	–
1415	DCMT 070204 M U 9035	2.17*	●	●	●	–	●	–	0.4	●	–
0327	DCGT 11T302 AL KNH 9010	5.10*	–	–	–	●	–	–	0.2	–	●
0330	DCGT 11T302 AL N 9020	3.56*	–	–	–	●	–	–	0.2	–	●
0321	DCGT 11T304 AL KNH 9010	5.26*	–	●	–	●	●	–	0.4	–	●
0324	DCGT 11T304 AL N 9020	4.14*	–	●	–	●	–	–	0.4	–	●
0300	DCMT 11T304 F PMK 9030	2.97*	●	●	●	–	–	–	0.4	●	–
0306	DCMT 11T304 M PMK 9030	2.97*	●	●	●	–	–	–	0.4	●	–
0309	DCMT 11T304 M U 9035	2.97*	●	●	●	–	●	–	0.4	●	–
0303	DCMT 11T308 F PMK 9030	2.97*	●	●	●	–	–	–	0.8	●	–
0312	DCMT 11T308 M PMK 9030	2.97*	●	●	●	–	–	–	0.8	●	–
0315	DCMT 11T308 M U 9035	2.97*	●	●	●	–	●	–	0.8	●	–
0318	DCMT 11T312 M PMK 9030	2.97*	●	●	●	–	–	–	1.2	●	–
* PU 10 units		(286)									

Boring Bars 93° A..-SWUCR/L with Internal Cooling

Design: Boring Bar for indexable inserts 7° positive, screw clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: Inside turning.

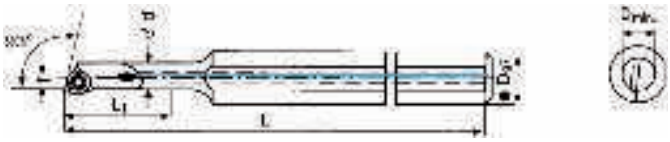




Fig.: Right-hand motion

Part No.	Product name	2968	Shank ● Dg7	Dimensions mm ø D min.	ø d	L	L_1	f	Execution	Indexable insert
1700	A0508H SWUCR 02	39.41	8	5.8	5	100	18	2.9	Right	WCGT 0201...
1705	A0508H SWUCL 02	39.41	8	5.8	5	100	18	2.9	Left	WCGT 0201...
1710	A0608H SWUCR 02	39.41	8	7.8	6	100	18	3.9	Right	WCGT 0201...
1715	A0608H SWUCL 02	39.41	8	7.8	6	100	18	3.9	Left	WCGT 0201...
		(285)								

Boring Bar Set with Internal Cooling

Design: Boring Bar for indexable inserts 7° positive, screw clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: Inside turning.

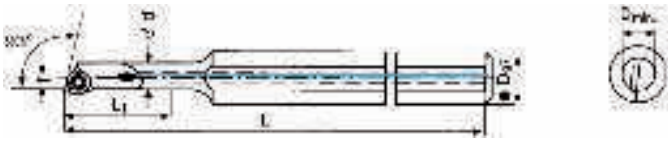




Fig.: Right-hand motion

Part No.	Set content	2968	Shank ● Dg7	Dimensions mm ø D min.	ø d	L	L_1	f	Execution	Indexable insert
1720	A0508H SWUCR 02	128.07	8	5.8	5	100	18	2.9	Right	WCGT 0201...
	A0608H SWUCR 02		8	7.8	6	100	18	3.9		
	10 units WCGT 020102 CT28									
1730	A0508H SWUCL 02	128.07	8	5.8	5	100	18	2.9	Left	WCGT 0201...
	A0608H SWUCL 02		8	7.8	6	100	18	3.9		
	10 units WCGT 020102 CT28									
		(285)								

Spare Parts for Boring Bars 93° A..-SWUCR/L with Internal Cooling







Part No.	2966 TORX® screw	5886 Screwdriver for TORX® T6 x 60 mm	6233 Torque screwdriver 0.6 Nm TX6
0050	2.34*	–	–
0010	–	3.23	–
0005	–	–	17.36
* PU 10 units	(281)	(526)	(539)

ISO Indexable Inserts – Turning



WF

Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
1750	WCGT 020102–WF C28	8.62*	●	–	●	–	–	–	0.2	–	●
* PU 10 units		(286)									

Boring Bar 52° A..-SVJCR/L with Internal Cooling

Design: Boring Bar for indexable inserts 7° positive, screw clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: Inside and outside turning.

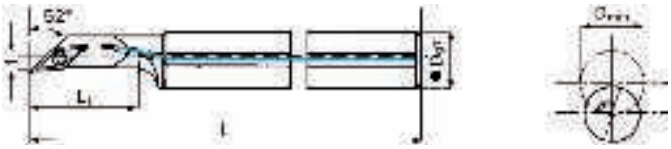




Fig.: Right-hand motion

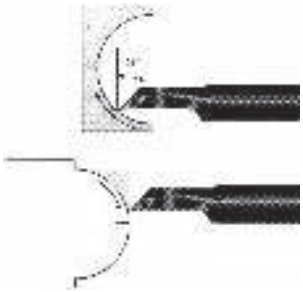
Part No.	Product name	2968	Shank ● Dg7	Dimensions mm ø D min.	L	L_1	f	Execution	Indexable insert
1500	A16M SVJCR 11	68.97	16	22	150	30	2	Right	VCMT/VCGT 1103...
1505	A16M SVJCL 11	68.97	16	22	150	30	2	Left	VCMT/VCGT 1103...
1510	A20M SVJCR 11	72.25	20	25	150	38	2	Right	VCMT/VCGT 1103...
1515	A20M SVJCL 11	72.25	20	25	150	38	2	Left	VCMT/VCGT 1103...
1520	A25M SVJCR 16	85.38	25	28	150	44	2	Right	VCMT/VCGT 1604...
1525	A25M SVJCL 16	85.38	25	28	150	44	2	Left	VCMT/VCGT 1604...
		(285)							

Boring Bar Set 52° A..-SVJCR/L with Internal Cooling

Design: Boring Bar for indexable inserts 7° positive, screw clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: Inside and outside turning.



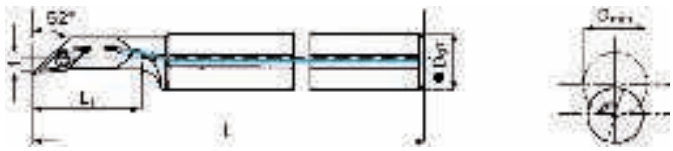




Fig.: Right-hand motion

Part No.	Set content	2968	Shank ● Dg7	Dimensions mm ø D min.	L	L_1	f	Execution	Indexable insert
1530	A16M SVJCR 11 A20M SVJCR 11	141.21	16 20	22 25	150 150	30 38	2 2	Right	VCMT/VCGT 1103...
1540	A16M SVJCL 11 A20M SVJCL 11	141.21	16 20	22 25	150 150	30 38	2 2	Left	VCMT/VCGT 1103...
		(285)							

Spare Parts for ISO Boring Bars 52° A..-SVJCR/L with Internal Cooling








Part No.	2966 TORX® screw for WSP VCMT/VCGT 1103…	2966 TORX® screw for WSP VCMT/VCGT 1604…	5886 Screwdriver for TORX® VCMT/VCGT 1103… T8 x 60 mm	6233 Torque screwdriver VCMT/VCGT 1103… 1.2 Nm TX8	5886 Screwdriver for TORX® VCMT/VCGT 1604… T15 x 80 mm	6233 Torque screwdriver VCMT/VCGT 1604… 3.0 Nm TX15
0052	2.34*	–	–	–	–	–
0057	–	2.34*	–	–	–	–
0030	–	–	3.21	–	–	–
0015	–	–	–	17.79	–	–
0050	–	–	–	–	3.31	–
0030	–	–	–	–	–	20.45
* PU 10 units	(281)	(281)	(526)	(539)	(526)	(539)

ISO Indexable Inserts – Turning


F


AL-N


AL-KNH

Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
1612	VCGT 110304 AL KNH 9010	6.86*	–	●	–	●	●	–	0.4	–	●
1615	VCGT 110304 AL N 9020	5.31*	–	●	–	●	–	–	0.4	–	●
1600	VCMT 110304 F PMK 9030	3.99*	●	●	●	–	–	–	0.4	●	–
1603	VCMT 110304 F U 9035	3.99*	●	●	●	–	●	–	0.4	●	–
1606	VCMT 110308 F PMK 9030	3.99*	●	●	●	–	–	–	0.8	●	–
1609	VCMT 110308 F U 9035	3.99*	●	●	●	–	●	–	0.8	●	–
1636	VCGT 160404 AL KNH 9010	7.13*	–	●	–	●	●	–	0.4	–	●
1639	VCGT 160404 AL N 9020	5.63*	–	●	–	●	–	–	0.4	–	●
1618	VCMT 160404 F PMK 9030	4.47*	●	●	●	–	–	–	0.4	●	–
1621	VCMT 160404 F U 9035	4.47*	●	●	●	–	●	–	0.4	●	–
1642	VCGT 160408 AL KNH 9010	7.13*	–	●	–	●	●	–	0.8	–	●
1645	VCGT 160408 AL N 9020	5.63*	–	●	–	●	–	–	0.8	–	●
1624	VCMT 160408 F PMK 9030	4.47*	●	●	●	–	–	–	0.8	●	–
1627	VCMT 160408 F U 9035	4.47*	●	●	●	–	●	–	0.8	●	–
1648	VCGT 160412 AL KNH 9010	7.13*	–	●	–	●	●	–	1.2	–	●
1651	VCGT 160412 AL N 9020	5.63*	–	●	–	●	–	–	1.2	–	●
1630	VCMT 160412 F PMK 9030	4.47*	●	●	●	–	–	–	1.2	●	–
1633	VCMT 160412 F U 9035	4.47*	●	●	●	–	●	–	1.2	●	–
* PU 10 units		(286)									

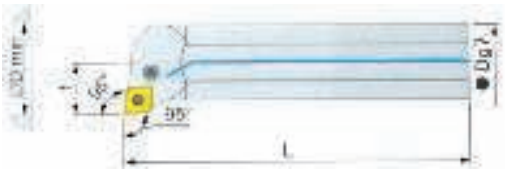
Boring Bars/Indexable Inserts – Turning

ISO Boring Bar 95° A..-PCLNR/L

Design: Boring Bar for indexable inserts 0° negative, toggle lever tension.

Scope of supply: Without indexable inserts, without screwdriver.

Application: Inside turning.



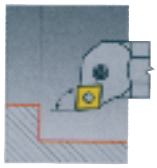




Fig.: Right-hand motion

Part No.	Product name	2968	Shank ● Dg7	Dimensions mm ⌀ D min.	L	f	Execution	Indexable insert
1200	A25S PCLNR 12	52.54	25	32	250	17	Right	CNMG 1204...
1205	A25S PCLNL 12	52.54	25	32	250	17	Left	CNMG 1204...
1210	A32S PCLNR 12	66.30	32	40	250	22	Right	CNMG 1204...
1215	A32S PCLNL 12	66.30 (285)	32	40	250	22	Left	CNMG 1204...

Spare Parts for ISO Boring Bars 95° A..-PCLNR/L with Internal Cooling









Part No.	2968 Base plate for shank ⌀ 32 mm	2968 Tube sockets for shank ⌀ 32 mm	2968 Toggle lever for shank ⌀ 25 mm	2968 Toggle lever for shank ⌀ 32 mm
0039	2.75*	–	–	–
0036	–	1.75*	–	–
0035	–	–	3.94*	–
0033	–	–	–	3.37*
* PU 10 units	(281)	(281)	(281)	(281)









Part No.	2968 Straining screw for shank ⌀ 25 mm	2968 Straining screw for shank ⌀ 25 mm	5850 Hex socket for shank ⌀ 25 mm 2.5 x 100 mm	5850 Hex socket for shank ⌀ 25 mm 3 x 100 mm
0046	2.63*	–	–	–
0044	–	2.50*	–	–
0010	–	–	1.12	–
0015	–	–	–	0.92
* PU 10 units	(281)	(281)	(528)	(528)

ISO Indexable Inserts – Turning



F M R R-EC L-EC WM

Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
0500	CNMG 120404 F PMK 9030	3.40*	●	●	●	–	–	–	0.4	●	–
0530	CNMG 120404R EC U 9035	3.40*	●	●	–	–	●	–	0.4	●	–
0527	CNMG 120404R EC PMK 9030	3.40*	●	●	–	–	–	–	0.4	●	–
0518	CNMG 120404L EC U 9035	3.40*	●	●	–	–	●	–	0.4	●	–
0515	CNMG 120404L EC PMK 9030	3.40*	●	●	●	–	–	–	0.4	●	–
0506	CNMG 120408 R PMK 9030	3.40*	●	●	●	–	–	–	0.8	●	–
0503	CNMG 120408 M PMK 9030	3.40*	●	●	●	–	–	–	0.8	●	–
0545	CNMG 120408 M PMK 9040	3.40*	●	●	●	–	●	–	0.8	●	–
0548	CNMG 120408 R PMK 9040	3.40*	●	●	●	–	●	–	0.8	●	–
0536	CNMG 120408R EC U 9035	3.40*	●	●	–	–	●	–	0.8	●	–
0533	CNMG 120408R EC PMK 9030	3.40*	●	●	–	–	–	–	0.8	●	–
0524	CNMG 120408L EC U 9035	3.40*	●	●	–	–	●	–	0.8	●	–
0521	CNMG 120408L EC PMK 9030	3.40*	●	●	–	–	–	–	0.8	●	–
0539	CNMG 120408 WM PMK 9030	3.88*	●	–	●	–	–	–	0.8	●	–
0512	CNMG 120412 R PMK 9030	3.40*	●	●	●	–	–	–	1.2	●	–
0509	CNMG 120412 M PMK 9030	3.40*	●	●	●	–	–	–	1.2	●	–
0542	CNMG 120412 WM PMK 9030	3.88*	●	–	●	–	–	–	1.2	●	–
* PU 10 units		(286)									

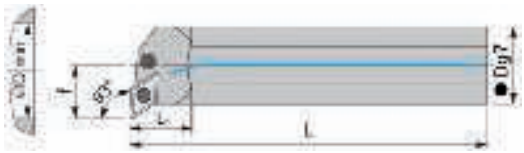
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ISO Boring Bar 93° A..-PDUNR/L with Internal Cooling

Design: Boring Bar for indexable inserts 0° negative, toggle lever tension.

Scope of supply: Without indexable inserts, without screwdriver.

Application: Inside turning.



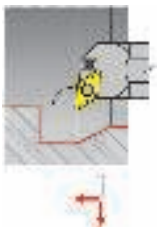




Fig.: Right-hand motion

Part No.	Product name	2968	Shank ● Dg7	Dimensions mm ø D min.	L	L_1	f	Execution	Indexable insert
1900	A32S PDUNR 15	66.30	32	40	250	60	22	Right	DNMG 1506...
1905	A32S PDUNL 15	66.30 (285)	32	40	250	60	22	Left	DNMG 1506...

Spare Parts for ISO Tool Holder 95° PCLNR/L



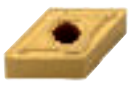


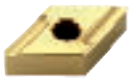


Part No.	2968 Base plate	2968 Tube socket	2968 Toggle lever	2968 Straining screw	5850 Hex socket wrench 3 x 100 mm
0041	3.25*	–	–	–	–
0036	–	1.75*	–	–	–
0034	–	–	5.88	–	–
0045	–	–	–	2.63*	–
0015	–	–	–	–	0.92
* PU 10 units	(281)	(281)	(281)	(281)	(528)

ISO Indexable Inserts – Turning







F M R R-EC L-EC

Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
0700	DNMG 150604 F PMK 9030	4.89*	●	●	●	–	–	–	0.4	●	–
0733	DNMG 150604R EC PMK 9030	4.89*	●	●	–	–	–	–	0.4	●	–
0736	DNMG 150604R EC U 9035	4.89*	●	●	–	–	●	–	0.4	●	–
0721	DNMG 150604L EC PMK 9030	4.89*	●	●	–	–	–	–	0.4	●	–
0724	DNMG 150604L EC U 9035	4.89*	●	●	–	–	●	–	0.4	●	–
0703	DNMG 150608 F PMK 9030	4.89*	●	●	●	–	–	–	0.8	●	–
0706	DNMG 150608 M PMK 9030	4.89*	●	●	●	–	–	–	0.8	●	–
0712	DNMG 150608 R PMK 9030	4.89*	●	●	●	–	–	–	0.8	●	–
0739	DNMG 150608R EC PMK 9030	4.89*	●	●	–	–	–	–	0.8	●	–
0742	DNMG 150608R EC U 9035	4.89*	●	●	–	–	●	–	0.8	●	–
0727	DNMG 150608L EC PMK 9030	4.89*	●	●	–	–	–	–	0.8	●	–
0730	DNMG 150608L EC U 9035	4.89*	●	●	–	–	●	–	0.8	●	–
0709	DNMG 150612 M PMK 9030	4.89*	●	●	●	–	–	–	1.2	●	–
0715	DNMG 150612 R PMK 9030	4.89*	●	●	●	–	–	–	1.2	●	–
0718	DNMG 150616 R PMK 9030	4.89*	●	●	●	–	–	–	1.6	●	–
* PU 10 units		(286)									

Boring Bars/Indexable Inserts – Turning

ISO Boring Bars 95° A..-PWLNR/L with Internal Cooling

Design: Boring Bar for indexable inserts 0° negative, toggle lever tension.

Scope of supply: Without indexable inserts, without screwdriver.

Application: Inside turning.

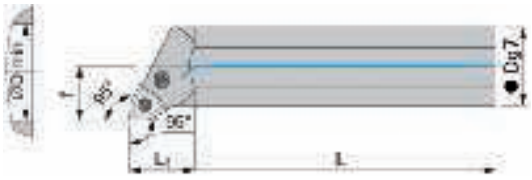






Fig.: Right-hand motion

Part No.	Product name	2968	Shank ● Dg7	Dimensions mm ø D min.	L	L_1	f	Execution	Indexable insert
1800	**A25S PWLNR 08**	52.54	25	32	250	45	17	Right	WNMG 0804...
1805	**A25S PWLNL 08**	52.54	25	32	250	45	17	Left	WNMG 0804...
1810	**A32S PWLNR 08**	66.30	32	40	250	60	22	Right	WNMG 0804...
1815	**A32S PWLNL 08**	66.30 (285)	32	40	250	60	22	Left	WNMG 0804...

Spare Parts for ISO Boring Bars 95° A..-PWLNR/L with Internal Cooling






Part No.	2968 Base plate for shank ø 32 mm	2968 Tube sockets for shank ø 32 mm	2968 Toggle lever for shank ø 25 mm	2968 Toggle lever for shank ø 32 mm
0042	4.00*	–	–	–
0036	–	1.75*	–	–
0035	–	–	3.94*	–
0033	–	–	–	3.37*
* PU 10 units	(281)	(281)	(281)	(281)






Part No.	2968 Straining screw for shank ø 32 mm	2968 Straining screw for shank ø 25 mm	5850 Hex socket wrench for shank ø 25 mm 2.5 x 100 mm	5850 Hex socket wrench for shank ø 32 mm 3 x 100 mm
0046	2.63*	–	–	–
0044	–	2.50*	–	–
0010	–	–	1.12	–
0015	–	–	–	0.92
* PU 10 units	(281)	(281)	(528)	(528)

ISO Indexable Inserts – Turning



F M R WM

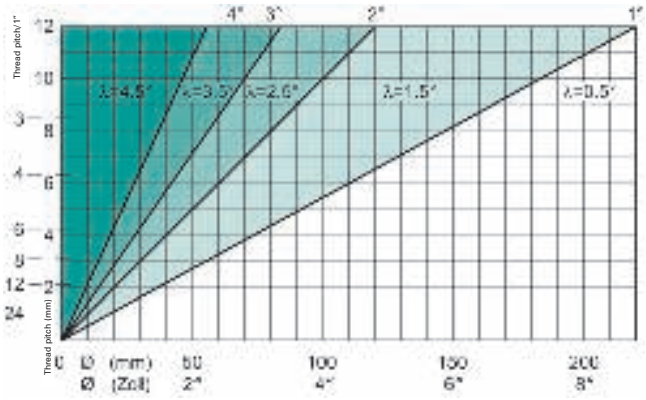
Part No.	Product name	2968	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision-sintered	Ground
0900	WNMG 080404 F PMK 9030	3.61*	●	●	●	–	–	–	0.4	●	–
0903	WNMG 080408 F PMK 9030	3.61*	●	●	●	–	–	–	0.8	●	–
0909	WNMG 080408 R PMK 9030	3.61*	●	●	●	–	–	–	0.8	●	–
0915	WNMG 080408 WM PMK 9030	4.20*	●	–	●	–	–	–	0.8	●	–
0906	WNMG 080412 M PMK 9030	3.61*	●	●	●	–	–	–	1.2	●	–
0912	WNMG 080412 R PMK 9030	3.61*	●	●	●	–	–	–	1.2	●	–
0918	WNMG 080412 WM PMK 9030	4.20*	●	–	●	–	–	–	1.2	●	–
* PU 10 units		(286)									

Choosing the Base Plate

Slope angle λ Tool holder		Positive 4.5°	3.5°	2.5°	1.5° Base plate	0.5°	Negative -0.5°	-1.5°	For indexable insert TN16.. ... ZZ
SER .... .16	SIL .... .16	PE16+4.5	PE16+3.5	PE16+2.5	PE16+1.5*	PE16+0.5	PE16-0.5	PE16-1.5	PE16ZZ
SEL .... .16	SIR .... .16	PI16+4.5	PI16+3.5	PI16+2.5	PI16+1.5*	PI16+0.5	PI16-0.5	PI16-1.5	PI16ZZ
SER .... .22	SIL .... .22	PE22+4.5	PE22+3.5	PE22+2.5	PE22+1.5*	PE22+0.5	PE22-0.5	PE22-1.5	–
SEL .... .22	SIR .... .22	PI22+4.5	PI22+3.5	PI22+2.5	PI22+1.5*	PI22+0.5	PI22-0.5	PI22-1.5	–

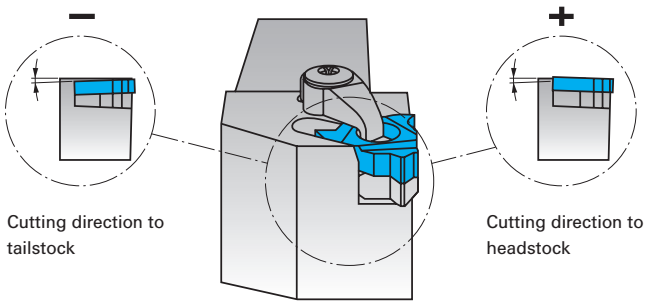
Please note: All tool holders are fitted with a fixed slope angle λ = 1.5°.
The slope angle can be changed by the base plate – see table and diagram.

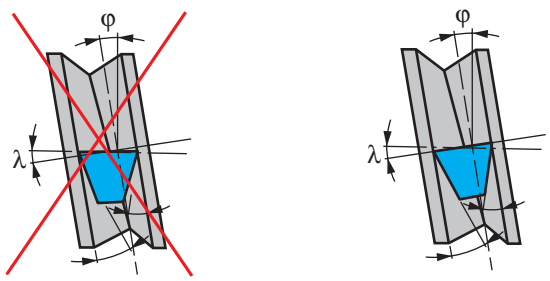
Diagram – Choosing the Base Plate



Fabrication Method

Attention:
If the cutting direction shows to the tailstock, the base plate must be changed.





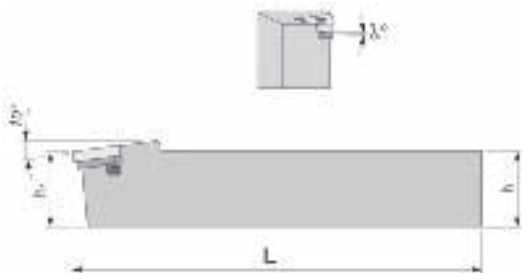
To achieve highest profile precision and even wear, the slope angle (λ) of the indexable insert must correspond exactly with the lead angle (φ) of the thread.

Threaded Tool Holders

Design: Threaded tool holders, incl. base plate, pitch angle 1.5°, screw clamping.

Scope of supply: Without indexable inserts, without screwdriver.

Application: External thread – right/left.



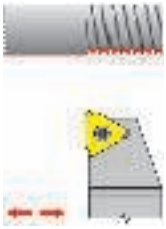




Fig.: Right-hand motion

Part No.	Product name	2969	Shank ■	Dimensions mm L	h_1	Execution	Indexable insert
0100	**SER 2020 K16**	69.15	20 x 20	125	20	Right	TN16ER...
0000	**SEL 2020 K16**	69.15	20 x 20	125	20	Left	TN16EL...
0105	**SER 2525 M16**	71.02	25 x 25	150	25	Right	TN16ER...
0005	**SEL 2525 M16**	71.02	25 x 25	150	25	Left	TN16EL...
0110	**SER 3225 P16**	78.28	32 x 25	170	32	Right	TN16ER...
0010	**SEL 3225 P16**	78.28 (287)	32 x 25	170	32	Left	TN16EL...

Spare Parts for Threaded Tool Holders Right/Left















Part No.	2969 Base plate for SER PE 16 + 1,5°	2969 Base plate for SEL PI 16 + 1,5°	2969 Straining screw for WSP	2969 Hex straining screw for base plate	5850 Hex socket wrench 2.5 x 100 mm	5886 Screwdriver for TORX® T15 x 80 mm	6233 Torque screwdriver 3.0 Nm TX15
0121	9.12	–	–	–	–	–	–
0123	–	9.12	–	–	–	–	–
0122	–	–	2.87*	–	–	–	–
0124	–	–	–	0.16*	–	–	–
0010	–	–	–	–	1.12	–	–
0050	–	–	–	–	–	3.31	–
0030	–	–	–	–	–	–	20.45
* PU 10 units	(287)	(287)	(287)	(287)	(528)	(526)	(539)

Note: Further base plates with other lead angles on request.

ISO Threaded Indexable Inserts, External 60°, metric, solid profile


ER-M


EL-M


ER-MP

Part No.	Product name	2969	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Lead mm	Precision sintered	Ground
0200	TN16EL 050 M U 9035	6.79*	●	●	●	●	●	–	0.50	–	●
0203	TN16EL 075 M U 9035	6.79*	●	●	●	●	●	–	0.75	–	●
0206	TN16EL 100 M U 9035	6.79*	●	●	●	●	●	–	1.00	–	●
0209	TN16EL 125 M U 9035	6.79*	●	●	●	●	●	–	1.25	–	●
0212	TN16EL 150 M U 9035	6.79*	●	●	●	●	●	–	1.50	–	●
0215	TN16EL 175 M U 9035	6.79*	●	●	●	●	●	–	1.75	–	●
0218	TN16EL 200 M U 9035	6.79*	●	●	●	●	●	–	2.00	–	●
0221	TN16EL 250 M U 9035	6.79*	●	●	●	●	●	–	2.50	–	●
0224	TN16EL 300 M U 9035	6.79*	●	●	●	●	●	–	3.00	–	●
0300	TN16ER 050 M U 9035	6.79*	●	●	●	●	●	–	0.50	–	●
0303	TN16ER 075 M U 9035	6.79*	●	●	●	●	●	–	0.75	–	●
0306	TN16ER 100 M U 9035	6.79*	●	●	●	●	●	–	1.00	–	●
0309	TN16ER 125 M U 9035	6.79*	●	●	●	●	●	–	1.25	–	●
0312	TN16ER 150 M U 9035	6.79*	●	●	●	●	●	–	1.50	–	●
0315	TN16ER 175 M U 9035	6.79*	●	●	●	●	●	–	1.75	–	●
0318	TN16ER 200 M U 9035	6.79*	●	●	●	●	●	–	2.00	–	●
0321	TN16ER 250 M U 9035	6.79*	●	●	●	●	●	–	2.50	–	●
0324	TN16ER 300 M U 9035	6.79*	●	●	●	●	●	–	3.00	–	●
0400	TN16ER 100 M P U 9035	5.84*	●	●	●	●	●	–	1.00	●	–
0403	TN16ER 125 M P U 9035	5.84*	●	●	●	●	●	–	1.25	●	–
0406	TN16ER 150 M P U 9035	5.84*	●	●	●	●	●	–	1.50	●	–
0409	TN16ER 175 M P U 9035	5.84*	●	●	●	●	●	–	1.75	●	–
0412	TN16ER 200 M P U 9035	5.84*	●	●	●	●	●	–	2.00	●	–
0415	TN16ER 250 M P U 9035	5.84*	●	●	●	●	●	–	2.50	●	–
0418	TN16ER 300 M P U 9035	5.84*	●	●	●	●	●	–	3.00	●	–

* PU 10 units (288)

ISO Threaded Indexable Inserts, External 55°, WW, solid profile


ER-W


ER-WP

Part No.	Product name	2969	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Lead "	Precision sintered	Ground
0500	TN16ER 080 W U 9035	7.13*	●	●	●	●	●	–	9	–	●
0503	TN16ER 090 W U 9035	7.13*	●	●	●	●	●	–	10	–	●
0506	TN16ER 100 W U 9035	7.13*	●	●	●	●	●	–	11	–	●
0509	TN16ER 110 W U 9035	7.13*	●	●	●	●	●	–	12	–	●
0512	TN16ER 120 W U 9035	7.13*	●	●	●	●	●	–	14	–	●
0515	TN16ER 140 W U 9035	7.13*	●	●	●	●	●	–	16	–	●
0518	TN16ER 160 W U 9035	7.13*	●	●	●	●	●	–	18	–	●
0521	TN16ER 180 W U 9035	7.13*	●	●	●	●	●	–	19	–	●
0524	TN16ER 190 W U 9035	7.13*	●	●	●	●	●	–	20	–	●
0527	TN16ER 200 W U 9035	7.13*	●	●	●	●	●	–	28	–	●
0530	TN16ER 280 W U 9035	7.13*	●	●	●	●	●	–	11	–	●
0600	TN16ER 110 W P U 9035	6.06*	●	●	●	●	●	–	14	●	–
0603	TN16ER 140 W P U 9035	6.06*	●	●	●	●	●	–	19	●	–
0606	TN16ER 190 W P U 9035	6.06*	●	●	●	●	●	–	19	●	–

* PU 10 units (288)

Threaded Indexable Inserts

Threaded Boring Bar

Design: Threaded Boring Bar, incl. base plate, lead angle 1.5°, screw clamping.
Scope of supply: Without indexable inserts, without screwdriver.
Application: Internal thread – right/left.

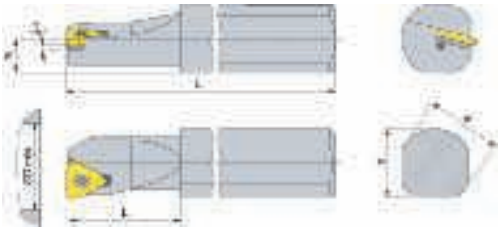






Fig.: Right-hand motion

Part No.	Product name	2969	Dimensions mm					Execution	Indexable insert
			ø	D min.	L	L_1	h_1		
0800	SIR 0010 K 11–1*	57.92	16	13	125	25	7	Right[1]	TN11NR...
0700	SIL 0010 K 11–1*	57.92	16	13	125	25	7	Left[1]	TN11NL...
0805	SIR 0013 M 11–1*	57.92	16	16	150	32	7	Right[1]	TN11NR...
0705	SIL 0013 M 11–1*	57.92	16	16	150	32	7	Left[1]	TN11NL...
0810	SIR 1416 N 16–0	78.77	16	22	160	–	7.5	Right[2]	TN16NR...
0710	SIL 1416 N 16–0	78.77	16	22	160	–	7.5	Left[2]	TN16NL...
0815	SIR 1416 N 16–1	78.77	16	22	160	–	7.5	Right[2]	TN16NR...
0715	SIL 1416 N 16–1	78.77	16	22	160	–	7.5	Left[2]	TN16NL...
0820	SIR 1820 P 16	86.97	20	27	170	–	9	Right[3]	TN16NR...
0720	SIL 1820 P 16	86.97	20	27	170	–	9	Left[3]	TN16NL...
0825	SIR 2325 Q 16	91.19	25	29	180	–	11.5	Right[3]	TN16NR...
0725	SIL 2325 Q 16	91.19	25	29	180	–	11.5	Left[3]	TN16NL...
0830	SIR 2532 S 16	97.11	32	36	250	–	12.5	Right[3]	TN16NR...
0730	SIL 2532 S 16	97.11	32	36	250	–	12.5	Left[3]	TN16NL...
0835	SIR 2532 S 22–A	105.55	32	36	250	–	12.5	Right[4]	TN22NR...
0735	SIL 2532 S 22–A	105.55	32	36	250	–	12.5	Left[4]	TN22NL...
0840	SIR 3240 T 22–A	113.99	40	48	300	–	16	Right[4]	TN22NR...
0740	SIL 3240 T 22–A	113.99	40	48	300	–	16	Left[4]	TN22NL...
* without base plate		(287)							

Spare Parts for Threaded Boring Bars Right/Left













Part No.	2969 Straining screw for holder size 2	2969 Straining screw for holder size 1	2969 Straining screw for holder size 3	2969 Straining screw for holder size 4	2969 Straining screw for base plate size 4	2969 Straining screw for base plate size 3
0850	2.87*	–	–	–	–	–
0854	–	1.94*	–	–	–	–
0122	–	–	2.87*	–	–	–
0852	–	–	–	3.54*	–	–
0856	–	–	–	–	0.26*	–
0124	–	–	–	–	–	0.16*
* PU 10 units	(287)	(287)	(287)	(287)	(287)	(287)

Spare Parts for Threaded Boring Bars 52° A..-SVJCR/L with Internal Cooling













Part No.	5886 Screwdriver for TORX® T7 size 1	6233 Torque screwdriver S 0.9 Nm TX 7 size 1	5886 Screwdriver for TORX® T15 size 2 + 3	6233 Torque screwdriver S 3.0 Nm TX 15 size 2 + 3	5886 Screwdriver for TORX® T20 size 4	5850 Hex socket wrench size 3
0020	3.19	–	–	–	–	–
0010	–	17.53	–	–	–	–
0050	–	–	3.31	–	–	–
0030	–	–	–	20.45	–	–
0060	–	–	–	–	3.38	–
0010	–	–	–	–	–	1.12
	(526)	(539)	(526)	(539)	(526)	(528)

Spare Parts for Threaded Boring Bar right/left






Part No.	2969 Base plate for SIR PI 16 + 1.5°	2969 Base plate for SIL PE 16 + 1.5°	2969 Base plate for SIR PI 22 + 1.5°	2969 Base plate for SIL PE 22 + 1.5°
0123	9.12*	–	–	–
0121	–	9.12*	–	–
0119	–	–	12.16*	–
0118	–	–	–	12.16*
* PU 10 units	(287)	(287)	(287)	(287)

Note: Further base plates with other lead angles on request.

ISO Threaded Indexable Inserts, Internal, 60°, metric, solid profile


NR-M


NL-M


NR-MP

Part No.	Product name	2969	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Lead mm	Precision sintered	Ground
0900	TN11 NR 050 M U 9035	6.59*	●	●	●	●	●	–	0.50	–	●
0901	TN11 NL 050 M U 9035	6.59*	●	●	●	●	●	–	0.50	–	●
0903	TN11 NR 075 M U 9035	6.59*	●	●	●	●	●	–	0.75	–	●
0904	TN11 NL 075 M U 9035	6.59*	●	●	●	●	●	–	0.75	–	●
0906	TN11 NR 100 M U 9035	6.59*	●	●	●	●	●	–	1.00	–	●
0908	TN11 NL 100 M U 9035	6.59*	●	●	●	●	●	–	1.00	–	●
0909	TN11 NR 125 M U 9035	6.59*	●	●	●	●	●	–	1.25	–	●
0910	TN11 NL 125 M U 9035	6.59*	●	●	●	●	●	–	1.25	–	●
0912	TN11 NR 150 M U 9035	6.59*	●	●	●	●	●	–	1.50	–	●
0913	TN11 NL 150 M U 903	6.59*	●	●	●	●	●	–	1.50	–	●
0915	TN16 NR 050 M U 9035	6.79*	●	●	●	●	●	–	0.50	–	●
0918	TN16 NR 075 M U 9035	6.79*	●	●	●	●	●	–	0.75	–	●
0921	TN16 NR 100 M U 9035	6.79*	●	●	●	●	●	–	1.00	–	●
0922	TN16 NL 100 M U 9035	6.79*	●	●	●	●	●	–	1.00	–	●
0924	TN16 NR 125 M U 9035	6.79*	●	●	●	●	●	–	1.25	–	●
0925	TN16 NL 125 M U 9035	6.79*	●	●	●	●	●	–	1.25	–	●
0927	TN16 NR 150 M U 9035	6.79*	●	●	●	●	●	–	1.50	–	●
0928	TN16 NL 150 M U 9035	6.79*	●	●	●	●	●	–	1.50	–	●
0930	TN16 NR 175 M U 9035	6.79*	●	●	●	●	●	–	1.75	–	●
0931	TN16 NL 175 M U 9035	6.79*	●	●	●	●	●	–	1.75	–	●
0933	TN16 NR 200 M U 9035	6.79*	●	●	●	●	●	–	2.00	–	●
0934	TN16 NL 200 M U 9035	6.79*	●	●	●	●	●	–	2.00	–	●
0936	TN16 NR 250 M U 9035	6.79*	●	●	●	●	●	–	2.50	–	●
0939	TN16 NR 300 M U 9035	6.79*	●	●	●	●	●	–	3.00	–	●
1000	TN11 NR 100 M P U 9035	5.46*	●	●	●	●	●	–	1.00	–	●
1003	TN11 NR 150 M P U 9035	5.46*	●	●	●	●	●	–	1.50	–	●
1006	TN16 NR 100 M P U 9035	5.84*	●	●	●	●	●	–	1.00	–	●
1009	TN16 NR 150 M P U 9035	5.84*	●	●	●	●	●	–	1.50	–	●
1012	TN16 NR 200 M P U 9035	5.84*	●	●	●	●	●	–	2.00	–	●
1015	TN16 NR 250 M P U 9035	5.84*	●	●	●	●	●	–	2.50	–	●
1018	TN16 NR 300 M P U 9035	5.84*	●	●	●	●	●	–	3.00	–	●
1100	TN22 NR 350 M U 9035	10.29*	●	●	●	●	●	–	3.50	–	●
1103	TN22 NR 400 M U 9035	10.29*	●	●	●	●	●	–	4.00	–	●
1106	TN22 NR 450 M U 9035	10.29*	●	●	●	●	●	–	4.50	–	●
1109	TN22 NR 500 M U 9035	10.29*	●	●	●	●	●	–	5.00	–	●
* PU 10 units		(288)									

ISO Threaded Indexable Inserts, Internal, 550°, WW, solid profile



NR-W



NR-WP

Part No.	Product name	2969	P Steel	M INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Lead "	Precision sintered	Ground
2000	TN11 NR 140 W U 9035	6.94*	●	●	●	●	●	–	14	–	●
2003	TN11 NR 190 W U 9035	6.94*	●	●	●	●	●	–	19	–	●
2006	TN16 NR 080 W U 9035	7.13*	●	●	●	●	●	–	8	–	●
2009	TN16 NR 090 W U 9035	7.13*	●	●	●	●	●	–	9	–	●
2012	TN16 NR 100 W U 9035	7.13*	●	●	●	●	●	–	10	–	●
2015	TN16 NR 110 W U 9035	7.13*	●	●	●	●	●	–	11	–	●
2018	TN16 NR 120 W U 9035	7.13*	●	●	●	●	●	–	12	–	●
2021	TN16 NR 140 W U 9035	7.13*	●	●	●	●	●	–	14	–	●
2024	TN16 NR 160 W U 9035	7.13*	●	●	●	●	●	–	16	–	●
2027	TN16 NR 190 W U 9035	7.13*	●	●	●	●	●	–	19	–	●
2030	TN16 NR 200 W U 9035	7.13*	●	●	●	●	●	–	20	–	●
2033	TN16 NR 280 W U 9035	7.13*	●	●	●	●	●	–	28	–	●
2100	TN11 NR 140 W P U 9035	5.46*	●	●	●	●	●	–	14	●	–
2103	TN11 NR 190 W P U 9035	5.46*	●	●	●	●	●	–	19	●	–
2106	TN16 NR 110 W P U 9035	6.06*	●	●	●	●	●	–	11	●	–
2109	TN16 NR 140 W P U 9035	6.06*	●	●	●	●	●	–	14	●	–
2200	TN22 NR 050 W U 9035	10.77*	●	●	●	●	●	–	5	–	●
2203	TN22 NR 060 W U 9035	10.77*	●	●	●	●	●	–	6	–	●
2206	TN22 NR 070 W U 9035	10.77*	●	●	●	●	●	–	7	–	●

* PU 10 units (288)



2/185

NEW

Boring Bar Set 107.5° A..SDQCR/L

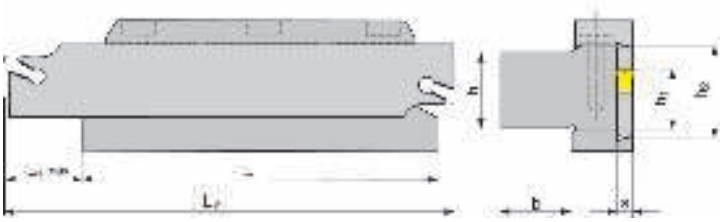
- Boring Bar set with internal cooling
- Made of special tool steel
- Boring Bar for indexable inserts 7° positive with screw clamping

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Holders for Parting/Parking Blocks

Design: Holding system for slicing blade – adjustable.

Application: Slicing and punching.

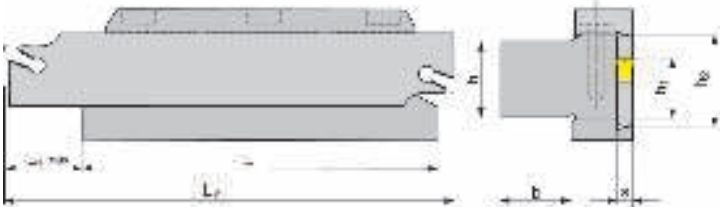


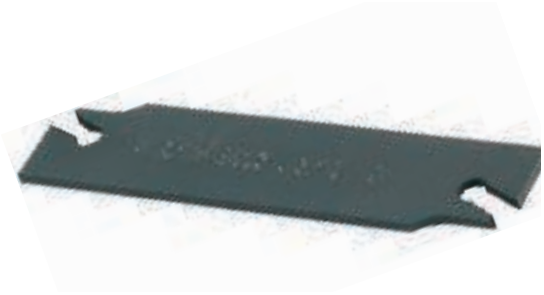


Part No.	Product name	2969	Dimensions mm			For blade
			h	b	L	
3000	26-DU 2020	100.49	20	20	90	XLCFN26...
3005	32-DU 2523	105.55	25	23	110	XLCFN32...
3010	32-DU 2532	109.77	25	32	110	XLCFN32...
3015	32-DU 3229	111.46	32	29	110	XLCFN32...
		(287)				

Parting Blades

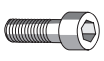
Design: Tool steel.





Part No.	Designation	2969	Dimensions mm				Punching/ slicing width mm	L_1 max. mm	For holder
			h_1	h_2	L_2	s			
3100	XLCFN 2601 J 2.00	48.97	20	26	110	1.6	2	25	26-DU...
3105	XLCFN 2602 J 3.00	48.97	20	26	110	2.4	3	40	26-DU...
3110	XLCFN 2603 J 4.00	48.97	20	26	110	3.4	4	40	26-DU...
3112	XLCFN 3202 M 3.00	51.52	25	32	150	2.4	3	50	32-DU...
3114	XLCFN 3203 M 4.00	51.52	25	32	150	3.4	4	50	32-DU...
3115	XLCFN 3204 M 5.00	51.52	25	32	150	4.4	5	50	32-DU...
		(287)							

Spare Parts for Holder/Parting Blade



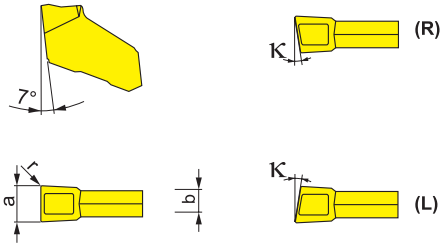


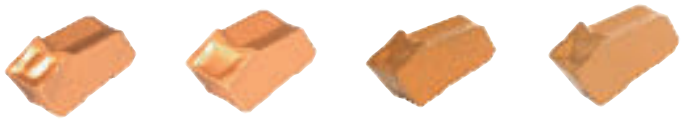


Part No.	2969 Straining screw for holder M6 x 20 mm	5850 Hex socket for straining screw 5 x 100 mm	2969 Drifts for punching/slicing blade
3020	0.26*	–	–
0045	–	1.20	–
3024	–	–	1.60
* PU 10 units	(287)	(528)	(287)

Parting/Slicing Blades

Design: ISO punching and slicing blade for punching and slicing of steel, aluminium and VA steel. Aluminium and VA self-gripping system in with stopper.





N-F N-M SR-SM SL-SM

Part No.	Product name	2969	a ± 0.06 mm	b mm	r mm	Clearance angle	Face angle
3197	LFMX 2.00-0.16N F U 9035	3.24*	2.00	1.60	0.16	7°	–
3200	LFMX 2.00-0.16N M U 9035	3.24*	2.00	1.60	0.16	7°	–
3203	LFMX 3.10-0.20N F U 9035	3.56*	3.10	2.60	0.20	7°	–
3206	LFMX 3.10-0.20N M U 9035	3.56*	3.10	2.60	0.20	7°	–
3209	LFMX 4.10-0.20N F U 9035	3.99*	4.10	3.60	0.20	7°	–
3212	LFMX 4.10-0.20N M U 9035	3.99*	4.10	3.60	0.20	7°	–
3215	LFMX 5.10-0.20N F U 9035	4.30*	5.10	4.60	0.20	7°	–
3218	LFMX 5.10-0.20N M U 9035	4.30*	5.10	4.60	0.20	7°	–
3221	LFMX 3.10-0.20SR SM 9035	3.56*	3.10	2.60	0.20	–	8°
3224	LFMX 3.10-0.20SL SM 9035	3.56*	4.10	3.60	0.20	–	8°
3227	LFMX 4.10-0.20SR SM 9035	3.99*	3.10	2.60	0.20	–	8°
3230	LFMX 4.10-0.20SL SM 9035	3.99*	4.10	3.60	0.20	–	8°

* PU 10 units (288)

Part No.	Product name	P Steel	M VA/INOX	K Cast iron	N Non-ferrous metal	S Super alloy	H 45-60 HRC	Corner radius	Precision sintered	Ground
3197	LFMX 2.00-0.16N M U 9035	●	●	●	○	○	○	0.16	–	●
3200	LFMX 2.00-0.16N M U 9035	●	●	●	○	○	○	0.16	–	●
3203	LFMX 3.10-0.20N F U 9035	●	●	●	○	○	○	0.20	–	●
3206	LFMX 3.10-0.20N M U 9035	●	●	●	○	○	○	0.20	–	●
3209	LFMX 4.10-0.20N F U 9035	●	●	●	○	○	○	0.20	–	●
3212	LFMX 4.10-0.20N M U 9035	●	●	●	○	○	○	0.20	–	●
3215	LFMX 5.10-0.20N F U 9035	●	●	●	○	○	○	0.20	–	●
3218	LFMX 5.10-0.20N M U 9035	●	●	●	○	○	○	0.20	–	●
3221	LFMX 3.10-0.20SR SM 9035	●	●	●	○	○	○	0.20	–	●
3224	LFMX 3.10-0.20SL SM 9035	●	●	●	○	○	○	0.20	–	●
3227	LFMX 4.10-0.20SR SM 9035	●	●	●	○	○	○	0.20	–	●
3230	LFMX 4.10-0.20SL SM 9035	●	●	●	○	○	○	0.20	–	●

Turning – Cutting Parameters

Nomenclature and formulas

Speed

$$n = \frac{v_c \cdot 1000}{\pi \cdot D} \quad \text{(rpm/min)}$$

Cutting speed

$$v_c = \frac{n \cdot \pi \cdot D}{1000} \quad \text{(rpm/min)}$$

a_p	=	Cutting depth	(mm)
D	=	Workpiece diameter	(mm)
f	=	Feed	(mm/rpm)
n	=	Speed	(rpm/min)
v_c	=	Cutting speed	(m/min)
κ	=	Setting angle	(°)

Milling – Cutting Parameters

Nomenclature and formulas

Speed

$$n = \frac{v_c \cdot 1000}{\pi \cdot D_c} \quad \text{(rpm/min)}$$

Cutting speed

$$v_c = \frac{n \cdot \pi \cdot D_c}{1000} \quad \text{(m/min)}$$

Feed speed

$$v_f = n \cdot z_n \cdot f_z \quad \text{(mm/min)}$$

$$v_f = n \cdot z_c \cdot f_z \quad \text{(mm/min)}$$

Feed/revolution

$$f = z_n \cdot f_z \quad \text{(mm/rpm)}$$

$$f = z_c \cdot f_z \quad \text{(mm/rpm)}$$

Cutting speed and speed profiling

$$v_c = \frac{n \cdot \pi \cdot D_w}{1000} \quad \text{(m/min)}$$

$$n = \frac{v_c \cdot 1000}{\pi \cdot D_w} \quad \text{(rpm/min)}$$

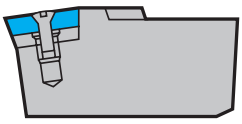
$$D_w = 2 \cdot \sqrt{a_p (D_c - a_p)} \quad \text{(mm)}$$

a_e	=	Radial cutting depth (contact width)	(mm)
a_p	=	Axial cutting depth	(mm)
D_c	=	Milling cutter diameter	(mm)
f	=	Feed/rpm	(mm/rpm)
f_z	=	Feed/tooth	(mm/tooth)
z_c	=	Effective number of teeth for calculation of feed	
n	=	Speed	(rpm/min)
v_c	=	Cutting speed	(m/min)
v_f	=	Feed speed	(mm/min)

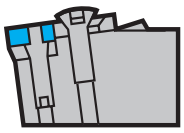
ISO Nomenclature – External Tool Holders

P	C	L	N	R	25	25	M	12	
1	2	3	4	5	6	7	8	9	10

1. Clamping system

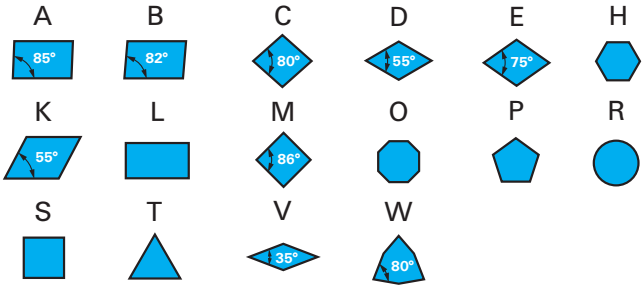


Screw

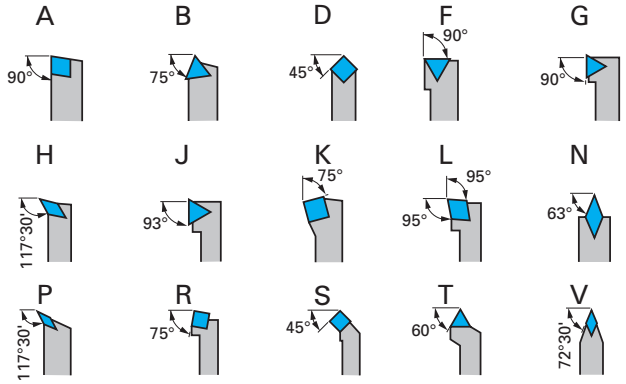


Pin/jaw or toggle lever

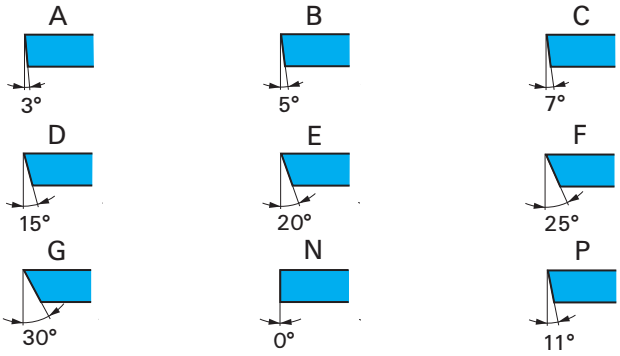
2. Shape – Indexable Insert



3. Tool Type



4. Clearance Angle of Indexable Insert

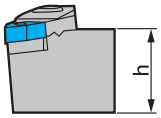


O = Special

5. Cutting Direction

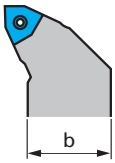


6. Shank Height



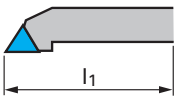
12 = 12 mm
25 = 25 mm
32 = 32 mm
etc.

7. Shank Width



12 = 12 mm
25 = 25 mm
32 = 32 mm
etc.

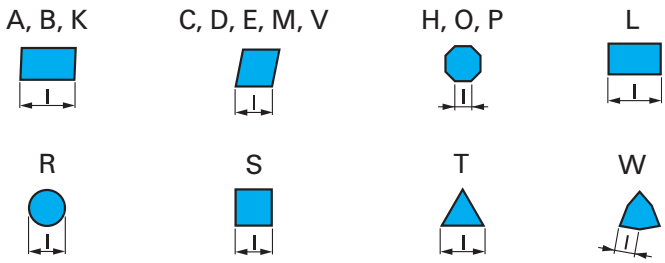
8. Tool Length



A = 32 mm
C = 50 mm
D = 60 mm (0808)
E = 70 mm (1010)
F = 80 mm (1212)
H = 100 mm (1616)
K = 125 mm (2020)
M = 150 mm (2525, 4032*)
P = 170 mm (3225, 3232)
R = 200 mm (4032**, 4040)
S = 250 mm (5050)
T = 300 mm
V = 400 mm

(- = standard length
* tool type N
** tool type J

9. Cutting Edge Length



l = cutting edge length in mm

10. Internal Designation

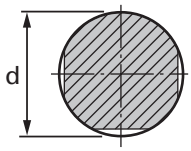
ISO Nomenclature – Internal Tool Holders

A	25	S	-	P	C	L	N	R	12	
1	2	3		4	5	6	7	8	9	10

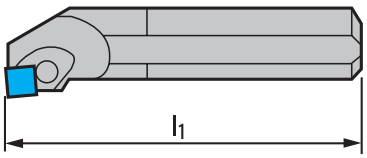
1. Shank Design

A = Steel in cooling duct
S = Solid steel

2. Shank Diameter

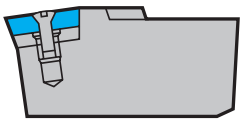


3. Tool Length

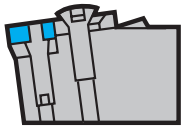


K = 125 mm
L = 140 mm
M = 150 mm
N = 160 mm
P = 170 mm
Q = 180 mm
R = 200 mm
S = 250 mm
T = 300 mm
U = 350 mm
V = 400 mm

4. Clamping System

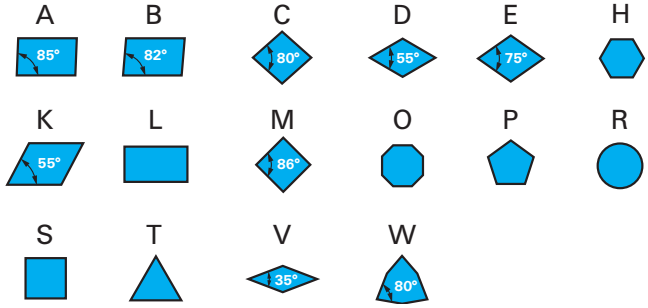


Screw

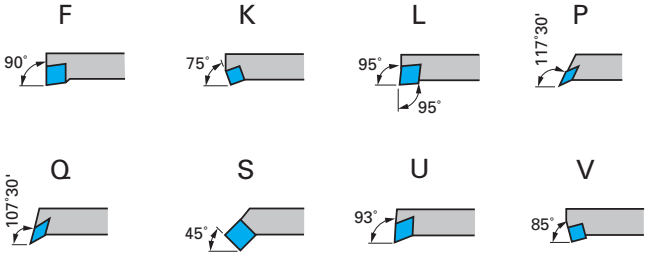


Pin/wedge or toggle lever

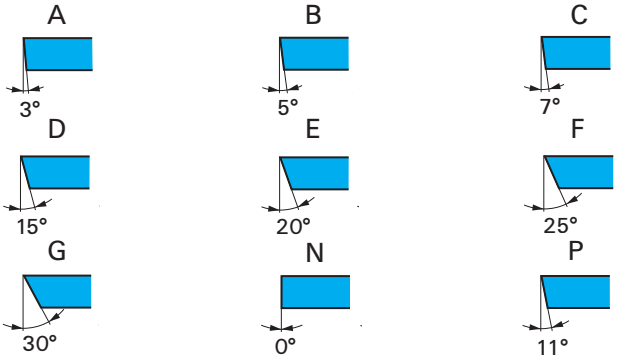
5. Shape – Indexable Insert



6. Tool Type



7. Clearance Angle of Indexable Insert

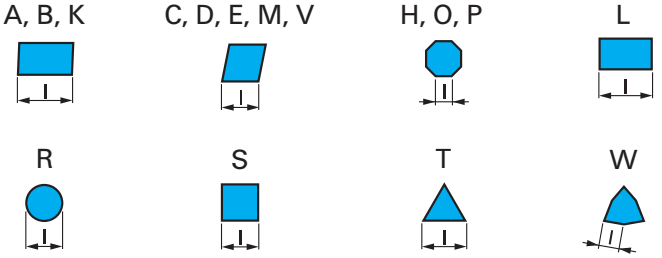


O = Special

8. Cutting Direction



9. Cutting Edge Length



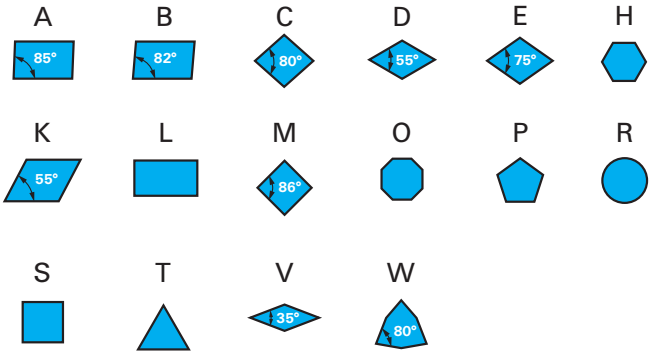
l = cutting edge length in mm

10. Internal Designation

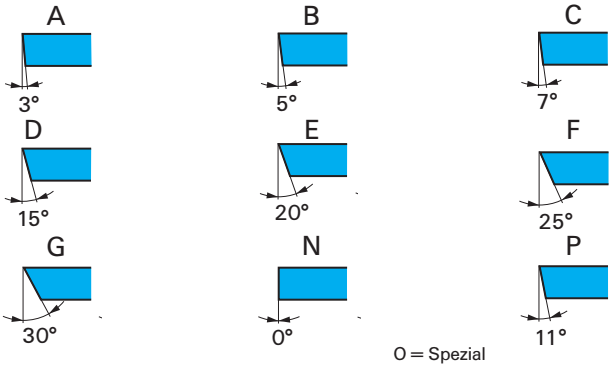
ISO Nomenclature – Indexable Inserts

C	N	M	G	12	04	08			-	
1	2	3	4	5	6	7	8	9		10

1. Shape



2. Clearance Angle



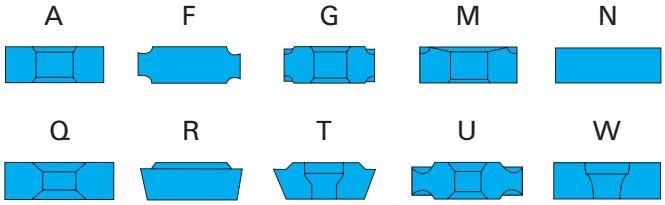
O = Spezial

3. Tolerances

* not ISO

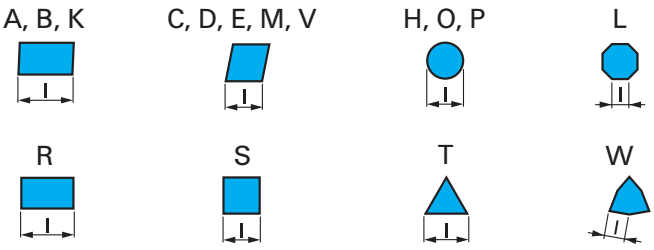
Tol. class	Tolerance ± mm			For d, dimensions mm									
	m	s	d	3.175*	4.76	6.35	9.525	12.7	15.875	19.05	25.4	31.75	38.1
A	0.005	0.025	0.025	●	●	●	●	●	●	●	●	●	●
E	0.025	0.025	0.025	●	●	●	●	●	●	●	●	●	●
F	0.005	0.025	0.013	●	●	●	●	●	●	●	●	●	●
G	0.025	0.13	0.025	●	●	●	●	●	●	●	●	●	●
H	0.013	0.025	0.013	●	●	●	●	●	●	●	●	●	●
J	0.005	0.025	0.05	●	●	●	●						
	0.005	0.025	0.08					●					
	0.005	0.025	0.10						●	●			
	0.005	0.025	0.13								●		
	0.005	0.025	0.15									●	●
K	0.013	0.025	0.05	●	●	●	●						
	0.013	0.025	0.08					●					
	0.013	0.025	0.10						●	●			
	0.013	0.025	0.13								●		
	0.013	0.025	0.15									●	●
M	0.08	0.13	0.05	●	●	●	●						
	0.13	0.13	0.08					●					
	0.15	0.13	0.10						●	●			
	0.18	0.13	0.13								●		
	0.20	0.13	0.15									●	●
U	0.13	0.13	0.08	●	●	●	●						
	0.20	0.13	0.13					●					
	0.27	0.13	0.18						●	●			
	0.38	0.13	0.25								●	●	●

4. Type – Indexable Insert



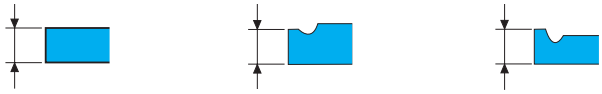
X = Spezial

5. Cutting Edge Length



l = cutting edge length in mm

6. Thickness, s



01 = 1.59 mm	T3 = 3.97 mm	07 = 7.94 mm
T1 = 1.98 mm	04 = 4.76 mm	08 = 8.00 mm
02 = 2.38 mm	05 = 5.56 mm	09 = 9.52 mm
03 = 3.18 mm	06 = 6.35 mm	

7. Indexable Inserts with Face Cutting/Right-angle Corner



1. Letter		2. Letter		Right-angle corner mm
A = 45°	F = 85°	A = 3°	F = 25°	M0* = round cutting edge
D = 60°	P = 90°	B = 5°	G = 30°	00 = Sharp edges
E = 75°		C = 7°	N = 0°	01 = 0.1
		D = 15°	P = 11°	02 = 0.2
		E = 20°		04 = 0.4
				08 = 0.8
Z = Special		Z = Special		12 = 1.2 etc.

* in millimetre

8. Cutting Edge Design



Details not obligatory

9. Cutting Direction



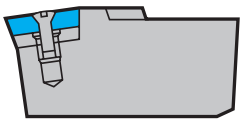
Details not obligatory

10. Internal Designation

Thread Cutting – ISO Code

S	E	R	25	25	M	16	
1	2	3	4	5	6	7	8

1. Clamping System



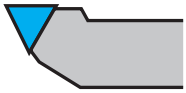
S

Screw

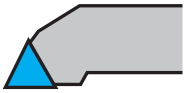
2. External/Internal

E = External
I = Internal

3. Cutting Direction

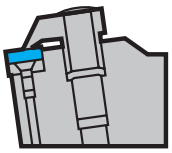


L



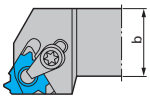
R

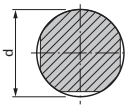
4. Shank Direction



25 = 25 mm
32 = 32 mm

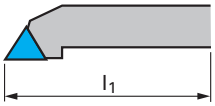
5. Shank Width/Diameter





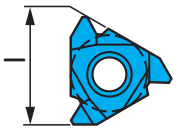
12 = 12 mm
20 = 20 mm
25 = 25 mm

6. Tool Length



H = 100 mm
K = 125 mm
L = 140 mm
M = 150 mm
P = 170 mm
Q = 180 mm
R = 200 mm
S = 250 mm
T = 300 mm
U = 350 mm
V = 400 mm

7. Cutting Edge Length



Example:
Cutting edge length = 16.5 mm
symbol = 16

8. Additional Information

Slope angle λ
0 = Slope angle λ 0°
1 = Slope angle λ 1°

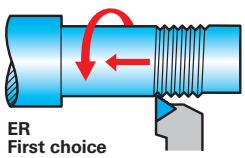
Machining Methods

The selection of the cutting direction depends on:

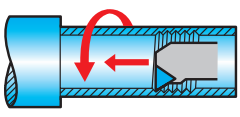
- workpiece (external or internal thread, right or left-hand thread)
- machine (right or left-hand tool)

Cutting Direction to Headstock

Right-hand thread – right-hand tool

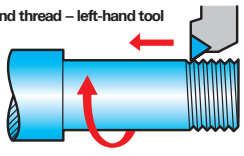


ER
First choice

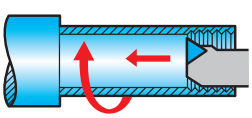


IR

Left-hand thread – left-hand tool



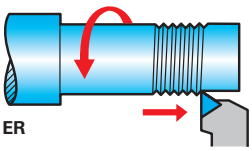
EL
First choice



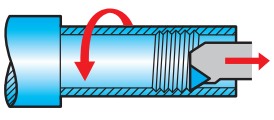
IL

Cutting Direction to Tailstock

Left-hand thread – right-hand tool

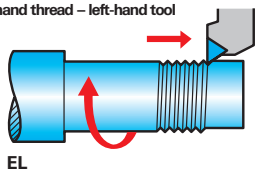


ER

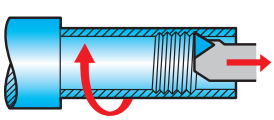


IR
First choice

Right-hand thread – left-hand tool



EL



IL
First choice

Overview – Group 3

New in the product range:

Extension of range of vices and drill chucks

In order to satisfy highest demands regarding quality and performance, our product range has ben extended by the following products:

- Röhm clamping tools
- Albrecht drill chucks





Your FORMAT plus partner will inform you about the performance of these and further cutting tools.


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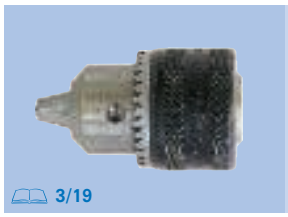

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3/10


3/15

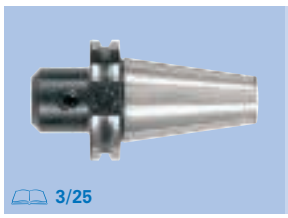

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3/18

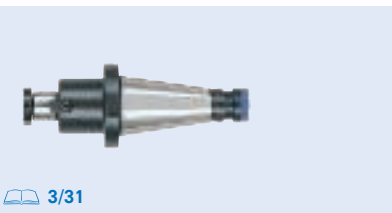

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Lathe chucks/accessories **3/2–3/9**
Quick-change tool holders/ accessories **3/10–3/11**
VDI tool holders **3/12–3/14**


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3/18

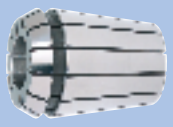
Live lathe centres/accessories **3/15–3/17**
Constant face drivers **3/18**
Live centre tapers **3/18**


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3/23


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Drill chucks/accessories **3/19–3/24**


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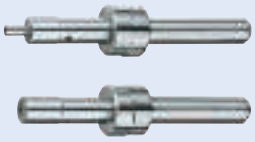

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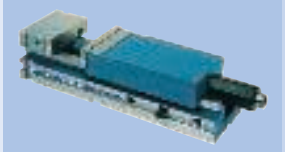
Tool holders/accessories **3/25–3/55**
Tapping heads/accessoires **3/56–3/62**


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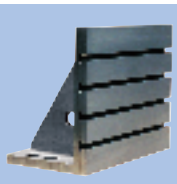
Tool presetting equipment **3/63**
Edge finders/ zero height adjustment devices **3/67**


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Machine vices/accessories **3/65–3/71**


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Precision clamping fixtures **3/72**
Angle plates/cubes **3/73**
Separation devices/compound tables **3/74**


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Clamping elements/accessories **3/75–3/90**
Quick-clamping devices/ accessories **3/91–3/99**


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Magnets **3/100–3/107**

Three-Jaw Lathe Chucks

With cylindrical centre mounting.

DIN 6350

Design: With spiral ring, centrally clamping, cast or steel body, 1 set with one-piece reversible jaws (for use as drill and lathe jaws), clamping key and fixing bolts.

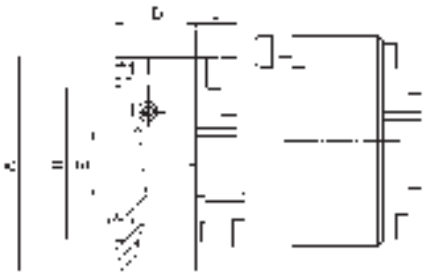
Application: For universal applications on lathes, rotary tables, dividing attachments etc.

3001 Cast iron format

3002 Steel format

3003 Cast iron ZG KOM

3004 Steel ZS KOM





Part No.	Size A mm	3001 Cast iron	3002 Steel	3003 Cast iron ZG	3004 Steel ZS	Inch	Clearance hole ⌀ E mm	Centre bore B mm	Height without jaws D mm	Jaw height J mm	Centring depth C mm
0080	80	258.70	271.22	–	–	3 1/4	19	56	39.5	14	3
0100	100	316.89	352.60	–	–	4	20	70	50	18	3
0125	125	346.87	399.77	–	–	5	32	95	56	22.5	4
0160	160	397.24	454.34	–	–	6 1/4	42	125	65	26	4
0200	200	461.08	518.19	–	–	8	55	160	73.5	32.5	4
0250	250	587.95	659.20	–	–	10	76	200	82	40	5
0315	315	964.13	1,056.44	–	–	12 1/2	103	260	95	46	5
0400	400	–	–	2,107.26 ◊	2,335.94 ◊	15 3/4	136	330	105	43	5
0500	500	–	–	4,476.54 ◊	5,750.10 ◊	20	190	420	120	54.5	5
0630	630	–	–	6,061.36 ◊	7,825.60 ◊	25	240	545	135	54.5	7
		(300)	(300)	(301)	(301)						

Three-Jaw Lathe Chucks

With short taper DIN 55027.

DIN 55027

Design: With spiral ring, centrally clamping, cast or steel body, 1 set with one-piece reversible stepped jaws (for use as drill and lathe jaws), clamping key and fastening screws.

Application: For universal applications on lathes, rotary tables, dividing heads etc.

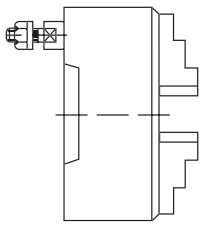
3008 Cast iron format

3010 Steel format

3012 Steel ZS KOM

DIN 55027
with studs and flange nuts







Part No.	Size A mm	3008 Cast iron	3010 Steel	3012 Steel ZS	Size of short taper	Through hole ⌀ E mm	Taper size in B mm	Height D mm
0001	160	432.46	486.53	–	4	42	63.5	66
0003	160	432.46	486.53	–	5	42	82.5	66
0005	200	529.14	578.17	–	5	55	82.5	74.5
0007	200	529.14	578.17	–	6	55	106.4	74.5
0009	250	676.05	792.29	–	5	76	82.5	83
0011	250	676.05	792.29	–	6	76	106.4	83
0013	315	1,041.46	1,140.51	–	6	103	106.4	96
0015	315	1,041.46	1,140.51	–	8	103	139.7	96
0001	400	–	–	3,274.43 ◊	8	136	139.7	106
0003	400	–	–	3,274.43 ◊	11	136	196.6	106
		(300)	(300)	(301)				

For technical information see appendix Group 10.

Three-Jaw Lathe Chucks ZS

With short taper DIN 55029.

Design: With spiral ring, self-centering, steel.
Scope of supply: 1 set of 1-piece reversing step jaws (for use as drilling and turning jaw), tightening key and fastening screws.

Application: For universal applications on lathes, rotary tables, dividing heads etc.

DIN 55029

DIN 55029 with studs for camlock



Part No.	Size A mm	3014 Steel ZS	Short taper	Clearance hole ⌀ E mm	Taper size in B mm	Height D mm
0001	100	558.50 ◊	3	20	53.9	75
0003	125	635.99 ◊	4	32	63.5	69
0005	160	721.59	4	42	63.5	66
0007	160	721.59	5	42	82.5	66
0009	200	940.09 ◊	5	55	82.5	74.5
0011	200	1,032.99 ◊	6	55	106.4	74.5
0013	250	1,157.32	6	76	106.4	83

(301)

Part No.	Size A mm	3014 Steel ZS	Short taper	Clearance hole ⌀ E mm	Taper size in B mm	Height D mm
0015	250	1,397.59 ◊	8	76	139.7	83
0017	315	1,959.58 ◊	6	103	106.4	96
0019	315	1,783.30 ◊	8	103	139.7	96
0021	315	2,069.14 ◊	11	103	196.9	104
0023	400	3,444.34 ◊	8	136	139.7	106
0025	400	3,444.34 ◊	11	136	196.6	106

(301)

Four-Jaw Lathe Chucks, ZG-ZS

With cylindrical centre mounting.

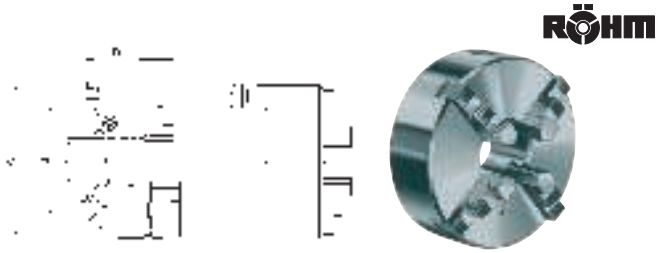
Design: With helix ring, self-centring, body made of cast iron or steel. Scope of supply: With 1-piece jaws, 1 set of which with outwardly stepped jaws (drilling jaws), 1 with inwardly stepped jaws (turning jaws), key and fastening screws.

Application: For universal application on lathes, rotary tables, dividing attachments etc.

3017 Cast iron ZG

3019 Steel ZS

DIN 6350



Part No.	Size A mm	3017 Cast iron ZG	3019 Steel ZS	Inch	Through hole-⌀ E mm	Centre bore B mm	Height without jaws D mm	Jaw height J mm	Centring depth C mm
0080	80	414.46 ◊	419.23 ◊	3 1/4	19	56	39.5	14	3
0100	100	383.35	516.58 ◊	4	20	70	50	18	3
0125	125	419.70	541.98 ◊	5	32	95	56	22.5	4
0160	160	500.06	581.68	6 1/4	42	125	65	26	4
0200	200	591.05	677.28	8	55	160	73.5	32.5	4
0250	250	813.68	967.08	10	76	200	82	40	5
0315	315	1,210.84	1,659.45 ◊	12 1/4	103	260	95	46	5
0400	400	2,291.46 ◊	3,087.05 ◊	15 3/4	136	330	105	43	5
0500	500	5,389.63 ◊	6,263.03 ◊	20	190	420	120	54.5	5
		(301)	(301)						

Four-Jaw Lathe Chucks ZS

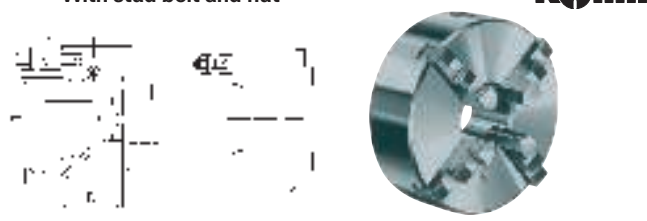
With short taper DIN 55027.

Design: With helix ring, self-centring, body made of cast iron or steel. Scope of supply: With 1-piece jaws, 1 set of which with outwardly stepped jaws (drilling jaws), 1 with inwardly stepped jaws (turning jaws), key and fastening screws.

Application: For universal application on lathes, rotary tables, dividing attachments etc.

DIN 55027

With stud bolt and nut



Part No.	Size A mm	3021 Steel ZS	Short taper	Clearance hole ⌀ E mm	Taper size in B mm	Height D mm
0001	100	657.43 ◊	3	20	53.9	75
0003	125	744.93 ◊	4	32	63.5	69
0005	160	801.77	4	42	63.5	66
0007	160	729.68	5	42	82.5	66
0009	200	847.36	5	55	82.5	74.5
0011	200	847.36	6	55	106.4	74.5
0013	250	1,299.46	6	76	106.4	83

(301)

Part No.	Size A mm	3021 Steel ZS	Short taper	Clearance hole ⌀ E mm	Taper size in B mm	Height D mm
0015	250	1,182.58	8	76	139.7	83
0017	315	2,043.74 ◊	6	103	106.4	96
0019	315	2,043.74 ◊	8	103	139.7	96
0021	315	2,177.14 ◊	11	103	196.9	104
0023	400	2,212.07 ◊	8	136	139.7	106
0025	400	3,800.06 ◊	11	136	196.6	106

(301)

For technical information see appendix Group 10.

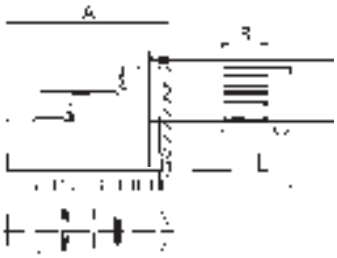
Spare Jaws for Three-/Four-Jaw Lathe Chucks

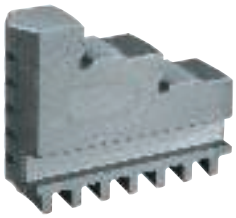
Design: Outwardly stepped drilling jaws, hardened.

3024 3-piece.

3036 3-piece.

3038 4-piece.





3024 format professional quality

Part No.	Dimensions mm	3024 3-piece	3036 3-piece	3038 4-piece	Length A mm	Width B mm	Height C mm
0080	80	66.88	–	118.11 ◊	37	12	26
0100	100	75.32	88.58	120.54	48	14	33.5
0125	125	85.75	100.65	124.78	52	18	41.5
0160	160	92.98	109.18	133.83	61	18	47.5
0200	200	103.54	113.72	149.97	69	20	53.5
0250	250	131.91	153.10	192.31	90	24	67.5
0315	315	225.57	263.44	327.13	130	34	79.5
0400	400	–	296.32 ◊	433.84 ◊	130	34	79.5
5063	500/630	–	691.56 ◊	919.93 ◊	190	42	95
		(300)	(301)	(301)			



3036/3038 RÖHM

Spare Jaws for Three-/Four-Jaw Lathe Chucks

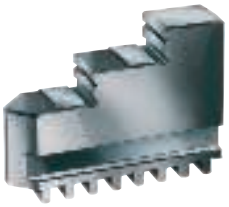
Design: Inwardly stepped turning jaws, hardened.

RÖHM

3048 3-piece.

3050 4-piece.





3048/3050

Part No.	Dimensions mm	3048 3-piece	3050 4-piece	Length A mm	Width B mm	Height C mm
0080	80	–	118.11 ◊	37	12	26
0100	100	83.25	109.70	48	14	33.5
0125	125	94.60	124.78	52	18	41.5
0160	160	102.65	133.83	61	18	47.5
0200	200	113.72	149.97	69	20	53.5
0250	250	143.92	192.31	90	24	67.5
0315	315	247.57	327.13	130	34	79.5
0400	400	325.69 ◊	394.78 ◊	130	34	79.5
5063	500/630	691.56 ◊	919.93 ◊	190	42	95
		(301)	(301)			

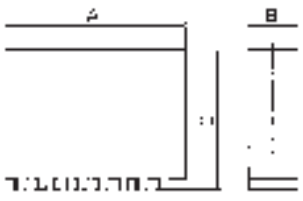
Spare Jaws for Three-/Four-Jaw Lathe Chucks

Design: Non-stepped jaws, unhardened, material 16MnCr5.

3028 3-piece.

3040 3-piece.

3042 4-piece.





3028 format professional quality

Part No.	Dimensions mm	3028 3-piece	3040 3-piece	3042 4-piece	Length A mm	Width B mm	Height C mm
0080	80	46.33	–	77.92 ◊	37	12	26
0100	100	46.33	51.32	67.73	48	14	33.5
0125	125	55.02	60.68	81.72	52	18	41.5
0160	160	70.15	76.79	103.65	61	18	47.5
0200	200	80.17	87.04	118.77	69	20	53.5
0250	250	104.14	113.72	153.97	90	24	67.5
0315	315	155.35	170.08	223.43	130	34	79.5
0400	400	–	208.97 ◊	272.18 ◊	130	34	79.5
5063	500/630	–	413.67 ◊	602.81 ◊	190	42	95
		(300)	(301)	(301)			



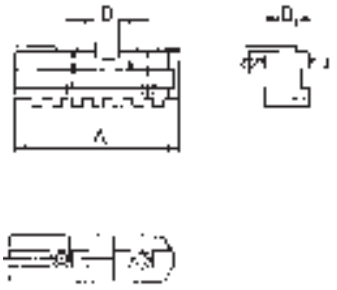
3040/3042 RÖHM

Spare Jaws for Three-/Four-Jaw Lathe Chucks

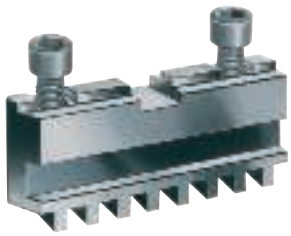
Design: Basic jaws with fastening screws.

3052 3-piece.

3054 4-piece.



Part No.	Dimensions mm	3052 3-piece	3054 4-piece	Length A mm	Width B – 0.05 mm	Flute width D + 0.01 mm
0100	100	148.00	223.43	46	7.94	9.5
0125	125	148.96	210.41	55	7.94	12.68
0160	160	173.09	253.29	65	7.94	12.68
0200	200	195.17	276.79	78	7.94	12.68
0250	250	263.77	354.28	92	12.7	19.03
0315	315	352.21	510.85	108	12.7	19.03
0400	400	537.54 ◊	845.92 ◊	127	12.7	19.03
0500	500	906.58 ◊	1,301.67 ◊	165	12.7	19.03
5063	500/630	1,052.52 ◊ (301)	– (301)	203	12.7	19.03



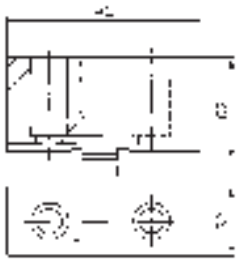
3052/3054

Spare-Jaws for Three-/Four-Jaw Lathe Chucks

Design: Non-stepped top jaws, unhardened, material 16MnCr5.

3056 3-piece.

3058 4-piece.



Part No.	Dimensions mm	3056 3-piece	3058 4-piece	Length A2 mm	Width B2 mm	Height C2 mm
0100	100	37.73	56.86	53	22.5	30
0125	125	44.67	60.20	62	26.5	38
0160	160	44.67	66.14	74	28.5	42
0200	200	51.73	67.73	87	30.5	43
0250	250	74.79	97.33	103	36.5	53
0315	315	107.69	141.89	120	42.5	58
0400	400	149.32	216.29 ◊	137	42.5	65
5063	500/630	296.32 ◊ (301)	387.63 ◊ (301)	140	50.5	80



3056/3058

Safety Chuck Key

Part No.	Square mm	3062	Length mm
0080	6	29.53	110
0100	8	32.13	130
0125	9	32.77	130
0160	10	35.89	160
0200	11	38.88	160
0250	12	46.33	160
0315	14	48.56	200
0400	17	112.86	250
0500	19	187.33 (300)	250

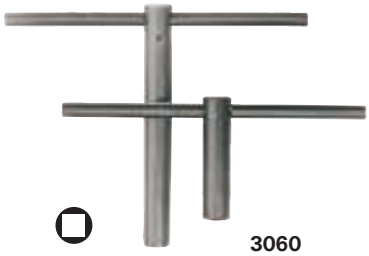


Four-Square Allen Key/External Square Key

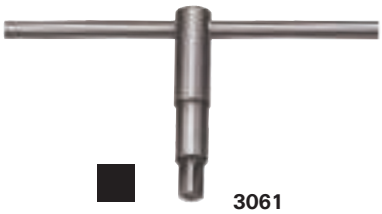
Design: Made of special steel, shank and tommy bar hardened and bronzed.

3060 **With square socket.**

3061 **With external square.**



3060



3061

Part No.	Square mm	3060	3061	Length mm 3060	Length mm 3061
0080	6	4.92	5.78	80	80
0100	8	6.79	7.03	80	80
0125	9	8.30	7.03	100	80
0160	10	7.86	8.94	100	100
0200	11	–	9.15	–	100
0250	12	17.29	10.54	200	100
0315	14	21.88	14.90	200	120
0400	17	30.05	22.31	250	160
0500	19	37.42	28.01	320	200
		(303)	(303)		

Special Grease for Lathe Chucks

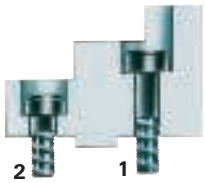
Part No.	Contents of set kg	3065
0005	1	44.42
		(300)

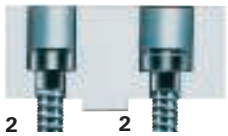


Fastening Screw for Jaws

3068 **Screw 1**

3070 **Screw 2**





Part No.	Dimensions mm	3068	Thread screw 1
0001	100	0.36	M 6 x 20
0004	125	0.36	M 8 x 25
0007	140/160/200	0.36	M 8 x 30
0010	250	0.36	M 12 x 40
0013	315	0.36	M 12 x 45
0016	350/400	0.98	M 16 x 50
0019	500/630	2.37	M 20 x 80
		(301)	

Part No.	Dimensions mm	3070	Thread screw 2
0001	100	0.36	M 6 x 16
0004	125/140/160/200	0.36	M 8 x 20
0007	250	0.36	M 12 x 25
0010	315	0.36	M 12 x 30
0013	350/400	0.77	M 16 x 35
0016	500/630	3.42	M 20 x 40
		(301)	

Chip Protection for Lathe Chuck ZG-ZS

Application: Chips are prevented from penetrating the chuck.
For fitting in the jaw guide.

Part No.	Chuck size mm	3072
0001	80	0.41
0004	100	0.45
0007	125	0.49
0010	160	0.51
		(301)

Part No.	Chuck size mm	3072
0013	200	0.57
0016	250	1.20
0019	315/400	1.50
0022	500/630	2.02
		(301)



Accessories for Lathe Chucks

Base Plate for Lathe Chuck with Cylindrical Centre Mounting

Part No.	Size A mm	3074	A_1 mm	E mm	J mm	L mm	N mm
0001	160	308.55	240	42	10	14	212
0004	200	378.26	280	55	11	14	252
0007	250	425.74	330	76	12	18	296
0010	315	972.33 ◊	390	103	14	18	360
		(301)					



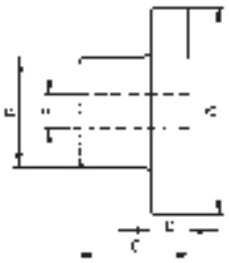




Cast Iron Flange

Design: For the fixing of lathe chucks and flanged chucks with cylindrical mounting on spindle noses according to DIN 800 or special holders. The flange must be adapted to machine and chuck.

Part No.	Chuck size mm	3078	A mm	B mm	C mm	D mm	E mm
0001	80	11.66 ◊	92	56	47	15	20
0004	100	19.33 ◊	120	80	58	20	25
0007	160	36.52	170	80	58	20	30
0010	200	55.85	210	92	66	22	40
0013	250	88.68	260	105	92	25	50
0016	315	217.88 ◊	330	165	100	30	50
		(301)					



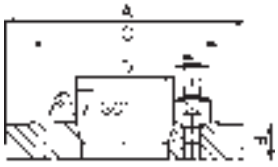


Short Taper Cast Iron Flanges

Design: Machine side finished, chuck faced. Fastening elements such as studs, stud bolts or Camlock bolts are included in the scope of supply.

3080 **DIN 55027 and 55022, with stud bolt and collar nut.**

3082 **DIN 55029 and ASA B 5.9 D 1, with stud bolt for Camlock.**





3080



3082

Part No.	∅ A mm/ taper	3080	3082	Height B mm 3080	Height B mm 3082	Taper ∅ mm C	Taper ∅ mm D	Bore hole ∅ E mm	Studs/ stud bolts/ Camlock bolts
0001	100/3	120.54	341.10	18	25	98	53.985	51.2	3/3/3
0004	125/4	112.71	178.01	20	25	117	63.525	60.6	3/3/3
0007	160/4	123.79	182.14	25	28	117	63.525	60.6	3/3/3
0010	160/5	119.77	182.14	25	28	146	82.575	79.4	4/4/6
0013	200/5	148.93	206.28	25	33	146	82.575	79.4	4/4/6
0016	200/6	149.94	215.33	25	33	181	106.390	103	4/4/6
0019	250/6	184.20	252.64	30	38	181	106.390	103	4/4/6
0022	250/8	197.26	288.86	30	38	225	139.735	135.7	4/4/6
0025	315/6	249.63	408.43	35	38	181	106.390	103	4/4/6
0028	315/8	293.14	361.27	35	38	225	139.735	135.7	4/4/6
0031	315/11	352.86	504.34	35	38	298	196.885	192.5	6/6/6
0034	400/8	523.88	578.50	36	45	225	139.735	135.7	4/4/6
0037	400/11	529.91	614.87	36	45	298	196.885	192.5	6/6/6
		(301)	(301)						

Hollowing Devices for Three-Jaw Chuck

Application: For internal grinding of hardened and hollowing of unhardened jaws.





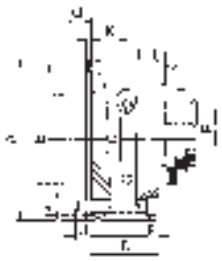
Part No.	Dimensions	3120	Outer ∅ mm	Inner ∅ mm	Suspending range ∅ J mm	Suspending range ∅ A mm	For lathe chucks up to mm	Screw head ∅ mm	Screw head B mm
0001	0	383.50	153	110	50–115	150–215	125	8.5	20
0003	1	459.88	176	110	35–125	170–260	200	13	31
0005	2	479.09	215	135	70–140	215–285	250	13	31
0007	3	513.24	244	162	100–175	240–315	250	13	31
0009	4	655.84	290	208	145–215	290–360	315	13	31
0011	5	675.69	342	260	160–270	330–440	400	16	31
		(301)							

Articles marked ◊ are not held in stock, procurement is effected at short notice.

Wedge Three-Jaw Lathe Chucks DURO

Design: Self-centring, with jaw locking, high concentricity and clamping force, body made of steel, jaw guide hardened and ground, **with reversing jaws.**

Application: For turning jobs with highest demands on concentricity and repeatability with high chucking force. The accuracy is twice as high as defined by DIN 6386/I.





DIN 6350



3090 With cylindrical centre mounting.

Part No.	Size A mm	3090	Inch	Clearance hole ⌀ C mm	Centre hole E mm	Height without jaws D mm	Min. thickness of flange Q mm	Centring depth F mm
0001	160	1,491.27	6 1/4	42	145	63	30	5
0004	200	1,732.50	8	52	185	81	30	5
0007	250	2,435.97	10	62	235	92	35	6
0010	315	3,604.74 ◊	12 1/2	87	300	111	35	6
0013	400	5,430.92 ◊	15 3/4	102	380	118	40	6
		(302)						

Further sizes and holders available on request.



DIN 55027



3092 With short taper DIN 55027 with stud bolt and collar nut.

Part No.	Size A mm	3092	Short taper	Clearance hole ⌀ C mm	Height without jaws D mm	Outer hole circle F mm
0001	160	1,962.75 ◊	4	42	76	85
0004	160	1,962.75 ◊	5	42	78	104.8
0007	160	2,005.62 ◊	6	42	85	133.4
0010	200	2,170.78 ◊	5	52	96	104.8
0013	200	1,999.28 ◊	6	52	97	133.4
0016	200	2,251.77 ◊	8	52	108	171.4
0019	250	2,840.91 ◊	6	62	108	133.4
0022	250	2,604.30 ◊	8	62	110	171.4
0025	315	3,754.01 ◊	6	87	127	133.4
0028	315	3,801.64 ◊	8	87	129	171.4
0031	315	3,536.45 ◊	11	87	131	235
0034	400	5,575.43 ◊	8	102	138	171.4
0037	400	5,669.13 ◊	11	102	138	235
		(302)				

Further sizes and holders available on request.



DIN 55029



3094 With short taper DIN 55029, with stud bolts for cam-lock.

Part No.	Size A mm	3094	Short taper	Clearance hole ⌀ C mm	Height without jaws D mm	Outer hole circle F mm
0001	160	1,965.93 ◊	4	42	83.5	82.6
0004	160	1,992.92 ◊	5	42	87	104.8
0007	160	2,088.20 ◊	6	42	104	133.4
0010	200	2,216.83 ◊	5	52	101	104.8
0013	200	2,248.59 ◊	6	52	106	133.4
0016	200	2,332.75 ◊	8	52	125	171.4
0019	250	2,891.72 ◊	6	62	117	133.4
0022	250	2,642.42 ◊	8	62	120	171.4
0025	315	3,838.17 ◊	6	87	145	133.4
0028	315	3,399.88 ◊	8	87	136	171.4
0031	315	3,908.04 ◊	11	87	143	235
0034	400	5,651.65 ◊	8	102	141	171.4
0037	400	5,707.23 ◊	11	102	148	235
		(302)				

Further sizes and holders available on request.

For technical information see annex group 10.

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Accessories for Three-Jaw Lathe Chucks

Spare Jaws for Wedge Three-Jaw Lathe Chuck DURO

3100 Reversing Jaw, hardened, 3-piece.

3102 Unstepped Attachable Jaw, unhardened, 3-piece.

3104 Base Jaw with fastening screws, 3-piece.

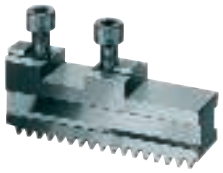
Part No.	Dimensions mm	3100 UB-set	3102 AB-set	3104 GB-set
0160	160	114.88	27.64	140.90
0200	200	150.65	34.25	175.63
0250	250	170.23	52.34	211.37
0315	315	210.25	76.10	319.66
0400	400	346.81	127.90	522.44
		(302)	(302)	(302)



3102



3100



3104

Accessories for Three-Jaw Lathe Chuck DURO

3108 Fastening screw

3110 Chuck key

3112 Safety chuck keys



3108



Part No.	Thread	3108 Fastening screw	Dimensions mm
0001	M 8 x 1 x 22	0.30	160/200
0004	M 12 x 1.5 x 30	0.30	250
0007	M 12 x 1.5 x 35	0.30	315
0010	M 16 x 1.5 x 40	1.39	400
		(302)	

Part No.	Dimensions mm	3110 Chuck key	3112 Safety chuck keys	Square mm
0001	160	25.25	51.26	10
0004	200	30.57	58.41	12
0007	250	48.11	72.28	14
0010	315	57.78	93.75	17
0013	400	76.97	131.03	19
		(302)	(302)	

Chip Protection for Lathe Chuck ZG-ZS

Design: Chip protection, 3-piece.

Part No.	Dimensions mm	3114 Chip protection set
0001	160	3.80
0004	200	3.80
0007	250	3.91
0010	315	4.66
0013	400	7.15
		(302)



Flange for Three-Jaw Lathe Chuck DURO

Design: With cylindrical centre mounting.

Part No.	Chuck size mm	3117	A mm	B mm	C mm	D mm	E mm
0001	160	37.17	155	80	60	40	30
0004	200	59.06	195	95	65	40	40
0007	250	113.80	245	120	90	45	50
0010	315	225.01 ◊	310	165	100	45	50
0013	400	659.65 ◊	390	230	130	50	70
		(302)					





Articles marked ◊ are not held in stock, procurement is effected at short notice.

Quick-change Tool Holders For Lathes

Design: The quick-change tool holders for lathes offer unlimited versatility. Compared with four-fold tool holders the quick-change tool holders allow a much faster tool change and ensure a repeatability below 0.01 mm for years.
The ground holding serration in the central body and the holders allows 40 possible holder angle positions.

Application: Quick-change tool holders are suitable for use on conventional as well as CNC lathes with manual tool change.



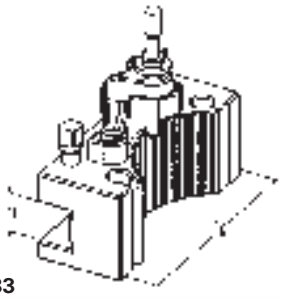
3130

Quick-change Basic Body

Part No.	Type	3130 mm	Weight approx. kg
0010	A	148.67	1.4
0020	B	219.21	4.5
0030	C	337.20	10.7
		(305)	

Quick-change Lathe Tool Holder, Type D

Part No.	Type	3133 mm	Dimensions D mm	Length lg mm	Weight approx. kg
0005	AD 1675	39.17	16	75	0.5
0010	AD 2090	40.15	20	90	0.61
0015	BD 25120	61.30	25	120	1.57
0020	BD 25140	61.30	25	140	1.65
0025	BD 32120	62.54	32	120	1.75
0030	CD 32150	97.10	32	150	2.95
0035	CD 40170	105.18	40	170	3.85
		(305)			

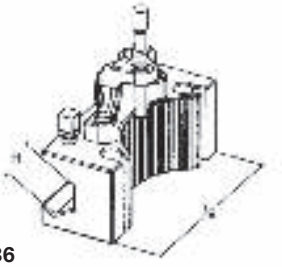




3133

Quick-change Drilling Tool Holders, Type H

Part No.	Type	3136 mm	Dimensions H mm	Length lg mm	Weight approx. kg
0005	AH 2085	42.56	20	85	0.56
0010	BH 32130	69.99	32	130	1.8
0015	CH 40160	110.85	40	160	3.7
		(305)			

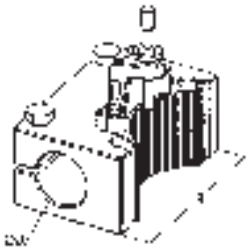




3136

Quick-change Drilling Tool Holders, Type J

Part No.	Type	3139 mm	Diameter J mm	Length lg mm	Weight approx. kg
0005	AJ 3080	51.84	30	80	0.81
0010	BJ 40120	79.24	40	120	2.31
0015	CJ 40160	134.35	40	160	3.87
0020	CJ 50160	142.71	50	160	4.49
		(305)			





3139

Quick-change Parting Tool Holders, Type A

Part No.	Type	3146 mm	For parting tool mm	Length lg mm	Weight approx.kg
0005	AT–K*	68.87	2.7 x 10	75	0.55
0010	BT–K*	86.37	4.2 x 15.9	110	1.5
0015	CT–K*	104.07	5.1 x 18.5	150	2.4
		(305)			

* Supplied without parting tool.





3146

For technical Information see appendix Group 10.

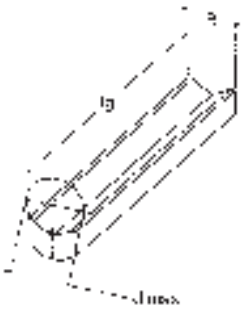
All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Insert Prisms, Type P

For quick-change drilling tool holders, type H.

format professional quality

Part No.	Type	3145	Dimensions d max. mm	Length lg mm	Dimensions B mm
0005	AP 1485	9.39	14	85	16
0010	BP 20130	9.79	20	130	22
0015	CP 25160	17.76	25	160	30
0020	CP 32160	21.48	32	160	38
		(305)			



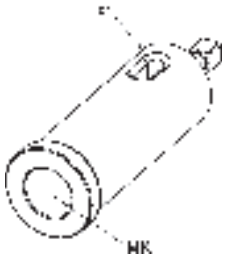


Morse Taper Bushes, Type L

For quick-change drilling tool holders, type J.

format professional quality

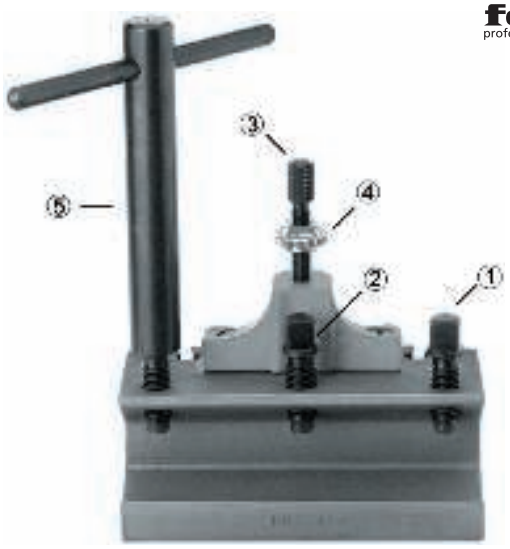
Part No.	Type	3142	Morse taper	Outer ø mm	Weight approx. kg
0005	AL/EL	20.88	1	30	0.4
0010	AL/EL	21.93	2	30	0.36
0015	EL/BL/CL	26.96	3	40	0.89
0020	EL/BL/CL	29.96	4	40	0.75
0025	CL	34.10	3	50	1.44
0030	CL	36.04	4	50	1.52
		(305)			





Spare Parts and Accessories

format professional quality



① **Square head bolt**
② **Console**
③ **Height adjustment bolt**
④ **Height adjustment nut**
⑤ **Internal hex. head socket wrench**

Part No.	For type	3148	Execution	Dimensions
0001	A	2.21	No. 1 square head bolt	M 7 x 1 x 23
0003	B	2.47	No. 1 square head bolt	M 11 x 1 x 30
0005	C	3.27	No. 1 square head bolt	M 14 x 1.5 x 40
0007	A	14.49	No. 2 + 3 + 4 console with screws and nut	Set
0009	B	18.53	No. 2 + 3 + 4 console with screws and nut	Set
0011	C	24.73	No. 2 + 3 + 4 console with screws and nut	Set
0013	A	12.41	No. 5 internal square head socket wrench	SW 8
0015	B	15.82	No. 5 internal square head socket wrench	SW 10
0017	C	19.26	No. 5 internal square head socket wrench	SW 14
0019	A	2.42	No. 3 height adjustment bolt	M 5 x 35
0021	B	2.94	No. 3 height adjustment bolt	M 7 x 56
0023	C	4.10	No. 3 height adjustment bolt	M 9 x 65
0027	A	1.70	No. 4 height adjustment nut	M 5
0029	B	2.15	No. 4 height adjustment nut	M 7
0031	C	2.63	No. 4 height adjustment nut	M 9
		(305)		

VDI Radial Tool Holders with Parallel Shank, square transverse holders, form B 1 short, right

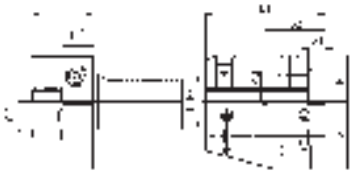
Design: With inside coolant supply and adjustable spherical spray nozzles.
Tempering steel, 900 N/mm², hardness 56 ± 2 HRC, depth of hardening min. 0.5 mm.

DIN 69880

KINTEK

Part No.		0005	0010	0015
d1	**mm**	**20**	**30**	**40**
3164 KINTEK		49.94 ◊	50.66 ◊	56.08 ◊
b1	mm	55	70	85
b2	mm	30	35	42.5
b3	mm	7	10	12.5
h1	mm	16/12	20/16	25/20
h5	mm	25	28	32.5
h6	mm	30	38	48
l1	mm	16	22	22
l2	mm	30	40	44

(307)





VDI Radial Tool Holders with Parallel Shank, square transverse holders, overhead, form B 3 short, right

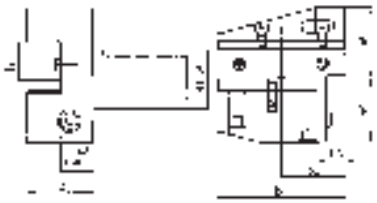
Design: With inside coolant supply and adjustable spherical spray nozzles.
Machining steel. 900 N/mm², hardness 56 ± 2 HRC, depth of hardening min. 0.5 mm.

DIN 69880

KINTEK

Part No.		0005	0010	0015
d1	**mm**	**20**	**30**	**40**
3173 KINTEK		50,23 ◊	52,71 ◊	56,53 ◊
b1	mm	55	70	85
b2	mm	30	35	42.5
b3	mm	7	10	12.5
h1	mm	16/12	20/16	25/20
h5	mm	25	35	42.5
h6	mm	30	38	48
l1	mm	16	22	22
l2	mm	30	40	44

(307)





VDI Axial Tool Holders with Parallel Shank, square longitudinal holders, form C 1, right

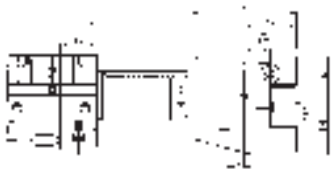
Design: With inside coolant supply and adjustable spherical spray nozzles.
Machining steel. 900 N/mm², hardness 56 ± 2 HRC, depth of hardening min. 0.5 mm.

DIN 69880

KINTEK

Part No.		0005	0010	0015
d1	**mm**	**20**	**30**	**40**
3177 KINTEK		68,41 ◊	62,96 ◊	65,89 ◊
b1	mm	65	70	85
b2	mm	40	35	42.5
b3	mm	26	17	21
h1	mm	16/12	20/16	25/20
h5	mm	25	28	32.5
h6	mm	30	38	48
l1	mm	50	70	85
l2	mm	–	10	12.5
l3	mm	30	30	30

(307)





VDI Tool Holders with Parallel Shank, form E 1

Design: For tools with parallel shank. With inside coolant supply and adjustable spray nozzles. Machining steel. 900 N/mm², hardness 56 ± 2 HRC, depth of hardening min. 0.5 mm.

DIN 69880

KINTEK





Part No.		0005	0010	0015	0020
d1	**mm**	**20**	**20**	**20**	**30**
3174 KINTEK		50.23 ◊	48.90 ◊	48.90 ◊	50.23 ◊
d2	mm	36	40	45	36
d3	mm	50	50	50	68
d4	mm	16	20	25	16
h1	mm	–	–	–	28
l1	mm	67	67	71	67
l2	mm	18	18	18	22
l3	mm	54	54	58	54

(307)

Part No.		0025	0030	0035	0040	0045	0050	0055	0060	0065
d1	**mm**	**30**	**30**	**30**	**30**	**40**	**40**	**40**	**40**	**40**
3174 KINTEK		50.23 ◊	50.23 ◊	50.23 ◊	56.39 ◊	54.03 ◊	54.03 ◊	54.03 ◊	54.03 ◊	56.22 ◊
d2	mm	40	45	52	65	36	40	45	52	65
d3	mm	68	68	68	68	83	83	83	83	83
d4	mm	20	25	32	40	16	20	25	32	40
h1	mm	28	28	28	28	32.5	32.5	32.5	32.5	32.5
l1	mm	67	71	75	90	67	67	75	75	90
l2	mm	22	22	22	22	22	22	22	22	22
l3	mm	54	58	61	72	54	54	59	61	73

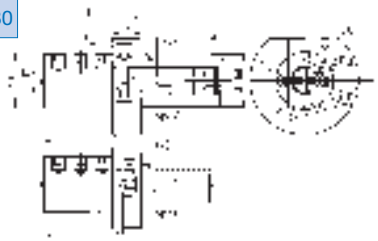
(307)

VDI Boring Bar Holders with Parallel Shank, form E 2

Design: For tools with parallel shank. With inside coolant supply and adjustable spherical spray nozzles. Machining steel. 900 N/mm², hardness 56 ± 2 HRC, depth of hardening min. 0.5 mm.

DIN 69880

KINTEK





Part No.		0005	0010	0015
d1	**mm**	**20**	**20**	**20**
3182 KINTEK		52.27 ◊	52.27 ◊	52.27 ◊
d2	mm	40	40	40
d3	mm	50	50	50
d4	mm	8	10	12
h1	mm	23	23	23
l1	mm	50	50	50
l2	mm	18	18	18
l3	mm	42	42	42
Type		B	B	B

(307)

Part No.		0020	0025	0030	0035	0040	0045	0050	0055	0060
d1	**mm**	**20**	**20**	**20**	**30**	**30**	**30**	**30**	**30**	**30**
3182 KINTEK		52.27 ◊	52.27 ◊	52.27 ◊	57.10 ◊	57.10 ◊	57.10 ◊	57.10 ◊	57.10 ◊	57.10 ◊
d2	mm	42	49	49	55	55	55	55	55	55
d3	mm	50	50	68	68	68	68	68	68	68
d4	mm	16	20	25	8	10	12	16	20	25
h1	mm	23	23	23	28	28	28	28	28	28
l1	mm	50	50	60	60	60	60	60	60	60
l2	mm	18	18	18	22	22	22	22	22	22
l3	mm	42	42	52	43	43	43	55	54	54
Type		B	B	B	A	A	A	A	B	B

(307)

Part No.		0065	0070	0075	0080	0085	0090	0095	0100	0105
d1	**mm**	**30**	**40**	**40**	**40**	**40**	**40**	**40**	**40**	**40**
3182 KINTEK		57.10 ◊	58.13 ◊	58.13 ◊	58.13 ◊	58.13 ◊	58.13 ◊	58.13 ◊	58.13 ◊	58.13 ◊
d2	mm	67	55	55	55	55	55	55	82	82
d3	mm	83	83	83	83	83	83	83	83	83
d4	mm	32	8	10	12	16	20	25	32	40
h1	mm	28	32.5	32.5	32.5	32.5	32.5	32.5	32.5	32.5
l1	mm	75	75	75	75	75	75	75	75	90
l2	mm	22	22	22	22	22	22	22	22	22
l3	mm	61	43	43	58	61	61	61	61	76
Type		B	A	A	A	A	A	B	B	B

(307)

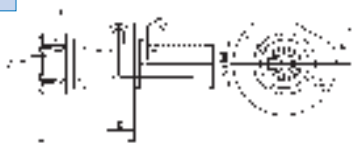
VDI Tool Holders with Parallel Shank

VDI Tool Holders with Parallel Shank, collet chuck holder, form E 4

Design: For tools with parallel shank. Range of collet according to DIN 6499. With inside coolant supply. Machining steel. 900 N/mm², hardness 56 ± 2 HRC, depth of hardening min. 0.5 mm.

DIN 69880

KINTEK





Part No.		0005	0010	0015	0020
d1	**mm**	**20**	**30**	**40**	**40**
3183 KINTEK		66.57 ◊	67.48 ◊	70.26 ◊	70.26 ◊
d2	mm	32	35	35	42
d3	mm	50	68	83	83
d4	mm	1–10	1–13	1–13	2–16
h1	mm	–	28	32.5	32.5
l1	mm	44	59	59	57
l2	mm	18	22	22	22
Matching collets		ER 16	ER 20	ER 20	ER 25

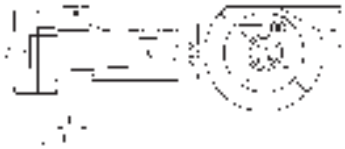
(307)

VDI Tool Holders with Parallel Shank, morse taper, form F

Design: For tools with MT. With inside coolant supply and adjustable spray nozzles. Machining steel. 900 N/mm², hardness 56 ± 2 HRC, depth of hardening min. 0.5 mm.

DIN 69880

KINTEK



Part No.		0005	0010	0015	0020
d1	**mm**	**20**	**30**	**30**	**30**
3185 KINTEK		61,94 ◊	61,94 ◊	61,94 ◊	61,94 ◊
d2	mm	–	–	55	55
d3	mm	50	68	68	68
MT		1	1	2	3
d4	mm	12.065	12.065	17.780	23.825
h1	mm	-	28	28	28
l1	mm	23	27	36	66
l2	mm	–	–	27	41

(307)



Part No.		0025	0030	0035
d1	**mm**	**40**	**40**	**40**
3185 KINTEK		64.72 ◊	64.72 ◊	69.33 ◊
d2	mm	55	58	68
d3	mm	83	83	83
MT		2	3	4
d4	mm	17.780	23.825	31.267
h1	mm	32.5	32.5	32.5
l1	mm	36	36	80
l2	mm	22	22	22

(307)

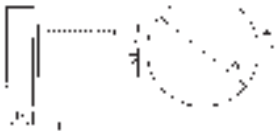
Protective plug form Z 2

3191 **Steel**

3192 **Plastics**

DIN 69880

KINTEK





Part No.		0005	0010	0015
d1	**mm**	**20**	**30**	**40**
3191 KINTEK		13.62	13.62	23.82
3192 KINTEK		5.85	5.85	6.60
d2	mm	50	68	83
h1	mm	23	28	32.5
l1	mm	56	71	83
l2	mm	16	16	20

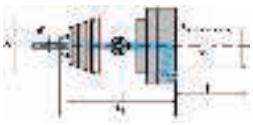
(307)

VDI CNC Drill Chucks for Parallel Shank DIN 69880

Central coolant supply.

DIN 69880

WTE









Part No.	Clamping range mm	3206 WTE	d_1 mm	D mm	L mm	L_1 max. mm
0005	0.3– 8	271.87 ◊	20	36	68	71
0010	0.5–13	191.19 ◊	20	50	90	96
0015	0.3– 8	271.87 ◊	30	36	68	71
0020	0.5–13	186.16 ◊	30	50	90	96
0025	2.5–16	193.70 ◊	30	57	90	101
0030	0.5–13	193.70 ◊	40	50	90	96
0035	2.5–16	199.99 ◊	40	57	90	101

(326)

Sealing washer WTE 13 ⌀ 2.05 mm included in supply for cooling duct drills ⌀ 3–6 mm with smooth surface shank according to DIN 6535 form HA

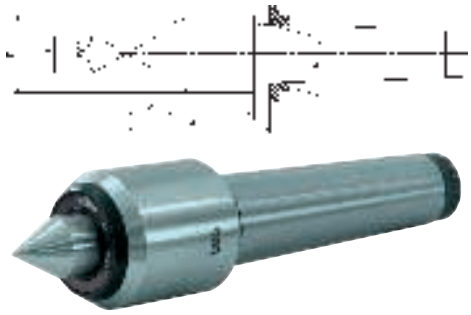
Sealing washer WTE 13 ⌀ 4.2 mm mounted in the drill chuck head for cooling duct drills ⌀ 6–13 mm with smooth surface shank according to DIN 6535 form HA

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Live Lathe Centres with Small Housing Diameter

Design: Due to small housing diameter no obstruction for supports, steel holders and lathe tools. The radial carrying force is similar to other constructions.
The axial carrying force is lower for constructional reasons.
Tip shank-supported, body hardened, point angle 60°.

Application: For all turning operations, in particular for machining of workpieces requiring a small head diameter.



Part No.		0005	0010	0015	0020
Morse taper	**(MT)**	**2**	**3**	**4**	**5**
3300		**73.58**	**86.21**	**109.99**	**164.26**
Dimensions		02	04	08	10
Dimension A	mm	62	62	75.5	104
Dimension B	mm	32	34	42	58
Dimension D	mm	15	15	20	30
Dimension G	mm	17.78	23.825	31.267	44.399
Dimension H	mm	7	7	8.5	9
Dimension K	mm	18	18	25	34
Max. concentricity deviation	mm	0.005	0.005	0.005	0.01
Max. workpiece weight	kg	200	400	800	1,600

(309)

Live Lathe Centres

Design: Body and tip hardened.

Application: For machining smaller parts on large lathes, point angle 60°.



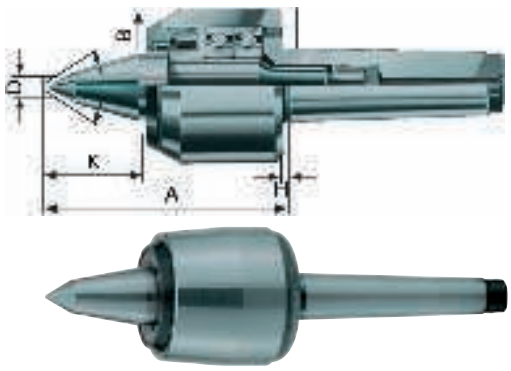
Part No.		0005	0010	0015	0020	0025
Morse taper	**(MT)**	**1**	**2**	**3**	**4**	**5**
3303		**52.22**	**62.98**	**75.11**	**92.39**	**141.10**
Largest body ⌀	mm	36	45	50	70	90
Largest tip ⌀	mm	15	20	22	32	40
Projection length	mm	60.5	65	70.5	102.5	129
Max. workpiece weight	kg	100	200	400	800	2,000

(310)

Live Lathe Centres with Extended Tip

Design: Short projection length, low vibration, tip shank-supported, body hardened and ground. Due to the extended tip the applicable load is reduced, point angle 60°.

Application: For precision turning and roughing on any type of lathe. Especially suitable for duplicating lathes.
The extended tip enables easy moving to the supports.



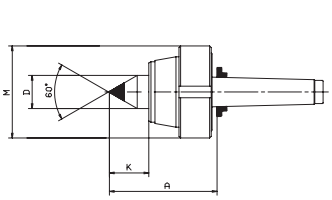
Part No.		0005	0010	0015	0020	0025
Morse taper	**(MT)**	**1**	**2**	**3**	**4**	**5**
3306		**79.54**	**105.55**	**142.67**	**167.18**	**239.35**
Dimensions		101	102	106	108	110
Dimension A	mm	70.5	75	95.5	114.5	143.5
Dimension B	mm	36	45	60	70	90
Dimension D	mm	15	20	25	32	40
Dimension H	mm	6	7	6.5	8.5	8.5
Dimension J	mm	9	10	12	14	16
Dimension K	mm	27	34	47	53	65
Max. concentricity deviation	mm	0.01	0.005	0.005	0.005	0.005
Max. weight of workpiece	kg	80	140	400	500	1,200

(309)

Live Lathe Centres with Forcing Nut and Carbide Insert

Design: Low vibration, short projection length, tip shank-supported. Body hardened and ground. Point angle 60°.

Application: For precision turning, roughing and turning on a duplicating lathe.





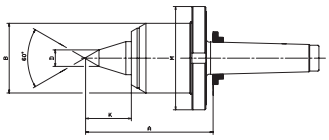
Part No.		0005	0010	0015	0020	0025
Morse taper	**(MT)**	**2**	**3**	**4**	**5**	**6**
3307		283.42 ◊	373.36 ◊	396.11 ◊	609.66 ◊	914.68 ◊
Dimensions		102	106	108	110	114
Dimension A	mm	65	79.5	102.5	129	152
Dimension D	mm	20	25	32	40	50
Dimension K	mm	24	31	41	50.5	57.5
Dimension M	mm	56	74	82	105	120
Max. concentricity deviation	mm	0.005	0.005	0.005	0.005	0.01
Max. weight of workpiece	kg	120	360	500	1,000	1,800

(309)

Live Lathe Centres with Extended Tip and Forcing Nut for High Loads

Design: High load at high speed, low excursion of the 60° VL tip due to extremely solid construction and bedding, with forcing nut.

Application: Especially designed for use on NC machines, in case of extremely high demands also for any other lathe.





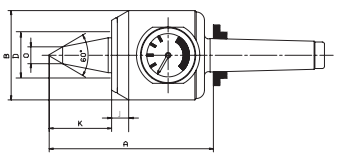
Part No.		0005	0010	0015
Morse taper	**(MT)**	**4**	**5**	**6**
3309		487.57	613.86	1,179.30
Dimensions		484	485	486
Dimension A	mm	122	150	180
Dimension B	mm	70	95	120
Dimension D	mm	16	20	26
Dimension H	mm	6.5	6.5	7
Dimension K	mm	44	59	77
Dimension M	mm	100	125	155
Max. concentricity deviation	mm	0.005	0.005	0.005
Max. weight of workpiece	mm	1,000	2,000	3,000

(309)

Live Lathe Centres with Extended Tip and Pressure Gauge

Design: Chuck power can be directly read on the manometer in daN. Pressure compensation is effected by means of disc springs, tip shank-supported, body hardened, point angle 60°.

Application: Especially suitable as tail centre for face drivers, for setting and maintaining of chuck power as well as for clamping of long and slender workpieces to prevent bending.





Part No.		0005	0010	0015	0020
Morse taper	**(MT)**	**3**	**4**	**5**	**6**
3312		358.25	387.98	523.91	822.71
Dimensions		503	504	505	506
Dimension A	mm	120	137.5	177.5	223
Dimension B	mm	64	72	95	120
Dimension D	mm	25	32	40	52
Dimension J	mm	12	15	16	23
Dimension K	mm	46.5	53	66	80
Dimension O	mm	11	14	15	24
Max. concentricity deviation	mm	0.01	0.01	0.01	0.015
Max. axial clamping force	daN	550	900	1,500	2,000
Max. weight of work piece	kg	260	550	1,100	2,500

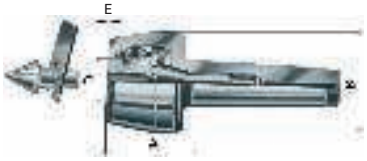
(309)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Live Lathe Centres with Changeable Inserts

Design: All inserts and lifter in wooden case.

Application: Multi-purpose use due to easy and quick change of centring inserts.





Part No.		0005	0010	0015	0020	0025
Morse taper	**(MT)**	**2**	**3**	**3**	**4**	**5**
3315		263.10	312.13	346.30	413.90	572.95
Dimensions		102	104	106	108	110
Dimension A	mm	45	48	55	67	85
Dimension D	mm	20	22	25	32	40
Dimension E	mm	4	4.5	5	5	6
Max. concentricity deviation	mm	0.01	0.01	0.01	0.01	0.01
Max. weight of workpiece	kg	40	130	150	250	650

(309)

Live Centre Tapers

Design: Taper, 60°, stable support. Receptacle shank, body and taper hardened.

Application: As centre taper for hollow bodies and as lathe centre for the machining of normal workpieces.



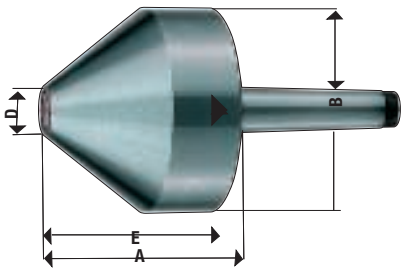
Part No.		0005	0010	0015	0020
Morse taper	**(MT)**	**2**	**3**	**4**	**5**
3320		110.74	132.25	172.40	289.14
Dimensions		272	273	274	275
Dimension A	mm	61	79	100	115.5
Dimension B	mm	42	56	64	78
Dimension D	mm	7	7	8.5	8.5
Max. concentricity deviation	mm	0.01	0.008	0.008	0.008
Max. weight of workpiece	kg	200	400	800	1,600

(309)

Live Centre Tapers, Blunt

Design: Taper, blunt, 75°, stable support. Receptacle shank, body and taper hardened.

Application: For the machining of tubes and other hollow bodies.



Part No.		0040	0045	0050	0055	0060	0065	0070	0075	0080
Morse taper	**(MT)**	**2**	**3**	**4**	**3**	**4**	**5**	**4**	**5**	**5**
3325		150.93	163.50	173.92	210.37	218.51	234.89	409.45	435.49	978.84
Dimensions		172	172a	172b	173	173a	173b	174	174a	175
Dimension A	mm	80	80	81.5	85.5	87	88	107	106	146.5
Dimension B	mm	80	80	80	120	120	120	170	170	250
Dimension D	mm	20	20	20	30	30	30	50	50	75
Dimension E	mm	67	67	67	72	72	72	90	90	130
Max. concentricity deviation	mm	0.008	0.008	0.008	0.008	0.008	0.008	0.01	0.01	0.01
Max. weight of workpiece	kg	300	400	400	600	800	800	1,200	1,600	2,000

(309)

Dead Lathe Centres

DIN 806

format professional quality

3330 **Design:** Full tip, completely hardened and ground, made of tool steel.

Application: For grinding at low speeds and for measuring.



3330

3333 **Design:** Full tip, with carbide insert, ground.

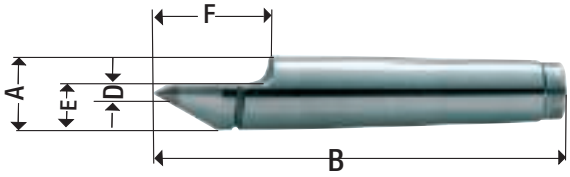
Application: For grinding at low speeds and for measuring.



3333

3336 **Design:** Half tip and carbide insert, ground.

Application: For grinding with low speeds and for measuring, especially suited for small workpieces where a full tip would be impeding during operation.



3336

Part No.		0005	0010	0015	0020
Morse taper	**MT**	**2**	**3**	**4**	**5**
3330		9.52	11.86	19.75	37.60
3333		34.23	46.35	62.48	109.65
3336		43.53	56.03	73.36	–
Dimension A	mm	18	24.1	31.6	44.7
Dimension B	mm	100	125	160	200
Dimension D	mm	7	11	14	18
Dimension E	mm	11	15	21	–
Dimension F	mm	30	38	50	–

(310)

Constant Face Drivers

Design: CoA small-sized range, clamping ⌀ 12–50 mm, turning range 13–100 mm. In wooden case.

Content: 1 base body, 4 driving tenon cutters clamping ⌀ 12 – 20 – 32 – 50 mm, 2 centre lathes ⌀ A = 6 + 12 mm.



Part No.	MT	3340 RÖHM	Running direction
0005	3	632.91 ◊	Right
0010	3	695.54 ◊	Left
0015	4	645.87 ◊	Right
0020	4	709.77 ◊	Left
0025	5	663.78 ◊	Right
0030	5	663.78 ◊	Left
0035	6	825.50 ◊	Right
0040	6	825.50 ◊	Left

(311)

Sets of Clamping Sleeves/Tensioning Spindles

In wooden case.

Application: Concentricity and run-out control. Turning, grinding etc. Holder between tips.



Part No.	Dimensions	3350 RÖHM	Clamping range	Content of set	
0005	1	1,124.68 ◊	12–26	3 tensioning spindles 7 clamping sleeves	size 02–06 12–14–16–18–0–22–24 mm
0010	2	1,245.87 ◊	25–55	3 tensioning spindles 6 clamping sleeves	size 07–09 25–30–35–40–45–50 mm

(311)

Drill Chucks (Three-Jaw Keyed)

Design: With inner chuck taper, for hammer drilling machines, including key.

Application: For universal drilling operations on electric hand, hammer and pillar drilling machines.

3400 format professional quality

3403 RÖHM



3400 format professional quality



3403 RÖHM

Part No.	Clamping range mm	3400	3403	Mount	Outer ø mm	Length opened mm	Length closed mm
0001	0.5– 8	–	18.12	3/8" x 24	29.5	42.5	53
0004	0.8–10	9.23	–	3/8" x 24	33.3	49.5	61
0007	0.8–10	9.23	–	1/2" x 20	33.3	49.5	61
0010	1.5–13	12.13	–	1/2" x 20	42.4	59	74
0013	0.5– 6.5	–	17.78	B 10	29.5	43	53
0016	0.5– 8	–	18.12	B 12	29.5	47.5	57.5
		(314)	(316)				

Part No.	Clamping range mm	3400	3403	Mount	Outer ø mm	Length opened mm	Length closed mm
0019	1 –10	12.13	–	B 12	33.3	50	61.5
0022	1 –10	12.13	–	B 16	42.4	63	78
0025	1.5–13	12.13	–	B 16	42	63	78
0028	3 –16	18.87	–	B 16	50	67.5	86.5
0031	3 –16	–	34.69	B 18	56.5	79	98
0034	5 –20	–	58.34	B 22	65	92.5	113.5
		(314)	(316)				

Design: For drilling machines and hammer drills with clockwise and anti-clockwise operation, drills ø 6.5 mm.

Part No.	Clamping range mm	3404	Mount	External ø mm	Length opened mm	Length closed mm
0001	1.5–13	12.13	1/2" x 20	42.5	59.0	74.0
		(314)				

Adaptors SDS-Plus

Design: Adaptor SDS-plus for drill chuck, including screw.

BOSCH

Part No.	Adaptor	3405
0001	1/2" x 20	10.35
		(310)



Chuck Keys

format professional quality

Part No.	Dimensions	3406	Suitable for drill chucks	Cone ø mm
0005	S 1	0.70	from 0.5 up to 8	4
0010	S 2	0.71	from 0.8 up to 10/1.5 up to 13	6
0015	S 3	1.16	from 3.0 up to 16	8
0020	S 4	3.58	from 5.0 up to 20	9
		(314)		



Keyless Chucks (Light Duty)

Design: Lightweight, key-less three-jaw drill chuck, self-clamping.

Application: Mainly for hand-guided drilling machines.

3412 format professional quality

3415 RÖHM

Part No.	Clamping range mm	3412	3415	Mount	Outer ø mm	Length opened mm	Length closed mm
0001	0.5–10	16.20	–	3/8" x 24	35.8	70.5	76.9
0004	0.5–10	16.20	–	1/2" x 20	35.8	70.5	76.9
0007	1 –13	20.78	29.55	1/2" x 20	42.5	81.5	89.8
0010	3 –16	25.00	–	1/2" x 20	46	95	104
0013	0 – 6.5	–	22.98	B 10	35	62.5	68.6
0016	0 – 8	–	23.06	B 10	35	62.5	68.6
0019	0 – 6.5	–	22.98	B 12	35	62.5	68.6
0022	0 – 8	–	23.06	B 12	35	62.5	68.6
0025	0.5–10	16.20	–	B 12	35.8	72	78.4
0028	1 –13	20.78	29.55	B 12	40	82.5	90.8
0031	0.5–10	16.20	–	B 16*	38	74.5	80.9
0034	1 –13	20.78	29.55	B 16	40	85	93.3
0037	3 –16	25.00	36.80	B 16	46	97.5	106
0040	3 –16	28.04	39.16	B 18*	51	97.5	106
		(314)	(316)				

* B 16 reduced by 2.5 mm – B 18 reduced by 7.0 mm.



3412 format professional quality



3415 RÖHM

Keyless Chucks

Design: Heavy-duty industrial version, key-less three-jaw drill chuck, self-clamping.

Application: For stationary drilling machines.

Part No.	Clamping range mm	3418	Mount	External ∅ mm	Length opened mm	Length closed mm
0001	0–10	25.47	B 16	43	82.5	90.1
0004	1–13	30.83	B 16	50	94.0	102.5
0007	3–16	33.53	B 16	55	96.5	106.8
0010	3–16	33.53	B 18*	55	96.5	106.85

* B 18 reduced by 7.0 mm (314)



Keyless Chucks (Precision)

Design: High accuracy, keyless chuck, self-tightening.

Application: For CNC-controlled drilling equipment, special drilling machines and drilling machines used in production.

3421 format professional quality

3422 ROHM

Part No.	Clamping range mm	3421	3422	Mount	Outer ∅ mm	Length opened mm	Length closed mm
0010	0–10	76.17	76.55	B 12	43	82.5	90.1
0013	0–10	73.36	76.55	B 16	43	82.5	90.1
0016	1–13	78.02	81.01	B 16	50	94	102.5
0019	3–16	90.35	93.64	B 16	55	96.5	106.8
0022	3–16	90.35	93.64	B 18*	55	96.5	106.8

* B 18 reduced by 7.0 mm (314) (316)



3421 format professional quality



3422 ROHM

Keyless Chucks (Impact)

Design: With self-locking, keyless chuck, self-tightening.

Application: Specially for impact drilling machines.

Part No.	Clamping range mm	3427	Mount	Outer ∅ mm	Length opened mm	Length closed mm
0001	0.5–10	25.58	3/8" x 24	40	66	73.7
0004	0.5–10	25.58	1/2" x 20	37	66	73.7
0007	1 –13	29.73	1/2" x 20	42.8	74.2	83.3
0010	0.5–10	23.46	B 12	37	68	75.7
0013	1 –13	29.73	B 12	40.2	77	86.1
0016	1 –13	29.73	B 16*	40.2	80.2	89.3

* B 16 reduced by 2.5 mm (314)



Drill Chucks Extra RV, with Radial Lock

Design: Bore hole drilled for clockwise and anti-clockwise operation. Plastic material, with polygonal for assembly and disassembly. Keyless chuck, resistant to impact drilling, automatic self-tightening during drilling, no additional locking, ergonomic, ease of use, protection against accidental activation. **Size 13 with clamping lands made of carbide.**

Application: For screwing, drilling and especially impact drilling using battery-operated or mains-operated drilling machines.

Part No.	Clamping range mm	3430	Mount	Outer ∅ mm	Length opened mm	Length closed mm	Max. machine power W
0001	1 –10	22.79	3/8" x 24	42.7	55.0	60.9	550
0004	1 –10	22.79	1/2" x 20	42.7	57.5	63.4	550
0007	1.5–13	27.46	3/8" x 24	42.7	65.5	75.4	1,000
0010	1.5–13	27.46	1/2" x 20	42.7	65.5	75.4	1,000

(316)



High-Performance Keyless Chucks

ALBRECHT

3435 With internal taper SBF

All individual drill chuck parts can be supplied as spare parts.

Application: For high speeds and precision work on drilling machines, horizontal boring machines and custom boring systems.

Design: Self-tightening three-jaw chuck, clockwise only. Deep case hardening, internal and external, concentric accuracy.
All parallel guide pieces and flat surfaces are ground. All parts replaceable.

3438 With internal taper SBFD

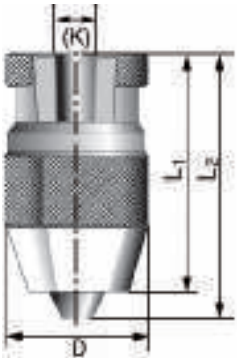
Design: Self-tightening three-jaw chuck with diamond-faced clamping jaws, only for clockwise rotation.
Deep case hardening, inside and outside, true running. All cylindrical guide pieces and flat surfaces are ground. All parts replaceable.

Application: For simple and positive locking clamping of solid carbide drills and HSS drills with through-hardened shank.





3435





3438

Part No.	Jaw span mm	3435	3438	Internal taper K	Chuck ⌀ D mm	Length open L_1 mm	Length closed L_2 mm
0001	0– 1.5	108.89	–	B 6	19	35	37.5
0004	0– 3	84.42	–	B 10	24	44	47.5
0007	0– 5	84.42	151.06	B 10	30	56	61.5
0010	0– 5	84.42	–	B 12	30	56	61.5
0013	0– 6.5	91.98	–	B 10	34	61.5	68
0016	0– 6.5	91.98	–	B 12	34	61.5	68
0019	0– 8	97.74	–	B 10	38	69	77.5
0022	0– 8	97.74	–	B 12	38	69	77.5
0025	0–10	104.44	–	B 12	43	80	91
0028	0–10	104.44	–	B 16	43	80	91
0031	1–13	111.93	–	B 16	50	90.5	103
0034	3–16	127.54	–	B 16	56	90.5	103
0037	3–16	127.54	–	B 18 shortened	56	95.5	109
		(318)	(318)				

High-Performance Keyless Chucks

ALBRECHT

With chuck power lock NCBF

Design: The self-tightening NCBF drill chucks have a key-free lock which ensures no loss of clamping force if the machine slows down abruptly. The chuck groove taper offers maximum application flexibility.

Application: For use on CNC machines and machining centres.





Part No.	Jaw span mm	3441	Internal taper K	Chuck ⌀ D mm	Length open L_1 mm	Length closed L_2 mm
0001	0–10	123.09	B 16	43	80	91
0004	1–13	132.42	B 16	50	90.5	103
0007	3–16	152.87	B 16	56	95.5	109
0010	3–16	152.87	B 18	56	95.5	109
		(318)				

High-Performance Keyless Chucks SBF-plus

ALBRECHT

Design: Self-tensioning three-jaw chuck, clockwise rotation. One-piece drill chuck and shank holder, optimum stability thanks to compact design.

Application: For high-speed precision operations. The particularly short, compact design is ideal for **machines with a small working range.**



Part No.	Jaw span mm	3444	Shank holder	Chuck ⌀ mm	Length open L_1 mm	Length closed L_2 mm
0001	1–13	123.09	MT 2	50	85	97.5
0004	1–13	125.35	MT 3	50	85	97.5
0007	1–13	130.23	MT 4	50	86.5	99
0010	1–13	122.65	⌀ 16	50	79	91.5
		(318)				

Precision Drilling Aid FBH

Application: Holder for the high-performance drill chuck "Albrecht" 0–1.5 mm, for fine-drilling in tool and fixture making. In order to prepare fine bore holes, feed is effected manually by pulling the guide ring. A spring motion moves the drill chuck automatically to its initial position. Drill chuck not included in the supply.





ALBRECHT



Part No.	Shank design	3450	Mounting taper	Drill stroke mm	L_1 mm	L_2 mm	D mm	d mm
0001	MT 1	122.58	B 6	20	82	96	12	30
0004	13 mm parallel	113.94	B 6	20	66	80	13	30
		(318)						

Fork Drifts for (ADG) for Drill Chucks

Application: For releasing drill chuck from drill chuck arbor. Prevents damage to the drill chuck, machine spindle and tapered arbor.





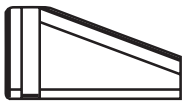


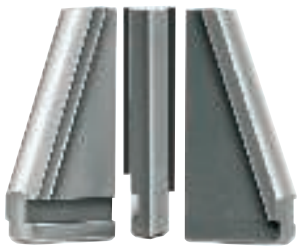
Part No.	Dimensions	3452	for drill chuck taper	Length A mm	Width b mm	Thickness e mm
0001	1	17.68	B 6	120	20	10
0004	2	24.92	B 10 and B 12	170	30	10
0007	3	26.32	B 16 and B 18	210	40	12
		(318)				

Spare Jaw for Keyless chucks, 3-piece

Design: For type SBF-Plus, NCBF, SBF.

Note: On request available with diamond-coated jaws.





Part No.	For clamping width mm	3453	Dimensions
0001	0–10	21.95	100
0003	1–13	25.52	130
0005	3–16	28.92	160
		(318)	

Parallel Shank for Drill Chucks

Design: Case hardened and ground, for DIN 238 chuck taper.

ALBRECHT





Part No.	Drill chuck taper	3460	D x L mm
0001	B 6	11.77	6 x 35
0004	B 10	11.77	8 x 35
0007	B 12	14.63	10 x 50
0010	B 16	19.70	16 x 50
0013	B 18*	22.56	16 x 70
		(318)	

* B 18 = 7 mm reduction

Drill Arbors

Design: Hardened and ground.

Application: To hold drill chucks on machines with morse taper.

DIN 238

format professional quality



Part No.	Morse taper	3455	Drill chuck taper
0001	1	2.01	B 10
0004	1	2.01	B 12
0007	1	1.76	B 16
0010	2	2.08	B 10
0013	2	2.01	B 12
0016	2	2.01	B 16
0019	2	2.15	B 18
0022	2	3.25	B 22

(314)

Part No.	Morse taper	3455	Drill chuck taper
0025	3	2.85	B 12
0028	3	2.78	B 16
0031	3	3.01	B 18
0034	3	3.02	B 22
0037	4	6.11	B 16
0040	4	6.20	B 18
0043	4	6.64	B 22

(314)

Drill Sleeves

Design: Precision design, fully hardened, inside and outside precision-ground.

Application: For fitting drill chucks on machines with morse taper.

DIN 2185

format professional quality



Part No.	Morse taper outside – inside	3463	Total length mm
0001	2/1	2.56	92
0004	3/1	3.94	99
0007	3/2	3.62	112
0010	4/1	6.11	124
0013	4/2	5.88	124
0016	4/3	5.64	140
0019	5/1	12.37	156

(314)

Part No.	Morse taper outside – inside	3463	Total length mm
0022	5/2	12.37	156
0025	5/3	12.70	156
0028	5/4	12.08	171
0031	6/2	32.04	218
0034	6/3	32.04	218
0037	6/4	28.26	218
0040	6/5	27.30	218

(314)

Extension Sleeves

Design: Precision design, fully hardened, inside and outside precision ground.

Application: For fitting drill chucks on machines with morse taper.

DIN 2187

format professional quality



Part No.	Morse taper outside – inside	3466	Total length mm
0001	1/1	5.53	145
0004	1/2	6.78	160
0007	2/1	6.78	160
0010	2/2	6.78	175
0013	2/3	9.10	200
0016	3/1	7.03	175
0019	3/2	8.07	194
0022	3/3	10.27	215
0025	3/4	12.82	240

(314)

Part No.	Morse taper outside – inside	3466	Total length mm
0028	4/1	9.17	200
0031	4/2	12.96	215
0034	4/3	16.82	240
0037	4/4	14.30	265
0040	4/5	28.69	300
0043	5/2	14.23	247
0046	5/3	16.82	268
0049	5/4	31.61	300
0052	5/5	30.75	335

(314)

Drill Drifts

Design: Made of special steel, hardened and bronze tempered.

Application: For taper shanks DIN 228.

DIN 317

format professional quality

Part No.	MT	3469	Total length mm
0001	0	1.37	90
0004	1–2	1.68	140
0007	3	2.66	190
0010	4	5.48	225
0013	5–6	8.95	265
		(314)	



Drill Drift – Semi-automatic

Design: Drill drift for one-hand operation, for taper shanks according to DIN 228.

Application: For taper shanks according to DIN 228.

format professional quality

Part No.	MT	3472	Total length mm
0001	1–3	27.05	317
0004	4–6	37.12	380
		(314)	





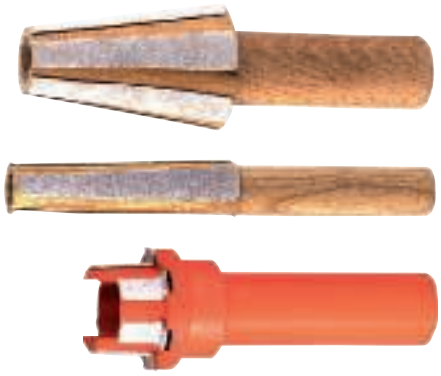
Taper Wipers

Design: Made of locally grown wood, fitted with felt strip.
In case of HSK, plastic material.

Application: For cleaning of tool holders at machine spindles, taper sleeves or taper gauges.

format professional quality

Part No.	For size	3660
0005	MT 1	3.84
0010	MT 2	3.84
0015	MT 3	4.73
0020	MT 4	6.82
0025	MT 5	8.52
0030	SK 40	7.26
0035	SK 50	10.24
0050	HSK 50	27.73
0063	HSK 63	27.73
0100	HSK 100	38.38
		(378)

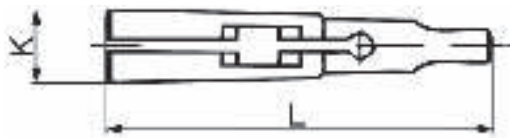


Clamping Sleeves for Taps

Design: With morse taper shank for receiving cylindrical taps with square driving tenon.

DIN 6328

FAHRION





Part No.	Type	3476	Bore hole ∅ mm	MT outside	K mm	L mm
0001	FM501/1	13.83	3.5	1	12.2	65.5
0003	FM501/1	13.83	4.0	1	12.2	65.5
0005	FM501/1	13.83	4.5	1	12.2	65.5
0007	FM501/1	13.83	5.0	1	12.2	65.5
0009	FM501/1	13.83	5.5	1	12.2	65.5
0011	FM501/1	13.83	6.0	1	12.2	65.5
0013	FM501/1	13.83	7.0	1	12.2	65.5
0015	FM501/1	13.83	8.0	1	12.2	65.5
0017	FM501/2	15.59	5.5	2	18	80
0019	FM501/2	15.59	6.0	2	18	80
0021	FM501/2	15.59	7.0	2	18	80
0023	FM501/2	15.59	8.0	2	18	80
0025	FM501/2	15.59	9.0	2	18	80
0027	FM501/2	15.59	10.0	2	18	80
0029	FM501/2	15.59	11.0	2	18	80
		(315)				

Part No.	Type	3476	Bore hole ∅ mm	MT outside	K mm	L mm
0031	FM501/2	15.59	12.0	2	18	80
0033	FM501/3	20.69	8.0	3	24.1	99
0035	FM501/3	20.69	9.0	3	24.1	99
0037	FM501/3	20.69	10.0	3	24.1	99
0039	FM501/3	20.69	11.0	3	24.1	99
0041	FM501/3	20.69	12.0	3	24.1	99
0043	FM501/3	20.69	14.0	3	24.1	99
0045	FM501/3	20.69	16.0	3	24.1	99
0047	FM501/4	30.55	12.0	4	31.6	99
0049	FM501/4	30.55	14.0	4	31.6	124
0051	FM501/4	30.55	16.0	4	31.6	124
0053	FM501/4	30.55	18.0	4	31.6	124
0055	FM501/4	30.55	20.0	4	31.6	124
0059	FM501/4	30.55	22.0	4	31.6	124
0061	FM501/4	30.55	25.0	4	31.6	124
		(315)				

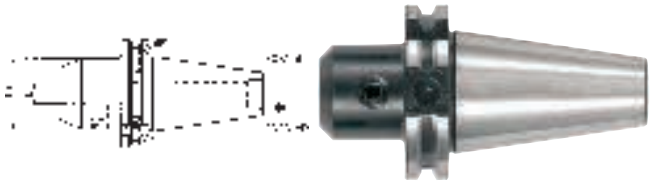
End Mill Holders Weldon

DIN 69871 | Form AD/B

format professional quality

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Hole tolerance: H5.
Concentricity: < 0.01 mm.
Scope of supply: Integrated clamping bolt, from ø 25 mm with two clamping bolts.

Application: For clamping tools with parallel shank and lateral side face according to DIN 1835-B and DIN 6535-HB.



3542 SK 40

3544 SK 50

Part No.	D mm	3542 mmmm	SK	L mm	D1 mm
0001	6	26.48	40	50	25
0004	6	33.93	40	100	25
0007	6	59.03	40	160	25
0010	8	25.42	40	50	28
0013	8	33.10	40	100	28
0016	8	56.70	40	160	28
0019	10	25.42	40	50	35
0022	10	33.54	40	100	35
0025	10	56.70	40	160	35
0028	12	26.12	40	50	42
0031	12	33.98	40	100	42
0034	12	56.70	40	160	42
0037	14	26.12	40	50	44
0040	14	33.10	40	100	44
0043	14	56.70	40	160	44
0046	16	25.77	40	63	48
0049	16	33.10	40	100	48
0052	16	56.70	40	160	48
0055	18	26.12	40	63	50
0058	18	33.10	40	100	50
0061	18	56.70	40	160	50
0064	20	25.77	40	63	52
0067	20	33.10	40	100	50
0070	20	56.70	40	160	50
0073	25	28.93	40	100	65
0076	32	30.89	40	100	72

(360)

Part No.	D mm	3544 mmmm	SK	L mm	D1 mm
0001	6	40.24	50	63	25
0004	6	54.38	50	100	25
0007	6	77.68	50	160	25
0010	8	39.48	50	63	28
0013	8	52.05	50	100	28
0016	8	75.03	50	160	28
0019	10	39.48	50	63	35
0022	10	49.91	50	100	35
0025	10	75.03	50	160	35
0028	12	39.48	50	63	42
0031	12	53.47	50	100	42
0034	12	75.03	50	160	42
0037	14	39.48	50	63	44
0040	14	51.34	50	100	44
0043	14	75.03	50	160	44
0046	16	39.48	50	63	48
0049	16	51.34	50	100	48
0052	16	75.03	50	160	48
0055	18	39.48	50	63	50
0058	18	51.34	50	100	50
0061	18	75.03	50	160	50
0064	20	39.48	50	63	52
0067	20	51.34	50	100	52
0070	20	75.03	50	160	52
0073	25	41.76	50	80	65
0076	25	77.68	50	160	65
0079	32	44.04	50	100	72
0082	32	79.44	50	160	72

(360)

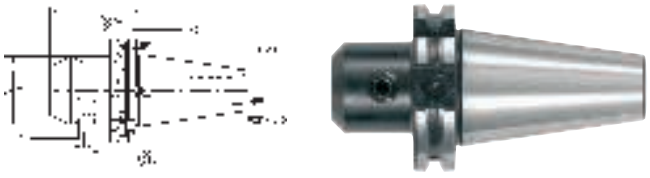
Collet Chucks Whistle Notch

DIN 69871 | Form AD/B

KINTEK

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Hole tolerance: H5.
Concentricity: < 0.01 mm.
Scope of supply: Integrated clamping bolt, from ø 25 mm with two clamping bolts.

Application: For clamping tools with parallel shank and lateral side face according to DIN 1835-B and DIN 6535-HB.



3560 SK 40

3559 SK 50

Part No.	D mm	3560 KINTEK	SK	L mm	D1 mm
4006	6	35.69	40	50	25
4008	8	34.32	40	50	28
4010	10	32.03	40	50	35
4012	12	34.32	40	50	42
4014	14	34.32	40	50	44
4016	16	34.32	40	63	48
4018	18	34.32	40	63	50
4020	20	34.32	40	63	52
4025	25	41.19	40	100	65
4032	32	44.93	40	100	72

(362)

Part No.	D mm	3559 KINTEK	SK	L mm	D1 mm
0001	6	52.71	50	63	25
0004	8	51.25	50	63	28
0007	10	51.25	50	63	35
0010	12	51.25	50	63	42
0013	14	51.25	50	63	44
0016	16	51.25	50	63	48
0019	18	51.25	50	63	50
0022	20	51.25	50	63	52
0025	25	54.17	50	80	65
0028	32	58.11	50	100	72
0031	40	74.89	50	120	80

(362)

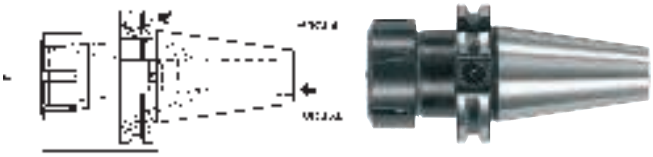
Collet Chucks Type ER

DIN 69871 | Form AD/B

format professional quality

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5.
Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm^2. Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G6.3 8,000 rpm.
Hole tolerance: H5.
Concentricity: < 0.01 mm.
Scope of supply: Integrated clamping bolt, from ⌀ 25 mm with two clamping bolts.

Application: For clamping tools with parallel shank and lateral side face according to DIN 1835-B and DIN 6535-HB.



3564 SK 40

3565 SK 50

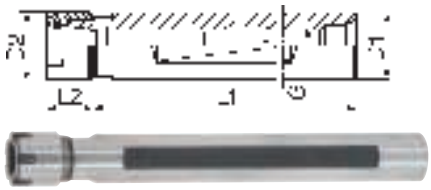
Part No.	Range mm	3564	SK	Collet chuck	D mm	L mm	D2 mm
0001	1 –10	38.84	40	ER 16	32	70	–
0004	1 –10	49.71	40	ER 16	32	100	22
0007	1 –10	65.25	40	ER 16	32	160	22
0010	0.5–16	38.84	40	ER 25	42	70	–
0013	0.5–16	49.71	40	ER 25	42	100	32
0016	0.5–16	65.25	40	ER 25	42	160	32
0019	2 –20	38.84	40	ER 32	50	70	–
0022	2 –20	49.71	40	ER 32	50	100	40
0023	2 –20	65.25	40	ER 32	50	160	40
0025	3 –30	39.60	40	ER 40	63	70	–
0028	3 –30	57.38	40	ER 40	63	100	50
0031	3 –30	69.90	40	ER 40	63	160	50
		(364)					

Part No.	Range mm	3565	SK	Collet chuck	D mm	L mm	D2 mm
0001	1 –10	72.38	50	ER 16	32	100	22
0004	1 –10	97.09	50	ER 16	32	160	22
0007	0.5–16	65.25	50	ER 25	42	100	32
0010	0.5–16	84.07	50	ER 25	42	160	32
0013	2 –20	57.04	50	ER 32	50	70	–
0016	2 –20	65.25	50	ER 32	50	100	40
0019	2 –20	84.07	50	ER 32	50	160	40
0022	3 –30	61.52	50	ER 40	63	80	–
0025	3 –30	87.00	50	ER 40	63	160	50
		(364)					

Mini Collet Chucks for ER Collets

FAHRION

Design: These cylindrical collet holders HFERM for collets DIN 6499 (ER) with lateral clamping face and of slender design are used as cutter bar extensions. The holders are supplied with standard clamping nut (mini nut) and internal bit stop.

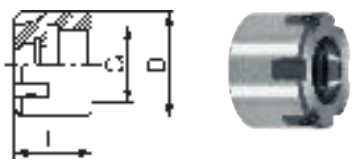


Part No.	Type	3566	Collet chuck	L1 mm	L2 mm	D1 mm	D2 mm
0005	HFER16M	70.88	ER 16	140	23	20	22
		(315)					

Mini Nuts – DIN 6499

FAHRION

Design: DIN 6499.



Part No.	Type	3566	Max. tightening torque mm	Max. speed 1/min	D mm	L mm	G
0010	STM 16M	15.32	28	20000	22	18	M 19x1
		(315)					

Chuck Spanner for Mini Nut

FAHRION



Part No.	Type	3566	Length mm	For
0020	SCHL-STM 16M	11.71	110	STM 16M
		(315)		

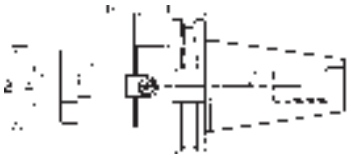
Shell End Mill Arbors with Large Flange and Dead Driver

DIN 69871 | Form A

format professional quality

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3. Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Hole tolerance: H5.
Concentricity: < 0.01 mm.
Scope of supply: With clamping screw.

Application: To hold milling cutters with transverse groove.





Part No.	D mm	3618 mm	SK	L1 mm	L2 mm	D2 mm
4022	22	39.72	40	45	19	48
4027	27	41.37	40	50	21	58
4032	32	42.96	40	55	24	78
4040	40	45.15	40	55	27	88
5022	22	52.52	50	45	19	48
5027	27	54.06	50	45	21	58
5032	32	58.69	50	50	24	78
5040	40	64.10	50	55	27	88

(372)

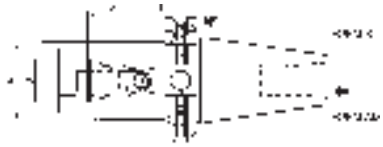
Shell End Mill Arbors

DIN 69871 | Form AD/B

format professional quality

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Hole tolerance: H5.
Concentricity: < 0.01 mm.
Scope of supply: With clamping screw.

Application: To hold milling cutters with transverse groove.





Part No.	D mm	3619 mm	SK	L1 mm	L2 mm	D2 mm
0001	16	58.47	40	45	17	38
0004	22	58.47	40	45	19	48
0007	22	71.72	40	100	19	40
0010	27	62.89	40	50	21	58
0013	27	75.03	40	100	21	48
0016	32	66.20	40	55	24	78
0019	32	77.23	40	100	24	58
0022	40	71.72	40	55	27	88
0025	40	242.74	40	100	27	40
0028	22	77.23	50	45	19	48
0031	27	79.45	50	45	21	58
0034	32	86.06	50	55	24	78
0037	40	93.79	50	55	27	88

(370)

Shell End Mill Arbors

DIN 69871 | Form A

format professional quality

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Hole tolerance: H5.
Concentricity: < 0.01 mm.
Scope of supply: With clamping screw.

Application: To hold milling cutters with transverse groove.





Part No.	D mm	3606 mm	SK	L1 mm	L2 mm	L3 mm	D2 mm
4160	16	37.13	40	55	17	27	32
4161	16	52.82	40	90	17	27	32
4220	22	37.13	40	55	19	31	40
4221	22	52.82	40	90	19	31	40
4270	27	38.61	40	55	21	33	48
4271	27	54.38	40	90	21	33	48
4320	32	42.23	40	60	24	38	58
4321	32	77.57	40	100	24	38	58
4400	40	46.15	40	60	27	41	70
4401	40	79.44	40	100	27	41	70
5160	16	54.06	50	55	17	27	32
5220	22	54.06	50	55	19	31	40
5270	27	55.61	50	55	21	33	48
5320	32	60.25	50	55	24	38	58
5400	40	65.65	50	55	27	41	70

(370)

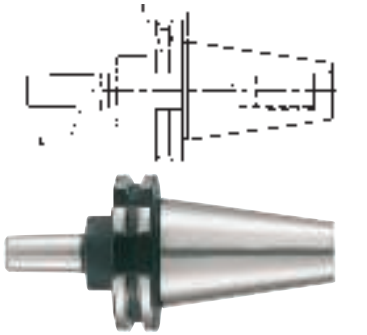
Drill Chuck Arbors

DIN 69871 | Form A

format professional quality

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Hole tolerance: H5.

Application: To hold drill chucks.



Part No.	Drill chuck taper	3666	SK	L mm
4016	B 16	46.35 (360)	40	40

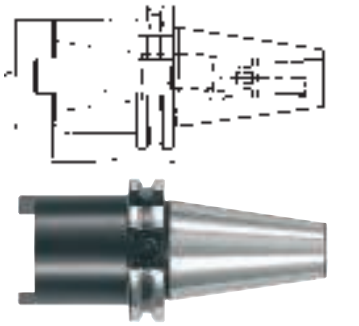
Reducing Bushes

DIN 69871 | Form A

KINTEK

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Hole tolerance: H5.

Application: To hold steep taper tools.



Part No.	Inner/outer SK	3669 KINTEK	D mm	L mm
5040	40/50	102.36 (362)	68	70

Morse Taper Adaptors

DIN 69871 | Form A

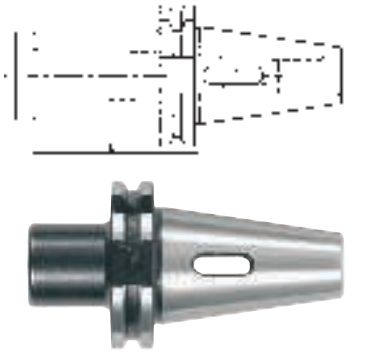
format professional quality

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Hole tolerance: H5.

Application: To hold tools with morse taper with drift tang.

3670 SK 40

3671 SK 50



Part No.	Inner MT	3670	3671	D mm	L mm 3670	L mm 3671
0001	1	32.62	–	25	50	–
0004	2	32.62	49.66	32	50	60
0007	3	32.62	49.66	40	70	65
0010	4	35.73 (360)	51.27 (360)	48	95	95

Morse Taper Adaptors

DIN 69871 | Form A

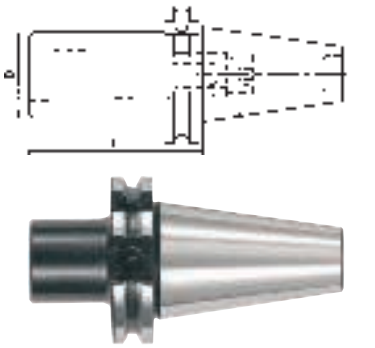
KINTEK

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Hole tolerance: H5.

Application: To hold tools with morse taper shank with tightening thread.

3672 SK 40

3673 SK 50



Part No.	Inner MT	3672 KINTEK	3673 KINTEK	D mm	L mm 3672	L mm 3673
0001	1	40.99 ◊	–	25	50	–
0004	2	40.99 ◊	56.33 ◊	32	50	60
0007	3	40.99 ◊	56.33 ◊	40	70	65
0010	4	42.46 ◊ (362)	55.99 ◊ (362)	48	95	95

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

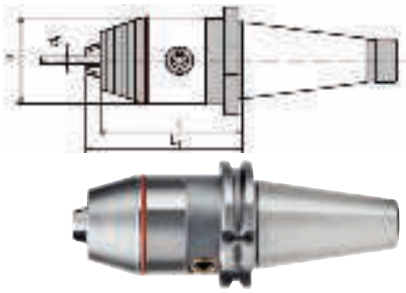
NC Drill Chucks for Clockwise and Anti-clockwise Rotation

DIN 69871 | Form A

format professional quality

Design: Short, one-piece chuck and shaft. Clamping is carried out using a hexagon spanner. The chuck power is considerably greater compared with conventional drill chucks. At the same time this prevents the chuck from slackening during anti-clockwise rotation or rapid braking from high speeds. Taper in accordance with DIN 254.
Concentricity: 0.05 mm.
Max. admissible speed: 7,000 rpm.
Taper angle tolerance: AT3.
Surface finish of taper: RA < 0.001 mm.

Application: To hold tools with parallel shank.



Part No.	Clamping range mm	3525 mm	SK	D mm	L mm	L_1 mm
0005	0.5–13	137.04	40	50	84	90
0010	2.5–16	141.38	40	57	84	92

(324)

Key-operated Short Drilling Chucks AKL for Clockwise and Anti-clockwise Rotation

DIN 69871 | Form A

ALBRECHT

Design: DIN 69871, form A. Short, one-piece chuck and shaft. **High chuck power,** reliability and concentricity (similar to DIN ISO 10888). With **particularly high holding torque** at tool due to **worm gear pair.** The chuck power is considerably greater compared with conventional drill chucks (by means of hexagon wrench). The **self-locking worm gear pair** prevents the chuck from opening.

Scope of supply: Short drilling chuck with hexagon wrench.

Taper angle tolerance: AT3. Surface finish of the taper: RA < 0.001 mm.
Balancing quality: up to 15,000 min^{-1} at G 6.3
Concentricity: 0.03 mm. Max. admissible speed: 15,000 min^{-1} (Standard balancing quality).

Application: To hold tools with parallel shank. For use on CNC machines, machining centres and universal milling machines.

Note: On request, available with diamond-coated jaws. In case of special balancing, higher speed possible.



Part No.	Taper SK	3483	Clamping range mm	L mm	D mm
0005	40	239.91	0.5–10	69	38
0010	40	198.18	1.0–13	80	50
0015	40	215.95	1.5–13	90	56
0018	50	249.67	1.0–13	80	50
0020	50	264.83	1.5–16	81	56

(318)

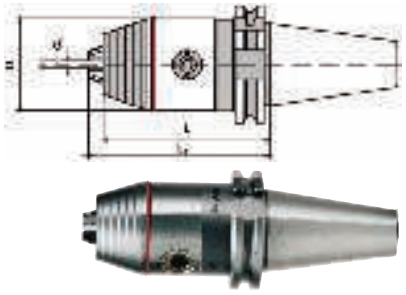
CNC Universal Drilling Chucks for Clockwise and Anti-clockwise Rotation

DIN 69871 | Form A

WTE

Design: Short, one-piece chuck and shaft. Clamping is carried out using a hexagon spanner. The chuck power is considerably greater compared with conventional drill chucks. At the same time this prevents the chuck from slackening during anti-clockwise rotation or rapid braking from high speeds. Taper in accordance with DIN 254.
Concentricity: 0.03 mm. Max. admissible speed: 7,000 rpm. Taper angle tolerance: AT3.
Surface finish of taper: RA < 0.001 mm.

Application: To hold tools with parallel shank.



Part No.	Clamping range mm	3534 WTE	SK	D mm	L mm	L_1 max. mm
0005	0.5–13	147.16	40	50	90	96
0010	2.5–16	154.71	40	57	90	101
0015	0.5–13	182.38	50	50	106	112
0020	2.5–16	191.19	50	57	106	117

(326)

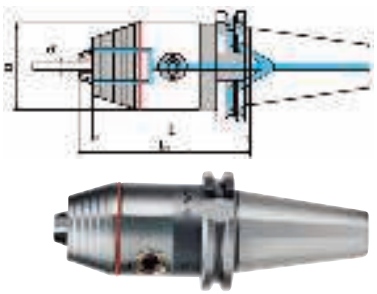
CNC Drilling Chucks for Clockwise and Anti-clockwise Rotation

DIN 69871 | Form AD/B

WTE

Design: Short and with central coolant supply. One-piece chuck and shaft. Clamping is carried out using a hexagon spanner. The chuck power is considerably greater compared with conventional drill chucks. At the same time this prevents the chuck from slackening during anti-clockwise rotation or rapid braking from high speeds. Taper in accordance with DIN 254.
Concentricity: 0.03 mm. Max. admissible speed: 7,000 rpm. Taper angle tolerance: AT3.
Surface finish of taper: RA < 0.001 mm.

Application: To hold tools with parallel shank and coolant supply.



Part No.	Clamping range mm	3535 WTE	SK	D mm	L mm	L_1 max. mm
0001	0.5–13	176.09	40	50	90	96
0007	2.5–16	184.90	40	57	90	101
0004	0.5–13	212.57	50	50	106	112
0010	2.5–16	221.38	50	57	106	117

(326)

End Mill Holders Weldon

DIN 2080 | Form A

format professional quality

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254. Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm. Hole tolerance: H5.
Concentricity: < 0.01 mm.
Scope of supply: Integrated clamping bolt, from ø 25 mm with two clamping bolts.

Application: For clamping tools with parallel shank and lateral drive face according to DIN 1835-B and DIN 6535-HB.





Part No.	D mm	3540	SK	L mm	D1 mm
4006	6	32.62	40	50	25
4008	8	31.06	40	50	28
4010	10	31.06	40	50	35
4012	12	31.06	40	50	42
4014	14	31.06	40	50	44
4016	16	31.06	40	63	48
4018	18	31.06	40	63	50
4020	20	31.06	40	63	52
4025	25	34.17	40	90	65
4032	32	37.29	40	90	72
5006	6	47.38	50	50	25
5008	8	45.83	50	50	28
5010	10	45.83	50	63	35
5012	12	45.83	50	63	42
5014	14	45.83	50	63	44
5016	16	45.83	50	63	48
5018	18	45.83	50	63	50
5020	20	45.83	50	63	52
5025	25	48.16	50	80	65
5032	32	52.82	50	85	72

(360)

Collet Chucks ER

DIN 2080 | Form A

format professional quality

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254. Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Concentricity: < 0.016 mm.
Scope of supply: With clamping bolt.

Application: For clamping tools with parallel shank in collets according to DIN 6499 (ER).





Part No.	Clamping range mm	3572	SK	Collet	D mm	L mm
4160	1–10	60.24	40	ER 16	28	50
4250	1–16	42.37	40	ER 25	45	53
4320	2–20	38.84	40	ER 32	50	68
4400	3–26	40.39	40	ER 40	63	80
5032	2–20	60.91	50	ER 32	50	68
5040	3–26	61.79	50	ER 40	63	76

(364)

Shell End Mill Arbors

DIN 2080 | Form A

format professional quality

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254. Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Concentricity: SK 30/40 = 0.01 mm, SK 50 = 0.015 mm.
Scope of supply: Including cutter retaining screw, drive ring and parallel key.

Application: To hold tools with longitudinal and transverse groove according to DIN 841, 842, 1830 and 1880.





Part No.	D mm	3601	SK	L1 mm	L2 mm	L3 mm	D2 mm
4016	16	53.47	40	52	17	27	32
4022	22	53.47	40	52	19	31	40
4028	27	53.47	40	52	21	33	48
4034	32	59.17	40	52	24	38	58
4040	40	68.41	40	52	27	41	70
5016	16	67.12	50	55	17	27	32
5022	22	67.12	50	55	19	31	40
5027	27	67.12	50	55	21	33	48
5032	32	64.80	50	55	24	38	58
5040	40	77.59	50	55	27	41	70

(370)

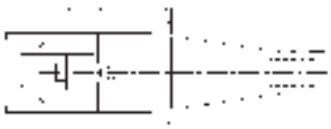
All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Shell End Mill Arbors with Enlarged Flange ⌀ and Fixed Driver

DIN 2080 | Form A | format professional quality

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254. Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Concentricity: SK 30/40 = 0.01 mm, SK 50 = 0.015 mm.
Scope of supply: With milling cutter tightening screw.

Application: To hold tools with transverse groove according to DIN 1880.





Part No.	D mm	3613	SK	L1 mm	L2 mm	D2 mm
4022	22	49.66	40	45	19	48
4027	27	52.96	40	45	21	58
4032	32	54.06	40	50	24	78
4040	40	64.00	40	55	27	88
5022	22	71.72	50	45	19	48
5027	27	72.82	50	45	21	58
5032	32	81.65	50	50	24	78
5040	40	88.27	50	50	27	88
		(372)				

Drill Chuck Arbors

DIN 2080 | Form A | format professional quality

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254. Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.

Application: To hold three-jaw drill chucks with inner taper according to DIN 238.





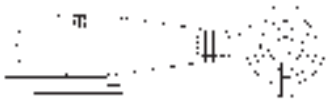
Part No.	Drill chuck taper	3665	SK	L mm	L1 mm
4016	B 16	44.13	40	134.4	17
		(360)			

Reducing Bushes

DIN 2080 | Form A | KINTEK

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254. Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.

Application: To hold steep taper tools.





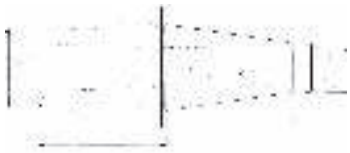
Part No.	Outer/inner SK	3668 KINTEK	D_1 mm	L mm
5040	50/40	95.76	78	63
		(362)		

Morse Taper Adaptors

DIN 2080 | Form A | format professional quality

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254. Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.

Application: To hold tools with morse taper shank and tightening screw according to DIN 228-2 form C.





Part No.	Inner MT	3672	Outer SK	D mm	L mm
4001	1	32.62	40	25	50
4002	2	32.62	40	32	50
4003	3	32.54	40	40	65
4004	4	35.65	40	48	95
5001	1	45.95	40	25	45
5002	2	45.95	50	32	60
5003	3	45.95	50	40	65
5004	4	49.12	50	48	70
5005	5	53.88	50	63	105
		(370)			

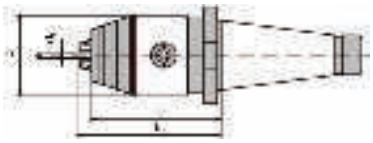
Keyless Chucks for Clockwise and Anti-clockwise Rotation

DIN 2080 | Form A

format professional quality

Design: Short, one-piece chuck and shaft. Clamping is carried out using a hexagon spanner. The chuck power is considerably greater compared with conventional drill chucks. At the same time this prevents the chuck from slackening during anti-clockwise rotation or rapid braking from high speeds.
Taper in accordance with DIN 254.
Concentricity: 0.05 mm.
Max. admissible speed: 7,000 rpm.
Taper angle tolerance: AT3.
Surface finish of taper: RA < 0.001 mm.

Application: To hold tools with parallel shank.





Part No.	Clamping range mm	3522	SK	D mm	L mm	L_1 mm
0005	0.5–13	137.04	40	50	78	84
0010	2.5–16	141.38	40	57	78	86
		(324)				

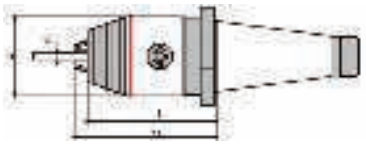
CNC Universal Drilling Chucks for Clockwise and Anti-clockwise Rotation

DIN 2080 | Form A

WTE

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm^2. Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Bore tolerance: H5.
Concentricity: < 0.03 mm
Scope of supply: With integrated clamping bolt, from ⌀ 25 mm with two clamping bolts.

Application: To hold tools with morse taper shank and lateral drive face according to DIN 1835-B and DIN 6535 HB.





Part No.	Clamping range mm	3531 WTE	SK	D mm	L mm	L_1 mm
0005	0.5–13	147.16	40	50	83	89
0010	2.5–13	154.71	40	57	83	94
0015	0.5–13	182.38	50	50	100	106
0020	2.5–16	191.19	50	57	100	111
		(326)				

Key-operated Short Drilling Chucks AKL for Clockwise and Anti-clockwise Rotation

DIN 2080 | Form A

ALBRECHT

Design: DIN 2080, form A. Short, one-piece chuck and shaft. **High chuck power,** reliability and concentricity (similar to DIN ISO 10888). With **particularly high holding torque** at tool due to **worm gear pair.** The chuck power is considerably greater compared with conventional drill chucks (by means of hexagon wrench). The **self-locking worm gear pair** prevents the chuck from opening.

Scope of supply: Short drilling chuck with hexagon wrench.

Taper angle tolerance: AT3.
Surface finish of the taper: RA < 0.001 mm.
Balancing quality: up to 15,000 min^{-1} at G 6.3.
Concentricity: 0.03 mm.
Max. admissible speed: 15,000 min^{-1} (Standard balancing quality).

Application: To hold tools with parallel shank. For use on CNC machines, machining centres and universal milling machines.

Note: On request, available with diamond-coated jaws. In case of special balancing, higher speed possible.





Part No.	SK	3480	Clamping range mm	L mm	D mm
0005	40*	211.51	1.0–13	73	50
0010	50	274.59	1.5–16	79	56
		(318)			

* With snap ring groove for automatic tool chucking.

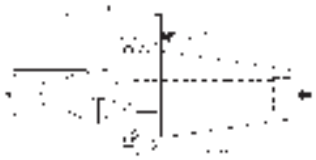
End Mill Holders Weldon

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5.
Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Bore tolerance: H5.
Concentricity: < 0.01 mm.
Scope of supply: With integrated clamping bolt, from ø 25 mm with two clamping bolts.

Application: To hold tools with parallel shank and lateral drive face according to DIN 1835-B and DIN 6535 HB.

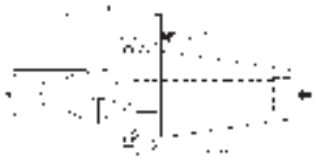
3563 format professional quality
3564 KINTEK

DIN JISB 6339 (MAS-BT) | Form AD/B





3563 format professional quality





3564 KINTEK

Part No.	D mm	3563	3564 KINTEK	BT	L mm	D1 mm
4006	6	28.24	–	40	50	25
4008	8	28.24	–	40	50	28
4010	10	28.24	–	40	63	35
4012	12	28.24	–	40	63	42
4014	14	28.24	–	40	63	44
4016	16	28.24	–	40	63	48
4018	18	28.24	–	40	63	50
4020	20	28.24	–	40	63	52
4025	25	33.55	–	40	90	65
4032	32	35.31	–	40	100	72
4106	6	–	34.11 ◊	40	100	25
4108	8	–	33.28 ◊	40	100	28
4110	10	–	33.28 ◊	40	100	35
4112	12	–	33.28 ◊	40	100	42
4114	14	–	33.28 ◊	40	100	44
4116	16	–	33.28 ◊	40	100	48
4118	18	–	33.28 ◊	40	100	50
4120	20	–	33.28 ◊	40	100	52
4206	6	–	56.58 ◊	40	160	25
4208	8	–	54.09 ◊	40	160	28
4210	10	–	54.09 ◊	40	160	35
4212	12	–	54.09 ◊	40	160	42
4214	14	–	54.09 ◊	40	160	44
4216	16	–	54.09 ◊	40	160	48
4218	18	–	54.09 ◊	40	160	50
4220	20	–	54.09 ◊	40	160	52
4225	25	–	60.74 ◊	40	160	65
4232	32	–	63.24 ◊	40	160	72
		(360)	(362)			

Part No.	D mm	3563	3564 KINTEK	BT	L mm	D1 mm
5006	6	48.55	–	50	63	25
5008	8	48.55	–	50	63	28
5010	10	48.55	–	50	70	35
5012	12	48.55	–	50	80	42
5014	14	48.55	–	50	80	44
5016	16	48.55	–	50	80	48
5018	18	48.55	–	50	80	50
5020	20	48.55	–	50	80	52
5025	25	50.31	–	50	100	65
5032	32	54.73	–	50	105	72
5106	6	–	50.75 ◊	50	100	25
5108	8	–	50.75 ◊	50	100	28
5110	10	–	50.75 ◊	50	100	35
5112	12	–	50.75 ◊	50	100	42
5114	14	–	50.75 ◊	50	100	44
5116	16	–	50.75 ◊	50	100	48
5118	18	–	50.75 ◊	50	100	50
5120	20	–	50.75 ◊	50	100	52
5206	6	–	73.22 ◊	50	160	25
5208	8	–	70.72 ◊	50	160	28
5210	10	–	70.72 ◊	50	160	35
5212	12	–	70.72 ◊	50	160	42
5214	14	–	70.72 ◊	50	160	44
5216	16	–	70.72 ◊	50	160	48
5218	18	–	70.72 ◊	50	160	50
5220	20	–	70.72 ◊	50	160	52
5225	25	–	73.22 ◊	50	160	65
5232	32	–	74.89 ◊	50	160	72
		(360)	(362)			

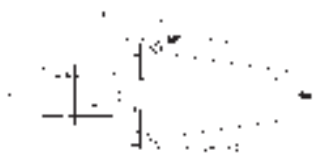
Collet Chucks Type ER

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5.
Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Concentricity: < 0.016 mm.
Scope of supply: With tensioning nut.

Application: To hold tools with parallel shank in collets according to DIN 6499 (ER).

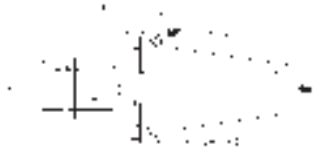
3580 BT 40 **3585** BT 50

DIN JISB 6339 (MAS-BT) | Form AD/B





3580 format professional quality





3585 KINTEK

Part No.	Clamping range mm	3580	3585 KINTEK	Collet	D mm	L mm
4160	1–10	38.84	–	ER 16*	32	70
4250	1–16	38.84	–	ER 25	42	70
4320	2–20	38.84	–	ER 32	50	70
4400	3–26	39.60	–	ER 40	63	70
5320	2–20	–	58.24	ER 32	50	80
5400	3–26	–	63.24	ER 40	63	80
		(364)	(362)			

* With hexagon nut.

Shell End Mill Arbors

DIN JISB 6339 (MAS-BT) Form A

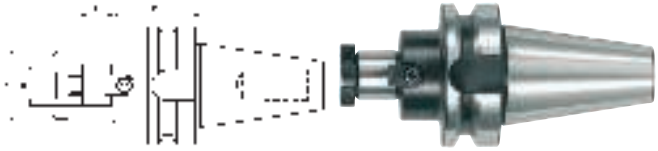
Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5.
Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Concentricity: SK 30/40 = 0.01 mm, SK 50 = 0.015 mm.
Scope of supply: With milling cutter tightening screw.

Application: To hold tools with transverse groove according to DIN 1880.

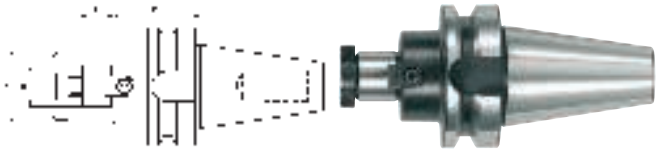
3622 BT 40
3625 BT 50

Part No.	D mm	3622	3625 KINTEK	L1 mm	L2 mm	D2 mm
4022	22	41.31	–	45	19	48
4027	27	41.37	–	45	21	58
4032	32	42.23	–	50	24	78
4040	40*	46.60	–	55	27	88
5032	32	–	67.19	60	24	78
5040	40*	–	73.38	60	27	88
		(372)	(362)			

* These sizes have another 4 threaded holes for fitting of milling cutters in accordance with DIN 2079. Further sizes on request.



3622 format professional quality



3625 KINTEK

Shell End Mill Arbors

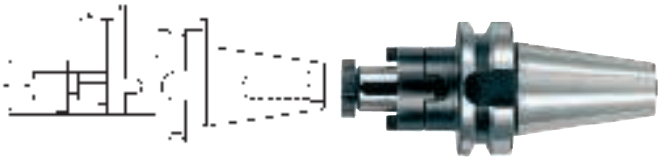
DIN JISB 6339 (MAS-BT) Form A

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5.
Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.
Concentricity: SK 30/40 = 0,01 mm, SK 50 = 0.015 mm.
Scope of supply: With cutter retaining screw, drive ring and parallel key.

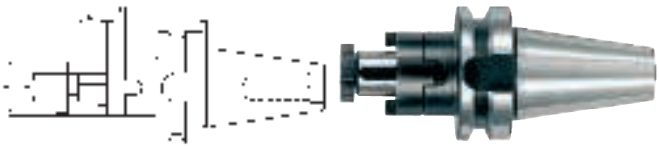
Application: To hold tools with longitudinal and transverse groove according to DIN 841, 842, 1830 and 1880.

3610 BT 40
3611 BT 50

Part No.	D mm	3610	3611 KINTEK	L1 mm	L2 mm	L3 mm	D2 mm
4016	16	49.51	–	55	17	27	32
4022	22	49.51	–	55	19	31	40
4027	27	49.51	–	55	21	33	48
4032	32	56.30	–	60	24	38	58
4040	40	63.21	–	60	27	41	70
5022	22	–	72.80	70	19	31	40
5027	27	–	74.88	70	21	33	48
5032	32	–	81.13	70	24	38	58
5040	40	–	88.40	70	27	41	70
		(370)	(362)				



3610 format professional quality



3611 KINTEK

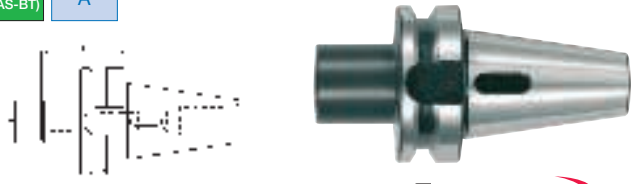
Morse Taper Adaptors

DIN JISB 6339 (MAS-BT) Form A

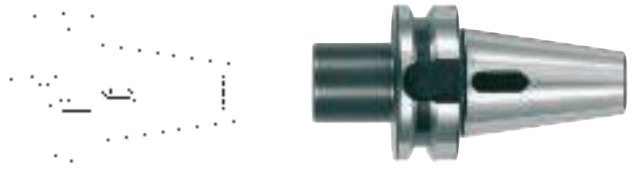
Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5.
Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.

3682 For morse taper with drift tang, BT 40.
3685 For morse taper with drift tang, BT 50.
3686 For morse taper with tightening thread, BT 50.

Part No.	Inner MT	3682	3685 KINTEK	3686 KINTEK	D mm	L mm 3682	3685	3686
4001	1	32.62	–	–	25	50	–	–
4002	2	32.62	–	–	32	50	–	–
4003	3	32.62	–	–	40	70	–	–
4004	4	35.73	–	–	48	95	–	–
5001	1	–	60.85	62.40	25	–	45	45
5002	2	–	60.85	63.65	32	–	60	60
5003	3	–	64.23	67.39	40	–	65	65
5004	4	–	69.16	70.73	48	–	70	90
5005	5	–	81.54	83.20	63	–	105	118
		(370)	(362)	(362)				



3682 format professional quality



3685/ 3686 KINTEK

Drill Chuck Arbors

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Alloyed hardened steel, tensile strength in core after case hardening min. 980 N/mm². Taper according to DIN 254.
Taper angle tolerance AT 3.
Surface finish of taper: RA < 0.001 mm.
Balanced: G 6.3 8,000 rpm.

Application: To hold three-jaw drill chucks with taper bore according to DIN 238.

DIN JISB 6339 (MAS-BT) Form A





3667 format professional quality



3674 KINTEK

3667 BT 40 **3674** BT 50

Part No.	Drill chuck taper	3667	3674 KINTEK	L mm
4016	B 16	46.35	–	40
5016	B 16	–	63.65	50
5018	B 18	–	63.65	50
		(370)	(362)	

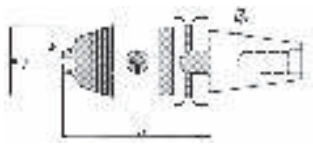
NC Drill Chucks for Right- and Left-hand Operation

Design: Short design, one-piece chuck and shank. Compared to conventional drill chucks the clamping force can be increased significantly by a spanner. At the same time, the chuck is prevented from working loose during left-hand operation or reducing of speed by braking at high speeds. Taper according to DIN 254.
Concentricity: 0.05 mm. Max. speed: 7,000 rpm.
Taper angle tolerance: AT3. Surface finish of taper: RA < 0.001 mm.

Application: To hold tools with parallel shank.

DIN JISB 6339 (MAS-BT) Form A

format professional quality





Part No.	Clamping range mm	3528	D mm	L mm
0005	0.5–13	137.04	50	94
0010	2.5–16	141.38	57	94
		(324)		

Key-operated Short Drilling Chucks AKL for Clockwise and Anti-clockwise Rotation

Design: DIN JISB 6339 (MAS-BT), form A. Short, one-piece chuck and shaft. **High chuck power,** reliability and **concentricity** (similar to DIN ISO 10888). With **particularly high holding torque** at tool due to **worm gear pair.** The chuck power is considerably greater compared with conventional drill chucks (by means of hexagon wrench).
The **self-locking worm gear pair** prevents the chuck from opening.
Taper according to DIN 69871, form A.

Scope of supply: Short drilling chuck with hexagon wrench.

Taper angle tolerance: AT3. Surface finish of the taper: RA
Balancing quality: up to 15,000 min^{-1} at G 6.3. Concentricity: 0.03 mm.
Max. admissible speed: 15,000 min^{-1} (Standard balancing quality)

Application: To hold tools with parallel shank. For use on CNC machines, machining centres and universal milling machines.

Note: On request, available with diamond-coated jaws. In case of special balancing, higher speed possible.

DIN JISB 6339 (MAS-BT) Form A

ALBRECHT





Part No.	Taper SK	3486	Jaw span mm	L mm
0005	40	239.91	0,5–10	77
0010	40	198.18	1,0–13	88
		(318)		

Part No.	Taper SK	3486	Jaw span mm	L mm
0015	40	215.95	1,5–16	90
0020	50	249.67	1,0–13	88
		(318)		

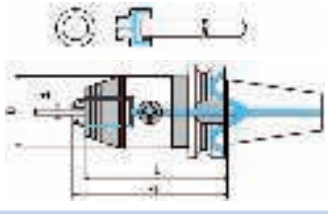
CNC Precision Drill Chucks for Right- and Left-hand Operation

Design: Short construction, chuck and shank in one piece. Considerably higher clamping force over conventional chucks by means of a hexagon spanner. At the same time, the chuck is prevented from working loose during left-hand operation or reducing of speed by braking at high speeds. Taper according to DIN 254.
Concentricity: 0.03 mm.
Max. speed: 7,000 rpm.
Taper angle tolerance: AT3.
Surface finish of taper: RA < 0.001 mm.

Application: To hold tools with parallel shank with inside cooling.

DIN JISB 6339 (MAS-BT) Form AD/B

WTE





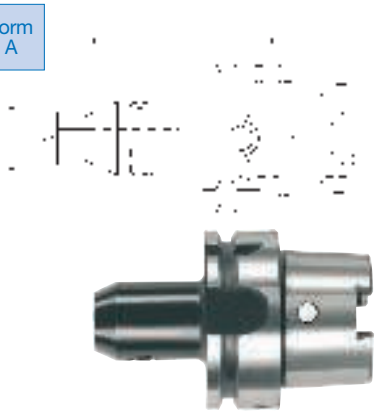
3529 BT 40 **3530** BT 50

Part No.	Clamping range mm	3529 WTE	3530 WTE	D mm	L mm 3529	L mm 3530	L_1 max. mm 3529	L_1 max. mm 3530
0005	0.5–13	176,09	212,57	50	98	110	104	116
0010	2.5–16	184,90	221,38	57	98	110	109	121
		(326)	(326)					

End Mill Holder Systems Weldon

DIN 69893 Form A

KINTEK



Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5.
Alloyed hardened steel for highly stressed components.
Tensile strength in core after case hardening min. 1,000 N/mm².
High repeatability when changing tools. Fixed axial positioning due to face contact. Perfectly suitable for high speed.
Balanced: G 6.3 8,000 rpm.
Bore tolerance: H5.
Concentricity: < 0.003 mm.
Scope of supply: With integrated clamping bolt.
Coolant supply and socket spanner see catalogue no. 3661.

Application: To hold tools with parallel shank and lateral drive face according to DIN 1835-B and DIN 6535 HB.

3708 HSK 50

3710 HSK 63

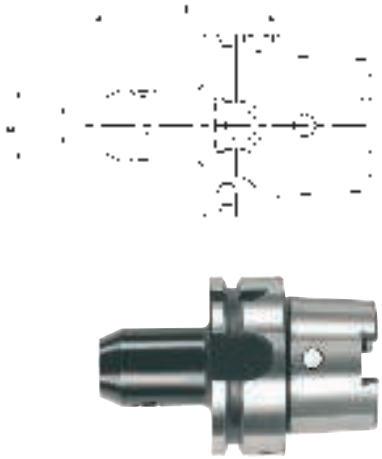
3712 HSK 100

Part No.	d mm	3708 KINTEK	3710 KINTEK	3712 KINTEK	D mm	H mm 3708	3710	3712
0001	6	72.80 ◊	72.64 ◊	99.05 ◊	25	65	65	90
0004	6	–	107.47 ◊	–	25	–	100	–
0007	6	–	97.40 ◊	123.81 ◊	25	–	160	160
0013	8	73.29 ◊	69.34 ◊	97.40 ◊	28	65	65	90
0016	8	–	102.36 ◊	–	28	–	100	–
0019	8	–	97.40 ◊	122.17 ◊	28	–	160	160
0025	10	73.29 ◊	69.34 ◊	94.10 ◊	35	65	65	90
0028	10	–	102.36 ◊	–	35	–	100	–
0031	10	–	97.40 ◊	122.17 ◊	35	–	160	160
0037	12	73.29 ◊	69.34 ◊	94.10 ◊	42	80	80	100
0040	12	–	102.36 ◊	–	42	–	100	–
0043	12	–	97.40 ◊	122.17 ◊	42	–	160	160
0049	14	73.29 ◊	69.34 ◊	94.10 ◊	44	80	80	100
0052	14	–	102.36 ◊	–	44	–	100	–
0055	14	–	128.78 ◊	135.38 ◊	44	–	160	160
0061	16	73.29 ◊	69.34 ◊	–	48	80	80	–
0064	16	–	102.36 ◊	94.10 ◊	48	–	100	100
0067	16	–	128.78 ◊	122.17 ◊	48	–	160	160
0073	18	73.29 ◊	69.34 ◊	–	50	80	80	–
0076	18	–	102.36 ◊	94.10 ◊	50	–	100	100
0079	18	–	128.78 ◊	135.38 ◊	50	–	160	160
0085	20	–	69.34 ◊	–	52	–	80	–
0088	20	73.29 ◊	102.36 ◊	94.10 ◊	52	80	100	110
0091	20	–	128.78 ◊	122.17 ◊	52	–	160	160
0097	25	–	72.64 ◊	97.40 ◊	65	–	110	120
0100	25	–	148.59 ◊	145.28 ◊	65	–	160	160
0106	32	–	72.64 ◊	99.05 ◊	72	–	110	120
0109	32	–	173.35 ◊	168.40 ◊	72	–	160	160
0115	40	–	118.86 ◊	107.31 ◊	80	–	120	120
0116	40	–	–	189.85 ◊	80	–	–	160
		(386)	(386)	(386)				

End Mill Holder Systems Weldon, Finely Balanced G 2.5/22,000 RPM

DIN 69893 Form A

KINTEK



Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5.
Alloyed hardened steel for highly stressed components.
Tensile strength in core after case hardening min. 1,000 N/mm².
High repeatability when changing tools. Fixed axial positioning due to face contact. Perfectly suitable for high speed.
Balanced: G 2.5 22,000 rpm.
Bore tolerance: H5.
Concentricity: < 0.003 mm.
Scope of supply: With integrated clamping bolt.
Coolant supply and socket spanner see catalogue no. 3661.

Application: To hold tools with parallel shank and lateral drive face according to DIN 1835-B and DIN 6535 HB.

Part No.	d mm	3573 KINTEK	D mm	H mm
0001	6	72.64	25	65
0004	8	72.64	28	65
0007	10	70.00	35	65
0010	12	70.00	42	80
0013	14	70.00	44	80
0016	16	70.00	48	80
0019	18	70.00	50	80
0022	20	70.00	52	80
		(386)		

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

End Mill Holders Whistle Notch

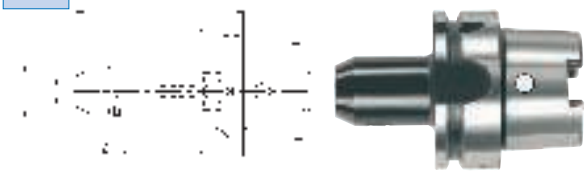
Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5.
Alloyed hardened steel for highly stressed components.
Tensile strength in core after case hardening min. 1,000 N/mm².
High repeatability when changing tools. Fixed axial positioning due to face contact. Perfectly suitable for high speed.
Balanced: G 6.3 8,000 rpm.
Bore tolerance: H5.
Concentricity: < 0.003 mm.
Scope of supply: With integrated clamping bolt.
Coolant supply and socket spanner see catalogue no. 3661.

3715 HSK 63
3717 HSK 100

Application: To hold tools with parallel shank and lateral drive face according to DIN 1835-B and DIN 6535 HB.

DIN 69893 Form A

KINTEK



Part No.	d mm	3715 KINTEK	3717 KINTEK	D mm	H mm 3715	H mm 3717
0001	6	82.55 ◊	114.73 ◊	25	80	90
0007	6	130.42 ◊	135.38 ◊	25	160	160
0013	8	80.90 ◊	108.96 ◊	28	80	90
0019	8	123.81 ◊	132.07 ◊	28	160	160
0025	10	80.90 ◊	108.96 ◊	35	80	90
0031	10	123.81 ◊	132.07 ◊	35	160	160
0037	12	80.90 ◊	–	42	90	–
0040	12	–	108.96 ◊	42	–	100
0043	12	123.81 ◊	132.07 ◊	42	160	160
0049	14	80.90 ◊	–	44	90	–
0052	14	–	108.96 ◊	44	–	100
		(386)	(386)			

Part No.	d mm	3715 KINTEK	3717 KINTEK	D mm	H mm 3715	H mm 3717
0055	14	123.81 ◊	132.07 ◊	44	160	160
0061	16	80.90 ◊	108.96 ◊	48	100	100
0064	16	123.81 ◊	132.07 ◊	48	160	160
0070	18	80.90 ◊	108.96 ◊	50	100	100
0073	18	123.81 ◊	132.07 ◊	50	160	160
0079	20	80.90 ◊	108.96 ◊	52	100	110
0082	20	123.81 ◊	132.07 ◊	52	160	160
0088	25	82.55 ◊	110.61 ◊	65	110	120
0091	25	150.23 ◊	158.48 ◊	65	160	160
0097	32	84.19 ◊	112.26 ◊	72	115	120
0100	32	181.60 ◊	181.60 ◊	72	160	160
		(386)	(386)			

Collet Chucks ER

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5.
Alloyed hardened steel for highly stressed components.
Tensile strength in core after case hardening min. 1,000 N/mm².
High repeatability when changing tools. Fixed axial positioning due to face contact. Perfectly suitable for high speed.
Balanced: G 6.3 8,000 rpm.
Concentricity: < 0.003 mm.
Scope of supply: With integrated clamping bolt.
Coolant supply and socket spanner see catalogue no. 3661.

3718 HSK 50
3720 HSK 63
3722 HSK 100

Application: To hold tools with parallel shank in collets according to DIN 6499 (ER).

DIN 69893 Form A

KINTEK



Part No.	Clamping range mm	3718 KINTEK	3720 KINTEK	3722 KINTEK	Collet	D mm 3718/3720/3722	H mm 3718	H mm 3720	H mm 3722
0001	0.5–10	75.95 ◊	74.29 ◊	115.57 ◊	ER 16	22	80	90	100
0003	0.5–10	122.17 ◊	115.57 ◊	–	ER 16	22	150	160	–
0004	0.5–10	–	165.09 ◊	173.35 ◊	ER 16	22	–	200	200
0007	1.0–16	75.95 ◊	70.98 ◊	69.60 ◊	ER 25	42	95	90	100
0008	1.0–16	118.86 ◊	115.57 ◊	–	ER 25	35	150	160	–
0010	1.0–16	–	165.09 ◊	184.90 ◊	ER 25	35	–	200	200
0013	2.0–20	77.59 ◊	70.98 ◊	102.36 ◊	ER 32	50	100	100	100
0015	2.0–20	122.17 ◊	115.57 ◊	–	ER 32	50	160	160	–
0016	2.0–20	–	173.35 ◊	189.85 ◊	ER 32	50	–	200	200
0019	3.0–26	–	79.24 ◊	104.00 ◊	ER 40	63	–	120	120
0020	3.0–26	–	117.21 ◊	–	ER 40	63	–	160	–
0022	3.0–26	–	181.60 ◊	206.36 ◊	ER 40	63	–	200	200
		(386)	(386)	(386)					

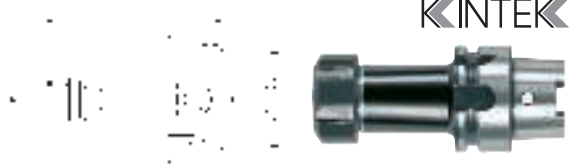
Collet Chucks ER, Finely Balanced G 2.5/22,000 RPM

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5.
Alloyed hardened steel for highly stressed components.
Tensile strength in core after case hardening min. 1,000 N/mm².
High repeatability when changing tools. Fixed axial positioning due to face contact. Perfectly suitable for high speed.
Balanced: G 2.5 22,000 rpm.
Concentricity: < 0.003 mm.
Scope of supply: With integrated clamping bolt.
Coolant supply and socket spanner see catalogue no. 3661.

Application: To hold tools with parallel shank in collets according to DIN 6499 (ER).

DIN 69893 Form A

KINTEK



Part No.	Clamping range mm	3724 KINTEK	Collet	D mm	H mm
0001	0.5–10	84.19 ◊	ER 16	22	90
0004	0.5–10	135.38 ◊	ER 16	22	160
0007	1.0–16	84.19 ◊	ER 25	42	90
0010	1.0–16	135.38 ◊	ER 25	35	160
		(386)			

Part No.	Clamping range mm	3724 KINTEK	Collet	D mm	H mm
0013	2.0–20	84.19 ◊	ER 32	50	100
0016	2.0–20	135.38 ◊	ER 32	50	160
0019	3.0–26	95.76 ◊	ER 40	63	120
0022	3.0–26	138.67 ◊	ER 40	63	160
		(386)			

Milling Arbours

DIN 69893 Form A

KINTEK

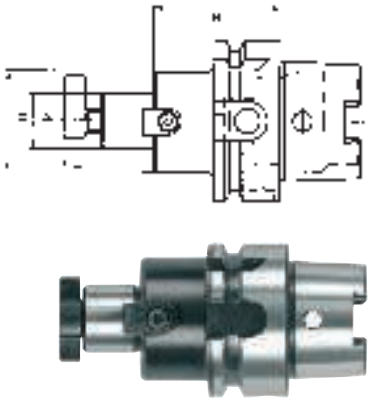
Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5.
Hardened steel for highly stressed components.
Tensile strength in core after case hardening min. 1,000 N/mm².
High repeatability when changing tools. Fixed axial positioning due to face contact. Perfectly suitable for high speed.
Balanced: G 6.3 8,000 rpm.
Concentricity: < 0.006 mm.
Scope of supply: With mill retaining screw.
Coolant supply and socket spanner see catalogue no. 3661.

Application: To hold tools with transverse nut according to DIN 1880.

3728 HSK 50

3730 HSK 63

3732 HSK 100



Part No.	d mm	3728 KINTEK	3730 KINTEK	3732 KINTEK	D mm	H mm 3728	3730	3732
0001	16	80.71 ◊	74.29 ◊	105.66 ◊	38	45	45	55
0003	16	102.36 ◊	99.05 ◊	127.12 ◊	38	100	100	100
0004	16	–	107.31 ◊	130.42 ◊	38	–	145	155
0007	22	79.24 ◊	75.95 ◊	107.31 ◊	48	55	50	55
0008	22	99.05 ◊	108.96 ◊	127.12 ◊	48	100	100	100
0010	22	–	107.31 ◊	130.42 ◊	48	–	150	155
0013	27	82.55 ◊	80.90 ◊	108.96 ◊	58	55	55	55
0015	27	102.36 ◊	108.96 ◊	132.07 ◊	58	100	100	100
0016	27	–	108.96 ◊	133.72 ◊	58	–	155	155
0019	32	–	82.55 ◊	111.44 ◊	78	–	60	60
0021	32	–	118.86 ◊	141.98 ◊	78	–	100	100
0022	32	–	110.61 ◊	135.38 ◊	58	–	155	155
0025	40	–	99.29 ◊	113.91 ◊	88	–	65	65
0027	40	–	122.17 ◊	150.23 ◊	88	–	100	100
0028	40	–	113.91 ◊	138.67 ◊	88	–	160	160
		(386)	(386)	(386)				

Combined Milling Arbors

DIN 69893 Form A

KINTEK

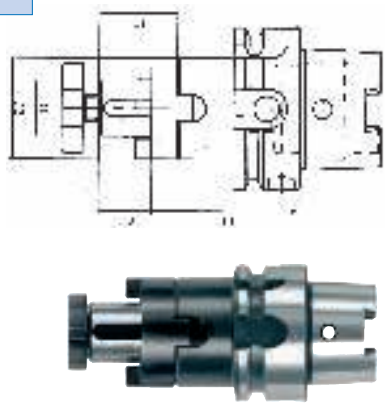
Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5.
Special hardened steel for highly stressed components.
Tensile strength in core after case hardening min. 1,000 N/mm².
High repeatability when changing tools. Fixed axial positioning due to face contact. Perfectly suitable for high speed.
Balanced: G 6.3 8,000 rpm.
Concentricity: < 0.006 mm.
Scope of supply: With integrated mill retaining screw, drive ring and feather key.
Coolant supply and socket spanner see catalogue no. 3661.

Application: To hold tools with longitudinal and transverse slot according to DIN 841, 842, 1830 and 1880.

3723 HSK 50

3725 HSK 63

3727 HSK 100



Part No.	D mm	3723 KINTEK	3725 KINTEK	3727 KINTEK	D2 mm 3723	3725/3727	L1 mm 3723	3725/3727	L2 mm 3723	3725/3727	L3 mm 3723	3725/3727
0001	16	84.89 ◊	90.19 ◊	123.81 ◊	32	32	50	60	65	17	27	27
0004	16	107.31 ◊	112.59 ◊	181.60 ◊	32	32	160	160	160	17	27	27
0007	22	88.42 ◊	91.96 ◊	123.81 ◊	40	40	55	60	65	19	31	31
0010	22	110.61 ◊	112.59 ◊	181.60 ◊	40	40	160	160	160	19	31	31
0013	27	90.19 ◊	95.50 ◊	123.81 ◊	48	48	65	60	65	21	33	33
0016	27	110.61 ◊	117.70 ◊	186.55 ◊	48	48	160	160	160	21	33	33
0019	32	–	99.04 ◊	137.95 ◊	–	58	–	65	70	24	–	38
0022	32	–	122.83 ◊	189.85 ◊	–	58	–	160	160	24	–	38
0025	40	–	99.04 ◊	140.33 ◊	–	70	–	70	70	27	–	41
0028	40	–	138.18 ◊	194.81 ◊	–	70	–	160	160	27	–	41
		(386)	(386)	(386)								

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Morse Taper Adapters

DIN 69893 | Form A | KINTEK

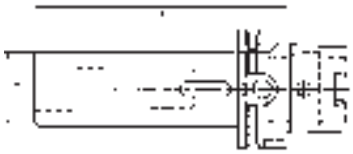
Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5 mm. Special hardened steel for highly stressed components. Tensile strength in core after case hardening min. 1,000 N/mm². High repeatability when changing tools. Fixed axial positioning due to face contact. Perfectly suitable for high speed.
Balanced: G 6.3 8,000 rpm.
Concentricity: < 0.008 mm.
Coolant supply and socket spanner see catalogue no. 3661.

Application: To hold tools with morse taper with drift tang DIN 228-2 form D.

3734 **HSK 50**

3735 **HSK 63**

3737 **HSK 100**



Part No.	Inner MT	3734 KINTEK	3735 KINTEK	3737 KINTEK	D mm	H mm 3734	3735	3737
0001	1	83.54 ◊	87.01 ◊	108.96 ◊	25	100	100	100
0004	2	83.54 ◊	87.01 ◊	103.04 ◊	32	115	115	120
0007	3	90.63 ◊	90.63 ◊	115.57 ◊	40	135	135	150
0010	4	–	103.04 ◊	115.57 ◊	48	–	160	170
		(386)	(386)	(386)				



Morse Taper Adapters

DIN 69893 | Form A | KINTEK

Design: Hardened, HRC 58 ± 2. Depth of case hardening 0.5. Hardened steel for highly stressed components. Tensile strength in core after case hardening min. 1,000 N/mm². High repeatability when changing tools. Fixed axial positioning due to face contact. Perfectly suitable for high speed.
Balanced: G 6.3 8,000 rpm.
Concentricity: < 0.008 mm.
Coolant supply and socket spanner see catalogue no. 3661.

Application: For holding tools with morse taper with tightening thread according to DIN 228-2 form C.



Part No.	Inner MT	3738 KINTEK	Outer HSK	D mm	H mm
0001	1	82.55	63	25	100
0004	2	85.19	63	32	115
0007	3	88.81	63	40	135
0010	4	101.20	63	48	160
0013	1	108.96	100	25	100
0016	2	106.31	100	32	120
0019	3	110.11	100	40	150
0022	4	120.35	100	48	170
		(386)			



CNC Drilling Chucks

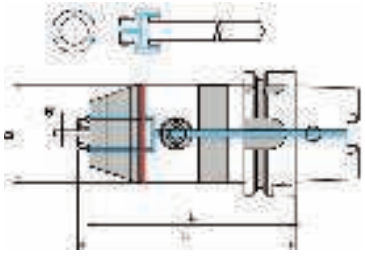
DIN 69893 | Form A | WTE

Design: Short construction, chuck and shank in one piece. Considerably higher clamping force over conventional chucks by means of a hexagon spanner. At the same time, the chuck is prevented from working loose during left-hand operation or reducing of speed by braking at high speeds.
Concentricity: 0.05 mm.
Max. speed: 7,000 rpm.

Application: To hold tools with parallel shank.

3523 **Without cooling lubricant supply.**

3524 **With central cooling lubricant supply.**



Part No.	Clamping range mm	3523 WTE	3524 WTE	HSK	D mm	L mm	L_1 max. mm
0001	0.5–13	191.19 ◊	212.57 ◊	A 63	50	104	110
0007	2.5–16	198.73 ◊	218.86 ◊	A 63	57	104	115
0004	0.5–13	235.21 ◊	256.59 ◊	A 100	50	111	117
0010	2.5–16	241.50 ◊	262.88 ◊	A 100	57	111	122
		(326)	(326)				



Precision Collet Chucks – HP-plus 3 µm

High-precision mechanical expansion chuck – better and low-priced alternative to hydraulic chucks.

Precise

Constant concentricity and repeatability 3 µm with a distance 3 x D (max. 50 mm). No torsional moments occur due to axial tightening of the collet by means of sleeve and nut.



Easy

Clamping using hexagonal wrench with T-handle – opening through patented ejector mechanism (without eccentric) allows quick and easy tool and collet change in the machine or in your hand. Shifting of the collet only axially. No radial forces occur affecting concentricity.

Unique

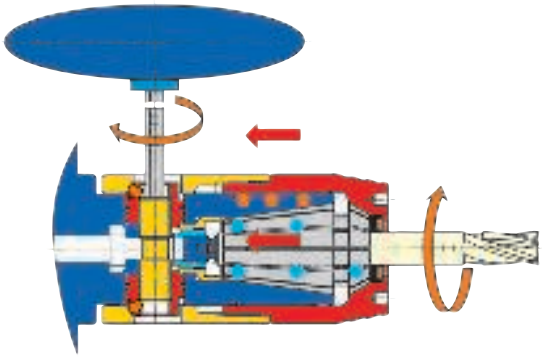


Patented mechanical wedge-type clamping mechanism
Manual clamping force up to 300,000 N which is even increased at higher speeds, the mechanical structure ensures long service life.

The precision collet HP-plus has a surface roughness of < Rz 1.5 µm at the outside in order to achieve high forces. Due to these high forces, the components form a homogenous entity with outstanding concentricity and stiffness.



FAHRION precision collet HP-plus features high repeatability and cushions possible machine vibrations.



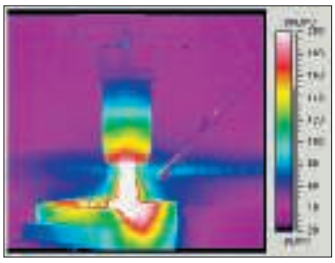
Unsurpassed

Retention force up to twice as high as with hydraulic chucks.
Chuck opening in 0.1 steps starting from 1 mm.
Collet collapse H10 without loss of concentricity and retention force.
Clamping of all shanks also with recess without loss of concentricity.
Flexible and cost-effective through use of collet HP-plus.
Temperature has no effect on retention forces.
Repair possible after crash.

No reduction of clamping force during long shelf life.
No inconvenient control of clamping force prior to each use.
No failure of hydraulic components or leakage
(The retention force is maintained due to the self-locking effect of the clamping force application).
Balancing without abrasion of material.

Short and long design, available in 4 sizes:

ø 1 up to 10 mm	ø 2 up to 16 mm
ø 2 up to 20 mm	ø 3 up to 26 mm



Hard-milling

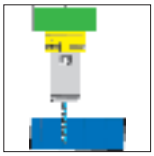
Material 1.2379-60 HRC
Solid carbide mill with TiAN coating

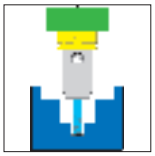
- ø 16 mm
- twist angle 50°
- cutting edges 6
- vc 120 m/min
- fz 0.24 mm
- ap 0.5 mm
- ae 8 mm

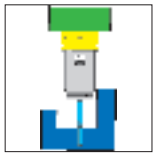
Insensitive

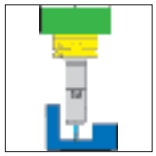
For dry machining and hard-milling, suitable up to 200°, resistant to thermal fluctuations.

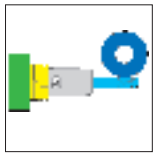
Application

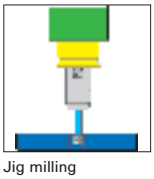

Drilling/countersinking

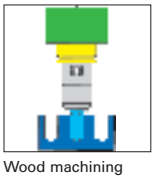

HSC fine-milling

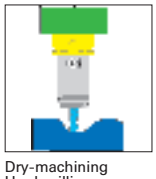

Precision raps

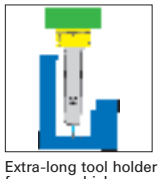

HSC parallel stroke milling


Tool grinding


Jig milling


Wood machining


Dry-machining
Hard-milling


Extra-long tool holder for areas which are difficult to access


HSC milling in tool and mould manufacturing

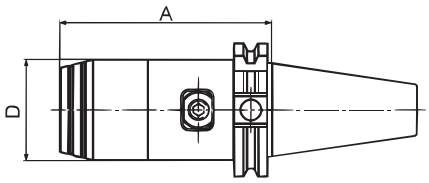
For drilling, cutting and thread cutting

Precision Collet Chucks HP+

DIN 69871 | Form AD/B

Design: Constant concentricity and repeatability of 0.003 mm with distance 3 x D.
Clamping by means of Allen key, opening by means of patented ejector mechanism.
Quick and easy tool and collet change in the machine is thereby possible.
Thanks to the patented mechanical manual wedge clamping mechanism, clamping forces up to 300,000 N occur. In case of increasing speed, they are even higher. Retention forces twice as high as retention force of hydro chucks.
Insensitive to temperature fluctuations.
Supplied with sleeve and internal stopper.

Application: In HSC range and for highly precise machining results. To hold tools with parallel shank as well as shank according to DIN 1835 B,1835 E, 6535 B and 6535 E.





Part No.	Clamping range mm	3567	SK	Collet	a mm	D mm
0001	2–20	160.99	40	470E HP+	100	48
0007	2–20	240.13	50	470E HP+	100	48
		(315)				

Set of Precision Collet Chucks HP+

Content: Collet with steep taper DIN 69871, 4 collets 6 – 8 – 10 – 12 mm and a hook wrench. In plastic case.



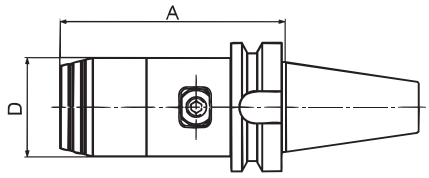
Part No.	SK	3567 Set	A mm
0009	40	321.07 (315)	100

Precision Collet Chucks HP+

DIN JISB 6339 (MAS-BT) | Form AD/B

Design: Constant concentricity and repeatability of 0.003 mm with distance 3 x D.
Clamping by means of Allen key, opening by means of patented ejector mechanism.
Quick and easy tool and collet change in the machine is thereby possible.
Thanks to the patented mechanical manual wedge clamping mechanism, clamping forces up to 300,000 N occur. In case of increasing speed, they are even higher. Retention forces twice as high as retention force of hydro chucks.
Insensitive to temperature fluctuations.
Supplied with sleeve and internal stopper.

Application: In HSC range and for highly precise machining results. To hold tools with parallel shank as well as shank according to DIN 1835 B,1835 E, 6535 B and 6535 E.





Part No.	Clamping range mm	3568	BT	Collet	a mm	D mm
0001	2–20	180.78 (315)	40	470E HP+	105	48

Set of Precision Collet Chucks HP+

Content: Chuck with steep taper DIN JIS B 6339 MAS-BT, 4 collets 6 – 8 – 10 – 12 mm and a hook wrench. In plastic case.



Part No.	BT	3568 Set
0009	40	341.75 (315)

Technical information see page 3/40.
Collets see page 3/42, part no. 3596.
Wrenches see page 3/43, part no. 5850.

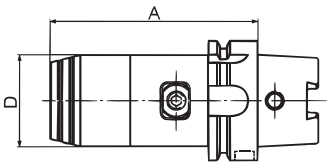
Precision Collet Chucks HP+

Design: Constant concentricity and repeatability of 0.003 mm with distance 3 x D. Clamping by means of Allen key, opening by means of patented ejector mechanism. Quick and easy tool and collet change in the machine is thereby possible. Thanks to the patented mechanic manual wedge clamping mechanism, clamping forces up to 300,000 N occur. In case of increasing speed, they are even higher. Retention forces twice as high as retention force of hydro chucks. Insensitive to temperature fluctuations. Supplied with sleeve and internal stopper.

Application: In HSC range and for highly precise machining results. To hold tools with parallel shank as well as shank according to DIN 1835 B,1835 E, 6535 B and 6535 E.

DIN 69893 | Form A

FAHRION





Form A with plane support for automatic tool change.

Part No.	Clamping range mm	3569	HSK	A mm	Form	Collet	D mm
0004	2–20	244.62 ◊ (315)	63	105	A	470E HP+	48

* without relief groove to ⌀ 42 mm before grooved flange to DIN 69893-1.

Set of Precision Collet Chucks HP+

Content: Chuck with HSK shank DIN 69893, 4 collets 6 – 8 – 10 – 12 mm and a wrench. In plastic case.

DIN 69893 | Form A

FAHRION

Part No.	HSK	3569 Set
0019	63	404.70 ◊

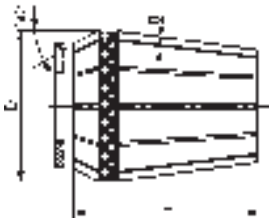


Precision Collets GER32-HP+

Design: According to DIN 6499/ISO 15488 form B. The outer profile of the precision collet HP+ features a surface roughness of < Rz 0.001 mm which is required for high wedge forces. In connection with our collets HP+ we guarantee an average concentricity and accuracy repeatability of 0,002 mm measured in the HP chuck. This is verified in four positions (turned by 90°) at a distance of 3 x D (max. 50 mm). Supplied with sealing washer.

DIN 6499-B

FAHRION





Part No.	Clamping range ⌀ mm	3596	D mm	L mm
0001	2	41.91	33	40
0004	3	34.54	33	40
0007	4	34.54	33	40
0010	5	34.54	33	40
0013	6	34.54	33	40
0016	7	34.54	33	40
0019	8	34.54 (315)	33	40

Part No.	Clamping range ⌀ mm	3596	D mm	L mm
0022	9	34.54	33	40
0025	10	34.54	33	40
0028	12	34.54	33	40
0031	14	34.54	33	40
0034	16	34.54	33	40
0037	18	34.54	33	40
0040	20	34.54 (315)	33	40

Seal Washers HPDI for Collets

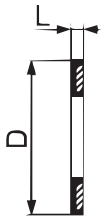
Application: The clamping nuts HPDI can be sealed with the seal washers HP rather cost-effectively (max. 80 bar). They feature a chuck diameter bridging of 0.5 mm (+0.4/-0.1). In connection with the tensioning nut HPDI, the seal washer can be used for collet types ER 16, ER 25, ER 32 and ER40.

3651 Type HP16-DI, size D = 12.6 mm, size L = 2 mm.

3653 Type HP25-DI, size D = 20.2 mm, size L = 2 mm.

3655 Type HP32-DI, size D = 26.2 mm, size L = 2 mm.

3657 Type HP40-DI, size D = 34.2 mm, size L = 2 mm.





Part No.	For collet bore mm	3651	3653	3655	3657
0020	2	10.13	10.13	10.68	–
0025	2.5	10.13	10.13	10.68	–
0030	3	7.93	7.93	8.15	10.13
0035	3.5	7.93	7.93	8.15	10.13
0040	4	7.93	7.93	8.15	10.13
0045	4.5	7.93	7.93	8.15	10.13
0050	5	7.93	7.93	8.15	10.13
0055	5.5	7.93	7.93	8.15	10.13
0060	6	7.93	7.93	8.15	10.13
0065	6.5	7.93	7.93	8.15	10.13
0070	7	7.93	7.93	8.15	10.13
0075	7.5	7.93	7.93	8.15	10.13
0080	8	7.93	7.93	8.15	10.13
0085	8.5	7.93	7.93	8.15	10.13
0090	9	7.93	7.93	8.15	10.13
0095	9.5	7.93	7.93	8.15	10.13
0100	10	7.93	7.93	8.15	10.13
0105	10.5	–	7.93	8.15	10.13
0110	11	–	7.93	8.15	10.13
0115	11.5	–	7.93	8.15	10.13
0120	12	–	7.93	8.15	10.13
0125	12.5	–	7.93	8.15	10.13
0130	13	–	7.93	8.15	10.13
0135	13.5	–	7.93	8.15	10.13
0140	14	–	7.93	8.15	10.13
		(315)	(315)	(315)	(315)

Part No.	For collet bore mm	3651	3653	3655	3657
0145	14.5	–	7.93	8.15	10.13
0150	15	–	7.93	8.15	10.13
0155	15.5	–	7.93	8.15	10.13
0160	16	–	7.93	8.15	10.13
0165	16.5	–	–	8.15	10.13
0170	17	–	–	8.15	10.13
0175	17.5	–	–	8.15	10.13
0180	18	–	–	8.15	10.13
0185	18.5	–	–	8.15	10.13
0190	19	–	–	8.15	10.13
0195	19.5	–	–	8.15	10.13
0200	20	–	–	8.15	10.13
0205	20.5	–	–	–	10.13
0210	21	–	–	–	10.13
0215	21.5	–	–	–	10.13
0220	22	–	–	–	10.13
0225	22.5	–	–	–	10.13
0230	23	–	–	–	10.13
0235	23.5	–	–	–	10.13
0240	24	–	–	–	10.13
0245	24.5	–	–	–	10.13
0250	25	–	–	–	10.13
0255	25.5	–	–	–	10.13
0260	26	–	–	–	10.13
		(315)	(315)	(315)	(315)

Hexagon T-Handle Screwdrivers

Design: With transverse handle made of polypropylene (PPN), with hook-up hole, blade made of chrome-vanadium steel (59 Cr-Mo-V4), nickel-plated, faces chamfered.

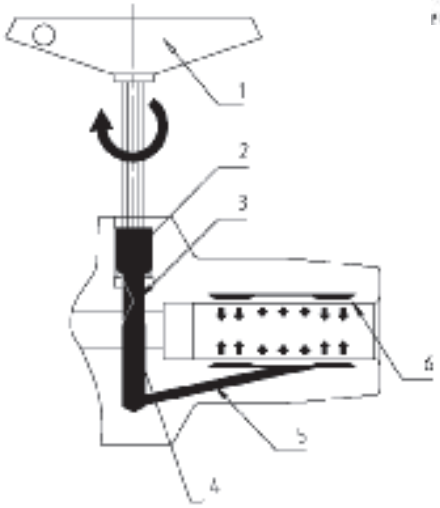
Part No.	Wrench size mm	5850	Length mm
0050	5	1.30	150
		(528)	



Hydro Chucks

Application: Hydro chuck with axial length adjustment for metal and wood machining machines with rotating tools. For automatic tool change, designs DIN 69871, DIN 69893-A, DIN 69893-F, DIN 699893-E and JIS B6339 MAS BT. For manual tool change, design DIN 69893-C.

Function: Using the T-handle socket spanner hydraulic oil is compressed by means of a hydraulic clamping set (pressing screw, pressing pin, seal). The pressure produced thereby causes a uniform deformation of the resilient sleeve, the tool shank is thereby clamped with high concentricity.



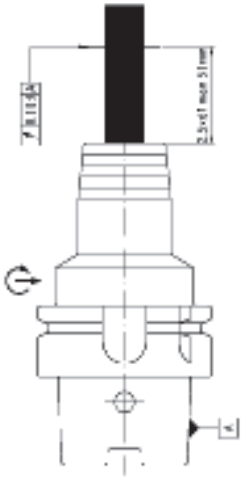
1 T-handle socket spanner
2 Pressing screw
3 Pressing pin
4 Seal
5 Hydraulic oil
6 Hydraulic sleeve

Advantages of hydro chucks

- Quick tool change
- High concentricity
- Vibration absorbing clamping of tools
- Increase of tool life
- Prevention of micro notches at cutting edge of tool
- Improvement of surface quality
- Flexible by use of reducing bushes
- Low maintenance due to closed clamping system
- Easy handling

Advantages of hydro chucks WTE

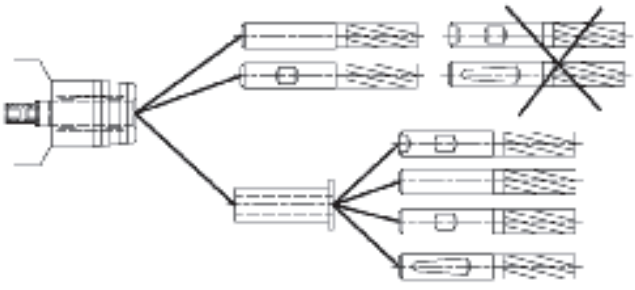
- High torque superposition
- Design according to DIN 69882-7
- High positioning accuracy and repeatability
- Tool clamping with highest concentricity – max. 3 µm
- Concentricity and balancing record for each hydro chuck
- Further development
- Certified production to DIN EN/ISO 9001:2000



Concentricity of WTE hydro chuck with check gauge in clamped position.

Technical data:

- Material 1,600–1,800 N/mm² tensile strength
- Hardness 52 ± HRC
- Holder balanced
- Laser marking
- Maximum speed 40,000 rpm (observance of limit speed interface, fine balancing recommended)
- Optimum operating temperature 20–50 °C; higher temperatures on request, not more than 80 °C
- Coolant pressure maxi. 80 bar
- Travel 60 mm
- Clamping shanks (tolerance h 6) with and without reducing bushes
  – DIN 1835A, DIN 6535HA, DIN 6535HAK from 3–32 mm
  – DIN 1835B, DIN 6535HB, DIN 6535HBK up to 20 mm
- Clamping shanks (tolerance h 6) only with reducing bushes
  – DIN 1835B, DIN 6535HB, DIN 6535HBK over 20 mm
  – DIN 1835D/E, DIN 6535HE, DIN 6535HEK



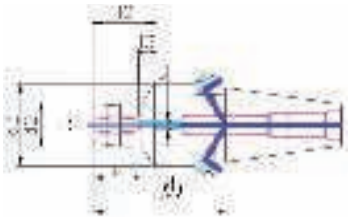
Hydro Chucks

DIN 69871 | Form AD/B

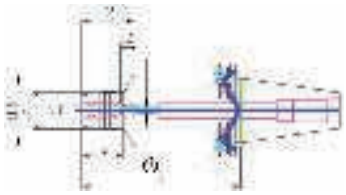
Design: Material 1,600–1,800 N/mm² tensile strength, hardness HRC 52 ± 2.
Maximum speed 40,000 rpm, perfect working temperature 20–50°, coolant lubricant pressure maximum 80 bar, travel 10 mm. Hydraulic oil is compressed by means of a hydraulic clamping set (pressing screw and pin, seal) using a hexagon wrench with transverse handle.
The pressure resulting therefrom provides an even deformation of the expansion bush and the tool shank is clamped with high concentricity (max. 3 µm).
Short and slim design, balanced G 6.3 15,000 rpm. Taper according to DIN 254.
Taper angle tolerance: AT3
Supplied with hexagon wrench with transverse handle.

Application: Hydro chuck for axial longitudinal adjustment for metal and wood working machines with rotating tools. For automatic tool change.

3439 SK 40
3440 SK 50



Short and slim design



Long and slim design



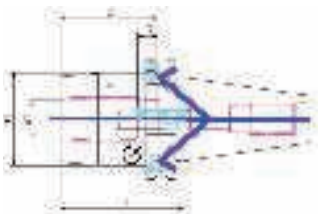
Part No.	d1 mm	3439 WTE	3440 WTE	SK 3439	SK 3440	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm 3439		g 3440		SW mm 3439	
0002	6	197.48 ◊	276.10 ◊	40	50	26	49.5	80	37	10	29	29	M 5	M 5	2.5	2.5
0006	6	296.22 ◊	356.60 ◊	40	50	26	49.5	110	37	10	29	29	M 5	M 5	2.5	2.5
0008	8	197.48 ◊	276.10 ◊	40	50	28	49.5	80	37	10	30	30	M 6	M 6	3	3
0011	8	296.22 ◊	356.60 ◊	40	50	28	49.5	110	37	10	30	30	M 6	M 6	3	3
0014	10	197.48 ◊	276.10 ◊	40	50	30	49.5	80	41	10	35	35	M 6	M 8	3	4
0017	10	296.22 ◊	356.60 ◊	40	50	30	49.5	110	41	10	35	35	M 6	M 8	3	4
0020	12	172.32 ◊	250.94 ◊	40	50	32	49.5	80	46	10	40	36	M 10	M 10	5	5
0023	12	245.91 ◊	309.42 ◊	40	50	32	49.5	110	46	10	40	36	M 10	M 10	5	5
0026	14	197.48 ◊	276.10 ◊	40	50	34	49.5	80	46	10	40	37	M 10	M 10	5	5
0029	14	296.22 ◊	356.60 ◊	40	50	34	49.5	110	46	10	40	37	M 10	M 10	5	5
0032	16	197.48 ◊	276.10 ◊	40	50	38	49.5	80	49	10	45	40	M 10	M 12	5	6
0035	16	296.22 ◊	356.60 ◊	40	50	38	49.5	110	49	10	45	40	M 10	M 12	5	6
0038	18	197.48 ◊	276.10 ◊	40	50	40	49.5	80	49	10	46	41	M 10	M 12	5	6
0041	18	296.22 ◊	356.60 ◊	40	50	40	49.5	110	49	10	46	41	M 10	M 12	5	6
0044	20	172.32 ◊	250.94 ◊	40	50	42	49.5	80	51	10	47	42	M 10	M 16	8	8
0047	20	245.91 ◊	309.42 ◊	40	50	42	49.5	110	51	10	47	42	M 10	M 16	8	8
0050	25	–	276.10 ◊	–	50	55	60	100	57	10	–	48	M 16	M 16	–	8
0053	25	–	356.60 ◊	–	50	55	60	110	57	10	–	48	M 16	M 16	–	8
0056	32	–	276.10 ◊	–	50	63	70	100	61	10	–	61	M 16	M 16	–	8
0060	32	–	356.60 ◊	–	50	63	70	110	61	10	–	61	M 16	M 16	–	8
		(326)	(326)													

Hydro Chucks

DIN 69871 | Form AD/B

Design: Material 1,600–1,800 N/mm² tensile strength, hardness HRC 52 ± 2.
Maximum speed 40,000 rpm, perfect working temperature 20–50°, coolant lubricant pressure maximum 80 bar, travel 10 mm. Hydraulic oil is compressed by means of a hydraulic clamping set (pressing screw and pin, seal) using a hexagon wrench with transverse handle.
The pressure resulting therefrom provides an even deformation of the expansion bush and the tool shank is clamped with high concentricity (max. 3 µm).
Short and slim design, balanced G 6.3 15,000 rpm. Taper according to DIN 254.
Taper angle tolerance: AT3
Supplied with hexagon wrench with transverse handle.

Application: Hydro chuck for axial longitudinal adjustment for metal and wood working machines with rotating tools. For automatic tool change.



Extra short design



Part No.	d1 mm	3443 WTE	SK	d2 mm	l1 mm	l2 mm	l3 mm	g	SW mm
0002	20	143.39 ◊	40	49.5	64.5	51	10	M 10	8
0005	32	164.77 ◊	50	72	81	61	10	M 16	8
		(326)							

Hydro Chucks

Design: Material 1,600–1,800 N/mm² tensile strength, hardness HRC 52 ± 2. Maximum speed 40,000 rpm, perfect working temperature 20–50°, coolant lubricant pressure maximum 80 bar, travel 10 mm. Hydraulic oil is compressed by means of a hydraulic clamping set (pressing screw and pin, seal) using a hexagon wrench with transverse handle. The pressure resulting therefrom provides an even deformation of the expansion bush and the tool shank is clamped with high concentricity (max. 3 µm). Short and slim design, balanced G 6.3 15,000 rpm.

Taper according to DIN 254.
Taper angle tolerance: AT3
Supplied with hexagon wrench with transverse handle.

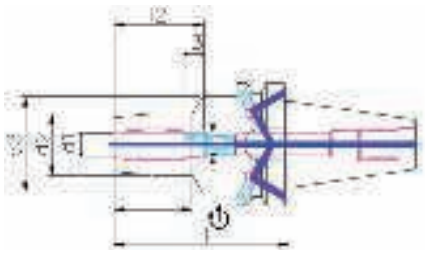
Application: Hydro chuck for axial longitudinal adjustment for metal and wood working machines with rotating tools. For automatic tool change.

DIN JISB 6339 (MAS-BT) | Form AD/B

Part No.	d1 mm	3442 WTE	BT	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	g	SW mm
0202	6	197.48 ◊	40	26	49.5	90	37	10	29	M 5	2.5
0205	8	197.48 ◊	40	28	49.5	90	37	10	30	M 6	3
0208	10	197.48 ◊	40	30	49.5	90	41	10	35	M 6	3
0211	12	172.32 ◊	40	32	49.5	90	46	10	40	M 10	5
0214	14	197.48 ◊	40	34	49.5	90	46	10	40	M 10	5
0217	16	197.48 ◊	40	38	49.5	90	49	10	46	M 10	5
0220	18	197.48 ◊	40	40	49.5	90	49	10	46	M 10	5
0223	20	172.32 ◊	40	42	49.5	90	51	10	47	M 10	5
0226	25	197.48 ◊	40	55	52	90	57	10	50	M 10	5
0229	6	276.10 ◊	50	26	49.5	110	37	10	29	M 5	2.5
0232	8	276.10 ◊	50	28	49.5	110	37	10	30	M 6	3
0235	10	276.10 ◊	50	30	49.5	110	41	10	35	M 8	4
0238	12	250.94 ◊	50	32	49.5	110	46	10	36	M 10	5
0241	14	276.10 ◊	50	34	49.5	110	46	10	37	M 10	5
0244	16	276.10 ◊	50	38	49.5	110	49	10	40	M 12	6
0247	18	276.10 ◊	50	40	49.5	110	49	10	41	M 12	6
0250	20	250.94 ◊	50	42	49.5	110	51	10	42	M 16	8
0253	25	276.10 ◊	50	55	60	110	57	10	48	M 16	8
0256	32	276.10 ◊	50	63	70	115	61	10	61	M 16	8
0302	20*	143.39 ◊	40	49.5	–	72.5	51	10	–	M 10	5
0305	32*	164.77 ◊	50	72	–	90	61	10	–	M 16	8

(326)

* Short, heavy-duty design.





Hydro Chucks

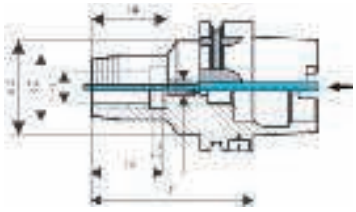
Design: Material 1,600–1,800 N/mm² tensile strength, hardness HRC 52 ± 2. Maximum speed 40,000 rpm, perfect working temperature 20–50°, coolant lubricant pressure maximum 80 bar, travel 10 mm. Hydraulic oil is compressed by means of a hydraulic clamping set (pressing screw and pin, seal) using a hexagon wrench with transverse handle. The pressure resulting therefrom provides an even deformation of the expansion bush and the tool shank is clamped with high concentricity (max. 3 µm). Short and slim design, balanced G 6.3 15,000 rpm. Supplied with hexagon wrench with transverse handle.

Application: Hydro chuck for axial longitudinal adjustment for metal and wood working machines with rotating tools. For automatic tool change.

DIN 69893 | Form A

Part No.	d1 mm	3547 WTE	HSK mm	d2 mm	d3 mm	l1 mm	l2 mm	l3 mm	l4 mm	g	SW mm
0002	6	215.09 ◊	63	26	50	70	37	10	24	M 5	2.5
0005	6	422.00 ◊	63	28	50	150	37	10	110	M 5	2.5
0008	8	215.09 ◊	63	28	50	70	37	10	24	M 6	3
0011	8	422.00 ◊	63	28	50	150	37	10	110	M 6	3
0014	10	215.09 ◊	63	30	50	80	41	10	32	M 6	3
0017	10	422.00 ◊	63	30	50	150	41	10	110	M 6	3
0020	12	197.48 ◊	63	32	50	85	46	10	40	M 10	5
0023	12	422.00 ◊	63	32	50	150	46	10	110	M 10	5
0026	14	215.09 ◊	63	34	50	85	46	10	40	M 10	5
0029	14	422.00 ◊	63	34	50	150	46	10	110	M 10	5
0032	16	215.09 ◊	63	38	50	90	49	10	45	M 10	5
0035	16	422.00 ◊	63	38	50	150	49	10	110	M 10	5
0038	18	215.09 ◊	63	40	50	90	49	10	46	M 10	5
0041	18	422.00 ◊	63	40	50	150	49	10	110	M 10	5
0044	20	197.48 ◊	63	42	50	90	51	10	48	M 10	5
0047	20	422.00 ◊	63	42	50	150	51	10	110	M 10	5
0050	25	215.09 ◊	63	57	53	120	57	10	63	M 10	5

(326)



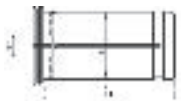


Reducing Bushes

Application: For clamping ∅ reduction, fits all hydro chucks.

Part No.	d mm	3443 WTE	d1 mm	L mm	L1 mm
0602	20	50.70	6	51	55.5
0605	20	50.70	8	51	55.5
0608	20	50.70	10	51	55.5
0611	20	50.70	12	51	55.5
0614	20	50.70	14	51	55.5
0617	20	50.70	16	51	55.5
0620	32	65.41	6	62	66.5
0623	32	65.41	8	62	66.5
0626	32	65.41	10	62	66.5

(326)





Part No.	d mm	3443 WTE	d1 mm	L mm	L1 mm
0629	32	65.41	12	62	66.5
0632	32	65.41	14	62	66.5
0635	32	65.41	16	62	66.5
0638	32	65.41	18	62	66.5
0641	32	65.41	20	62	66.5
0644	32	65.41	25	62	66.5

(326)

Shrink Chucks, Balanced

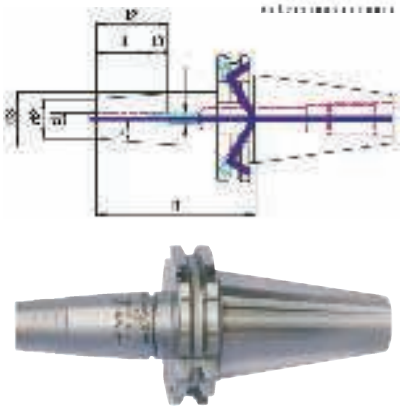
DIN 69871 | Form AD/B

Design: High-tensile hot-forming steel, concentricity and repeatability max. 0.002 mm. Highest retention forces and rigidity for heavy-duty chip removal. Advantages: Wear-free clamping, easy handling as well as operation with low vibration.
Taper according to DIN 254.
Taper angle tolerance: AT3.
Recommended limit speed: 35,000 rpm.
Balanced: G 6.3 15,000 rpm.
Supplied with adjusting screw.

Application: To hold tools with parallel shank as well as shank according to DIN 1835 B, 1835 E, 6535 B and 6535 E.
For HSC milling, heavy-duty chip removal, drilling and reaming.

3445 SK 40

3446 SK 50



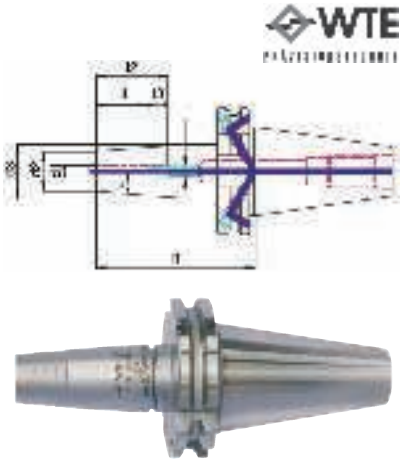
Part No.	d2 mm	3445 WTE	3446 WTE	SK 3445	SK 3446	d3 mm	d2 mm	l1 mm	l2 mm	l3 mm	g 3445	g 3446	SW mm
0001	6	80.94 ◊	121.13 ◊	40	50	27	20	80	36	10	M 5	M 5	2.5
0004	6	108.68 ◊	148.86 ◊	40	50	27	20	160	36	10	M 5	M 5	2.5
0007	8	80.94 ◊	121.13 ◊	40	50	27	20	80	36	10	M 6	M 6	3
0010	8	108.68 ◊	148.86 ◊	40	50	27	20	160	36	10	M 6	M 6	3
0013	10	80.94 ◊	121.13 ◊	40	50	31	24	80	42	10	M 6	M 6	3
0016	10	108.68 ◊	148.86 ◊	40	50	31	24	160	42	10	M 6	M 6	3
0019	12	80.94 ◊	121.13 ◊	40	50	31	24	80	47	10	M 10 x 1	M 10 x 1	5
0022	12	108.68 ◊	148.86 ◊	40	50	31	24	160	47	10	M 10 x 1	M 10 x 1	5
0025	14	80.94 ◊	121.13 ◊	40	50	34	27	80	47	10	M 10 x 1	M 10 x 1	5
0028	14	108.68 ◊	148.86 ◊	40	50	34	27	160	47	10	M 10 x 1	M 10 x 1	5
0031	16	80.94 ◊	121.13 ◊	40	50	34	27	80	50	10	M 10 x 1	M 10 x 1	5
0034	16	108.68 ◊	148.86 ◊	40	50	34	27	160	50	10	M 10 x 1	M 10 x 1	5
0037	18	80.94 ◊	121.13 ◊	40	50	40	33	80	50	10	M 16 x 1	M 16 x 1	8
0040	18	108.68 ◊	148.86 ◊	40	50	40	33	160	50	10	M 16 x 1	M 16 x 1	8
0043	20	80.94 ◊	121.13 ◊	40	50	40	33	80	52	10	M 16 x 1	M 16 x 1	8
0046	20	108.68 ◊	148.86 ◊	40	50	40	33	160	52	10	M 16 x 1	M 16 x 1	8
0049	25	80.94 ◊	121.13 ◊	40	50	53	44	100	58	10	M 16 x 1	M 16 x 1	8
0052	25	108.68 ◊	148.86 ◊	40	50	53	44	160	58	10	M 16 x 1	M 16 x 1	8
0055	32	–	121.13 ◊	–	50	53	44	100	62	10	–	M 16 x 1	8
0058	32	–	148.86 ◊	–	50	53	44	160	62	10	–	M 16 x 1	8
		(327)	(327)										

Shrink Chucks, Finely Balanced to G 2.5 at max. 18,000 rpm

DIN 69871 | Form AD/B

Design: High-tensile hot-forming steel, concentricity and repeatability max. 0.002 mm. Highest retention forces and rigidity for heavy-duty chip removal. Advantages: Wear-free clamping, easy handling as well as operation with low vibration.
Taper according to DIN 254.
Taper angle tolerance: AT3.
Recommended limit speed: 35,000 rpm.
Balanced: G 2.5 18,000 rpm.
Supplied with adjusting screw.

Application: To hold tools with parallel shank as well as shank according to DIN 1835 B, 1835 E, 6535 B and 6535 E.
For HSC milling, heavy-duty chip removal, drilling and reaming.



Part No.	d1 mm	3449 WTE	SK	d2 mm	l1 mm	l2 mm	l3 mm	g	SW mm
0001	6	91.00 ◊	40	20	80	36	10	M 5	2.5
0004	8	91.00 ◊	40	20	80	36	10	M 6	3
0007	10	91.00 ◊	40	24	80	42	10	M 6	3
0010	12	91.00 ◊	40	24	80	47	10	M 10 x 1	5
0013	14	91.00 ◊	40	27	80	47	10	M 10 x 1	5
		(327)							

Part No.	d1 mm	3449 WTE	SK	d2 mm	l1 mm	l2 mm	l3 mm	g	SW mm
0016	16	91.00 ◊	40	27	80	50	10	M 10 x 1	5
0019	18	91.00 ◊	40	33	80	50	10	M 16 x 1	8
0022	20	91.00 ◊	40	33	80	52	10	M 16 x 1	8
0025	25	91.00 ◊	40	44	100	58	10	M 16 x 1	8
		(327)							

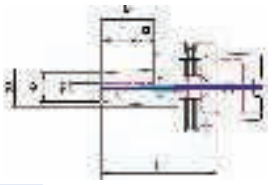
Shrink Chucks

Design: High-tensile hot-forming steel, concentricity and repeatability max. 0.002 mm. Highest retention forces and rigidity for heavy-duty chip removal. Advantages: Wear-free clamping, easy handling as well as operation with low vibration.
Recommended limit speed: 40,000 rpm.
Supplied with adjusting screw with ⌀ 6 mm.

Application: To hold tools with parallel shank as well as shank according to DIN 1835 B, 1835 E, 6535 B and 6535 E.
For HSC milling, heavy-duty chipping, drilling and reaming.

DIN 69893 | Form A | Form E

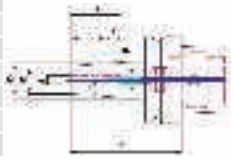
3548 HSK 50 form A, balanced to G 6.3 15,000 rpm.
3562 HSK 50 form E, balanced to G 6.3 25,000 rpm.





3548

Part No.	d1 mm	3548 WTE	3562 WTE	d3 mm	d2 mm	l1 mm	l2 mm	l3 mm	g	SW mm
0001	6	96.79 ◊	96.23 ◊	20	20	80	36	10	M 5	2.5
0004	8	96.79 ◊	96.23 ◊	27	20	80	36	10	M 6	3
0007	10	96.79 ◊	96.23 ◊	31	24	85	42	10	M 6	3
0010	12	96.79 ◊	96.23 ◊	31	24	90	47	10	M 10 x 1	5
0013	14	96.79 ◊	96.23 ◊	34	27	90	47	10	M 10 x 1	5
0016	16	96.79 ◊	96.23 ◊	34	27	95	50	10	M 10 x 1	5
0019	18	96.79 ◊	96.23 ◊	40	33	95	50	10	M 16 x 1	5
0022	20	96.79 ◊	96.23 ◊	40	33	100	52	10	M 16 x 1	5
		(327)	(327)							





3562

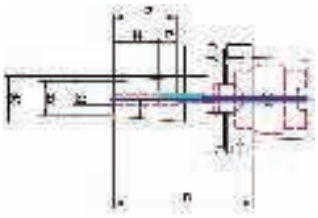
Shrink Chucks

Design: High-tensile hot-forming steel, concentricity and repeatability max. 0.002 mm. Highest retention forces and rigidity for heavy-duty chipping. Advantages: Wear-free clamping, easy handling as well as operation with low vibration.
Recommended limit speed: 41,000 rpm.
HSK 63, form A, balanced: G 6.3 15,000 rpm.
Supplied with adjusting screw with ⌀ 6 mm.

Application: To hold tools with parallel shank as well as shank according to DIN 1835 B, 1835 E, 6535 B and 6535 E.
For HSC milling, heavy-duty chip removal, drilling and reaming.

DIN 69893 | Form A

Part No.	d1 mm	3549 WTE	d3 mm	d2 mm	l1 mm	l2 mm	l3 mm	g	SW mm
0001	6	99.05 ◊	27	20	80	36	10	M 5	2.5
0004	6	125.09 ◊	27	20	160	36	10	M 5	2.5
0007	8	99.05 ◊	27	20	80	36	10	M 6	3
0010	8	125.09 ◊	27	20	160	36	10	M 6	3
0013	10	99.05 ◊	31	24	85	42	10	M 6	3
0016	10	125.09 ◊	31	24	160	42	10	M 6	3
0019	12	99.05 ◊	31	24	90	47	10	M 10 x 1	5
0022	12	125.09 ◊	31	24	160	47	10	M 10 x 1	5
0025	14	99.05 ◊	34	27	90	47	10	M 10 x 1	5
0028	14	125.09 ◊	34	27	160	47	10	M 10 x 1	5
0031	16	99.05 ◊	34	27	95	50	10	M 10 x 1	5
0034	16	125.09 ◊	34	27	160	50	10	M 10 x 1	5
0037	18	99.05 ◊	40	33	95	50	10	M 16 x 1	5
0040	18	125.09 ◊	40	33	160	50	10	M 16 x 1	5
0043	20	99.05 ◊	40	33	100	52	10	M 16 x 1	5
0046	20	125.09 ◊	40	33	160	52	10	M 16 x 1	5
0049	25	99.05 ◊	53	44	115	58	10	M 16 x 1	5
0052	25	125.09 ◊	53	44	160	58	10	M 16 x 1	5
		(327)							





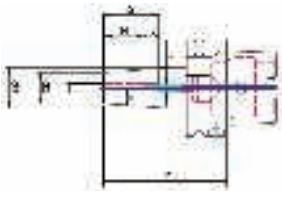
Shrink Chucks

Design: High-tensile hot-forming steel, concentricity and repeatability max. 0.002 mm. Highest retention forces and rigidity for heavy-duty chipping. Advantages: Wear-free clamping, easy handling as well as operation with low vibration.
Recommended limit speed: 20,000 rpm.
HSK 100, form A, balanced: G 6.3 12,000 rpm.
Supplied with adjusting screw with ⌀ 6 mm.

Application: To hold tools with parallel shank as well as shank according to DIN 1835 B, 1835 E, 6535 B and 6535 E.
For HSC milling, heavy-duty chip removal, drilling and reaming.

DIN 69893 | Form A

Part No.	d1 mm	3551 WTE	d3 mm	d2 mm	l1 mm	l2 mm	l3 mm	g	SW mm
0001	6	156.22 ◊	27	20	85	36	10	M 5	2.5
0004	8	156.22 ◊	27	20	85	36	10	M 6	3
0007	10	156.22 ◊	31	24	90	42	10	M 6	3
0010	12	156.22 ◊	31	24	95	47	10	M 10 x 1	5
0013	14	156.22 ◊	34	27	95	47	10	M 10 x 1	5
0016	16	156.22 ◊	34	27	100	50	10	M 10 x 1	5
0019	18	156.22 ◊	40	33	100	50	10	M 16 x 1	8
0022	20	156,22 ◊	40	33	105	52	10	M 16 x 1	8
0025	25	156.22 ◊	53	44	115	58	10	M 16 x 1	8
0028	32	156.22 ◊	53	44	120	58	10	M 16 x 1	8
		(327)							



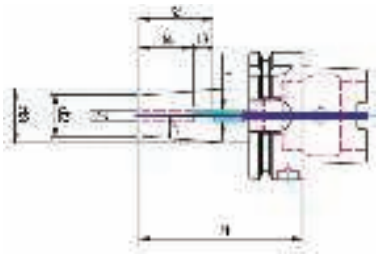


Shrink Chucks, Finaly Balanced to G 2.5 at max. 22,000 rpm

DIN 69893 | Form A

Design: High-tensile hot-forming steel, concentricity and repeatability max. 0.002 mm. Highest retention forces and rigidity for heavy-duty chip removal. Advantages: Wear-free clamping, easy handling as well as operation with low vibration.
HSK 63 form A, finely balanced G 2.5 22,000 rpm.
As from ⌀ 6 mm supplied with adjusting screw.

Application: To hold tools with parallel shank as well as shank according to DIN 1835 B, 1835 E, 6535 B and 6535 E.
For HSC milling, heavy-duty chip removal, drilling and reaming.





Part No.	d1 mm	3549 WTE	d3 mm	d2 mm	l1 mm	l2 mm	l3 mm	g	SW mm
0401	6	109.11 ◊	27	20	80	36	10	M 5	2.5
0404	8	109.11 ◊	27	20	80	36	10	M 6	3
0407	10	109.11 ◊	31	24	85	42	10	M 6	3
0410	12	109.11 ◊	31	24	90	47	10	M 10 x 1	5
0413	14	109.11 ◊	34	27	90	47	10	M 10 x 1	5
0416	16	109.11 ◊	34	27	95	50	10	M 10 x 1	5
0419	18	109.11 ◊	40	33	95	50	10	M 16 x 1	5
0422	20	109.11 ◊	40	33	100	52	10	M 16 x 1	5

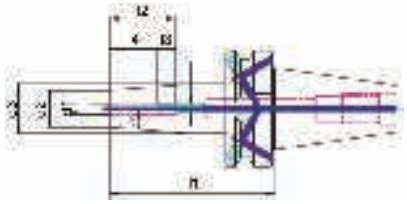
(327)

Shrink Chucks

DIN JISB6339 | Form AD/B

Design: High-tensile hot-forming steel, concentricity and repeatability max. 0.002 mm. Highest retention forces and rigidity for heavy-duty chip removal. Advantages: Wear-free clamping, easy handling as well as operation with low vibration. Taper according to DIN 254.
Taper angle tolerance: AT3.
Recommended limit speed: 35,000 rpm.
Balanced: G 6.3 15,000 rpm.
Supplied with adjusting screw.

Application: To hold tools with parallel shank as well as shank according to DIN 1835 B, 1835 E, 6535 B and 6535 E.
For HSC milling, heavy-duty chip removal, drilling and reaming.



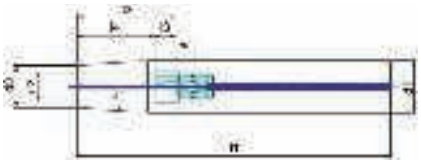


Part No.	d1 mm	3444 WTE	BT	d3 mm	d2 mm	l1 mm	l2 mm	l3 mm	g	SW mm
0101	6	87.17 ◊	40	27	20	90	36	10	M 5	2.5
0104	8	87.17 ◊	40	27	20	90	36	10	M 6	3
0107	10	87.17 ◊	40	31	24	90	41	10	M 6	3
0110	12	87.17 ◊	40	31	24	90	47	10	M 10 x 1	5
0113	14	87.17 ◊	40	34	27	90	47	10	M 10 x 1	5
0116	16	87.17 ◊	40	34	27	90	50	10	M 10 x 1	5
0119	18	87.17 ◊	40	40	33	90	50	10	M 16 x 1	8
0122	20	87.17 ◊	40	40	33	90	52	10	M 16 x 1	8
0125	25	87.17 ◊	40	53	44	100	58	10	M 16 x 1	8
0128	6	127.36 ◊	50	27	20	90	36	10	M 5	2.5
0131	8	127.36 ◊	50	27	20	90	36	10	M 6	3
0134	10	127.36 ◊	50	31	24	90	41	10	M 6	3
0137	12	127.36 ◊	50	31	24	90	47	10	M 10 x 1	5
0140	14	127.36 ◊	50	34	27	90	47	10	M 10 x 1	5
0143	16	127.36 ◊	50	34	27	90	50	10	M 10 x 1	5
0146	18	127.36 ◊	50	40	33	90	50	10	M 16 x 1	8
0149	20	127.36 ◊	50	40	33	90	52	10	M 16 x 1	8
0152	25	127.36 ◊	50	53	44	100	58	10	M 16 x 1	8
0155	32	127.36 ◊	50	53	44	100	62	10	M 16 x 1	8

(327)

Shrink Extensions

Application: Due to the combination of standard shrink chucks with extensions almost any dimension can be reached, even in case of extreme lengths.





Part No.	d1 mm	3549 WTE	d3 mm	d2 mm	d3 mm	l1 mm	l2 mm	g	SW mm
0501	20	76.41	10	3	10	150	12	–	–
0504	20	76.41	10	4	10	150	16	–	–
0507	20	76.41	10	5	10	150	20	–	–
0510	20	76.41	10	6	10	150	36	M 5	2.5
0513	20	76.41	12	8	12	150	36	M 6	3
0516	20	76.41	14	10	14	150	42	M 6	3
0519	20	76.41	16	12	16	150	47	M 10 x 1	5

(327)

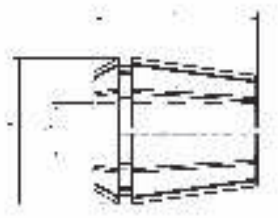
Collet Chucks – System ER

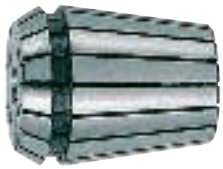
Design: Collet chuck DIN 6499-B/ISO 15488 type ER.
Due to double slots high and efficient clamping length and high clamping forces. Flexing of cutter excluded.
Highly precise chip removal and long tool life.
Short-time clamping of twist drill on land possible.

Application: To hold tools with parallel shank as well as shank according to DIN 1835 B, 1835 E, 6535 B and 6535 E.
Multi-range collet chuck for diameters of max. 1 mm below nominal diameter

DIN 6499-B

format professional quality





Collet chucks for chucks size ER 16.

Part No.	Clamping range d mm	3591 mm	D mm	L mm
0001	2	6.41	17	27
0004	3	6.41	17	27
0007	4	6.41	17	27
0010	5	6.41	17	27
0013	6	6.41	17	27
0016	7	6.41	17	27
0019	8	6.41	17	27
0022	9	6.41	17	27
0025	10	6.41	17	27

(368)

Collet chucks for chuck size ER 25.

Part No.	Clamping range d mm	3592 mm	D mm	L mm
0001	2	7.21	26	35
0004	3	7.21	26	35
0007	4	7.21	26	35
0010	5	7.21	26	35
0013	6	7.21	26	35
0016	7	7.21	26	35
0019	8	7.21	26	35
0022	9	7.21	26	35
0025	10	7.21	26	35
0028	11	7.21	26	35
0031	12	7.21	26	35
0034	13	7.21	26	35
0037	14	7.21	26	35
0040	15	7.21	26	35
0043	16	7.21	26	35

(368)

Collet chucks for chuck size ER 32.

Part No.	Clamping range d mm	3593 mm	D mm	L mm
0001	3	7.21	33	40
0004	4	7.21	33	40
0007	5	7.21	33	40
0010	6	7.21	33	40
0013	7	7.21	33	40
0016	8	7.21	33	40
0019	9	7.21	33	40
0022	10	7.21	33	40
0025	11	7.21	33	40
0028	12	7.21	33	40
0031	13	7.21	33	40
0034	14	7.21	33	40
0037	15	7.21	33	40
0040	16	7.21	33	40
0043	17	7.21	33	40
0046	18	7.21	33	40
0049	19	7.21	33	40
0052	20	7.21	33	40

(368)

Collet chucks for chuck size ER 40.

Part No.	Clamping range d mm	3594 mm	D mm	L mm
0001	4	8.67	41	46
0004	5	8.67	41	46
0007	6	8.67	41	46
0010	7	8.67	41	46
0013	8	8.67	41	46
0016	9	8.67	41	46
0019	10	8.67	41	46
0022	11	8.67	41	46
0025	12	8.67	41	46
0028	13	8.67	41	46
0031	14	8.67	41	46
0034	15	8.67	41	46
0037	16	8.67	41	46
0040	17	8.67	41	46
0043	18	8.67	41	46
0046	19	8.67	41	46
0049	20	8.67	41	46
0052	21	8.67	41	46
0055	22	8.67	41	46
0058	23	8.67	41	46
0061	24	8.67	41	46
0064	25	8.67	41	46
0067	26	8.67	41	46

(368)

Collet Chuck Sets with Wooden Stand

Part No.	Clamping range mm	3594 mm Set	PU	Collet type	Content of set
0105	1–10	113.42	Set	ER 16	10-piece
0110	2–16	120.09	Set	ER 25	15-piece
0115	3–20	141.44	Set	ER 32	18-piece
0120	4–26	200.16	Set	ER 40	23-piece

(320)

DIN 6499-B

format professional quality

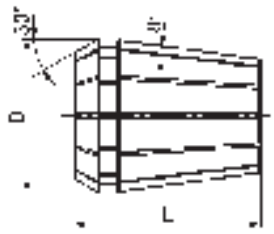


Precision Collets System ER

Design: FAHRION collets DIN 6499-B (ER) set new standards as to precision in the standard range. The super finish provides the following advantages: Higher percentage contact area, higher rigidity and retention force, higher concentricity and better corrosion resistance. The features of collets EGER made by Fahrion are:

- **High-precision** – Concentricity and repeatability 6 µm.
- **Great stability** – Only 12 slots are required to achieve the chuck diameter bridging defined by DIN 6499. This is possible due to custom-made steel and the adjusted hardening process. Compared to 16-slot collets, the tendency to cross in the lower clamping range is much smaller with our collets.
- **Material protection** – All longitudinal edges are not only deburred but also rounded preventing damage to the taper bore of the collet chuck. These features are a prerequisite for continuously high concentricity.
  The chuck diameter bridging is 1.0 mm (below ⌀ 2.0 mm = 0.5 mm) for GER 16 to GER 40. The higher ⌀ is always indicated, i.e. ⌀ 16 mm to ⌀ 15 mm (marking e.g. GER 32 F 470 E 16).

DIN 6499-B





Collets GER 16

Part No.	GER 16 max. ⌀ mm	3595	D mm	L mm
0001	1	14.05	17	27.5
0004	1.5	14.05	17	27.5
0007	2	14.05	17	27.5
0010	2.5	14.05	17	27.5
0013	3	11.07	17	27.5
0016	4	11.07	17	27.5
		(319)		

Part No.	GER 16 max. ⌀ mm	3595	D mm	L mm
0019	5	11.07	17	27.5
0022	6	11.07	17	27.5
0025	7	11.07	17	27.5
0028	8	11.07	17	27.5
0031	9	11.07	17	27.5
0034	10	11.07	17	27.5
		(319)		

Collets GER 25

Part No.	GER 25 max. ⌀ mm	3595	D mm	L mm
0101	2	15.23	26	34
0104	2.5	15.23	26	34
0107	3	11.76	26	34
0110	4	11.76	26	34
0113	5	11.76	26	34
0116	6	11.76	26	34
0119	7	11.76	26	34
0122	8	11.76	26	34
		(319)		

Part No.	GER 25 max. ⌀ mm	3595	D mm	L mm
0125	9	11.76	26	34
0128	10	11.76	26	34
0131	11	11.76	26	34
0134	12	11.76	26	34
0137	13	11.76	26	34
0140	14	11.76	26	34
0143	15	11.76	26	34
0146	16	11.76	26	34
		(319)		

Collets GER 32

Part No.	GER 32 max. ⌀ mm	3595	D mm	L mm
0201	3	12.59	33	40
0204	4	12.59	33	40
0207	5	12.59	33	40
0210	6	12.59	33	40
0213	7	12.59	33	40
0216	8	12.59	33	40
0219	9	12.59	33	40
0222	10	12.59	33	40
0225	11	12.59	33	40
		(319)		

Part No.	GER 32 max. ⌀ mm	3595	D mm	L mm
0228	12	12.59	33	40
0231	13	12.59	33	40
0234	14	12.59	33	40
0237	15	12.59	33	40
0240	16	12.59	33	40
0243	17	12.59	33	40
0246	18	12.59	33	40
0249	19	12.59	33	40
0252	20	12.59	33	40
		(319)		

Collets GER 40

Part No.	GER 40 max. ⌀ mm	3595	D mm	L mm
0301	3	21.16	41	46
0304	4	15.91	41	46
0307	5	15.91	41	46
0310	6	15.91	41	46
0313	7	15.91	41	46
0316	8	15.91	41	46
0319	9	15.91	41	46
0322	10	15.91	41	46
0325	11	15.91	41	46
0328	12	15.91	41	46
0331	13	15.91	41	46
0334	14	15.91	41	46
		(319)		

Part No.	GER 40 max. ⌀ mm	3595	D mm	L mm
0337	15	15.91	41	46
0340	16	15.91	41	46
0343	17	15.91	41	46
0346	18	15.91	41	46
0349	19	15.91	41	46
0351	20	15.91	41	46
0355	21	15.91	41	46
0358	22	15.91	41	46
0361	23	15.91	41	46
0364	24	15.91	41	46
0367	25	15.91	41	46
0370	26	15.91	41	46
		(319)		

Precision Collets Set – System ER

Design: According to DIN 6499-B, concentricity/repeatability: 6 µm. Supplied in wooden case.

DIN 6499-B

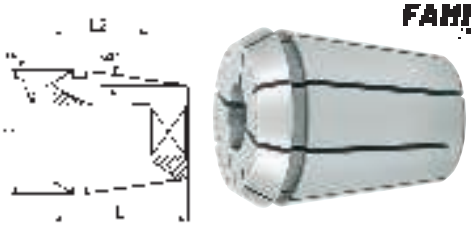


Part No.	Range mm	3595	Collet type	Contents of set
0405	1–10	127.29	ER 16	10-piece
0410	2–16	196.47	ER 25	15-piece
0415	3–20	245.59	ER 32	18-piece
0420	4–26	392.94	ER 40	23-piece
		(319)		

Collets for Taps

Design: These collets to DIN 6499-A include a square for the positive driving of the tap, but no length compensation, as this is not needed for synchronous tapping. With the same shank ∅, these collets are suitable for DIN and ISO taps alike. They can be exchanged with the collets to DIN 6499-B, however cannot be used in the precision collet chuck HP+.

DIN 6499-B



Collets GER 32-GB

Part No.	Shank ∅ mm	3597	Square mm	D mm	L mm	L2 mm
0001	4.5	32.45	3.55	32.7	40	18
0004	5.5	32.45	4.5	32.7	40	18
0007	6	32.45	5	32.7	40	18
0010	7	32.45	5.6	32.7	40	18
0013	8	32.45	6.3	32.7	40	22
		(319)				

Part No.	Shank ∅ mm	3597	Square mm	D mm	L mm	L2 mm
0016	9	32.45	7.1	32.7	40	22
0019	10	32.45	8	32.7	40	25
0022	11	32.45	9	32.7	40	25
0025	12	32.45	9	32.7	40	25
		(319)				

Clamping Nuts ER

3644 Standard
3646 Ball-bearing design



Part No.	For collet	3644	3646
0160	ER 16*	17.51	36.29
0250	ER 25	18.14	36.29
0320	ER 32	16.90	36.29
0400	ER 40	23.78	40.03
* Hexagon nut		(378)	(378)

Milling Arbour Rings, Form A

Design: DIN 2084, spring band steel, stamped, hardened.

DIN 2084

Part No.	Hole mm	3630 KINTEK	Thickness mm	Outer ∅ mm
0001	16	2.91	0.03	25
0004	16	2.91	0.05	25
0007	16	2.91	0.10	25
0010	16	2.91	0.20	25
0013	16	2.91	0.30	25
0016	16	2.91	0.50	25
0019	16	2.91	0.60	25
0022	16	2.91	1.00	25
0025	22	3.46	0.03	33
0028	22	3.46	0.05	33
0031	22	3.46	0.10	33
0034	22	3.46	0.20	33
0037	22	3.46	0.30	33
0040	22	3.46	0.50	33
0043	22	3.46	0.60	33
0046	22	3.46	1.00	33
0049	27	4.09	0.03	39
0052	27	4.09	0.05	39
0055	27	4.09	0.10	39
0058	27	4.09	0.20	39
		(376)		

Part No.	Hole mm	3630 KINTEK	Thickness mm	Outer ∅ mm
0061	27	4.09	0.30	39
0064	27	4.09	0.50	39
0067	27	4.09	0.60	39
0070	27	4.09	1.00	39
0073	32	4.32	0.03	45
0076	32	4.32	0.05	45
0079	32	4.32	0.10	45
0082	32	4.32	0.20	45
0085	32	4.32	0.30	45
0088	32	4.32	0.50	45
0091	32	4.32	0.60	45
0094	32	4.32	1.00	45
0097	40	4.63	0.03	54
0100	40	4.63	0.05	54
0103	40	4.63	0.10	54
0106	40	4.63	0.20	54
0109	40	4.63	0.30	54
0112	40	4.63	0.50	54
0115	40	4.63	0.60	54
0118	40	4.88	1.00	54
		(376)		

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Milling Arbour Rings, Form B

Design: DIN 2084, hardened steel, hardening at least HRC 54.

DIN 2084

KINTEK

Part No.	Hole mm	3632 KINTEK	Thickness mm	Outer ⌀ mm
0001	16	9.43	2	27
0004	16	9.43	3	27
0007	16	10.61	5	27
0010	16	10.61	6	27
0013	16	14.15	10	27
0016	16	17.61	20	27
0019	16	22.41	30	27
0022	16	35.38	60	27
0025	22	10.61	2	34
0028	22	10.61	3	34
0031	22	12.97	5	34
0034	22	12.97	6	34
0037	22	16.52	10	34
0040	22	21.23	20	34
0043	22	27.13	30	34
0046	22	42.45	60	34
0049	22	65.09	100	34
0052	27	10.61	2	41
0055	27	10.61	3	41
0058	27	12.97	5	41
0061	27	15.33	6	41
0064	27	16.52	10	41

(376)

Part No.	Hole mm	3632 KINTEK	Thickness mm	Outer ⌀ mm
0067	27	23.58	20	41
0070	27	33.02	30	41
0073	27	49.53	60	41
0076	27	82.55	100	41
0079	32	11.80	2	47
0082	32	14.15	3	47
0085	32	16.52	5	47
0088	32	16.52	6	47
0091	32	21.23	10	47
0094	32	29.48	20	47
0097	32	35.38	30	47
0100	32	57.78	60	47
0103	32	89.62	100	47
0106	40	15.33	2	55
0109	40	15.33	3	55
0112	40	20.04	5	55
0115	40	20.04	6	55
0118	40	25.95	10	55
0121	40	36.56	20	55
0124	40	43.63	30	55
0127	40	73.12	60	55
0130	40	110.85	100	55

(376)

Assortment of Milling Arbour Rings, Form A

35 units/assortment

Contents Ring width mm/unit									
0.03	0.04	0.05	0.1	0.2	0.3	0.5	0.6	1.0	1.5
5	5	5	6	3	3	3	2	2	1

60 units/assortment

Contents Ring width mm/unit									
0.03	0.04	0.05	0.1	0.2	0.3	0.5	0.6	1.0	1.5
10	10	10	10	5	5	4	3	2	1

DIN 2084

KINTEK



Part No.	Hole mm	3634 KINTEK	Contents of set
0001	16	89.62	35-piece
0004	22	99.05	35-piece
0007	27	106.13	35-piece
0010	32	122.64	35-piece
0013	40	153.30	35-piece

(374)

Part No.	Hole mm	3634 KINTEK	Contents of set
0016	16	122.64	60-piece
0019	22	148.59	60-piece
0022	27	176.89	60-piece
0025	32	214.62	60-piece
0028	40	238.21	60-piece

(374)

Spanner

Application: For standard clamping nut.

format professional quality

Part No.	For size	3648
0016	ER 16	25.02
0025	ER 25	11.27
0032	ER 32	15.64
0040	ER 40	18.77

(378)



Spanner

Application: For cutter retaining screws.

format professional quality

Part No.	For tenon ⌀/thread	3654
0016	16 mm/M 8	16.27
0022	22 mm/M 10	16.90
0027	27 mm/M 12	18.14
0032	32 mm/M 16	21.90
0040	40 mm/M 20	25.02

(378)



Locking Screws

Application: For milling machine arbours.

format professional quality

Part No.	For tenon ∅/thread	3650
0016	16 mm/M 8	5.63
0022	22 mm/M 10	7.51
0027	27 mm/M 12	9.39
0032	32 mm/M 16	10.64
0040	40 mm/M 20	10.64

(378)



Driving Rings

Application: For milling machine arbours.

format professional quality

Part No.	For tenon ∅ mm	3652
0016	16	7.51
0022	22	7.51
0027	27	10.01
0032	32	12.51
0040	40	30.02

(378)



Parallel Keys

Application: For milling machine arbours.

format professional quality

Part No.	For tenon ∅ mm	3656
0016	16	1.89
0022	22	1.89
0027	27	1.89

(378)

Part No.	For tenon ∅ mm	3656
0032	32	1.89
0040	40	1.89

(378)



Spare Locking Screws

Application: For chuck systems Weldon and Whistle Notch.

format professional quality

Part No.	Size	3642	Thread
0060	6	5.00	M 6 x 10
0080	8	5.00	M 8 x 10
0100	10	5.63	M 10 x 12
0120	12 + 14	5.63	M 12 x 16

(378)

Part No.	Size	3642	Thread
0160	16 + 18	5.63	M 14 x 16
0200	20	7.12	M 16 x 16
0250	25	7.74	M 18 x 20
0320	32	8.49	M 20 x 20

(378)



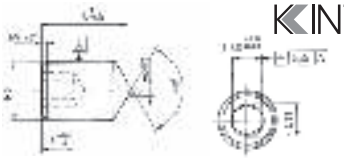
Sealing Screws

Application: For sealing coolant bore at collar of tool holders.

KINTEK

Part No.	Size mm	3642 KINTEK	Thread
4044	6	1.78	M 5

(376)



Coolant Supply Units

Design: Coolant supply unit for HSK shanks.

KINTEK

Part No.	Suitable for HSK	3661 KINTEK
0002	A 50	7.23
0005	A 63	7.23
0010	A 100	8.65

(376)



Socket Spanners for Coolant Supply Unit

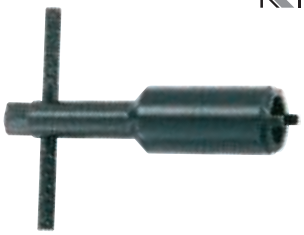
Design: Blade made of special steel, hardened, bronze finish.

Application: For connecting and/or changing coolant supply units at high-speed machining tools with HSK shank.

KINTEK

Part No.	Suitable for HSK	3661 KINTEK
0015	A 50	14.15
0020	A 63	14.15
0025	A 100	17.10

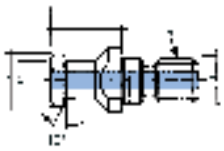
(376)



Pull Studs

Design: Case hardened HRC 58 ± 2, Eht 0.5–0.8, thread soft rolled, parallel grind according to DIN , bronze finish.

format professional quality





DIN 69872 A

Design: DIN 69872 A, with bore.

Part No.		0005	0010
SK		40	50
3685		4.82	6.65
D	mm	19	28
D1	mm	14	21
D2	mm	17	25
G		M 16	M 24
L	mm	54	74
L1	mm	26	34
Degree		15	15

(380)



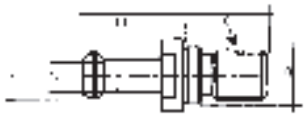


DIN 69872 B

Design: DIN 69872 B, without bore.

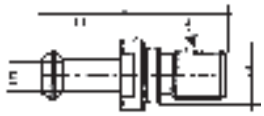
Part No.		0015	0020
SK		40	50
3685		4.82	6.82
D	mm	19	28
D1	mm	14	21
D2	mm	17	25
G		M 16	M 24
L	mm	54	74
L1	mm	26	34
Degree		15	15

(380)



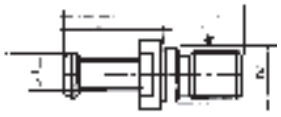


JISB 6339 – 45°
3685 0035





JISB 6339 – 60°
3685 0040



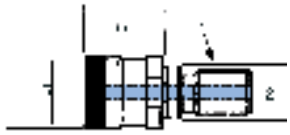


JISB 6339 – 90°
3685 0045

Design: JISB 6339, without bore.

Part No.		0035	0040	0045
SK		40	40	40
3685		5.07	5.07	5.07
D	mm	15	15	15
D1	mm	10	10	10
D2	mm	17	17	17
G		M 16	M 16	M 16
L	mm	60	60	60
L1	mm	35	35	35
Degree		45	60	90

(380)





Ott ring groove with inner bore
3685 0050



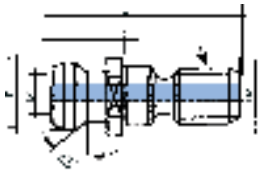


Ott ring groove with inner thread M 16
3685 0055

Design: Ott ring groove for shank DIN 69871 AD.

Part No.		0050	0055
SK		40	40
3685		5.33	5.83
D	mm	25	25
D1	mm	21.1	21.1
D2	mm	17	17
G		M 16	M 16
L	mm	53	53
L1	mm	25	25
Degree		15	15

(380)





ISO 7388 II B

Design: ISO 7388 II B, with bore.

Part No.		0025	0030
SK		40	50
3685		4.82	6.65
D	mm	18.95	29.10
D1	mm	12.95	19.6
D2	mm	17	25
G		M 16	M 24
L	mm	44.5	65.5
L1	mm	16.4	25.55
Degree		45	45

(380)





Cover

Design: Threaded bolt without bore.

Part No.		0060
SK		40
3685		10.01
D	mm	S 20 x 2
D1	mm	–
D2	mm	17
G		M 16
L	mm	56.2
L1	mm	28
Degree		–

(380)

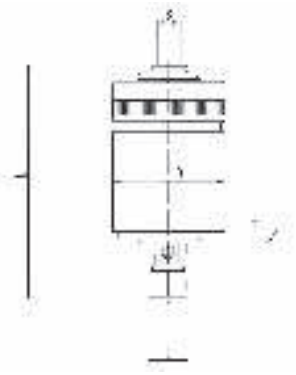
Tapping Heads

TAPMATIC

1873 **Description: With adjustable friction clutch and quick return motion.** The length compensation regulates the difference between machine feed and thread pitch. The short compression-spring supported chamfer prevents incorrect cutting of the thread. Time-saving return motion, as faster return of the tap (1.75:1).

Right-hand operation (on request also available for left-hand threads). Universal multi-range collets RF (2 collets needed for the whole cutting area), as well as an adjustable square driver for the tap. Exchangeable shanks (morse cones, parallel shanks or steep tapers) for pushing-in or screwing-in.

Application: On all bench-top and column-type drilling machines with manual feed and on which the rotation of the drilling machine spindle cannot be reversed.





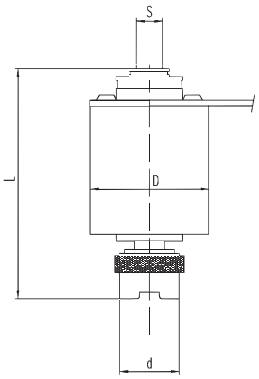
1873

1874 **Description: Including return motion for automatic feed.** Range of application of the device: Automatic turret head drilling machines, feed work, NC-controlled milling machines. The reversing units are suitable for right-hand rotating drives. They include a length compensation for tension and compression with a transmission ratio of 1:1. The unit has a compression-spring supported chamfer, while the spindle is equipped with a quick change holder.

Application: On automatic turret head drilling machines, compression and electric drill units.

Scope of supply: For 1873 and 1874. The standard accessories include 2 chuck keys, all necessary Allen keys and a holding lever.

The two multi-range collets required as well as the cone must be ordered separately.





1874



Never hold the holding lever with your hand: Danger of injuries.



Do not extend the holding lever, it might break off.



Wear safety goggles. Do not wear loose clothing near the spindles.



Do not hold the work-piece or vice with your hands but clamp it.

Part No.	Model	1873	1874	Cutting range in steel	Receptacle S taper bore	Collets mm	Max. speed mm	Pull-out T mm	Dimensions mm D	d	L	Weight kg
0005	30 X	424.13	–	M 1.4 –M 7	B 16	J115, J116, J117	2000	3.5	48	19	113	0.500
0010	50 X	638.26	–	M 3.0 –M 12	B 16	J420, J421, J422, J423	1500	6.0	70	27	153	1.400
0015	70 X	859.58	–	M 5.0 –M 18	B 18	J440, J441, J443, J445	1200	9.0	76	36	176	2.100
0020	90 X	1,559.59	–	M 10.0–M 30	JT 4	J461, J462	600	13.0	105	57	219	5.000
0050	SPD5-QC	– (180)	869.47 (180)	M 3.0 –M 12	B 16	–	1500	5.0	69	36	130	1.600

Multi-range Collets for Tapping Heads and Chucks

TAPMATIC

Design: Rubber-Flex® collets. Lamellas move parallel over the entire clamping range, resulting in constant concentricity when using the chuck diameter bridging. High radial clamping force. Rubber is resistant to coolant lubricant and temperatures up to 100°.

Application: Large chuck diameter bridging for clamping of tools with parallel shank. Use in tapping heads, drill holders and supports according to DIN 6345.





Part No.	Collet type	1875	Collets ø mm
0115	J 115	31.57	1.0– 2.5
0116	J 116	31.57	2.5– 4.5
0117	J 117	31.57	4.5– 6.5
0420	J 420	33.99	4.5– 8.0
0421	J 421	33.99	3.5– 6.5
0422	J 422	33.99	6.5–10.0
0423	J 423	33.99 (180)	2.0– 4.5

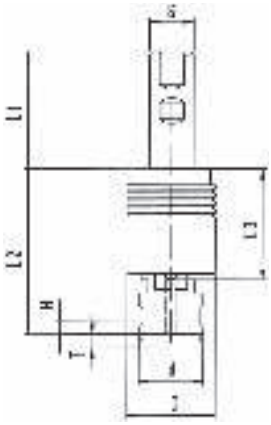
Part No.	Collet type	1875	Collets ø mm
0440	J 440	36.42	7.0–13.0
0441	J 441	36.42	4.5– 9.7
0443	J 443	36.42	2.8– 7.0
0445	J 445	38.86	10.0–15.0
0461	J 461	80.13	10.0–16.0
0462	J 462	80.13 (180)	16.0–23.0

Tapping Chucks with Parallel Shank

TAPMATIC

Design: For multi-range collets. Length compensation of tension and compression, chamfer compression intensifier, multiple-range collets RF, adjustable clamping of the tap square, attachable modular steep taper holders, parallel shank with face according to DIN 1835 B and E. Various steep taper modules can be attached.

Application: These new CNC devices enable the use of upgraded taps at constantly high cutting speed. They are particularly suitable for highest demands in series production. Ideal for use on CNC machining centres and on all machines with reversing rotation.





Part No.	Model	1879	Cutting range in steel	Parallel shank S mm	Collets	Compensation mm Length T	Tension H	Dimensions mm D	d	L1	L2	L3	Weight kg
0005	SM 2–020	259.78	M 1.4 – M 7	20	J116, J117	4.5	5	27	19	50	53	26	0.200
0010	SM 4–025	280.99	M 3 – M 12	25	J421, J422	7	7	38	27	56	71	36	0.400
0015	SM 6–025	328.70	M 5 – M 20	25	J440, J443	11	11	47.5	37	56	96	56	0.800
0020	SM 8–025	493.06	M 10 – M 30	25	J461, J462	17.0	17	63.5	57	56	128	78	2.000
		(180)											

Tapping Heads with Morse Taper

FAHRION

Design: With integrated return motion 2:1 due to planetary gear. Immediate reversing when changing feed direction. Continuous adjustment of safety clutch by turning the union nut with graduation of recommended values. Easy turning of cam plate allows change from cam clutch to friction clutch, for small threads. Suitable for right-hand and left-hand thread. All tap shanks of the respective cutting range – also intermediate sizes or measures in inches – can be clamped continuously in the clamping jaws.

Application: On all bench-top and column-type drilling machines with manual feed, with only one sense of rotation.





Part No.	Model	1878	Cutting range in steel	MT	Clamping range mm	Max. speed RPM	Dimensions mm D	L
0005	GAN10	305.37	M 3 – M 10	1	2.5–10	600	69	156
0010	GAN10	305.37	M 3 – M 10	2	2.5–10	600	69	158
0015	GAN16	373.43	M 6 – M 16	2	4.5–12.5	400	82	183
0020	GAN16	373.43	M 6 – M 16	3	4.5–12.5	400	82	183
0025	GAN27	649.37	M 14 – M 27	3	11 –22.4	250	105	244
0030	GAN27	649.37	M 14 – M 27	4	11 –22.4	250	105	246
		(180)						

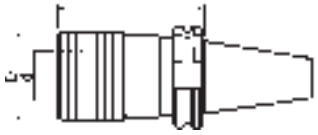
Tapping Heads with Elastic Length Compensation

Design: With steep taper shank according to DIN 69871 A for automatic tool change. Short type at max. longitudinal extension (compare!) and lightweight. Optimum and smooth length adjustment to pressure and tension to compensate for the difference between machine thrust and thread increase. With adjustable starting taper pressure intensifier. Thread pitch can be controlled within ± 0,1 mm. Prevents workpiece breakage during difficult processing operation when used with our safety-clutch inserts.

Application: Ideal for use on milling machines and machining centres.

DIN 69871 | Form A

format professional quality





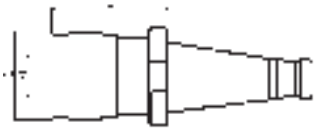
Part No.	For taps	1883	Shank SK	Length compensation Compression	Length compensation Tension	Outer ø D mm	Projecting length L mm	Holder ø d mm	For holder types
0005	M 3 – M 12	128.51	40	9	9	38	60	19	FES 1/FE 1
0010	M 6 – M 20	156.31	40	15	15	55	100	31	FES 2/FE 2
0015	M 3 – M 12	184.52	50	9	9	38	62	19	FES 1/FE 1
0020	M 6 – M 20	204.05	50	15	15	55	83	31	FES 2/FE 2
		(185)							

Tapping Heads with Elastic Length Compensation

Design: With steep taper shank DIN 2080 (Ott ring groove).

DIN 2080 | Form A







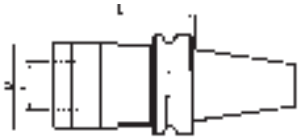
Part No.	For taps	1906	Shank SK	Length compensation Compression	Length compensation Tension	Outer ø D mm	Projecting length L mm	Holder ø d mm	For holder types
0005	M 3 – M 12	140.37	40	9	9	38	53	19	FES/FE 1
0015	M 6 – M 20	171.96	40	15	15	55	77	31	FES/FE 2
0010	M 3 – M 12	225.47	50	9	9	38	57	19	FES/FE 1
0020	M 6 – M 20	221.09	50	15	15	55	79	31	FES/FE 2
		(190)							

Tapping Heads with Elastic Length Compensation

Design: With steep taper shank JIS B-6339 (MAS 403 BT), for automatic tool change.

DIN JISB 6339 (MAS-BT) | Form A







Part No.	For taps	1903	Shank SK	Length compensation Compression	Length compensation Tension	Outer ø D mm	Projecting length L mm	Holder ø d mm	For holder types
0005	M 3 – M 12	124.58	40	9	9	38	68	19	FES/FE 1
0015	M 6 – M 20	161.43	40	15	15	55	93	31	FES/FE 2
0010	M 3 – M 12	208.80	50	9	9	38	80	19	FES/FE 1
0020	M 6 – M 20	240.38	50	15	15	55	102	31	FES/FE 2
		(190)							

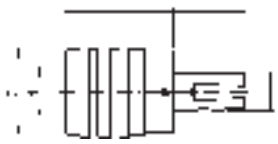
Tapping Heads with Elastic Length Compensation

Design: With parallel shank according to DIN 1835 B+E.

Application: Ideally on CNC lathes. Also with end mill holder no. 3540, 3560 and 3563.

Form A | DIN 1835 B+E

format professional quality





Part No.	For taps	1885	Shank ø D_1 mm	Length compensation Compression	Length compensation Tension	Outer ø D mm	Projecting length L mm	Shank length L_1 mm	Holder ø d mm	For holder types
0015	M 3 – M 12	117.66	20	9	9	38	41	50	19	FES 1/FE 1
0020	M 6 – M 20	161.51	20	15	15	55	63	75	31	FES 2/FE 2
		(185)								

You can find the appropriate inserts on page 3/60–3/61 under item no. 1887 0001 to 1889 1040.

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Tapping Heads with Elastic Length Compensation

Design: With parallel shank according to DIN 1835 B+E, for automatic tool change. With central coolant supply max. 50 bar.
Length compensation of tension and compression, with anti-friction slideway bush. On request available with tension compensation only.

Application: Preferably on milling machines and machining centres. Can also be used with end mill holder no. 3540, 3560 and 3563.

DIN 1835 B+E





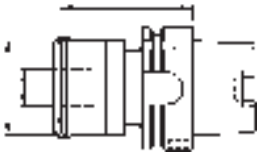
Part No.	For taps	1909	Parallel shank ⌀ mm	Length compensation Compression	Length compensation Tension	Outer ⌀ D mm	Projecting length L mm	Holder ⌀ d mm	For holder types
0005	M 3 – M 12	280.74	25	7.5	7.5	39	62	19	FE 1/FES 1
0010	M 6 – M 20	303.56	25	10.0	10.0	53	98	31	FE 2/FES 2
		(190)							

Tapping Heads with Elastic Length Compensation

Design: With HSK shank to DIN 69893-A. Smooth-running length compensation of tension and compression through use of anti-friction slideway bush. Cutting pressure intensifier. On request available with tension compensation only.

Application: On machining centres (HSC).

DIN 69893 Form A





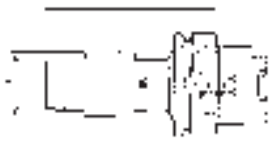
Part No.	For taps	1912	Shank HSK	Length compensation Compression	Length compensation Tension	Outer ⌀ D mm	Projecting length L mm	Holder ⌀ d mm	For holder types
0005	M 3 – M 12	252.66 ◊	63	7.5	7.5	41	72	19	FE 1/FES 1
0010	M 6 – M 20	293.91 ◊	63	10.0	10.0	60	110	31	FE 2/FES 2
		(190)							

Tapping Heads with Elastic Length Compensation

Design: With HSK shank to DIN 69893-A for automatic tool change. With central coolant supply up to 50 bar. Smooth-running length compensation of tension and compression through use of anti-friction slideway bush. On request available with tension compensation only.

Application: On machining centres.

DIN 69893 Form A





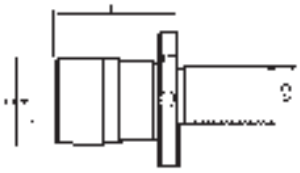
Part No.	For taps	1915	Shank HSK	Length compensation Compression	Length compensation Tension	Outer ⌀ D mm	Projecting length L mm	Holder ⌀ d mm	For holder types
0005	M 3 – M 12	344.79 ◊	63	7.5	7.5	39	105	19	FE 1/FES 1
0010	M 6 – M 20	376.38 ◊	63	10.0	10.0	53	140	31	FE 2/FES 2
		(190)							

Tapping Heads with Elastic Length Compensation

Design: With shank according to DIN 69880 (VDI 3425).
Short structure with maximum length compensation and low weight. Optimum and smooth-running length compensation of tension and compression for compensating the difference between machine feed and thread pitch through use of a ball cage.
With adjustable cutting pressure intensifier. Thread pitch controllable within ± 0,1 mm. Using inserts including safety clutch prevents tool breakage when machining complex workpieces. Supply includes steel tube and fitting R 1/8".

Application: On CNC lathes.

DIN 69880





Part No.	For taps	1918	Shank VDI	Length compensation Compression	Length compensation Tension	Outer ⌀ D mm	Projecting length L mm	Holder ⌀ d mm	For holder types
0002	M 3 – M 12	199.15 ◊	20	9	9	38	55	19	FE 1/FES 1
0005	M 3 – M 12	152.65 ◊	30	9	9	38	55	19	FE 1/FES 1
0015	M 6 – M 20	201.78 ◊	30	15	15	55	77	31	FE 2/FES 2
0010	M 3 – M 12	171.08 ◊	40	9	9	38	55	19	FE 1/FES 1
0020	M 6 – M 20	210.56 ◊	40	15	15	55	77	31	FE 2/FES 2
		(190)							

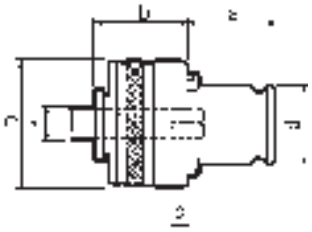
You can find the appropriate inserts under article no. 1887 0001 to 1889 1040.

Quick-change Adaptors for Tapping Heads

Design: With integrated safety clutch. FES 1/2 inserts with torque-limit safety clutch, used for blind hole thread or for tapping in materials with high tensile strength.
The torque is factory pre-set for the corresponding tap size.
100 % mathematical allowance for the effects of tool wear.
Only for clockwise rotation, compulsory return driver.

format professional quality

Type	a mm	b mm	c mm	d mm	D mm
FES 1	21.5	25	8	19	32
FES 2	35	34	4	31	50





Part No.	Holder Type	1887	f ø mm	Square mm	For taps DIN 371	DIN 376	JIS-Norm	ISO-Norm
0001	FES 1	38.21	2.8	2.1	M 2	–	–	–
0004	FES 1	35.61	3.5	2.7	M 3	–	–	–
0007	FES 1	38.21	4.0	3.0	M 3.5	–	–	–
0010	FES 1	38.21	3.15	2.5	–	–	–	M 4
0013	FES 1	38.21	4.0	3.15	–	–	–	M 4
0016	FES 1	35.61	4.5	3.4	M 4	–	–	–
0019	FES 1	38.21	5.0	4.0	–	–	M 4	–
0022	FES 1	35.61	6.0	4.9	M 5/M 6	–	–	–
0025	FES 1	38.21	6.3	5.0	–	–	–	M 6
0028	FES 1	38.21	8.0	6.3	M 8	–	–	M 8
0031	FES 1	38.21	7.0	5.5	–	M 10	M 10	–
0034	FES 1	35.61	10.0	8.0	M 10	–	–	–
0037	FES 1	38.21	9.0	7.1	–	M 12	–	M 12
		(185)						

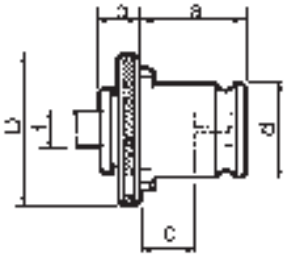
Part No.	Holder Type	1889	f ø mm	Square mm	For taps DIN 371	DIN 376	JIS-Norm	ISO-Norm
0001	FES 2	46.89	6.0	4.9	M 6	–	–	–
0004	FES 2	50.36	6.3	5.0	–	–	–	M 6
0007	FES 2	50.36	8.0	6.3	M 8	–	–	M 8
0010	FES 2	50.36	7.0	5.5	–	M 10	M 10	–
0013	FES 2	46.89	10.0	8.0	M 10	–	–	–
0016	FES 2	50.36	9.0	7.1	–	M 12	–	M 12
0019	FES 2	46.89	11.0	9.0	–	M 14	–	–
0022	FES 2	50.36	11.2	9.0	–	–	–	M 14
0025	FES 2	46.89	12.0	9.0	–	M 16	–	–
0028	FES 2	50.36	12.5	10.0	–	–	M 16	M 16
0031	FES 2	46.89	14.0	11.0	–	M 18	M 18	–
0034	FES 2	50.36	14.0	11.2	–	–	–	M 20
0037	FES 2	46.89	16.0	12.0	–	M 20	–	–
0040	FES 2	50.36	16.0	12.5	–	–	–	M 24
		(185)						

Quick-change Adaptor FE for Tapping heads

Design: Without safety clutch. Are used for tapping in materials with high tensile strength. 100 % mathematical allowance for the influence of tool wear. Only clockwise rotation, compulsory driver on return.

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Type	a mm	b mm	c mm	d mm	D mm
FE 1	21.5	7	10	19	30
FE 2	35	11	19	31	46





Part No.	Adaptor type	1887 mm/min	f ø mm	Square mm	For taps DIN 371	DIN 376	JIS-Norm	ISO-Norm
1001	FE 1	15.20	2.8	2.1	M 2–M 2.6	M 4	–	–
1004	FE 1	13.90	3.5	2.7	M 3	M 5	–	–
1016	FE 1	13.90	4.5	3.4	M 4	M 6	–	–
1019	FE 1	15.20	5.0	4.0	–	–	M 4	M 5
1022	FE 1	13.90	6.0	4.9	M 5/M 6	M 8	–	–
1028	FE 1	15.20	8.0	6.3	M 8	M 11	–	M 8/M 10
1031	FE 1	15.20	7.0	5.5	M 7	M 10	M 10	–
1034	FE 1	13.90	10.0	8.0	M 10	–	–	–
1037	FE 1	15.20 (185)	9.0	7.1	–	M 12	–	M 12

Part No.	Adaptor type	1889 mm/min	f ø mm	Square mm	For taps DIN 371	DIN 376	JIS-Norm	ISO-Norm
1001	FE 2	18.68	6.0	4.9	M 5/M 6	M 8	–	–
1007	FE 2	20.83	8.0	6.3	M 8	M 11	–	M 8/M 10
1010	FE 2	20.83	7.0	5.5	M 7	M 10	M 10	–
1013	FE 2	18.68	10.0	8.0	M 10	–	–	–
1016	FE 2	18.68	9.0	7.1	–	M 12	–	M 12
1019	FE 2	18.68	11.0	9.0	–	M 14	–	–
1025	FE 2	18.68	12.0	9.0	–	M 16	–	–
1031	FE 2	18.68	14.0	11.0	–	M 18	M 18	–
1040	FE 2	18.68 (185)	16.0	12.0	–	M 20	–	–

Quick-change Chucks SF

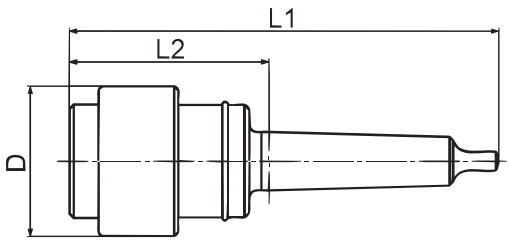
Design: Retrofitting from drilling to tapping can easily be performed by means of the quick-change adaptors.

Application: The adaptors are typically used on vertical drilling machines and drilling machines with right and left-hand operation.

Part No.	Type	1923	MT	For steel bore hole ∅	L1 mm	L2 mm	D mm
0020	26	128.77	2	24.0	150	75.5	48
0030	34	162.80	3	32.0	176	82.0	61
0040	46	255.70	4	50.0	222	104.0	86

(185)





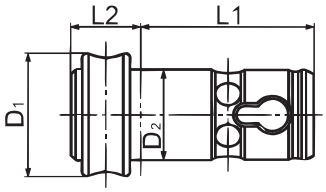
Tool Inserts for Quick-change Chucks SF

Application: The tool inserts feature a taper bore and ejector slot for sockets to DIN 6329 for twist drills or tools with morse taper, in particular drills and countersinks.

Part No.	Type	1924	MT	L1 mm	L2 mm	D1 mm	D2 mm
0001	26	78.18	1	60	18	37	26
0004	26	78.18	2	60	30	37	26
0007	34	91.05	1	65	22	46	34
0010	34	91.05	2	65	26	46	34
0013	34	91.05	3	65	43	46	34
0016	46	114.05	1	82	23	58	46
0019	46	114.05	2	82	23	58	46
0022	46	114.05	3	82	27	58	46
0025	46	114.05	4	82	53	58	46

(315)





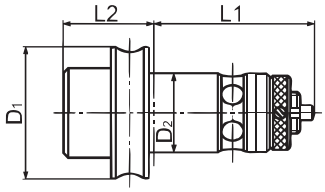
Tool Inserts for Quick-change Chucks SF

Application: The tool inserts for taps feature a taper bore and an ajdustable friction clutch, standard value indication and ejector pin. Sockets to DIN 6328 for taps are used.

Part No.	Type	1926	MT	Cutting range	L1 mm	L2 mm	D1 mm	D2 mm
0001	26	217.99	1	M 1 –M 10	60	28	43	26
0004	26	217.99	2	M 4 –M 16	60	39	43	26
0007	34	254.78	1	M 1 –M 10	65	23	56	34
0010	34	254.78	2	M 4 –M 16	65	37	56	34
0013	34	254.78	3	M 8 –M 20	65	53	56	34
0016	46	319.16	2	M 4 –M 16	82	28	70	46
0019	46	319.16	3	M 8 –M 20	82	42	70	46
0022	46	319.16	4	M 16–M 33	82	67	70	46

(315)





Tool Locking Fixtures

Application: Quick and safe assembly and disassembly of tool holders with steep taper in vertical and horizontal position.

Part No.	Size	3695 mm	DIN
2040	SK 40	255.52	2080
2050	SK 50	255.52	2080
6340	BT 40	255.52	69871
6940	SK 40	255.52	DIN 6339/MAS BT
6950	SK 50	255.52	69871

(360)



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Tool Locking Fixtures

Application: Quick and safe assembly and disassembly of tool holders with steep taper in vertical and horizontal positon.

Part No.	Size	3697 KINTEK
0005	HSK 40	280.07
0010	HSK 50	280.07
0015	HSK 63	280.07
0020	HSK 100	336.07
0025	VDI 20	306.59
0030	VDI 30	306.59
0035	VDI 40	306.59

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3697 0005 – 3697 0020



KINTEK

3697 0025 – 3697 0035

Tool Presetting Equipment

Basic unit: Uncompromising concept, various options, high-quality, high-tech elements mounted on base frame made of mineral cast iron providing optimum stability. Opto-electronic measuring system and illuminated digital 2-axis display ensure utmost safety. Ease of use, tool holder with precision spindle bearing and reference flange with steep taper in gauge quality provide utmost concentricity, repeatability and measuring accuracy.

Measuring equipment: Measuring system with reference marks integrated in the glass scales, lighted LCD for measured value and menu, measurement evaluation 0.001 mm, CNC-compatible management of reference values with print, for 100 reference values, editable alphanumeric reference assignment, change of X/Z axis selectable via reference, for cross-staff heads and driven bent lathe tools, hold function, conversion feature mm/inch, dia/rad, absolute/incremental, interface with software for up to 6-digit tool number assignment and print head for the printing of tool lists and labels, PC connection for extended measurement software and inventory management.

Technical data: Reference value memory for 100 machine zero points, glass scales accuracy class 5 µm, digital display with 0.005 mm resolution, key pad with acoustic signal suitable for workshops, reference memory for 100 machine or tool types, parallel printer interface with software for printing labels and protocols, continuous fine-adjustment of both axis with pre-tensioned nut, quick-adjustment feature for both axis, bearing-supported weight compensation.

Design: Model TSO = standard – optical version
Schneider transmitted light projector with mains plug, screen size 100 mm, graticule, angle/radius template, magnification 20-fold, digital display 0.001 mm resolution, other features same as standard sensing device.

Part No.	Model	3745 STS	X axis ø mm	Z axis ø mm	Steep taper	Dimensions w x l x h mm	Weight kg
0005	TS 240	5,150.74 ◊	250	0–330	SK 40	310 x 430 x 640	38
0010	TS 250	5,150.74 ◊	250	0–330	SK 50	310 x 430 x 640	38
0015	TS 350	6,438.43 ◊	350	0–430	SK 50	310 x 480 x 740	42
0020	TSO 240	7,644.36 ◊	250	0–320	SK 40	310 x 430 x 640	40
0025	TSO 250	7,644.36 ◊	250	0–320	SK 50	310 x 430 x 640	40
0030	TSO 350	9,173.23 ◊	350	0–420	SK 50	310 x 480 x 740	44

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STS



Model TS



Model TSO

Toolset Spindle Reductions

Design: Precision spindle bearing with reference calibration edge, adjusting arbour not necessary (procedure up to Z O).

Part No.	Reduction	3747 STS
0005	SK 40/SK 30	429.23 ◊
0010	SK 40/VDI 20	441.49 ◊
0015	SK 40/VDI 30	441.49 ◊
0020	SK 40/HSK 40	564.13 ◊
0025	SK 50/SK 30	429.23 ◊

Part No.	Reduction	3747 STS
0030	SK 50/SK 40	429.23 ◊
0035	SK 50/VDI 40	478.28 ◊
0040	SK 50/VDI 50	478.28 ◊
0045	SK 50/HSK 50	600.92 ◊
0050	SK 50/HSK 63	600.92 ◊

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STS

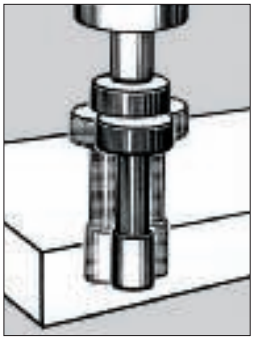


Edge Finders

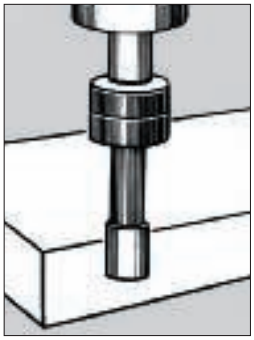
Edge Finder, Mechanical

Design: Precision edge finder with smooth cylindrical shank. All parts hardened and ground. Shank and probe are connected by a spring. Supplied in plastic case.

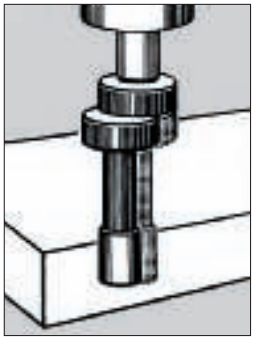
Application: To align workpiece surfaces or edges to an accuracy of 0.01 mm. Thereby eases finding the zero line. Spindle speed approx. 600 rpm.



Approach, probe runs out of true



Probe touches the tool and runs true



Probe jerks to the side = reference point/zero line

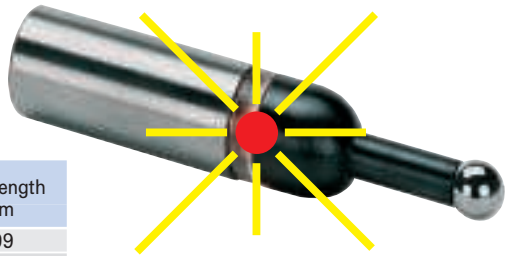


Part No.	Dimensions	3755	Probe ∅ mm	Clamping shank ∅ mm
0001	1	22.16	6	6
0003	3	13.23	10	10
0005	5	13.23	10 + 4	10
0008	Spare springs for size 1	13.23	PU = 10 pieces	–
0010	Spare springs for size 3 + 5	12.88 (390)	PU = 10 pieces	–

Edge Probe with LED Indicator

Design: Hardened and precision ground, **with red LED.** Supplied in wooden box: Edge probe with 2 cell batteries.

Application: For measurements on drilling and milling machines as well as machining centres with a precision of 0.01 mm. For external and internal centring. The display lights up and an acoustic signal is given when contact is made with the edge of the workpiece. (part no. 0030 + 0035; part no. 0016 + 0020 only with LED). The edge of the workpiece is located by taking into account the radius of the probe sphere. The probe can be used with fixed or rotating spindles. If the tool passes over the edge of a workpiece, the spring-loaded ball moves out of the way to prevent damaging the probe.

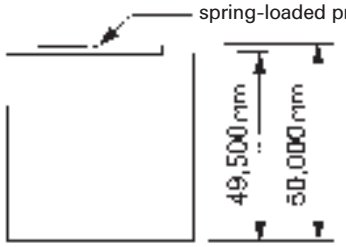


Part No.	Shank ∅ mm	3757	Ball ∅	Design	Total length mm
0016	16	50.00 (390)	10 mm	with LED indicator	99
0020	20	40.03 (390)	10 mm	with LED indicator	95
0030	20	68.82 (391)	2 D	with acustic signal	119
0035	20	110.93 (391)	3 D	with acustic signal	131

Zero Height Adjustment Devices

Design: The zero height adjuster is used to find the zero point of the workpiece. Optionally available with flat side plane. This enables measurements to be determined in other axis. Delivery incl. dial gauge and wooden case.

Application: Simply place the zero height adjustment device on or next to your workpiece. Now move your milling tool to the spring-loaded probe face, continue until the dial is at zero point. Now enter 50 mm into your controller. The measurements are then determined quickly and simply.

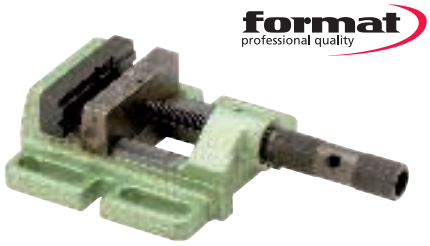




Part No.	Design	3759
0005	Without magnetic base	142.60
0010	With magnetic base	180.39 (390)

Drill Vices

Design: Body made of high quality special casting, case hardened and ground V-block jaws, interchangeable.



Part No.	Jaw width mm	3801	Jaw span mm	Slot clearance mm	Weight approx. kg
0095	95	61.55 (328)	70	130	4.3

Drill Vices

Design: Heavy-duty design, for pillar drill machines. Body made of high-quality custom casting, case-hardened and ground V-block jaws, interchangeable, both clamping jaws with flat faces for clamping flat workpieces.



Part No.	Jaw width mm	3803	Jaw span mm	Slot clearance mm	Weight kg
0110	110	137.10 (328)	110	145	10.1

Drill Vices

Design: Cast body. Universal fitting options with clamping and normal slots. Moving jaw, lateral action. Fixed clamping jaw with three vertical V-blocks and a horizontal V-block. Both jaws with flat surfaces for clamping flat workpieces. Bronzed jaws and spindle. For universal use.



Part No.	Dimensions	3805	Jaw width mm	Jaw span mm	Slot clearance mm	Weight kg
0085	1	28.56	85	65	111	3.6
0100	2	37.79	100	87	124	4.3
0120	3	51.24 (328)	120	110	148	6.3

Precision Drill Vices

Design: Body in special cast iron, prism jaws in steel (90°/120°), with support surfaces for clamping flat workpieces, long guide throughout the clamping area.



Part No.	Dimensions	3807	Jaw width mm	Jaw span mm	Slot clearance mm	Weight kg
0080	1	82.06	80	70	110	4
0100	2	139.28	100	110	140	9
0125	3	210.49	125	130	165	15
0160	4	352.45 (328)	160	225	210	29

Precision Drill Vices

Design: Standard version with prism jaws, support surfaces for clamping flat workpieces, short clamping times, robust construction, clamping and releasing via eccentric, single-handed operation, right and left hand.



Part No.	Dimensions	3809	Jaw width mm	Jaw span mm	Slot clearance mm	Weight kg
0100	2	228.51	100	80	140	13
0125	3	343.60 (328)	125	125	160	21

Precision Drill Vices

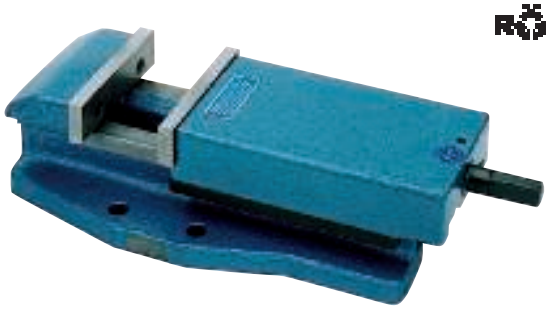
Design: Body made of special cast iron. Large clamping range. Side and front attachment options. Moving jaws have long reach even in outer clamping range. Both jaws with flat surfaces for clamping flat workpieces. Reversible clamping jaws: One side flat or with longitudinal and lateral V-form, one side grooved, ground both sides.



Part No.	Dimensions	3810	Jaw width mm	Jaw span mm	Slot clearance mm	Weight kg
0110	2	235.68	110	130	140	9.5
0135	3	247.82	135	160	170	13.5
0160	4	386.29 (328)	160	220	210	25

Vice Systems RS – Mechanical

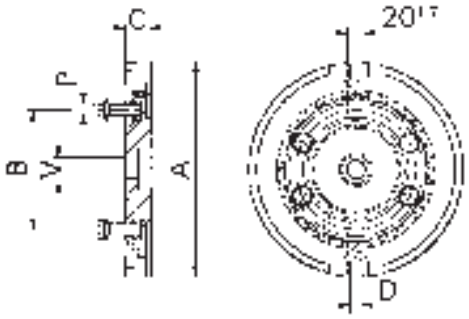
Design: Body made of special cast iron. Standard design for all machine tools. Robust construction, mechanically operated, long guidance of moving jaw, covered spindle, soil and chip resistant, clamping jaws reversible, one side plain, one grooved with detachable crank handle.



Part No.	Dimensions	3823	Jaw width mm	Jaw span mm	Jaw height mm	Clamping force daN	Length opened mm	Weight approx. kg
0092	1	339.20	92	85	31.6	1800	362	12
0113	2	410.81	113	105	31.6	2500	423	13.5
0135	3	524.51	135	125	39.6	3500	510	25
0160	4	661.08	160	145	49.6	4500	575	40
		(331)						

Standard Swivel Plate

Design: For vices RS. Contact edge ground with graduation, fastening screws and tenon blocks for fixing the vice on the swivel plate.





Part No.	size	3825	a mm	b mm	c mm	D mm	P	V	Weight approx. kg
0006	1 + 2	215.02	242	134.5	30	14	M 12	28	7.5
0011	3	261.71	280	162	30	14	M 12	28	11.0
0016	4	338.72	340	201	34	18	M 16	28	18.0
		(331)							

Vices UZ – Mechanical

Design: Body made of special cast iron. Centric clamping fixture, solid construction, mechanically operated. Low, robust design. Spindle in operating area covered. Lateral guides allow convenient and accurate aligning of the vice. Clamping jaws reversible, one side plain, one side grooved with detachable crank handle.

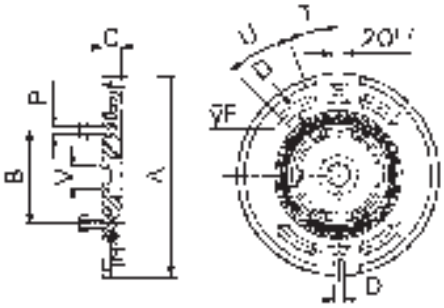
Application: For milling and planing all kinds of moulds, slots and grooves. Due to the centric clamping, workpieces of various widths have no influence on the centred position of the workpieces.



Part No.	Dimensions	3828	Jaw width mm	Jaw span mm	Jaw height daN	Clamping force mm	Length opened mm	Height mm	Weight approx. kg
0113	2	593.91	113	110	31.6	1500	358	93.5	12.4
0135	3	715.39	135	140	39.6	2200	408	106	19
0160	4	1,026.63	160	180	49.6	2400	495	124.5	31
0200	5	1,400.29	200	300	62.6	2500	655	142.5	52
0250	6	1,702.33	250	400	62.6	2800	767	148.5	71
		(331)							

Universal Swivel Plates

Design: For machine vices 3828. Ground contact edge, graduation, with T-slot screws and nuts to secure the vice on the swivel plate.



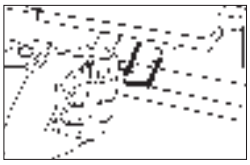


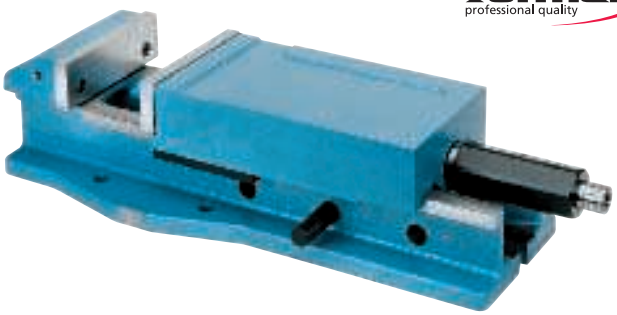
Part No.	Dimensions	3830	a mm	b mm	c mm	D mm	⌀ E mm	P	T	U	V	Weight approx. kg
0006	2	235.33	245	113	25	11	190	M 10	20°	25°	28	5.0
0011	3	278.85	295	133	27	13	225	M 10	18°	48°	38	8.0
0016	4	356.99	345	154	30	17	275	M 16	15°	40°	38	11.5
0021	5	441.14	450	173	30	17	350	M 16	15°	45°	38	16.5
0026	6	447.18	450	192	30	17	350	M 16	15°	45°	38	17.3
		(331)										

Machine Vices – Mechanical/Hydraulic

Design: Steel body with fixed clamping jaw, all consumables case hardened and ground. Clamping range is quickly adjusted by repositioning the setting pin. Large, reliable chuck power, highly accurate due to constant chuck power during every clamping operation. Robust and maintenance-free spindle, self-tightening in the hydraulic unit thanks to integrated disc springs. Chuck power can be preset with blocking aid for mechanical pre-tensioning of workpiece assemblies, self-locking force transfer, quick-change economical hydraulic unit.

Application: To be used on machining equipment and machine tools featuring high performance accuracy.

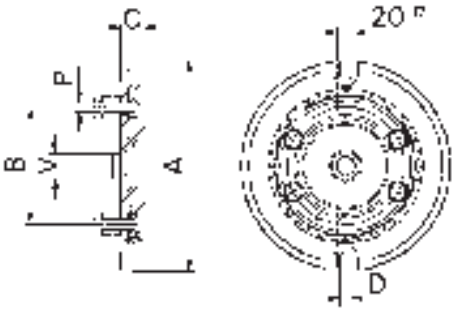




Part No.	Dimensions	3832	Jaw width mm	Jaw span mm	Jaw height mm	Length opened mm	Clamping force daN	Weight approx. kg
0113	1	958.90	113	170	31.6	583	3000	24
0135	2	1,184.48	135	220	39.6	681	4000	39
0160	3	1,567.56	160	310	49.6	817	5000	60
		(328)						

Swivel Plates

Design: For Format machine vice no. 3832. With ground support rim for above sizes, graduation and screws for fixing vices.





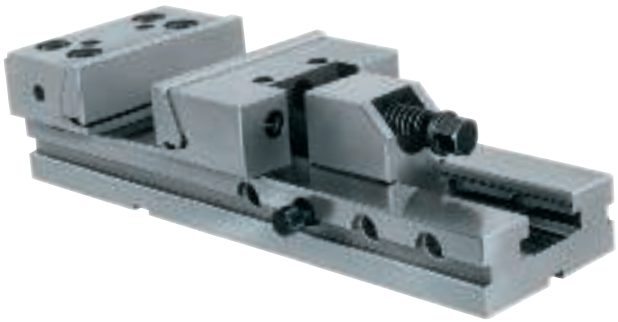
Part No.	Dimensions	3834	a mm	b mm	c mm	D mm	P	V	Weight kg
0006	1	185.81	242	134.5	30	14	M 12	28	7.5
0011	2	230.45	280	162	30	14	M 12	28	11.0
0016	3	260.45	340	201	34	18	M 16	28	18.0
		(328)							

Machine Vices – Mechanical

format professional quality

Design: All-steel body hardened (60 HRC) and ground.
Tolerance range within 0.02 mm.
Pull-down jaws can also be fixed.
Fixing by boring or clamping jaws.

Application: To be used on machining equipment and machine tools with high performance accuracy.



Part No.	Jaw width mm	3836	Jaw span mm	Weight kg
1125	125	534.87	150	13.0
1152	150	632.08	200	25.5
1153	150	743.09	300	29.0
1175	175	969.51	400	42.0
		(336)		

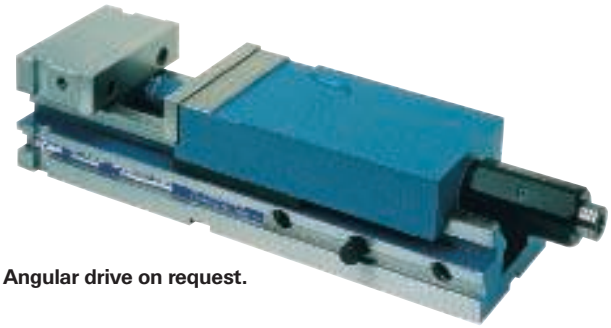
Swivel plates available on request.

NC Compact Clamping Fixtures Type RBA – Mechanical/Hydraulic

RÖHM

Design: Mechanical, hydraulic drive with crank handle. Steel body with fixed clamping jaw, equally drop-forged. The slender construction allows space-saving clamping of adjacent workpieces. Precise height adjustment ± 0.01 mm at customer's request. Blocking system for pre-clamping of workpieces. Fast changing and cost-effective hydraulic unit. Automatic reclamping in the hydraulic unit by means of fitted disk springs. 3 different clamp positions: At bottom, side and face. Face clamping including support angles. A gas spring prevents the unlatched jaw from falling down. Quick change of jaw opening via bolts. The short construction of the moving jaw (steel) results in short unit, also at maximum jaw opening. Stepped jaws (see accessories) or special mould jaws can be fixed on the firm and moving jaws. Robust flat guidance track of the moving jaw. Drive spindle is soil and chip resistant. All wear parts, in particular the jaw guidance, are hardened and ground.

Application: For universal use on milling machines and machining centres.



Angular drive on request.

Part No.	Dimensions	3838	Jaw width mm	Jaw span mm	Total length mm	Clamping force daN	Weight approx. kg
0092	1	1,965.93 ◊	92	100	490	2500	15.5
0113	2	1,951.63	113	170	583	3000	24
0135	3	2,197.78	135	220	681	4000	39
0160	4	2,972.72	160	310	817	5000	60
		(332)					

Screwed Clamping Jaws for Machine Vices RS/UZ/RBA

RÖHM

3840 **Design:** Standard jaws SGN. One side plain, one side grooved (Both sides finely-ground).

3841 **Design:** Prism jaws SPR. With ground vertical and horizontal prisms, hardened. Can be combined with standard jaw SGN.

3842 **Design:** Prism jaws and standard jaws SBO. With workpiece support, untempered and bronzed.





3840



3841



3842

Part No.	Size	3840	3841	3842	Jaw width mm
0092	1	19.73 ◊	49.83 ◊	–	92
0113	2	19.95 ◊	54.15 ◊	42.79 ◊	113
0135	3	31.34 ◊	63.38 ◊	54.15 ◊	135
0160	4	44.13 ◊	87.72 ◊	69.89 ◊	160
0200	5	79.73 ◊	142.67 ◊	–	200
0250	6	130.40 ◊	193.58 ◊	–	250
		(332)	(332)	(332)	

NC Compact Clamping Fixtures RKE

Design: With mechanical power transmission. Solid steel body, all sides hardened and ground. All guides hardened and ground. Clamping of the compact clamping fixture can be effected vertically, horizontally or laterally. Drive spindle including preset clamping. Fastening thread for workpiece stop and angular drive. Clamping face for jaws: Sound chip protection prevents the chips from penetrating the interior of the body. Tap holes for receiving of all RÖHM flat jaws with a jaw width of 135/160 mm (partly also other brands). Supplied with stepped jaws.

Application: Preferably used on high-precision machining centres.



Part No.	Jaw width mm	3844	Jaw height mm	Jaw span mm	Total length mm	Clamping force kN	Weight kg
0125	125	2,748.81 (333)	40	216	463	40	41

NC Compact Clamping Fixtures RKE-L

Design: Body made of steel, all guides hardened and ground. Size 92 – clamping system mechanical/hydraulic. Interchangeable false jaw, reversible, case-hardened and ground. Size 125 and 160 – clamping system mechanical/hydraulic. Interchangeable false moving jaw, hardened and ground. Long clamping slide with cross grooves, all sides hardened, operating faces ground. Drive spindle and preset clamping force. With lubricating nipple mounted at both sides ensuring the lubrication of all guides subjected to wear as well as the spindle thread. Fastening threads for workpiece stop, clamping faces for jaws. Solid chip protection prevents chips from penetrating the interior of the body. Supplied with stepped jaws.

Application: Preferably used on high-precision machining centres.

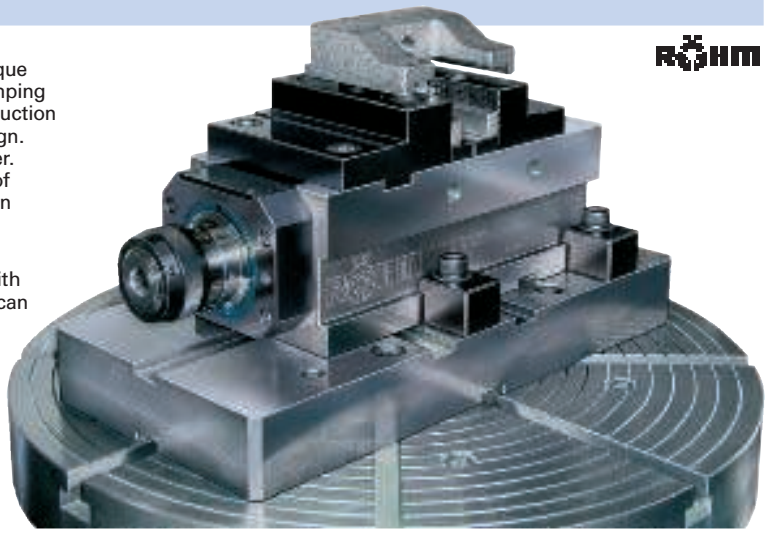


Part No.	Jaw width mm	3845	Jaw height mm	Jaw span mm	Length mm	Clamping force kN	Weight kg
1092	92	1,953.23 ◊	32	138	330	25	15
2125	125	2,113.62	40	216	463	40	41
4160	160	3,218.85	50	320	618	60	79
6200	200	4,104.95 ◊ (333)	60	315	618	60	85

NC Compact Clamping Fixtures RKE-LV

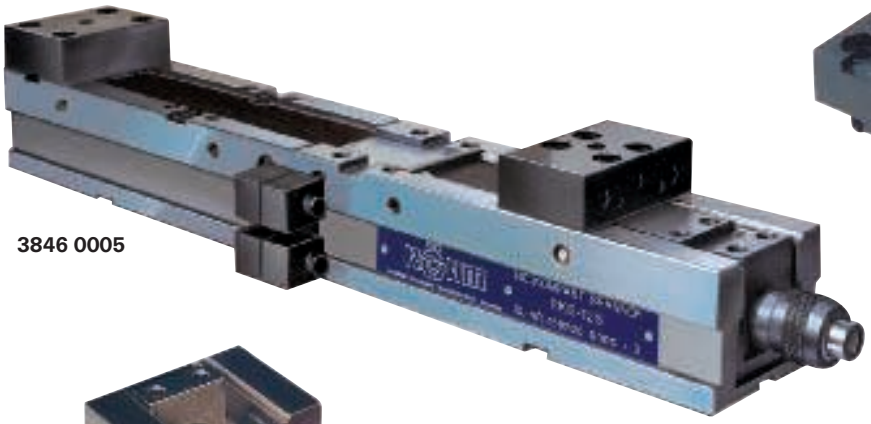
Design: Clamping system mechanical/mechanical with power transmission and presetting of clamping force. A new and unique NC compact clamping fixture for 5-side machining in one clamping operation. Three-side clamping allows higher flexibility in production of single parts and series production. Short and compact design. With tensile stress, 0 point of workpiece on the side of the user. Large clamping range, no shifting of moving jaw. Body made of steel and all guides hardened and ground. Solid chip protection prevents the chips from penetrating the interior of the body. Supplied with stepped jaws.

Application: Due to perfect utilisation of the working range with a clamping width of up to 192 mm, the NC compact spanner can be used in machining centres and milling machines.



Part No.	Jaw width mm	3856	Jaw height mm	Jaw span mm	Total length mm	Clamping force kN	Weight kg
0125	125	2,083.44 ◊ (333)	40	192	372	40	29

Accessories for RKE/RKE-L/RKE-LV



3846 0005





3846 0015



3846 0010



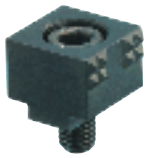


3846 0125

Part No.	Accessories	3846
0005	Jaw opening extension (Jaw opening max. 630 mm)	1,715.03 ◊ (333)
0010	Angular drive 90°	442.09 ◊ (333)
0015	Support jaws, jaw width 125 mm (set)	526.09 ◊ (335)
0125	Stepped jaws, jaw width 125 mm (set)	608.67 ◊ (335)

Prong Inserts for Support Jaws for NC Compact Clamping Fixture RKE

Design: Reversible, suitable for all sizes of support jaws, with fixing screw.



Part No.	For jaw width mm	3847
0005	110–200	60.99 ◊ (335)

Clamping Claws

Design: For NC compact clamping fixture RKG-L.

Application: For face- and bottom-side clamping.



Part No.	Suitable for T-slot	3851
0120	12	27.73
0140	14	27.73
0160	16	28.30
0180	18	27.73
0200	20	35.68
0220	22	40.51 (335)

Slot Tenons

Design: Set includes 2 pieces, case-hardened and ground.
For NC compact clamping fixture RKG-L.
Scope of supply: Slot tenon with fastening screw.



Part No.	Size	3851
2012	20x12	30.76
2014	20x14	29.63
2016	20x16	29.63
2018	20x18	29.63
2020	20x20	31.14
2022	20x22	74.40 (335)

NC Compact Clamping Fixtures RKG-125 L

Design: Clamping system mechanical/mechanical. Solid cast iron body, all sides hardened and ground, all guides hardened and ground, clamping slide with cross grooves, all sides ground, and operating faces hardened. With two movable jaws, reversible, case-hardened and ground. Clamping faces for jaws and sound chip protection prevents the chips from penetrating the interior of the body.
Supplied with stepped jaws.

Application: Due to perfect utilisation of the working range (with a clamping width of up to 192 mm), it can be used on machining centres and milling machines.



Part No.	Jaw width mm	3858	Jaw height mm	Jaw span mm	Clamping force kN	Weight kg
0000	125	2,064.38 ◊ (333)	40	0–216	40	41

Compact Clamping Fixtures RKZM

Design: Clamping system mechanical/mechanical. Solid steel body, all sides hardened and ground, all guides hardened and ground, clamping slide with cross grooves, all sides ground, and operating faces hardened. With two movable jaws, reversible, case-hardened and ground. Due to the short, compact design, a large clamping width can be achieved. 5-side machining in one clamping operation and 3-side machining for highest flexibility in production of single parts and series production. 0 point of workpiece is always on the side of the user. Constant clamping force during each clamping operation and great repeatability is ensured when using a torque wrench. Drive spindle including preset clamping. With lubricating nipples mounted at both sides ensuring the lubrication of all guides subjected to wear as well as the spindle thread.
Supplied with stepped jaws.

Application: Due to perfect utilisation of the working range (with a clamping width of up to 192 mm), it can be used on machining centres and milling machines.

Note: Accessories see part no. 3848 and 3851.



Part No.	Jaw width mm	3858	Jaw height mm	Jaw span mm	Clamping force kN	Weight kg
0005	50	1,616.58 ◊	20	0–39	10	3.5
0015	70	2,150.13 ◊	25	0–58	15	7
0020	92	2,655.12 ◊	32	0–76	20	18
0025	125	3,239.50 ◊ (333)	40	0–97	25	32.5

Crank

Design: Female octagon. For compact clamping fixtures RKG-125 and RKZM.



Part No.	Female octagon x length mm	3848
1110	12 x 80	17.83
1115	14 x 125	23.30
1120	19 x 160	49.56 (335)

Drive Adapters

Design: For torque wrench. For compact clamping fixture RKZM.



Part No.	Opening hexagon x square	3848
2050	8 x 12	43.93
2070	10 x 14	46.73
2100	14 x 19	60.47 ◊ (335)

Stepped Jaws

Design: For compact clamping fixture RKZM.



Part No.	Jaw width mm	3851	Jaw height mm
0050	50	432.73 ◊	20
0070	70	475.92 ◊ (335)	25

Precision Clamping Fixtures PL-S micro

Design: With horizontally ground prism. Alloyed tool steel. With quick-adjustment feature, in wooden case. Easy clamping and releasing by means of Allen key. Hardened and finely ground, with quick adjustment feature and pull-down effect.

Rectangularity: 100 mm = 0.005 mm,
Parallelism: 100 mm = 0.002 mm.

Application: High fine-grinding, milling, measuring and erosion accuracy.





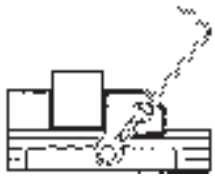
Part No.	Dimensions	3875 mm	Jaw width mm	Jaw span mm	Jaw height mm	Total height mm	Total length mm	Weight kg
0030	1	133.36	30	25	15	35	75	0.35
0045	2	193.25	45	50	20	45	110	1
		(337)						

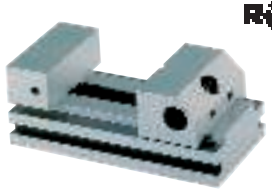
Precision Clamping Fixtures PL-S

Design: With horizontally ground prism. Alloyed tool steel. With quick-adjustment feature, in wooden case. Easy clamping and releasing by means of Allen key. Hardened and finely ground, with quick adjustment feature and pull-down effect.

Rectangularity: 100 mm = 0.005 mm,
Parallelism: 100 mm = 0.002 mm.

Application: High fine-grinding, milling, measuring and erosion accuracy.





Part No.	Dimensions	3877 mm	Jaw width mm	Jaw span mm	Jaw height mm	Total height mm	Total length mm	Weight kg
0070	1	248.68	70	80	30	62	160	3
0090	2	507.53	90	120	40	80	210	5.8
0120	3*	756.21	120	150	40	90	280	13.5
		(337)						

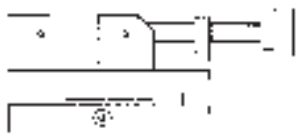
* Size 3 only with horizontally ground prism.

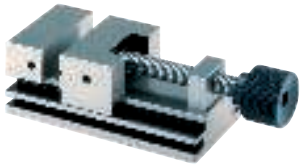
Precision Clamping Fixtures Type PL-G with Threaded Spindle

Design: Alloyed tool steel. In wooden case. Clamping and releasing by means of threaded spindle. Hardened and finely ground.

Rectangularity: 100 mm = 0.005 mm,
Parallelism: 100 mm = 0.002 mm.

Application: High fine-grinding, milling and measuring accuracy.





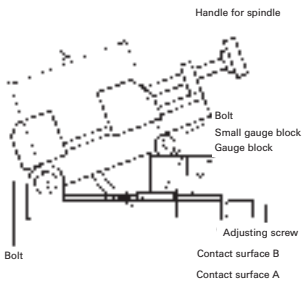
Part No.	Dimensions	3879 mm	Jaw width mm	Jaw span mm	Jaw height mm	Total height mm	Total length mm	Weight kg
0060	0	244.07	60	31	25	50	85	1.6
0070	1	323.31	70	80	30	62	160	4
0090	2	579.77	90	120	40	80	210	7.6
		(337)						

Precision Sine Clamping Fixtures Type PS-SV with Front Swivel Axis

Design: Setting range 0°–46°. Alloyed tool steel. Clamping and releasing by means of threaded spindle. Setting of angle with gauge block according to sine method, in wooden case. Hardened and finely ground. Bolts hardened and ground, with accuracy of 0.001 mm. Positive locking at each angle. Mechanical workpiece clamping by means of threaded spindle.

Rectangularity: 100 mm = 0.005 mm,
Parallelism: 100 mm = 0.002 mm,
Angular deviation at 45° ± 15".

Application: For high grinding, milling, measuring accuracy etc.





Part No.	Dimensions	3881 mm	Jaw width mm	Jaw span mm	Jaw height mm	Total height mm	Total length mm	Weight kg
0070	1	1,632.45	70	80	30	93	160	5.3
0090	2	2,604.30	90	120	40	113	210	11.0
		(337)						

Formula for calculation of the gauge block x

$x = \sin \alpha \cdot K$ (for contact surface A)
$x = \sin \alpha \cdot K + 1$ (for contact surface B)

Example:

Required: Gauge block for angular adjustment of 24° 15" with precision sine clamping fixture PS-SV.
Given: $K = 100$, $\sin \alpha = 0.4107$.
Calculation: $x = 0.4107 \cdot 100 = 41.07$.
Gauge block height: 41.07 mm.

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Clamping Cubes

Design: Made of special cast iron. Grade 3 clamping surfaces planed.
4 faces with cast slots. 1 face with T-slots according to DIN 650, for clamping elements. 1 face open.
All faces of cube are plane-parallel and rectangular.

Part No.	l x w x h mm	3883 PoTc	Slot width mm
0250	250 x 180 x 150	427.78 ◊	14
0300	300 x 220 x 200	652.20 ◊	14
0350	350 x 280 x 250	755.97 ◊	22
0400	400 x 350 x 300	1,106.92 ◊	22
0500	500 x 450 x 400	1,491.14 ◊	22
		(338)	



Angle Plates 90° with T-slots

Design: Made of special cast iron with 2 oblique ribs, outside faces to DIN 876, angular accuracy to DIN 875, angular milled edges.

3885 **Grade 3 – Clamping face planed**

3887 **Grade 1 – Clamping face ground**

Part No.	l x w x h mm	3885 PoTc	3887 PoTc	T-slots
0150	150 x 75 x 100	102.81	134.45 ◊	12 H12
0200	200 x 100 x 150	134.45	196.14 ◊	12 H12
0275	275 x 150 x 200	237.26	317.93 ◊	12 H12
0300	300 x 150 x 250	292.62	454.43 ◊	12 H12
0400	400 x 225 x 300	431.83	654.06 ◊	18 H12
0500	500 x 300 x 400	717.36	1,066.31 ◊	18 H12
		(338)	(338)	

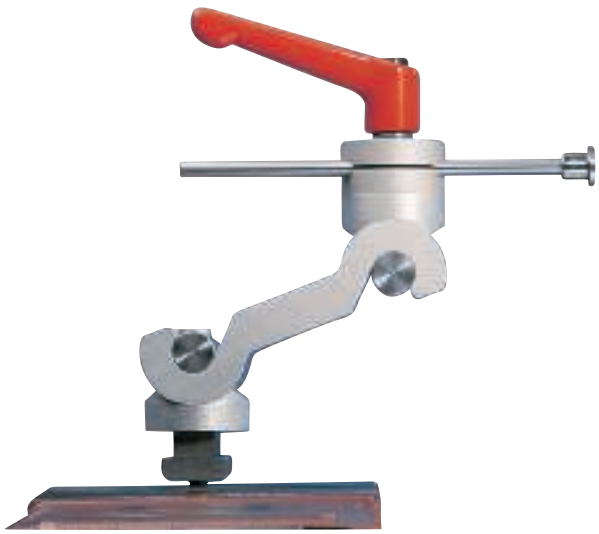


ESSET 3D Stopper Systems

Design: Aluminium, anodised. The stopper is a modular construction. Several units can be assembled. The basic unit has a working range of 150 mm. With 2-step adjustment mechanism and a stop plate used as inner stop (slots etc.).

Application: Suitable for workpieces on drilling and milling machines.

Part No.	Design	3955 S	Working range mm
0010	Single stop	126.57	150
0020	Double stop	247.64	300
		(346)	



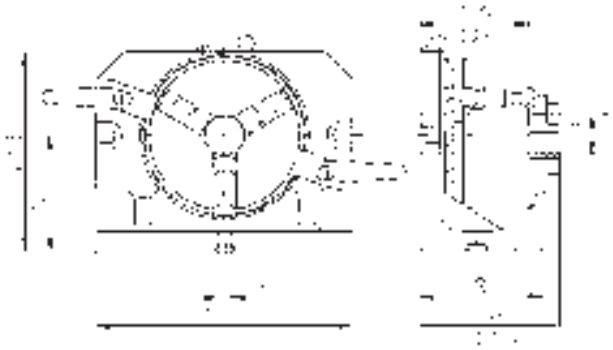
Slot Tenons

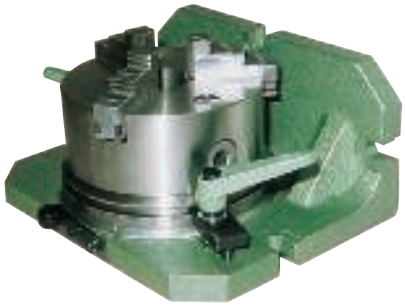
Part No.	For slot width mm	3956 S	Thread
0010	10	4.84	M 8
0012	12	4.84	M 8
0014	14	4.84	M 8
0016	16	4.84	M 8
0018	18	4.84	M 8
		(346)	

Single Separation Devices VT 2

Design: Vertical and horizontal separation. Pitches of 2, 3, 4, 6, 8, 12, 24 can be effected. The spirals of the robust chucks are temper-hardened, drill and lathe jaws as well as pinions are inductive hardened and ground. Concentricity and run-out accuracy comply with DIN 6350 tolerances.

Scope of supply: Lathe chuck with lathe and drill jaws and chuck wrench.





For chuck diameter 125 mm see values in brackets.

Part No.	3-jaw chuck ∅ mm	3994	Base plate mm	Side plate mm	Clamp slot width mm	Weight kg
0125	125	1,566.81 ◊	275 x 215	275 x 130	16	28
0160	160	1,603.25 ◊ (001)	275 x 215	275 x 130	16	30

Compound Tables with Dovetail Guidance

Design: In special cast iron, clamping area and guides ground. Run-out accuracy 0.03 mm. Pitch accuracy on 100 mm = 0.01 mm. Dovetail guides adjustable through guide bars. Whirl trapezoid-thread spindle including thrust bearings. Scaled drums including zero adjustment, thereby readable without conversion. Graduation 0.05 mm. Tables from 450 x 240 mm including water channel as well as clamping lever in both axles enabling clamping in any position.

Application: For use on drilling machines and for small milling jobs.



Part No.	Clamping face mm	3997	Number of T-slots	T-slot width mm	T-slot distance mm	Vertical movement mm	Transverse movement mm	Spindle pitch mm	Load kg	Total height (–0.01)	Base mm	Weight kg
0010	300 x 160	924.49 ◊	3	10	50	180	100	2	75	78	160 x 160	16
0020	450 x 240	1,727.92 ◊	3	14	60	275	155	5	280	126	259 x 200	52
0030	580 x 240	1,782.95 ◊ (395)	3	14	60	375	155	5	280	126	259 x 200	60

Other models and dimensions availabe on request.

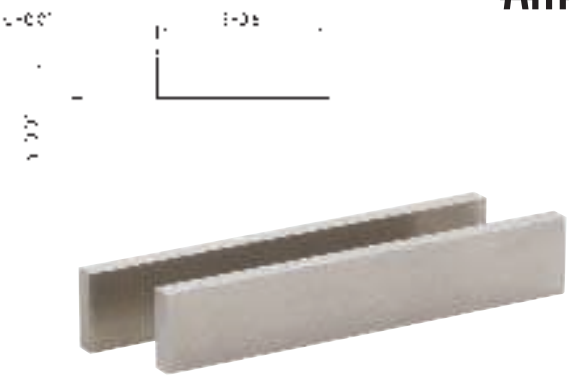
All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Parallel Pair

Design: Case-hardened and finely ground in pairs. Plane-parallel and true.

Tolerance for H and W = 0.01 mm.

Hardness 600–700 HV10.



Part No.	Dimensions W x H x L mm	3869
0001	4 x 12 x 100	29.07
0003	5 x 18 x 100	29.89
0005	6 x 19 x 100	30.69
0007	8 x 26 x 125	31.66
0009	10 x 33 x 125	32.88
0011	12 x 40 x 125	34.18
0013	8 x 26 x 150	38.38
0015	10 x 33 x 150	39.35
0017	12 x 40 x 150	40.17
0019	14 x 42 x 150	41.71

(342)

Parallel Set

Design: In wooden case with removable lid. Case-hardened and ground. Nominal dimension according to ISO 2768 m.

Tolerance for H = 0.01 mm.

Nominal tolerance for H = ± 0.2 mm.

Application: Parallels are used as supports for workpieces for a wide range of machining operations.
They reduce clamping times and thereby reduce tool costs.



Part No.		0001
Length	**mm**	**150**
3870		249.39
Set contents 1 pair each of W x H	mm	14 x 10, 16 x 10, 18 x 10, 20 x 10, 22 x 10, 24 x 10, 26 x 10, 28 x 10, 30 x 10, 32 x 10, 35 x 10, 40 x 10, 45 x 10, 50 x 10

(340)

Parallel Set

Design: In wooden stand. Case-hardened and ground in pairs. Plane-parallel and true.

Tolerance for H and W = 0.01 mm.

Hardness: 600–700 HV10.

3870 0003
Support surface height 2–24 mm in 1-increments

3870 0005 + 3870 0007
Support surface height 8–42 mm in 1 increments (except 9 mm).

The missing measurements can be achieved by combining elements.



3870 0003



3870 0005 + 3870 0007

Part No.		0003	0005	0007
Length	**mm**	**100**	**125**	**150**
3870		383.81	417.81	443.72
Set contents 1 pair each of W x H	mm	2 x 5, 2 x 10, 2 x 15, 2 x 20, 3 x 6, 3 x 11, 3 x 16, 3 x 21, 4 x 7, 4 x 12, 4 x 17, 4 x 22, 5 x 8, 5 x 13, 5 x 18, 5 x 23, 6 x 9, 6 x 14, 6 x 19, 6 x 24	8 x 11, 8 x 16, 8 x 21, 8 x 26, 8 x 31, 8 x 36, 10 x 13, 10 x 18, 10 x 23, 10 x 28, 10 x 33, 10 x 38, 12 x 15, 12 x 20, 12 x 25, 12 x 30, 12 x 35, 12 x 40, 14 x 17, 14 x 22, 14 x 27, 14 x 32, 14 x 37, 14 x 42	8 x 11, 8 x 16, 8 x 21, 8 x 26, 8 x 31, 8 x 36, 10 x 13, 10 x 18, 10 x 23, 10 x 28, 10 x 33, 10 x 38, 12 x 15, 12 x 20, 12 x 25, 12 x 30, 12 x 35, 12 x 40, 14 x 17, 14 x 22, 14 x 27, 14 x 32, 14 x 37, 14 x 42

(340)

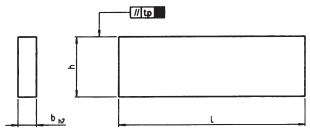
Parallel Stoppers – Pair

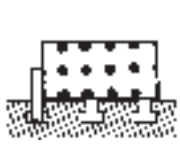
Design: Suitable for machine slots as well as parallel sets.

Case-hardened and ground, height pair-wise according to pair tolerance IT 5. Absolute dimension according to DIN 7168 medium.

Application: Preferably for small and medium-sized machines. Thickness is adjusted to the machine slots with H 8 tolerance.

A pair of stoppers are fitted in the machine slot, afterwards the workpieces can quickly be aligned parallel to the table. Several pairs of equal size are available on request against extra charge.







Part No.	Dimensions W x H x L mm	3913 Pair	Pair tolerance h mm	Nominal dimension tolerance DIN 7168 m h mm	Tolerance h7 mm
0010	8 x 25 x 100	61.54	0.009	0.2	0.015
0020	10 x 32 x 100	66.01	0.011	0.3	0.015
0030	12 x 40 x 100	75.71	0.011	0.3	0.018
0040	14 x 50 x 100	82.20	0.011	0.3	0.018
0050	16 x 50 x 160	91.51	0.011	0.3	0.018
0060	18 x 63 x 160	107.30	0.013	0.3	0.018
0070	20 x 63 x 160	112.56	0.013	0.3	0.021
0075	22 x 80 x 160	168.83	0.013	0.3	0.021
0080	24 x 80 x 160	178.95	0.013	0.3	0.021
0090	28 x 100 x 160	204.05	0.015	0.3	0.021
		(342)			

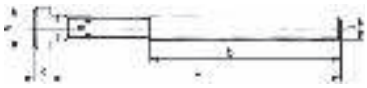
T-bolts with Nut and Washer

Design: Milled T-slot, rolled thread, stamped with strength class.

Material: M 6 –M 12 tempered to strength class 10.9,
M 14–M 24 tempered to strength class 8.8.

DIN 787

format professional quality





Part No.	Slot width mm	3900 mm	Screw Ø x Length mm	Width a mm	Thread length b mm	Head size e mm	Head thickness mm
5001	6	3.71	M 6 x 25	5.7	15	10	4
5002	6	3.76	M 6 x 40	5.7	28	10	4
5003	6	4.05	M 6 x 63	5.7	40	10	4
5005	8	4.05	M 8 x 32	7.7	22	13	6
5006	8	4.17	M 8 x 50	7.7	35	13	6
5007	8	4.42	M 8 x 80	7.7	50	13	6
5010	10	4.05	M 10 x 40	9.7	30	15	6
5020	10	4.09	M 10 x 63	9.7	45	15	6
5025	10	4.27	M 10 x 80	9.7	50	15	6
5030	10	4.42	M 10 x 100	9.7	60	15	6
5040	12	4.42	M 12 x 50	11.7	35	18	7
5050	12	4.65	M 12 x 80	11.7	55	18	7
5055	12	4.94	M 12 x 100	11.7	65	18	7
5060	12	5.06	M 12 x 125	11.7	75	18	7
5061	12	5.39	M 12 x 160	11.7	100	18	7
5063	12	5.84	M 12 x 200	11.7	120	18	7
5070	14	4.50	M 12 x 50	13.7	35	22	8
5080	14	4.79	M 12 x 80	13.7	55	22	8
5085	14	5.06	M 12 x 100	13.7	65	22	8
5090	14	5.26	M 12 x 125	13.7	75	22	8
5092	14	5.55	M 12 x 160	13.7	100	22	8
5093	14	5.88	M 12 x 200	13.7	120	22	8
5091	14	5.55	M 12 x 160	13.7	100	22	8
5095	16	5.39	M 14 x 63	15.7	45	25	9
5096	16	6.04	M 14 x 100	15.7	65	25	9
		(340)					

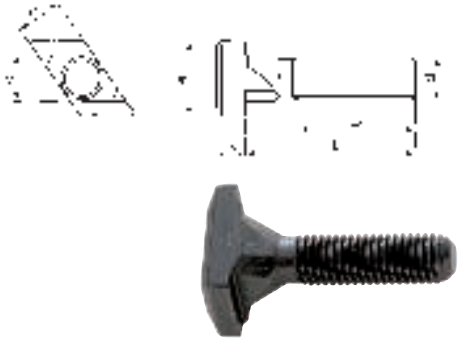
Part No.	Slot width mm	3900 mm	Screw Ø x Length mm	Width a mm	Thread length b mm	Head size e mm	Head thickness mm
5094	16	6.11	M 14 x 125	15.7	75	25	9
5097	16	6.48	M 14 x 160	15.7	100	25	9
5098	16	8.03	M 14 x 250	15.7	150	25	9
5100	16	5.88	M 16 x 63	15.7	45	25	9
5110	16	6.48	M 16 x 100	15.7	65	25	9
5115	16	6.81	M 16 x 125	15.7	85	25	9
5120	16	7.16	M 16 x 160	15.7	100	25	9
5125	16	9.00	M 16 x 250	15.7	150	25	9
5130	18	6.19	M 16 x 63	17.7	45	28	10
5140	18	6.56	M 16 x 100	17.7	65	28	10
5145	18	6.84	M 16 x 125	17.7	85	28	10
5150	18	7.45	M 16 x 160	17.7	100	28	10
5155	18	9.15	M 16 x 250	17.7	150	28	10
5160	20	9.15	M 20 x 80	19.7	55	32	12
5170	20	9.72	M 20 x 125	19.7	85	32	12
5172	20	11.51	M 20 x 200	19.7	125	32	12
5175	20	14.34	M 20 x 315	19.7	190	32	12
5177	22	9.15	M 20 x 80	21.7	55	35	14
5180	22	9.88	M 20 x 125	21.7	85	35	14
5182	22	11.74	M 20 x 200	21.7	125	35	14
5185	22	14.66	M 20 x 315	21.7	190	35	14
5188	28	14.01	M 24 x 100	27.7	70	44	18
5190	28	15.80	M 24 x 160	27.7	110	44	18
5200	28	18.55	M 24 x 250	27.7	150	44	18
5210	28	25.18	M 24 x 400	27.7	240	44	18
		(340)					

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Rhombus Screws for T-slots

Design: Forged, milled T-slot, rolled thread.

Material: M 12–M 24 tempered to strength class 10.9.



Part No.	Slot width mm	3899 mm	Screw ∅ x length mm	Width a mm	Thread length b mm	Head size e mm	Head thickness k mm
0001	14	11.25	M 12 x 50	13.7	35	22	8
0004	14	11.74	M 12 x 80	13.7	55	22	8
0007	14	12.80	M 12 x 125	13.7	75	22	8
0010	18	13.77	M 16 x 63	17.7	45	28	10
0013	18	14.66	M 16 x 100	17.7	65	28	10
0016	18	16.76	M 16 x 160	17.7	100	28	10
0019	22	21.14	M 20 x 50	21.7	55	35	14
0022	22	21.62	M 20 x 125	21.7	85	35	14
0025	22	22.29	M 20 x 200	21.7	120	35	14
0028	28	22.03	M 24 x 100	27.7	70	44	18
0031	28	22.60	M 24 x 125	27.7	85	44	18
0034	28	23.41	M 24 x 250	27.7	150	44	18

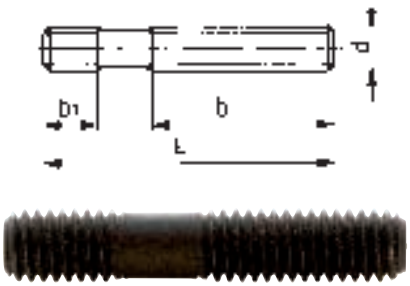
(340)

Studs

Design: Rolled thread. The stud length increments are specially adapted to standard clamping measurements.

Material: M 6–M 12 tempered to strength class 10.9,
M 14–M 24 tempered to strength class 8.8.

DIN 6379



Part No.	Screw ∅ x length d x L mm	3901 mm	Thread length b mm	Thread length b_1 mm
0001	M 6 x 32	0.34	16	9
0003	M 6 x 50	0.44	30	9
0005	M 6 x 80	0.51	50	9
0006	M 8 x 40	0.51	20	11
0007	M 8 x 63	0.53	40	11
0008	M 8 x 100	0.64	63	11
0011	M 8 x 125	0.83	75	11
0009	M 8 x 160	0.93	100	11
0010	M 10 x 50	0.59	25	13
0020	M 10 x 80	0.75	50	13
0030	M 10 x 125	0.98	75	13
0040	M 10 x 200	1.56	125	13
0050	M 12 x 50	0.77	25	15
0060	M 12 x 63	0.82	32	15
0070	M 12 x 80	0.92	50	15
0080	M 12 x 100	1.03	63	15
0090	M 12 x 125	1.24	75	15
0100	M 12 x 200	1.53	125	15
0110	M 14 x 63	0.98	32	17
0115	M 14 x 80	1.11	50	17
0120	M 14 x 100	1.26	63	17
0125	M 14 x 125	1.44	75	17
0130	M 14 x 160	1.67	100	17
0135	M 14 x 250	2.63	160	17

(340)

Part No.	Screw ∅ x length d x L mm	3901 mm	Thread length b mm	Thread length b_1 mm
0140	M 16 x 63	1.38	32	19
0150	M 16 x 80	1.48	50	19
0160	M 16 x 100	1.50	63	19
0170	M 16 x 125	1.71	75	19
0180	M 16 x 160	2.24	100	19
0190	M 16 x 250	3.21	160	19
0192	M 18 x 80	2.08	50	23
0194	M 18 x 125	2.99	75	23
0196	M 18 x 200	4.17	125	23
0198	M 18 x 315	6.32	180	23
0200	M 20 x 80	2.27	32	27
0210	M 20 x 125	2.94	70	27
0220	M 20 x 200	4.33	125	27
0230	M 20 x 250	5.11	160	27
0240	M 20 x 315	6.45	200	27
0250	M 20 x 500	9.23	315	27
0260	M 22 x 100	3.75	45	31
0270	M 22 x 160	4.79	100	31
0280	M 22 x 250	7.30	160	31
0290	M 22 x 400	9.56	250	31
0300	M 24 x 100	3.96	45	35
0310	M 24 x 160	4.70	100	35
0320	M 24 x 250	7.01	160	35
0330	M 24 x 400	10.05	250	35

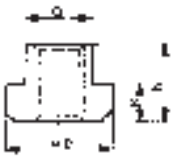
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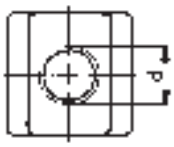
T-nuts

Material: Tempered to strength class 10.

DIN 508

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Part No.	d x T-nut	3902	Dim. a mm	Dim. e mm	Dim. h mm	Dim. k mm
0005	M 6 x 8	0.81	7.7	13	10	6
0010	M 8 x 10	0.85	9.7	15	12	6
0020	M 10 x 12	0.88	11.7	18	14	7
0030	M 12 x 14	1.11	13.7	22	16	8
0040	M 14 x 16	1.42	15.7	25	18	9
		(340)				

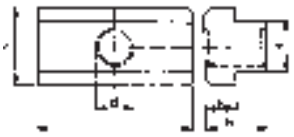
Part No.	d x T-nut	3902	Dim. a mm	Dim. e mm	Dim. h mm	Dim. k mm
0050	M 16 x 18	1.75	17.7	28	20	10
0060	M 18 x 20	2.76	19.7	32	24	12
0070	M 20 x 22	2.95	21.7	35	28	14
0080	M 24 x 28	5.55	27.7	44	36	18
		(340)				

T-nuts

Design: Long type.

Material: Tempered to strength class 10.

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Part No.	d x T-nut	3903	Dim. a mm	Dim. e mm	Dim. l mm	Dim. h mm	Dim. k mm
0010	M 6 x 8	2.09	7.7	13	26	10	6
0020	M 8 x 10	2.06	9.7	15	30	12	6
0030	M 10 x 12	2.23	11.7	18	36	14	7
0040	M 12 x 14	2.42	13.7	22	44	16	8
0050	M 14 x 16	3.05	15.7	25	50	18	9
		(340)					

Part No.	d x T-nut	3903	Dim. a mm	Dim. e mm	Dim. l mm	Dim. h mm	Dim. k mm
0060	M 16 x 18	3.87	17.7	28	56	20	10
0070	M 18 x 20	5.51	19.7	32	64	24	12
0080	M 20 x 22	6.56	21.7	35	70	28	14
0090	M 24 x 28	12.65	27.7	44	88	36	18
		(340)					

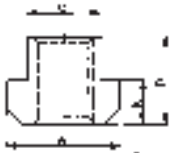
T-nuts Rhombus

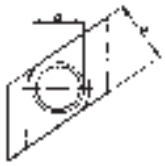
Part No.	d x T-nut	3904	Dim. a mm	Dim. e mm	Dim. h mm	Dim. k mm
0003	M 8 x 10	2.41	9.7	15	12	6
0005	M 10 x 12	2.52	11.7	18	14	7
0010	M 12 x 14	2.53	13.7	22	16	8
0015	M 14 x 16	3.32	15.7	25	18	9
0020	M 16 x 18	3.54	17.7	28	20	10
0030	M 20 x 22	5.84	21.7	35	28	14
0035	M 20 x 28	9.56	27.7	44	36	18
0040	M 24 x 28	9.08	27.7	44	36	18
		(340)				

Application: The T-nut can be inserted from the top, if lateral insertion is not possible.

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Material: Tempering steel.







Slot Tenons

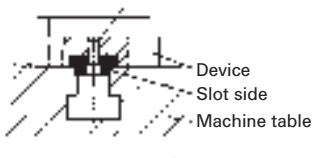
Part No.	Nominal slot size – machine b mm	3905	Nominal slot size – device mm	Height mm	Length mm	For screws DIN 84/912
0010	10	14.01	20	10	22	M 6 x 10
0020	12	12.80	20	10	22	M 6 x 10
0030	14	12.80	20	10	25	M 6 x 16
0040	16	12.80	20	10	25	M 6 x 16
0050	18	12.80	20	10	25	M 6 x 16
0060	20	4.50	20	10	22	M 6 x 16
0070	22	15.89	20	12	32	M 6 x 16
0080	24	18.31	20	12	32	M 6 x 16
0090	28	18.87	20	12	32	M 6 x 16
		(342)				

* Flat slot tenon.

Design: Compliance with tolerance, sides precisely ground.

Application: The slot tenons are fixed in pairs in the standard slot (width 20 mm) of vices or other devices. Different slot widths can be used on machines by changing the slot tenons.

Material: Steel C 15, case-hardened and ground.



Fitting surface h 6 ground.



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Loose Slot Tenons

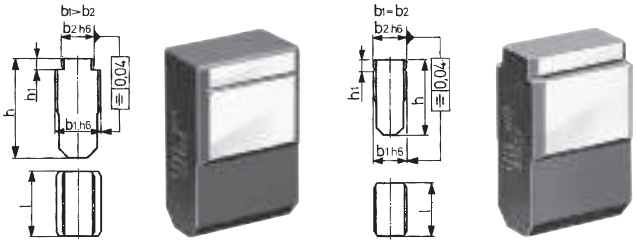
Part No.	Nominal slot size – machine b mm	3905	Nominal slot size – device mm	h mm	h1 mm	l mm
5010	10	11.66	12	12.0	3.6	20
5020	12	9.64	12	28.6	5.5	20
5025	12	16.53	20	14.0	5.5	32
5030	14	16.76	20	14.0	5.5	32
5040	16	16.76	20	14.0	5.5	32
5050	18	16.76	20	14.0	5.5	32
5060	20	15.89	20	45.5	7.0	32
5070	22	24.46	20	50.5	7.0	40
5080	24	27.60	20	55.5	7.0	40
5090	28	30.28	20	61.5	7.0	40

(340)

Design: Case-hardened and ground.

Application: After rough alignment, the slot tenons DIN 6323 are inserted at the side. No protruding slot tenons during transport of the device and no damage of the machine table.

DIN 6323



Hexagon Nuts

Part No.	Thread	3906	Hexagon SW mm	Dimensions e mm	Height m mm	Height r mm
0005	M 6	0.23	10	11.5	9	9
0010	M 8	0.23	13	15	12	12
0020	M 10	0.33	16	18.4	15	15
0030	M 10*	0.33	17	19.6	15	15
0040	M 12	0.38	18	20.7	18	17
0050	M 12*	0.38	19	21.9	18	17
0060	M 14	0.56	21	24.2	21	20
0070	M 14*	0.56	22	25.4	21	20
0080	M 16	0.66	24	27.7	24	22
0090	M 18	1.18	27	31.2	27	24
0100	M 20	1.19	30	34.6	30	27
0110	M 22*	1.98	32	36.9	33	30
0120	M 22	1.98	34	39.2	33	30
0130	M 24	1.96	36	41.5	36	32

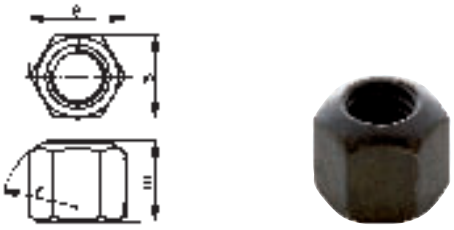
* Obsolete DIN standard.

(340)

Design: With spherical end for conical seats DIN 6319 D or G and flat end for flat washers DIN 6340.

Material: Tempering steel, strength class 10.

DIN 6330B



Hexagon Nuts with Collar

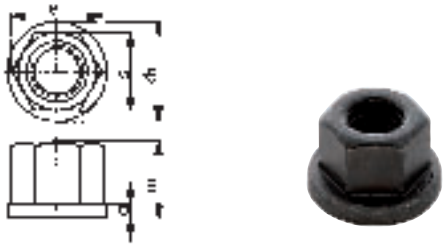
Part No.	Thread	3907	Hexagon SW mm	Dimensions e mm	Height m mm	Height a mm	Collar Ø mm
0200	M 8	0.36	13	15	12	3.5	18
0205	M 10	0.49	16	18.4	15	4.0	22
0210	M 12	0.53	18	20.7	18	4.0	25
0215	M 16	0.96	24	27.7	24	5.0	31
0220	M 18	1.67	27	31.2	27	5.0	34
0225	M 20	1.75	30	34.6	30	6.0	37
0230	M 24	2.65	36	41.5	36	6.0	45

(340)

Design: Height 1.5 d, preforged.

Material: Tempering steel, strength class 10.

DIN 6331



Hexagon Nuts with Collar

Design: DIN 6331. Preforged tempering steel, strength class 10, height 1.5 d. One end with collar, washers are therefore not necessary, if permitted by the size of the bore hole or the clamping slot.

Material: Tempering steel, strength class 10.

Advantages:
Long screw thread and clamping spindles can be bridged without any effort.
Easy assembly and/or disassembly even in confined spaces.
No looking for the thread.
Seizing to the thread by external influences is avoided.
No impairment by impurities such as paint or even rust.

DIN 6331



Part No.	Thread	3905	Hexagon SW mm	Dimensions e mm	Height m mm	Height a mm	Collar Ø mm
6000	M 16	19.58	27	30.68	23.4	10.4	35.5
6100	M 20	21.55	34	38.6	29	12.5	45
6200	M 24	23.50	41	46.72	34.8	16	50.4

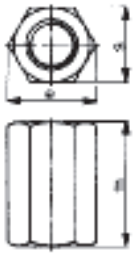
(342)

Extension Nuts

Design: 3 d high. Connecting element between T-bolt DIN 787 and stud DIN 6379. Blind bolt holes. Min. screw-in length 1 x ⌀, optimum 1/2 height of nut.

Material: Tempering steel, strength class 10.

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Part No.	Thread	3908	Hexagon wrench size mm	Dimensions e mm	Height m mm
0005	M 6	0.75	10	11.5	18
0010	M 8	0.75	13	15	24
0020	M 10	0.88	16	18.4	30
0030	M 10*	0.88	17	19.6	30
0040	M 12	1.03	18	20.7	36
0050	M 12*	1.03	19	21.9	36
0060	M 14	1.50	21	24.2	42
0070	M 14*	1.50	22	25.4	42
0080	M 16	1.82	24	27.7	48
0090	M 18	2.56	27	31.2	54
0100	M 20	3.46	30	34.6	60
0110	M 22*	4.79	32	36.9	66
0120	M 22	4.79	34	39.2	66
0130	M 24	5.55	36	41.5	72

* Obsolete DIN standard.

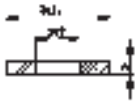
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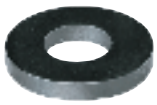
Washers

Material: Stamped, evenly-pressed, tempered, strength 1,200–1,400 N/mm^2.

DIN 6340

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Part No.		0005	0010	0020	0030	0040	0050	0060	0070	0080	0090
For screws		M 6	M 8	M 10	M 12	M 14	M 16	M 18	M 20	M 22	M 24
3909		0.30	0.31	0.36	0.42	0.49	0.56	0.74	0.96	1.19	1.45
⌀ d_1	mm	6.4	8.4	10.5	13.0	15.0	17.0	19.0	21.0	23.0	25.0
⌀ d_2	mm	17	23	28	35	40	45	45	50	50	60
Thickness s	mm	3	4	4	5	5	6	6	6	8	8

(340)

Spherical Washers DIN 6319 C, Conical Seats DIN 6319 D, Conical Seats DIN 6319 G

3910 **Design:** Case-hardened and phosphate finish.

3911 **Design:** Case-hardened and phosphate finish.

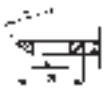
Application: To be placed on bore holes only, must not be placed on slots.

3912 **Design:** Stamped, pressed and tempered.

Application: For clamping over slots.

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DIN 6319C





3910

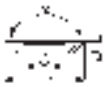
DIN 6319D





3911

DIN 6319G





3912

Part No.		0010	0020	0030	0040	0050	0060	0070
For screws		M 8	M 10	M 12	M 14	M 16	M 20	M 24
3910		0.27	0.36	0.44	0.66	0.63	1.05	1.61
3911		0.27	0.40	0.44	0.75	0.77	1.26	2.09
3912		0.62	0.62	0.77	1.18	1.18	1.67	2.91
⌀ d_1/d_2	mm	8.4/9.6	10.5/12.0	13/14.2	15/16.5	17/19.0	21/23.2	25/28.0
⌀ $d_3/d_4/d_5$	mm	17/17/23	21/21/30	24/24/35	28/28/40	30/30/45	36/36/50	44/44/60
Height $h_2/h_3/h_4$/	mm	3.2/3.5/4.0	4/4.2/5.0	4.6/5.0/5.0	5/5.6/5.0	5.3/6.2/6.0	6.3/7.5/8.0	8.2/9.5/10.0
r	mm	12	15	17	22	22	27	32

(340)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Work Holding Sets for T-slots

Design: Complete set in solid wooden box. All parts tempered, strength class 8 and/or 10. Due to the removable lid, the open boxes can be stored in a tool cabinet.

Explanation:

T-bolts	DIN 787	(Part No. 3900)
Studs	DIN 6379	(Part No. 3901)
T-nuts	DIN 508	(Part No. 3902)
Hexogonal nuts	DIN 6330 B	(Part No. 3906)
Extension nuts		(Part No. 3908)
Spherical washers and conical seats	DIN 6319 C	(Part No. 3910)
Washers	DIN 6340	(Part No. 3909)



Part No.		0010	0020	0025	0030	0035	0040
d x T-nut		M 12 x 12	M 12 x 14	M 14 x 16	M 16 x 18	M 18 x 20	M 20 x 22
3915		99.19	99.60	120.24	136.86	185.02	206.49
DIN 787	mm	2 x 50 4 x 80 4 x 125	2 x50 4 x 80	2 x 63 4 x 100	2 x 63 4 x 100	** **	2 x 80 4 x 125
DIN 6379	mm	4 x 63 4 x 100 4 x 200	4 x 63 4 x 100 4 x 125 4 x 200	4 x 63 4 x 100 4 x 160 4 x 250	4 x 80 4 x 125 4 x 160	6 x 80 8 x 125 4 x 200 4 x 315	4 x 80 4 x 125 4 x 200 4 x 315
DIN 508		*	4 x	4 x	4 x	4 x	4 x
DIN 6330 B		4 x	4 x	4 x	4 x	4 x	4 x
Catalogue no. 3908		4 x	4 x	4 x	4 x	4 x	4 x
DIN 6319 C+G		4 x	4 x	4 x	4 x	–	4 x
DIN 6340		4 x	4 x	4 x	4 x	4 x	4 x

* Nuts for DIN 508 T-slots cannot be used with these sizes.
** Instead of DIN 787, M 18 x 20 has an additional 4 x DIN 6379, 125 mm stud bolts and 2 x 80 mm, each with nuts for DIN 508 T-slots and DIN 6340 washers.

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Work Holding Sets – Assortments in Case

Design: Tempering steel. With deep clamping jaws and cutting paste. This assortment includes all elements required for rapid clamping of tools, equipment or workpieces onto T-slot tables. All parts comply with DIN or trade standards, are interchangeable and can be added to at any time. The hinged lid is detachable so that the case can be housed in a tool cupboard with parts easily accessible.

Explanation:

Universal set-up blocks		(Part No. 3926)
Clamps with stepped teeth		(Part No. 3919)
Screw for T-slots	DIN 787	(Part No. 3900)
Stud bolts	DIN 6379	(Part No. 3901)
Nuts for T-slots	DIN 508	(Part No. 3902)
Hexagon nuts	DIN 6330 B	(Part No. 3906)
Extension nuts		(Part No. 3908)
Conical sockets	DIN 6319 G	(Part No. 3912)
Deep clamping jaws		(Part No. 3934)
T-slot scrapers		



Part No.	0010	0020	0030	0040	0050	0070
d x T-nut	M 10 x 10	M 12 x 12	M 12 x 14	M 16 x 16	M 18 x 20	M 20 x 22
3916	275.31	313.37	327.13	423.49	430.77	423.49
Universal set-up blocks	4 x 1 4 x 2 2 x 3	4 x 2 4 x 3	4 x 2 4 x 3	4 x 2 4 x 3	4 x 2 4 x 3	4 x 2 4 x 3
Clamp with stepped teeth	4 x 11/80	4 x 14/100	4 x 14/100	4 x 18/125	4 x 18/125	4 x 22/160
DIN 787	2 x 40	2 x 50	2 x 50	2 x 63	2 x 63	
	4 x 63	4 x 80	4 x 80	4 x 100	4 x 100	4 x 125
	4 x 100	4 x 125	4 x 125	4 x 160	4 x 160	4 x 200
DIN 6379	4 x 80	4 x 100	4 x 100	4 x 125	4 x 125	4 x 125
DIN 6330 B	6 x M 10	6 x M 12	6 x M 12	6 x M 16	6 x M 16	6 x M 20
AS DIN 6319 G	6 x M 10	6 x M 12	6 x M 12	6 x M 16	6 x M 16	6 x M 20
Extension nut	4 x M 10	4 x M 12	4 x M 12	4 x M 16	4 x M 16	4 x M 20
Deep clamping jaws*	4 x size 12	4 x size 12	4 x size 14	4 x size16	4 x size18	**
Slot broachers	–	–	1 x 14–20	1 x 14–20	1 x 14–20	1 x 22–32
Wrench	1 x SW 16	1 x SW 18	1 x SW 18	1 x SW 24	1 x SW 24	1 x SW 30

* The deep clamping jaws are supplied with nuts for T-slots DIN 508, DIN 912 bolts and two hexagonal allen keys DIN 911.
** M 20 x 22, no deep clamping jaws, part no. 3934. Includes 4 clamps for this purpose.

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Covering Strips for T-slots

Design: Made of aluminium profile. The strips can easily be cut to the desired length by means of a fine saw blade.

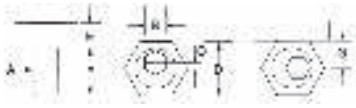
Part No.	Slot width x length mm	3914
0012	12 x 1000	13.52
0014	14 x 1000	13.03
0016	16 x 1000	14.01
0018	18 x 1000	14.49
0020	20 x 1000	15.31
0022	22 x 1000	16.20

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Eccentric Clamps

Design: Eccentric screw 10.9, brass hexagon bolt. Eccentric clamp for clamping device. Universal use, no special device required. More parts per clamping, low height. Clamp can also be used as stopper. Eccentric screw with brass hexagon allows cost-effective clamping of workpiece.



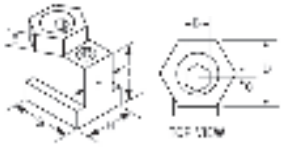


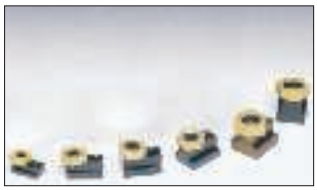
Part No.	Eccentric screw	3917	SW height E mm	Thread length F mm	Hexagon B mm	Throw of eccentric C mm	SW D mm	Clamping force G kN	PU
0000	M 4	4.76 ◊	2.8	10	3	0.8	8	0.9	10
0010	M 6	5.14 ◊	4.8	12	4	1.3	16	3.4	10
0020	M 8	5.26 ◊	4.8	16	5	1	20	3.9	12
0030	M 10	5.77 ◊	6.4	20	7	1.6	20	9	10
0040	M 12	7.90 ◊	9.5	24	8	2	25	18	8
0050	M 16	11.94 ◊	12.7	30	12	2.5	30	27	4

(343)

Eccentric Clamps for T-slots

Design: Eccentric screw 10.9, brass hexagon bolt, T-nut tempered. Eccentric clamp for machine table. Universal use, no special device required. More parts per clamping, low height. Clamp can also be used as stopper. Eccentric screw with brass hexagon and one nut allows cost-effective clamping of workpiece.





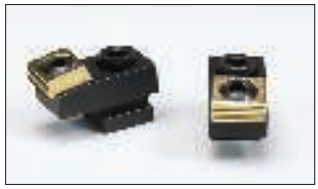
Part No.	T-slot width mm	3917	Eccentric screw	SW height E mm	Thread length F mm	Hexagon B mm	Throw of eccentric C mm	SW D mm	Clamping force G kN	PU
0060	8	21.77 ◊	M 6	4.8	12	4	1	16	3.4	2
0070	10	22.50 ◊	M 6	4.8	12	4	1	16	3.4	2
0080	12	23.06 ◊	M 8	4.8	16	5	1	21	3.4	2
0090	14	23.35 ◊	M 10	6.4	20	7	1.5	21	9	2
0100	16	23.87 ◊	M 12	9.5	25	8	2	25.4	18	2
0110	18	24.98 ◊	M 12	9.5	25	8	2	25.4	18	2
0120	20	30.83 ◊	M 16	13	30	12	2.5	30	27	2
0130	22	43.82 ◊	M 16	13	30	12	2.5	30	27	2

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Pull-down Clamping Claws

Design: Eccentric screw 10.9, body and T-nut tempered, clamping disk case hardened. Reinforced pull-down force for T-slots 14, 16, 18 mm and for plate of fixture. The clamping disk can be turned in a way that parts already machined are clamped with the smooth face without damage or parts to be sawn, forged and cast parts are clamped with the toothed face. The clamping disc adjusts to the angles of the workpiece, i.e. a rectangular workpiece is not absolutely required.





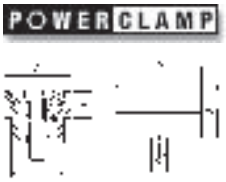
Part No.	Slot width mm	3917	A mm	B mm	C mm	D mm	E mm	Throw of eccentric mm	Clamping force kN
0140	14	56.70 ◊	50	28.5	15.7	25.4	9.6	2	18
0150	16	56.70 ◊	50	28.5	15.7	25.4	9.6	2	18
0160	18	61.66 ◊	50	28.5	15.7	25.4	9.6	2	18
0170	Without tenon block	49.64 ◊	50	28.5	15.7	25.4	9.6	2	18

(343)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Wedge-Type Clamping Fixtures

Design: Aluminium profile coated, steel wedge tempered.
Space-saving design allows more parts per clamping.
Two parts are clamped simultaneously with one clamping element.
For cubic and round parts.





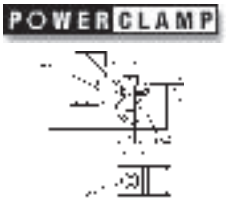
Part No.	A mm	3917	B mm	C mm	D mm	E mm	F mm	Screw	Wrench size mm	Clamping force kN	PU
0180	6.1– 6.7	14.01 ◊	6.9	8.1	5.3	3.6	6.4	M 2	1.5	0.8	6
0190	9.1–10	14.01 ◊	9.7	11.9	7.9	4.7	9.5	M 2.5	2	1.3	6
0200	12.3–13.2	10.29 ◊	14.5	15.9	10.4	5.6	12.7	M 4	3	2.2	8
0210	18.6–20	14.29 ◊	19	23.8	16.1	9.5	19	M 6	5	6.6	6
0220	24.8–26.5	17.02 ◊	25.9	31.7	20.8	12.7	25.4	M 8	6	8.8	4
0230	37.3–39.8	74.72 ◊	38.6	47.6	30.8	19	38.1	M 12	10	15.5	2
0240	49.7–52	113.52 ◊	51.5	63.5	41.2	25.4	50.8	M 16	14	26.6	2
		(343)									

* 0.2 mm wider than dimension D, prevents clamping element from turning when clamping it.

Dimension A = Width in unspread and spread condition.
Dimension F = Distance between workpieces.

Clamps Pitbull

Design: Space-saving design allows more parts per clamping.
Support at the rear side and clamp to the front and to the bottom by tightening the screw (DIN 912): an absolute pull-down effect is thereby reached.



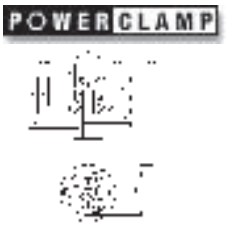


Part No.	Design	3917	Material of clamping disc	A mm	B mm	C mm	D mm	Screw	Clamping width mm	Clamping force kN	Tightening torque Nm	Clamping travel mm	PU
0250	Sharp-edged	18.31 ◊	Tempering steel	3.8	3.6	9.5	1.9	M 2.5	9.5	2.8	1.8	0.15	8
0260	Blunt	18.16 ◊	Tempering steel	3.8	3.6	9.5	1.9	M 2.5	9.5	2.8	1.8	0.15	8
0270	Blunt	18.38 ◊	Brass	3.8	3.6	9.5	1.9	M 2.5	9.5	0.9	0.6	0.15	8
0280	Sharp-edged	18.94 ◊	Tempering steel	5.1	4.8	12.7	2.6	M 4	12.7	6.6	5.6	0.4	8
0290	Blunt	18.74 ◊	Tempering steel	5.1	4.8	12.7	2.6	M 4	12.7	6.6	5.6	0.4	8
0300	Blunt	19.07 ◊	Brass	5.1	4.8	12.7	2.6	M 4	12.7	1.7	2.8	0.4	8
0310	Sharp-edged	24.42 ◊	Tempering steel	7.6	7.2	19.1	3.8	M 6	19.1	16	22.5	0.6	6
0320	Blunt	24.21 ◊	Tempering steel	7.6	7.2	19.1	3.8	M 6	19.1	16	22.5	0.6	6
0330	Blunt	24.50 ◊	Brass	7.6	7.2	19.1	3.8	M 6	19.1	4.2	5.6	0.6	6
0340	Sharp-edged	36.61 ◊	Tempering steel	10.2	11.4	25.4	6.4	M 10	25.4	26	40.5	1.2	4
0350	Blunt	36.61 ◊	Tempering steel	10.2	11.4	25.4	6.4	M 10	25.4	26	40.5	1.2	4
0360	Sharp-edged	66.86 ◊	Tempering steel	15.2	16.2	38.1	9.5	M 12	38.1	37.5	200	1.9	2
0370	Blunt	66.86 ◊	Tempering steel	15.2	16.2	38.1	9.5	M 12	38.1	37.5	200	1.9	2
		(343)											

Dimension B and D are recommended values.

Tensioning Spindles XPA

Design: Almost any workpiece has at least one bore. This bore can be used for clamping the workpiece (part to be turned, milled, drilled) for machining of the second side. By means of the tensioning spindle the part is clamped internally. It is made of structural steel and can be machined without any problems. The diameter of the fixing flange is concentric to the clamping diameter, thereby achieving a high repeatability of the parts. The clamping screw is hardened and coated. Three fastening screws are included in the scope of supply.





Part No.	Diameter F mm	3917	A mm	B mm	C mm	D mm	E mm	G mm	H mm	I clamping screw	J mm
0380	7.4	57.01 ◊	10.7	7.6	6.1	3	20	4.1	M 2	M 2	4.1
0390	12	57.65 ◊	21.8	16	15	5.9	29.72	8	M 3	M 4	8
0400	14	60.50 ◊	24.9	19	15	5.9	31.5	12	M 3	M 6	12
0410	20	63.88 ◊	24.9	19	15	5.9	37.5	14	M 3	M 8	14
0420	27	82.17 ◊	28.6	22.2	17.5	6.4	50	20	M 4	M 10	17
0430	35	102.10 ◊	31.8	25.4	20.6	6.4	56	25	M 4	M 12	21
0440	42	130.94 ◊	39.6	31.8	27	7.9	69.5	30	M 5	M 16	22
0450	51	134.20 ◊	39.6	31.8	27	7.9	75.5	30	M 5	M 16	22
0460	77	246.72 ◊	45.5	37.6	32.3	7.9	107.5	30	M 6	M 16	20
0470	103	324.19 ◊	46	38	32	8	132.9	30	M 6	M 16	20
		(343)									

Dimension G is the lowest diameter on which dimension F can be milled or turned.

Clamps

Design: Tempering steel, painted.
With plane-parallel clamping and holding faces. Clamps can be combined with various clamping underlays and adapted to different workpiece shapes and sizes.

DIN 6314

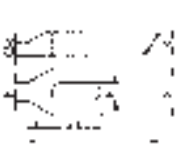
3918 **Basic Clamps, DIN 6314**

3919 **Clamp with Stepped Teeth**





3918





3919

Part No.	Slot width b_1 mm	3918 mm	3919 mm	Length l mm	For screws	a mm	b_2 mm	b_3 mm	e_1 mm	e_2 mm
0007	6.6	2.80	5.47	50	M 6	10	20	8	10	20
0009	9	3.55	6.64	60	M 8	12	25	10	13	22
0011	11	3.96	6.64	80	M 10	15	30	12	15	30
0013	11	–	10.36	125	M 10	15	30	12	15	70
0014	14	4.74	7.74	100	M 12/M 14	20	40	14	21	40
0016	14	5.39	–	125	M 12/M 14	20	40	14	21	50
0017	14	–	13.52	160	M 12/M 14	20	40	14	21	90
0018	18	6.60	12.24	125	M 16/M 18	25	50	18	26	45
0020	18	8.74	–	160	M 16/M 18	25	50	18	26	65
0021	18	–	22.03	200	M 16/M 18	25	50	18	26	110
0022	22	12.65	19.51	160	M 20/M 22	30	60	22	30	60
0024	22	15.71	–	200	M 20/M 22	30	60	22	30	80
		(340)	(340)							

Elbow Clamps

Design: Tempering steel, painted.
With plane-parallel clamping and holding faces. Clamps can be combined with various clamping underlays and adapted to different workpiece shapes and sizes.

DIN 6316



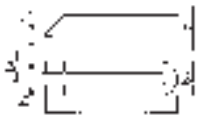


Part No.	Slot width b_1 mm	3920 mm	Length l mm	For screws	a mm	b_2 mm	b_3 mm	c mm	e_1 mm	e_2 mm
0007	6.6	5.11	60	M 6	10	20	10	8	20	20
0009	9	6.11	80	M 8	12	25	12	9	25	25
0011	11	6.56	100	M 10	15	30	15	12	32	32
0014	14	7.45	125	M 12/M 14	20	40	20	16	40	40
0018	18	11.98	160	M 16/M 18	25	50	25	20	49	50
0022	22	17.58	160	M 20/M 22	30	60	30	24	55	55
		(340)								

Fork Clamps, Bevelled

Design: Tempering steel, painted.
With plane-parallel clamping and holding faces. Clamps can be combined with various clamping underlays and adapted to different workpiece shapes and sizes.

DIN 6315B

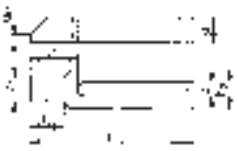




Part No.	Slot width b_1 mm	3921 mm	Length l mm	For screws	a mm	b_2 mm	b_3 mm	b_4 mm
0007	6.6	4.06	60	M 6	12	19	6	3
0009	9	4.09	80	M 8	15	25	8	4
0011	11	4.65	100	M 10	20	31	10	5
0014	14	5.59	125	M 12/M 14	25	38	12	6
0015	14	6.48	160	M 12/M 14	25	38	12	6
0016	14	8.27	200	M 12/M 14	25	38	12	6
0018	18	7.86	160	M 16/M 18	30	48	15	8
0019	18	9.15	200	M 16/M 18	30	48	15	8
0020	18	13.21	250	M 16/M 18	40	48	15	10
0022	22	12.07	200	M 20/M 22	40	52	15	10
0024	22	16.37	250	M 20/M 22	40	62	20	10
0026	22	21.05	315	M 20/M 22	40	62	20	10
		(340)						

Fork Clamps with Nose

Design: Tempering steel, painted.
With plane-parallel clamping and holding faces. Clamps can be combined with various clamping underlays and adapted to different workpiece shapes and sizes.



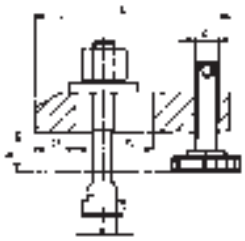


format professional quality

Part No.	Slot width b_1 mm	3922 mm/inch	l_1 mm	For screws	a mm	b_2 mm	b_3 mm	l_2 mm	l_3 mm
0009	9	8.42	100	M 8	15	30	16	32	18
0011	11	10.28	125	M 10	20	30	20	38	24
0014	14	11.51	160	M 12/M 14	25	40	24	47	30
0018	18	16.53	200	M 16/M 18	30	50	28	57	36
0022	22	27.14	250	M 20/M 22	40	60	35	68	45
		(340)							

Straight Clamps with Adjustable Supporting Screw

Design: Tempering steel, painted.
With bolts for T-slots DIN 787, nut and washer.





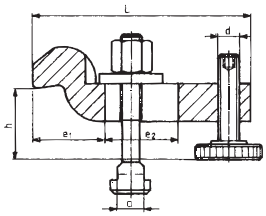
format professional quality

Part No.	Groove width mm	3924 mm/inch	T-slot bolt	Slot width. mm	h mm	l_1 mm	e_1 mm	e_2 mm
0010	10	14.82	M 10 x 10 x 80	11	8–32	39	15	30
0012	12	17.09	M 12 x 12 x 100	14	10–40	49	21	40
0014	14	17.09	M 12 x 14 x 100	14	10–38	49	21	40
0015	16	23.65	M 16 x 16 x 125	18	13–48	55	26	45
0018	18	24.71	M 16 x 18 x 125	18	13–48	55	26	45
0022	22	39.12	M 20 x 22 x 160	22	16–65	69	30	60
		(340)						

h = depends on depth of slot, in accordance with DIN 650, and nut screw-in length.

Elbow Clamps with Adjustable Supporting Screw

Design: Tempering steel, painted.
With bolts for DIN 787 T-slots, nut and washer.





format professional quality

Part No.	Groove width mm	3925 mm/inch	T-slot bolt	Slot width. mm	H mm	l_1 mm	e_1 mm	e_2 mm
0011	10	20.00	M 10 x 10 x 80	11	22–51	39	32	32
0014	12	23.24	M 12 x 12 x 100	14	28–65	49	40	40
0015	14	23.24	M 12 x 14 x 100	14	28–65	49	40	40
0017	16	31.51	M 16 x 16 x 125	18	36–75	55	49	50
0018	18	31.51	M 16 x 18 x 125	18	36–75	55	49	50
0020	22	50.20	M 20 x 22 x 200	22	43–92	69	55	70
		(340)						

h = depends on depth of slot, in accordance with DIN 650, and nut screw-in length.

Detent Clamping Lever

Design: Steel, bronze finish.
Suitable for the following adjustable clamps: 3924, 3925 and 3931.



format professional quality

Part No.	Dimensions	3925 mm/inch	l mm	d mm	h mm
5010	M 12	33.03	135	33	48
5020	M 16	37.32	151	40	64
		(340)			

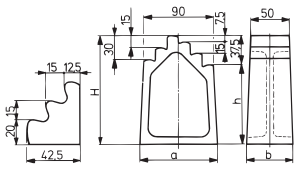
Stepped Jack DIN 6318

Design: Engineering casting, painted. Standing surface and steps milled flat. Support surface 50 mm wide. Stepped jacks have clamping steps of 7.5 mm difference in height.

DIN 6318

format professional quality

Part No.	Size mm	3928	Clamping height h-H mm
0050	50	9.97	12.5– 50
0095	95	15.89	57.5– 95
0140	140	20.41	102.5–140
0185	185	28.01	147.5–185
0230	230	33.21	192.5–230
0275	275	37.32	237.5–275
0320	320	46.57	282.5–320
		(340)	





Universal Set-up Blocks

Design: Tempering steel, painted. Step height: Vertical 4.65 mm, horizontal 2.3 mm. Depth 30 mm.

format professional quality

Part No.	Dimensions	3926	Clamping height h-H mm	a mm	b mm	c mm
0010	1	2.31	22– 51	33	19	38
0020	2	4.21	39–107	66	35.5	70
0030	3	10.46	71–208	131	68	135
		(340)				



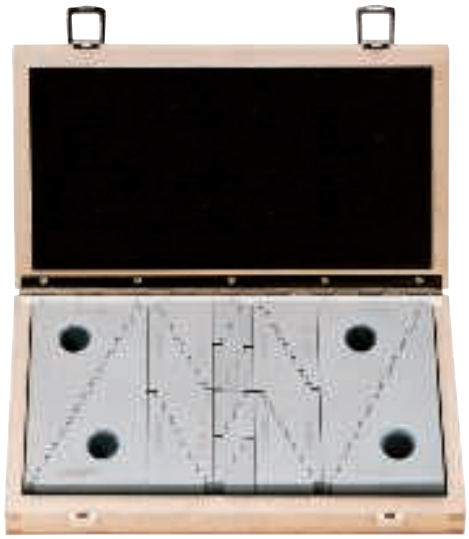


Universal Set-up Block Sets

Design: Tempering steel, painted.
In wooden box with hinged lid.
Clamping height from 22 to 208 mm.
8 piece size 1 (part no. 3926 0010),
8 piece size 2 (part no. 3926 0020),
4 piece size 3 (part no. 3926 0030).

format professional quality

Part No.	Dimensions W x H x D mm	3927	Set contents
0001	380 x 155 x 40	99.19	20-piece
		(340)	



Screw Jacks with Flat Support Surface

Design: Tempering steel, painted. With centring hole, ⌀ 12 mm. Spindle: Trapezoid thread, self-locking, with end lock. Medium jacks fit clamps with a slot width of approx. 14–22 mm. Size 52, 70 and 100. Heavy-duty jacks fit clamps with a slot width of approx. 20–44 mm. Size 140. Extra heavy jacks are intended for large workpieces. Size 200.

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Part No.	Size mm	3929	Height-adjustable h-H mm	Support ⌀ mm	Base ⌀ mm	Carrying force kN
0052	52	19.61	42– 52	50	50	60
0070	70	20.97	50– 70	50	50	60
0100	100	23.90	70–100	50	50	60
0140	140	41.71	100–140	65	70	100
0200	200	98.40	140–200	80	100	350
		(340)				



Heavy Duty Screw Jacks

Design: With centring hole 12 mm ⌀. With brass locking screw.

Material: Spindle made of tempering steel with trapezoidal thread, spindle painted.

Body: Painted tempering steel.

Part No.	Size mm	3929	Height-adjustable h-H mm	a mm	d mm	Carrying force kN
0300	300	148.98	200–300	26	70	80
0460	460	180.17	280–460	26	70	60
		(340)				





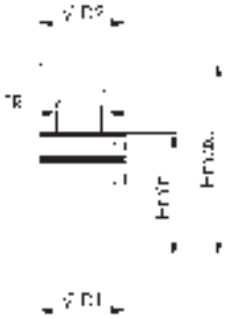
Screw Jacks with Magnetic Base

Design: Medium screw jacks. Body and spindle made of tempering steel, painted. Trapezoid thread, self-locking, with end lock. With centring hole ⌀ 12 mm to hold various clamps.

Application: For clamps with a slot width of 14–22 mm.

Note: Suitable clamps see (part no. 3930 and 3932).

Part No.	Size	3905	Height- h-H adjustable mm	Support ⌀ mm	Base ⌀ mm	Carrying force kN
7000	52	32.62	52– 62	50	50	60
7100	70	33.41	62– 72	50	50	60
7200	100	34.19	80–110	50	50	60
		(342)				





Magnetic Base for Screw Jack

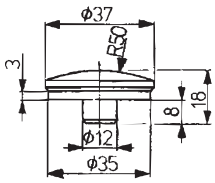
Part No.	3905
7300	23.50
	(342)



Ball Attachments

Material: Steel, tempered, with bronze finish.

Part No.	⌀ D mm	3932
0010	37	4.50
		(340)

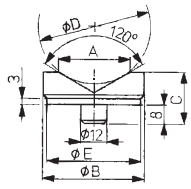


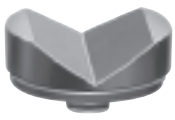


V-Block Attachments

Design: Steel, tempered, bronze finish.

Part No.	Dimensions	3932	A mm	B ⌀ mm	C mm	D ⌀ mm	E ⌀ mm
0030	45	9.00	32	45	23	10–50	42
		(340)					

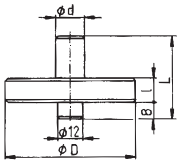




Fixing Sets

Material: Tempered steel with bronze finish. For fork clamp.

Part No.	Dimensions	3932	D ⌀ mm	d ⌀ mm	L mm	l mm
0050	14	15.48	63	14	40	12
0070	25	19.84	78	25	53	15
		(340)				

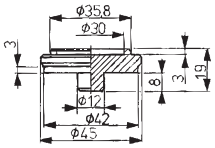




Centre Plates

Application: Screw jack, ⌀ 50 mm, can be used with all Format screw jacks and aligning equipment with ⌀ 12 mm mounting hole.

Part No.	For attaching screw jacks	3932 mm
0090	As no. 3929/size 52–100	6.11
		(340)





Attachments with Rotating Ball

Design: Tempered steel, bronze finish. Ball hardened.
This solid element is suitable for supporting and aligning of cast and forged parts.

Part No.	Carrying force kN	3930 mm
0001	30	17.81
		(340)





Screw Jacks with Rotating Ball

Design: Tempered steel, bronze finish, ball hardened.
Due to its support, this element is suitable for supporting and aligning of cast and forged workpieces.
The adjusting accuracy is 0.1 mm.

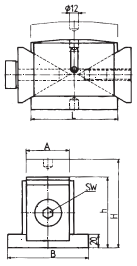
Part No.	Size	3930 mm	Height-adjustable h-H mm	Carrying force kN
0003	70	26.81	56–70	30
		(340)		

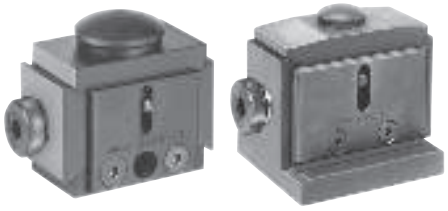




Aligning Wedges

Design: Spheroidal graphite iron and tempered steel with bronze finish. Centre hole ⌀ 12 mm. With ball attachment 3932.
The alignment wedge can be easily adjusted with normal hand strength at a load of 1/3 F max. The finely finished wedge surfaces enable smooth, sensitive adjustment, more accurate than 1/10 mm, using either knurled thumbscrew or hexagonal screwdriver.
The double wedge effect guarantees precise vertical movement with no lateral drift. The hollow wedge has proven ideal for difficult cast or forged pieces on large tool machines. The aligning wedge can be attached to heavy-duty screw jacks. For this purpose, you will require a parallel pin 6325 (12 x 30 mm).



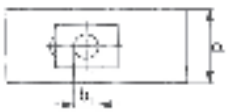


Part No.	Dimensions	3930 mm	Height-adjustable h-H mm	a mm	b mm	L mm	SW mm	H* U mm	Carrying force kN
0010	63	153.85	50– 63	40	–	63	8	0.86	40
0020	125	331.19	100–125	60	115	125	14	1.16	100
0030	190	862.35	170–190	80	145	175	22	2.02	250
		(340)							

* H mm U = height adjustment per revolution.

Clamping Claws, Continuously Adjustable

Design: With bolt for T-slots DIN 787, nut and washer.
Steel, forged and tempered, galvanised.

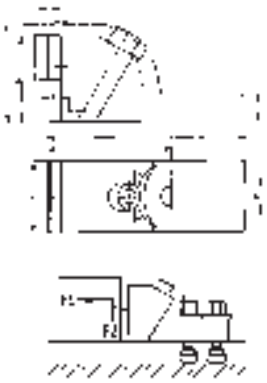




Part No.	Slot width mm	3931 mm	b_1 mm	T-slot bolt	Clamping height mm	b x l mm
5012	12	26.96	17	M 12 x 12 x 125	0–50	50 x 140
5014	14	27.45	17	M 12 x 14 x 125	0–50	50 x 140
5016	16	29.64	17	M 16 x 16 x 160	0–75	50 x 140
5018	18	29.64	17	M 16 x 18 x 160	0–75	50 x 140
		(340)				

Heavy-Duty Clamping Jaws

Design: Body: Malleable cast iron. Clamping jaws: Case-hardened steel. Reversible clamping jaws, high, with precise V-block guide. No hexagonal screwdriver or fixing bolts. The stated clamping forces are achieved with the optimum arrangement of the fixing bolts and utilisation of maximum admissible torque. The pull-down force F2 is achieved with a flat upper workpiece surface. Thanks to its large clamping surface this heavy-duty clamping jaw is suitable for lateral clamping of tall workpieces. Reversible clamping jaws, with flat side for finished workpieces and grooved side for rough clamping faces. We recommend using two clamping bolts for fastening to the machine table! Order fastening screws separately depending on the groove width, DIN 787 bolts for T-slots – two per clamping jaw.



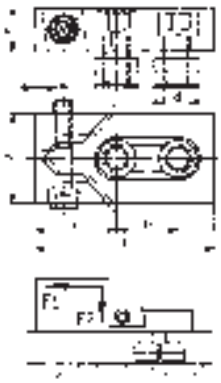


Part No.	Slot width mm	3933	b_1 mm	c mm	h mm	h_1 mm	h_2 mm	h_3 mm	b mm	l mm	l_1 mm	e mm	F1 kN	F2 kN
0019	12 14 16 18	148.19	19	8	85	37	99	40	65	177.5	112.5	12	8 15 20 28	1.2 2.2 3.0 4.2
0026	20 22 24 28 30	205.67	26	11	100	45	118	40	75	226.5	136.5	12	30 30 32 32 36	4.5 4.5 4.8 4.8 5.4

(340)

Deep Clamping Jaws

Design: Tempered and bronze finish. Complete with fixing screws, DIN 912, nuts for T-slots DIN 508 and hexagon socket screw driver ISO 2936 C. Simultaneous clamping due to wedge effect, front and rear.



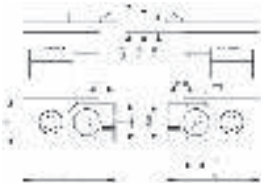


Part No.	Slot width mm	3934 Pair	c mm	h mm	b mm	l mm	l_1 mm	l_2 mm	d	F1 kN	F2 kN
0012	12	55.06	3	20	40	80	39	26	M 10	16	0.6
0014	14	59.53	3	20	40	80	39	26	M 12	22	0.9
0016	16	63.97	3	20	40	80	39	26	M 12	22	0.9
0018	18	78.15	4	25	50	100	46	34	M 16	36	1.4
0020	20	83.82	4	25	50	100	46	34	M 16	36	1.4
0022	22	137.65	5	30	78	140	65	50	M 20	36	1.4

(340)

Horizontal Flat Clamping Devices for T-Slot Tables

Design: Including a clamping element and a stop.

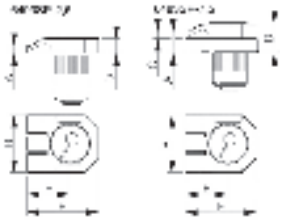


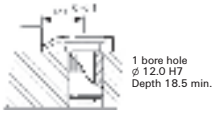


Part No.	Slot a	3905	Clamping force N	Clamping height mm	Stroke	A	B	Weight g
8000	10	184.90	4000	7.5	1.2	46	18	140
8100	12	184.90	4000	7.5	1.2	48	18	150
8200	14	209.82	4000	7.5	1.2	52	22	162
8300	16	213.36	4000	7.5	1.2	48	25	178
8400	18	218.08	4000	7.5	1.2	48	25	190
		(342)						

Horizontal Clamping Devices

Application: The clamping devices turn around an eccentric shaft which furnishes the clamping force. It can be clamped in all directions.
The clamping device (1 fixed stop) permits easy positioning of the workpiece at the stops.





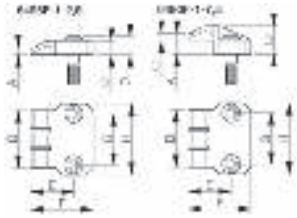


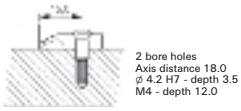
Part No.	Clamping height A	3905	B	C	D	E	F	Weight g	Clamping force N
8500	2.5	40.10	20	–	5	15*	25	29	4000
8600	7.5	42.37	10	2.5	10	15*	25	29	4000
		(342)							

* Eccentric stroke ± 0.6 mm.

Fixed Stops

Application: The ground stops are fastened by means of special screws ensuring high accuracy during assembly.
Size 1 – Single stop
Size 2 – Double stop



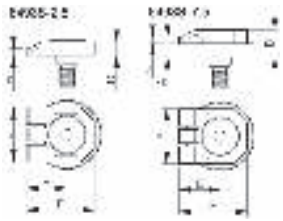


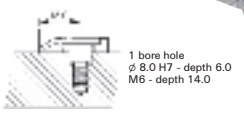


Part No.	Size	3905	Clamping height A	B	C	D	E	F	G	H	Weight g
8700	1	31.21	2.5	20	5.0	6.5	15	22	18	25	23
8800	1	32.31	7.5	20	2.5	10	15	22	18	25	23
8900	2	34.51	2.5	25	5.0	6.5	15	22	18	–	23
9000	2	37.90	7.5	25	2.5	10	15	22	18	–	23
		(342)									

Swing Stops

Application: The ground stops are fastened by means of special screws ensuring high accuracy during assembly.







Part No.	Clamping height A	3905	B	C	D	E	F	Weight g	Clamping force N
9100	2.5	33.41	20	–	5	15*	25	29	4000
9200	7.5	36.79	20	2.5	10	15*	25	29	4000
		(342)							

* Eccentric stroke ± 0.6 mm.

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Quick-clamping devices function following the toggle lever method and offer these advantages: Wide and quick opening of the clamping device, complete clearing and unimpeded removal of the workpiece. The high transmission ensures high clamping forces with only minor effort. The self-locking in the clamping position prevents opening of the clamping device caused by the operating forces.
The selection of the correct clamping device size depends on the forces (see table). The forces are indicated as kN and differentiated between retention force F1 and F2.

Application: The favourable relation of force and movement and the convenient use enable various applications of the quick-clamping device. They are used in metalworking industry for drilling, welding, bending, grinding, controlling and mounting as well as in the wood working and plastics industry on gluing, drilling, cutting and milling devices.

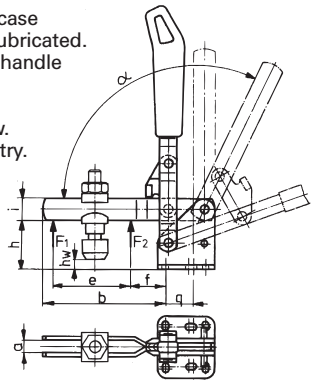
The clamping force is the force which is exerted by the clamping arm on the workpiece when closing the clamping device.
In contrast to pneumatic clamping devices, the clamping forces cannot be indicated in case of manual clamping devices, as they depend on the operator.

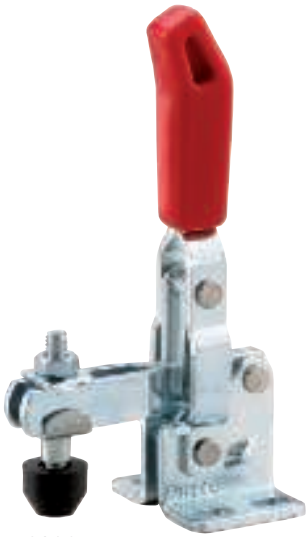
The retention force is the force which the closed clamping arm reacts on the operating forces generated at the workpiece and which it resists without deformation. The retention force is higher than the clamping force, as in case of a closed spanner, the dead centre of the lever must be overcome when pushed back.

Vertical Clamping Devices with Horizontal Base

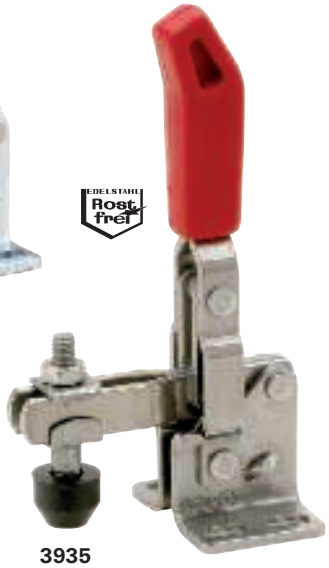
3936 **Design:** Zinc-coated and passivated. Rivets in stainless steel, running in case-hardened bearing bushes; for reasons of space not in case of sizes 0 and 1. Bearings lubricated. With open arm, ergonomic handle made of red oil-resistant plastic material. Setscrew made of machining steel and completely zinc-coated.

3935 **Design:** Stainless steel, polished. Rivets in bearing bushes, for reasons of space not in case of sizes 0 and 1. Bearings lubricated. With open arm, ergonomic handle made of red oil-resistant plastic material. With stainless setting screw. Also suitable for food industry.

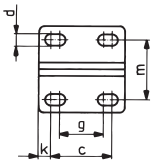




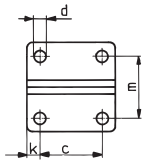
3936



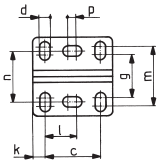
3935



Size 0



Sizes 1, 3, 4, 6



Sizes 2 + 5

Part No.	Dimensions	3936	3935	F_1 kN		F_2 kN	Length of clamping lever mm	Length of clamping arm mm
0000	0	8.08	14.37	0.5		0.7	90	49
0010	1	9.16	15.74	0.8		1.1	105	60
0020	2	12.09	20.13	1		1.2	144	82
0030	3	14.27	28.08	1.4		2.5	206	112
0040	4	19.07	–	2		3	230	140
0050	5	30.68	–	3		5	300	195
0060	6	43.41	–	3.5		5.5	347	230
		(342)	(342)					

Table of Dimensions

Size	a	b	c	d	e	f	g	h	i	k	l	m	n	p	q	α	α*
0	4	31	13.5	4.5	16	10	8.5	17.5	8	4.0	4.3	–	23	–	10.0	95°	–
1	5	38	16.0	4.5	19	14	–	20.0	10	5.5	–	24	–	–	12.0	95°	–
2	6	51	20.0	5.5	25	20	24.0	25.0	12	6.0	12.5	30	27	–	13.0	105°	60°
3	8	80	20.0	7.1	43	27	–	34.0	18	7.5	–	32	–	–	16.0	105°	60°
4	10	100	32.0	8.5	61	30	–	42	20	13.0	–	45	–	–	22.0	105°	60°
5	14	142	45.0	8.5	88	40	45.0	55	25	9.5	31.5	50	45	5	31.0	115°	60°
6	14	165	50.5	13.0	90	55	–	81	30	24.5	–	70	–	–	35.5	140°	60°

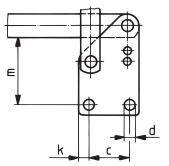
* Alternatively with reversible stop pin.

Vertical Clamping Devices with Vertical Base

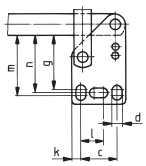
Design: Zinc-coated and passivated. Rivets in stainless steel, running in case-hardened bearing bush, for lack of space not in size 1. Bearings lubricated. With open arm, ergonomic handle made of red oil-resistant plastic material. Setscrew made of machining steel and completely zinc-coated.

Application: For fixing on webs and for welded constructions.

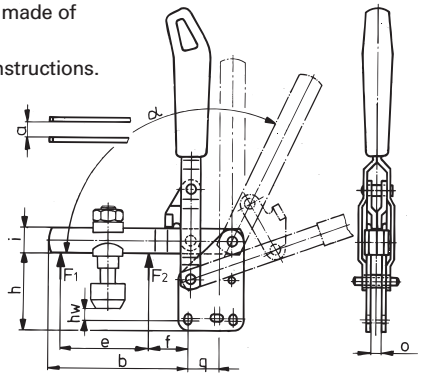
Note: Transverse arm for two-point clamping see (part no. 3946).



Sizes 1, 3, 4, 6



Size 2 + 5





Part No.	Dimensions	3937	F_1 kN		F_2 kN	Length of clamping lever mm	Length of clamping arm mm
0010	1	9.16	0.8		1.1	115	60
0020	2	12.09	1.0		1.2	157	82
0030	3	14.27	1.4		2.5	220	98
0040	4	19.07	2.0		3.0	252	140
0050	5	30.68	3.0		5.0	321	195
0060	6	43.41	3.5		5.5	382	230
		(342)					

Table of Dimensions

Size	a	b	c	d	e	f	g	h	i	k	l	m	n	o	q	α	α*
1	5	38	16.0	4.5	19	14	–	31	10	5.5	–	26.5	–	5	12.0	95°	–
2	6	51	20.0	5.5	25	20	30	38	12	6.0	12.5	33.0	31	5.5	13.0	105°	60°
3	8	80	20.0	7.1	43	27	–	48	18	7.5	–	42.0	–	6	16.0	105°	60°
4	10	100	32.0	8.5	61	30	–	65	20	13.0	–	55.5	–	8	22.0	105°	60°
5	14	142	45.0	8.5	88	40	64	76	25	9.5	31.5	66.5	64	10	31.0	115°	60°
6	14	165	50.5	13.0	90	55	–	117	30	24.5	–	102.0	–	10	35.5	140°	60°

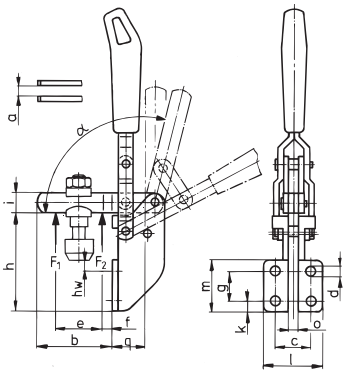
* Alternatively with reversible stop pin.

Vertical Clamping Devices with Angular Base Type 6803

Design: Zinc-coated and passivated. Rivets in stainless steel, running in case hardened bearing bushes, for lack of space not in size 1. Bearings lubricated. With open arm, ergonomic handle made of red oil-resistant plastic material. Setting screw tempered, zinc-coated.

Application: For lateral assembly.

Note: Transverse arm for two-point clamping see (part no. 3946).





Part No.	Dimensions	3938	F_1 kN		F_2 kN	Length of clamping lever mm	Length of clamping arm mm
0010	1	10.55	0.8		1.1	132	60
0020	2	13.22	1.0		1.2	180	76
0030	3	14.37	1.8		2.5	243	98
		(342)					

Size 2 also available in stainless steel.

Table of dimensions

Size	a	b	c	d	e	f	g	h	i	k	l	m	o	q	α	α*
1	5	34	17.5	4.5	19	8	14	47	10	5.5	28	25	5	16	105°	–
2	6	40	25.5	5.5	25	9	20	61	12	6	37	32	5	24	105°	60°
3	8	65	28.5	6.5	43	11	24	71	18	7	42.5	38	6	31	105°	60°

* Alternatively with reversible stop pin.

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Horizontal Clamping Devices with Horizontal Base

3939 **Design:** Zinc-coated and passivated. Rivets in stainless steel, running in case hardened bearing bushes, for lack of space not in size 0 and 1. Bearings lubricated. With open arm, ergonomic handle made of red oil-resistant plastic material. Setting screw tempered, zinc-coated.

3949 **Design:** Stainless steel, polished. Rivets in stainless steel, running in case hardened bearing bushes, for lack of space not in size 1. Bearings lubricated. With open arm, ergonomic handle made of red oil-resistant plastic material. Setting screw tempered, zinc-coated. Also suitable for food industry.

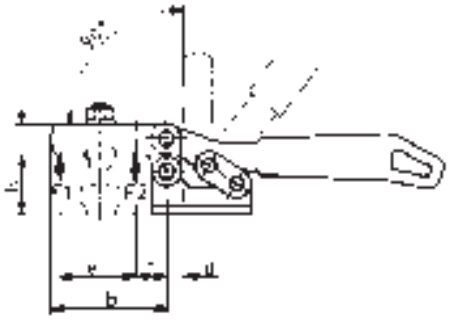
Note: Transverse arm for two-point clamping see (part no. 3946).



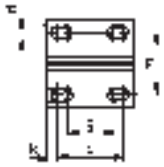
3939



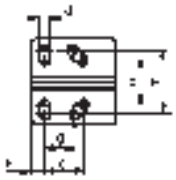
3949



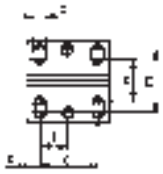




Sizes 0 + 5



Size 1



Sizes 2, 3 + 4

Part No.	Dimensions	3939	3949	F1 kN	F2 kN	Clamping height mm	Total length mm
0000	0	7.31	12.91	0.25	0.4	23	85
0010	1	10.55	18.17	0.8	1.1	30	130
0020	2	11.76	20.21	1	1.2	44	176
0030	3	14.68	24.91	1.8	2.5	48	221
0040	4	18.99	–	2	3	74	293
0050	5	30.27	–	3	5	71	338
		(342)	(342)				

Table of Dimensions

Size	a	b	c	d	e	f	g	h	i	k	l	m	n	q	α
0	4	26	16.0	4.6	11	10	11.2	15	7	5.0	–	15.6/16	–	2	90°
1	5	40	15.0	4.8	26	11	13.0	20	10	5.5	–	22.0	18	5	90°
2	6	64	26.0	5.5	35	22	–	25	13	6.0	12.7	29.0	20	0	90°
3	8	72	25.5	6.5	44	22	–	33	15	7.0	–	29.0	23	8	90°
4	10	111	41.0	8.5	66	34	–	44	20	8.0	–	43.0	29	1	90°
5	10	121	41.5	8.5	78	30	–	46	25	12.5	20.5	41.5	–	9	90°

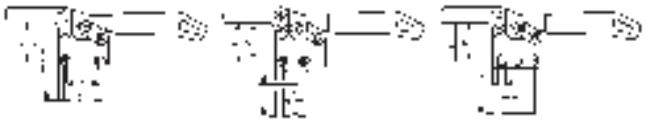
Horizontal Clamping Devices with Vertical Base

Design: Zinc-coated and passivated. Rivets in stainless steel, running in case hardened bearing bushes, for lack of space not in size 0 and 1. Bearings lubricated. With open arm, ergonomic handle made of red oil-resistant plastic material. Setting screw tempered, zinc-coated.

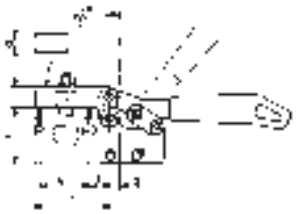
Application: For fixing on webs and for welded constructions.

Note: Transverse arm for two-point clamping see (part no. 3946).





Sizes 0 + 5 Size 1 Size 2, 3 + 4





Part No.	Dimensions	3940	F1 kN	F2 kN	Clamping height mm	Total length mm
0000	0	7.31	0.25	0.4	33	86
0010	1	10.55	0.8	1.1	42	130
0020	2	11.76	1	1.2	59	176
0030	3	14.68	1.8	2.5	63.5	221
0040	4	20.13	2	3	96	293
0050	5	31.96	3	5	91.5	338

(342)

Table of Dimensions

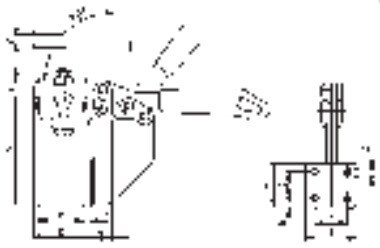
Size	a	b	c	d	e	f	g	h	i	k	l	m	n	o	q	α
0	4	26	16.0	4.6	11	10	11.2	24	7	5.0	–	20	–	3	2	90°
1	5	40	15.0	4.8	26	11	13.0	32	10	5.5	–	27	25	5	5	90°
2	6	64	26.0	5.5	35	22	–	40	13	6.0	12.7	35	31	5	0	90°
3	8	72	25.5	6.5	44	22	–	48	15	7.0	–	42	39	6	8	90°
4	10	111	41.0	8.5	66	34	–	66	20	8.0	–	59	52	8	1	90°
5	10	121	41.5	8.5	78	30	–	66	25	12.5	20.5	58	–	10	9	90°

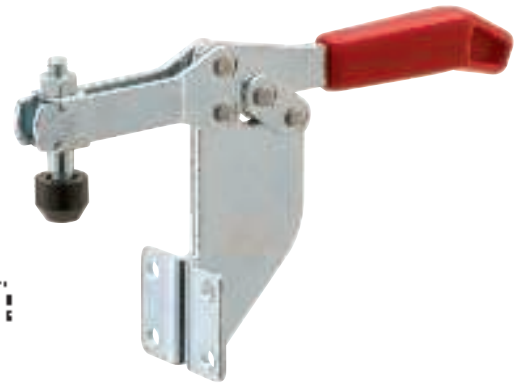
Horizontal Clamping Devices with Angular Base

Design: Zinc-coated and passivated. Rivets in stainless steel, running in case hardened bearing bushes. Bearings lubricated. With open arm, ergonomic handle made of red oil-resistant plastic material. Setting screw tempered, zinc-coated.

Application: For lateral assembly.

Note: Transverse arm for two-point clamping see (part no. 3946).





Part No.	Dimensions	3941	F1 kN	F2 kN	Clamping height mm	Total length mm
0020	2	12.74	1	1.2	88.5	176
0030	3	15.65	1.8	2.5	86	221

(342)

Table of Dimensions

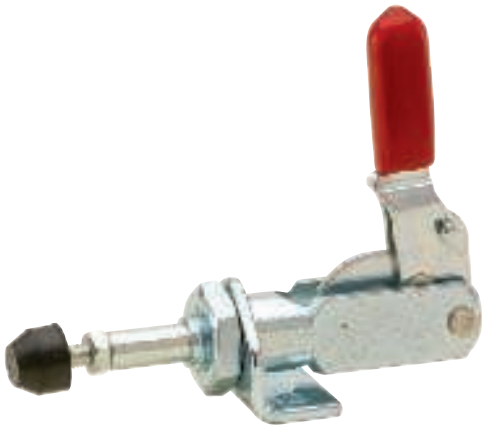
Size	a	b	c	d	e	f	g	h	i	k	l	m	q	α
2	6	52	25.5	5.5	35	10	20	74	13	6	37	32	12	90°
3	8	58	28.5	6.5	40	8	24	71	15	7	42.5	38	23	90°

Push-Pull Clamping Devices with Small Angular Base

Design: Push and pull clamping device (push rod and hand lever unidirectional). Long push rod guide with fixing thread and nut. Zinc-coated and passivated. Rivets in stainless steel, running in case-hardened bearing bushes in case of size 2 and 3. Lever parts and push rod made of machining steel. Bearings lubricated. Handle made of red, oil-resistant plastic. Hand lever adjustable at any angle to the base. Setscrew in machining steel and completely zinc-coated.

Application: The clamping device can be fixed at sheet metal walls without angular base or fixed in devices with its thread by screwing.





Part No.	Dimensions	3942	F_1 kN		F_2 kN	Total height mm	Total length mm
0000	0	16.15	0.8		0.8	47	90
0010	1	16.97	1		1	60	121
0020	2	17.46	2		2	95	165
0030	3	21.03	2.5		2.5	96	190
0050	5	31.88	4.5		4.5	131	239
		(342)					

Size 0 and 3 also available in stainless steel.

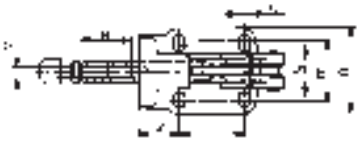
Table of Dimensions

Size	∅ a	b	c	d	e	f	g	h	k	l	m	n	o	M
0	6.5	33.0	16	4.5	13	16	16	12	M 10 x 10	10	16.0	25	6.5	M 4
1	8.0	44.5	20	4.5	20	20	16	15	M 12 x 1.0	16	19.5	30	7.0	M 4
2	10.0	57.5	25	5.5	25	28	–	20	M 16 x 1.5	19	36.0	50	12.5	M 6
3	12.0	69.0	32	6.5	30	30	30	25	M 20 x 1.5	22	42.0	60	13.0	M 8
5	16.0	81.5	40	8.5	50	35	30	30	M 24 x 1.5	25	45.0	65	15.0	M 12

Push-Pull Clamping Devices

Design: Push and pull clamping device (push rod and hand lever unidirectional). Heavy duty with long push rod guide, body made of malleable cast iron, varnished. Lever parts and push rod made of machining steel, zinc-coated and passivated. Rivets made of stainless steel, running in case-hardened bearing bushes in case of size 3. Bearings lubricated. Hand lever made of red, oil-resistant plastic. Setscrew in machining steel and completely zinc coated.

Application: To be used in puhing and pulling operations. Ideal for use in special clamping devices and series production.





Part No.	Dimensions	3943	F_1 kN		F_2 kN	Total height mm	Total length mm
0030	3	25.80	4		4	107	191
0050	5	38.05	10		10	134	245
0070	7	84.38	25		25	180	305
		(342)					

Table of Dimensions

Size	a	b	c	d	e	f	g	h	k	l	m	n	M
3	12	72	32	6.5	30	96	36	30	28	41	44	60	M 8
5	16	98	40	8.5	50	122	41	38	45	41	50	70	M 12
7	22	105	50	11.0	50	157	57	55	44	70	65	94	M 12

Push-Pull Clamping Devices

Design: Push and pull clamping device. Long push rod guide with fixing thread and nut. Zinc-coated and passivated. Rivets in stainless steel. Fitting bolt tempered. Bearings lubricated. Handle made of red, oil-resistant plastic. Setscrew in machining steel and completely zinc-coated.







Part No.	Dimensions	3954	F_1 kN		F_2 kN	Total height mm	Total length mm
0020	2	15.50	1		1	85	70
0030	3	17.84	2.5		2.5	135	110
0050	5	28.81	4		4	155	175
		(342)					

Also available in stainless steel.

Table of Dimensions

Size	∅ a	b	c	e	k	l	M
2	10	14-35	21	15	M 16 x 1.5	13	M 6
3	12	18-56	38	25	M 20 x 1.5	16	M 8
5	16	25-92	67	35	M 24 x 1.5	22	M 12

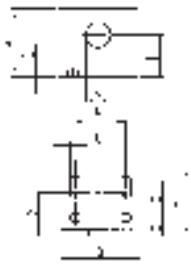
The push-pull clamping device can be fixed at sheet metal walls or screwed into devices with thread at the face. Furthermore, flange mounting by means of the angular base is possible.

Angular Bases

Design: Large range of application due to higher clamping height. For assembly of devices. Fixing by means of 4 screws.



Size 0, 3, 5



Size 1, 2



Part No.	Size	3957	a mm	f mm	i mm
0000	0	2.64	30	30	23
0010	1	3.28	60	40	40
0020	2	3.76	60	40	40
0030	3	5.44	65	44	50
0050	5	11.53	70	60	60
		(342)			

Table of Dimensions

Size	b	c	d	e	g	h	k	l	m
0	9	16	4.5	–	16	13	10.2	3	20
1	11	18	6.7	22	40	24	12.2	4	–
2	11	18	6.5	22	40	24	16.2	5	–
3	14.5	19	6.5	–	41	33	20.2	6	–
5	17	32	9	–	45	37	24.2	8	–

Toggle Clamps

Design: Zinc-coated and passivated. Case-hardened and lubricated bearing bushes. Rivets in stainless steel, hook and tensioning sleeve in machining steel. Red, oil-resistant plastic handle.

Application: Fixing of flaps and covers at containers.





Part No.	Dimensions	3944	Piston force kN	Setting range mm	Total height mm	Total length mm
0010	1	14.53	2	5	33	130
0030	3	16.31	3	12	36	230
0050	5	27.84	5	12	70	308
		(342)				

Also available in stainless steel.

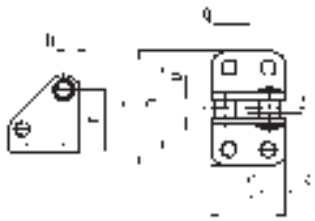
Table of Dimensions

Size	b	c	d	e	g	h	k	l	m	n	R	s
1	36–41	19	5.3	36.5–41.5	4.5	22.5	6	31	28	41	4.5	45
3	67–79	19	7.1	74.5–86.5	5.5	23.0	13	40	32–35	46	5.5	98
5	58–70	29	12	58.5–70.5	11	49.0	13	55	60	88	8.0	144

Fixed Catches

Design: Zinc-coated and passivated. Case-hardened bushes. Rivet in stainless steel. Suitable for article 3944.

Part No.	Size	3945 AMF	Total height mm	Total length mm
0010	1	5.85	29	31
0030	3	6.82	29	40
0050	5	9.50	61	55
		(342)		





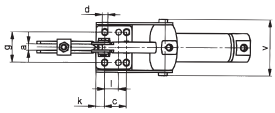
Also available in stainless steel

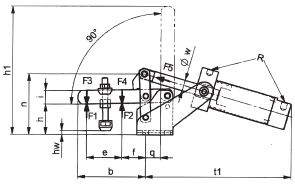
Table of Dimensions

Size	b	c	d	g	h	k	l	m	n	o
1	6	19	8	4.5	22.5	6	31	28	41	6.8
3	6	19	10	5.5	23.0	13	40	32–35	46	10.8
5	12	29	15	11.0	49.0	13	55	60	88	13.7

Pneumatic Vertical Clamping Devices

Design: Pneumatic clamping device with horizontal cylinder attachment. Fitted with FESTO pneumatic cylinder, double-acting, anodised and ready for connection. Magnetic piston for end position sensing. With throttling ports for cushioned speed. Clamping device zinc-coated and passivated, rivet in stainless steel running in case-hardened bearing bushes, for lack of space not in size 1. Bearings lubricated. Setscrew in machining steel and completely zinc coated.







Part No.	Size	3947 AMF	F1 kN	F2 kN	F3* kN	F4* kN	F5 kN	Vn**	Height mm	Length mm	Setscrew
0010	1	105.05 ◊	0.8	1.1	0.20	0.3	0.10	0.08	52	175	M 5 x 30
0020	2	114.00 ◊	1.0	1.2	0.70	1.0	0.30	0.26	66	200	M 6 x 35
0030	3	118.86 ◊	1.4	2.5	0.65	1.1	0.50	0.35	85	260	M 8 x 45
0040	4	167.54 ◊	2.0	3.0	1.50	2.2	0.75	0.80	100	315	M 8 x 65
		(342)									

* F3 + F4 = max. clamping forces at 6 bar.
** Vn = air consumption per double stroke in dm^3 at 6 bar.

Table of Dimensions

Size	a	b	c	∅ d	e	f	g	h	h1	hw	i	k	l	n	q
1	5	38	16	4.5	19	14	24	22	96	–2 ÷ 5	10	6.0	–	47	12
2	6	51	20	5.5	27	18	27	27	106	–1 ÷ 8	12	6.0	12.5	56	13
3	8	80	20	7.1	43	27	32	36	157	2 ÷ 14	18	7.5	–	74	16
4	10	100	32	8.5	52	35	45	45	194	–5 ÷ 24	20	8.0	–	87	22

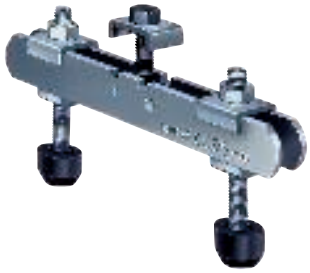
Transverse Arms for Clamping Device

Design: Zinc-coated and passivated, including tempered setscrews and fastening screw.

Application: Transverse arm size 3 suitable for: Clamping device 935, 3936, 3937, 3938, 3939, 3940, 3941, 3949.

Transverse arm size 4 suitable for: Clamping device 3935, 3936, 3937, 3939, 3940, 3947, 3949.

Transverse arm size 6 suitable for: Clamping device 3935, 3936, 3937.

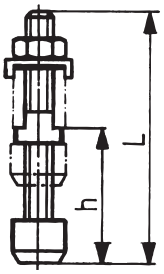


Part No.	Dimensions	3946 AMF	Screw DIN 933	Clamping range mm	Thickness mm
0010	3	12.43	M 8 x 45	34–100	120
0020	4	13.88	M 8 x 45	40–125	150
0030	6	20.77	M 12 x 80	54–200	240
		(342)			

Setting Screws for Open Holding Arm

Design: Tempered, zinc-coated and passivated. Strength class 8.8.
Size 0–3 with assortment of washers. Size 4–6 with nut for T-slot.

Part No.	Dimensions	3946	Screw DIN 933	Nut for T-slot DIN 508	L mm	h min. mm	h max. mm
0040	0/0	2.43	M 4 x 25	–	32	13	20
0045	0	2.43	M 4 x 25	–	32	13	20
0050	1	2.47	M 5 x 30	–	38	17	24
0060	2	2.50	M 6 x 35	–	45	19	28
0070	3	2.58	M 8 x 45	–	58	19	34
0080	4	3.05	M 8 x 65	M 8 x 10	78	21	50
0090	6	5.39	M 12 x 80	M 12 x 14	97	28	58
		(342)					



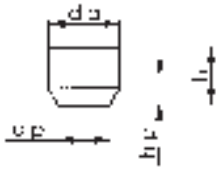


Protective Caps for Setting Screw

Design: Suitable for above setting screws.

Part No.	Dimensions	3946	SW	Thread	d a mm	d p mm	h mm	h p mm
0100	0/0 + 0	0.53	7	M 4	11	7	8.5	4.2
0110	1	0.55	8	M 5	12.5	8	10	5
0120	2	0.60	10	M 6	15	10	12	6
0130	3 + 4	0.62	13	M 8	19	13	15	7.5
0140	6	0.88	18*	M 12	25	18	20	9.5
		(342)						

* Due to the conversion from DIN 933 to ISO 4017 for screw M 12, the screw head changes from SW 19 to SW 18. The new protective cap for SW 18 is marked with "6".





Clamping Devices BS for Machine Table

Design: Slide and guide bow in machining steel, surface zinc-coated, steel base, drop forged, steel lever plastic-coated. Swivelling and continuous height adjustment.

Application: For drilling and small milling jobs. Fastening on the machine table by means of T-slot tenon and Allen screw.



Part No.	Dimensions	3948	Clamping height mm	Jaw projection mm	Slide mm	Clamping force at 50 mm clamping height approx. N	Bore hole for fastening screw mm
0020	2	60.99	200	100	19.5 x 9.5	3500	10.5
0030	3	69.43	200	120	22.0 x 10.5	5500	13.0
0040	4	75.77	200	120	27.0 x 13.0	7500	16.5
0050	5	88.85	240	120	30.0 x 15.0	10000	16.5
		(344)					

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Compact Clamping Devices

Design: Housing made of stainless steel – 42 CrMo 4, hardened and tempered. Heavy duty, compact construction. Continuous clamping force up to 16 kN. 2 throat sizes as well as fixing hole open or closed to front.

Application: For quick and powerful clamping of workpieces on tool machines, measuring tables and fixtures.

3950 **Fixing hole: open.**

3951 **Fixing hole: closed.**

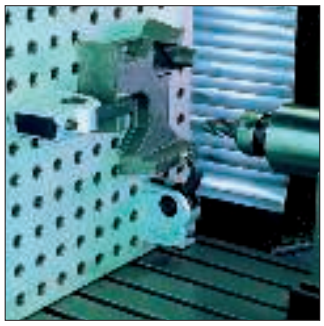


3950



3951





Part No.	Model	3950 IMO	3951 IMO	Clamping height mm	Jaw projection mm	Incl. AL pressure shoe
0010	BAS-C 9-4	138.66	–	88	40	yes
0020	BAS-C 10-6	143.43	–	97	60	yes
0030	BSP-C 10-6	148.22	–	97	60	no
0040	BAS-CB 9-4	–	138.66	88	40	yes
0050	BAS-CB 10-6	–	143.43	97	60	yes
0060	BSP-CB 10-6	–	148.22	97	60	no
		(344)	(344)			

Clamping Sockets

Design: Fixing hole: open, incl. cylindrical screw M 10 x 25 DIN 912.

Part No.	Model	3952 IMO	Clamping height extension mm	Fastening screw thread	For cylindrical screw K DIN 912
0010	BASO	43.82	80	M 10	M 10/M 12
		(344)			



Wrenches for Tommy Screws

Design: To clamp the compact clamping devices.

Part No.	Model	3953 IMO	Wrench size hexagon socket	Wrench size ball-shaped hexagon socket	Length mm
0010	BASKN	14.67	SW 11	SW 8 + SW 10	230
		(344)			



BM Permanent Magnetic Clamping Plates

Design: With transverse pole pitch. The clamping plates are especially construed for machining on flat grinding machines. Strong permanent ceramic magnetic system, low construction and small pole steps are ideal for a diversity of operations. Long and maintenance-free service life is guaranteed through the cast iron body, stable top plate and a ceramic magnetic system.

Course of strain lines: Approx. 8 mm above the pole plate, therefore no magnetisation of the workpieces.

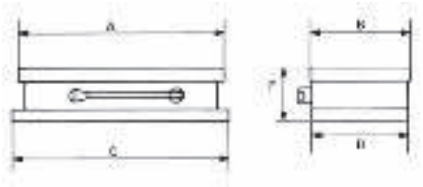
Holding power: Max. 80 N/cm² in case of ground workpiece clamping face. Pole pitch: 6 mm St, 5 mm NE.

Application: The clamping plates are designed for grinding operations. The clamping systems can also be used on EDM equipment.



Part No.	A mm	3958 bebh	B mm	C mm	F mm
0010	250	668.61 ◊	150	258	65
0020	300	775.92 ◊	150	308	65
0030	350	858.46 ◊	150	358	65
0040	400	1,262.93 ◊	200	413	72
0050	450	1,386.74 ◊	200	463	72
0060	500	1,494.05 ◊	200	515	72

(350)



Further dimensions on request. Machining of top plate without affecting the holding power possible up to a depth of 15 mm in steel and 7 mm in non-ferrous. Fastening of clamping plates on table by means of clamping claws. The clamping plates are supplied with 2 stop shoulders.

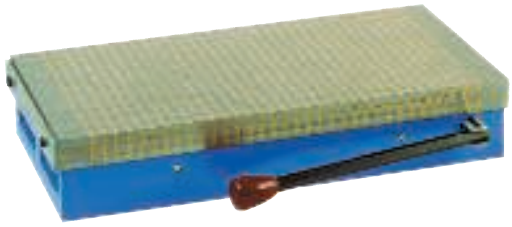
BM Permanent Magnetic Clamping Plates

Design: With transverse pole pitch in reinforced magnetic design. Double and reinforced permanent ceramic magnetic system with highest and evenly distributed clamping force allows the use of the clamping plates also in heavy-duty chipping. The compact construction of the cast-iron body and the solid top plate, as well as a ceramic magnetic system are the guarantee for a long and maintenance-free service life.

Course of strain lines: Approx. 10 mm above the pole plate, therefore no magnetisation of the workpieces.

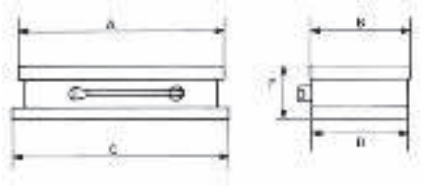
Holding power: Max. 120 N/cm² in case of ground workpiece clamping surface. Pole pitch: 8 mm in steel, 5 mm in non-ferrous.

Application: Construed for heavy-duty chipping. For milling, planing, drilling, grinding and eroding.



Part No.	A mm	3959 bebh	B mm	C mm	F mm
0010	250	767.66 ◊	150	260	93
0020	300	894.78 ◊	150	310	93
0030	350	974.03 ◊	150	360	93
0040	400	1,348.77 ◊	200	395	93
0050	500	1,563.38 ◊	200	495	93
0060	600	1,832.48 ◊	200	595	93

(350)



Further dimensions on request. The top plate can be machined up to 15 mm deep in steel and 6 mm in non-ferrous without affecting the magnetic retention force. Fastening of the clamping plates on the table is effected by claws. The clamping plates are supplied with 2 stop shoulders.

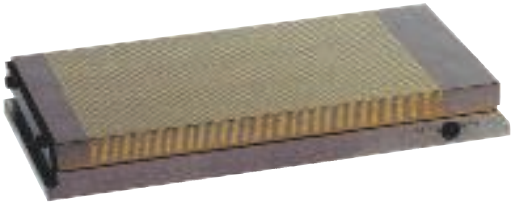
BM Permanent Magnetic Clamping Plates

Design: With fine transverse pole pitch and extremely low structure (40 mm). The high-energy magnetic system consisting of neodyme-iron-boron magnets NdFeB (rare earth), with a low structure (40 mm) and a fine pole pitch (St 1.5/NE 0.8 mm) offer a wide range of applications. The compact construction and solid top plate as well as the high-energy magnetic system ensure a very long and maintenance-free service life. All clamping plates include a detachable switch lever.

Course of strain lines: The magnetic force building up during use is only minor, resulting in negligible residual magnetisation at the workpiece and the tool.

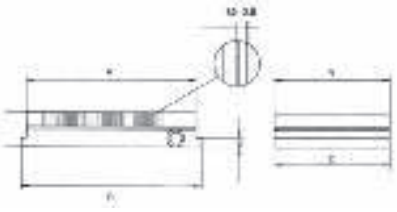
Holding power: Max. 70 N/cm² in case of ground workpiece clamping surface. Fine pole pitch: 1.5 mm in steel, 0.8 mm in non-ferrous.

Application: The clamping plates are ideal for the clamping of rather thin and small-sized workpieces. The clamping systems can also be used on electrical discharge equipment.



Part No.	A mm	3960 bebh	B mm	C mm
0010	150	553.04 ◊	100	165
0020	250	726.39 ◊	150	265
0030	350	927.80 ◊	150	365
0040	450	1,155.62 ◊	150	465

(350)

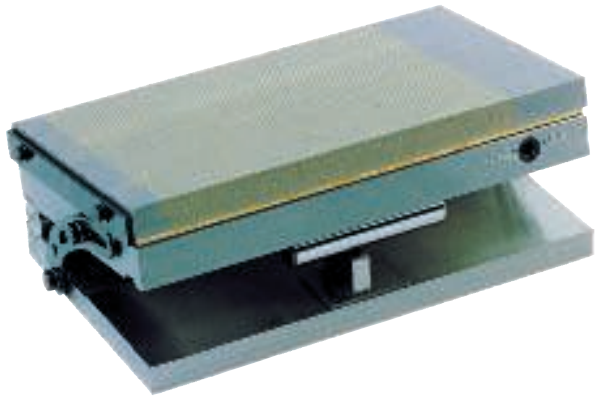


Further dimensions on request. The top plate can be machined up to 3 mm without affecting the magnetic retention force. Fastening of the clamping plates on the table is effected by claws. The clamping plates are supplied with 2 stop shoulders.

BM Permanent Magnetic Clamping Plates

BM Sine Bar Clamping Tables

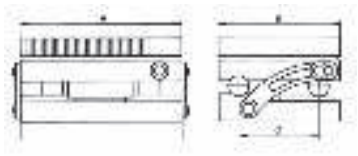
Design: With permanent-magnetic clamping plates including fine transverse pole pitch swivelled at the x-axis. The high-energy magnetic system consisting of neodyme-iron-boron magnets NdFeB (rare earth) and a fine pole pitch (St 1.5/NE 0.8 mm) offer a wide range of applications. The compact construction and solid top plate as well as the high-energy magnetic system ensure extremely long and maintenance-free service life. All clamping plates include a detachable switch lever. Features of the sine bar clamping table: Completely made of steel, extremely low height, gauge blocks can be adjusted to max. 45°; 75° swivel range of the table, the support surface for gauge blocks is 2 mm below the 0 line and thereby allows the setting of very small angles, setting accuracy of the angle is ± 5 sec.



Course of strain line: The magnetic force building up during use is only minor, resulting in negligible residual magnetisation at the workpiece and the tool.

Adhesive force: max. 70 N/cm² for ground workpiece clamping surface. Fine pole pitch: 1.5 mm in steel, 0.8 mm in non-ferrous metals.

Application: Precision sine bar clamping tables are especially suitable for high-precision grinding of very thin and small workpieces with nonparallel surfaces. The angles are set by using the gauge blocks.
The table should be fixed on the main shaft to avoid vibrations during grinding. The clamping systems can also be used on electrical discharge equipment. A sinusoid is included in the supply.



Part No.	A mm	3961	B mm	C mm
0010	250	1,919.97 ◊	150	125
0020	300	2,170.90 ◊ (350)	150	125

Further dimensions on request. The top plate can be machined up to 5 mm deep without affecting the magnetic retention force. Fastening of the clamping plates on the table is effected by claws. The clamping plates are supplied with stop shoulders.

Permanent Magnetic Prism Blocks

Design: Includes three magnetic surfaces, 2 prisms top and bottom, 1 flat. With on/off snap switch. For measuring, grinding and control operations.

3965 **One prism block.**

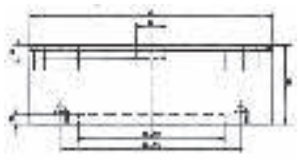
3966 **Two prism blocks, ground to one height in pairs.**



Part No.	Length mm	3965	3966	Thickness mm	Height mm	Parallelism mm	Angularity mm	Adhesive force N
0010	100	387.95 ◊	759.40 ◊	70	95	0.01	0.025	1800
0020	80	366.50 ◊ (350)	704.92 ◊ (350)	70	95	0.01	0.025	1450

BM Permanent Magnetic Round Chucks

Design: With parallel pole pitch in reinforced magnetic construction. A particularly strong permanent-ceramic magnetic system with high holding power which is evenly distributed over the whole clamping area is perfectly suitable for use on lathes and grinding machines. Incorporated centric grooves facilitate the alignment of the workpiece. On request, the round chucks can be provided with a centring – for dimensions see table. Besides, bore holes etc. can be machined in the top plate with no detrimental effect on the holding power. The clamping force is continuously adjustable from 0 to maximum.





Adhesive force: Max. 120 N/cm² in case of ground workpiece clamping surface.

Application: For heavy-duty chipping. Machining on lathes and grinding machines.

Part No.	A mm	3968	B mm	C mm	D mm	F mm	G mm	H mm	Thread bores	Pole pitch mm St	Pole pitch mm NE
0165	160	759.40 ◊	75	125	20	3.0	142	6	M 8 (4x)	6	5
0205	200	955.86 ◊	80	150	20	4.5	182	6	M 8 (4x)	8	5
0255	250	1,267.88 ◊	80	200	20	4.5	232	20	M 8 (4x)	8	5
0305	300	1,776.35 ◊ (350)	85	250	20	4.5	285	20	M 8 (4x)	8	5

Further dimensions and round chucks with fine parallel pitch on request.

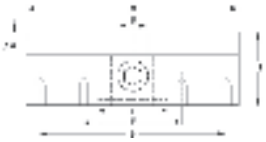
BM Permanent Magnetic Round Chucks

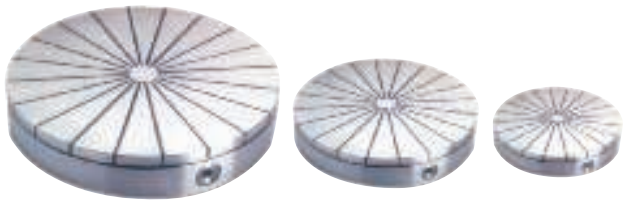
BM Permament Magnetic Round Chucks

Design: With radial pole pitch. Exceptionally strong high energy magnetic system in neodyme iron boron (NdFeB) with high and evenly distributed adhesive force over the whole clamping area. On request, the round chucks can be provided with a through hole for attaching of the centring device and coolant supply.

Holding power: Max. 100 N/cm^2 in case of ground workpiece clamping surface.

Application: For grinding machines.





Part No.	A mm	3969 bebh	B mm	C mm	H mm	D mm	E mm	F mm	Thread hole	Number of poles
0150	150	1,205.15 ◊	20	20	68	50	80	120	M 6 x 10 (8x)	10
0200	200	1,545.22 ◊	25	20	68	60	110	180	M 6 x 12 (8x)	12
0250	250	1,857.24 ◊	30	20	68	60	140	220	M 6 x 12 (8x)	16
0300	300	2,903.89 ◊	30	20	68	80	180	260	M 8 x 16 (8x)	16
0350	350	3,886.18 ◊	36	20	68	80	220	300	M 8 x 16 (8x)	20

(350)

Further dimensions on request.

BM Plate Demagnetisation Units

Design: Equipped with signal light, on/off switch and mains cable including plug, for trouble-free demagnetising of workpieces with residual magnetisation. Supply voltage: AC 230 volt, 50 Hz.

Part No.	Length mm	3970 bebh	Thickness mm	Height mm	Electric power VA
0010	165	364.85 ◊	120	115	286
0020	175	561.30 ◊	220	120	660
0030	210	453.99 ◊	155	110	45

(350)

Other supply voltages on request.



Permanent Magnetic Extractor

Design: With flexible lever, chromium-plated and plastic handle for removing steel chips, screws and other parts.

Part No.	Magnet ∅ mm	3972	Overall ∅ mm	Total length mm	Adhesive force N
0012	9	11.83	12	460	10
0015	12	15.85	15	520	18

(352)



Magnets, Round and Flat

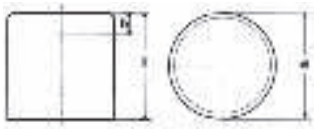
Design: High-quality plastic cap in flat design.
Any symbol or logo can be printed on it or glued.

Part No.	ø mm	3991	Height mm	Adhesive force g	Colour
0725	25	0.25	7	425	grey
0726	25	0.25	7	425	blue
0740	40	0.38	8	950	grey
0741	40	0.38	8	950	blue
		(354)			



Magnet Bars

Design: Smooth version with fit tolerance H6, surface galvanised, screened, material AlNiCo 500, operating temperature: up to 450° C, for pressing or gluing in place.





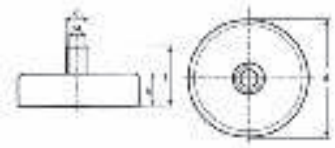
Part No.	d mm	3974	l mm	h mm	Adhesive force N
0006	6	2.88	10	2	1.7
0008	8	3.16	12	3	4
0010	10	3.32	16	6	8.5
0013	13	3.86	18	7	12
0016	16	4.55	20	5	20
		(352)			

Part No.	d mm	3974	l mm	h mm	Adhesive force N
0020	20	6.30	25	6	45
0025	25	11.73	30	5	100
0032	32	21.81	35	3	190
0040	40	42.03	45	5	240
		(352)			

Magnet – Flat

Magnets – Flat with Threaded Bush

Design: Galvanised surface, screened, material: Hard ferrite, recommended operating temperature: Up to 100 °C, for easy assembly.

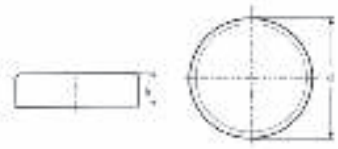




Part No.	d mm	3975	l mm	h mm	d_1 mm	Thread	Thread length mm	Adhesive force N
0010	10	1.13	11.5	4.5	6	M 3	5	4
0013	13	1.23	11.5	4.5	6	M 3	5	10
0016	16	1.39	11.5	4.5	6	M 3	5	18
0020	20	1.75	13	6	6	M 3	5	30
0025	25	1.93	15	7	8	M 4	6	40
0032	32	2.19	15	7	8	M 4	6	80
0040	40	2.88	18	8	10	M 5	8	125
		(352)						

Magnets – Flat without Threaded Bush

Design: Galvanised surface, screened, material: Hard ferrite, recommended operating temperature: Up to 100 °C, for pressing or gluing.



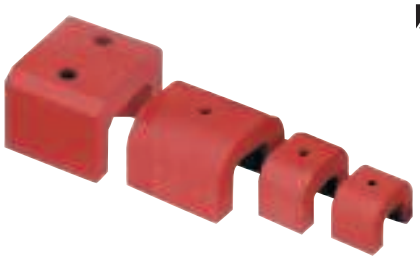


Part No.	d mm	3976	h mm	Adhesive force N
0010	10	0.96	4.5	4
0013	13	1.05	4.5	10
0016	16	1.23	4.5	18
0020	20	1.57	6	30
		(352)		

Part No.	d mm	3976	h mm	Adhesive force N
0025	25	1.75	7	40
0032	32	2.01	7	80
0040	40	2.63	8	125
		(352)		

Strong Bridge Magnets, AlNiCo 500

Design: Bridge magnet with extreme adhesive force and through hole for attachment, max. operating temperature: 450 °C, for lifting, positioning, holding and aligning. With retaining plate.



Part No.	Width mm	3977	Height mm	Bore hole mm	Adhesive force N
0030	30	6.40	20	5.2	45
0040	40	8.76	25	5	90
0045	45	12.61	30	5	118
0057	57.2	30.65	34.9	7.9*	235
		(352)		* Includes two through holes.	

Pot Magnets

Design: Screened with threaded blind hole, material: AlNiCo 500, max. operating temperature: 450 °C, for use in jigs, holding, clamping and mounting. With retaining plate.



Part No.	ø mm	3978	Height mm	Thread	Adhesive force N
0017	17.5	1.93	16	M 6	26
0020	20.6	2.37	19	M 6	40
0027	27	4.55	25	M 6	61
0035	35.0	7.36	30	M 6	147
0065	65	34.15	43	M 12	400
		(352)			

Flat Pot Magnets

Design: Screened with through hole and countersink on the adhering surface, material: AlNiCo 500, max. operating temperature: 450 °C, for installing in equipment and for holding. With retaining plate.



Part No.	ø mm	3979	Height mm	Hole mm	Adhesive force N
0019	19.1	1.93	7.5	3.7	30
0028	28.6	3.06	8.5	4.8	50
0038	38.1	4.81	10.4	4.8	130
		(352)			

Button Magnets

Design: With divided surface and through hole bores for attachment, material: AlNiCo 500, max. operating temperature: 450 °C, for positioning, holding and for laboratory uses. With retaining plate.

format professional quality

Part No.	∅ mm	3980	Height mm	Bore hole mm	Adhesive force N
0012	12.7	1.39	9.5	4.4	7
0019	19.1	2.11	12.7	4.8	19
0025	25.4	4.20	15.9	4.8	34
0031	31.8	8.49	25.4	7.1	48
		(352)			

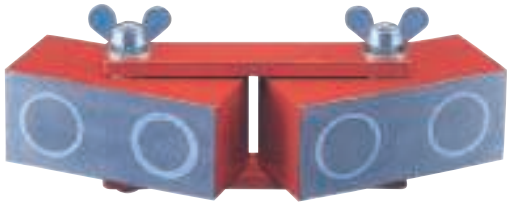


BM Adjustable Magnet Positioners

Design: Two magnet blocks connected by a joint, can be clamped in any angle, with magnetic face each, max. operation temperature: 450 °C, suitable as welding and assembly aid for holding metal sheets and flat irons.

Part No.	Length mm	3982	Block dimensions mm	Adhesive force N
0010	125	38.80	60 x 25 x 25	150
0020	190	81.72	90 x 40 x 40	250
		(354)		

Also single magnet blocks available.



BM Prism Joint Permanent Magnets

Design: Prism joint consisting of 2 magnet blocks which can be switched on and off including one flat and one prismatic magnetic clamping face each for round and flat workpieces, for positioning, assembly and as welding aid for round and flat workpieces.

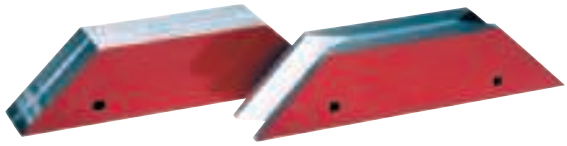
Part No.	Length mm	3983	Block dimensions mm
0010	170	269.09	70 x 63 x 52
		(354)	



BM Permanent Magnetic Mitre Clamps

Design: All 4 front faces are magnetic, max. operation temperature: 450 °C, suitable as welding and assembly aid in the machining of frames.

Part No.	Design	3984	Length mm	Width mm	Height mm	Prism
0010	Flat	113.91	170	35	40	–
0020	Prismatic	160.14	170	35	40	90°
		(354)				

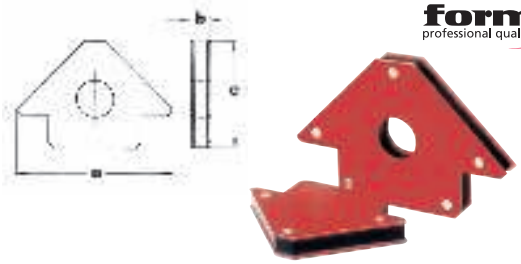


Multipurpose Angled Magnets

Design: Suitable as welding and assembly aid for flat and round workpieces, fixed 45° and 90° angles.

format professional quality

Part No.	a mm	3985	b mm	c mm
0010	120	7.18	15	82
0020	160	12.70	20	100
		(354)		



BM Permanent Load Lifting Magnets

Design: Very strong ceramic magnetic system ensures highest operational safety, to be used in any location, compact structure and low dead weight, housing and magnet made of high-quality, durable material, powerful permanent lifting, minimal residual magnetisation after switch-off, very low switching force required, low maintenance costs, manufactured to EU Machinery Directive, including operating manual, test certificate and EU Declaration of Conformity.

Application: For loading and positioning of workpieces of max. 800 kg, two BM lifting magnets can be used for larger-sized and heavier workpieces, also suitable as effective aid e.g. for building and assembly work, shipbuilding and goods transports in warehouses.



Part No.	Dimensions L x W x H mm	3987 bekh	Total height mm	Lifting power kN Recommended	Lifting power kN Certified	Weight kg
0020	210 x 160 x 150	858.46 ◊	320	4.0	12.0	36
0030	290 x 200 x 180	1,403.25 ◊ (355)	410	8.0	24.0	72

For **safety reasons,** a 1:3 factor is recommended with respect to differing conditions such as surface condition, material alloys and plate thickness of the workpieces. The indicated lifting rates should be regarded as standard values.

BM Permanent Load Lifting Magnets

Design: These magnets construed with the powerful and efficient high-energy system neodyme are suitable for transporting, lifting and fixing of round and flat material made of diverse ferro-magnetic materials. The low dead weight and prismatic poles which can be reground if necessary ensure long tool life and perfect use.
The safety locking of the switch lever prevents the load lifting magnets from accidentally switching off during operation.
Manufactured in compliance with the EU Machinery Directive, including operating manual, test certificate and EU Declaration of Conformity.

Application: For transporting, lifting and fixing of round and flat workpieces made of various ferromagnetic materials.



Part No.	Dimensions L x W x H mm	3989 bekh	Recommended lifting force kN flat material	Recommended lifting force kN round material	Certified lifting force kN	Holder for a round material ⌀ mm	Weight kg
0010	188 x 80 x 75	726.39 ◊	2.5	1.0	8	40–350	7
0020	262 x 100 x 95	1,089.58 ◊	5.0	2.5	16	60–400	16
0030	360 x 140 x 135	1,807.71 ◊ (355)	10.0	5.0	35	80–400	40

For **safety reasons,** a 1:3 factor is recommended with respect to differing conditions such as surface condition, material alloys and plate thickness of the workpieces. The indicated lifting rates should be regarded as standard values.

Magnetic Tapes, Coloured

Design: Magnetic tape with coloured PVC coating.

Part No.	Thickness mm	3991 bebb	Width mm	Roll length mm	Colour
0020	0.6	33.02	20	30	white
0030	0.6	39.62	20	30	yellow
0040	0.6	39.62	20	30	blue
0120	0.6	44.57	30	30	white
0130	0.6	53.48	30	30	yellow
0140	0.6	53.48	30	30	blue
0220	0.6	57.78	40	30	white
0230	0.6	69.34	40	30	yellow
0240	0.6	69.34	40	30	blue
		(354)			

Further dimensions and designs available on request.

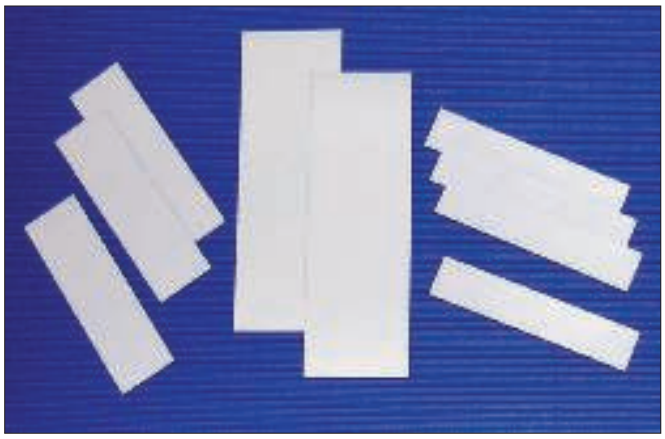


Magnetic Labels, Coloured

Design: Magnetic labels with white PVC coating.

Part No.	Thickness mm	3991 bebb	Width mm	Length mm	Colour
0520	0.6	12.39	20	100	white
0530	0.6	18.57	30	100	white
		(354)			

Further designs available on request.



Overview – Group 4

New in the product range:

Extension of range of vernier callipers

In order to satisfy highest demands regarding quality and performance, our range of products has been extended by the following articles:

- Optimisation of range of 3D sensing devices





Thanks to technical improvements we were able to adjust and optimise our range of products according to your requirements.

Your FORMAT plus partner would be pleased to inform you about the performance of these and further tools.


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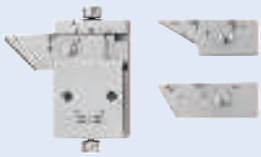

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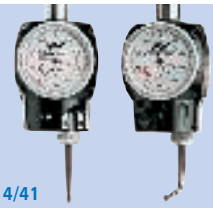

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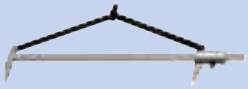

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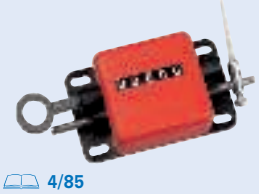

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Vernier Calliper Gauges

Design: Accuracy according to DIN 862, stainless steel, completely hardened, main graduation and vernier matt chromium plated for four modes of measurement (internal, external, depth and step measurements), thread table on the back. Supplied in imitation leather wallet.

4001 With rectangular depth gauge
4005 With round depth gauge

DIN 862 | INOX

format professional quality



4001 0150 with instant lock and rectangular depth gauge



4001 0151 with locking screw and rectangular depth gauge

DIN 862 | INOX | ø 1,6 mm



4005 0150 with instant lock and round depth gauge



4005 0151 with locking screw and round depth gauge

Part No.	Measuring range mm	4001 mm/inch	4005 mm/inch	Design	Jaw length mm	Bottom vernier mm	Top vernier inch
0150	150	12.20	17.01	With instant lock	40	1/20	1/128
0151	150	12.20	17.01	With locking screw	40	1/20	1/128
0155	150	12.69	19.92	With instant lock	40	1/50	1/128
0156	150	12.69	19.92	With locking screw	40	1/50	1/128
		(401)	(401)				

Precision Pocket Vernier Calliper Gauges Duo-Fix

Design: Accuracy according to DIN 862, stainless steel, **with instant lock and locking screw,** graduation and vernier matt chromium-plated, for four modes of measurement (internal, external, depth and step measurements), thread table on the back. Supplied in imitation leather wallet.

DIN 862 | INOX

PREISSER MESSTECHNIK



Part No.	Measuring range mm	4011 PREISSER mm/inch	Jaw length mm	Bottom vernier mm	Top vernier inch
0150	150	19.32	40	1/20	1/128
		(408)			

Precision Pocket Vernier Calliper Gauges with anti-parallax reading

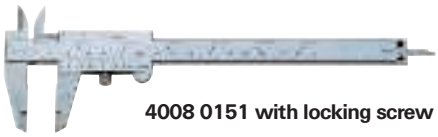
Design: Accuracy according to DIN 862, stainless steel, anti-parallax reading, scale and vernier matt chromium-plated, for 4 measurement modes (internal, external, depth and step measurements), thread table on the back and rectangular depth gauge. Supplied in imitation leather wallet.

DIN 862 | INOX

format professional quality



4008 0150 with instant lock



4008 0151 with locking screw

Part No.	Measuring range mm	4008 mm/inch	Design	Jaw length mm	Bottom vernier mm	Top vernier inch
0150	150	21.08	With instant lock	40	1/20	1/128
0151	150	21.08	With locking screw	40	1/20	1/128
0155	150	21.51	With instant lock	40	1/50	1/128
0156	150	21.51	With locking screw	40	1/50	1/128
		(401)				

Precision Pocket Vernier Calliper Gauges, parallax-free reading and double prism guide

Design: Accuracy according to DIN 862, stainless steel, anti-parallax reading, double prism guide for almost play-free running of slide, graduation and vernier matt chromium-plated, measuring surfaces lapped, for four modes of measurement (internal, external, depth and step measurements), thread table on the back and rectangular depth gauge. Supplied in imitation leather wallet.

DIN 862 | INOX

format professional quality



Part No.	Measuring range mm	4009 mm/inch	Design	Jaw length mm	Bottom vernier mm	Top vernier inch
0150	150	29.54	With locking screw	40	1/20	1/128
0155	150	30.71	With locking screw	40	1/50	1/128
		(401)				

Vernier Calliper Gauges

Precision Pocket Vernier Calliper Gauges with Tungsten Carbide Measuring Surfaces

Design: Stainless steel, tungsten carbide prevents quick wear of the measuring surfaces. Reading side matt chromium-plated, DIN 862, locking screw above, with cross tips, main graduation recessed, for four modes of measurement (internal, external, depth and step measurements), with thread table and rectangular depth gauge. Supplied in imitation leather wallet.

DIN 862 | INOX

PREISSER MESSTECHNIK



Part No.	Measuring range mm	4012 PREISSER	Jaw length mm	Bottom vernier mm	Top vernier inch
0150	150	69.81 (408)	40	1/20	1/128

Pocket Vernier Calliper Gauges Left-Handed

Design: Accuracy according to DIN 862, stainless steel, completely hardened, main graduation and vernier matt chromium-plated, for four measurement modes (internal, external, depth and step measurements), thread table on the back. Supplied in imitation leather wallet.

DIN 862 | INOX

format professional quality



4002 0150 – 4002 0156



4002 0200 – 4002 0300

Part No.	Measuring range mm	4002	Design	Jaw length mm	Bottom vernier mm	Top vernier inch
0150	150	20.75	With instant lock	40	1/20	1/128
0151	150	18.68	With locking screw	40	1/20	1/128
0155	150	24.90	With instant lock	40	1/50	1/128
0156	150	24.90	With locking screw	40	1/50	1/128
0200	200	128.43	With locking screw	40	1/50	1/128
0300	300	183.39 (401)	With locking screw	40	1/50	1/128

Pocket Vernier Calliper Gauges – Small

Design: Accuracy according to DIN 862, stainless steel, completely hardened, main graduation and vernier matt chromium-plated. Supplied in imitation leather wallet.

DIN 862 | INOX

format professional quality



Part No.	Measuring range mm	4004	Design	Jaw length mm	Vernier inch mm
0100	100	10.96	With locking screw	25	1/20
0105	100	11.21 (401)	With locking screw	25	1/50

Dial Vernier Callipers with Cross Tips

Design: Accuracy according to DIN 862, stainless steel, main graduation matt chromium-plated, shock-proof, rack covered, measuring surfaces ultra-fine ground and lapped, with roller precision setting. Supplied in plastic case.

DIN 862 | INOX

format professional quality



Part No.	Measuring range mm	4013	Reading mm
0150	150	22.57	1/ 50 (0.02)
0151	150	24.73 (401)	1/100 (0.01)

Dial Vernier Callipers with Cross Tips

Design: DIN 862, stainless steel, for four modes of measurement (internal, external, depth and step measurements) with locking screw and cross tip, pointer revolution = 2 mm. Supplied in wallet, **incl. calibration certificate.**

DIN 862 | INOX | Certificate

PREISSER MESSTECHNIK



Part No.	Measuring range mm	4015 PREISSER	Reading mm
0150	150	55.69 (408)	0.02

Depth Measuring Bridges

Design: Stainless steel with attachment screw, suitable for all pocket vernier calliper gauges.

format professional quality



Part No.	Bridge length mm	4014
0075	75	10.09 (403)

Digital Pocket Calliper Gauges, absolute function

Design: Accuracy according to DIN 862. Hardened stainless steel, measuring surfaces ultra-fine ground, with cross points, locking screw on top, height of digits on LCD 7.0 mm, for four measurement modes (internal, external, depth and step measurement). With data output (RS-232 interface).

Functions: ABS, mm/inch selection, on/zero and off switch, zero point setting in any position with absolute function. Supplied in plastic case.

Note: Spare battery 4027 0357
Data cable 4025 0002

DIN 862 | INOX | RS232 | Absolute function | ø 1,5 mm

format professional quality



Part No.	Measuring range mm	4016 mm/inch	Jaw length mm	Reading mm/inch	Design
0150	150	29.87	40	0.01/0.0005	With rectangular depth gauge
0151	150	30.71	40	0.01/0.0005	With round depth gauge, 1.5 mm
0152	150	58.09	40	0.01/0.0005	With carbide-tipped measurement shanks

(404)

Digital Pocket Calliper Gauges, Large Display

Design: Accuracy according to DIN 862, stainless steel, large display, 11 mm. Hardened stainless steel, measuring surfaces ultra-fine ground, with cross tips, locking screw on top, for four modes of measurement (internal, external, depth and step measurement). With data output (RS-232 interface).

Functions: ABS, mm/inch selection, on/zero and off switch, zero point setting in any position, with absolute function. Supplied in plastic case.

Note: Spare battery 4027 0357

DIN 862 | INOX | RS232 | Absolute function

format professional quality



Part No.	Measuring range mm	4017 mm/inch	Jaw length mm	Reading mm/inch
0150	150	30.71	40	0.01/0.0005

(404)

Digital Pocket Calliper Gauges

Design: DIN 862, stainless steel, completely hardened, measuring surfaces ultra-fine ground, for four modes of measurement (internal, external, depth and step measurement). On/off switch, zero point setting in any position, HOLD function, LCD, mm/inch selection, data output Opto RS 232, max. traverse rate 1.5 m/s, with locking screw and depth gauge, power supply by 3 v lithium battery. Supplied in plastic wallet, incl. battery.

Note: Spare battery 4027 0357
Data cable 4025 0002

DIN 862 | INOX | RS232 | ø 1,5 mm

format professional quality



Part No.	Measuring range mm	4020 mm/inch	Jaw length mm	Reading mm/inch	Error margin µm/inch
0150	150	66.72	40	0.01/0.0005	30/0.001
0200	200	108.42	40	0.01/0.0005	40/0.0015

(404)

Digital Pocket Calliper Gauges

Design: DIN 862, from stainless steel, hardened, measuring surfaces ultra-fine ground, locking screw, height of digits on LDC 7.5 mm, 4020 1150 without data output, 4020 1200 with data output variable RS 232 and Digimatic (DATA Variable).
Supplied in plastic case incl.: Digital pocket calliper gauge incl. battery and calibration certificate.

Functions: Automatic On/Off switch, mm/inch selection, reference lock function, zero point setting, reset in any position possible.

Application: For four modes of measurement (internal, external, depth and step measurement).

Note: Spare battery 4027 0357
Data cable 4025 0232 (Opto RS 232)
4025 0102 (Digimatic)

DIN 862 | INOX | RS232 | Digimatic | ø 1,5 mm | Certificate

format professional quality



Part No.	Measuring range mm	4020 mm/inch	Jaw length mm	Reading mm/inch
1150	150	105.83	40	0.01/0.0005
1200	150	122.01	40	0.01/0.0005

(404)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Digital Pocket Calliper Gauges for Left-handers

Factory standard | INOX | ø 1,5 mm

format professional quality

Design: Accuracy according to factory standard, from stainless steel, hardened, measuring surfaces ultra-fine ground, locking screw, height of digits on LCD 11 mm.
Supplied in plastic case incl.: Digital pocket calliper gauge incl. battery.

Functions: Automatic On/off switch, mm/inch selection, absolute function (ABS), no zero point setting required, reset in any position possible.

Application: For four modes of measurement (internal, external, depth and step measurement).

Note: Spare battery 4027 0357



Part No.	Measuring range mm	4020	Jaw length mm	Reading mm/inch
2150	150	54.13 (404)	40	0.01/0.0005

Digital Pocket Calliper Vernier Gauges DIGI-MET®

DIN 862 | INOX | RS232 | ø 1,5 mm | Certificate

PREISSER MESSTECHNIK

Design: DIN 862, stainless steel, **measuring surfaces carbide-tipped,** 6 mm LCD, with locking screw and cross tips, for four modes of measurement (internal, external, depth and step measurement). On/off switch, zero point setting in any position, mm/inch selection, data output RS 232, HOLD function (measurement result memory). Supplied in wooden case, **incl. calibration certificate.**

Note: Spare battery 4027 2032
Data cable 4025 0002



Part No.	Measuring range mm	4021 PREISSER	Jaw length mm	Reading mm/inch	Design
0150	150	111.66	40	0.01/0.0005	Rectangular depth gauge 4 x 1.5 mm
0151	150	105.21 (411)	40	0.01/0.0005	Round depth gauge 1.8 mm

Digital Pocket Calliper Gauges DIGI-MET® PRISMA, RS 232 and Digimatic

DIN 862 | INOX | RS232 | Digimatic | ø 1,5 mm | Certificate

PREISSER MESSTECHNIK

Design: DIN 862, with prismatic guide, stainless steel, 7.5 mm display, with fixing screw and cross tips, for four modes of measurement (internal, external, depth and step measurement). On/off switch, zero point setting in any position, mm/inch selection.

With variable data output RS 232 and Digimatic (DATA Variable). Supplied in wallet, **incl. battery and calibration certificate.**

Note: Spare battery 4027 2032
Data cable 4025 0102 (Digimatic)
4025 0232 (RS 232)



Part No.	Measuring range mm	4023 PREISSER	Jaw length mm	Reading mm/inch
0150	150	147.90 (411)	40	0.01/0.0005

Digital Pocket Calliper Vernier Gauges, Splash-proof IP 65

DIN 862 | INOX | RS232 | IP 65 | ø 1,5 mm

Design: Accuracy to DIN 862, stainless steel, hardened and ground, splash-proof (IP 65), measuring surfaces ultra-fine ground, for four modes of measurement (internal, external, depth and step measurements), on/off switch, zero point setting in any position, HOLD function, LCD, mm/inch selection, data output Opto RS 232 C, max. traversing speed 2 m/s, repeatability 10 µm, with locking screw and depth gauge, battery-operated (3 v lithium battery). Automatic off switch.
Supplied in plastic wallet, incl. battery.

Note: Spare battery 4027 2032
Data cable 4025 0002



Part No.	Measuring range mm	4022	Jaw length mm	Reading mm/inch	Error margin µm
0150	150	117.92	40	0.01/0.0005	30
0200	200	166.66	50	0.01/0.0005	30
0300	300*	213.83 (406)	65	0.01/0.0005	30

* without depth gauge

Digital Pocket Calliper Gauges

Digital Pocket Calliper Gauges, Splash-proof IP 67

D **esign:** Accuracy according to factory standard, from stainless steel, hardened, measuring surfaces ultra-fine ground, **IP 67,** locking screw, height of digits on LCD 6.0 mm.
Supplied in wooden case incl.: Digital pocket calliper gauge incl. battery.

Factory standard | INOX | IP 67

format professional quality

Functions: On/off switch, mm/inch selection, reset in any position possible.

Application: For four modes of measurement (internal, external, depth and step measurement).

Note: Spare battery 4027 0357



Part No.	Measuring range mm	4024	Jaw length mm	Reading mm/inch
0100	150	97.58 (404)	40	0.01/0.0005

IP Ratings

In industrial applications, the IP rating is to be selected as high as possible. Damages are thereby prevented, if the measuring device falls into a water basin accidentally.

1st digit	Protection of equipment
0	No protection
1	Protection against solid objects with a diameter > 50 mm
2	Protection against solid objects with a diameter > 12.5 mm
3	Protection against solid objects with a diameter > 2.5 mm
4	Protection against solid objects with a diameter > 1 mm
5	Protection against dust
6	Dust-proof

Example: Measuring device with **IP 67:** (IP – International Protection).
This measuring device is dust-proof and can even be submerged shortly.

2nd digit	Protection against water
0	No protection
1	Protection against drips of water falling vertically
2	Protection against drips of water falling at an angle of 15°
3	Protection against water spray
4	Protection against splash water
5	Protection against jet of water
6	Protection against strong jet of water
7	Protection against intermittent submersion in water
8	Protection against continuous submersion in water

Digital Pocket Calliper Vernier Gauges DIGI-MET®, water-proof IP 67

Design: DIN 862, stainless steel, 7.5 mm LCD, with locking screw and cross tips, for four modes of measurement (internal, external, depth and step measurement). On/off switch, reference lock function, zero point setting in any position, mm/inch selection.
Supplied in wallet, **incl. battery and calibration certificate.**

Note: Spare battery 4027 2032

DIN 862 | INOX | IP 67 | ø 1,5 mm | Certificate

PREISSER MESSTECHNIK



Part No.	Measuring range mm	4024 PREISSER	Jaw length mm	Reading mm/inch	Design
0150	150	139.06	40	0.01/0.0005	Round depth gauge
0200	200	199.66	40	0.01/0.0005	Rectangular depth gauge
0300	300	251.70 (411)	65	0.01/0.0005	Without depth gauge

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Data Cables

Design: For all digital measuring tools with Opto RS 232.
9-pole sub-D socket, direct transmission of measurement data to the PC/printer by means of an opto-electronic coupler without complex interfaces. Supplied in plastic film.

RS232



Part No.	Length m	4025 mm
0002	2	61.71 (404)

Data Cables RS 232 Opto

Design: For all measuring tools with RS 232 data transfer, Opto coupler. Supplied in plastic film.

RS232



Part No.	Length m	4025 PREISSER
0232	2	41.82 (411)

Data Cables Digimatic

Design: For all measuring tools with Digimatic interface. Supplied in plastic film.

Digimatic



Part No.	Length m	4025 PREISSER
0102	2	41.82 (411)

Spare Batteries

Spare batteries for digital measuring tools.



Part No.	Type	4027 mm	Design
0357	CR 357	0.82	1.5 v silver oxide
2032	CR 2032	0.82 (403)	3 v lithium

Workshop Calliper Gauges, without Tips

Design: Accuracy according to DIN 862, hardened stainless steel, scale and vernier matt chromium-plated, for internal and external measurements, main graduation recessed. **Up to 1,000 mm incl. calibration certificate.** Supplied in cardboard box.

INOX | DIN 862 | Certificate

format professional quality

4030 Without precision setting

4031 With precision setting



4030



4031

Part No.	Measuring range mm	4030	4031	Jaw length mm	Min. hole mm	Vernier mm	Vernier inch
0300	300	121.90	144.36	90	10	1/20	1/128
0305	300	121.90	144.36	90	10	1/50	1/128
0500	500	315.48	357.55	150	20	1/20	–
0505	500	315.48	357.55	150	20	1/50	–
0800	800	398.78	444.20	150	20	1/20	–
0805	800	398.78	444.20	150	20	1/50	–
1000	1000	529.43	581.83	150	20	1/20	–
1005	1000	529.43	–	150	20	1/50	–
1500	1500	–	1,248.16	200	30	1/20	–
1505	1500	–	1,248.15	200	30	1/50	–
2000	2000	–	1,894.18	200	30	1/20	–
		(407)	(407)				

Workshop Calliper Gauges, with Tips

Design: Accuracy according to DIN 862, hardened stainless steel, scale and vernier matt chromium-plated, for internal and external measurements, main graduation recessed, **up to size 1,000 mm incl. calibration certificate.** Supplied in cardboard box.

INOX | DIN 862 | Certificate

format professional quality

4034 Without precision setting

4035 With precision setting



4034



4035

Part No.	Measuring range mm	4034	4035	Jaw length mm	Min. hole mm	Vernier mm	Vernier inch
0250	250	116.94	137.98	80	10	1/20	1/128
0255	250	116.94	137.98	80	10	1/50	1/128
0300	300	126.18	147.23	90	10	1/20	1/128
0305	300	126.18	147.23	90	10	1/50	1/128
0500	500	374.38	415.61	150	20	1/20	–
0505	500	374.38	415.61	150	20	1/50	–
0800	800	529.43	581.83	150	20	1/20	–
0805	800	529.43	581.83	150	20	1/50	–
1000	1000	634.27	687.72	150	20	1/20	–
1005	1000	634.27	687.72	150	20	1/50	–
1500	1500	1,334.76	1,415.05	200	30	1/20	–
1505	1500	1,334.76	1,415.05	200	30	1/50	–
		(407)	(407)				

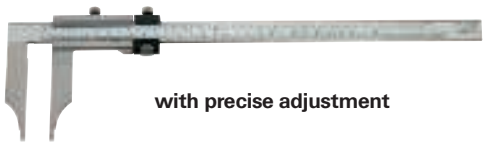
Workshop Vernier Calliper Gauges

Workshop Calliper Gauges without Tips, with Extra-Long Jaws

Design: Accuracy according to company standard. Hardened stainless steel, scale and vernier matt chromium-plated, for internal and external measurements, **main graduation recessed, with locking screw.** Supplied in cardboard box.

INOX

format professional quality



with precise adjustment

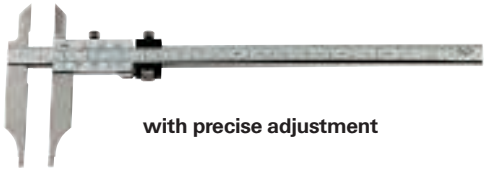
Part No.	Measuring range mm	4038	Jaw length mm	Min. hole mm	Vernier inch
0500	500	493.01	200	20	1/20
0501	500	580.75	250	20	1/20
0505	500	493.01	200	20	1/50
0506	500	580.75	250	20	1/50
0800	800	709.13	200	20	1/20
0805	800	709.13	200	20	1/50
1000	1000	1,068.46	300	20	1/20
1001	1000	1,572.65	500	20	1/20
1500	1500	1,645.45	300	20	1/20
2000	2000	2,457.42	300	20	1/20
3000	3000	3,219.85	300	20	1/20
		(407)			

Precision Workshop Calliper Gauges, Parallax-Free Reading

Design: Accuracy according to DIN 862, stainless steel, scale and vernier matt chromium-plated, direct reading of the internal and external measurements, with knife jaws, locking screw and precision setting. **Incl. traceable calibration certificate.** Supplied in cardboard box.

INOX | Certificate | DIN 862

format professional quality



with precise adjustment

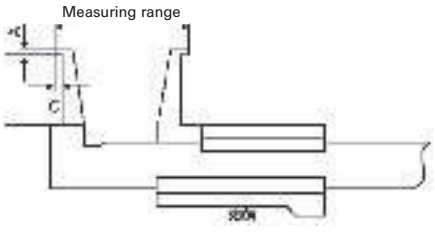
Part No.	Measuring range mm	4039	Jaw length mm	Min. hole mm	Vernier mm	Vernier inch
0300	300	167.93	90	10	1/20	1/128
0305	300	167.92	90	10	1/50	1/128
		(407)				

Precision Calliper Gauges with Inside Locking Groove

Design: Accuracy according to factory standard, stainless steel, graduation and vernier matt chromium-plated, main graduation recessed, with locking screw.
Supplied in cardboard box.

INOX

PREISSER MESSTECHNIK





Part No.	Measuring range mm	4045 PREISSER	Jaw length mm	Dimension A mm	Dimension C mm	Vernier mm
1016	10–160	117.25	25	0.9	3.0	1/20
2016	20–160	157.04	40	2.0	5.0	1/20
2620	26–200	235.84	60	3.0	7.0	1/20
		(408)				

Digital Calliper Gauges with Inside Groove

Design: Accuracy according to factory standard, from stainless steel, hardened, measuring surfaces ultra-fine ground, locking screw, height of digits on LCD 6.0 mm, data output Opto RS 232. Supplied in wooden case incl.: Digital calliper gauge incl. battery.

Functions: On/off switch, mm/inch selection, Reset (zero point setting) in any position, Hold function, ± Preset function.

Application: For internal and external measurements.

Note: Spare battery 4027 2032
Data cable 4025 0102

Factory standard | INOX | RS232

PREISSER MESSTECHNIK



Part No.	Measuring range mm	4046 PREISSER	Jaw length mm	Reading mm/inch
1016	10–160	322.31	25	0.01/0.0005
2016	20–160	374.20	40	0.01/0.0005
		(408)		

Calliper Gauges for Brake Drums

Design: Accuracy according to factory standard, stainless steel, vernier matt chromium-plated, main graduation recessed, with locking screw.
Supplied in cardboard box.

Application: For internal measurements.

Factory standard | INOX

format professional quality





Part No.	Measuring range mm	4048	Jaw length mm	Vernier mm
6300	0–300	107.42	100	1/20
6500	0–500	181.81	150	1/20
6600	0–600	205.16	200	1/20
		(407)		

Inspection Gauges for Brake Disks

Design: Accuracy according to factory standard, stainless steel, hardened, vernier matt chromium-plated, with locking screw and trailing slide.
Supplied in cardboard box.

Application: For internal measurements.

Factory standard | INOX

format professional quality



Part No.	Measuring range mm	4048	Jaw length mm	Reading mm/inch	Vernier mm
7001	0–60	21.44	55	0.1/0.0005	0.1
7002	0–60	41.03	80	0.1/0.0005	0.1
7003	0–90	64.89	120	0.1/0.0005	0.1
		(407)			

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Marking Calliper Gauges

Design: Accuracy according to factory standard, special steel, graduation and vernier matt chromium-plated, long T-square, **marking edges hardened,** with locking screw and fine adjustment. Supplied in cardboard box.

INOX



PREISSER MESSTECHNIK

Part No.	Measuring range mm	4050 PREISSER	Stop length mm	Reading mm
0160	160	107.84	135	1/20
0250	250	139.23	135	1/20
0300	300	175.89	160	1/20
		(408)		

Wooden Cases for Workshop Calliper Gauges

format professional quality

Part No.	For Measuring range/ jaw length mm	4041 Without tips	4041 With tips	4041 With extra long shanks
0250	250 x 80	9.84	9.84	–
0300	300 x 90	11.77	11.77	–
0500	500 x 150	23.56	–	–
0501	500 x 150	–	24.40	–
0501	500 x 200	–	–	24.40
0502	500 x 250	–	–	42.15
0800	800 x 150	35.33	–	–
0801	800 x 150	–	55.60	–
0801	800 x 200	–	–	55.60
1000	1000 x 150	42.90	–	–
1001	1000 x 150	–	73.79	–
1002	1000 x 300	–	–	93.04
1500	1500 x 200	130.48	–	–
1501	1500 x 200	–	141.16	–
2000	2000 x 200	218.19	–	–
		(403)	(403)	(403)



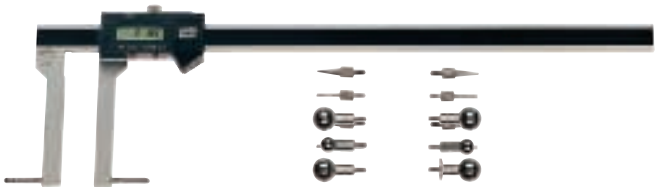
Universal Calliper Gauges DIGI-MET®

Design: For various measuring tasks, quick adjustment to appropriate measurement, suitable for stylus with thread M 2.5. Accuracy according to factory standard, stainless steel, LCD, on/off switch, zero point setting in any position, mm/inch selection, HOLD function, ± preset function, data output Opto RS 232, with locking screw. Supplied in wooden case, incl. battery, **without stylus. Exchangeable stylus see chapter Dial Gauges (Order no. 4236 and 4237).**

Note: Spare battery 4027 2032
Data cable 4025 0232

Factory standard | INOX

PREISSER MESSTECHNIK



Part No.	Measuring range inside mm	4055 PREISSER	Measuring range outside mm	Jaw length mm	Reading mm/inch
4030	40–300	469.04	0–300	90	0.01/0.0005
		(411)			

Digital Workshop Calliper Gauges

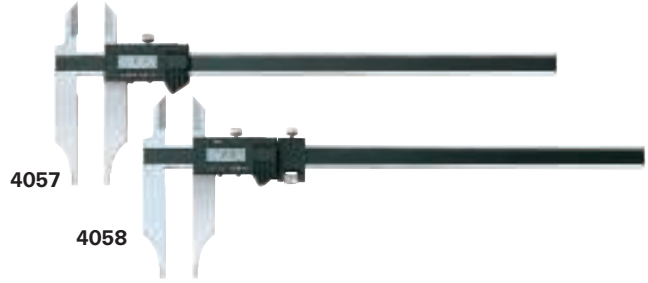
Design: Accuracy according to DIN 862, stainless steel, fully hardened, measuring surfaces ultra-fine ground, suitable for internal and external measurements, zero point setting in any position, HOLD function, LCD display, mm/inch selection, data output Opto RS 232 C, max. traversing speed 1.5 m/s, with locking screw and knife tips, battery-operated (3 v lithium battery). **Incl. calibration certificate.** Supplied in wooden case, incl. battery.

Note: Spare battery 4027 2032
Data cable 4025 0002

4057 **Without precision setting**
4058 **With precision setting**

DIN 862 | INOX | RS232 | Certificate

format professional quality



4057

4058

Part No.	Measuring range mm	4057	4058	Jaw length mm	Min. hole mm	Reading mm/inch
0300	300	331.56	365.80	90	10	0.01/0.0005
0500	500	485.56	544.32	125	20	0.01/0.0005
		(404)	(404)			

Digital Workshop Vernier Calliper Gauges DIGI-MET®, RS 232 and Digimatic

Design: Accuracy according to DIN 862, stainless steel, with knife tips and locking screw. Variable data output RS 232 and Digimatic (DATA Variable), on/off function, zero point setting in any position, LCD display (7.5 mm for 300 mm measuring range; 12.5 mm for 600 mm measuring range), mm/inch selection, preset function, storage of measured values.
Supplied in wooden case, **incl. battery and calibration certificate.**

Note: Spare battery 4027 2032
Data cable Digimatic 4025 0102
Data cable RS 232 4025 0232

DIN 862 | INOX | Digimatic | RS232 | Certificate



Part No.	Measuring range mm	4059 PREISSER	Jaw length mm	Min. hole mm	Reading mm/inch
0300	300	342.26	90	10	0.01/0.0005
0600	600	610.83	125	20	0.01/0.0005
		(411)			

Digital Workshop Vernier Callipers DIGI-MET®, RS 232 and Digimatic

Design: DIN 862, from stainless steel, hardened, measuring surfaces ultra-fine ground, locking screw, height of digits on LCD 7.5 mm (in case of measuring range 300 mm) and/or 12.5 mm (in case of measuring range 600 mm). Data output Variable RS 232 and Digimatic (DATA Variable).
Supplied in wooden case incl.: Digital workshop calliper gauge incl. battery and calibration certificate.

Functions: On/off switch, mm/inch selection, Reset (zero point setting) in any position, Hold function, ± Preset function.

Note: Spare battery 4027 2032
Data cable Digimatic 4025 0102
Data cable RS 232 4025 0232

DIN 862 | INOX | RS232 | Digimatic | Certificate



4060 without probe tips

Part No.	Measuring range mm	4060 PREISSER	Jaw length mm	Reading mm/inch
0300	300	305.57	90	0.01/0.0005
0600	600	521.21	125	0.01/0.0005
		(411)		

Digital Workshop Vernier Calliper Gauges DIGI-MET®

Design: Accuracy according to DIN 862, stainless steel, fully hardened, measuring surfaces ultra-fine ground, suitable for internal and external measurements, zero point setting in any position, HOLD function, LCD display, mm/inch selection, data output Opto RS 232 C, max. traversing speed 1.5 m/s, with locking screw and fine adjustment, battery-operated (3 v lithium battery), **incl. calibration certificate.**
Supplied in wooden case, incl. battery.

Note: Spare battery 4027 2032
Data cable 4025 0002

4061 **Without probe tips**

4062 **With probe tips**

DIN 862 | INOX | RS232 | Certificate



4061 without probe tips



4062 with probe tips

Part No.	Measuring range mm	4061 PREISSER	4062 PREISSER	Jaw length mm	Min. hole mm	Reading mm/inch
0500	500	465.90	–	125	20	0.01/0.0005
0800	800	763.22	823.95	150	20	0.01/0.0005
1000	1000	878.39	948.51	150	20	0.01/0.0005
		(411)	(411)			

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Digital Light Metal Calliper Gauges

Design: According to factory standard, measuring bar from strong aluminium V profile, jaws made of stainless steel. With locking screw, height of digits on LCD 8.0 mm, maximum travel speed 1.5 m/s. Digital light metal calliper gauge with battery.

Application: For internal and external measurements.

Functions: On/off switch, mm/inch selection, reset in any position possible.

Note: Spare battery 4027 2032

Factory standard

PREISSER MESSTECHNIK



Part No.	Measuring range mm	4068 PREISSER	Jaw length mm	Reading mm/inch	Error margin µm
0500	500	522.79	150	0.01/0.0005	100
1000	1000	724.04	150	0.01/0.0005	130
1500	1500	804.22	150	0.01/0.0005	160
2000	2000	1,568.34 (411)	150	0.01/0.0005	190

Attachable Digital Calliper Gauges, with rectangular measuring bar

Design: Steel measuring rail, for measuring travels on machine tools and adjusting of limit stops. With LCD display, mm/inch selection, preset function, HOLD function, indication of direction ±, data output Opto RS 232, max. traversing speed 2 m/s, repeatability 10 µm. Supplied in cardboard box, incl. battery.

4070 **Horizontal design**

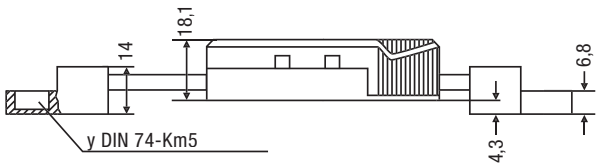
4071 **Vertical design**

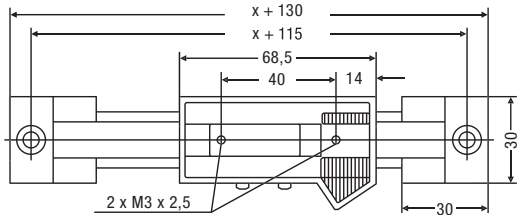
RS232

PREISSER MESSTECHNIK



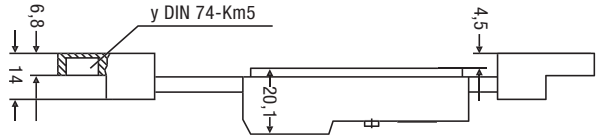
Horizontal design

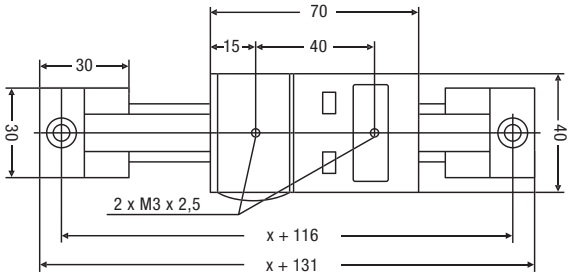






Vertical design





Part No.	Measuring range mm	4070 PREISSER	4071 PREISSER	Resolution mm/inch	Error margin µm	Repeatability µm
1150	150	146.54	208.80	0.01/0.0005	30	10 (±2)
1200	200	153.77	219.49	0.01/0.0005	30	10 (±2)
1300	300	158.48 (411)	223.26 (411)	0.01/0.0005	30	10 (±2)

Universal Measuring Devices DIGI-MET®

RS232

Design: With reversible measuring direction, enlargement of measuring by extensions possible, dial gauge with LCD, rotating 270°, tolerance indicated by LED. On/off function, zero point setting in any position, mm/inch selection, data output Opto RS 232, storage of max./min. value, Hold function (memory of measured value), preset function (presetting of value).

Internal and external measurements, large measuring range, with extensions up to 3,000 mm, constant measuring pressure, digital or analogue display, extensive accessories for measuring threads, grooves, internal and external teeth, diameters, length, centring seats, recesses etc.

Measuring path 15 mm, special inserts on request.

Set content: Basic unit, DIGI-MET dial gauge with protective cap, pair of measuring arms 50 mm, adjustable depth stops (pair), ball-shaped measuring inserts with clamping set. Supplied in wooden case.

Special accessories: Extensive accessories for measuring of internal and external diameter, length, grooves, centring seats, recesses, drilling distances, pitches of internal and external teeth (ball-shaped inserts), toothed wheels (measuring pins), inserts for measuring pitches of internal threads, measuring wires for threads and holders for measuring of external threads etc. Further 500 mm extensions available.



Note: Spare battery 4027 2032
Data cable 4025 0232

Part No.	Internal measuring range mm	4074 PREISSER	External measuring range mm	Measuring range mm
0250	30–250	2,817.43 (411)	0–215	15



Ball-shaped measuring surfaces for internal measurement



Inserts for use with measuring arms



Ball-shaped inserts for measuring external teeth



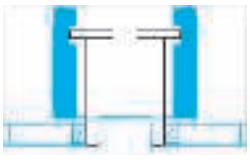
Ball-shaped inserts for measuring internal teeth



Inserts for measuring female threads



Inserts for external measurement



Inserts for internal measurement



Cone-shaped inserts for measuring distances between bore holes



Inserts for measuring external centring seats

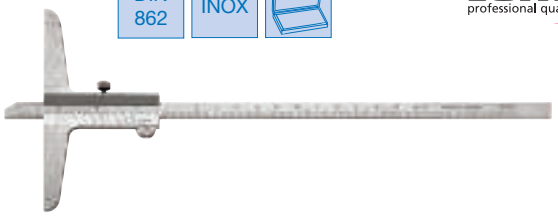


Cylindrical inserts for measuring internal centring seats

Vernier Depth Gauges with Straight Measuring Bar

Design: Accuracy according to DIN 862, stainless steel, scale and vernier matt chromium-plated, with laser scale and locking screw, for depth and step measurements. Supplied in wooden case.

DIN 862 | INOX



Part No.	Measuring range mm	4076 mm	Bridge length mm	Cross-section of measuring bar mm	Vernier mm
0200	200	17.43	100	10 x 3.5	1/20
0205	200	18.14	100	10 x 3.5	1/50
0300	300	33.20	150	12 x 3.5	1/20
0305	300	34.18	150	12 x 3.5	1/50
0500	500	57.76	150	12 x 3.5	1/20
0505	500	59.88	150	12 x 3.5	1/50
0800	800	310.53	250	20 x 5	1/20
1000	1000	448.10	250	20 x 5	1/20
		(412)			

Vernier Depth Gauges with Measuring Pin

Design: Accuracy according to DIN 862, stainless and hardened steel, scale and vernier matt chromium-plated, with hardened measuring pin and laser scale on both sides. Supplied in wallet.

INOX | DIN 862

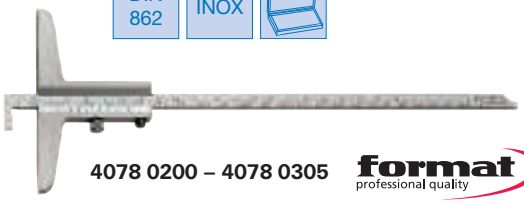


Part No.	Measuring range mm	4077 mm	Bridge length mm	Cross-section of measuring bar mm	Measuring pin ∅ mm	Vernier mm
0080	80	16.60	50	8 x 3	1.0	1/20
0085	80	17.39	50	8 x 3	1.0	1/50
0200	200	44.82	100	8 x 3	1.5	1/20
0205	200	47.51	100	8 x 3	1.5	1/50
0300	300	63.07	150	12 x 4	2.0	1/20
0305	300	64.97	150	12 x 4	2.0	1/50
		(412)				

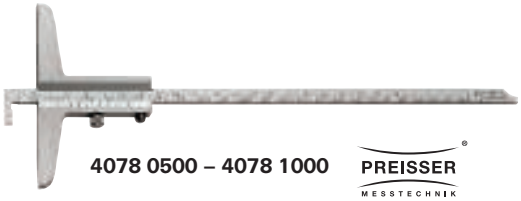
Vernier Gauges with Offset Measuring Bar

Design: Accuracy according to DIN 862, stainless steel, scale and vernier matt chromium-plated, graduated on both sides to enable the measuring bar to be converted into a standard depth gauge, with locking screw. Supplied in wooden case.

DIN 862 | INOX



4078 0200 – 4078 0305



4078 0500 – 4078 1000

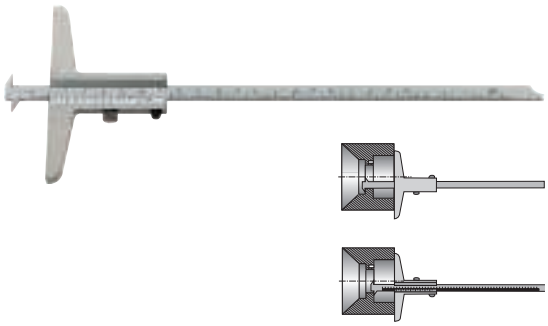
Part No.	Measuring range mm	4078 mm	4078 PREISSER	Bridge length mm/inch	Cross-section of measuring bar mm	Vernier mm
0200	200	49.79	–	100	8 x 3	1/20
0205	200	51.73	–	100	8 x 3	1/50
0300	300	60.58	–	150	12 x 4	1/20
0305	300	63.62	–	150	12 x 4	1/50
0500	500	–	146.54	150	12 x 4	1/20
0800	800	–	350.62	250	20 x 5	1/20
1000	1000	–	479.54	250	20 x 5	1/20
		(412)	(402)			

Depth Gauges for Width and Distance Measurements

Design: Accuracy according to DIN 862, stainless steel, scale and vernier matt chromium-plated, laser scale on both sides, measuring bar offset on both sides to enable it to be converted, with locking screw. Supplied in cardboard box.

DIN 862 | INOX

format professional quality



Part No.	Measuring range mm	4079 mm/inch	Bridge length mm	Cross-section of measuring bar mm	Vernier mm
0200	200	71.67	100	8 x 3	1/20
0205	200	54.28	100	8 x 3	1/50
0300	300	82.35	100	12 x 4	1/20
0305	300	70.41	100	12 x 4	1/50

(412)

Digital Depth Gauges

Design: Accuracy according to DIN 862, stainless steel, measuring surfaces ultra-fine ground and hardened, for measuring drilling depths and steps, on/off switch, zero point setting in any position, LCD, mm/inch selection, data output Opto RS 232 C, max. traverse rate 1.5 m/s, with locking screw and straight measuring bar, battery-operated (3 v lithium battery). Supplied in wallet, incl. battery.

Note: Spare battery 4027 2032
Data cable 4025 0002

DIN 862 | INOX | RS232 | Certificate

format professional quality



Part No.	Measuring range mm	4080 mm/inch	Bridge length mm	Reading mm/inch	Cross-section of measuring bar mm
1200	200	217.92	100	0.01/0.0005	12 x 4
1300	300	253.53	150	0.01/0.0005	12 x 4
1500	500	328.59	150	0.01/0.0005	12 x 4
2000	1000	1,642.95	250	0.01/0.0005	30 x 7

(404)

Depth Gauges DIGI-MET®, Splash-proof IP 65

Design: Accuracy according to DIN 862, stainless steel, protection class IP 65 according to EN 60529, measuring system insensitive to coolants and dust, housing and keyboard chemically stable, LCD 7.5 mm, with locking screw, measuring pin 1.5 mm. On/off switch, reference lock function, zero point setting is assured, no faulty measurement possible, zero point setting in any position possible, mm/inch selection. Supplied in wallet, **incl. calibration certificate.**

Note: Spare battery 4027 2032
Data cable 4025 0232

DIN 862 | INOX | IP 65 | Certificate

PREISSER MESSTECHNIK



Part No.	Measuring range mm	4081 PREISSER mm/inch	Bridge length mm	Reading mm/inch
0150	150	339.10	100	0.01/0.0005
0300	300	415.99	150	0.01/0.0005
0500	500	479.16	150	0.01/0.0005

(411)

Accessories for Depth Gauge DIGI-MET®

Part No.	Design	4081 PREISSER
1200	Measuring bridge 200 mm	79.26
1300	Measuring bridge 300 mm	92.27
1400	Measuring insert	34.75

(411)



Digital Depth Gauges/Depth Micrometers

Digital Depth Gauges DIGI-MET® for Width and Distance Measurements

Design: Accuracy according to DIN 862, stainless steel, measuring bar with graduation on both sides, on/off switch, zero point setting in any position, mm/inch selection, HOLD function, data output Opto RS 232, with locking screw. Supplied in wooden case, **incl. battery and calibration certificate.**

Note: Spare battery 4027 2032
Data cable 4025 0232

DIN 862 | INOX | RS232 | Certificate

PREISSER MESSTECHNIK



Part No.	Measuring range mm	4082 PREISSER	Bridge length mm	Reading mm/inch	Cross-section of measuring bar mm
0300	300	437.61 (411)	150	0.01/0.0005	12 x 4

Digital Depth Gauges DIGI-MET® with Graduated Measuring Bar

Design: Accuracy according to DIN 862, stainless steel, graduated measuring bar with 90° angle, on/off switch, zero point setting in any position, mm/inch selection, HOLD function, data output Opto RS 232, with locking screw. Supplied in wooden case, **incl. battery and calibration certificate.**

Note: Spare battery 4027 2032
Data cable 4025 0232

DIN 862 | INOX | RS232 | Certificate

PREISSER MESSTECHNIK



Part No.	Measuring range mm	4084 PREISSER	Bridge length mm	Reading mm/inch	Cross section of measuring bar mm
0300	300	364.78	150	0.01/0.0005	12 x 4
0500	500	416.65 (411)	150	0.01/0.0005	12 x 4

Small Depth Gauges DIGI-MET®

Design: DIN 862, stainless steel, LCD 6 mm. On/off function, zero point setting in any position, mm/inch selection, Hold function (memory of measured values), data output Opto RS 232. Supplied in wooden case, incl. battery.

Note: Spare battery 4027 2032
Data cable 4025 0232

DIN 862 | INOX | RS232

PREISSER MESSTECHNIK



Part No.	Measuring range mm	4085 PREISSER	∅ of measuring pin mm
0025	25	218.23 (411)	2

Depth Micrometers with Exchangeable Stylus

Design: Accuracy higher than DIN 863, hardened steel, reading parts matt chromium-plated, measuring surfaces of bridge 100 x 17 mm, with clamping ring and friction clutch. After releasing the cap, the stylus (25 mm steps) can be exchanged. Stylus ∅ 4 mm, tips hardened and plane-lapped to gauge block length. Supplied in wooden case.

DIN 863

Hartig

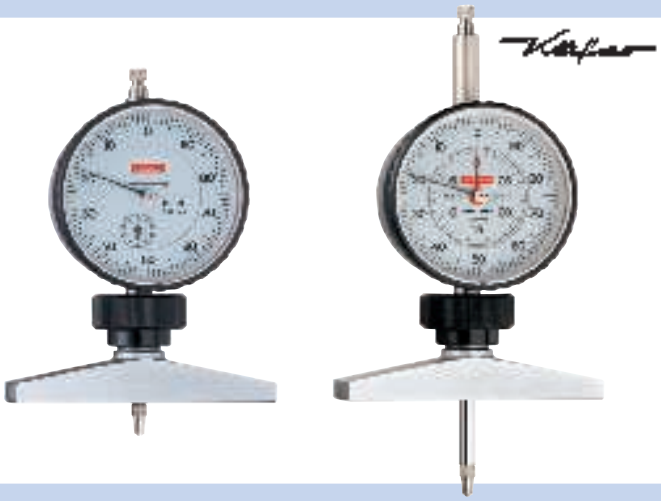


Part No.	Measuring range mm	4090	Micrometer drum ∅ mm	Spindle pitch mm	Reading mm	Error margin µm	Number of styluses
0100	0–100	208.78	20.0	0.5	0.01	5	4
0150	0–150	244.51	20.0	0.5	0.01	6	6
0300	0–300	393.74 (413)	20.0	0.5	0.01	9	12

Depth Gauges/Measuring Tool Sets

Depth Gauges TM

Design: The measuring bridge is matt chromium-plated and hardened. Contact surface finely lapped. Contact surface of bridge 80 x 16 mm. The metal collet enables secure clamping of the dial gauge and increases measurement reliability. An additional Allen screw eases exchange of the dial gauge. The millimetre indication of article 4093 0030 is arranged concentrically enabling easy reading. Supplied with special stylus (length 10 mm) in plastic box.



Part No.	Graduation value mm	4093	Measuring range mm	1 pointer revolution mm	Dial ∅ mm
0010	0.01	97.40	10	1	58
0030	0.01	137.65	30	1	58
		(423)			

Measuring Bridges for Depth Gauge

Design: The measuring bridges are provided with a location hole 8 mm H 7. They are matt chromium-plated and hardened. The contact surfaces are fine-lapped.



Part No.	Dimensions mm	4093
0050	50 x 16	48.34
0080	80 x 16	48.34
0120	120 x 20	55.58
0150	150 x 20	80.10
		(423)

Measuring Tool Set, 4-piece

Design: Comprising pocket vernier calliper gauge, stainless, chromium-plated, with instant lock and depth gauge, measuring range 150 mm; micrometer, carbide tipped, with locking mechanism, chromium-plated reading parts and ratchet, measuring range 0–25 mm; hairline set-square, DIN 875/00, stainless, 100 x 70 mm; flexible rule, stainless, 150 mm. Supplied in wooden case.

INOX

format professional quality



Part No.	Design	4094	Vernier mm
0004	4-piece	55.95	1/20
0014	4-piece	82.71	1/50
		(401)	

Measuring Tool Set, 6-piece

Design: Comprising pocket vernier calliper gauge, stainless, chromium-plated, with instant lock and depth gauge, measuring range 150 mm; micrometer, carbide tipped, with locking mechanism, chromium-plated reading parts and ratchet, measuring range 0–25 mm; hairline set-square, DIN 875/00, stainless, 100 x 70 mm; flexible rule, stainless, 150 mm; spring calliper, 150 mm. Supplied in wooden case.

INOX

format professional quality



Part No.	Design	4095	Vernier mm
0006	6-piece	67.94	1/20
0016	6-piece	101.72	1/50
		(401)	

External Micrometers

Design: Accuracy to DIN 863, reading parts matt chromium-plated, measuring surfaces carbide-tipped, control of measuring force through ratchet, with insulating surface to avoid conduction of hand temperature, locking by clamping device, supplied in wallet, incl. setting key, from measuring range 25–50 mm.
Supplied with setting gauge.

DIN 863



format professional quality

Part No.		0025	0050	0075	0100	0125	0150	0175	0200
Measuring range	**mm**	**0–25**	**25–50**	**50–75**	**75–100**	**100–125**	**125–150**	**150–175**	**175–200**
4100		13.44	14.78	15.93	17.60	21.59	24.16	26.97	31.13
Spindle Ø	mm	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Micrometer drum Ø	mm	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
Spindle pitch	mm	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Reading	mm	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

(416)

External Micrometer Set, 0–100 mm

Design: Accuracy to DIN 863, reading parts matt chromium-plated, measuring surfaces carbide-tipped, measuring force controlled by ratchet, with special insulating surface to avoid conduction of hand heat, locked with clamping lever.

Comprising 1 micrometer each: 0–25 mm; 25–50 mm; 50–75 mm; 75–100 mm; supplied in wooden case.

DIN 863

format professional quality



Part No.	Design	4103
0004	4-piece	73.02

(416)

External Micrometers with Pre-tensioned Ratchet

Design: Accuracy to DIN 863, reading parts matt chromium-plated, measuring surfaces carbide-tipped, pre-tension ratchet for constant measuring force, with insulating surface to avoid conduction of hand heat, locked with clamping lever.
Supplied in wallet, incl. setting key, from measuring range 25–50 mm with setting gauge.

DIN 863

format professional quality

Part No.		0025	0050	0075	0100
Measuring range	**mm**	**0–25**	**25–50**	**50–75**	**75–100**
4105		15.09	17.43	19.92	23.23
Spindle Ø	mm	6.5	6.5	6.5	6.5
Micrometer drum Ø	mm	19.0	19.0	19.0	19.0
Spindle pitch	mm	0.5	0.5	0.5	0.5
Reading	mm	0.01	0.01	0.01	0.01

(416)



External Micrometers with 28 mm Scale Drum

Design: Accuracy to DIN 863, reading parts matt chromium-plated, measuring surfaces carbide-tipped, measuring force controlled by ratchet, with insulating surface to avoid conduction of hand heat, locked with clamping lever.
Supplied in wallet, incl. setting key, from measuring range 25–50 mm with setting gauge.

DIN 863

format professional quality

Part No.		0025	0050	0075	0100
Measuring range	**mm**	**0–25**	**25–50**	**50–75**	**75–100**
4107		34.86	38.19	42.31	43.98
Spindle Ø	mm	8.0	8.0	8.0	8.0
Micrometer drum Ø	mm	28.0	28.0	28.0	28.0
Spindle pitch	mm	1.0	1.0	1.0	1.0
Reading	mm	0.01	0.01	0.01	0.01

(416)



External Micrometers with Dial Indicator for Linear Measurement

Design: Higher accuracy than DIN 863, reading parts matt chromium-plated, measuring surfaces carbide-tipped, convenient operation by lever, constant measuring force, with insulating surface to avoid conduction of hand temperature, locking by clamping device, precisely supported anvil with 2.5 mm stroke, parallelism of measuring surfaces $<= 1$ µm.
Ideal for accurate series measurements such as during grinding of shafts.
Supplied in wooden case, without setting reference gauge.

DIN 863

Hartig

Part No.		0025	0050
Measuring range	**mm**	**0–25**	**25–50**
4110		572.35 ◊	580.29 ◊
Spindle Ø	mm	8.0	8.0
Micrometer drum Ø	mm	25.0	25.0
Spindle pitch	mm	0.5	0.5
Read out finearm	µm	1	1
Read out micrometer	µm	5	5

(413)



Stands for External Micrometer

Design: With cast iron base. Reading side can be turned and adjusted vertically.

Part No.	Measuring range mm	4108 mm
0001	0–300	20.75

(416)



format professional quality

External Micrometers DIGI-MET®

Design: On/off switch, automatic off switch, zero point setting in any position, mm/inch selection, splash proof IP 54, clamping lever, control of measuring force by ratchet, with insulating surface to avoid conduction of hand temperature, as from 25 mm with setting reference gauge. Supplied in wooden case.

DIN 863 | IP 54



PREISSER MESSTECHNIK

Part No.		1025	1050	1075	1100
Measuring range	**mm**	**0–25**	**25–50**	**50–75**	**75–100**
4111 PREISSER		72.91	83.75	95.38	110.13
Reading	mm/inch	0.001/0.0005	0.001/0.0005	0.001/0.0005	0.001/0.0005

(411)

External Micrometers DIGI-MET® RS 232 and Digimatic

Design: Accuracy according to DIN 863, LCD 7.5 mm, with clamping lever, ratchet integrated in measuring drum, fast drive, measuring surfaces made of carbide, with insulating surface to avoid conduction of hand temperature. Variable data output RS 232 and Digimatic (DATA Variable), on/off switch, zero point setting in any position, absolute/relative measurement, mm/inch selection, preset function (presetting of value). Supplied in wooden case, **incl. battery.**

Note: Spare battery 4027 2032
Data cable Digimatic 4025 0102

DIN 863 | Digimatic | RS232

PREISSER MESSTECHNIK



Part No.		0025	0050	0075	0100
Measuring range	**mm**	**0–25**	**25–50**	**50–75**	**75–100**
4109 PREISSER		167.45	214.81	296.98	342.26
Spindle ∅	mm	6.5	6.5	6.5	6.5
Spindle pitch	mm	0.635	0.635	0.635	0.635
Reading	mm/inch	0.001/0.00005	0.001/0.00005	0.001/0.00005	0.001/0.00005

(411)

External Micrometers with 50 mm Spindle Adjustment

Design: Higher accuracy than DIN 863, reading parts matt chromium-plated, measuring surfaces carbide-tipped, control of measuring force by friction clutch, with insulating surface to avoid conduction of hand temperature, locking by clamping device. Supplied in wooden case, **without setting reference gauge.**

DIN 863

Hartig



Part No.		0050	0100	0150	0200	0250	0300
Measuring range	**mm**	**0–50**	**50–100**	**100–150**	**150–200**	**200–250**	**250–300**
4113 Hartig		207.20	234.19	269.91 ◊	308.81 ◊	350.89 ◊	396.13 ◊
Spindle ∅	mm	8.0	8.0	8.0	8.0	8.0	8.0
Micrometer drum ∅	mm	24.0	24.0	24.0	24.0	24.0	24.0
Spindle pitch	mm	1.0	1.0	1.0	1.0	1.0	1.0
Reading	mm	0.01	0.01	0.01	0.01	0.01	0.01

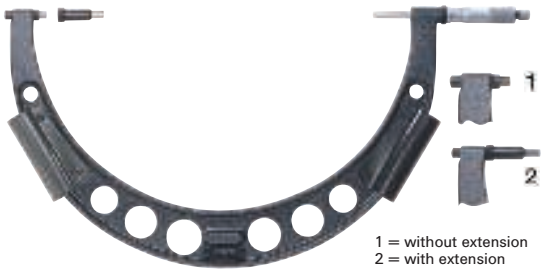
(413)

External Micrometers with Gauge Block Extension

Design: Higher accuracy than DIN 863, measuring surfaces carbide-tipped, solid light-metal bow. Due to the screwable carbide-tipped extension lapped to gauge block length, the measuring range of the 50 mm spindle is doubled. Inner graduation provided with digits for both measuring ranges, higher measurement reliability in contrast to micrometers with exchangeable anvil inserts. Reading parts matt chromium-plated, with clamping device, friction clutch and insulating surface to avoid conduction of hand temperature. Supplied in plastic foil, incl. one gauge block extension, **without setting reference gauge.**

DIN 863

Hartig



1 = without extension
2 = with extension

Part No.		0400	0500	0600	0700	0800	0900	1000
Measuring range	**mm**	**300–400**	**400–500**	**500–600**	**600–700**	**700–800**	**800–900**	**900–1000**
4114		645.38 ◊	708.90 ◊	785.90 ◊	864.50 ◊	941.49 ◊	1,018.50 ◊	1,113.75 ◊
Spindle ∅	mm	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Micrometer drum ∅	mm	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Spindle pitch	mm	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Reading	mm	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Error margin	µm	7	8	9	9	9	10	10

For wooden case see part no. 4115.

(413)

Wooden Case for External Micrometers with Gauge Block Extension

Part No.		0400	0500	0600	0700	0800	0900	1000
Measuring range	**mm**	**300–400**	**400–500**	**500–600**	**600–700**	**700–800**	**800–900**	**900–1000**
4115		49.22 ◊	68.26 ◊	95.27 ◊	122.24 ◊	152.41 ◊	185.76 ◊	219.09 ◊

(413)

Setting Reference Gauges for External Micrometers

Design: Special steel, measuring surfaces hardened and plane-parallel lapped, with insulating surface to avoid conduction of hand temperature and continuous identity no.

Hartig

Part No.	Length mm	4116	Error margin µm	∅ of measuring surface mm
0025	25	21.42 ◊	1.25	6.5
0050	50	21.42 ◊	1.25	6.5
0075	75	22.23 ◊	1.5	6.5
0100	100	23.02 ◊	2.0	6.5
0125	125	23.82 ◊	2.5	6.5
0150	150	27.00 ◊	2.5	6.5
0175	175	30.17 ◊	2.5	6.5
0200	200	33.35 ◊	3.0	6.5
0250	250	39.70 ◊	3.0	6.5
0300	300	53.18 ◊	3.0	10.0
0400	400	69.85 ◊	3.5	10.0
0500	500	86.52 ◊	3.5	10.0

(413)



External Groove Micrometers

Design: Accuracy to DIN 863, hardened spindle, reading parts matt chromium-plated, control of measuring force by ratchet, non-rotating spindle, with insulating surface to avoid conduction of hand temperature, locking by clamping lever. Supplied in wallet, incl. setting key, from 25 mm with setting reference gauge.

DIN 863

format professional quality





Part No.		0025	0050	0075	0100
Measuring range	**mm**	**0–25**	**25–50**	**50–75**	**75–100**
4119		87.96	97.93	102.89	116.17
Spindle ∅	mm	8.0	8.0	8.0	8.0
Micrometer drum ∅	mm	17.0	17.0	17.0	17.0
Spindle pitch	mm	0.5	0.5	0.5	0.5
Reading	mm	0.01	0.01	0.01	0.01

(416)

External Disk Micrometers

Design: Accuracy according to DIN 863, hardened spindle, measuring plate plane-parallel lapped, reading parts matt chromium-plated, control of measuring force by ratchet, with insulating surface to avoid conduction of hand temperature. Locking by clamping lever, for modules 0.5–6.0 mm. Supplied in wallet, incl. setting reference gauge.

DIN 863

format professional quality



Part No.		0025	0050	0075	0100	0125	0150
Measuring range	**mm**	**0–25**	**25–50**	**50–75**	**75–100**	**100–125**	**125–150**
4120		44.82	49.79	58.09	64.74	76.34	79.67
Spindle Ø	mm	6.5	6.5	6.5	6.5	6.5	6.5
Drum Ø	mm	17.0	17.0	17.0	17.0	17.0	17.0
Measuring plate Ø	mm	20.0	20.0	20.0	20.0	30.0	30.0
Spindle pitch	mm	0.5	0.5	0.5	0.5	0.5	0.5
Reading	mm	0.01	0.01	0.01	0.01	0.01	0.01

(416)

External Tube Micrometers

Design: Accuracy to DIN 863, reading parts matt chromium-plated, spindle hardened and ground, measuring force controlled by ratchet, with spherical anvil Ø 4.7 x 27 mm. Supplied in wallet.

DIN 863

format professional quality



Part No.	Measuring range mm	4121	Spindle Ø mm	Micrometer drum Ø mm	Spindle pitch mm	Reading mm
0025	0–25	26.55	6.5	17.0	0.5	0.01

(416)

External Disk Micrometers

Design: Accuracy according to factory standard, carbide measuring surfaces, reading parts matt chromium-plated, control of measuring forces by ratchet, with insulating surface to avoid conduction of hand temperature, locking by clamping lever. Scope of supply in plastic case incl.: External micrometer with reference gauge.

Application: For reference-free measuring of tooth width of cylindrical and toothed gears for modules of 0.5–6.0 mm. Also suitable for thickness measurement of soft materials such as rubber, plastic, paper etc.

Factory standard

format professional quality



Part No.	Measuring range mm	4126	Spindle Ø mm	Drum Ø mm	Spindle pitch mm	Reading mm
0015	0–15	40.87	6.5	17	1	0.01
0025	0–25	49.12	6.5	17	1	0.01

(416)

External V-Anvil Micrometers

Design: Accuracy according to DIN 863, matt chromium-plated, spindle hardened and ground, measuring surfaces plane-parallel lapped, control of measuring forces by ratchet, with insulating surface to avoid conduction of hand temperature, clamping device and adjusting nut.
The spindle pitch is adjusted to the respective V-block angle.
Supplied in wooden case, **incl. setting reference gauge.**

DIN 863

format professional quality



Part No.		0015	0020	0035	0050	1025	1045	1065
Measuring range	**mm**	**1–15**	**5–20**	**20–35**	**35–50**	**5–25**	**25–45**	**45–65**
4125		99.57	104.56	122.81	149.37	99.57	131.11	149.37
Spindle Ø	mm	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Micrometer drum Ø	mm	17.0	17.0	17.0	17.0	17.0	17.0	17.0
Reading	mm	0.01	0.01	0.01	0.01	0.01	0.01	0.01
V-block angle		60°	60°	60°	60°	108°	108°	108°

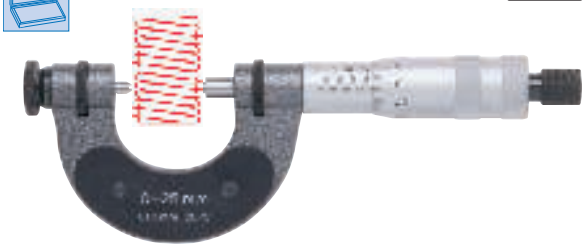
(416)

External Micrometers for Thread Measurements

Design: Higher accuracy than DIN 863, suitable for measuring of threads which are true to gauge size, reading parts matt chromium-plated, with insulating surface to avoid conduction of hand temperature, clamping device and friction clutch. Spindle and anvil with location hole for stylus ∅ 3.5 mm. Supplied in wooden case, without thread flank inserts, **without setting reference gauge.**

DIN 863

Hartig



Part No.		0025	0050	0075	0100	0125	0150
Measuring range	**mm**	**0–25**	**25–50**	**50–75**	**75–100**	**100–125**	**125–150**
4122		196.08	204.01	219.90 ◊	240.53 ◊	262.76 ◊	286.58 ◊
Spindle ∅	mm	6.5	6.5	6.5	6.5	6.5	6.5
Micrometer drum ∅	mm	20.0	20.0	20.0	20.0	20.0	20.0
Spindle pitch	mm	0.5	0.5	0.5	0.5	0.5	0.5
Reading	mm	0.01	0.01	0.01	0.01	0.01	0.01

(413)

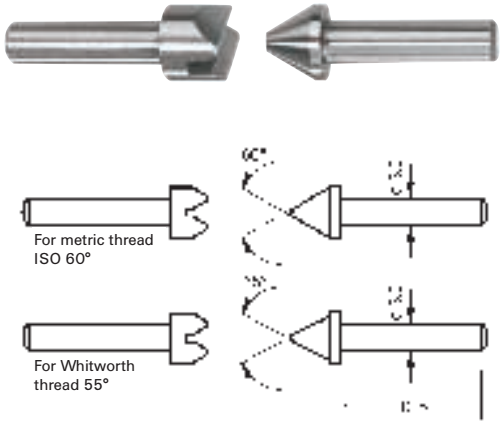
Styluses for Micrometers for External Threads

Design: Wear-resistant steel, hardened, ultra-fine ground and pitch marked.

Hartig

Part No.	Design	4123	Lead mm	Pitch/thread of screw/inch
1001	Metric ISO 60°	73.87	0.35–0.5	–
1002	Metric ISO 60°	63.51	0.6 –0.8	–
1003	Metric ISO 60°	63.51	0.9 –1.25	–
1005	Metric ISO 60°	63.51	1.5 –2	–
1006	Metric ISO 60°	63.51	2.5 –3.5	–
1007	Metric ISO 60°	73.83 ◊	4 –6	–
2001	Whitworth 55°	80.17 ◊	–	60–48
2002	Whitworth 55°	69.85 ◊	–	40–32
2003	Whitworth 55°	69.85 ◊	–	28–22
2004	Whitworth 55°	69.85 ◊	–	20–16
2005	Whitworth 55°	69.85 ◊	–	14–11
2006	Whitworth 55°	69.85 ◊	–	10– 7
2007	Whitworth 55°	80.17 ◊	–	6– 4

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Setting Reference Gauge for Micrometers for External Threads

Design: Measuring surfaces made of aged and hardened steel with lapped hole, round-off at one side, with insulating surface to avoid conduction of hand temperature and continuous identity no.

Hartig

Part No.	Design	4124	Length mm	Error margin µm
1025	Metric ISO 60°	46.03 ◊	25	3
1050	Metric ISO 60°	46.84 ◊	50	3
1075	Metric ISO 60°	47.62 ◊	75	3
1100	Metric ISO 60°	48.43 ◊	100	4
1125	Metric ISO 60°	49.22 ◊	125	4
2025	Whitworth 55°	46.03 ◊	25	3
2050	Whitworth 55°	46.84 ◊	50	3
2075	Whitworth 55°	47.62 ◊	75	3
2100	Whitworth 55°	50.80 ◊	100	4
2125	Whitworth 55°	51.60 ◊	125	4

(413)



Precision Internal Micrometers with Jaw

Design: Accuracy according to DIN 863, reading parts matt chromium-plated, carbide measuring surfaces ultra-fine lapped, measuring force controlled by ratchet. Supplied in wallet.

DIN 863

format professional quality



Part No.		0030	0050	0075	0100
Measuring range	**mm**	**5–30**	**25–50**	**50–75**	**75–100**
4133		37.35	41.49	46.47	50.63
Micrometer drum ∅	mm	17.0	17.0	17.0	17.0
Spindle pitch	mm	0.5	0.5	0.5	0.5
Reading	mm	0.01	0.01	0.01	0.01

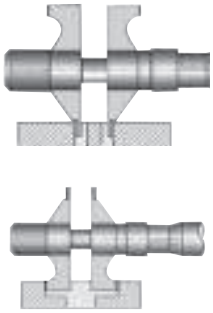
(416)

Precision Internal Micrometers with Jaw

Design: Higher accuracy than DIN 863. Ideal for measuring of bore holes during lathe, milling and grinding operations. Convenient handling allows precise measurements, with some experience also in µm range. Due to the large measuring range, it is an alternative to three-point internal gauges with equal measuring accuracy. Measuring surfaces cylindrical and carbide-tipped, spindle with ball bearing, jaws on both side with 2 separate internal measuring sleeves for convenient reading, friction clutch advanced to measuring drum for fine measuring, repeatability < 2 µm. Supplied in wooden case.

DIN 863

Hartig





Part No.		0055
Measuring range	**mm**	**5–55**
4134 Hartig		527.11
Micrometer drum ∅	mm	21.0
Spindle pitch	mm	0.5
Reading	mm	0.01
Error margin	µm	2.5

(413)

Precision Internal Micrometers with Extension Bar

Design: Higher accuracy than DIN 863, reading parts matt chromium-plated, carbide measuring surfaces lapped spherically, graduation drum 17 mm ∅, reading 0.01 mm, spindle pitch 0.5 mm, measuring body 25 mm adjustable, spindle sluggish to prevent misalignment of graduation, high measuring accuracy due to the hardened tips of the extension bar lapped to gauge block length, with insulating surface to avoid conduction of hand temperature. The error indicated in the table refers to the maximum dimension of the set. Supplied in wooden case.

DIN 863

Hartig





Part No.	Measuring range mm	4140 Hartig	Extension bars mm	Error margin µm
0250	50– 250	306,41 ◊	25/50/100	8
0450	50– 450	377,86 ◊	25/50/100/200	10
0850	50– 850	475,52 ◊	25/50/100/200/400	12
1250	50–1250	566,00 ◊	25/50/100/200/400/400	14
1450	50–1450	604,11 ◊	25/50/100/200/400/600	15

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Precision Dial Bore Gauges with Automatic Centring Function

Design: With fixed points made of steel, moving carbide measuring pin, dial gauge ∅ 58 mm, for quick measurement of various hole parameters. Supplied in wooden case, incl. dial gauge.

format professional quality



Part No.		0035	0050	0160
Measuring range	**mm**	**18–35**	**35–50**	**50–160**
4143		66.39	66.39	71.37
Measuring depth	mm	115	150	200
Reading	mm	0.01	0.01	0.01

(418)

Three-point Internal Micrometers

Design: Reading 0.005 mm, reading parts matt chromium-plated, pitch 0.5 mm, measuring surfaces carbide tipped from measuring range 12.5 mm, measuring force control by ratchet. For accurate measurement of clearance holes. Also for blind holes from 12.5 mm measuring range. **Incl. setting ring gauge with calibration certificate.** Supplied in wooden case.

Certificate

PREISSER MESSTECHNIK



Part No.	Measuring range mm	4162 PREISSER	Measuring depth mm	Accuracy mm
0080	6.0– 8.0	347.44	58	0.003
0100	8.0– 10.0	319.20	58	0.003
0125	10.0– 12.5	319.20	58	0.003
0160	12.5– 16.0	319.20	62	0.003
0200	16.0– 20.0	325.71	62	0.003
0250	20.0– 25.0	359.38	66	0.003
0350	25.0– 35.0	513.54	66	0.003
0500	35.0– 50.0	522.22	80	0.003
0650	50.0– 65.0	625.37	80	0.004
0800	65.0– 80.0	625.37	80	0.004
1000	80.0–100.0	793.67	100	0.004
1250	100.0–125.0	799.07	115	0.005
1500	125.0–150.0	933.71	115	0.005
1750	150.0–175.0	1,186.71	115	0.005
2000	175.0–200.0	1,356.06	115	0.005
2250	200.0–225.0	1,827.27	115	0.005
2500	225.0–250.0	1,944.51	115	0.005
2750	250.0–275.0	2,057.45	115	0.005
3000	275.0–300.0	2,148.63	115	0.005

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DIGI-MET® Three-point Internal Micrometers XTD

Design: For accurate measuring of clearance holes. Measuring of blind holes from 12.5 mm measuring range possible. LCD 6 mm, measuring force control by ratchet, measuring surfaces carbide-tipped from measuring range 12.5 mm. On/off switch, zero point setting in any position, mm/inch selection, data output Opto RS 232, storage of max./min. value, HOLD function (measuring value storage), ± preset function (presetting of measuring value), tolerance feature.

Incl. setting ring gauge with calibration certificate.
Supplied in wallet.

Note: Spare battery 4027 2032
Data cable 4025 0002

PREISSER MESSTECHNIK

DIN 863 | RS232 | Certificate

Part No.	Measuring range mm	4166	Measuring depth mm	Reading mm/inch	Accuracy mm
0080	6 – 8	967.98 ◊	58	0.001/0.00005	0.003
0100	8 – 10	967.98 ◊	58	0.001/0.00005	0.003
0125	10 – 12.5	979.56 ◊	58	0.001/0.00005	0.003
0160	12.5– 16	993.47 ◊	62	0.001/0.00005	0.003
0200	16 – 20	993.47 ◊	62	0.001/0.00005	0.003
0250	20 – 25	1,192.63 ◊	66	0.001/0.00005	0.004
0350	25 – 35	1,370.92 ◊	66	0.001/0.00005	0.004
0500	35 – 50	1,426.52 ◊	80	0.001/0.00005	0.004
0650	50 – 65	1,586.32 ◊	80	0.001/0.00005	0.004
0800	65 – 80	1,586.32 ◊	80	0.001/0.00005	0.004
1000	80 –100	1,671.99 ◊	100	0.001/0.00005	0.004
1250	100 –125	1,743.78 ◊	115	0.001/0.00005	0.005
1500	125 –150	1,799.37 ◊	115	0.001/0.00005	0.005
1750	150 –175	1,966.10 ◊	115	0.001/0.00005	0.005
2000	175 –200	2,091.15 ◊	115	0.001/0.00005	0.005

(411)



DIGI-MET® Measuring Pistols XTH

Design: For accurate measuring of clearance holes. Measuring of blind holes from 12.5 mm measuring range. With pistol grip, carbide-tipped from measuring range 12.5 mm, LCD display, setting ring gauges with NAMAS certificate. On/off switch, zero point setting in any position, mm/inch selection, data output Opto RS 232, storage of max./min. value, HOLD function (measuring value storage), ± preset function (presetting of measuring value), tolerance feature.

Incl. setting ring gauge with calibration certificate.
Supplied in wooden case.

Note: Spare battery 4027 2032
Data cable 4025 0002

PREISSER MESSTECHNIK

DIN 863 | RS232 | Certificate

Part No.	Measuring range mm	4168	Measuring depth mm	Reading mm/inch	Accuracy mm
0080	6 – 8	1,141.68 ◊	58	0.001/0.00005	0.003
0100	8 – 10	1,116.19 ◊	58	0.001/0.00005	0.003
0125	10 – 12.5	1,178.71 ◊	58	0.001/0.00005	0.003
0160	12.5– 16	1,194.92 ◊	62	0.001/0.00005	0.003
0200	16 – 20	1,266.74 ◊	62	0.001/0.00005	0.003
0250	20 – 25	1,352.42 ◊	66	0.001/0.00005	0.004
0350	25 – 35	1,468.20 ◊	66	0.001/0.00005	0.004
0500	35 – 50	1,505.26 ◊	80	0.001/0.00005	0.004
0650	50 – 65	1,544.63 ◊	80	0.001/0.00005	0.005
0800	65 – 80	1,544.63 ◊	80	0.001/0.00005	0.005
1000	80 –100	1,646.49 ◊	85	0.001/0.00005	0.005
1250	100 –125	1,722.93 ◊	100	0.001/0.00005	0.005
1500	125 –150	1,827.15 ◊	100	0.001/0.00005	0.005
1750	150 –175	1,933.65 ◊	100	0.001/0.00005	0.005
2000	175 –200	2,019.35 ◊	100	0.001/0.00005	0.005

(411)



Spare Heads XT

Design: For DIGI-MET® three-point internal micrometers XTD and DIGI-MET® measuring pistols XTH.

Part No.	Measuring range mm	4172
0080	6 – 8	234.92 ◊
0100	8 – 10	234.92 ◊
0125	10 – 12.5	234.92 ◊
0160	12.5– 16	234.92 ◊
0200	16 – 20	234.92 ◊
0250	20 – 25	279.90 ◊
0350	25 – 35	414.86 ◊
0500	35 – 50	467.35 ◊
0650	50 – 65	547.29 ◊
0800	65 – 80	547.29 ◊
1000	80 –100	677.25 ◊
1250	100 –125	692.28 ◊
1500	125 –150	792.23 ◊
1750	150 –175	892.20 ◊
2000	175 –200	942.18 ◊

(411)

Extension BSX

Design: For DIGI-MET® three-point internal micrometers and DIGI-MET® measuring pistols XTH.

Part No.	Measuring range mm	4170
0100	6 – 10	86.17 ◊
0125	10 – 12.5	86.17 ◊
0200	12.5– 20	86.17 ◊
0500	20 – 50	125.58 ◊
3000	50 –300	135.42 ◊

(411)

Three-Point Internal Micrometer Sets

Design: According to DIN 863, part 4, for cylindrical and blind holes, reading parts and probe matt chromium-plated, measuring surfaces carbide tipped from measuring range 10–12 mm, reading 0.005 mm, lead 0.5 mm, measuring drum diameter 23 mm, with ratchet, complete with screwdriver and setting rings.
Supplied in wooden case.

DIN 863

format professional quality



Part No.	Measuring range mm	4175	Set contents
0012	6–12	590.83	1 micrometer each 6– 8 mm 8–10 mm 10–12 mm 1 setting ring ⌀ 8 mm 1 setting ring ⌀ 10 mm
0020	11–20	380.06	1 micrometer each 11–14 mm 14–17 mm 17–20 mm 1 setting ring ⌀ 11 mm 1 setting ring ⌀ 17 mm

(418)

Part No.	Measuring range mm	4175	Set contents
0040	20– 40	667.17	1 micrometer each 20–25 mm 25–30 mm 30–35 mm 35–40 mm 1 setting ring ⌀ 25 mm 1 setting ring ⌀ 35 mm
0100	40–100	1,349.29	1 micrometer each 40–50 mm 50–60 mm 60–70 mm 70–80 mm 80–90 mm 90–100 mm 1 setting ring ⌀ 50 mm 1 setting ring ⌀ 70 mm 1 setting ring ⌀ 90 mm

(418)

DIGI-MET® Three-point Internal Measuring Sets XT

4178 **DIGI-MET® Three Point Internal Measuring Sets XTD**

Design: For accurate measuring of clearance holes. Measuring of blind holes from measuring range 12.5 mm possible. LCD 6 mm, measuring force control by ratchet, measuring surfaces carbide tipped from measuring range 12.5 mm. On/off switch, zero point setting in any position possible, mm/inch selection, data output Opto RS 232, storage of max./min. value, HOLD function (measuring value storage), ± preset function (presetting of measuring value), tolerance feature.
Incl. setting ring gauge with calibration certificate.
Supplied in wooden case.

4180 **DIGI-MET® Measuring Pistol Sets XTH**

Design: For accurate measuring of clearance holes. Blind holes from measuring range 12.5 mm possible. With pistol grip, carbide tipped from measuring range 12.5 mm, LCD, setting ring gauges. On/off switch, zero point setting in any position possible, mm/inch selection, data output Opto RS 232, storage of max./min. value, HOLD function (measuring value storage), ± preset function (presetting of measuring value), tolerance feature.
Incl. setting ring gauge with calibration certificate.
Supplied in wooden case.

Note: Spare battery 4027 2032
Data cable 4025 0232

DIN 863 | RS232 | Certificate

PREISSER MESSTECHNIK



4178



4180

Part No.	Measuring range mm	4178	4180	Number of measuring heads	Measuring range of head mm	Reading mm/inch	Accuracy mm
0102	6– 10	1,370.03 ◊	1,384.82 ◊	2	6–8/8–10	0.001/0.00005	0.003
0203	10– 20	1,656.55 ◊	1,637.25 ◊	3	10–12.5/12.5–16/16–20	0.001/0.00005	0.004
0205	6– 20	–	2,019.53 ◊	5	6–8/8–10/10–12.5/12.5–16/16–20	0.001/0.00005	0.004
0503	20– 50	2,284.49 ◊	2,144.42 ◊	3	20–25/25–35/35–50	0.001/0.00005	0.004
1003	50–100	2,540.79 ◊	2,401.45 ◊	3	50–65/65–80/80–100	0.001/0.00005	0.005
1006	20–100	–	3,643.29 ◊	6	20–25/25–35/35–50/50–65/65–80/80–100	0.001/0.00005	0.005
1502	100–150	2,131.14 ◊	2,144.42 ◊	2	100–125/125–150	0.001/0.00005	0.005
2002	150–200	2,848.62 ◊	2,866.94 ◊	2	150–175/175–200	0.001/0.00005	0.005
2004	100–200	4,445.21 ◊	4,701.05 ◊	4	100–125/125–150/150–175/175–200	0.001/0.00005	0.005

(411) (411)

Precision Dial Gauges

Design: Accuracy to DIN 878.

DIN 878

4200 **Design:** Robust metal casing, matt chromium-plated, with adjustable tolerance indicators, with locking screw, clamping shank (ø 8 mm h6) hardened and ground. Supplied in wallet.

4203 **Design:** Accuracy control with calibrated measuring instruments according to national standards, robust metal casing, clamping shank hardened and ground, gauge plug and clamping shank (ø 8 mm h6) in stainless steel, dial turnable to zero, two adjustable tolerance markings, exchangeable stylus. Supplied in case.

Note: Styluses see 4236–4238.





Part No.	Measuring range mm	4200	4203	Outer ø mm	Reading mm	1 pointer revolution mm
0010	10	13.70 (422)	26.81 (423)	58	0.01	1.0

Precision Dial Gauges, shock-proof

Design: Accuracy according to DIN 878, accuracy control with calibrated measuring instruments according to national standards.

DIN 878

4205 **Design:** Gauge plug and clamping shank (ø 8 mm h6) in robust stainless steel. A precisely guided sleeve over the spindle is arranged and cushioned in a way that an impact will not be transmitted on to the gauge transmission. Supplied in case.

4207 **Design:** Brass casing, matt nickel-plated, non-breakable glass, measuring pin and clamping shank (ø 8 mm h6) lapped and made of hardened stainless steel. Supplied in wallet.

4210 **Design:** Gauge plug and clamping shank (ø 8 mm h6) in robust, stainless steel, incl. fine pointer adjustment. A precisely guided sleeve on the spindle is arranged and cushioned in a way that an impact will not be transmitted on to the gauge transmission. The large pointer is turned by turning the top knurled knob of the gauge allowing the setting to zero without rotation of the outer ring. Supplied in case.

Note: Styluses see 4236–4238.



Part No.	Measuring range mm	4205	4207	4210	Outer ø mm	Reading mm	1 pointer revolution mm
0005	5	51.34	–	–	40	0.01	0.5
0010	10	– (423)	35.11 (422)	66.90 (423)	58	0.01	1.0

Dial Gauges with Large Measuring Range and Large Dial

Design: Accuracy control with measuring instruments calibrated to national standards, gauge plug and clamping shank (ø 8 mm h6) lapped and in hardened stainless steel. Supplied in wallet.

DIN 878

4212 **Design:** Accuracy according to factory standard, brass casing, matt nickel-plated, non-breakable glass, all main parts of instrument mounted in hollow ceramic blocks.

4215 **Design:** Accuracy according to factory standard, shock-proof, brass casing, matt nickel-plated, non-breakable glass, the main parts of the measuring instrument mounted in hollow ceramic blocks.

4222 **Design:** Accuracy according to DIN 878, hysteresis error = 5µ, large casing diameter with clear reading, robust metal casing.

Note: Styluses see 4236–4238.



Part No.	Measuring range mm	4212	4215	4222	Outer ø mm	Reading mm	1 pointer revolution mm
0030	30	70.14	77.12	–	58	0.01	1.0
0050	50	–	103.54	–	58	0.01	1.0
0100	100	–	260.37	–	80	0.01	1.0
0810	10	–	–	77.44	80	0.01	1.0
1010	10	– (422)	– (423)	89.70 (423)	100	0.01	1.0

Dial Gauges – Small

DIN 878

Design: Accuracy according to DIN 878, accuracy control with measuring instruments calibrated to national standards.

4218 **Design:** Brass casing, matt chromium-plated, non-breakable glass, measuring pin and clamping shank (⌀ 8 mm h6) lapped and made of hardened stainless steel. Supplied in wallet.

4220 **Design:** Metal casing, gauge plug and clamping shank (⌀ 8 mm h6) in stainless steel, dial turnable to zero, two adjustable tolerance markings and exchangeable stylus. Supplied in wallet.

Note: Styluses see 4236–4238.

Part No.	Measuring range mm	4218	4220	Outer ⌀ mm	Reading mm	1 pointer revolution mm
0003	3	33.44	–	40	0.01	0.5
3203	3	–	47.25	32	0.01	0.5
4003	5	–	31.53	40	0.01	0.5
		(422)	(423)			



Dial Gauges with 1/1.000 Reading

Design: Accuracy according to factory standard, accuracy control with measuring instruments calibrated to national standards, including **precision cog wheel measuring instrument** with high measurement resolution. Main parts of the measuring instrument mounted in hollow ceramic blocks. **Shock-proof** design with screwed-on protective sleeve at the top. Supplied in case.

Note: Styluses see 4236–4238.

Part No.	Measuring range mm	4225	Outer ⌀ mm	Reading mm	1 pointer revolution mm
4001	1	91.27	40	0.001	0.2
5805	5	106.52	58	0.001	0.2
8005	5	136.39	80	0.001	0.2
		(423)			



Gauges, Oil and Water-proof

DIN 878 IP 67

Design: Accuracy according to DIN 878, accuracy control with measuring instruments calibrated to national standards, gauge plug and clamping shank (⌀ 8 mm h6) in robust stainless steel, including rubber bellow on gauge plug and O-ring washer at scale and rear face to protect against fluids and impurities. A precisely guided sleeve over the gauge plug is arranged and cushioned in a way that an impact will not be transmitted on to the gauge transmission. Supplied in case.

Note: Styluses see 4236–4238.

Part No.	Measuring range mm	4228	Outer ⌀ mm	Reading mm	1 pointer revolution mm
4403	3	76.64	44.5	0.01	0.5
6110	10	76.64	61.5	0.01	1
6101	1	126.81	61.5	0.001*	0.2
		(423)			

* Accuracy according to factory standard



Gauges with Magnetic Clamp

DIN 878

Design: Accuracy according to DIN 878, accuracy control with measuring instruments calibrated to national standards, with robust metal casing, hardened and ground, gauge plug and clamping shank (⌀ 8 mm h6) in stainless steel, dial turnable to zero, two adjustable tolerance markings, exchangeable stylus, **powerful rear wall magnet for use without stand and holder.** Supplied in wallet.

Note: Styluses see 4236–4238.

Part No.	Measuring range mm	4230	Outer ⌀ mm	Reading mm	1 pointer revolution mm
0010	10	80.10	58	0.01	1.0
		(423)			



Dial Gauges with Dial Indicator

Design: Accuracy according to factory standard. Other than with conventional dial gauges with precision cog wheel these instruments are based on a design principle similar to dial indicators. The gauge plug travel of the dial gauges is extended and by means of a leverage transmitted onto the indicator. In contrast to the dial indicators, these dial gauges are supplied with a 1 mm measuring range. The lever transmission ensures a low hysteresis error of max. 1.5 µm. Metal outer rings and detachable sleeves are included in the supply.
Supplied in wallet.

Note: Styluses see 4236–4238.

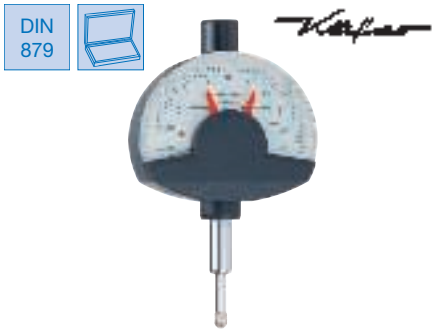


Part No.	Measuring range mm	4232	Outer ∅ mm	Reading mm	1 pointer revolution mm
4001	1	140.64	40	0.001	0.1
5801	1	140.64	58	0.001	0.1
		(423)			

Dial Indicators

Design: Accuracy according to DIN 879, **shock-proof,** axes of actuators and shafts mounted in hollow ceramic blocks, fine adjustment through knurled knob including adjustable tolerance marking. 4 mm gauge plug and clamping shaft (∅ 8mm h6) in stainless steel, hardened and ground, measuring force approx. 1 N, with wire release.
Supplied in case.

Note: Styluses see 4236–4238.



Part No.	Reading mm	4235	Measuring range mm	Overtravel mm
0101	0.01	118.32	0.5	2.5
1001	0.001	145.36	0.1	3
		(423)		

Digital Dial Gauges DIGI-MET, RS 232 and Digimatic

Design: Accuracy according to DIN 878, protection class 54 according to IEC 529, with exchangeable stylus M 2.5 mm, LCD 8.5 mm, measuring force 0.5–1.1 N.
With variable data output RS 232 and Digimatic. On/off switch, zero point setting in any position, inversion of counting sense, mm/inch selection, preset function (presetting of measuring value).
Supplied in wallet, **incl. calibration certificate.**

Note: Spare battery 4027 2032
Data cable 4025 0102
Styluses see 4236–4238



Part No.	Measuring range mm	4241	External ∅ mm	Reading mm/inch	Accuracy mm
0126	12.5	155.65	58	0.005/.001	0.015
		(411)			

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

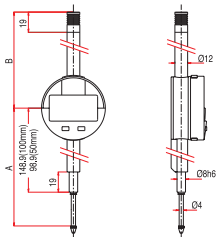
Digital Dial Gauges

Design: Aluminium casing, gauge spindle in stainless steel, hardened, front face made of shock-resistant polyamide, **protection class IP 51,** stylus exchangeable, LCD with mm/inch selection, zero point setting in any position, hold function, preset function, preselection call, reversion of measuring direction, data inquiry through ASCII code, data output Opto RS 232, power supply by 3-V lithium battery, clamping shank (⌀ 8 mm 6h), M 2.5 thread.
Supplied in cardboard box, incl. battery.

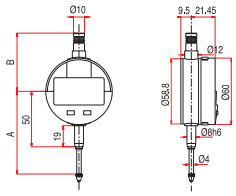
RS232 IP 51

Note: Spare battery 4027 2032
Data cable 4025 0002
Styluses see 4236–4238





Design L



Design S

Part No.	Measuring range mm	4242	Reading mm	Error margin µm	Dimension A	Dimension B	Design
0125	12.5	226.41	0.01	10	66.0	54.0	S
0126	12.5	284.58	0.001	5	66.0	54.0	S
0250	25.0	259.42	0.01	10	82.5	64.0	S
0251	25.0	308.16	0.001	5	82.5	64.0	S
0500	50.0	548.72 ◊	0.01	20	142.5	121.0	L
0501	50.0	605.32 ◊	0.001	7	142.5	121.0	L
1000	100.0	625.76 ◊	0.01	20	244.5	172.0	L
1001	100.0	683.94 ◊	0.001	8	244.5	172.0	L

(406)

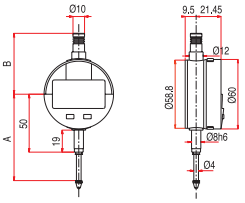
Digital Dial Gauges

Design: Aluminium casing, gauge spindle in stainless steel, hardened, front face made of shock-resistant polyamide, **protection class IP 51,** stylus exchangeable, LCD with mm/inch selection, zero point setting in any position, hold function, preset function, preselection recall, reversion of measuring direction min/max/Delta memory, selection and display of tolerance limits and half-duplex transmission, data inquiry through ASCII code, data output Opto RS 232, power supply by 3-V lithium battery, clamping shank (⌀ 8 mm 6h), M 2.5 thread.
Supplied in cardboard box, incl. battery.

RS232 IP 51

Note: Spare battery 4027 2032
Data cable 4025 0002
Styluses see 4236–4238





Part No.	Measuring range mm	4245	Reading mm	Error margin µm	Dimension A	Dimension B	Design
0125	12.5	352.19	0.001	5	66.0	54.0	S
0250	25	375.77	0.001	5	82.5	64.0	S

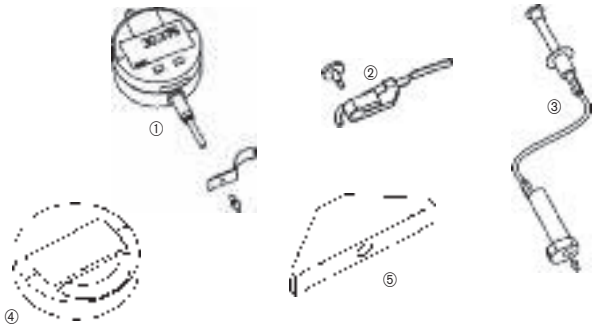
(406)

Accessories

For digital dial gauges 4242 and 4245.

Part No.	Design	4246	Figure
0001	Lifting lever bottom	6.60	1
0002	Lifting lever top	24.53	2
0003	Lifting lever incl. photo cable	86.79	3
0004	Protective cap	7.55	4
0005	Depth gauge bridge	139.93	5

(406)



Styluses for Gauges and Indicators

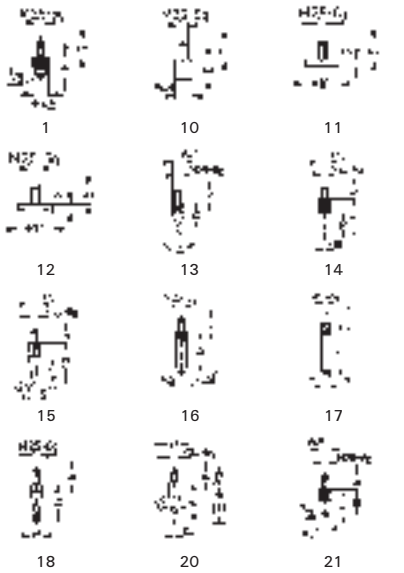
Design: With threaded connection M 2.5. All dial gauges and indicators are usually supplied with stylus no. 1 in hardened steel.

4236 **Styluses for gauge and indicator**

4237 **Carbide-tipped, for gauge and indicator**

Part No.	Figure	4236	4237	Design
0001	1	0.55	2.91	Standard
0002	10	2.43	16.43	Plane, ø 4.8 mm
0003	11	2.75	26.81	Plane, ø 10 mm
0004	12	3.38	53.06	Convex, ø 10 mm
0005	13	3.38	31.36	Pointed, 45°
0006	14	4.17	14.23	Parallel pin ø 1.5 mm
0007	15	3.23	–	Pointed 0.5 mm
0008	16	1.97	–	Crowned. 16 mm long
0009	17	–	7.31	Crowned, 26 mm long
0010	18	4.17	–	Spherical ø 1 mm
0011	18	4.17	–	Spherical ø 2 mm
0012	18	4.17	–	Spherical ø 3 mm
0013	18	4.17	–	Spherical ø 4 mm
0014	18	4.17	–	Spherical ø 5 mm
0015	20	4.48	34.19	Stylus, 5 mm wide
0016	21	1.97	–	Crowned, ø 3 mm
		(423)	(423)	

Styluses with ruby and sapphire balls on request.

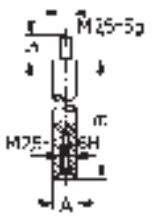


Extensions for Stylus

Design: In hardened steel including connection thread ø M 2.5, without stylus.

Part No.	Length mm	4238
0010	10	2.60
0020	20	2.60
0030	30	2.60
0040	40	2.60
0050	50	2.60
		(423)

Part No.	Length mm	4238
0060	60	2.60
0070	70	2.60
0080	80	2.60
0090	90	2.60
0100	100	2.60
		(423)



Wire Release/Lifting Lever

Design: Wire release. For dial gauges and dial indicators fitted with a connection for a lifting lever. (Dial indicator = standard supply; Dial gauges = Custom-made).

Design: The lifting lever enables the quick lifting of the gauge plug. It can be turned to the position desired by the user.

Part No.	Design	4239
0005	Wire release	6.21
0010	Lifting lever	4.63
		(423)



Digital Micro Gauges S 233, splash-proof IP 65

Design: The first electronic micro gauge ø 44 mm with digital display, patented inductive measuring system, **protection class IP 65,** data output RS 232, combined with external power supply, carbide-tipped ball stylus. Measuring force (± 0.15 N): 0.5–0.9 N, autonomy 5.000 hours uninterrupted, corresponds to 2 years in normal auto-off operation, absolute and relative mode, mm/inch selection, automatic switch-off, pre-select input, max. setting speed 2 m/s, clamping shank ø 8 mm 6h and dovetail.
Supplied in cardboard box.

Note: Spare battery 4027 2032
Data cable 4248 0232
Styluses see 4236–4238

RS232 IP 65

sylvac

Part No.	Measuring range mm	4247 sylvac	Reading mm	Error margin µm	Design
0010	12.5	169.80	0.01	20	Standard
0001	12.5	235.84	0.001	5	Standard
1010	12.5	183.01	0.01	20	Incl. rubber bellow
1001	12.5	259.42	0.001	5	Incl. rubber bellow
		(406)			



Standard

Incl. rubber bellow



Michael Grimme, foreman
Gebrüder Lödige Maschinenbau, Paderborn/Germany

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A professional recognizes the quality of a tool at once. Tools which aren't any good will never be purchased.
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You can thus be sure of the best solution for your application.

format
professional quality

Lever Dial Gauges

Design: Accuracy according to DIN 2270, measuring units mounted in rubies, automatic switch-over of measuring direction, housing with three milled dovetail guides for attachment of the clamping shank (⌀ 8 mm h6), housing hard chromium-plated to protect the dovetail guides against damages, shock-proof, indicator shaft mounted in precision ball bearings, carbide-tipped ball stylus with 2 mm ⌀, outer ring turnable.
Supplied in wallet incl. key for stylus.

DIN 2270

4250 **Form A** = Swiveling of stylus at right-angle to scale.

4252 **Form A** = Swivelling of stylus at right-angle to scale.

Form B = Swivelling of stylus parallel to scale.

Form C = Swivelling of stylus backwards to scale.



4250 Form A

format professional quality



4252 Form A



4252 Form B

Käfer



4252 Form C

Part No.		0008	1033	1036	1040	1043	1046	1402	2031	2034	2047	3032	3045	3048
Measuring range	**mm**	**0.8**	**0.5**	**0.2**	**0.8**	**0.5**	**0.2**	**2.0**	**0.8**	**0.5**	**0.2**	**0.8**	**0.5**	**0.2**
4250	(422)	66.80	–	–	–	–	–	–	–	–	–	–	–	–
4252	(423)	–	84.51	77.27	66.75	93.94	78.22	106.52	84.51	96.62	94.57	87.19	100.86	96.14
Reading	mm	0.01	0.01	0.002	0.01	0.01	0.002	0.02	0.01	0.01	0.002	0.01	0.01	0.002
Scale numbering	mm	0–40–0	0–25–0	0–100–0	0–40–0	0–25–0	0–100–0	0–100–0	0–40–0	0–25–0	0–100–0	0–40–0	0–25–0	0–100–0
Dial ⌀	mm	32	32	32	40	40	40	40	32	32	40	32	40	40
Stylus length	mm	12	35	12	12	35	12	35	12	35	12	12	35	12
Shape	mm	A	A	A	A	A	A	A	B	B	B	C	C	C

Lever Dial Gauges with Swivelling Stylus

Design: Accuracy according to DIN 2270, **but for max. 5µ,** stylus can be adjusted 110 degrees to the right and left, lever movement reversible.
Attachment at the top and bottom of the clamping shank (⌀ 8 mm h6).
Right-angle holder available as a special accessory.
Supplied in wallet.

DIN 2270

format professional quality



Part No.	Measuring range mm	4255	Reading mm	Scale numbering	Outer ring ⌀ mm	Stylus length mm
0008	0.8	68.63 (422)	0.01	0–40–0	28	12

Clamping Holders

Design: Right-angle holder 6 x 12 x 80 mm with attachment holes 4 mm h7 and 8 mm h7 as well as dovetail clamping.

format professional quality

Part No.	4256
0001	12.59 (422)



Articulated Stand for Lever Dial Gauges

Design: Central (continuously adjustable) mechanic clamping guarantees absolute rigidity. Two ball bearings and a central joint provide movability in any direction. Clamping by means of knurled nut. Attachment of dial gauge which can directly be attached to the machine. Particularly suitable for narrow areas and places which are difficult to access. Supplied in plastic wallet.



Part No.	Shank ⌀ mm	4256	Length mm	Jaw projection mm
0011	8	66.04 (433)	40	120

Centring Holders

Design: Clamping shank (⌀ 8 mm h6) with attachment (⌀ 4 mm h7) and dovetail clamping. Holder for lever dial gauges (⌀ 4 mm h7). Also added: Attachment (⌀ 8 mm h7).



Part No.	4257
0001	16.12 (423)

Clamping Holders

Design: (⌀ 8 mm h6), with dovetail clamping.



Part No.	4257
0005	6.84 (423)

Stylus

Design: With thread ⌀ M 1.6.



Part No.	Length mm	4257	Design	Ball ⌀ mm
0012	12	6.06	Solid carbide ball	2
0015	12*	11.72	Ruby ball	2
0035	35	9.52 (423)	Solid carbide ball	2

* non-magnetic

4257 0012 4257 0015 4257 0035

Digital Lever Dial Gauges, splash-proof IP 65

Design: DIN 2270. Patented, inductive measuring system, digital and analogous display, water and coolant proof to IP 65. Data output RS 232, combined with external power supply. Normal/min/max/max.-min. measuring mode with automatic switch-off. Autonomy at least 4,000 hours uninterrupted. Electro-magnetic compatibility according to EN 61326-1. Supplied in plastic wallet.

DIN 2270 | RS232 | IP 65

Note: Spare battery 4027 2032
Data cable 4248 0232



Part No.	Measuring range mm	4258	Reading mm	Stylus length mm	Error margin µm
0005	0.5	246.07	0.001	36.5	10
0008	0.8	221.69 (406)	0.001	12.5	10

Data Cables RS 232 (Power Supply)

Design: Data cable for digital micro gauges S 233 and digital lever gauges 234.

Part No.	4248
0232	77.36 (406)

Stylus

Design: For digital lever gauges 4258.

Part No.	Measuring range mm	4259
0125	12.5	10.23
0360	36	13.37 (406)

Pocket Thickness Gauges

Design: With aluminium bracket, including detachable wheel and plastic hollows, zero setting through turning outer ring, scale ø 40 mm, measuring force approx. 1 N, with flat callipers 6.35 mm ø. Supplied in wallet.

Application: These light-weight and handy instruments are ideal for measuring a diversity of materials of a thickness range from 0–10 mm (e.g. paper, textiles, foils, metal sheets).



Part No.	Measuring range mm	4260	Bracket depth mm	Reading mm
0015	0–10	77.12	18	0.01
0045	0–10	89.39	45	0.01
		(423)		

Thickness gauges in other measuring ranges and bracket depths on request.

Thickness Gauges

Design: With aluminium bracket, zero setting through turning outer ring, scale ø 58 mm, with flat calliper 10 mm ø. Supplied in box.

Application: For measuring of soft leather, cardboard, paper and foils.

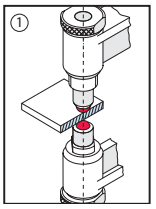


Part No.	Measuring range mm	4262	Bracket depth mm	Reading mm
0050	0–10	91.42	50	0.01
0100	0–10	114.69	100	0.01
0503	0–30	129.95	50	0.01
		(423)		

Thickness gauges in other measuring ranges and bracket depths on request.

External Quick Callipers Poco

Design: With fixed and moving calliper, direct measuring result through deflection of the moving calliper arm for speedy measurements of sheet metal, foils, external grooves, etc. Readjustable solid carbide ball support. Supplied in plastic wallet, incl. operating manual.



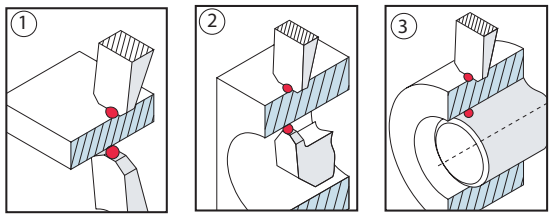


Part No.	Application mm	4265	Measuring range mm	Scale pitch mm	Deviation in measuring range mm	Repeat-ability mm	Measuring depth mm	Measuring contact mode mm	Measuring contact length mov. mm	Measuring contact length fix. mm	Min. measuring pressure N	Max. measuring force N
0010	0–10	102.83 ◊	10	0.1	± 0.1	0.05	36	K ø 2 ①	5	5	0.3	1.3
0011	0–10	118.55 ◊	10	0.1	± 0.1	0.05	36	K ø 2/R0.5 ②	5	0.8	0.3	1.3
		(424)										

External Quick Callipers Oditest

Design: With fixed and moving calliper, direct measuring result through deflection of the moving calliper arm for speedy measurements of tubes, hollow bodies etc. Moving elbow calliper arm, measuring contacts in solid carbide. Supplied in cardboard box, **incl. calibration certificate** and operating manual.

Factory standard | Certificate





Part No.	Application mm	4266	Measuring range mm	Scale pitch mm	Deviation in measuring range mm	Repeat-ability mm	Measuring depth mm	Measuring contact mode mm	Measuring contact length mov. mm	Measuring contact length fix. mm	Min. measuring pressure N	Max. measuring force N
0020	0–20	365.71 ◊	20	0.01	± 0.03	0.01	80	K ø 1.5 ①	22	22	0.9	1.5
0021	0–20	365.71 ◊	20	0.01	± 0.03	0.01	80	K ø 1.5 ②	22	2.3	0.9	1.5
0050	0–50	421.05 ◊	50	0.05	± 0.05	0.025	170	K ø 2.0 ①	32	32	1.2	1.8
0051	0–50	421.05 ◊	50	0.05	± 0.05	0.025	170	K ø 2.0 ③	32	1	1.2	1.8
		(424)										

External Quick Callipers with Analogue/Digital Display

Design: The new generation of quick callipers for groove, hole and wall thickness measurements features a clearly arranged LCD display for quick reading.
Suitable for workshops IP 63, Mitutoyo interface, USB interface, absolute and relative measurement, red/green light for tolerance measurements, mm/inch selection.
Supplied with calibration certificate, in cardboard box.

Factory standard | Certificate | IP63





Ball ⌀ 1.5 mm



Ball ⌀ 3 mm

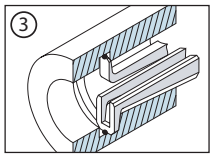
Part No.	Application mm	4267	Measuring range mm	Scale pitch mm	Deviation in measuring range mm	Repeatability mm	Measuring depth mm	Measuring contact mode mm	Measuring contact length mov. mm	Measuring contact length fix. mm	Min. measuring force N	Max. measuring force N
0020	0–20	377.03	20	0.01	0.02	0.01	50	K ⌀ 1.5	15	15	0.7	1.3
0040	0–40	377.03	40	0.02	0.04	0.02	115	K ⌀ 3	22	22	1.0	1.5
		(424)										

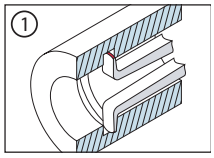
Internal Quick Callipers Intertest

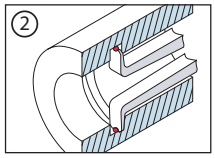
Design: For measuring of internal grooves and clearance grooves. Soil-resisting and splashwater-proof, rack and pinion gear for long service life, secured reproducability of display, measuring contacts in solid carbide.
Supplied in cardboard box, **incl. test certificate** and operating manual.

Factory standard | Certificate









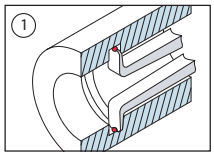
Part No.	Application mm	4268	Measuring range mm	Scale pitch mm	Deviation in measuring range mm	Repeatability mm	Measuring depth mm	Groove depth mm	Groove width mm	Measuring contact mode mm	Measuring contact length mov. mm	Measuring contact length fix. mm	Measuring contact thickness mm	Min. measuring force N	Max. measuring force N
0015	5–15	365.71 ◊	10	0.01	± 0.02	0.005	50	1.7	1.1	K ⌀ 0.6 ①	2.3	2.3	1.2	0.80	1.30
0020	10–20	365.71 ◊	10	0.01	± 0.02	0.005	50	4	2	K ⌀ 1 ③	5	5	1.7	0.80	1.30
0030	20–30	365.71 ◊	10	0.01	± 0.02	0.005	52	4	2	K ⌀ 1 ③	5	5	1.7	0.80	1.30
0040	30–40	365.71 ◊	10	0.01	± 0.02	0.005	57	4.5	2	K ⌀ 1 ②	5	5	1.7	0.80	1.30
0050	40–50	365.71 ◊	10	0.01	± 0.02	0.005	57	4.5	2	K ⌀ 1 ②	5	5	1.7	0.80	1.30
		(424)													

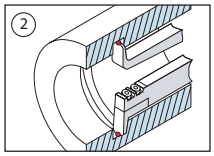
Internal Quick Callipers Intertest

Design: For trouble-free use in the workshop, for measuring of internal grooves and clearance grooves. Soil-resisting and splash-proof, cushioned movement with steel spring transmission for higher precision, measuring contacts in solid carbide, tolerance marking adjustable.
Supplied in cardboard box. **incl. test certificate** and operating manual.

Factory standard | Certificate





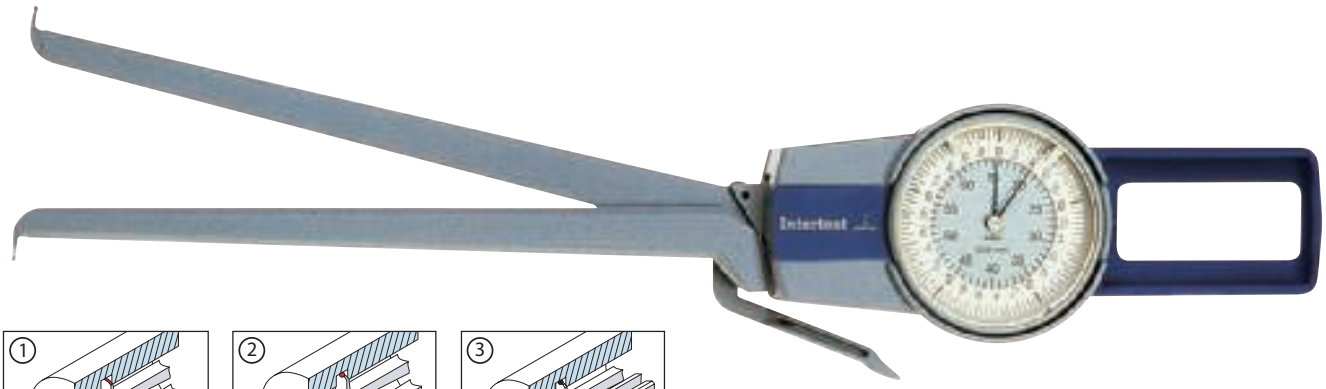


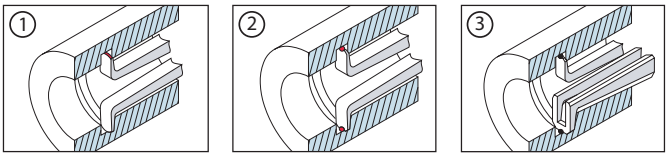
Part No.	Application mm	4269	Measuring range mm	Scale pitch mm	Deviation in measuring range mm	Repeatability mm	Measuring depth mm	Groove depth mm	Groove width mm	Measuring contact mode mm	Measuring contact length mov. mm	Measuring contact length fix. mm	Measuring contact thickness mm	Min. measuring force N	Max. measuring force N
0030	10–30	365.71 ◊	20	0.01	± 0.03	0.01	80	4.5	1.8	K ⌀ 1 ①	5	5	1.3	0.9	1.5
0040	20–40	365.71 ◊	20	0.01	± 0.03	0.01	80	6	2.5	K ⌀ 1 ①	7	7	1.9	0.9	1.5
0050	30–50	365.71 ◊	20	0.01	± 0.03	0.01	80	6	2.5	K ⌀ 1 ②	7	7	1.9	0.9	1.5
0060	40–60	365.71 ◊	20	0.01	± 0.03	0.01	80	6	2.5	K ⌀ 1 ②	10	10	2.5	0.9	1.5
0070	50–70	377.03 ◊	20	0.01	± 0.03	0.01	80	6	2.5	K ⌀ 1 ②	10	20	2.5/4	0.9	1.5
0080	60–80	377.03 ◊	20	0.01	± 0.03	0.01	80	6	2.5	K ⌀ 1 ②	10	10	2.5	0.9	1.5
		(424)													

Internal Quick Callipers Intertest

Design: For trouble-free use in the workshop, for measuring of internal grooves and clearance grooves. Soil-resisting and splash-proof, cushioned movement with steel spring transmission for higher precision, measuring contacts in solid carbide, tolerance marking adjustable. Supplied in cardboard box. **incl. test certificate** and operating manual. With adjustable handle.

Factory standard | Certificate





Part No.	Application mm	4270	Measuring range mm	Scale pitch mm	Deviation in measuring range mm	Repeatability mm	Measuring depth mm	Groove depth mm	Groove width mm	Measuring contact mode mm	Measuring contact length mm	Measuring contact length fix. mm	Measuring contact thickness mm	Min. measuring force N	Max. measuring force N
0065	15– 65	421.05 ◊	50	0.05	± 0.05	0.025	175	4.5	2.5	K ⌀ 1.5 ①	5.3	5.3	1.8	1.2	2
0090	40– 90	421.05 ◊	50	0.05	± 0.05	0.025	175	8	3.3	K ⌀ 2 ②	10.5	10.5	2.5	1.2	2
0120	70–120	484.89 ◊	50	0.05	± 0.05	0.025	175	8	3.3	K ⌀ 2 ③	10.5	40.5	2.5/5	1.2	2
		(424)													

Internal Quick Callipers with Analogue/Digital Display

Design: The new generation of quick callipers for groove and borehole measurements features a clearly arranged LCD display for quick reading.
Suitable for workshops IP 63, Mitutoyo interface, USB interface, absolute and relative measurement, red/green light for tolerance measurements, mm/inch selection. **Supplied with test certificate,** in cardboard box.

Certificate | IP63 | Factory standard





Ball ⌀ 0.6 mm
Ball ⌀ 1 mm

Part No.	Application mm	4271	Measuring range mm	Scale pitch mm	Deviation in measuring range mm	Repeatability mm	Measuring depth mm	Groove depth mm	Groove width mm	Measuring contact mode mm	Measuring contact length mm	Measuring contact length fix. mm	Measuring contact thickness mm	Min. measuring force N	Max. measuring force N
0025	5–25	377.03 ◊	20	0.01	± 0.02	0.02	29	2.2	1.8	K ⌀ 0.6	4	4	2.5	0.9	1.4
0030	10–30	377.03 ◊	20	0.01	± 0.02	0.01	49	4	2	K ⌀ 1	9	9	3	0.9	1.4
0040	20–40	377.03 ◊	20	0.01	± 0.02	0.01	53	4	2	K ⌀ 1	9	9	3	0.9	1.4
0050	30–50	377.03 ◊	20	0.01	± 0.02	0.01	54	7.5	4	K ⌀ 1	6	6	2	1.1	1.7
		(424)													

Universal 3D Sensing Devices

Design: The universal 3D sensing device is clamped in the milling spindle or in the countersunk head and allows exact alignment of the spindle axis to the edge of the workpiece or the device.
Thereby enabling quick and easy setting of zero points of workpieces and effectively carrying out length measurements. The sensing direction can be defined by the user (X, Y, Z axis). The dial gauge deflects in the same direction and indicates the distance between spindle axis and workpiece edge. If the needle is at zero, the spindle axis is placed directly at the workpiece edge. At first go, no calculation, no problems with algebraic signs. Low additional costs, higher productivity and more convenience for the operator.

The new generation of sensing devices is more compact, easier to use and lower priced. The sensing insert can now be changed without any tools. It goes without saying that the new sensing inserts fit in the older universal 3D sensing devices. Safety is increased by a prolonged travel connected with the proven rated break point in the sensing insert.
A steep taper holder is integrated for easy handling. Steep taper (DIN 69871, SK 40) and universal 3D sensing device form an entity.
In order to ensure highest measuring accuracy, all universal 3D sensing devices are measured and adjusted individually during assembly.
Short sensing insert ⌀ 4 mm is included in the supply.

Application: The universal 3D sensing device is extremely precise and is used in a variety of measuring applications for milling and erosion machines (insulated sensing insert).



HAIMER

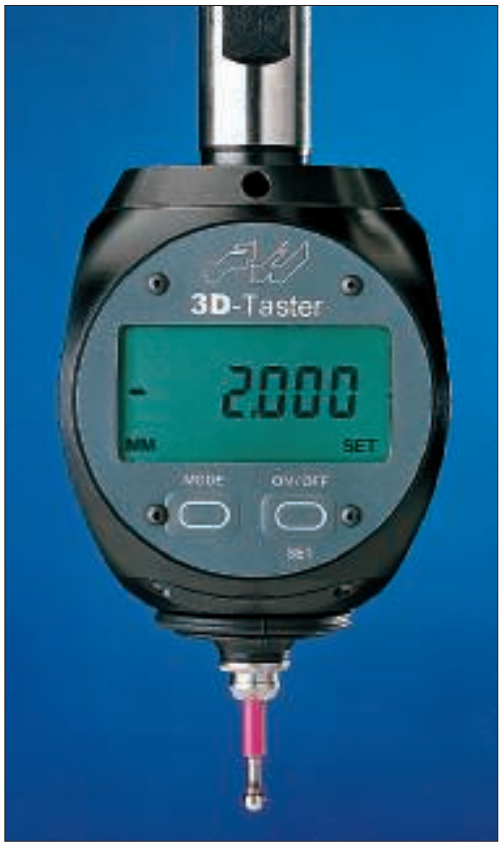
IP 67

Part No.	Shank ⌀ mm	3770 Ha. MFR	Sensing ball ⌀ mm	Accuracy mm	Housing ⌀ mm	Length without clamping shank mm
0005	20 mm	189.27	4	0.01	65	113
0010	SK 40/DIN 69871	198.11 (392)	4	0.01	65	113

Digital 3D Sensing Device

Design: The digital 3D sensing device is a further advancement of the proven mechanical 3D sensing device. The spindle or the countersunk head can be positioned quickly and safely at the respective edges.
The movement can be monitored on the digital gauge. The 0 setting is found at once. The measuring system of the machine can be reset without requiring calculation, as the spindle axis is directly placed at the sensed edge. The digital gauge features a 0.001 mm display with large digits. If used in connection with large machining centres, it allows reading from far distances. The gauge is splash- and dust-proof and can be deposited in the tool magazine of the machine. Short sensing insert ⌀ 4 mm is included in the supply.

Application: The digital 3D sensing device is used for sensing of workpieces on milling and erosion machines.



IP64

Part No.	Shank ⌀ mm	3775 Ha. MFR	Sensing ball ⌀ mm	Accuracy mm	Repeatability mm	Measuring accuracy mm	Housing ⌀ mm	Length without clamping shank mm
0005	20	316.15 (392)	4	0.001	0.001	0.005	65	113

Zero Master analogue

IP 67

HAIMER

Design: Smallest 3D sensing device in the world, can be clamped in the milling spindle and/or in the countersunk head, the spindle axis is aligned exactly to the edge of the workpiece or the device. The sensing direction can be defined by the user (X, Y, Z axis). The Zero Master is dimensioned for small machines. The small analogue dial gauge always deflects in the same direction and indicates the distance between spindle axis and workpiece edge. As soon as the needle is at zero, the spindle is placed directly at the workpiece edge – at first go, no calculation, no problems with algebraic signs. Low additional costs, higher productivity and more convenience for the operator.
The clamping shank has a diameter of 10 mm and can thus be used on machines with SK 30 and small HSK spindles. Even large workpieces can be measured thanks to the shortened housing which protrudes only slightly from the spindle. The sensing insert can be changed without any tools, no calibration required. Safety is increased by prolonged travel connected with the proven rated break point in the sensing insert. In order to ensure highest measuring accuracy, all 3D sensing devices are measured and adjusted individually.
Protection class IP 67. The Zero Master can be fitted with a short (ball ∅ 4 mm) and a long (ball ∅ 8 mm) sensing insert. The sensing inserts are compatible with all other Haimer 3D sensing devices.
Supplied in cardboard box filled with Styrofoam® incl.:
Zero Master analogue with short sensing insert 4 mm ∅.



Application: For setting zero points of workpieces and length measurements at milling and erosion machines (insulated sensing insert) as well as centring and evening-out bore holes and shafts.

Part No.	Shank ∅ mm	3777 Ht. HFR	Sensing ball ∅ mm	Display accuracy mm	Housing ∅ mm	Length without clamping shank mm
0000	10	199.46 (392)	4	0.01	49	96

3D Sensing Devices NEW GENERATION

IP 67

HAIMER

Design: Further advancement of universal 3D sensing device, improved mechanics and new compact and handy housing, can be mounted in the milling spindle and/or countersunk head. The spindle axis is aligned exactly to the edge of the workpiece or the device.
The sensing direction can be defined by the user (X, Y, Z axis).
The large analogue 1/100 mm dial gauge (2 hands) with marked travel always deflects in the same direction and indicates the distance between spindle axis and workpiece edge. As soon as the needle is at zero, the spindle is placed directly at the workpiece edge – at first go, no calculation, no problems with algebraic signs. Low additional costs, higher productivity and more convenience for the operator.
The original Haimer sensing insert for highest accuracy of 0.01 mm is changed without any tools, no calibration of the sensing device required. Safety is increased by prolonged travel connected with the proven rated break point in the sensing insert. In order to ensure highest measuring accuracy, all 3D sensing devices are measured and adjusted individually. **Protection class IP 67.**
Supplied in cardboard box filled with Styrofoam® incl.:
3D sensing device NEW GENERATION with short sensing insert 4 mm ∅.



Application: For setting zero points of workpieces, length and depth measurements on milling and erosion machines (insulated sensing insert) as well as centring and evening-out of bore holes and shafts. Furthermore, for checking surfaces for straightness and evenness.

Part No.	Shank ∅ mm	3777 Ht. HFR	Sensing ball ∅ mm	Display accuracy mm	Housing ∅ mm	Length without clamping shank mm
0010	12	199.46 (392)	4	0.01	62	100

Spare Sensing Inserts for 3D Sensing Device

HAIMER

Application: For mechanical and digital sensing devices.

Part No.	Sensing ball ∅ mm	3777 Ht. HFR	Length mm
0004	4	14.84	25
0008	8	25.06 (392)	65

Precision Centring Instruments Centro

Design: The gauge does not rotate with the spindle, thereby can be viewed by the user at any time. No adjustment necessary. In case of lower speeds, the spindle is positioned near the potential axis. For the centring of bore holes and shafts in centric position to the spindle. The calliper moves along the bore hole wall respectively the shaft. As long as spindle and axis are not in alignment, the calliper deflects during rotation and transmits the movement onto a large-sized gauge. Concentricity errors of the spindle or the clamping are compensated. Supplied in Styrofoam with cardboard box: Precision centring Instrument with straight calliper 5 mm ⌀.

Application: For the centring of bore holes and shafts in centric position to the spindle on milling machines.

Part No.	Housing ⌀ mm	4276 Hr. MFR	Measuring range bore mm	Measuring range shaft mm	Reading mm	Centricity mm	Max. speed 1/min
0125	80	294.81 (431)	3–125	0–125	0.01	0.003	150



Accessories for Precision Centring Instruments Centro

Part No.	Design	4276 Hr. MFR	Sensing ball ⌀ mm
1001	Calliper straight with ball ⌀ 5 mm	21.11	5
2001	Calliper bent with ball ⌀ 5 mm	27.13 (431)	6

Magnetic Stands – Small

Design: Magnetic base, no switch, clamping is effected by a knurled nut, dial gauge holder ⌀ 8 mm. Perfectly suitable in areas with confined space. Supplied **without** gauge.

Part No.	Magnet ⌀ mm	4285	Total height mm	Stand ⌀ mm	Magnetic force N	Stand holder
0135	35	28.07 (433)	135	8	ca. 150	M 6



Magnetic Stands – Small

Design: With central mechanical clamping stem, attachment ⌀ 8 H7, permanent magnet, with precision setting, supplied in wooden case.

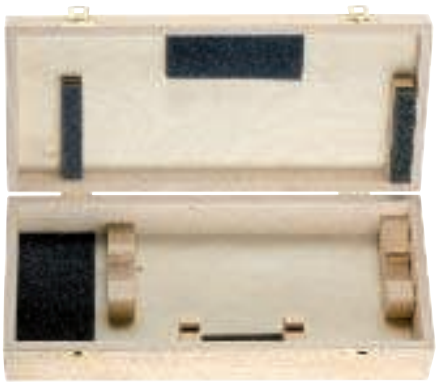
Part No.	Magnet ⌀ mm	4286	Jaw projection mm	Pillar height mm	Magnetic force N
0100	35	33.20 (434)	150	180	150



Accessories for Magnetic Stands

Design: For magnetic stands (part no. 4293 0430).

Part No.	Description	4287
1000	Wooden box	15.98 (434)



Magnetic Stands "Extra"

Design: Magnetic base with on/off switch and **fixed rods.**
The magnetic base is equipped with a high-energy magnet.
For attaching measuring tools with 8 mm shank ∅ (H7),
with precision setting, supplied in wooden box.

Dimensions of the magnetic base L x W x H: 65 x 50 x 55 mm.

Technical data: Stand ∅ 16 mm, overall height approx. 280 mm,
magnetic power approx. 600 N, cross-arm length approx. 180 mm, weight approx. 2.0 kg.

Part No.	Description	4289
0280	Measuring stand	21.98 (434)



Magnetic Articulated Stands "Extra"

Design: Magnetic base with on/off switch. The hydraulic, central clamping stern guarantees absolute rigidity. Two ball-and-socket joints and one central joint offer movement in any direction. The magnetic base is equipped with a high energy magnet. For the attachment of measuring tools with 8 mm shank ∅ (H7), with fine adjustment. Supplied in wooden box.

Dimensions of the magnetic base L x W x H: 65 x 50 x 55 mm.

Technical data: Overall height approx. 370 mm, magnetic power approx. 600 N, operating radius approx. 260 mm, weight approx. 1.8 kg.

Part No.	Description	4291
0370	Measuring stand	46.47 (434)



Spare Magnetic Bases

Design: For magnetic stand "Extra"; order no. 4289 0280 and
magnetic articulated stand "Extra"; order no. 4291 0370.

Part No.	Measuring stand	4292
0008	M 8	13.70
0010	M 10	13.70 (403)



Magnetic Articulated Stands

Design: Magnetic base with on/off switch, high magnetic power and mechanical central clamping, prismatic recess in base, high flexibility due to high clamping force with **one** clamping lever, anodized aluminium rods. Combined attachment for dial gauges, lever gauges or probes with 8 mm shank ∅ (H7) or lever dial gauges with dovetail guide.

Dimensions of magnetic base L x W x H: 70 x 46 x 65 mm.

Technical Data: Stand attachment M10, total height 430 mm, operating radius 320 mm, adhesive power approx. 700 N.

Part No.	Description	4293	4287
0430	Measuring stand	130.39 (434)	–
1000	Wooden box	21.78 (403)	–
1070	Spare magnetic base M 10	–	51.32 (434)



Magnetic Holders



Design: Low overall height, contact surface with 2 powerful sinter permanent magnets, thereby achieving high magnetic force, instrument holder can be turned by 360°, gauge holder 8 mm H7.
Supplied without gauge.

For dial gauges and callipers.

Part No.	Jaw projection mm	4295	Size L x W x H mm
0045	35	44.26 (423)	72 x 37.5 x 45

Universal Magnetic Holders



Design: Suitable in any position, with prismatic sole and additional adhering side faces. Magnetic force 180 N, location hole 8 mm H7.
Supplied without gauge.

Part No.	Jaw projection mm	4297	Size L x W x H mm
0059	35	74.13 (423)	72 x 36.5 x 59

Micro Measuring Tables with Rigid Horizontal Arm



Design: Surface of table ground and lapped. Pillar hardened and ultra-fine ground. Location hole for dial gauge 8 H7.
Supplied without gauge.

Part No.	Total surface ∅ mm	4300	Table height/ Measuring range mm	Pillar ∅ mm	Jaw projection mm	Weight kg
0200	50	122.02 (414)	200/100	22	49	2.3

Micro Measuring Tables with Horizontal Measuring Arm



Design: Surface of table ground and lapped with dust grooves. Pillar hardened and ultra-fine ground, location hole for dial gauge 8 H7. Arm can be shifted.
Supplied without dial gauge.

Part No.	Total surface ∅ mm	4302	Table height/ Measuring range mm	Pillar ∅ mm	Jaw projection mm	Weight kg
0200	60 x 68	178.32 (414)	200/100	22	100	3.5

Micro Measuring Tables with Rigid Horizontal Arm



Design: Hard-chromium plated pillar, table surface lapped with longitudinal grooves. Location hole for dial gauge 8 H7.
Supplied without dial gauge.

Part No.	Total surface ∅ mm	4304	Table height/ Measuring range mm	Pillar ∅ mm	Jaw projection mm	Weight kg
0284	98 x 115	240.90 ◊ (414)	284/150	28	76	7

Measuring Tables with Horizontal Measuring Arm

Design: Vertical pillar hard-chromium plated, table surface precision ground, including threaded pillar with set collar. Location hole for dial gauge 8 H7.
The dial gauge can reach any position on the table.
Supplied without dial gauge.



Part No.	Table size mm	4306	Total height/ Measuring range mm	Vertical pillar ø mm	Horizontal pillar ø mm	Jaw projection mm	Weight kg
0320	170 x 215	589.22 ◊ (414)	320/160	35	22	up to 180	23

Measuring Tables with Horizontal Measuring Arm

Design: Vertical pillar hard-chromium plated, table surface precision ground, including threaded pillar with set collar. Location hole for dial gauge 8 H7.
The clamping head including arm allows the utilization of the entire surface of the table for the measurement.
Supplied without dial gauge.



Part No.	Table size mm	4308	Total height/ Measuring range mm	Vertical pillar ø mm	Horizontal pillar ø mm	Jaw projection mm	Weight kg
0320	98 x 180	495.37 ◊ (414)	320/160	35	22	up to 180	13

Measuring Tables with Solid Rock Base

Design: Solid rock base plate to DIN 876/00. Threaded pillar, height adjustment through set collar. Location hole for dial gauge 8 H7.
Supplied without gauge.

DIN 876



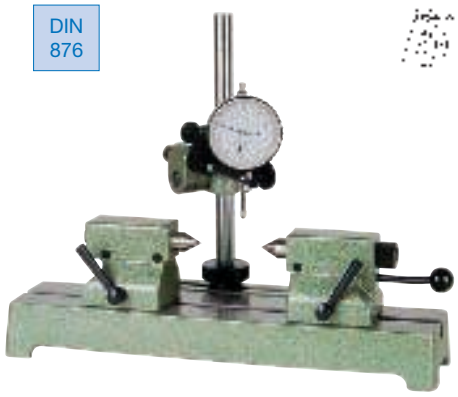
Part No.	Table size mm	4310	Total height/ Measuring range mm	Vertical pillar ø mm	Horizontal pillar ø mm	Jaw projection mm	Weight kg
0320	150 x 200	478.68 ◊ (414)	320/160	35	22	200	9.5

Centricity Control Instruments

Design: With 2 sliding tailstocks, right-hand tailstock including moving tip, base plate flatness according to DIN 876/I. Stand including fine adjustment, location hole for dial gauge 8 H7.
Supplied without gauge.

Attached prism for tailstocks with a tip height of 75 mm for positioning non-centric workpieces and long objects from 5 to 20 mm ø.

DIN 876



Part No.	Tip height mm	4315	Length x width Base plate mm	Max. tip distance mm	T-groove width	Height incl. stand mm	Weight kg
0050	50	515.18 ◊ (414)	350 x 110	200	10 H7	260	8
0075	75	676.83 ◊ (414)	500 x 110	350	10 H7	260	12
0100	100	1,570.58 ◊ (414)	700 x 180	450	12 H7	320	35

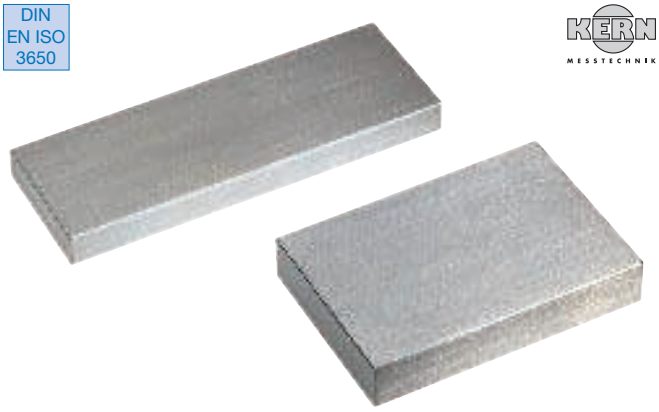
All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Single Gauge Parallel Blocks, DIN EN ISO 3650, Steel

Design: High-quality, highly solid special steel, specially alloyed and stress relieved. Carefully hardened and lapped. Hardness of gauge blocks 800 HV (64 HRC), thus very robust and wear-resistant. **Each gauge block is engraved with an individual identification number.**

In case of lengths
0.5 to 10.0 mm, the height is 30 mm and the depth is 9 mm.
10.0 to 1000.0 mm, the height is 35 mm and the depth is 9 mm.

DIN EN ISO 3650



4350 **Tolerance class 0:** For all length measurements, for gauges in workshops and for adjusting of precision measuring instruments.

4351 **Tolerance class 1:** For measuring gauges and for adjusting measuring tools.

4352 **Tolerance class 2:** Perfectly suitable as working and calibration tool in the construction of gauges, equipment and machine construction.

Part No.	Length mm	4350	4351	4352
0000	0.5	10.17 ◊	7.21 ◊	3.91 ◊
0001	1	7.83 ◊	5.07 ◊	3.13 ◊
0002	1.001	8.60 ◊	6.26 ◊	3.91 ◊
0003	1.002	8.60 ◊	6.26 ◊	3.91 ◊
0004	1.003	8.60 ◊	6.26 ◊	3.91 ◊
0005	1.004	8.60 ◊	6.26 ◊	3.91 ◊
0006	1.005	8.60 ◊	6.26 ◊	3.91 ◊
0007	1.006	8.60 ◊	6.26 ◊	3.91 ◊
0008	1.007	8.60 ◊	6.26 ◊	3.91 ◊
0009	1.008	8.60 ◊	6.26 ◊	3.91 ◊
0010	1.009	8.60 ◊	6.26 ◊	3.91 ◊
0011	1.01	8.20 ◊	5.47 ◊	3.13 ◊
0012	1.02	8.20 ◊	5.47 ◊	3.13 ◊
0013	1.03	8.20 ◊	5.47 ◊	3.13 ◊
0014	1.04	8.20 ◊	5.47 ◊	3.13 ◊
0015	1.05	8.20 ◊	5.47 ◊	3.13 ◊
0016	1.06	8.20 ◊	5.47 ◊	3.13 ◊
0017	1.07	8.20 ◊	5.47 ◊	3.13 ◊
0018	1.08	8.20 ◊	5.47 ◊	3.13 ◊
0019	1.09	8.20 ◊	5.47 ◊	3.13 ◊
0020	1.1	8.20 ◊	5.47 ◊	3.13 ◊
0021	1.11	8.20 ◊	5.47 ◊	3.13 ◊
0022	1.12	8.20 ◊	5.47 ◊	3.13 ◊
0023	1.13	8.20 ◊	5.47 ◊	3.13 ◊
0024	1.14	8.20 ◊	5.47 ◊	3.13 ◊
0025	1.15	8.20 ◊	5.47 ◊	3.13 ◊
0026	1.16	8.20 ◊	5.47 ◊	3.13 ◊
0027	1.17	8.20 ◊	5.47 ◊	3.13 ◊
0028	1.18	8.20 ◊	5.47 ◊	3.13 ◊
0029	1.19	8.20 ◊	5.47 ◊	3.13 ◊
0030	1.2	8.20 ◊	5.47 ◊	3.13 ◊
0031	1.21	8.20 ◊	5.47 ◊	3.13 ◊
0032	1.22	8.20 ◊	5.47 ◊	3.13 ◊
0033	1.23	8.20 ◊	5.47 ◊	3.13 ◊
0034	1.24	8.20 ◊	5.47 ◊	3.13 ◊
0035	1.25	8.20 ◊	5.47 ◊	3.13 ◊
0036	1.26	8.20 ◊	5.47 ◊	3.13 ◊
0037	1.27	8.20 ◊	5.47 ◊	3.13 ◊
0038	1.28	8.20 ◊	5.47 ◊	3.13 ◊
0039	1.29	8.20 ◊	5.47 ◊	3.13 ◊
0040	1.3	8.20 ◊	5.47 ◊	3.13 ◊
0041	1.31	8.20 ◊	5.47 ◊	3.13 ◊
0042	1.32	8.20 ◊	5.47 ◊	3.13 ◊
0043	1.33	8.20 ◊	5.47 ◊	3.13 ◊
0044	1.34	8.20 ◊	5.47 ◊	3.13 ◊
0045	1.35	8.20 ◊	5.47 ◊	3.13 ◊
0046	1.36	8.20 ◊	5.47 ◊	3.13 ◊
0047	1.37	8.20 ◊	5.47 ◊	3.13 ◊
0048	1.38	8.20 ◊	5.47 ◊	3.13 ◊
0049	1.39	8.20 ◊	5.47 ◊	3.13 ◊
0050	1.4	8.20 ◊	5.47 ◊	3.13 ◊
0051	1.41	8.20 ◊	5.47 ◊	3.13 ◊
0052	1.42	8.20 ◊	5.47 ◊	3.13 ◊
0053	1.43	8.20 ◊	5.47 ◊	3.13 ◊
0054	1.44	8.20 ◊	5.47 ◊	3.13 ◊
0055	1.45	8.20 ◊	5.47 ◊	3.13 ◊
0056	1.46	8.20 ◊	5.47 ◊	3.13 ◊
		(436)	(436)	(436)

Part No.	Length mm	4350	4351	4352
0057	1.47	8.20 ◊	5.47 ◊	3.13 ◊
0058	1.48	8.20 ◊	5.47 ◊	3.13 ◊
0059	1.49	8.20 ◊	5.47 ◊	3.13 ◊
0060	1.5	8.20 ◊	5.47 ◊	3.13 ◊
0061	1.6	8.20 ◊	5.47 ◊	3.13 ◊
0062	1.7	8.20 ◊	5.47 ◊	3.13 ◊
0063	1.8	8.20 ◊	5.47 ◊	3.13 ◊
0064	1.9	8.20 ◊	5.47 ◊	3.13 ◊
0065	2	7.83 ◊	4.70 ◊	3.13 ◊
0066	2.5	7.83 ◊	4.70 ◊	3.13 ◊
0067	3	7.83 ◊	4.70 ◊	3.13 ◊
0068	3.5	7.83 ◊	4.70 ◊	3.13 ◊
0069	4	7.83 ◊	4.70 ◊	3.13 ◊
0070	4.5	7.83 ◊	4.70 ◊	3.13 ◊
0071	5	7.83 ◊	4.70 ◊	3.13 ◊
0072	5.5	8.20 ◊	5.47 ◊	3.53 ◊
0073	6	8.20 ◊	5.47 ◊	3.53 ◊
0074	6.5	8.20 ◊	5.47 ◊	3.53 ◊
0075	7	8.20 ◊	5.47 ◊	3.53 ◊
0076	7.5	8.20 ◊	5.47 ◊	3.53 ◊
0077	8	8.20 ◊	5.47 ◊	3.53 ◊
0078	8.5	8.20 ◊	5.47 ◊	3.53 ◊
0079	9	8.20 ◊	5.47 ◊	3.53 ◊
0080	9.5	8.20 ◊	5.47 ◊	3.53 ◊
0081	10	11.73 ◊	6.26 ◊	3.91 ◊
0082	10.5	11.73 ◊	6.26 ◊	3.91 ◊
0083	11	11.73 ◊	6.26 ◊	3.91 ◊
0084	11.5	11.73 ◊	6.26 ◊	3.91 ◊
0085	12	11.73 ◊	6.26 ◊	3.91 ◊
0086	12.5	11.73 ◊	6.26 ◊	3.91 ◊
0087	13	11.73 ◊	6.26 ◊	3.91 ◊
0088	13.5	11.73 ◊	6.26 ◊	3.91 ◊
0089	14	11.73 ◊	6.26 ◊	3.91 ◊
0090	14.5	11.73 ◊	6.26 ◊	3.91 ◊
0091	15	11.73 ◊	6.26 ◊	3.91 ◊
0092	15.5	11.73 ◊	6.26 ◊	3.91 ◊
0093	16	11.73 ◊	6.26 ◊	3.91 ◊
0094	16.5	11.73 ◊	6.26 ◊	3.91 ◊
0095	17	11.73 ◊	6.26 ◊	3.91 ◊
0096	17.5	11.73 ◊	6.26 ◊	3.91 ◊
0097	18	11.73 ◊	6.26 ◊	3.91 ◊
0098	18.5	11.73 ◊	6.26 ◊	3.91 ◊
0099	19	11.73 ◊	6.26 ◊	3.91 ◊
0100	19.5	11.73 ◊	6.26 ◊	3.91 ◊
0101	20	11.73 ◊	6.26 ◊	3.91 ◊
0102	20.5	11.73 ◊	6.26 ◊	3.91 ◊
0103	21	11.73 ◊	6.26 ◊	3.91 ◊
0104	21.5	11.73 ◊	6.26 ◊	3.91 ◊
0105	22	11.73 ◊	6.26 ◊	3.91 ◊
0106	22.5	11.73 ◊	6.26 ◊	3.91 ◊
0107	23	11.73 ◊	6.26 ◊	3.91 ◊
0108	23.5	11.73 ◊	6.26 ◊	3.91 ◊
0109	24	11.73 ◊	6.26 ◊	3.91 ◊
0110	24.5	11.73 ◊	6.26 ◊	3.91 ◊
0111	25	11.73 ◊	6.26 ◊	3.91 ◊
0112	30	12.51 ◊	7.83 ◊	4.70 ◊
0113	40	13.30 ◊	8.20 ◊	5.07 ◊
		(436)	(436)	(436)

Continued overleaf

Single Gauge Parallel Blocks, DIN EN ISO 3650, Steel

Continued

Part No.	Length mm	4350	4351	4352
0114	50	14.08 ◊	8.60 ◊	5.47 ◊
0115	60	15.64 ◊	9.39 ◊	6.26 ◊
0116	70	17.21 ◊	10.17 ◊	6.64 ◊
0117	75	18.77 ◊	10.96 ◊	7.04 ◊
0118	80	19.56 ◊	12.51 ◊	7.83 ◊
0119	90	20.34 ◊	12.91 ◊	8.20 ◊
0120	100	21.11 ◊	14.08 ◊	9.39 ◊
0125	125	54.76 ◊	34.41 ◊	27.37 ◊
0150	150	82.92 ◊	50.07 ◊	34.41 ◊
0175	175	109.51 ◊	62.58 ◊	43.01 ◊
0200	200	126.72 ◊	73.54 ◊	57.11 ◊
		(436)	(436)	(436)

Part No.	Length mm	4350	4351	4352
0250	250	145.50 ◊	88.39 ◊	65.71 ◊
0300	300	159.56 ◊	101.69 ◊	78.22 ◊
0350	350	179.91 ◊	139.23 ◊	125.15 ◊
0400	400	195.56 ◊	137.66 ◊	109.51 ◊
0450	450	219.02 ◊	178.34 ◊	162.70 ◊
0500	500	234.66 ◊	156.45 ◊	128.28 ◊
0600	600	406.75 ◊	234.66 ◊	179.91 ◊
0700	700	453.67 ◊	281.60 ◊	195.56 ◊
0800	800	547.54 ◊	312.88 ◊	234.66 ◊
0900	900	719.63 ◊	391.10 ◊	297.24 ◊
1000	1000	860.43 ◊	469.33 ◊	344.18 ◊
		(436)	(436)	(436)

Gauge Block Sets, DIN EN ISO 3650

DIN EN ISO 3650

Design: DIN EN ISO 3650 (former DIN 861), from high-quality, highly solid special steel, specially alloyed and stress relieved. High adhesive force. Hardness of gauge blocks 800 HV (64 HRc), thus very robust and wear-resistant. **Each gauge block is engraved with an individual identification number.**
Supplied in wooden case.

In case of lengths
0.5 to 10.0 mm, the height is 30 mm and the depth is 9 mm.
10.0 to 1000.0 mm, the height is 35 mm and the depth is 9 mm.

4360 **Tolerance class 0:** For all precise length measurements, for measuring end gauges used during operation and for adjusting precision measuring tools.

4361 **Tolerance class 1:** For measuring gauges and for adjusting measuring tools.

4362 **Tolerance class 2:** Especially for workshop and setting gauges for manufacturing gauges, fixtures and machines.



Part No.	Number of pieces in a box	4360	4361	4362	Dimension mm	Graduation mm	Number
0032	32	214.10	141.08	74.69	1.005	1.005	1
					1.01 – 1.09	0.01	9
					1.10 – 1.90	0.1	9
					1.00 – 9.00	1.0	9
					10.00 – 30.00	10.0	3
					50.00		1
0047	47	315.33	182.56	124.48	1.005	1.005	1
					1.01 – 1.20	0.01	20
					1.30 – 1.90	0.1	7
					1.00 – 9.00	1.0	9
					10.00 – 100.00	10.0	10
0087	87	477.97	315.33	182.56	1.001 – 1.009	0.001	9
					1.01 – 1.49	0.01	49
					0.50 – 9.50	0.5	19
					10.00 – 100.00	10.0	10
0103	103	610.75	373.42	224.05	1.005	1.005	1
					1.01 – 1.49	0.01	49
					0.50 – 24.50	0.5	49
					25.00 – 100.00	25.00	4
		(437)	(437)	(437)			

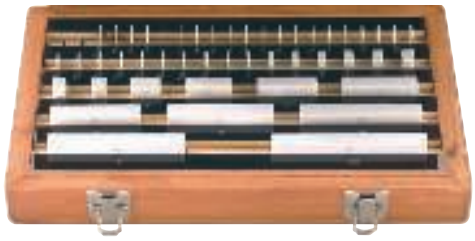
Ceramic Parallel Gauge Blocks DIN EN ISO 3650

Design: DIN EN ISO 3650 (former DIN 861), from ceramic. Shock and break resistant. Almost no material accumulation in case of damage to the measuring surface caused by scratches or by impacts on edges. Slip-on ability is further ensured. Extremely wear-resistant, corrosion-resistant, not magnetizable. The expansion coefficient is similar to steel. **Each gauge block is marked with an identification no.** Supplied in wooden box: Ceramic parallel gauge blocks with test certificate calibrated to national standard.

In case of lengths
0.5 to 10.0 mm, the height is 30 mm and the depth is 9 mm.
10.0 to 1000.0 mm, the height is 35 mm and the depth is 9 mm.

4372 **Tolerance class 0**

4373 **Tolerance class 1**



Part No.	Number of pieces in a box	4372	4373	Dimensions mm	Graduation mm	Unit
0032	32	883.90 ◊	782.21 ◊	1.005	–	1
				1.01 – 1.09	0.01	9
				1.10 – 1.90	0.1	9
				1.00 – 9.00	1.0	9
				10 / 20 / 30 / 50	–	4
0047	47	1,486.19 ◊	1,196.78 ◊	1.005	–	1
				1.01 – 1.20	0.01	20
				1.30 – 1.90	0.1	7
				1.00 – 9.00	1.0	9
				10.00 – 100.00	10.0	10
0087	87	2,542.16 ◊	1,994.62 ◊	1.001 – 1.009	0.001	9
				1.01 – 1.49	0.01	49
				0.50 – 9.50	0.5	19
				10.00 – 100.00	10.0	10
		(436)	(436)			

Gauge Block Checking Sets DIN EN ISO 3650

Application: For checking of calliper gauges according to VDI/VDE/DGQ Z618, page 8, high-quality steel, hardened and lapped. Tolerance class I. Supplied in wooden case.

In case of lengths
0.5 to 10.0 mm, the height is 30 mm and the depth is 9 mm.
10.0 to 1000.0 mm, the height is 35 mm and the depth is 9 mm.



Part No.	No. per set	4126	Nominal dimension mm	Design
0003	3	77.83 ◊	30.0/41.3/131.4	Steel
		(436)		

Gauge Block Checking Sets for Micrometers

Application: For calibrating external micrometers according to VDI/VDE/DGQ 2618. Nominal dimensions: 2.5 mm/5.1 mm/7.7 mm/10.3 mm/12.9 mm/15 mm/17.6 mm/20.2 mm/22.8 mm/25 mm. Supplied in wooden case.

In case of lengths
0.5 to 10.0 mm, the height is 30 mm and the depth is 9 mm.
10.0 to 1000.0 mm, the height is 35 mm and the depth is 9 mm.

4131 **Special steel**

4132 **Ceramics**



Part No.	No. per set	4131	4132	Accuracy
0010	10	206.27 ◊	354.99 ◊	0
0110	10	133.40 ◊	291.03 ◊	1
		(402)	(402)	

Plane Face Glasses

Design: For evenness and wring-on measurements on high-precision, plane surfaces according to the interference method. Supplied in wooden case.



Part No.	ø mm	4130	Thickness mm	Eveness µm
1045	45	93.39 ◊	12	0.1
		(436)		

Gauge Block Accessories

The range of applications for the parallel gauge blocks can be expanded significantly with the use of these accessories. Especially in small-series and custom-made production, as well as in the control room they are suitable for the quick composition of gauges, control devices, marking and measuring instruments.

Please note: Single measuring pins, different set compositions as well as various qualities available on request.

Gauge Block Holders including Quick Adjustment

Application: For secure and fast clamping of gauge blocks and measuring jaws.

Part No.	Measuring range mm	4380
0100	0–100	126.57 ◊
0200	100–200	138.36 ◊
0400	200–400	190.24 ◊

(441)



Measuring Jaw – Pairs

Design: With cylindrical attachment for inner and outer measurements.

Part No.	Nominal size (attachment-⌀ of a pair) mm	4382	Max. measuring depth mm
0004	4	127.35 ◊	8
0010	10	127.35 ◊	15
0016	16	139.93 ◊	20
0020	20	171.38 ◊	40

(441)

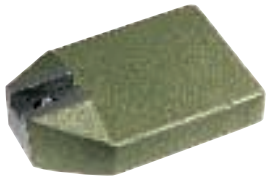


Base

Application: For holding the gauge block holder.

Part No.	Dimensions mm	4834
0106	106 x 70 x 28/20	99.05 ◊

(441)



Gauge Block Accessories – Sets

Design: In wooden case.

Content: 1 pair of measuring jaws ⌀ 4 mm and ⌀ 10 mm each
1 scriber and 1 centre point
1 gauge block holder 0–50 mm,
0–100 mm and 100–200 mm each
1 base

Part No.	Design	4388
0010	10-piece	938.64 ◊

(441)



Clamp Holders

Application: For convenient and effective handling of gauge blocks in the verification of micrometers.

Part No.	4386
0001	503.92 ◊

(441)



Measuring Pin Holders

Design: Measuring pin holders made of diecast with locking screw.

Application: To hold two measuring pins within one tolerance field.

Part No.	Dimensions	4390	Length	For measuring pin ∅
			mm	mm
0001	1	9.95 ◊	60	1– 2
0002	2	11.57 ◊	68	2– 4
0003	3	16.20 ◊	76	4– 6
0004	4	23.49 ◊	84	6– 8
0005	5	26.87 ◊	92	8–10

(442)



Measuring Pin Sets in Wooden Box

Design: Tolerance ± 0.001. Overall hardened, annealed, ultra-fine ground and lapped. Length of measuring pin 70 mm.

Please note: Single measuring pins and different set compositions in a variety of materials available on request.

DIN 2265

Part No.	Number	4395	Graduation	Measuring range	Measuring pin length
			mm		mm
0005	41	400.61 ◊	0.10	1.00– 5.00	70
0010	91	887.51 ◊	0.10	1.00–10.00	70

(442)



Limit Plug Gauges DIN 2245 H7

Design: Hardened gauge steel, tolerance and dimensions according to DIN 7162, with GO and NO-GO side, for checking of bore holes for dimensional accuracy.

Please note: Intermediate dimensions and other tolerances on request.

DIN 2245 | H7



Part No.	Nominal dimension mm	4402
0002	2	20.06
0003	3	17.41
0004	4	15.71
0005	5	14.65
0006	6	14.65
0007	7	15.18
0008	8	15.71
0009	9	16.24
0010	10	16.88
0011	11	17.41
0012	12	17.94
0013	13	18.47
0014	14	19.00
0015	15	19.53
0016	16	20.06

(443)

Part No.	Nominal dimension mm	4402
0017	17	20.59
0018	18	21.12
0019	19	21.76
0020	20	21.76
0021	21	22.81
0022	22	23.34
0023	23	23.87
0024	24	24.40
0025	25	24.93
0026	26	24.93
0027	27	25.99
0028	28	26.63
0030	30	27.16
0032	32	29.29
0033	33	30.35

(443)

Part No.	Nominal dimension mm	4402
0034	34	30.88
0035	35	31.53
0036	36	32.06
0037	37	32.59
0038	38	33.65
0040	40	34.71
0042	42	35.87
0044	44	37.99
0045	45	38.66
0046	46	40.11
0047	47	41.29
0048	48	42.35
0050	50	43.41
0052	52	45.54
0055	55	47.77

(443)

Part No.	Nominal dimension mm	4402
0058	58	51.05
0060	60	53.17
0062	62	55.41
0065	65	56.99
0068	68	60.81
0070	70	61.87
0072	72	64.51
0075	75	67.30
0080	80	71.64
0085	85	78.82
0090	90	84.41
0095	95	88.94
0100	100	94.54

(443)

Double-sided Gap Gauges

Design: GO and NO-GO side made of hardened gauge steel, measuring surfaces hardened, ground and lapped, blank forged. Accuracy of manufacture to DIN 7162 and DIN 7163, tolerance field h6.

DIN 2230



Part No.	Nominal dimension mm	4406
0004	4	91.88 ◊
0005	5	91.88 ◊
0006	6	91.88 ◊
0007	7	83.54 ◊
0008	8	83.54 ◊
0009	9	83.54 ◊
0010	10	83.54 ◊
0011	11	88.54 ◊
0012	12	88.54 ◊
0013	13	88.54 ◊
0014	14	58.07 ◊
0015	15	93.55 ◊
0016	16	93.55 ◊
0017	17	93.55 ◊

(443)

Part No.	Nominal dimension mm	4406
0018	18	93.55 ◊
0019	19	101.91 ◊
0020	20	101.91 ◊
0021	21	101.91 ◊
0022	22	101.91 ◊
0023	23	103.58 ◊
0024	24	103.58 ◊
0025	25	103.58 ◊
0026	26	103.58 ◊
0027	27	103.58 ◊
0028	28	105.24 ◊
0030	30	105.24 ◊
0032	32	105.24 ◊
0033	33	110.26 ◊

(443)

Part No.	Nominal dimension mm	4406
0034	34	110.26 ◊
0035	35	110.26 ◊
0036	36	110.26 ◊
0037	37	110.26 ◊
0038	38	110.26 ◊
0040	40	116.95 ◊
0042	42	116.95 ◊
0044	44	125.29 ◊
0045	45	125.29 ◊
0046	46	125.29 ◊
0048	48	125.29 ◊
0050	50	133.64 ◊
0052	52	133.64 ◊
0055	55	133.64 ◊

(443)

Part No.	Nominal dimension mm	4406
0058	58	145.33 ◊
0060	60	145.33 ◊
0062	62	145.33
0065	65	158.70
0068	68	158.70
0070	70	158.70
0075	75	172.06
0080	80	187.10
0085	85	192.11 ◊
0090	90	192.11 ◊
0095	95	200.46 ◊
0100	100	200.46 ◊

(443)

Setting Ring Gauges DIN 2250 C

Design: Wear-resistant special gauge steel, hardened, ground and lapped.
For adjusting internal fine measuring instruments.

DIN 2250C



Part No.	Nominal dimension mm	4411
0030	3	54.52 ◊
0035	3.5	36.01 ◊
0040	4	35.15 ◊
0045	4.5	35.15 ◊
0050	5	34.44
0060	6	33.72
0070	7	33.72 ◊
0080	8	33.72
0090	9	33.72 ◊
0100	10	33.72
0110	11	34.44 ◊
0120	12	35.15
0130	13	36.01 ◊
0140	14	36.01
0150	15	36.73
0160	16	37.44 ◊

(444)

Part No.	Nominal dimension mm	4411
0170	17	38.16 ◊
0180	18	38.16
0190	19	38.88 ◊
0200	20	39.60
0210	21	40.31 ◊
0220	22	40.31
0230	23	41.03 ◊
0240	24	41.75
0250	25	42.60
0260	26	43.34 ◊
0270	27	43.34
0280	28	44.04
0300	30	45.48
0320	32	46.21
0340	34	47.65 ◊
0350	35	47.65

(444)

Part No.	Nominal dimension mm	4411
0360	36	48.48 ◊
0380	38	49.92 ◊
0400	40	50.65
0420	42	53.51
0440	44	56.52 ◊
0450	45	57.95
0460	46	59.39 ◊
0480	48	62.41 ◊
0500	50	65.28
0520	52	67.44
0550	55	71.88
0580	58	76.34 ◊
0600	60	79.21
0620	62	82.20 ◊
0650	65	87.23 ◊
0680	68	92.39 ◊

(444)

Part No.	Nominal dimension mm	4411
0700	70	96.13
0750	75	104.16 ◊
0800	80	112.91
0850	85	126.98 ◊
0880	88	135.73 ◊
0900	90	141.61
0920	92	146.77 ◊
0950	95	155.52 ◊
0980	98	163.55 ◊
1000	100	169.43
1250	125	212.03 ◊
1500	150	254.52 ◊
1750	175	369.72 ◊
2000	200	485.66 ◊

(444)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

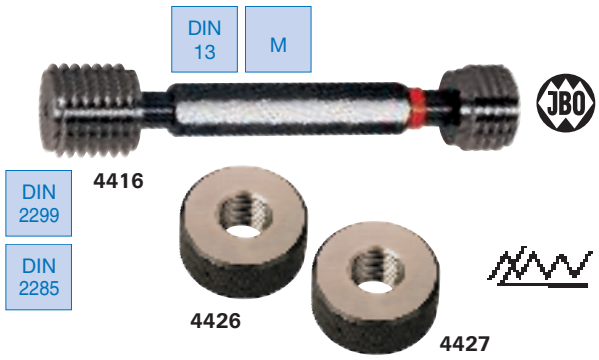
Thread Gauges for ISO Metric Fine Screw Thread

4416 **Design: Plug thread gauge.** Hardened gauge steel, ISO metric thread DIN 13, **tolerance field 6H,** with GO and NO-GO side.

4426 **Design:** Thread ring gauge GO. High-quality special steel, fully hardened, stress-relieved and ultra-fine ground. **Thread ring gauges DIN 2285,** ISO metric screw thread DIN 1502 (former DIN 13), **tolerance field 6g.**

4427 **Design:** Thread ring gauge NO-GO. High-quality special gauge steel, fully hardened, stress-relieved and ultra-fine ground. **Thread ring gauges NO-GO DIN 2299,** ISO metric screw thread DIN 1502 (former DIN 13), **tolerance field 6g.**

Please note: Intermediate dimensions and other tolerances on request.



Part No.	Thread	4416	4426	4427
0010	M 1	–	98.23 ◊	98.23 ◊
0012	M 1.2	–	93.05 ◊	93.05 ◊
0014	M 1.4	–	85.38 ◊	85.38 ◊
0016	M 1.6	71.69	75.18	75.18
0018	M 1.8	65.59	66.67	66.67
0020	M 2	61.47	66.67	66.67
0022	M 2.2	63.37	–	–
0025	M 2.5	52.98	50.45	50.45
0030	M 3	46.26	39.27	39.27
0035	M 3.5	46.95	36.76	36.76
0040	M 4	43.58	35.92	35.92
0050	M 5	42.50	35.92	35.92
0060	M 6	41.10	35.92	35.92
0080	M 8	42.50	36.76	36.76
0100	M 10	45.56	42.76	42.76
0120	M 12	48.74	49.63	49.63
0140	M 14	52.52	54.64	54.64
0160	M 16	56.29	60.65	60.65
		(446)	(444)	(444)

* Thread plug gauge GO
** Thread plug gauge NO-GO

Part No.	Thread	4416	4426	4427
0180	M 18	60.75	69.16	69.16
0200	M 20	65.11	76.85	76.85
0220	M 22	68.89	83.71	83.71
0240	M 24	77.59	89.72	89.72
0270	M 27	86.44	99.89	99.89
0300	M 30	95.72	109.43	109.43
0330	M 33	108.54 ◊	119.61 ◊	119.61 ◊
0360	M 36	117.24 ◊	128.96 ◊	128.96 ◊
0390	M 39	124.21 ◊	140.17 ◊	140.17 ◊
0420	M 42	–	152.01 ◊	152.01 ◊
0420	M 42*	85.60 ◊	–	–
0421	M 42**	76.65 ◊	–	–
0450	M 45	–	161.38 ◊	161.38 ◊
0450	M 45*	91.98 ◊	–	–
0451	M 45**	83.04 ◊	–	–
0480	M 48	–	170.90 ◊	170.90 ◊
0480	M 48*	99.09 ◊	–	–
0481	M 48**	89.65 ◊	–	–
		(446)	(444)	(444)

Thread Gauges for ISO Metric Fine Screw Threads

4421 **Design: Plug thread gauge,** hardened gauge steel, ISO metric fine screw thread DIN 13, **tolerance field 6H,** with GO and NO-GO side.

4431 **Design:** Thread ring gauge GO, high-quality special steel, fully hardened, stress-relieved and ultra-fine ground. ISO metric fine thread DIN 1502 (former DIN 13), **tolerance field 6g. Thread ring gauges GO DIN 2285,** complete thread profile, pitch and core diameter correspond to maximum size of male thread to be gauged. It should be possible to screw the rings smoothly onto the test sample.

4432 **Design:** Thread ring gauge NO-GO, high-quality special gauge steel, fully hardened, stress-relieved and ultra-fine ground. ISO metric fine thread DIN 1502 (former DIN 13), **tolerance field 6g. Thread ring gauges NO-GO DIN 2299** are provided with slightly shortened threads of screw and serve to gauge the pitch diameter. It should not be possible to screw them onto the test sample.



Please note: Intermediate dimensions as well as deviating tolerances and types of thread on request.

Part No.	Plug thread gauge	4421	4431	4432
0301	M 3 x 0.35	81.33 ◊	–	–
0401	M 4 x 0.35	79.37 ◊	–	–
0402	M 4 x 0.5	72.17	55.46	55.46
0502	M 5 x 0.5	69.21	55.46	55.46
0602	M 6 x 0.5	68.75	56.31	56.31
0603	M 6 x 0.75	50.62	42.76	42.76
0703	M 7 x 0.75	50.62	42.76	42.76
0802	M 8 x 0.5	71.37	58.98	58.98
0803	M 8 x 0.75	50.62	44.43	44.43
0804	M 8 x 1	46.74	40.93	40.93
0904	M 9 x 1	50.76 ◊	42.76 ◊	42.76 ◊
1003	M 10 x 0.75	55.82 ◊	48.62 ◊	48.62 ◊
1004	M 10 x 1	49.34	46.11	46.11
1104	M 11 x 1	54.69 ◊	47.78 ◊	47.78 ◊
1204	M 12 x 1	53.58	52.12	52.12
		(446)	(444)	(444)

Part No.	Plug thread gauge	4421	4431	4432
1206	M 12 x 1.5	48.76	51.30	52.12
1404	M 14 x 1	56.88	56.46	56.46
1406	M 14 x 1.5	52.06	54.64	54.64
1504	M 15 x 1	66.46 ◊	57.30 ◊	60.65 ◊
1506	M 15 x 1.5	62.79	57.30	57.30
1604	M 16 x 1	60.52	61.47	61.47
1606	M 16 x 1.5	54.52	59.80	59.80
1804	M 18 x 1	63.37	67.49	67.49
1806	M 18 x 1.5	57.80	64.99	64.99
1807	M 18 x 2	66.24 ◊	–	–
2004	M 20 x 1	67.69	71.83	71.83
2006	M 20 x 1.5	62.02	70.00	70.00
2007	M 20 x 2	65.93	70.00	70.00
2204	M 22 x 1	75.23	80.36	80.36
2206	M 22 x 1.5	68.27	75.18	75.18
		(446)	(444)	(444)

Continued overleaf

Thread Gauges for ISO Metric Fine Screw Threads

Continued

Part No.	Plug thread gauge	4421	4431	4432
2207	M 22 x 2	73.35 ◊	75.18 ◊	75.18 ◊
2404	M 24 x 1	80.89	84.53	84.53
2406	M 24 x 1.5	73.35	80.36	80.36
2407	M 24 x 2	77.74 ◊	80.36 ◊	80.36 ◊
2506	M 25 x 1.5	78.49 ◊	82.85 ◊	82.85 ◊
2606	M 26 x 1.5	80.94 ◊	85.38 ◊	85.38 ◊
2706	M 27 x 1.5	80.07	88.05	88.05
2707	M 27 x 2	84.63 ◊	88.05 ◊	88.05 ◊
2806	M 28 x 1.5	85.84 ◊	89.72 ◊	89.72 ◊
3004	M 30 x 1	103.51 ◊	101.56 ◊	101.56 ◊
3006	M 30 x 1.5	88.88	95.74	95.74
3007	M 30 x 2	93.19 ◊	95.74 ◊	95.74 ◊
3206	M 32 x 1.5	94.81 ◊	100.74 ◊	100.74 ◊
3306	M 33 x 1.5	97.26 ◊	103.41 ◊	103.41 ◊
3307	M 33 x 2	99.72 ◊	103.41 ◊	103.41 ◊
3506	M 35 x 1.5	101.79 ◊	107.58 ◊	107.58 ◊
3606	M 36 x 1.5	104.25 ◊	110.26 ◊	110.26 ◊
3607	M 36 x 2	107.31 ◊	110.26 ◊	110.26 ◊
3609	M 36 x 3	116.64 ◊	119.61 ◊	119.61 ◊
3806	M 38 x 1.5	112.83 ◊	116.11 ◊	116.11 ◊
3907	M 39 x 2	121.05 ◊	118.79 ◊	118.79 ◊
		(446)	(444)	(444)

Part No.	Plug thread gauge	4421	4431	4432
4006	M 40 x 1.5	118.96 ◊	122.12 ◊	122.12 ◊
4007	M 40 x 2	126.31 ◊	122.12 ◊	122.12 ◊
4206	M 42 x 1.5	70.89	127.30	127.30
4207	M 42 x 2	73.09	127.30	127.30
4209	M 42 x 3	85.60	136.65	136.65
4216	M 42 x 1.5	65.25	–	–
4217	M 42 x 2	67.21	–	–
4219	M 42 x 3	78.99	–	–
4506	M 45 x 1.5	75.30	134.16	134.16
4507	M 45 x 2	77.52	134.16	134.16
4509	M 45 x 3	90.39	146.00	146.00
4516	M 45 x 1.5	69.06	–	–
4517	M 45 x 2	71.76	–	–
4519	M 45 x 3	83.38	–	–
4806	M 48 x 1.5	79.71	142.67	142.67
4807	M 48 x 2	82.05	142.67	142.67
4809	M 48 x 3	95.41	154.53	154.53
4816	M 48 x 1.5	69.06	–	–
4817	M 48 x 2	75.69	–	–
4819	M 48 x 3	87.94	–	–
		(446)	(444)	(444)

Morse Taper Gauges without Tang DIN 229

Design: Gauge steel, hardened, ground and lapped.

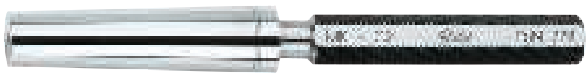
Application: For checking male and female taper of tools and workpieces.

DIN 229

4436 **Morse taper plug gauge,** without tang DIN 229.

4438 **Morse taper sleeve gauge,** without tang DIN 229.

Part No.	MT	4436	4438
0000	0	56.26 ◊	140.73 ◊
0001	1	59.17 ◊	137.16 ◊
0002	2	66.17 ◊	133.73 ◊
0003	3	78.84 ◊	161.79 ◊
0004	4	98.51 ◊	200.45 ◊
0005	5	146.37 ◊	270.87 ◊
		(443)	(443)



4436



4438

Morse Taper Gauges with Tang DIN 230/DIN 230A

Design: Gauge steel, hardened and ground.

Application: For checking taper shanks and bore holes of tools and tool machines.

DIN 230 DIN 230A

4440 **Morse taper plug gauge,** with tang DIN 230.

4442 **Morse taper sleeve gauge,** with one-sided tang DIN 230A.

Part No.	MT	4440	4442
0000	0	81.31 ◊	219.43 ◊
0001	1	83.50 ◊	215.30 ◊
0002	2	94.37 ◊	211.04 ◊
0003	3	114.60 ◊	253.27 ◊
0004	4	140.87 ◊	312.30 ◊
0005	5	197.29 ◊	422.07 ◊
		(443)	(443)



4440



4442

Steep Taper Gauges DIN 2079/DIN 2080

Design: Gauge steel, hardened and ground.

DIN 2079 DIN 2080

4444 **Application:** Steep taper plug gauge, for gauging of spindle heads according to DIN 2079.

4446 **Application:** Steep taper sleeve gauge, for gauging of taper shanks according to DIN 2080.

Part No.	SK	4444	4446
0030	30	126.57 ◊	204.02 ◊
0040	40	154.77 ◊	267.30 ◊
0050	50	218.05 ◊	443.12 ◊
		(443)	(443)



4444



4446

Drill Point Grinding Gauges

Design: With 118° point angle, max. drill diameter 50 mm.

Part No.	For drills ∅ up to mm	4451 mm
0050	50	0.89
		(447)



V-Thread Steel Gauges

Design: Marked with size and various recesses for measuring the polished sections of lathe tools and for setting up steels on the support.

Part No.	For thread	4453 mm
0055	55°	1.85
0060	60°	1.85
		(447)



Trapezoidal Thread Gauges

Design: For trapezoidal threads from 2–12 mm. Angle 30°, with recess 30°, all recesses milled properly.

DIN 103

Part No.	4455 mm
0001	2.02
	(447)



Lathe and Thread Gauges

Design: Combined, for trapezoidal threads from 2 to 12 mm and flat threads with 2 to 8 thread/ inch, V-threads 55° and 60°, all recesses milled properly.

Part No.	4457 mm
0001	2.02
	(447)



Lathe Gauges

Design: For measuring wedge angles on lathe tools for various materials.

Part No.	Design	4459 mm
0001	For HSS lathe tools	5.48
0002	For carbide lathe tools	5.48
		(447)



For HSS lathe tools



For carbide lathe tools

Gauges for Chamfers

Application: Chromium-plated special steel, for checking chamfers at workpieces, with exchangeable measuring guide, for chamfers 30°, 45° and 60°.
The stop is adjustable, with locking screw for measuring guide and stop.
Supplied in wooden case.

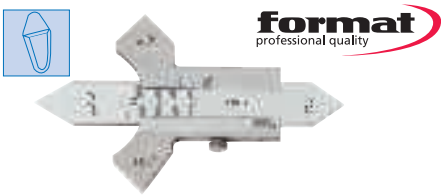
Part No.	Measuring range mm	4460 inch	Dimension mm	Reading mm
0001	0–10	135.93	48 x 30 x 9	0.1
		(402)		





Weld Gauges with Slide

Design: Special stainless steel, for measuring flat welds and welds in corners as well as V-weld angles of 60°/70°/80° and 90°. With 1/10 vernier and scale, matt chromium-plated. Supplied in wallet.



Part No.	Measuring range mm	4461 mm
0020	20	9.98
		(447)

Weld Gauges with 12 Blades

Design: Fan-shaped arrangement of 12 blades 3–12 mm, for measuring welds in corners, polished.



Part No.	Measuring range mm	4463 mm
0012	3–12	10.09
		(447)

Screw-Pitch Gauges

Design: Steel, for internal and external measurements, in bright outer leaf with size and locking screws. For gauging pitches of male and female threads.



Part No.	Dimensions	4467 mm	Number of blades
0052	0.25–6.00/4–62 metr. + Whitworth comb.	2.52	52
0058	0.25–6.00/4–26 metr. + Whitworth + pipe thread comb.	3.27	58
		(447)	

Precision Nozzle Gauges

Design: Hardened and ground round measuring pin, taper 1:10, reading 0.1 mm, vernier 0.01 mm, casing nickel-plated. Supplied in wallet.



Part No.	Measuring range mm	4471 mm
0003	0–3	37.67
0005	0–5	50.03
		(447)

Conical Hole Gauges

Design: Hardened and ground round measuring pin made of stainless steel, handle knurled. Supplied in wallet.

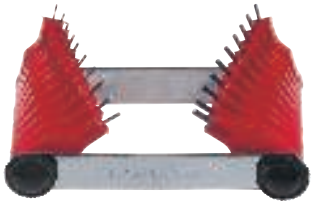
Application: For measuring all types of nozzles and small bore holes.



Part No.	Measuring range mm	4472 mm
0006	1– 6	48.37
0015	4–15	66.72
0030	15–30	137.61
0045	30–45	216.00
0060	45–60	341.93
		(447)

Nozzle Gauges

Design: With steel pins, set in plastic. Steel frame. For measuring all types of nozzles and small bore holes.



Part No.	Measuring range mm	4473 mm	Number of measuring pins
0015	0.45–1.5	6.30	20
0030	1.5 –3.0	6.74	16
		(447)	

Millimetre Hole Gauges

Design: Hardened steel, polished.



Part No.	Measuring range mm	4475 mm	Increments in mm	Number of holes
0010	0.1–10	67.94	0.1	100
		(447)		

Profile Gauges

Design: Pins cold-hammered, packed individually.

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Part No.	Dimension mm	4476	∅ mm	Pin ∅ mm
0150	150 x 40	13.97	154 x 85	1.0
0300	300 x 60	42.88	350 x 150	1.0
		(402)		



Radius Gauges

Design: Standard steel, radii concave and convex, size indicated on the outer leaf.
Pitch in mm:
1.0– 3 mm, increments 0.25 mm
3.5–20 mm, increments 0.50 mm
20.0–25 mm, increments 1.00 mm

format professional quality

Application: For measuring internal and external radii.



Part No.	Radius in mm	4479	Number of blades
0007	1.0– 7	4.47	17
0015	7.5–15	5.25	16
0025	15.5–25	5.25	15
		(447)	

Gauges for ISO Fits

Design: Aluminium, anodized, deep-black print, scratch resistant, with tables on the front and back, for standard bores H 6 to H 13 according to DIN 7154 from 1–160 mm ∅ as well as shafts h 5 to h 12 according to DIN 7155, from 1–160 mm ∅.

format professional quality



Part No.	Dimensions mm	4480
0001	280 x 80	15.31
		(447)

Gauges for DIN Threads

Design: Aluminium, anodized, deep-black print, scratch resistant, with tables on front and back for ISO metric standard coarse-pitch threads (DIN 13). Whitworth threads (DIN 11), Whitworth taper threads (DIN 259), direct reading of all major thread dimensions as well as thread width, thread height and groove depth for 10–500 mm shaft ∅.

format professional quality



Part No.	Dimensions mm	4481
0001	260 x 50	11.36
		(447)

Indicators

4482 0010 **Design:** ISO tolerance indicator **Tolerator.**
Application: Direct reading of all tolerance values.

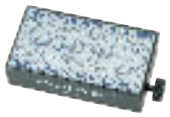
4482 0020 **Design:** ISO thread indicator **Filetor.**
Application: For reading all details of a thread.

4482 0030 **Design:** mm/inch **Convertor.**
Application: Direct mm/inch conversion.

PREISSER MESSTECHNIK



Tolerator



Filetor



Convertor

Part No.	Design	Dimension mm	4482
0010	Tolerator	60 x 30 x 110	39.96
0020	Filetor	60 x 30 x 110	39.96
0030	Convertor	60 x 30 x 110	39.96
			(402)

Feeler Gauges

Application: For measuring gaps, contact clearances, etc.

format professional quality

4483 **Design:** Blades made of hardened spring steel, each individually marked with size, tapered, in high-gloss nickel-plated frame, with locking nut.

4485 **Design:** Blades made of brass, each individually marked with size, tapered, with locking nut.

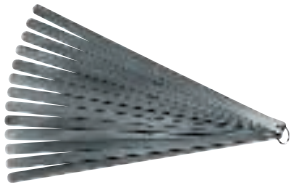
4487 **Design:** Hardened spring steel, blades cylindrically shaped, suspended on a ring.



4483 Feeler Gauges



4485 Feeler gauges, non-magnetic



4487 Piston play gauge

Part No.	Number of blades	4483 mm	4485 mm	4487 mm	Measuring range mm	Blade length mm
0008	8	0.83	–	–	0.05–0.5 up to 0.3 mm increasing by 0.05 mm, then by 0.1 mm	100
0013	13	1.04	–	–	0.05–1.00 up to 0.3 mm increasing by 0.5 mm, then by 0.1 mm	100
0013	13	–	–	6.08	0.05–1.00 up to 0.3 mm increasing by 0.05 mm, then by 0.1 mm	300
0020	20	1.87	7.86	–	0.05–1.00 increasing by 0.05 mm	100
0020	20	–	–	9.04	0.05–1.00 increasing by 0.05 mm	300
0021	21	3.42	–	–	0.05–2.00 up to 0.1 mm increasing by 0.05 mm, then by 0.1 mm	100
		(447)	(447)	(447)		

Feeler Gauge Strips



format professional quality

Application: Perfect for repeated measurements of identical material thicknesses, e.g. for serial measurements or as a base for aligning machine components in production and assembly.

Design: Hardened spring steel, burr-free edges, thickness marked on the strip at regular intervals in mm and inches. Strip width 12.7 mm, length 5 m each. Coiled inside plastic box.

Part No.	Dimension mm	4489 mm
0000	0.005	56.33
0001	0.01	19.11
0002	0.02	16.41
0003	0.03	5.97
0004	0.04	5.97
0005	0.05	4.20
0006	0.06	4.95
0007	0.07	6.70
0008	0.08	5.48
0009	0.09	6.70
0010	0.10	4.20
0012	0.12	7.04
0015	0.15	4.05
		(447)

Part No.	Dimension mm	4489 mm
0018	0.18	7.04
0020	0.20	4.05
0025	0.25	4.05
0030	0.30	4.05
0035	0.35	4.47
0040	0.40	4.05
0045	0.45	4.95
0050	0.50	4.05
0060	0.60	6.22
0070	0.70	6.22
0080	0.80	6.22
0090	0.90	6.22
0100	1.00*	6.22
		(447)

* in film packing

Feeler Gauge Strips in Box

format professional quality

Design: Hardened spring steel, burr-free edges, thickness marked on the strip at regular intervals in mm and inch. Strip width 13.0 mm, length 5 m each. Supplied in wall unit.

Application: Perfect for repeated measurements of identical material thicknesses, e.g. for serial measurements. Also suitable as a base for aligning machine components in production and assembly.



Part No.	Thickness mm	4490 mm
0100	0.01–0.25	134.27
		(447)

Holders for Feeler Gauge Strip

format professional quality

Design: Shock-proof plastic, reinforced with flexible steel rail.



Part No.	4491 mm
0001	1.31
	(447)

Metal Foils

Design: In plastic boxes which can be fitted together and stacked, strip 150 x 2,500 mm.

Application: For adjusting tools and devices, balancing tolerances, as shims for devices, for adjusting moulds and bearing clearance etc.

Thickness tolerances brass, stainless steel.

Material thickness	Tolerance
0.01–0.03 mm	0.002 mm
0.04–0.05 mm	0.003 mm
0.06–0.18 mm	0.005 mm
0.20–0.30 mm	0.007 mm
0.40–0.50 mm	0.010 mm

Steel: Unalloyed, tolerance DIN 1544

4494 **Steel, unalloyed**

4496 **Brass (MS 63)**

4498 **Stainless steel (18 Cr 9 Ni)**



Part No.	Foil thickness mm	4494	4496	4498
0025	0.025	15.33	12.18	21.34
0050	0.05	8.87	11.62	17.54
0075	0.075	8.91	12.93	17.27
0100	0.1	8.68	14.56	17.94
0150	0.15	8.90	17.71	20.62
0200	0.2	9.23	20.86	24.53
0250	0.25	10.34	23.56	26.29
0300	0.3	11.74	26.55	28.07
0400	0.4	13.33	28.51	29.60
0500	0.5	14.70	32.99	32.16
		(448)	(448)	(448)

Assortment of Metal Foils, brass

Design: Including 4 boxes, 1 box each incl. 1 strip 150 x 1.200 mm, foil thickness 0.025–0.050–0.075 and 0.100 mm.

Thickness tolerances brass.

Material thickness	Tolerance
0.01–0.03 mm	0.002 mm
0.04–0.05 mm	0.003 mm
0.06–0.18 mm	0.005 mm
0.20–0.30 mm	0.007 mm
0.04–0.50 mm	0.010 mm

Part No.	Dimensions mm	4499
0001	150 x 1200	25.07
		(448)



Folding Pocket Magnifiers, Classic

ESCHENBACH

Design: Mount: Transparent plastic material. Lens: Biconvex, PXM® lightweight lens with Duplex coating. Leather wallet, granulated, black.

Part No.	Magnification	4502	Lens ø mm
0035	3.5 x	13.00	50
0060	6 x	10.91	30
		(451)	



Precision Folding Pocket Magnifiers

ESCHENBACH

Design: Mount: Metal, black. Casing: Brass, matt chromium-plated surface.
Lens: Aplanatic (distortion-free image up to the rim).

Part No.	Magnification	4504	Lens ø mm
0006	6 x	26,89	23
0008	8 x	27.64	23
0010	10 x	27.64	14
0015	15 x	30.04	10
		(451)	



Aplanatic Reading Glasses

ESCHENBACH

Design: The lens system includes two plano-convex lenses facing one another with the convex face. A distortion-free quality up to the rim of the lens is thereby achieved.
The convenient handle allows easy and fatigue-proof use over a longer period.

Part No.	Magnification	4507	Lens ø mm
0024	2.4 x	41.52	75
		(451)	



Biconvex Magnifiers

ESCHENBACH

Design: The biconvex glasses provide a large visual field in a small magnification range.
Lens and frame made of high-quality plastic material:
Lens: Biconvex PXM® light-weight lens with permanent antistatic coating.

Part No.	Magnification	4507	Lens ø mm
0025	2.5 x	23.00	80
		(451)	



Illuminated Magnifiers Mobilux

ESCHENBACH

Design: White plastic casing. Lens: Biaspheric PXM® lightweight lens, surface hardened.
Supplied with 2 round cells (1.5 v each) and a bulb (2.5 v/250 mA).

Part No.	Magnification	4508	Lens ø mm
0007	7 x	20.62	35
0010	10 x	23.16	35
		(451)	



Gooseneck Magnifiers with Illumination

ESCHENBACH

Design: Mount: Heat-resistant white plastic material, movable to all sides, biconvex PXM® lightweight lens with Duplex coating.
Base: Sturdy, round table base, white.
Connecting cable 2 m, 230 v.

Part No.	Magnification	4513	Lamp	Lens ø mm
1002	2 x	129.65	Bulb 60 Watt	100
2002	2 x	161.31	PL-lamp 7 Watt	100
		(451)		



Gooseneck Magnifiers Vario with Illumination

Design: Due to the infinity optics, this magnifier allows high flexibility in the selection of working distances. The lens is protected against dust by a folding cover. Lens: Aspheric PXM® lightweight lens with cera-tec® hard coating. Support: Solid articulated support with integrated cable duct, max. protrusion 900 mm, pivoting range of the magnifier head; horizontal ± 48°, vertical and radial ± 90°. Supplied with PL lamp, 3 m connecting cable and table clamp for table tops 18–74 mm.

Part No.	Magnification	4520	Lens ø mm	Design
0019	1.9 x	233.76 ◊	132	Without additional pivoting lens
1928	1.9 x + 2.8 x	277.38 ◊	132	With additional pivoting lens

(451)

ESCHENBACH



4520 0019

4520 1928

Gooseneck Magnifiers Vario-Maxi, with Illumination

Design: This magnifier allows reading of complete pages at a time. Variable adjustment of the magnifier head by the solid articulated support with integrated cable duct. Optimum illumination of the field of view ensured by the offset 11 watt compact fluorescent lamp. Lens: Aspheric PXM® lightweight lens with cera-tec® hard coating. Support: Solid articulated support with integrated cable duct, max. protrusion 900 mm, pivoting range of magnifier head; vertical ± 90°, radial ± 90°. Supplied with magnifier, compact fluorescent lamp, 3 m connecting cable and dust protection cover, table clamp for table tops 18–74 mm.

Part No.	Magnification	4522	Lens ø mm
0175	1.75 x	417.32 ◊	220

(451)



4522

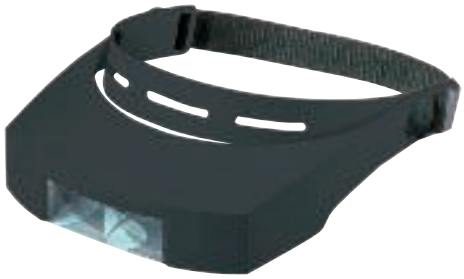
Binocular Headband Magnifiers, labo-comfort

Design: Binocular PXM® lightweight lens with surface coating. The visor is closed on all sides to protect the eyes against scattered light and can be turned up/folded up, when not needed. Latching at different heights for individual adjustment of the visor. The forehead support is perforated for circulation of air.

Part No.	Magnification	4525	Working distance mm	Weight g
0020	2.0 x	59.14	250	198
0030	3.0 x	59.14	160	198

(451)

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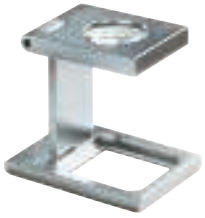
Precision Thread Counters

Design: Brass casing, semi-matt chromium-plated. Lens: Biconvex, optically ground silicate glass.

Part No.	Magnification	4527	Section mm	Height mm
0010	10 x	16.73	15 x 15	27

(451)

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Watchmaker's Magnifiers

Design: With plastic mount, anthracite, with vent. Lens: PXM® light-weight lens with Duplex coating, ø 25 mm.

Part No.	Design	4530	Magnification
0003	Lens plane-convex	8.07	3 x
0005	Lens plane-convex	8.82	5 x
0007	Lens plane-convex	9.56	7 x

(451)

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Micro Magnifiers with Illumination

Design: Plastic casing, matt black. Fine-adjustment by swivel, with 2 micro batteries 1.5 v.

Application: For surface inspection of all kinds of material and for the detection of defects.

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Part No.	Magnification	4533	Lens lamp
0030	30 x	51.54 (451)	2.2 V/0.25 A

Precision Scale Magnifiers

Design: Casing made of fibreglass reinforced polyamide, focus setting by focus arresting ring. Lens: Achromatic, for distortion-free and sharp pictures. Exchangeable measuring scales for various applications. Supplied with standard scale, measuring range 20 mm with 1/10 graduation, in plastic box with room for further scales.

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Part No.	Magnification	4535	Lens ø mm
0007	7 x	63.19	23
0010	10 x	70.66 (451)	23

Illuminating Units for Precision Scale Magnifier

Design: Handle designed for 2 batteries type Baby (R 14). Also available as mains-operated halogen version.

ESCHENBACH



Part No.	Design	4535
0100	Supplied with bulb, without batteries	20.17 (451)

Spare Precision Scales



Part No.	Type	4535	Design
0500	A	18.83	Standard
0600	B	18.83	Polar grid, angle, radius
0700	C	18.83	Angle, radius, bore holes
0800	D	18.83 (451)	Length in mm

Stereo Microscopes

Design: 45° oblique observation for low-fatigue operation, height-adjustable pillar (height 180 mm), 360° rotation, locking button, black anodised tubes, rubber eyepiece cups, distance between eyes adjustable from 54–74 mm, one eyepiece tube adjustable in terms of diopter ± 5 dpt, due to mounted prism system upright and right-reading image with brilliant, three-dimensional reproduction. Eyepieces: changeable pair of wide field eyepieces W 10 x, eyepiece tube adjustable in terms of diopter. Lens: Turret, 2 x and 4 x. Focusing: Screw for coarse adjustment on both sides. Illumination is effected by a vertical fluorescent lamp 12 v/5 W with grid adjustment for transmitted light plugged into the base. Solid metal support, pillar length 180 mm, black-white plastic plate for incident light, matt plate for transmitted light, ø 95 mm each.

Please note: Magnification range can be extended to 80 x.

ESCHENBACH



Transmitted light

Incident light

Part No.	Magnification range	4537	Working distance mm	Observation angle °	Pillar length mm	ø matt plate for transmitted light mm
0001	20 x up to 40 x	289.02 (451)	54–74	45	180	95 each

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Machinist's Squares

Design: Steel, galvanised, machined on all sides.

Application: For general applications.

4601 **Without stop**

4602 **With stop**

format professional quality

Part No.	Leg length mm	4601	4602	Cross-section mm
0100	100 x 70	1.82	3.25	20 x 5
0150	150 x 100	2.27	3.87	20 x 5
0200	200 x 130	2.87	5.07	20 x 5
0250	250 x 160	3.02	6.58	25 x 5
0300	300 x 180	3.61	7.04	25 x 5
0400	400 x 230	4.40	9.84	30 x 5
0500	500 x 280	5.39	12.88	30 x 5
0750	750 x 375	8.26	19.69	30 x 5
1000	1000 x 500	11.20	30.27	30 x 5
		(453)	(453)	



Flat and Stop Squares, DIN 875/II

Design: Special steel, right-angle, parallelism and flatness tolerances according to DIN 875/II. Measuring surfaces and flat sides ground.

Application: For precision applications in engineering and in workshops.

DIN 875/ II

format professional quality

4603 **Flat Squares, Form A**

4604 **Stop Squares, Form B**

Part No.	Leg length mm	4603	4604	Cross-section mm
0075	75 x 50	3.17	4.17	15 x 5
0100	100 x 70	3.84	5.17	20 x 5
0150	150 x 100	4.92	7.75	25 x 5
0200	200 x 130	7.11	9.93	30 x 6
0250	250 x 165	9.76	14.16	35 x 7
0300	300 x 175	12.43	17.91	35 x 7
0400	400 x 200	18.98	27.73	35 x 7
0500	500 x 250	26.66	35.18	40 x 8
0750	750 x 375	46.70	66.55	45 x 10
1000	1000 x 500	70.05	99.24	50 x 10
		(454)	(454)	



Flat and Stop Squares, DIN 875/I

Design: Right-angle, parallelism and flatness tolerances according to DIN 875/I. Measuring surfaces and flat sides fine-ground and calibrated.

Application: Suitable for high-precision applications and for measurements in precision engineering.

DIN 875/ I

format professional quality

4605 **Flat Squares, Form A, Special Steel**

4606 **Stop Squares, Form B, Special Steel**

4607 **Flat Squares, Form A, Stainless Steel**

4608 **Stop Squares, Form B, Stainless Steel**

Part No.	Leg length mm	4605	4606	4607	4608	Cross-section mm 4605/ 4606/4608	4607
0075	75 x 50	3.84	4.84	5.18	9.68	15 x 5	15 x 5
0100	100 x 70	4.50	6.26	6.38	11.68	20 x 5	20 x 5
0150	150 x 100	6.14	9.42	9.35	15.01	25 x 5	28 x 6
0200	200 x 130	8.42	12.00	14.71	21.36	30 x 6	32 x 7
0250	250 x 165	12.59	16.35	23.78	32.53	35 x 7	35 x 8
0300	300 x 200	16.50	21.68	31.69	37.53	40 x 8	40 x 8
0400	400 x 265	39.70	64.22	100.41	119.10	45 x 10	45 x 10
0500	500 x 330	56.04	91.07	115.60	151.79	50 x 10	50 x 10
		(454)	(454)	(454)	(454)		



INOX



Flat and Stop Squares, DIN 875/0

Design: Special steel, right-angle, parallelism and flatness tolerances according to DIN 875/0. Working edges and flat sides precisely and ultra-finely ground. Measuring surfaces ground.

DIN 875/0

format professional quality

4609 Flat Squares, Form A
4610 Stop Squares, Form B

Part No.	Leg length mm	4609	4610	Cross-section mm
0050	50 x 40	11.85	12.84	12 x 5
0075	75 x 50	13.85	15.85	15 x 5
0100	100 x 70	15.26	19.85	20 x 5
0150	150 x 100	22.19	25.85	25 x 5
0200	200 x 130	29.44	41.70	30 x 6
		(456)	(456)	



4609 Flat Squares

4610 Stop Squares

Precision Hairline Squares, DIN 875/00

Design: Stainless steel, working edges and hairline measuring edges fine-ground and lapped, flat design.

Application: For measuring and testing in conjunction with the light-gap method.

DIN 875/00 INOX

format professional quality

4621 Hardened stainless steel
4622 Special stainless steel

Part No.	Leg length mm	4621	4622	Body cross-section mm	Shallow angle cross-section mm
0050	50 x 40	9.93	25.65	14 x 4	14 x 4
0075	75 x 50	13.10	31.14	16 x 4	16 x 4
0100	100 x 70	14.26	34.82	25 x 5	25 x 5
0150	150 x 100	23.78	41.62	25 x 6	25 x 6
0200	200 x 130	30.53	56.83	30 x 7	30 x 7
		(456)	(456)		



4621 4622

Precision Hairline Squares with Sliding Ruler

Design: Right-angle, parallelism and flatness tolerances. For highest accuracy. Working edges and hairline measuring edges precisely ground. Supplied in plastic case.

Application: For measuring and testing in conjunction with the light-gap method.

format professional quality

Part No.	Ruler mm	4623	Handle mm
0100	60/75	50.71	40 x 23 x 9
		(456)	



Precision Angle Squares, DIN 875/00

Design: Hardened stainless steel, accuracy according to DIN 875/00, hairline measuring edge on the inside of the long side. Working edges and flat sides precisely and ultra-finely ground, measuring surfaces ground.

Application: For use in equipment construction.

DIN 875/00 INOX

format professional quality

Part No.	Leg length mm	4625	Cross-section long/short leg mm
0025	25 x 20	10.51	5.0 x 3.5/6 x 3.5
0040	40 x 28	10.51	5.5 x 3.5/8 x 3.5
		(453)	



Precision Measuring Tool Sets

DIN 874/00 | DIN 875/00 | INOX

format professional quality

Design: 5-piece, comprising: Hairline square, stainless, DIN 875/00, dimensions 75 x 50 mm; cutting angle with internal measuring edge, stainless, dimensions 40 x 28 mm; cutting angle with internal measuring edge, stainless, dimensions 25 x 20 mm; hairline rule, standard steel, DIN 874/00, length 100 mm; end measurement scribing point 60 x 8 x 8 mm.

Application: For measurements in toolmaking and production.

Part No.	Design	4627 mm
0005	Set in wooden case	66.72 (454)



Precision Centre Squares

DIN 875/ I

format professional quality

Design: Special steel with graduation in mm on the beam. Working edges and flat sides ground. Angularity tolerance for the median according to DIN 875 I.

Application: For centring and marking the centre point on discs and shafts.

Part No.	Dimensions mm	4631 mm	For shanks up to ∅ mm
0100	100 x 70	18.27	90
0150	150 x 130	21.44	190
0200	200 x 150	27.02	220
0250	250 x 160	41.11	230
0300	300 x 180	46.95 (454)	280



Squares 120° – Hexagon

format professional quality

Design: Special steel, accuracy according to factory standard. Working edges and flat sides ground.

Part No.	Leg length mm	4633 mm	Cross-section mm
0050	50 x 50	6.38	15 x 5
0075	75 x 75	8.12	18 x 5
0100	100 x 100	9.54 (454)	20 x 5



Mitre Squares with Stop

format professional quality

Design: Special steel, accuracy according to factory standard, precisely manufactured, both sides with equal thickness. Measuring surfaces and flat sides ground.

Application: For precise marking and measuring of 45° for 90° corner joints.

Part No.	Leg length mm	4634 mm	Cross-section mm
0120	120 x 80	9.65	20 x 5
0150	150 x 100	9.99	20 x 5
0200	200 x 130	13.67 (454)	25 x 5



Squares 45°

format professional quality

Design: Special steel, accuracy according to factory standard. Working edges and flat sides ground.

4635 Without stop

4636 With stop

Part No.	Leg length mm	4635 mm	4636 mm	Cross-section mm
0120	120 x 80	8.97	12.00	20 x 5
0150	150 x 100	10.99	14.66	20 x 5
0200	200 x 130	13.97 (454)	20.33 (454)	20 x 5



Flange Squares

format professional quality

Design: Steel, galvanised, working edges and flat sides machined.

Application: Especially suitable for precise adjustment of flanges in tube construction.

Part No.	Dimensions mm	4637 mm	Cross-section mm
0300	300 x 300	9.01	30 x 5
0400	400 x 400	11.09	30 x 5
0500	500 x 500	13.59 (453)	30 x 5

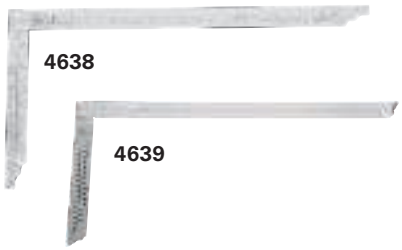


Carpenter's Squares

Design: Spring steel, chromated, conically ground.
Width of sides 35 mm.

4638 **Without scribing holes**
4639 **With scribing holes and cm graduation**

Part No.	Dimensions mm	4638	4639
0600	600 x 280	7.74	10.17
0800	800 x 320	10.09	12.46
1000	1000 x 380	13.04	15.31
		(453)	(453)



Aluminium Stop Squares

Design: Aluminium, with black graduation.

Part No.	Leg length mm	4615
0300	300	32.91
0500	500	41.15
1000	1000	70.75
		(453)



Precision Joiner's Squares

Design: With palisander leg and lasered graduation on the cold-hammered blue steel tongue.
Double-grooved solid brass fitting, with mitre.

Part No.	Leg length mm	4641
0200	200	27.28
0250	250	30.84
0300	300	34.59
		(458)



Metal Bevels

Design: 3-piece, with thumb nut, galvanised.

Application: For a variety of simple machining applications.

Part No.	Dimensions mm	4642	Cross-section mm
0200	200	4.76	20 x 3
0300	300	7.93	30 x 3
		(453)	



Precision Bevels

Design: With palisander leg, blue cold-hammered steel tongue, with adapted U-beam fitting made of brass.
The long hole in the steel tongue allows internal measurements.

Part No.	Leg length mm	4643
0250	250	26.82
0300	300	30.52
		(458)



Protractors

Design: Open semi-circular arc, for measuring angles from 0 to 180°, with locking screw, matt chromium-plated.

format professional quality



Part No.	Graduated arc mm	4651	Leg length mm
0080	80	7.82	120
0120	120	9.09	150
0150	150	10.96	200
0200	200	14.70	300
0300	300	29.72	500
		(461)	

Protractors, Adjustable in Length

Design: Open, semi-circular arc, beam adjustable in length, special steel, non-dazzling matt chromium-plated scale.

Application: For measuring angles from 10°–170°, also on small workpieces.

format professional quality



Part No.	Graduated arc mm	4653	Leg length mm
0100	100	16.93	150
0150	150	19.66	300
0200	200	24.90	400
0250	250	29.87	500
0300	300	34.03	600
		(461)	

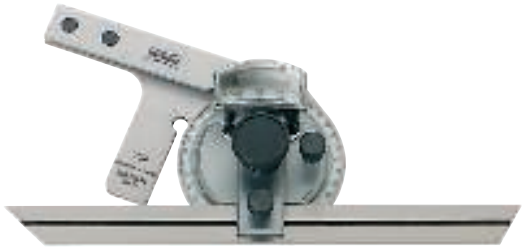
Universal Protractors with Magnifier, Antiparallax

Design: Accuracy according to factory standard, stainless steel, reading parts matt chromium-plated, antiparallax reading, rail hardened, with locking screw and fine-adjustment. Adjustment of base plate 4 x 90°, vernier reading 5". Supplied in wooden case.

Factory standard | INOX

PREISSER MESSTECHNIK

Application: For measuring on workpieces, devices, machines etc., also suitable as ruler, cross square and mitre square.



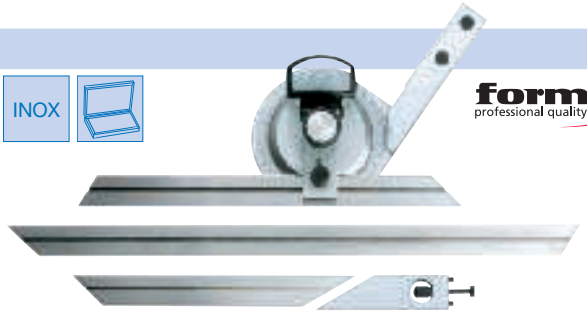
Part No.	Rail mm	4655	Design
0150	150	104.70	–
0200	200	123.54	–
0300	300	126.68	–
1150	150	23.87	Spare measuring rail
1200	200	27.02	Spare measuring rail
1300	300	30.37	Spare measuring rail
		(408)	

Universal Bevel Protractor Sets

Design: With reading magnifier, stainless steel, fine polish. Adjustment of the scale 4 x 90°, vernier reading 1 1/2 degree = 5 angular minutes, chromium-plated graduation. With 3 replacable measuring beams 150, 200 and 300 mm long. Supplied in wallet.

INOX

format professional quality



Part No.	4657
0001	37.09
	(461)

Application: For measuring angles on workpieces, fixtures and machines. Can also be used as straight edge, T-square or mitre square.

Digital Protractors

Design: Digital protractor with multifunctional digital display, protection class IP 51, indication in angular degrees or angular minutes, resolution 0.01° or 1 angular minute (0°01'), preselect value 0° or 180°, with locking screw, rail 200 mm, locking and clamping device, data output Opto-RS-232, 2 measuring directions, measuring ranges 1 x 360°, 2 x 180°, 4 x 90°, error margin 4 angular minutes. Operating temperature +5 to 40°, service life of battery up to 4.400 hours. Supplied in wooden case.

RS232 | IP 51



Note: Spare battery 4027 2032
Data cable 4025 0002

Part No.	Rail length mm	4660
0200	200	770.41
		(406)

Spare Measuring Rails

Part No.	Rail mm	4660
1200	200	55.03
1300	300	81.76
1500	500	95.91
		(406)

Wooden Folding Rules

Design: Beechwood, thickness of joints 3.0 mm, maintenance-free internal steel fields, riveted joints, permanent lubrication. Wear-resistant white protective varnish with clearly visible black mm graduation on both edges. Special latching allows stability also at an angle of **90°. With angle graduation 15°/30°/45°/60°/75°/90°** between 1st and 2nd and 9th and 10th joint. When folded, this rule features a large promotion surface on all side faces. Measuring accuracy according to **EC accuracy class III.**





Part No.	Length m	4671	Width mm	Number of joints
0005	2	2.05 (462)	16	10

Light Metal Folding Rules

Design: Cold-hammered special aluminium alloy, black anodised, weather-proof surface protection, heat-resistant, mm graduation, nickel-plated steel spring, digits and graduation engraved, rounded edges, **EC accuracy class II.**



Part No.	Length m	4672	Thickness mm	Number of joints
0002	2	12.78 (464)	14	10

Plastic Folding Rules

Design: Glass fibre reinforced ABS plastic, white, black graduation in mm on both sides. The sections latch at right angles. Measuring accuracy according to **EC accuracy class III.**



Part No.	Length m	4673	Thickness mm	Number of joints
0001	1	2.49	13	10
0002	2	3.51 (462)	16	10

Tapes in Casing

Design: Casing made of highly shock-proof plastic, tape width 13 mm, easy handling due to the large crank handle with locking position. Beginning of measurement approx. 100 mm after fitting. Measuring accuracy according to **EC accuracy class II.**



4675 **Design:** Tape made of spring **steel with polyamide coating,** yellow, black graduation across complete width in mm, m digits in red, resistant to alkalis, salt solutions, greases, oils and diluted acids.

4676 **Design:** Tape made of **stainless** chromium-nickel steel, non-breakable, surface with matt finish, black graduation across complete width in mm, m digits in red, non-wearing transparent enamel finish.

4677 **Design:** Tape made of glass **fibre reinforced plastic,** yellow, black graduation on one side in cm, m digits in red. Non-conductive when dry.

4675



4676



4677



Part No.	Length m	4675	4676	4677	Thickness mm
0010	10	15.61	16.38	9.27	13
0020	20	22.12	23.00	14.42	13
0025	25	27.43	27.15	17.19	13
0030	30	30.31	31.54	19.58	13
0050	50	– (463)	52.40 (463)	– (463)	13

Tapes in Casing FatMax®

Design: The Inox tape is a stainless steel tape (width 10 mm). DynaGrip housing. Winding-up three times faster than conventional tapes.



Part No.	Length m	4681 STANLEY	Thickness mm
0020	20	17.71	10
0030	30	20.75 (581)	10

Frame Tapes

Design: Light metal frame with inclined plastic handle and non-slip rubber naps, tape width 13 mm, crank handle can be fitted on both sides, crank mechanism mounted in two ball bearings, locking position for start ring. Beginning of measurement approx. 100 mm after fitting. Measuring accuracy **to EC accuracy class II.**

4678 **Design:** Tape made of plastic with **polyamide coating,** yellow, black graduation across complete width in mm, m digits in red, resistant to alkalis, salt solutions, greases, oils and diluted acids.

4679 **Design:** Tape made of **stainless** chromium-nickel steel, non-breakable, surface with matt finish, black graduation across complete width in mm, m digits in red, non-wearing transparent enamel finish.

4680 **Design:** Tape made of **glass fibre reinforced plastic,** white, black graduation on one side in cm, m digits in red, non-conductive when dry.



4678, Straight design



4678, V-shaped



4679, Straight design



4680, Straight design

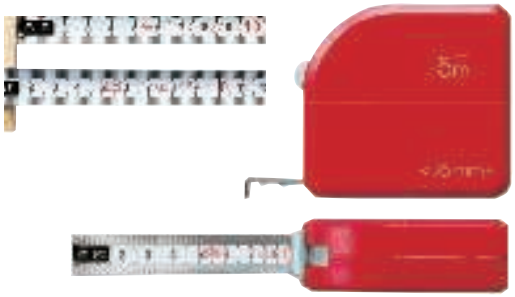


4680 V-shaped

Part No.	Length mm	4678	4679	4680	Thickness mm	Frame 4678/4678	Frame 4679
0020	20	24.39	–	20.77	13	Straight design	–
0025	25	31.08	30.09	23.17	13	Straight design	Straight design
0030	30	31.32	37.67	24.86	13	V-shaped	Straight design
0050	50	42.23	46.76	30.98	13	V-shaped	Straight design
		(463)	(463)	(463)			

Measuring Tapes

Design: Casing made of highly shock-proof ABS plastic, printed graduation with transparent enamel finish, made of rounded and hardened spring steel, duplex graduation in mm, automatic tape return incl. stop button, flexible tape end fitting for internal and external measurements. Measuring accuracy to **EC accuracy class II.** 8 m long tape incl. belt clip.



Part No.	Length m	4685	Thickness mm	Dimension mm
0002	2	3.25	13	60 x 58 x 19
0003	3	4.16	13	60 x 58 x 19
0005	5	8.04	16	75 x 70 x 26
0008	8	15.22	25	90 x 83 x 46
		(462)		

Pocket Tapes, Polymer Coated

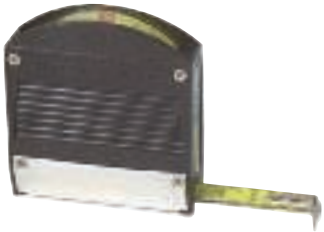
Design: Ergonomically designed, extremely shock-proof plastic casing, ribbed for better handling. This tape is provided with a clearly readable two-colour print. With automatic tape return, locking device and belt clip. Polymer coating.



Part No.	Length m	4686 STANLEY	Thickness mm	Dimensions mm
0003	3	3.08	12.7	274 x 274 x 78
0005	5	4.92	19.0	326 x 295 x 82
		(581)		

Pocket Tapes Panoramic

Design: Brown plastic casing, direct reading of internal dimensions through window. Yellow steel tape, two-colour print. U-shaped aluminium strip. No automatic tape return.

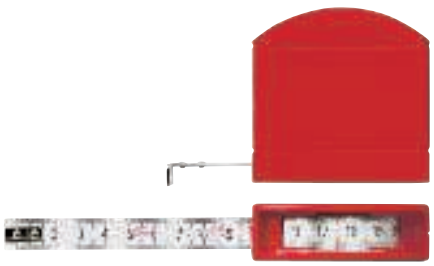


Part No.	Length m	4687 STANLEY	Thickness mm	Dimensions mm
0003	3	6.19	12.7	325 x 155 x 80
		(581)		

Pocket Measuring Tapes with Window

Design: Casing made of polyamide, printed graduation with non-wearing, transparent enamel finish, made of rounded and hardened spring steel, duplex graduation in mm, free-running tape, window **with magnifying effect,** flexible tape end fitting for internal and external measurements. Measuring accuracy to **EC accuracy class II.**

format professional quality



Part No.	Length m	4689	Thickness mm	Dimension mm
0002	2	3.62	13	65 x 65 x 21
0003	3	4.20	13	65 x 65 x 21
		(462)		

Pocket Measuring Tapes Bi-material

Design: Shock-proof housing for maximum durability. Varnished tape for long service life. With locking device and belt clip. Flexible tape end for inside and outside measurements. **Accuracy class II.**

Part No.	Length m	4691 STANLEY	Width mm	Dimension mm
0003	3	2.20	12.7	62 x 60 x 22
0005	5	5.17	19	73 x 70 x 30
		(581)		

Pocket Measuring Tapes Leverlock

Design: Shock-proof housing for maximum durability. Compact size – 15 % smaller than comparable measuring tapes. Varnished tape for long service life. Patented locking mechanism or free tape return. Comfortable locking and releasing thanks to wide lever from bi-material. Flexible tape end for inside and outside measurements.

Part No.	Length m	4693 STANLEY	Width mm	Dimension mm
0003	3	4.20	12.7	62 x 60 x 22
0005	5	7.51	19	73 x 70 x 30
		(581)		

Measuring Tapes, Chromium-Plated Casing

Design: Casing made of shock-proof plastics, chromium-plated, tape yellow enamel finish, **epoxy resin coating,** made of hardened spring steel, Duplex mm graduation, automatic tape return incl. stop button and bumper, belt clip, flexible tape end fitting for inside and outside measuring. Measuring accuracy to **EC accuracy class II.**

format professional quality



Part No.	Length m	4696	Thickness mm	Dimension mm
0003	3	8.20	13	65 x 56 x 22
0005	5	11.39	13	70 x 65 x 33
0006	5	12.46	19	70 x 65 x 33
		(462)		

Pocket Tapes Powerlock

Design: Removable belt clip, locking device, automatic tape return, yellow steel tape, two-colour print. Mylar coating for longer service life, protection against corrosion, scratches and chemicals.

4698 **Design:** In metal casing.

4699 **Design:** In chromium-plated plastic casing.

STANLEY



4698



4699

Part No.	Length m	4698 STANLEY	4699 STANLEY	Thickness mm	Dimension mm
0002	2	5.33	–	12.7	51 x 50 x 20
0003	3	5.99	–	12.7	56 x 55 x 20
0005	5	–	9.08	19	65 x 25 x 66
0006	5	–	13.28	19	65 x 25 x 66
0008	8	–	14.26	25	75 x 72 x 40
0010	10	–	17.71	25	81 x 76 x 40
		(581)	(581)		

Measuring Tapes with Crank Handle

Design: Shock-proof casing with anti-slip cover in orange, tape extra long in handy design, solid end hook with 4 rivets. The rolling mechanism enables the use of long tapes in pocket tape format, flexible tape end fitting for inside and outside measuring. Measuring accuracy to **EC accuracy class II.**

format professional quality



Part No.	Length m	4697	Thickness mm	Dimension mm
0015	15	21.03	25	90 x 80 x 40
		(462)		

Telescopic Rules mEssfix

Design: Aluminium. The respective pull-out length is shown in the window. Fitted sturdy measuring tape with mm graduation and oversized winding-up device for heavy duty. Measuring range 5 m, supplied in wallet.

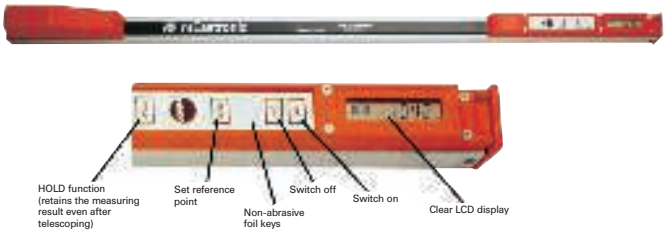
Part No.	Length m	4706	Weight kg
0300	0.70–3.00	117.46	1.1
0400	0.86–4.00	133.64	1.4
0500	1.07–5.00	155.65	1.7
		(466)	



Digital Rules mEsstronic Easy

Design: Convenient electronic length measuring device, clear LCD display with HOLD function and mm graduation.
The measuring result is retained even after telescoping.

Part No.	Measuring range m	4708	Weight kg
0300	0.70–3.00	243.70	1.5
0500	1.04–5.00	270.43	2.1
		(466)	



Angle Measuring Instruments Winkelfix

Design: Quick and reliable reading of angles from the analogue display. With integrated level. Sturdy design for heavy duty. Reading: 0.5°, accuracy: 0.25°, measuring range 180°.

Part No.	Leg length mm	4707	Model	Weight kg	Compass point
0300	300	100.63	Shorty	0.7	No
0430	430	133.64	Mini	1.0	No
0600	600	106.91	Maxi	1.4	Yes
		(466)			



Digital Angle Measuring Instruments Winkeltronic

Design: Symmetrical arrangement of legs for perfect measuring of angles, large display, resolution 0.1°, accuracy ± 0.1°, Hold function for retaining the measured result, resetting possible in any position of the legs, integrated horizontal and vertical level, power supply: four 1.5 v round cells, service life approx. 50 hours.

Part No.	Leg length mm	4709	Weight kg	Measuring range
0450	450	156.60	1.2	0°–352°
0600	600	166.66	1.5	0°–355°
		(466)		



Manual Laser Meter Disto™ A3

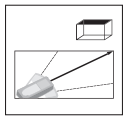
Design: Small, light and compact, with marking edge and stop. **Protection class IP 54.** The integrated level allows easy horizontal measurements. For easy handling, one key is provided for each function (no double assignment of keys). Step-by-step measuring operations for easy and clear measurements. Illuminated LCD for measurements in dark rooms and rooms with poor daylight.
Energy-saving concept, up to 10,000 measurements (alkaline batteries).
Supplied in bag, incl. batteries.

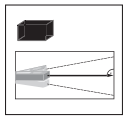
Application: For all base measurements as well as distance and volume measurements.



IP 54







Part No.	Measuring range m	4711	Accuracy mm	Dimensions mm
0400	0.5–100	364.77 (460)	± 1.5	142 x 73 x 45

Disto™ A5

Design: For quick and accurate measurement, with marking edge and stop. **Protection class IP 54.**
The integrated level allows easy vertical measurements. For quick and accurate measuring in case of longer and shorter distances. Illuminated LCD for measurements in dark rooms and rooms with poor daylight.
An integrated telescopic view finder facilitates accurate measuring in case of longer distances. The device features numerous additional functions. Furthermore, the device is provided with a multi-functional end piece for measuring corners and planes. Energy-saving concept, up to 10,000 measurements (alkaline batteries).
Supplied in bag, incl. batteries.

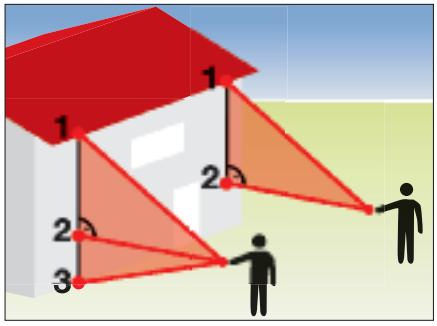
Functions: With integrated calculator for addition, subtraction and multiplication, tracking function for determination of position for minimum and maximum distances, storage of 15 measuring results and/or 10 constants (e.g. room height).

Application: For all base measurements as well as distance and volume measurements. For indirect height and distance measurements (Pythagoras), determination of minimum and maximum distances. The multi-functional end piece allows measuring of corners and planes.



IP 54





Part No.	Measuring range m	4712	Accuracy mm	Dimensions mm
0400	0.5–200	471.68 (460)	± 2	172 x 73 x 45

Measuring Wheels

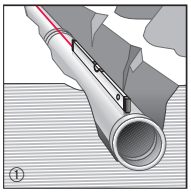
Design: The sturdy counter is mounted above the running wheel and shock-proof. The measuring wheel is driven by a toothed belt. The counter counts forward and backward travel and is positioned in the middle. Resetting is effected by means of a resetting lever. The brake is integrated in the stand.

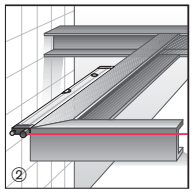


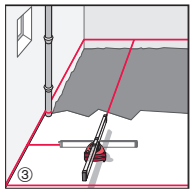
Part No.	Circumference of wheel m	4710	Measuring range m	Weight kg
0100	1	136.01 (466)	9,999.98	4.5

Laser Level Sets Compact

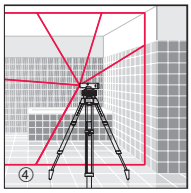
Design: Set comprises: Laser level LASERKING 670 (4717 1030) and LASERKING 635 (4717 1002), all-metal levelling head Compact and 90° deviating prism (4719 1002). Supplied in plastic case, incl. batteries.







① ② ③
The included accessories allow the above applications.



④
Used with stand 4722 1001.



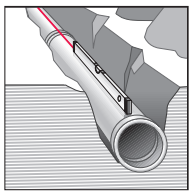
Part No.	Dimensions plastic case mm	4721	Shaft length mm
1001	450 x 300 x 160	230.18	670
1002	450 x 300 x 160	262.55	670
		(469)	

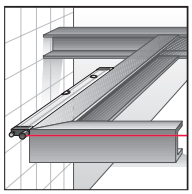
Laser Levels LASERKING

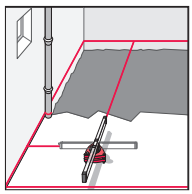
Design: Aluminium profile, grey powder-coated, milled measuring surface. The laser module is designed for use on sites and is therefore enclosed in the aluminium profile. The parallelism in relation to the measuring surface amounts to 0.1 mm/m. The fitting accuracy of the horizontal level is 0.25 mm/m. The level allows the use of deviating prisms or beam splitting prisms. Thanks to the integrated magnet the levelling head is safely supported on the levelling head. Supplied in sturdy plastic tube.



Part No.	Length cm	4717	Reach m	Shaft length nm
1030	80	103.48	approx. 30	670
1045	80	121.00	approx. 45	633
		(469)		


Basic application without accessories.


Possible application due to use of deviating prism 4719 1002.


Possible application due to use of levelling head Compact 4719 1001.

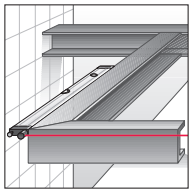
Attachable Laser LASERBOY II

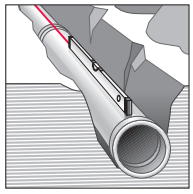
Design: Handy attachable laser made of glass fibre reinforced ABS plastic transforming every level or ruler with a profile of 18–24 mm width into a laser level. **Protection class IP 54.** The device is fitted with a bubble (fitting accuracy 0.5 mm/m), operation without level is thereby ensured. The beam parallelism amounts to 0.2 mm/m. A 3/8" thread permits installation on a stand. The device allows the use of deviating prisms or beam splitting prisms. Supplied with batteries.

IP 54



Part No.	Reach m	4715	Shaft length nm
1030	approx. 30	85.38	670
		(469)	

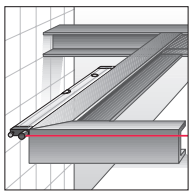

Basic application without accessories.


Possible thanks to use of deviating prism 4719 1002.

Beam Deviating Prisms

Design: Suitable for "LASERBOY" (4715) and "LASERKING" (4717). Supplied with adapter.

Application: For deviating laser beam by 90°.





Part No.	Accuracy mm/m	4719
1002	0.15	48.77
		(469)

Levelling Heads Compact

Design: Heavy-duty metal design, turnable levelling head mounted in a ball bearing intended for support of BMI levels. Quick setting feature by two spindles. Due to the box level in the rotary table, adjusting control during levelling is possible. Can be used on the floor or on supports (1/4, 3/8 and 5/8" threads). Supplied with bracket for fixing of laser level without magnet.

Application: For quick and precise metric marking.

Part No.	4719
1001	101.61 (469)



Figure with locking bracket for laser levels without magnet

Tripods

Design: 5/8" thread, robust light-metal design, with base pins.

Application: For levelling heads to enable levelling at various heights.

Part No.	Height cm	4722
1001	105–160	89.43 (469)



4722 1001

Elevator Tripods

Design: 5/8" thread, robust light-metal design, with base pins. Perfectly suitable for rotating laser topoMAT.
A minimum height of 1 m (laser included) can be reached.

Part No.	Height cm	4722
1002	112–242	179.09 (470)



4722 1002

Laser Levelling Sets MAGIC

Design: The set includes the laser levelling head LaserMagic with 2 lasers which can be switched on separately or together (point and/or line). The levelling head is rotating and mounted in ball bearing. Quick setting feature by two spindles. Due to the box level in the rotary table, adjusting control during levelling is possible. Furthermore, a 90° deviating prism, tree angular support surfaces with magnet as well as laser goggles are included in the set. Supplied with 4 1.5 v batteries (LR6 Mignon).

Application: Perfectly suitable for quick marking of meters.

Part No.	Dimensions plastic case mm	4723	Shaft length nm
0010	395 x 295 x 105	496.95 (470)	635



Laser Levelling Set topoMAT

Design: The rotating laser provides efficient and safe operation in any situation. It is suitable for outside use, for use in buildings, for over-ground working and underground working as well as interior fittings. Due to easy operation by sturdy, **dirt and humidity resistant (IP 54)** keys at the laser or remote operation, levelling operations can be effected by only one person. By means of the 90° joint, horizontal and vertical operation of the device can be set continuously. The automatic self-levelling feature with an accuracy of ± 2.6 mm/30 m and the automatic laser stop in case of shock or other changes of the position ensure highest precision and safety. The rotating laser features three laser modes, **rotation** with 600, 300 and 100 rpm, **line mode** with 15°, 30° and 45° setting as well as **spot-line mode** to the right and left, for slow or quick supply of light spots/lines. The topMAT is optionally fitted with an electronic clinometer. Inclines from 0° to 90° can be set easily and quickly. This clinometer is detachable and can be used independently.

IP 54









Part No.	Design	4723 BMI	Shaft length nm
0020	Without clinometer	1,356.11	635
0030	With clinometer	1,571.99	635
		(470)	

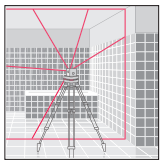
Laser NAUTILUS IPX7

Design: For heavy-duty use on sites, **protection class IP 67,** set-up, switch-on and start (operation by one button). The sturdy, precise and safe aluminium housing is provided with ESP (**E**lectronic **S**afety **P**rogram). The device features an automatic laser stop in case of shocks and other changes of the position as well as an impact protection by rubber shock absorber. The initial power of the laser is 1 mW; laser class 2. The levelling time is less than 30 seconds.

The set includes the laser NAUTILUS IPX7, a receiver with support, a charger for NiMH accumulators (without memory effect), operating instructions as well as batteries (9 v) for receiver.

Three-year warranty is granted and an initial inspection is included in the purchase price.

IP 67









Part No.	Shaft length nm	4723 BMI
0040	650	1,256.14
		(470)

Rotating Lasers pendoMAT

Design: Light weight self-levelling device for horizontal and vertical levelling, with plumbing and flip function (visible line), 200 mm height adjustment and impact protection. The rotating laser is fitted with a red diode laser (laser class 2).

The set includes rotating laser pendoMAT, receiver, support and operating instructions, incl. batteries.



Part No.	Shaft length nm	4723 BMI
0050	635	802.84
		(470)

Teak Wood Levels

Design: For sensitive surfaces, artificially dried, oiled, unbreakable, barrel-shaped horizontal and vertical level. Measuring accuracy for normal measurements 1.0 mm/m.

Part No.	Length cm	4726
0040	40	10.62
0060	60	12.11
0080	80	15.05
		(464)



Light-Metal Levels

4727 **Design:** Thick-walled light-metal sections, silver anodized, barrel-shaped horizontal and vertical bubbles with magnifying effect for clear readings even in poor light, 2 % inclination, visible at a glance up to 100 cm, life-time warranty for bubbles, measuring accuracy 0.5 mm/m in normal position.

Application: For all horizontal and vertical measurements in normal position of the level.



Part No.	Length cm	4727	4728	Cross section mm
0030	30	5.99	10.23	50 x 22
0040	40	6.51	10.86	50 x 22
0050	50	6.92	11.29	50 x 22
0060	60	7.26	11.91	50 x 22
0080	80	8.07	13.52	50 x 22
		(468)	(468)	

4728 **Design:** Thick-walled light-metal sections, red powder-coated, break-proof barrel-shaped bubbles in acrylic glass.
Both vertical and horizontal bubble are electronically calibrated and ultrasonically welded to the holders (5-year warranty on service life of bubbles).
Minimum measuring accuracy 0.5 mm/m for normal and indexing measurements, **measuring face milled (up to size 100 cm).**

Application: For all horizontal and vertical measurements in normal position of the level.



Part No.	Length cm	4727	4728	Cross section mm
0100	100	8.90	15.91	50 x 22
0150	150	16.28	30.19	50 x 22
0180	180	18.29	–	50 x 22
0200	200	18.89	39.76	50 x 22
		(468)	(468)	

Levels ROBUST

Design: The professional level for highest demands. Two vertical and one horizontal bevel. Powder-coated strong aluminium profile, extremely torsion-proof due to 4-chamber profile. Horizontal bubble with magnifying effect for clear readings. The measuring accuracy amounts to 0.5 mm/m for normal and indexing measurements. The handles are lined with rubber. Furthermore, the level is fitted with shock-absorbing, unbreakable rubber caps.



Part No.	Length cm	4733	Cross section mm
0060	60*	36.91	60 x 26
0080	80*	41.64	60 x 26
0100	100*	49.03	60 x 26
* with two milled measuring surfaces		(464)	

Part No.	Length cm	4733	Cross section mm
0180	180	65.45	60 x 26
0200	200	71.37	60 x 26
		(464)	

Magnetic Levels

Design: Thick-walled light-metal profile, powder-coated red surface finish, high magnetic power due to permanent large-volume magnets in the base. One unbreakable barrel-shaped horizontal and vertical bubble each. End fittings made of plastic. Both the vertical and the horizontal bubble are electronically and ultrasonically calibrated (5-year warranty for durability of bubble). Minimum measuring accuracy 0.5 mm/m in normal position, measuring surface milled.

Application: Especially suitable for plumbing, shop-fitting and shelf construction.



Part No.	Length cm	4729	Cross section mm
0040	40	15.48	50 x 22
0060	60	17.10	50 x 22
		(468)	

Part No.	Length cm	4729	Cross section mm
0080	80	22.24	50 x 22
0100	100	23.83	50 x 22
		(468)	

Magnetic Levels ULTRASONIC

Design: Even aluminium profile, silver anodized. Due to the head bubble perfectly suitable for vertical measurements. Bubble with magnifying effect for good readability. Measuring accuracy in normal position 0.5 mm/m.



Part No.	Length cm	4733	Cross section mm
0020	20	19.58	50 x 22
		(464)	

Universal Levels

Design: Plastic, with 2 magnets in the base. The horizontal bubble is fixed, while the inclination angle bubble can be turned by 180°; one end of the body is inclined by 45° and the other by 60°, with mm graduation.

Application: For all horizontal measurements and for measuring inclination angles.



Part No.	Length cm	4731	Cross section mm
0025	25	16.16	54 x 15
		(468)	

Electrician's Levels

Design: Compact, sturdy level made of glass fibre reinforced ABS plastic. Clearly visible bubbles with a fitting accuracy of 1 mm/m in normal position. 2 magnets provide great adhesive force.



Part No.	Length cm	4737	Cross section mm
0025	25	6.64	43 x 22
		(464)	

Electronic Angle Levels

Design: Thick-walled 4-chamber aluminium hollow section, powder-coated, 2 milled measuring surfaces. Horizontal bubble with minimum accuracy of at least 0.5 mm/m in normal position. Quick electronic measurement of angles between 0° and 90°. Display can be toggled between degrees and %. Measurements indicated in 0.1° or 0.1% increments. Audible signal can be activated to indicate when the horizontal or vertical position is reached. Most recent measured value can be stored. Measuring accuracy at 0° and 90°: ± 0.1°, between 1° and 89°: ± 0.3°. Battery 9 v (6LR61 E-block).

Application: For fast and accurate determination of gradients and angles.



Part No.	Length cm	4732	Cross section mm
0060	60	114.93	60 x 26
0080	80	118.19	60 x 26
		(467)	

Precision Machine Levels

Design: Grey cast iron, horizontal and vertical bubbles made of glass (filled with diethyl ether) with dust cover, measuring surfaces fine-ground, prism base, insulated handle. Supplied in wooden case. The horizontal bubble is mounted and can easily be readjusted to the zero position by means of a setting screw with no play and without dismantling.

Application: For aligning horizontal shafts and surfaces.



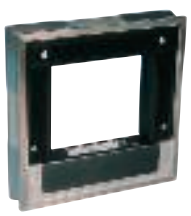
Part No.	1150	1200	1300	2150	2200	2300	3150	3200	3300
Length mm	150	200	300	150	200	300	150	200	300
4735	127.50	143.36	168.70	161.66	195.67	233.27	148.59	165.74	199.91
Sensitivity mm/m	0.1	0.1	0.1	0.02	0.02	0.02	0.05	0.05	0.05

(471)

Precision Frame Levels

Design: Grey cast iron, horizontal and vertical bubbles made of glass (filled with diethyl ether) with dust cover, measuring surfaces fine-ground, 3 prism bases and one flat support surface, insulated handle. Supplied in wooden case. The horizontal bubble is stress-relieved and can easily be readjusted to the zero position by means of a setting screw with no play and without dismantling.

Application: For aligning horizontal and vertical shafts and surfaces.



Part No.	1150	1200	2150	2200	3150	3200	3250
Length mm	150 x 150	200 x 200	150 x 150	200 x 200	150 x 150	200 x 200	250 x 250
4736	191,42	225,57	213,80	238,00	323,00	369,43	403,74
Sensitivity mm/m	0.5	0.5	0.1	0.1	0.02	0.02	0.02

(471)

Steel Rules

Design: Hard-rolled stainless spring steel, surface with matt finish, rounded edges. 500 mm length and longer marked with EC accuracy class II.
Graduation: top edge 1/2 mm, bottom edge 1 mm.

INOX

format professional quality



Part No.	Length mm	4751	Thickness mm	Dimension mm
0100	100	0.78	13	0.5
0150	150	0.82	13	0.5
0200	200	0.82	13	0.5
0250	250	0.96	13	0.5
0300	300	1.08	13	0.5
0330	300	2.64	28	0.8

(463)

Part No.	Length mm	4751	Thickness mm	Dimension mm
0500	500	2.17	18	0.5
0530	500	4.79	30	1.0
1000	1000	3.54	18	0.5
1001	1000	9.73	30	1.0
1500	1500	14.63	30	1.0
2000	2000	19.20	30	1.0

(463)

Circumference Tapes

Design: Accuracy and reading 0.1 mm, hardened spring band steel, engraved mm graduation, for measuring circumference and diameter.

PREISSER MESSTECHNIK

Part No.	For circumference mm	4752	For diameter mm	Thickness mm
0300	60– 950	31.80	20– 300	10
0700	940–2200	38.53	300– 700	10
1100	2190–3460	48.38	700–1100	10
1500	3450–4720	58.63	1100–1500	10
1900	4710–5980	70.15	1500–1900	10
2300	5960–7230	80.61	1900–2300	10

(408)



Straight Edges, Steel, DIN 874/I

Design: Standard steel, working edges and flat sides precision-machined. 2,000 mm length and longer I-shaped with 2 gripping slots and varnished inside, **with test certificate.**

Application: Suitable for measurements and for high-precision applications in precision engineering.

DIN 874/I

Factory standard

format professional quality



Part No.	Length mm	4753	Thickness mm	Dimension mm
0500	500	17.76	40	8
1000	1000	40.73	50	10
1500	1500	84.11	60	12
2000	2000	234.96	70	14
3000	3000	576.01	100	16

(457)

Workshop Straight Edges, Steel, DIN 874/II

Design: Standard steel, working edges and flat sides precision-machined, without test certificate.

Application: For precision levelling applications in engineering and in workshops.

format professional quality

DIN 874/II



Part No.	Length mm	4755	Thickness mm	Dimension mm
0500	500	11.95	30	6
1000	1000	23.90	40	8
1500	1500	55.67	50	10
2000	2000	81.36	60	12
3000	3000	232.50	80	15

(457)

Precision Steel Rules, DIN 866/I

Design: Standard steel, 5 mm protection at both ends, graduation thickness 70 to 100 µm, accuracy per metre ± 0.04 mm.

format professional quality

DIN 866/I



Part No.	Length mm	4756	Thickness mm	Dimension mm
0500	500	17.39	30	6
1000	1000	33.20	40	8
2000	2000	101.21	50	10

(457)

Workshop Steel Rules, DIN 866/II

Design: Standard steel, 10 mm protection at right-hand end, graduation thickness 100 to 150 µm, accuracy per metre ± 0.10 mm.

Application: For precise marking and measuring in engineering and in workshops.

format professional quality

DIN 866/I



Part No.	Length mm	4757	Thickness mm	Dimension mm
0500	500	9.84	25	5
1000	1000	21.40	30	6
2000	2000	66.55	40	8

(457)

Straight Edges, Steel

Design: With chamfer, fine-polished, galvanised, with mm graduation, with unprotected ends.

format professional quality

Part No.	Length mm	4759	Thickness mm	Dimension mm
0500	500	14.26	40	5
1000	1000	26.77	40	5
		(457)		



Aluminium Rules

Design: Extruded aluminium profile, anodised, anti-glare reading, with black mm graduation.

PREISSER MESSTECHNIK

Part No.	Length mm	4760	Thickness mm	Dimension mm
0300	300	6.11	50	5
0600	600	9.09	50	5
1000	1000	13.71	50	5
		(402)		



Hairline Gauges, DIN 874/00

Design: Hardened standard steel, with special insulating surface to avoid conduction of hand heat, hairline measuring edges ultra-fine ground and lapped. Chamfers with non-dazzling (bronzed) finish.

DIN 874/00

format professional quality

Application: For measuring the straightness of surfaces using the light-gap testing method.

Part No.	Length mm	4761
0075	75	5.09
0100	100	5.76
0125	125	6.75
0150	150	7.75
0200	200	9.76
0300	300	19.51
		(457)



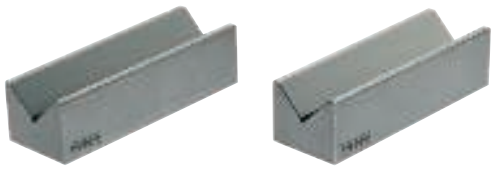
Pair of V-blocks

Design: Special cast iron, with 90° cuts, machined in pairs.

Grade 1: Parallelism tolerance < 0.016 mm, V-block and bottom ground.
Grade 3: Parallelism tolerance < 0.064 mm, V-block and bottom milled.

PREISSER MESSTECHNIK

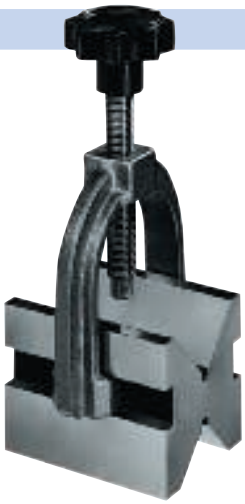
Part No.	Dimensions mm	4785 Per pair	For shaft ø mm	Grade
1100	100 x 40 x 32	52.13	6–40	1
1150	150 x 50 x 40	70.15	8–50	1
1200	200 x 70 x 50	118.32	8–70	1
3100	100 x 40 x 32	37.49	6–40	3
3150	150 x 50 x 40	54.44	8–50	3
3200	200 x 70 x 50	90.04	8–70	3
		(408)		



Pair of Double V-Blocks with Bracket

Design: Fine-ground in pairs, 2 cuts of different size 90°, V-block cuts 90° and faces ground at a right angle to the bottom, accuracy 0.004 mm.

Part No.	Length x width x height mm	4786 Per pair	For shaft ø mm
0050	50 x 40 x 40	62.11	5–30
0075	75 x 55 x 55	88.84	5–50
0100	100 x 75 x 75	140.72	7–70
		(477)	



Surface Plates

Granite Measuring Beams

Design: Fine-grained structure and free of pores. Grain size below 1 mm. Conventional granite types feature a grain size of 2 to 3 mm. Precision and parallel grinding of the two narrow faces. From length 800 mm provided with 2 handles.

4770 **Grade 0**: $4 + \frac{L}{250}$ **4771** **Grade 00**: $2 + \frac{L}{500}$

Note: Special designs on request.



Part No.	Length mm	4770 MYTRI	Grade 0 µ	4771 MYTRI	Grade 00 µ	Weight kg
0630	630 x 50 x 100	508.85 ◊	7	586.52 ◊	3	10
0800	800 x 50 x 100	843.58 ◊	7	972.10 ◊	3	12
1000	1000 x 60 x 150	1,143.49 ◊	8	1,283.39 ◊	4	27
		(472)		(472)		

Part No.	Length mm	4770 MYTRI	Grade 0 µ	4771 MYTRI	Grade 00 µ	Weight kg
1200	1200 x 60 x 150	1,328.26 ◊	8	1,526.42 ◊	4	32
1500	1500 x 70 x 200	1,959.89 ◊	10	2,260.19 ◊	5	63
2000	2000 x 80 x 250	2,209.31 ◊	12	2,557.43 ◊	6	120
		(472)		(472)		

Precision Granite Surface Plates

Design: The Swedish black diabase is used for the production of granite surface plates and precision components. Black diabase has a fine-grained structure and is free of pores. The grain size is below 1 mm. Conventional granite types feature a grain size of 2 to 3 mm. The high homogeneity of diabase (density 20 % higher than that of conventional granite) results in equal hardness in almost any place (6–7 according to Moh's hardness scale). Due to the high flexural strength, it is resistant to mechanical stress. Absorptivity of diabase is half as high as that of granite. Accordingly, there is no risk of corrosion.

4772 **DIN 876 grade 1 = 10** $+ \frac{L}{100}$

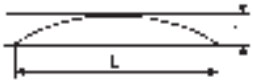
4773 **DIN 876 grade 0 =** **4** $+ \frac{L}{250}$

Note: Special designs on request.

The measuring tolerances for faces or lengths is 1 µm per 1000 mm length. Manufactured according to DIN 876. **Supplied with test certificate.**

DIN 876





Part No.	Dimensions mm	4772 MYTRI	4773 MYTRI	Height mm	Weight kg
0300	300 x 300	122.43 ◊	141.23 ◊	50	13
0400	400 x 250	135.72 ◊	152.28 ◊	60	18
0401	400 x 400	199.69 ◊	227.24 ◊	60	29
0500	500 x 500	329.33 ◊	373.43 ◊	80	60
0630	630 x 400	329.33 ◊	373.43 ◊	80	60
0631	630 x 630	498.16 ◊	567.66 ◊	80	95
		(473)	(473)		

Part No.	Dimensions mm	4772 MYTRI	4773 MYTRI	Height mm	Weight kg
0800	800 x 500	575.94 ◊	658.67 ◊	100	120
1000	1000 x 630	848.49 ◊	984.16 ◊	100	190
1001	1000 x 1000	1,480.06 ◊	1,675.42 ◊	150	450
1200	1200 x 800	1,480.06 ◊	1,675.42 ◊	150	432
1500	1500 x 1000	2,718.45 ◊	3,065.92 ◊	150	675
2000	2000 x 1000	3,495.11 ◊	4,056.01 ◊	200	1200
		(473)	(473)		

Sturdy Substructure Cabinets

Design: Sturdy steel sheet metal cabinet with support for solid rock surface plates, fitted with adjustable Bessel three-point bearing and a two-sided protection against tilting with setting bolt. Working height of bearing-supported plate adjustable from 900 to 950 mm. The drawers are fitted with ball bearing guides. Colour: Hammergrey. Supplied with levelling instruments and without solid rock plate.



Part No.	Surface plate size mm	4774 MYTRI	Cabinet size mm	No. of drawers
0800	800 x 500	1,074.76 ◊	700 x 450	1
1000	1000 x 630	1,178.45 ◊	900 x 580	1
1001	1000 x 1000	1,203.38 ◊	900 x 900	2
1200	1200 x 800	1,203.38 ◊	1000 x 700	2
1500	1500 x 1000	1,384.82 ◊	1300 x 800	2
2000	2000 x 1000	1,487.49 ◊	1600 x 800	2
		(473)		

Sturdy Safety Base Frames

Design: Base frames made of sturdy and welded rectangular steel tubing, with three-point bearing and protection against tilting. Furthermore, 4 bolts M 16 are mounted at the feet. The edges of the plate are protected against slipping and collision by means of angular sections. The base frames are height-adjustable from 900 to 950 mm. Colour: Hammergrey. Supplied with levelling instruments and without solid rock plate.



Part No.	Surface plate size mm	4775 MYTRI
0630	630 x 400	427.38 ◊
0631	630 x 630	449.37 ◊
0800	800 x 500	471.17 ◊
1000	1000 x 630	478.19 ◊
		(473)

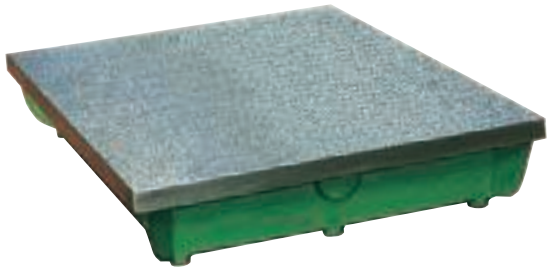
Part No.	Surface plate size mm	4775 MYTRI
1001	1000 x 1000	555.19 ◊
1200	1200 x 800	505.87 ◊
1500	1500 x 1000	587.63 ◊
2000	2000 x 1000	752.13 ◊
		(473)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Surface Plates

Design: Compact special cast iron, reinforced with ribs, surface accuracy to DIN 876, edges rectangular.

4781 Grade 1
4783 Grade 3



Part No.	Dimensions mm	4781 PoTe	Accuracy µm Grade 1	4783 PoTe	Accuracy µm Grade 3	Weight kg
0300	300 x 200	103.62	12	79.57	48	7
0301	300 x 300	118.45	13	89.71	52	19
0400	400 x 400	204.12	13	129.88	52	27
0500	500 x 500	277.96 ◊	15	211.45 ◊	60	50
0800	800 x 500	525.49 ◊	18	410.70 ◊	72	100
1000	1000 x 800	1,310.13 ◊	20	836.32 ◊	80	236
1200	1200 x 800	1,437.17 ◊	22	971.11 ◊	88	287
1500	1500 x 1000	2,551.87 ◊	25	1,787.99 ◊	100	690
		(474)		(474)		

Angular Steel Frames

Design: Robust welded construction, including adjusting screws, working height 900 mm.



Part No.	Dimensions mm	4784 PoTe	Weight kg
0400	400 x 400	207.94 ◊	15
0500	500 x 500	235.53 ◊	24
0800	800 x 500	279.40 ◊	44
1000	1000 x 800	328.06 ◊	49
1200	1200 x 800	380.02 ◊	52
1500	1500 x 1000	463.82 ◊	70
		(476)	

Surface Paste

Design: For the control of the surface condition. Apply paste onto the machined components and move them against one another.
The quality of the finish is reflected by the evenness of the coating.





Part No.	Design	4807	Colour
0080	Tube à 80 ml	4.72	Blue
0250	Tin à 250 ml	8.34	Blue
1080	Tube à 80 ml	4.72	Red
1250	Tin à 250 ml	8.34	Red
		(475)	

Markers

Design: Fast drying, anti-reflecting, good adhesion and easily removed. For the exact marking of certain points on metal surfaces, apply a thin layer of the agent. Allow to dry for a short time, perform the marking and remove it with the solvent spray.



Part No.	Colour	4810
0001	Blue	6.38
		(475)

Scribers

Scriber, Bronzed

Design: Bronzed, with screwed-in CV tips, knurled handles.

4801 One straight tip.

4802 One straight tip, one curved tip (90°).

Part No.	Length mm	4801	4802
0175	175	0.66	–
0250	250	–	1.00
		(478)	(478)



Scribers, with Carbide Tip

Design: With one straight and one curved carbide tip (70°), screwed in and bronzed.

Part No.	Length mm	4804
0250	250	7.42
		(478)



Scribers, with Carbide Tip

Design: With fixed hexagon carbide tip, with clip.

Part No.	Length mm	4803
0150	150	0.83
		(478)



Scribers, Pen-Shaped Model

4805 **Design:** Metal casing, with captive tip and clip.

4806 **Design:** Metal casing with clip. The carbide scriber can be automatically extended and retracted. The adjustable scriber lead permits the tip to be reground up to 12 mm.

Part No.	Length	4805	4806
0150	150 mm	4.92	–
0165	165 mm	–	11.09
1150	Spare scriber	1.91	–
1165	Spare scriber	–	4.85
		(478)	(481)



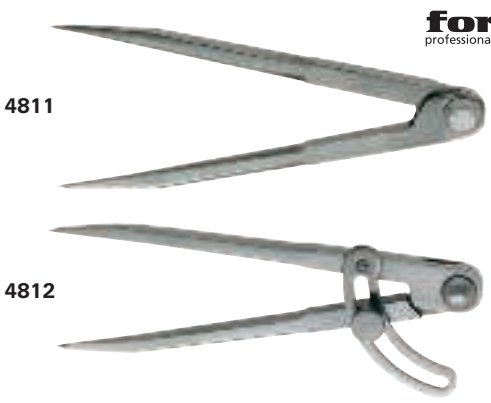
Dividers

Design: Special steel with square jaws and rivet hinge, points hardened and ground, fine-polish finish.

4811 Without setting arc

4812 With setting arc

Part No.	Overall length mm	4811	4812	Opening width mm
0150	150	2.15	2.47	300
0200	200	3.20	3.57	400
0250	250	4.20	4.59	500
0300	300	4.94	5.51	600
		(478)	(478)	



Precision Spring Dividers

Design: Pointed divider with quick-action nut. Extra-strong square legs, hardened points, through spindle.

Part No.	Leg length mm	4813	Opening width mm
0150	150	2.27	300
0200	200	3.01	400
0250	250	3.86	500
		(478)	



Internal and External Callipers

Design: Cut from bright steel, ground and polished, with extra-strong rivet hinge.

4815 Internal Calliper

4816 External Calliper



Part No.	Overall length mm	4815	4816	Opening width mm
0150	150	2.27	2.27	300
0200	200	2.47	2.47	400
0250	250	3.28	3.28	500
0300	300	4.05	4.05	600
		(478)	(478)	

Precision Marking Gauges

Design: Stainless steel, flat design, marking edge hardened, laser mm graduation. Scale with matt finish, locking screw.

Application: For simple marking of workpieces.

INOX



Part No.	Measuring range mm	4817
0200	200	9.15
0250	250	10.68
0300	300	12.18
		(461)

Marking Gauges with Round Measuring Bar

Design: Steel, with guide groove, round stop plate, mm graduation, locking screw, hardened and removable tip. Supplied in cardboard box.



Part No.	Measuring range	4820	Measuring bar ∅ mm	Reading mm
0300	300 mm	38.09	12	0.1
1300	Spare tip	3.25	–	–
		(408)		

Roller Marking Gauges

Design: Stainless steel, reading parts matt chromium-plated, vernier 0.05 mm on bottom, 1/128" on top, with locking screw, with interchangeable hardened steel point. Supplied in imitation leather wallet with 1 spare point.

Application: For simple marking of workpieces.

INOX



Part No.	Measuring range mm	4821	Vernier bottom mm	Vernier top inch
0200	200	14.18	1/20	1/128
		(461)		

Precision Bar Compasses

Design: Accuracy to DIN 866/B, measuring rail with mm graduation, precise and convenient fine adjustment by means of a friction wheel. Position slide including reference marking and exchangeable tips.

DIN 866



Part No.	Measuring range mm	4822	Cross-section mm	Vernier mm
0050	500	54.88	30 x 6	1/10
0100	1000	85.07	30 x 6	1/10
0200	2000	154.40	40 x 8	1/10
1000	Spare tips*	6.79	–	–
		(482)		

* Price per pair

Compass Calliper Gauges

Design: Hardened special steel, laser graduation, 0.1 mm reading. Jaw length 40 mm, with locking screw.



Part No.	Measuring range mm	4823	For circle ∅ mm	Jaw length mm	Vernier mm
0200	200	42.25	400	40	1/10
0300	300	54.76	600	40	1/10
		(402)			

Height Gauges



Design: Flat bar with mm graduation. Scale and vernier matt chromium-plated, with precision setting, interchangeable carbide-tipped scribing point, base surfaces ground. Supplied in wooden case.

Application: For simple but precise marking, tracing and measuring of workpieces and machine components.

Part No.	Measuring range	4831	Reading mm	Base size mm
0300	300 mm	57.19	1/50 (0.02)	115 x 70
0500	500 mm	87.92	1/50 (0.02)	160 x 115
1300	Spare scriber 300 mm	6.59	–	–
1500	Spare scriber 500 mm	13.18	–	–
		(483)		

Height Gauges



Design: With reading magnifier and precision setting, interchangeable offset scribing point, carbide-tipped, zero adjustment, reading parts matt chromium-plated, slide adjustable with precision setting, base surface ground. Supplied in cardboard box.

Part No.	Measuring range	4832	Reading mm	Base size mm
0300	300 mm	74.69	1/50 (0.02)	125 x 85
1300	Spare scribing tool 300 mm	16.60	–	–
		(483)		

Precision Height Gauges



Design: Steel, all surfaces of measuring bar and slide are hard-chromium plated, vernier and scale mat-chromium finish. The **parallax-free reading** enables fast and accurate reading of measuring results. Carbide-tipped exchangeable scribers with holder for dial gauges ⌀ 8 mm H7. Hardened steel base with dirt grooves, surface smooth ground. With precision setting mechanism. Device is supplied with protective cover in wooden case.

Application: For measuring and marking workpieces.

Part No.	Measuring range	4833	Reading mm	Base size mm
0300	300 mm	364.72	1/50 (0.02)	100 x 60
0600	600 mm	487.70	1/50 (0.02)	110 x 50
1300	Spare scriber 300 mm	65.23	–	–
1600	Spare scriber 600 mm	108.87	–	–
		(483)		

Dial Gauge Stands

Design: For precision height gauges 4833. Supplied in plastic film.

Application: For length measurements. Fitted to the attachment arm of the height gauge, can be used in conjunction with a dial gauge for length measurements.

Part No.	Design	4833
2001	For length measurements	54.56
		(483)



4833 2001

Application: Screwed in place of the scriber for measuring steps, holes and parallelism.

Part No.	Design	4833
2005	For measuring steps	93.04
		(483)



4833 2005

Precision Height Gauges

DIN 862

Design: Error tolerance of the scale to DIN 862, **antiparallax reading,** scale and vernier matt chromium-plated, fine adjustment of slide by means of pinion and toothed rack, scriber starting from base plate, scale and vernier can be exchanged and readjusted.



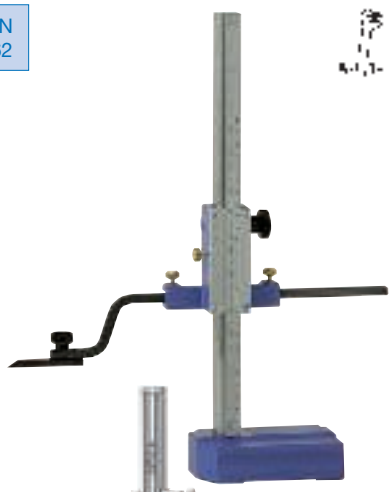
Part No.	Measuring range mm	4836	Reading mm	Bar cross-section mm	Base size mm
0300	300	151.28	0.05	14 x 14	120 x 75
0500	500	190.83	0.05	14 x 14	120 x 75
		(484)			

Part No.	Accessories	4836
2065	Spare scriber carbide-tipped, 65 mm	53.43
2120	Spare scriber carbide-tipped, 120 mm	60.29
3001	Dial gauge holder	34.73
		(484)

Precision Height Gauges

DIN 862

Design: Error tolerance of the scale to DIN 862, **antiparallax reading,** scale and vernier matt chromium-plated, scale with 2 digit lines, 1 starting at 50 mm for the straight scriber; 1 starting at 0 for the cranked scriber, for measuring from the base plate, the screwed-on vernier plates can be exchanged and readjusted, precision slide adjustment by means of pinion and toothed rack; slide and scriber holder are made from one piece, the hardened scriber is placed on 2 supports, base includes hardened glide journals.



Part No.	Measuring range mm	4838	Reading mm	Bar cross-section mm	Base size mm
0300	300	213.58	0.02	20 x 20	120 x 75
0600	600	271.06	0.02	20 x 20	120 x 75
		(484)			

Part No.	Accessories	4838
2001	Spare scriber carbide-tipped, straight 270 x 8 x 8 mm	77.45
2005	Spare scriber carbide-tipped, cranked 270 x 8 x 8 mm	91.49
3001	Dial gauge holder	61.55
		(484)

Digital Height Gauges

RS232

format professional quality

Design: With precision setting, carbide scribing point, on/off switch, mm/inch selection, zero/ABS function, ± preset function for measured values and reset.
With data output RS 232 interface, sturdy base with ground surface.

Note: Spare battery 4025 0357
Data cable and interface on request



Part No.	Measuring range mm	4840	Reading mm/inch
0300	0–300	157.68	0.01/0.0005
0600	0–600	165.96	0.01/0.0005
1300	Spare tips 0–300	16.60	–
1600	Spare tips 0–600	23.23	–
		(483)	

DIGI-MET® Height Gauges

RS232

PREISSER MESSTECHNIK

Design: Cast iron base 90 x 40 x 140 mm, gauge bar 25 x 10 mm, incl. locking screw, exchangeable carbide-tipped scriber, with protective cover and fine adjustment, on/off switch, zero point setting at any position, mm/inch selection, data output Opto RS 232, HOLD function (measuring result memory), ± preset function (preset measuring value).

Note: Spare battery 4027 2032
Data cable 4025 0232



Part No.	Measuring range mm	4842	Reading mm
0300	0–300	526.01	0.01/0.005
0600	0–600	614.73	0.01/0.005
1300	Spare tips 0–300	62.64	–
1600	Spare tips 0–600	104.52	–
3001	Dial Gauge holder	52.39	–
		(411)	

Precision Button Stopwatches

Design: Black ABS plastic housing incl. bow, shock-proof, pin lever fork, 1 stone.

Part No.	Graduation	4862	Readout min	Housing ø mm	Weight g
0015	1/10 sec.	57.39	15	55	75
0030	1/100 min.	57.39	30	55	75
		(487)			



Precision Addition Timers

Design: Black, robust ABS housing, shock-proof pin lever fork, winder on rear side, 1 stone.

Supplied with string.

Part No.	Graduation	4863	Readout min	Housing ø mm	Weight g
0015	1/10 sec.	40.88	15	55	85
		(487)			



Precision Double Stopwatches

Design: Diamond milled and chromium-coated metal housing, shock and dust-proof, water-proof lever fork, 7 stones.

Part No.	Graduation	4865	Readout min	Housing ø mm	Weight g
0030	1/100 min.	153.30	30	55	130
		(487)			



Digital Timers

Design: ABS plastic housing, 82 x 61 x 28 mm, **waterproof,** display window, ultrasonic welded, single-button operation, weight 90 g, 1.5 line LCD display, 2-digit memory control, decimal graduation, 1/100 min., start/stop/reset – split/lap, switching of both times at any time. Separate system and memory reset, time and date, powered by round cell (AA), 1.5 v, operation time approx. 2–5 years.

Supplied with battery, wallet and string.

Part No.	LCD display	4867	Readout min	Memory	Model
0060	Single display	89.22	99999.99	60	Accord
		(487)			



Digital Timers

Design: ABS plastic housing, 82 x 61 x 28 mm, waterproof up to 100 m, display window, ultrasonic welded, 2-button operation, weight 85 g, 2.5 line LCD display, 2-digit memory control, decimal graduation optional 1/100 min.; 1/100 sec., start/stop/reset – split/lap/addition, split and lap displayed simultaneously, time and date, powered by round cell (AAA), 1.5 v, operation time approx. 5–7 years.

Supplied with battery, wallet and string.

Part No.	LCD display	4869	Readout min	Memory	Model
0065	Double display	97.48	99999.99	65	Spectron
		(487)			



Hand-held Piece Counters

Design: Housing made of cast iron, cap made of wear-resistant plastic material, by pushing the button 1 digit is added, zero point setting by turning knob.

Part No.	No. of digits	4890	Height of digits mm	Design
1001	4	25.81	4.5	With retaining ring
1002	4	29.42	4.5	For mounting on table

(402)



4890 1001



4890 1002

Stroke Counters with Rotary Switch for Zero Point Setting

Design: Casing made of glass fibre reinforced plastic, cap made of shock-proof plastic. One digit added per stroke. With fixing devices for wall or table.

Part No.	No. of digits	4891	Height of digits mm	Stroke travel
1002	5	29.79	4.5	Left II
1001	6	29.79	4.5	Right II

(402)

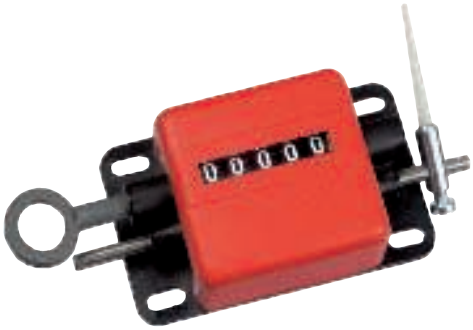


Meter Counters with Zero Point Setting by Spanner

Design: Housing made of glass fibre reinforced plastic, cap made of shock-proof plastic, drive possible on both sides.

Part No.	No. of digits	4893	Height of digits mm	Stroke travel
1001	6	55.66	4.5	I
1002	6	55.64	4.5	II

(402)



Travel of Stroke and Rotation

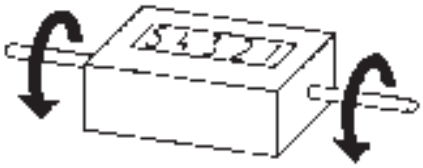
Explanation for 4891 and 4893.

Stroke travel



Stroke travel I = away from user

Stroke travel



Stroke travel II = towards user

UNITEST Mini Thermometers

Design: Compact construction, temperature measurements with connected NTC sensor. Suitable for fluid measurements (order no. 4906) and surface measurements (order no. 4908), with integrated measuring result memory (DATA HOLD). 3 1/2 digit LCD, reaction time approx. 10 K/s.
Supplied incl. 3 v battery and operating manual, 4906 additionally with protective cover.



4906 **Fluid Feelers**

Part No.	Measuring range/resolution	4906	Response time K/s
0005	-50 to -20 °C (1 °C) -19.9 up to 199.9 °C (0.1 °C) +200 up to +250 °C (1 °C)	15.86	5

(490)

UNITEST Thermometers

Design: Digital thermometer with adapter for temperature feeler type K, integrated measuring value memory (Data Hold), °C/°F selection, illumination of measuring point, 3 1/2 digit LCD, key for conversion resolution 1 °C or 0.1 °C.

Supplied incl. 4 batteries LR03, 1.5 v and operating manual.



Part No.	Measuring range/resolution	4909
4002	-50 up to 1,200 °C (1 °C)	80.38

(490)

UNITEST Temperature Feelers

Design:

Quick surface feeler: Measuring range -50 °C – +900 °C, reaction time approx. 2.3 s (63.2 % of final temperature result), including 500 m helix cable.

Insert feeler: Measuring range -50 °C – +600 °C, reaction time approx. 12.0 s (63.2 % of final temperature result), including 500 m helix cable.



Quick surface feeler

Insert feeler

Part No.	Design	4909	Dimensions mm
5000	Quick surface feeler	81.62	130 x 8
6000	Insert feeler	59.32	130 x 3

(490)

UNITEST Infrared Thermometers

Design: For non-contact temperature measurements, with additional adapter for sensor type K, measuring point marking by laser beam, °C/°F conversion, measuring optics 8:1, adjustable degree of emission and alarm function. LCD, 3 1/2 digit, measuring rate 1/s, tolerance ± 3 % or ± 3 °C. 9 v battery, wire feeler, wallet and operating manual included in supply.



Part No.	Measuring range	4914
0005	-40 to + 500 °C -40 to +1022 °F	175.71

(490)

UNITEST Humidity Meters for Building Material

Design: For humidity measurements in wood and building material. Includes humidity graduation and correction table for different types of wood. Measured in %. 3 1/2 digit LCD. Principle of measurement: Electrical resistance. 9 v battery, wallet and operating manual included in supply.



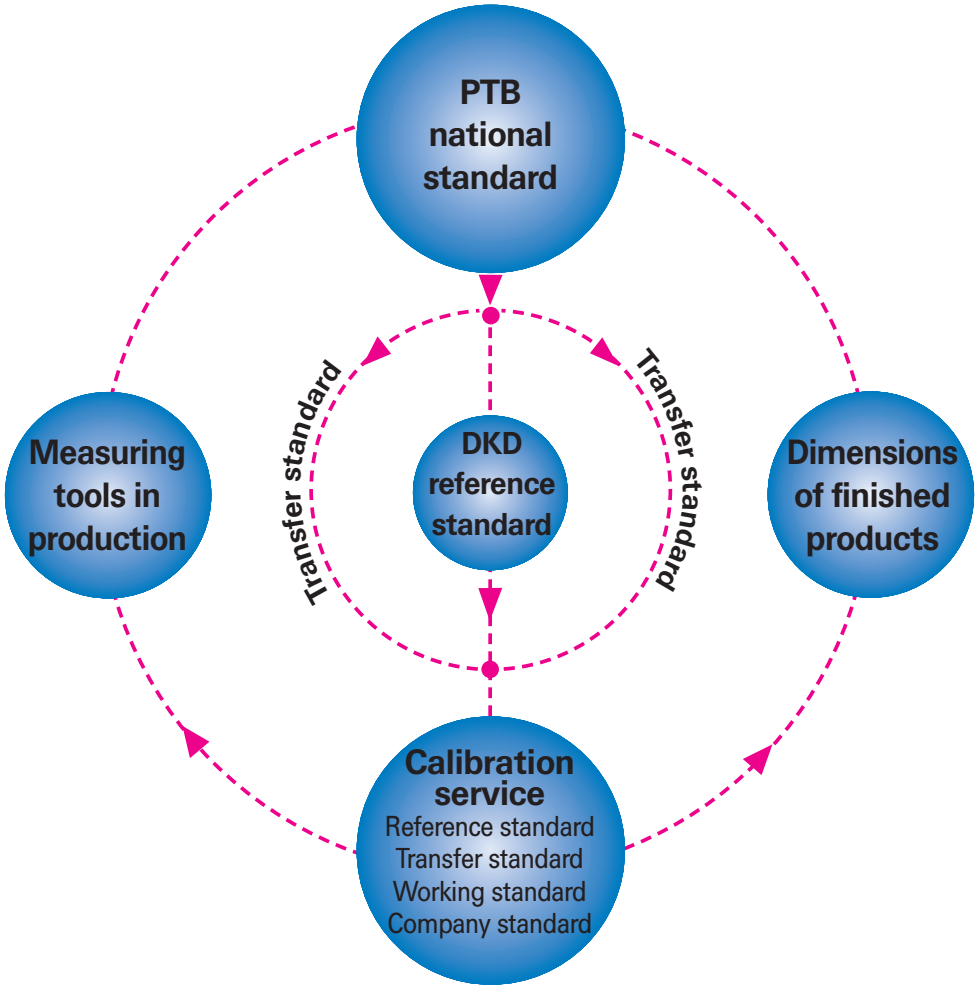
Part No.	Measuring range	4918	Tolerance
0001	Wood: 7 to 90 % Building material: 0.2 to 2.0 %	255.95	Wood: ± 1 % Building material: ± 0,05 %

(490)

Calibration Service for Measuring Tools

Calibration service? – Why?

Product quality is an increasingly decisive factor in safeguarding the future of a company. Strict customer requirements as well as the international legislation on product liability, extensive warranties and regulations require the consistent identification of measuring and control tools regarding product quality.
Special attention is paid to the calibration of measuring tools and test equipment in the series of DIN EN ISO 9000 standards. Each certified company has to ensure that testing equipment is checked for usability and accuracy at regular intervals.
The companies have to prove that the measuring tools used for **quality-relevant measurements** and controls are subjected to national measurement standards.
The traceability is to be ensured and documented by checks for the compliance with national measurement standards at prescribed intervals.
A large number of measuring and control tools offered in this catalogue are already delivered with a **calibration certificate to national standards** at no charge.
Furthermore, we offer calibration of new measuring tools as well as recalibration.
The calibration is not dependant on manufacturers.
It goes without saying that we cooperate solely with calibration services affiliated to **Deutscher Kalibrierdienst (DKD/German calibration service).**
The standards **(DKD standard)** of these calibration services are compared to the **national standards of PTB** (German federal physical-technical institute) at prescribed intervals.
The calibration is effected in accordance with prescribed DIN standards, the directives VDI/VDE/DGQ 2618 ff. and/or company standards.
Do not hesitate to contact our specialist in case of further questions.
The employees of our partners are looking forward to supporting you, too.

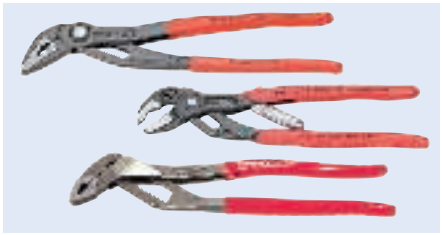


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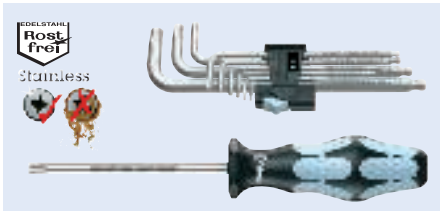
Overview – Group 5

New in the product range:

Water pump pliers



Stainless steel screwdrivers



TORX® screwdrivers with retaining function



Please pay attention to our extended range of products and innovations in all areas of this group:

- Quick action clamps OMEGA
- Water pump pliers for extended fields of application
- Stripping pliers for wire cross section 0.5–16 mm²
- Precision electrician's pliers, also available in ESD design
- Crimping sets from Knipex in TANOS-Minisystainer®
- Extension of wrench range
- Hexagon wrenches and TORX® screwdrivers from stainless steel to avoid extraneous rust
- TORX® screwdrivers with retaining function

Your FORMAT plus partner is looking forward to informing you about all innovations and their advantages in daily use.


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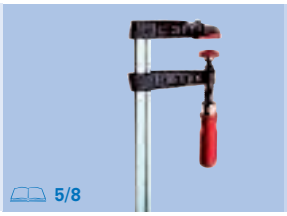

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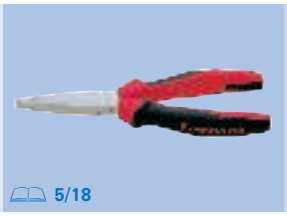

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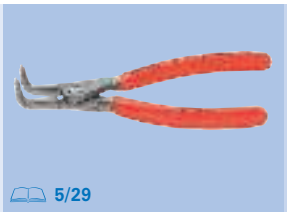
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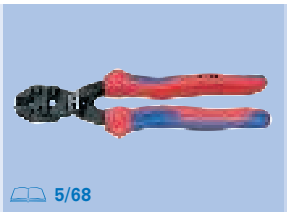
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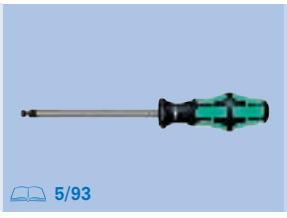
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Precision Parallel Bench Vices

Design: Heavy-duty, robust tool in grey cast iron, highest clamping accuracy due to long and precise dovetail guide, trapezoidal spindle covered and protected against dirt, exchangeable and reversible steel jaws, integrated tube clamping jaws, opening to the rear.
Large anvil face.

Application: Robust construction and exact, precise clamping and control makes this suitable for universal use.



Part No.	Jaw width mm	5003 mm	Jaw span mm	Clamping depth mm	Weight kg
0100	100	146.78	130	82	13
0125	125	171.80	180	80	22
0150	150	308.57	215	90	42
		(500)			

Spare clamping jaws available on request.

Automatic Height Adjustment Devices

For precision parallel vice no. 5003.

Design: Automatic adjustment up to max. 220 mm. Gas compression spring enables vertical and horizontal adjustment to any level.



Part No.	For jaw opening mm	5009 mm	Design	Weight kg
0100	100	156.79	Aluminium casting	10
0125	125	156.79	Aluminium casting	12
0150	150	213.50	Cast iron	16
		(500)		

Engineer's Bench Vices

Design: Forged steel, surface hardened jaws, anvil face suitable for aligning and upsetting.
Spindle and guide protected against dirt.



Part No.	Jaw width mm	5015 mm	Jaw span mm	Clamping depth mm	Hole pitch mm	Hole ∅ mm	Anvil surface mm	Weight kg
0115	115	85.75	140	70	102	13.5	45 x 63	7.8
0125	125	94.08	160	75	113	13.5	50 x 70	9.4
0126	125*	100.78	160	75	113	13.5	50 x 70	9.9
0135	135	114.31	170	85	120	16	57 x 75	14
0150	150	128.15	190	100	137	16	65 x 80	18.5
		(500)						

* With welded tube clamping jaws.

Bench Vice Turntables

For engineer's bench vice no. 5015.



Part No.	For jaw opening mm	5006 mm
0125	125	29.04
0135	135	29.11
0150	150	31.79
		(500)

Parallel Vices

Design: In forged steel, with extra large anvil and moulded jaws, enabling deeper clamping.
Jaws and anvil induction-hardened.
Adjustable centring guide ensures precise clamping. With fixture to hold turnable and exchangeable tube clamping jaws.



Part No.	Jaw width mm	5013 mm	Jaw span mm	Clamping depth mm	Hole pitch mm	Hole ∅ mm	Anvil surface mm	Weight kg
0100	100*	80.36	116	66	90	11.5	64 x 61	5.5
0120	120	94.40	150	82	113	13.5	75 x 75	9.5
0140	140	127.31	176	98	145	15	95 x 90	16.5
0160	160	158.10	225	117	145	15	122 x 110	23.5
0180	180	183.11	225	117	145	15	122 x 110	24
		(500)						

* without fixture for protective jaws.

Spare Jaws

For parallel vices no. 5013 + no. 5015.

5028 Tube Clamping Jaws

5029 Man-made Fibre Protective Jaws

Part No.	For jaw opening mm	5028	5029
0120	120	19.92	19.00
0140	140	24.46	20.34
0160	160	27.15	21.74
0180	180	29.87	23.53
		(500)	(500)



5028



5029

Parallel Vices

Design: In forged steel, with extra large anvil and moulded jaws, enabling deeper clamping.
Jaws and anvil induction-hardened.
Adjustable centring guide ensures precise clamping. With welded tube clamping jaws.

Part No.	Jaw width mm	5014	Jaw span mm	Clamping depth mm	Hole pitch mm	Hole ∅ mm	Anvil surface mm	Weight kg
0120	120	101,54	150	82	113	13.5	75 x 75	10
0140	140	135,12	176	98	145	15	95 x 90	17.2
0160	160	166,28	225	117	145	15	122 x 110	24.3
		(500)						



Bench Vice Turntables

For parallel vices no. 5013 + no. 5014.

Part No.	For jaw opening mm	5021
0100	100	26.74
0120	120	31.17
0140	140	33.78
0160	160	36.85
0180	180	38.14
		(500)



Adjusting Screws

For parallel vices no. 5013 + no. 5014.

Part No.	For jaw opening mm	5018
0100	100	36.67
0120	120	36.67
		(500)



Height Adjustment Devices

For parallel vices no. 5013 + no. 5014. Height adjustment up to 240 mm, turnable by 360°, enabling continuous vertical and horizontal adjustment.

5031 **Design:** Automatic height adjustment device with gas compression spring.

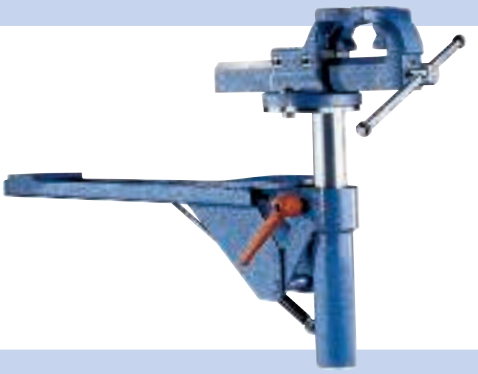
5032 **Design:** Mechanical height adjustment on spindle.

Part No.	For jaw opening mm	5031	5032	Weight kg 5031	5032
0100	100	159.52	137.83	8.8	8.8
0120	120	159.52	137.83	9.1	8.9
0140	140	159.52	137.83	9.4	9
0160	160	159.52	137.83	9.4	9.1
0180	180	159.52	–	9.4	–
		(500)	(500)		



Telescopic Height Adjustment Devices

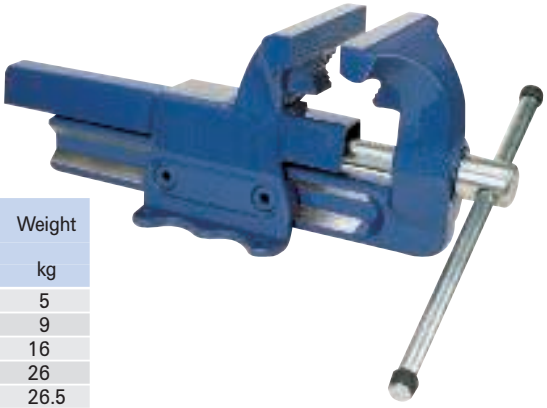
For parallel vices no. 5013 + no. 5014. Due to the lifting function, the vice can be conveniently adjusted to the desired working position. It requires only little space and can be stored under the workbench. Available without vice.



Part No.	For jaw opening mm	5035	Weight kg
0120	120	272.02 (500)	14

Engineer's Bench Vices

Design: Forged steel, milled jaws and surface-hardened (54–58 HRC), anvil face suitable for aligning and upsetting, cross, forged steel bar and adjustable guide are protected against dirt.
With solid forged induction-hardened jaws for clamping tubes.



Part No.	Jaw width mm	5048	Jaw span mm	Clamping depth mm	Hole pitch mm	Hole ∅ mm	Anvil surface mm	Weight kg
0100	100	79.30	127	55	72 x 58	9.5	40 x 40	5
0120	120	102.35	150	70	97 x 76	11.5	50 x 40	9
0140	140	142.91	200	87	119 x 95	11.5	58 x 55	16
0160	160	190.86	227	107	139 x 121	14	70 x 60	26
0180	180	205.68 (500)	227	107	139 x 121	14	70 x 60	26.5

Bench Vice Turntables

For parallel vice no. 5048.

Design: Steel forged, for 360° turn of the vice.
Locking screw enables locking in any position.

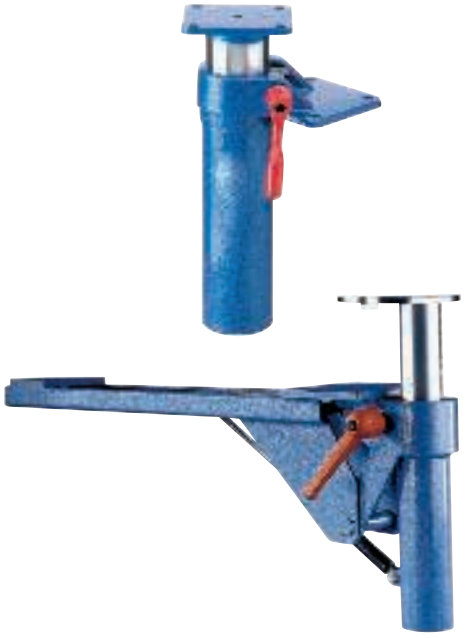


Part No.	For jaw opening mm	5054
0100	100	27.75
0120	120	36.86
0140	140	48.40
0160	160	55.56
0180	180	59.35 (500)

Automatic Height Adjustment Devices

For parallel vice no. 5048.

Design: Automatic adjustment up to max. 240 mm, for 360° turn of the vice, thus enables vertical and horizontal adjustment to any level.



Part No.	For jaw opening mm	5045	Weight kg
0120	120	159.52	9.1
0140	140	159.52	9.4
0160	160	159.52	9.4
0180	180	159.52 (500)	9.6

Telescopic Height Adjustment Devices

For parallel vice no. 5048. Due to the lifting function, the vice can be conveniently adjusted to the desired working position.
It requires only little space and can be stored under the workbench.

Part No.	For jaw opening mm	5049	Weight kg
0120	120	280.16 (500)	14

Gentle Touch Vice Jaws – Magnetic

Application: For all vices with relevant jaw width.

5074 **Type M** – Made of plastic, with magnet, one side plane surface, other side with prisms.

5075 **Type N** – Made of aluminium sections, with magnet, standard design.

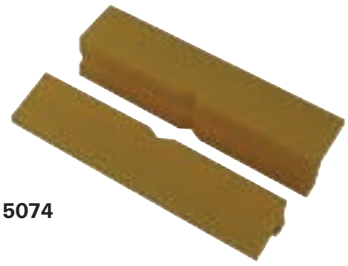
5076 **Type F** – Made of aluminium sections, with magnet and fibre coating.

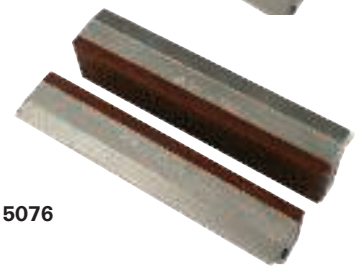
5077 **Type G** – Made of aluminium sections, with magnet and rubber coating.

5078 **Type MF** – Made of felt, with magnet.


5075


5077


5074


5076


5078

Part No.	Jaw width mm	5074 Pair	5075 Pair	5076 Pair	5077 Pair	5078 Pair
5100	100	3.32	10.17	11.96	11.96	9.23
5115	115	–	11.36	12.89	12.89	–
5120	120	–	11.77	13.21	13.21	–
5125	125	3.66	12.15	13.54	13.54	11.50
5135	135	–	12.96	14.15	14.15	12.55
5140	140	–	13.34	14.48	14.48	–
5150	150	4.12	13.54	15.09	15.09	13.69
5160	160	–	14.25	15.71	15.71	–
5175	175	–	14.63	16.65	16.65	–
5180	180	–	14.74	16.97	16.97	–
		(503)	(503)	(503)	(503)	(503)

Aluminium Jaws for Vices, with Friction Spring

Type F – Made of aluminium, with friction spring.

Application: Suitable for all vices with relevant jaw width.



Part No.	Jaw width mm	5081 Pair
0100	100	5.11
0115	115	5.41
0120	120	5.80
0125	125	5.97
0135	135	6.54
0140	140	6.64
0150	150	6.88
0160	160	7.27
0175	175	7.83
0180	180	7.93
		(503)

Aluminium Prism Jaws for Vices

Type AP – Made of aluminium, with prisms, without friction spring.

Application: Suitable for all vices with relevant jaw width.



Part No.	Jaw width mm	5082 Pair
0100	100	3.13
0125	125	3.57
0150	150	4.17
		(503)

Reversible Clamping Devices

Design: Horizontal - vertical adjustment in any angle, 360° rotation at the ball and simultaneously reversible by 90°. The ball pin has a toothed upper face, used for the mounting of other equipment. Including screwed and exchangeable aluminium jaws.

5083 **Application:** For screwed mounting on workbenches.

5084 **Application:** For clamping on workbenches of max. 80 mm board thickness.

Part No.	Jaw width mm	5083 UNiSPANN	5084 UNiSPANN	Jaw span mm	Clamping depth mm
0046	46	113.20	113.20	70	35
0080	80	264.14 (505)	264.14 (505)	110	52

UNiSPANN



5084

5083

Chain Pipe Vices

Design: Robust, powerful construction with V-shape support, bending feature and pipe rest, exchangeable clamping jaws and chain, quick locking through eccentric lever and pre-clamping screw, convenient adjusting to different pipe diameters.

Part No.	For pipes inch	5037 ROTHENBERGER	Weight kg
0010	1/8 – 2.1/2	112.93	3.85
0020	1/8 – 4.	145.78 (591)	6.24

ROTHENBERGER



Pipe Vices

Design: Forged, body and jaws from hardened steel, foldable design with self-locking hook, readjusting by means of self-locking screws.

Note: Spare jaws see (part no. 5040).

Part No.	For pipes inch	5039	Weight kg
0010	1/2 – 2.	78.38	5
0020	1/2 – 3.	104.18 (500)	6.4

format professional quality



5039

Pipe Vice Outfit

Design: With forged pipe vice 2“ (part no. 5039 0010), foldable and portable. Foot stand, tool support and flexible plate with 5 holes. Assembly of 3“ pipe vice (part no. 5039 0020) is possible.

Application: For mobile use, e.g. on the building site. For clamping pipes and cold-bending of pipes by means of bending tools.

Note: Spare jaws see (part no. 5040).

Part No.	For pipes inch	5042	Weight kg
0010	1/2 – 2.	183.49 (500)	22



5042

Spare Clamping Jaws

Design: From high-quality steel, forged and hardened.

Application: Fits pipe vice (part no. 5039) and pipe vice outfit (part no. 5042).

Part No.	For pipes inch	5040
0010	1/2 – 2.	5.10
0020	1/2 – 3.	10.08 (500)



5040

Clamp-on Workbenches ROBOY®, without Vice

ROTHENBERGER

Design: Portable, mini workbench, very handy and practical for on-site repairs and servicing. Can be clamped on door frames or fixed on the wall, includes a height-adjusting support tube for higher stability.

Part No.	Length x width mm	5044 ROTHENBERGER	Weight kg
0010	aprox. 650 x 400	126.26 (592)	14.9



Figure shown with special features

Hand Vices

URBO

Design: Steel C35, drop-forged, jaws hardened, with prism, special spring, zinc-chromium coated. Wide opening and butterfly nut.

Part No.	Length mm	5089	Jaw width mm	Jaw span mm
0100	100	8.98	36	18
0120	120	10.17	40	22
0145	145	13.75	50	28
0160	160	15.16 (507)	52	30



Tapered Filing Vices

URBO

Design: Steel C35, drop-forged, jaws hardened, with prism, special spring, zinc-chromium coated. Tapered opening and butterfly nut.

Part No.	Length mm	5090	Jaw width mm	Jaw span mm
0130	130	10.42 (507)	14	20



Hand Vices

URBO

Design: Steel C35, drop-forged, jaws hardened, with prism, special spring, zinc-chromium coated, incl. spanner.

Part No.	Length mm	5093	Jaw width mm	Jaw span mm
0180	180	37.20	62	45
0200	200	47.65 (507)	65	55



Quick Action Clamps

Screw Parallel Clamps

Design: Steel, parallel adjustment by 2 threaded spindles.

Application: For connecting and holding workpieces.



TURNUS

Part No.	Dimensions	5095	Jaw span mm	Jaw length mm
0001	1	3.62	28	50
0002	2	4.40	40	60
0003	3	5.51	55	75
		(508)		

Part No.	Dimensions	5095	Jaw span mm	Jaw length mm
0004	4	7.86	70	100
0005	5	11.32	105	135
		(508)		

Quick Action Clamps

Design: Fixed and sliding jaws in high-quality cast iron, powder-coated, galvanized hollow tube structure with 6 grooves, burnished spindle with burr-free riveted wooden handle, adjustable pressure plate position.

Application: Universal clamping tool for gripping workpieces or for connecting pieces together.

5091 Without anti-slipping device. Jaw span up to 400 mm with plastic protective caps on pressure plate and upper jaw for gentle clamping of workpieces.

5092 Including anti-skid feature through threaded pin in the sliding jaw.

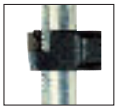


5091

format professional quality



5092



Part No.	Jaw span mm	5091	5092	Jaw projection mm	Rail mm
0010	100	3.57	5.56	50	15 x 5
0012	120	4.69	7.37	60	20 x 5
0016	160	5.61	8.70	80	25 x 6
0020	200	7.81	12.17	100	27 x 7
0025	250	9.50	14.81	120	29 x 9
0030	300	11.81	18.43	140	32 x 10
0040	400	14.46	22.53	175	32 x 10
0050	500	14.78	22.97	120	35 x 11
		(509)	(510)		

Part No.	Jaw span mm	5091	5092	Jaw projection mm	Rail mm
0060	600	15.67	24.29	120	35 x 11
0080	800	17.64	27.37	120	35 x 11
0100	1000	19.80	30.67	120	35 x 11
0125	1250	21.40	33.84	120	35 x 11
0150	1500	23.53	37.06	120	35 x 11
0200	2000	28.74	45.25	120	35 x 11
0250	2500	34.95	–	120	35 x 11
		(509)	(510)		

Quick Action Clamps (Deep Jaw)

Design: Fixed and sliding jaws made of high-quality cast iron, bright-drawn steel bar with 2 grooves, burnished steel trapezoidal thread spindle with adjustable pressure cap, wooden handle.

Application: Universal clamping tool for gripping protruding workpieces or for connecting pieces together.



format professional quality

Part No.	Jaw span mm	5097	Jaw projection mm	Rail mm
0040	400	19.54	250	40 x 11
0060	600	21.14	250	40 x 11
		(509)		

Part No.	Jaw span mm	5097	Jaw projection mm	Rail mm
0080	800	28.30	300	45 x 12
		(509)		

Screw Edge Clamps

Design: With 1 spindle, bronze, with wooden handle, adjustable pressure plate position.

Application: Practical extra tool for all customary screw clamps.
For simple gluing of edges.



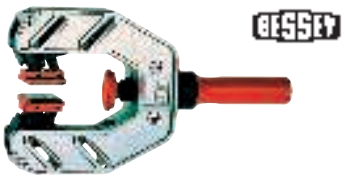
Part No.	For rail thickness max. mm	5098
0005	12	5.41
		(510)

Screw Edge Clamps

Design: For one-hand operation, plastic handle. Unique function due to double spindle feature. Outer spindle actuates the pressure clamps, inner spindle the pressure plate. Adjustable position of pressure jaws and pressure plate.

Application: Clamping of the device and pressing of the edge are effected in one operation through the handle, leaving one hand for positioning and aligning of the workpiece.





Part No.	Jaw span mm	5099	Jaw projection mm
0005	10–55	31.14	0–45
		(519)	

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Quick Action Clamps - Steel

Design: Fixed and sliding jaws made of annealed steel, fixed jaw curved with formed pressure plate. Spindle and pressure plate made of steel, wooden handle, jaws electroplated, bronze spindle.

Application: The spring-clamping feature of this universal tool enables the gentle holding of workpieces. High clamping forces while weight of the tool is low.



Part No.	Jaw span mm	5106	Jaw projection mm	Rail mm
0010	100	6.59	50	11.5 x 5.7
0012	120	8.22	60	13.5 x 6.5
0016	160	9.87	80	16 x 7.5
0020	200	13.43	100	19.5 x 9.5
0025	250	16.21	120	22 x 10.5
0030	300	20.23	140	25 x 12
0040	400	23.50	120	25 x 12
0050	500	25.27	120	25 x 12
0060	600	26.69	120	25 x 12
0080	800	32.22	120	27 x 13
0100	1000	36.15	120	27 x 13
		(509)		

Quick Action Clamps OMEGA - Steel



Design: Fixed and sliding jaw consisting of a single piece from statically optimized, cold drawn profile steel. **The patented OMEGA jaw provides maximum flexibility and safety. Also in case of heavy vibrations, the clamping force is maintained longer.** Sliding jaw made of forged and galvanized tempering steel. Easy-running spindle with rolled, strain-hardened and bronze trapezoidal thread.
The movable pressure plate (part no. 5104) can be changed without tool. With ergonomic 2-component plastic handle.

Application: The spring-clamping feature enables the gentle and precise holding of workpieces. The OMEGA jaw provides for precise clamping force. High clamping forces while the weight of the tool is low.

Note: Pressure plates for different applications see (part no. 5104, 5105 and 5107).

Part No.	Jaw span mm	5102	Jaw projection mm	Rail mm
0160	160	13.56	80	16 x 7.5
0200	200	18.33	100	19.5 x 9.5
0250	250	22.20	120	22 x 10.5
0300	300	27.74	120	25 x 12
0400	400	32.18	120	25 x 12
0500	500	34.58	120	25 x 12
0600	600	36.57	120	25 x 12
		(510)		



Pressure Plates for Quick Action Clamp OMEGA

Design: 4 pieces supplied in plastic bag.

Application: For quick action clamps OMEGA (part no. 5102). Quick change without tool.

5104 **From quality steel, galvanized.** Versatile use.

5105 **From stainless steel with plastic cap** for gentle clamping. Ideal for clamping of sensitive surfaces such as ceramics and polished workpieces. Furthermore, impurities on stainless steel are avoided.

5107 **From aluminium with large ∅ (80 mm).** For optimum clamping of large and thin-walled workpieces without drag marks.



5104



5105



5107



Part No.	For quick action clamps mm	5104 bag	5105 bag	5107 bag
0010	160	4.44	8.82	–
0020	200–250	5.26	10.45	15.30
0030	300–400	6.07	12.07	16.12
		(510)	(510)	(510)

Quick Action Lever Clamps

Design: Moulded steel bar, machined, drop-forged sliding bracket, steel swivel case-hardened pressure flap, sintered steel cam, extremely hard-wearing due to surface hardness, rapid release via plastic-coated release lever.

Application: Universal clamping for efficient clamping and vibration-free holding of workpieces.



Part No.	Jaw span mm	5100	Jaw projection mm	Rail mm
0012	120	23.86	60	13.5 x 6.5
0016	160	26.18	80	16 x 7.5
0020	200	29.90	100	19.5 x 9.5
0025	250	34.62	120	22 x 10.5
0030	300	40.77	140	25 x 12
0040	400	42.70	120	25 x 12
0050	500	46.18	120	25 x 12
0060	600	48.04	120	25 x 12
		(509)		

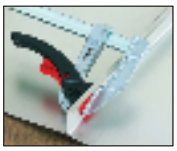
Ratcheting KliKlamps

Design: Fixed and sliding magnesium jaws, cast iron technique, exceptionally light-weight but robust, fixed jaw with cross prism for round, tapered and edged workpieces, with detachable plastic protective cap, swivelling pressure plate and ergonomic clamping arm made of glass-fibre reinforced polyamide, graduated locking mechanism for controlled and vibration-free clamping.

Application: Universal screw clamp for low to medium clamping forces, for convenient and safe operations, power build-up to max. 1,200 N.







Part No.	Jaw span mm	5117	Jaw projection mm	Rail mm
0012	120	11.76	80	20 x 5
0016	160	12.11	80	20 x 5
0020	200	12.54	80	20 x 5
0025	250	12.97	80	20 x 5
		(519)		

Single-hand Clamps

Design: Single-hand quick action lever clamp made of glass-fibre reinforced polyamide, can be operated from the handle or the rail, fixing with the clamping lever with a single grip, no changing of position for fixing and releasing through the wooden handle. Rail, fixed jaw and pressure plate in one piece made of optimized cold-formed sectional steel, sliding jaws in annealed steel, drop-forged, spindle with trapezoidal thread, bronze, guided bushing keeps the pressure plate in straight position, protective caps removable.









Part No.	Jaw span mm	5123	Jaw projection mm	Rail mm
0030	300	20.88	100	19.5 x 9.5
0060	600	25.16	100	19.5 x 9.5
		(519)		

Quick Action Engineer's Clamps - Steel

Design: Fixed jaw, rail and pressure plate made of section steel, hot-formed, sliding jaw, spindle and bolt of pressure cap machined, lockable clamp, burr-free holes on both sides. Burnished spindle and pressure plate, other steel parts electrogalvanized, adjustable special pressure cap, pivots up to an angle of 35 degrees.
For manufacturing reasons the 1,500 mm span is only machined up to 1,300 mm, measured from the elbow.

Application: Ideal for clamping forces up to 12 kN, can be used in all metal work applications, especially in steel construction, and also in woodwork applications.



Part No.	Jaw span mm	5103	Jaw projection mm	Rail mm
0025	250	40.48	120	30 x 15
0030	300	41.43	140	30 x 15
0050	500	52.66	120	30 x 15
0080	800	60.98	120	30 x 15
0100	1000	68.66	120	30 x 15
0125	1250	79.94	120	30 x 15
0150	1500	89.22	120	30 x 15
		(509)		

Quick Action Engineer's Clamps - Steel Construction

Design: Fixed jaw, rail and pressure plate from one piece of cold-formed sectional steel, annealed and electro-galvanized, sliding jaw drop-forged, annealed and electro-galvanized. Wear-resistant spindle with flexible pressure cap, turnable up to 35°, in steel, annealed and bronze. Spindle with additional hexagon for clamping with socket wrenches, spanners, torque wrenches or ratchets, clamping force max. 22 kN at 150 mm jaw span (corresponds to 80 Nm torque).



Part No.	Jaw span mm	5109	Jaw projection mm	Rail mm
0030	300	84.71	175	40 x 20
0040	400	89.07	175	40 x 20
0050	500	92.96	175	40 x 20
0060	600	96.40	175	40 x 20
0080	800	102.59	175	40 x 20
0100	1000	110.93	175	40 x 20
		(510)		

Gripper Arm Clamps

Design: Rail, fixed jaw and pressure plate from one piece of cold-formed sectional steel, annealed and electro-galvanized, clamping lever in high-tensile steel, electro-galvanized, continuously sliding feature, swivel stroke max. 26 mm, sliding jaw in precision-cast machining steel, electro-galvanized, spindle and pressure plate bronze, swivelling to 30°.

Application: Clamp with clamping mechanism located outside the operating range. This enables its use in confined spaces, as well as in narrow orifices or on short projections. After release of the final stop, the clamping lever can be fully turned, whereby, with the use of the pressure element, it is also suitable for expanding operations.







Part No.	Jaw span	5119	Jaw projection mm	Rail mm
0060	600 mm	62,22	100	27 x 13
0500	Pressure element	9,39	–	–
		(510)		

Quick Action Steel Clamps

Design: C-shape, in quality steel, drop-forged, electro-galvanized. Spindle bronze, with toggle.

Application: Mainly for metal and steel construction, ensures high clamping forces due to only short projection and the robust structure.



Part No.	Dimensions	5112	Jaw span mm	Jaw projection mm
0006	1	16.79	60	55
0010	2	23.58	100	75
0012	3	28.34	120	85
0015	4	31.40	150	95
0020	5	39.65	200	105
		(510)		

Quick Action Steel Clamps

Design: Fixed jaw U-shape curved with pressure plate. Sliding jaw drop-forged, fixed and gliding jaws annealed and electro-galvanized, bronze spindle.

Application: For wide-span clamping, e.g. on T-girders and double T-girders. Quick vibration-free clamping.



Part No.	Jaw span mm	5113	Jaw depth mm	Jaw projection mm	Rail mm
0025	250	30.58	60	120	22 x 10.5
		(510)			

Super Quick Action Clamps

Design: Fixed jaw U-shape curved with pressure plate. Sliding jaw drop-forged, fixed and gliding jaws annealed and electro-galvanized, bronze spindle incl. special pressure plate max. 35° swivelling.

Application: For wide-span clamping, e.g. on T-girders and double T-girders. Quick vibration-free clamping.





Part No.	Jaw span mm	5114	Jaw depth mm	Jaw projection mm	Rail mm
0030	300	62.67	100	140	30 x 15
		(510)			

Lever Clamps

Design: Fixed jaw U-shape curved with pressure plate for efficient clamping. Sliding jaw drop-forged, fixed and sliding jaws annealed and electro-galvanized, swivelling steel pressure plate case-hardened, eccentric in sintered steel, wear-resistant.

Application: For wide-span clamping, e.g. on T-girders and double T-girders. Quick vibration-free clamping.

Part No.	Jaw span mm	5120	Jaw depth mm	Jaw projection mm	Rail mm
0025	250	41.04 (510)	60	120	22 x 10.5



Face Clamps

Design: Super-polyamide jaw faces, reinforced with special steel inlays. 2 large, tiltable jaw faces enable also the clamping of both sides of bevelled workpieces or the fixing of mitres. Easy exchange of jaw faces.

Part No.	Jaw span mm	5124	Jaw projection mm	Rail mm
0020	200	22.00 (510)	100	19.5 x 9.5



UniKlamps

Design: Hollow rail structure in quality steel, electro-galvanized, detachable final stop made of polyamide for converting the bottom part for expanding tasks, shells made of glass-fibre reinforced polyamide, break-proof, glue-resistant, paint, grease and solvent resistant, large and plane clamping faces, sliding jaw in special zinc alloy, cast-iron technique, electro-galvanized, bronze spindle with burr-free riveted handle.

Application: Universal clamp for clamping and expanding of sensitive surfaces, right angled, round and tapered workpieces. The UniKlamp clamps workpieces also behind and at the side of the rail. This allows clamping in locations which cannot be accessed with normal quick action clamps.

Part No.	Jaw span mm	5116	Jaw projection mm	Rail mm
0016	160	9.83	80	20 x 5
0030	300	10.13	80	20 x 5
0060	600	10.55 (519)	80	20 x 5





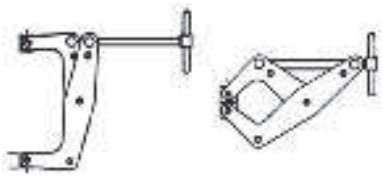




Parallel Clamps

Design: Shanks in quality-steel, spindle with trapezoidal thread, bronze.

Application: Moving jaws with prism cut for clamping of different profiles.



TURNUS



Part No.	Jaw span mm	5122
0005	0– 25	7.55
0010	0– 50	8.34
0015	0– 75	11.95
0020	0–100	18.55
0025	0–150	32.07
		(527)

Angle Clamps

Design: Zinc cast iron jaws with plastic coating.

Application: For holding, fixing and aligning of workpieces at right angles, also for T-joints and workpieces of different thickness.





BESSEY



Part No.	Jaw span mm	5115	Max. passage mm	Jaw height mm	Jaw length mm
0005	2 x 55	21.38	30	30	46
0010	2 x 100	34.14	60	36	80
		(510)			

Angle Clamps - Metal

Design: Body and clamping jaws in cast iron, electro-galvanized, trapezoidal thread spindles in steel, thus no adhesion of weld beads, joint bedding of spindle nut, push-in ratchet grip for high clamping forces, lateral long holes for clamping on welding and machine tables.

Application: For holding, fixing and aligning of workpieces at right angles, also for T-joints.



BESSEY



Part No.	Jaw span mm	5121	Max. passage mm	Jaw height mm	Jaw length mm
0009	2 x 90	99.48	60	35	110
0012	2 x 120	112.78	100	61	120
		(510)			

Carpenter's Pincers/Combination Pliers

Carpenter's Pincers

Design: DIN ISO 9243, special tool steel, **head polished.**

5130 Polished flank surface, plastic-covered handles.

5133 Cutting edge oil-hardened, handles black atramentised.

Part No.	Length mm	5130	5133
0160	160	–	7.10
0180	180	4.70	7.31
0200	200	5.52	–
0210	210	–	7.85
0225	225	6.70	9.00
0250	250	8.18	10.66
0300	300	–	15.61
		(512)	(525)



5130 format professional quality



5133

Construction Pincers

Design: DIN ISO 9242, special tool steel, **head polished.**

5136 Polished flank surface, handles plastic-covered.

5139 Oil-hardened, handles black atramentised.

Part No.	Length mm	5136	5139
0220	220	6.06	8.15
0250	250	6.97	8.91
0280	280	7.83	9.72
0300	300	–	11.51
		(512)	(525)



5136 format professional quality



5139

High-leverage Combination Pincers

Design: DIN ISO 9242. Excellent cutting performance, dampens the cut impact after cutting the binding wire. **27 % easier cutting** due to optimal transmission of forces compared with normal combination pincers of equal length. Binding wire up to ⌀ 4.5 mm. Special tool steel, oil-hardened, **head and handles nickel-plated.**

Part No.	Length mm	5143
0300	300	16.38
		(525)



Mini-Combination Pincers

Design: Vanadium steel, oil-hardened, **head chromium-plated,** handles with composite plastic covers.

Hard wire = 1,800 N/mm²

Part No.	Length mm	5144	Cutting capacity ⌀ hard wire mm
0110	110	12.43 (525)	1.6



Combination Pliers

Design: DIN ISO 5746, induction-hardened cutting edges.
Head polished, plastic-covered handles.

5145 Special tool steel, annealed.
Hard wire = 1,600 N/mm²

5152 Special tool steel, oil-hardened.
Hard wire = 1,800 N/mm²

Part No.	Length mm	5145	5152	Cutting capacity ⌀ hard wire mm 5145	5152
0140	140	–	7.01	–	1.8
0160	160	5.44	7.10	1.8	2.0
0180	180	5.89	7.55	2.5	2.2
0200	200	7.03 (512)	8.68 (525)	2.8	2.5



5145 format professional quality



5152

Combination Pliers

Design: DIN ISO 5746, induction-hardened cutting edges.
Head polished, handles with multi-component plastic covers.

5149 Special tool steel, annealed.
Hard wire = 1,600 N/mm²

5150 Special tool steel, oil-hardened.
Hard wire = 1,800 N/mm²

Part No.	Length mm	5149	5150	Cutting capacity ø hard wire mm 5149	5150
0160	160	5.87	9.08	1.8	2.0
0180	180	6.02	9.21	2.5	2.2
0200	200	7.03 (512)	10.58 (525)	2.8	2.8



5149 format professional quality



5150

Combination Pliers

Design: DIN ISO 5746, induction-hardened cutting edges.
Chromium-plated head, handles with multi-component plastic covers.

5148 Special tool steel, annealed.
Hard wire = 1,600 N/mm²

5153 Special tool steel, oil-hardened.
Hard wire = 1,800 N/mm²

Part No.	Length mm	5148	5153	Cutting capacity ø hard wire mm 5148	5153
0160	160	8.20	10.73	1.8	2.0
0180	180	8.54	11.57	2.5	2.2
0200	200	10.01 (512)	13.10 (525)	2.8	2.5



5148 format professional quality



5153

Combination Pliers VDE

Design: DIN ISO 5746, special tool steel, oil-hardened, induction-hardened cutting edges.
Chromium-plated head, handles insulated up to 1000 v, in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/Part 201.

5151 Special tool steel, individually annealed.
Hard wire = 1,600 N/mm²

5154 Special tool steel, oil-hardened.
Hard wire = 1,800 N/mm²

Part No.	Length mm	5151	5154	Cutting capacity ø hard wire mm 5151	5154
0160	160	9.72	12.50	1.8	2.0
0180	180	10.23	13.44	2.5	2.2
0200	200	11.39 (512)	14.97 (525)	2.8	2.5



5151 format professional quality



5154

Combination Pliers VDE

Design: DIN ISO 5746 , with high-precision cutting edges for all wires, including piano wires, cutting edges induction-hardened 64 HRC, especially low-wear gripping jaws for firm hold, hardness 53 HRC, chromium-vanadium electric steel, oil-hardened, **head chromium-plated,** handles with multi-component plastic covers, insulated up to 1,000 v according to IEC 60 900, DIN EN 60 900, VDE 0682/part 201.

Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²

Part No.	Length mm	5155	Cutting capacity ø hard wire mm	Cutting capacity ø piano wire mm
0160	160	17.29	2.0	1.5
0190	190	19.20 (525)	2.5	2.0



High-Leverage Combination Pincers

Design: DIN ISO 5746, with high leverage, **35 % easier cutting** due to improved leverage compared with usual pincers of equal length. For all wires, including piano wire, long-term performance, cutting edges induction-hardened, hardness approx. 64 HRC, special tool steel, oil-hardened, **head polished,** handles with multi-component plastic covers.

Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²



Part No.	Length mm	5157	Cutting capacity ø hard wire mm	Cutting capacity ø piano wire mm
0180	180	10.06	2.5	2.0
0200	200	10.58 (525)	2.8	2.2

High-Leverage Combination Pincers

Design: DIN ISO 5746, from special tool steel, oil-hardened and annealed. **Head polished,** jaws with gripping zones for flat and round material. Handles with multi-component plastic covers.



5159 Cutting edges extra long and induction-hardened (60 HRC).
With additional gripping surfaces below the joint.

Hard wire = 1,600 N/mm²
Piano wire = 2,000 N/mm²

5159 format professional quality

5156 Cutting edges induction-hardened (64 HRC), with high leverage, **35 % easier cutting due to improved leverage** compared with usual pincers of equal length. For all wires, including piano wire, long-term performance.

Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²



5156

Part No.	Length mm	5159	5156	Cutting capacity ø mm hard wire 5159	hard wire 5156	piano wire 5159	piano wire 5156
0180	180	–	11.35	–	2.5	–	2.0
0200	200	11.43	12.35	3.0	2.8	2.5	2.2
0225	225	– (512)	14.63 (525)	–	3.0	–	2.5

High-Leverage Combination Pincers VDE

Design: DIN ISO 5746, with high leverage, **35 % easier cutting** due to improved leverage compared with usual pincers of equal length. For all wires, including piano wire, long-term performance, cutting edges induction-hardened, hardness approx. 64 HRC, special tool steel, oil-hardened, **head chromium-plated,** handles with multi-component plastic covers. insulated up to 1,000 v, according to IEC 60900, DIN EN 60900, VDE 0682/part 201.

Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²



Part No.	Length mm	5158	Cutting capacity ø hard wire mm	Cutting capacity ø piano wire mm
0180	180	16.06	2.5	2.0
0200	200	17.06	2.8	2.2
0225	225	19.11 (525)	3.0	2.5



Gripping zones for round material.



Induction-hardened cutting edges, also suitable for piano wire.



Powerful gripping, pulling and bending due to high leverage.

High-Leverage Combination Pincers

Flat-Nosed Pliers

Design: DIN ISO 5745, special tool steel, oil-hardened, with short, flat jaws, serrated gripping surface.

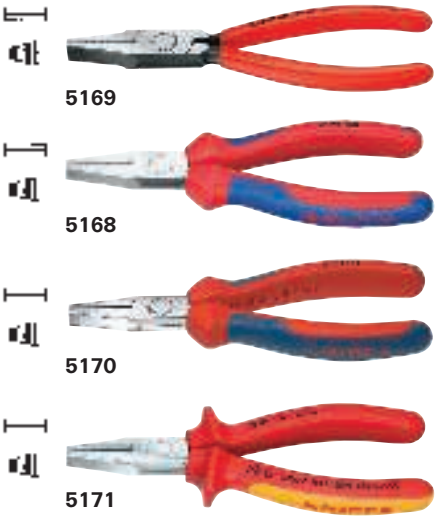
5169 **Head polished,** handles with plastic covers.

5168 **Head polished,** handles with multi-component plastic covers.

5170 **Head chromium-plated,** handles with multi-component plastic covers.

5171 **Head chromium-plated,** handles with multi-component plastic covers, insulated up to 1,000 v, according to IEC 60900, DIN EN 60900, VDE 0682/part 201.

Part No.	Length mm	5169	5168	5170	5171
0125	125	7.23	–	–	–
0140	140	7.31	8.83	10.90	–
0160	160	7.68 (525)	9.00 (525)	11.39 (525)	13.07 (525)



Three-way Pliers

Design: DIN ISO 5745, special tool steel, induction-hardened, **head chromium-plated,** angular jaws, serrated gripping surfaces, multi-component plastic-covered handles. All-in-one flat-nosed pliers, cable strippers and crimping pliers.

Hard wire = 1,600 N/mm²

Part No.	Length mm	5199	Cutting capacity ∅ hard wire mm
0160	160	8.87 (512)	1.6



Bending Pliers

Design: Vanadium steel, oil-hardened and annealed. **Head polished.** Fine, pointed and round jaws, precision ground. Cutting edges induction-hardened (60 HRC), handles with plastic covers.

Application: For fine wire and silver jewellery. Furthermore for **bending and cutting** in electronic engineering and bending of wire eyelets.

Part No.	Length mm	5186
0130	130	13.86 (525)



Round-Nosed Pliers

Design: DIN ISO 5745, special tool steel, oil-hardened, with short, round jaws, precision ground, smooth gripping surfaces.

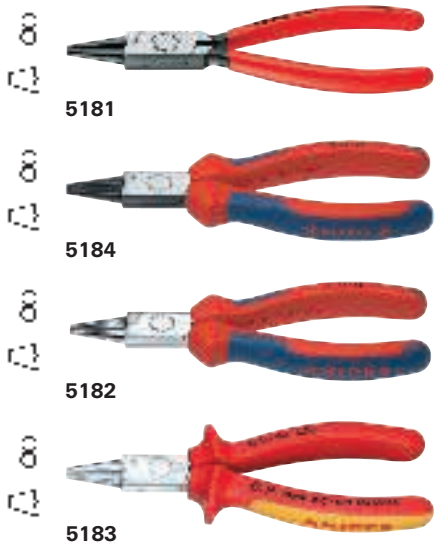
5181 **Head polished,** handles with plastic covers.

5184 **Head polished,** handles with multi-component plastic covers.

5182 **Head chromium-plated,** handles with multi-component plastic covers.

5183 **Head chromium-plated,** handles with multi-component plastic covers, insulated up to 1,000 v, according to DIN IEC 60900, DIN EN 60900, VDE 0682/part 201.

Part No.	Length mm	5181	5184	5182	5183
0125	125	7.23	–	–	–
0140	140	7.23	8.60	10.58	–
0160	160	7.55	8.76	11.17	12.77
0180	180	9.60 (525)	– (525)	– (525)	– (525)



Long-Nosed Pliers

Design: DIN ISO 5745, long, flat jaws, ridged gripping surfaces, **polished head,** plastic-covered handles.

5160 Special tool steel, induction-hardened.

5187 Chromium-vanadium electric steel, oil-hardened, high-load and low wear.

Part No.	Length mm	5160	5187	Jaw length mm 5160	Jaw length mm 5187
0140	140	–	9.00	–	42.0
0160	160	5.21	9.30	50.0	46.5
0190	190	– (512)	10.66 (525)	–	50.0



5160 format professional quality



5187

Long-Nosed Pliers

Design: DIN ISO 5745, long, flat jaws, ridged gripping surfaces, **chromium-plated head,** handles with composite plastic covers.

5163 Special tool steel, oil-hardened.

5190 Chromium-vanadium electric steel, oil-hardened, high-load and low wear.

Part No.	Length mm	5163	5190	Jaw length mm 5163	Jaw length mm 5190
0140	140	–	12.56	–	42.0
0160	160	7.81	13.10	50.0	46.5
0190	190	– (512)	14.48 (525)	–	50.0



5163 format professional quality



5190

Long-Nosed Pliers VDE

Design: DIN ISO 5745, long, flat jaws, special tool steel, oil-hardened, **head chromium-plated,** handles insulated up to 1,000 v, according to IEC 60900, DIN EN 60900, VDE 0682/part 201.

format professional quality

Part No.	Length mm	5166	Jaw length mm
0160	160	9.17 (512)	50.0



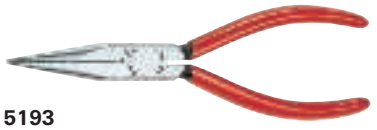
Long-Nosed Pliers

Design: DIN ISO 5745, long, flat round jaws, serrated gripping surfaces, chromium-vanadium electric steel, oil-hardened, high load and low wear.

5193 **Head polished,** handles with plastic covers.

5195 **Head chromium-plated,** handles with multi-component plastic covers.

Part No.	Length mm	5193	5195	Jaw length mm
0140	140	9.08	12.56	42.0
0160	160	9.45	12.96	50.0
0190	190	– (525)	14.63 (525)	50.0



5193



5195

Long-Nosed Pliers

Design: DIN ISO 5745, long, round jaws, smooth gripping surfaces, **polished head,** plastic-covered handles.

5175 Special tool steel, induction-hardened.

5198 Chromium-vanadium electric steel, oil-hardened, high-load and low wear.

Part No.	Length mm	5175	5198	Jaw length mm 5175	Jaw length mm 5198
0160	160	5.36 (512)	8.91 (525)	50.0	41.0



5175 format professional quality



5198

Long-Nosed Pliers

Design: DIN ISO 5745, long, round jaws, smooth gripping surfaces, **chromium-plated head,** handles with composite plastic covers.

5178 Special tool steel, induction-hardened.

5200 Chromium-vanadium electric steel, oil-hardened, high-load and low wear.

Part No.	Length mm	5178	5200	Jaw length mm 5178	Jaw length mm 5200
0140	140	–	12.35	–	37.5
0160	160	7.71 (512)	12.56 (525)	50.0	41.0



5178 format professional quality



5200

Long-Nosed Pliers VDE

Design: DIN ISO 5745, long, round jaws, special tool steel, oil-hardened. **Chromium-plated head,** handles with multi-component plastic covers, insulated up to 1,000 v, in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/Part 201.

Part No.	Length mm	5180	Jaw length mm
0160	160	9.20 (512)	50.0

format professional quality



Mechanic's Pliers

Design: DIN ISO 5745. Head chromium-plated, gripping surfaces serrated, resistant to torsion, handles with multi-component plastic covers.

5204 From special tool steel, hardened.

5203 From vanadium electric steel, oil-hardened and annealed.

Part No.	Design	5204	5203	Length mm	Jaw length mm
0005	Flat long-round jaws	8.59	16.06	200	73
0010	Bent, flat-round jaws	10.09	17.68	200	73
0015	Cropped flat-pointed jaws	–	17.75	200	73
0020	Flat-wide jaws	– (512)	14.94 (525)	190	50



5204 0005 format professional quality



5203 0005



5204 0010 format professional quality



5203 0010



5203 0015



5203 0020

Gripping Pliers (Needle Nose Pliers)

Design: Chromium-vanadium electric steel, oil-hardened and annealed.
Head polished, with extra long, smooth jaws, edges deburred.
Handles plastic-coated.

Application: For fine mounting, bending and adjusting work.

5201 Straight jaws.

5202 Jaws bent by 45°.

Part No.	Length mm	5201	5202	Jaw length mm
0160	160	13.86 (525)	15.48 (525)	55



5201



5202

Adjusting Pliers

Design: DIN ISO 5235, polished head, chromium-vanadium electric steel, oil-hardened, gripping surfaces polished, for gripping components and wires of smallest diameters as well as bending of contact and relay springs, handles plastic-coated.

Part No.	Design	5209	Length mm	Jaw length mm
0010	Flat-wide jaws	13.71 (525)	135	34.0



Radio Pliers

Design: DIN ISO 5745, flat-round jaws, serrated gripping surfaces, induction-hardened cutting edges, for medium-hard and soft wire, **polished head.**

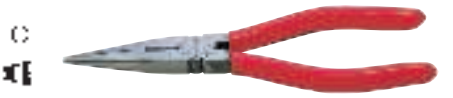
5214 Special tool steel, induction hardened, straight jaws, plastic-covered handles. For hard wire = 1,600 N/mm² to 1.6 mm ⌀.

5218 Special tool steel, oil-hardened, straight jaws, plastic-covered handles. For hard wire = 1,800 N/mm² to 1.6 mm ⌀.

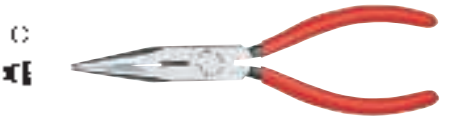
5222 Special tool steel, oil-hardened, angular jaws, plastic-covered handles. For hard wire = 1,800 N/mm² to 1.6 mm ⌀.

5221 Special tool steel, oil-hardened, straight jaws, handles with multi-component plastic covers. For hard wire = 1,800 N/mm² to 1.6 mm ⌀.

Part No.	Length mm	5214	5218	5222	5221
0140	140	–	9.08	–	10.45
0160	160	5.36 (512)	9.13 (525)	10.66 (525)	10.58 (525)



5214 format professional quality



5218



5222



5221

Radio Pliers

Design: DIN ISO 5745, flat-round jaws, serrated gripping surfaces, induction-hardened cutting edges, for medium-hard and soft wire, **chromium-plated head,** handles with multi-component plastic covers.

5215 Special tool steel, induction-hardened.
For hard wire = 1,600 N/mm² to 1.6 mm ø.

5219 Special tool steel, oil-hardened.
For hard wire = 1,800 N/mm² to 1.6 mm ø.

Part No.	Length mm	5215	5219
0140	140	–	11.96
0160	160	8.29 (512)	12.29 (525)


5215 format professional quality


5219

Radio Pliers VDE

Design: DIN ISO 5745, serrated gripping surfaces, induction-hardened cutting edges, for medium-hard and soft wire, **chromium-plated head,** handles insulated up to 1,000 v, in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/Part 201.

5217 Special tool steel, induction-hardened, straight jaws.
For hard wire = 1,600 N/mm² to 1.6 mm ø.

5220 Special tool steel, oil-hardened.
For hard wire = 1,800 N/mm² to 1.6 mm ø.

5223 Special tool steel, oil-hardened, angular jaws.
For hard wire = 1,800 N/mm² to 1.6 mm ø.

Part No.	Length mm	5217	5220	5223
0160	160	10.38 (512)	13.86 (525)	15.61 (525)


5217 format professional quality


5220


5223

Radio Pliers

Design: DIN ISO 5745, flat-round, straight jaws, ridged gripping surfaces, induction-hardened cutting edges. **Polished head.**

5226 Special tool steel, induction-annealed, plastic-covered handles.
For hard wire = 1,600 N/mm² to 1.8 mm ø.

5239 Vanadium steel, oil-hardened, plastic-covered handles.
For hard wire = 1,800 N/mm² to 2.2 mm ø.

5240 Vanadium steel, oil-hardened. Handles with multi-component plastic covers.
For hard wire = 1,800 N/mm² to 2.2 mm ø.

Part No.	Length mm	5226	5239	5240
0200	200	6.37 (512)	12.04 (525)	13.18 (525)


5226 format professional quality


5239


5240

Radio Pliers

Design: DIN ISO 5745, flat-round, straight jaws, ridged gripping surfaces, induction-hardened cutting edges.
Chromium-plated head, handles with composite plastic covers.

5227 Special tool steel, induction-annealed.
For hard wire = 1,600 N/mm² to 1.8 mm ø.

5242 Vanadium steel, oil-hardened.
For hard wire = 1,800 N/mm² to 2.2 mm ø.

Part No.	Length mm	5227	5242
0200	200	8.87 (512)	14.86 (525)


5227 format professional quality


5242

Radio Pliers VDE

Design: DIN ISO 5745, flat-round, straight jaws, ridged gripping surfaces, induction-hardened cutting edge, for hard and medium-hard wire, **chromium-plated head,** handles insulated up to 1,000 v, in accordance with IEC 60900, DIN EN 60900, VDE 0682/Part 201.

5230 Special tool steel, induction-hardened.
For hard wire = 1,600 N/mm² to 1.8 mm ⌀.

5245 Vanadium steel, oil-hardened.
For hard wire = 1,800 N/mm² to 2.2 mm ⌀.

Part No.	Length mm	5230	5245
0200	200	11.39 (512)	17.06 (525)



Radio Pliers

Design: DIN ISO 5745, flat-round, curved jaws, ridged gripping surfaces, induction-hardened cutting edges, **head polished.**

5232 Special tool steel, induction-hardened, jaws with 45° curve, plastic-covered handles.
For hard wire = 1,600 N/mm² to 1.8 mm ⌀.

5251 Vanadium steel, oil-hardened, jaws bent by 40°. Handles with plastic covers.
For hard wire = 1,800 N/mm² to 2.2 mm ⌀.

5252 Vanadium steel, oil-hardened, jaws bent by 40°, handles with multi-component plastic covers. For hard wire = 1,800 N/mm² to 2.2 mm ⌀.

Part No.	Length mm	5232	5251	5252
0200	200	7.48 (512)	13.63 (525)	14.63 (525)



Bent Nosed Radio Pliers

Design: DIN ISO 5745, flat-round, bent jaws, ridged gripping surfaces, induction-hardened cutting edges. **Chromium-plated head,** handles with composite plastic covers.

5233 Special tool steel, induction-hardened, jaws with 45° curve.
For hard wire = 1,600 N/mm² to 1.8 mm ⌀.

5254 Vanadium steel, oil-hardened, jaws bent by 40°.
For hard wire = 1,800 N/mm² to 2.2 mm ⌀.

Part No.	Length mm	5233	5254
0200	200	10.46 (512)	17.21 (525)



Radio Pliers VDE

Design: DIN ISO 5745, flat-round, curved jaws, ridged gripping surfaces, induction-hardened cutting edges, for hard and medium-hard wire, **chromium-plated head,** handles insulated up to 1,000 v, in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/Part 201.

5236 Special tool steel, induction-hardened, jaws with 45° curve.
For hard wire = 1,600 N/mm² to 1.8 mm ⌀.

5257 Vanadium steel, oil-hardened, jaws with 45° curve.
For hard wire = 1,800 N/mm² to 2.2 mm ⌀.

Part No.	Length mm	5236	5257
0200	200	12.56 (512)	19.28 (525)

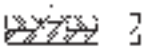


Centre Cutters

Design: Chromium-vanadium electric steel, oil-hardened, **head polished,** with forged-on articulated axle for heavy-duty applications. Cuts hard or thick wires requiring less effort than diagonal side cutting pliers of the same size. Cutting edges induction-hardened approx. 64 HRC, handles plastic-coated.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²





Part No.	Length mm	5278	Cutting capacity ⌀ mm soft wire	medium wire	hard wire	piano wire
0250	250	22.01 (525)	>5.0	5.0	3.8	3.5

End Cutting Pliers

Design: Special tool steel, oil-hardened. **Head polished,** handles plastic-coated. For hard and soft wires. Cutting edges induction-hardened, hardness approx. 61 HRC.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²



Part No.	Length mm	5284	Cutting capacity ⌀ mm soft wire	medium wire	hard wire
0180	180	8.76	>4.0	3.2	2.5
0200	200	11.05 (525)	>4.0	3.5	2.8

High-Leverage End Cutting Pliers

Design: DIN ISO 5748. Head polished. High cutting performance with low effort due to optimum harmonisation of cutting angle and leverage. Cutting edges induction-hardened (64 HRC). Handles plastic-coated.

Application: For cutting hard and soft wire. Also suitable for twisting and cutting binding wire.

5280 From special tool steel.
Soft wire = 200 N/mm²
Medium-hard wire = 800 N/mm²
Hard wire = 1,600 N/mm²
Piano wire = 2,000 N/mm²



5280 format professional quality

5281 Chromium-vanadium electric steel, oil-hardened and annealed.
Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²





5281

Part No.	Length mm	5280	5281	soft wire	Cutting capacity ⌀ mm medium wire	hard wire	piano wire
0140	140	–	14.08	4.0	3.1	2.0	1.5
0160	160	11.35	14.86	4.0	3.4	2.5	2.0
0200	200	–	18.43	4.0	4.2	2.0	2.5
		(512)	(525)				

Bolt End Cutting Pliers

Design: Compared with other lever end cutting pliers especially high cutting performance, with only little force due to optimal transmission ratio. Cutting edges induction-hardened. Hardness approx. 64 HRC. Vanadium electric steel, oil-hardened, **head polished,** handles plastic-coated.



Soft wire = 220 N/mm²
Medium wire = 750 N/mm²
Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²



Part No.	Length mm	5287	soft wire	Cutting capacity ⌀ mm medium wire	hard wire	piano wire
0200	200	26.06 (525)	6.0	4.0	3.5	3.0

Diagonal Side Cutting Pliers

Diagonal Side Cutting Pliers

Design: DIN ISO 5749, induction-hardened cutting edges, for hard and soft wire.
Polished head, plastic-covered handles.

5290 Special tool steel, induction-hardened.
Medium-hard wire = 800 N/mm²
Hard wire = 1,600 N/mm²

5299 Vanadium electric steel, oil-hardened.
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²

Part No.	Length mm	5290	5299	Cutting capacity ø mm medium wire	hard wire
0110	110	–	9.00	2.0	1.2
0125	125	5.10	9.00	2.3	1.5
0140	140	5.70	9.08	2.5	1.8
0160	160	6.11	9.21	2.8	2.0
0180	180	7.14 (512)	10.13 (525)	3.0	2.5


5290 format professional quality


5299

Diagonal Side Cutting Pliers

Design: DIN ISO 5749, induction-hardened cutting edges, for hard and soft wire.
Polished head, handles with composite plastic covers.

5292 Special tool steel, induction-hardened.
Medium-hard wire = 800 N/mm²
Hard wire = 1,600 N/mm²

5300 Vanadium electric steel, oil-hardened.
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²

Part No.	Length mm	5292	5300	Cutting capacity ø mm medium wire	hard wire
0125	125	6.67	10.90	2.3	1.5
0140	140	7.44	11.05	2.5	1.8
0160	160	8.20	11.35	2.8	2.0
0180	180	9.72 (512)	12.18 (525)	3.0	2.5


5292 format professional quality


5300

Diagonal Side Cutting Pliers

Design: DIN ISO 5749, induction-hardened cutting edges, for hard and soft wire.
Chromium-plated head, handles with composite plastic covers.

5293 Special tool steel, induction-hardened.
Medium-hard wire = 800 N/mm²
Hard wire = 1,600 N/mm²

5302 Vanadium electric steel, oil-hardened.
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²

Part No.	Length mm	5293	5302	Cutting capacity ø mm hard wire	medium wire
0125	125	7.42	12.88	2.3	1.5
0140	140	8.44	12.96	2.5	1.8
0160	160	8.80	13.49	2.8	2.0
0180	180	9.98 (512)	14.78 (525)	3.0	2.5


5293 format professional quality


5302

Diagonal Side Cutting Pliers VDE

Design: DIN ISO 5749, induction-hardened cutting edges, for hard and soft wire.
Chromium-plated head, handles with multi-component plastic covers. Insulated up to 1,000 v, in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/Part 201.

5296 Special tool steel, induction-hardened.
Medium-hard wire = 800 N/mm²
Hard wire = 1,600 N/mm²

5305 Vanadium electric steel, oil-hardened.
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²

Part No.	Length mm	5296	5305	Cutting capacity ø mm medium wire	hard wire
0125	125	8.85	14.16	2.3	1.5
0140	140	8.85	14.33	2.5	1.8
0160	160	10.72	15.39	2.8	2.0
0180	180	12.04 (512)	16.53 (525)	3.0	2.5


5296 format professional quality


5305

Side Stripping Pliers

Design: Made of special tool steel, oil-hardened, with precision stripping holes for single-lead wires, induction-hardened cutting edges, for soft wire = 220 N/mm² to 4 mm ∅, cutting edge hardness approx. 60 HRc. **Head chromium-plated,** handles with multi-component plastic covers. Insulated up to 1,000 v, in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/Part 201.





Part No.	Length mm	5308	Wire cross section mm²
0160	160	22.39 (525)	1.5 + 2.5

Diagonal Side Cutting (Power) Pliers

Design: DIN ISO 5749, induction-hardened cutting edges, for hard wire and piano wire.
Polished head, plastic-covered handles.

5314 Made of special steel, induction-hardened.
Medium-hard wire = 800 N/mm²
Hard wire = 1,600 N/mm²
Piano wire = 2,000 N/mm²

5323 Powerful tool, **applied force reduced by 21 %** due to improved lever transmission – in contrast to conventional side cutting pliers of same length. Made of vanadium electric steel, oil-hardened. With forged-on articulated axle for heavy duty applications.

Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²



5314 format professional quality



5323

Part No.	Length mm	5314	5323	Cutting capacity ∅ mm medium wire	hard wire	piano wire
0140	140	–	11.35	3.1	2.0	1.5
0160	160	7.88	11.65	3.4	2.5	2.0
0180	180	8.35	12.80	3.8	2.7	2.2
0200	200	9.54	14.08	4.2	3.0	2.5
0250	250	– (512)	17.51 (525)	4.6	3.5	3.0

Diagonal Side Cutting (Power) Pliers

Design: DIN ISO 5749, induction-hardened cutting edges, for hard wire and piano wire.
Polished head, handles with composite plastic covers.

5315 Special steel, induction-hardened.
Medium-hard wire = 800 N/mm²
Hard wire = 1,600 N/mm²
Piano wire = 2,000 N/mm²

5322 Powerful tool, **applied force reduced by 21 %** due to improved lever transmission – in contrast to conventional side cutting pliers of same length. Vanadium electric steel, oil-hardened. With forged-on articulated axle for heavy duty applications.

Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²



5315 format professional quality



5322

Part No.	Length mm	5315	5322	Cutting capacity ∅ mm medium wire	hard wire	piano wire
0140	140	–	13.49	3.1	2.0	1.5
0160	160	9.54	13.86	3.5	2.5	2.0
0180	180	10.14	15.31	3.8	2.7	2.2
0200	200	11.89	16.31	4.2	3.0	2.5
0250	250	– (512)	19.50 (525)	4,6	3.5	3.0

Diagonal Side Cutting (Power) Pliers

Design: DIN ISO 5749, induction-hardened cutting edges, for hard wire and piano wire.
Chromium-plated head, handles with multi-component plastic covers.

5317 Made of special steel, induction-hardened.
Medium-hard wire = 800 N/mm²
Hard wire = 1,600 N/mm²
Piano wire = 2,000 N/mm²

5324 Powerful tool, **applied force reduced by 21 %** due to improved lever transmission – in contrast to conventional side cutting pliers of same length. Made of vanadium electric steel, oil-hardened. With forged-on articulated axle for heavy duty applications.

Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²

Part No.	Length mm	5317	5324	Cutting capacity 1mm medium wire	hard wire	piano wire
0160	160	10.55	17.06	3.5	2.5	2.0
0180	180	11.14	18.66	3.8	2.7	2.2
0200	200	12.56	19.58	4.2	3.0	2.5
0250	250	–	23.78	4.6	3.5	3.0
		(512)	(525)			



5317 format professional quality



5324

High-Leverage Diagonal Side Cutting Pliers with Opening Spring

Design: DIN ISO 5749. From vanadium electric steel, oil-hardened and annealed.
Head polished with opening spring, cutting edges induction-hardened (64 HRC), high leverage, **applied force reduced by 21 %** due to improved lever transmission in contrast to conventional side cutting pliers of same length. With forged-on articulated axle for heavy-duty applications. Handles with multi-component plastic covers.

Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²

Part No.	Length mm	5311	Cutting capacity 1mm medium wire	hard wire	piano wire
0180	180	16.84 (525)	3.8	2.7	2.2



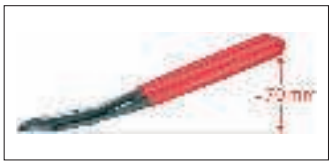
High-Leverage Diagonal Side Cutting Pliers with Bent Head

Design: DIN ISO 5749. From vanadium electric steel, oil-hardened and annealed.
Head polished and bent by 12°, cutting edges induction-hardened (64 HRC), with high-leverage, **applied force reduced by 21 %** due to improved lever transmission in contrast to conventional side cutting pliers of same length.
With forged-on articulated axle for heavy-duty applications. Handles plastic-coated.

Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²

Part No.	Length mm	5312	Cutting capacity 1mm medium wire	hard wire	piano wire
0200	200	15.16 (525)	4.2	3	2.5





Diagonal Side Cutting (Power) Pliers

Diagonal Side Cutting (Power) Pliers VDE

Design: DIN ISO 5749, induction-hardened cutting edges, for hard wire and piano wire.
Chromium-plated head, handles insulated up to 1,000 v, in accordance with IEC 60900, DIN EN 60900, VDE 0682/Part 201.

5320 Special steel, induction-hardened.
Medium-hard wire = 800 N/mm²
Hard wire = 1,600 N/mm²
Piano wire = 2,000 N/mm²

5325 Powerful tool, **applied force reduced by 21 %** due to improved lever transmission – in contrast to conventional side cutting pliers of same length. Made of vanadium electric steel, oil-hardened. With forged-on articulated axle for heavy duty applications.

Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²

Part No.	Length mm	5320	5325	Cutting capacity ∅ mm medium wire	hard wire	piano wire
0160	160	12.22	18.89	3.5	2.5	2.0
0180	180	13.22	20.41	3.8	2.7	2.2
0200	200	15.24	21.63	4.2	3.0	2.5
0250	250	–	27.66	4.6	3.5	3.0
		(512)	(525)			



5320 format professional quality



5325

Diagonal Side Cutting Pliers for Plastics

Design: Vanadium electric steel, oil-hardened, **head polished,** handles plastic-coated, with opening spring, without facette.

Application: For the square cutting of sprues on plastic parts or soft materials such as lead.

5326 Straight cutting edges

5328 45° angle cutting edges

5330 85° angle cutting edges

Part No.	Length mm	5326	5328	5330
0140	140	12.71	–	–
0160	160	12.80	21.88	23.00
0180	180	13.86	–	–
		(525)	(525)	(525)



5326



5328



5330

Pliers Sets

Design: DIN ISO 5749, DIN ISO 5746, DIN ISO 5745
3-piece set: Diagonal side cutting pliers 160 mm, combination pliers 180 mm and radio pliers 200 mm with straight jaws.

format professional quality

Part No.	3-piece set	5327
0010	Head polished, plastic-covered handle	21.27
0020	Head polished, handles with multi-component plastic cover	26.78
0030	Chromium-plated head, handles insulated up to 1,000 v, in accordance with IEC 60900, DIN EN 60 900, VDE 0682/Part 201	31.83
		(512)



5327 0010



5327 0030



5327 0020

Circlip Pliers

Internal Circlip Pliers, Straight

Design: DIN 5256, form C, straight.

Application: For internal circlips.

5617 From chromium-vanadium steel, tips induction-hardened.
Head polished. Handles with plastic covers.

5614 Chromium-vanadium electric steel, forged, oil-hardened and annealed.
Head polished. Anti-slip feature thanks to special tip geometry.
Handles plastic-coated.

5618 From chromium-vanadium electric steel, with exchangeable tips made of annealed steel and releasable locking mechanism.
Head and handles black powder-coated.

Part No.	Size	5617	5614	5618	Length mm 5617	Length mm 5614	Length mm 5618	Hole ø mm
0000	J 0	5.46	7.10	–	135	140	–	8– 13
0001	J 1	5.07	7.10	–	135	140	–	12– 25
0002	J 2	5.36	7.55	–	180	180	–	19– 60
0003	J 3	7.78	8.53	–	225	225	–	40–100
0004	J 4	13.37	14.48	–	320	320	–	85–140
0005	J 5	– (512)	– (525)	71.91 (525)	–	–	570	122–300


5617 format professional quality


5614 CRIMP


5618 CRIMP

Internal Circlip Pliers, Curved

Design: DIN 5256, form D, curved.

Application: For internal circlips.

5623 From chromium-vanadium steel, tips induction-hardened.
Head polished. Handles plastic-coated.

5615 Chromium-vanadium electric steel, forged, oil-hardened and annealed.
Head polished. Anti-slip feature thanks to special tip geometry.
Handles with plastic covers.

5624 From chromium-vanadium electric steel, with exchangeable tips made of annealed steel and releasable locking mechanism.
Head and handles black powder-coated.

Part No.	Size	5623	5615	5624	Length mm 5623	Length mm 5615	Length mm 5624	Hole ø mm
0001	J 01	5.76	8.08	–	125	130	–	8– 13
0011	J 11	5,36	8.08	–	125	130	–	12– 25
0021	J 21	5.91	8.22	–	165	170	–	19– 60
0031	J 31	8.29	9.08	–	210	215	–	40–100
0041	J 41	13.86	15.48	–	300	300	–	85–140
0051	J 51	– (512)	– (525)	72.30 (525)	–	–	590	122–300


5623 format professional quality


5615 CRIMP


5624 CRIMP

External Circlip Pliers, Straight

Design: DIN 5254, form A, straight.

Application: For external circlips and opening of snap rings.

5620 From chromium-vanadium steel, tips induction-hardened. **Head polished.**
Handles plastic-coated.

5631 From chromium-vanadium electric steel, forged, oil-hardened and annealed.
Head polished. Anti-slip feature thanks to special tip geometry.
Handles with plastic covers.

5621 From chromium-vanadium electric steel, with exchangeable tips made of annealed steel and releasable locking mechanism.
Head and handles black powder-coated.

Part No.	Size	5620	5631	5621	Length mm 5620	Length mm 5631	Length mm 5621	Hole ø mm
0000	A 0	7.03	8.22	–	135	140	–	3– 10
0001	A 1	5.52	7.77	–	135	140	–	10– 25
0002	A 2	6.02	8.53	–	180	180	–	19– 60
0003	A 3	8.37	9.30	–	225	210	–	40–100
0004	A 4	13.74	16.15	–	320	320	–	85–140
0005	A 5	– (512)	– (525)	71.91 (525)	–	–	560	122–300


5620 format professional quality


5631 CRIMP


5621 CRIMP

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

External Circlip Pliers

Design: Curved.

5626 From chromium-vanadium steel, tips induction-hardened. **Head polished.** Handles plastic-coated.

5632 From chromium-vanadium electric steel, forged, oil-hardened and annealed. **Head polished.** Anti-slip feature thanks to special tip geometry. Handles with plastic covers.

5627 From chromium-vanadium electric steel, with exchangeable tips made of annealed steel and releasable locking mechanism. **Head and handles black powder-coated.**

Part No.	Size	5626	5632	5627	Length mm 5626	Length mm 5632	Length mm 5627	Hole ø mm
0001	A 01	7.21	8.91	–	125	125	–	3– 10
0011	A 11	5.87	8.46	–	125	125	–	10– 25
0021	A 21	6.37	9.30	–	165	170	–	19– 60
0031	A 31	8.87	10.28	–	210	200	–	40–100
0041	A 41	14.21	17.60	–	300	300	–	85–140
0051	A 51	– (512)	– (525)	72.30 (525)	–	–	570	122–300





5626 format professional quality



5632



5627

Precision Internal Circlip Pliers, Straight





Design: DIN 5256, form C, straight. Chromium-vanadium electric steel, forged, **head grey atramentised,** tips made of high-quality patented formed spring steel wire. **High precision thanks to screwed articulation, thus suitable for heavy-duty applications, up to 10-times longer service life.** The tips feature a large supporting surface, thus no twisting of the circlips. Handles coated with anti-slip plastic.

Application: For heavy-duty installation of internal circlips.

Part No.	Dimensions	5619	Length mm	Hole ø mm
0000	J 0	8.91	140	8– 13
0001	J 1	8.91	140	12– 25
0002	J 2	9.37	180	19– 60
0003	J 3	10.58	225	40–100
0004	J 4	18.13 (525)	320	85–140



Precision Internal Circlip Pliers, Curved





Design: DIN 5256, form D, curved. Chromium-vanadium electric steel, forged, **head grey atramentised,** tips made of high-quality patented formed spring steel wire. **High precision thanks to screwed joint, thus suitable for heavy-duty applications, up to 10-times longer service life.** The tips feature a large supporting surface, thus no twisting of the circlips. Handles coated with anti-slip plastic.

Application: For heavy-duty installation of internal circlips.

Part No.	Dimensions	5625	Length mm	Hole ø mm
0001	J 01	10.13	130	8– 13
0011	J 11	10.13	130	12– 25
0021	J 21	10.28	160	19– 60
0031	J 31	11.35	210	40–100
0041	J 41	19.41 (525)	305	85–140



External Circlip Pliers

Precision External Circlip Pliers, Straight




Design: DIN 5254 A, straight. Chromium-vanadium electric steel, forged, **head grey atramentised,** tips made of high-quality patented formed spring steel wire.
High precision thanks to screwed joint with opening spring seated in the joint, thus suitable for heavy-duty applications, up to **10-times longer service life.**
The tips feature a large supporting surface, thus no twisting of the circlips.
Handles coated with anti-slip plastic.

Application: For heavy-duty installation of external circlips and opening of snap rings.



Part No.	Dimensions	5622	Length mm	Hole ⌀ mm
0000	A 0	10.28	140	3– 10
0001	A 1	9.67	140	10– 25
0002	A 2	10.66	180	19– 60
0003	A 3	11.65	225	40–100
0004	A 4	20.19	320	85–140
		(525)		

Precision External Circlip Pliers, Curved




Design: DIN 5254 B, curved. Chromium-vanadium electric steel, forged, **head grey atramentised,** tips made of high-quality patented formed spring steel wire.
High precision thanks to screwed joint with opening spring seated in the joint, thus suitable for heavy-duty applications, up to **10-times longer service life.**
The tips feature a large supporting surface, thus no twisting of the circlips.
Handles coated with anti-slip plastic.

Application: For heavy-duty installation of external circlips and opening of snap rings.



Part No.	Dimensions	5628	Length mm	Hole ⌀ mm
0001	A 01	11.20	130	3– 10
0011	A 11	10.58	130	10– 25
0021	A 21	11.65	165	19– 60
0031	A 31	12.80	210	40–100
0041	A 41	22.01	305	85–140
		(525)		

Circlip Pliers Sets




Design: Straight form, DIN 5254 A and 5256 C.
Supplied in handy bag.

5616 Internal circlip pliers J1 and J2 (part no. 5617).
External circlip pliers A1 and A2 (part no. 5620).

5629 Precision internal circlip pliers J1 and J2 (part no. 5619).
Precision external circlip pliers A1 and A2 (part no. 5622).



5616 format professional quality

Part No.	Contents	5616 piece	5629 piece
0010	4-piece set	32.36 (512)	42.81 (525)







5629

Electrician's Combination Pliers

Design: Head polished, bronze, handles with tough, coated composite plastic covers, with opening spring.

Part No.	Length mm	5327
0500	125	10.04 (512)

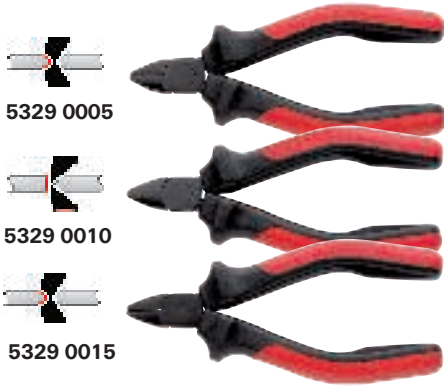


Electrician's Diagonal Side Cutting Pliers

Design: DIN ISO 9654, head polished, bronze, with tough, coated, composite plastic covers, with opening spring.

Medium-hard wire = 800 N/mm²
Hard wire = 1,600 N/mm²
Piano wire = 2,000 N/mm²

Part No.	Design	5329	Length mm	Cutting capacity ∅ mm medium wire	hard wire	piano wire
0005	With bevel	10.04	110	0.2–2.0	0.2–1.2	0.2–0.6
0010	Without bevel	10.04	110	0.2–2.0	–	–
0015	With bevel and wire clamp	10.04 (512)	110	0.2–2.0	0.2–1.2	0.2–0.6

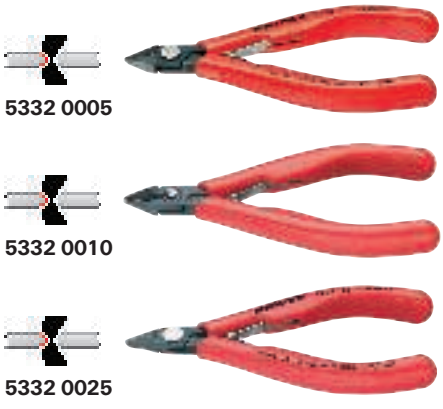


Electrician's Diagonal Side Cutting Pliers

Design: DIN ISO 9654, slim shape, special tool steel, oil-hardened. For ultra-fine cutting of electronic components. Induction-hardened precision cutting edges, hardness approx. 64 HRC, with captive, frictionless double spring.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²

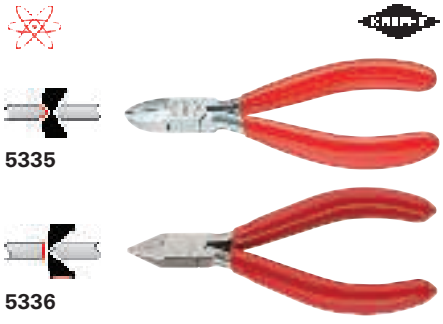
Part No.	Design	5332	Length mm	Cutting capacity ∅ mm soft wire	medium wire	hard wire	piano wire
0005	With bevel	19.58	125	0.2–1.3	0.2–1.0	0.2–0.6	0.2–0.4
0010	With bevel and wire clamp	23.16	125	0.2–1.3	0.2–1.0	0.2–0.6	0.2–0.4
0025	With bevel and small head	22.24 (525)	125	0.2–1.0	0.2–0.6	0.2–0.5	0.2–0.3



Electrician's Diagonal Side Cutting Pliers

Design: DIN ISO 9654, special tool steel, oil-hardened. With play-free joint box. With captive, low-friction double spring. Cutting edges induction-hardened, hardness approx. 62 HRC. **Head polished.** Handles with plastic covers.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²



Part No.	Design	5335	5336	Length mm	Cutting capacity ∅ mm soft wire	medium wire	hard wire
0005	With bevel, round head	17.60	–	115	0.3–1.6	0.3–1.2	0.3–0.5
0010	With bevel, round head	18.74	–	130	0.3–2.0	0.3–1.5	0.3–0.8
0010	Without bevel, pointed head	– (525)	18.43 (525)	115	0.3–1.3	0.3–1.0	–

Electrician's Diagonal Side Cutting Pliers

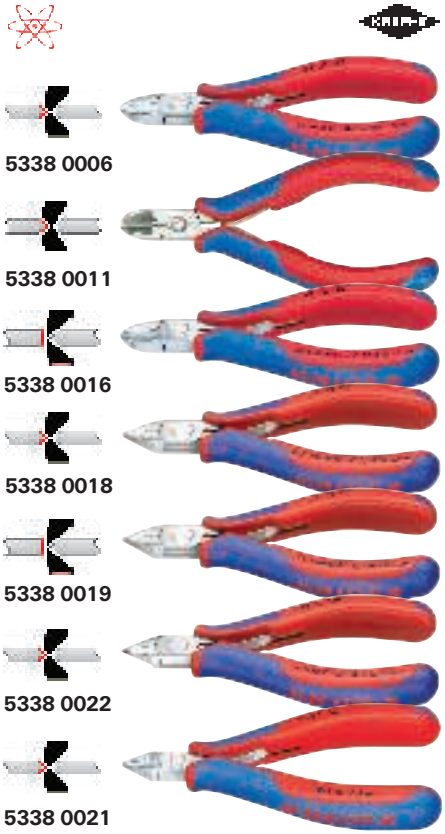
Design: DIN ISO 9654, special tool steel, oil-hardened. With play-free precision joint box. With captive, low-friction double spring. Cutting edges induction-hardened, hardness approx. 62 HRC. **Surface bright-polished,** handles with multi-component plastic covers.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²

Part No.	Design	5338	Length mm	Cutting capacity Ø mm soft wire	medium wire	hard wire
0006	With small bevel, round head	19.73	115	0.3–1.6	0.3–1.2	0.3–0.5
0011	With bevel and wire clip	23.61	115	0.3–1.6	0.3–1.2	0.3–0.5
0016	Without bevel, round head	19.89	115*	0.3–1.3	0.3–1.0	–
0018	With small bevel, pointed head	21.79	115	0.3–1.3	0.3–1.2	0.3–0.5
0019	Without bevel, pointed head	21.26	115*	0.3–1.3	0.3–1.0	–
0022	With small bevel, pointed, flat head	22.33	115*	0.3–1.0	0.3–0.8	0.3–0.5
0021	With small bevel and small pointed heads	21.26	115	0.3–0.8	–	–

* Hardness of cutting edge approx. 57 HRC.

(525)



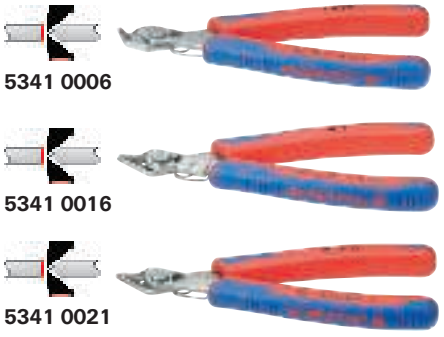
Electrician's Diagonal Side Cutting Pliers Super-Knips

Design: DIN ISO 9654, INOX stainless steel, precision ground cutting edges without bevel, hardness approx. 54 HRC. For plane cutting. Play-free joint with stainless steel rivet, with opening spring. Handles with soft plastic covers.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²

Part No.	Design	5341	Length mm	Cutting capacity Ø mm soft wire	medium wire
0006	Without bevel	11.81	125	0.2–1.6	0.2–1.0
0016	Without bevel, with wire clamp	13.25	125	0.2–1.6	0.2–1.0
0021	Without bevel, points 60° angled	13.33	125	0.2–1.0	0.2–0.6

(525)



Electrician's Diagonal Side Cutting Pliers Super Knips

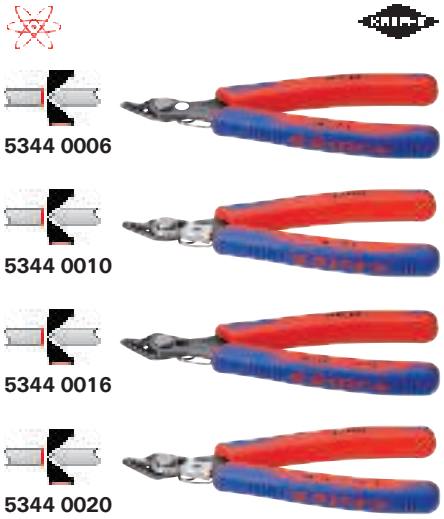
Design: DIN ISO 9654, special tool steel, precision ground cutting edges without bevel, hardness approx. 64 HRC. For plane cutting. Play-free joint with stainless steel rivet, with opening spring. Handles with soft plastic covers.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²

Part No.	Design	5344	Length mm	Cutting capacity Ø mm soft wire	medium wire	hard wire
0006	Without bevel, slender head	13.10	125*	0.2–1.0	–	–
0010	Without bevel, slender head, with wire clip	14.94	125*	0.2–1.0	–	–
0016	Without bevel	12.26	125	0.2–1.6	0.2–1.2	0.2–0.6
0020	Without bevel, with wire clip	13.71	125	0.2–1.6	0.2–1.2	0.2–0.6

* Hardness approx. 60 HRC.

(525)



Precision Electrician's Diagonal Side Cutting Pliers

Design: DIN ISO 9654, highest quality chromium-vanadium ball bearing steel, forged. **Non-glare polished head, with screwed joint** for highest precision and play-free operation of the pliers as well as captive, low-friction double opening spring. **The joint surfaces are precision ground** and ensure low-friction movement along the entire opening range. With sharpened and induction-hardened (64 HRC) cutting edges. Handles with ergonomic multi-component plastic covers developed especially for the precision pliers. Safe grip as well as low-fatigue operation.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²

Application: Precision electrician's diagonal side cutting pliers for demanding cutting operations in confined spaces in the electric and precision engineering range.

Part No.	Design	5363	Length mm	Cutting capacity ∅ mm soft wire	medium wire	hard wire
0005	Very small bevel, mini head	28.19	120	1	0.55	0.3
0010	Without bevel, mini head	31.31	120	0.8	0.4	–
0015	Very small bevel, round head	27.34	125	1.5	0.8	0.5
0020	Without bevel, round head	30.54	125	1.2	0.65	–
0025	Very small bevel, pointed head	27.34	125	1.3	0.7	0.4
0030	Without bevel, pointed head	30.54	125	1	0.55	–
		(525)				



5363 0005–0010



5363 0015–0020



5363 0025–0030

Electrician's Oblique Cutting Pliers

Design: DIN ISO 9654, special tool steel, oil-hardened. Play-free joint box, with opening spring. Cutting edge hardness from approx. 56 HRC. **Surface polished.** Handles with multi-component plastic covers.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²

Part No.	Design	5350	Length mm	Cutting capacity ∅ mm soft wire	medium wire	hard wire
0005	With small bevel, short head bent by 15°	24.45	120	1.5	1.0	0.5
0010	With small bevel, small head bent by 27°	23.99	115	1.5	1.0	0.5
0016	Without bevel, small head, bent by 27°	24.76	115	1.3	–	–
0021	Mini cutting edge with small bevel	25.06	120	0.6	–	–
0025	Mini cutting edge with small bevel, head with groove	27.28	120	1.5	–	–
		(525)				


5350 0005


5350 0010


5350 0016


5350 0021


5350 0025

Electrician's End Cutting Pliers

Design: DIN ISO 9654, special tool steel, oil-hardened. Play-free joint box, with opening spring. Cutting edge hardness approx. 56 HRC. **Surface polished.** Handles with multi-component plastic covers.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²

Part No.	Design	5350	Length mm	Cutting capacity ∅ mm soft wire	medium wire	hard wire
0003	With bevel	22.78	115	2.0	1.0	0.6
		(525)				



Electrician's End Cutting Pliers

Design: DIN ISO 9654, polished head, burnished, handles with composite plastic covers, with opening spring.

Part No.	Length mm	5352	Cutting values, copper wire mm
0005	130	10.04 (512)	0.5–2.0



Electrician's Wire Stripping Pliers

Design: For strands max. 3 mm ∅. **Head polished, burnished,** handles with composite plastic covers, with regulating screw for adjusting to the desired wire or stand diameter, easily adjustable due to knurled screw with opening spring.

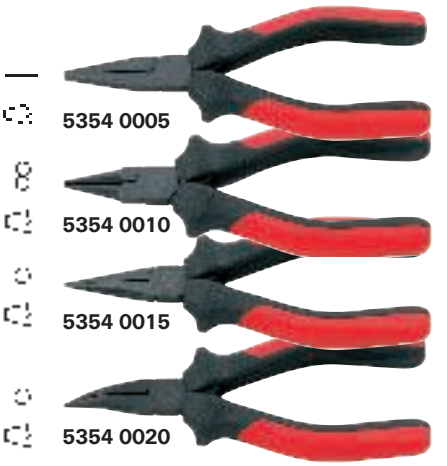
Part No.	Length mm	5348
0005	125	11.38 (512)



Electrician's Gripping Pliers

Design: DIN ISO 9655, polished head, burnished, smooth jaws, handles with composite plastic covers, with opening spring.

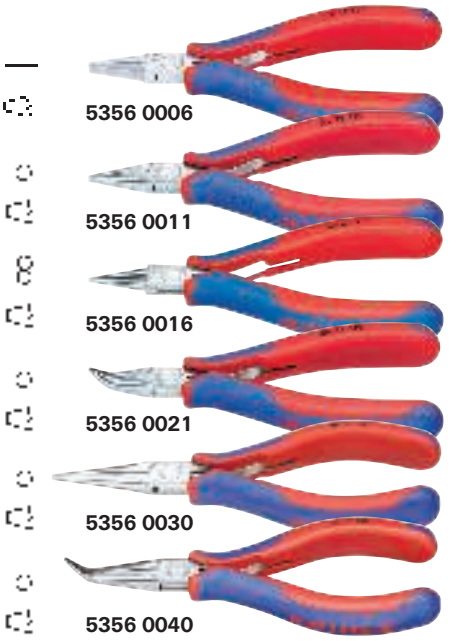
Part No.	Design	5354	Length mm
0005	Flat jaws	8.37	130
0010	Pointed-round jaws	8.37	130
0015	Pointed half-round jaws	8.71	130
0020	Pointed half-round jaws, tips bent by 35°	8.90 (512)	130



Electrician's Gripping Pliers

Design: DIN ISO 9655, special tool steel, oil-hardened, **surface bright polished.** Handles with multi-component plastic covers.

Part No.	Design	5356	Length mm	Jaw length mm
0006	Flat wide jaws	16.31	115	22.5
0011	Flat round jaws for the bending of wire eyelets	16.31	115	22.5
0016	Pointed round jaws for the bending of wire eyelets	16.31	115	22.5
0021	Flat round jaws, bent by 45°	17.60	115	22.5
0030	Flat-round, long jaws	19.36	145	40.0
0040	Flat-round, long jaws, bent by 45°	20.88 (525)	145	35.0



Precision Electrician's Gripping Pliers

Design: DIN 9655, highest quality chromium-vanadium ball bearing steel, forged. **Non-glare polished head, with screwed joint** for highest precision and play-free operation of the pliers as well as captive, low-friction double opening spring. **The joint surfaces are precision ground** and ensure low-friction movement along the entire opening range. With sharpened and induction-hardened (64 HRC) gripping surfaces. Handles with ergonomic multi-component plastic covers developed especially for the precision pliers. Safe grip as well as low-fatigue operation.

Application: Precision electrician's gripping pliers for demanding assembly operations in confined spaces in electric and fine mechanics engineering. For gripping, holding and bending.

Note: For ESD precision electrician's gripping pliers see page 5/40.

Part No.	Design	5363	Length mm	Jaw length mm
0040	Flat wide jaws	23.54	130	19
0045	Flat round jaws	23.54	130	19
0050	Pointed round jaws	23.54	130	21
		(525)		



5363 0040



5363 0045



5363 0050

Electrician's Pliers Sets

Design: In convenient storage box made of impact-resistant plastic material with foam inlet.

Application: Suitable for working on electronic components.

Part No.	Content of set	5361 Set	Content	
0015	8-piece	75.88	Electrician's gripping pliers, flat-round jaws	115 mm
			Electrician's diagonal side cutting pliers, with small bevel	115 mm
			Wera Electrician's screwdriver, slotted head, 2035	2.5 x 0.4 x 80 mm
			Wera Electrician's screwdriver, slotted head, 2035	3 x 0.5 x 80 mm
			Wera Electrician's screwdriver, slotted head, 2035	3.5 x 0.6 x 80 mm
			Wera Electrician's screwdriver, slotted head, 2035	4 x 0.8 x 80 mm
			Wera Electrician's screwdriver, slotted head, 2050PH	PH 0 x 60 mm
			Wera Electrician's screwdriver, slotted head, 2050PH	PH 1 x 80 mm
		(525)		



Electrician's Diagonal Side Cutting Pliers ESD

Design: Special tool steel, oil-hardened. Play-free joint box, with captive, low-friction double spring. Cutting edges induction-hardened, hardness from approx. 62 HRC. **Surface bright polished.** Handles with multi-component plastic covers.

Application: Controlled and slow (dissipative) discharge of electrostatic energy for protection of the respective components.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²

Part No.	Design	5368	Length mm	Cutting capacity ∅ mm soft wire	medium wire	hard wire
0005	With small bevel, round head	20.88	115	0.3–1.6	0.3–1.2	0.3–0.5
0010	Without bevel, round head	21.03	115*	0.3–1.3	0.3–1.0	–
0015	Pointed head with small bevel	22.54	115	0.3–1.3	0.3–1.2	0.3–0.5
0020	Pointed head without bevel	22.39	115*	0.3–1.3	0.3–1.0	–
0025	Pointed, flat head with small bevel	23.46	115*	0.3–1.0	0.3–0.8	0.3–0.5
0030	Pointed mini head with small bevel	22.39	115	0.3–0.8	–	–

* Hardness of cutting edge approx. 57 HRC. (525)


5368 0005


5368 0010


5368 0015


5368 0020


5368 0025


5368 0030

Electrician's Diagonal Side Cutting Pliers ESD Super Knips

Design: Special tool steel, **head burnished,** cutting edges induction-hardened for prolonged service life, precision ground for best separation results. Hardness approx. 64 HRC. Play-free joint box, with stainless steel rivet, with opening spring. Handles with multi-component plastic covers.

Application: Controlled and slow (dissipative) discharge of electrostatic energy for protection of the respective components.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²

Part No.	Design	5371	Length mm	Cutting capacity ∅ mm soft wire	medium wire	hard wire
0005	Without bevel	13.02	125*	0.2–1.6	0.2–1.0	–
0008	Without bevel, with wire clamp	14.25	125*	0.2–1.6	0.2–1.0	–
0010	Without bevel	13.49	125	0.2–1.6	0.2–1.2	0.2–0.6
0013	Without bevel, with wire clamp	14.70	125	0.2–1.6	0.2–1.2	0.2–0.6

* INOX stainless steel, hardness approx. 54 HRC. (525)


5371 0005


5371 0008


5371 0010


5371 0013

Precision Electrician's Diagonal Side Cutting Pliers ESD

Design: Highest quality chromium-vanadium ball bearing steel, forged. **Non-glare polished head, with screwed joint** for highest precision and play-free operation of the pliers as well as captive, low-friction double opening spring. **The joint surfaces are precision ground** and ensure low-friction movement along the entire opening range. With sharpened and induction-hardened (64 HRC) cutting edges. Handles with ergonomic multi-component plastic covers developed especially for the precision pliers. Safe grip as well as low-fatigue operation.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²

Application: Precision electrician's diagonal side cutting pliers for demanding cutting operations in confined spaces in electric engineering, especially where **ESD-compatible tools** are required.

Part No.	Design	5364	Length mm	Cutting capacity ∅ mm soft wire	medium wire	hard wire
0005	Very small bevel, mini head	29.24	120	1	0.55	0.3
0010	Without bevel, mini head	32.38	120	0.8	0.4	–
0015	Very small bevel, round head	28.49	125	1.5	0.8	0.5
0020	Without bevel, round head	31.62	125	1.2	0.65	–
0025	Very small bevel, pointed head	28.49	125	1.3	0.7	0.4
0030	Without bevel, pointed head	31.62	125	1	0.55	–
		(525)				



5364 0005–0010



5364 0015–0020



5364 0025–0030

Electrician's Oblique Cutting Pliers ESD

Design: Special tool steel, oil-hardened. With play-free joint box, with captive, low-friction double spring. Cutting edges induction-hardened, hardness approx. 56 HRC. **Surface bright polished.** Handles with multi-component plastic covers.

Application: Controlled and slow (dissipative) discharge of electrostatic energy for protection of the respective components.

Soft wire = 220 N/mm²

Part No.	Design	5365	Length mm	Cutting capacity ∅ soft wire mm
0005	Mini cutting edge with small bevel	26.43	120	0.6
		(525)		



Electrician's Gripping Pliers ESD

Design: Special tool steel, oil-hardened. Precision pliers for ultra-fine electronical and mechanical precision assembly. With play-free precision joint box with captive low friction double spring. **Surface polished,** handles with multi-component plastic covers.

Application: Dissipative, derivates electro-static energy slowly and in a controlled way to protect components.

Part No.	Design	5362	Length mm
0005	Flat wide jaws	17.75	115
0010	Flat round jaws	17.75	115
0015	Pointed round jaws	17.75	115
0020	Flat round jaws, bent by 45°	19.20	115
		(525)	



5362 0005



5362 0010



5362 0015



5362 0020

ESD Electrician's Pliers

Precision Electrician's Gripping Pliers ESD

Design: Highest quality chromium-vanadium ball bearing steel, forged. **Non-glare polished head, with screwed joint** for highest precision and play-free operation of the pliers as well as captive, low-friction double opening spring. **The joint surfaces are precision ground** and ensure low-friction movement along the entire opening range. With sharpened and induction-hardened (64 HRC) gripping surfaces. Handles with ergonomic multi-component plastic covers developed especially for the precision pliers. Safe grip as well as low-fatigue operation.

Application: Precision electrician's gripping pliers for demanding assembly operations in confined spaces in electric engineering, especially where **ESD-compatible tools** are required. For gripping, holding and bending.

Part No.	Design	5364	Length mm	Jaw length mm
0040	Flat wide jaws	24.69	130	19
0045	Flat round jaws	24.69	130	19
0050	Pointed round jaws	24.69 (525)	130	21



5364 0040



5364 0045



5364 0050

Electrician's Tool Sets ESD

Design: Supplied in convenient storage box made of impact-resistant plastic material with foam inlet, incl.

electrician's gripping pliers ESD, flat round jaws, 115 mm (part no. 5362 0010)
electrician's diagonal side cutting pliers ESD, with small bevel, 115 mm (part no. 5368 0005)
electrician's screwdriver ESD, slotted head, 2.5 x 0.4 x 80 mm (part no. 6369 0025)
electrician's screwdriver ESD, slotted head, 3 x 0.5 x 80 mm (part no. 6369 0030)
electrician's screwdriver ESD, slotted head, 3.5 x 0.6 x 80 mm (part no. 6369 0035)
electrician's screwdriver ESD, slotted head, 4 x 0.8 x 80 mm (part no. 6369 0040)
electrician's Philips screwdriver ESD, PH 0 x 60 mm (part no. 6370 0010)
electrician's Philips screwdriver ESD, PH 1 x 80 mm (part no. 6371 0015)

Application: For finest assembly operations in confined spaces in electric engineering, especially where **ESD-compatible tools** are required.

Part No.	Quantity	5366 Set
0015	8 pcs.	82.04 (525)



Cable Cutters

Design: For copper and aluminium cable. Made of chromium-vanadium steel, oil-hardened, handles with multi-component plastic covers.

Not suitable for steel wire and hard drawn copper conductors.

Part No.	Cutting capacity ∅ mm	5390	Cutting capacity mm²	Length mm
0180	12	15.91	40	170
0230	18	20.93 (512)	60	230



Cable Cutters

Design: For copper and aluminium cable, **head bronze.** Suitable for cutting, dismantling and stripping.

Not suitable for steel wire and hard drawn copper conductors.

5380 Vanadium steel, forged. No crushing, no deformation. Handles plastic-coated.

5383 With initial and final cut (blade 1 and 2), cables with a diameter of over 20 mm ∅ can be cut. Made of special tool steel, oil-hardened. Handles plastic-coated.

Part No.	Cutting capacity ∅ mm	5380	5383	Cutting capacity mm²	Length mm
0165	15	15.39	–	50	165
0200	20	– (525)	24.14 (525)	70	200



5380



5383

Cable cutters VDE

Design: For copper and aluminium cable, handles insulated up to 1,000 v, according to IEC 60900, VDE 0682/part 201, no crushing, no deformation, suitable for cutting, dismantling and stripping.

Not suitable for steel wire and hard drawn copper conductors.

5381 Vanadium steel, forged, **head chromium-plated.**

5382 With initial and final cut (blade 1 and 2), cables with a diameter of over 20 mm ∅ can be cut. Made of special tool steel, oil-hardened, **head chromium-plated.**

5389 Special stainless steel. Punched out of stainless steel, **head polished.**

Part No.	Cutting capacity ∅ mm	5381	5382	5389	Cutting capacity mm²	Length mm
0165	15	24.91	–	–	50	165
0230	16	–	–	28.86	50	230
0200	20	– (525)	31.69 (525)	– (525)	70	200



5381



5382



5389

Cable Cutters

Design: Head bronzed, handles coated with thick-walled plastic. Releasing of blade in any position. Cutting tools for crush-free cutting of copper and aluminium cables.

Not suitable for steel wire, reinforced steel cables, aluminium alloys and hard drawn copper conductors.

Part No.	Cutting capacity ∅ mm	5400	Cutting values mm²	Length mm
0265	35	183.18	240 (fine wire)	265
0010	Spare blade	56.60	–	–
0260	45*	251.56	300 (fine wire)	260
0020	Spare blade	63.10	–	–
		(523)		

* for 4 x 95 mm² aluminium sector cable.



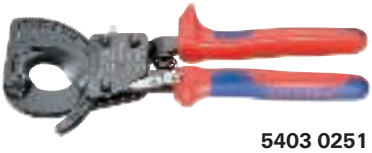
Cable Cutters

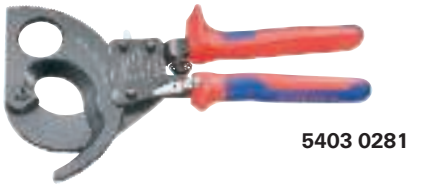
Design: Head varnished, handles with multi-component covers, VDE approved according to DIN EN 60900, one-hand operation using ratchet system, two-speed gear rim drive for easy cutting, smooth and clean cutting without crushing.

Not suitable for steel ropes or steel wire.

Part No.	Cutting capacity ∅ mm	5403	Cutting values mm²	Length mm
0251	32	128.12	240	250
0281	52*	171.98	380	280
		(525)		

* for 4 x 150 mm² aluminium sector cable.





Cable Cutters

Design: Precision cutting edges made of special tool steel, oil-hardened and annealed, legs made of powder-coated steel tube. **Head varnished.** Very high cutting performance by two-hand operation and ratchet system. Low force applied by optimum lever transmission. Opening of the tool is possible in any cutting position. Can also be used in confined spaces. Handles with plastic covers.

Application: For smooth cutting of single-wire and multi-wire copper and aluminium cables without crushing, even cables with hard rubber or plastic cover. Also suitable for steel tape armoured buried cables.

Note: Not suitable for steel wire and wire ropes.





Part No.	Cutting capacity ∅ mm	5404	Cutting values mm²	Length mm
0720	60	401.90	740	720
		(525)		

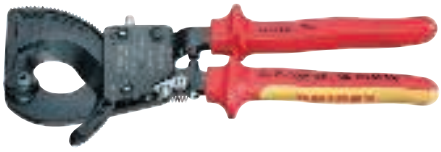
Cable Cutters VDE

Design: Head varnished, handles with multi-component covers, VDE approved according to DIN EN 60900, one-hand operation using ratchet system, two-speed gear rim drive for easy cutting, smooth and clean cutting without crushing.

Not suitable for steel ropes or steel wire.

Part No.	Cutting capacity ∅ mm	5406	Cutting values mm²	Length mm
0250	32	140.21	240	250
0280	52*	186.44	380	280
		(525)		

* for 4 x 150 mm² aluminium sector cable.



Cable Cutters

Design: For copper and aluminium cables, plastic-coated handles, easy and accurate cut due to novel cutting edge geometry, low force applied by optimum lever transmission.

Not suitable for steel ropes or steel wire.

5395 Robust design in tool steel alloy with steel tube handles, **head bronze.**

5392 Vanadium steel, **head polished,** short design, low weight.

5396 Special tool steel, **head polished,** low effort due to double lever, changeable blade.

Not suitable for steel ropes or steel wire.

Part No.	Cutting capacity ∅ mm	5395	5392	5396	Cutting capacity mm²	Length mm
0597	25	69.04	–	–	150	597
0500	27	–	62.62	–	150	500
0600	27	–	–	108.66	150	600
		(512)	(525)	(525)		



5395 format professional quality



5392



5396

Cable Cutters VDE

Design: Special tool steel, for copper and aluminium cable, **head polished,** handles insulated up to 1,000 v, according to IEC 60900, DIN EN 60 900, VDE 0682/part 201, low effort due to double lever, changeable blade.

Not suitable for steel ropes or steel wire.

Part No.	Cutting capacity ∅ mm	5397	Cutting capacity mm²	Length mm
0600	27	131.33 (525)	150	600



Wire Rope Shears

Design: For medium-hard wire ropes, e.g. Bowden wire, but also for cable and round steel. Special cutting edge geometry prevents the wire rope from fanning out. With opening spring and pawl, cutting edges induction-hardened. **Head polished,** handle plastic-covered.

Part No.	Cutting capacity ∅ mm	5421	Cutting capacity round steel ∅ mm	Cutting capacity copper and aluminium mm²	Length mm
0190	6	22.29 (525)	4	10	190



Wire Rope and Cable Cutters

Design: For copper and aluminium cables, wire ropes and round steel, also suitable for cutting of overhead cables with strain relief, **head varnished,** handles plastic-coated, high-strength aluminium jaws and optimum lever transmission, angular cutting blades allow cutting of individual rope lines, changeable blade.

Part No.	Cutting capacity ∅ mm	5410	Cutting capacity round steel ∅ mm	Cutting capacity copper and aluminium mm²	Length mm
0445	7	134.38	10	95	445
0600	9	166.84 (525)	14	150	600



Stripping Tools for Round Cables

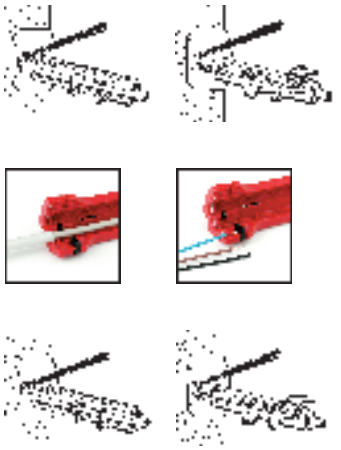
Design: Hollow plastic handle, with fixed blades.

5413 For all conventional round cables. For stripping in areas which are difficult to reach, e.g. branch and distribution boxes. Suitable for damp-proof installation cables.

5414 For stripping NYM cables, also suitable for left-hand operation. Stripping of tough external insulation and stripping device for strand by changing of position.

5415 Blade can be pulled out. For all conventional round cables. For stripping in areas which are difficult to reach, e.g. branch and distribution boxes. Suitable for damp-proof installation cables.

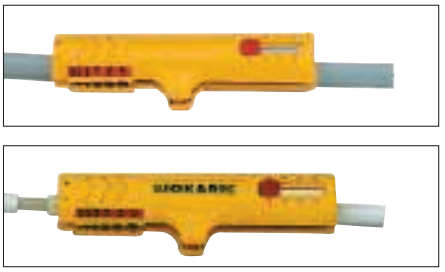
5417 For all conventional PVC insulated data and control cables.

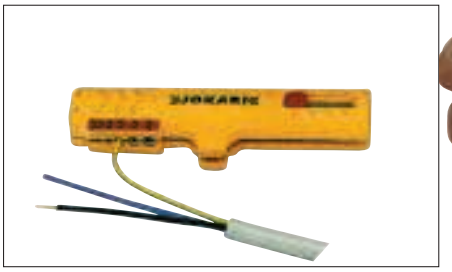




Part No.	0005	0005	0005	0005
Machining range	8–13 mm ⌀	8–13 mm ⌀/ 1.5 + 2.5 mm²	8–13 mm ⌀/ 0.2–4.0 mm²	5–15 mm ⌀/ 0.2–4.0 mm²
5413	8.89	–	–	–
5414	–	11.09	–	–
5415	–	–	16.67	–
5417	–	–	–	25.87

(523)



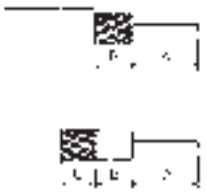




Coax-Stripping Tools

Design: Glass-fibre reinforced hollow plastic handle, with fixed blades. 2-level insulation. For all conventional coaxial cables (e.g. B. RG 58; 59). Also suitable for PVC-Flex 3 x 0.75 mm². With longitudinal graduation.

Application: For stripping areas which are difficult to access.





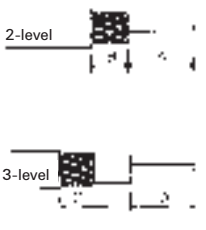
Part No.	Machining range ⌀ mm	5420
0005	4.8–7.5	8.89

(523)

Coax-Stripping Tools

Design: Basic device without blade for changeable blade cassettes. For coaxial cables and round (shielded) data lines.

Application: For 2- or 3-level stripping in one operation.





5423 0010



5423 0015



5423 0005

Part No.	Machining range ⌀ mm	5423
0005	2.5–8	51.11
0010	Blade cassette blue 6.5 mm = B	19.66
0015	Blade cassette green 7.1/5.1 mm = C/B	21.23

(523)

Coax-Stripping Tools

Design: With three built-in blades, cutting depth can be adjusted for each blade individually with a hexagon socket wrench, distance of blades remains constant.

Application: For stripping of sheathing, shielding and insulating in a single work step.





Part No.	Machining range	5424
0005	RG 58, RG 59, RG 62	14.14 (525)

Cable Knives

5426 One-piece, fixed carbon steel blade, with wooden handle.

5429 One-piece tool, fold-away blade, with wooden handle, grooved blade.

5432 Two-piece tool, fold-away blades with wooden handle, cutting and reaming blade.

5430 One-piece tool, fold-away blade, grooved, with plastic handle.

5433 1-piece tool, stainless steel, foldable, with plastic cover and blade locking by push button, 2-grooved blade.

Part No.	Length mm	5426	5429	5432	5430	5433
0160	160	–	–	4.72	–	–
0185	185	2.05	–	–	–	–
0195	195	–	2.52	–	2.72	7.51
		(512)	(512)	(512)	(512)	(512)



5426



5429 format professional quality



5432 format professional quality



5430 format professional quality



5433 format professional quality

Cable Knives VDE

Design: With transparent protective cover, handle insulated up to 1,000 v according to IEC 60900, DIN EN 60900, VDE 0682/part 201.

5434 Ergonomic safety handle, sturdy, fixed blade.

5435 Ergonomic safety handle, sturdy, fixed blade, blade back plastic-coated to avoid short-circuits.

5438 With shoe at the blade tip, no damage of the conductor insulation, sickle-shaped blade made of stainless steel.

Part No.	Length mm	5434	5435	5438	Blade length mm
0155	155	–	–	18.83	38
0180	180	7.10 (525)	7.31 (525)	– (525)	50



5434



5435



5438

Universal Cable Knives

Design: With rotational internal cutter and hook blade. The rotational internal cutter can switch from circular to longitudinal cutting. This enables long sections to be stripped in a single operation. The knurled screw at the end of the handle allows fast and precise setting of the cutting depth. Includes spare cutter inside the handle.

Application: For fast and easy stripping of standard cable types.

Part No.	Machining range ∅	5441	5442
0005	8–28 mm	4.40	7.31
0010	Spare blade	1.34 (512)	1.01 (523)



5441 format professional quality

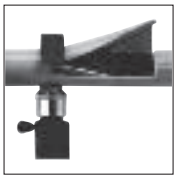


5442 JOKARI

Universal Cable Knives

Design: Plastic-coated aluminium handle, sharp-edge steel bracket for breaking up of cut-in insulation material. Cutting depth can be set by the knurled screw up to insulation thickness of 4.5 mm, knife pivoting for round, longitudinal or spiral cut. Incl. spare blade in the handle.

Application: For quick stripping of round cables with various cross sections in any position.



Weidmüller



Part No.	Machining range ∅	5444
0005	6–25 mm	27.52
0010	Spare blade	4.17 (523)

Stripping Tools

Design: Cutting depth adjustable using knurled screw, up to insulation thickness 5.0 mm, knife pivoting for round, longitudinal cut. With exchangeable blade, to be used on both sides.

Application: For stripping round cables, removes all insulation layers.





Part No.	Machining range ∅ mm	5445
0005	From 25	120.05 (525)

All-Purpose Wire Stripping Tools

Design: Fibre glass reinforced polyamide housing, hardened special steel blade. Range of use: outer insulation from 4 to 13 mm ∅, strands and conductors from 0.5 to 16 mm², coaxial cable from approx. 4 to 8 mm ∅.

Application: For stripping outer and inner insulation as well as the step-by-step stripping of coaxial cables with only one tool without readjusting.

format professional quality



Part No.	5447
0005	7.44 (512)

Side Stripping Pliers

Design: Made of special tool steel, oil-hardened, with precision stripping holes for single-lead wires, induction-hardened cutting edges, for soft wire = 220 N/mm² to 4 mm ∅, cutting edge hardness approx. 60 HRC. **Head chromium-plated,** handles with multi-component plastic covers. Insulated up to 1,000 v, in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/Part 201.





Part No.	Length mm	5308	Wire cross section mm²
0160	160	22.39 (525)	1.5 + 2.5

Wire Stripping Pliers

Design: Head polished. The desired wire or strand ⌀ (max. ⌀ 5 mm and/or 10 mm²) can be adjusted using a knurled screw and counternut. With opening spring. Handles with plastic covers.

Application: For stripping single-wire, multi-wire and fine-wire conductors with plastic or rubber insulation.

5449 Special tool steel, induction-hardened.

5454 Special tool steel, oil-hardened and annealed.

Part No.	Length mm	5449	5454
0160	160	7.21 (512)	10.31 (525)



5449 format professional quality



5454

Wire Stripping Pliers

Design: Head polished. The desired wire or strand ⌀ (max. ⌀ 5 mm and/or 10 mm²) can be adjusted using a knurled screw and counternut. With opening spring. Handles with multi-component plastic covers.

Application: For stripping single-wire, multi-wire and fine-wire conductors with plastic or rubber insulation.

5452 Special tool steel, induction-hardened.

5455 Special tool steel, oil-hardened and annealed.

Part No.	Length mm	5452	5455
0160	160	8.59 (512)	11.96 (525)



5452 format professional quality



5455

Wire Stripping Pliers

Design: Head chromium-plated. The desired wire or strand ⌀ (max. ⌀ 5 mm and/or 10 mm²) can be adjusted using a knurled screw and counternut. With opening spring. Handles with multi-component plastic covers.

Application: For stripping single-wire, multi-wire and fine-wire conductors with plastic or rubber insulation.

5450 Special tool steel, induction-hardened.

5456 Special tool steel, oil-hardened and annealed.

Part No.	Length mm	5450	5456
0160	160	9.95 (512)	13.82 (525)



5450 format professional quality



5456

Wire Stripping Pliers VDE

Design: Head chromium-plated. The desired wire or strand ⌀ (max. ⌀ 5 mm and/or 10 mm²) can be adjusted using a knurled screw and counternut. With opening spring. Handles with multi-component plastic covers, **insulated up to 1,000 v, according to IEC 60 900, DIN EN 60 900, VDE 0682/part 201.**

Application: For stripping single-wire, multi-wire and fine-wire conductors with plastic or rubber insulation.

5453 Special tool steel, induction-hardened.

5459 Special tool steel, oil-hardened and annealed.

Part No.	Length mm	5453	5459
0160	160	11.39 (512)	15.65 (525)



5453 format professional quality



5459

Automatic Wire Stripping Pliers

Design: For stripping all flexible and massive conductors.
With wire cutter up to max. 2 mm ∅. No adjustment to conductor cross-section required, with length stop.

Part No.	Wire cross-section mm²	5474
0005	0.2– 6	9.99
0010	0.5–16	36.03
		(512)



Automatic Wire Stripping Pliers

Design: For stripping (3–7 mm) and cutting (max. 2.8 mm ∅) fine-wired and solid PVC-insulated conductors. No adjustment to conductor cross-section required.

Part No.	Wire cross-section mm²	5468
0005	0.08–1	45.60
0010	Spare blade	14.15
		(523)



Automatic Wire Stripping Pliers

Design: For stripping of one, multiple and fine-wire conductors with standard insulation. With wire cutter up to max. 2.5 mm². No adjustment to conductor cross-section required, with length stop.

Part No.	Wire cross-section mm²	5470
0005	0.2–6	20.26
		(525)



Automatic Wire Stripping Pliers

Design: For stripping and cutting fine-wired and solid PVC-insulated conductors and multi-wire cables. No adjustment to conductor cross-section required, with length stop adjustment. The blade holders are replaceable.

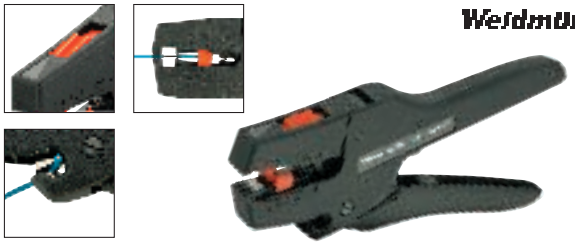
Part No.	Wire cross-section mm²	5478
0005	0.08–6	35.03
		(512)



Automatic Wire Stripping Pliers

Design: For stripping and cutting fine-wired and solid PVC-insulated conductors. No adjustment to conductor cross-section required.

Part No.	Wire cross-section mm²	5486
0005	0.08–6	48.74
0010	Spare blade	18.87
		(523)



Automatic Wire Stripping Pliers

Design: Glass-fibre reinforced plastic, for stripping (max. 20 mm) and cutting (max. 6 mm²) fine-wired and solid PVC-insulated conductors. No adjustment to conductor cross-section required.

Part No.	Wire cross-section mm²	5489
0005	6–16	99.85
0010	Spare blade	36.16
		(523)



Automatic Wire Stripping Pliers

Design: For stripping and cutting fine-wired and solid plastic and rubber-insulated conductors. Wire cutters for copper and aluminium conductors, multiple wire up to 10 mm², single-wire up to 6 mm². No adjustment to conductor cross-section required, with length stop adjustment. Ergonomic soft handle.

Part No.	Wire cross-section mm²	5490
0005	0.03–10	52.86 (525)



Automatic Wire Stripping Pliers

Design: For stripping and cutting fine-wired and solid plastic and rubber-insulated conductors. Wire cutters for copper and aluminium conductors, multiple wire up to 10 mm², single-wire up to 6 mm². No adjustment to conductor cross-section required.

Part No.	Wire cross-section mm² 5480	5483	5480	5483
0005	0.03–10*	2.5–16	41.90	61.24
0010	Spare blade	–	10.28	–
0015	Spare clamping jaws	–	2.37	–
0020	Spare length stop	–	1.37	–
			(525)	(525)

* with length stop



5480



5483

Automatic Wire Stripping Pliers

Design: No adjustment to conductor cross-section required. Suitable for stripping PVC Flex 3 x 0.75 mm².

Part No.	Wire cross-section mm²	5495
0005	6–16	46.39 (523)



5495

Automatic Wire Stripping Pliers

Design: Suitable for insulation materials which are difficult to machine, such as Teflon, with novel patented stripping mechanism, with adjustable length stop.

Part No.	Wire cross-section mm²	5497
0005	0.03–2.08	68.63
1005	Spare blade for 0.03–2.08	32.83
0010	0.14–6	67.80
1010	Spare blade for 0.14–6	32.83 (525)



Automatic Wire Stripping Pliers

Coated-Wire Stripping Tweezers

Design: Spring steel, for removing enamel-insulation from Cu wires, with changeable, milled blades, blades for wire ∅ 0.6 mm, plastic handles.

Part No.	Length mm	5448
0120	120	5.70 (525)



Spare Blades

Part No.	Length mm	5448
1005	Spare blade ∅ 0.5	1.98
1010	Spare blade ∅ 0.6	1.98
1015	Spare blade ∅ 0.8	1.98
1020	Spare blade ∅ 1.0	1.98 (525)

Ferrule Pliers

Design: Head polished. Handles plastic-coated.

Application: Reliable pressing **(trapezoidal profile)** of ferrules DIN 46228 (part 1 + 4), with plastic collar.

5499 Special tool steel, hardened.

5500 Vanadium steel, oil-hardened and annealed.

Part No.	Wire cross-section mm²	5499	5500	Length mm
0005	0.25–2.5	9.93 (512)	13.52 (525)	145





5499 format professional quality



5500

Ferrule Pliers

Design: Head polished. 8 deep recesses with tapered side faces. Handles with plastic covers.

Application: Reliable pressing **(half-round profile)** of ferrules DIN 46228 (part 1 + 4), with plastic collar.

5501 Special tool steel, induction-hardened.

5503 Special tool steel, oil-hardened and annealed.

Part No.	Wire cross-section mm²	5501	5503	Length mm
0006	0.25–16	10.92 (512)	20.41 (525)	180





5501 format professional quality



5503

Ferrule Pliers with Front Loading

Design: Special tool steel, oil-hardened and annealed. **Head polished.** Handles with plastic covers.

Application: Reliable pressing of ferrules DIN 46228 (part 1 + 4), with plastic collar. Ideal for confined spaces, e.g. narrow and deep control cabinets.

Part No.	Wire cross-section mm²	5504	Length mm
0005	0.5–6	25.29 (525)	180





Crimping Pliers

Design: For ferrules DIN 46228 (part 1 + 4) with and without plastic collars.
Trapezoidal pressing, release possible in any position.

Part No.	Wire cross-section mm²	5518	Application	Length mm
0000	0.5– 4	17.51	Ferrules with/without plastic collar	185
0005	0.5– 6	53.38	Ferrules with/without plastic collar	205
0010	6 –16	53.38	Ferrules with/without plastic collar	205
		(512)		



Crimping Pliers

Design: For ferrules DIN 46228 (part 1 + 4) with and without plastic collars.
Trapezoidal pressing, ratchet ensures correct, complete crimping.
Release possible in case of faulty operation.

5506 Only one crimp station for the whole range of wire cross-sections.

5515 Three crimp stations for the whole range of wire cross-sections:
Crimp complies with EN 60947-1.

Part No.	Wire cross-section mm²	5506	5515	Application	Length mm
0005	0.5– 4	121.06	–	Ferrules with and without plastic collar	200
0005	6 –16	–	125.78	Ferrules with and without plastic collar	200
		(523)	(523)		



Crimping Pliers

Design: For ferrules DIN 46228 (part 1 + 4) with and without plastic collars.
Ratchet for correct and complete crimping. Ratchet release option in case of faulty operation. Only one die for the entire cross-section range.

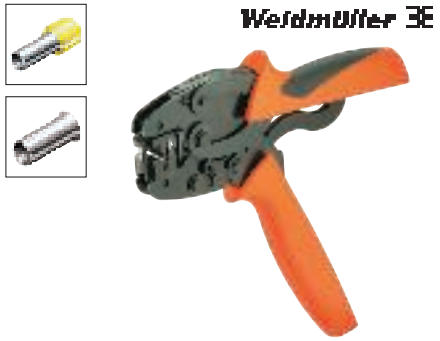
Part No.	Wire cross-section mm²	5521	Application	Length mm
0005	0.25–6	132.07	Ferrules with and without plastic collar/ twin ferrules 0.5–4 mm²	200
		(523)		



Crimping Pliers

Design: For ferrules DIN 46228 (part 1 + 4) with and without plastic collars.
Ratchet for correct and complete crimping. Ratchet release option in case of faulty operation. Only one die for the entire cross-section range.
Die turnable for insertion in the ferrules.

Part No.	Wire cross-section mm²	5527	Application	Length mm
0005	0.14–6	128.93	Ferrules with and without plastic collar/ twin ferrules 0.5–4 mm²	200
		(523)		



Crimping Pliers

Design: For ferrules DIN 46228 (part 1 + 4) with and without plastic collars. Made of special steel, oil-hardened and annealed, head bronze, handles with lever transmission and multi-component plastic covers. Optimal crimping results due to precision profiles and releasable ratchet.

Part No.	Wire cross-section mm²	5508	Application	Length mm
0005	0.25–6	64.98 (525)	Ferrules with and without plastic collar	220





Crimping Pliers

Design: Tempered special steel. **Reduction of effort by up to 30 %** compared with conventional crimping pliers due to novel lever transmission. Two-hand operation for convenient crimping of large conductor cross-sections, optimum crimping results thanks to ratchet, releasable, adjustable crimping pressure.

Part No.	Wire cross-section mm²	5509	Application	Length mm
0005	0.25– 6	75.35	Ferrules with plastic collar	250
0010	10 – 25	75.35	Ferrules with plastic collar	250
0015	35 + 50	96.21 (525)	Ferrules with plastic collar	250




Self-Adjustable Crimping Pliers

Design: All stressed parts made of special steel and tempered. For crimping of ferrules according to DIN. Crimping in one profile. Square and hexagon crimping for optimum contact areas irrespective of the positioning in the clamp connection, increased leverage due to lever transmission, ratchet for reliable crimping, releasable.

Part No.	Wire cross-section mm²	5512	Application	Length mm
0005	0.08–10	101.13	Ferrules with plastic collar	180
0015	0.08– 6	106.41 (525)	Ferrules with plastic collar	180





5512 0005 Square crimping




5512 0015 Hexagon crimping

Self-Adjustable Crimping Pliers

Design: All stressed parts made of special steel and tempered. For crimping of ferrules according to DIN. Crimping in one profile from 0.08 to 10 + 16 mm², AWG 28–7. Square crimping for optimum contact areas irrespective of the positioning in the clamp connection, handy and light design, low-fatigue operation due to high transmission and user-friendly handles. Ratchet for reliable crimping, releasable.

Part No.	Wire cross-section mm²	5524	Application	Length mm
0005	0.08–10	100.13	Ferrules with plastic collar	190*
0010	0.08–10 + 16	108.13 (525)	Ferrules with plastic collar	190

* Ferrules of max. 2.5 mm² can be loaded parallel from the side.





5524 0005




5524 0010

Crimping Pliers for Cable Lugs

Crimp Grip Pliers

Design: High-tensile steel, **head and handle bronzed.** With quick-release lever and toggle lever transmission for high pressure while the required effort is low. Adjustable crimping pressure.

5529 0005 For insulated cable lugs and plug-in connectors.
5529 0010 For non-insulated, open plug-in connectors.

Application: For solderless connections. Reproducible crimping quality.

Part No.	Wire cross-section mm²	5529	Application	Length mm
0005	0.5–6	49.44	From the side	215
0010	0.5–6	75.03 (525)	From the side	215

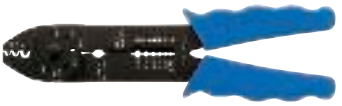




Crimping Pliers

Design: For cutting and stripping of insulated and non-insulated cable lugs and plug-in connectors. Shear-off function for screwed bolts ranging from M 2.6 to M 5 and stripping function of PVC conductors of 0.5–6 mm².

Part No.	Wire cross-section mm²	5530	Application	Length mm
0005	0.5–6	12.51	Insulated cable lugs	220
0010	0.5–6	12.51 (512)	Non-insulated cable lug	225

5530 0005

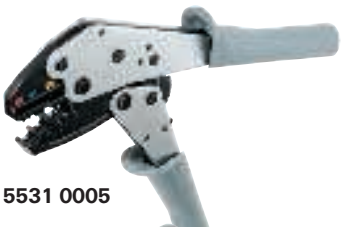



5530 0010

Crimping Pliers

Design: For PVC and polyamide-insulated connectors. Forced locking mechanism ensures high-quality crimping. Release option in case of faulty handling.

Part No.	Wire cross-section mm²	5531	Application	Length mm
0005	0.5–6	61.71	Insulated cable lugs	235
0010	0.5–6	53.38 (512)	Non-insulated cable lugs	205

5531 0005




5531 0010

Crimping Pliers

Design: For PVC- and polyamide-insulated connectors, with stop for exact positioning of the terminals. Ratchet ensures best crimping quality. Release option in case of faulty crimping, certified according to DIN EN 60352 T.1 (gas-free compression).

Part No.	Wire cross-section mm²	5539	Application	Length mm
0005	0.5–6	125.78 (523)	Insulated cable lugs	240




Crimping Pliers for Cable Lugs

Lever-Action Crimping Pliers

Design: Tempered special steel, oil-hardened, head burnished, handles with novel lever transmission, with multi-component covers.
Optimum crimping performance due to precision profiles and releasable ratchet.

Part No.	Wire cross-section mm	5510	Application	Length mm
0005	1.5–10	64.98	Push connectors	220
0010	0.5–10	64.98	Non-insulated cable lugs and plug-in connectors	220
0015	0.1– 2.5	74.81	Non-insulated, open plug-in connectors	220
0020	0.5– 6	74.81	Non-insulated, open plug-in connectors	220
0025	0.5– 6	60.94 (525)	Insulated cable lugs	220







Lever-Action Crimping Pliers

Design: Tempered special steel. **Reduction of effort by up to 30 %** compared with conventional crimping pliers thanks to novel lever transmission.
Two-hand operation for convenient crimping of large conductor cross-sections.
Optimum crimping results due to ratchet, releasable. Adjustable crimping pressure.

Part No.	Wire cross-section mm²	5536	Application	Length mm
0005	0.1 – 2.5	90.88	Non-insulated, open plug-in connector, roll-crimping	250
0010	0.5– 6	89.06	Non-insulated, open plug-in connector, roll-crimping	250
0013	0.5– 10	78.78	Non-insulated cable lugs and connectors	250
0014	16 + 25	81.74	Non-insulated cable lugs and connectors	250
0015	0.5– 6	70.68 (525)	Insulated cable lugs	250








Lever-Action Crimping Pliers

Design: Special steel, oil-hardened. Head burnished, handles with lever transmission and multi-component plastic covers. Optimum crimping results due to precision profiles and releasable ratchet.

Part No.	Capacity	5543	Application	Length mm
0005	RG 58, 174, 188, 316	87.75 (525)	Coax BNC plug-in connectors	220



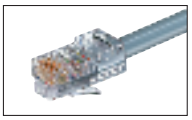

Crimping Pliers

Design: For cutting and stripping of flat, not shielded telephone cable and crimping of WE plugs. Precise crimping due to parallel crimping and ratchet (releasable).
Reduction of effort thanks to lever system with length cutter and stripping tool.

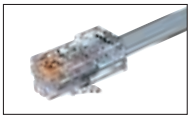
5545 Crimping range: RJ 11/12 (6-pole), 9.65 mm, RJ45 (8-pole) 11.68 mm.

5546 Crimping range: RJ 10 (4-pole), 7.65 mm; RJ11/12 (6-pole), 9.65 mm; RJ45 (8-pole) 11.68 mm.

Part No.	Capacity	5545	5546	Application	Length mm
0005	6 + 8-pole	26.59	–	WE plugs	190
0005	4 + 6 + 8-pole	– (525)	86.24 (525)	WE plugs	200



5545



5546

Wire Laying Devices

Design: For wire laying on strips, sockets and fields, pressing-in and cutting in a single step. For UTP and STP cable with conductor ⌀ 0.4–0.8 mm.
With integrated pull hook and release blade, plastic housing.





Part No.	Application	5541
0005	UTP and STP cable, LSA–Plus and similar	26.21 (525)

Ferrule Sets

Design: Ferrules with plastic collar, from 0.5–16 mm².

Supplied in plastic box, incl.
250 ferrules for conductor cross-section 0.5 mm²
250 ferrules for conductor cross-section 0.75 mm²
500 ferrules for conductor cross-section 1 mm²
500 ferrules for conductor cross-section 1.5 mm²
250 ferrules for conductor cross-section 2.5 mm²
250 ferrules for conductor cross-section 4 mm²
100 ferrules for conductor cross-section 6 mm²
50 ferrules for conductor cross-section 10 mm²
50 ferrules for conductor cross-section 16 mm²





Part No.	5566 Set
0050	55.04 (512)

Crimping Sets for Ferrules

Design: Ferrules with plastic collar, from 0.5–4 mm².

Supplied in plastic case, incl.
Stripping pliers (part no. 5486 0005)
Crimping pliers (part no. 5506 0005)
500 ferrules for conductor cross-section 0.5 mm²
500 ferrules for conductor cross-section 0.75 mm²
1,000 ferrules for conductor cross-section 1 mm²
1,000 ferrules for conductor cross-section 1.5 mm²
500 ferrules for conductor cross-section 2.5 mm²
250 ferrules for conductor cross-section 4 mm²

Crimping pliers, for ferrules DIN 46228 (part 1 + 4), with and without plastic collars, 0.5–4 mm². Only one crimping station for the entire cross-section range. In plastic case.





Part No.	5551 Set
0005	209.11 (523)

Crimping Sets for Ferrules

Design: Ferrules with plastic collar, from 6–16 mm².

Supplied in plastic case, incl.
Stripping pliers (part no. 5489 0005)
Crimping pliers (part no. 5515 0005)
200 ferrules for conductor cross-section 6 mm²/20 mm
200 ferrules for conductor cross-section 10 mm²/22 mm
200 ferrules for conductor cross-section 16 mm²/24 mm
100 ferrules for conductor cross-section 16 mm²/28 mm

Crimping pliers, for ferrules DIN 46228 (part 1 + 4), with and without plastic collars, 6–16 mm². Three crimping stations for the entire cross-section range. In plastic case.





Part No.	5554 Set
0005	251.56 (523)

Crimping Sets for Ferrules



Design: Ferrules with plastic collar, from 0.5–10 mm².

Supplied in stackable TANOS MINI-Systainer®, incl.
Crimping pliers (part no. 5512 0005) and the following ferrules:
200 ferrules for conductor cross-section 0.5 mm²
200 ferrules for conductor cross-section 0.75 mm²
200 ferrules for conductor cross-section 1 mm²
200 ferrules for conductor cross-section 1.5 mm²
200 ferrules for conductor cross-section 2.5 mm²
100 ferrules for conductor cross-section 4 mm²
100 ferrules for conductor cross-section 6 mm²
50 ferrules for conductor cross-section 10 mm²

Note: TANOS MINI-Systainers® can be connected with one another.

Part No.	5547 Set
0005	157.76 (525)



Crimping Sets for Ferrules



Design: Ferrules with plastic collar, from 0.5–10 mm².

Supplied in stackable TANOS MINI-Systainer®, incl.
Automatic stripping pliers (part no. 5480 0005),
Crimping pliers (part no. 5512 0005) and the following ferrules:
200 ferrules for conductor cross-section 0.5 mm²
200 ferrules for conductor cross-section 0.75 mm²
200 ferrules for conductor cross-section 1 mm²
200 ferrules for conductor cross-section 1.5 mm²
200 ferrules for conductor cross-section 2.5 mm²
100 ferrules for conductor cross-section 4 mm²
100 ferrules for conductor cross-section 6 mm²
50 ferrules for conductor cross-section 10 mm²

Note: TANOS MINI-Systainers® can be connected with one another.

Part No.	5549 Set
0005	207.27 (525)



Crimping Sets for Ferrules



Design: Ferrules with plastic collar, from 0.5–10 mm².

Supplied in stackable TANOS MINI-Systainer®, incl.
Automatic stripping pliers (part no. 5480 0005),
Crimping pliers (part no. 5524 0005) and the following ferrules:
200 ferrules for conductor cross-section 0.5 mm²
200 ferrules for conductor cross-section 0.75 mm²
200 ferrules for conductor cross-section 1 mm²
200 ferrules for conductor cross-section 1.5 mm²
200 ferrules for conductor cross-section 2.5 mm²
100 ferrules for conductor cross-section 4 mm²
100 ferrules for conductor cross-section 6 mm²
50 ferrules for conductor cross-section 10 mm²

Note: TANOS MINI-Systainers® can be connected with one another.

Part No.	5550 Set
0005	206.28 (525)



Crimping Sets for Ferrules



Design: Ferrules with plastic collar, from 0.5–10 mm².

Supplied in stackable TANOS MINI-Systainer®, incl.
Automatic stripping pliers (part no. 5490 0005),
Crimping pliers (part no. 5524 0005) and the following ferrules:
200 ferrules for conductor cross-section 0.5 mm²
200 ferrules for conductor cross-section 0.75 mm²
200 ferrules for conductor cross-section 1 mm²
200 ferrules for conductor cross-section 1.5 mm²
200 ferrules for conductor cross-section 2.5 mm²
100 ferrules for conductor cross-section 4 mm²
100 ferrules for conductor cross-section 6 mm²
50 ferrules for conductor cross-section 10 mm²

Note: TANOS MINI-Systainers® can be connected with one another.

Part No.	5540 Set
0005	217.33 (525)



Crimping Sets for Ferrules



Design: Ferrules with plastic collar, from 0.5–4 mm².

Supplied in plastic case, incl.
Ferrule pliers (part no. 5499 0005),
Voltage tester and the following ferrules:
100 ferrules for conductor cross-section 0.5 mm²
100 ferrules for conductor cross-section 0.75 mm²
100 ferrules for conductor cross-section 1.5 mm²
100 ferrules for conductor cross-section 2.5 mm²
50 ferrules for conductor cross-section 4 mm²

Part No.	5534 Set
0005	18.06 (512)



Crimping Sets for Ferrules



Design: Ferrules with plastic collar, from 0.5–16 mm².

Supplied in stackable TANOS MINI-Systainer®, incl.
Ferrule pliers (part no. 5503 0005) and the following ferrules:
200 ferrules for conductor cross-section 0.5 mm²
200 ferrules for conductor cross-section 0.75 mm²
200 ferrules for conductor cross-section 1 mm²
200 ferrules for conductor cross-section 1.5 mm²
150 ferrules for conductor cross-section 2.5 mm²
75 ferrules for conductor cross-section 4 mm²
75 ferrules for conductor cross-section 6 mm²
50 ferrules for conductor cross-section 10 mm²
40 ferrules for conductor cross-section 16 mm²

Note: TANOS MINI-Systainer® can be connected with one another.

Part No.	5544 Set
0005	89.00 (525)



Sets of Cable Lugs/Connectors





format professional quality



Design: Insulated ring-type cable lugs, pin-type cable lugs, shock connectors and flat connectors 0.5–6 mm².

Supplied in plastic case, incl.

50 ring-type cable lugs	for conductor cross-section	0.5–1.5 mm²
50 ring-type cable lugs	for conductor cross-section	1.5–2.5 mm²
50 ring-type cable lugs	for conductor cross-section	4 –6 mm²
50 pin-type cable lugs	for conductor cross-section	0.5–1.5 mm²
50 pin-type cable lugs	for conductor cross-section	1.5–2.5 mm²
50 pin-type cable lugs	for conductor cross-section	4 –6 mm²
50 shock connectors	for conductor cross-section	0.5–1.5 mm²
50 shock connectors	for conductor cross-section	1.5–2.5 mm²
50 shock connectors	for conductor cross-section	4 –6 mm²
50 flat receptacles	for conductor cross-section	0.5–1.5 mm²
50 flat receptacles	for conductor cross-section	1.5–2.5 mm²
50 flat receptacles	for conductor cross-section	4 –6 mm²

Part No.	5567 Set
0005	36.70 (512)

Crimping Sets for Insulated Cable Lugs





Weidmüller



Design: Insulated ring-type cable lugs, pin-type cable lugs, shock connectors and flat connectors 0.5–6 mm².

Supplied in plastic case, incl.
Stripping pliers (part no. 5486 0005)
Crimping pliers (part no. 5539 0005)

100 **ring-type cable lugs**	for conductor cross-section	0.5–1.0 mm², ø 4 mm
100 ring-type cable lugs	for conductor cross-section	0.5–1.0 mm², ø 5 mm
100 ring-type cable lugs	for conductor cross-section	1.5–2.5 mm², ø 5 mm
100 ring-type cable lugs	for conductor cross-section	1.5–2.5 mm², ø 6 mm
100 ring-type cable lugs	for conductor cross-section	4.0–6.0 mm², ø 5 mm
100 ring-type cable lugs	for conductor cross-section	4.0–6.0 mm², ø 6 mm
100 **fork-type cable lugs**	for conductor cross-section	0.5–1.0 mm², ø 4 mm
100 fork-type cable lugs	for conductor cross-section	1.5–2.5 mm², ø 5 mm
100 fork-type cable lugs	for conductor cross-section	4.0–6.0 mm², ø 6 mm
100 **pin-type cable lugs**	for conductor cross-section	0.5–1.0 mm², ø 4 mm
100 pin-type cable lugs	for conductor cross-section	1.5–2.5 mm², ø 5 mm
100 pin-type cable lugs	for conductor cross-section	4.0–6.0 mm², ø 6 mm
100 **shock connectors**	for conductor cross-section	0.5–1.0 mm²
100 shock connectors	for conductor cross-section	1.5–2.5 mm²
50 shock connectors	for conductor cross-section	4.0–6.0 mm²
100 **receptacles**	for conductor cross-section	0.5–1.0 mm², ø 2.8 x 0.8 mm
100 receptacles	for conductor cross-section	0.5–1.0 mm², ø 6.3 x 0.8 mm
100 receptacles	for conductor cross-section	1.5–2.5 mm², ø 6.3 x 0.8 mm
100 receptacles	for conductor cross-section	4.0–6.0 mm², ø 6.3 x 0.8 mm

Part No.	5560 Set
0005	330.18 (523)

Crimping Sets for Insulated Cable Lugs







Design: Insulated ring-type cable lugs, shock connectors, receptacles, round receptacles and round plugs.

Supplied in stackable TANOS MINI-Systainer®, incl. **Crimp grip pliers** (part no. 5529 0005) and the following cable lugs:

25 **ring-type cable lugs** for conductor cross-section 0.5–1.0 mm², ⌀ 4 mm
25 ring-type cable lugs for conductor cross-section 1.5–2.5 mm², ⌀ 4 mm
25 ring-type cable lugs for conductor cross-section 4.0–6.0 mm², ⌀ 5 mm
25 ring-type cable lugs for conductor cross-section 4.0–6.0 mm², ⌀ 6 mm

25 **shock connectors** for conductor cross-section 0.5–1.0 mm²
25 shock connectors for conductor cross-section 1.5–2.5 mm²

25 **receptacles** for conductor cross-section 0.5–1.0 mm², ⌀ 6.3 x 0.8 mm
25 receptacles for conductor cross-section 1.5–2.5 mm², ⌀ 6.3 x 0.8 mm
25 receptacles for conductor cross-section 1.5–2.5 mm², ⌀ 8.0 x 0.8 mm

25 **round receptacles** for conductor cross-section 0.5–1.0 mm², ⌀ 4 mm
25 **round plugs** for conductor cross-section 0.5–1.0 mm², ⌀ 4 mm

Note: TANOS MINI-Systainers® can be connected with one another.

Part No.	5557 Set
0005	125.92 (525)

Crimping Sets for Insulated Cable Lugs







Design: Insulated ring-type cable lugs, shock connectors, receptacles, round receptacles and round plugs.

Supplied in stackable TANOS MINI-Systainer®, incl. **Lever-action crimping pliers "PreciForce"** (part no. 5510 0025) and the following cable lugs:

25 **ring-type cable lugs** for conductor cross-section 0.5–1.0 mm², ⌀ 4 mm
25 ring-type cable lugs for conductor cross-section 0.5–1.0 mm², ⌀ 5 mm
25 ring-type cable lugs for conductor cross-section 1.5–2.5 mm², ⌀ 4 mm
25 ring-type cable lugs for conductor cross-section 1.5–2.5 mm², ⌀ 5 mm
25 ring-type cable lugs for conductor cross-section 1.5–2.5 mm², ⌀ 6 mm
20 ring-type cable lugs for conductor cross-section 4.0–6.0 mm², ⌀ 6 mm
20 ring-type cable lugs for conductor cross-section 4.0–6.0 mm², ⌀ 8 mm

25 **insulated shock connectors** for conductor cross-section 0.5–1.0 mm²
25 insulated shock connectors for conductor cross-section 1.5–2.5 mm²
20 insulated shock connectors for conductor cross-section 4.0–6.0 mm²

25 **receptacles** for conductor cross-section 0.5–1.0 mm², ⌀ 6.3 x 0.8 mm
25 receptacles for conductor cross-section 1.5–2.5 mm², ⌀ 6.3 x 0.8 mm

Note: TANOS MINI-Systainers® can be connected with one another.

Part No.	5537 Set
0005	144.81 (525)

Crimping Sets for Insulated Cable Lugs







Design: Insulated ring-type cable lugs, shock connectors, receptacles, round receptacles and round plugs.

Supplied in stackable TANOS MINI-Systainer®, incl. **Lever-action crimping pliers "PreciForce"** (part no. 5510 0025), **Automatic stripping pliers** (part no. 5490 0005) and the following connectors:

25 **ring-type cable lugs** for conductor cross-section 0.5–1.0 mm², ⌀ 4 mm
25 ring-type cable lugs for conductor cross-section 0.5–1.0 mm², ⌀ 5 mm
25 ring-type cable lugs for conductor cross-section 1.5–2.5 mm², ⌀ 4 mm
25 ring-type cable lugs for conductor cross-section 1.5–2.5 mm², ⌀ 5 mm
25 ring-type cable lugs for conductor cross-section 1.5–2.5 mm², ⌀ 6 mm
20 ring-type cable lugs for conductor cross-section 4.0–6.0 mm², ⌀ 6 mm
20 ring-type cable lugs for conductor cross-section 4.0–6.0 mm², ⌀ 8 mm

25 **insulated shock connectors** for conductor cross-section 0.5–1.0 mm²
25 insulated shock connectors for conductor cross-section 1.5–2.5 mm²
20 insulated shock connectors for conductor cross-section 4.0–6.0 mm²

25 **receptacles** for conductor cross-section 0.5–1.0 mm², ⌀ 6.3 x 0.8 mm
25 receptacles for conductor cross-section 1.5–2.5 mm², ⌀ 6.3 x 0.8 mm

Note: TANOS MINI-Systainers® can be connected with one another.

Part No.	5538 Set
0005	198.06 (525)

Voltage Tester Screwdrivers

5563 **Design:** Single-pole, for 150–250 volts, in accordance with DIN 57860 Part 6 and VDE 0680/6.

5564 **Design:** For 220–250 volts, with fully insulated grip. Clip in insulated material. Indication in the handle for convenient reading by the user.

Part No.	Tip width mm	5563	5564	Total length mm
0005	3	3.96	0.70	150
0010	3.5	–	0.81	190
		(542)	(514)	



Voltage Tester Sticks

Design: For 230–1,000 volts, certified according to IEC 900; CE, IEC 61010-1 (AC tester). For detecting cable breaks, defect fuses in connectors and fixtures, as well as series switches, and bulbs. Scope of supply: 2 micro batteries 1.5 v.

Part No.	Length mm	5569
0050	146	17.29 (544)



Auto Circuit Testers

Design: For 6–24 volts, in brass, with steel tip, firm cable and clip.

Part No.	5565
0005	1.45 (514)



Voltage Testers Car Check

Design: Because of its low power consumption of only 1.5 mA, the Car Check is ideal for troubleshooting on electrical components: Conventional test lamps often cause damage. Nominal voltage range: 3–48 v DC. Checking device: measuring tip, insert needle and mechanical slide feature, test lead = 130 cm.

Part No.	5570
0005	10.23 (515)



Voltage Testers

Design: Tested and certified according to **IEC/EN 61243-3 (DIN VDE 0682-401)**, two-pole. Housing made of shock- and break-proof plastic material, with two testing handles and flexible cable.

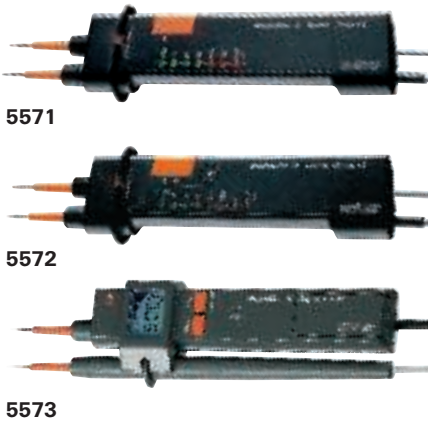
Application: For testing of AC and DC voltage as well as continuity, semiconductor and phase tests.

5571 **Master-Check 3.2**

5572 **Combi-Check 1.2**

5573 **Digi-Check 3.2**

Part No.	0010	0050	0005
Indication	**LED**	**LED**	**LCD**
5571	28.30	–	–
5572	–	43.71	–
5573	–	–	80.98
Indication levels	6–400 v	6–690 v	5–690 v
Continuity test	0–500 kOhm	0–500 kOhm with acoustic signal	0–500 kOhm with acoustic signal
Phase control	LED	LED	LCD
Polarity control	LED	LED	LCD
Illuminated measure values	–	Yes	Yes
Protection type	IP 50	IP 50	IP 50
Battery fitted	2 micro batteries 1.5 v (515)	2 micro batteries 1.5 v (515)	2 micro batteries 1.5 v (515)



Voltage Testers

Design: Tested and certified according to **IEC/EN 61243-3, (DIN VDE 0682-401), two-pole.**
Housing made of shock- and break-proof plastic material, with two handles and flexible cable.
Protection type IP 64.
"DUSPOL expert" and "DUSPOL digital plus" supplied with batteries.

IP64

BENNING

Application: For professional testing of AC and DC voltages as well as semiconductor, phase and polarity control **with load actuation via push button.**

5552 **DUSPOL® COMPACT**
5553 **DUSPOL® combi**
5555 **DUSPOL® master**
5556 **DUSPOL® expert**
5558 **DUSPOL® analog**
5559 **DUSPOL® digital plus**



5552 5553 5555 5556 5558 5559

Part No.	0005	0005	0005	0005	0005	0005
Indication	**LED**	**LED/LCD**	**LED/LCD**	**LED/LCD**	**Plunger/LED**	**LCD digital**
5552	25.95	–	–	–	–	–
5553	–	36.16	–	–	–	–
5555	–	–	31.92	–	–	–
5556	–	–	–	39.62	–	–
5558	–	–	–	–	31.92	–
5559	–	–	–	–	–	54.25
Indication steps	12–750 v	12–750 v	12–750 v	12–750 v	12–750 v	1.5–750 v
Continuity test	–	LCD	–	Buzzer + LED	–	–
Cyclic control	–	–	LCD	LCD	LCD	LCD
Phase control	–	LCD	LCD	LCD	LCD	LCD
Polarity control	LED	LED	LED	LED	LED	LCD
Load actuation via push botton	yes	yes	yes	yes	Plunger	yes
Vibration alarm	–	yes	yes	yes	–	yes
Illuminated measure values	–	–	–	LED	–	LED
Protection type	IP 64	IP 64	IP 64	IP 64	IP 64	IP 64
Battery fitted	–	–	–	2 micro batteries 1.5 v	–	2 micro batteries 1.5 v

(514)

Protective case

Design: Made of artifical leather, with zip-fastener, to hold Compact, Combi, Master, Expert, Analog and Digital Plus. Supplied **without** Duspol Expert.

Part No.	5586
0005	10.06

(514)



Continuity and Circuit Testers DUTEST

Design: For continuity testing in electric wires, conduits and components. For determining the polarity in semi-conductor components. Control display via LED and buzzer, indications; low impedance max. 900 Ohm, high impedance max. 90 kOhm, with torch function, external voltage protection up to 400 v, tested and approved according to IEC/EN 61010-1/A2 (DIN VDE 403). 3 Mignon batteries 1.5 v are required for operating the device.

IP30

BENNING



Part No.	Continuity test	5575	Protection class
0005	Buzzer + LED	15.26 (514)	IP 30

Digital Multimeters

Design: A.C. and D.C. indication, as well as current and resistance control, frequency and capacity control, continuity and diode test. Multimeter is made of robust plastic material. Tested and approved according to EN 61010, part 1, (DIN VDE 0411-1).

IP30

BENNING

5584 0005 **MM 1** Scope of supply: Rubber holster, case, batteries, double-insulated safety test leads.

5587 0005 **MM 2** Scope of supply: Rubber holster, case, battery, double-insulated safety test leads.

5587 0050 **MM 3** Scope of supply: Rubber holster, case, battery, double-insulated safety test leads.

5587 0100 **MM 4** Scope of supply: A.C. clamp, case, batteries, double-insulated test leads, measuring bits, tapping clip.

5587 0250 **MM 7** Scope of supply: Rubber holster, case, battery, double-insulated safety test leads, magnetic hook, temperature probe incl. adapter.



5584 0005



5587 0005



5587 0050



5587 0100



5587 0250

Part No.	0005	0005	0050	0100	0250
D.C.	**0.1 mV–600 v**	**0.1 mV–1000 v**	**0.1 mV–600 v**	**1 mV–600 v**	**1 mV–1000 v**
5584	58.80	–	–	–	–
5587	–	69.97	88.36	101.42	150.94
A.C.	0.1 mv–600 v	0.1 mv–750 v	0.1 mv–600 v	1 mv–600 v	1 mv–750 v
D.C.	0.1 µA–3.2 mA	0.1 µA–20 A	0.1 µA–20 A	–	10 µA–10 A
A.C.	–	0.1 µA–20 A	0.1 µA–20 A	0.1 A–300 A	10 µA–10 A
Resistance	0.1 Ohm–32 MOhm	0.1 Ohm–20 MOhm	0.1 Ohm–20 MOhm	0.1 Ohm–42 MOhm	0.1 Ohm–40 MOhm
Clearence	yes	yes	yes	yes	yes
Frequency	–	–	1 Hz–200 kHz	–	1 Hz–40 MHz
Capacity	–	–	1 pF–200 µF	–	1 pF–40 mF
Temperature	–	–	–	–	–20° to +800° C
Jaw width	–	–	–	30 mm	–
Measuring class	CAT III 600 v	CAT III 600 v	CAT II 300 v	CAT II 300 v	CAT III 600 v
Test procedure	RMS	RMS	RMS	RMS	TRUE RMS
Protection class	IP 30	IP 30	IP 30	IP 30	IP 30
Battery fitted	2 micro batteries 1.5 v	1 block battery 9 v	1 block battery 9 v	2 micro batteries 1.5 v	1 block battery 9 v
Indication	LCD	LCD	LCD	LCD	LCD

(514)

Digital Combined Current Clamp – Multimeters

Design: Made of impact-resistant plastic material. Measured value hold, RMS measuring method. Tested and certified according to IEC/EN 61010-1 (DIN VDE 0411-1), protection class IP 30.

IP30

BENNING

5585 0100 **CM 1** A.C. and D.C. indication, as well as current and resistance control. Scope of supply: Compact case, battery, integrated and double-insulated test leads.

5585 0200 **CM 2** A.C. and D.C. indication, as well as current and resistance control. Scope of supply: Compact case, battery, integrated and double-insulated test leads.

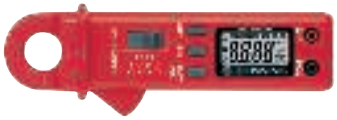
5585 0300 **CM 3** Current indication. Scope of supply: Compact case, battery.

Part No.	0100	0200	0300
D.C. voltage	**1–600 v**	**0.1 mV–600 v**	**–**
5585 BENNING	81.44	132.38	112.26
A.C. voltage	1–600 v	0.1 mV–600 v	–
D.C.	–	10 mA–300 A	0.1–600 A
A.C.	0.1–200 A	10 mA–300 A	0.1–600 A
Resistance	1–2,000 Ohm	100 mOhm–40 MOhm	–
Clearance	yes	yes	–
Jaw width	12.5 mm	25 mm	38 mm
Test procedure	RMS	RMS	RMS
Protection class	IP 30	IP 30	IP 30
Battery fitted	1 block battery 9 v	2 micro batteries 1.5 v	1 block battery 9 v
Indication	LCD	LCD	LCD

(514)



5585 0100



5585 0200

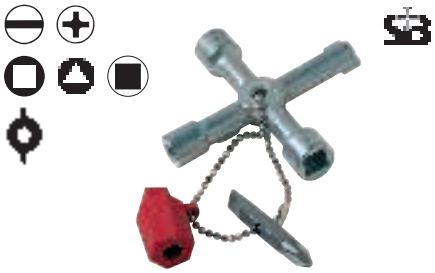


5585 0300

Control Cabinet Wrenches

Design: Zinc cast iron, squares 6, 7 and 8 mm, three-square 9 mm, flange with chain 3 to 5 mm, double-bit slot 1 x 7 mm and PH 2, plastic adapter 1/4 inch and square radiator valve wrench.

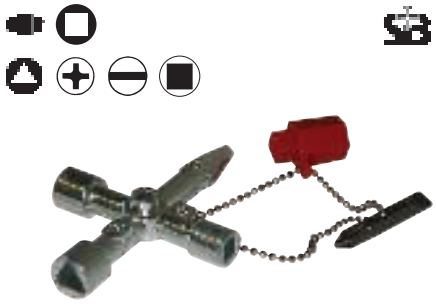
Part No.	Dimensions mm	5588
0005	72 x 72	9.54 (516)



Control Cabinet Wrenches Profi-Key

Design: Zinc cast iron, conical squares from 4 to 10 mm, squares 5, 7 and 8 mm, three-square 9 mm, double-bit slot 1 x 7 mm and PH 2, plastic adapter 1/4 inch and square radiator valve wrench.

Part No.	Dimensions mm	5590
0005	72 x 72	7.21 (516)



Universal Wrenches SuBKey Bau

Design: Patented universal wrench from zinc cast iron and shock-proof plastic material. With stepped external square 6–9 mm, square socket 5 and 8 mm, triangle socket 9 mm, bit for Philips screws PH 2 in plastic adapter with permanent magnet for all 1/4" bits and radiator valves 5 mm. Thanks to the clip, the wrench can be transported in the pocket of the chemise or blouse.

Application: For all conventional locks, also for door and window furniture as well as aeration of radiators. Due to a double rotating mechanism 3 different control cabinet wrenches can be positioned.

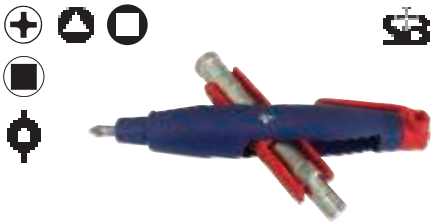
Part No.	Length mm	5601
0005	145	15.26 (516)



Control Cabinet Wrenches SuBKey Elektro

Design: Patented control cabinet wrench and screwdriver made of zinc cast iron and shock-proof plastic with rotating mechanism. With square socket 6 mm and stepped square socket 7–8 mm, triangle socket 9 mm, two-way key bit 3–5 mm, bit for Philips screws PH 2 in plastic adapter with permanent magnet for all 1/4" bits and radiator valves 5 mm. Thanks to the clip, the wrench can be transported in the pocket of the chemise or blouse.





Application: For all conventional control cabinet locks as well as aeration of radiators. Due to a double rotating mechanism 4 different control cabinet wrenches can be positioned.

Part No.	Length mm	5603
0005	145	15.26 (516)





Set Screw and Contact Screw Wrenches

Design: Two-piece combination for inserting and removing of D screw gauge inserts D II to DIN 49516 and with attachment also for D screw gauge inserts D III to DIN 49516, in or out of adapters. Tested and approved according to DIN 57680 part 7/VDE 0680 part 7.

Part No.	Length mm	5594
0005	105	4.17 (516)



Pull-in Wire

Design: Stretched strand made of Bayer Perlon®, with solid steel end pieces and additional spring.

Part No.	Length m	5595	Diameter mm
0010	10	3.38	3
0015	15	4.48	3
0020	20	5.66 (516)	3



Cable Tie Pliers

Design: For tensioning and cutting of cable ties in cross-section range of 2.4 to 4.8 mm.

Part No.	5596
0005	36.16 (516)



Cable Ties

Design: Nylon 6.6, self-extinguishing according to UL94 V2 standard. High flexibility also in extreme temperature fluctuations, almost chemical-proof. For fixing and bundling hoses, cables and wires (1 unit = 100 pieces).

5600 Natural colour

5610 Black

Part No.	Length mm	5600	5610	Width mm	Bundle ø mm
0005	100	0.34	0.44	2.5	24
0010	140	0.86	0.86	3.5	26
0015	280	1.65	–	3.5	76
0020	200	1.65	1.65	4.5	51
0025	280	2.37	2.37	4.5	76
0030	360	5.03	–	7.5	101
0035	540	10.69 (516)	– (516)	7.5	164



5600



5610

Water Pump Pliers

Water Pump Pliers

Design: DIN ISO 8976, through slide jaw with trap protection, prevents crushing injuries. Clamps onto pipes and nuts without hand pressure.

5599 Chromium-vanadium forged, high quality tempered steel.

5605 Chrome-vanadium electric steel, oil-hardened, gripping surfaces with specially hardened teeth. **Head polished,** handles plastic-coated.

Part No.	Length mm	5599	5605	For nuts mm 5599	For nuts mm 5605	For pipes inch 5599	For pipes inch 5605
0175	175	6.55	–	26	–	1.	–
0180	180	–	10.45	–	30	–	1.1/4
0240	240	5.77	–	35	–	1.1/4	–
0250	250	–	11.09	–	36	–	1.1/2
0300	300	12.22 (512)	16.68 (512)	43	46	1.1/2	2.



5599 format professional quality



5605

Water Pump Pliers

Design: DIN ISO 8976, through slide jaw with trap protection, prevents crushing injuries. Clamps onto pipes and nuts without hand pressure.

5602 Chrome-vanadium steel, forged, **chromium-plated polished,** tempered, handles with transparent plastic covers.

5608 Chrome-vanadium electric steel, oil-hardened, gripping surfaces with specially hardened teeth. **Chromium-plated,** handles with multi-component plastic covers.

Part No.	Length mm	5602	5608	For nuts mm	For pipes inch
0240	240	9.73	–	35	1.1/4
0250	250	–	17.06	36	1.1/2
0300	300	– (512)	23.24 (525)	46	2.



5602 format professional quality



5608

Water Pump Pliers VDE

Design: DIN ISO 8976, chrome-vanadium electric steel, oil-hardened. Gripping surfaces with specially hardened teeth, joint box, prevents crushing. Self-gripping on pipes and nuts. **Chromium-plated,** handles with multi-component plastic covers, insulated up to 1,000 v, according to IEC 60900, DIN EN 60900, VDE 0682/part 201.

Part No.	Length mm	5611	For nuts mm	For pipes inch
0250	250	18.96 (525)	36	1.1/2



Water Pump Pliers "Cobra ES"

Design: DIN ISO 8976. Chromium-vanadium electric steel, oil-hardened and tempered, **head polished,** gripping surfaces with specially hardened teeth (61 HRC). Very slender design in head and articulation area with long, pointed jaws. Quick and precise adjustment at the push of the button, one-hand adjustment in confined spaces. Joint box allows high stability. Trap protection prevents crushing injuries. Clamps on pipes, nuts and also flat workpieces thanks to three-point bearing. Handles plastic-coated.

Application: Ideal for service and maintenance, repair, automotive sector and industry. Effortless operation thanks to slender design especially in confined spaces.

Part No.	Length mm	5612	Fine adjustment	For nuts mm	For pipes inch
0250	250	16.06 (525)	19-fold	42	1.1/4



Water Pump Pliers

Water Pump Pliers "COBRA"

Design: DIN ISO 8976. Chromium-vanadium electric steel, oil-hardened and tempered, gripping surfaces with specially hardened teeth (61 HRC). **Quick and precise adjustment at the push of the button,** one-hand adjustment. Joint box allows high stability. Trap protection prevents crushing injuries. Clamps on pipes and nuts. Handles plastic-coated.

5593 **Head polished.**

5607 **Head chromium-plated.**

Part No.	Length mm	5593	5607	Fine adjustment	For nuts mm	For pipes inch
0150	150	13.37	–	11-fold	30	1.1/4
0180	180	14.14	18.85	11-fold	30	1.1/4
0250	250	14.94	19.66	11-fold	36	1.1/2
0300	300	20.56 (525)	25.36 (525)	14-fold	46	2.



5593



5607

Water Pump Pliers "Cobra"

Design: DIN ISO 8976. Chromium-vanadium electric steel, oil-hardened and tempered, **head chromium-plated,** gripping surfaces with specially hardened teeth (61 HRC). **Quick and precise adjustment at the push of the button,** one-hand adjustment. Joint box allows high stability. Trap protection prevents crushing injuries. Clamps on pipes and nuts. Handles with multi-component plastic sheaths.

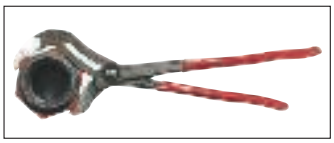
Part No.	Length mm	5609	Fine adjustment	For nuts mm	For pipes inch
0250	250	21.48	11-fold	36	1.1/2
0300	300	27.69 (525)	14-fold	46	2.



Pipe and Water Pump Pliers Cobra XL/XXL

Design: Chrome-vanadium electric steel, oil-hardened. Gripping surfaces with specially hardened teeth. **Head polished,** handles plastic-coated. Joint box. Quick and precise adjustment at a push of the button, one-hand adjustment. Prevents crushing. Self-gripping on pipes and nuts.







Part No.	Length mm	5593	Fine adjustment	For nuts mm	For pipes inch
0400	400	35.64	27-fold	95	3.1/2
0560	560	58.13 (525)	20-fold	120	4.1/2

Water Pump Pliers "Smart-Grip"

Design: DIN ISO 8976. Chromium-vanadium electric steel, oil-hardened and tempered, **head polished,** gripping surfaces with specially hardened teeth (61 HRC). Automatic adjustment on the workpiece by simple pressing of handles, perfect for frequent gripping of different workpieces. Quick and precise adjustment at the push of the button, for right-hand and left-hand operation with fine adjustment for optimum position of handles. The slender design allows perfect use in confined spaces. Joint box allows high stability. Trap protection prevents crushing injuries. Clamps on pipes and nuts. The locking lever allows space-saving and safe transport without unintended opening of the pliers. Handles plastic-coated.



Part No.	Length mm	5613	For nuts mm	For pipes inch
0250	250	25.06 (525)	36	1.1/4

Water Pump Pliers

Water Pump Pliers with Ridged Joint

Design: DIN ISO 8976, supported with ridged joint, trap protection prevents crushing injuries. Clamps onto pipes and nuts without hand pressure.

5598 Special tool steel, induction-hardened. **Polished head,** plastic-covered handles.

5694 Chrome-vanadium electric steel, oil-hardened, gripping surfaces with specially hardened teeth. **Head polished,** handles plastic-coated.

5695 Chrome-vanadium electric steel, oil-hardened, gripping surfaces with specially hardened teeth. **Chromium-plated,** handles plastic-coated.

5696 Chrome-vanadium electric steel, oil-hardened, gripping surfaces with specially hardened teeth. **Chromium-plated,** handles with multi-component plastic covers.

Part No.		0160	0250	0250	0315
Length	**mm**	**170**	**250**	**250**	**300**
5598	(512)	5.52	6.52	–	11.99
5694	(525)	–	–	9.75	–
5695	(525)	–	–	13.25	–
5696	(525)	–	–	16.76	–
For nuts	mm	30	36	36	48
For pipes	inch	1.	1.1/4	1.5/16	1.1/2



5598 format professional quality



5694 KNIPEX



5695 KNIPEX



5696 KNIPEX

Water Pump Pliers with Quick Adjustment

format professional quality

Design: Chrome-vanadium steel, tempered and hardened individually, gripping surfaces with specially hardened teeth (65 HRC). **Quick and precise adjustment at the push of the button and spring-supported fine adjustment,** one-hand adjustment. Optimum leg position by fine adjustment. Joint box allows high stability. Trap protection prevents crushing injuries. Clamps on pipes and nuts. Handles plastic-coated.

Part No.	Length mm	5797	Fine adjustment	For nuts mm	For pipes inch
0250	250	13.34 (512)	13-fold	36	1.1/2



Plier Wrenches

KNIPEX

Design: Head nickel-plated, parallel and even jaws allow perfect gripping, holding, pressing and bending of workpieces; also suitable for careful installation of components with finished surfaces. Quick-adjustment at a touch of the button. Ratchet system.

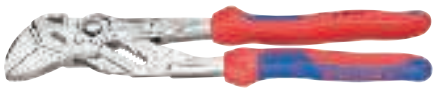
7156 Handles plastic-coated.

7157 Handles with multi-component plastic covers.

Part No.	Length mm	7156	7157	For nuts mm	For pipes inch
0180	180	29.11	30.84	35	1.3/8
0250	250	33.36	35.72	46	1.3/4
0300	300	39.07 (525)	– (525)	60	2.3/8



7156



7157

Self Grip Pliers

Self Grip Universal Pliers

Design: With adjusting screw and quick-release lever, bright nickel-plated.

Application: For clamping and holding flat, round and sectional material.

5630 **Design:** Body made of special, high-strength steel, wire cutter for 1.0 mm weld wire, oval opening, forged and annealed jaws in chromium-vanadium steel.

5633 **Design:** Forged and hardened jaws and special opening. GEDORE-Vanadium 31 CrV 3 material no. 1.22208, body made of high-strength steel sheet.

Part No.	Length mm	5630	5633	Jaw span mm
0175	175	–	11.73	25
0180	180	6.13	–	30
0240	240	–	13.19	32
0250	250	6.37	–	35
0280	280	–	20.22	45
0300	300	10.75 (512)	27.54 (522)	65



5630 format professional quality



5633 GEDORE

Special Self Grip Pliers

GEDORE

Design: Forged and hardened chrome-vanadium jaws, setting screw and quick-release lever bright nickel-plated. Lower jaw movable, gripping surfaces toothed, parallel clamping.

Part No.	Length mm	5636	Jaw span mm
0250	250	21.23 (522)	45



Self Grip Sheet Metal Pliers

format professional quality

Design: Body made of high-strength steel, jaws machined, 80 mm wide, adjusting screw, quick-action release, bright nickel-plated finish.

Application: For bending, shaping, sticking and edging workpieces.

Part No.	Length mm	5639
0178	178	11.74 (512)



Langbeck Self Grip Pliers

VISE-GRIP

Design: Ideal for quick and easy gripping of workpieces in confined areas. With adjusting screw, quick-action release and integrated wire cutter for cutting wire and bolts of max. 6 mm ⌀ in several work steps.

Application: Working range from precision and fine work to tough applications in the workshop.

Part No.	Length mm	5640
0100	100	10.83
0150	150	11.72
0225	225	15.27 (252)



Self Grip Welding Pliers

format professional quality

Design: Body made of high-strength steel, malleable cast iron jaws, with pronounced profiling, protects against burning, upper jaw with 90 degree elbow, adjusting screw, quick-release lever, bright nickel-plated finish.

Application: For clamping and holding sectional flat material during welding operations.

Part No.	Length mm	5642
0280	280	10.86 (512)



Welder's Self Grip Pipe Pliers

Design: Body made of high-strength steel, malleable cast iron jaws, with pronounced profiling, protects against burning, upper jaw prism-shaped angle, adjusting screw, quick-release lever, bright nickel-plated finish.

Application: For clamping and holding tubes and round material during welding operations.

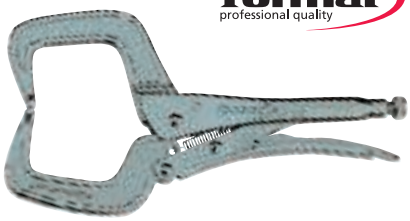


Part No.	Length mm	5645
0280	280	10.91 (512)

Sectional Self Grip Welding Pliers

Design: Body made of high-strength steel, chromium-vanadium jaws, forged for highest strength, quick-release lever, bright nickel-plated finish.

Application: All-round clamping of bulky workpieces (angle-shaped and sections).

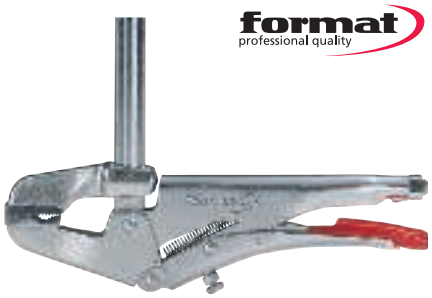


Part No.	Length mm	5648
0280	280	12.20 (512)

Parallel Grip Pliers

Design: Jaws made of chromium-vanadium steel, forged and hardened, infinitely variable clamping range, jaws constantly parallel and adjustable up to 9 degrees, adjustable clamping force, with ridged clamping faces and prism recess for smaller round pieces.

Application: For clamping and holding of manifold workpieces.



Part No.	Jaw span mm	5651	Jaw projection mm
0100	100	31.91	65
0200	200	35.10 (512)	65

C Grip Pliers

Design: With two C-shaped brackets with small grooved gripping surfaces, continuously adjustable. Both brackets made of chromium-vanadium steel and tempered. All steel parts nickel-plated.

Application: For overlapping and powerful clamping, with high surface pressure. Perfectly suitable for small areas.



Part No.	Jaw span mm	5657	Jaw projection mm
0110	110	41.23 (510)	80

Welder's Grip Pliers "Variogrip"

Design: High-tensile fine-grained steel, with two plane, fork-type and tempered jaws from chromium-vanadium steel which are continuously adjustable regarding jaw span and jaw projection. The upper gripping surfaces are grooved. **The right and left clamping lever can be adjusted independently.** With screw in order to adjust parallelism for clamping oblique parts up to 9°. Gripping surfaces grooved. With set screw for clamping pressure and plastic-coated quick-release lever without return stroke.

Application: Safe clamping and holding of two workpieces of different thickness or offset workpieces.





Part No.	Jaw span mm	5661	Jaw projection mm
0100	100	49.77 (510)	50–80

Pipe Grip Pliers

Design: With two fork-shaped jaws, one side with two prism-shaped supports. The counterpart with two even clamping surfaces grips between the above. Accordingly, even parts with small diameters can be held. All steel parts nickel-plated.

Application: Fixing of two pipe sections of equal size.





Part No.	Jaw span mm	5663	Jaw projection mm
0110	0–110	46.58 (510)	65

Compact Bolt Cutters "CoBolt"

Design: Ergonomic handle, chromium-vanadium electric steel, oil-hardened. Induction-hardened precision cutting edges, hardness approx. 64 HRC. Head atramentised. High cutting performance with low effort due to novel lever construction. **61 % less effort** due to optimal transmission than with power side cutter of the same length.

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²

Application: For piano wire as well as soft solid wire, bolts, nails, rivets, screws.

5666 Plastic-covered handles.

5658 Handles with multi-component plastic covers.

5664 Handles with multi-component plastic covers, **with opening spring and shackle-type locking.**



5666



5658



5664

Part No.	Length mm	5666	5658	5664	Cutting capacity ∅ mm soft wire	medium wire	hard wire	piano wire
0200	200	23.80 (525)	25.40 (525)	28.00 (525)	6.0	5.0	4.0	3.6

Compact Bolt Cutters "CoBolt"

Design: Chromium-vanadium electric steel, oil-hardened and annealed, **head atramentised.** Induction-hardened precision cutting edges (64 HRC) with **cutting edge recess close to the joint.** High cutting performance with low effort due to lever construction. **61 % less effort** due to optimal transmission than with power side cutter of the same length. Handles with plastic covers.

Application: For piano wire as well as soft or hard solid wire, bolts, nails, rivets and screws. **Thanks to recess for cutting edges close to the joint, thicker wires can be held in a favourable cutting position, perfectly suitable for suspended ceilings.**

Soft wire = 220 N/mm²
Medium-hard wire = 750 N/mm²
Hard wire = 1,800 N/mm²
Piano wire = 2,300 N/mm²





Part No.	Length mm	5665	Cutting capacity ∅ mm soft wire	medium wire	hard wire	piano wire
0200	200	27.38 (525)	6	5.2	4	3.6

Bolt Cutters

Design: Knife made of chromium-vanadium steel, forged, adjustable knife, replaceable knife head.

Application: For cutting round material up to HRC 40.

Part No.	Length mm	5674	Max. cutting capacity ø mm HRC 40 1260 N/mm²
0460	460	37.65	6
0610	610	49.12	8
0760	760	65.64	9
0910	910	90.82	10
		(517)	



Spare cutters heads incl. fastening screws

Part No.	For length mm	5674
0461	460	17.45
0611	610	24.05
0761	760	36.87
0911	910	43.04
		(517)



Structural Steel Cutters

Design: Knife made of chromium-vanadium steel, high-quality-annealed, adjustable knife, replaceable knife head.

Part No.	Length mm	5677	Max. cutting capacity ø mm HRC 19 750 N/mm²	HRC 40 1260 N/mm²
0950	950	69.06	11	9/2 x 8
		(517)		



Spare cutters heads incl. fastening screws

Part No.	For length mm	5677
0951	950	35.77
		(517)



Blacksmith's Tongs

Design: Made of C 35 steel, forged, black varnish, long legs as well as slip joint.

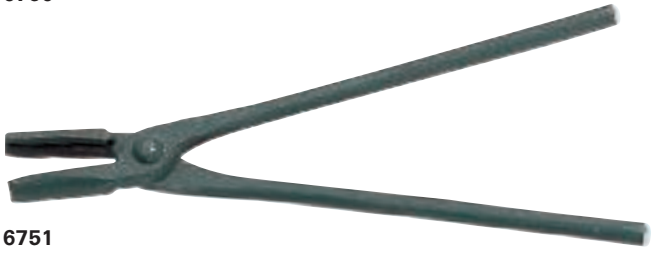
6750 **Wolf's jaw.**

6751 **Round jaw.**

Part No.	Length mm	6750	6751
0501	500	27.67	22.74
		(557)	(557)



6750



6751

Metric Open End Wrenches

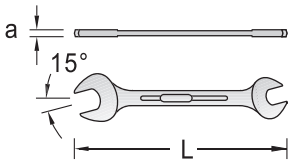
Metric Open End Wrenches DIN 3110, ISO 3318, ISO 1085

Design: Chromium-plated, jaw offset 15°.

5700 Made of chromium-vanadium steel, forged.

5703 Machined from GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Heads precision-ground.





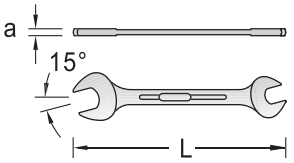


Part No	Wrench size mm	5700	5703	Length L 5700	Length L 5703	Jaw size a mm
0002	4 x 4.5	–	3.13	–	100	3.4
0005	4 x 5*	–	3.13	–	100	3.4
0010	5 x 5.5	–	3.13	–	100	3.5
0015	5.5 x 7*	–	2.43	–	122	3.5
0025	6 x 7	1.00	2.05	125	122	3.5
0027	6 x 8	–	2.43	–	122	3.5
0030	7 x 8	–	2.61	–	140	3.8
0034	7 x 9	–	2.69	–	140	3.8
0040	8 x 9	1.05	2.09	142	140	3.8
0050	8 x 10	1.05	2.54	142	140	4
0052	9 x 10	–	2.83	–	157	4.5
0053	9 x 11	–	2.83	–	157	4.5
0055	10 x 11	1.13	2.38	157	157	4.5
0057	10 x 12	–	2.79	–	172	4.5
0060	10 x 13	1.23	3.19	170	172	5
0067	10 x 14	–	3.28	–	172	5
0070	11 x 13	–	3.24	–	172	5
0072	11 x 14	–	3.28	–	172	5
0080	12 x 13	1.29	2.86	175	172	5
0090	12 x 14	1.34	3.21	172	172	5
0100	13 x 14	1.34	3.21	178	178	5
0105	13 x 15	1.37	3.49	188	188	5.5
0115	13 x 16	–	3.64	–	190	6
0120	13 x 17	1.53	3.55	205	205	6
0125	14 x 15	1.39	3.08	188	188	5.5
0135	14 x 17	1.64	3.55	205	205	6
0140	16 x 17	1.70	3.32	205	205	6
	* non-standard size.	(520)	(522)			

Part No	Wrench size mm	5700	5703	Length L 5700	Length L 5703	Jaw size a mm
0145	16 x 18	1.82	3.99	205	205	6
0150	17 x 19	1.89	4.06	222	222	6.5
0160	18 x 19	1.98	3.91	222	222	6.5
0165	18 x 21	–	5.04	–	236	7
0170	19 x 22	2.09	4.72	233	236	7
0180	19 x 24	2.47	5.37	250	250	7.5
0185	20 x 22	2.20	4.58	233	236	7
0195	21 x 23	2.37	5.04	249	247	7.5
0205	21 x 24	–	5.84	–	250	7.5
0210	22 x 24	2.67	5.32	249	250	7.5
0220	22 x 27*	–	6.52	–	266	8
0225	24 x 26	–	6.11	–	266	8
0230	24 x 27	2.94	6.11	266	266	8
0235	24 x 30	3.49	7.21	290	280	8.5
0245	25 x 28	3.13	7.04	282	280	8.5
0255	27 x 30	3.65	8.56	282	302	9
0270	27 x 32	3.84	8.56	305	302	9
0280	30 x 32	4.03	8.56	305	302	9
0285	30 x 34	–	9.79	–	302	9
0290	30 x 36	4.77	15.34	320	328	9.4
0300	32 x 36	5.51	15.34	320	328	9.4
0310	34 x 36	5.99	18.10	320	328	9.4
0320	36 x 41	6.26	20.43	360	360	10
0325	38 x 42*	–	23.82	–	360	10
0335	41 x 46	12.15	27.25	405	400	10.7
0340	46 x 50	–	37.95	–	450	11.6
		(520)	(522)			

Open End Wrenches – US Inches

Design: Machined from GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Chromium-plated. Heads precision-ground.





Part No.	Wrench size A.F.	5712	Length L mm	Jaw size a mm
0005	1/4 x 5/16	2.65	122	4.5
0010	5/16 x 3/8	2.93	140	5
0015	3/ 8 x 7/16	3.08	157	5.5
0020	7/16 x 1/2	3.60	172	6
0025	1/2 x 9/16	3.76	190	7
0030	9/16 x 5/8	4.09	190	7.5
0035	19/32 x 11/16	4.20	205	8
		(522)		

Part No.	Wrench size A.F.	5712	Length L mm	Jaw size a mm
0040	5/8 x 3/4	4.54	222	8.5
0050	3/4 x 7/8	5.58	236	8.5
0055	25/32 x 13/16	5.58	236	9
0065	7/8 x 15/16	6.30	250	9
0070	1. x 1.1/8	7.78	280	9.4
0075	1.1/16 x 1.1/8	9.56	302	10
		(522)		

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Metric Open End Wrenches

Metric Open End Wrench Sets DIN 3110, ISO 3318, ISO 1085

Design: Chromium-plated, jaw offset 15°.

5706 Made of chromium-vanadium steel, forged, jaw offset 15°, chromium-plated.



5706 format professional quality

5709 With flat heads and oval shank for better grip. Machined in GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Chromium-plated. Heads precision-ground.

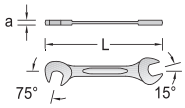


5709 GEDORE

Part No.	Number	5706 Set	5709 Set	Contents of set mm or A.F.
0005	8-piece	11.76	24.28	6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22
0010	9-piece	14.11	–	6x7, 8x9, 10x11, 12x13, 14x15, 17x19, 19x22, 24x27, 30x32
0015	10-piece	–	35.46	6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 24x27
0017	12-piece	–	51.12	6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 24x26, 25x28, 27x32
0020	12-piece	24.21	51.08	6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 24x27, 25x28, 30x32
				Inches A.F.
0025	8-piece	–	35.15	1/4x5/16, 5/16x3/8, 7/16x1/2, 9/16x5/8, 19/32x11/16, 3/4x25/32, 13/16x7/8, 15/16x1.
0030	12-piece	–	56.74	1/4x5/16, 5/16x3/8, 3/8x7/16, 7/16x1/2, 1/2x9/16, 9/16x5/8, 19/32x11/16, 5/8x3/4, 3/4x7/8, 25/32x13/16, 15/16x1., 1.1/16x1.1/8
		(520)	(522)	

Metric Open End Wrenches, Small

Design: With same wrench size and flat heads, molybdenum steel 34 CrMo4, chromium-plated, heads finely ground.





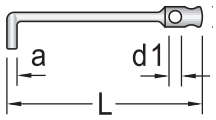
GEDORE

Part No.	Wrench size mm	5713	Length L mm	Jaw size a mm
0005	4	2.41	70	1.8
0010	4.5	2.41	70	1.8
0015	5	2.41	78	1.8
0020	5.5	2.41	78	1.8
0025	6	2.41	78	1.8
0030	7	2.41	91	1.8
0035	8	2.71	96	2.8
		(522)		

Part No.	Wrench size mm	5713	Length L mm	Jaw size a mm
0040	9	2.71	103	2.8
0045	10	2.71	105	2.8
0050	11	2.71	116	2.8
0055	12	2.86	116	2.8
0060	13	2.86	131	2.8
0065	14	3.46	131	2.8
		(522)		

Claw Wrenches

Design: Open end wrench with offset for working in confined areas. GEDORE Vanadium steel 31 CrV 3 mat. no. 1.2208, chromium-plated.





GEDORE

Part No.	Wrench size mm	5714	Length L mm	Diameter d1 mm	Jaw size a mm
0005	13	11.88	160	8.5	5.5
0010	14	12.14	160	8.5	5.5
0015	16	15.64	200	10.5	6
0020	17	13.74	200	10.5	6
0025	18	15.64	200	12.5	7
0030	19	15.64	200	12.5	7
		(522)			

Part No.	Wrench size mm	5714	Length L mm	Diameter d1 mm	Jaw size a mm
0035	21	18.21	200	12.5	8
0040	22	18.21	200	12.5	8
0045	24	22.42	250	14.5	9
0050	27	24.72	250	14.5	10
0055	30	26.80	250	16.5	11
0060	32	29.89	250	16.5	11.8
		(522)			

Tommy Bars DIN 900

Design: Fully hardened, GEDORE Vanadium steel 31 CrV 3 mat. no. 1.2208, chromium-plated.

GEDORE

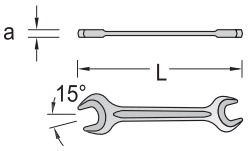
Part No.	Diameter mm	5716	Length mm
0015	8	1.90	180
0020	10	2.43	200
0025	12	3.04	250
0030	14	4.39	320
0035	16	6.77	400
		(522)	



Metric Open End Wrenches

Open End Wrenches DIN 895

Design: Machined in GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Phosphate finish up to 34 x 36 mm, steel-grey from 36 x 41 mm, jaw offset 15°.





Part No.	Wrench size mm	5717	Length L mm	Jaw size a mm
0005	6 x 7	1.38	96	3.2
0015	8 x 9	1.38	108	3.7
0020	8 x 10	1.38	114	4.2
0030	10 x 11	1.46	124	5
0035	10 x 13	1.68	128	5
0040	12 x 13	1.68	140	5.5
0045	12 x 14	1.68	140	5.5
0055	13 x 15	1.86	154	5.5
0060	13 x 17	1.89	158	6
0065	14 x 15*	2.09	154	5.5
0070	14 x 17	1.96	158	6
0075	16 x 17*	2.23	158	6
0080	16 x 18	2.87	168	6.5
0085	17 x 19	2.19	171	7
0090	18 x 19*	3.04	171	7
0095	18 x 21	3.10	192	8
0100	19 x 22	2.76	195	8

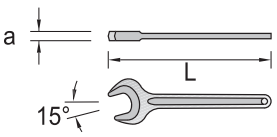
* non-standard size (522)

Part No.	Wrench size mm	5717	Length L mm	Jaw size a mm
0105	19 x 24	3.54	207	9
0110	20 x 22*	3.10	195	8
0120	22 x 24	3.69	221	9
0125	22 x 27*	4.36	233	9.8
0130	24 x 27	4.59	246	9.8
0135	24 x 30	4.96	269	10.8
0145	27 x 30	6.33	275	10.8
0150	27 x 32	6.33	275	11.8
0155	30 x 32	6.33	278	11.8
0160	30 x 36	8.38	306	12.8
0165	32 x 36	8.38	310	12.8
0170	34 x 36	10.27	320	13.3
0175	36 x 41	13.66	347	13.8
0180	41 x 46	14.11	383	14.8
0185	46 x 50	19.36	420	15.8
0190	50 x 55	23.05	463	16.8
0195	55 x 60	27.44	504	17.7

(522)

Single Open End Wrenches DIN 894

Design: Machined in GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Phosphate finish up to 38 mm, steel-grey from 41 mm, from 10 mm incl. hole, jaw offset 15°.





Part No.	Wrench size mm	5715	Length L mm	Jaw size a mm
0006	6	1.35	73	3.2
0007	7	1.35	78	3.2
0008	8	1.35	94	3.5
0009	9	1.37	100	4
0010	10	1.37	106	4.5
0011	11	1.53	112	5
0012	12	1.61	124	5
0013	13	1.61	132	5.5
0014	14	1.67	140	5.5
0015	15	2.09	145	5.5
0016	16	2.11	155	5.5
0017	17	1.70	159	6
0018	18	3.32	159	6
0019	19	2.08	170	7
0022	22	2.43	193	8
0024	24	3.27	217	9
0025	25*	3.43	217	9
0027	27	3.86	239	9.8
0030	30	4.63	263	10.8
0032	32	5.14	275	11.8

* non-standard size. (522)

Part No.	Wrench size mm	5715	Length L mm	Jaw size a mm
0034	34	9.13	290	12.3
0036	36	7.10	305	12.8
0038	38*	7.93	305	12.8
0041	41	8.56	344	13.8
0046	46	11.24	380	14.8
0050	50	14.38	413	15.8
0055	55	16.23	459	16.8
0060	60	20.71	494	17.7
0065	65	24.73	528	18.7
0070	70	31.55	572	19.7
0075	75	37.32	610	20.7
0080	80	47.04	645	21.7
0085	85	64.24	688	22.7
0090	90*	77.57	740	24.6
0095	95*	107.93	740	24.6
0100	100*	112.81	847	25
0105	105*	154.96	1000	28
0110	110*	162.45	1000	28
0115	115*	221.87	1000	28
0120	120*	225.94	1000	27

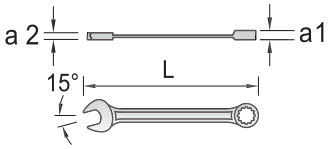
(522)

Metric Combination Wrenches DIN 3113, ISO 3318, Form A

Design: Chromium-plated, ring offset 15°.

5720 Made of chromium-vanadium steel, forged.

5723 GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Ring polished.





5720 format professional quality



5723 GEDORE

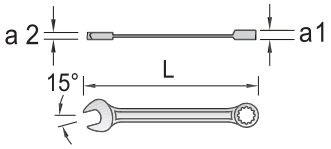
UNIT DRIVE

Part No.	Wrench size mm	5720	5723	Length L mm 5720	Length L mm 5723	Jaw size a2 mm 5720	Jaw size a2 mm 5723	Ring size a1 mm 5720	Ring size a1 mm 5723
0010	3*	–	4.80	–	78	–	2.8	–	2.8
0015	3.2*	–	4.80	–	78	–	2.8	–	2.8
0020	3.5*	–	4.80	–	78	–	2.8	–	2.8
0025	4	–	4.80	–	85	–	3.2	–	3.2
0002	4.5*	–	4.80	–	85	–	3.2	–	3.2
0004	5*	–	4.80	–	92	–	3.6	–	3.6
0005	5.5	–	4.80	–	92	–	3.6	–	3.6
0006	6	1.20	3.17	100	100	3.6	3.4	5	5
0007	7	1.27	3.17	110	110	3.8	3.6	5	5.5
0008	8	1.29	3.25	120	120	4	3.8	6	6
0009	9	1.31	3.39	130	130	4.2	4	6.5	6.5
0110	10	1.37	3.36	140	140	4.4	4.2	7	7
0111	11	1.50	3.69	150	150	4.7	4.5	7.5	7.5
0120	12	1.64	3.95	160	160	5	4.8	8	8
0130	13	1.70	3.95	170	170	5.2	5	8.5	8.5
0140	14	1.75	4.27	180	180	5.4	5.5	9	9
0150	15	1.82	4.54	190	190	5.7	5.5	9.5	9.5
0160	16	2.05	4.84	190	200	6.2	5.8	10	10
0170	17	2.26	4.69	210	210	6.4	6	10.5	10.5
0180	18	2.43	5.59	210	220	6.6	6.2	11	11
0190	19	2.56	5.48	230	230	6.9	6.5	11.5	11.5
0200	20	2.93	6.62	230	240	7.2	6.8	12	12
0211	21	3.13	6.79	260	252	7.4	7	12.5	12.5
0220	22	3.19	7.59	260	262	7.6	7.2	13	13
0230	23*	–	7.86	–	270	–	7.6	–	13.5
0240	24	3.57	8.53	280	282	8	8	14	14
0250	25*	–	8.53	290		8.2	–	14.5	–
0255	26*	–	8.76	–	302	–	8.2	–	15
0270	27	5.02	9.88	310	310	8.9	8.5	15.5	15.5
0280	28*	–	11.33	–	320	–	8.8	–	16
0290	29	–	11.57	–	330	–	8.8	–	16.5
0300	30	5.93	11.80	340	340	9.4	9	17	17
0320	32	6.51	12.92	360	380	9.9	9.5	18	18
0360	36	11.99	24.77	385	460	10.5	10.5	20	20
		(520)	(522)						

* non-standard size.

Combination Wrenches – US Inches

Design: GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Chromium-plated, rings polished, 15° angle.



GEDORE



UNIT DRIVE

Part No.	Wrench size A.F.	5725	Length L mm	Jaw size a2 mm	Ring size a1 mm
0005	1/4	3.77	100	3.4	5
0010	5/16	3.77	120	3.8	6
0015	11/32	3.81	130	4	6.5
0020	3/8	3.87	140	4.2	7
0025	7/16	4.16	150	4.5	7.5
0030	1/2	4.61	170	5	8.5
0035	9/16	4.91	180	5.2	9
		(522)			

Part No.	Wrench size A.F.	5725	Length L mm	Jaw size a2 mm	Ring size a1 mm
0040	5/8	5.65	200	5.8	10
0045	11/16	6.40	220	6.2	11
0050	3/4	6.63	230	6.5	11.5
0055	13/16	7.42	252	7	12.5
0060	7/8	8.42	262	7.2	13
0065	15/16	9.71	282	8	14
0070	1.	9.50	302	8.2	15
		(522)			

Metric Combination Wrenches

Metric Combination Wrench Sets DIN 3113, ISO 3318, Form A

Design: Chromium-plated, ring offset 15°.

5726 Made of chromium-vanadium steel, forged.

5729 GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Ring polished.

5725 GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Ring polished.





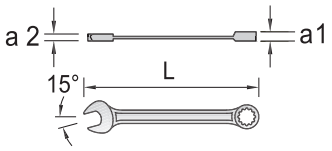


Part No.	Number	5726 Set	5729 Set	5725 Set	Set contents SW mm or A.F.
0005	8-piece	12.95	–	–	8, 9, 10, 11, 13, 14, 17, 19
0010	8-piece	–	41.84	–	10, 12, 13, 14, 17, 19, 22, 24
0015	10-piece	18.58	–	–	10, 11, 13, 14, 17, 19, 22, 24, 27, 30
0020	11-piece	–	48.19	–	8, 9, 10, 11, 12, 13, 14, 15, 17, 19, 22
0025	12-piece	22.45	–	–	6, 7, 8, 9, 10, 11, 12, 13, 14, 17, 19, 22
0030	12-piece	–	80.20	–	10, 11, 12, 13, 14, 17, 19, 22, 24, 27, 30, 32
					Inches A.F.
0800	8-piece	–	–	47.71	3/8, 7/16, 1/2, 9/16, 5/8, 3/4, 7/8, 1.
		(520)	(522)	(522)	

Combination Wrenches, Extra Long, Similar to DIN 3113

Design: Machined in GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Chromium-plated, ring polished.

GEDORE





Part No.	Wrench size mm	5732	Length L mm	Jaw size a2 mm	Ring size a1 mm
0008	8	4.22	170	4.5	7
0009	9	4.47	180	4.5	7.5
0010	10	5.21	190	5	8.5
0011	11	5.21	200	5.5	9
0012	12	5.21	210	5.5	10
0013	13	5.21	225	6	10.5
0014	14	6.29	235	6.5	10.8
0015	15	6.29	250	7	11.2
0016	16	7.41	265	7.5	11.8
0017	17	7.41	280	8.5	12.2
0018	18	9.15	295	8.5	13.2
0019	19	9.15	310	9.5	14.2
		(522)			

Part No.	Wrench size mm	5732	Length L mm	Jaw size a2 mm	Ring size a1 mm
0021	21	10.50	340	9.5	14.2
0022	22	10.50	350	11	16.2
0024	24	11.66	400	12	18.2
0027	27	14.97	450	13	20.2
0030	30	23.67	480	14	21.2
0032	32	28.63	500	14	22.2
0033	33*	35.83	520	15	23.2
0034	34	35.83	520	15	23.2
0036	36	35.83	550	15	24.2
0041	41	40.80	600	16	26
0046	46	66.08	640	17	28
		(522)			

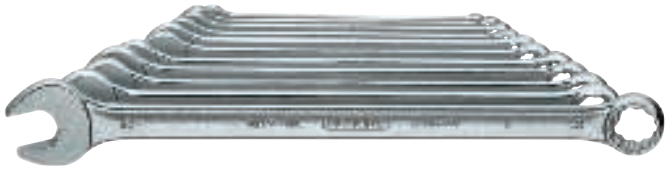
* non-standard size.

Combination Wrench Sets Extra Long, Similar to DIN 3113

Design: Machined in GEDORE Vanadium 31 CrV 3 mat. no. 1.2208.
Chromium-plated, ring polished.

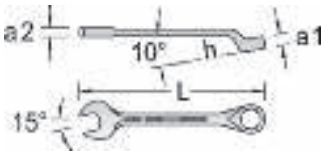
Part No.	Number	5733 Set	Set contents wrench size mm
0010	8-piece	47.17	8, 9, 10, 11, 13, 14, 17, 19
0015	12-piece	133.14	10, 11, 12, 13, 14, 17, 19, 22, 24, 27, 30, 32

(522)



Combination Wrenches DIN 3113, ISO 3318, Form B

Design: Ring side flat offset, jaw offset 15°.
GEDORE Vanadium 31 CrV 3 mat. no. 1.2208.
Chromium-plated, ring polished.





Part No.	Wrench size mm	5735	Length L mm	Jaw size a2 mm	Ring size a1 mm
0000	5	3.87	100	3.4	5
0005	5.5	3.87	100	3.4	5
0006	6	3.69	100	3.4	5
0007	7	3.69	112	3.7	6
0008	8	3.65	125	4	6.5
0009	9	4.10	138	4.3	7.5
0010	10	4.10	148	4.7	8
0011	11	4.40	158	5	9
0012	12	4.65	168	5.3	9.5
0013	13	5.04	185	6	10.2
0014	14	5.10	198	6.3	11
0015	15	6.02	210	6.7	11.5
0016	16	6.51	220	7	12
0017	17	6.73	232	7.5	12.5
0018	18	7.53	245	7.7	13.3
0019	19	7.89	258	8	13.5
0020	20*	8.35	270	8.5	14.5
0021	21	8.68	280	8.7	14.5
0022	22	9.73	292	9	14.5

(522)

Part No.	Wrench size mm	5735	Length L mm	Jaw size a2 mm	Ring size a1 mm
0023	23	10.51	305	9.3	15.5
0024	24	10.99	318	9.5	15.5
0025	25	11.55	328	10	17.5
0026	26*	11.68	340	10.2	17.5
0027	27	12.44	352	10.5	17.5
0028	28*	14.18	370	11	19.5
0029	29*	15.13	370	11	19.5
0030	30	15.90	390	12.2	19.5
0032	32	16.64	412	11.8	20.5
0033	33*	18.87	412	11.8	20.5
0034	34	21.56	412	11.8	20.5
0036	36	28.66	460	12.8	23.5
0038	38*	34.26	460	13.2	24.2
0041	41	35.64	520	14	25.5
0046	46	49.85	550	15	27.5
0050	50	61.29	580	16	29.5
0055	55	76.44	620	17	30.5
0060	60	106.16	660	18	32

* non-standard sizes. (522)

Combination Wrench Sets DIN 3113, ISO 3318, Form B

Design: Ring side flat offset, jaw offset 15°.
GEDORE Vanadium 31 CrV 3 mat. no. 1.2208.
Chromium-plated, ring polished.

Part No.	Number	5736 Set	Set contents wrench size mm
0000	8-piece	41.02	8, 9, 10, 11, 13, 14, 17, 19
0005	8-piece	54.20	10, 12, 13, 14, 17, 19, 22, 24
0010	12-piece	61.35	8, 9, 10, 11, 12, 13, 14, 15, 17, 19, 22
0015	12-piece	103.67	10, 11, 12, 13, 14, 17, 19, 22, 24, 27, 30, 32

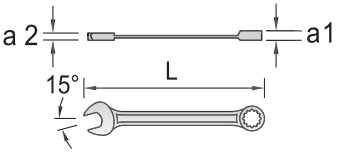
(522)



Ratchet Sink Spanners

Design: Screw connections which are difficult to access.
Easy removing or quick tightening with the spanner in a single stroke, without readjusting. Precision toothing, 72 teeth.

5738 Ratchet Sink Spanners
5740 Ratchet Sink Spanners, Reversible





5738



5740



Powerful tightening of screw.



Free running when readjusted.

Part No.	Wrench size mm	5738	5740	Length L mm 5738	Length L mm 5740	Jaw size a2 mm 5738	Jaw size a2 mm 5740	Ring size a1 mm
0005	8	5.76	8.50	140	144	4.1	4.6	6.5
0010	9	5.88	8.50	150	149	4.5	4.9	6.9
0015	10	6.02	8.98	160	159	4.9	5.3	7.3
0020	11	6.19	8.98	165.5	164	5.3	5.6	7.7
0025	12	6.56	9.23	172	174	5.6	6	8.2
0030	13	7.03	9.23	177	182	5.9	6.4	8.6
0035	14	7.27	10.71	191	183	6.3	6.8	9
0040	15	7.62	10.71	200	199	6.6	7	9.4
0045	16	8.05	12.71	208.5	216	6.9	7.2	9.9
0050	17	8.49	12.71	225	226	7.4	7.7	10.3
0055	18	9.04	13.66	236.5	240	8	8.2	10.7
0060	19	9.23	13.66	248	252	8.4	8.8	11.2
0065	22	12.69	20.21	290	290	9	9	13
0070	24	14.48	23.87	323	290	10	10	14.5
0075	27	31.94	–	359	–	10.5	–	15.5
0080	30	35.55	–	403	–	11.4	–	17
0085	32	41.78	–	425	–	12.5	–	17.5
		(522)	(522)					

Ratchet Sink Spanner Sets

Design: For screw connections which are difficult to access.
Easy removing or quick tightening with the spanner in a single stroke, without readjusting. Precision toothing, 72 teeth.

5741 Ratchet Sink Spanner Sets
5743 Ratchet Sink Spanner Sets, Reversible



5741 0010

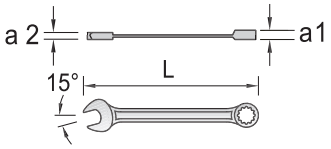


5743 0010

Part No.	Number	5741 Set	5743 Set	Design	Set contents wrench size mm
0005	4-piece	30.79	44.57	In PE bag	10, 13, 17, 19
0010	12-piece	102.65	146.89	In steel case	8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
		(522)	(522)		

Ratchet Sink Spanners

Design: For screw connections which are difficult to access.
Easy removing or quick tightening with the spanner in a single stroke, without readjusting. With reversing feature, head with 15° offset.



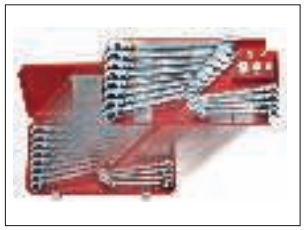


Part No.	Wrench size mm	5744 carolus	Length L mm	Jaw size a2 mm	Ring size a1 mm
0005	8	8.49	140	4	6.5
0010	9	8.79	150	4.4	6.9
0015	10	9.34	160	4.8	7.3
0020	11	9.54	160	5.2	7.7
0025	12	9.97	170	5.5	8.2
0030	13	10.28	180	5.8	9.6
		(531)			

Part No.	Wrench size mm	5744 carolus	Length L mm	Jaw size a2 mm	Ring size a1 mm
0035	14	10.91	190	6.2	9
0040	15	11.39	200	6.5	9.4
0045	16	12.48	210	6.8	9.9
0050	17	12.96	220	7.2	10.3
0055	18	13.59	230	7.7	10.7
0060	19	14.05	245	8.2	11.2
		(531)			

Ratchet Sink Spanner Sets, Chamfered

Design: addigrip® modular, variable storage system for stationary and mobile use, with and without steel case. Ratchet sink spanner with reversible lever, head with 15° offset, incl. adapter to be used as socket wrench or bit ratchet.





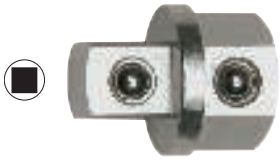
Part No.	Number	5746 carolus Set	Set contents
0010	12-piece	109.43	SW 8, 10, 12, 13, 15, 17, 19 Hexagon socket adapter 1/4" x 8 mm, 5/16" x 13 mm External square adapter 1/4" x 10 mm, 3/8" x 15 mm, 1/2" x 19 mm
0015	17-piece	166.32	SW 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 Hexagon socket adapter 1/4" x 8 mm, 5/16" x 13 mm External square adapter 1/4" x 10 mm, 3/8" x 15 mm, 1/2" x 19 mm
		(531)	

Adapter for Ratchet Sink Spanners

Part No.	Design	5745 carolus	To be used for wrench size mm
0005	1/4" Hexagon, with magnet	2.31	8
0015	5/16" Hexagon, with magnet	2.91	13
0010	1/4" External square	1.45	10
0025	3/8" External square	2.75	15
0020	1/2" External square	3.54	19
		(531)	



5745 0005
5745 0010



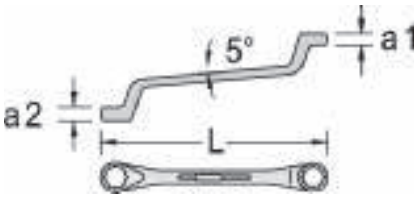
5745 0015
5745 0020
5745 0025

Metric Double-ended Ring Wrenches DIN 838, ISO 3318, ISO 1085, ISO 10104

Design: Chromium-plated, deep-offset design.

5739 Made of chromium-vanadium steel, forged.

5742 GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Rings polished.





5739 format professional quality



5742 GEDORE UNIT DRIVE

Part No.	Wrench size mm	5739	5742	Length L mm		Ring size a1 mm		Ring size a2 mm	
				5739	5742	5739	5742	5739	5742
0005	5.5 x 7*	–	5.37	–	170	–	5.6	–	6.6
0015	6 x 7	1.27	4.43	178	170	5.8	5.6	6.8	6.6
0020	7 x 8	–	5.37	–	180	–	5.6	–	6.6
0030	8 x 9	1.39	4.51	195	182	6.8	6.6	7.8	7.6
0040	8 x 10	1.39	5.22	195	182	6.8	6.6	8.5	8.5
0045	9 x 11*	–	5.85	–	195	–	7.6	–	9.5
0055	10 x 11	1.64	4.94	200	195	8.5	8.5	9.5	9.5
0057	10 x 12*	–	5.84	–	195	–	8.5	–	9.6
0065	10 x 13	1.70	6.06	220	212	8.5	8.5	10.5	10.3
0067	11 x 13	–	6.29	–	212	–	9.5	–	10.3
0068	11 x 14*	–	6.33	–	212	–	9.5	–	10.6
0075	12 x 13	1.79	5.24	220	212	9.8	9.6	10.5	10.3
0080	12 x 14	–	6.11	–	212	–	9.6	–	10.6
0090	13 x 14	1.85	6.11	220	225	10.5	10.3	10.8	10.6
0095	13 x 15	1.89	6.22	238	225	10.5	10.3	11.5	11.3
0100	13 x 16	–	7.11	–	235	–	10.3	–	11.6
0110	13 x 17	1.98	6.95	250	245	10.7	10.3	12.5	12.3
0120	14 x 15	1.98	5.66	235	225	10.8	10.6	11.8	11.3
0125	14 x 17	2.11	6.95	254	245	10.8	10.6	12.5	12.3
0135	16 x 17	2.20	6.40	250	245	11.8	11.6	12.5	12.3
0145	16 x 18	2.20	7.78	250	265	11.8	11.6	12.8	12.6
0155	17 x 19	2.72	7.44	285	265	12.5	12.3	13.2	13
0165	18 x 19	2.72	7.01	285	265	12.8	12.6	13.5	13
0170	18 x 21	–	9.54	–	285	–	12.6	–	13.4
0180	19 x 22	3.35	9.34	300	287	13.2	13	14.5	14.3
0190	19 x 24	3.58	10.87	320	305	13.4	13	14.8	14.4
0200	20 x 22	3.35	8.24	300	287	13.8	13.3	14.5	14.3
0210	21 x 23	3.61	9.95	320	305	14	13.4	14.5	14.3
0215	21 x 24	–	11.14	–	307	–	13.4	–	14.4
0225	22 x 24	3.84	10.87	320	307	14.5	14.3	15	14.4
0227	22 x 27*	–	12.67	–	325	–	14.3	–	15.4
0230	24 x 26	–	11.80	–	325	–	14.4	–	15.3
0240	24 x 27	4.24	11.14	330	325	14.8	14.4	15.8	15.4
0245	24 x 30	5.24	12.54	360	345	15	14.4	17	16.4
0250	25 x 28	4.73	12.30	345	345	15.2	14.4	16.5	15.4
0252	27 x 29*	–	15.96	–	345	–	15.4	–	16.4
0255	27 x 30	–	14.55	–	345	–	15.4	–	16.4
0260	27 x 32	5.76	14.18	360	370	15.8	15.4	17.8	17.4
0270	30 x 32	5.76	14.18	360	370	16.8	16.4	18	17.7
0280	30 x 34	–	16.20	–	375	–	16.4	–	18.7
0290	30 x 36	8.26	24.71	405	400	17	16.4	19.8	19.4
0295	32 x 36	8.26	24.71	410	400	18	17.4	20	19.4
0300	34 x 36	8.39	28.70	410	420	18.2	18.7	20	20.4
0315	36 x 41	8.90	30.43	450	440	19.8	19.4	20.8	22.2
0317	38 x 42*	–	35.15	–	440	–	19.7	–	20.4
0320	41 x 46	–	40.80	–	485	–	20.4	–	23.3
0325	46 x 50	–	51.65	–	535	–	22.2	–	23.6
0330	55 x 60*	–	82.15	–	610	–	24.6	–	25.6
0335	65 x 70*	–	159.51	–	685	–	26.6	–	27.6
0340	75 x 80*	–	267.90	–	790	–	29.5	–	29.5
0345	85 x 90*	–	338.28	–	800	–	29	–	30

* non-standard size.

(520) (522)

Metric Double-ended Ring Wrench Sets DIN 838, ISO 3318, ISO 1085, ISO 10104

Design: Chromium-plated, deep-offset design.

5748 Chromium-vanadium steel, forged.



5748 format professional quality

5751 GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Rings polished.



5751 GEDORE UNIT DRIVE

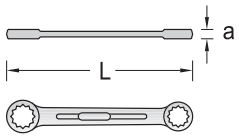
Part No.	Number	5748 mm Set	5751 Inches Set	Set contents wrench size mm or A.F.
0005	8-piece	16.31	46.47	6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22
0007	10-piece	–	67.54	6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 24x27
0010	9-piece	19.93	–	6x7, 8x9, 10x11, 12x13, 14x15, 17x19, 19x22, 24x27, 30x32
0015	10-piece	–	71.83	6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 24x27, 30x32
0020	12-piece	34.44	94.09	6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 24x27, 25x28, 30x32
				Inches A.F.
0025	8-piece	–	62.56	1/4x5/16, 5/16x3/8, 7/16x1/2, 9/16x5/8, 19/32x11/16, 3/4x25/32, 13/16x7/8, 15/16x1.
0030	10-piece	–	93.84	1/4x5/16, 5/16x3/8, 7/16x1/2, 9/16x5/8, 19/32x11/16, 3/4x25/32, 13/16x7/8, 15/16x1., 1.1/16x1.1/4, 1./1/8x1.5/16
		(520)	(522)	

Metric Double-ended Ring Wrenches DIN 837 B, ISO 3318, ISO 1085

Design: Chromium-plated, straight form.

5754 Chromium-vanadium steel, forged.

5757 GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Rings polished.





5754 format professional quality



5757 GEDORE UNIT DRIVE

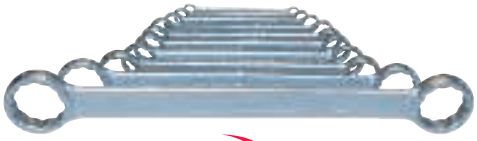
Part No.	Wrench size mm	5754 mm	5757 Inches	Length L mm 5754	Length L mm 5757	Ring size a mm 5754	Ring size a mm 5757
0010	6 x 7	1.13	5.70	102	99	4.6	4.5
0015	8 x 9	1.23	5.89	107	114	5.7	5.2
0030	8 x 10	1.23	5.43	120	115	5.7	5.2
0035	10 x 11	1.39	5.58	130	131	5.8	5.8
0040	10 x 13	–	6.17	–	149	–	6.4
0045	12 x 13	1.50	6.40	145	149	6.4	6.4
0055	12 x 14	1.50	–	147	–	6.4	–
0060	13 x 15*	1.68	6.93	160	161	7.2	7.2
0070	13 x 17	1.72	7.05	170	167	7.8	7.8
0075	14 x 15	1.68	6.78	160	161	7.2	8.5
0080	14 x 17	–	7.05	–	169	–	8.5
0090	16 x 17	1.75	7.05	172	169	7.8	9.4
0100	17 x 19	2.13	7.15	190	186	8.5	9.4
0110	18 x 19	2.13	7.15	190	186	8.6	10
0115	19 x 22	–	7.85	–	209	–	10
	* non-standard size.	(520)	(522)				

Part No.	Wrench size mm	5754 mm	5757 Inches	Length L mm 5754	Length L mm 5757	Ring size a mm 5754	Ring size a mm 5757
0117	19 x 24*	–	9.50	–	233	–	10
0120	20 x 22	2.38	8.27	207	209	9.4	10.8
0130	21 x 23	2.73	8.67	215	233	10.2	10.8
0140	22 x 24	2.87	9.21	218	233	10.4	10.6
0150	24 x 26	–	10.09	–	261	–	10.8
0155	24 x 27	3.01	9.93	260	260	11	10.8
0160	24 x 30	–	11.42	–	290	–	10.6
0165	25 x 28	3.80	11.13	267	289	11.8	11.6
0167	27 x 32	–	13.55	–	320	–	12.6
0175	30 x 32	5.33	13.55	285	320	12.8	12.6
0185	30 x 36	–	20.14	–	357	–	13.8
0190	32 x 36	–	20.14	–	357	–	13.8
0195	36 x 41	–	24.49	–	391	–	15
0200	41 x 46	–	34.67	–	431	–	16.2
0205	46 x 50	–	43.18	–	473	–	16.5
		(520)	(522)				

Metric Double-ended Ring Wrench Sets DIN 837 B, ISO 3318, ISO 1085

Design: Chromium-plated, straight form.

5760 Chromium-vanadium steel, forged.



5760 format professional quality

5763 GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Rings polished.



5763 GEDORE UNIT DRIVE

Part No.	Number	5760 mm	5763 Inches	Set contents wrench size mm
0005	8-piece	–	52.81	6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22
0010	10-piece	24.16	–	6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 24x27, 30x32
0015	12-piece	–	96.18	6x7, 8x9, 10x11, 12x13, 14x15, 16x17, 18x19, 20x22, 21x23, 24x27, 25x28, 30x32
		(520)	(522)	

Open End Slugging Spanners

Heavy-duty Box Spanners, Deep Offset

Design: Heavy-duty construction for highest torque. Machined from GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Chromium-plated, rings polished.





GEDORE

Part No.	Wrench size mm	5766	Length L mm	Ring size a mm	⌀ d mm
0024	24	14.38	180	17	18.3
0027	27	14.81	190	17	18.3
0030	30	15.90	200	18	18.3
0032	32	16.83	235	18	21.3
0034	34	22.09	235	18	21.3
0036	36	21.57	245	20	21.3
0041	41	25.07	265	22	21.3
0046	46	29.42	280	23	24.1
0050	50	34.47	290	25.5	24.1
		(522)			

Part No.	Wrench size mm	5766	Length L mm	Ring size a mm	⌀ d mm
0055	55	37.13	300	28	24.1
0060	60	49.33	345	30.5	29.1
0065	65	53.06	355	33	29.1
0070	70	63.30	365	35.5	29.1
0075	75	67.99	375	38	29.1
0080	80	84.25	385	40.5	29.1
0085	85	84.25	385	40.5	29.1
0090	90	162.85	410	45	29.1
0095	95	178.46	410	45	29.1
		(522)			

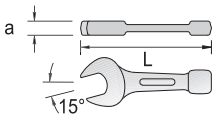
Attachable Tubes for Heavy-duty Box Spanners

Part No.	For wrench size mm	5767	⌀ x length mm
0005	24–30	11.77	19 x 460
0010	32–41	17.19	22 x 610
0015	46–55	25.63	25 x 760
0020	60–80	34.40	30 x 860
		(522)	



Open End Slugging Spanners DIN 133

Design: For especially heavy-duty assembly. Jaw offset 15°.
GEDORE Vanadium 31 CrV 3 W.





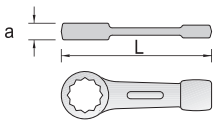
GEDORE

Part No.	Wrench size mm	5770	Length L mm	Jaw size a mm
0027	27	10.83	180	16.5
0030	30	11.59	190	17
0032	32	11.91	195	17.5
0036	36	13.82	210	18.5
0041	41	18.47	225	19.5
0046	46	22.31	255	20
0050	50	25.79	280	21.5
0055	55	32.25	310	24.5
0060	60	34.79	320	24.5
0065	65	43.68	350	28
0070	70	55.23	370	30
		(522)		

Part No.	Wrench size mm	5770	Length L mm	Jaw size a mm
0075	75	59.79	400	31.5
0080	80	72.24	405	34.5
0085	85	78.08	405	34.5
0090	90	107.93	455	39
0095	95	112.81	455	39
0100	100	214.13	500	47
0105	105	232.54	500	47
0110	110	235.72	500	47
0115	115	314.23	525	55
0120	120	325.66	525	55
		(522)		

Slugging Box Spanners DIN 7444

Design: For especially heavy-duty assembly, wrench size 24–60, with UD profile from wrench size 65 with double hexagon.
GEDORE Vanadium 31 CrV 3 W.





GEDORE

UNIT DRIVE

Part No.	Wrench size mm	5773	Length L mm	Ring size a mm
0024	24*	9.04	160	15
0027	27	11.07	180	15.5
0030	30	12.96	190	16.5
0032	32	13.92	195	16.5
0034	34	14.68	195	16.5
0036	36	17.19	205	19.5
0041	41	22.46	225	20.5
0046	46	24.13	240	22.5
0050	50	27.99	250	23.5
0055	55	31.02	270	25
0060	60	33.46	270	26
0065	65	43.74	290	29

* non-standard size.
(522)

Part No.	Wrench size mm	5773	Length L mm	Ring size a mm
0070	70	48.19	320	32.5
0075	75*	52.24	325	34
0080	80	73.96	345	35
0085	85*	90.07	360	37
0090	90	108.49	400	41.5
0095	95	122.46	400	41.5
0100	100	137.58	400	41.5
0105	105*	172.48	435	47.5
0110	110*	186.06	435	47.5
0115	115	202.26	435	47.5
0120	120	443.73	480	54
		(522)		

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Open End Slugging Spanners

Starter and Manifold Wrenches

Design: With thin-walled rings.
GEDORE Vanadium 31 CrV 3 mat. no. 1.2208.
Chromium-plated, rings polished.

Part No.	Wrench size mm	5776	Length L mm	Ring size a1 mm	Ring size a2 mm
0011	11 x 13	9.45	150	7	7.5
0012	13 x 15	11.17	185	8.5	8.5
0013	13 x 17	11.94	185	8.5	8.5
0014	14 x 17	11.94	185	8.5	8.5
0015	15 x 17	11.94	185	8.5	8.5
0016	16 x 18	14.38	185	8.5	8.5
0017	14 x 16	11.94	185	8.5	8.5
0019	19 x 22	15.05	230	10	10.5
		(522)			

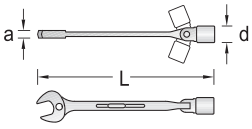




Combination Wrenches

Design: Slender construction with free-moving socket wrench ends.
Including bore hole for Tommy bar.
GEDORE Vanadium 31 CrV 3 mat. no. 1.2208,
chromium-plated, precision ground heads.

Part No.	Wrench size mm	5779	Length L mm	Jaw size a mm	ø d mm	Suitable for Tommy bar mm
0010	10	9.23	179	4.7	15.5	5
0011	11	9.43	189	5	16.7	5
0012	12	10.25	198	5.3	18	5
0013	13	10.25	208	6	19.2	5
0014	14	10.71	218	6.3	20.5	6
0015	15	11.18	231	6.7	21.7	6
0016	16	12.26	244	7	22.9	6
0017	17	12.26	255	7.5	24.2	8
0018	18	13.64	269	7.7	25.5	8
0019	19	13.64	283	8	26.7	8
		(522)				

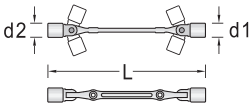


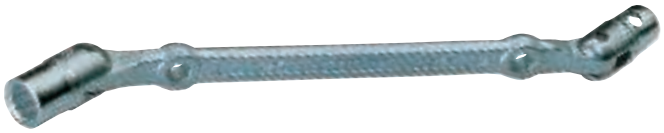


Double Joint Socket Wrenches

Design: With thin-walled heads, extra large swivel range.
Innovative design of shank and bore holes for Tommy bars.
GEDORE Vanadium 31 CrV 3 mat. no. 1.2208,
chromium-plated, precision ground heads.

Part No.	Wrench size mm	5762	Length L mm	ø d1 mm	ø d2 mm	Suitable for Tommy bar mm
0008	8 x 9	18.14	200	13	14.2	6
0010	10 x 11	18.32	205	15.5	16.7	6
0012	12 x 13	19.67	240	18	19.2	8
0013	13 x 17	22.71	275	19.2	24.2	10
0014	14 x 15	20.95	245	20.5	21.7	8
0017	17 x 19	26.13	315	24.2	26.7	12
0020	20 x 22	29.78	350	28	30.5	12
		(522)				





Open Double End Ring Wrenches

Double-end Socket Wrenches

Design: Solid chromium-vanadium steel, chromium-plated. With two hexagon sockets and deep bore hole to receive long stud bolts. The bore hole is suitable for Tommy bars.

Note: Tommy bars see (part no. 5716).



Part No.	Wrench size mm	5790	Length mm
0060	6	2.43	105
0070	7	2.43	107
0080	8	2.16	112
0090	9	2.16	122
0100	10	2.16	130
0110	11	2.43	136
0120	12	2.65	145
0130	13	2.97	152
0140	14	3.23	160
0150	15	3.65	170
0160	16	4.33	178
		(522)	

Part No.	Wrench size mm	5790	Length mm
0170	17	4.53	187
0180	18	4.65	195
0190	19	5.06	205
0210	21	6.37	212
0220	22	6.37	225
0240	24	8.27	250
0270	27	10.68	280
0300	30	14.12	310
0320	32	14.12	330
0340	34	15.97	340
0360	36	17.72	355
		(522)	

Double-end Socket Wrench Sets

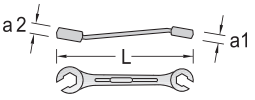
Design: Solid chromium-vanadium steel, chromium-plated. With two hexagon sockets and deep bore hole to receive long stud bolts. The bore hole is suitable for Tommy bars.

Note: Tommy bars see (part no. 5716).

Part No.	Number	5790	Set contents wrench size mm
0600	6-piece	59.94	21, 22, 24, 27, 30, 32
1200	12-piece	39.94	8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19
		(522)	

Open Double-End Ring Wrenches DIN 3118

Design: Heads 15° angle, hexagon hole, 30° shifted (up to wrench size 12 x 14), UD profile, opening 15° shifted (from wrench size 13 x 15). GEDORE Vanadium 31 CrV 3 mat. no. 1.2208, chromium-plated, rings polished.





Part No.	Wrench size mm	5765	Length L mm	Ring size a1 mm	Ring size a2 mm
0008	8 x 10	7.96	140	6.5	8
0009	9 x 11*	8.76	145	7.5	8.5
0010	10 x 11	8.59	150	8	8.5
0015	10 x 12	8.76	150	8	8.5
0011	11 x 13	8.76	160	8.5	10.5
0012	12 x 14	8.93	170	9.5	11.2
0013	13 x 15*	9.75	180	10.5	11.8
		(522)			

* non-standard size.

Part No.	Wrench size mm	5765	Length L mm	Ring size a1 mm	Ring size a2 mm
0014	14 x 17	9.75	195	11.2	12.2
0017	17 x 19	10.92	210	12.2	13.2
0019	19 x 22	13.17	230	13.2	15.2
0022	22 x 24	14.78	250	15.2	16.2
0024	24 x 27	18.12	270	16.2	17.2
0030	30 x 32	23.76	300	20.2	22.2
		(522)			

T-handled Square Socket Wrenches, Offset

Design: Heavy-duty construction with extreme head depth for projecting bolts. GEDORE Vanadium 31 CrV 3 mat. no. 1.2208. Chromium-plated.



Part No.	Wrench size mm	5768	Length mm
0005	8	7.33	150
0010	9	8.49	160
0015	10	7.53	175
0020	12	8.42	215
		(522)	

Part No.	Wrench size mm	5768	Length mm
0025	13	8.97	230
0030	14	9.46	240
0035	17	13.52	280
		(522)	

Three-square Socket Wrenches

Design: Made from cold-formed precision steel tube, zinc-plated, to DIN 22417, with Tommy bar.

Part No.	Content Sizes	5784	Length mm	Tommy bar mm
		mm		
0004	M 4	1.24	90	5 x 63
0005	M 5	1.34	100	6 x 63
0006	M 6	1.42	112	6 x 80
0008	M 8	1.64	125	6 x 100
0010	M 10	1.82	140	8 x 125
0012	M 12	2.16	160	10 x 160
0016	M 16	3.14	170	12 x 200
		(521)		



Box Wrenches DIN 896, ISO 2236, ISO 1085, Form B

Design: Seamless drawn precision steel tube, chromium-plated.

Part No.	Wrench size mm	5772	Length mm	Tommy bar ∅ mm
		mm		
0005	6 x 7	1.38	100	5
0010	8 x 9	1.48	100	6
0015	8 x 10	1.67	120	6
0020	10 x 11	1.60	120	6
0025	10 x 13	1.87	140	8
0030	12 x 13	1.80	140	8
0035	13 x 14	2.09	140	8
0040	13 x 15	2.26	140	8
0045	13 x 17	2.54	150	10
0050	14 x 15	1.96	140	8
0055	16 x 17	2.32	150	10
0060	17 x 19	2.54	160	12
0065	18 x 19	2.54	160	12
0070	19 x 22	2.91	170	12
0075	20 x 22	2.78	170	12
0080	21 x 23	3.29	185	12
0085	24 x 27	3.69	185	14
0090	30 x 32	4.76	225	16
0095	36 x 41	7.55	225	18
0100	46 x 50	24.34	245	20
		(521)		



Box Wrench Sets

Design: Seamless drawn precision steel tube, chromium-plated, in plastic bag.

Part No.	Number	5775	Set contents wrench size
		Set	mm
0005	8-piece	22.24	6 x 7, 8 x 9, 10 x 11, 12 x 13, 14 x 15, 16 x 17, 18 x 19, 20 x 22, Tommy bar
		(521)	



Tommy Bars, DIN 900

Design: Hardened, chromium-plated.

format professional quality

Part No.	Diameter mm	5778	Length mm
0005	5	1.01	125
0006	6	1.16	160
0008	8	1.31	180
0010	10	1.59	200
0012	12	2.37	250
0014	14	3.13	320
0016	16	6.58	400
0018	18	7.90	500
0020	20	11.54	630
		(521)	



Stepped Tommy Bars

Design: Hardened, chromium-plated. Due to the stepped design, the Tommy bar is the perfect fit for several box wrench sizes.

format professional quality

Part No.	Diameter mm	5781	Length mm
0005	5–12	3.68	280
		(521)	



Screwdrivers for Tube Clamps

Design: Round, flexible blade. Drive for hexagon socket screws. Kraftform® grip with anti-slip surface, 3-component material.

Wera

Part No.	Wrench size mm	5809 Wera	Length mm	Total length mm
0060	6	8.03	167	265
0070	7	8.38	167	265
0080	8	8.76	167	265
		(526)		



Hexagon Nut Drivers

Design: Round blade, nicro-matt, drive for hexagon socket screws. 2-component anti-slip handle.

format professional quality

Part No.	Wrench size mm	5800	Length mm	Total length mm
0050	5	2.78	125	220
0055	5.5	2.78	125	220
0060	6	2.78	125	220
0070	7	3.09	125	230
0080	8	3.16	125	230
0090	9	3.31	125	230
0100	10	3.35	125	230
0110	11	3.94	125	240
0120	12	4.02	125	240
0130	13	4.14	125	240
		(524)		



Hexagon Nut Drivers "HOLO"

Design: With round, **hollow blade,** nicro-matt. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.

Application: Thanks to hollow blade ideal for screw connections at long bolts and protruding threaded rods. Ideal for releasing tight screws.



Part No.	Wrench size mm	5801 Wera	Blade length mm	Total length mm
0050	5	4.94	70	168
0055	5.5	4.94	70	168
0060	6	5.22	70	168
0070	7	5.48	80	185
		(526)		

Part No.	Wrench size mm	5801 Wera	Blade length mm	Total length mm
0080	8	7.05	80	185
0100	10	7.52	80	192
0130	13	9.30	80	192
		(526)		

Hexagon Nut Drivers, VDE

Design: Blade bronze, insulated, drive DIN 475/2. Kraftform® grip with anti-slip surface, 3-component material. DIN EN 60900 standard.



Part No.	Wrench size mm	5803 Wera	Length mm	Total length mm
0055	5.5	5.21	125	223
0060	6	5.30	125	223
0070	7	5.63	125	230
0080	8	5.78	125	230
0090	9	6.02	125	230
		(526)		

Part No.	Wrench size mm	5803 Wera	Length mm	Total length mm
0100	10	6.82	125	237
0110	11	7.36	125	237
0120	12	7.53	125	237
0130	13	9.00	125	237
		(526)		

Hexagon Nut Drivers with T-Handle

Design: Blade made of chromium-vanadium steel. T-shape plastic handle.



Part No.	Wrench size mm	5806	Length mm	Total length mm
0055	5.5	2.80	230	263
0060	6	2.86	230	263
0070	7	2.87	230	274
0080	8	2.93	230	274
0090	9	2.95	230	274
0100	10	3.10	230	274
0110	11	3.25	230	274
		(528)		

Part No.	Wrench size mm	5806	Length mm	Total length mm
0120	12	3.31	230	274
0130	13	3.65	230	274
0140	14	3.72	230	274
0150	15	4.05	230	274
0160	16	4.12	230	274
0170	17	4.05	230	274
0171	17	5.51	350	394
		(528)		

Adjustable Wrenches

5812 **Design:** Chromium-vanadium, matt chromium finish, ground head, with black roller-adjuster, jaw setting 15°, with lasered scale.

5818 **Design:** DIN 3117, form A, Swedish model, jaw offset 15°, roll with left-hand motion. GEDORE Vanadium 31 CrV 3 mat. no. 1.2208, chromium-plated, polished head. Size 15 and 18 inch machining steel DIN 17200 mat. no. 1.0501. Phosphate finish, ground head.



5812 format professional quality



5818 GEDORE

Part No.	Dimensions inch	5812	5818	Length mm 5812	Length mm 5818	Opening max. mm
0020	6.	4.03	11.28	150	155	20
0025	8.	5.22	12.09	200	205	25
0030	10.	6.30	15.54	250	255	30
0036	12.	7.82	22.80	300	305	36
0040	15.	–	32.69	–	380	43
0045	18.	–	51.04	–	455	53
		(520)	(522)			

Ratchet-Type Pliers

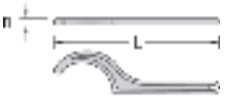
Design: Ratchet-type operation, replaces open-end and adjustable wrenches. For all metric and inch screwing jobs. Safe gripping of worn, corroded or painted nuts.



Part No.	Length mm	5820	Wrench size mm
0250	250	16.60 (525)	10–32

Hook Wrenches

Design: DIN 1810, form A, for groove nuts to DIN 1084/981. GEDORE Vanadium 31 CrV 3 mat. no. 1.2208, phosphate finish.



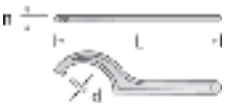


Part No.	Jaw span mm	5821	Length mm	Dimension mm
0005	16–20	4.84	110	3.8
0010	25–28	4.92	135	4.5
0015	30–32	4.92	135	4.5
0020	34–36	5.28	170	5.5
0025	40–42	5.28	170	5.5
0030	45–50	5.95	205	6.5
0035	52–55	5.95	205	6.5
0040	58–62	7.04	240	7.5
0045	68–75	7.04 (522)	240	7.5

Part No.	Jaw span mm	5821	Length mm	Dimension mm
0050	80– 90	8.85	280	8.5
0055	95–100	8.85	280	8.5
0060	110–115	12.61	335	10.3
0065	120–130	12.61	335	10.3
0070	135–145	18.02	385	12.3
0075	155–165	18.02	385	12.3
0080	180–195	47.55	465	14.3
0085	205–220	47.55 (522)	465	14.3

Pin Wrenches

Design: DIN 1810, form B, for capstan nuts to DIN 1816. GEDORE Vanadium 31 CrV 3 mat. no. 1.2208, phosphate finish.



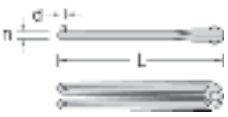


Part No.	Jaw span mm	5823	Length mm	Cone ∅ mm	Dimension mm
0005	16–18	5.91	110	2.5	3.8
0010	20–22	5.91	110	2.5	3.8
0015	25–28	5.91	135	3	4.5
0020	30–32	5.91	135	4	4.5
0025	34–36	6.70	170	4	5.5
0030	40–42	6.70	170	4	5.5
0035	45–50	7.36	205	5	6.5
0040	52–55	7.36	205	5	6.5
0045	58–62	8.78 (522)	240	5	7.5

Part No.	Jaw span mm	5823	Length mm	Cone ∅ mm	Dimension mm
0050	68– 75	8.78	240	6	7.5
0055	80– 90	10.73	280	6	8.5
0060	95–100	10.73	280	8	8.5
0065	110–115	16.16	335	8	10.3
0070	120–130	16.16	335	8	10.3
0075	135–145	20.54	385	8	12.3
0080	155–165	20.54	385	8	12.3
0085	180–195	50.91	465	10	14.3
0090	205–220	50.91 (522)	465	10	14.3

Two-hole Nut Twisters, Adjustable

Design: Similar to DIN 3116. GEDORE Vanadium 31 CrV 3 mat. no. 1.2208, phosphate finish.





Part No.	Dimensions	5825	Length mm	Cone ∅ mm	Dimension mm
0030	3	13.13	178	2.9	4
0040	4	13.13	178	3.8	5
0050	5	15.08	230	4.8	6
0060	6	15.08	230	5.8	7
0080	8	15.76 (522)	230	7.8	8

Special sizes on request.

Pin-Type Face Wrenches/Free-Running Ratchets/Ring Inserts

Pin-Type Face Wrenches

Design: Special steel, zinc-coated, with electrically welded pins.

5827 Straight

5828 Deep offset

Part No.	Pin distance mm	5827	5828	Cone ∅ mm
0005	35	3.13 (506)	3.08 (506)	5

5827



5828



Free-Running Ratchets without Ring

Design: Friction wrench for exchangeable bihexagonal and square insert rings. GEDORE Vanadium 31 CrV 3 mat. no. 1.2208, bronze.

Part No.	Dimensions	5830	Length mm	For bihex rings Wrench size mm	For square rings Wrench size mm
0006	6	17.57	150	8–13	8–11
0008	8	21.19	205	14–17	12–14
0010	10	23.76	255	18–23	17–19
0012	12	28.96	305	24–28	22–24
0016	16	41.71	400	30–32	27
0020	20	56.94 (522)	500	36 + 41	30–36

Larger-sized free running ratchets on request.



Ring Inserts for Free-Running Ratchets

Design: Bihexagonal, GEDORE Vanadium 31 CrV 3 mat. no. 1.2208, ground.



Part No.	Wrench size mm	5831	Fitting ratchet length mm	Fitting ratchet size
0008	8	4.88	150	6
0009	9	5.21	150	6
0010	10	4.88	150	6
0011	11	5.21	150	6
0012	12	5.04	150	6
0013	13	4.88	150	6
0014	14	5.85	205	8
0017	17	5.66	205	8
0018	18	6.51 (522)	255	10

Part No.	Wrench size mm	5831	Fitting ratchet length mm	Fitting ratchet size
0019	19	6.41	255	10
0021	21	6.41	255	10
0022	22	6.41	255	10
0024	24	8.05	305	12
0027	27	8.05	305	12
0030	30	11.28	400	16
0032	32	11.28	400	16
0036	36	12.82	500	20
0041	41	12.82 (522)	500	20

Larger-sized ring inserts on request.

Ring Inserts for Free-Running Ratchets

Design: Square, GEDORE Vanadium 31 CrV 3 mat. no. 1.2208, ground.



Part No.	Wrench size mm	5832	Fitting ratchet length mm	Fitting ratchet size
0009	9	5.07	150	6
0010	10	5.07	150	6
0012	12	5.85 (522)	205	8

Part No.	Wrench size mm	5832	Fitting ratchet length mm	Fitting ratchet size
0014	14	5.85	205	8
0017	17	6.41	255	10
0019	19	6.41 (522)	255	10

Larger-sized ring inserts on request.

Hexagon Wrenches

Design: ISO 2936 (DIN 911), chromium-vanadium steel (59 CrMoV4), short shank chamfered.
Copper-plated layer and nickel-plated.
Jaw spans of 3 mm upwards, stamped with jaw span, ISO 2936 and 59 CrMoV4.

format professional quality



Part No.	Wrench size mm	5840	Shank length mm
0007	0.7*	0.14	33 x 7
0009	0.9*	0.14	33 x 11
0013	1.3	0.07	41 x 13
0015	1.5	0.07	46.5 x 15.5
0020	2	0.08	52 x 18
0025	2.5	0.08	58.5 x 20.5
0030	3	0.10	66 x 23
0035	3.5	0.12	69.5 x 25.5
0040	4	0.14	74 x 29
0045	4.5	0.21	80 x 30.5
0050	5	0.21	85 x 33
0055	5.5	0.25	91 x 36
0060	6	0.27	96 x 38
0070	7	0.37	102 x 41
		(528)	

* black version

Part No.	Wrench size mm	5840	Shank length mm
0080	8	0.45	108 x 44
0090	9	0.56	114 x 47
0100	10	0.66	122 x 50
0120	12	0.98	137 x 57
0140	14	1.68	154 x 70
0170	17	2.79	177 x 80
0190	19	3.71	199 x 89
0220	22	5.85	222 x 102
0240	24	8.80	248 x 114
0270	27	11.09	277 x 127
0300	30	18.51	315 x 142
0320	32	26.25	347 x 157
0360	36	36.97	391 x 176
		(528)	

Hexagon Wrenches, US inches A.F.

Design: Chromium-vanadium steel (59 CrMoV4), chamfered bits.
Copper-plated layer and nickel-plated. From wrench size 1/8 A.F. stamped with wrench size and 59 CrMoV4.



Part No.	Wrench size A.F.	5841	Leg length mm
0005	0.05	0.08	41 x 13
0010	1/16	0.08	47 x 16
0015	5/64	0.08	52 x 18
0020	3/32	0.10	58 x 20
0025	1/8	0.11	66 x 23
0030	9/64	0.12	72 x 26
0035	5/32	0.16	74 x 29
0040	3/16	0.23	85 x 33
0045	7/32	0.27	91 x 36
0050	1/4	0.31	96 x 38
		(529)	

Part No.	Wrench size A.F.	5841	Leg length mm
0055	9/32	0.42	102 x 42
0060	5/16	0.53	108 x 44
0065	3/8	0.77	122 x 50
0070	7/16	0.96	130 x 53
0075	1/2	1.50	145 x 63
0080	9/16	1.79	154 x 69
0085	5/8	2.84	176 x 76
0090	3/4	3.98	199 x 89
0095	7/8	6.10	222 x 102
0100	1.	10.49	275 x 125
		(529)	

Hexagon Wrench Sets

Design: ISO 2936 (DIN 911), chromium-vanadium steel (59 CrMoV4), shank ends chamfered. Copper-plated layer and nickel-plated. From wrench size of 3 mm upwards stamped with wrench size, ISO 2936 and 59 CrMoV4.

Design: In plastic wallet.

Part No.	Number	5847 Set	Set contents wrench size mm
0035	8-piece	2.50	2, 2,5, 3, 4, 5, 6, 8, 10
0040	10-piece	5.39	2, 2,5, 3, 4, 5, 6, 8, 10, 12, 14
		(528)	

Design: On ring, in self-service wallet with hook hole.

Part No.	Number	5847 Set	Set contents wrench size mm
0045	8-piece	2.72	2, 2,5, 3, 4, 5, 6, 8, 10
		(528)	

Design: In plastic slide case.

Part No.	Number	5847 Set	Set contents wrench size mm or A.F.
0005	8-piece	3.25	2, 2,5, 3, 4, 5, 6, 8, 10
0010	8-piece	3.20	5/64, 3/32, 1/8, 5/32, 3/16, 1/4, 5/16, 3/8
		(528)	



5847 0035



5847 0040



5847 0045



5847 0005

Hexagon Wrench Sets

Design: In workshop stand.

Part No.	Number	5847 Set	Set contents wrench size mm
0050	9-piece	9.45	2,5, 3, 4, 5, 6, 8, 10, 12, 14
		(528)	



Hexagon Wrench Sets

Design: Shank ends chamfered. Copper-plated layer and nickel-plated. Wrench sizes from 3 mm upwards, stamped with SW, ISO 2936 and 59 CrMoV4.

Design: In hand clip, nickel-plated.

Part No.	Number	5847 Set	Set contents wrench size mm
0013	7-piece	3.28	1,5, 2, 2,5, 3, 4, 5, 6
0015	6-piece	3.79	2,5, 3, 4, 5, 6, 8
0020	7-piece	4.92	2,5, 3, 4, 5, 6, 8, 10
		(528)	



5847 0013

Design: In plastic hand clip.

Part No.	Number	5847 Set	Set contents wrench size mm
0025	6-piece	4.25	2,5, 3, 4, 5, 6, 8
0030	7-piece	5.46	2,5, 3, 4, 5, 6, 8, 10
		(528)	



5847 0025

Hexagon Wrenches, Long

Design: ISO 2936 L (DIN 911 L) long design, chromium-vanadium steel (59 CrMoV4), short shank chamfered. Copper-plated layer and nickel-plated.



Part No.	Wrench size mm	5844	Shank length mm
0020	2	0.15	102 x 18
0025	2.5	0.18	114.5 x 20.5
0030	3	0.22	129 x 23
0040	4	0.33	144 x 29
0050	5	0.40	165 x 33
0060	6	0.52	186 x 38
		(528)	

Part No.	Wrench size mm	5844	Shank length mm
0080	8	0.75	208 x 44
0100	10	1.12	234 x 50
0120	12	1.45	262 x 57
0140	14	2.34	294 x 70
0170	17	4.50	337 x 80
0190	19	5.93	379 x 89
		(528)	

Hexagon Wrench Sets, Long

5847 0055 **Design:** In plastic slide case.

5847 0060 **Design:** In workshop stand.

Part No.	Number	5847 Set	Set contents wrench size mm
0055	8-piece	8.37	2, 2,5, 3, 4, 5, 6, 8, 10
0060	9-piece	12.36	2,5, 3, 4, 5, 6, 8, 10, 12, 14
		(528)	



5847 0055



5847 0060

Hexagon T-Handle Screwdrivers

Design: With T-handle made of polypropylene (PPN), hook hole, chromium-vanadium steel (59 CrMoV4) blade, nickel-plated, chamfered leading edge.

format professional quality

Part No.	Wrench size mm	5850	Length mm
0005	2	1.07	100
0010	2.5	1.12	100
0015	3	0.92	100
0020	3	1.05	150
0025	3	1.20	200
0030	4	1.05	100
0035	4	1.20	150
0040	4	1.34	200
0045	5	1.20	100
0050	5	1.30	150
0055	5	1.42	200
0060	6	1.30	100
0065	6	1.42	150
0070	6	1.52	200
0080	8	1.57	100
0085	8	1.72	150
0090	8	1.83	200
0095	10	3.25	200
		(528)	



Hexagon T-Handle Screwdriver Sets

Design: Plastic T-handle with hook-up hole, blade chromium-vanadium steel (59 CrMoV4), nickel-plated, chamfered leading edge. In workshop stand.

format professional quality

Part No.	Number	5847 Set	Set contents wrench size mm
0065	7-piece	13.93	2x100, 2.5x100, 3x100, 4x150, 5x150, 6x200, 8x200
		(528)	



Hexagon Wrench Ball Ended with MagicRing®, Long

Design: The special ball geometry results in improved retaining force and up to 10 % higher torque; holds all standard hexagon socket screws in any position thanks to high-quality spring steel ring; for screwing up to 25° angle, chromium-vanadium, blade continuously hardened, chromium-finish.

Part No.	Wrench size mm	5865	Shank length mm
0005	1.5*	0.56	89 x 14
0010	2*	0.56	99 x 16
0015	2.5*	0.59	111 x 18
0020	3	1.65	125 x 20
0025	4	1.71	138 x 25
0030	5	1.82	158 x 28
0035	6	2.13	178 x 32
0040	8	2.97	198 x 36
0045	10	3.90	221 x 40
0050	12*	3.71	247 x 45
		(530)	

* without MagicRing





Hexagon Wrench Sets Ball Ended with MagicRing®, Long

Design: The special ball geometry results in improved retaining force and up to 10 % higher torque; holds firm all standard hexagon socket screws in any position thanks to high-quality spring steel ring; for screwing up to 25° angle, chromium-vanadium, blade continuously hardened, chromium finish. In plastic case.

Part No.	Number	5865 Set	Set contents wrench size mm
0100	9-piece	17.75	1.5*, 2*, 2.5*, 3, 4, 5, 6, 8, 10
		(530)	

* without MagicRing





Hexagon Wrench – with Spherical Head

Design: Chromium-vanadium steel (59 CrMoV4), hardness and torque similar to ISO 2936 L (DIN 911 L), long shank with spherical head, short shank chamfered, nickel-plated (copper-plated layer). Wrench size from 4 mm stamped with wrench size and 59 CrMoV4 Germany. The ball head permits screwing up to an angle of 30°.



Part No.	Wrench size mm	5856	Leg length mm
0015	1.5	0.25	91.5 x 15.5
0020	2	0.27	102 x 18
0025	2.5	0.31	114.5 x 20.5
0030	3	0.37	129 x 23
0040	4	0.52	144 x 29
0050	5	0.62	165 x 33
		(528)	

Part No.	Wrench size mm	5856	Leg length mm
0060	6	0.85	186 x 38
0070	7	1.01	197 x 41
0080	8	1.20	208 x 44
0100	10	1.65	234 x 50
0120	12	2.42	262 x 57
		(528)	

Hexagon Wrench Sets with Spherical Head, Long

Design: Chromium-vanadium steel (59 CrMoV4), hardness and torque similar to ISO 2936 L (DIN 911 L), long shank with spherical head, short shank chamfered, nickel-plated (copper-plated layer). Jaw spans from 4 mm stamped with jaw span and 59 CrMoV4 Germany. The ball head permits screwing up to an angle of 30°.

Part No.	Number	5858 Set	Set contents wrench size mm Design
0005	8-piece	9.64	2, 2,5, 3, 4, 5, 6, 8, 10 In plastic foldable holder
0010	9-piece	7.59	1,5, 2, 2,5, 3, 4, 5, 6, 8, 10 In plastic holder
		(528)	



5858 0005



5858 0010

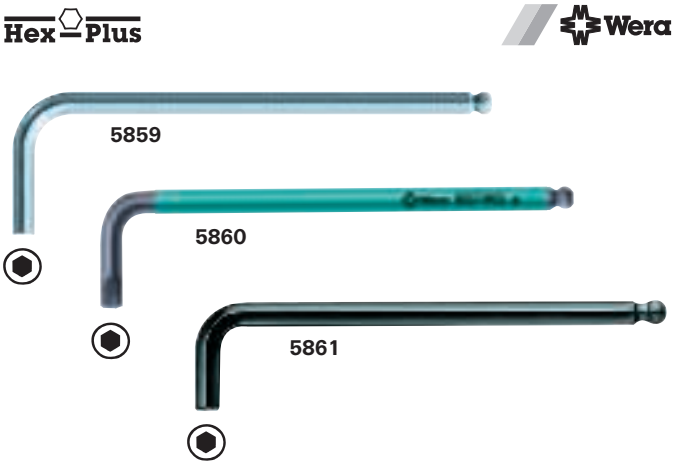
Hexagon Wrenches – with Spherical Head, Long

Design: The hex-plus geometry of the wrench results in a 20 % higher static torque. Longer service life of the tool through use of special tool steel (bit material). Drive: hex-plus, long shank with spherical head.

5859 Blade chromium-plated.

5860 Tubular covered blade.

5861 Blade BlackLaser®.



Part No.	Wrench size mm	5859 Wera	5860 Wera	5861 Wera	Shank length mm 5859/5861	5860
0005	1.5	–	1.97	–	90 x 14	90 x 14
0005	1.5*	0.67	–	0.44	90 x 14	–
0015	2	0.67	1.97	0.44	100 x 16	101 x 16
0025	2.5	0.82	1.91	0.44	112 x 18	112 x 19
0035	3	1.23	1.86	0.53	126 x 20	123 x 21
0050	4	1.23	2.06	0.56	140 x 25	137 x 24
0060	5	1.50	2.34	0.70	160 x 28	154 x 27
0070	6	1.64	3.13	0.90	180 x 32	172 x 31
0075	7	1.86	–	1.12	190 x 34	–
0085	9	2.11	3.91	1.45	200 x 36	195 x 37
0090	10	2.39	5.28	2.01	219 x 40	224 x 42
0100	12	3.60	–	2.72	248 x 45	–
		(526)	(526)	(526)		

* Conventional hexagon profile.

Hexagon Wrench Sets with Spherical Head, Long

Design: The hex-plus geometry of the wrench results in a 35 % higher static torque. Longer service life of the tool through use of special tool steel (bit material). Drive: hex-plus, long shank with spherical head.

5863 Blade chromium-plated, in plastic clip.

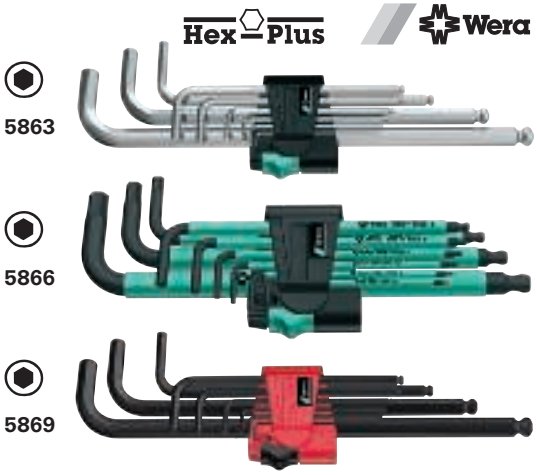
5866 Blade tubular cover, in plastic clip.

5869 Blade BlackLaser®, in plastic clip.

Part No.	Number	0009 Set	Set contens wrench size mm
5863 Wera	9-piece	12.80	1.5*, 2, 2.5, 3, 4, 5, 6, 8, 10
5866 Wera	9-piece	18.65	1.5, 2, 2.5, 3, 4, 5, 6, 8, 10
5869 Wera	9-piece	8.90	1.5*, 2, 2.5, 3, 4, 5, 6, 8, 10

* Conventional hexagon profile.

(526)

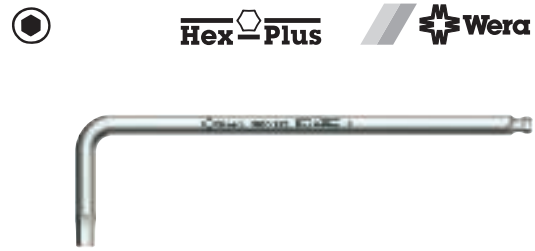


INOX Hexagon Wrenches Stainless

Design: From stainless steel, tough hard (HRC 54) with Hex-Plus® geometry, up to 20 % higher torque. The ball head results in improved retaining force of the screw when working at an angle of 20°. Thanks to the **vacuum ice-hardening** the screwdriver features the same hardness as conventional tools and is therefore **workshop-compatible and wear-resistant.**

Application: Screwdrivers from stainless steel are used where extraneous rust at stainless steel is to be avoided. Especially for screwing stainless steel screws in window and door construction, in case of fittings and sinks, facades, handrails, balconies, fences etc.

Note: Extraneous rust in stainless steel processing is caused by tools made of normal steel. Abraded particles are thereby produced which adhere to the stainless steel. These particles become rust under the effect of oxygen. **Use stainless steel tools only for stainless steel screws and store them separately! Extraneous rust is thereby avoided.**



Part No.	Wrench size mm	5872 Wera	Shank length mm
0005	1.5	2.12	50 x 14
0015	2	2.00	100 x 16
0025	2.5	1.93	112 x 18
0035	3	1.86	126 x 20
0050	4	2.06	140 x 25

(584)

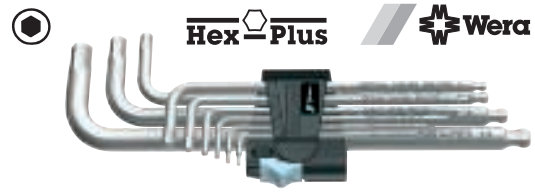
Part No.	Wrench size mm	5872 Wera	Shank length mm
0060	5	2.34	160 x 28
0070	6	3.28	180 x 32
0085	8	4.06	200 x 36
0090	10	5.33	219 x 40

(584)

INOX Hexagon Wrench Sets Stainless

Part No.	Design	5875 Wera Set	Set contents wrench size mm
0005	9-piece	17.21	1.5, 2, 2.5, 3, 4, 5, 6, 8, 10

(584)



Screwdrivers – Spherical Driving Bit

Design: Hexagon shank, nicromatt. Drive similar to ISO 2936, black-point tip for higher torque and precision, safe working in confined areas.

5870 2-component handle with anti-roll protection.

5867 Kraftform® handle with anti-roll protection, 3-component.



Part No.	Wrench size mm	5870	5867 Wera	Blade length mm	Total length mm
0005	1.5	–	2.06	60	130
0010	2	2.09	2.24	100	170
0020	2.5	2.09	2.28	100	181
0030	3	2.12	2.32	100	181
0040	4	2.35	2.54	100	198

(528) (526)

Part No.	Wrench size mm	5870	5867 Wera	Blade length mm	Total length mm
0050	5	2.86	3.12	100	205
0060	6	3.61	3.94	125	230
0070	8	4.92	5.36	150	262
0080	10	–	6.84	150	262
0090	12*	–	7.86	150	267

(528) (526)

* Black Kraftform grip with anti-slip surface

Screwdriver Sets – Spherical Driving Bit

Design: Hexagon shank, nicro-matt, drive ISO 2936, black-point tip for higher torque and precision, reliable machining in confined installation areas.

5871 2-component handle with anti-roll protection.

5868 Kraftform® handle with anti-roll protection, 3-component.



5871 format professional quality



5868 Wera

Part No.	Number	5871 Set	5868 Set	Set content wrench size mm
0005	6-piece	17.91 (528)	19.67 (526)	2, 3, 4, 5, 6, 8

Hexagon Wrenches with Pin

Design: DIN 6911, chromium-vanadium steel (59 CrMoV4), copper-plated layer and nickel-plated.

format professional quality



Part No.	Wrench size mm	5874	Leg length mm
0030	3	0.22	63 x 20
0040	4	0.25	71 x 25
0050	5	0.33	80 x 28
0060	6	0.40	90 x 32
0080	8	0.67 (528)	100 x 36

Part No.	Wrench size mm	5874	Leg length mm
0100	10	1.04	112 x 40
0120	12	1.49	125 x 45
0140	14	2.35	140 x 55
0170	17	3.86 (528)	160 x 60

TORX® Wrenches

Design: Chromium-vanadium steel (59 CrMoV4), milled profile.

format professional quality



Part No.	Dimensions	5876	Leg length mm
0060	T 6	0.81	44.5 x 18.5
0070	T 7	0.81	50.5 x 18.5
0080	T 8	0.81	51 x 19
0090	T 9	0.81	51 x 19
0100	T 10	0.81	54 x 20
0150	T 15	0.82	57.5 x 21.5
0200	T 20	0.82	61 x 23
0250	T 25	0.82 (528)	64.5 x 24.5

Part No.	Dimensions	5876	Leg length mm
0270	T 27	0.83	69.5 x 26.5
0300	T 30	0.89	76 x 30
0400	T 40	1.05	83 x 33
0450	T 45	1.16	91 x 37
0500	T 50	1.34	104 x 41
0550	T 55	1.85	120 x 47
0600	T 60	2.50 (528)	134 x 52

TORX® Wrenches with Retaining Function

Design: Made of special-alloy tool steel, chromium-plated. Milled profile **with retaining function.**

Note: Due to the novel geometry of the wrenches, all TORX® screws manufactured to the tolerances of Camcar Textron (TORX®) are retained. This facilitates positioning of the screw.

Wera



Part No.	Dimensions	5887	Leg length mm
0080	T 8	1.22	76 x 16
0090	T 9	1.27	79 x 16
0100	T 10	1.33	85 x 17
0150	T 15	1.38	90 x 18
0200	T 20	1.48 (526)	96 x 19

Part No.	Dimensions	5887	Leg length mm
0250	T 25	1.53	104 x 21
0270	T 27	1.57	112 x 22
0300	T 30	1.68	122 x 24
0400	T 40	1.75 (526)	132 x 27

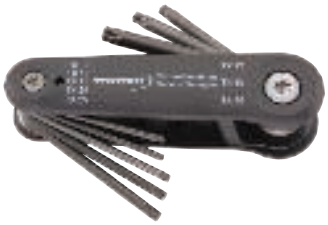
TORX® Wrench Sets

Design: Chromium-vanadium steel (59 CrMoV4), milled profile.

Part No.	Number	5877 Set	Set contents
0005	8-piece	8.33 (528)	T 9, 10, 15, 20, 25, 27, 30, 40



5877 0005



5877 0010

TORX® Screwdriver Sets

Design: Chromium-vanadium steel (59 CrMoV4), milled profile.

Part No.	Number	5877 Set	Set contents
0010	8-piece	7.52 (528)	T 9, 10, 15, 20, 25, 27, 30, 40

TORX® Wrenches with Hole

Design: Chrome-vanadium steel (59 CrMoV4).

5881 With hole.

5882 Ball-ended and with hole.

Part No.	Contents sizes	5881	5882	Shank length mm 5881	5882
0090	T 9	0.96	1.76	59 x 19	67 x 19
0100	T 10	0.96	1.89	65 x 20	76 x 20
0150	T 15	0.96	1.96	75.5 x 20.5	86.5 x 20.5
0200	T 20	1.13	2.00	87 x 22	98 x 22
0250	T 25	1.22	2.11	97.5 x 22.5	100.5 x 22.5
0270	T 27	1.26	2.17	105.5 x 25.5	111.5 x 25.5
0300	T 30	1.37	2.21	111 x 30	125 x 30
0400	T 40	1.37 (528)	2.43 (528)	119 x 33	139 x 33



5881



5882

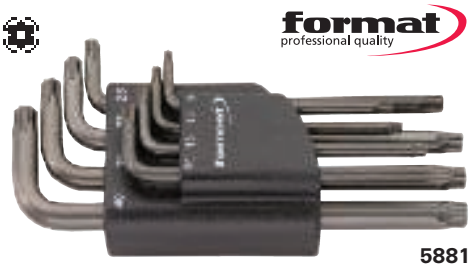
TORX® Wrench Sets with Hole

Design: Chromium-vanadium steel (59 CrMoV4).

5881 With hole.

5882 Ball-ended and with hole.

Part No.	Number	5881 Set	5882 Set	Set contents
1800	8-piece	14.10 (528)	17.38 (528)	T 9, 10, 15, 20, 25, 27, 30, 40



5881



5882

TORX® Wrench Sets with Retaining Function

Design: Made of special-alloy tool steel, BlackLaser®. Milled profile with retaining function. Supplied with rubber clip for permanent clamping of the wrenches.

Note: Due to the novel geometry of the wrenches, all TORX® screws manufactured to the tolerances of Camcar Textron (TORX®) are retained. This facilitates positioning of the screw in the thread or in wood.

Part No.	Number	5888 Set	Set contents
0005	9-piece	13.28 (526)	T 8, 9, 10, 15, 20, 25, 27, 30, 40



TORX® Screwdrivers

Design: Blade round, nicromatt, black point driving tip.

5883 Round blade, 2-component handle with anti-roll protection.



5886 Round blade, Kraftform® Handle with anti-roll protection, 3-component.



5898 Round blade, with hole, Kraftform® with anti-roll protection, 3-component.



5895 Blade nicromatt, round, with ball end, Kraftform® handle with anti-roll protection, 3-component.



5897 Blade with continuous hexagon, with impact cap, Kraftform® handle with anti-roll protection, 3-component.



Part No.	Dimensions	5883	5886 Wera	5898 Wera	5895 Wera	5897 Wera	Blade length mm 5883	Blade length mm 5886/5898/5895	Blade length mm 5897	Total length mm 5883	Total length mm 5886/5898/5895	Total length mm 5897
0005	T 5	1.65	3.23	–	–	–	60	60	–	130	130	–
0010	T 6	1.65	3.23	–	–	–	60	60	–	130	130	–
0020	T 7	1.68	3.19	5.22	–	–	60	60	–	130	130	–
0030	T 8	1.68	3.21	5.22	–	–	60	60	–	141	141	–
0035	T 9	1.80	3.19	5.22	–	–	60	60	–	141	141	–
0036	T 9	–	–	5.67	–	–	–	**300**	–	–	381	–
0040	T 10	1.64	3.25	4.73	–	–	80	80	–	161	161	–
0041	T 10	–	–	5.67	–	–	–	**300**	–	–	381	–
0050	T 15	1.82	3.31	4.81	4.50	4.40	80	80	80	178	178	178
0051	T 15	–	–	5.89	–	–	–	**300**	–	–	398	–
0060	T 20	1.90	3.38	4.94	4.73	4.47	100	100	90	198	198	198
0061	T 20	–	–	5.89	–	–	–	**300**	–	–	398	–
0070	T 25	1.94	3.57	5.26	4.92	4.76	100	100	100	198	205	205
0080	T 27	2.00	3.91	5.76	5.88	–	115	115	–	213	220	–
0090	T 30	2.17	4.12	6.10	5.82	5.47	115	115	150	213	220	262
0100	T 40	2.38	4.63	6.81	7.00	6.17	130	130	150	242	242	262
0105	T 45	2.75 (528)	5.48 (526)	– (526)	8.39 (526)	– (526)	130	130	–	242	242	–

TORX® Screwdrivers with Retaining Function

Design: With round blade, tip nicro-matt for higher torque and fitting accuracy. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.

Note: Due to the novel geometry of the screwdrivers, all TORX® screws manufactured to the tolerances of Camcar Textron (TORX®) are retained. This facilitates positioning of the screw in the thread or in wood.

TORX JIT Wera



Part No.	Size	5904 Wera	Blade length mm	Total length mm
0010	T 10	3.36	80	161
0015	T 15	3.39	80	178
0020	T 20	3.49	100	198
0025	T 25	3.66	100	205
0030	T 30	4.25	115	220
0040	T 40	4.79 (526)	130	242

TORX® Screwdrivers VDE

Design: With round and insulated blade, Black-Point tip for higher torque and fitting accuracy.
Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection.
Blade and handle insulated up to 1,000 v according to IEC 60900 : 2004.
Stamped with drive symbol and size.



Part No.	Size	5905 Wera	Blade length mm	Total length mm
0005	T 5	4.18	80	161
0006	T 6	3.69	80	161
0007	T 7	3.69	80	161
0008	T 8	3.69	80	161
0009	T 9	3.69	80	161
0010	T 10	3.80	80	161
0015	T 15	3.86 (526)	80	178

Part No.	Size	5905 Wera	Blade length mm	Total length mm
0020	T 20	3.90	80	178
0025	T 25	3.98	100	205
0027	T 27	4.18	100	205
0030	T 30	4.38	100	205
0040	T 40	4.65	150	262
0045	T 45	5.80 (526)	150	262

TORX® Screwdrivers with T-handle

Design: Blade from chromium-vanadium steel (59 CrMoV4), chromium-plated with black tip.
Handle made of polypropylene with eye.



Part No.	Dimensions	5880 mm/inch	Length mm
0005	T 9	2.30	100
0010	T 10	2.35	100
0015	T 15	2.37	100
0020	T 15	2.47	200
0025	T 20	2.53	100
0030	T 20	2.79	200
0035	T 25	2.57 (528)	100

Part No.	Dimensions	5880 mm/inch	Length mm
0040	T 25	2.93	200
0045	T 27	2.64	100
0050	T 27	3.06	200
0055	T 30	2.64	100
0060	T 30	3.25	200
0065	T 40	2.83 (528)	100

TORX® Screwdrivers with Flag

Design: Blade from chromium-vanadium steel (59 CrMoV4), bronzed, with flag.

Application: In particular for fastening of indexable inserts made of carbide.



Part No.	Contents size	5879 mm/inch	Blade length mm
0001	T 5	1.26	35
0002	T 6	1.26	35
0003	T 7	1.26	35
0004	T 8	1.26 (528)	40

Part No.	Contents size	5879 mm/inch	Blade length mm
0005	T 9	1.26	40
0010	T 10	1.11	40
0015	T 15	1.13	45
0025	T 20	1.26 (528)	45

INOX TORX® Screwdrivers Stainless

Design: With round blade **made of stainless steel,** tough hard (HRC 54). Thanks to the **vacuum ice-hardening** the blade features the same hardness as conventional tools and is therefore **workshop-compatible and wear-resistant. Ergonomic Kraftform® Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.**

Application: Screwdrivers from stainless steel are used where extraneous rust at stainless steel is to be avoided. Especially for screwing stainless steel screws in window and door construction, in case of fittings and sinks, facades, handrails, balconies, fences etc.

Note: Extraneous rust in stainless steel processing is caused by tools made of normal steel. Abraded particles are thereby produced which adhere to the stainless steel. These particles become rust under the effect of oxygen. **Use stainless steel tools only for stainless steel screws and store them separately! Extraneous rust is thereby avoided.**



Part No.	Size	5906 Wera	Blade length mm	Total length mm
0008	T 8	4.31	60	141
0009	T 9	4.31	60	141
0010	T 10	4.58	80	161
0015	T 15	4.58	80	178
0020	T 20	4.63 (584)	100	198

Part No.	Size	5906 Wera	Blade length mm	Total length mm
0025	T 25	4.94	100	205
0027	T 27	5.39	115	220
0030	T 30	5.65	115	220
0040	T 40	6.43 (584)	130	242

TORX® Screwdriver Sets

Design: Blade round, nicromatt, black point driving tip, in box.

5902 2-component handle with anti-roll protection.

5908 Kraftform® handle with anti-roll protection, 3-component.

5910 With hole, Kraftform® handle with anti-roll protection, 3-component.

5911 With impact cap and blade with continuous hexagon, Kraftform® handle with anti-roll protection, 3-component.



5902 format professional quality



5908 Wera



5910 Wera



5911 Wera

Part No.	Number	5902 format Set	5908 Wera Set	5910 Wera Set	5911 Wera Set	Set contents
0005	6-piece	11.65 (528)	22.46 (526)	29.65 (526)	29.64 (526)	T 10, 15, 20, 25, 30, 40

TORX® Screwdriver Sets with Retaining Function

Design: With round blade made of high-alloy special steel, tip nicro-matt for higher torque and fitting accuracy. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size. Supplied in cardboard box **incl. rack.**

Note: Due to the novel geometry of the screwdrivers, all TORX® screws manufactured to the tolerances of Camcar Textron (TORX®) are retained. This facilitates positioning of the screw in the thread or in wood.

Part No.	Number	5904 Wera Set	Set contents
0100	6-piece	23.04 (526)	T 10, 15, 20, 25, 30, 40



TORX® Screwdriver Sets with Spherical Driving Bit

Design: Round blade, nicro-matt, Black-Point driving bit, spherical driving bit, Kraftform® grip with anti-slip surface, 3-component material. Supplied in box.

Part No.	Number	5909 Wera Set	Set contents
0005	6-piece	34.26 (526)	T 15, 20, 25, 27, 30, 40



TRI-WING® Screwdrivers

Design: From high-alloy special steel. Round blade, nicro-matt with Black-Point coating for higher torque and fitting accuracy. Ergonomic Kraftform®-handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.

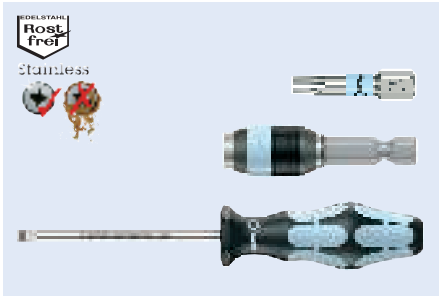
Part No.	Size	5915 Wera	Blade length mm	Total length mm
0002	2	4.51	80	178
0003	3	4.51	80	178
0004	4	5.26	100	198
0005	5	5.26 (526)	100	198



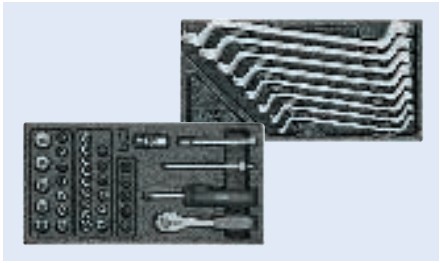
Overview – Group 6

New in the product range:

Stainless steel screwdrivers and bits



Tool modules fit our tool trolleys



Electrician's screwdrivers ESD



Please pay attention to our extended rage of products and innovations in all areas of this group:

- Impact socket wrenches
- Tool trolleys
- Torque wrenches
- Screwdrivers
- Electrician's screwdrivers
- Diamond needle files
- Hammers with fibre glass handle
- Ball bearing pulling and extractor sets


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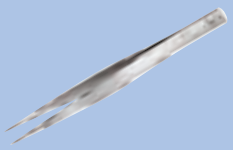
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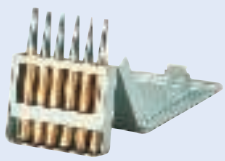

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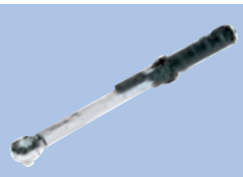


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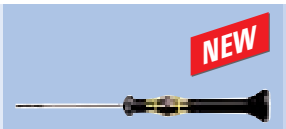
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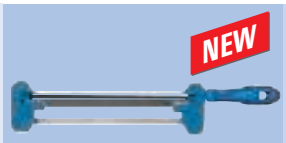
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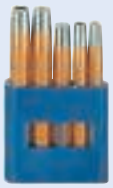

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Socket Wrench Sets 1/4“

Design: With 1/4“ driving square, in accordance with DIN 3120/ ISO 1174 with socket wrenches in accordance with DIN 3122, DIN 3123, DIN 3124/ISO 3315, ISO 3316, ISO 2725 in painted metal case. Hex socket and square socket with rounded corners to protect drive and screw head.

format professional quality

6003 0010 — **16-piece**
Lever ratchet wrench, hex. socket wrenches 4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 13 mm, hand adapter for hexagonal insert bits, handle with slide, extension bars 105 mm, universal joint.



6003 0010

6003 0020 — **33-piece**
Lever ratchet wrench, hexagon socket wrenches 4; 5; 6; 7; 8; 9; 10; 11; 12; 13; 14 mm, hexagon insert bits 3; 4; 5; 6; 8 mm, slot head screwdriver bits 0.6 x 3.5; 0.8 x 4; 1.0 x 5.5; 1.2 x 8 mm, cross head bits PH 1; 2; 3; 4, PZ 1; 2; 3, hand adapter for hexagon insert bits, T-handle with slide, universal joint, extension bars 50; 150 mm.



6003 0020

6003 0030 — **33-piece TORX®**
Lever ratchet wrench, hex. socket wrenches 4; 5; 6; 7; 8; 9; 10; 11; 12; 13; 14 mm, TORX® bits T 10; 15; 20; 25; 27; 30; 40, hexagon socket wrenches 3; 4; 5; 6; 8 mm, slot head screwdriver bit 1.0 x 5.5, cross head bits PH 1; 2; 3, hand adapter for hexagon insert bits, T-handle with slide, universal joint, extension bars 50; 150 mm.



6003 0030

Part No.	0010	0020	0030
Design	16-piece	33-piece	33-piece
6003 [illegible]	50.44	81.20	94.31

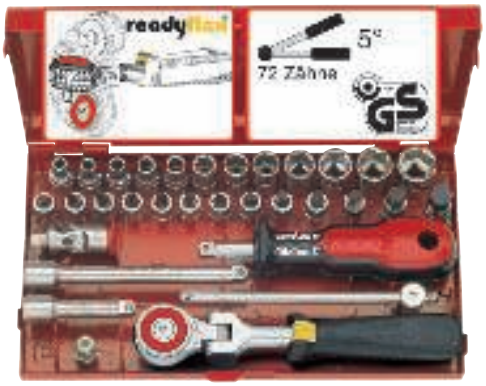
(532)

Socket Wrench Sets 1/4“

Design: Socket wrench set in **“addigrip® compact“** steel case, quick tool change through smart arrangement in confined space.

6010 0010

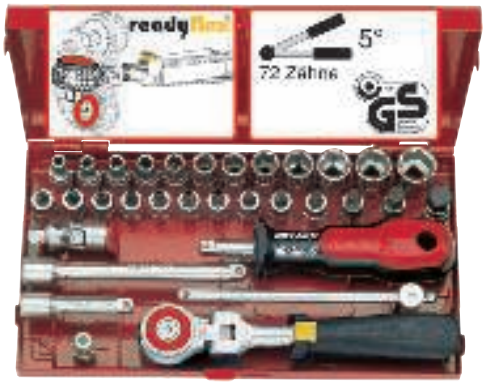
Readyflex® ratchet® fine toothing, steerable,
7 regulating steps through flexstop variomatic
hexagon sockets:
4 ; 4.5; 5; 5.5; 6; 7; 8; 9;
10; 11; 12; 13 mm
Screwdriver bits:
Slot 4; 5.5; 6.5 mm
Cross recess PH 0; 1; 2; 3
Hexagon: 3; 4; 5; 6; 8; 10 mm
Extensions 50/100 mm
Universal joint, handle with slide
Machine adapter 1/4“ square x 1/4“ hexagon,
Length 50 mm
Minimus reversing handle
Bit coupling 1/4“ incl. magnet holder



6010 0010

6010 0020

Readyflex® ratchet® fine toothing, steerable,
7 regulating steps through flexstop variomatic
hexagon sockets:
4; 4.5; 5; 5.5; 6; 7; 8; 9;
10; 11; 12; 13 mm
Screwdriver bits:
TORX® with face bore T 10; T 15; T 20; T 25;
T 27; T 30; T 40
Hexagon: 3; 4; 5; 6; 8; 10 mm
Extensions 50/100 mm
Universal joint, handle with slide
Machine adapter 1/4“ square 1/4“ hexagon,
Length 50 mm
Minimus reversing handle
Bit coupling 1/4“ incl. magnet holder



6010 0020

6010 0030

Ratchet, lever change, oval head
Hexagon socket wrenches:
4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 12; 13 mm
Screwdriver bits:
Slot 4; 5.5; 6.5 mm
Cross recess PH 0; 1; 2; 3
Hexagon: 3; 4; 5; 6; 8; 10 mm
Extensions 50/100 mm
Minimus reversing handle
Universal joint, handle with slide
Hexagon shank with 1/4“ holder
Machine adapter 1/4“ square x 1/4“ hexagon,
Length 50 mm



6010 0030

6010 0040

Ratchet, lever change, oval head
Hexagon sockets:
4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 12; 13 mm
Screwdriver bits:
TORX® with face bore T 10; T 15; T 20; T 25;
T 27; T 30; T 40
Hexagon: 3; 4; 5; 6; 8; 10 mm
Extensions 50/100 mm
Minimus reversing handle
Hexagon shank with 1/4“ holder
Universal joint, handle with slide
Machine adapter 1/4“ square x 1/4“ hexagon,
Length 50 mm



6010 0040

Part No.	0010	0020	0030	0040
Design	32-piece	32-piece	32-piece	32-piece
6010 carolus	65.42	65.42	52.23	52.23

(531)

Socket Wrench Sets 1/4“

Design: With forged, annealed hand hex. socket wrenches, including driving tools in stylish, shock-proof plastic case with PUR lining, GEDORE vanadium 31 CrV 3 mat. no. 1.2208.

GEDORE

6006 0010

1 reversible change ratchet
1 handle with slide
1 universal joint
1 square handle
1 extension 97 mm
11 hex. socket wrenches 4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 13 mm



6006 0020

1 reversible ratchet
1 handle with slide
1 universal joint
1 square handle
1 joint handle 150 mm
1 square handle
1 flexible extension 120 mm
1 extension 97 mm
11 hex. socket wrenches 4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 13 mm



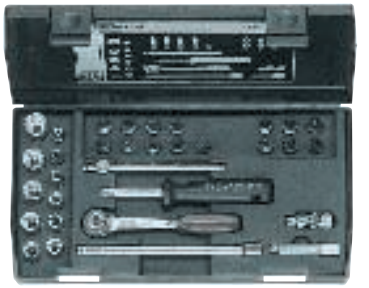
6009 0010

1 reversible ratchet
1 handle with slide
1 universal joint
1 square handle
1 extension 97 mm
11 hex. socket wrenches 4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 13 mm
1 insert adapter for 1/4“ socket wrenches
2 inserts for slotted screws 4 x 0.5; 5.5 x 0.8 mm
5 inserts for Allen screws 2.5; 3; 4; 5; 6 mm
2 inserts for cross recess screws PH size 1; 2



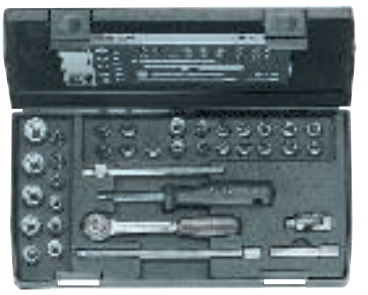
6009 0020

1 reversible ratchet
1 handle with slide
1 universal joint
1 square handle
2 extensions 55 and 148 mm
11 hex. socket wrenches 4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 12; 13; 14 mm
4 hexagon socket wrenches for slotted screws 4; 5.5; 6.5; 8 mm
5 hexagon socket wrenches 3; 4; 5; 6; 8 mm
3 hexagon socket wrenches for cross recess screws PH size 1; 2; 3
3 socket wrenches for cross recess screws PZ size 1; 2; 3



6009 0030

1 reversible ratchet
1 handle with slide
1 universal joint
1 square handle
2 extensions 55 and 148 mm
11 hex. socket wrenches 4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 13; 14 mm
6 TORX® sockets E 4; 5; 6; 7; 8; 10
5 hexagon socket wrenches 3; 4; 5; 6; 8 mm
8 inserts for TORX® screws T 8; 9; 10; 15; 20; 25; 27; 30



6009 0040

1 reversible ratchet (part no. 6023)
10 bi-hexagon socket wrenches 4; 5; 6; 7; 8; 9; 10; 11; 12; 13 mm
10 hexagon socket wrenches, long (part no. 6041) 4; 4,5; 5; 6; 7; 8; 9; 10; 12; 13 mm
2 slot head screwdriver bits 4; 6.5 mm
5 hexagon socket wrenches 3; 4; 5; 6; 8 mm
3 bits for screws with internal serration XZN 5; 6; 8
7 inserts for hexagon TORX® screws T 10; 15; 20; 25; 27; 30; 40
2 hexagon socket wrenches for cross recess screws PH 1; PH 2
3 hexagon socket wrenches for cross recess screws PZ 1; PZ 2; PZ 3
1 screwdriver handle
1 insert adapter with magnet 1/4“
1 coupling 1/4“
2 extensions (part no. 6016) 55; 148 mm
1 universal joint (part no. 6034)



Part No.	0010	0020	0010	0020	0030	0040
Design	16-piece	18-piece	26-piece	32-piece	36-piece	49-piece
6006	86.02	107.16	–	–	–	–
6009	–	–	100.23	148.74	164.94	175.22

(522)

Bi-hexagonal Socket Wrench Sets 1/4“

Design: GEDORE vanadium 31 CrV 3 mat. no. 1.2208, forged, ground and chromium-plated. Supplied in shock-proof plastic case with PUR lining.

6007 0010
1 T-handle ratchet (part no. 6026)
1 hand ratchet (part no. 6025)
10 bi-hexagonal socket wrenches 4; 5; 6; 7; 8; 9; 10; 11; 12; 13 mm
1 extension (part no. 6016)

6007 0020
1 reversible ratchet (part no. 6013)
11 bi-hexagonal socket wrenches 4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 13 mm
1 T-handle with slide (part no. 6021)
1 extension (part no. 6016) 97 mm
1 universal joint (part no. 6034)
1 screwdriver handle
1 insert adapter

6007 0030
1 reversible ratchet (part no. 6023)
10 bi-hexagonal socket wrenches 4; 5; 6; 7; 8; 9; 10; 11; 12; 13 mm
2 cross head bits 4; 6.5 mm
5 bis for Allen screws 3; 4; 5; 6; 8 mm
3 bits for screws with internal serration XZN 5; 6; 8
7 bits für hexagon TORX® screws T 10; 15; 20; 25; 27; 30; 40
2 cross head bits PH 1; PH 2
3 cross head bits PZ 1; PZ 2; PZ 3
1 coupling 1/4“
1 combination tool holder
1 adapter
1 screwdriver handle
1 bit holder
1 universal joint (part no. 6034)
1 extension (part no. 6016)

Part No.	0010	0020	0030
Design	13-piece	17-piece	40-piece
6007	65.39	84.88	101.88

(522)




6007 0010


6007 0020


6007 0030

Lever Ratchet Wrenches 1/4“

6018 **Design:** With control lever, oval head, with plastic handle, **20 teeth.**

6023 **Design:** With control lever, locking centre position, oval head, **24 teeth.**

6013 **Design:** With metal gear disk and fine toothing, **72 teeth.**

6022 **Design:** Made of GEDORE vanadium steel 31 CrV 3 mat. no. 1.2208, chromium-plated, with oval head and reversing lever, locking in centre position, **24 teeth.** Handle with ergonomic and anti-slip 2-component plastic cover.

Part No.	Length mm	6018	6023	6013	6022
0010	129	–	29.24	21.74	27.49
0010	140	14.38	–	–	–
		(532)	(522)	(522)	(522)


6018 format professional quality


6023


6013


6022

Ratchets 1/4“

Design: With ring change, fine toothing, 7 regulating steps, locking by yellow flex button, 72 teeth.

Part No.	Length mm	6024
0020	135	27.48 (531)



Standard Ratchets 1/4“

6012 **Design:** Toothed ratchets incl. through square, medium toothing and very sturdy, 20 teeth.

6030 **Design:** Through square 1/4“.

Part No.	Length mm	6012	6030
0010	129	14.14	–
0010	20	–	1.89
		(522)	(522)



6012



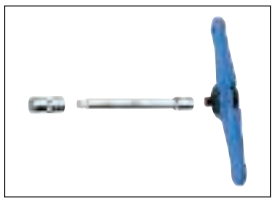
6030

T-handle Ratchets 1/4“

Design: With ergonomic plastic wings for quick and convenient operation. Supplied without extension bar.

Note: Extension bar see (part no. 6016).

Part No.	Length mm	6026
0010	140	16.17 (522)





Hand Ratchets without Handle 1/4“

Design: For uninterrupted operations in confined areas which are not accessible for normal ratchets and other screwing tools. Perfectly suitable for servicing of car engines in connection with the extension bar: Dimensions ø 27 x 20 mm.

Part No.	ø mm	6025
0010	27	11.81 (522)



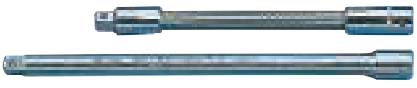
Extension Bars 1/4“

Design: In accordance with DIN 3123, form B/ISO 3316.

Part No.	Length mm 6015	6016	6015	6016
0050	50	–	2.56	–
0055	–	55	–	3.95
0075	75	–	2.58	–
0100	–	97	–	4.06
0105	105	–	2.58	–
0120	–	120 flexible	–	7.48
0150	150	148	2.58	4.12
0300	–	305	–	5.66
			(532)	(522)



6015



6016

T-handles with Slide 1/4“

Design: In accordance with DIN 3123, form A/ISO 3316.

Part No.	Length mm	6020	6021
0010	115	2.87 (532)	5.43 (522)



6020



6021

Square Handles 1/4“

Design: In accordance with DIN 3123, form E/ISO 3315.

Part No.	Length mm	6027	6028
0010	140	–	4.32
0020	145	2.87	–
		(532)	(522)



6027 format professional quality



6028 GEDORE

Universal Joints 1/4“

Design: In accordance with DIN 3123, form C/ISO 3316.

Part No.	Length mm	6033	6034
0010	38	–	12.18
0020	40	6.28	–
		(532)	(522)



6033 format professional quality



6034 GEDORE

Converter Sockets

Design: In accordance with DIN 3123. Square 1/4“ internal, 3/8“ external.

Part No.	Length mm	6036	6037
0010	25	2.52	–
0020	26	–	4.89
		(532)	(522)



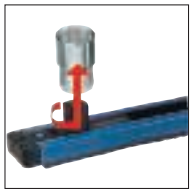
6036 format professional quality



6037 GEDORE

Magnetic Strips 1/4“

Application: Suitable for all conventional 1/4“ socket wrenches. Due to the strong permanent magnet, the strip can safely be fixed at FE metals, such as machine casings, tool trolley or lifting platforms. The strip can be mounted horizontally, vertically or even at the ceiling. For wall fastening, the strip is further provided with bore holes. The socket wrenches are fixed by turning them by 90°. The socket wrench is then blocked by the ball. By turning in the opposite direction, the socket wrenches can be released and removed.



GEDORE



Part No.	Use	6043	Length x width mm
0013	For 13 wrenches	16.11	380 x 33
		(522)	

Hexagon Socket Wrenches 1/4“

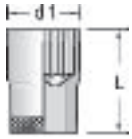
Design: DIN 3124 – ISO 2725, with butt groove.

6039 Made of chromium-vanadium CrV 3, chromium-plated.

6040 Made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground, chromium-plated and knurled.



6039 format professional quality





6040 GEDORE

Part No.	Key width mm	6039	6040	Length L mm 6039	Length L mm 6040	∅ d1 mm 6039	∅ d1 mm 6040
0040	4	1.53	2.38	25	24.7	6.8	6.9
0045	4.5	1.53	2.38	25	24.7	7.4	7.5
0050	5	1.53	2.47	25	24.7	8	8.2
0055	5.5	1.53	2.47	25	24.7	8.7	8.8
0060	6	1.53	2.47	25	24.7	9.3	9.4
0070	7	1.53	2.47	25	24.7	10.8	11
0080	8	1.53	2.47	25	24.7	11.9	12
0090	9	1.53	2.54	25	24.7	12.9	13
0100	10	1.53	2.54	25	24.7	14.4	14
0110	11	1.53	2.54	25	24.7	15.9	16
0120	12	1.53	2.68	25	24.7	16.9	17
0130	13	1.53	2.68	25	24.7	17.9	18
0140	14	1.53	2.68	25	24.7	19.7	19.7
		(532)	(522)				

Hexagon Socket Wrenches 1/4“, Long

Design: DIN 3124 – ISO 2725, made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, with butt groove, ground, chromium-plated and knurled.



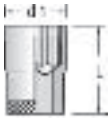


Part No.	Key width mm	6041	Length L mm	⌀ d1 mm
0040	4	7.82	50	6.9
0045	4.5	7.82	50	7.5
0050	5	7.82	50	8.2
0055	5.5	7.82	50	8.8
0060	6	7.82	50	9.4
0070	7	7.90	50	11
		(522)		

Part No.	Key width mm	6041	Length L mm	⌀ d1 mm
0080	8	7.90	50	12
0090	9	7.90	50	13
0100	10	8.22	50	14
0110	11	8.22	50	16
0120	12	8.22	50	17
0130	13	8.22	50	18
		(522)		

Socket Wrenches 1/4“ – US Inches

Design: Hand socket wrenches with square drive C 6.3 DIN 3120/ ISO 1174. With spherical groove. Knurled for firm grip. GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground, chromium-plated.





Part No.	Key width	6042	Length mm
0010	3/16	2.52	24.7
0020	7/32	2.52	24.7
0030	1/4	2.52	24.7
0040	9/32	2.54	24.7
0050	5/16	2.54	24.7
		(522)	

Part No.	Key width	6042	Length mm
0060	11/32	2.54	24.7
0070	3/8	2.54	24.7
0080	7/16	2.73	24.7
0090	1/2	2.73	24.7
0100	9/16	2.97	24.7
		(522)	

Socket Bit Sets 1/4“

Design: Made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground, chromium-plated and knurled, bits GEDORE vanadium special steel, bronze. Supplied in plastic case with PUR lining incl.

5 socket bits for hexagon socket screws (part no. 6045) 3; 4; 5; 6; 8 mm

4 socket bits for slotted screws (part no. 6048) 4; 5.5; 6.5; 8 mm

3 socket bits for recessed head screws (part no. 6050) PH 1; 2; 3

3 socket bits for recessed head screws (part no. 6052) PZ 1; 2; 3



Part No.	Design	6043
0010	15–piece	63.10
		(522)

Socket Bits 1/4“ for Hexagon Socket Screws

6044 **Design:** Chromium-plated holder, shank burnished, with 1/4“ driving square, in accordance with DIN 3120/ ISO 1174, with butt hole, manually operated. Dimensions in accordance with DIN 3124/ISO 2725. Made of chromium-vanadium 31 CrV 3.

6045 **Design:** Square drive C 6.3 DIN 3120, ISO 1174. Bits GEDORE vanadium special steel. Knurled for firm grip. With spherical groove. Chromium-plated, bronze bits, length 28 mm.



6044 format professional quality



6045

Part No.	Key width mm	6044	6045	Length mm 6044	6045
0030	3	1.91	3.69	30	28
0040	4	1.91	3.69	30	28
0050	5	1.91	3.69	30	28
		(532)	(522)		

Part No.	Key width mm	6044	6045	Length mm 6044	6045
0060	6	1.91	3.69	30	28
0080	8*	1.91	3.69	30	28
* non-standard		(532)	(522)		

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Screwdriver Bits 1/4" for Slotted Screws

6047 **Design:** Chromium-plated holder, bronzed shank, with 1/4" driving square, in accordance with DIN 3120/ ISO 1174, with butt hole, manually operated. Dimensions in accordance with DIN 3124/ISO 2725. Made of chromium-vanadium 31 CrV 3.

6048 **Design:** For slotted screws, square drive C 6.3, DIN 3120 with spherical groove, chromium-plated. Bits GEDORE vanadium special steel and bronze.



6047 format professional quality



6048 GEDORE

Part No.	Tip width mm	6047	6048	Blade thickness mm	Length mm
0010	3.5	2.27	–	0.6	30
0020	4.0	2.27	–	0.7	30
0010	4.0	–	3.69	0.8	28
0030	5.5	2.27	–	1.0	30
0020	5.5	–	3.69	1.0	28
0030	6.5	–	3.69	1.2	28
0040	8.0	2.27	–	1.2	30
0040	8.0	–	3.69	1.6	28
		(532)	(522)		

Socket Bits 1/4" for Phillips Cross Recess Screws

6049 **Design:** Chromium-plated holder, bronzed shank, with 1/4" driving square, in accordance with DIN 3120/ ISO 1174, with butt hole, manually operated. Dimensions in accordance with DIN 3124/ISO 2725. Made of chromium-vanadium 31 CrV 3.

6050 **Design:** For cross recess screws, square drive, C 6.3 DIN 3120, with spherical groove, chromium-plated, bits GEDORE vanadium special steel, bronze.



6049 format professional quality



6050 GEDORE

Part No.	PH	6049	6050	Length mm 6049	Length mm 6050
0010	1	2.19	3.69	30	28
0020	2	2.19	3.69	30	28
		(532)	(522)		

Part No.	PH	6049	6050	Length mm 6049	Length mm 6050
0030	3	2.19	3.69	30	28
0040	4	2.35	3.69	30	28
		(532)	(522)		

Socket Bits 1/4" for Pozidriv Recessed Head Screws

6051 **Design:** Chromium-plated holder, bronzed shaft, with 1/4" driving square, in accordance with DIN 3120/ISO 1174, with butt hole, manually operated. Dimensions in accordance with DIN 3124/ISO 2725. Made of chromium-vanadium 31 CrV 3.

6052 **Design:** For cross recess screws, square drive, C 6.3 DIN 3120, with spherical groove, chromium-plated, bits GEDORE vanadium special steel, bronze.



6051 format professional quality



6052 GEDORE

Part No.	PZ	6051	6052	Length mm 6051	Length mm 6052
0010	1	2.32	4.12	30	28
0020	2	2.32	4.12	30	28
		(532)	(522)		

Part No.	PZ	6051	6052	Length mm 6051	Length mm 6052
0030	3	2.32	4.12	30	28
0040	4	–	4.12	–	28
		(532)	(522)		

Socket Bits 1/4" for TORX® Head Screws

6053 **Design:** Chromium-plated holder, bronzed shank, with 1/4" driving square, in accordance with DIN 3120/ ISO 1174, with butt hole, manually operated. Dimensions in accordance with DIN 3124/ISO 2725. Made of chromium-vanadium 31 CrV 3.

6054 **Design:** For TORX® head screws with pressed-in bolt, square drive C 6.3, DIN 3120/ISO 1174 with spherical groove. Bits GEDORE vanadium special steel. Knurled for firm grip. Chromium-plated, bits bronze.



6053 format professional quality



6054 GEDORE

Part No.	Dimensions	6053	6054	Length mm 6053	Length mm 6054
0008	T 8	–	4.12	–	30.5
0009	T 9	3.73	4.12	36	30.5
0010	T 10	3.73	4.12	36	30.5
0015	T 15	3.73	4.12	36	30.5
0020	T 20	3.43 (532)	4.12 (522)	36	30.5

Part No.	Dimensions	6053	6054	Length mm 6053	Length mm 6054
0025	T 25	3.43	4.12	36	30.5
0027	T 27	3.43	4.12	36	30.5
0030	T 30	3.43	4.12	36	30.5
0040	T 40	3.43 (532)	4.62 (522)	36	33.5

Socket Bit Sets 1/4" for TORX® Head Screws and TORX® Screws

Design: Made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground, chromium-plated and knurled, bits GEDORE vanadium special steel, bronze. Supplied in plastic case with PUR lining incl.

9 socket bits for TORX® head screws (part no. 6054) T8; 9; 10; 15; 20; 25; 27; 30; 40

6 socket bits for TORX® screws (part no. 6046) E4; 5; 6; 7; 8; 10

GEDORE



Part No.	Design	6054
0100	15-piece	66.02 (522)

Socket Bits 1/4" for External TORX® Screws

Design: Socket bits with square drive C 6.3 DIN 3120, ISO 1174. With spherical groove, knurled for firm grip. GEDORE vanadium steel 31 CrV 3 mat. no. 1.2208, ground, chromium finish.

GEDORE



Part No.	Size	6046	Length mm
0040	E 4	3.49	25
0050	E 5	3.49	25
0060	E 6	3.49 (522)	25

Part No.	Size	6046	Length mm
0070	E 7	3.49	25
0080	E 8	3.49	25
0100	E 10	3.95 (522)	25

Socket Wrench Sets 3/8“

Design: 3/8“ square drive according to DIN 3120/ISO 2274, with socket wrenches to DIN 3124, DIN 3120/ISO 2725, ISO 1174, in varnished metal case.

Lever ratchet wrench, hexagon socket wrenches 6; 7; 8; 9; 10; 11; 13; 14; 15; 16; 17; 19 mm. Sliding T-bar, extension bar 125; 250 mm, universal joint.

Part No.	Design	6056
0010	17-piece	68.59
		(532)



Socket Wrench Sets 3/8“

Design: Forged, annealed hex socket wrenches and driving tools in GEDORIT-blue steel case.

6055 0010

1 reversible ratchet with gear lever with push button release, locking at centre position
1 extension bar 125 mm
10 hexagon sockets 6; 7; 8; 9; 10; 11; 13; 14; 17; 19 mm



6055 0020

1 reversible ratchet with gear lever with push button release, locking at centre position
1 handle with slide
1 extension bar 125 mm
1 extension bar 250 mm
1 universal joint
12 hexagon sockets 6; 7; 8; 9; 10; 11; 13; 14; 15; 16; 17; 19 mm



6055 0030

1 reversible ratchet with gear disk, particularly smooth running
1 handle with slide
1 angular handle
1 extension bar 125 mm
1 extension bar 250 mm
1 universal joint
1 hexagon sockets 6; 7; 8; 9; 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 20; 21; 22 mm



6055 0040

1 reversible ratchet with gear lever with push button release
1 handle with slide
1 extension bar 125 mm
1 extension bar 250 mm
1 universal joint
12 hexagon sockets 6; 7; 8; 9; 10; 11; 13; 14; 15; 16; 17; 19 mm
4 sockets for hexagon socket screws 4; 5; 6; 8 mm
2 sockets for slotted screws 5.5; 8 mm
2 sockets for Phillips cross recess screws 2; 3



6055 0050

1 reversible ratchet with gear lever with push button release
1 handle with slide
1 angular handle
1 extension bar 125 mm
1 extension bar 250 mm
1 universal joint
17 hexagon sockets 6; 7; 8; 9; 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 20; 21; 22 mm
1 screwdriver with bit holder 1/4“
1 bit holder 1/4“ with 1/4“ square
1 bit each for hexagon socket screws 4; 5; 6; 8 mm
1 bit each for slotted screws 6.5; 7; 8 mm
1 bit each for Phillips cross recess screws 1; 2; 3



Part No.	0010	0020	0030	0040	0050
Design	12-piece	17-piece	23-piece	25-piece	36-piece
6055	85.00	124.55	146.64	170.64	195.84
					(522)

Lever Ratchet Wrenches 3/8“

6058 0010 **Design:** According to DIN 3122, form D/ISO 3315, 30 teeth, plastic handle.

6059 0010 **Design:** Acording to DIN 3120-C 10, ISO 1174, with gear lever, locking at centre position, oval head, 32 teeth.

6059 0020 **Design:** According to DIN 3120-C 10, ISO 1174, ball stop with push button release. Due to the automatic catch, the gear lever catches automatically for right and left-hand motion in the reversing operation. The reverse lever is imbedded and thus protected against impacts. Precision toothing with 60 teeth. Ergonomic anti-slip handle made of 2-component material/colours.

6059 0510 **Design:** According to DIN 3120-C 10, ISO 1174, 180° rotation, with joint locking, gear disk, especially smooth running. Max. torque 200 Nm, 72 teeth.

Part No.	Length mm	6058	6059	6059	6059
0010	200	16.83	35.42	–	–
0020	200	–	–	33.99	–
0510	282	–	–	–	39.10
		(532)	(522)	(522)	(522)



6058 0010 format professional quality



6059 0010 GEDORE



6059 0020 GEDORE



6059 0510 GEDORE

Standard Ratchets 3/8“

6057 0010 **Design:** According to DIN 3120-C 10, ISO 1174, with through square, medium toothing, 18 teeth.

6057 0050 **Design:** With through square for standard ratchet 3/8“.

Part No.	Length mm	6057	6057
0010	200	16.23	–
0050	28.5	–	1.82
		(522)	(522)

GEDORE



6057 0010



6057 0050

Joint Handles 3/8“

Part No.	Length mm	6061
5000	254	18.24
		(522)

GEDORE



Extension Bars 3/8“

Design: In accordance with DIN 3123, form B/ISO 3316.

Part No.	Length mm	6060	6061
0075	76	–	4.92
0125	125	3.39	5.82
0250	250	4.44	8.27
0305	305	–	8.76
		(532)	(522)



6060 format professional quality



6061 GEDORE

T-handles with Slide 3/8“

Design: In accordance with DIN 3122, form A/ISO 3315.

Part No.	Length mm	6062	6063
0010	200	5.93	–
0010	163	–	7.01
		(532)	(522)



6062 format professional quality



6063 GEDORE

Universal Joints 3/8“

Design: In accordance with DIN 3123, form C/ISO 3315.

Part No.	Length mm	6064	6065
0010	58	7.71	–
0010	52	–	14.29
		(532)	(522)



6064



6065

Socket Converters

Design: DIN 3123 A 10 x 12.5 – ISO 3316. With ball stop.
From square socket 3/8“ to 1/4“ external square.

6066 Made of chromium-vanadium CrV 3, chromium-plated.

6067 Made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground and chromium-plated.

Part No.	Length mm	6066	6067
0010	27	2.52	–
0010	28.4	–	4.65
		(532)	(522)



6066



6067

Socket Converters

Design: DIN 3123 A 10 x 12.5 – ISO 3316. With ball stop.
From square socket 1/2“ to external square 3/8“.

6068 Made of chromium-vanadium CrV 3, chromium-plated.

6069 Made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground and chromium-plated.

Part No.	Length mm	6068	6069
0010	36	2.75	–
0010	35	–	4.65
		(532)	(522)



6068



6069

Magnetic Strips 3/8“

Application: Suitable for all conventional 3/8“ socket wrenches. Due to the strong permanent magnet, the strip can safely be fixed at FE metals, such as machine casings, tool trolley or lifting platforms. The strip can be mounted horizontally, vertically or even at the ceiling. For wall fastening, the strip is further provided with bore holes. The socket wrenches are fixed by turning them by 90°. The socket wrench is then blocked by the ball. By turning in the opposite direction, the socket wrenches can be released and removed.





Part No.	Use	6071	Length x width mm
7014	For 14 wrenches	17.28	480 x 33
		(522)	

Hexagon Socket Wrenches 3/8“

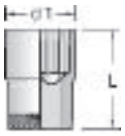
Design: DIN 3124 – ISO 2725, with butt groove.

6070 Made of chromium-vanadium CrV 3, chromium-plated.

6071 Made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground, chromium-plated, axially and circumferentially knurled.



6070 format professional quality





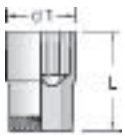
6071 GEDORE

Part No.	Key width mm	6070	6071	Length L mm 6070	Length L mm 6071	⌀ d1 mm 6070	⌀ d1 mm 6071
0006	6*	1.60	3.65	28	28	9.6	9.7
0007	7	1.46	3.65	28	28	10.9	11
0008	8	1.46	3.65	28	28	12	12.2
0009	9	1.46	3.65	28	28	13.3	13.5
0010	10	1.46	3.65	28	28	14.5	14.7
0011	11	1.50	3.65	28	28	15.9	16
0012	12	–	3.65	–	28	–	17.2
0013	13	1.50	3.65	28	28	18.4	18.5
0014	14	1.50	3.79	28	28	19.9	19.7
0015	15	1.60	3.79	28	30	21	21
0016	16	1.60	3.79	28	30	22.2	22.2
0017	17	1.60	3.79	28	30	23.9	23.5
0018	18	1.60	3.79	28	30	24.7	24.7
0019	19	1.65	3.79	28	30	25.9	26
0020	20	–	4.22	–	31	–	27.2
0021	21	–	4.22	–	31	–	28.5
0022	22	1.75	4.22	28.5	32	29.5	29.7
* non-standard sizes		(532)	(522)				

Bi-hexagonal Socket Wrenches 3/8“

Design: DIN 3124 – ISO 2725, made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, with butt groove, ground and chromium-plated, axially and circumferentially knurled.

UNIT DRIVE GEDORE





Part No.	Key width mm	6071	Length L mm	⌀ d1 mm
1010	10	3.65	28	14.7
1011	11	3.65	28	16
1012	12	3.65	28	17.2
1013	13	3.65	28	18.5
1014	14	3.79	28	19.7
1015	15	3.79	30	21
1016	16	3.79	30	22.2
1017	17	3.79	30	23.5
1018	18	3.79	30	24.7
1019	19	3.79	30	26
1020	20	4.22	31	27.2
1021	21	4.22	31	28.5
1022	22	4.22	32	29.7
		(522)		

Grippers 3/8“

Design: For universal screwing, firm gripping of all three-square, square and hexagon screws or nuts, as well as hook or eyelet bolts due to 54 spring-loaded pins.



Part No.	Replaces sockets	6073
0005	7–19 mm	17.19 (530)

Gripper Sets 3/8“

Design: 3-piece set consisting of gripper 3/8“, ratchet and adapter for drilling machine or battery-powered screwdriver.



Part No.	Replaces sockets	6073
0500	7–19 mm	24.65 (530)

Socket Bits 3/8" for Hexagon Socket Screws

Design: Square drive C 10, DIN 3120/ISO 1174, with spherical groove, chromium-plated, bits GEDORE vanadium special steel, bronze.

Part No.	SW mm	6071	Length mm
2005	4	4.01	47
2010	5	4.01	47
2015	6	4.01	47
		(522)	

Part No.	SW mm	6071	Length mm
2020	8	4.01	49
2025	10	4.01	49
		(522)	



Socket Bits 3/8" for Slotted Screws

Design: Square drive C 10, DIN 3120/ISO 1174, with spherical groove, chromium-plated, bits GEDORE vanadium special steel, bronze.

Part No.	Bit width mm	6071	Blade thickness mm	Length mm
3005	5.5	5.47	1.0	55
3007	6.5	6.07	1.2	55
3010	8	6.37	1.2	55
3015	10	6.59	1.6	55
		(522)		



Socket Bits 3/8" for Phillips Cross Recess Screws

Design: Square drive C 10, DIN 3120/ISO 1174, with spherical groove, chromium-plated, bits GEDORE vanadium special steel, bronze.

Part No.	Design	6071	Length mm
4005	PH 1	6.48	55
4010	PH 2	6.48	55
4015	PH 3	6.48	55
		(522)	



Socket Bits 3/8" for Pozidriv Recessed Head Screws

Design: Square drive C 10, DIN 3120/ISO 1174, with spherical groove, chromium-plated, bits GEDORE vanadium special steel, bronze.

Part No.	Design	6071	Length mm
4105	PZ 1	7.40	55
4110	PZ 2	7.40	55
4115	PZ 3	7.40	55
		(522)	



Socket Bits 3/8" for TORX® Head Screws

Design: Square drive C 10, DIN 3120/ISO 1174, with spherical groove, chromium-plated, bits GEDORE vanadium special steel, bronze.

Part No.	Dimensions	6071	Length mm
5005	T 20	5.32	49
5010	T 25	5.32	49
5015	T 27	5.32	49
5020	T 30	5.32	49
		(522)	

Part No.	Dimensions	6071	Length mm
5025	T 40	5.32	49
5030	T 45	5.32	49
5035	T 50	5.32	49
		(522)	

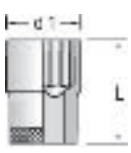


Socket Bits 3/8" for TORX® Screws

Design: Square drive C 10, DIN 3120/ISO 1174, with spherical groove, chromium-plated, bits GEDORE vanadium special steel, bronze.

Part No.	Dimensions	6071	Length mm
6005	E 5	5.28	28
6010	E 6	5.28	28
6015	E 7	5.28	28
6020	E 8	5.28	28
		(522)	

Part No.	Dimensions	6071	Length mm
6025	E 10	5.28	28
6030	E 11	5.28	28
6035	E 12	5.28	28
6040	E 14	5.28	28
		(522)	





Socket Wrench Sets 1/2“

Design: With 1/2“ driving square, in accordance with DIN 3122, DIN 3123, DIN 3124/ ISO 3315, ISO 3316, ISO 2725, hex socket and square socket with rounded corners to protect drive and screw head, in painted metal case.

format professional quality

6072 0010 Lever ratchet wrench, **hex. socket wrenches** 10; 11; 12; 13; 14; 15; 16; 17; 19; 22; 24; 27; 30; 32 mm, T-handle with slide, extension bars 125 and 250 mm, universal joint.

6072 0020 Lever ratchet wrench, **hex. socket wrenches** 10; 11; 12; 13; 14; 15; 17; 19; 22; 24; 27; 30 mm, screwdriver bits for hex. socket-head screws 5; 6; 7; 8; 10; 12; 14 mm, for TORX® socket head screws T 30; 40; 45; 50, extension bars 125 and 250 mm, universal joint.

Part No.	0010	0020
Design	19-piece	27-piece
6072	75.13	95.47

(532)



6072 0010



6072 0020

Socket Wrench Sets 1/2“

Design: Forged, annealed socket wrenches and driving tools in GEDORIT-blue steel case, GEDORE vanadium 31 CrV 3 mat. no. 1.2208.

GEDORE

6074 0010
1 reversible ratchet with gear disk,
1 extension bar 125 mm,
11 hexagon sockets 8; 9; 10; 11; 12; 13; 14; 15; 17; 19; 22 mm.

6074 0020
1 reversible ratchet,
1 handle with slide,
1 extension bar 250 mm;
1 universal joint;
13 hexagon sockets 8; 9; 10; 11; 12; 13; 14; 15; 17; 19; 22; 24; 27; 30; 32 mm.

6074 0031
1 reversible ratchet with gear lever,
1 handle with slide, 1 extension bar 125 mm,
1 extension bar 250 mm; 1 universal joint;
19 hexagon sockets 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 21; 22; 23; 24; 26; 27; 28; 30; 32 mm.

Part No.	0010	0020	0031
Design	13-piece, hexag.	17-piece, hexag.	24-piece, hexag.
6074	78.27	125.44	170.84

(522)



6074 0010



6074 0020

Design: Identical to 6074, however, with **12 hexagon sockets.**

Part No.	0010	0020	0031
Design	13-piece, bi-hexag.	17-piece, bi-hexag.	24-piece, bi-hexag.
6077	78.27	125.44	170.84

(522)



6074 0031

Socket Wrench Sets 1/2“

Design: Reversible ratchet, hexagon sockets 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 21; 22; 24; 27; 28; 30; 32 mm adapter 1/2“ square x 5/16“ hexagon, also fits with 8 mm wrench size; universal joint; handle with slide, extension bars 75/125/250 mm.



Part No.	Design	6075
0010	24-piece	90.06 (531)

Combination Socket Wrench Sets 1/2“ and 1/4“

6074 **Design:** Forged, annealed hexagon sockets and driving tools in steel case, powder coating. GEDORE-blue, driving tools: GEDORE vanadium 31 CrV 3 mat. no. 1.2208.

Content 1/4“:
1 reversible ratchet with gear disk; 1 handle with slide;
2 extension bars 55 and 100 mm; 1 universal joint; 1 square handle;
11 hexagon sockets 4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 13 mm;
4 hexagon sockets 3; 4; 5; 6 mm; 3 sockets for slotted screws 4; 5.5; 6.5 mm;
2 sockets for cross recess screws size 1 and 2.

Content 1/2“:
1 reversible ratchet with gear disk; 2 extension bars 125 and 250 mm;
1 universal joint;
12 hexagon sockets 10; 11; 12; 13; 14; 15; 17; 19; 21; 22; 24; 27; 30 mm;
5 hexagon sockets 7; 8; 10; 12; 14 mm;
2 sockets for slotted screws size 8 and 10 mm;
1 socket for cross recess screws size 3.

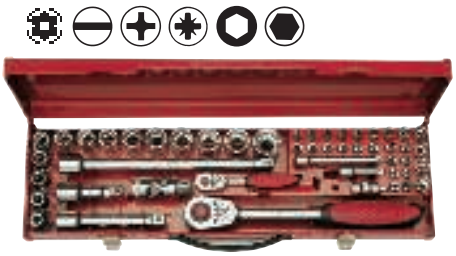


6074

6075 **Design:** Socket wrench set in **“addigrip® compact“** steel case, fast tool change at any time through smart arrangement in confined space.

Content 1/4“:
1/4“ reversible ratchet with lever change, hexagon sockets:
4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 12; 13 mm;
socket bits: TORX® with face bore T 10; T 15; T 20; T 25; T 27; T 30; T 40;
Hexagon 4; 5; 6; 8 mm; slot 5.5 mm cross recess screws PH 2/PZ 2;
extension bars 50/100 mm; universal joint.

Content 1/2“:
1 reversible ratchet; hexagon sockets: 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 21; 22; 24 mm; extension bars 75; 125; 250 mm; universal joint;
adapter 1/2“ square x 5/16“ hexagon, also fits with 8 mm wrench size.



6075

Part No.	0040	0100
Design	50-piece	49-piece
6074	287.72	–
6075	– (522)	120.64 (531)

Socket wrench sets with bi-hexagon sockets or other ratchets on request.

Lever Ratchet Wrenches 1/2“

6080 **Design:** According to DIN 3122, form D/ISO 3315, includes **32 teeth,** plastic handle.

6082 **Design:** With locking at centre position, with push button release and low seated gear lever, oval head, **32 teeth.**

6083 **Design:** Ball locking with push button release. The lever latches automatically when reversed for right or left-hand motion. The lever is placed in shock-proof bedding. Fine toothing with **60 teeth.**
Ergonomic and anti-slip handle in 2-component material and 2 colours.

6084 **Design:** With metal gear disk, fine toothing, **72 teeth.**

6086 **Design:** With metal gear disk, **50 teeth.**



6080



6082



6086



6084



6083

Part No.	Length mm	6080	6082	6083	6084	6086
0010	250	19.18	–	–	–	–
0020	270	–	–	34.67	30.21	27.14
0030	350	– (532)	47.92 (522)	– (522)	– (522)	– (522)

Reversible Aluminium Ratchets 1/2“

Design: Made of forged and tempered aluminium. **With 350 grams one of the most light-weight ratchets of its type, with a tensile strength of approx. 430 N/mm².** With oval head, actuation at push of the button and reversing lever. Automatic locking for right- and left-hand operation, **60-fold toothed.** Handle with plastic cover.

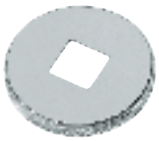




Part No.	Length mm	6087	Weight g
0010	270	61.32 (522)	350

Quick Turning Disks for 1/2“ Ratches

Design: For fixing of loose screws, for higher screwing speed, easy assembly between ratchet head and socket.



Part No.	6089
0010	3.55 (522)

Standard Ratchets 1/2“

6076 **Design:** In accordance with DIN 3122, form C/ISO 3315, with 24 teeth, with plastic handle, **no insert driving square.**

6078 **Design:** Medium-fine toothing, robust due to double pawl, 32 teeth, **with insert square.**

6092 **Design:** Insert square for standard ratchet 1/2“.

6093 **Design:** Spare insert square for standard ratchets 1/2“.



6076 format professional quality



6092



6078



6093

Part No.	Length mm	6076	6078	6092	6093
0010	250	8.59 (532)	– (522)	– (532)	– (522)
0020	270	–	19.93	–	–
0010	35	–	–	1.31	–
0020	37.8	–	–	–	2.01

Grip Ratchets 1/2“

Design: Housing and grip in one piece. Functional and ergonomic design for user-friendly handling. Quick tightening of many screwed connections up to 70 Nm. Exceptionally handy and compact. Made from high-tensile composite material. Dimensions 44 x 145 x 43 mm.



Part No.	6088
0010	20.26 (522)

Joint Handles 1/2“



Part No.	Length mm	6098
0010	255	22.57
0020	381	24.91 (522)

Extension Bars 1/2“

Design: In accordance with DIN 3123, form D/ISO 3316.



6095 format professional quality



6096

Part No.	Length mm	6095	6096
0063	63	– (532)	5.37 (522)
0075	75	3.24	–
0076	76	–	5.37
0125	125	3.43	5.77
0180	180	–	6.47
0250	250	4.63	7.90

Extension Bars 1/2" with Release Feature

Design: With locking ring to prevent unintentional detaching from the socket.

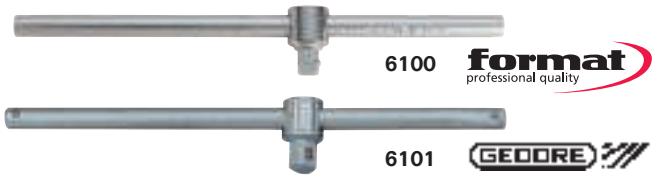
Part No.	Length mm	6097
0125	125	13.69
0250	250	15.16
		(522)



T-handles with Slide 1/2"

Design: In accordance with DIN 3122, form A/ISO 3315.

Part No.	Length mm	6100	6101
0010	292	–	8.16
0020	300	6.11	–
		(532)	(522)



6100 format professional quality

6101 GEDORE

Universal Joints 1/2"

Design: In accordance with DIN 3123, form C/ISO 3315.

Part No.	Length mm	6103	6104
0010	73	7.82	–
0020	73.5	–	14.57
		(532)	(522)



6103 format professional quality



6104 GEDORE

Socket Converters

Design: DIN 3123 A 12.5 x 10 – ISO 3316. With ball stop.
From square socket 1/2" to external square 3/8".

6106 Made of chromium-vanadium CrV 3, chromium-plated.

6107 Made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground and chromium-plated.

Part No.	Length mm	6106	6107
0010	38	2.75	–
0020	38.5	–	5.07
		(532)	(522)



6106 format professional quality



6107 GEDORE

Socket Converters

Design: DIN 3123 A 12.5 x 20 – ISO 3316. With ball stop.
From square socket 1/2" to external square 3/4.

6108 Made of chromium-vanadium CrV 3, chromium-plated.

6109 Made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground and chromium-plated.

Part No.	Length mm	6108	6109
0010	44	4.98	–
0020	44	–	6.49
		(532)	(522)



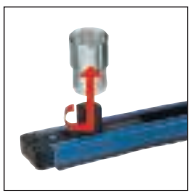
6108 format professional quality



6109 GEDORE

Magnetic Strips 1/2"

Application: Suitable for all conventional 1/2" socket wrenches.
Due to the strong permanent magnet, the strip can safely be fixed at FE metals, such as machine casings, tool trolley or lifting platforms.
The strip can be mounted horizontally, vertically or even at the ceiling.
For wall fastening, the strip is further provided with bore holes.
The socket wrenches are fixed by turning them by 90°.
The socket wrench is then blocked by the ball.
By turning in the opposite direction, the socket wrenches can be released and removed.





Part No.	Use	6117	Length x width mm
0012	For 12 wrenches	18.59	480 x 33
		(522)	

Hexagon Socket Wrenches 1/2“

Design: DIN 3124 – ISO 2725, with butt groove.

6111 Made of chromium-vanadium CrV 3, chromium-plated.

6113 Made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground, chromium-plated, axially and circumferentially knurled.



6111 format professional quality



6113 GEDORE

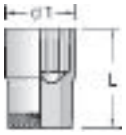
Part No.	Key width mm	6111	6113	Length L mm 6111	Length L mm 6113	ø d1 mm 6111	ø d1 mm 6113
0081	8	1.67	3.73	40	38	12.9	13
0091	9	1.67	3.73	40	38	14.1	14.2
0101	10	1.67	3.19	40	38	15.4	15.5
0111	11	1.67	3.43	40	38	16.6	16.7
0121	12	1.67	3.43	40	38	17.9	18
0131	13	1.67	3.19	40	38	19.1	19.2
0141	14	1.67	3.53	40	38	20.4	20.5
0150	15	1.67	3.53	40	39.5	21.6	21.7
0160	16	1.67	3.53	40	39.5	22.9	22.5
0170	17	1.83	3.75	40	39.5	24.1	24.2
0180	18	1.83	4.02	40	39.5	25.4	25.5
0190	19	1.83	3.75	40	40	26.6	26.7
0200	20	–	4.09	–	40	–	28
0210	21	1.83	4.42	40	41.5	29.1	29.2
0220	22	1.83	4.12	40	41.5	30.4	30.5
0230	23	–	4.53	–	41.5	–	31.7
0240	24	2.09	4.54	40	41.5	32.9	33
0250	25	–	5.22	–	41.5	–	34.5
0260	26	–	4.95	–	41.5	–	35.5
0271	27	2.45	5.70	45	41.5	36.6	36.7
0280	28	–	6.08	–	43	–	38
0285	29	–	6.33	–	43	–	39.2
0301	30	2.45	6.11	45	43	40.4	40.5
0321	32	2.45	6.11	47	44.5	42.9	43
0341	34	2.45	6.60	47	44.5	45.4	45.5
		(532)	(522)				

Bi-hexagonal Socket Wrenches 1/2“

6114 **Design:** DIN 3124-ISO 2725, with ball butt, made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground and chromium-plated, axially and circumferentially knurled.

UNIT DRIVE





GEDORE

Part No.	Key width mm	6114	Length L mm	ø d1 mm
0081	8	3.73	38	13
0091	9	3.73	38	14.2
0101	10	3.19	38	15.5
0111	11	3.43	38	16.7
0121	12	3.43	38	18
0131	13	3.19	38	19.2
0141	14	3.53	38	20.5
0150	15	3.53	39.5	21.7
0160	16	3.53	39.5	22.5
0170	17	3.75	39.5	24.2
0180	18	4.02	39.5	25.5
0190	19	3.75	40	26.7
0200	20	4.09	40	28
0210	21	4.42	41.5	29.2
0220	22	4.12	41.5	30.5
0230	23	4.53	41.5	31.7
0240	24	4.54	41.5	33
0250	25	5.35	41.5	34.2
0260	26	5.10	41.5	35.5
0271	27	5.85	41.5	36.7
0280	28	6.22	43	38
0290	29	6.49	43	39.2
0301	30	6.26	43	40.5
0321	32	6.26	44.5	43
		(522)		

Socket Wrenches 1/2", Long

Design: DIN 3124-ISO 2725, with butt groove.

6118 **Hexagon,** made of chromium-vanadium 31 CrV 3, chromium-plated.

6119 **Bi-hexagonal,** made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, precision ground, chromium-plated, axially and circumferentially knurled.







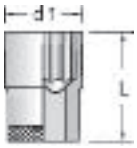
6118 format professional quality

6119 GEDORE

Part No.	Key width mm	6118	6119	Length L mm 6118	Length L mm 6119	ø d1 mm 6118	ø d1 mm 6119
0100	10	4.88	8.45	77	77	15.5	15.5
0120	12	–	8.45	–	77	–	18
0130	13	4.88	8.45	77	77	19	19.2
0140	14	4.88	8.79	77	77	20.5	20.5
0150	15	–	9.43	–	77	–	21.7
0160	16	–	9.43	–	77	–	23
0170	17	5.21	9.43	77	77	24	24.2
0180	18	–	9.79	–	82	–	25.5
0190	19	5.59	9.15	77	82	26	26.7
0210	21	–	9.88	–	82	–	29.2
0220	22	6.07	10.08	77	82	30	30.5
0240	24	6.75	10.28	77	82	32	33
0270	27	6.84	11.48	77	82	36	36.7
0300	30	–	11.99	–	82	–	40.5
0320	32	–	12.48	–	82	–	43
		(532)	(522)				

Socket Wrenches 1/2", US Inches

Design: Bi-hexagonal socket wrenches with UD profile, square drive C 12.5 DIN 3120; ISO 1174. GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground, chromium-plated. With spherical groove, extra strong and knurled for firm grip.





GEDORE

Part No.	Key width A.F.	6116	Length mm
0010	5/16	3.87	38
0020	11/32	4.25	38
0030	3/8	3.87	38
0040	13/32	3.87	38
0050	7/16	3.87	38
0060	1/2	3.87	38
0070	9/16	4.07	38
0080	19/32	4.07	39.5
0090	5/8	4.07	39.5
0100	11/16	4.33	39.5
0110	3/4	4.33	40
0120	25/32	4.33	40
0130	13/16	4.84	41.5
0140	7/8	4.84	41.5
0150	15/16	5.21	41.5
0160	1.	5.21	41.5
0170	1. 1/16	6.40	41.5
0180	1. 1/8	6.40	43
0190	1. 3/16	6.64	43
0200	1. 1/4	6.82	44.5
		(522)	

Screwdriver Bits 1/2" for Hex. Socket Head Screws

6123 **Design:** Chromium-plated holder, bronze shaft, in accordance with DIN 3120/ISO 1174, with butt groove, manually operated. Dimensions to DIN 3124/ISO 2725. Made of chromium-vanadium 31 CrV 3.

6124 **Design:** Blade bronze with pressed pin and spherical groove. Square drive C 12.5 to DIN 3120, ISO 1174. Bits GEDORE vanadium special steel, chromium-plated, knurled for firm grip. Bits bronze.

6123 format professional quality



6124 GEDORE



Part No.	Key width mm	6123	6124	Length mm
0040	4	2.87	3.94	60
0050	5	2.87	3.94	60
0051	5	–	4.54	90
0052	5	3.58	5.41	180
0060	6	2.87	3.94	60
0061	6	–	4.54	90
0062	6	3.50	–	137
0063	6	–	5.41	160
0070	7	2.93	3.94	60
0071	7	3.32	–	100
0080	8	2.93	3.94	60
0081	8	3.32	–	80
		(532)	(522)	

Part No.	Key width mm	6123	6124	Length mm
0082	8	–	4.54	90
0083	8	–	5.11	120
0090	9	–	4.22	60
0100	10	2.93	4.51	60
0101	10	3.69	6.18	140
0120	12	3.10	4.51	60
0121	12	–	6.52	140
0140	14	3.35	5.48	60
0141	14	–	7.59	140
0170	17	3.66	6.08	60
0190	19	3.66	6.32	60
		(532)	(522)	

Hex Socket Bit Sets 1/2"

6126 **Design:** In varnished metal case.



6126 format professional quality

6127 **Design:** In solid steel sheet case.



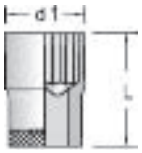
6127 GEDORE

Part No.	Design	6126	6127	Set contents
0010	9-piece	–	47.47	5, 6, 7, 8, 9, 10, 12, 14, 17 mm
0010	10-piece	41.47	–	4, 5, 6, 7, 8, 10, 12, 14, 17, 19 mm
		(532)	(522)	

Screwdriver Bits 1/2" for TORX® Socket Screws

6129 **Design:** Chromium-plated holder, bronze shaft, in accordance with DIN 3120/ISO 1174, with butt groove, manually operated. Dimensions in accordance with DIN 3124/ISO 2725. Made of chromium-vanadium 31 CrV 3.

6130 **Design:** For recess TORX® screws, square drive C 12.5 DIN 3120/ISO 1174, with spherical groove, bits GEDORE vanadium, bronze.





6129 format professional quality



6130 GEDORE

Part No.	Dimensions	6129	6130	Length mm 6129	Length mm 6130	For screws
0020	T 20	4.69	5.89	52	55	M 4 – M 5
0025	T 25	4.69	5.89	52	55	M 4.5 – M 5
0027	T 27	4.69	5.89	52	55	M 4.5 – M 5 – M 6
0030	T 30	4.40	5.89	52	55	M 6 – M 7
0040	T 40	4.40	6.77	52	55	M 7 – M 8
0045	T 45	5.59	6.77	52	55	M 8 – M 10
0050	T 50	5.59	6.77	54	55	M 10
0055	T 55	5.81	8.82	55	55	M 12
0060	T 60	5.81	8.82	55	55	M 14
		(532)	(522)			

Screwdriver Bits 1/2" for Recess TORX® Screws, Long

Design: Long, for TORX® screws, square drive C 12.5, with butt groove, chromium-plated, tips Gedore vanadium, bronze.

GEDORE

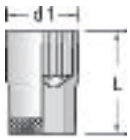


Part No.	Dimensions	6130	Length mm	For screws
0021	T 20	6.95	100	M 4 – M 5
0026	T 25	6.95	100	M 4.5 – M 5
0028	T 27	6.95	100	M 4.5 – M 5 – M 6
0031	T 30	6.95	100	M 6 – M 7
0041	T 40	7.86	100	M 7 – M 8
0046	T 45	7.86	100	M 8 – M 10
0051	T 50	7.86	100	M 10
0056	T 55	10.24	100	M 12
0061	T 60	10.24	100	M 14
		(522)		

Screwdriver Bits 1/2" for TORX® Screws

6121 **Design:** According to DIN 3120/ISO 1174, with spherical groove, manually operated. Dimensions comply with DIN 3124/ISO 2725, made of chromium-vanadium 31 CrV 3.

6122 **Design:** For TORX® screws, square drive C 12.5 DIN 3120/ ISO 1174, with spherical groove, chromium-plated, GEDORE vanadium, ground, chromium-plated.





6121 format professional quality



6122 GEDORE

Part No.	Dimensions	6121	6122	Length mm 6121	Length mm 6122	ø d1 mm 6121	ø d1 mm 6122	For screws
0010	E 10	2.45	5.22	38	38	13.3	13.5	M 8
0011	E 11	2.45	5.22	38	38	14	14	–
0012	E 12	2.45	5.22	38	38	14.9	15.5	M 10
0014	E 14	2.45	5.67	38	38	16.7	17	M 12
0016	E 16	2.67	5.67	38	38	19	19	M 12
0018	E 18	3.25	5.97	38	40	21	21	M 14
0020	E 20	3.40	5.97	38	40	23.5	23.5	M 16
0024	E 24	3.50	8.29	38	41.5	28	28.5	M 18–M 20
		(532)	(522)					

Socket Bit Sets 1/2" for Recessed TORX® Screws

Design: 9-piece for recessed TORX® screws.
In blue steel plate case.

Part No.	Set contents	6128
0030	Recessed TORX ® T 20 – T 25 – T 27 – T 30 – T 40 – T 45 – T 50 – T 55 – T 60	68.44

(522)



Socket Bit Sets 1/2" for Recess TORX®

Design: 18-piece, for recess TORX® screws.
In blue steel case.

Part No.	Set contents	6128
0020	Recess TORX® 55 mm long T 20 – T 25 – T 27 – T 30 – T 40 – T 45 – T 50 – T 55 – T 60 Recess TORX® 100 mm long T 20 – T 25 – T 27 – T 30 – T 40 – T 45 – T 50 – T 55 – T 60	153.75

(522)



Socket Bit Sets 1/2" for TORX®

Design: 9-piece set for TORX® screws.
In blue steel sheet case.

Part No.	Set contents	6128
0005	TORX® E10 – E11 – E12 – E14 – E16 – E18 – E20 – E24, Adapter E 3/8" to A 1/2"	58.63

(522)



Socket Bit Sets 1/2"

Design: 17-piece set for recessed TORX® screws and TORX® screws.
In blue steel sheet case.

Part No.	Set contents	6128
0010	Recess TORX® T 20 – T 25 – T 27 – T 30 – T 40 – T 45 – T 50 – T 55 –T 60 TORX® E10 – E11 – E12 – E14 – E16 – E18 – E20 – E24	117.37

(522)



Socket Wrench Sets

Socket Wrench Sets 3/4“

Design: With 3/4“ square drive, in accordance with DIN 3120/ISO 1174 with socket wrenches to DIN 3122, DIN 3123, DIN 3124/ISO 3315, ISO 3316, ISO 2725 in painted metal case.

Ratchet wrench with square, hex. socket wrenches 22; 24; 27; 30; 32; 34; 36; 41; 46; 50 mm. Handle with slide with additional 12 mm hex socket in the head, extension bars 200–400 mm.

Part No.	0010
Design	**14-piece**
6131	185.45

(532)



Socket Wrench Sets 3/4“

Design: Forged, annealed hexagon socket wrenches and driving tools in GEDORIT-blue steel sheet case.

6132
1 reversible ratchet
1 extension bar 200 mm
1 extension bar 400 mm
1 handle with slide
10 hexagon sockets 22; 24; 27; 30; 32; 36; 38; 41; 46; 50 mm.

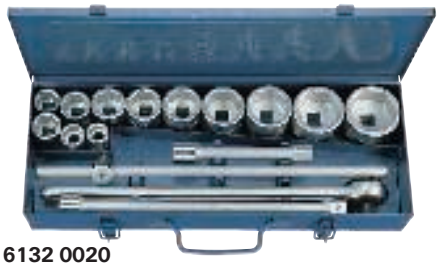
6132
1 reversible ratchet
1 extension bar 200 mm
1 extension bar 400 mm
1 handle with slide
12 hexagon sockets 22; 24; 27; 30; 32; 36; 38; 41; 46; 50; 55; 60 mm.

Part No.	0010	0020
Design	**14-piece**	**16-piece**
6132	247.97	335.82

(522)



6132 0010



6132 0020

Ratchet Wrenches with Square 3/4“

Design: DIN 3122 B 20-ISO 3315, made of chromium-vanadium steel CrV 3.

6133 With round head and pin locking, **36 teeth.** Handle with plastic cover. Supplied with square (part no. 6136).

6136 Spare squares for ratchet wrench (part no. 6133).

Part No.	Length mm	6133	6136
0010	500	38.73	–
0020	46	–	7.34
		(532)	(532)



6133 0010



6136 0020

Reversible Ratchets 3/4“

Design: For socket wrenches with connecting square and pin locking.

6134 Ratchet set, reversible, micro-toothing, **60 teeth.**

6152 With metal gear disk and internal serration, **50 teeth.**

6153 With detachable tube, gear lever, particularly robust, with centre locking, **32 teeth.**

Part No.	Length mm	6134	6152	6153
0010	542	61.62	–	–
0010	510	–	57.71	–
0010	620	–	–	91.72
		(532)	(522)	(522)



6134



6152



6153

Extensions 3/4“

Design: According to DIN 3123, form B/ISO 3316, with pin locking.

Part No.	Length mm	6135	6154
0200	200	8.96	15.80
0400	400	12.20	21.18
		(532)	(522)



6135 format professional quality



6154 GEDORE

T-handles with Slide 3/4“

Design: According to DIN 3123, form A/ISO 3315.

Part No.	Length mm	6137	6162
0010	430	13.88	–
0010	500	–	20.56
		(532)	(522)



6137 format professional quality



6162 GEDORE

Universal Joints 3/4“

Design: According to DIN 3123, form B/ISO 3316.

Part No.	Length mm	6139	6156
0010	104	27.75	–
0010	108	–	44.00
		(532)	(522)



6139 format professional quality



6156 GEDORE

Socket Converters

Design: DIN 3123 A 20 x 25, with pin locking.
From square socket 3/4“ to external square 1/2“.

6141 Made of chromium-vanadium CrV 3, chromium-plated.

6157 Made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground and chromium-plated.

Part No.	Length mm	6141	6157
0010	58	7.34	–
0010	56	–	8.67
		(532)	(522)



6141 format professional quality



6157 GEDORE

Socket Converters

Design: DIN 3123 A 25 x 20, with pin locking.
From square socket 3/4“ to external square 1“.

6142 Made of chromium-vanadium CrV 3, chromium-plated.

6158 Made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground and chromium-plated.

Part No.	Length mm	6142	6158
0010	60	12.93	14.22
		(532)	(522)



6142 format professional quality



6158 GEDORE

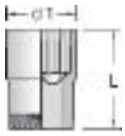
Hexagon Socket Wrenches 3/4“

Design: DIN 3124-ISO 2725, with pin locking.

6143 Made of chromium-vanadium CrV 3, chromium-plated.

6144 Made of GEDORE vanadium 31 CrV 3 mat. no. 1.2208, ground and chromium-plated. Axially and circumferentially knurled.







6143 format professional quality

6144 GEDORE

Part No.	Key width mm	6143	6144	Length L mm 6143	Length L mm 6144	ø d1 mm 6143	ø d1 mm 6144
0018	18	–	8.57	–	51.5	–	28.3
0019	19	–	7.59	–	51.5	–	29.6
0021	21	–	8.27	–	51.5	–	32
0022	22	5.28	7.59	52	51.5	32	33.3
0024	24	5.48	7.59	52	51.5	34.5	35.8
0027	27	5.93	7.67	54	54.5	38.5	39.6
0029	29	–	8.27	–	54.5	–	42
0030	30	6.19	8.27	56	57.5	43	43.3
0032	32	6.28	8.27	56	57.5	45	45.8
0033	33	–	10.50	–	57.5	–	47
0034	34	8.26	10.50	56	57.5	46	48.3
0036	36	8.20	10.50	65	59.5	50	50.8
0038	38	8.49	10.61	65	59.5	53	53.3
0041	41	9.84	16.60	65	62.5	56	57.1
0046	46	11.27	17.43	65	65.5	62	63.3
0050	50	12.58	21.00	65	68.5	68	68.3
0055	55	15.87	23.86	70	68.5	74	74.6
0060	60	18.70	27.74	70	68.5	80	80.8
		(532)	(522)				

Bi-hexagonal Socket Wrenches 3/4“

Design: Bi-hexagonal sockets with UD profile, square drive D 20, DIN 3120/ISO 1174, with locking pin, GEDORE vanadium, ground, chromium-plated.

GEDORE

Part No.	Key width mm	6146	Length L mm	ø d1 mm
0018	18	8.57	51.5	28.3
0019	19	7.59	51.5	29.6
0021	21	8.57	51.5	32
0022	22	7.59	51.5	33.3
0024	24	7.59	51.5	35.8
0027	27	7.67	54.5	39.6
0029	29	8.27	54.5	42
0030	30	8.27	57.5	43.3
0032	32	8.27	57.5	45.8
0033	33	10.50	57.5	47
0036	36	10.50	59.5	50.8
0038	38	10.61	59.5	53.3
0041	41	16.60	62.5	57.1
0046	46	17.43	65.5	63.3
0050	50	21.00	68.5	68.6
0055	55	23.86	68.5	74.6
0060	60	27.74	68.5	80.8
		(522)		





Screwdriver Bits 3/4“ for Hexagon Socket Screws

Design: Square drive D 20, DIN 3120/ISO 1174, chromium-plated, knurled for firm grip, bits bronze.

GEDORE

Part No.	SW mm	6148	Length mm
0000	14	9.91	80
0005	17	11.61	80
0010	19	12.33	80
0015	22	13.33	80
		(522)	





Socket Wrench Sets 1“

Design: In GEDORIT-blue steel sheet case.

1 reversible ratchet, 2 extensions 200 and 400 mm;
1 handle with slide; 10 bi-hexagonal sockets 36, 41, 46, 50, 55, 60, 65, 70, 75, 80 mm; case dimensions 765 x 289 x 105 mm.



Part No.	Set contents	6145
0010	15-piece	684.35 (522)

Reversible Ratchets 1“

Design: With gear lever, centre locking, particularly robust. 32 teeth, including push-in lever.



Part No.	Length mm	6153
0020	810	111.41 (522)

Toothed Ratchets 1“

6151 **Design:** Toothed ratchet with through square, smooth running and robust, 40 teeth, including slip-on tube.

6147 **Design:** Spare through square for toothed ratchet 6151 0010.



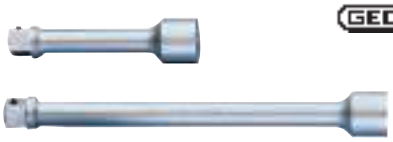
6151

6147



Part No.	Length mm	6151	6147
0010	720	99.29	–
0010	68	–	11.61
		(522)	(522)

Extensions 1“



Part No.	Length mm	6157
0205	200	29.34
0405	400	40.81 (522)

Handles with Slide 1“



Part No.	Length mm	6149
0010	700	45.01 (522)

Universal Joints 1“



Part No.	Length mm	6159
0010	140	100.04 (522)

Socket Converters

Design: Internal 1“ square, external 3/4“ square.



Part No.	Length mm	6161
0010	75	17.01 (522)

Sockets 1“

Design: DIN 3124 with UD profile and hexagon, with square drive D 25 to DIN 3120/ISO 1174 and locking pin. GEDORE-vanadium 31 CrV 3 mat. no. 12208, chromium-plated.



Part No.	Key width mm	6163	Length mm
0036	36	19.66	70
0041	41	22.74	70
0046	46	26.65	75
0050	50	29.83 (522)	75

Part No.	Key width mm	6163	Length mm
0055	55	36.24	80
0060	60	41.47	85
0065	65	49.14	88
0070	70	52.43 (522)	92

Part No.	Key width mm	6163	Length mm
0075	75	59.79	95
0080	80	60.57 (522)	97

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Machinist's Tool Kits, 54-piece

Design: In sheet steel tool case (part no. 7358 0530) containing 1 each of the following per kit:

Water pump pliers 240 mm	(part no. 5599 0240)
Universal pliers 180 mm	(part no. 5145 0180)
Diagonal side cutting pliers 160 mm	(part no. 5290 0160)
Metric open end wrenches, 9-piece set, sizes 6–32 mm	(part no. 5706 0010)
Metric double-ended ring wrenches, 12-piece set, sizes 6–32 mm	(part no. 5748 0020)
Hex. angled screwdriver, 8-piece set, on ring, size 2–10	(part no. 5847 0045)
Screwdriver set, 6-piece, with wooden handle	(part no. 6354 0010)
Centre punch 120 x 12 mm	(part no. 6874 0121)
Drift punch 3 mm	(part no. 6860 0003)
Drift punch 5 mm	(part no. 6860 0005)
Machinist's hammer 500 g	(part no. 6775 0500)
Machinist's hammer 1,000 g	(part no. 6775 1000)
Hacksaw frame 300 mm	(part no. 6740 0300)
HSS bimetal hand saw blade 300 mm	(part no. 2750 0010)
Carbide scriber 150 mm	(part no. 4803 0150)
Steel brush, 4-row	(part no. 7004 0004)
Engineer's file, H2, flat 200 mm	(part no. 6530 0202)
Engineer's file, H2, round 200 mm	(part no. 6560 0202)
File handles (2 pcs.)	(part no. 6682 0110)
Flat chisel 300 mm	(part no. 6844 0300)
Cross-cut chisel 200 mm	(part no. 6842 0200)
Wooden folding rule 2 m	(part no. 4671 0005)
Padlock	(part no. 7356 0040)



Part No.	Set contents	6165 Set
0054	54-piece	137.44 (533)

Note: All the tools in the above kits are in conformity with the article description in this catalogue.
We reserve the right to alter the composition of the kits.

Electrician's Tool Kits, 40-piece

Design: In sheet steel tool case (part no. 7358 0530) containing 1 each of the following per kit:

Radio pliers 160 mm	(part no. 5215 0160)
Radio pliers, VDE, straight, 160 mm	(part no. 5217 0160)
Diagonal side cutting pliers, VDE, 160 mm	(part no. 5296 0160)
Metric open end wrenches, 9-piece set, sizes 6–32	(part no. 5706 0010)
Universal pliers, VDE, 160 mm,	(part no. 5151 0160)
Hex. socket offset screwdrivers, 8-piece set, on ring, sizes 2–10	(part no. 5847 0045)
Centre punch 120 x 12 mm	(part no. 6874 0121)
Cable knife, 1-piece	(part no. 5429 0195)
Universal cable knife	(part no. 5441 0005)
Machinist's hammer 500 g	(part no. 6775 0500)
Voltage tester	(part no. 5563 0005)
Hacksaw 150 mm	(part no. 6730 0150)
Screwdriver set VDE, 6-piece	(part no. 6354 0040)
Carbide scriber 150 mm	(part no. 4803 0150)
Plaster bowl	(part no. 7326 0005)
Painter's spatula 60 mm	(part no. 7320 0060)
Padlock	(part no. 7356 0040)
Voltage tester DUSPOL® compact	(part no. 5552 0005)
Continuity and conduction tester DUTEST	(part no. 5575 0005)



Part No.	Set contents	6165 Set
0040	40-piece	153.08 (533)

Note: All the tools in the above kits are in conformity with the article description in this catalogue.
We reserve the right to alter the composition of the kits.

Universal Tool Kits, 43-piece

format professional quality

Design: In ABS plastic case (part no. 7395 0005), with double aluminium frame, approved as hand luggage on airlines, containing 1 each of the following per kit:

Pocket measuring tape 3 m	(part no. 4689 0003)
Universal pliers 180 mm	(part no. 5148 0180)
Radio pliers 200 mm	(part no. 5227 0200)
Cable strippers 160 mm	(part no. 5450 0160)
Diagonal side cutting pliers 160 mm	(part no. 5293 0160)
Water pump pliers 240 mm	(part no. 5599 0240)
Self grip pliers 250 mm	(part no. 5630 0250)
Universal shears 190 mm	(part no. 7087 0190)
Combination wrenches sizes 8, 10, 11, 12, 13, 14, 17 mm	(part no. 5720)
Socket wrenches 1/2“, sizes 10, 13, 17 mm	(part no. 6111)
Extension bar 1/2“, 250 mm	(part no. 6095 0250)
Lever ratchet wrench 1/2“	(part no. 6080 0010)
T-handle with slide 1/2“	(part no. 6100 0020)
Hex. socket offset screwdrivers, 8-piece set, sizes 2–10	(part no. 5847 0035)
Machinist’s hammer 300 g, with impact protection socket	(part no. 6777 0300)
Flat chisel 150 mm	(part no. 6840 0150)
Nylon-faced hammer 30 mm	(part no. 6825 0030)
Drift punch 5 mm	(part no. 6860 0005)
Centre punch 120 x 12 mm	(part no. 6874 0121)
Screwdrivers, 1 each 3.5 x 0.6; 4 x 0.8; 5.5 x 1; 7 x 1.2 mm	(part no. 6266)
Screwdrivers, 1 each PH 1; 2; 3	(part no. 6300)
Cable knife, 1-piece	(part no. 5429 0195)



Part No.	Set contents	6165 Set
0043	43-piece	307.88 (533)

Note: All the tools in the above kits are in conformity with the article description in this catalogue.
We reserve the right to alter the composition of the kits.

Tool Kits Touring No. 1000, 47-piece, in Case

GEDORE

Design: The perfect tool kit for all purposes. Selected and arranged to meet the requirements of any application. The tools are conveniently arranged and held firmly in the case. Blown polypropylene case with snap-in latches and foldable handle, shock-proof, oil and acid resistant, weather resistant, with plastic foam inserts.
A robust device for use in the car, boat or aircraft.

Supplied in handy plastic case incl.

11 deep-offset combination wrenches sizes 6; 7; 8; 10; 11; 12; 13; 14; 15; 17; 19 mm
3 screwdrivers for slotted screws 4; 5.5; 6.5 mm
2 screwdrivers for cross head screws PH 1; 2
1 screwdriver for slotted screws, insulated, 3 mm
1 hexagon socket offset screwdriver set, 8-piece of each size 2; 2.5; 3; 4; 5; 6; 8; 10 mm
1 reversible ratchet 1/2“
2 extension bars 1/2“, 125; 250 mm
1 universal joint 1/2“
1 T-handle with slide 1/2“
1 spark plug set size 20.8
9 hex. socket wrenches 1/2“ sizes 10; 11; 12; 13; 14; 15; 17; 19; 22 mm
1 combination pliers 180 mm
1 diagonal side cutting pliers 160 mm
1 water pump pliers 250 mm
1 voltage tester
1 cable knife, 1-piece
1 machinist’s hammer 300 g
1 small item box



Part No.	Set contents	6166 Set
0047	47-piece	285.66 (522)

Electrician's Tool Kits No. 1090, 90-piece, in Case

Design: The perfect tool kit for electricians and caretakers. Convenient device to be used on the spot. The tools are accommodated in a shock-proof, hard plastic case. With aluminium frame, three metal hinges, four bottom glides and screwed, integrated handle with integrated locks.

Supplied in hard plastic case, incl.

12 metric open end wrenches, small, sizes 4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 12; 13 mm
4 metric open end wrenches, sizes SW 14 x 17; 18 x 19; 21 x 23; 22 x 24 mm
1 hexagon socket screwdriver set, 9-piece, sizes 2; 2.5; 3; 4; 5; 6; 7; 8; 10 mm
4 slotted head screwdrivers, VDE 3.5; 4; 5.5; 6.5 mm
2 cross recess screwdrivers VDE PH 1; 2
1 slotted head screwdriver, short, 5.5 mm
1 cross recess screwdriver, short, PH 1
2 cross recess screwdrivers PZ 1; 2
1 hexagon socket offset screwdriver for slotted screws 5.5 and 8 mm
1 hexagon socket offset screwdriver for cross recess screws PH 1 and PH 2
1 combination pliers, VDE 180 mm
1 diagonal side cutting pliers, VDE 200 mm
1 flat pliers, VDE, angled 160 mm
1 cable strippers, VDE, 160 mm
1 flat pliers, VDE, 160 mm
1 water pump pliers 245 mm
11 hex. socket wrenches 1/4", sizes 4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 13 mm
1 reversible ratchet 1/4"
1 T-handle with slide 1/4"
1 extension bar 1/4" 97 mm
1 universal joint 1/4"
1 square handle 1/4"
1 single-ended open wrench, adjustable, max. wrench size 30 mm
1 small scissors 140 mm
1 cable knife
1 metal saw 350 mm
10 spare saw blades 200 mm
1 square awl
1 measuring tape 3 m
1 scriber, curved
1 voltage tester 3.5 mm
1 glazier's hammer 100 g
1 machinist's hammer 300 g
1 flat chisel 175 mm
2 drift punches 2; 4 mm
1 automatic centre punch 4 mm
1 electrician's slotted chisel 200 mm
1 electrician's chisel octagonal shaft 250 mm
1 soldering iron 60 watts
1 tin solder HS 10
1 solder paste 50 g
1 solder stone 64 x 45 x 40 mm







Part No.	Set contents	6166
0090	90-piece	639.27 (522)

Universal Tool Assortments 100-piece No. 1400 GM



Supplied in steel locker.

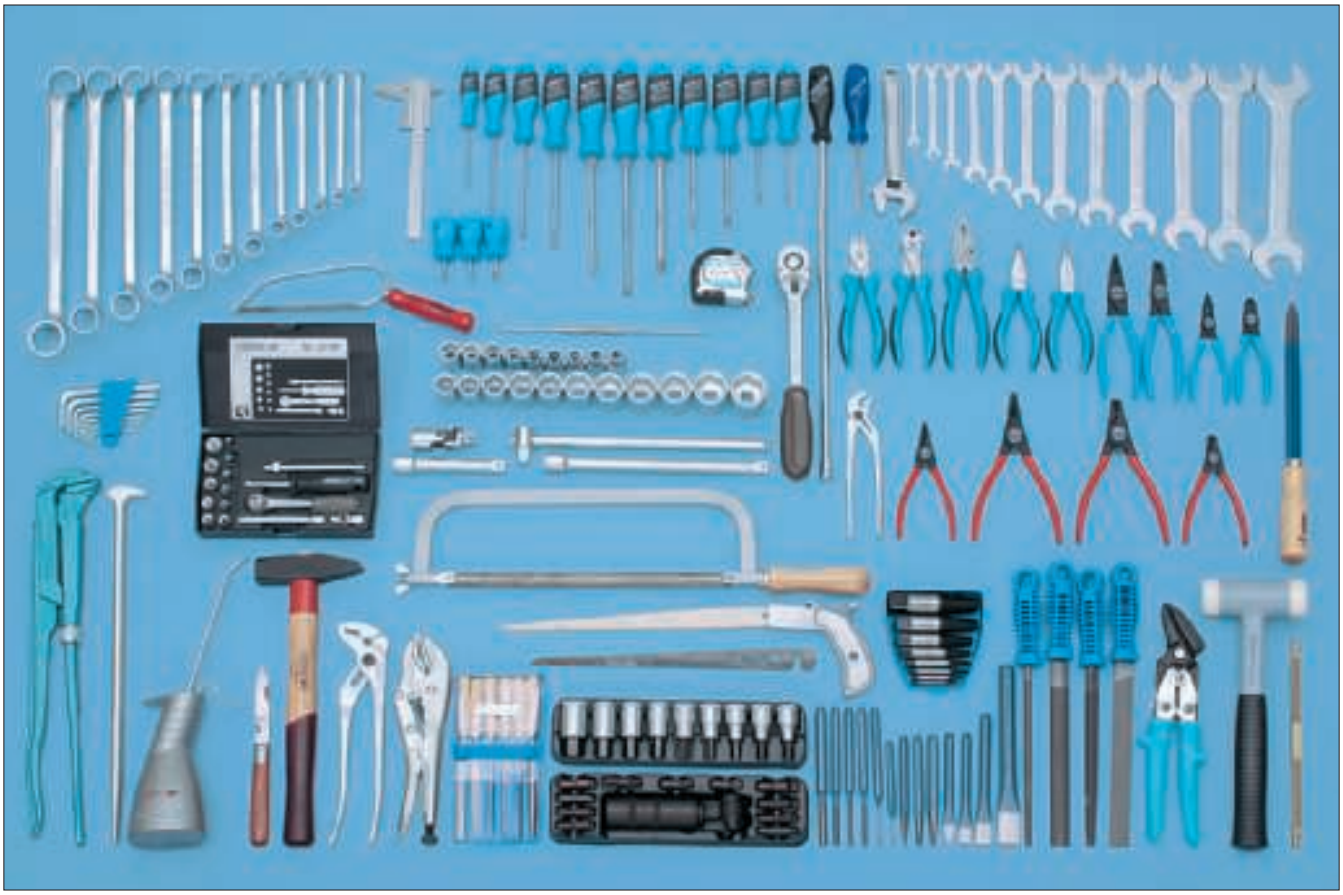
Content:

8 double-ended ring wrenches, sizes 6 x 7; 8 x 9; 10 x 11; 12 x 13; 14 x 15; 16 x 17; 18 x 19; 20 x 22 mm
10 metric open-end wrenches sizes 6 x 7; 8 x 9; 10 x 11; 12 x 13; 14 x 15; 16 x 17; 18 x 19; 20 x 22; 21 x 23; 24 x 27 mm
19 hex. socket wrenches 1/2" sizes 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 21; 22; 23; 24; 26; 27; 28; 30; 32 mm
7 socket bits 1/2" for Allen screws sizes 6; 7; 8; 9; 10; 12; 14 mm
1 reversible ratchet 1/2"
2 extension bars 1/2" 125; 250 mm
1 universal joint 1/2"
1 T-handle with slide 1/2"
6 socket wrenches with handle sizes 5.5; 6; 7; 8; 9; 10 mm
10 hex. socket offset screwdrivers sizes 1.3; 1.5; 2; 2,5; 3; 4; 5; 6; 8; 10 mm
1 single-headed wrench, adjustable max. size SW 25 mm
1 gripping pliers 240 mm
1 water pump pliers 250 mm
4 slotted head screwdrivers 4; 4.5; 6.5; 8 mm
2 slotted head screwdrivers PH 1; PH 2
1 centre punch 5 mm
1 drift punch 5 mm
1 flat chisel 250 mm
1 crosscut chisel 5 mm
3 pin punches 1.5; 3; 4 mm
1 metal bow saw
1 hobby saw
1 flat file 150 mm cut 2
1 three-square file 150 mm cut 2
1 round file 150 mm cut 2
1 key file set 6-piece
1 three-square scraper 150 mm
1 high-leverage combination pliers 180 mm
1 high-leverage diagonal side cutting pliers 160 mm
1 flat-round pliers 160 mm
2 machinist hammers 300; 500 g
1 nylon-faced hammer 40 mm ∅
1 steel slitting shears 250 mm

Part No.	Set contents	6166
0092	100-piece	1,168.07 (522)

Mechanic's Tool Assortments 175-piece No. S 1007 M

GEDORE



Content:

12 double-ended ring wrenches sizes 6 x 7; 8 x 9; 10 x 11; 12 x 13; 14 x 15; 16 x 17; 18 x 19; 20 x 22; 21 x 23; 24 x 27; 25 x 28; 30 x 32 mm
12 metric open-end wrenches sizes 6 x 7; 8 x 9; 10 x 11; 12 x 13; 14 x 15; 16 x 17; 18 x 19; 20 x 22; 21 x 23; 24 x 27; 25 x 28; 30 x 32 mm
20 hex. socket wrenches 1/2" sizes 8; 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 21; 22; 23; 24; 26; 27; 28; 30; 32 mm
1 reversible ratchet 1/2"
2 extensions 1/2" 125; 250 mm
1 universal joint 1/2"
1 T-handle with slide 1/2"
11 hexagon socket wrenches 1/4" sizes 4; 4.5; 5; 5.5; 6; 7; 8; 9; 10; 11; 13 mm
1 reversible ratchet 1/4"
1 T-handle with slide 1/4"
1 extension bar 1/4" 97 mm
1 universal joint 1/4"
1 square handle 1/4"
9 hexagon socket screw key inserts sizes 5; 6; 7; 8; 9; 10; 12; 14; 17 mm
1 screw remover
1 adapter for square bits 1/2" to hex 5/16"
1 adapter for square bits 1/4" to hex 5/16"
4 bits for slotted screws 7; 8; 9; 12 mm
4 bits for Allen screws sizes 5; 6; 8; 10 mm
3 bits for cross recess screws PH 2; 3; 4L
1 set of hexagon socket offset screwdrivers, 8 piece sizes 2; 2.5; 3; 4; 5; 6; 8; 10 mm
1 mechanic's pliers 175 mm
1 universal pliers 248 mm
1 water pipe pliers 1.1/2"
1 gripping pliers 240 mm
2 pliers for external locking rings, straight jaws A 1; A 2
2 pliers for external locking pliers, curved jaws A 11; A 21
2 pliers for internal locking rings, straight jaws J 1; J 2
2 pliers for internal locking rings, curved jaws J 11; J 21
1 high-leverage combination pliers 180 mm
1 high-leverage diagonal side cutting pliers 160 mm
1 high-leverage face cutter 160 mm
1 flat-round pliers, straight 160 mm
1 flat-round pliers, curved 160 mm
3 slotted head screwdrivers with hexagon drive 6.5; 8; 10 mm
3 slotted head screwdrivers 3; 4; 5.5 mm
3 cross recess screwdrivers PH 1; 2; 3
2 cross recess screwdrivers PZ 1; 2
1 slotted head screwdriver, short 6.5 mm
2 cross recess screwdrivers, short PH 1; 2
6 pin punches 2; 3; 4; 5; 6; 8 mm
1 centre punch 4 x 120 mm
2 drift punches 3; 5 mm
3 flat chisels 125; 150; 200 mm
1 crosscut chisel 125 mm
1 steel slitting shears 250 mm
1 single-headed wrench, adjustable max. size 28 mm
1 small metal saw Puk 290 mm
1 metal bow saw 520 mm
1 keyhole saw 380 mm
1 flat file 200 mm cut 2
1 three-square file 200 mm cut 2
1 round file 200 mm cut 2
1 half-round file 200 mm cut 2
1 key file set 6-piece
1 thread file
1 cable and electrician's knife 195 mm
1 machinist's hammer Red Band Plus 500 g
1 Desmopan nylon-faced hammer 40 mm ∅
1 three-square scraper 200 mm
1 square awl
1 lever iron 400 mm
1 magnetic lifter 1,800 g
1 screw extractor set 8-piece
1 force feed oiler 0.3 l
1 measuring tape 3 m
1 scriber 250 mm
1 vernier calliper gauge 140 mm

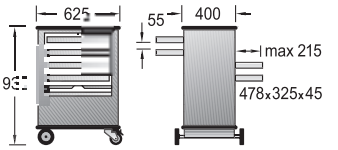
Part No.	Set contents	6166
0175	175-piece	1,328.04 (522)

Tool Trolleys

Design: With four sliding drawers with ball-cage guides, centre position stop, central lock, recessed worktop with soft rubber edge protection and grooved plastic surface, reinforced wide-track rear axle with large true-running solid rubber wheels, highly stable, steering castors on one side with swivel brake (Totalstop), thread protection on all wheels, circumferential soft rubber profile strips give edge protection.
Load 300 kg.

format professional quality





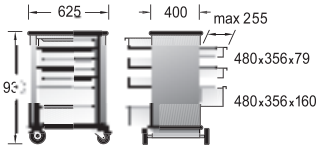
Part No.	Dimensions L x W x H mm	6172	Drawer dimensions L x B x H mm	Drawer load kg	Static carrying force kg	capacity kg
0100	625 x 400 x 930	218.50 (536)	478 x 325 x 45	20	300	38

Tool Trolleys

Design: Spacious tool trolley with 7 drawers, which can be pulled out on both sides, for manifold use. With smooth running guides, all drawers with individual locking and centre position stop.
Central locking for all drawers. 2 large drawers, 160 mm high, for bulky items and 5 drawers, 79 mm high, (4 of which with fixed separation walls). Recessed worktop with grooved plastic surface. Highly stable due to reinforced wide-track rear axle with 2 large true-running solid rubber wheels. Steering castors on one side with swivel brake, circumferential soft rubber profile strips give edge protection.
Load 300 kg.

format professional quality





Part No.	Dimensions L x W x H mm	6172	Drawer dimensions L x B x H mm	Drawer load kg	Static carrying force kg	capacity kg
0200	625 x 400 x 930	498.72 (536)	480 x 356 x 79 480 x 356 x 160	20	300	55

Tool Trolleys

Design: Robust steel construction, torsion-resistant, protective edges, therefore suitable for high loads, four large wheels, two of which steering casters ⌀ 100 mm, 1 of which lock-type castor, 2 running wheels ⌀ 140 mm, projecting at the sides, thus offer high stability, load per castor 210 kg.

Individual locking prevents the opening of the drawer when moved, load per drawer 25 kg. Worktop made of ABS plastic with hollows for small items, punched side walls for holding various objects.
Central locking with cylinder lock incl. two keys.
Internal drawer dimensions: W x D 482 x 345 mm.

METEC



With accessories.
Available on request.

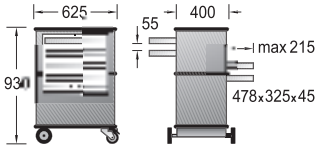
Part No.	Dimensions L x W x H mm	6170	Drawer dimensions L x B x H mm	Drawer load kg	Static carrying force kg	capacity kg
0100	630 x 410 x 930	275.15 (547)	482 x 345 x 75 482 x 345 x 150	25	210	48

Tool Trolleys, Type 1580

Design: Sturdy steel plate construction with **four drawers which can be pulled out on both sides** (all drawers can be arranged individually). Ball cage guide and centre and end position stop. The standard supply includes eight longitudinal and two transverse compartments. Large bottom shelf for large-sized tools as well as double-sided metal sliding doors secure the entire interior. **Central lock by padlock.** Work top with grooved plastic surface and soft ruber edge protection. High stability due to reinforced wide-track rear axle with two large solid-rubber wheels protruding at the side and two steering castors, one with swivel brake (full braking). Furthermore, the tool trolley is profied with three circumferential soft rubber profile strips as edge protection. Surface scratchproof, powder-coated, body and sliding doors in GEDORIT-blue, drawers GEDORIT-silver.

Please note: Padlock see (part no. 7356).



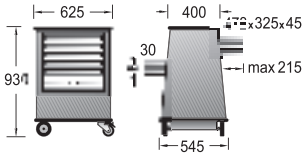


Part No.	Dimensions L x W x H mm	6170	Drawer dimensions L x B x H mm	Drawer load kg	Static carrying force kg	capacity kg
0040	625 x 400 x 930	385.21 (535)	478 x 325 x 45	20	300	38

Tool Trolleys, Type 2000

Design: Large, trend-setting trolley, non-tilting trapezoidal form. Five drawers which can be arranged individually. The standard supply includes twelve compartments: ten longitudinal and two transverse. Drawers can be pulled out on both sides, with centre and end position stop. Large bottom case, easily accessible. Double-sided metal doors secure the entire interior. Central lock by padlock. Five smooth running drawers with ball cage guides. Precise running. Wide-track base with large wheels mounted internally. Two steering castors, one with swivel brake (full braking). High stability. Static carrying capacity 300 kg. GEDORIT-blue, drawers GEDORIT-silver. Steel plate, electrostatic powder coating.



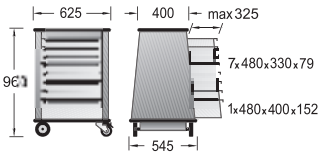


Part No.	Dimensions L x W x H mm	6170	Drawer dimensions L x B x H mm	Drawer load kg	Static carrying force kg	capacity kg
0050	625 x 400/545 x 930	429.23 (535)	478 x 325 x 45	20	300	42

Tool Trolleys, Type 2500

Design: Trapezoidal form, with 8 spacious, sturdy drawers to be pulled out on one side. Seven drawers can be arranged individually. The standard supply includes ten longitudinal and two transverse compartments. Wide-track base with sturdy wheels mounted internally. Two steering castors, one with swivel brake (full braking). Central cylinder lock. GEDORIT-blue, drawers GEDORIT-silver. Steel plate, electrostatic powder coating.





Part No.	Dimensions L x W x H mm	6170	Drawer dimensions L x B x H mm	Drawer load kg	Static carrying force kg	capacity kg
0070	625 x 400/545 x 960	649.35 (535)	480 x 330 x 79 480 x 400 x 152	45	300	60

Tool Trolleys Type 2004

Design: Sturdy steel construction, **multi-purpose use, drawers can be pulled out on one side** (all drawers can be arranged individually), individual locking and cover of the latches, sturdy and **removable.** The standard supply includes 12 compartments: 10 longitudinal and 2 transverse. With 4 removable drawers for small parts behind the compartment door at the side. The other side with 4 holes for attaching accessories. **Central lock by cylinder lock.** Convenient and spacious worktop made of ABS plastic, high rim and 3 compartments for small parts. Highly stable, steering stability and manoeuvrability due to sturdy heavy-load base with 2 large solid rubber wheels as well as two steering castors, one with locking device. Impact-protection on all sides with heel protection.
Surface scratchproof powder-coating, corpus GEDORIT-blue, drawers and compartment door as well as small item drawers in GEDORIT- silver.

6170 0120 With 9 drawers which can be pulled out on one side, 2 sizes.

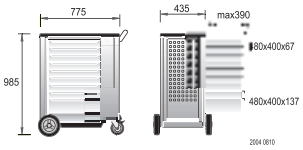
6170 0130 With 7 drawers which can be pulled out on one side, 3 sizes.

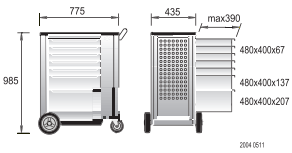


6170 0120



6170 0130





Part No.	Dimensions L x W x H mm	6170	Drawer dimensions L x B x H mm	Drawer load kg	Static carrying force kg	capacity kg
0120	775 x 435 x 985	858.46	480 x 400 x 67 480 x 400 x 137	45	500	82
0130	775 x 435 x 985	805.00	480 x 400 x 67 480 x 400 x 137 480 x 400 x 207	45	500	83
		(522)				

Tool Trolleys Type 2005

Design: Sturdy steel construction, multi-purpose use, with 7 drawers which can be pulled out on one side (all drawers can be arranged individually), individual locking and cover of the latches, sturdy and **removable.** The standard supply includes 12 compartments: 10 longitudinal and 2 transverse. With 4 removable drawers for small parts behind the compartment door at the side. The other side with 4 holes for attaching accessories. Central lock by cylinder lock. Convenient and spacious worktop made of ABS plastic, high rim and 3 compartments for small parts. Highly stable, steering stability and manoeuvrability due to sturdy heavy-load base with 2 large solid rubber wheels as well as two steering castors, one with locking device. Impact-protection on all sides with heel protection.
Surface scratchproof powder-coating, corpus GEDORIT-blue, drawers and compartment door as well as small item drawers in GEDORIT- silver.



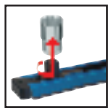


Part No.	Dimensions L x W x H mm	6170	Drawer dimensions L x B x H mm	Drawer load kg	Static carrying force kg	capacity kg
0140	775 x 435 x 985	864.75	640 x 400 x 67 640 x 400 x 137 640 x 400 x 207	45	500	79
		(522)				

Magnetic Strips

Application: Suitable for all conventional socket wrenches. Due to the strong permanent magnet, the strip can safely be fixed at FE metals, such as machine casings, tool trolley or lifting platforms.
The socket wrenches are fixed by turning them by 90°.

6043 **For 1/4" socket wrenches.**
6071 **For 3/8" socket wrenches.**
6117 **For 1/2" socket wrenches.**





Part No.	Use	6043	6071	6117	Length x width mm
0013	For 13 wrenches	16.11	–	–	380 x 33
7014	For 14 wrenches	–	17.28	–	480 x 33
0012	For 12 wrenches	–	–	18.59	480 x 33
		(522)	(522)	(522)	

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Tool Modules

Application: Suitable for all tool trolleys and mobile workbenches.

6173 0005 17 combination wrenches (part no. 5735) 6; 7; 8; 9; 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 20; 21; 22 mm
8 offset screwdrivers 2; 2.5; 3; 4; 5; 6; 8; 10 mm

6173 0010 8 double-ended ring wrenches (part no. 5742) 6 x 7; 8 x 9; 10 x 11; 12 x 13; 14 x 15; 16 x 17; 18 x 19; 20 x 22 mm

6173 0015 10 metric open-end wrenches (part no. 5703) 6 x 7; 8 x 9; 10 x 11; 12 x 13; 14 x 15; 16 x 17; 18 x 19; 20 x 22; 21 x 23; 24 x 27 mm

6173 0020 17 combination wrenches (part no. 5723) 6; 7; 8; 9; 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 20; 21; 22 mm
8 offset screwdrivers 2; 2.5; 3; 4; 5; 6; 8; 10 mm

6173 0025 10 ratchet combination wrenches (part no. 5738) 8; 10; 12; 13; 14; 15; 16; 17; 18; 19 mm

6173 0030 19 hexagon socket wrenches 1/2" (part no. 6113) 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 21; 22; 23; 24; 26; 27; 28; 30; 32 mm
7 socket bits 1/2" for Allen screws (part no. 6124) 6; 7; 8; 9; 10; 12; 14 mm

6173 0035 1 reversible ratchet 3/8" (part no. 6059)
14 hexagon socket wrenches 3/8" (part no. 6071) 6; 7; 8; 9; 10; 11; 12; 13; 14; 15; 16; 17; 18; 19 mm
5 socket bits 3/8" for Allen screws (part no. 6071) 4; 5; 6; 8; 10 mm
1 universal joint 3/8" (part no. 6065)
1 T-handle with slide 3/8" (part no. 6063)
2 extension bars 3/8" (part no. 6061) 125; 250 mm

6173 0040 1 reversible ratchet 1/2"
1 universal joint 1/2" (part no. 6104)
1 T-handle with slide 1/2" (part no. 6101)
2 extension bars 1/2" (part no. 6096)

6173 0045 9 socket bits 1/2" for Allen screws (part no. 6124) 5; 6; 7; 8; 9; 10; 12; 14; 17 mm
6 socket bits 1/2" long for Allen screws (part no. 6124) 5 x 90; 6 x 90; 8 x 90; 10 x 140; 12 x 140; 14 x 140 mm

6173 0050 9 socket bits 1/2" 55 mm for TORX® head screws (part no. 6130) T20; 25; 27; 30; 40; 45; 50; 55; 60
9 socket bits 1/2" 100 mm for TORX® head screws (part no. 6130) T20; 25; 27; 30; 40; 45; 50; 55; 60
1 TORX® screw gauge

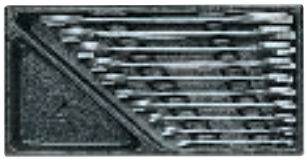
6173 0055 1 reversible ratchet 1/4" (part no. 6023)
12 hexagon socket wrenches 1/4" (part no. 6040) 4; 5; 5.5; 6; 7; 8; 9; 10; 11; 12; 13; 14 mm
5 socket bits 1/4" for Allen screws (part no. 6045) 3; 4; 5; 6; 8 mm
6 socket wrenches 1/4" for TORX® screws (part no. 6046) E4; 5; 6; 7; 8; 10
9 socket bits 1/4" for TORX® head screws (part no. 6054) T8; 9; 10; 15; 20; 25; 27; 30; 40
1 T-handle with slide 1/4" (part no. 6021)
1 extension bar 1/4" (part no. 6016) 97 mm
1 universal joint 1/4" (part no. 6034)
1 screwdriver handle 1/4" (part no. 6028)



6173 0005



6173 0010



6173 0015



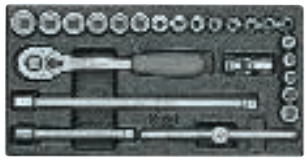
6173 0020



6173 0025



6173 0030



6173 0035



6173 0040



6173 0045



6173 0050



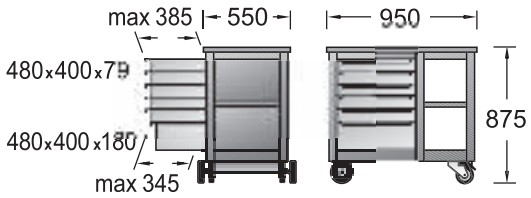
6173 0055

Part No.	Contents	6173	Dimensions D x W mm	Module type
0005	25-piece	119.53	315 x 310	2/3
0010	8-piece	53.68	157.5 x 310	1/3
0015	10-piece	42.18	157.5 x 310	1/3
0020	25-piece	97.07	315 x 310	2/3
0025	10-piece	80.19	157.3 x 310	1/3
0030	26-piece	122.84	157.5 x 310	1/3
		(522)		

Part No.	Contents	6173	Dimensions D x W mm	Module type
0035	24-piece	147.86	157.5 x 310	1/3
0040	5-piece	81.57	157.5 x 310	1/3
0045	15-piece	82.84	157.5 x 310	1/3
0050	19-piece	147.59	157.5 x 310	1/3
0055	37-piece	168.16	157.5 x 310	1/3
		(522)		

Mobile Workbenches, Type 1502

Design: The base with two large wheels and two steering castors with swivel brake provide high stability in any position. With six large drawers, 5 of which can be arranged individually, all drawers with individual locking. The standard supply includes 12 compartments: 10 longitudinal and 2 transverse. Precise and smooth running of the drawers in ball cage guides. All drawers with individual locking. Large, easily accessible trays for bulky parts. Strong, 11-fold bonded hardwood plate. Static carrying capacity more than 700 kg, in mobile operation more than 500 kg. Twistlock with hole for padlock. GEDORIT-blue, drawers GEDORIT-silver.
Steel plate, electrostatic powder coating.







Part No.	Dimensions L x W x H mm	6170	Drawer dimensions L x B x H mm	Drawer load kg	Static carrying force kg	Weight kg
0010	950 x 550 x 875	761.80	480 x 400 x 79 480 x 400 x 180	17 30	700	65

(535)

Mobile Workbenches, Type 1504

Design: Ergonomic working height of 960 mm. Very spacious. Multiplex beech wood plate thickness 30 mm. Central lock with hole for padlock. 7 drawers with individual locking, heavy-duty. 6 drawers 79 mm high, individual arrangement, one drawer 180 mm high. Standard supply includes 12 compartments: 10 longitudinal and 2 transverse. Precise and smooth running in ball cage guides. Heavy-load base, roller bearings, with 2 steering castors each ∅ 125 mm, with swivel brake and fixed rollers ∅ 200 mm. Static carrying capacity more than 700 kg, in mobile operation more than 500 kg. GEDORIT-blue, doors and drawers GEDORIT-silver. Steel plate, electrostatic powder coating. Supplied empty.





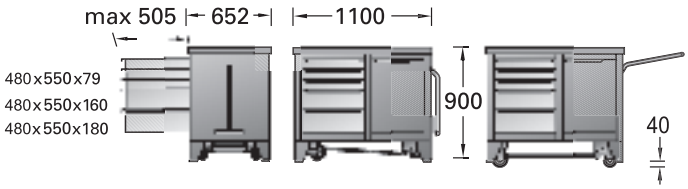
Part No.	Dimensions L x W x H mm	6170	Drawer dimensions L x B x H mm	Drawer load kg	Static carrying force kg	Weight kg
0015	1,100 x 550 x 985	873.63	480 x 400 x 67 480 x 400 x 137 480 x 400 x 207	45	700	101

(535)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Mobile Workbenches, Type 1505

Design: Non-tilting and mobile on solid 4-wheel retractable base, novel lifting mechanism – easy lifting of pulling handle. 5 spacious drawers – three of which can be arranged individually with 9 compartments longitudinal and 9 transverse – in smooth-running ball cage guides. The drawers can be pulled out almost completely.
A large lockable side part with shelf for the safe accommodating and quick finding of tools and devices. Twistlock with hole for padlock.
Extremely large Multiplex working plate, 1,100 x 652 mm.
High load – high ground clearance – easy and safe running – high stability. GEDORIT-blue, drawers GEDORIT-silver.
Steel plate, electrostatic powder coated.





Part No.	Dimensions L x W x H mm	6170	Drawer dimensions L x B x H mm	Drawer load kg	Static carrying force kg	Weight kg
0020	1,100 x 652 x 900	1,415.03	480 x 550 x 79 480 x 550 x 160 480 x 550 x 180	45	1,000	100

(535)

Folding Workbenches

Design: For mobile and stationary use. High quality beech plywood worktop, waterproof laminate finish, treated with linseed oil.
Circumferential angle iron frame, steel tube subframe, 38 x 2 mm, with divided cross-strut attached to plywood worktop with strong hinges.
Metal parts painted blue. Working height 850 mm.

Part No.	Worktop dimensions mm	6174
1000	1,000 x 700 x 30	103.74
1200	1,200 x 700 x 30	120.93

(536)



Impact Sockets for Wrenches

Impact Socket Wrenches 3/8“

Design: Hex. sockets wrenches with square drive, in accordance with DIN 3129, mechanically operated. Hot-forged special steel, hex socket and square socket with rounded corners to protect drive and screw head.

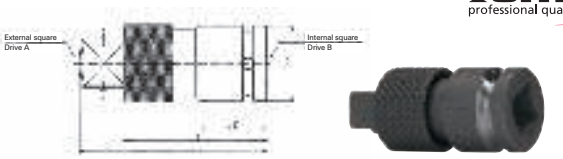
Part No.	SW mm	6178	L mm	D1 mm	D2 mm
0008	8	2.75	30	14.5	19
0010	10	2.75	30	16	19
0011	11	2.75	30	17.5	19
0012	12	2.75	30	19	19
0013	13	2.75	30	20	22
0014	14	2.75	30	21	22
0015	15	3.02	30	22	22
0017	17	3.02	30	25	22
0019	19	3.02	30	27.5	22
		(538)			



Impact Quick-change Chucks 3/8“

Design: For impact socket wrenches.

Part No.	Length mm	6180	L1 mm	L2 mm	D2 mm
0005	46	32.65	35	17	19
		(538)			



Impact Extension Bars 3/8“

Design: For machine operated high-strength socket wrenches. Hot-forged special steel, grey surface. Square socket according to DIN 3121G, external square according to DIN 3121F.

Part No.	Length mm	6182	D2 mm
0075	75	3.13	19
0150	150	4.10	19
		(538)	



Impact Ball Joints 3/8“

Part No.	L1 mm	6184	D2 mm
0005	50	11.35	20.4
		(538)	



Impact Socket Adapters

Design: Square internal 3/8“ to external 1/2“.

Part No.	L1 mm	6186	D2 mm
0005	36	5.69	22
		(538)	



Locking Pins/Rubber Rings

Part No.	For drive ∅ D2 mm	6187	6188
0005	19	0.40	0.63
0010	22	0.40	0.63
		(538)	(538)

6187

6188



Impact Sockets for Wrenches

Impact Socket Wrenches 1/2“

Design: Hex. socket wrenches with square drive, according to DIN 3129, mechanically operated.
Hot-forged special steel, hex socket and square socket with rounded corners to protect drive and screw head.

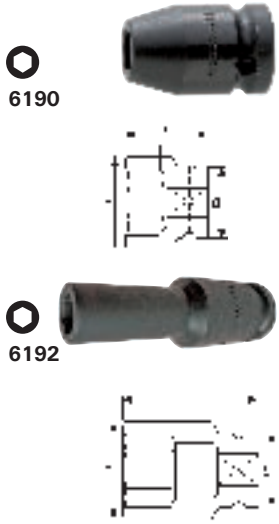
6190 **Short version**
6192 **Long version**

Part No.	SW mm	6190 mm	L mm	D1 mm	D2 mm
0010	10	2.97	38	17.0	25
0011	11	2.97	38	19.0	25
0012	12	2.97	38	20.0	25
0013	13	2.97	38	21.0	25
0014	14	2.97	38	22.0	25
0015	15	3.31	38	24.0	30
0016	16	3.31	38	25.0	30
0017	17	3.31	38	26.0	30
		(538)			

Part No.	SW mm	6190 mm	L mm	D1 mm	D2 mm
0018	18	3.31	38	27.5	30
0019	19	3.31	38	27.5	30
0021	21	3.95	38	30.0	30
0022	22	4.20	38	32.0	30
0024	24	4.95	45	35.0	30
0027	27	6.79	50	38.0	30
0030	30	7.10	50	44.0	30
		(538)			

Part No.	SW mm	6192 mm	L mm	D1 mm	D2 mm
0010	10	5.39	78	17.0	25
0013	13	5.70	78	21.0	25
0014	14	5.70	78	22.0	25
0017	17	6.00	78	26.0	30
		(538)			

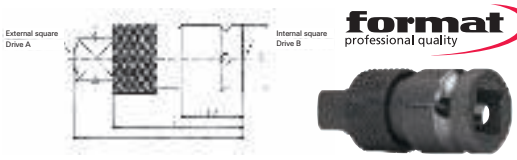
Part No.	SW mm	6192 mm	L mm	D1 mm	D2 mm
0019	19	6.00	78	27.5	30
0022	22	7.03	78	32.0	30
0024	24	7.63	78	35.0	30
0027	27	8.61	78	38.0	30
		(538)			



Impact Quick Change Chucks 1/2“

Design: For socket wrenches.

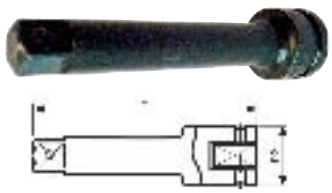
Part No.	Length mm	6194 mm	L mm	D2 mm
0005	60	34.44	44	25
		(538)		



Impact Extension Bars 1/2“

Design: For machine operated high-strength socket wrenches.
Hot-forged special steel, grey surface. Square socket according to DIN 3121G, external square according to DIN 3121F.

Part No.	L mm	6196 mm	D2 mm
0125	125	6.97	30
0250	250	8.22	30
		(538)	



Impact Ball Joints 1/2“

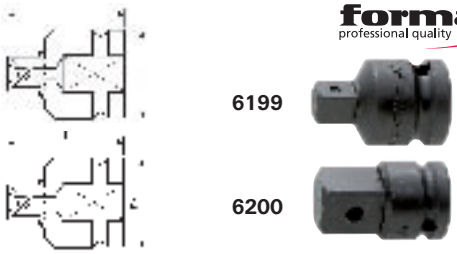
Part No.	L mm	6198 mm	D2 mm
0005	52	12.56	32
		(538)	



Impact Socket Adapters

6199 **Design:** Square internal 1/2“ to external 3/8“.
6200 **Design:** Square internal 1/2“ to external 3/4“.

Part No.	L mm	6199 mm	6200 mm	D2 mm
0005	38	5.69	–	25
0010	48	–	9.49	30
		(538)	(538)	



Impact Locking Pins/Rubber Rings

Part No.	For drive ⌀ D2 mm	6201 mm	6202 mm
0005	25	0.40	0.63
0010	30	0.40	0.63
		(538)	(538)



Impact Sockets for Wrenches

Impact Socket Wrenches 3/4“

Design: Hex. socket wrenches with square drive, according to DIN 3129, mechanically operated.
Hot-forged special steel, hex socket and square socket with rounded corners to protect drive and screw head.

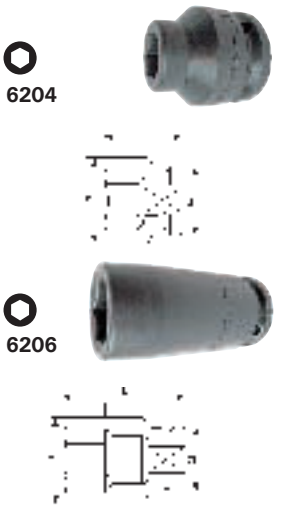
6204 **Short version**
6206 **Long version**

Part No.	SW mm	6204 mm	L mm	D1 mm	D2 mm
0017	17	7.29	45	29.0	44
0018	18	7.29	45	32.0	44
0019	19	7.45	45	32.0	44
0021	21	7.89	46	35.0	44
0022	22	7.89	46	38.0	44
0024	24	7.89	46	40.0	44
0027	27	8.56	46	41.0	44
		(538)			

Part No.	SW mm	6204 mm	L mm	D1 mm	D2 mm
0030	30	8.56	52	44.0	44
0032	32	9.41	52	49.0	44
0034	34	11.62	55	52.0	44
0036	36	11.62	56	52.0	44
0038	38	12.15	59	54.0	44
0041	41	14.05	59	57.0	44
		(538)			

Part No.	SW mm	6206 mm	L mm	D1 mm	D2 mm
0017	17	12.46	90	29.0	44
0019	19	12.46	90	32.0	44
0022	22	12.46	90	38.0	44
0024	24	12.73	90	40.0	44
0027	27	12.73	90	41.0	44
0030	30	14.93	90	44.0	44
		(538)			

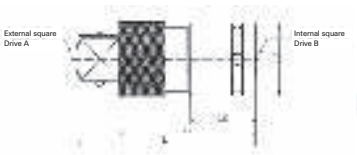
Part No.	SW mm	6206 mm	L mm	D1 mm	D2 mm
0032	32	15.41	90	49.0	44
0034	34	19.78	90	52.0	44
0036	36	19.78	90	52.0	44
0038	38	21.21	90	54.0	44
0041	41	23.38	90	57.0	44
		(538)			



Impact Quick-change Chucks 3/4“

Design: For impact socket wrenches.

Part No.	Length mm	6208 mm	L1 mm	L2 mm	D2 mm
0005	78	41.33	55	29	44
		(538)			

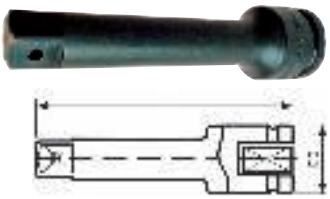




Impact Extension Bars 3/4“, DIN 3121

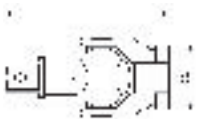
Design: For machine operated high-strength socket wrenches.
Hot-forged special steel, grey surface. Square socket according to DIN 3121G, external square according to DIN 3121F.

Part No.	L mm	6210 mm	D2 mm
0175	175	22.82	44
0250	250	28.53	44
0330	330	29.78	44
		(538)	



Impact Ball Joints 3/4“

Part No.	L mm	6212 mm	D2 mm
0005	90	26.71	44
		(538)	

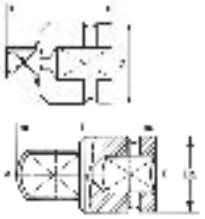




Impact Socket Adapters

6213 **Design:** Square internal 3/4“ to external 1/2“.
6214 **Design:** Square internal 3/4“ to external 1“.

Part No.	L mm	6213 mm	6214 mm	L1 mm 6214	D2 mm
0005	55	10.14	14.56	59	44
		(538)	(538)		





Impact Locking Pins/Rubber Rings

Part No.	For drive ∅ D2 mm	6215 mm	6216 mm
0005	44	0.40	0.63
		(538)	(538)



Impact Sockets for Wrenches

Impact Socket Wrenches 1“

Design: Hex. socket wrenches with driving square, in accordance with DIN 3129, mechanically operated.
Hot-forged special steel, hex socket and square socket with rounded corners to protect drive and screw head.

6218 **Short version**
6220 **Long version**

Part No.	SW mm	6218	Length mm	D1 mm	D2 mm
0027	27	12.88	55	46.0	54
0030	30	12.88	57	50.0	54
0032	32	12.88	57	51.0	54
0034	34	14.31	60	54.0	54
0036	36	14.31	60	54.0	54
		(538)			

Part No.	SW mm	6218	Length mm	D1 mm	D2 mm
0041	41	16.95	64	63.0	54
0046	46	19.43	69	70.0	54
0050	50	23.63	72	73.0	54
0055	55	28.75	76	82.0	54
0060	60	37.54	82	86.0	54
		(538)			

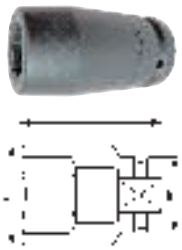
6218



Part No.	SW mm	6220	Length mm	D1 mm	D2 mm
0027	27	20.02	100	46.0	54
0030	30	20.15	100	50.0	54
0032	32	20.15	100	51.0	54
0034	34	21.93	100	54.0	54
		(538)			

Part No.	SW mm	6220	Length mm	D1 mm	D2 mm
0036	36	21.93	100	54.0	54
0041	41	26.32	100	63.0	54
0046	46	30.99	100	70.0	54
		(538)			

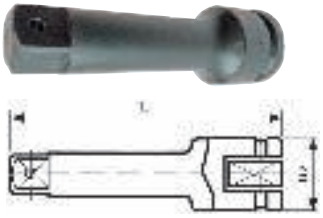
6220



Impact Extension Bars 1“

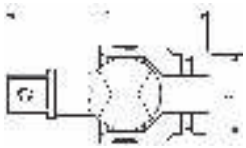
Design: For machine operated high-strength socket wrenches.
Hot-forged special steel, grey surface. Square socket according to DIN 3121G, external square according to DIN 3121F.

Part No.	L mm	6222	D2 mm
0175	175	36.11	54
0250	250	43.09	54
0330	330	50.71	54
		(538)	



Impact Ball Joints 1“

Part No.	L mm	6224	D2 mm
0005	100	56.23	54
		(538)	

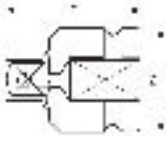




Impact Socket Adapters

Design: Square internal 1“ to external 3/4“.

Part No.	L mm	6226	D2 mm
0005	70	22.20	54
		(538)	





Impact Locking Pins/Rubber Rings

Part No.	For drive ∅ D2 mm	6227	6228
0005	54	0.40	0.63
		(538)	(538)

6227

6228



Torque Wrenches with Preset Torque

Certificate

Design: Ergonomic Kraftform® handle, 4 mm hexagon blade, chromium-plated with Black Point tip, TORX® profiles, size 6 up to 15, 6 designs each from 0.6 to 3.0 Nm (± 10 %), handle marked with symbol for tip, size and preset torque, fixed blade, no danger of errors, protection against manipulation of the preset torque, release mechanism with acoustic signal, for defined screw connections in hard metal influenced by heat or cold. For screws with TORX® profile.

Part No.	Dimensions N•m	6233 Wera	Measured result	Length mm
0005	0.6	17.36	T 6	170
0010	0.9	17.53	T 7	170
0015	1.2	17.79	T 8	170
0020	1.4	18.79	T 9	170
0025	2.0	19.28	T 10	170
0030	3.0	20.45	T 15	170

(539)



Torque Wrenches with Quick-change Chuck

Certificate

Design: Ergonomic and anti-slip rubber handle, (part no. 6239 0015) with pistol grip. Easy and precise setting of the value. Saving of set values by automatic locking feature. Precision ball locking for controlled **clockwise and anti-clockwise tightening.** Constant accuracy repeatability with a tolerance of ± 6 % of set value. When the set value is reached, the automatic **snap mechanism releases noticeably** and thus prevents excessive tightening. For actuation of 1/4" hexagon bits according to C 6.3 DIN 3126 and E 6.3 DIN 3126 with quick-change chuck Rapidaptor®.

Application: In electric and electronic industry as well as apparatus engineering. Due to quick and controlled tightening of screws also suitable for series production and quality control.

Part No.	Scale range	6239 Wera	Graduation	Length mm
0005	0.3–1.2	41.59	0.05	155
0010	1.2–3	41.59	0.1	155
0015	3.0–6	59.81	0.25	150

(539)



6239 0005–0010



6239 0015

Torque Screwdrivers, No. 756

Certificate

Design: Torque screwdriver, clockwise/anti-clockwise tightening, for operation of 1/4" hexagon bits according to C 6.3 DIN 3126 or 1/4" socket wrenches according to DIN 3124. No exceeding of values possible due to automatic sliding mechanism. No interruption. Ergonomic handle with rubber coating.

Easy and precise setting of the value by micrometer collar. Additional saving of the value by locking feature preventing accidental misadjustment.

Constant accuracy repeatability with a tolerance of ± 6 % of set value, incl. certificate according to DIN EN ISO 6789.

Part No.	Scale range	6230	Graduation	Length mm
0035	5– 40 cN•m	283.50	1.0 cN•m	159
0040	20–120 cN•m	260.70	1.0 cN•m	183
0050	1– 6 N•m*	278.65	0.1 N•m	196
0060	4– 9 N•m*	278.65	0.1 N•m	196

* Supplied with slide handle

(540)



TSN Slippers, No. 759

Certificate

Application: Using the RAHSOL DREMOTEST-tronic TA-PC-DR or the torque wrench control unit you can set and control your values individually. Thus, accurate tightening of screws also in case of large series or changing torque is ensured. The wrenches can only be adjusted by means of the supplied special tool. Accuracy ± 4 % of scale value. Incl. certificate according to DIN EN ISO 6789.

Part No.	Square range N•m	6229	Square drive inch	Length mm
0005	3– 25	308.05 ◊	1/4	216
0010	3– 25	311.28 ◊	3/8	216
0015	15– 55	393.91 ◊	3/8	324
0020	40–125	449.90 ◊	1/2	460

(540)



Mini Torque Wrenches, Type DREMOMETER

Design: For clockwise tightening, click type with acoustic and sensitive signal.
Direct torque transmission to lever mechanism, glass fibre reinforced plastic housing, resistant to oil, benzene and kerosene.
Accuracy ± 3 % of scale value. DIN EN/ISO 6789 certificate attached.

Certificate

RAHSOL DREMOTEC



Part No.	Scale range N•m	6232	Scale range. lbf•in	Graduation lbf•in	Length mm
0010	1–12	155.04	10–100	1/10 N•m	185
		(540)			

Torque Wrenches, Type DREMOMETER

Design: For clockwise tightening, click type with acoustic and sensitive signal.
Direct torque transmission to lever mechanism, aluminium metal construction.
Accuracy ± 3 % of scale value. DIN EN ISO 6789 certificate attached.

Certificate

RAHSOL DREMOTEC



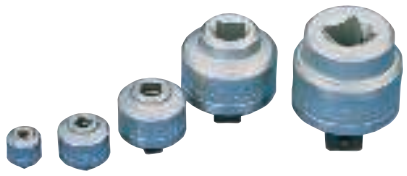
Part No.	Scale range N•m	6234	Scale range	Graduation	Square drive inch	Length mm	Weight kg
0005	6– 30	182.82	50–270 lbf•in	1 N•m/10 lbf•in	1/4	265	0.58
0010	8– 40	212.71	70–350 lbf•ft	5 N•m/50 lbf•in	3/8	340	1
0015	20– 120	236.14	15– 90 lbf•ft	5 N•m/ 5 lbf•ft	1/2	463	1.5
0020	40– 200	258.38	30–150 lbf•ft	5 N•m/ 5 lbf•ft	1/2	553	1.4
0025	50– 300	295.78	35–220 lbf•ft	5 N•m/ 5 lbf•ft	1/2	618	2
0026	80– 360	397.22	60–260 lbf•ft	5 N•m/ 5 lbf•in	3/4	718	2.4
0027	110– 550	526.09	80–405 lbf•ft	10 N•m/10 lbf•ft	3/4	812	2.9
0030	140– 760	557.87	105–560 lbf•ft	10 N•m/10 lbf•ft	3/4	812	3.2
0035	140– 760	683.17 ◊	105–560 lbf•ft	10 N•m/10 lbf•ft	3/4	800–1,400*	5
0040	520–1,000	683.73	380–730 lbf•ft	10 N•m/10 lbf•ft	3/4	800–1,400*	5.6
0045	750–2,000	1,180.69 ◊	–	50 N•m	1.	1,078–1,998*	11.6
0050	1,500–3,000	1,350.26 ◊	–	50 N•m	1.1/2	1,423–2,343*	13.2
		(540)					

* With ratchet

Ratchets for Torque Wrenches

Design: For DREMOMETER, for clockwise tightening, sturdy, fine-pitched.

RAHSOL DREMOTEC



Part No.	Square drive inch	6236	Height mm	ø mm	Pivoting angle
0005	1/4	41.67	21	24	18°
0010	3/8	43.49	28	35	20°
0015	1/2	55.56	35	46	10°
0020	3/4	82.21	53	65	10°
0025	1.	214.25 ◊	63	73	10°
		(540)			

Ratchets for anti-clockwise tightening on request.

Torque Wrenches

Design: Adjustable torque wrench with square drive and integrated ratchet function for controlled clockwise/anticlockwise tightening. Insert square with ball locking to DIN EN ISO 6789, resettable to national standard. Release accuracy: tolerance of ± 3 % of set value. Robust, steel tube construction with matt-chromium finish, ratchet zinc-coated. Constant repeatability accuracy is ensured at 5,000 load changes. Highest precision also in continuous operation. Supplied with certificate to DIN EN ISO 6789, in transparent plastic box.

Certificate

format professional quality

6238 **Design:** Torque Wrenches 1/4"–1/2"

6240 **Design:** Torque Wrenches 3/4"



6238 0105



6240 0100

Part No.	Scale range N•m	6238	6240	Graduation N•m	Square drive inch	Length mm
0100	2– 25	91.66	–	0.1	1/4	285
0105	5– 50	94.47	–	0.25	3/8	335
0110	10–100	82.48	–	0.5	1/2	395
0115	20–200	83.15	–	1	1/2	485
0100	140–750	–	405.30	1	3/4	1,240
		(541)	(541)			

Torque Wrenches, Type TORCOFIX-UK 5550

Design: Torque wrench with automatic release feature, sturdy steel tube, matt chromium-plated with glass fibre reinforced plastic handle. Sturdy, but fine-pitched. The snap mechanism ensures a sensitive and acoustic releasing signal. The integrated 1/2" reversible ratchet ensures controlled clockwise tightening. Anti-clockwise tightening possible. Easy adjustment of the scale, extremely high accuracy by micrometer collar. Click type, accuracy ± 3 % tolerance of scale value, **incl. DIN EN ISO 6789 test certificate.** Supplied in sturdy transparent plastic box.

Certificate

RAHSOL DREMOTEC



Part No.	Scale range N•m	6241	Scale range lbf•ft	Graduation N•m	Square drive inch	Length mm
0050	20–100	177.49	15– 75	0.5	1/2	410
0060	40–200	185.42	30–150	1.0	1/2	500
0070	60–300	202.47	45–220	1.0	1/2	590
		(540)				

Torque Wrenches, Type Torcofix-K

Design: Slender construction, with plastic handle, easy adjustment by turning the handle, protection against misadjustment by button at the handle end, scale protected by window with magnification, with micrometer collar for Nm at turning handle and changeable GEDORE square for clockwise/anticlockwise tightening. Accuracy ± 3 % of scale value. DIN EN ISO 6789 test certificate attached.

Certificate

RAHSOL DREMOTEC



6241 0006–0035



6241 0040–0045

Part No.	Scale range N•m	6241	Scale range lbf•ft	Graduation N•m	Drive square inch	Length mm
0006	1– 5	118.56	0.75– 3.7	0.025	1/4	220
0011	2– 25	135.82	1.5 – 18	0.1	1/4	285
0016	5– 50	139.74	4 – 37	0.25	3/8	335
0020	10–100	129.51	8 – 75	0.5	1/2	395
0025	20–200	139.11	15 –150	1	1/2	485
0030	60–300	159.88	45 –220	1	1/2	575
0035	75–400	251.49	55 –300	1	1/2	665
0040	100–550	415.04	75 –405	1	3/4	960
0045	140–750	470.87	105 –550	1	3/4	1,240
		(540)				

Torque Wrenches, Type TORCOTRONIC

Design: LCD display with optical plus/minus tolerance indication, easy operation with 2 buttons, automatic standby mode, time setting, automatic calibration by pressing a button, optical operator guidance, square drive with lever, clockwise and anti-clockwise tightening, accuracy ± 1 %, incl. DIN EN ISO 6789 test certificate. Round cell 1.5 v or rechargeable battery 1.2 v.

RS232 Certificate

RAHSOL DREMOTEC



Part No.	Scale range N•m	6256	Graduation of scale N•m	Square drive inch	Memory/ data storage	Length mm	Weight kg
0201	20–200	370.52 ◊	0.1	1/2	no	530	1.4
1200	20–200	427.44 ◊	0.1	1/2	yes	530	1.4
0300	30–300	395.61 ◊	0.1	1/2	no	595	2.3
1300	30–300	453.97 ◊	0.1	1/2	yes	595	2.3
		(540)					

Torque Wrenches, Type Torcofix-SE

Design: For socket wrenches, quick-adjustment with safety button in the handle. Actuation only at the handle. Quick-changing system and pin retention. Basic unit (without socket wrenches). Accuracy ± 3 % of scale value. Test certificate DIN EN ISO 6789 attached.

Certificate

RAHSOL DREMOTEC



Part No.	Scale range N•m	6242	Scale range lbf•ft	Graduation N•m	Drive square mm	Length mm
0011	2– 25	97.37	1.5– 18	0.1	9 x 12	285
0016	5– 50	102.16	4 – 37	0.25	9 x 12	325
0020	10–100	106.91	8 – 75	0.5	9 x 12	375
0026	20–150	119.90	15 –110	1	9 x 12	465
0030	20–200	122.91	15 –150	1	14 x 18	475
0035	60–300	140.37	45 –220	1	14 x 18	565
0040	75–400	208.65	55 –300	1	14 x 18	650
		(540)				

Electronic Torque Wrenches E-TORC

Design: Adjustable micro-processor controlled, electronic torque wrench, CE mark, for controlled clockwise and anti-clockwise tightening. Optical, acoustic and sensor signal when the desired torque is reached. With bi-directional interface RS 232 for PC/printer or SPS control to DIN EN ISO 6789, can be reset to national standard.

Robust aluminium housing with carbon tube, housing turnable by 120°, large measuring range in Nm, reversible to lbf·ft/lbf·in, high measurement accuracy tolerance of ± 1 % with all indicated values, scale values, ± 1 digit, baud value adjustable to 300–9,600 baud. Easy to use, for battery or rechargeable battery operation, with appropriate status indication. Automatic calibration by touch of button or after stand-by mode, complete documentation of measured values, memory function for max. 2,000 measurement values. Compensation of applied force – length ratio.

Several optional specifications on request (e.g. ear plugs).

Supplied incl. test certificate to DIN EN ISO 6789 in robust sheet metal case with inlets provided for accessories.

Application: For highest demands set to torque measurement and documentation, to be used in quality control, in the test lab and in all industrial applications.

RS232 Certificate

RAHSOL DREMOTEC



Part No.	Scale range N•m	6251	Scale range lbf•ft	Drive square mm	Length mm
0010	10–150	1,182.73 ◊	8–110	9 x 12	470
0030	30–300	1,219.61 ◊	22–220	14 x 18	555
		(540)			

Socket Wrenches

Design: For TORCOFIX-SE and E-TORC.

Material: Chrome-vanadium-steel, chromium-plated.

RAHSOL DREMOTEC



Part No.	Key width mm	6244	Shank mm	Length mm	Thickness mm	Height mm
0007	7	20.48	9 x 12	17.5	22	5
0008	8	20.48	9 x 12	17.5	22	5
0009	9	20.48	9 x 12	17.5	26	5.5
0010	10	20.48	9 x 12	17.5	26	5.5
0011	11	20.48	9 x 12	17.5	26	5.5
0012	12	20.48	9 x 12	17.5	30	7
0013	13	20.48	9 x 12	17.5	30	7
0014	14	20.48	9 x 12	17.5	35	8
0015	15	20.48	9 x 12	17.5	35	8
0016	16	20.48	9 x 12	17.5	38	8.5
0017	17	20.48	9 x 12	17.5	38	8.5
0018	18	20.48	9 x 12	20	42	9
0019	19	20.48	9 x 12	20	42	9
		(540)				

Part No.	Key width mm	6244	Shank mm	Length mm	Thickness mm	Height mm
0113	13	23.37	14 x 18	25	30	7
0114	14	23.37	14 x 18	25	35	8
0115	15	23.37	14 x 18	25	35	8
0116	16	23.37	14 x 18	25	38	9
0117	17	23.37	14 x 18	25	38	9
0118	18	23.37	14 x 18	25	42	10
0119	19	23.37	14 x 18	25	42	10
0121	21	27.99	14 x 18	25	50	11
0122	22	27.99	14 x 18	25	50	11
0124	24	27.99	14 x 18	25	53	12
0127	27	27.99	14 x 18	30	60	13
0130	30	31.49	14 x 18	30	66	14
0132	32	31.49	14 x 18	32.5	66	14
		(540)				

Open Ring Wrenches

Design: For TORCOFIX-SE and E-TORC.

Material: Chrome-vanadium-steel, chromium-plated.



RAHSOL DREMOTEC

Part No.	Key width mm	6246	Shank mm	Length mm	Thickness mm	Height mm
0010	10	22.74	9 x 12	17.5	22	12
0011	11	22.74	9 x 12	17.5	22.5	12
0012	12	22.74	9 x 12	17.5	23.7	12
0013	13	22.74	9 x 12	17.5	25.2	12
0014	14	22.74	9 x 12	17.5	27	12
		(540)				

Part No.	Key width mm	6246	Shank mm	Length mm	Thickness mm	Height mm
0017	17	22.74	9 x 12	17.5	31.5	13
0018	18	22.74	9 x 12	17.5	33	15
0019	19	22.74	9 x 12	17.5	34.5	15
0022	22	22.74	9 x 12	19.0	39	15
		(540)				

Ring Wrenches

Design: For TORCOFIX-SE and E-TORC.

Material: Chrome-vanadium-steel, chromium-plated.



RAHSOL DREMOTEC

Part No.	Key width mm	6245	Shank mm	Length mm	Thickness mm	Height mm
0007	7	21.60	9 x 12	17.5	13	8
0008	8	21.60	9 x 12	17.5	14.2	8
0010	10	21.60	9 x 12	17.5	17.2	9
0011	11	21.60	9 x 12	17.5	18.5	9
0012	12	21.60	9 x 12	17.5	20	12
0013	13	21.60	9 x 12	17.5	21.5	12
0014	14	21.60	9 x 12	17.5	23	12
0015	15	21.60	9 x 12	17.5	24.2	12
0016	16	21.60	9 x 12	17.5	25.7	13
0017	17	21.60	9 x 12	17.5	27.2	13
0018	18	21.60	9 x 12	17.5	28.5	13
0019	19	21.60	9 x 12	17.5	30.3	13
0021	21	21.60	9 x 12	17.5	33	15
0022	22	21.60	9 x 12	17.5	34.5	15
0113	13	23.93	14 x 18	25	21.5	11
		(540)				

Part No.	Key width mm	6245	Shank mm	Length mm	Thickness mm	Height mm
0114	14	23.93	14 x 18	25	23	11
0115	15	23.93	14 x 18	25	24.2	11
0116	16	23.93	14 x 18	25	25.7	12
0117	17	23.93	14 x 18	25	27.2	12
0118	18	23.93	14 x 18	25	28.5	12
0119	19	23.93	14 x 18	25	30.5	12
0121	21	28.55	14 x 18	25	33	15
0122	22	28.55	14 x 18	25	34.5	15
0124	24	28.55	14 x 18	25	37.5	15
0127	27	28.55	14 x 18	25	41.5	17
0130	30	32.14	14 x 18	25	45	19
0132	32	32.14	14 x 18	25	47.5	19
0134	34	35.29	14 x 18	28	50.5	19
0136	36	35.29	14 x 18	28	53	19
0141	41	35.29	14 x 18	30	59	20
		(540)				

Reversible Ratchets

Design: Fine-toothed – pivoting angle 7°, for TORCOFIX-SE and E-TORC.

Material: Chrome-vanadium-steel, chromium-plated.



RAHSOL DREMOTEC

Part No.	Drive square	6247	Shank mm	Length mm	Thickness mm
0010	3/8"	49.88	9 x 12	17.5	33
0020	1/2"	51.98	9 x 12	17.5	33
0030	1/2"	51.98	14 x 18	25	43
0040	3/4"	75.35	14 x 18	25	50
		(540)			

Squares

Design: For TORCOFIX-SE and E-TORC.

Material: Chrome-vanadium-steel, chromium-plated.



RAHSOL DREMOTEC

Part No.	Drive square	6248	Shank mm	Length mm	Thickness mm
0010	3/8"	20.92	9 x 12	17.5	22
0020	1/2"	20.92	9 x 12	17.5	22
0030	1/2"	22.37	14 x 18	25	30
0040	3/4"	37.32	14 x 18	25	40
		(540)			

Bit Holders

Design: For TORCOFIX-SE and E-TORC.

Material: Chrome-vanadium-steel, chromium-plated.



RAHSOL DREMOTEC

Part No.	Hexagon drive inch	6249	Shank mm	Length mm	Thickness mm	Height mm
0010	5/16	21.60	9 x 12	17.5	16	12.5
0020	5/16	45.31	14 x 18	25	16	12.5
		(540)				

Welding Pieces

Design: For TORCOFIX-SE and E-TORC.

Material: Chrome-vanadium-steel.



RAHSOL DREMOTEC

Part No.	Shank mm	6250	Length mm	Thickness mm	Height mm
0010	9 x 12	16.90	8	8 x 14	14
0020	14 x 18	20.00	11	11 x 21.5	21.5
		(540)			

Torque Multiplier Sets

Design: Precise torque multiplier for industrial applications and automotive industry, HGV tool kit, with locking and mountable support. Actuation with all 1/2" standard tools (ratchet, turning handle etc.) or with a 32 mm wrench. 5-fold multiplication of the set torque value when using a torque wrench.
Simple planetary gear, roller bearing.
Multiplication: effective 1:5, in sturdy plastic case.

Contents: Support rod and angle, spare square 3/4", shearing protection, Allen wrench (for changing 3/4" square), impact socket wrench 27 mm, HGV, impact socket wrench 32 mm, for trailers.

RAHSOL DREMOTEC



Part No.	Torque N•m	6252	Drive inch	Tip inch	Weight kg
0010	1,300 max.	835.39	1/2	3/4	7.5
		(540)			

Universal Torque Multipliers

Design: Torque multiplier with mountable support. For industrial applications and automobile industry, lorry tool kit. Actuation with all 3/4" standard tools (ratchet, turning handle etc.) or with 36 mm wrench. 5-fold multiplication of the set torque value when using a torque wrench.
Simple planetary gear, roller bearing. Multiplication: effective 1:5.

RAHSOL DREMOTEC



Part No.	Torque N•m	6252	Drive inch	Tip inch	Weight kg
0020	2,700 max.	888.15	3/4	1	7.1
		(540)			

Further torque multipliers on request.

Electronic Torsion Testers E-TP

RS232 | Certificate

Design: Thanks to the modular design, the display can always be placed in the field of vision of the user. The special software allows transfer, processing and saving of the test results and data in MS Excel®. To fix the basic housing for horizontal and vertical measurements, the housing is fitted with 4 bore holes in order to fix the device on a flat and horizontal surface (e.g. worktop) using screws. The device further features an electronic overload protection. Data transfer is effected by data cable RS 232. Supplied in sturdy plastic case, incl. power unit with Euro plug, model-specific adapters, detailed operating instructions (German and English) and test certificate.

Three sets were designed for different tasks:

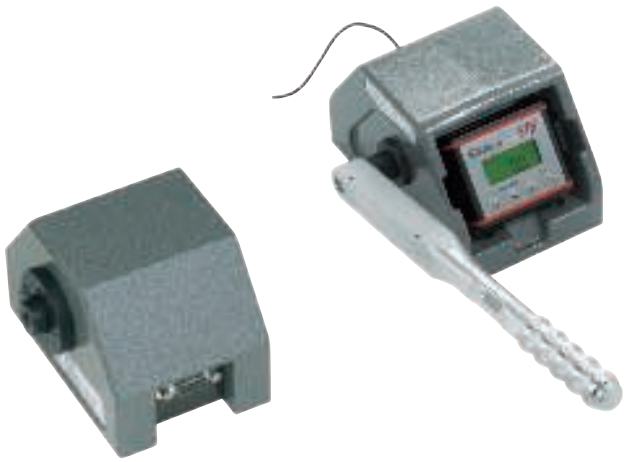
Set Basic
- Basic housing (measuring device)
- Display
- Display support incl. connecting cable

Set PC
- Basic housing (measuring device)
- Software incl. PC connecting cable

Set High-Line
- Basic housing (measuring device)
- Display
- Display holder incl. connecting cable
- Software incl. PC connecting cable

Application: By means of the electronic torsion testers E-TP all torque wrenches and screwdrivers with clockwise and anti-clockwise tightening can be checked and adjusted precisely either horizontally or vertically.





Part No.	Design	6254 Euro ex Works	Measuring range N•m	Square adapter inch	Adapter inch	Pitch N•m	Control display	Display support incl. cable	Software incl. cable	Weight kg
0005	Set Basic	1,964.69 ◊	0.5– 15	1/4	–	0.001	yes	yes	no	4.6
0011	Set Basic	1,964.69 ◊	4 – 100	1/2	1/4, 3/8	0.01	yes	yes	no	9.8
0015	Set Basic	1,964.69 ◊	20 – 500	3/4	3/8, 1/2	0.1	yes	yes	no	10.1
0021	Set Basic	1,964.69 ◊	50 –1,000	3/4	3/8, 1/2	0.1	yes	yes	no	10.1
0023	Set PC	2,261.22 ◊	0.5– 15	1/4	–	0.001	no	no	yes	3.95
0025	Set PC	2,261.30 ◊	4 – 100	1/2	1/4, 3/8	0.01	no	no	yes	9.15
0030	Set PC	2,261.30 ◊	20 – 500	3/4	3/8, 1/2	0.1	no	no	yes	9.45
0035	Set PC	2,261.30 ◊	50 –1,000	3/4	3/8, 1/2	0.1	no	no	yes	9.45
0038	Set High-Line	2,565.98 ◊	0.5– 15	1/4	–	0.001	yes	yes	yes	4.75
0040	Set High-Line	2,565.98 ◊	4 – 100	1/2	1/4, 3/8	0.01	yes	yes	yes	9.95
0045	Set High-Line	2,565.98 ◊	20 – 500	3/4	3/8, 1/2	0.1	yes	yes	yes	10.25
0050	Set High-Line	2,565.98 ◊	50 –1,000	3/4	3/8, 1/2	0.1	yes	yes	yes	10.25

(540)

Screwdrivers – Slotted Head, with Wooden Handle

Design: From high-alloy special steel. Round blade with hexagon bolster for force intensification with open-end wrenches or double ring wrenches and special coating for higher torque and fitting accuracy. Handle made of hard ash wood and double leather cap to protect against splinters during hammer strokes.

format professional quality



Part No.	Tip width mm	6260	Blade thickness mm	Length mm	Total length mm	Hexagonal mm
0035	3.5	1.05	0.6	90	192	6
0045	4.5	1.13	0.8	90	192	6
0055	5.5	1.38	1	100	202	8
0070	7	1.59	1.2	125	236	10
		(542)				

Part No.	Tip width mm	6260	Blade thickness mm	Length mm	Total length mm	Hexagonal mm
0090	9	2.06	1.6	175	301	12
0100	10	2.45	1.6	175	301	13
0120	12	3.20	2	200	330	16
0140	14	4.03	2.5	250	390	16
		(542)				

Screwdrivers – Slotted Head – with Impact Cap

Design: High-quality bit material, tough hard. Hexagon blade with hexagon bolster for force intensification with open-end and double ring wrenches. Black Point coating for higher torque and fitting accuracy. With ergonomic Kraftform® handle with integrated soft zones, anti-roll protection and **impact cap.** From blade width 12 mm with Kraftform® grip without soft zones.

Application: For heavy-duty applications, for releasing and knocking-off screwed clips, and as chisel for opening walls.

Wera



Part No.	Tip width mm	6264 Wera	Blade thickness mm	Length mm	Total length mm	Hexagonal mm
0035	3.5	3.21	0.6	80	161	4
0045	4.5	3.66	0.8	90	188	5 + 8
0055	5.5	4.83	1	100	205	6 + 10
0070	7	5.89	1.2	125	230	6 + 10
		(543)				

Part No.	Tip width mm	6264 Wera	Blade thickness mm	Length mm	Total length mm	Hexagonal mm
0090	9	7.82	1.6	150	262	8 + 13
0100	10	9.63	1.6	175	287	8 + 13
0120	12	12.56	2	200	317	10 + 16
0140	14	16.04	2.5	250	367	10 + 16
		(543)				

Screwdrivers – Slotted Head

Design: From high-quality special steel. Round blade, surface special coating. Plastic handle with anti-roll protection.

format professional quality

Part No.	Tip width mm	6268	Blade thickness mm	Length mm	Total length mm
0040	4.0	1.57	0.8	25	79
0055	5.5	1.70	1.0	25	79
0065	6.5	2.17	1.2	25	79
		(542)			



Slotted Head Screwdrivers

Design: From high-quality special steel. Round and/or hexagonal blade and hexagonal bolster (only for hexagonal blade) for force intensification with open-end or double ring wrenches with special coating for higher torque and fitting accuracy. Ergonomic 2-component handle, integrated soft zones and anti-slip protection.

format professional quality

Part No.	Tip width mm	6266	Blade thickness mm	Length mm	Total length mm	Hexagonal mm
0025	2.5	1.13	0.4	75	159	–
0030	3	1.12	0.5	75	159	–
0035	3.5	1.20	0.6	125	209	–
0040	4	1.37	0.8	100	184	–
0045	4.5*	1.37	0.8	90	188	5 + 8
0055	5.5*	1.65	1	100	198	5 + 8
0070	7*	2.09	1.2	130	233	6 + 10
0090	9*	2.20	1.6	160	258	8 + 13
0100	10*	3.04	1.6	185	283	8 + 13
0120	12*	4.87	2	200	308	10 + 13
		(542)				* with hexagonal blade and bolster



6266 0025–0040
with round



6266 0045–0120
with hexagonal blade and bolster

Slotted Head Screwdrivers

Design: From high-alloy special steel. **Round blade** with **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.



Part No.	Tip width mm	6270 Wera	Blade thickness mm	Length mm	Total length mm
0015	2.0*	1.57	0.4	60	130
0020	2.5*	1.57	0.4	60	130
0025	2.5*	1.61	0.4	75	145
0030	3*	1.89	0.5	80	161
0032	3*	2.39	0.5	150	248
0034	3*	2.82	0.5	200	281
0035	3.5	2.12	0.6	100	181
0037	3.5	2.27	0.6	125	206
0038	3.5	3.46	0.6	200	281
0040	4	2.38	0.8	100	198
0041	4	3.13	0.8	150	248
0045	4	3.86	0.8	200	298
0048	4*	5.13	0.8	300	398
0050	5	3.21	0.8	100	198
0055	5.5	3.73	1.0	125	223
0058	5.5	4.29	1.0	150	248
0060	5.5	4.58	1.0	200	298
0063	5.5*	5.78	1.0	300	398
0064	6	4.72	1.0	125	223
0066	6	3.79	1.2	100	198
0065	6.5	5.17	1.2	150	255
0068	6.5	5.10	1.2	200	298
0080	8	6.06	1.2	175	287
0090	8	5.67	1.6	175	287
0100	10	7.21	1.6	200	312
0120	12*	9.76	2.0	250	367
		(543)			

* without Lasertip®

Slotted Head Screwdrivers

Design: High-alloy special steel, hexagonal blade, as from blade width 4.5 mm with hexagonal bolster for force intensification with open-end and double-ended ring wrenches.

6276 Special coating for higher torque and fitting accuracy, ergonomic 3-component handle, with integrated soft zones and anti-roll protection.

6275 With **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.



6276 format professional quality



6275 Wera

Part No.	Tip width mm	6276	6275 Wera	Blade thickness mm	Length mm	Total length mm	Hexagonal mm
0035	3.5	1.80	2.64	0.6	80	161	4
0045	4.5*	2.09	3.06	0.8	90	188	5 + 8
0055	5.5	2.58	3.90	1	100	198	6 + 10
0060	6.5	–	4.74	1.2	125	230	6 + 10
0070	7*	3.16	7.08	1.2	125	230	8 + 13
0090	8*	3.90	–	1.6	150	262	8 + 13
0091	9	–	6.41	1.6	150	262	8 + 13
0100	10	4.54	7.11	1.6	175	287	10 + 16
0120	12	6.07	–	2	200	312	10 + 16
		(542)	(543)				

INOX Slotted Head Screwdrivers

Design: Made of stainless steel. Round blade, tough hard (HRC 54), with **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Thanks to the **vacuum ice-hardening** the blade features the same hardness as conventional tools and is therefore **workshop-compatible and wear-resistant.** With ergonomic Kraftform®-Plus grip, integrated soft zones and hexagonal anti-roll protection. Stamped with drive symbol and size.

Application: Screwdrivers from stainless steel are used where extraneous rust at stainless steel is to be avoided. Especially for screwing stainless steel screws in window and door construction, in case of fittings and sinks, facades, handrails, balconies, fences etc.

Note: Extraneous rust in stainless steel processing is caused by tools made of normal steel. Abraded particles are thereby produced which adhere to the stainless steel. These particles become rust under the effect of oxygen. **Use stainless steel tools only for stainless steel screws and store them separately! Extraneous rust is thereby avoided.**



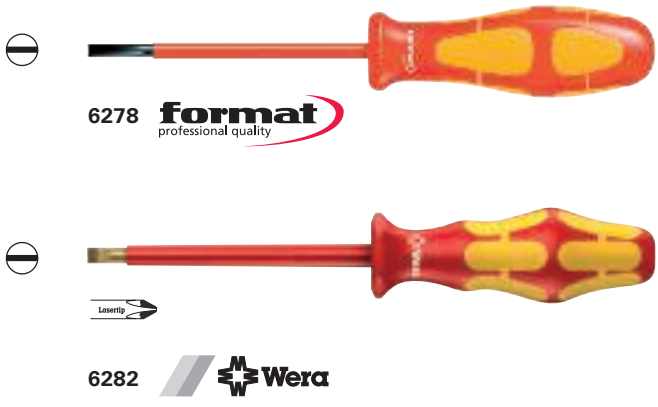
Part No.	Tip width mm	6277	Blade thickness mm	Length mm	Total length mm
0030	3*	3.42	0.5	80	161
0035	3.5	3.60	0.6	100	181
0040	4	3.79	0.8	100	198
0055	5.5	5.00	1	125	223
0065	6.5	6.10	1.2	150	255
0080	8	8.11	1.2	175	287
0100	10	10.29	1.6	200	312
* without Lasertip®		(584)			

VDE Slotted Head Screwdrivers

Design: From high-alloy special steel. Round, insulated blade. Handle and blade insulated up to 1,000 v, in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/part 201.

6278 Special coating for higher torque and fitting accuracy. Ergonomic 2-component handle, integrated soft zones and anti-slip protection.

6282 With **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.



Part No.	Tip width mm	6278	6282	Blade thickness mm	Length mm	Total length mm 6278	Total length mm 6282
0025	2.5*	1.39	2.80	0.4	80	161	161
0030	3*	1.38	2.84	0.5	100	181	181
0035	3.5	1.49	3.01	0.6	100	181	181
0040	4	1.82	3.60	0.8	100	198	198
0045	4	–	4.10	0.8	150	–	248
0055	5.5	2.09	4.02	1	125	223	223
0060	5.5	–	4.42	1	200	–	298
0065	6.5	2.64	5.39	1.2	150	248	255
0070	6.5	–	5.95	1.2	200	–	305
0080	8	3.55	5.93	1.2	175	283	287
0081	8	–	5.93	1.6	200	–	312
0100	10	–	7.51	1.6	200	–	312
* without Lasertip®		(542)	(543)				

Cross Head Screwdrivers (Phillips), with Wooden Handle

Design: From high-alloy special steel. Round blade with hexagon bolster for force intensification with open-end wrenches or double ring wrenches and special coating for higher torque and fitting accuracy. Handle made of hard ash wood and double leather cap to protect against splinters during hammer strokes.



Part No.	PH Size	6292 mm	Blade length mm	Total length mm	Hexagonal mm
0001	1	1.39	90	192	8
0002	2	1.79	100	211	10
		(542)			

Part No.	PH Size	6292 mm	Blade length mm	Total length mm	Hexagonal mm
0003	3	2.49	175	301	13
0004	4	4.61	200	340	16
		(542)			

Cross Head Screwdrivers (Phillips), with Impact Cap

Design: High-quality bit material, tough hard. Hexagon blade with hexagon bolster for force intensification with open-end and double ring wrenches. Black Point coating for higher torque and fitting accuracy. With ergonomic Kraftform® handle with integrated soft zones, anti-roll protection and **impact cap.** From size PH 4 with Kraftform® grip without soft zones.

Application: For heavy-duty applications, for releasing and knocking-off screwed clips, and as chisel for opening walls.



Part No.	PH Size	6286 Wera	Blade length mm	Total length mm	Hexagonal mm
0001	1	3.99	80	178	5 + 8
0002	2	5.66	100	205	6 + 10
		(543)			

Part No.	PH Size	6286 Wera	Blade length mm	Total length mm	Hexagonal mm
0003	3	8.50	150	262	8 + 13
0004	4	12.43	200	317	10 + 16
		(543)			

Cross Head Screwdrivers (Phillips)

Design: From high-alloy special steel. Round blade, surface special coating. Plastic handle with anti-roll protection.



Part No.	PH Size	6290 mm	Blade length mm	Total length mm
0001	01	1.39	25	79
0002	02	1.39	25	79
		(542)		

Cross Head Screwdrivers (Phillips)

Design: From high-alloy special steel. Round blade.

6300 Special coating for higher torque and fitting accuracy. Ergonomic 2-component handle, integrated soft zones and anti-slip protection.

6304 With **Lasertip®** and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.



6300



6304

Part No.	PH Size	6300 mm	6304 Wera	Blade length mm	Total length mm	Hexagonal mm
0000	0*	1.39	2.52	60	154	141
0005	0*	–	2.64	100	–	181
0001	1	1.46	3.24	80	164	178
0010	1*	–	4.48	300	–	398
0002	2	1.90	4.33	100	198	205
0020	2*	–	5.93	300	–	398
0003	3	2.30	5.80	150	258	262
		(542)	(543)			

* without Lasertip®

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Cross Head Screwdrivers (Phillips)

Design: High-alloy special steel, **hexagonal blade,** as from size PH 1 with hexagonal bolster for force intensification with open-end and double-ended ring wrenches.

6302 Special coating for higher torque and fitting accuracy. Ergonomic 3-component handle, integrated soft zones and anti-slip protection.

6325 With **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.



6302 format professional quality



Lasertip

6325 Wera

Part No.	PH Size	6302	6325 Wera	Blade length mm	Total length mm	Hexagonal mm
0000	0*	–	3.04	60	141	4
0001	1	2.58	3.96	80	178	5 + 8
0002	2	3.39	5.32	100	205	6 + 10
0003	3	5.54	8.16	150	262	8 + 13
		(542)	(543)			

* without Lasertip®

INOX Cross Head Screwdrivers Stainless (Phillips)

Wera

Design: Made of stainless steel. Round blade, tough hard (HRC 54), with **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Thanks to the **vacuum ice-hardening** the blade features the same hardness as conventional tools and is therefore **workshop-compatible and wear-resistant.** With ergonomic Kraftform®-Plus grip, integrated soft zones and hexagonal anti-roll protection. Stamped with drive symbol and size.

Application: Screwdrivers from stainless steel are used where extraneous rust at stainless steel is to be avoided. Especially for screwing stainless steel screws in window and door construction, in case of fittings and sinks, facades, handrails, balconies, fences etc.

Note: Extraneous rust in stainless steel processing is caused by tools made of normal steel. Abraded particles are thereby produced which adhere to the stainless steel. These particles become rust under the effect of oxygen. **Use stainless steel tools only for stainless steel screws and store them separately! Extraneous rust is thereby avoided.**





Lasertip

Part No.	PH Size	6327 Wera	Blade length mm	Total length mm
0000	0*	3.66	60	141
0001	1	4.25	80	178
0002	2	5.85	100	205
0003	3	8.80	150	262
		(584)		

* without Lasertip®

VDE Cross Head Screwdrivers (Phillips)

Design: High-alloy special steel with round, insulated blade. **Handle and blade insulated up to 1,000 v, in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/part 201.**

6328 Special coating for higher torque and fitting accuracy. Ergonomic 2-component handle, integrated soft zones and anti-slip protection.

6332 With **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.



6328 format professional quality



Lasertip

6332 Wera

Part No.	PH Size	6328	6332 Wera	Blade length mm	Total length mm 6328	Total length mm 6332
0000	0*	1.60	3.21	80	161	161
0001	1	1.75	3.81	80	178	178
0002	2	2.20	5.33	100	198	205
0003	3	3.20	5.88	150	262	262
		(542)	(543)			

* without Lasertip®

VDE Slotted Head PlusMinus Screwdrivers (Phillips)

Design: Combination profile Phillips/slotted head. From high-alloy special steel. Round, insulated blade. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size. **Handle and blade insulated up to 1,000 v, in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/part 201.**

Application: Especially for terminal blocks, fuse boxes, switches, relais etc.

Part No.	Size	6333 Wera	Blade length mm	Total length mm
0001	PH/S 1	5.17	80	178
0002	PH/S 2	6.60	100	205
		(543)		



Cross Head Screwdrivers (Pozidriv), with Wooden Handle

Design: From high-alloy special steel. Round blade with hexagon bolster for force intensification with open-end wrenches or double ring wrenches and special coating for higher torque and fitting accuracy. Handle made of hard ash wood and double leather cap to protect against splinters during hammer strokes.

Part No.	PZ Size	6330	Length mm	Total length mm	Hexagonal mm
0101	1	1.45	90	192	8
0102	2	1.89	100	211	10
0103	3	2.63	150	301	13
		(542)			



Cross Head Screwdrivers (Pozidriv), with Impact Cap

Design: High-quality bit material, tough hard. Hexagon blade with hexagon bolster for force intensification with open-end and double ring wrenches. Black Point coating for higher torque and fitting accuracy. Ergonomic Kraftform® handle, integrated soft zones and anti-slip protection and **impact cap.**

Application: For heavy-duty applications, for releasing and knocking-off screwed clips, and as chisel for opening walls.

Part No.	PZ Size	6287 Wera	Blade length mm	Total length mm	Hexagonal mm
0005	1	3.95	80	178	5 + 8
0010	2	5.67	100	205	6 + 10
0015	3	8.52	150	262	8 + 13
		(543)			



Cross Head Screwdrivers (Pozidriv)

Design: From high-alloy special steel. Round blade, surface special coating. Plastic handle with anti-roll protection.

Part No.	PZ Size	6331	Blade length mm	Total length mm
0001	01	1.20	25	79
0002	02	1.39	25	79
		(542)		



Cross Head Screwdrivers (Pozidriv)

Design: From high-alloy special steel. Round blade.

6336 Special coating for higher torque and fitting accuracy. Ergonomic 2-component handle, integrated soft zones and anti-slip protection.

6340 With **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.



6336 format professional quality



6340 Wera

Part No.	PZ Size	6336 format	6340 Wera	Blade length mm	Total length mm 6336	Total length mm 6340
0000	0*	–	3.19	60	–	141
0001	1	1.53	3.86	80	164	178
0011	1	–	4.42	200	–	298
0021	1*	–	4.79	300	–	398
0002	2	1.85	5.21	100	198	205
* without Lasertip®		(542)	(543)			

Part No.	PZ Size	6336 format	6340 Wera	Blade length mm	Total length mm 6336	Total length mm 6340
0022	2	–	5.85	200	–	305
0032	2*	–	6.47	300	–	405
0003	3	2.38	7.16	150	258	262
0004	4*	–	9.24	200	–	312
		(542)	(543)			

Cross Head Screwdrivers (Pozidriv)

Design: From high-alloy special steel. Hexagon blade, from size PZ 1 with hexagonal bolster for force intensification with open-end and double-ended ring wrenches.

6303 Special coating for higher torque and fitting accuracy. Ergonomic 3-component handle, integrated soft zones and anti-slip protection.

6337 With **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Ergonomic Kraftform®-Plus grip, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.



6303 format professional quality



6338 Wera

Part No.	PZ Size	6303 format	6337 Wera	Blade length mm	Total length mm	Hexagonal mm
0000	0*	–	3.80	60	141	4
0001	1	2.86	4.59	80	178	5 + 8
* without Lasertip®		(542)	(543)			

Part No.	PZ Size	6303 format	6337 Wera	Blade length mm	Total length mm	Hexagonal mm
0002	2	2.15	6.30	100	205	6 + 10
0003	3	5.54	9.78	150	262	8 + 13
		(542)	(543)			

INOX Cross Head Screwdrivers Stainless (Pozidriv)

Wera

Design: Made of stainless steel. Round blade, tough hard (HRC 54), with **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Thanks to the **vacuum ice-hardening** the blade features the same hardness as conventional tools and is therefore **workshop-compatible and wear-resistant.** With ergonomic Kraftform®-Plus grip, integrated soft zones and hexagonal anti-roll protection. Stamped with drive symbol and size.

Application: Screwdrivers from stainless steel are used where extraneous rust at stainless steel is to be avoided. Especially for screwing stainless steel screws in window and door construction, in case of fittings and sinks, facades, handrails, balconies, fences etc.

Note: Extraneous rust in stainless steel processing is caused by tools made of normal steel. Abraded particles are thereby produced which adhere to the stainless steel. These particles become rust under the effect of oxygen. **Use stainless steel tools only for stainless steel screws and store them separately. Extraneous rust is thereby avoided.**



Part No.	PZ Size	6341 Wera	Blade length mm	Total length mm
0000	0*	4.18	60	141
0001	1	4.81	80	178
0002	2	6.69	100	205
0003	3	10.23	150	262
* without Lasertip®		(584)		

VDE Cross Head Screwdrivers (Pozidriv)

Design: From high-alloy special steel. Round, insulated blade. **Handle and blade insulated up to 1,000 v, in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/part 201.**

6343 Special coating for higher torque and fitting accuracy. Ergonomic 2-component handle, integrated soft zones and anti-slip protection.

6344 With **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.

Part No.	PZ Size	6343	6344	Blade length mm	Total length mm
0001	1	1.68	3.73	80	178
0002	2	2.12	5.22	100	205
0003	3	3.16	5.70	150	262
		(542)	(543)		



6343 format professional quality



6344 Wera

VDE Slotted Head PlusMinus Screwdrivers (Pozidriv)

Design: Combination profile Pozidriv/slotted head. From high-alloy special steel. Round, insulated blade. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size. **Handle and blade insulated up to 1,000 v, in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/part 201.**

Application: Especially for terminal blocks, fuse boxes, switches, relais etc.

Part No.	Size	6345	Blade length mm	Total length mm
0001	PZ/S 1	5.56	80	178
0002	PZ/S 2	7.37	100	205
		(543)		



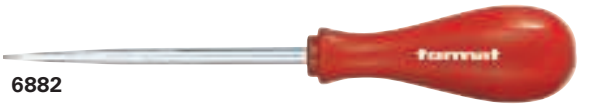
Awls/Square Bradawls

Design: Chromium-vanadium steel, continuous blade, with impact cap and plastic handle.

6882 **Awl,** with round blade.

6883 **Square bradawl,** with square blade.

Part No.	Blade length mm	6882	6883	Total length mm	ø mm
0005	105	2.82	–	197	6
0010	107	–	2.98	199	6
		(542)	(542)		



6882



6883

Screwdriver Sets with Wooden Handle

Design: From high-alloy special steel. Round continuous blade with hexagonal bolster for force intensification with open-end wrenches or double-ended ring wrenches and special coating for higher torque and fitting accuracy. Handle made of hard ash wood and double leather cap to protect against splinters during hammer strokes.

Content:
4 slotted head screwdrivers 3.5 x 90; 4.5 x 90; 5.5 x 100; 7 x 125
2 cross head screwdrivers sizes 1; 2



Part No.	Contents	6354 mm	Design
0010	6-piece	9.72	Slotted head (part no. 6260) and Phillips (part no. 6292)
0110	6-piece	10.25	Slotted head (part no. 6260) and Pozidriv (part no. 6330)

(542)

Screwdriver Sets

Design: From high-alloy special steel. Blade with special coating for higher torque and fitting accuracy. Ergonomic 2-component handle, integrated soft zones and anti-slip protection.

Content:
4 slotted head screwdrivers with **hexagonal blade** and hexagonal bolster
4.5 x 90; 5.5 x 100; 7 x 125; 9 x 150
2 cross head screwdrivers with **round blade** sizes 1; 2



Part No.	Contents	6354 mm	Design
0120	6-piece	10.66	Slotted head (part no. 6266) and Phillips (part no. 6300)
0130	6-piece	10.69	Slotted head (part no. 6266) and Phillips (part no. 6336)

(542)

Screwdriver Sets

Design: From high-alloy special steel. Blade with special coating for higher torque and fitting accuracy. Ergonomic 2-component handle, integrated soft zones and anti-slip protection.

Content:
1 slotted head screwdriver with **round blade** 3 x 75
4 slotted head screwdrivers with **hexagonal blade** 4.5 x 90; 5.5 x 100 (2 pcs.); 7 x 130
3 cross head screwdrivers with **round blade** PH 1; PH 2 (2 pcs.)
2 cross head screwdrivers with **round blade** PZ 1; PZ 2



Part No.	Contents	6354 mm	Design
0100	10-piece	12.71	Slotted head (part no. 6266) Phillips (part no. 6300) Pozidriv (part no. 6336)

(542)

Screwdriver Sets

Design: From high-alloy special steel. **Hexagonal blade** with special coating for higher torque and fitting accuracy. Ergonomic 3-component handle, integrated soft zones and anti-slip protection.

Content:
4 slotted head screwdrivers 4.5 x 90; 5.5 x 100; 7 x 125; 8 x 150
2 cross head screwdrivers sizes 1; 2



Part No.	Contents	6354 mm	Design
0030	6-piece	18.58	Slotted head (part no. 6276) and Phillips (part no. 6302)
0035	6-piece	18.62	Slotted head (part no. 6276) and Pozidriv (part no. 6303)

(542)

Screwdriver Sets

Design: From high-alloy special steel. Round blade with Lasertip® and nicromat surface.
The contact force is thereby reduced and prevents slipping out of the screw head.
Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection.
Stamped with drive symbol and size.

Contents with rack:
6350 0020/0030
4 slotted head screwdrivers 3 x 80 (without Lasertip®); 4 x 100; 5.5 x 125; 6.5 x 150
2 cross head screwdrivers sizes 1; 2

6350 0100
2 slotted head screwdrivers 4 x 100; 5.5 x 125
2 cross head screwdrivers PH 1; PH 2
2 cross head screwdrivers PZ 1; PZ 2



Part No.	Contents	6350 Wera	Design
0020	6-piece	17.54	Slotted head (part no. 6270) and Phillips (part no. 6304)
0030	6-piece	17.54	Slotted head (part no. 6270) and Pozidriv (part no. 6340)
0100	6-piece	19.22	Slotted head (part no. 6270), Phillips (part no. 6304) and Pozidriv (part no. 6340)

(543)

Screwdriver Sets with Impact Cap

Design: Continuous hexagon blade, with impact cap, nicromatt, **3-component Kraftform® grip with anti-roll protection.**

Contents with rack:
1 slotted head screwdriver of each size: 3.5 x 80; 4.5 x 90; 5.5 x 100; 7 x 125
1 cross head screwdriver of each size: 1 x 80, 2 x 100



Part No.	Contents	6350 Wera	Design
0010	6-piece	23.67	Slotted head (part no. 6264) and Phillips (part no. 6286)
0110	6-piece	23.67	Slotted head (part no. 6264) and Pozidriv (part no. 6287)

(543)

Screwdriver Sets with Hexagonal Blade

Design: From high-alloy special steel. Hexagonal blade with **Lasertip®** and nicromat surface.
The contact force is thereby reduced and prevents slipping out of the screw head.
Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection.
Stamped with drive symbol and size.

Contents with rack:
4 slotted head screwdrivers 3.5 x 75; 4 x 90 ; 5.5 x 100; 6.5 x 125
2 cross head screwdrivers sizes 1; 2



Part No.	Contents	6350 Wera	Design
0160	6-piece	21.19	Slotted head (part no. 6275) and Phillips (part no. 6325)
0165	6-piece	21.19	Slotted head (part no. 6275) and Pozidriv (part no. 6337)

(543)

INOX Screwdriver Sets Stainless

Design: From stainless steel. Round blade, tough hard (HRC 54), with **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Thanks to the **vacuum ice-hardening** the blade features the same hardness as conventional tools and is therefore **workshop-compatible and wear-resistant.**
With ergonomic Kraftform®-Plus grip, integrated soft zones and hexagonal anti-roll protection. Stamped with drive symbol and size.

Contents with rack:
4 slotted head screwdrivers 3 x 80 (without Lasertip®); 4 x 100; 5.5 x 125; 6.5 x 150
2 cross head screwdrivers sizes 1; 2

Application: Screwdrivers from stainless steel are used where extraneous rust at stainless steel is to be avoided. Especially for screwing stainless steel screws in window and door construction, in case of fittings and sinks, facades, handrails, balconies, fences etc.

Note: Extraneous rust in stainless steel processing is caused by tools made of normal steel. Abraded particles are thereby produced which adhere to the stainless steel. These particles become rust under the effect of oxygen. **Use stainless steel tools only for stainless steel screws and store them separately! Extraneous rust is thereby avoided.**



Part No.	Contents	6352 Wera	Design
0010	6-piece	24.24	Slotted head (part no. 6277) and Phillips (part no. 6327)
0015	6-piece	24.57	Slotted head (part no. 6277) and Pozidriv (part no. 6341)

(584)

VDE Screwdriver Sets

Design: From high-alloy special steel. Round, insulated blade with special coating for higher torque and fitting accuracy. Ergonomic 2-component handle, integrated soft zones and anti-slip protection. **Handle and blade insulated up to 1,000 v, in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/part 201.**

Contents:
6354 0040
4 slotted head screwdrivers 2.5 x 80; 3 x 100; 3.5 x 100; 4 x 100
2 cross head screwdrivers sizes 0; 1

6354 0050
3 slotted head screwdrivers 4 x 100; 5.5 x 125; 6.5 x 150
2 cross head screwdrivers sizes 1; 2
1 voltage tester, single-pole



Part No.	Contents	6354	Design
0040	6-piece	9.47	Slotted head (part no. 6278) and Phillips (part no. 6328)
0050	6-piece	11.47	Slotted head (part no. 6278), Phillips (part no. 6328) and voltage tester

(542)

VDE Screwdriver Sets

Design: From high-alloy special steel. Round blade with **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Ergonomic Kraftform®-Plus handle, integrated soft zones and anti-slip protection. Stamped with drive symbol and size.

Contents with rack:
4 slotted head screws 2.5 x 80 (without Lasertip®); 3.5 x 100; 4 x 100; 5.5 x 125
2 cross head screwdrivers sizes 1; 2
1 voltage tester, single pole 3 x 70 (without Lasertip®)



Part No.	Contents	6350 Wera	Design
0140	7-piece	21.72	Slotted head (part no. 6282), Phillips (part no. 6332) and voltage tester
0150	7-piece	21.72	Slotted head (part no. 6282), Pozidriv (part no. 6344) and voltage tester

(543)

Cross Head Screwdriver Sets

Design: With round blade made of high-alloy special steel.
Supplied in cardboard box, incl. 3 cross head screwdrivers sizes 1; 2; 3.

6354 Special coating for higher torque and fitting accuracy.
Ergonomic 2-component handle, integrated soft zones and anti-slip protection.

6350 With **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Ergonomic Kraftform®-Plus grip, with integrated soft zones and hexagonal anti-roll protection. Stamped with drive symbol and size.

Part No.	Contents	6354	6350	Design
0070	3-piece	5.85	–	Phillips (part no. 6300)
		–	13.64	Phillips (part no. 6304)
0080	3-piece	5.77	–	Pozidriv (part no. 6336)
		–	13.64	Pozidriv (part no. 6340)
		(542)	(543)	



6354 format professional quality



6350 Wera

Slotted Head Screwdriver Sets

Design: With round blade from high-alloy special steel.
Supplied in cardboard box, incl. 7 slotted head screwdrivers 3 x 80; 3.5 x 125; 4.5 x 90; 5.5 x 100; 7 x 125; 9 x 150; 10 x 175.

6354 Special coating for higher torque and fitting accuracy.
Ergonomic 2-component handle, integrated soft zones and anti-slip protection.

6350 With **Lasertip**® and nicromat surface. The contact force is thereby reduced and prevents slipping out of the screw head. Ergonomic Kraftform®-Plus grip, with integrated soft zones and hexagonal anti-roll protection. Stamped with drive symbol and size.

Part No.	Contents	6354	6350	Design
0090	7-piece	13.17	–	Slotted head (part no. 6266)
		–	25.99	Slotted head (part no. 6270)**
		(542)	(543)	

** without Lasertip®



6354 0090 format professional quality



6350 0090 Wera

VDE Spare Blade Sets Kraftform Kompakt

Design: Blade bronzed and insulated. With 3-component Kraftform® grip with integrated soft zones and anti-roll protection, **insulated up to 1,000 v in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/part 201.**
Supplied in handy bum bag incl.
1 handle
4 spare blades slotted head 2.5 x 0.4; 3.5 x 0.6; 4.0 x 0.8; 5.5 x 1.0 mm
2 spare blades Phillips PH 1; PH 2
2 spare blades Pozidriv PZ 1; PZ 2
2 spare blades PlusMinus slotted head/Phillips PH/S 1; PH/S 2
2 spare blades PlusMinus slotted head/Pozidriv PZ/S 1; PZ/S 2
2 spare blades square 6.3; 8.1 mm
1 spare blade three-square
1 spare blade two-way
1 voltage tester



Part No.	Contents	6355 Wera
0005	18-piece	37.65 (543)

VDE Handles for Spare Blades

Design: 3-component Kraftform® handle with integrated soft zones and anti-roll protection, **insulated up to 1,000 v in accordance with IEC 60 900, DIN EN 60 900, VDE 0682/part 201.**

Application: To hold spare blades.

Part No.	Length mm	6355 Wera
0010	102	10.24 (543)



VDE Spare Blades for Slotted Screws

Part No.	Blade width mm	6355 Wera	Blade thickness mm	Blade length mm
0100	2.5	1.57	0.4	154
0105	3	1.64	0.5	154
0110	3.5	1.70	0.6	154
0115	4	2.05	0.8	154
0120	5.5	2.11	1	154
0125	6.5	3.16	1.2	154
		(543)		



VDE Spare Blades for Phillips Screws

Part No.	Size	6355 Wera	Blade length mm
0130	PH 1	1.78	154
0135	PH 2	2.42	154
		(543)	



VDE Spare Blades for Pozidriv Screws

Part No.	Size	6355 Wera	Blade length mm
0140	PZ 1	2.12	154
0145	PZ 2	2.90	154
		(543)	



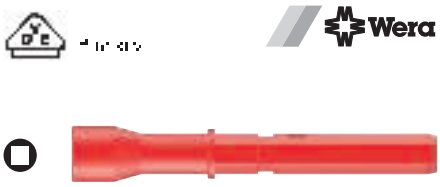
VDE Spare Blades for TORX® Screws

Part No.	Size	6355 Wera	Blade length mm
0152	T 9	2.30	154
0155	T 10	2.28	154
0160	T 15	2.28	154
0165	T 20	2.34	154
0170	T 25	2.42	154
		(543)	



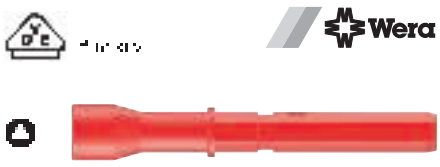
VDE Spare Blades for External Square Screws

Part No.	SW mm	6355 Wera	Blade length mm
0180	6.3	2.93	89
0190	8.1	2.93	89
		(543)	



VDE Spare Blades for External Three-square Screws

Part No.	Blade length mm	6355 Wera
0200	89	2.93
		(543)



VDE Spare Blades for Two-way Screws

Part No.	Blade length mm	6355 Wera
0210	89	2.93
		(543)



Offset Screwdrivers

Design: Blade made of high-alloy, mat chromium-plated special steel with tips curved by 90° and 180° and black plastic handle (polypropylene).

Part No.	Blade size mm	6360	Total length mm
0005	4 + 4	2.27	100
0010	5.5 + 5.5	2.63	125
0015	8 + 8	3.28	150
		(542)	



Offset Screwdrivers (Phillips)

Design: Nicromatt blade.

Part No.	PH Size	6362	Total length mm
0005	1 + 2	2.50	125
0015	3 + 4	4.40	200
		(542)	



Offset Screwdrivers (Pozidriv)

Design: Black-lasered blade.

Part No.	PZ Size	6363	Total length mm
0005	1 + 2	2.95	125
		(542)	



Screwdrivers for Electronic Use

Design: With round chromium-plated blade made of high-alloy special steel, Black Point tip for higher torque and fitting accuracy. With 2-component Kraftform® Micro handle with integrated soft zones, anti-roll protection and turnable cap. With three-zone concept (precision, high-leverage and high-speed zone) for ergonomic handling.

Application: For precise, efficient and quick screwing operations. Ideal for precise adjusting operations, e.g. in electronic range.

Note: For ESD electrician's screwdrivers ESD see (part no. 6369 ff).



Power zone



Precision zone



Quick turning zone

Screwdrivers for Cross-recessed Screws

Part No.	Blade width mm	6366 Wera	Blade thickness mm	Blade length mm	Total length mm
0008	0.8	2.83	0.16	40	137
0010	1	2.52	0.18	40	137
0012	1.2	2.30	0.25	40	137
0015	1.5	2.01	0.23	40	137
0018	1.8	2.01	0.30	60	157
0020	2	1.79	0.40	60	157
0021	2	1.87	0.40	100	217
0025	2.5	1.78	0.40	80	177
0030	3	1.80	0.50	80	177
0031	3	1.90	0.50	150	247
0035	3.5	1.75	0.60	80	177
0040	4	1.98	0.80	80	177
0041	4	2.08	0.80	150	247
		(543)			



Screwdrivers for Cross-Recessed Screws Phillips

Part No.	Dimensions	6368 Wera	Blade length mm	Total length mm
0005	PH 00	2.42	60	157
0010	PH 0	2.01	60	157
0015	PH 1	2.45	80	177
0020	PH 1	2.47	150	217
		(543)		



Screwdrivers for Cross-Recessed Screws Pozidriv

Part No.	Dimensions	6370 Wera	Blade length mm	Total length mm
0000	PZ 0	2.08	60	157
0001	PZ 1	2.31	80	177
		(543)		



TORX® Screwdrivers for Electronic Use, with Hole

Design: Up to size T6 without bore hole, **from size T7 with bore hole.**

Part No.	Dimensions	6372 Wera	Blade length mm	Total length mm
0001	T 1	3.64	40	137
0002	T 2	3.64	40	137
0003	T 3	3.64	40	137
0004	T 4	3.64	40	137
0005	T 5	3.34	40	137
0006	T 6	2.73	40	137
0007	T 7*	3.10	60	157
0008	T 8*	3.10	60	157
0009	T 9*	3.16	60	157
0010	T 10*	3.16	60	157
0015	T 15*	3.25	60	157
0020	T 20*	3.25	60	157
* without bore hole		(543)		



TORX® Screwdrivers with Holding Function

Design: With holding function.

Part No.	Dimensions	6373 Wera	Blade length mm	Total length mm
0008	T 8	3.08	60	157
0009	T 9	3.23	60	157
0010	T 10	3.23	60	157
0015	T 15	3.34	60	157
0020	T 20	3.34	60	157
		(543)		



Hexagon Socket Screwdrivers for Electronic Use

6374 With Hex-Plus geometry.
6376 With ball point tip.

Part No.	Key width mm	6374 Wera	6376 Wera	Blade length mm	Total length mm
0007	0.7	2.90	–	40	137
0009	0.9	2.47	–	40	137
0013	1.3	2.16	–	40	137
0015	1.5	2.08	2.97	60	157
0020	2	1.90	2.73	60	157
0025	2.5	1.90	2.53	60	157
0030	3	1.75	2.47	60	157
		(543)	(543)		


6374


6376

Hexagon Socket Screwdrivers for Electronic Use

Part No.	Key width mm	6378 Wera	Blade length mm	Total length mm
0020	2	4.09	60	157
0025	2.5	3.57	60	157
0030	3	3.57	60	157
0032	3.2	3.57	60	157
0035	3.5	3.80	60	157
0040	4	3.80	60	157
0045	4.5	3.87	60	157
0050	5	3.87	60	157
0055	5.5	3.87	60	157
		(543)		



Lifters for Electronic Use

Application: For lifting tight electronic components on circuit boards. Also suitable for positioning of small screws.

Part No.	Blade width mm	6379 Wera
0005	3.5 x 1	3.31 (543)



Screwdriver Sets for Electronic Use, Slotted/Phillips

Contents with rack:
4 slotted head screwdrivers 1.8 x 0.3; 2 x 0.4; 2.5 x 0.4; 3 x 0.5
2 cross head screwdrivers sizes 00; 0

Part No.	Contents	6380 Wera	Design
0005	6-piece	11.55 (543)	Slotted head (part no. 6366) and Phillips (part no. 6368)



TORX® Screwdriver Sets with Bore Hole for Electronic Use

Contents with rack:
6 TORX® screwdrivers T 7; T 8; T 9; T 10; T 15; T 20

Part No.	Contents	6381 Wera	Design
0005	6-piece	15.65 (543)	TORX® BO (part no. 6372)



ESD Screwdrivers for Electronic Use

General note ESD: When using tools on electro static discharge sensitive components (ESDS), relevant standards and directives (e.g. IEC TR 61340-5, DIN EN 61340-5, SP Method 2472) require controlled conducting away of electric charges through the handles of such tools.

Design: With round chromium-plated blade made of high-alloy special steel, Black Point tip for higher torque and fitting accuracy. With 2-component Kraftform® Micro handle with integrated soft zones, anti-roll protection and turnable cap. With three-zone concept (precision, high-leverage and high-speed zone) for ergonomic handling.

Application: For precise, efficient and quick screwing operations. Ideal for highly precise adjusting operations, e.g. in electronic range, can be used where ESD screwdrivers are required.

ESD Slotted Head Screwdrivers

Part No.	Blade width mm	6369 Wera	Blade thickness mm	Blade length mm	Total length mm
0012	1.2	2.24	0.25	40	137
0015	1.5	2.24	0.23	40	137
0018	1.8	2.01	0.3	60	157
0020	2	2.01	0.4	60	157
0025	2.5	1.87	0.4	80	177
0030	3	1.91	0.5	80	177
0035	3.5	2.27	0.6	80	177
0040	4	2.49	0.8	80	177

(543)



ESD Cross Head Screwdrivers (Phillips)

Part No.	Size	6371 Wera	Blade length mm	Total length mm
0005	PH 00	2.80	60	157
0010	PH 0	2.42	60	157
0015	PH 1	2.69	80	177

(543)



ESD Cross Head Screwdrivers (Pozidriv)

Part No.	Size	6373 Wera	Blade length mm	Total length mm
0000	PZ 0	2.90	60	157
0001	PZ 1	3.10	80	177

(543)



ESD TORX® Screwdrivers

Design: Up to size T6 without bore hole, **from size T7 with bore hole.**

Part No.	Size	6375 Wera	Blade length mm	Total length mm
0004	T 4	3.80	40	137
0005	T 5	3.66	40	137
0006	T 6	3.17	40	137
0007	T 7*	3.25	60	157
0008	T 8*	3.25	60	157
0009	T 9*	3.32	60	157
0010	T 10*	3.32	60	157

* with bore hole

(543)



ESD Hexagon Head Screwdrivers

Part No.	Key width mm	6377 Wera	Blade length mm	Total length mm
0050	5	5.47	60	157
0055	5.5	5.47	60	157

(543)



Clockmaker's Screwdriver Sets

Design: Chamfered brass shaft, nickel-plated, blade made of high-quality chrome-vanadium steel, induction-hardened, handle ends with turnable hexagonal tip for precision work.

Part No.	Set contents	6384
0005	Cross head 1 – 5 – 2 – 2.5 – 3	15.57
0010	Slotted head: 1 – 1.5 – 2 – 3 mm; cross head: 2.5 – 3	18.09

(527)



6384 0005 6384 0010

Magnetization Devices Wera Star

Design: For magnetizing and de-magnetizing of tools.

Part No.	Dimension mm	6382
0005	47 x 47 x 20	5.37

(543)



Impact Screwdriver Sets

Design: Solid impact screwdriver with exchangeable slotted and cross-recess bits. Reversible for right- or left-hand operation. Exceptionally powerful due to double-curve design. In sturdy steel sheet case incl.
1 impact screwdriver
1 adapter for power inserts 3/8"
6 bits for slotted screws 1.0 x 5.5; 1.2 x 6.5; 1.6 x 8; 1.6 x 10; 2.0 x 12; 2.5 x 14 mm
3 bits for cross recess screws PH 2; PH 3; PH 4

Application: For unscrewing and tightening of seized screws without the use of machines.

Part No.	Torque N•m	6387	Contents
0005	90	110.03	11-piece

(543)



Impact Screwdriver Sets

Design: Solid impact screwdriver with exchangeable slotted, cross-recess and hexagon socket bits. Reversible for right- or left-hand operation. Exceptionally powerful due to double-curve design. In sturdy steel sheet case incl.
1 impact screwdriver
1 adapter for power inserts 3/8" and 1/2"
5 bits for slotted screws 1.0 x 7; 1.4 x 9; 1.6 x 10; 2.0 x 12; 1.5 x 13 mm
3 bits for cross recess screws PH 2; PH 3; PH 4
4 bits for hexagon screws SW 5; SW 6; SW 8; SW 10 mm

Application: For unscrewing and tightening of seized screws without the use of machines.

Part No.	Torque N•m	6388	Contents
0005	120	212.54	15-piece

(543)



Bit Hand Holders

Design: With 1/4" bit mounting, strong permanent magnet, with 3-component handle and anti-roll protection.

format professional quality

Part No.	Total length mm	6389
0212	212	3.86 (546)



Bit Hand Holders

Design: With Wera quick change chuck for 1/4" bits, powerful permanent magnet, with hexagonal bolster, 3-component Kraftform® grip with anti-roll protection.

Wera

Part No.	Total length mm	6395 Wera
0218	218	16.04 (545)



Bit Hand Holders with Flexible Shaft

Design: With Wera quick change chuck for 1/4" bits, powerful permanent magnet, flexible shaft for jobs in locations difficult to access, 3-component Kraftform® grip, with anti-roll protection.

Wera

Part No.	Total length mm	6396 Wera
0275	275	10.71 (545)



Bit Hand Holders, Short

Design: Extra short, with powerful permanent magnet, 1/4" hexagon DIN 3126-D 6.3, 1-component Kraftform® grip, Weralit® II.

Wera

Part No.	Total length mm	6390 Wera
0005	54	5.76 (545)



Bit Magazine Hand Holders

Design: For receiving 1/4" bits, powerful permanent magnet, Kraftform® grip with anti-roll protection, Weralit® II, 1-component, rotating magazine.

Wera

Part No.	Total length mm	6397 Wera	Set contents
0232	232	12.14 (545)	1 bit each of: 0.8 x 5.5, 1.2 x 6.5, PH 1, PH 2, PZ 1, PZ 2



Kraftform Kompakt®

Design: The ergonomic 3-component Kraftform® handle with anti-roll protection serves as holder for 6 bits and can be opened to the top at the push of the button. The bits can be removed conveniently. Furthermore, these Kraftform Kompakt® sets feature a bayonet blade with Rapidaptor® quick-change chuck for easy and quick change of bits.





Kraftform Kompakt® 20

Supplied in bum bag incl.
2 bits for slotted screws 1.0 x 5.5; 1.2 x 6.5
2 bits for cross recess screws PH 1; PH 2
2 bits for cross recess screws PZ 1; PZ 2

Part No.	Contents	6393 Wera
0020	6-piece	26.66 (545)



Kraftform Kompakt® 22

Supplied in bum bag incl.
3 bits for cross recess screws PZ 1; PZ 2 (2 pcs.)
3 bits for TORX® screws T 15, T 20, T 25

Part No.	Contents	6394 Wera
0022	6-piece	26.66 (545)



One-hand Ratchets

Design: Kraftform® grip with elastomer insert, needle-bearing free-running mechanism including integrated switching for left and right-hand movement.

6399 With 1/4" square.
6401 With 1/4" hexagon including quick change mechanism.

Part No.	Length mm	6399 Wera	6401 Wera	Height mm
0005	140	31.23 (545)	31.23 (545)	100

1/4"



1/4"

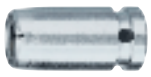


Adapters

Design: For industrial socket bits, with snap ring.

Part No.	Tip inch	6403 Wera	Drive inch	Length mm
0005	1/4	6.06	1/4	25
0010	1/4	6.67	3/8	30
0015	1/4	7.36	1/2	35
0020	5/16	7.36	1/2	35
		(545)		

1/4“ + 5/16“



Adapters

Design: With Wera quick change chucks for holding 1/4“ socket bits.

Part No.	Tip inch	6405 Wera	Drive inch	Length mm
0005	1/4	11.80	1/4	30
0010	1/4	12.85	3/8	43
0015	5/16	13.86	3/8	50
0020	1/4	13.17	1/2	50
0025	5/16	15.72	1/2	50
		(545)		

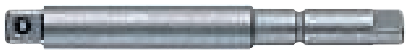
1/4“ + 5/16“



Adapters

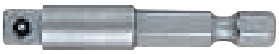
Design: For industrial socket bits.

1/4“ ⬤ ø 7



6407 0010

1/4“ ⬢ 1/4“



6407 0005

3/8“ ⬢ 1/4“



6408 0005

1/4“ SDS plus



6408 0010

Part No.	Tip inch	6407	6408 Wera	Drive inch	Length mm
0005	1/4	2.11	–	1/4	50
0010	1/4	2.20	–	7 mm round	75
0005	3/8	–	4.92	1/4	50
0010	1/4	–	7.11	SDS-plus	70
		(546)	(545)		

Universal Holders 1/4“ with 1/4“ Drive DIN 3126 E 6.3

Design: DIN 3126 E 6.3. With 1/4“ drive.

Application: For connecting bits with the respective tools.

6409 **Design:** With snap ring and powerful permanent magnet.

6413 **Design:** With quick-change chuck and permanent magnet.

1/4“ ⬢ 1/4“



6409

1/4“ ⬢ 1/4“



6413

Part No.	Tip inch	6409	6413	Drive inch	Length mm
0005	1/4	1.52	–	1/4	50
0010	1/4	2.20	–	1/4	75
0005	1/4	–	5.37	1/4	77
		(546)	(546)		

Universal Holders 1/4“ with 7 mm ø Drive DIN 3126 G7

6411 **Design:** With snap ring and permanent magnet.

6417 **Design:** With quick-change chuck and permanent magnet.

1/4“ ø 7



6411

1/4“ ø 7



6417

Part No.	Tip inch	6411 Wera	6417 Wera	Drive mm	Length mm 6411	Length mm 6417
0005	1/4	3.91	9.83	7 round	75	77
		(545)	(545)			

Universal Holders 1/4“ with 1/4“ Drive DIN 3126 E 6.3

Design: DIN 3126 G7. With 7 mm ⌀ drive.

Application: For connecting bits with the respective tools.

6416 **Design:** Simple socket bit and automatic locking through rapid-in-function. Speedy bit removal. Also suitable for small bit sizes without tool. Safe guidance due to free-running sleeve, complete tool change realized with one hand only.

6422 **Design:** Simple socket bit and automatic locking through rapid-in-function. Speedy bit removal. Also suitable for small bit sizes without tool. Safe guidance due to free-running sleeve, complete tool change realized with one hand only. Due to the integrated torsion zone of the Rapidaptor® BiTorsion® holder, load peaks are securely cushioned for longer life of the bits.

6428 **Ring magnet Rapidaptor®**. The magnet ring holds all magnetic screws at the head and thus facilitates positioning. Ideal for overhead operations. Also suitable for long and heavy screws.

1/4“ 1/4“



6416

1/4“ 1/4“



6422

BiTorsion

1/4“ 1/4“



6428



Part No.	Tip inch	6416 Wera	6422 Wera	6428 Wera	Drive inch	Length mm 6416	6422	6428
0005	1/4	7.56 (545)	11.05 (545)	11.05 (545)	1/4	50	75	57

INOX Bit Holders Rapidaptor® Stainless

Design: Made of stainless steel, DIN 3126 E 6.3 drive 1/4“.
The quick-change chuck featuring 5 functions for increased safety and efficiency in mechanical screwing.
Rapid-In and Self-Lock for safe holding of the bit without shaking.
Rapid-out for easy bit change without tool.
Rapid-Spin means free-running stop sleeve. The sleeve can thus be held firmly even during screwing.
Chuck-all for receiving all 1/4“ bits as well as bits according to DIN 3126-C 6.3 and DIN 3126 E 6.3.
Single-hand means that all functions can be realised with one hand only.

Application: For connecting stainless steel bits with the respective tools.

EDELSTAHL Rostfrei

Stainless

1/4“ 1/4“



Note: Extraneous rust in stainless steel processing is caused by tools made of normal steel. Abraded particles are thereby produced which adhere to the stainless steel. These particles become rust under the effect of oxygen. **Use stainless steel tools only for stainless steel screws and store them separately! Extraneous rust is thereby avoided.**

Part No.	Tip inch	6428 Wera	Drive inch	Length mm
0010	1/4	11.21 (584)	1/4	50

Universal Holders 1/4“ with Drive SDS plus

Design: With quick-change chuck and permanent magnet.

Part No.	Tip inch	6419 Wera	Drive SDS plus	Length mm
0005	1/4	15.07 (545)	SDS plus	81

1/4“ SDS plus



Combination Holders

Design: With powerful permanent magnet and quick change chuck, square drive for use with ratchet or screwdriver, 1/4“ hexagon tip DIN 3126-D 6.3 and F 6.3.

6418 **With 1/4“ drive.**

6420 **With 3/8“ drive.**

BiTorsion

1/4“ 1/4“



6418

1/4“ 3/8“



6420

Part No.	Tip inch	6418 Wera	6420 Wera	Length mm 6418	6420
0005	1/4	13.13 (545)	14.31 (545)	77	82

Bit Tips

Description of Design:

Extra-hard – for gentle screwing in wood to prevent breakage.

Tough-hard – for hard screwing in metal and sheet metal to prevent breakage.

Torsion – load peaks in the torsion zone of the bit are cushioned for longer life of the bits.

BiTorsion® – the torsion zone of the BiTorsion® bit has a higher hardness of 20 % compared with the shank. It serves to cushion torque peaks.

Diamond-coated – for universal use, long life. Very small diamond particles adhere to the screw and ensure secure seating of the tool in the screw head.

Bit for Slotted Screws 1/4" DIN 3126 C 6.3

Design: Torsion-shaped, extra-hard tip.

format professional quality

Part No.	Blade width mm	6421 mm	Blade thickness mm	Length mm	PU piece
0005	4	0.30	0.5	25	10
0010	5.5	0.30	0.8	25	10
0015	5.5	0.30	1	25	10
0020	6.5	0.30	1.2	25	10
		(546)			



Bit for Slotted Screws 1/4" DIN 3126 C 6.3

Design: Tip tough-hard.

Wera

Part No.	Blade width mm	6423 Wera	Blade thickness mm	Length mm	PU piece
0005	3	1.18	0.5	39	10
0010	3.5	1.18	0.6	39	10
0015	4	1.18	0.8	39	10
0020	5.5	1.18	1	39	10
0025	6.5	1.18	1.2	39	10
0030	8	1.18	1.2	39	10
0035	8	1.18	1.6	39	10
		(545)			



INOX Bits for Slotted Screws 1/4" DIN 3126 C 6.3 Stainless

Design: Made of stainless steel. Thanks to the vacuum ice-hardening, the tip features the same hardness as conventional tools and is therefore workshop-compatible and wear-resistant.

Application: Bits from stainless steel are used where extraneous rust at stainless steel is to be avoided. Especially for screwing stainless steel screws in window and door construction, in case of fittings and sinks, facades, handrails, balconies, fences etc.

TORSION

Wera





Part No.	Blade width mm	6430 Wera	Blade thickness mm	Length mm	PU piece
0010	5.5	2.05	0.8	25	10
0015	5.5	2.05	1	25	10
0020	6.5	2.05	1.2	25	10
		(584)			

Note: Extraneous rust in stainless steel processing is caused by tools made of normal steel. Abraded particles are thereby produced which adhere to the stainless steel. These particles become rust under the effect of oxygen. **Use stainless steel tools only for stainless steel screws and store them separately! Extraneous rust is thereby avoided. Stainless Rapidaptor® see (part no. 6428 0010).**

Bits for Cross Recess Screws (Phillips) 1/4" DIN 3126 C 6.3

6424 **Design:** Tough-hard tip.

6425 **Design:** Torsion-shaped, extra-hard drive.

6437 **Design:** BiTorsion®, diamond-coated tip, Hex-Plus drive.

Part No.	Dimensions	6424 mm	6425 mm	6437 Wera	Length mm	PU piece
0005	PH 1	0.21	0.27	1.39	25	10
0010	PH 2	0.21	0.27	1.39	25	10
0015	PH 3	0.21	0.27	1.39	25	10
		(546)	(546)	(545)		



6424 format professional quality



6425 format professional quality



BiTorsion

6437 Wera

INOX Bits for Cross Recess Screws Phillips 1/4" DIN 3126 C 6.3 Stainless

Design: Made of stainless steel. Thanks to the vacuum ice-hardening the tip features the same hardness as conventional tools and is therefore workshop-compatible and wear-resistant.

Application: Bits from stainless steel are used where extraneous rust at stainless steel is to be avoided. Especially for screwing stainless steel screws in window and door construction, in case of fittings and sinks, facades, handrails, balconies, fences etc.

TORSION

Wera





Part No.	Dimensions	6432 Wera	Length mm	PU piece
0005	PH 1	1.39	25	10
0010	PH 2	1.39	25	10
0015	PH 3	1.39	25	10
		(584)		

Note: Extraneous rust in stainless steel processing is caused by tools made of normal steel. Abraded particles are thereby produced which adhere to the stainless steel. These particles become rust under the effect of oxygen. **Use stainless steel tools only for stainless steel screws and store them separately! Extraneous rust is thereby avoided. Stainless Rapidaptor® see (part no. 6428 0010).**

Bits for Cross Recess Screws Pozidriv 1/4" DIN 3126 C 6.3

6426 **Design:** Tough-hard tip.

6427 **Design:** Torsion-shaped, extra-hard tip.

6439 **Design:** BiTorsion®, torsion-shaped, diamond-coated tip, Hex-Plus drive.



6426 format professional quality



6427 format professional quality



BiTorsion

6439 Wera

Part No.	Dimensions	6426	6427	6439 Wera	Length mm	PU piece
0005	PZ 1	0.21	0.27	1.39	25	10
0010	PZ 2	0.21	0.27	1.39	25	10
0015	PZ 3	0.21	0.27	1.39	25	10
		(546)	(546)	(545)		

INOX Bits for Cross Recess Screws Pozidriv 1/4" DIN 3126 C 6.3 Stainless

Design: Made of stainless steel. Thanks to the vacuum ice-hardening the tip features the same hardness as conventional tools and is therefore workshop-compatible and wear-resistant.

Application: Bits from stainless steel are used where extraneous rust at stainless steel is to be avoided. Especially for screwing stainless steel screws in window and door construction, in case of fittings and sinks, facades, handrails, balconies, fences etc.

TORSION

Wera





Part No.	Dimensions	6434 Wera	Length mm	PU piece
0005	PZ 1	1.39	25	10
0010	PZ 2	1.39	25	10
0015	PZ 3	1.39	25	10
		(584)		

Note: Extraneous rust in stainless steel processing is caused by tools made of normal steel. Abraded particles are thereby produced which adhere to the stainless steel. These particles become rust under the effect of oxygen. **Use stainless steel tools only for stainless steel screws and store them separately! Extraneous rust is thereby avoided. Stainless Rapidaptor® see (part no. 6428 0010).**

Bits for Hexagon Socket Screws 1/4" DIN 3126 C 6.3

Design: The Hex-Plus geometry permits a higher static torque of max. 35 %, Hex-Plus® tough-hard tip.

Hex-Plus

Wera



Part No.	Key width mm	6429 Wera	Length mm	PU piece
0005	2	0.81	25	10
0010	2.5	0.81	25	10
0015	3	0.81	25	10
0020	4	0.81	25	10
0025	5	0.81	25	10
0030	6	0.81	25	10
0035	8	1.13	25	10
		(545)		

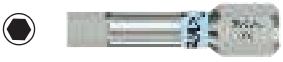
Hexagon Socket Screws

Design: Made of stainless steel. Thanks to the vacuum ice-hardening the tip features the same hardness as conventional tools and is therefore workshop-compatible and wear-resistant.

Application: Bits from stainless steel are used where extraneous rust at stainless steel is to be avoided. Especially for screwing stainless steel screws in window and door construction, in case of fittings and sinks, facades, handrails, balconies, fences etc.

Part No.	Key width mm	6457 Wera	Length mm	PU piece
0000	1.5	1.74	25	10
0005	2	1.74	25	10
0010	2.5	1.74	25	10
0015	3	1.74	25	10
0020	4	1.74	25	10
0025	5	1.74	25	10
0030	6	1.74	25	10
		(584)		

TORSION Hex-Plus Wera





Note: Extraneous rust in stainless steel processing is caused by tools made of normal steel. Abraded particles are thereby produced which adhere to the stainless steel. These particles become rust under the effect of oxygen. **Use stainless steel tools only for stainless steel screws and store them separately! Extraneous rust is thereby avoided. Stainless Rapidaptor® see (part no. 6428 0010).**

NEW

KNIPEX "Cobra" ES

The Cobra grips everything!

- Firm grip, even in confined spaces and at components which are difficult to access
- Patented very slender design (ES) in head and articulation area
- Long, pointed jaws for safe grip
- Ideal tool for maintenance and repair operations
- Handy fine adjustment of 19 positions at the push of a button

For further KNIPEX water pump pliers see pages 5/63 to 5/65.

KNIPEX



5/63

TORX® and TORX PLUS® Bits
TORX® tools fit into TORX PLUS® screws. TORX PLUS® tools are however superior to TORX® tools in torque transmission, due to the significantly larger contact face in the screw.

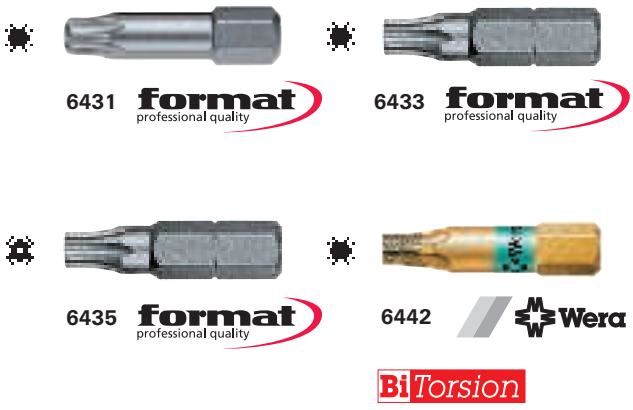
Note: The TORX® system and the TORX PLUS® system are compatible only to a limited extent: The operation (restricted) of a TORX PLUS® tool with the conventional TORX® tool is possible. The use of TORX PLUS® with a TORX® profile is however not possible.



Contact Faces TORX® and TORX PLUS®

Bits for Recess TORX® Screws 1/4" drive, DIN 3126 C 6.3

6431 **Design:** Torsion-shaped, tough-hard tip.
6433 **Design:** Tough-hard tip.
6435 **Design:** With hole, tough-hard tip.
6442 **Design:** BiTorsion®, diamond-coated.



Part No.	Dimensions	6431	6433	6435	6442 Wera	Length mm	PU piece
0001	T 6	0.29	–	–	–	25	10
0002	T 7	0.29	–	0.81	–	25	10
0003	T 8	0.29	–	0.81	–	25	10
0004	T 9	0.29	–	0.81	–	25	10
0005	T 10	–	0.29	0.81	1.65	25	10
0010	T 15	–	0.29	0.81	1.65	25	10
0015	T 20	–	0.29	0.81	1.65	25	10
0020	T 25	–	0.29	0.81	1.65	25	10
0025	T 27	–	0.29	0.81	–	25	10
0030	T 30	–	0.29	0.81	1.65	25	10
0035	T 40	–	0.29	0.81	1.65	25	10
		(546)	(546)	(546)	(545)		

INOX Bits for Recess TORX® Screws 1/4" DIN 3126 C 6.3 Stainless

Design: Made of stainless steel. Thanks to the vacuum ice-hardening the tip features the same hardness as conventional tools and is therefore **workshop-compatible and wear-resistant.**

Application: Bits from stainless steel are used where extraneous rust at stainless steel is to be avoided. Especially for screwing stainless steel screws in window and door construction, in case of fittings and sinks, facades, handrails, balconies, fences etc.

TORSION Wera



Part No.	Size	6444 Wera	Length mm	PU piece
0003	T 8	1.74	25	10
0004	T 9	1.74	25	10
0005	T 10	1.74	25	10
0010	T 15	1.74	25	10
0015	T 20	1.74	25	10
0020	T 25	1.74	25	10
0025	T 27	1.74	25	10
0030	T 30	1.74	25	10
0035	T 40	1.74	25	10
		(584)		

Note: Extraneous rust in stainless steel processing is caused by tools made of normal steel. Abraded particles are thereby produced which adhere to the stainless steel. These particles become rust under the effect of oxygen. **Use stainless steel tools only for stainless steel screws and store them separately! Extraneous rust is thereby avoided. Stainless Rapidaptor® see (part no. 6428 0010).**

Bits for Recess TORX® Screws 1/4" DIN 3126 C 6.3, with Holding Function

Design: Torsion-shaped and holding function. The special geometry of the tip ensures reliable holding of the screw.

Application: Bits with holding function are the ideal tool when positioning TORX® screws in confined spaces, e.g. assembly of indexable inserts.

Part No.	Size	6449 Wera	Length mm	PU piece
0003	T 8	0.38	25	10
0004	T 9	0.38	25	10
0005	T 10	0.38	25	10
0010	T 15	0.38	25	10
0015	T 20	0.38	25	10
0020	T 25	0.38	25	10
0025	T 27	0.38	25	10
0030	T 30	0.38	25	10
0035	T 40	0.38	25	10
		(545)		



Bits for Recess TORX® Screws 1/4" DIN 3126 C 6.3, with Holding Function

Design: Torsion-shaped and holding function. The special geometry of the tip ensures reliable holding of the screw.

Application: Bits with holding function are the ideal tool when positioning TORX® screws in confined spaces, e.g. assembly of indexable inserts.

Part No.	Size	6451 Wera	Length mm	PU piece
0003	T 8	1.46	50	10
0005	T 10	1.46	50	10
0010	T 15	1.46	50	10
0015	T 20	1.46	50	10
0020	T 25	1.46	50	10
0025	T 27	1.46	50	10
0030	T 30	1.46	50	10
0035	T 40	1.46	50	10
		(545)		



Bits for Recess TORX PLUS® Screws 1/4" DIN 3126 C 6.3

Design: Tough-hard tip.

Part No.	Size	6438 Wera	Length mm	PU piece
0010	10 IP	1.27	25	10
0015	15 IP	1.27	25	10
0020	20 IP	1.27	25	10
0025	25 IP	1.27	25	10
0030	30 IP	1.27	25	10
0040	40 IP	1.27	25	10
		(545)		



Bits for ASSY®-, pias Screws 1/4" DIN 3126-C 6.3

Design: SIT tip, tough-hard.

1 Improved transmission of forces due to 6 contact faces.

2 Faster screwing and improved fit due to tapered geometry. Reduced ejection forces due to secure fit in the screw.



Part No.	Size	6440 Wera	Length mm	PU piece
0010	SIT 10	0.70	25	10
0020	SIT 20	0.70	25	10
0025	SIT 25	0.70	25	10
0030	SIT 30	0.70	25	10
0040	SIT 40	0.70	25	10
		(545)		



Bits for Recess TORX® Screws with ABC-TORX® profile 1/4" DIN 3126 C 6.3

Design: Though-hard tip, with tenon.

Application: Especially for screws with ABC-TORX® profile.

Part No.	Size	6446 Wera	Length mm	PU piece
0005	T 10	0.49	25	10
0010	T 15	0.49	25	10
0015	T 20	0.49	25	10
0020	T 25	0.49	25	10
0030	T 30	0.49	25	10
0035	T 40	0.49	25	10
		(545)		



Bits for Slotted Head Screws 1/4" DIN 3126 E 6.3

Design: Tough-hard tip.

Part No.	Blade width mm	6441 Wera	Blade thickness mm	Length mm	PU piece
0005	3	1.45	0.5	50	10
0010	3.5	1.45	0.6	50	10
0015	4	1.45	0.8	50	10
0020	4	2.11	0.8	89	10
0025	5.5	1.45	0.8	50	10
0030	5.5	2.11	1	89	10
0035	6.5	1.45	1.2	50	10
0036	6.5	2.11	1.2	89	10
0040	8	1.45	1.2	50	10
0045	8	2.11	1.2	89	10
		(545)			



Bits for Cross Recess Screws (Phillips) with 1/4" drive, DIN 3126 E 6.3

6447 **Design:** Torsion-shaped, tough-hard tip.

6456 **Design:** BiTorsion®, diamond-coated tip.

Part No.	Dimensions	6447	6456 Wera	Length mm	PU piece
0005	PH 1	0.77	2.13	50	10
0010	PH 2	0.77	2.13	50	10
0015	PH 3	0.77	2.13	50	10
		(546)	(545)		



6447 format professional quality



6456 Wera BiTorsion

Socket Bits 1/4" for Phillips Cross Recess Screws, 1/4" Square Drive DIN 3126 E 6.3

Design: Drive toughened, **long version.**

Part No.	Dimensions	6443 Wera	Length mm	PU piece
0005	PH 1	1.78	70	10
0010	PH 1	2.06	89	10
0012	PH 1	2.94	152	10
0015	PH 2	1.78	70	10
0020	PH 2	2.06	89	10
0022	PH 2	2.94	152	10
0025	PH 3	1.78	70	10
0030	PH 3	2.06	89	10
0032	PH 3	2.94	152	10
		(545)		



Bits for Cross Head Screws Pozidriv 1/4" DIN 3126 E 6.3

6448 **Design:** Torsion form, drive toughened.

6458 **Design:** BiTorsion®, tip diamond-coated.

Part No.	Dimensions	6448	6458 Wera	Length mm	PU piece
0005	PZ 1	0.77	2.13	50	10
0010	PZ 2	0.77	2.13	50	10
0015	PZ 3	0.77	2.13	50	10
		(546)	(545)		



6448 format professional quality



6458 Wera BiTorsion

Bits for Cross Head Screws Pozidriv 1/4" DIN 3126 E 6.3

Design: Tip toughened, **long version.**

Part No.	Dimensions	6445 Wera	Length mm	PU piece
0005	PZ 1	1.78	70	10
0010	PZ 1	2.06	89	10
0015	PZ 2	1.78	70	10
0020	PZ 2	2.06	89	10
0025	PZ 3	1.78	70	10
0030	PZ 3	2.06	89	10
		(545)		



Bits for Hexagon Socket Screws 1/4" DIN 3126 E 6.3

Design: The Hex-Plus geometry permits a higher static torque of max. 35 %, Hex-Plus® tip toughened.

Part No.	Key width mm	6450 Wera	Length mm	PU piece
0005	2	1.53	50	10
0010	2.5	1.53	50	10
0015	3	1.53	50	10
0020	4	1.53	50	10
0025	5	1.53	50	10
0030	6	1.53	50	10
0035	8	2.56	50	10
		(545)		



Bits for TORX® Socket Screws with 1/4" Drive, DIN 3126 E 6.3

6452 **Design:** Tip toughened.

6454 **Design:** Tip toughened, **long version.**

Part No.	Dimensions	6452	6454 Wera	Length mm 6452	Length mm 6454	PU piece
0008	T 8	1.16	–	50	–	10
0010	T 10	1.16	2.23	50	70	10
0015	T 15	1.16	2.23	50	70	10
0020	T 20	1.16	2.23	50	70	10
0025	T 25	1.16	2.23	50	70	10
0027	T 27	1.16	2.23	50	70	10
0030	T 30	1.16	2.23	50	70	10
0040	T 40	1.16	2.23	50	70	10
		(546)	(545)			



6452 format professional quality



6454 Wera

Bits for TORX® Socket Screws 1/4" DIN 3126 E 6.3

Design: Tip toughened, extra long version.

Part No.	Size	6455 Wera	Length mm	PU piece
0010	T 10	3.01	89	10
0015	T 15	3.01	89	10
0020	T 20	3.01	89	10
0025	T 25	3.01	89	10
0030	T 30	3.01	89	10
0040	T 40	3.01	89	10
		(545)		



Bits for TORX® Socket Screws 1/4" DIN 3126 E 6.3

Design: Tip toughened, **with hole, extra long version.**

Part No.	Size	6459 Wera	Length mm	PU piece
0008	T 8	3.62	89	10
0010	T 10	3.68	89	10
0015	T 15	3.68	89	10
0020	T 20	3.68	89	10
0025	T 25	3.68	89	10
0030	T 30	3.68	89	10
0040	T 40	3.68	89	10
		(545)		



Socket Wrenches 1/4“ DIN 3126 E 6.3

Design: With powerful permanent magnet.

Part No.	Key width mm	6460 Wera	Length mm
0006	5.5	1.85	50
0011	6	1.85	50
0016	7	1.85	50
0021	8	1.85	50
0026	9	1.85	50
0031	10	1.85	50
0036	12	2.23	50
0041	13	2.23	50
		(545)	



6460 0006 – 0041

Part No.	Key width inch	6460 Wera	Length mm
0046	1/4	1.93	50
0051	5/16	2.17	50
0056	3/8	2.17	50
		(545)	



6460 0046 – 0056

Bits for Slotted Head Screws 5/16“ DIN 3126 C 8

Design: Drift, toughened.

Part No.	Blade width mm	6462 Wera	Blade thickness mm	Length mm	PU piece
0005	5.5	1.46	1	41	10
0010	6.5	1.46	1.2	41	10
0015	8	1.46	1.2	41	10
0020	10	3.12	1.6	41	10
0025	12	3.12	2	41	10
0030	14	3.53	2.5	41	10
		(545)			



Bits for Cross Recess Screws Phillips/Pozidriv 5/16“ DIN 3126 C 8

6464 **Design:** Tip tough-hard, Phillips (PH).

6466 **Design:** Tip tough-hard, Pozidriv (PZ).

Part No.	Size	6464 Wera	6466 Wera	Length mm	PU piece
0005	1	1.04	1.04	32	10
0010	2	1.04	1.04	32	10
0015	3	1.04	1.04	32	10
0020	4	1.04	1.04	32	10
		(545)	(545)		



6464



6466

Bits for Hexagon Socket Screws 5/16“ DIN 3126 C 8

Design: The Hex-Plus geometry permits a higher static torque of max. 35 %, Hex-Plus®, tip tough-hard.

Part No.	Key width mm	6468 Wera	Length mm	PU piece
0005	3	1.48	30	10
0010	4	1.48	30	10
0015	5	1.48	30	10
0020	6	1.48	30	10
0025	8	1.48	30	10
		(545)		



Bits for TORX® Screws 5/16“ DIN 3126 C 8

Design: Drift, toughened.

Part No.	Dimensions	6470 Wera	Length mm	PU piece
0005	T 20	1.70	35	10
0010	T 25	1.70	35	10
0015	T 27	1.70	35	10
0020	T 30	1.70	35	10
0025	T 40	1.70	35	10
0030	T 45	1.70	35	10
0035	T 50	1.70	35	10
0040	T 55	1.70	35	10
		(545)		



Bit Sets

Design: 7-piece, in folding holder.

Part No.	Contents of set	6480 mm
0003	Universal holder with permanent magnet 1 slot each of 4.5 x 0.6, 5.5 x 0.8 1 cross recess each of PH 1, PH 2 1 cross recess each of PZ 1, PZ 2	4.65

(546)



Bit Sets

Design: 7-piece, in mini Bit-Safe®.

Part No.	Contents of set	6480 mm
0005	Universal holder with permanent magnet and snap ring 1 slot each of 4.5 x 0.6, 5.5 x 0.8 1 cross recess each of PH 1, PH 2 1 cross recess each of PZ 1, PZ 2	5.82

(546)



Bit Sets

Design: 10-piece, in Bit-Safe®.

Part No.	Contents of set	6480 mm
0010	Universal holder including permanent magnet and quickchange chuck 1 slot each of 5.5 x 0.8, 5.5 x 1.0, 6.5 x 1.2 mm 1 cross recess each of PH 1, PH 2, PH 3 1 cross recess each of PZ 1, PZ 2, PZ 3	11.68

(546)



Bit-Sets

Design: 31-piece, in Bit-Safe®.

Part No.	Contents of set	6480 mm
0030	Universal holder including permanent magnet 1 slotted head of each size: 4.5 x 0.6, 5.5 x 1, 6.5 x 1.2 mm; 3 cross recess of each size: PH 1, PH 2, PH 3; 3 cross recess of each size: PZ 1, PZ 2, PZ 3; 1 TORX® of each size: T 10, T 15, T 20, T 25, T 30, T 40; 1 hex of each size: SW 4, SW 5, SW 6	12.48

(546)



Bit Sets

Design: Handy plastic box, with easy removal of tools, as they are arranged in a clear and space-saving way. **Tough-hard tip.**

Application: For hard screwing in metal and sheet metal etc.

Contents in plastic box:
1 bit holder Rapidaptor® **with ring magnet** (part no. 6428 0005)
3 bits for slotted screws 0.6 x 4.5; 1.0 x 5.5; 1.2 x 6.5 mm
3 bits for hexagon socket screws 4; 5; 6 mm
9 bits for cross recess screws PH 1 (3 each); PH 2 (3 each); PH 3 (3 each)
9 bits for cross recess screws PZ 1 (3 each); PZ 2 (3 each); PZ 3 (3 each)
6 bits for TORX® screws T 10; T 15; T 20; T 25; T 30; T 40

Part No.	Design	6482
0090	31-piece	18.55 (545)



Bit Sets

Design: Handy plastic box, with easy removal of tools, as they are arranged in a clear and space-saving way. **Tough-hard tip.**

Application: For hard screwing in metal and sheet metal etc.

Contents in plastic box:
1 bit holder Rapidaptor® (part no. 6416 0005)
3 bits for slotted screws 0.6 x 4.5; 1.0 x 5.5; 1.2 x 6.5 mm
11 bits for hexagon socket screws 2.5 (3 each); 3 (3 each); 4 (3 each); 5 mm (2 each)
15 bits for cross recess screws PH 1 (3 each); PH 2 (10 each); PH 3 (2 each)
15 bits for cross recess screws PZ 1 (3 each); PZ 2 (10 each); PZ 3 (2 each)
16 bits for TORX® screws T 10 (2 each); T 15 (3 each); T 20 (3 each); T 25 (3 each); T 30 (3 each); T 40 (2 each)

Part No.	Design	6482
0100	61-piece	23.93 (545)



Bit Sets

Design: Handy plastic box, with easy removal of tools, as they are arranged in a clear and space-saving way. **Tough-hard tip.**

Application: For hard screwing in metal and sheet metal etc.

Contents in plastic box:
1 bit holder Rapidaptor® **with ring magnet** (part no. 6428 0005)
1 bit for cross recess screws PH 2
9 bits for cross recess screws PZ 1 (2 each); PZ 2 (5 each); PZ 3 (2 each)
20 bits for TORX® screws T 10 (3 each); T 15 (4 each); T 20 (4 each); T 25 (4 each); T 30 (4 each); T 40 (1 each)

Part No.	Design	6482
0120	31-piece	20.41 (545)



Bit Sets

Design: Handy plastic box, with easy removal of tools, as they are arranged in a clear and space-saving way. **Tough-hard tip.**

Application: For hard screwing in metal and sheet metal.

Contents in plastic box:
1 bit holder Rapidaptor® (part no. 6416 0005)
3 bits for cross recess screws PH 2 (3 each)
35 bits for cross recess screws PZ 1 (10 each); PZ 2 (20 each); PZ 3 (5 each)
22 bits for TORX® screws T 10 (3 each); T 15 (5 each); T 20 (5 each); T 25 (5 each); T 30 (2 each); T 40 (2 each)

Part No.	Design	6482
0110	61-piece	23.90 (545)



BiTorsion®-Bit-Check®-Rapidaptor®

Design: 7-piece, diamond-coated.

Part No.	Set contents	6482 Wera
0060	BiTorsion® Holder Rapidaptor® with quick change chuck 1 slotted head of each size: 5.5 x 1, 6.5 x 1.2 mm 1 cross recess of each size: PH 1, PH 2 1 cross recess of each size: PZ 1, PZ 2	19.48

(545)



BiTorsion®-Bit-Check®-Rapidaptor®

Design: 7-piece, diamond-coated.

Part No.	Set contents	6482 Wera
0065	BiTorsion® Holder Rapidaptor® with quick change chuck 2 cross recess PZ 1 3 cross recess PZ 2 1 cross recess PZ 3	19.48

(545)



BiTorsion®-Bit-Check®-Rapidaptor® with Ring Magnet

Design: 10-piece, handy plastic box, convenient removal of tools due to easy opening mechanism, Bit-Check locks in opening position. Stability and easy removal of tools at place of use is thereby ensured. **Extra-hard tip.**

Application: For gentle screwing in wood etc.

Part No.	Set contents	6482 Wera
0130	1 ring magnet Rapidaptor® with quick–change chuck 3 bits for cross recess screws PZ 1 x 25 mm 3 bits for cross recess screws PZ 2 x 25 mm 3 bits for cross recess screws PZ 3 x 25 mm	16.60

(545)



Bit Assortments TORX®

Design: 7-piece, in folding holder.

Part No.	Set contents	6480
0014	Universal holder with permanent magnet, 1 TORX® of each size: T 10, T 15, T 20, T 25, T 30, T 40	4.84

(546)



Bit Sets TORX®

Design: 10-piece, in Bit-Safe®.

Part No.	Set contents	6480
0015	Universal holder with permanent magnet and quick change chuck 1 TORX® of each size: T 7, T 8, T 9, T 10, T 15, T 20, T 25, T 30, T 40	13.74

(546)



BiTorsion®-Bit-Check®-Rapidaptor® TORX®

Design: 10-piece, tip toughened.

Part No.	Set contents	6482
0080	BiTorsion® Holder Rapidaptor® with quick change chuck 1 TORX® of each size: T 10, T 15 2 TORX® of each size: T 20, T 25, T 30 1 TORX® T 40	26.65

(545)



BiTorsion®-Bit-Check®-Rapidaptor® TORX®

Design: 7-piece, diamond-coated.

Part No.	Set contents	6482
0070	BiTorsion® Holder Rapidaptor® with quick change chuck 1 TORX® of each size: T 10, T 15, T 20, T 25, T 30, T 40	20.29

(545)



INOX BiTorsion®-Bit-Check®-Rapidaptor® Stainless

Design: 10-piece, handy plastic box, convenient removal of tools due to easy opening mechanism, Bit-Check locks in opening position. Stability and easy removal of tools at place of use is thereby ensured.

Application: Especially for screwing of **stainless steel screws to avoid extraneous rust.**

Part No.	Set contents	6482
0200	1 bit holder Rapidaptor® Stainless 1 bit for cross recess screws PH 2 3 bits for cross recess screws 1 x PZ 1, 2 x PZ 2 5 bits for TORX® screws T 10; T 15; T 20; T 25; T 30	21.16

(584)



INOX BiTorsion®-Bit-Check®-Rapidaptor® Stainless

Design: 10-piece, handy plastic box, convenient removal of tools due to easy opening mechanism, Bit-Check locks in opening position. Stability and easy removal of tools at place of use is thereby ensured.

Application: Especially for screwing of **stainless steel screws to avoid extraneous rust.**

Part No.	Set contents	6482 Wera
0210	1 bit holder Rapidaptor® Stainless 5 bits for cross recess screws 2 x PH 1; 2 x PH 2; 1 x PH 3 4 bits for hexagon socket screws 2.5; 3; 4; 5 mm	22.05

(584)



INOX BiTorsion®-Bit-Check®-Rapidaptor® Stainless

Design: 10-piece, handy plastic box, convenient removal of tools due to easy opening mechanism, Bit-Check locks in opening position. Stability and easy removal of tools at place of use is thereby ensured.

Application: Especially for screwing of **stainless steel screws to avoid extraneous rust.**

Part No.	Set contents	6482 Wera
0220	1 bit holder Rapidaptor® Stainless 3 bits for cross recess screws PZ 1; PZ 2; PZ 3 6 bits for TORX® screws with tenon T 10; T 15; T 20; T 25; T 30; T 40	21.16

(584)



Bit-Safe® Allround

Design: 32-piece, Kraftform® hand holder with quick change chuck, in plastic box.

Part No.	Set contents	6482 Wera
0040	Bits hand holder Kraftform® holder with quick change chuck Universal holder with quick change chuck 1 each: slot 4.5 x 0.6, 5.5 x 1.0, 6.5 x 1.2 mm 3 each: cross recess PH 1, PH 2, PH 3 3 each: cross recess PZ 1, PZ 2, PZ 3 1 each: TORX® with bore T 10, T 15, T 20, T 25, T 30, T 40 1 each: SW 4, SW 5, SW 6	35.40

(545)



Bit-Safe® Security

Design: 32-piece **special set for locking screws,** Kraftform® hand holder incl. quick change chuck in plastic box.

Part No.	Set contents	6482 Wera
0045	Bits Kraftform® hand holder incl. quick change chuck Universal holder incl. quick change chuck 1 each of wrench size 2, 3, 4, 5, 6 for hexagon socket with dowel pin 1 each No. 4, No. 6, No. 8, No. 10 for spanner screws 1 each T 7, T 8, T 9, T 10, T 15, T 20, T 25, T 30, T 40 for TORX® screws with dowel pin 1 each No. 6, No. 8, No. 10, No. 1/4" for TORQ–SET® screws 1 each No. 1, No. 2, No. 3 for TRI–WING® screws 1 each No. 0, No. 1, No. 2, No. 3 for SQUARE DRIVE screws	51.71

(545)



Kraftform Kompakt® 50

Design: 14-piece, variable use for machine and hand screwing. Kraftform® hand holder with bajonet, in plastic box.

Part No.	Set contents	6482 Wera
0055	Hand holder with bayonet Adapter bayonet with quick change chuck 1 slotted head of each size: 4.5 x 0.6, 5.5 x 1 mm; 1 cross recess of each size: PH 1, PH 2; 1 cross recess of each size: PZ 1, PZ 2; 1 TORX® with hole T 10, T 15, T 20, T 25, T 30, T 40	34.17

(545)



Kraftform Kompakt® 91

Design: 18-piece, Kraftform Kompakt® one-hand ratchet with right/left-hand motion, incl. quick change chuck, in plastic box.

Part No.	Set contents	6483 Wera
0020	Kraftform Kompakt® one-hand ratchet with quick change chuck Universal holder with permanent magnet and quick change chuck Adapter 1/4" for Socket wrenches: 1 cross recess of each size: PH 1, PH 2, PH 3 1 TORX® with bore hole of each size: T 15, T 20, T 25, T 30, T 40 1 hexagon of each wrench size: 3, 4, 5 1 socket wrench of each size: 5.5; 7; 8; 10; 13	61.88

(545)



Kraftform Kompakt® 40

Design: 7-piece, wallet with 89 mm long bits.

Part No.	Set contents	6496 Wera
0005	Hand holder with quick change chuck 1 slotted head of each size: 5.5 x 1, 6.5 x 1.2 mm 1 cross recess of each size: PH 1, PH 2 1 cross recess of each size: PZ 1, PZ 2	19.89

(545)



Kraftform Kompakt® 40

Design: 11-piece, wallet with 89 mm long bits.

Part No.	Set contents	6496 Wera
0010	Hand holder with quick change chuck 1 cross recess of each size: PH 1, PH 2, PH 3 1 cross recess of each size: PZ 1, PZ, PZ 3 1 TORX® with hole of each size: T 15, T 20, T 25, T 30	25.72

(545)



Kraftform Kompakt® 60

Design: 17-piece, wallet with 89 mm long bits.

Part No.	Set contents	6496 Wera
0015	Hand holder with quick change chuck 1 slotted head of each size 5.5 x 1 mm, 1 cross recess of each size: PH 1, PH 2, PH 3 1 cross recess of each size: PH 1, PH 2; PZ 1, PZ 2, PZ 3 1 TORX® with hole of each size: T 10, T 15, T 20, T 25, T 30 1 hexagon of each wrench size: 3, 4, 5, 6	34.93

(545)



Kraftform Kompakt® 61

Design: 17-piece, wallet with 89 mm long bits.

Part No.	Set contents	6496 Wera
0020	Hand holder with quick change chuck 1 TORX® with bore hole of each size: T 10, T 15, T 20, T 25, T 30 1 Torq-Set® of each size: #6, #8, #10 1 Tri-Wing® of each size: #1, #2, #3 1 spanner of each size #4, #6, #8, #10	36.82

(545)



Kraftform Kompakt® 62

Design: 33-piece, wallet with 89 mm long bits.

Part No.	Set contents	6496 Wera
0025	Design: Wallet with 89 mm long bits. Hand holder with quick change chuck 1 slotted head 6.5 x 1.2 mm 1 cross recess of each size: PH 1, PH 2, PH 3 1 cross recess of each size: PZ 1, PZ 2, PH 3 1 TORX® with bore hole of each size: T 8, T 10, T 15, T 20, T 25, T 27, T 30, T 40 1 Hex-Plus® of each wrench size: 2, 2.5, 3, 4, 5, 6 1 Torq-Set® of each size: #6, #8, #10 1 Tri-Wing® of each size: #1, #2, #3, #4 1 spanner of each size: #4, #6, #8, #10	57.53

(545)



Vario Handles

Design: Handles with 6 mm hexagon socket for vario blades and adapters.

6484 **Design:** 3-component, Kraftform® handle with anti-roll protection, 10 mm bolster.

6485 **Design:** T-handle Weralit® II, 1-component.

Part No.	Length mm	6484	6485
0005	98	5.17	–
0010	56	–	5.37
		(545)	(545)



6484



6485

Vario Free-running T-handles

Design: With 6 mm hexagon socket for vario blades and adapters, free-running ratchet with almost 0° restoring angle, incl. overload protection and 10 mm bolster, Weralit® II T-handle, 1-component.

Part No.	Length mm	6486
0005	105	20.37
		(545)



Vario Extensions

Design: Blade from 6 mm hexagonal material, nicromatt, with 6 mm hexagon socket for vario blades and adapters.

Part No.	Length mm	6488
0005	175	7.42
		(545)



Adapter Blades

Design: Blade from 6 mm hexagonal material, nicromatt.

6490 **Design:** With quick change chuck, 1/4" hexagon socket and powerful permanent magnet.

6492 **Design:** With 1/4" square.

Part No.	Length mm	6490	6492
0005	165	9.79	–
0005	155	–	6.28
		(545)	(545)



6490



6492

Vario Combination Blades

Design: Blade from 6 mm hexagonal material, nicromatt, 175 mm long.

Part No.	Design	6494	Dimensions
0005	Slot	3.53	4 x 0.6 + 6 x 1 mm
0010	Slot	3.53	5 x 0.8 + 7 x 1.2 mm
0015	Cross recess and slot	3.53	PH 1 + 4 x 0.6 mm
0020	Cross recess and slot	3.53	PH 2 + 6 x 1 mm
0025	Cross recess and slot	3.53	PH 3 + 7 x 1.2 mm
0030	Cross recess	3.53	PH 1 + PH 2
0035	Cross recess	3.53	PZ 1 + PZ 2
0040	Ball point and hexagon	3.53	SW 2.5 + SW 2.5
0045	Ball point and hexagon	3.53	SW 3 + SW 3
0050	Ball point and hexagon	3.53	SW 4 + SW 4
0055	Ball point and hexagon	3.53	SW 5 + SW 5
0060	Ball point and hexagon	3.53	SW 6 + SW 6
0065	TORX®	3.53	T 6 + T 8
0070	TORX®	3.53	T 7 + T 9
0075	TORX®	3.53	T 10 + T 15
0080	TORX®	3.53	T 20 + T 25
0085	TORX®	3.53	T 30 + T 40
		(545)	



6494 0005–0010



6494 0015–0025



6494 0030



6494 0035



6494 0040–0060



6494 0065–0085

Vario Sets

Design: 11-piece set, especially for rough work in the workshop.

Part No.	Contents of set	6495 Wera
0005	Vario-handle, 3-component-Kraftform®-Grip with anti-slip surface 1 blade each for slotted screws 4 x 0.6 + 6 x 1, 5 x 0.8 + 7 x 1.2 mm 1 blade each for hexagon screws, wrench size 4 + wrench size 4; wrench size 5 + wrench size 5; wrench size 6 + wrench size 6 1 blade each for cross recess screws PH 1 + PH 2; PZ 1 + PZ 2 1 blade each for TORX® screws T 10 + T 15; T 20 + T 25; T 30 + T 40	47.67

(545)



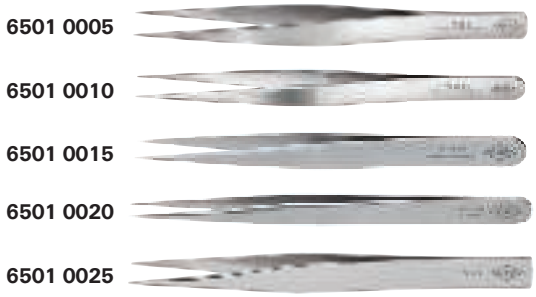
Precision Tweezers, Pointed Form, Straight

Design: Especially fine tips, smooth gripping jaws.

Application: For precision assembly work.

Part No.	Length mm	6501	Design
0005	130	9.37	Stainless steel, anti-magnetic, acid-proof
0010	120	9.37	Stainless steel, anti-magnetic, acid-proof
0015	115	8.60	Stainless steel, anti-magnetic, acid-proof
0020	120	14.16	Titan, light-weight, anti-glare matt finish
0025	120	4.88	Nickel-plated, high-polished

(525)



Precision Tweezers, Extra-fine Tips

Design: Extra fine tips, smooth gripping jaws.

Application: For precision assembly work.

Part No.	Length mm	6503	Design
0005	105	10.20	Stainless steel, anti-magnetic, acid-proof
0010	135	9.60	Straight, US form, solid tips
0015	120	10.36	Bent, stainless steel, anti-magnetic
0020	105	10.13	Bent, stainless steel, anti-magnetic

(525)



ESD Tweezers

Design: Non-reflective coating, surface resistance 10^5 Ohm.

Application: For precision assembly jobs in electrostatic protection zones (EPA).

Part No.	Length mm	6505	Design
0005	120	12.65	Offset tips, smooth gripping jaws, for SMD technique
0010	120	10.90	Smooth gripping jaws, grooved for gripping cylindrical items of ⌀ 1 mm
0015	130	6.63	Straight tips, smooth gripping jaws
0020	105	9.13	Straight tips, smooth gripping jaws
0025	110	9.91	Straight, very fine tips, smooth gripping jaws
0030	135	9.60	Straight, very fine tips, smooth gripping jaws, US form, sturdy
0035	120	10.81	Bent tips, smooth gripping jaws
0040	120	9.13	Round tips, approx. 2 mm wide, straight, smooth gripping jaws
0045	145	9.00	Round tips, approx. 3.5 mm wide, straight, serrated gripping jaws
0050	130	8.22	Pointed tips, serrated gripping jaws

(525)



VDE Tweezers

Design: Plastic dipped to IEC 60900:2004, for working on live equipment up to 1,000 v.

Part No.	Length mm	6507	Design
0005	130	12.04	Pointed tips, straight, smooth gripping jaws
0010	150	12.18	Pointed tips, straight, gripping jaws with fine serration
0015	150	12.43	Pointed tips, bent, gripping jaws with fine serration
0020	145	12.11	Round tips, straight, serrated gripping jaws

(525)



Plastic Tweezers

Part No.	Length mm	6509	Design
0005	130	1.53	Trapezoidal tips, approx. 3.5 mm wide, serrated jaws, resistant to temperatures of 130°

(525)



Precision Tweezers

Part No.	Length mm	6511	Design
0005	125	5.95	Rectangular stepped tips, jaws finely serrated, nickel-plated
0010	120	8.91	Round tips, approx. 2 mm wide, smooth gripping jaws, stainless steel, acid-proof
0015	140	5.95	Jeweller's tweezers, gripping jaws with diagonal serration, nickel-plated, round tips
0020	120	4.72	Round tips, approx. 3 mm wide, gripping jaws with fine serration, nickel-plated
0025	145	5.25	Round tips, approx. 3 mm wide, gripping jaws with fine serration, nickel-plated
0030	145	6.10	Round tips, approx. 3 mm wide, gripping jaws with fine serration, black-coated surface
0035	145	8.53	Round tips, approx. 3 mm wide, gripping jaws with fine serration, stainless steel, anti-magnetic

(525)



Precision Tweezers, Pointed, with Dowel Pin

Part No.	Length mm	6513	Design
0005	155	8.46	Straight, pointed tips, stainless steel anti-magnetic
0010	155	5.95	Straight, nickel-plated
0015	155	8.00	Bent, fine tips, nickel-plated
0020	155	6.10	Bent, black coated

(525)



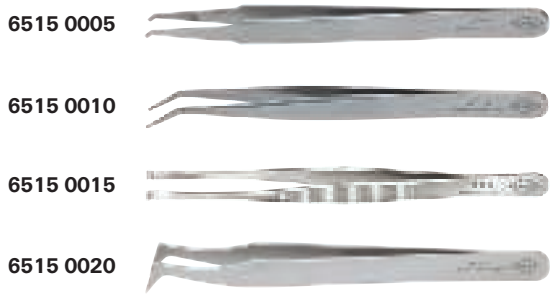
Tweezers

Assembly Tweezers

Design: Smooth gripping jaws, non-reflective, matt, stainless steel, non-magnetic.

Part No.	Length mm	6515	Design
0005	120	11.81	For SMD applications, stepped tips
0010	120	12.35	For SMD applications, stepped tips, profile for cylindrical components of ⌀ 0.6 mm
0020	120	9.91	Stepped tips, very strong
0015	115	9.30	Gripping jaw approx. 3 mm wide, profile for cylindrical components ⌀ 0.8 mm

(525)



Crossover Tweezers

Design: Good clamping, special steel.

Part No.	Length mm	6517	Design
0005	160	9.08	Trapezoidal, gripping jaws with fine serration
0015	160	10.73	Pointed, gripping jaws with fine serration, handles
0010	160	10.73	Pointed, bent, gripping jaws with fine serration, handles

(525)



Claw Grippers

Design: With 3 gripping jaws with spring pressure for holding of items. Claws opening max. 15 mm, rigid shaft with fastening clip.

Part No.	Length mm	6525
0010	170	9.83

(516)



Magnetic Extractors

Design: With flexible lever, chromium-plated and plastic handle for removing steel chips, screws and other items.

Part No.	Magnet ⌀ mm	3972	Overall ⌀ mm	Total length mm	Adhesive force g
0012	9	11.83	12	460	10
0015	12	15.85	15	520	18

(352)



Telescopic Magnetic Extractors

Design: Extractable telescopic shaft, chromium-plated, with capped scribing pin.

Part No.	Length mm	6526	Magnet ⌀ mm	External ⌀ mm	Holding power g
0010	145–650	10.23	6	8	500

(350)

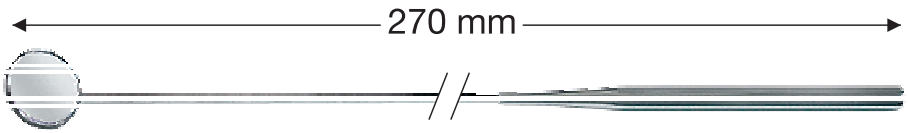


Hand-held Mirrors

Design: Mirror with metal frame, chromium-plated shaft, hexagon metal handle in wallet.

Part No.	Length mm	6527	ø mm
0010	260	7.08 (516)	24



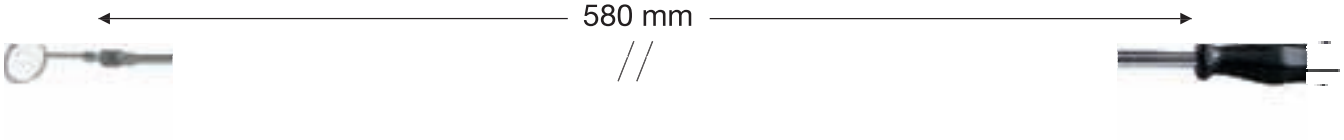


Telescopic Hand-held Mirror

Design: Extractable telescopic shaft, mirror with metal frame, chromium-plated shaft.

Part No.	Length mm	6527	ø mm
0020	180–530	7.86 (516)	30





NEW

Quick action clamps BESSEY OMEGA

Increased flexibility

- Offers maximum flexibility and safety in workshops and on building sites
- Minor clamping force loss even in case of heavy vibrations due to patented OMEGA jaw
- Protection of sensitive surfaces due to precise setting of clamping force
- Multi-purpose use in wood and metal working
- For suitable pressure plates see page 5/9

BESSEY



5/9

Files

General notes: Flawless steel structure ensures even hardness. Type and angle of the cut are defined by the intended application, whereby these cuts are possible: 1-bastard cut, 2-second cut and 3-smooth cut. Ideal tooth geometry for any desired application. The length of the file is measured without the tang from the tip to the nose.

Flat Files

Application: For producing angles and flat surfaces, everywhere where a smooth edge is required.

6530 **Design:** Form A, DIN 7261.

6532 **Design:** With ergonomic file handle.



6530



6532

format professional quality

PFERD

Part No.	Length mm	6530	6532	Cut	Cross-section mm
0101	100	1.45	–	1	12 x 2.5
0102	100	1.52	–	2	12 x 2.5
0103	100	1.54	–	3	12 x 2.5
0151	150	1.57	2.24	1	16 x 4
0152	150	1.60	2.27	2	16 x 4
0153	150	1.70	2.38	3	16 x 4
0201	200	1.87	2.68	1	20 x 5
0202	200	1.98	2.80	2	20 x 5
0203	200	2.09	2.90	3	20 x 5
		(548)	(551)		

Part No.	Length mm	6530	6532	Cut	Cross-section mm
0251	250	2.53	3.36	1	25 x 6
0252	250	2.65	3.49	2	25 x 6
0253	250	2.93	3.79	3	25 x 6
0301	300	3.39	–	1	30 x 6.5
0302	300	3.61	–	2	30 x 6.5
0303	300	3.84	–	3	30 x 6.5
0351	350	4.68	–	1	35 x 7.5
0352	350	4.87	–	2	35 x 7.5
0353	350	5.10	–	3	35 x 7.5
		(548)	(551)		

Flat Pointed Files

Design: DIN 7261 A. With ergonomic handle.

Application: For producing angles and flat surfaces.



PFERD

Part No.	Length mm	6534	Cut	Cross-section mm
0151	150	2.32	1	16 x 4
0152	150	2.38	2	16 x 4
0153	150	2.52	3	16 x 4
0201	200	2.80	1	20 x 5
0202	200	2.93	2	20 x 5
		(551)		

Part No.	Length mm	6534	Cut	Cross-section mm
0205	200	3.10	3	20 x 5
0251	250	3.53	1	25 x 6
0252	250	3.64	2	25 x 6
0253	250	3.91	3	25 x 6
		(551)		

Three Square Files

Application: For filing acute internal angles and the reaming of corners.

6542 **Design:** Form C, DIN 7261.

6544 **Design:** With ergonomic handle.



6542



6544

format professional quality

PFERD

Part No.	Length mm	6542	6544	Cut	Cross-section mm
0101	100	1.74	–	1	8
0102	100	1.87	–	2	8
0103	100	2.04	–	3	8
0151	150	2.04	2.73	1	11
0152	150	2.11	2.80	2	11
0153	150	2.19	2.90	3	11
0201	200	2.47	3.28	1	15
0202	200	2.56	3.36	2	15
		(548)	(551)		

Part No.	Length mm	6542	6544	Cut	Cross-section mm
0203	200	2.67	3.53	3	15
0251	250	3.49	–	1	17.5
0252	250	3.66	–	2	17.5
0253	250	4.03	–	3	17.5
0301	300	5.09	–	1	20
0302	300	5.25	–	2	20
0303	300	5.43	–	3	20
		(548)	(551)		

Square Files

Application: For filing grooves, keyways and flat surfaces.

6548 **Design:** Form D, DIN 7261.

6549 **Design:** With ergonomic handle.



6548



6549

format professional quality

PFERD

Part No.	Length mm	6548	6549	Cut	Cross-section mm
0151	150	1.67	2.37	1	6
0152	150	1.80	2.52	2	6
0153	150	1.98	2.69	3	6
0201	200	2.02	2.82	1	8
0202	200	2.13	2.93	2	8
0203	200	2.27	3.08	3	8
		(548)	(551)		

Part No.	Length mm	6548	6549	Cut	Cross-section mm
0251	250	2.60	–	1	10
0252	250	2.75	–	2	10
0253	250	2.95	–	3	10
0301	300	3.84	–	1	12
0302	300	4.03	–	2	12
0303	300	4.22	–	3	12
		(548)	(551)		

Half Round Files

Application: For filing corners and concave surfaces.

6554 **Design:** Pointed, form E, DIN 7261.

6558 **Design:** Pointed, with ergonomic handle.

6556 **Design:** Straight, with ergonomic handle.



6554



6558



6556

Part No.	Length mm	6554	6558	6556	Cut	Cross-section mm
0151	150	2.72	3.46	3.12	1	16 x 4.5
0152	150	2.82	3.57	3.23	2	16 x 4.5
0153	150	2.90	3.65	3.31	3	16 x 4.5
0201	200	3.16	4.01	3.65	1	20 x 6
0202	200	3.32	4.18	3.76	2	20 x 6
0203	200	3.50	4.38	4.05	3	20 x 6
0251	250	4.32	5.24	4.81	1	25 x 7
0252	250	4.48	5.41	4.95	2	25 x 7
0253	250	4.70	5.65	5.15	3	25 x 7
0301	300	5.63	–	–	1	30 x 8.5
0302	300	5.84	–	–	2	30 x 8.5
0303	300	6.11	–	–	3	30 x 8.5
		(548)	(551)	(551)		

Round Files

Application: For filing or enlarging circular openings or concave workpieces.

6560 **Design:** Form F, DIN 7261.

6562 **Design:** With ergonomic handle.



6560



6562

Part No.	Length mm	6560	6562	Cut	Cross-section mm
0101	100	1.45	–	1	4
0102	100	1.60	–	2	4
0103	100	1.72	–	3	4
0151	150	1.45	2.12	1	6
0152	150	1.60	2.27	2	6
0153	150	1.72	2.42	3	6
0201	200	1.74	2.52	1	7.5
0202	200	1.87	2.68	2	7.5
		(548)	(551)		

Part No.	Length mm	6560	6562	Cut	Cross-section mm
0203	200	2.04	2.83	3	7.5
0251	250	2.38	3.21	1	9.5
0252	250	2.53	3.36	2	9.5
0253	250	2.72	3.57	3	9.5
0301	300	3.12	–	1	12
0302	300	3.39	–	2	12
0303	300	3.66	–	3	12
		(548)	(551)		

Engineer's File Sets

6566 **Design:** 5-piece, in roll-up wallet, with plastic handle. Consisting of 1 of the following engineer's files: flat, half-round, round, three-square and wood rasp (half-round).

6568 **Design:** 5-piece, in roll-up wallet, with ergonomic handle. Including 1 engineer's file each: hand, three-square, square, round, half-round.

6570 **Design:** 6-piece, in roll-up wallet, with ergonomic handle. Including 1 hand file each: flat file 200 mm, cut 1-3 and 1 flat file 300 mm, cut 1-3.



6566



6568



6570

Part No.	Length mm	6566 Set	6568 Set	6570 Set	Cut
0200	200	19.06	25.05	–	2
0250	250	25.69	31.25	–	2
0300	300	–	41.44	–	2
0500	200/300	–	–	33.10	1, 2, 3
		(548)	(551)	(551)	

Knife Files

Design: Form G; DIN 7261.

Application: For filing acute angles. Ideal for tool making and die work.

Part No.	Length mm	6572	Cut	Cross-section mm
0200	200	8.54	2	20 x 6.4 x 1.5
0250	250	10.62	2	25 x 7.9 x 1.75
		(548)		



Lathe Files

Design: Form H, DIN 7261, single cut, reverse cutting.

Advantage: During operation on the lathe the file moves away from the chuck.

Part No.	Length mm	6575	Cut	Cross-section mm
0250	250	11.17	1	25 x 6
0300	300	14.42	1	30 x 6.5
		(549)		



Key Files DIN 7283

Part No.	Shape	6578	Length mm	Cut	Cross-section mm
0005	Flat	2.21	100	2	10 x 1.4
0010	Flat point	2.21	100	2	10 x 1.4
0015	Triangular	2.50	100	2	5
0020	Square	2.38	100	2	3
0025	Half-round	2.71	100	2	9 x 3
0030	Round	2.28	100	2	3
		(549)			



6578 0005



6578 0010



6578 0015



6578 0020



6578 0025



6578 0030

Key File Sets

Contents: Consisting of 1 file each: flat, flat point, three square, square, round, half-round with wooden handle.

6581 **Design:** In metal case.

6582 **Design:** In plastic wallet.

Part No.	Length mm	6581	6582	Cut
0100	100	–	17.19	2
0102	100	5.29	–	2
		(548)	(549)	



6581



6582

Contact File Sets

Design: With tang and crosscut, parallel in width and thickness, cut out both sides. Cutting length 80 mm. Plastic wallet with 6 files.

Application: For filing distributor contacts in auto repair applications.

Part No.	Length mm	6584 Set with 6 pieces	Cut
0002	150	2.64	2
		(548)	



Saw Files

Design: Slender, form A; DIN 7262.

Part No.	Length mm	6587	Cut	Cross-section mm
0125	125	2.27	2	7
0150	150	2.52	2	8.5
0200	200	3.76	2	12
		(548)		



Mill Saw Files

Design: Form F, DIN 7262, two rounded edges.

Part No.	Length mm	6590	Cut	Cross-section mm
0250	250	6.14	2	25 x 4.5
		(548)		



Chain Saw Files

Design: With helical cut.

Part No.	Length mm	6599	Cross-section mm
0150	200	0.85	3.5
0201	200	0.85	4
0203	200	0.85	4.8
0204	200	0.85	5.5
		(548)	

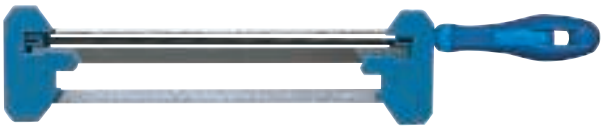


Chain Saw Sharpening Devices CHAIN SHARP

Design: Supplied in plastic bag, incl. sharpening device, chain saw file, special file and ergonomic handle.

Application: For precise filing of teeth and bit stop in one operation. The sharpening process is more cost-saving, economic and gentler than sharpening by machines and ensures a longer service life of the chain.

Part No.	Chain saw file ∅ mm	6600
0010	5.5	17.71
0020	4.8	17.71
0030	4	14.16
		(549)



Soft Metal Files

6602 **Design:** Flat.

6603 **Design:** Half round with helical cut.

Part No.	Length mm	6602	6603	Cut	Cross-section mm 6602	6603
0250	250	8.29	10.54	0	25 x 6	25 x 7
0300	300	–	14.48	0	–	30 x 8.5
		(549)	(549)			



6602



6603

Deburring Files

Design: For machining of plastics.

Part No.	Length mm	6604	Cut	Cross-section mm
0200	200	6.59	Cross cut	20 x 3.5
		(549)		

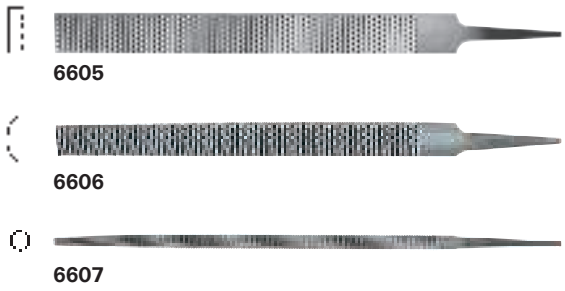


Wood Rasps

6605 **Design:** Flat, form A, DIN 7263.

6606 **Design:** Half-round, form C, DIN 7263.

6607 **Design:** Round, form E, DIN 7263.



Part No.	Length mm	6605	6606	6607	Cut 6605	Cut 6606	Cut 6607	Cross-section mm 6605	Cross-section mm 6606	Cross-section mm 6607
0200	200	–	5.13	4.46	–	2	2	–	21 x 7.5	9.5
0250	250	5.59	6.81	5.85	1	2	2	25 x 7.5	25 x 8.5	11.5
0300	300	–	8.78	–	–	2	–	–	30 x 10	–
		(548)	(548)	(548)						

Special Tooth Files, Flat

Design: For roughing and smooth-filing of steel, non-ferrous metal, wood and plastics. Spade-shaped teeth for easy and effortless filing.



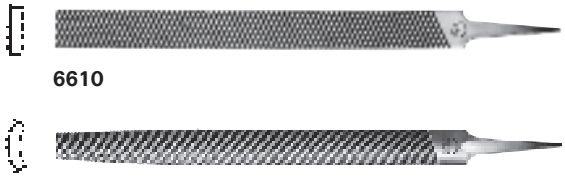
Part No.	Length mm	6608	Cut	Cross-section mm
0200	250	3.54	Special cut	25 x 6
0250	300	4.42	Special cut	30 x 6.5
		(548)		

Milled Tooth Files

Application: For rough cutting of soft metals such as unhardened steel, grey cast iron, copper, brass.

6610 **Design:** Flat, form A, DIN 7264.

6611 **Design:** Half-round, hollow, form F, DIN 7264. Only outside serrated.



Part No.	Length mm	6610	6611	Toothing	Cross-section mm
0250	250	–	15.33	1	23 x 7
0251	250	13.93	–	1	26 x 7
0252	250	15.27	–	2	26 x 7
0300	300	–	18.35	1	27 x 9
0301	300	17.53	–	1	31 x 8.3
0302	300	18.07	–	2	31 x 8.3
0303	300	18.96	–	3	31 x 8.3
0351	350	24.79	–	1	36 x 8.8
0352	350	25.98	–	2	36 x 8.8
		(549)	(549)		

Car Body Files

Design: Due to the fixture of the flexible file holder, the car body file can be bent to a greater or lesser extent. Individual adaptation to different shapes is thereby given.

6615 **Design:** With light metal handle, silver-coated, adjustable, for blade length 350 mm.

6616 **Design:** Car body file for fixing on holder 6615 0001, both sides spiral toothing, straight design.



Part No.	6615
0001	45.54
	(549)



Part No.	Length mm	6616	Toothing	Cross-section mm
0351	350	28.01	1	36 x 5.4
0352	350	30.05	2	36 x 5.4
		(549)		

Precision Files

General information: PFERD precision files meet the highest requirements on dimensional accuracy, cutting performance and service life. Compared with engineer's files, precision files are smaller, handier and more precise with regard to their geometry. They are used in device and tool construction, in particular for the production of tools for punching, moulding, forging, stamping of series articles etc. Precision files are further employed for the installation and construction of complex units and machines requiring highest precision.

Hand Files, Flat

Design: 3 sides dressed.



PFERD

Part No.	Length mm	6620	Swiss cut	Cross-section mm
0100	100	5.74	00	13 x 3
0101	100	6.00	0	13 x 3
0102	100	6.18	1	13 x 3
0103	100	6.86	3	13 x 3
0104	100	7.12	4	13 x 3
		(549)		

Part No.	Length mm	6620	Swiss cut	Cross-section mm
0150	150	6.30	00	18 x 4
0151	150	6.75	0	18 x 4
0152	150	6.99	1	18 x 4
0153	150	7.64	3	18 x 4
0154	150	8.29	4	18 x 4
		(549)		

Part No.	Length mm	6620	Swiss cut	Cross-section mm
0200	200	8.93	00	22 x 5
0201	200	9.31	0	22 x 5
0202	200	9.82	1	22 x 5
0203	200	10.23	2	22 x 5
0204	200	11.12	4	22 x 5
		(549)		

Standard Pillar Files

Design: 2 sides dressed.



PFERD

Part No.	Length mm	6623	Swiss cut	Cross-section mm
0150	150	6.99	00	13 x 4
0151	150	7.31	0	13 x 4
0152	150	8.07	2	13 x 4
		(549)		

Part No.	Length mm	6623	Swiss cut	Cross-section mm
0200	200	9.82	00	15 x 5
0201	200	10.31	0	15 x 5
0202	200	11.25	2	15 x 5
		(549)		

Part No.	Length mm	6623	Swiss cut	Cross-section mm
0250	250	13.86	00	18 x 6
0251	250	14.59	0	18 x 6
0252	250	15.96	2	18 x 6
		(549)		

Small Pillar Files

Design: 2 sides dressed.



PFERD

Part No.	Length mm	6626	Swiss cut	Cross-section mm
0150	150	7.90	00	8 x 3.5
0151	150	8.30	0	8 x 3.5
0152	150	9.23	2	8 x 3.5
		(549)		

Part No.	Length mm	6626	Swiss cut	Cross-section mm
0200	200	10.88	00	10 x 4.5
0201	200	11.48	0	10 x 4.5
0202	200	12.50	2	10 x 4.5
		(549)		

Part No.	Length mm	6626	Swiss cut	Cross-section mm
0250	250	15.64	00	12 x 5
0251	250	16.45	0	12 x 5
0252	250	18.05	2	12 x 5
		(549)		

Extra-small Pillar Files

Design: 2 sides dressed.

PFERD

Part No.	Length mm	6629	Swiss cut	Cross-section mm
0150	150	7.90	00	6 x 3
0151	150	8.30	0	6 x 3
		(549)		

Part No.	Length mm	6629	Swiss cut	Cross-section mm
0152	150	9.23	2	6 x 3
0200	200	10.86	00	8 x 3.5
		(549)		

Part No.	Length mm	6629	Swiss cut	Cross-section mm
0201	200	11.48	0	8 x 3.5
0202	200	12.52	2	8 x 3.5
		(549)		

Round Tang Files



PFERD

Part No.	Length mm	6631	Swiss cut	Cross-section mm
0100	100	5.30	0	4
0102	100	5.73	2	4
0150	150	5.74	0	6
		(549)		

Part No.	Length mm	6631	Swiss cut	Cross-section mm
0151	150	6.04	1	6
0152	150	6.30	2	6
0153	150	6.62	3	6
		(549)		

Part No.	Length mm	6631	Swiss cut	Cross-section mm
0200	200	7.64	0	8
0201	200	7.90	1	8
0203	200	8.78	3	8
		(549)		

Three-square Tang Files



PFERD

Part No.	Length mm	6634	Swiss cut	Cross-section mm
0101	100	8.20	1	6
0150	150	8.78	0	10
0151	150	9.50	1	10
		(549)		

Part No.	Length mm	6634	Swiss cut	Cross-section mm
0152	150	9.68	2	10
0153	150	9.90	3	10
0200	200	10.96	0	14
		(549)		

Part No.	Length mm	6634	Swiss cut	Cross-section mm
0201	200	11.55	1	14
0203	200	12.39	3	14
		(549)		

Precision Files

Square Tang Files



Part No.	Length mm	6637	Swiss cut	Cross-section mm
0150	150	7.38	0	6
0151	150	7.66	1	6
0153	150	8.41	3	6
		(549)		

Part No.	Length mm	6637	Swiss cut	Cross-section mm
0200	200	9.82	0	8
0201	200	10.17	1	8
0203	200	11.27	3	8
		(549)		

Half-round Tang Files



Part No.	Length mm	6640	Swiss cut	Cross-section mm
0100	100	10.72	00	12 x 3.5
0101	100	11.02	0	12 x 3.5
0102	100	12.24	2	12 x 3.5
0150	150	12.39	00	16 x 4.5
0151	150	13.02	0	16 x 4.5
0152	150	13.66	1	16 x 4.5
0153	150	14.86	3	16 x 4.5
0154	150	17.38	4	16 x 4.5
		(549)		

Part No.	Length mm	6640	Swiss cut	Cross-section mm
0200	200	16.56	00	21 x 6
0201	200	17.24	0	21 x 6
0202	200	18.16	1	21 x 6
0203	200	19.78	3	21 x 6
0250	250	19.28	00	25 x 7
0251	250	20.25	0	25 x 7
0252	250	21.04	1	25 x 7
		(549)		

Tang Files with Lenticular Cross-section



Part No.	Length mm	6643	Swiss cut	Cross-section mm
0152	150	18.96	2	16 x 4.5
		(549)		

Knife Tang Files



Part No.	Length mm	6644	Swiss cut	Cross-section mm
0200	200	15.54	0	22 x 5
		(549)		

Part No.	Length mm	6644	Swiss cut	Cross-section mm
0202	200	17.10	2	22 x 5
		(549)		

Barrette Tang Files



Part No.	Length mm	6645	Swiss cut	Cross-section mm
0150	150	10.54	0	16 x 4
		(549)		

Part No.	Length mm	6645	Swiss cut	Cross-section mm
0152	150	11.51	2	16 x 4
		(549)		

Precision Needle File Sets

Design: 12-piece set in plastic wallet.

Comprising: 1 file each of the following types: Flat pointed, square, lenticular, triangular, square, round, knife, half-round, barrette, flat with rounded edges, taper-square with rounded edges, lenticular round-oval.

Part No.	Length mm	6647	6649	Swiss cut
0160	160	39.36	42.90	2
0200	200	49.41	54.99	0
		(548)	(549)	



6647 format professional quality



6649

Precision Needle-point Files

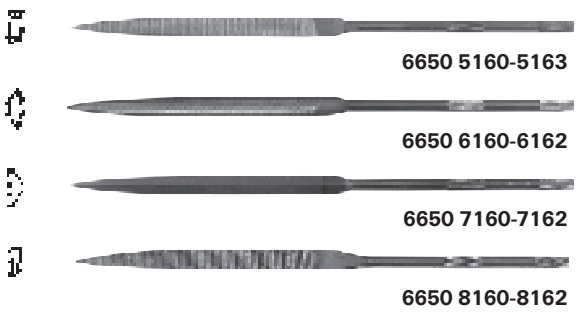
Design: High quality design in standard forms and dimensions, with rough and fine cutting feature. Dimensional accuracy with good filing performance and long service life.
Available in lengths of 160 and 200 mm.

Cut length = half of file length, i.e. at a total length of 160 mm, the dressed length is approx. 80 mm. Shaft/tang ⌀ 3.25 mm at a total length of 160 mm and is 3.75 mm at a total length of 200 mm.

PFERD



6650 0160-0262
6650 1160-1202
6650 2160-2202
6650 3160-3202
6650 4160-4202



6650 5160-5163
6650 6160-6162
6650 7160-7162
6650 8160-8162

Part No.	Shape	6650	Length mm	Swiss cut
0160	Flat	3.12	160	0
0161	Flat	3.12	160	1
0162	Flat	3.12	160	2
0163	Flat	3.31	160	3
0260	Flat	4.02	200	0
0261	Flat	4.02	200	1
0262	Flat	4.02	200	2
1160	Half-round	3.57	160	0
1161	Half-round	3.57	160	1
1162	Half-round	3.57	160	2
1163	Half-round	3.72	160	3
1200	Half-round	4.89	200	0
1201	Half-round	4.89	200	1
1202	Half-round	4.89	200	2
2160	Triangular	3.34	160	0
2161	Triangular	3.34	160	1
2162	Triangular	3.34	160	2
2163	Triangular	3.49	160	3
2200	Triangular	4.47	200	00
2201	Triangular	4.47	200	0
2202	Triangular	4.47	200	2
3160	Square	3.34	160	0
3161	Square	3.34	160	1
3162	Square	3.34	160	2

(549)

Part No.	Shape	6650	Length mm	Swiss cut
3163	Square	3.49	160	3
3200	Square	4.47	200	00
3201	Square	4.47	200	0
3202	Square	4.47	200	2
4160	Round	3.12	160	0
4161	Round	3.12	160	1
4162	Round	3.12	160	2
4164	Round	3.31	160	4
4200	Round	4.02	200	00
4201	Round	4.02	200	0
4202	Round	4.02	200	1
5160	Flat point	3.34	160	0
5161	Flat point	3.34	160	1
5162	Flat point	3.34	160	2
5163	Flat point	3.49	160	3
6160	Lenticular cross section	3.57	160	0
6161	Lenticular cross section	3.57	160	1
6162	Lenticular cross section	3.57	160	2
7160	Barrette	3.34	160	0
7161	Barrette	3.34	160	1
7162	Barrette	3.34	160	2
8160	Blade	3.57	160	0
8161	Blade	3.57	160	1
8162	Blade	3.57	160	2

(549)

Diamond Files

General notes: The abrasive coating ensures optimum material removal and profile/edge strength with minimal pressure. Diamond files are also suitable for particularly hard surfaces, plastics, carbides, glass, ceramics, non-ferrous metals, super nickel alloys, armour plating, ferrite and marble.

Caution: High pressure does not give better filing results but will damage the file.

Diamond Needle Files

Design: Electro-bonded, hard-chromed precision design. Overall length 140 mm, diamond dressing length 70 mm, shank ⌀ 3 mm. Original Swiss body made of ground and forged special file steel. Universal grain: D 126-medium (in accordance with FEPA standard).

Application: For precision finishing of workpieces/tools (e.g. punching, cutting and pressing tools) in machine and mould construction. Also for deburring and processing glass-fibre reinforced and related materials, pre- and post-sintered carbide and ceramics, graphite, ferrite, castings, HSS etc.





Part No.	Shape	6655	6657	Dimensions mm	Total length mm	Diamond dressing length mm	Shank ⌀ mm
0005	Flat	8.01	8.89	5.2 x 1.6	140	70	3
0010	Flat stub with round tapered section	8.01	8.89	5.2 x 1.6	140	70	3
0015	Flat point	8.01	8.89	5.2 x 1.6	140	70	3
0020	Triangular	8.01	8.89	3.7	140	70	3
0025	Square	7.10	8.89	2.6	140	70	3
0030	Half-round	7.10	8.89	5.4 x 1.6	140	70	3
0035	Round	7.10	8.89	3.2	140	70	3
0040	Blade	8.01	8.89	5.2 x 1.7	140	70	3
0045	Feather-edge file	7.51	8.89	5.2 x 2.2	140	70	3
0050	Lenticular cross section	8.01	8.89	4.9 x 2.2	140	70	3
0055	Barrette	7.10	8.89	4.9 x 1.8	140	70	3
		(550)	(559)				

Diamond Needle File Sets

6660 **Design:** 6-piece, consisting of 1 each: flat, three square, square, half-round, round and flat point files.
In plastic roll-up wallet.
Universal grain D 126 medium (to FEPA standard).

6665 **Design:** 10-piece, consisting of 1 each: flat, three square, square, half-round, round, flat point, knife, feather-edge file, lenticular and barrette files.
In plastic roll-up wallet.
Universal grain D 126 medium (to FEPA standard).

Part No.	Total length mm	6660	6665
0140	140	42.93	74.47
		(550)	(550)





6660





6665

6 Hand tools

Diamond Needle File Sets

6658 **Design:** 5-piece, with universal grain D 126-medium (in accordance with FEPA standard).



PFERD Supplied in plastic roll-up wallet incl. diamond needle files (part no. 6657).
1 flat stub
1 triangular
1 square
1 half-round
1 round

6659 **Design:** 11-piece, with universal grain D 126-medium (in accordance with FEPA standard).



PFERD Supplied in plastic roll-up wallet incl. diamond needle files (part no. 6655).
1 flat stub
1 flat stub, with round tapered section
1 triangular
1 square
1 half-round
1 round
1 flat point
1 blade
1 feather-edge
1 lenticular cross section
1 barrette

Part No.	Total length mm	6658	6659
0140	140	44.37 (559)	97.62 (559)

Diamond Habilis Files (handy file)

Design: Original Swiss body made of ground and forged special file steel. Universal grain D 126-medium (in accordance with FEPA standard). Electro-bonded, hard-chromed precision design, with square handle.

Application: Especially suitable for efficient and precise finishing of large surfaces. Due to large-size tool, best choice for efficient and precise finishing of large surfaces.

6670 format professional quality

6656 PFERD



Part No.	Shape	6670	6656	Dimensions mm 6670	Dimensions mm 6656	Total length mm	Diamond dressing length mm 6670	Diamond dressing length mm 6656
0005	Flat	21.36	23.06	10 x 3	10.3 x 2.8	215	110	100
0010	Half-round	22.75	23.06	13 x 4	12.5 x 3.8	215	110	100
0015	Triangular	24.61	23.06	10 x 10	10 x 10	215	110	100
0020	Square	17.49	20.32	6 x 6	6 x 6	215	110	100
0025	Round	16.16 (550)	20.32 (559)	6	6.7	215	110	100

Diamond Habilis File Sets (handy file set)

Design: Original Swiss body made of ground and forged special file steel. Universal grain D 126-medium (in accordance with FEPA standard). Electro-bonded, hard-chromed precision design, with square handle.

Supplied in plastic wallet incl.
1 flat stub
1 triangular
1 square
1 half-round
1 round

6675 Set includes diamond habilis files (part no. 6670).

6656 Set includes diamond habilis files (part no. 6656).

Part No.	Design	6675	6656
0215	5-piece	90.74 (550)	109.81 (559)

format professional quality



6675

PFERD



6656

File Handles

File Handles, Beech

Design: Normal welded form, waxed.

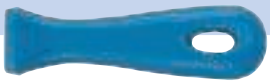


format professional quality

Part No.	Length mm	6682	For file sizes mm
0060	60	0.38	Spanner files 100
0080	80	0.14	110/113
0090	90	0.16	125
0100	100	0.18	150
0110	110	0.19	200
		(548)	

Part No.	Length mm	6682	For file sizes mm
0120	120	0.23	250
0130	130	0.26	300
0140	140	0.29	350
0160	160	0.37	400/450
		(548)	

File Handles, PPN Plastic



format professional quality

Part No.	Shaft length mm	6687	For file sizes mm	Form
0900	90	0.48	up to 150	Square, three-square, round, other small files
0901	90	0.48	up to 150	Flat, half-round, other broad files
1101	110	0.68	up to 200	Square, three-square, round, other small files
1102	110	0.68	up to 200	Flat, half-round, other broad files
		(548)		

Part No.	Shaft length mm	6687	For file sizes mm	Form
1251	125	0.86	up to 300	Square, three-square, round, other small files
1252	125	0.86	up to 250	Flat, half-round, other broad files
1253	125	0.86	> 250	Flat, half-round, other broad files
		(548)		

Ergonomic File Handles

Design: Ergonomic handle, 2-component, anti-slip.



PFERD

Part No.	Shaft length mm	6689	For file sizes mm	Shape
0005	110	0.96	100–150	Key files, very small tangs
0010	110	0.96	100–150	Normal tangs
0015	120	1.16	200–250	Hand, flat-pointed, half-round
0020	120	1.16	200–250	Three-square, square, round, special forms
0025	120	1.37	300–350	Hand, flat-pointed, half-round
0030	120	1.37	300–350	Three-square, square, round, special forms
		(551)		

Plastic File Handles for Needle-point, Key and Diamond Files

Design: For quick-clamping of needle-point, key and diamond files, as well as small workshop and precision files up to 115 mm length. Easy clamping by turning the two handle halves.

PFERD



Part No.	Length mm	6681
0001	80	1.98
		(549)

Needle-point File Holders

Application: For safe guiding and quick-clamping of needle-point files with tang ⌀ 3–5 mm.

PFERD



Part No.	6681
0100	11.91
	(549)

Thread Restorers

Design: For restoring damaged female and male threads. Yellow chromating.

GEDORE

6685 **Design:** For metric threads.

6686 **Design:** For threads in inch sizes (AF).



Part No.	Thread pitch	6685	6686
0005	0.8 – 1 – 1.25 – 1.5 – 1.75 – 2 – 2.5 – 3 mm	30.26	–
0005	24 – 20 – 18 – 16 – 14 – 13 – 12 – 11 threads	–	30.26
		(522)	(522)

Three-Square (Hollow-ground) Scrapers

Design: DIN 8350 C, special chromium steel, three square-hollow profile concave ground blade. Hardness of blade optimises cutting capability: 58–65 HRC on 1/3 of the blade length. Clean stove enamelled surface, painted wooden shaft.

Part No.	Length mm	6690	Tip width mm
0100	100	2.95	14
0150	150	3.17	14
0200	200	3.62	16
0250	250	3.87	16
		(552)	



Three-Square Scrapers

Design: Triple cutting-edge hollow profile blade made of special steel with tough elastic synthetic shaft made of cellulose propionate (CP). With plastic safety cap.

Part No.	Length mm	6692	Tip width mm	Total length mm
0150	25	5.92	8	150
		(552)		



Curved Scrapers

Design: Special chromium steel, hardness of blade optimises cutting capability: 58–65 HRC on 1/3 of the blade length. Clean stove enamelled surface, painted wooden shaft.

Part No.	Length mm	6694	Spoon scraper size mm
0200	200	3.62	85 x 15
		(552)	



Flat Scrapers

Design: DIN 8350A, special chromium steel. Hardness of blade optimises cutting capability: 62–65 HRC on 90 % of the blade length. Clean stove enamelled surface, painted wooden shaft.

Part No.	Length mm	6696	Blade width mm
0200	200	3.62	20
0250	250	3.87	25
0300	300	5.30	25
		(552)	



Carbide Flat Scrapers

Design: Special chromium steel, flat steel blade with clamp to hold replaceable carbide cutting blade. The blade is ground ready for use. Galvanised surface with plastic handle.

Part No.	Length	6698	Blade width mm
0010	340 mm	34.73	25
0020	Carbide spare tips	16.67	25
		(552)	



Seal Scrapers

Design: Special chromium steel, galvanised, painted plastic handle.

Part No.	Length mm	6699	Blade width mm
0150	150	4.53	22
		(552)	



Mini Saws

Design: With beech handle, orange varnish. Easy and quick blade tensioning by turning handle.

Part No.	Blade length mm	6729
0150	150	4.65
		(556)



Universal Saws

Design: For 150 mm handsaw blades, supplied with universal saw blade.

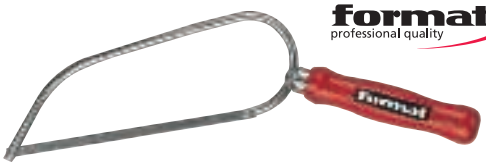
6730 **Design:** With fixed, red handle, round steel bow. Overall length 290 mm.

6732 **Design:** Handle adjustable to any position on bow, which is made of square steel bar. Overall length 310 mm, in wallet.

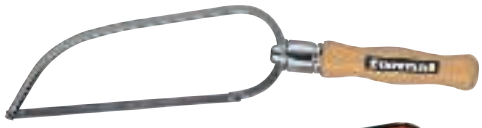
6733 **Design:** Round steel bow, with plastic handle. Overall length 240 mm.

Part No.	Overall length mm	6730	6732	6733
0150	240	–	–	2.79
0150	290	2.60	–	–
0150	310	–	5.51	–
		(555)	(555)	(555)

6730



6732



6733



Saw Blades for Universal Saw

Design: Fine toothing, for cutting very thin sheet metal, thin-walled pipes and extrusions (PU = 12 blades).

Design: Curved, fine teeth for burr-free cutting of all standard material, ideal for metal (PU = 12 blades).

Design: Crosscut, coarse teeth, for cutting wood, particle board, plywood, hard board, greenheart wood, cardboard, fibreboard and soft plastic (PU = 12 blades).

Part No.		0005	0010	0015
Length	mm	150	150	150
6734		0.49	0.23	0.19
Teeth	per cm/inch	20/50	12/32	6/14
				(555)

6734 0005



6734 0010



6734 0015



Hand Saw Blades

2749 **Design:** Double-sided hand saw blade, made from premium high-speed steel. Fully hardened blade with good cut stability.

2750 **Design:** Tooth edge made of high-performance high-speed steel. The toothing is electronically welded in a vacuum to the backing material made of spring steel. These blades combine maximum performance with breakage-resistance and are universally applicable.

2751 **Design:** Bi-metal hand saw blade with **progressive toothing, descending from 32 to 18 teeth per inch.** Efficient in universal applications. Materials of different coarseness can be cut without having to change the blade; long service life. Reduced vibration for thin materials during the taper lead, high cutting performance, even in rough materials.

SS



2749

HSS Bi-Metall



2750

HSS Bi-Metall



2751

Part No.	Length mm	2749	2750	2751	Thickness mm	Dimension mm	Teeth per inch
0001	300	–	–	0.48	13	0.65	32–18
0005	300	–	0.48	–	13	0.65	18
0010	300	–	0.48	–	13	0.65	24
0015	300	–	0.48	–	13	0.65	32
0020	300	1.35	–	–	25	0.70	24
		(250)	(250)	(250)			

Hacksaws

Design: DIN 6473 A, wooden handle and captive pins, bow 18 x 18 mm, silver varnish finish, **without blade.**

Part No.	Blade length mm	6740	Total length mm
0300	300	4.48 (555)	530



Hacksaws

Design: Robust aluminium design for high blade tension at 0 and 55 degrees. Spare blade in bow. Can be used as keyhole saw by fastening blade in the bow. Complete with HSS bi-hacksaw blade.

Part No.	Blade length mm	6738	Total length mm
0300	300	13.62 (555)	400



Mini Hacksaws

Design: Supplied with SANDFLEX® bi-metal blade, 24 teeth/inch. For working in confined areas.

Part No.	Blade length mm	6734
0001	250	7.59 (556)



Carbide Metal Saw Wire

Design: Tungsten-coated, fits all conventional 300 mm hacksaws. Separates, cuts and saws glass, wood, metal and plastic. Also suitable for circular sawing applications.

Part No.	Length mm	6742
0010	300	2.19 (555)



Bow Saws

Design: Bow saw blade with planing teeth and additional metal saw blade.

Part No.	Blade length	7263
0005	300 mm	4.74
0010	Spare blade, planing teeth	1.08 (581)



Machinist's Hammers DIN 1041

6773 **Design:** Made of C 45 tempered steel, forged, hardened and annealed, hammer head finished with black water-soluble varnish, bright ground face and peen, **with ash handle.**

6775 **Design:** Made of C 45 tempered steel, forged, ground on all faces, hardened and annealed, hammer head finished with black water-soluble varnish, bright ground face and peen, **with hickory handle.**

6777 **Design:** Made of special steel, hardened and annealed, head finished in black water-soluble varnish, face and peen bright ground, edge quality complies with regulations, **with hickory handle and hardened impact protection socket.**

format professional quality



Part No.	Weight g	6773	6775	6777	Length mm
0050	50	–	5.06	–	250
0100	100	4.25	4.99	5.85	260
0200	200	4.25	4.99	5.85	280
0300	300	4.77	5.56	6.49	300
0400	400	5.17	6.07	7.05	310
0500	500	5.55	6.55	7.74	320
		(560)	(560)	(560)	

Part No.	Weight g	6773	6775	6777	Length mm
0600	600	6.44	7.71	9.05	330
0800	800	7.22	8.65	10.19	350
1000	1,000	8.96	10.25	12.03	360
1500	1,500	11.39	13.13	15.52	380
2000	2,000	15.00	16.82	19.88	400
		(560)	(560)	(560)	

Machinist's Hammers Red Band Plus

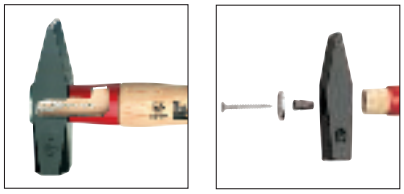
6780 **Design:** Forged hammer head, DIN 1041, made of high-quality special steel. With black water-soluble varnish. Hickory handle DIN 5111 with long, hardened protective sleeve. **Hammer head and handle form a single-unit tool due to circular wedge, locking plate and wood screw.**

DGBM G 9414 1878, European patent no. 0703045.

6790 **Design:** Hickory spare handle for machinist's hammer Red Band Plus.

Note: With this standard wooden handle, DIN 5111, each DIN hammer can be adapted to a Redband Plus hammer.

habero





Part No.	Weight g	6780	6790	Length mm
0100	100	7.90	2.99	260
0200	200	8.34	3.05	280
0300	300	8.71	3.60	300
0400	400	9.45	3.75	310
0500	500	10.24	4.01	320
0600	600	11.94	4.54	330
0800	800	13.43	4.95	350
1000	1,000	15.90	5.74	360
1500	1,500	20.06	6.45	380
2000	2,000	25.57	7.27	400
		(558)	(558)	

Machinist's Hammers with Fibre Glass Handle

Design: DIN 1041, made of C 45 tempered steel, forged, hardened and annealed. Finished with black water-soluble varnish. Bright ground face and peen, edge quality complies with regulations. **With solid fibre glass handle and plastic grip.** From 1,000 g with head support.

habero



Part No.	Weight g	6772	Length mm
0200	200	13.56	280
0300	300	14.27	300
0500	500	16.53	320
0800	800	20.51	350
1000	1,000	22.94	360
		(558)	

Machinist's Hammers with Graphite Handle

Design: Patented head/handle assembly system, low-vibration due to coated graphite handle, anti-slip handle, resistant to oil and most other solvents.

Part No.	Weight g	6778
0200	200	9.87
0300	300	10.94
0500	500	12.76
0800	800	15.93
1000	1,000	19.11
		(581)



Machinist's Hammer MaxxCraft

Design: From high-quality steel, forged, hardened and annealed. Finished with black water-soluble varnish. Bright ground face and peen, edge quality complies with regulations. **Recoil attenuation for impact power increased by 25 % and gentle operation.** With hickory handle and handle protection.

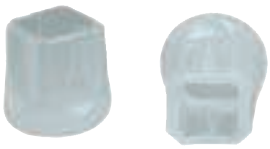
Part No.	Weight g	6776	Length mm
0300	300	14.15	300
0500	500	17.02	320
0800	800	21.34	350
1000	1,000	24.02	360
		(561)	



Protective Cups for Machinist's Hammers

Design: Made of nylon, suitable for all machinist's hammers according to DIN 1041.

Part No.	For hammers g	6779
0301	300	3.58
0501	500	4.96
0801	800	5.63
1001	1,000	7.56
		(558)



Sledge Hammers, DIN 1042

Design: Made of machining steel C 45, forged, ground, hardened and annealed, head coated with black varnish, hickory handle DIN 5112.

Part No.	Weight kg	6781
0003	3	19.06
0004	4	22.08
0005	5	27.22
0006	6	32.61
0008	8	44.27
0010	10	53.10
		(560)



Club Hammers DIN 6475

Design: Made of C 45 tempered steel, forged, hardened and annealed, head finished in black water-soluble varnish, bright finished working faces, with hickory handle.

Part No.	Weight g	6783
1000	1,000	8.76
1250	1,250	9.05
1500	1,500	9.84
2000	2,000	12.44
		(560)



Joiner's Hammers

Design: DIN 5109, French form, made of C 45 tempered steel, forged, hardened and annealed. Finished with black water-soluble varnish. Bright ground face and peen. Edge quality complies with regulations. With curved and varnished ash handle.

Note: Spare handles see (part no. 6795).

Part No.	Dimensions mm	6785	Length mm	Weight g
1020	20	5.91	300	255
1022	22	6.45	300	340
1025	25	6.82	310	460
1028	28	7.46	320	625
		(558)		



Plasterer's Drywall Hammers

Design: Tubular steel handle and plastic grip, with black water-soluble varnish.

Part No.	Weight g	6787
0600	600	9.91
		(560)



Brick Hammers

6789 **Design: "Rhineland" model,** DIN 5108, with ash insert shaft and smooth face.

6791 **Design: "Berlin" model,** tubular steel handle and plastic grip, smooth surface, coated with black water-soluble varnish. With VPA/GS test mark.

Part No.	Weight g	6789	6791
0500	500	5.22	–
0600	600	–	9.91
		(560)	(560)



Welder's Hammers

Design: All-steel with round tube 20 mm.

Part No.	Weight g	9237
0010	420	2.20
		(945)



Roofing Pick Hammers, DIN 7239 Form C

Design: Rough surface, including nail holder, tubular steel handle and plastic grip.

6793 **Design:** Without magnet.

6794 **Design:** With magnetic nail holder.

Part No.	Weight g	6793	6794
0600	600	9.63 (560)	12.13 (560)



Roofing Pick Hammers with Fibre Glass Handle

Design: Made of special steel, finished with water-soluble varnish. Smooth surface and magnetic nail holder. With solid fibre glass handle, hardened protective cup and head support.

Part No.	Weight g	6803	Length mm
0600	600	20.02 (558)	300



Carpenter's Roofing Hammers with Graphite Handle

Design: Polished head with nail holder, patented head/handle assembly system, low-vibration due to coated graphite handle, anti-slip grip, resistant to oil and most solvents.

Part No.	Weight g	6782
0600	600	17.88 (581)



Claw Hammers Steelmaster

Design: Highly polished, forged steel head with ground claws. Steel handle with ergonomic neoprene grip.
The hammer withstands a tension force of up to 5 tons.

Part No.	Weight g	6780
0450	450	9.37 (581)



Claw Hammers Blue Strike®

Design: Forged steel head, finished with blue varnish, with ground claws. Steel handle with neoprene grip.

Part No.	Weight g	6788
0450	450	13.93 (581)



Claw Hammers with Graphite Steel

Design: Made of steel casting, laser-etched for durability and easy identification. With round edges. The hammer is extremely light-weight and optimally balanced. The patented head/grip system reduces vibrations. Graphite handle with ergonomic anti-slip coating. Furthermore, the handle is resistant to oil and almost all solvents.

Part No.	Weight g	6790
0450	450	21.31 (581)



Spare Handles for Machinist's Hammer, Hickory

6795 **Design:** For machinist's hammers with oval mounting hole.

6796 **Design:** With protective handle sleeve, for machinist's hammers with oval mounting hole.



6795



6796

Part No.	for hammer g	6795	6796	Length mm
0050	50	1.30	–	250
0100	100	1.29	2.09	260
0200	200	1.31	2.13	280
0300	300	1.38	2.28	300
0400	400	1.49	2.41	310
0500	500	1.57	2.68	320
		(560)	(560)	

Part No.	for hammer g	6795	6796	Length mm
0600	600	1.90	3.12	330
0800	800	1.97	3.43	350
1000	1,000	2.05	3.73	360
1500	1,500	2.20	4.46	380
2000	2,000	2.35	5.25	400
		(560)	(560)	

Spare Handles for Sledge Hammer, Hickory

Design: Supplied incl. 2 ring wedges and 1 wooden wedge.

Part No.	For hammers kg	6798	Length mm
3000	3	6.28	600
4000	4	6.49	700
5001	5 + 6	8.41	800
8001	8 + 10	10.46	900
		(560)	



Spare Handles for Club Hammer, Hickory

Part No.	For club hammers g	6799	Length mm
1001	1,000 + 1,250	1.57	260
1500	1,500	1.61	280
2000	2,000	1.68	300
		(560)	



Spare Handles for Brick, Ash Wood

Part No.	For brick hammers g	6797	Length mm
0501	500 + 600	1.42	300
		(560)	



SFIX Wedges for Hammer Handles



Design: Malleable cast iron. By driving the SFIX wedge into the handle the ground teeth hold and stabilise the wedge.

Part No.	Dimensions	6800	Wedge width mm	For hammers g
0005	00	0.10	13	100– 200
0010	0	0.12	16	250– 400
0015	1	0.15	20	500– 800
0020	2	0.19	23	500– 800
0025	3	0.25	26	1,000–1,500
		(561)		

Part No.	Dimensions	6800	Wedge width mm	For hammers g
0030	4	0.31	29	1,000– 1,500
0035	5	0.38	32	1,750– 2,000
0040	5 1/2	0.55	40	3,000– 4,000
0045	6	0.67	50	3,000–15,000
		(561)		

Ring Wedges

Application: For safe fixing of wooden handles.



Part No.	∅ x length mm	6801	For hammers g
0100	7 x 12	0.42	100
0200	8 x 15	0.42	200
0300	9 x 16	0.51	300
0400	11 x 18	0.53	400
0500	12 x 20	0.59	500
		(561)	

Part No.	∅ x length mm	6801	For hammers g
0600	13 x 20	0.62	600
0800	13 x 20	0.66	800
1000	14 x 21	0.66	1,000
1500	15 x 21	0.75	1,500
2000	16 x 23	0.79	2,000
		(561)	

Copper Hammers

Design: E-Cu, similar to DIN 5130, with hickory handle.



Part No.	Weight g	6805
0250	250	9.83
0500	500	16.26
0750	750	22.41
1000	1,000	28.51
1500	1,500	40.26
		(561)

Part No.	Weight g	6805
2000	2,000	50.79
3000	3,000	69.60
4000	4,000	91.62
5000	5,000	112.46
Prices plus applicable alloy surcharge.		(561)

Rubber Composite Hammers

Design: Hard material, approx. 90 shore hardness ash handle.
DIN 5128-90, form A; both faces flat, sizes 0, 1, 2, 3 and 4.
DIN 5128-90, form B; one face flat, one curved, size 2 B.



Part No.	Dimensions	6808	Head ∅ mm
0005	0	1.49	37
0010	1	1.53	50
0015	2	2.02	60
0020	2 B	2.13	60
0025	3	3.17	70
0030	4	4.62	90
		(560)	

Wooden Mallets, DIN 7462 B

Design: With metal lining, common beech hammer head with crowned faces, ash shaft.



Part No.	Head ∅ mm	6802	Head length mm	Total length mm	Weight g
0060	60	7.75	120	310	370
0070	70	9.34	140	350	560
0080	80	11.76	160	360	810
0090	90	15.09	180	380	1,100
0100	100	21.01	200	400	1,500
		(560)			

Light-metal Hammers

Design: Al-CuMgPb, F30-35, similar to DIN 6491 C, cylindrical, with hickory handle, with transverse pin fixture for additional securing of handle.



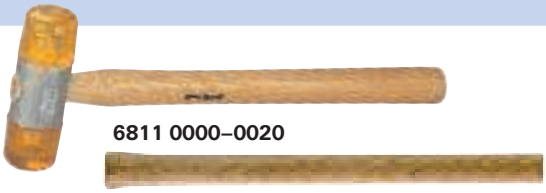
Réf.	Weight g	6807
0250	250	7.41
0500	500	10.69
0750	750	14.74
		(561)

Réf.	Weight g	6807
1000	1,000	17.64
1500	1,500	25.01
Prices plus applicable alloy surcharge.		(561)

Plastic Hammers

Design: With replaceable yellow CA attachments, central section made of galvanised grey cast iron, polished ash handle.

Application: For careful hammering without damaging the workpiece.



6811 0000–0020

6811 0042–0060



6811 0022–0040

Part No.	Design	6811
0000	Plastic hammer 22 mm	2.64
0005	Plastic hammer 27 mm	3.24
0010	Plastic hammer 32 mm	4.09
0015	Plastic hammer 40 mm	5.78
0020	Plastic hammer 50 mm	8.82
		(560)

Part No.	Design	6811
0022	Spare head 22 mm	0.25
0025	Spare head 27 mm	0.40
0030	Spare head 32 mm	0.66
0035	Spare head 40 mm	1.01
0040	Spare head 50 mm	1.50
		(560)

Part No.	Design	6811
0042	Spare handle 22 mm	0.60
0045	Spare handle 27 mm	0.62
0050	Spare handle 32 mm	0.68
0055	Spare handle 40 mm	0.78
0060	Spare handle 50 mm	0.86
		(560)

Nylon-faced Hammers

Design: Divided tempered cast hammer housing, replaceable hammer heads and wooden shaft, painted wooden shaft.

6812 Heads made of composite rubber to suit a variety of applications. Case hardening 95 shore A.

6814 Nylon heads for powerful precision blows. Grease and oil-proof, high elasticity, case hardening 73 shore D.

6816 Heads made of composite rubber and nylon.



6812

6814

6816

Part No.	Head ∅ mm	6812	6814	6816	Head length mm	Total length mm
0030	30	9.46	11.55	10.49	90	300
0040	40	11.89	16.21	14.04	110	330
0050	50	16.12	25.27	20.67	135	350
		(560)	(560)	(560)		

Part No.	Head ∅ mm	6812	6814	6816	Head length mm	Total length mm
0060	60	20.90	32.80	26.82	145	405
0080	80	37.13	55.03	46.05	175	490
		(560)	(560)	(560)		

Housings and Spare Handles for Nylon-faced Hammers

6817 Nylon-faced hammer housings.

6818 Spare wooden handle, varnished.



6817



6818

Part No.	For head ∅ mm	6817	6818
0030	30	4.02	2.32
0040	40	5.32	2.43
0050	50	7.75	2.95
		(560)	(560)

Part No.	For head ∅ mm	6817	6818
0060	60	9.76	3.19
0080	80	19.35	3.92
		(560)	(560)

Spare Heads for Nylon-faced Hammers

6819 Special rubber composition, hardness 95 shore A.

6820 Plastic, red, hard. Grease and oil-proof.

6821 Nylon, white, hard. High elasticity provides effective hammer blows. Grease and oil-proof. For powerful precision blows.

6822 Soft metal, silver, hard. Optimum hammer momentum, special lightweight alloy with added copper.

6823 Super plastic, white, medium hard. Very tough, unbreakable plastic (edge blows). Grease and oil-proof. Acid and alkali-resistant.



6819



6820



6821



6822



6823

Part No.	Head ∅ mm	6819	6820	6821	6822	6823
0030	30	1.65	1.65	2.72	3.49	2.53
0040	40	2.17	3.13	4.32	5.03	4.03
0050	50	2.87	4.72	7.44	8.46	6.22
0060	60	4.16	6.70	10.10	11.22	8.65
0080	80	7.27	–	16.21	19.51	15.94
		(560)	(560)	(560)	(560)	(560)

Nylon-faced Hammers with Wooden Shaft, Recoil-free

Design: Replaceable hammer heads and wooden shaft, nylon hammer heads, cadmium-free, hickory shaft, varnished.

Application: For precise strokes in tool making and machine and gear production.

Part No.	Head ∅ mm	6825	Head length mm	Total length mm
0025	25	11.35	105	305
0030	30	11.83	110	330
0035	35	12.76	110	335
0040	40	15.13	115	360
0050	50	18.62	120	370
0060	60	30.27	145	370
		(560)		



Supercraft Hammers with Steel Tube Handle, Recoil-free

Design: Heads and metal handle replaceable, heads made of nylon, cadmium-free, lacquered Hickory handle.

Application: Recoil-free, with changeable inserts made of high-quality plastic material, steel body, with steel tube handle and ergonomic rubber grip.

Part No.	Head ∅ mm	6827	Head length mm	Total length mm
0030	30	14.51	110	290
0035	35	15.19	110	295
0040	40	17.75	115	300
0050	50	22.15	120	310
0060	60	35.31	145	325
		(561)		



Supercraft Hammers with 3-component Handle, Recoil-free

Design: Recoil-free, with changeable nylon inserts and ergonomic, anti-slip 3-component handle (fibre glass core), optimum strokes due to low-vibration and anti-slip handle.

Part No.	Head ∅ mm	6828	Head length mm	Total length mm
0040	40	21.78	116	370
0050	50	26.87	120	380
0060	60	43.59	145	390
		(561)		

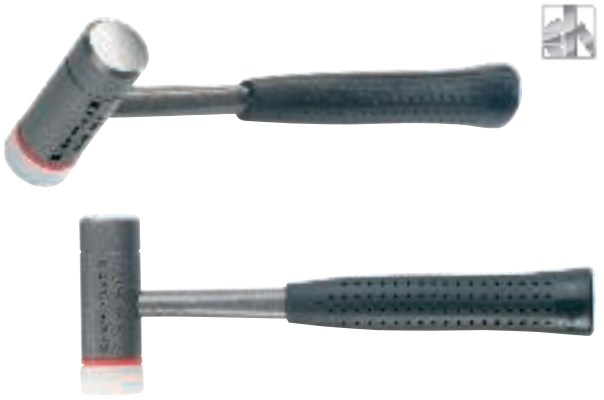


Ferroplex Hammers

Design: Head made of high-quality machining steel, face hardened and tempered, changeable insert made of extruded special nylon, fixed tubular steel handle, rubber grip with cushioning effect.

Application: General assembly work in industry, craft and automobile industry, maintenance and repair work.

Part No.	Head ∅ mm	6833	Head length mm	Total length mm
0030	30	18.06	104	290
0035	35	18.46	104	295
		(561)		



Spare Nylon Heads for Nylon-faced Hammers

Design: Nylon, cadmium-free, for nylon-faced hammers no. 6825, 6827, 6828 and 6833.



format professional quality

Part No.	For head ⌀ mm	6830
0025	25	1.31
0030	30	1.46
		(560)

Part No.	For head ⌀ mm	6830
0035	35	1.68
0040	40	2.11
		(560)

Part No.	For head ⌀ mm	6830
0050	50	2.63
0060	60	4.40
		(560)

Spare Handles for Nylon-faced Hammers

Design: Spare hickory handle for nylon-faced hammer no. 6825.

format professional quality



Part No.	For head ⌀ mm	6829
0025	25	2.00
0031	30/35	2.30
		(560)

Part No.	For head ⌀ mm	6829
0041	40/50	2.79
0060	60	3.49
		(560)

Nylon-faced Hammers, Recoil-free

format professional quality

6832 **Design:** Polyurethane hammer head inserts, yellow, cadmium-free, replaceable, heavy duty steel plate housing and ergonomic rubber handle.

Application: The rectangular head shape is particularly good for working in corners, particularly for use in sheet metalwork and bodywork construction, and for laying parquet and laminates.

6832 **Design:** Polyurethane hammer head inserts, rectangular, for nylon-faced hammer no. 6832.





6832 0005

Part No.	Head size mm	6832	6832	Head length mm	Total length mm
0005	30 x 40	17.35	–	117	300
0010	30 x 40	–	1.79	–	–
		(560)	(560)		



6832 0010

Supercraft Sledge Hammers, Recoil-free

6834 **Design:** With changeable inserts made of high-quality plastic material, steel body, with hickory handle.

6836 **Spare nylon head,** for recoil-free sledge hammer 6834.

6838 **Spare hickory handle,** for recoil-free sledge hammer 6834.



6834





6836



6838

Part No.	⌀ Head mm	6834	6836	6838	Head length mm	Total length mm
0080	80	87.06	9.12	8.67	200	880
0100	100	134.13	14.94	11.03	210	1,000
		(561)	(561)	(561)		

Crowbars

Design: Round, made of machined steel C45, black varnished.

format professional quality

9703 **With straight cutting edge.**

9704 **With curved cutting edge.**

9705 **With nail claw.**



Part No.	Length mm	9703	9704	9705	⌀ mm
1500	1,500	13.40	13.40	13.40	30
		(987)	(987)	(987)	



9703



9704



9705

Wrecking Bars

Design: Hex. material, forged, tensile steel DIN 17100, curved on one side, wide blade; other side straight wrecking bar with clean nail pull, powder coated.

format professional quality



Part No.	Length mm	9708	⌀ mm
0500	500	5.33	18
0600	600	5.74	18
0800	800	6.81	18
		(552)	

Flat Chisels for Metal

Design: Flattened oval, DIN 6453. Made of chromium-vanadium air-hardened steel, tempered hammer head. Build-up, beading and chipping is almost eliminated by the tempering. Hardened and annealed shaft. The cutting edge can be repeatedly ground using simple wet sanding. Surface varnished.



Part No.	Length mm	6840	Tip width mm	Material thickness mm
0100	100	1.90	15	14 x 9
0125	125	1.97	15	17 x 11
0150	150	2.04	18	17 x 11
0175	175	2.49	21	20 x 12
		(552)		

Part No.	Length mm	6840	Tip width mm	Material thickness mm
0200	200	2.83	24	23 x 13
0250	250	3.32	25	23 x 13
0300	300	3.71	26	23 x 13
		(552)		

Crosscut Chisels for Metal

Design: Flattened oval, DIN 6451. Made of chromium-vanadium air-hardened steel, tempered hammer head. Build-up, beading and chipping is almost eliminated by the tempering. Hardened and annealed shaft. The cutting edge can be repeatedly ground using simple wet sanding. Surface varnished.



Part No.	Length mm	6842	Tip width mm	Material thickness mm
0125	125	1.97	5	17 x 11
0150	150	2.32	6	17 x 11
0175	175	2.52	7	17 x 11
		(552)		

Part No.	Length mm	6842	Tip width mm	Material thickness mm
0200	200	2.95	8	20 x 12
0250	250	3.71	9	23 x 13
0300	300	4.70	10	23 x 13
		(552)		

Mason Chisels

Design: Octagonal, DIN 7254 B. Made of chrome-vanadium air-hardened steel, tempered impact head. Build-up, beading and chipping is almost eliminated by the tempering. Hardened and annealed shaft. The cutting edge can be repeatedly ground using simple wet sanding. Surface varnished.



Part No.	Length mm	6844	Tip width mm	Material thickness mm
0250	250	3.19	23	16
0300	300	3.57	26	16
0400	400	4.33	30	20
		(552)		

Part No.	Length mm	6844	Tip width mm	Material thickness mm
0500	500	5.97	30	20
0600	600	7.44	34	20
		(552)		

Mason Chisels

Design: Flattened-oval, DIN 7254 A. Made of chrome-vanadium air-hardened steel, tempered impact head. Build-up, beading and chipping is almost eliminated by the tempering. Hardened and annealed shaft. The cutting edge can be repeatedly ground using simple wet sanding. Surface varnished.



Part No.	Length mm	6848	Tip width mm	Material thickness mm
0250	250	3.19	26	20 x 12
0300	300	3.57	29	23 x 13
0400	400	4.33	29	23 x 13
		(552)		

Part No.	Length mm	6848	Tip width mm	Material thickness mm
0500	500	5.97	32	26 x 13
0600	600	9.56	32	26 x 13
		(552)		

Pointed Mason Chisels

Design: Octagonal, DIN 7256. Made of chromium-vanadium air-hardened steel, tempered hammer head. Build-up, beading and chipping is almost eliminated by the tempering. Hardened and annealed shaft. The cutting edge can be repeatedly ground using simple wet sanding. Surface varnished.



Part No.	Length mm	6846	Material thickness mm
0250	250	2.95	16
0300	300	3.27	18
		(552)	

Part No.	Length mm	6846	Material thickness mm
0400	400	4.24	20
0500	500	5.51	20
		(552)	

Car Body Chisels

Design: DIN 7255. Made of chromium-vanadium air-hardened steel, tempered hammer head. Build-up, beading and chipping is practically excluded by the tempering. Hardened and annealed shaft.
The cutting edge can be repeatedly ground using simple wet sanding. Surface varnished.

Please note: Not to be used for levering, as driving wedges or similar.

Application: For light cutting and mortising work with minimal breaking effect.





Part No.	Design	6850	Length mm	Tip width mm	Material thickness mm
0005	Without hand protection	3.13	240	26	26 x 7
0010	With hand protection	4.59	240	26	26 x 7
		(552)			

Universal Hand Protection Fitting for Chisels

Design: Made of special rubber, for enhanced grip ensuring safety when working with oily hands.



Part No.	For chisels flat oval mm	6851	For chisels octagonal mm
0005	20 x 12 – 26 x 13	1.53	16–20
		(552)	

Cold Chisels for Masonry

Design: Octagonal, DIN 7255. Made of chromium-vanadium air-hardened steel, tempered hammer head. Build-up, beading and chipping is almost eliminated by the tempering. Hardened and annealed shaft. The cutting edge can be repeatedly ground using simple wet sanding. Surface varnished.



Part No.	Length mm	6854	Tip width mm	Material thickness mm
0200	200	1.57	10	8 x 8
0250	250	1.79	10	8 x 8
0300	300	2.19	12	10 x 10
		(552)		

Flat Chisels for Tiles

Design: Octagonal, made of chromium-vanadium air-hardened steel, tempered hammer head. Build-up, beading and chipping is almost eliminated by the tempering. Hardened and annealed shaft.
The cutting edge can be repeatedly ground using simple wet sanding. Surface varnished.



Part No.	Length mm	6858	Tip width mm	Material thickness mm
0100	100	1.53	10	8
		(552)		

Grooving Chisels/Cutting Chisels

Design: Made of chromium-vanadium air-hardened steel, tempered impact head. Build-up, beading and chipping is almost excluded by the tempering. Hardened and annealed shaft. The cutting edge can be repeatedly ground using simple wet sanding.
Surface varnished.

6855 Grooving chisels
6856 Cutting chisels



6855



6856

Part No.	Tip width mm	6855	6856	Length mm	Material thickness mm
0002	2	3.47	4.69	150	10
0003	3	3.47	4.69	150	10
0004	4	3.47	–	150	10
0005	5	3.47	–	150	10
0006	6	3.47	–	150	10
		(552)	(552)		

Drift/Pin Punches

Drift Punches

6860 **Design:** Octagonal, DIN 6458. Made of chromium-molybdenum-vanadium air-hardened steel, tempered hammer head. Build-up, beading and chipping is almost eliminated by the tempering. Hardened shaft. Tapered drift shape. Surface varnished.

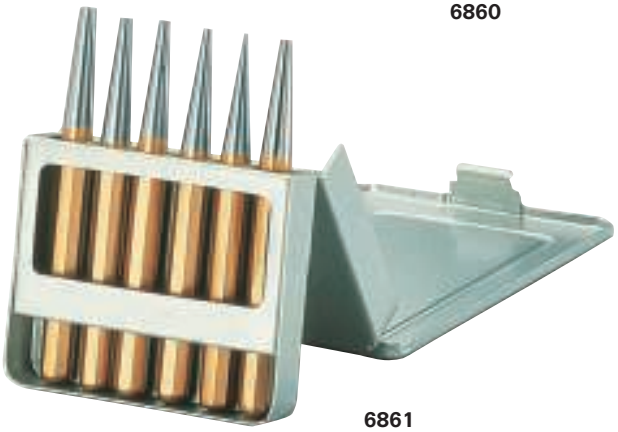
6861 **Design:** 1 centre punch 120 x 10 mm, 1 drift punch per 120 x 2 – 3 – 4 – 5 – 6 mm, in sheet steel case.

Part No.	ø mm	6860	6861	Length mm	Material thickness
0002	2	0.71	–	120	10
0003	3	0.78	–	120	12
0004	4	0.78	–	120	12
0005	5	0.78	–	120	12
0006	6	0.78	–	120	12
0008	8	0.78	–	120	12
0010	10	0.89	–	150	12
0012	12	1.26	–	150	14
0005	–	–	9.84	–	–
		(552)	(552)		

format professional quality



6860



6861

Pin Punches

6863 **Design:** Octagonal, DIN 6450. Made of chromium-molybdenum-vanadium air-hardened steel, tempered hammer head. Build-up, beading and chipping is almost eliminated by the tempering. Hardened shaft. Cylindrical drift shape. Surface varnished.

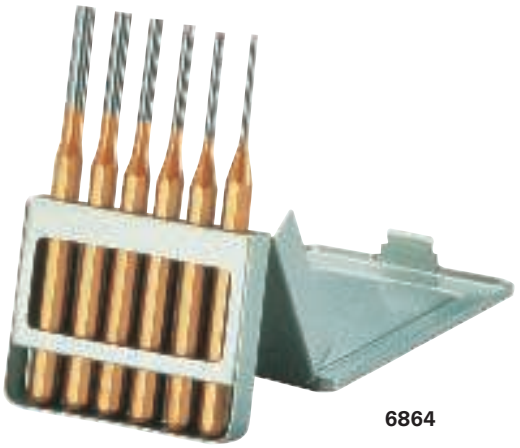
6864 **Design:** 1 drift each of 150 x 2 – 3 – 4 – 5 – 6 – 8 mm, in sheet steel case.

Part No.	ø mm	6863	6864	Length mm	Material thickness mm
0002	2	1.11	–	150	10
0003	3	1.05	–	150	10
0004	4	1.05	–	150	10
0005	5	1.05	–	150	10
0006	6	1.05	–	150	10
0007	7	1.11	–	150	12
0008	8	1.11	–	150	12
0009	9	1.11	–	150	12
0010	10	1.11	–	150	12
0012	12	1.29	–	150	14
0005	–	–	11.29	–	–
		(552)	(552)		

format professional quality



6863



6864

Pin Punches with Guide Sleeve

6867 **Design:** Cordite-treated shank, zinc-chromium plated. Insert made of material 115 Cr V 3, precision ground, bronze.

6869 0005 **Design:** 8-piece, with 1 drift with loose guide sleeve each of ø 0.9 – 1.4 – 1.8 – 2.4 – 2.8 – 3.4 – 3.9 mm and 1 drift ø 5.9 mm with loose sleeve, in plastic stand.

6869 0010 **Design:** 8-piece, with 1 drift with loose guide sleeve each of ø 0.9 – 1.4 – 1.8 – 2.4 – 2.8 – 3.4 – 3.9 mm and 1 drift ø 5.9 mm with firm sleeve, in plastic wallet.

Part No.	ø mm	6867	6869	Length mm
0009	0.9	1.60	–	84
0014	1.4	1.60	–	89
0018	1.8	1.60	–	92
0024	2.4	1.60	–	97
0028	2.8	1.60	–	100
0034	3.4	1.60	–	100
0039	3.9	1.60	–	100
0059	5.9	1.60	–	100
0005	–	–	17.14	–
0010	–	–	15.87	–
		(552)	(552)	

format professional quality



6867



6869 0005



6869 0010

Centre Punches

Design: Octagonal, made of chromium-molybdenum-vanadium air-hardened steel, tempered impact head.

6874 **Design:** DIN 7250, extra slim. Tapered drift shape, stove enamelled surface.

6876 **Design:** Chromed surface with carbide tips.



6874



6876

Part No.	Length mm	6874	6876	Material thickness mm
0100	100	0.71	–	8
0120	120	0.75	5.44	10
0121	120	0.85	–	12
0130	130	–	8.61	14
0150	150	0.93	–	12
		(552)	(552)	

Automatic Centre Punches

6878 **Design:** Automatic centre punch with spring mechanism, machining steel.



6878 0100-0110

6878 0200-0210

Part No.	Length mm	6878	Shank ∅ mm	Impact power N
0100	95	13.28	11	20– 50
0105	125	14.10	14	60–130
0110	130	15.56	17	180–250
		(552)		

Part No.	Length mm	6878	Shank ∅ mm
0200	3.5	2.09	11
0205	4	2.88	14
0210	6	3.47	17
		(552)	

Chisel and Punch Sets

Design: Made of chromium-molybdenum-vanadium steel, tempered impact head, in sheet steel case.

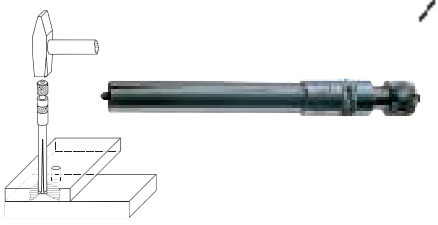
Set contents: 1 centre punch 120 x 10 mm, 1 pinch punch each: 4 x 150 and 6 x 150 mm, 1 drift punch each: 2 x 120 and 3 x 120 mm and 1 flat chisel 150 mm.



Part No.	6880
0005	11.29
	(552)

Adjustable Centre Punches

Design: Tempered continuous lathe centre for precise and offset-free centring on workpieces, for even adjustment of the centre point in the drilling jig or specimen.



Part No.	Length mm	6879	∅ mm
0005	95	24.20	6– 8
0010	105	25.02	8–11
0015	115	26.85	11–16
		(553)	

Sets of Adjustable Centre Punches

Design: 3-piece set including 1 centre punch each 6–8, 8–11, 11–16 mm, in plastic packing.



Part No.	6879
0500	78.30
	(553)

Rivet Setters/Rivet Head Formers

Design: Made of octagonal chromium-vanadium steel, air-hardened. With annealed head; build-ups, beading and splintering is thereby excluded almost completely. Stove enamelled surface.

6889 Rivet setters, DIN 6434.

6890 Rivet head formers, DIN 6435.

Part No.	For rivet thickness mm	6889 mm	6890 mm	Hole width 6889 mm	Head ø 6890 mm	Shank mm	Length mm
0002	2	1.05	1.07	2.5	3.5	10	100
0003	3	1.05	1.08	3.5	5.2	10	100
0004	4	1.05	1.12	4.5	7	12	100
0005	5	1.50	1.42	6	8.8	12	110
0006	6	1.59 (552)	1.83 (552)	7	10.5	14	110



6889



6890

Rivet Setter/Rivet Head Former Sets

Design: Made of octagonal chromium-vanadium steel, air-hardened. With annealed head; build-ups, beading and splintering is thereby excluded almost completely. Stove enamelled surface.

6889 **Supplied in plastic holder,** with 1 each of ø 2; 3; 4; 5; 6 mm.

6890 **Supplied in plastic holder,** with 1 each of ø 2; 3; 4; 5; 6 mm.

Part No.	Contents	6889 mm	6890 mm
0500	5-piece	6.69 (552)	7.21 (552)



6889



6890

Small Pullers

Design: With self-centring quick-clamping and automatic grip readjustment. Ideal for small-sized electric motors, battery clips, small ball bearings etc. Handy, room-saving device for electrical systems in cars, for electric applications, repairs on compressed air devices and similar applications.



Part No.	Model	6901	Jaw span mm	Jaw depth mm
0060	43-1	18.65 (562)	60	50

Pullers, Two-leg

Design: Sturdy design for extraction of seized toothed wheels, pinions, ball bearings, pulleys, etc.



Part No.	Model	6902	Jaw span mm	Jaw depth mm
0100	44-1	22.26	100	100
0120	44-2	34.79 (562)	120	120
0160	44-3	51.69	160	160
0250	44-4	70.34 (562)	250	200

Pullers, Two-leg

Design: Universal, sturdy design for extraction of pulleys, toothed wheels, ball bearings, pulleys and similar items.



Part No.	Model	6903	Jaw span mm	Jaw depth mm
0060	41-0	13.59	60	40
0065	41-1	13.59	65	65
0080	41-2	15.93 (562)	80	80
0090	41-3	30.49	90	120
0130	41-4	46.57	130	160
0180	41-5	63.77 (562)	180	200

Universal Pullers, Two-leg

Design: Sturdy, drop-forged design, single-unit extraction legs, profile-milled jaws with adjusted radii for fixing on shafts and axles. Profiled claws for firm grip also in confined areas. Self-locking pull hook, reversible for use as external and internal puller.

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Part No.	Jaw span mm	6904	Jaw depth mm
0090	90	28.19	100
0120	120	31.69	100
0160	160	50.37 (563)	150
0201	200	55.88	150
0250	250	74.39	200
0350	350	102.07 (563)	200

Universal Pullers, Two-leg

Design: Sturdy, drop-forged design, with sliding, constantly parallel hooks, reversible for use as external and internal puller, strong, hardened spindle with fine-pitch thread and centre punch.



Part No.	Model	6905	Jaw span mm	Jaw depth mm
0090	20-1	36.01	90	100
0120	20-10	38.87	120	100
0160	20-2	68.00	160	150
0200	20-20	73.96	200	150
0250	20-3	124.74 (562)	250	200
0350	20-30	135.93	350	200
0520	20-4	200.07	520	200
0650	20-40	363.54	650	300
0750	20-5	767.29 (562)	750	400–700

Universal Pullers, Two-leg, with Quick Clamping Device

Design: Sturdy, drop-forged design, with reversible hooks for use as external and internal pullers, with small wheels quick releasing and shifting of pull hooks without wrench, strong spindle with centre punch.



Part No.	Model	6906	Jaw span mm	Jaw depth mm
0090	20-1+	40.97	90	100
0120	20-10+	43.85	120	100
0160	20-2+	77.27 (562)	160	150
0200	20-20+	83.40	200	150
0250	20-3+	140.37	250	200
0350	20-30+	151.77 (562)	350	200

Pullers Autogrip, Two-leg

Design: Ease-of-use puller with automatic tensioning, self-locking and self-centring, requires only little space. The spring effect and the slim design enables extraction in confined areas.



Part No.	Model	6907	Jaw span mm	Jaw depth mm
0150	482-3	52.38	150	150
		(562)		

Pullers with Claw Feet

Design: With pointed claw feet for narrow areas, for extraction of pinions, bearings and similar parts. Jaw width and jaw depth can be selected individually by means of self-locking retaining pins.

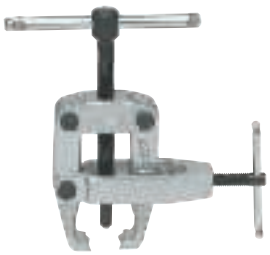




Part No.	Model	6908	Jaw span mm	Jaw depth mm	A mm	B mm	C mm	D mm
0100	14-01	57.82	6–100	85	11	9.5	3.5	2.5
0140	14-03	88.14	15–140	160	12	11	3.5	3.9
1100	14-1	49.51	6–100	85	21	9.5	3.5	2.5
1140	14-2	62.56	10–140	125	29	11	3.5	3.9
1141	14-3	72.08	15–140	160	29	11	3.5	3.9
		(562)						

Bearing Pullers

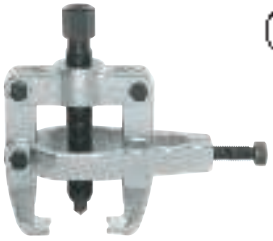
Design: With lateral clamp for extraction of flush mounted ball bearings, bearing washers and similar precision parts, electric appliances, repair of compressed air devices etc.
On tightening the clamp, the claws of the hooks grab below the part to be extracted and remove it prior to the actual extraction process.



Part No.	Model	6909	Jaw span mm	Jaw depth mm
0050	204-0	47.84	50	70
0090	204-02	73.58	90	100
		(562)		

Pullers for Steering Levers

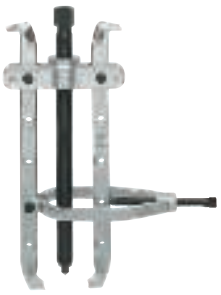
Design: With lateral clamp for extraction of steering levers, toothed wheels, pinions and similar items.



Part No.	Model	6910	Jaw span mm	Jaw depth mm
0080	204-1	52.08	80	90
0100	204-2	60.07	90	100
0150	204-3	80.83	150	140
		(562)		

Parting Pullers

Design: Suitable for a wide range of applications, where normal pullers cannot be used.
For releasing of flush mounted parts, such as axle bearings, bearing washers, pinions, etc. the hooks are provided with tapered, sharp cutting edges at the sides. They are pressed behind the parts to be extracted by means of the clamp. Normal claws are provided on the other side of the jaws for normal use.



Part No.	Model	6911	Jaw span mm	Jaw depth mm
0090	210-1	90.34	95	170
0100	210-0*	111.99	135	170
		(562)		

* without pressure unit.

Part No.	Model	6911	Jaw span mm	Jaw depth mm
0135	210-2	112.53	135	270
0150	210-3	128.97	150	325
		(562)		

Pullers, Three-leg

Design: With self-centring quick-clamping and automatic grip readjustment.
Ideal for small-sized electric motors, battery clips, small ball bearings etc.
Handy, device requires only little space, for electrical systems in cars, for electric applications, repairs on compressed air devices and similar applications.



Part No.	Model	6912	Jaw span mm	Jaw depth mm
0101	45-1	31.69	100	100
0120	45-2	47.47	120	120
		(562)		

Part No.	Model	6912	Jaw span mm	Jaw depth mm
0160	45-3	69.21	160	160
0250	45-4	92.30	250	200
		(562)		

Pullers, Three-leg

Design: Strong version for extraction of seized toothed wheels, pinions, ball bearings, pulley etc.



Part No.	Model	6913	Jaw span mm	Jaw depth mm
0060	42-0	18.03	60	40
0065	42-1	18.27	65	65
0080	42-2	21.72	80	80
		(562)		

Part No.	Model	6913	Jaw span mm	Jaw depth mm
0090	42-3	41.67	90	120
0130	42-4	61.21	130	160
0180	42-5	83.93	180	200
		(562)		

Universal Pullers, Three-leg

Design: Sturdy, drop-forged design, single-unit extraction legs, profile-milled jaws with adjusted radii for fixing on shafts and axles. Profiled hooks for firm grip also in confined areas. Self-locking pull hook, reversible to external and internal puller.



Part No.	Jaw span mm	6914	Jaw depth mm
0090	90	42.70	100
0120	120	65.56	100
		(563)	

Part No.	Jaw span mm	6914	Jaw depth mm
0160	160	80.90	150
0200	200	127.44	150
		(563)	

Universal Pullers, Three-leg

Design: Sturdy, drop-forged design, with sliding, constantly parallel hooks, reversible for use as external and internal puller, strong, hardened spindle with centre punch.



Part No.	Model	6915	Jaw span mm	Jaw depth mm
0090	30-1	52.08	90	100
0120	30-10	56.07	120	100
		(562)		

Part No.	Model	6915	Jaw span mm	Jaw depth mm
0160	30-2	99.33	160	150
0200	30-20	108.83	200	150
		(562)		

Universal Pullers, Three-leg

Design: Sturdy, drop-forged design, with sliding, constantly parallel hooks, reversible for use as external and internal puller, strong, hardened spindle with centre punch.



Part No.	Model	6916	Jaw span mm	Jaw depth mm
0375	11-0-A	323.54	375	200
0520	11-1-A	444.05	520	200
0650	11-2-A	465.94	650	200
		(562)		

Universal Pullers, with Preadjusted Jaw Width, Three-leg

Design: Strong version with high extraction force and outstanding clamping effect, for extracting highly seized ball bearings, toothed wheels, pulleys and similar parts.



Part No.	Model	6917	Jaw span mm	Jaw depth mm
0100	12-1	52.53	100	100
0150	12-2	77.05	150	125
0200	12-3	111.10	200	165
		(562)		

Part No.	Model	6917	Jaw span mm	Jaw depth mm
0250	12-4	227.08	250	225
0350	12-5	740.43	350	275
		(562)		

Pullers Autogrip, Three-leg

Design: Ease-of-use puller with automatic tensioning, self-locking and self-centring, requires only little space. The spring effect and the slim design enables extraction in confined areas.



Part No.	Model	6918	Jaw span mm	Jaw depth mm
0150	483-3	61.96	150	150
		(562)		

Universal Puller Sets, Two/Three-leg



Design: With slim hooks for narrow areas in several clamping depths, supplied in tool case. Contents: Universal puller, 2-leg, jaw span 120 mm, traverse, 3-leg, jaw span 120 mm and 3 hooks each 100, 200, 250 mm, incl. spindle.

Part No.	Model	6919
0010	K 2030 S	235.09 (562)

Hydraulic Spindles

Design: For heavy-duty pulling. High pressing force is advantageous for extremely seized parts, which can be extracted quickly and easily. With integrated resetting mechanism.

Part No.	Model	6920	Stroke mm	Pressure	Matches puller model
0015	8-1-B	243.61	10	15 t/150 KN	20-4, 20-40
0021	8-2-K	284.89	10	20 t/200 KN	11-1, 11-2
		(562)			



6920

Hydraulic Presses

Design: Great performance, requires only little space. These presses are helpful tools to increase the pressing force when extremely seized parts are to be pulled. The presses are positioned between puller and the item to be pulled. **To avoid overload, these extra presses should only be used with pullers from size 3 onwards.**

Part No.	Model	6921	Stroke mm	Pressure
0011	9-1	72.61	10	10 t/100 KN
0015	9-2	83.55	15	15 t/150 KN
		(562)		



6921

Internal Extractors

Design: For pulling ball bearings, ball bearing external washers and bushings. Also tightly fitting bearings on the rear wall are grabbed and quickly extracted, due to outstanding clamping effect.

Part No.	Model	6922	For hole mm
0012	21-01	21.42	8–12
0014	21-02	21.42	10–14
0016	21-1	18.79	12–16
0019	21-2	18.87	14–19
0023	21-3	24.69	18–23
0030	21-4	26.33	20–30
		(562)	

Part No.	Model	6922	For hole mm
0040	21-5	30.11	28– 40
0046	21-6	36.38	36– 46
0058	21-7	47.17	45– 58
0070	21-8	60.68	56– 70
0100	21-9	92.07	70–100
		(562)	



Slide Hammers and Slide Hammer Sets

6924 **Design:** For use with internal extractor no. 6922. Allows quick extraction of ball bearings and is useful especially in confined spaces instead of normal counter support. After placing the internal extractor, connect slide hammer bar with wedge-type spindle by screwing and actuate slide hammer.

6925 **Design:** Slide hammer sets for use with internal extractors no. 6922. Supplied in plastic case. Set contents: 1 slide hammer, 1 adaptor of each size M3, M4, M5, M6, M8 and M10.

Part No.	Model 6924	Model 6925	6924	6925	For internal extractor model	Design
0000	22-0	–	12.99	–	21-0 – 21-2	–
0003	22-01	–	45.06	–	21-3 – 21-8	–
0000	–	KS-22-01	–	58.19	–	Slide hammer set
			(562)	(562)		





6924 6925

Counter Supports for Internal Extractors

Design: For use with internal extractor no. 6922. For connecting the internal extractor, the spindle of the counter support is screwed into the clamping nut of the internal extractor.

Part No.	Model	6923	For internal extractor model
0001	22-1	20.97	21-0 – 21-5
0002	22-2	33.29	21-3 – 21-8
0003	22-3	67.70	21-6 – 21-9
		(562)	



Ball Bearing Pulling and Extractor Sets

Design: Assortment in metal case containing internal extractors, counter supports, pulling chucks and external extractors.

Part No.	Model	6926	Set contents
0046	24-A	388.58	1 internal extractor of each size 1–6 (extracting range 12–46 mm) 2 counter supports, 1 Extracting chuck for internal washers of deep groove ball bearing (5–32 mm), 1 puller, 2-leg, (jaw width 60 mm, clamping depth 50 mm), 1 puller, 2-leg, (jaw width 90 mm, clamping depth 100 mm)
0070	24-B	576.88	1 internal extractor of each size 1–8 (extracting range 12–70 mm), 2 counter supports, 1 Extracting chuck for internal washers of deep groove ball bearing (5–32 mm), 1 puller, 2-leg, (jaw width 60 mm, clamping depth 50 mm), 1 puller, 2-leg, (jaw width 90 mm, clamping depth 100 mm), 1 puller, 2-leg, (jaw width 160 mm, clamping depth 150 mm)
0110	24-C	750.91	1 internal extractor of each size 1–7 (extracting range 12–58 mm), 1 internal extractor (extracting range 56–110 mm), 3 counter supports, 1 Extracting chuck for internal washers of deep groove ball bearing (5–32 mm), 1 puller, 2-leg, (jaw width 60 mm, clamping depth 50 mm), 1 puller, 2-leg, (jaw width 90 mm, clamping depth 100 mm), 1 puller, 2-leg, (jaw width 160 mm, clamping depth 150 mm)
		(562)	



Ball Bearing Pulling and Extractor Sets

Design: Supplied in plastic case, incl. 2 dividing plates with counternut and spindle, 7 pulling hook sets with ball heads, 2 guide rings for convenient handle of pulling hooks as well as 26 different supporting rings.

Application: For extracting deep groove ball bearings no. 6000-6012/6200-6212/6300-6311/6403-6408 which sit in a housing on a shaft and are to be gripped between the internal and external ring.

Part No.	Model	6339	Design
0005	KS-70-A-K	546.31	37-piece
		(562)	



Internal Extractor Sets

Design: Assortment in metal case containing internal extractors and counter supports.

Part No.	Model	6927	Set content
0046	25-A	247.08	1 internal extractor of each size 1–6 (extracting range 12–46 mm) 2 counter supports
0070	25-B	357.72	1 internal extractor of each size 1–8 (extracting range 12–70 mm) 2 counter supports
0110	25-C	532.72	1 internal extractor of each size 1–7 (extracting range 12–58 mm) 1 internal extractor each (extracting range 56–110 mm) 3 counter supports
		(562)	



Separators

Design: Clamping of the separating jaws is effected by the even tightening of the nuts on the side bolt.

Part No.	Model	6928	A mm	B mm
0061	17-0	43.39	5–60	60
0075	17-1	50.64	12–75	75
0115	17-2	86.87	22–115	115
0155	17-3	132.15	25–155	155
		(562)		



Pullers

Design: To connect these pullers with the separators no. 6928, the bolts are screwed in the threaded holes of the separator jaws.

Part No.	Model	6929	For separator model	A mm	B mm
0150	18-0	27.70	17-0	50–110	150
0200	18-1	45.50	17-1	60–150	200
0250	18-2	67.32	17-2	60–200	250
0300	18-3	101.80	17-3	80–300	300
		(562)			



Separator and Puller Sets for Ball Bearings

Design: Set in metal case, including separator with quick-chuck pressure spindle, puller, 1 pair of extensions.

Part No.	Model	6930	Clamping range mm
0060	17-K	100.21	5– 60
0075	17-A	128.97	12– 75
0115	17-B	195.30	22–115
0155	17-C	285.65	25–155
		(562)	



Tools Sets for Assembly of Bearings

Design: Light-weight design from shock-resistant polyacetal with unique locking.
Supplied in plastic case incl.
1 recoilless hammer
13 striking rings for bearings with bore hole ⌀ 10–50 mm
3 striking sleeves for inside ⌀ 18, 32 and 52 mm.

Application: For mounting of ball bearings. Ideal for use on building sites.

Part No.	Model	6339	Striking ring ⌀ mm	Striking sleeve ⌀ mm
0010	71-L	402.04	10–50	18-32-52
		(562)		



Separating Forks

Design: Universal tool for releasing of jammed ball joints, steering levers, for dismantling shock absorbers and other separating and disassembly work.

Part No.	Model	6931	Fork opening mm
0018	135-1	24.45 (567)	18

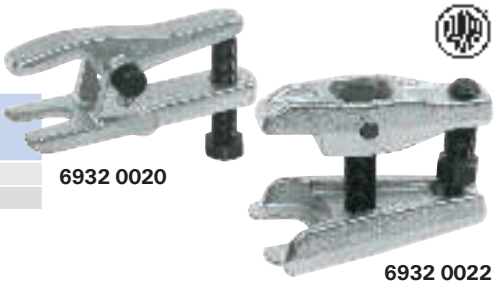


Ball Joint Pullers

Design: **6932 0020** suitable for car makes AUDI, BMW, Fiat, Ford, Mercedes, Nissan-Datsun, Opel, Toyota, VW, Volvo.

6932 0022 suitable for all cars and most vans.

Part No.	Model	6932	Fork opening mm
0020	129-0	56.90	20
0022	129-1	38.65 (562)	18–22



6932 0020

6932 0022

Stud Bolt Extractors

Design: Wide clamping range, the low positioning of the knurled wheel enables the gripping also of short stud bolts.

Part No.	Model	6933	Clamping range mm
0019	52	42.64 (562)	5–19



Mechanical Nut Splitters

Design: For splitting jammed or stripped nuts up to hardness class 6 without damaging the threaded bolt.

Part No.	Model	6934	For nut size
0010	55-0	25.88	SW 4–10
0018	55-1	32.38	SW 10–18
0027	55-2	33.36 (562)	SW 19–27



Hydraulic Nut Splitters

Design: For splitting jammed or stripped nuts of hardness classes 5, 6, 8 and 10 without damaging the threaded bolt. The double crank allows the use also in confined areas. Only little effort required due to the hydraulic feature.

Part No.	Model	6935	For nut size
0022	56-1	73.58	SW 7–22
0036	56-2	145.06 (562)	SW 22–36



Standard Pulling Hooks

Part No.	Model	6936	For puller model	Total length mm
0090	1-90-P	20.75	20-1, 20-10	100
0150	2-150-P	38.79	20-2, 20-20	150
0200	3-200-P	64.68 (562)	20-3, 20-30, 20-4, 20-40	200



Long Pulling Hooks

Part No.	Model	6937	For puller model	Total length mm
0190	1-190-P	28.97	20-1, 20-10	200
0250	1-250-P	35.55	20-1, 20-10	250
0300	2-300-P	53.36	20-2, 20-20	300
0301	3-300-P	82.71	20-3, 20-30, 20-4, 20-40	300
0400	3-400-P	99.61	20-3, 20-30, 20-4, 20-40	400
0500	3-500-P	105.05	20-3, 20-30, 20-4, 20-40	500
		(562)		



Pressure Spindles

Part No.	Model	6938	For puller model
0001	612130	11.17	18-0, 44, 45-1
0002	614135	10.72	20-1, 20-10, 30-1, 30-10
0003	621170	16.45	18-2
0004	621210	17.14	20-2, 20-20, 30-2, 30-20
0005	626280	32.29	20-3, 20-30, 30-3
		(562)	



Drum Brake Pliers

Design: For drum brakes. With special frame and protection crown, suitable for bonded brake linings. GEDORE vanadium 31 CrV 3 material no. 1.2208. Chromium-plated.

Part No.	Length mm	6960
0330	330	25.01
		(522)



Hose Clamp Pliers

Design: For self-clamping hose clamps. Handles chromium-plated.

Part No.	Length mm	6964
0220	220	19.85
		(522)

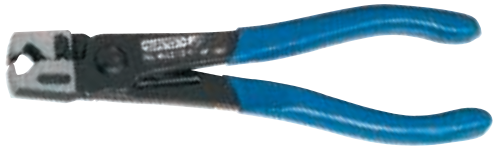


Hose Clamp Pliers

Design: For CLIC-R sheet metal clamps. Ground, bright polished, burnished joints. Forged design for clamp diameters of 5–30 mm.

Part No.	Length mm	6965
0180	180	28.21
		(522)





Pliers for Balancing of Wheels

Design: For releasing, cutting to size and fixing of balancing weights.
GEDORE vanadium 31 CrV 3 material no. 1.2208.

Part No.	Length mm	6968
0250	250	35.18 (522)



Outside Wrenches for Oil Sump Stopper

Design: Universal square pin wrench.

Part No.	Length mm	6966
0220	220	13.64 (522)



Strap Wrenches

Design: With sturdy, anti-slip fabric tap, extra-wide.

Part No.	Design	6972	Clamping range mm
0285	Strap wrench	26.66	200
0900	Spare strap	9.84 (522)	–



Universal Oil Filter Extractors

Design: Nickel-plated, with handle and adjustable metal band.
For conventional oil filters and round screwing.

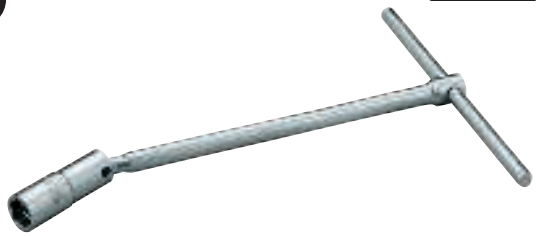
Part No.	Range mm	6962	Design
0005	80–110	20.74	With actuating lever
0010	80–110	20.29 (522)	With 1/2" actuating lever



Socket Wrenches for Spark Plugs

Design: With retaining spring and joint. GEDORE vanadium 31 CrV 3 material no. 1.2208. Chromium-plated.

Part No.	Key width hexagon mm	6970	Wrench size hexagon A.F. inch	Length mm	∅ mm
0016	16	20.03	5/8	500	22.5
0020	20.8	20.03 (522)	13/16	500	27



Socket Wrenches for Spark Plugs 3/8“

Design: GEDORE vanadium 31 CrV 3 mat. no. 1.2208, thin-walled and heavy-duty use. The spark plug is held safely by strong retaining spring. Furthermore, the wrench is fitted with a bore hole for actuation by means of an 8 mm tommy bar, see (part no 5778).

Application: For spark plugs with platinum electrode. The retaining spring enables gentle installation protecting the thread.
Especially for spark plugs in space-saving design (e.g. Bosch 14 ZR 8, Beru 12 Zr-6 GP) which are mainly used in French passenger cars (Citroen C5 with HDI engine, Peugeot 406 with HDI engine, Renault Clio 1.2-16 v and Renault Twingo 1.2–16 v).



Part No.	SW mm	6971 [redacted]
0014	14	12.69 (522)

Socket Wrench Sets for Spark Plugs 3/8“

Design: GEDORE vanadium 31 CrV 3 mat. no. 1.2208, thin-walled and heavy-duty use. Supplied in blue GEDORIT steel sheet case incl.
1 ratchet (part no. 6059)
4 wrenches for spark plugs 13 mm; 16 mm (5/8“); 18 mm; 20.8 mm (13/16“)
1 wrench for spark plugs (part no. 6971) 14 mm
3 extension bars (part no. 6061) 76, 125, 250 mm
1 universal joint (part no. 6065)



Part No.	Contents	6973 [redacted]
0005	10-piece	169.11 (522)

Pry Bars, Rolled Head

Design: Chromium-vanadium steel 31 CrV 3, nickel-plated, material ⌀ 14 mm.

Application: For loosening rusted-on parts, removing and inserting bearings and bearing shells.
Removing and inserting springs, pins, cogs etc.



Part No.	Length mm	6974 [redacted]
0001	400	18.18 (552)

Curved Pry Bars

Design: Chromium-molybdenum-vanadium air-hardened steel 45 CrMoV7. Evenly through-hardened along its length and carefully annealed, nickel-plated. Hex. material ⌀ 17 mm.



Part No.	Length mm	6974 [redacted]
0002	400	10.71 (552)

Four-way Socket Wrenches

Design: DIN 3119/ISO 6788, for wheel nuts in metric and inch sizes. With protective central boss (German utility model). GEDORE vanadium 31 CrV 3 material no. 1.2208. GEDORIT silver powder-coated.

6975 For passenger cars, wrench size hexagon 17 x 19 (3/4“). Chromium-plated, heads polished.

6976 For passenger cars. Wrench size hexagon: 17 x 19 (3/4“) x 21 mm x 11/16“ A.F.

6980 For vans and lightweight lorries, buses and tractors. Wrench size hexagon: 10 (3/4“) x 22 (7/8“) x 24 (15/16“) x 27 (1.1/16“) mm (A.F.).

6978 For HGV, agricultural machines, tractors and industrial applications. Wrench size hexagon: 27 x 32 x 33 mm x 3/4“ external square.

Part No.	Dimension mm	0005
6975	260 x 285	18.33
6976	420 x 420	16.02
6980	600 x 600	35.04
6978	750 x 750	55.93

(522)


6975


6976


6980


6978

Tyre Levers

Material: GEDORE vanadium 31 CrV 3 material no. 1.2208, chromium-plated.

6985 **Design:** Profiled form, forged, with protective surface for aluminium wheel rims.

6986 **Design:** Heavy, depressed design for HGV.

Part No.	Length mm	6985	6986
0008	200	6.11	–
0012	305	7.53	–
0016	400	10.50	–
0020	500	14.92	–
0024	610	21.60	22.49
		(522)	(522)


6985


6986

Overview – Group 7

New in the product range:

Extension of range of pipe cleaning devices



Our extensive range of pipe cleaning devices offers many quality products for professionals:

- Cleaning cables
- Accessories for pipe cleaning machines
- Pipe cleaning machines

At a glance, you find all articles required for pipe cleaning, as our extended pipe cleaning range offers high-quality products for optimum use.



Furthermore, our range of tool storage systems has been topped off.


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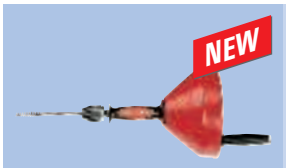


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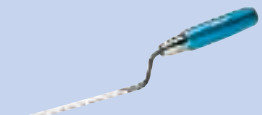

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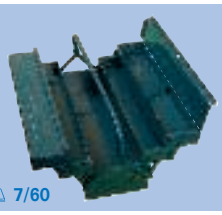

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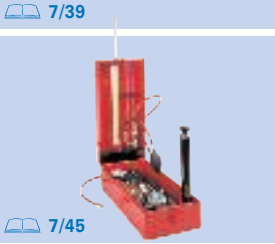
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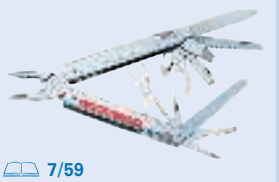

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Wire Brushes

Spark Plug Brushes

Design: Brass wire, crimped, gauge 0.2 mm. Beech body, length 200 mm.

Application: For automotive applications but can be used for any job in any other area.

Part No.	7000
0001	0.67
	(566)



File Brushes

Design: 1a premium file brush strip, brush size 115 X 40 mm, straight wooden body, length 235 mm.

Application: For cleaning clogged files.

Part No.	7002
0001	1.01
	(566)



Wire Hand Brushes

Design: Made of waxed, burnished beech with rounded edges, with hole for hanging up, length 295 mm.

Application: For all light rust removal and cleaning work.

7004 Cast iron wire, smooth, oil-tempered, wire gauge 0.35 mm.

7006 Stainless steel wire, smooth wire gauge 0.30 mm.

7008 Brass wire, crimped, wire gauge 0.30 mm.

Part No.	Number of rows	7004	7006	7008
0002	2	0.44	1.08	1.01
0003	3	0.51	1.26	1.13
0004	4	0.59	1.46	1.37
0005	5	0.68	1.68	1.53
0006	6	0.74	1.87	–
		(566)	(566)	(566)



7004



7006



7008

Concave Fillet Weld Brushes

Design: Made of waxed, burnished beech with rounded edges, with hole for hanging up, length 295 mm, smooth, 3 rows of wires, wire gauge 0.35.

Application: For light rust removal and cleaning in corners.

Part No.	Brush	7010
0001	Cast iron wire	1.83
0005	Stainless steel wire INOX	3.76
		(566)



Universal Hand Brushes

Design: Back of brush made of reinforced steel rail, with ergonomic plastic handle, crimped wire, wire gauge 0.3 mm. Overall length 260 mm, working length 130 mm.

Application: For all cleaning operations, in particular for working in confined spaces.

Part No.	Brush	7012
0010	Steel wire	0.89
0020	Stainless steel wire INOX	2.15
0030	Brass wire	2.15
		(566)



Wire Brushes

Internal Copper Pipe Brushes

Design: Sturdy plastic handle, for quick cleaning of the soldering joint.

Part No.	For pipe ∅ mm	7013 ROTHENBERGER
0012	12	2.99
0015	15	2.99
0018	18	2.99
0022	22	2.99
0028	28	4.92
		(592)



External Copper Pipe Brushes

Design: Sturdy housing, for quick cleaning of the soldering joint.

ROTHENBERGER

Part No.	For pipe ∅ mm	7015 ROTHENBERGER
0012	12	4.92
0015	15	4.84
0018	18	4.84
0022	22	5.13
0028	28	6.17
		(592)



Hole Brushes

Design: 2-ply wire with wooden handle: cast iron wire, length 280 mm.

format professional quality

Part No.	∅ mm	7014
0015	15	3.94
0020	20	3.96
0025	25	4.10
		(566)



Nozzle Brushes

Design: Nozzle brush with 2-ply wire and eyelet, suitable ideally for cleaning of nozzles, gas cylinders, tubes and pipes.

format professional quality

7017 Steel wire, crimped



7017

7019 Brass wire, crimped



7019

7021 Nylon, smooth



7021

Part No.	∅ mm	7017	7019	7021	Working length mm	Total length mm
0005	4	3.50	–	1.05	100	300
0010	5	3.54	–	1.08	100	300
0015	6	3.57	3.64	1.12	100	300
0020	8	2.64	3.64	1.15	100	300
0025	10	2.67	3.42	1.19	100	300
0030	12	2.71	3.47	1.20	100	300
0035	15	2.75	3.54	1.23	100	300
0040	18	2.80	3.61	1.27	100	300
0045	20	2.83	3.66	1.29	100	300
0050	25	2.87	3.71	1.31	100	300
		(566)	(566)	(566)		

Brushing Wheels

Design: Universal brush for all medium-duty brushing jobs.
Supplied with a selection of plastic reducing brushes for smaller bores.

100–125 mm	150–200 mm	
20 mm = 1/2“	31.75 = 13 mm	31.75 = 20 mm
20 mm = 5/8“	31.75 = 15 mm	31.75 = 7/8“
	31.75 = 16 mm	31.75 = 1“

7016 **SS steel wire 0.3 mm, crimped.**

7018 **Stainless steel wire 0.3 mm, crimped.**



7016



7018

Part No.		0100	0125	0150	0178	0200
Brush ∅	**mm**	**100**	**125**	**150**	**178**	**200**
7016		5.92	6.59	8.65	10.92	13.77
7018		–	14.68	21.00	25.69	28.67
Effective working	mm	20	22	30	32	30
Bore hole ∅	mm	20	20	31.75	31.75	31.75
Max. speed	RPM	8,000	6,000	6,000	6,000	4,500

(566)

Brushing Wheels, Twist Knot

Straight, twist knot

Design: According to DIN 68347 part 1 and 2.
Designed for applications at extremely high circumferential speeds.
Can also be used on hand machines. Hole 22.2 mm.

Application: De-scaling, deburring, rust removal, removing glue and for preparing and cleaning weld seams.



Part No.		0115	0125	0178	1115	1125	1178
Design		**Hardened steel**			**Stainless steel**		
7020		3.87	4.50	7.42	8.18	9.26	20.52
Brush ∅	mm	115	125	178	115	125	178
Wire thickness	mm	0.5	0.5	0.5	0.5	0.5	0.5
Effective working	mm	12	13	13	12	13	13
Max. speed	RPM	12,500	10,000	9,000	12,500	10,000	9,000

(566)

Brushing Wheels, Twist Knot

Design: Heavy-duty, extremely narrow design, from hardened twist knot steel wire.
Hole 22.23 mm.

Application: Particularly for preparing and cleaning weld seams on hand machines, furthermore perfectly suitable for de-scaling, deburring and removing glue at high circumferential speeds.

Note: Wear eye protection.



Part No.		0115	0125	0178
Brush ∅	**mm**	**115**	**125**	**178**
7023		13.44	15.13	17.87
Wire thickness	mm	0.5	0.5	0.3
Effective working	mm	6	6	13
Max speed	RPM	12,500	12,500	12,000

(566)

Brushing Wheels, Silicon Carbide

Design: Very sturdy, nylon threads fitted with silicon carbide with hard and sharp tips and very flexible working area. Despite high elasticity and flexibility no risk of breakage. Clogging of the brush by swarf is avoided, whereby a continuously high grinding result is achieved. Furthermore, the bristles are resistant to weak acids and alkaline solutions. Supplied with set of 7 adaptors for different holes.

Application: For deburring of precision parts with constant grinding effect. Thanks to the novel silicon carbide bristles, processing of non-ferrous metals as well as stainless steel is possible. Suitable for wet and dry processing.
Can be used individually or in a row on shafts.

Note: Wear eye protection.



Part No.		0150	0178	0200
Brush ∅	**mm**	**150**	**178**	**200**
7011		40.15	45.94	53.59
Brush thickness	mm	0.5	0.5	0.5
Grain		120	120	120
Effective working	mm	36	36	36
Hole	mm	31.75	31.75	31.75
Max. speed	RPM	12,500	10,000	9,000

(566)

Taper Brushes

Design: Heavy-duty. To fit all standard one-hand angle grinders.
Thread M 14 x 2.0.

Application: De-scaling, deburring, rust removal, removing glue and for preparing and cleaning weld seams.

Note: Wear eye protection.

7022 **0100 + 0115** Hardened steel wire, twist knot.
1115 + 1116 Stainless steel wire, twist knot.

7025 **0101** Hardened steel wire, crimped.
1100 Stainless steel wire, crimped.



7022



7025 0101



7025 1100

Part No.		0100	0101	0115	1100	1115	1116
Design		**Hardned steel wire**			**Stainless steel wire**		
7022		3.76	–	6.92	–	9.93	11.16
7025		–	4.94	–	10.13	–	–
Brush ∅	mm	100	100	115	100	115	115
Wire thickness	mm	0.5	0.3	0.5	0.2	0.5	0.35
Effective working	mm	13	10	15	15	15	15
Max. speed	RPM	12,500	12,500	12,500	12,500	12,500	12,500

(566)

Tool Brushing Wheels

Design: In accordance with DIN 68347, part 1 and 2, with 6 mm shank.

Application: For use in drilling machines and high speed electrical and compressed air tools. The small diameter enables use in confined spaces, internal surfaces and grooves. Ideal for removing burrs, clinker, rust, slag, paint etc.

7024 **Crimped steel wire**
7026 **Crimped stainless steel wire**
7028 **Crimped brass wire**
7030 **Twist knot steel wire**

format professional quality


7024


7026


7028


7030

Part No.		0030	0040	0050	0060	0061	0070	0071	0075	0080
Brush ∅	**mm**	**30**	**40**	**50**	**60**	**60**	**70**	**70**	**75**	**80**
7024		1.68	1.80	2.47	–	2.57	–	2.67	–	2.75
7026		2.26	2.75	3.84	4.14	–	4.47	–	–	–
7028		2.34	2.71	3.58	4.14	–	4.38	–	–	–
7030		–	–	–	–	–	–	–	3.40	–
Wire thickness	mm	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.5	0.3
Brush width	mm	9	11	17	18	18	18	18	8	19
Max. speed	RPM	20,000	18,000	15,000	15,000	15,000	15,000	15,000	20,000	12,000

(566)

Safety Brushing Wheels

Design: From plastic-coated, crimped steel wire. **Approved by the German Technical Supervisory Association (TÜV), 10-fold longer service life.** Particularly safe due to plastic coat, as breakage of wire is avoided. Shank 6 mm.

Application: For use in drilling machines and high-speed electric and pneumatic tools. The small diameter enables use in confined spaces, internal surfaces and grooves. Ideal for removing paint and varnish as well as deburring and cleaning of many surfaces.

Note: Wear eye protection.

format professional quality



Part No.	Brush ∅ mm	7031	Wire thickness mm	Effective working mm	Max. speed RPM
0063	63	7.41	0.3	8	15,000

(566)

Rotary Crimped Wire Cup Brushes

Design: To fit all standard one-handed angle grinders, SS wire. Thread M 14 X 2.0.

Application: For light-duty rust removal and cleaning jobs.

7032 **Hardened steel wire**
7034 **Stainless steel wire**

format professional quality

Part No.		0060	0080
Brush ∅	**mm**	**60**	**80**
7032		2.53	6.73
7034		4.92	9.17
Wire thickness	mm	0.30	0.30
Max. speed	RPM	12,500	8,500

(566)


7032


7034

Wire Cup Brushes

Rotary Twist Knot Cup Brushes

Design: In accordance with DIN 68347 Part 1 and 2, to fit all standard one-handed angle grinders, balanced running characteristic.
Thread M 14 x 2.0.

Application: For light to medium-duty rust removal and deburring.

7036 **Hardened steel wire**

7038 **Stainless steel wire**



7036



7038

Part No.		0005	0010
Brush ⌀	**mm**	**65**	**65**
7036		3.66	3.50
7038		7.10	6.67
Wire thickness	mm	0.35	0.50
Max. speed	RPM	12,500	12,500

(566)

Pot Brushes, with Support Ring

Design: In accordance with DIN 68347, part 1 and 2, to fit all standard one-handed angle grinders, balanced running characteristics.
Thread M 14 x 2.0.

Application: For heavy-duty cleaning work and preparing large surfaces. For removing clinker, rust, slag, paint etc.

7040 **Hardened steel wire**

7042 **Stainless steel wire**



7040



7042

Part No.		0080	0081	0082	0100	0101	0102
Brush ⌀	**mm**	**80**	**80**	**80**	**100**	**100**	**100**
7040		7.82	7.75	7.64	8.50	8.42	8.26
7042		–	16.52	–	–	–	–
Wire thickness	mm	0.35	0.50	0.80	0.35	0.50	0.80
Max. speed	RPM	8,500	8,500	8,500	8,500	8,500	8,500

(566)

Rotary Wire Cup Brushes, Twist Knot

Design: Heavy-duty with twist knot wire. **Shank 6 mm.**

Application: For heavy-duty surface treatment.
For roughening as well as removing paint, burr, slag, scale, rust etc.

Note: Wear eye protection.



Part No.	Brush ⌀ mm	7033	Wire thickness mm	Max. speed RPM
0065	65	5.29	0.5	6,000

(566)

Mounted Rotary Brushes, Crimped

Design: SS wire, with 6 mm shank.

Application: Use on fast-moving hand tools, for removing rust, burrs, slag, cinder, paint, excessive rubber and other pollution in hard-to-reach areas and internal surfaces.

7044 **Hardened steel wire**

7046 **Stainless steel wire**



7044



7046

Part No.		0010	0017	0025	0030
Brush ∅	**mm**	**10**	**17**	**25**	**30**
7044		1.19	1.26	1.67	2.26
7046		1.52	2.15	2.79	3.39
Brush length	mm	20	25	25	25
Wire thickness	mm	0.30	0.30	0.30	0.30
Max. speed	RPM	20,000	18,000	18,000	15,000

(566)

Mounted Rotary Brushes, Twist Knot

Design: Steel wire, with 6 mm shaft seat. High cleaning efficiency and great flexibility. Opening and closing of brush through centrifugal force generated during operation.

Application: Use on fast-moving hand tools, for removing rust, burrs, slag, cinder, paint, excessive rubber and other pollution in hard-to-reach areas and internal surfaces. Particularly suitable for internal cleaning of bore holes and pipes.

7045 **Hardened steel wire**

7047 **Stainless steel wire**



7045



7047

Part No.		0020	0023
Brush ∅	**mm**	**20**	**23**
7045		6.84	7.10
7047		10.04	10.43
Brush length	mm	29	29
Wire thickness 7045	mm	0.35	0.35
Wire thickness 7047	mm	0.26	0.26
Max. speed	RPM	22,000	20,000

(566)

Mounted Safety Rotary Brushes

Design: From plastic-coated, crimped steel wire. **Approved by the German Technical Supervisory Association (TÜV), 10-fold longer service life.** Particularly safe due to plastic coat, as breakage of wire is avoided. **Shank 6 mm.**

Application: For removing rust, burr, slag, scale, paint, excessive rubber and other impurities in confined spaces and internal surfaces.

Note: Wear eye protection.



Part No.		0024
Brush ∅	**mm**	**24**
7043		7.22
Brush length	mm	23
Wire thickness	mm	0.3
Max. speed	RPM	15,000

(566)

Varnishing Brushes

Design: Flat, sheet metal casing, pure black China bristle, varnished wooden handle.



Part No.		0010	0020	0030	0040	0060
Dimensions		**3/4“**	**1.“**	**1.1/2“**	**2.“**	**2.1/2“**
7048		0.19	0.23	0.30	0.40	0.49
Brush width	mm	19	25	38	51	64

(567)

Round Paint Brushes

Design: Metal ring, double plastic collar, pure black China bristle.



Part No.		0001	0011	0021	0031	0041	0050
Dimensions		**2**	**4**	**6**	**8**	**10**	**12**
7050		0.40	0.44	0.72	0.90	1.22	2.01
Brush diameter	mm	21	25	30	35	39	45

(567)

Universal Paint Brushes for Enamel Varnish

Design: Flat sheet metal collars, pure bright bristle, wooden handle.



Part No.		0010	0020	0030	0040
Dimensions		**00**	**01**	**02**	**03**
7052		0.11	0.12	0.14	0.14
Brush width	mm	10	12	14	17

(567)

Radiator Paint Brushes

Design: Bent, sturdy quality, pure grey China bristle, wooden handle, approx. 40 cm



Part No.		0011	0021	0031	0041
Dimensions		**1.“**	**1.1/2“**	**2.“**	**2.1/2“**
7054		0.30	0.34	0.44	0.56
Brush width	mm	25	38	51	64

(567)

Plate Shears

Plate Shears, Berlin Form

Design: Right-hand cutting, drop-forged, stainless steel, induction hardened cutting edges (min. 58 HRC).

Application: For long straight cuts and shaping, cutting performance: Steel plate up to 1.2 mm, stainless steel plate up to 0.8 mm.



Part No.	Length mm	7060
0250	250	8.72
0300	300	10.84
		(568)

Sheet Metal Shears

Design: Right-hand cutting, drop forged, stainless steel, induction hardened cutting edges (min. 58 HRC).

Application: For long straight cuts and continuous cuts. Cutting performance: Sheet steel up to 1.2 mm, stainless sheet steel up to 0.8 mm.



Part No.	Length mm	7066
0300	300	14.57
0350	350	17.21
		(568)

Hole Snips

Design: Drop-forged, made of stainless steel, induction hardened cutting edges (min. 58 HRC).

Application: For short straight cuts and shaping, cutting performance: Sheet steel up to 1.2 mm, stainless sheet steel up to 0.8 mm.

7073 Right-hand cutting
7075 Left-hand cutting



Part No.	Length mm	7073	7075
0250	250	9.64	9.64
0275	275	10.38	10.38
0300	300	11.59	11.59
		(568)	(568)

Ideal Offset Snips

Design: Drop-forged, made of stainless steel, induction hardened cutting edges (min. 58 HRC).

Application: For continuous straight cuts and shaping, cutting performance: Sheet steel up to 1.2 mm, stainless sheet steel up to 0.8 mm.

7062 Right-hand cutting
7064 Left-hand cutting



Part No.	Length mm	7062	7064
0260	260	13.29	13.29
0280	280	15.00	15.00
		(568)	(568)

Shaping Snips with Toggle Joint

Design: Drop-forged shear head, fully tempered, made of stainless steel, heavy-duty ergonomic steel handle, plastic extrusion coated, with sideslip protection, induction hardened cutting edges (min. 58 HRC), with micro-teeth.

Application: For short straight cuts and shaping. Cutting performance: Sheet steel up to 1.8 mm, stainless sheet steel up to 1.2 mm.

7068 Right-hand cutting
7070 Left-hand cutting



Part No.	Length mm	7068	7070
0260	260	16.16	16.15
		(568)	(568)

Ideal Offset Snips with Toggle Joint

Design: Drop-forged shear head, induction hardened cutting edges, with micro-teeth.

Application: For straight continuous cuts and shaping, Cutting capacity: Sheet steel up 1.8 mm, stainless sheet steel up to 1.2 mm.

7082 **Right-hand cutting,** stainless steel, min. 58 HRC
7084 **Left-hand cutting,** stainless steel, min. 58 HRC



Part No.	Length mm	7082	7084
0260	260	16.27 (568)	16.27 (568)

Sheet Metal Shears with Toggle Joint

Design: Especially sturdy, shear head and handles drop-forged, cutting edges induction hardened, with micro teeth.

Application: For straight cuts and shaping, cutting capacity: sheet steel max. 1.8 mm, stainless sheet steel max. 1.2 mm.

7077 **Right-hand cutting,** stainless steel, min. 58 HRC
7079 **Left-hand cutting,** stainless steel, min. 58 HRC



Part No.	Length mm	7077	7079
0240	240	22.44 (568)	22.44 (568)

Ideal Offset Snips with Toggle Joint, cutting edge: special stainless steel

Design: Especially sturdy, drop-forged shear head and jaws, induction hardened cutting edges, with micro-teeth.

Application: For straight, continuous cuts and shaping, cutting capacity: sheet steel max. 1.8 mm, stainless sheet steel max. 1.2 mm.

7078 **Right-hand cutting,** special stainless steel, min. 60 HRC
7080 **Left-hand-cutting,** special stainless steel, min. 60 HRC



Part No.	Length mm	7078	7080
0240	240	25.27 (568)	25.27 (568)

Sheet Metal Shears with Toggle Joint and Multi-component Handle

Design: With lever transmission, shear head drop-forged, special stainless steel, cutting edges induction hardened (min. 58 HRC), **effort reduced by 25 %** due to optimum lever transmission and cutting edge geometry.

Application: For straight continuous cuts and figure cutting. Cutting capacity: Sheet steel up to 1.8 mm; stainless sheet steel up to 1.2 mm.

7087 **Right-hand cutting**
7089 **Left-hand cutting**



Part No.	Length mm	7087	7089	Cutting edge length mm
0261	260	23.60 (565)	23.60 (565)	29

Universal Shears Multisnip Master for Continuous Cuts

Design: Left-hand cutting, blades and all metal components in stainless steel, tempered, 50 mm long blades, tapered edges for continuous cuts, adjustable screws, ergonomic, GFC plastic handles with soft material insert, gentle to hands and anti-slip protection, secure latch, integrated steel spring for self-actuating opening of shears, with eyelet for hanging up.

Application: For long and straight continuous cuts and large ranges. Cutting capacity: Aluminium sheet max. 0.75 mm, copper sheet max. 0.6 mm, steel sheet max. 0.6 mm, stainless steel max. 0.4 mm.



Part No.	Length mm	7090
0235	235	7.04 (565)






Shears Multisnip Longstyle for Continuous Cuts

Design: Left-hand cutting, with lever transmission, shear head drop-forged, stainless steel, induction hardened cutting edges (min. 58 HRC), 75 mm long cutting edges with stepped sides, stable torsion-free steel handles, bright-nickel plated, ergonomic handle covers with soft material inlays for gentle touch and slip protection, catch, spring-loaded opening action, suspension shackle.

Application: For long and straight continuous cuts as well as large ranges, cutting capacity: Aluminium sheet max. 1.2 mm, copper sheet max. 1.2 mm, sheet steel max. 1.0 mm, stainless sheet steel max. 0.8 mm. Length 75 mm, cutting capacity: Sheet metals up to 1.0 mm, stainless sheet steel up to 0.8 mm.





Part No.	Length mm	7081
0281	280	19.18 (565)

Sheet Metal Shears with Toggle Joint

Design: Shear head drop-forged and completely tempered. Blades induction hardened (min. 58 HRC), with micro teeth, particularly flat shear head enables cutting of narrow ranges.

Application: For straight continuous cuts and figure cuts, cutting capacity: Sheet steel max. 1.8 m; stainless sheet steel max. 1.2 mm.

7086 0210 Right-hand cutting

7086 0211 Left-hand cutting



Part No.	Length mm	7086	7086
0210	210	16.52	–
0211	210	–	16.52
		(565)	(565)

Steel Band Snips

Design: Left-hand cutting, drop-forged, high-quality steel, induction hardened cutting edges (min. 54 HRC), with spring and sideslip protection.

Application: For steel packaging straps up to 0.6 mm thick and 25 mm wide, lower section slides easily beneath the packaging straps, clamp prevents the ends of the strap from springing up.



Part No.	Length mm	7088
0225	225	11.06 (568)

Sheet Metal Nibblers

Design: Functional parts tempered or special case-hardened, locking lever, ergonomic handle shape.

Application: For cutting sheet steel, aluminium, copper and plastic up to 1.2 mm thick.



Part No.	Length	7097
0250	250 mm	15.41
0255	Spare cutter	4.94
		(568)

Universal Shears

Design: From stainless steel. Left-hand cutting. The lower cutting edge is toothed, the upper cutting edge is smooth. With spring for self-actuated opening of shears and locking latch.

Application: For cutting of paper, cardboard, fabric, thin sheet, leather, cords etc.

7087 Plastic handles.

7091 Handles with ergonomic 2-component plastic sheaths.



Part No.	Length mm	7087	7091	Design	Cutting edge length mm 7087	7091
0190	190	5.07	5.10	Straight cutting edges	40	42
0191	190	5.33 (568)	5.39 (565)	Angled cutting edges	40	38

Universal Shears/Fabric Shears

Universal Shears

Design: Made of stainless steel, wire guide for cutting binding wire, insulated cable knife for cables 1.0 and 1.5 mm², ergonomic handle with soft inlay, spring-loaded opening action, safety catch.

Application: For cutting all materials including thin copper and aluminium or florist's wire. Not for steel, hardened or naturally hard materials.



Part No.	Length mm	7100
0190	190	8.03 (568)

General Purpose Scissors

Design: Robust design, one long and one round finger ring, painted black, polished cutting edges.



Part No.	Length mm	7094
0200	200	5.87
0250	250	8.13 (568)

Fabric Shears "Fibre"

Design: Resistant to solvents. Screw head and nut drop-forged, thus no protrusions. The screws can be adjusted and secured by means of a counternut.

Application: For cutting of glass and carbon fibre mats.

7103 Without toothing, for long and pushing cuts.

7104 **With micro-toothing** for cutting of close meshed and even fabrics.



Part No.	Length mm	7103	7104	Cutting edge length mm
0225	225	36.83 (565)	39.69 (565)	100

Fabric Shears "Aramid"

Design: Resistant to solvents. Screw head and nut drop-forged, thus no protrusions. The screws can be adjusted and secured by means of a counternut. Cutting edges with micro-toothing and **special coating.**

Application: For cutting of glass and carbon fibre mats. Thanks to the micro-toothing ideal for cutting of close meshed and even fabrics without slipping. The special coating enhances the service life and is perfectly suitable for cutting of kevlar fibres.



Part No.	Length mm	7105	Cutting edge length mm
0225	225	68.02 (565)	100

Multi-purpose Shears

Design: From stainless steel with one long and one round finger ring. Screw head and nut drop-forged, thus no protrusions. The screws can be adjusted and secured by means of a counternut. Finger rings with ergonomic soft material lining.



Part No.	Length mm	7106	Cutting edge length mm
0200	200	4.79	70
0250	250	6.48 (565)	95

Multi-purpose Shears

Design: From stainless steel with 2 round finger rings. Screw head and nut drop-forged, thus no protrusions. The screws can be adjusted and secured by means of a counternut. Finger rings with ergonomic soft material cushion.

Part No.	Length mm	7107	Cutting edge length mm
0160	160	3.57	65
0180	180	4.21	75
		(565)	



Cable Shears

Design: Toothed cutting edges, nickel-plated, red handles, with wire cutter.

Part No.	Length mm	7096
0125	125	4.58
		(565)



Universal Shears

Design: Nickel-plated, sturdy design, with long finger ring.

Part No.	Length mm	7098
0155	155	3.62
0180	180	4.27
0200	200	5.17
		(573)



Wallpapering and Paper Scissors

Design: Nickel-plated, stable design, in accordance with DIN 6488 St.

Part No.	Length mm	7095
0201	200	4.01
		(568)



Goldsmith's Shears

Design: Quality steel, nickel-plated.

Application: For cutting thin sheet metal.

Part No.	Design	7101	Length mm
0006	Straight cutting edges, open handle.	4.18	180
0011	Bent cutting edges, open handle.	4.73	175
0016	Straight cutting edges, handle with finger rings.	4.48	180
0021	Bent cutting edges, handle with finger rings.	4.73	175
		(565)	



7101 0006



7101 0011



7101 0016



7101 0021

Universal Shears

Design: Original Löwe principle, drawing cut against fixed anvil, unbreakable blades in special steel, CNC ground, no breakage of blades, extreme toughness is retained even in temperatures below zero. Shear body in sheet steel, surfaces chromium-plated, anvil made of zinc-cast iron, plastic handles, all components exchangeable. Cutting length 40 mm.

Application: For all materials, except for hard metal.

Part No.	7097
0005	17.84 (573)



Bevelling Shears

Design: Unbreakable blades in special steel, CNC ground, no breakage of blades, extreme toughness is retained even in temperatures below zero. Shear body in steel sheet, surfaces chromium-plated, plastic handles, all components exchangeable. With 2 stops of 45° and markings for 15°, 30° and 90°.

Application: For battens and profiles made of plastic, rubber or wood which are to be mitred.

Part No.	7098
0005	23.00 (573)



Profile Shears

Design: Unbreakable blades in special steel, CNC ground, no breakage of blades, extreme toughness is retained even in temperatures below zero. Shear body in steel sheet, surfaces chromium-plated, plastic handles, all components exchangeable.

Application: For easy and clear cutting of plastic profiles as well as rods and tubes.

Part No.	Design	7099
0005	Profiles up to 25 x 45 mm	24.61
0010	Profiles up to 15 x 20 mm	15.82 (573)



Revolving Belt Punches

Design: Tool body made of high tensile-strength special steel, tumble-polished, one-handed operation, 6 replaceable hollow punches ø 2.0; 2.5; 3; 3.5; 4; 4.5 mm.

Application: For punching holes in leather, cardboard, rubber, fabric etc.

Part No.	Length mm	7102
0225	225	5.46 (568)



Sheet Metal and Wire Shears

Design: High quality steel body, case-hardened insert knife, adjustable clamp for precision cutting, easy plate piercing facilitates cutting and trimming of steel plate in unlimited lengths, with lever latch to prevent accidents and ergonomic handle for optimum use.

Application: For cutting sheet, flat and round steel bar, particularly for use in assembly work and training workshops, locksmiths' and fitting operations.



Part No.	Knife length mm	7110	Cutting capacity Steel sheet up to mm	Cutting capacity Flat steel up to mm	Cutting capacity Round steel up to mm
0120	120	81.59	4	50 x 4	11
0150	150	93.13	5	50 x 5	11
0180	180	131.37	6	70 x 6	13
0300	300	280.30	5	70 x 5	13

(568)

Spare Parts for Sheet Metal and Wire Shears

Part No.	Design	7115
0005	Top blade 120 mm	21.63
0010	Bottom blade 120 mm	13.18
0015	Round blade 120 mm	4.69
0020	Torsion spring for 120 mm plate shears	4.69
0025	Hand lever for 120–150 mm sheet metal shears	12.21
0030	Top blade 150 mm	27.28
0035	Bottom blade 150 mm	15.98
0040	Round blade 150 mm	4.69
0045	Torsion spring for 150 mm plate shears	5.18

(568)

Part No.	Design	7115
0050	Top blade 180 mm	33.87
0055	Bottom blade 180 mm	17.88
0060	Round blade 180 mm	5.63
0065	Torsion spring for 180 mm plate shears	8.48
0070	Hand lever for 180–300 mm sheet metal shears	17.88
0075	Top blade 300 mm	48.92
0080	Bottom blade 300 mm	26.33
0085	Round blade 300 mm	15.98
0090	Torsion spring for 300 mm plate shears	7.29
0095	Wing screw for 120–300 mm sheet metal shears	3.81

(568)

Hand Lever Presses

Design: For profitable pressing, riveting, compressing, punching etc. Spindle hardened and ground, long spindle guide, T-slot milled in the centre according to DIN 650. Working height adjustable. Hand lever with spring return mechanism.

Hand Presses with rack: Constant pressure during operation, adjustment of stroke by stop screw.

Hand presses with toggle lever: Max. pressure when toggle lever is extended.



7114 0250



7114 0800



7114 2601

Part No.	Power transmission	7114	Model	Pressure kp	Working height mm	Stroke mm	Jaw projection mm	Spindle ø mm	Table size mm	Slot width mm
0150	Rack	255.34	HZ 150	150	75–170	40	70	20	115 x 70	10
0250	Rack	347.16	HZ 250	250	80–220	45	90	20	120 x 160	12
0500	Toggle lever	246.53	HK 500	500	60–150	40	73	20	115 x 70	10
0800	Toggle lever	337.09	HK 800	800	50–200	40	90	24	120 x 160	12
1701	Toggle lever	748.40	HK 1700	1,700	75–180	60	105	25	125 x 150	14
2601	Toggle lever	1,125.74	HK 2600	2,600	70–250	60	110	30	140 x 185	14

(571)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Punching Device PunchBird

Design: Light-weight, electro-mechanic punching tool with 12 v accumulator. Thanks to the novel gripping system for the tie bolt, the **processing time can be reduced by about 50 % compared to other devices.** Furthermore, the tie bolt at the punching tools does not need to be changed. It is driven by a 12 v d.c. motor. Safety according to EC directive 98/37 EC.
Supplied in sheet metal case, incl. first bit ∅ 11 mm, 12 v accumulator (part no. 9319) and quick charging device (part no. 9322) as well as 2 adaptors for existing punching tools (UNF 3/8-24 and M 10 x 1).

Working range: Up to ∅ 22 mm: max. 2.0 mm steel plate or 1.5 mm stainless steel plate,
up to ∅ 35 mm: max. 1.5 mm steel plate or 1.0 mm stainless steel plate.

Application: For wireless hole punching of steel and stainless steel plates. Up to 250 punching operations are possible per battery charge, while about 18s are required for one punching operation (depending on material thickness and punching ∅).

Part No.	Motive power kN	7119 GESIPA	Weight kg
0005	13	1,052.95 (964)	2.4 incl. accumulator



Punching Tools

Design: Punching tools for punching device PunchBird.

Part No.	∅ mm	7119 GESIPA
0152	15.2	104.08
0160	16	104.08
0186	18.6	104.08
0204	20.4	104.08
0225	22.5	104.08
0283	28.3	104.08
0320	32	104.08
0350	35	104.08
		(964)



Spare Accumulator

Design: Spare accumulator for PunchBird (part no. 7119).

Part No.	Performance	9319 GESIPA
0005	12 v–2.0 Ah	109.12 (966)



Quick Charging Device

Design: Quick charging device for PunchBird (part no. 7119).

Part No.	9322 GESIPA
0005	87.90 (966)



Screw Hole Punches (Plate Punch)

Screw Hole Punches (Metal Punch)

Design: Special tool steel, consisting of bottom die, top die and pressure screw.

Application: For punching holes in various materials including stainless steel, copper, brass, aluminium and iron plate.
Particularly suited for working in confined spaces, e.g. switchgear cabinets, dashboards etc.
Actuated with Allen key or hydraulic tools.

7116 **Design:** Standard version.

7117 **Design:** With ball bearing.



7116



7117

Part No.	Punch diameter mm	7116	7117	Punch diameter PG mm	Screw size mm	Sheet thickness max. mm
0012	12.7	9.01	15.76	7	M 6 x 30	1.5
0015	15.2	9.34	17.60	9	M 8 x 1 x 35	1.5
0016	16	9.50	13.51	–	M 10 x 1 x 45	2
0018	18.6	10.60	14.34	11	M 10 x 1 x 45	2
0020	20	10.60	14.34	–	M 10 x 1 x 45	2
0021	20.4	10.60	14.34	13.5	M 10 x 1 x 45	2
0022	22	11.27	15.26	–	M 10 x 1 x 45	2
0023	22.5	11.27	15.26	16	M 10 x 1 x 45	2
0025	25	13.18	16.93	–	M 10 x 1 x 45	2
0028	28	12.67	16.52	–	M 10 x 1 x 55	2
0029	28.3	14.01	17.76	21	M 10 x 1 x 55	2
0030	30	14.01	17.76	–	M 10 x 1 x 55	2
0032	32	14.01	17.76	–	M 10 x 1 x 55	2
0035	35	16.01	19.93	–	M 10 x 1 x 55	2
0037	37	17.68	21.68	29	M 10 x 1 x 55	2
0038	38	17.68	21.68	–	M 10 x 1 x 55	2
0040	40	22.01	26.28	–	M 12 x 1.5 x 70	2
0047	47	26.44	30.45	36	M 12 x 1.5 x 70	2
0051	51	32.12	35.86	–	M 16 x 1.5 x 80	3
0054	54	34.62	38.45	42	M 16 x 1.5 x 80	3
0060	60	40.03	45.04	48	M 16 x 1.5 x 80	3
		(570)	(570)			

Spare Screws for Screw Hole Punch

Part No.	Screw size mm	7118
0006	M 6 x 30	0.51
0008	M 8 x 1 x 35	0.59
0010	M 10 x 1 x 45	0.59
		(570)

Part No.	Screw size mm	7118
0011	M 10 x 1 x 55	0.67
0012	M 12 x 1.5 x 70	1.50
0016	M 16 x 1.5 x 80	2.50
		(570)

Wad Punches

Design: Painted, with highly polished punch, DIN 7200 A, drop-forged.

Application: For making seals and gaskets out of cardboard, leather, rubber etc.



Part No.	Diameter mm	7120
0002	2	2.57
0003	3	2.57
0004	4	2.57
0005	5	2.57
0006	6	2.56
0007	7	2.56
0008	8	2.73
0009	9	2.83
0010	10	3.04
0011	11	3.43
0012	12	3.87
0013	13	4.18
0014	14	4.53
0015	15	4.92
		(572)

Part No.	Diameter mm	7120
0016	16	5.28
0017	17	5.91
0018	18	6.06
0019	19	6.55
0020	20	7.03
0022	22	7.93
0024	24	8.46
0025	25	9.42
0026	26	10.39
0028	28	12.48
0030	30	13.02
0032	32	14.63
0035	35	15.49
0040	40	21.86
		(572)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Wad Punch Sets

Design: Varnished and fine polished, according to DIN 7200 A, drop-forged.

Part No.	Design	7121 Set
0010	19-piece, 2–20 mm, in 1 mm increments, in synthetic leather roll-up carrying cases	86.13
0020	15-piece, 2–30 mm, in 2 mm increments, in 2 plastic wallets	95.50

(572)



7121 0020



7121 0010

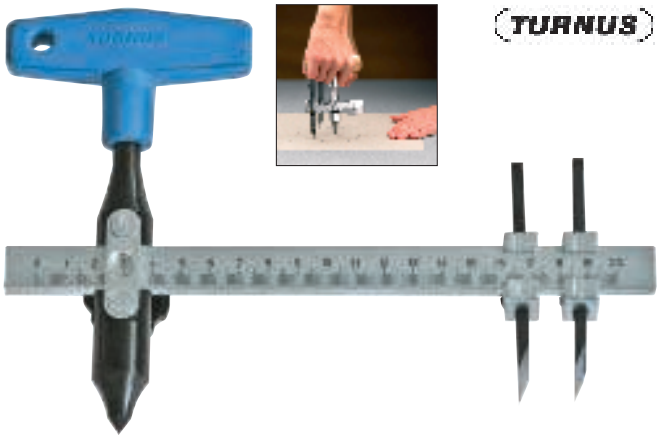
Disk Cutters

Design: With polished handle, millimetre graduation.

Application: For cutting disks and seal rings made of rubber, leather, paper, pressboard and plastic material.

Part No.	For disk ∅ up to	7123	Number of blades
0200	200 mm	19.50	2
0400	400 mm	21.23	2
0600	600 mm	22.96	2
1000	Spare cutter	4.09	–
1010	Spare cutter with blade	6.29	–

(508)



Tongs

Design: Made of quality forged steel, supported single joint, black powder coated.

Part No.	Shape	7124	Jaw width mm	Length mm
0005	Straight	19.66	60	270
0010	45° curved	22.23	60	270
0015	90° angle	24.02	60	270

(572)



7124 0005



7124 0010



7124 0015

Punch Lock Riveters for one-hand operation

Design: High-strength special steel, tempered, U- and C-shaped profile, max. sheet metal thickness 1.2 mm (2 x 0.6 mm), head bronzed, handles plastic-coated.

Part No.	Capacity mm	7125
0250	Max. 1.2	70.01

(525)



Water Pump Pliers

Design: DIN ISO 8976. Through slide jaw with trap protection, prevents crushing injuries. Clamps onto pipes and nuts without hand pressure.

5599 Chromium-vanadium forged, high quality tempered steel.

5605 Chromium-vanadium electric steel, oil-hardened, gripping surfaces with specially hardened teeth. **Head polished,** handles plastic-coated.

Part No.	Length mm	5599	5605	For nuts mm 5599	For nuts mm 5605	For pipe inch 5599	For pipe inch 5605
0175	175	6.55	–	26	–	1.	–
0180	180	–	10.45	–	30	–	1.1/4
0240	240	5.77	–	35	–	1.1/4	–
0250	250	–	11.09	–	36	–	1.1/2
0300	300	12.22 (512)	16.68 (525)	43	46	1.1/2	2.



5599 format professional quality



5605

Water Pump Pliers

Design: DIN ISO 8976. Through slide jaw with trap protection, prevents crushing injuries. Clamps onto pipes and nuts without hand pressure.

5602 Chromium-vanadium forged, **chromium-plated, polished,** high quality tempered steel, handle with transparent plastic sheath.

5608 Chromium-vanadium electric steel, oil-hardened, gripping surface with specially hardened teeth. **Chromium-plated,** handles with multi-component plastic sheaths.

Part No.	Length mm	5602	5608	For nuts mm	For pipe inch
0240	240	9.73	–	35	1.1/4
0250	250	–	17.06	36	1.1/2
0300	300	– (512)	23.24 (525)	46	2.



5602 format professional quality



5608

Water Pump Pliers VDE

Design: DIN ISO 8976. Chromium-vanadium electric steel, oil-hardened. Gripping surfaces with specially hardened teeth, joint box, with trap protection, prevents crushing injuries. Self-gripping on pipes and nuts. **Head chromium-plated,** handles with multi-component plastic sheaths, insulated up to 1,000 v, according to IEC 60900, DIN EN 60900, VDE 0682/part 201.

Part No.	Length mm	5611	For nuts mm	For pipe inch
0250	250	18.96 (525)	36	1.1/2



Water Pump Pliers "Cobra ES"

Design: DIN ISO 8976. Chromium-vanadium electric steel, oil-hardened and tempered, **head polished,** gripping surfaces with specially hardened teeth (61 HRC). Very slender design in head and articulation area with long, pointed jaws. Quick and precise adjustment at the push of the button, one-hand adjustment in confined spaces. Joint box allows high stability. Trap protection prevents crushing injuries. Clamps on pipes, nuts and also flat workpieces thanks to three-point bearing. Handles plastic-coated.

Application: Ideal for service and maintenance, repair, automotive sector and industry. Effortless operation thanks to slender design especially in confined spaces.

Part No.	Length mm	5612	Fine adjustment	For nuts mm	For pipe inch
0250	250	16.06 (525)	19-fold	42	1.1/4



Water Pump Pliers

Water Pump Pliers "Cobra"

Design: DIN ISO 8976. Chromium-vanadium electric steel, oil-hardened and tempered, gripping surfaces with specially hardened teeth (61 HRC). **Quick and precise adjustment at the push of the button,** one-hand adjustment. Joint box allows high stability. Trap protection prevents crushing injuries. Clamps on pipes and nuts. Handles plastic-coated.

5593 **Design: DIN ISO 8976.** Chromium-vanadium electric steel, oil-hardened. Gripping surfaces with specially hardened teeth. **Head polished,** handles plastic-coated. Joint box. **Quick and precise adjustment at the push of the button, one-hand adjustment. Trap protection prevents crushing injuries. Clamps on pipes and nuts.**

5607 **Head chromium-plated.**

Part No.	Length mm	5593	5607	Fine adjustment	For nuts mm	For pipe inch
0150	150	13.37	–	11-fold	30	1.1/4
0180	180	14.14	18.85	11-fold	30	1.1/4
0250	250	14.94	19.66	11-fold	36	1.1/2
0300	300	20.56	25.36	14-fold	46	2.
		(525)	(525)			



5593



5607

Water Pump Pliers "Cobra"

Design: DIN ISO 8976. Chromium-vanadium electric steel, oil-hardened and tempered, **head chromium-plated,** gripping surfaces with specially hardened teeth (61 HRC). **Quick and precise adjustment at the push of the button,** one-hand adjustment. Joint box allows high stability. Trap protection prevents crushing injuries. Clamps on pipes and nuts. Handles with multi-component plastic sheaths.

Part No.	Length mm	5609	Fine adjustment	For nuts mm	For pipe inch
0250	250	21.48	11-fold	36	1.1/2
0300	300	27.69	14-fold	46	2.
		(525)			

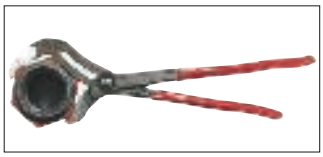


Pipe and Water Pump Pliers "Cobra XL/XXL"

Design: Chromium-vanadium electric steel, oil-hardened. Gripping surfaces with specially hardened teeth. **Head polished,** handles plastic-coated. Joint box. **Quick and precise adjustment at the push of the button, one-hand adjustment. Trap protection prevents crushing injuries. Clamps on pipes and nuts.**

Part No.	Length mm	5593	Fine adjustment	For nuts mm	For pipe inch
0400	400	35.64	26-fold	95	3.1/2
0560	560	58.13	20-fold	120	4.1/2
		(525)			







Water Pump Pliers "Smart-Grip"

Design: DIN ISO 8976. Chromium-vanadium electric steel, oil-hardened and tempered, **head polished,** gripping surfaces with specially hardened teeth (61 HRC). Automatic adjustment on the workpiece by simple pressing of handles, perfect for frequent gripping of different workpieces. Quick and precise adjustment at the push of the button, for right-hand and left-hand operation with fine adjustment for optimum position of handles. The slender design allows perfect use in confined spaces. Joint box allows high stability. Trap protection prevents crushing injuries. Clamps on pipes and nuts. The locking lever allows space-saving and safe transport without unintended opening of the pliers. Handles plastic-coated.

Part No.	Length mm	5613	For nuts mm	For pipe inch
0250	250	25.06	36	1.1/4
		(525)		



Water Pump Pliers

Water Pump Pliers with Grooved Jaw

Design: DIN ISO 8976. Supported grooved jaw with trap protection, prevents crushing injuries. Clamps onto pipes and nuts.

5598 Special tool steel. Induction hardened. **Polished head,** plastic sheathed handles.



5598 format professional quality

5694 Chrome-vanadium electric steel, oil-hardened, gripping surfaces with specially hardened teeth. **Head polished,** handles plastic coated.



5694

5695 Chrome-vanadium electric steel, oil-hardened, gripping surfaces with specially hardened teeth. **Chromium-plated,** handles plastic-coated.



5695

5696 Chrome-vanadium electric steel, oil-hardened, gripping surfaces with specially hardened teeth. **Head chromium-plated,** handles with multi-component plastic covers.



5696

Part No.	Length mm	5598	5694	5695	5696	For nuts mm 5598	For nuts mm 5694/5695/5596	For pipe inch 5598	For pipe inch 5694/5695/5596
0160	170	5.52	–	–	–	30	–	1.	–
0250	250	6.52	9.75	13.25	16.76	36	36	1.1/4	1.5/16
0315	300	11.99	–	–	–	48	–	1.1/2	–
		(512)	(525)	(525)	(525)				

Water Pump Pliers with Quick Adjustment

format professional quality

Design: Chrome-vanadium steel, tempered and hardened individually, gripping surfaces with specially hardened teeth (65 HRC). **Quick and precise adjustment at the push at the button and spring-supported fine adjustment,** one-hand adjustment. Optimum leg position by fine adjustment. Joint box allows high stability. Trap protection prevents crushing injuries. Clamps on pipes and nuts. Handles plastic-coated.

Part No.	Length mm	5797	Fine adjustment	For nuts mm	For pipe inch
0250	250	13.34	13-fold	36	1.1/2
		(512)			



Pipe Wrenches

Design: DIN 5234, Form A. Made of chromium-vanadium steel, drop-forged, painted red. Swedish model.

format professional quality



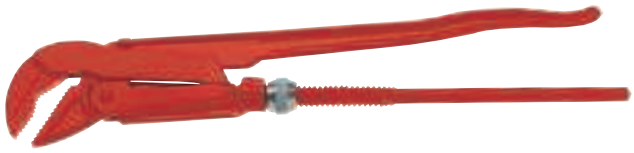
Part No.	For pipe inch	7140 mm	Length mm	Jaw span mm
0010	1	14.30	320	44
0015	1.1/2	18.88	430	62
0020	2	29.09	580	76
		(512)		

Part No.	For pipe inch	7140 mm	Length mm	Jaw span mm
0030	3	57.45	670	105
0040	4	81.07	760	130
		(512)		

Corner Pipe Wrenches

Design: DIN 5234, Form B. Made of chromium-vanadium steel drop-forged, painted red.

format professional quality



Part No.	For pipe inch	7148 mm	Length mm	Jaw span mm
0010	1	14.30	320	44
0015	1.1/2	18.88	430	62
0020	2	29.09	580	76
		(512)		

Corner Pipe Wrenches

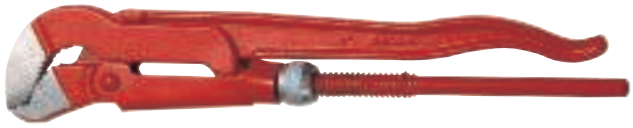
Design: Made of chromium-vanadium steel, three point system.

Application: For **safe 3-point support** of the workpiece to be clamped.

7152 **Corner Pipe Wrenches, painted red.**

7153 **Eck-Schwede-snap® 100, painted blue.**

Part No.	For pipe inch	7152 mm	7153	Length mm	Jaw span mm
0005	1/2	–	24.50	245	35
0010	1	14.21	33.63	320	48
0015	1.1/2	17.83	42.23	420	60
0020	2	27.85	59.09	550	80
0030	3	42.48	90.70	630	110
		(512)	(511)		



7152 format professional quality



7153 Dako



Corner Pipe Wrench Sets

Design: Made of chromium-vanadium steel forged, painted red, three-point system.

Application: For **safe 3-point support** of the workpiece to be clamped.

format professional quality

Part No.	Set contents	7152 mm
0500	per unit 1", 1.1/2", 2"	58.71
		(512)



Chain Wrenches

ROTHENBERGER

Design: Drop-forged handle, chrome-vanadium steel, polished head with special teeth, special steel chain, all parts tempered, resistant epoxy coating.

Application: Perfectly suitable for large screw connections, teeth on both sides, for working in both directions without turning the wrench.

Part No.	For pipe ∅ mm	7143 ROTHENBERGER	Length mm
0005	115	29.23 (593)	300



Chain Wrenches, HEAVY DUTY

ROTHENBERGER

Design: Sturdy design for heavy-duty applications, jaws and handle forged, changeable jaws, chain made of special tempered steel, resistant epoxy powder coating.

Application: Well proven in pipeline construction, teeth on both sides, for ratchet-style working in both directions, quick-opening.

Part No.	For pipe ∅ mm	7143 ROTHENBERGER	Length mm
0510	76	75.88 (593)	690
0515	115	110.82 (593)	940
0520	166	170.78 (593)	1,120
0530	324	440.02 (592)	1,630



Strap and Fittings Wrenches

ROTHENBERGER

Design: Special aluminium alloy, with changeable nylon strap.

Application: For gentle work on chromium-plated fittings.

Part No.	For pipe ∅	7147 ROTHENBERGER	Length mm
0005	90 mm	26.41	300
0007	220 mm	29.72	300
0010	Spare strap 90 mm	11.83	–
0012	Spare strap 220 mm	12.56 (592)	–



Plastic Strap Wrenches EASYSTRAP

ROTHENBERGER

Design: Automatic plastic strap wrench with quick-clamping ratchet, clamping of tube by means of high-grip special nylon strap.

Application: For gentle work on chromium-plated fittings, no damage to polished surfaces.

Part No.	For pipe ∅ mm	7151 ROTHENBERGER
0006	20–160	30.73 (591)



Fittings Wrenches

ROTHENBERGER

Design: All-steel forged, bronzed, with roller adjustment, lever transmission, smooth jaws for protection of fittings and sensitive surfaces.

Part No.	Jaw span mm	7155 ROTHENBERGER	Clamping depth mm	Length mm
0005	65	34.62 (594)	45	275



Quick-clamping Wrenches

ROTHENBERGER

Design: All-steel forged, with quick snap-in adjustment, lever transmission, with smooth jaws for protection of fittings and sensitive surfaces.

Part No.	Jaw span mm	7158 ROTHENBERGER	Clamping depth mm	Length mm
0005	75	34.62 (594)	45	260



Plier Wrenches

Design: Head nickel-plated, parallel, smooth gripping jaws, perfectly suitable for gripping, holding, pressing and bending of workpieces; also for gentle assembly of finished fittings. Quick adjustment at the push of a button. Ratchet principle.

7156 **Handle plastic-coated**

7157 **Handle with multi-component plastic covers**

Part No.	Length mm	7156	7157	For nuts mm	For pipes inch
0180	180	29.11	30.84	35	1.3/8
0250	250	33.36	35.72	46	1.3/4
0300	300	39.07	–	60	2.3/8
		(525)	(525)		



7156



7157

Syphon Pliers SANIGRIP PL

Design: Chrome-vanadium steel, chromium-plated, 4-position adjustment, with changeable plastic jaws.

Application: Safe and gentle gripping of fittings without damaging polished surfaces.

Part No.	For pipe ∅	7161 ROTHENBERGER	Length mm
0005	14–80 mm	18.31	250
0010	Spare stop	2.47	–
		(593)	



Basin Wrenches

Design: Chrome-vanadium, drop-forged, resilient epoxy powder coating, swivelling claw for right and left-hand action.

Part No.	Length mm	7163 ROTHENBERGER	For nuts mm
0005	235	17.47	up to 32
		(592)	



Adjustable Basin Wrenches

Design: Chromium-plated, swivelling claw for right- and left-hand action, 4-position length adjustment by telescope.

Part No.	Length mm	7163 ROTHENBERGER	For nuts mm
0500	275–455	28.19	up to 32
		(592)	



Cartridge Extractor Sets

Design: In steel case, 10-piece, 4 adapters for hooks, threaded pins, screws or rivets for cartridges manufactured before 1979, after 1979 and MOEN cartridges as well as extractor tool.

Application: Easy extraction of cartridges in mixing batteries.

Part No.	7149 ROTHENBERGER
0005	48.74
	(591)



Wash Basin Installation Set ROFIX SANISET Profi

ROTHENBERGER

Design: Set includes 8 pieces.
Supplied in sheet metal case, incl. tool for stud bolts M 8 and M 10, RO-QUICK 2 adaptors for current draw-off taps as well as 6 extensions of 9 and 14 mm.

Application: For mixing taps of basins with confined space and for gentle work on draw-off taps. Fixing and releasing of screws M 10 and M 8.

Part No.	7166 ROTHENBERGER
0006	124.32 (592)



Valve Spanners RO-QUICK

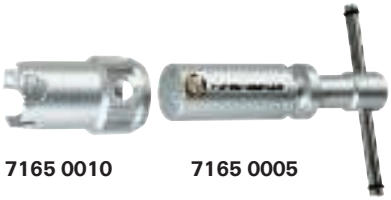
ROTHENBERGER

Design: Waste valve holder and spanner for eccentric and standard valves, can be inserted from bottom or top, with 2 opposing tappets with spring bearing, holder with T-handle, no damage of chromium-plated parts.

Application: Quick and easy installation of bath tubs, basins and sinks. Cross point adapter for shower basins and tubs (accessories).

Part No.	Length mm	7165 ROTHENBERGER	Design
0005	120	33.92	Spanner
0010	75	14.23 (592)	Cross point adapter





7165 0010 7165 0005

Sink Spanners

ROTHENBERGER

Design: Chrome-vanadium steel, nickel-plated, spanner width 17 x 19, centrepiece with female thread for threaded bolts M 10, integrated ball allows easy removal from the threaded bolt.

Application: For express and threaded bolts, for fixing of washing stands and assembly of corner valves.

Part No.	Length mm	7167 ROTHENBERGER
0005	220	10.90 (592)



Ratchet Sink Spanners

ROTHENBERGER

Design: Chrome-vanadium steel, chromium-plated, spanner width 17 x 19, with smallest ratchet angle, fine teeth, right-/left-hand change by locking push button, double hexagon, flat cranked, centrepiece with female thread for threaded bolts M 10, integrated ball allows easy removal from the threaded bolt.

Application: Perfectly suitable for screw connections which are difficult to access, quick assembly of washing stands and corner valves.

Part No.	Length mm	7169 ROTHENBERGER
0005	260	45.84 (592)



Tap Extension Wrenches

ROTHENBERGER

Design: Special chrome-vanadium steel, bent at right angles, spanner width 12 x 17.

Application: For unscrewing tap extensions.

Part No.	7171 ROTHENBERGER
0005	12.59 (594)



Sanitary Wrenches

Design: Chrome-vanadium steel, combination wrench with hexagon socket 3/8 – 1/2 – 3/4 – 1“. For tap extensions, female thread M 10 and M 6 for threaded bolts.

Application: For installing and dismantling radiator valves and return pipe screw connections as well as washing stands.

Part No.	Dimensions mm	7173 ROTHENBERGER
0005	200 x 200	18.31
		(591)

ROTHENBERGER



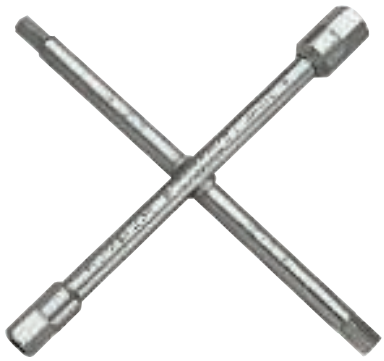
Sanitary Spider Wrench

Design: Chrome-vanadium steel.

Application: 10 functions. 4 hexagon sockets with 2 double nut slaving for tap extensions 3/8“; 1/2“; 3/4“ and 1“ up to 100 mm for installing and dismantling radiator valves and return pipe screw connections, internal threads M 10 and M 12 for screws and internal threads for pipe plugs 3/8“ and 1/2“.

Part No.	Dimensions mm	7176 ROTHENBERGER
0005	230 x 230	24.50
		(594)

ROTHENBERGER



UNI Radiator Spud Wrenches

Design: Chrome-vanadium steel, hardened, nickel-plated, with cam, hexagon and double hexagon socket, size 3/8 – 1/2 – 3/4 – 1“ and further in-between sizes, square drive 1/2“.

Application: Installing and dismantling radiator valve nipples, return pipe screw connections and short tap extensions.

Part No.	Design	7181 ROTHENBERGER
0005	Radiator Spud Wrenches	12.33
0500	Set: Radiator spud wrench with ratchet, Reversible right-/left-hand	22.94
		(592)

ROTHENBERGER

7181 0005





7181 0500, Set



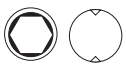
Gas Radiator Spud Wrenches

Design: Chrome-vanadium steel, hardened, nickel-plated, with cam, hexagon and double hexagon socket, size 1/2 – 3/4 – 1“ and further in-between sizes, square drive 1/2“.

Application: Easy and quick assembly of screw connections for gas fittings.

Part No.	Design	7183 ROTHENBERGER
0005	Radiator Spud Wrenches	12.33
0500	Set: Radiator spud wrench with ratchet, Reversible right-/left-hand	22.94
		(592)

ROTHENBERGER



7183 0005





7183 0500, Set



Tap Milling Devices

Design: In sheet steel box, with cylindrically stepped thread adapter, milling pressure adjustable by spring and adjusting screw, changeable milling cutter, for tap valve seat 3/8 – 1" with 3 seals per size.

Application: For accurate finish milling of the valve seat in case of leaky taps.

Part No.	7189 ROTHENBERGER
0005	37.71
	(592)



Corner Valve Level Sets ROCHECK

Design: In sheet steel case, 1 spacing level 300 mm with horizontal and vertical spirit level, non-breakable, for standard spacing 97 – 120 – 150 – 153 – 160 – 170 – 200 – 210 mm, 2 corner valve levels 200 mm with horizontal and head spirit level, one side with 1/2" male thread, 1 folding rule 2 m.

Application: For precise vertical and horizontal adjustment of fixtures.

Part No.	7191 ROTHENBERGER
0005	93.53
	(591)



Cleaning Cables

Design: High-quality double-wound outer wire, zinc-plated spring steel wire, for professionals, counter-wound inner wire, with fixed claw and crank with wooden handle. **From cable ⌀ 10 mm** with drill head and crank with wooden handle, changeable and can be extended by 1/2" WW threaded connections.

Part No.	Hole ⌀ mm	7261 ER	Length m
0005	8	30.27	5
0010	8	38.99	7.5
0015	8	48.99	10
0020	10	22.49	5
0025	10	30.38	7.5
0030	10	37.19	10
0035	12	35.45	7.5
0040	12	44.97	10
		(576)	



Three-prong Claws

Design: With 1/2" WW thread for cleaning cables.

Part No.	⌀ mm	7265 ER
0005	30	6.36
0010	40	7.19
0015	50	8.04
		(576)



Mud Augers

Design: With 1/2" WW thread for cleaning cables.

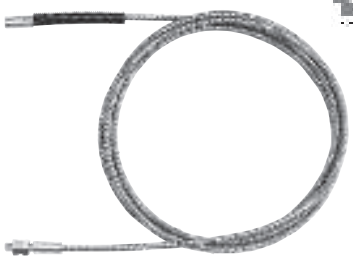
Part No.	⌀ mm	7267 ER
0005	30	6.92
0010	40	7.97
0015	50	9.15
		(576)



Extensions for Cleaning Cables 7261

Design: With 1/2" WW thread connections, for cleaning cables.

Part No.	Hole ∅ mm	7268 E+R	Length m
0005	10	16.27	5
0010	12	18.63	5
		(576)	



Household Cleaning Cables

Design: Zinc-plated spring steel wire, with fixed claw and plastic handle.

Part No.	Hole ∅ mm	7268 E+R	Length m
0500	6	1.65	3
		(576)	



Pipe Cleaning Device ROPUMP® Super Plus

Design: Professional suction/pressure cleaning device in compact and sturdy design for plumbers and pipe cleaning staff. The handle can be adjusted in all directions, with patented piston dressing for increased suction power.

Scope of supply:
1 short rubber adaptor for basins/drains and
1 long rubber adaptor for basins, toilets and bathtubs.

Application: Quick and easy removal of blockages at connections in toilets, basins, tubs and floor drains.

Part No.	7193 ROTHENBERGER
0006	70.57
	(592)



Pipe Cleaning Device ROSPI H+E Plus

Design: Closed and shock-resistant plastic cable housing with long handle and soft material cushion. Hand-operation with crank and hexagon drive for conventional drilling machines, cable locking device and flexible cables with built-in club drill head. The handle can be removed without tool.

Application: For blockages in pipes, also suitable for small pipe bends and knee pieces without having to dismantle sieves or siphons.

Part No.	Cable ∅ mm	7194 ROTHENBERGER	Cable length mm
0006	8	75.88	7.5
		(592)	



Drain Cleaning Cables for ROSPI H+E

Design: Special steel, with club head, wire ∅ 2 mm, easy operation through sieves, crosses in sinks and drains without having to dismantle drain pipes or drain traps, also small pipe bends.

Application: Matching ROSPI manual and electric cleaning devices, when using adapter drum or collets also suitable for pipe cleaning machines.

Part No.	Length m	7197 ROTHENBERGER	Cable ∅ mm
0005	7.5	27.95	8
		(592)	



Drain Cleaning Machines R600

Design: Torsion-free, light-weight cast aluminium frame, side panels made of glass fibre reinforced polyamide. For cable ⌀ 16 and 22 mm with direct adapter, cable ⌀ 8 and 10 mm with adapter drum. For pipes of 20–150 mm, maximum working length for cables S with ⌀ 22 mm amounts to 60 m, with ⌀ 16 mm S cables 50 m and with ⌀ 10 and 8 mm cables 10 m. Reinforced guide protection tube with precision quick coupling device for safe and kink-free cable feed, prevents soiling. CENTER-LOCK cable drive, centrally positioned drive lever ensures concentrated power transmission. When the drive lever is locked, it can at the same time be used as carrying handle of the machine. Safe and non-positive radial clamping of the jaws for optimum power transmission and reliability. Drive shaft in twin ball-bearing with permanent lubrication, maintenance-free. Complete utilization of motor power by low-wear tooth belt and toothed pinion, no drive shaft slippage, chain spin and milling possible. Level adjustable for sloped surfaces, three-leg base providing high stability. **Performance 0.4 kW (0.55 PS), 230 v, 50 Hz, right-/left-hand operation, shielded and splash-proof.**

Application: For plumbers and caretakers in domestic households, maintenance, hotels, hospitals, homes and community facilities. Ideal for universal use in case of blockages in tubs, basins, toilets, kitchens, canteens, drains, floor drains and gutters.

ROTHENBERGER



7195

Part No.	Design	7195 ROTHENBERGER	7196 ROTHENBERGER
0005	Basic machine without accessories	1,018.34 ◊	–
0006	Basic machine with accessories (part no. 7199)	–	1,560.13 ◊
		(594)	(594)

Cable Tool Sets

Design: Tools in plastic case, cables in basket.

Application: Cables/Tool set for drain cleaning machine R 600.

Including: Guide hose FS22/4.0 m; 5 cables ⌀ 22 mm/4.5 m; 5 cables ⌀ 16 mm/2.3 m; cable baskets for 16 and 22 mm cables, straight auger ⌀ 22/22 mm and 16/16 mm; funnel auger ⌀ 22/55 mm; club head auger ⌀ 16/28 mm and 22/40 mm; retriever auger ⌀ 16/25 mm; bulb auger ⌀ 22/65 mm, shark-tooth cutter ⌀ 22/76 mm, coupling key pin 16 mm and 22/32 mm; guide glove, left; ROWONAL cable spray.





Part No.	7199 ROTHENBERGER
0005	527.55 ◊ (591)

Pipe Cleaning Machines ROSPEED 3 F

Design: Safety pipe cleaning machine with automatic feed and automatic torque control ATC to protect the motor and the cable. The feed unit is fitted with a control in the moving direction of the cable. The electronic control provides for optimum cleaning results. The special drum prevents torsion or rollover of the cable in the drum. **With direct support ⌀ 16 mm.**

Application: For professional use in domestic households, maintenance, hotels, hospitals and community facilities.

Note: Various accessories are offered for removing pipe blockages.

ROTHENBERGER

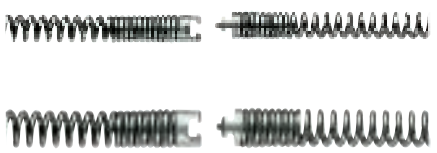


Part No.	For pipe ⌀ mm	7196 ROTHENBERGER	Length	Speed RPM	Motor power W
0100	50–125	2,229.21 ◊ (594)	15 m (max. 30 m)	270–340	250

Drain Cleaning Cables

Design: Quality spring steel, zinc-plated and tempered, non-abrasive, low wear, cable ends provided with sufficiently dimensioned connecting sections for professional changing of coupling, captive couplings with stainless locking pressure pin and spring for operational safety even after long use due to reduced risk of corrosion and fracture.

Application: Suitable for drain cleaning machine R 600 as well as other makes with cable ⌀ 16 mm and 22 mm.

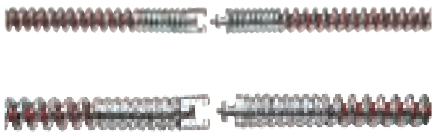


Part No.	Length m	7198 ROTHENBERGER	Cable ⌀ mm
0005	2.3	34.05 ◊	16
0010	4.5	61.16 ◊	22
		(592)	

ROPOWER Profile Cables

Design: Quality spring steel, zinc-plated, with plastic core, cleaning force increased by 50 %, as cleaning is effected with the entire cable and not only with the tool head, low resilience with equal flexibility in bends, higher torsional strength.

Application: For extremely difficult cleaning, suitable for the drain cleaning machine R 600 as well as other makes with cable ⌀ 16 mm and 22 mm.



Part No.	Length m	7277 ROTHENBERGER	Cable ⌀ mm
0300	2.3	48.92 ◊	16
0305	4.5	87.40 ◊	22
		(592)	

Accessories for Pipe Cleaning Machine

Straight Augers

Application: For taking specimens in order to determine the appropriate follow-up tool.



Part No.	⌀ mm	7197 ROTHENBERGER	Coupling mm/Inch	Length mm	Working area mm
0010	16	21.48 ◊	16/5/8	110	25– 75
0015	22	25.79 ◊	22/7/8	210	50–100
		(592)			

Bulb Augers

Application: Especially for narrow and several pipe bends in a row.



Part No.	⌀ mm	7197 ROTHENBERGER	Coupling mm/Inch	Length mm	Working area mm
0020	28	22.33 ◊	16/5/8	115	40– 75
0025	40	30.50 ◊	22/7/8	180	50–100
		(592)			

Retrieving Augers

Application: Special tools with catch hook to remove textiles, tools or cables in the pipe.



Part No.	⌀ mm	7197 ROTHENBERGER	Coupling mm/Inch	Length mm	Working area mm
0030	35	22.33 ◊	16/5/8	55	50– 75
0033	45	30.09 ◊	22/7/8	100	75–150
		(592)			

Funnel Augers

Application: For removing or boring a hole in blockages caused by textiles or paper.



Part No.	⌀ mm	7197 ROTHENBERGER	Coupling mm/Inch	Length mm	Working area mm
0035	32	24.06 ◊	16/5/8	110	50–100
0040	55	28.36 ◊	22/7/8	185	110–150
		(592)			

Accessories for Pipe Cleaning Machine

ROTHENBERGER

Blade Borers

Application: For boring a hole in soft deposits such as fat or soap etc.

Part No.	∅ mm	7197 ROTHENBERGER	Coupling mm/Inch	Length mm	Working area mm
0045	25	21.48 ◊	16/5/8	35	40– 75
0050	45	34.38 ◊	22/7/8	60	60–125
		(592)			



Shovel-head Augers

Application: For cleaning pipes clogged with sand or mud.

Part No.	∅ mm	7197 ROTHENBERGER	Coupling mm/Inch	Length mm	Working area mm
0055	65	45.58 ◊	22/7/8	65	100–150
		(592)			



Cross-blade Augers, Toothed

Application: For boring a hole in and removing hardened blockages caused by textiles or mud as well as removing incrustations or as preparing tool for chain spin.

Part No.	∅ mm	7197 ROTHENBERGER	Coupling mm/Inch	Length mm	Working area mm
0060	35	43.00 ◊	16/5/8	45	50– 75
0065	45	49.71 ◊	22/7/8	60	70–100
		(592)			



Shark-tooth Cutters, Serrated

Application: Versatile use, in particular for removing mud and roots.

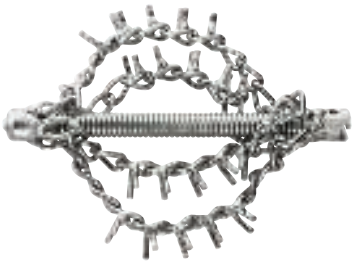
Part No.	∅ mm	7197 ROTHENBERGER	Coupling mm/Inch	Length mm	Working area mm
0070	76	57.64 ◊	22/7/8	100	100–150
		(592)			



Chain Spinning Heads

Application: Intensive cleaning effect, ideal for final cleaning of concrete and cast iron pipes. The chain spin head reduces the possibility of new blockages.
Supplied without ring, with 4 chains.

Part No.	∅ mm	7197 ROTHENBERGER	Coupling mm/Inch	Length mm	Working area mm
0075	40	130.81 ◊	16/5/8	155	50–125
0080	60	168.67 ◊	22/7/8	170	75–130
		(592)			



Cable Guide Gloves

Design: From cattle leather, with short sleeve. The area of the palm is fitted with metal rivets.

Application: For safe gripping and guiding of cleaning cables.

Part No.	Design	7197 ROTHENBERGER
0085	right	30.00 ◊
0090	left	30.00 ◊
		(591)



Coupling Pin Keys

Application: For releasing cables and cable tools.

Part No.	For cable ∅ mm	7197 ROTHENBERGER
0095	16	2.54 ◊
0100	22	2.95 ◊
		(592)

Note: Further designs and sizes on request.



Pipe Cutters, Mini

Design: Zinc die-cast body, high alloy steel cutting wheel, deburring blade in the handle.

Application: For cutting small pipes in confined spaces. For copper, lightweight alloy and thin walled steel tubing.

Part No.	For pipe ∅	7200	7209
0005	1/8–5/8." (3–16 mm)	7.15	–
0001	Spare cutting wheel (PU 1 piece)	–	1.13 (per PU)
		(574)	(574)

7200 0005





7209 0001

Pipe Cutters MINICUT I PRO/MINICUT II PRO

Design: Ergonomic design for very small working radius (38 and/or 42 mm). Pressure adjustment through large knurled wheel.

Application: For working in confined areas and parallel running pipes.

Part No.	For pipe ∅	7200 ROTHENBERGER	7207 ROTHENBERGER
0050	3–16 mm	10.02	–
0055	6–22 mm	10.57	–
0010	Spare cutting wheel (PU 5 pieces)	–	12.11 (per PU)
		(592)	(592)

7200 0050–0055





7207 0010

Pipe Cutters MINI MAX

Design: Ergonomic body and button, handy, with very small working radius (58 mm or 2.1/4"), large knurled wheel for pressure adjustment, two grooved rollers for cutting close to flared ends.

Application: For cutting in areas which are difficult to access and parallel running pipes. For copper, brass, aluminium, thin-walled steel pipes, as well as PVC rigid plastic and plastic-coated pipes.

Part No.	For pipe ∅	7203 ROTHENBERGER	7207 ROTHENBERGER
0005	1/8–1.1/8." (3–28 mm)	13.90	–
0010	Spare cutting wheel (PU 5 pieces)	–	12.11 (per PU)
		(592)	(592)

7203 0005





7207 0010

Pipe Cutters PIPE SLICE

Design: Robust aluminium cast housing, easy to use, few turns sufficient to cut the pipe. Self-clamping and self-adjusting, damage to pipe and deburring avoided.

Application: Pipe cutter for confined areas, easy to use with one hand only. For copper pipes 12, 15, 18 and 22 mm.

Part No.	For pipe ∅	7227 ROTHENBERGER
0005	12 mm	27.86
0010	15 mm	27.86
0015	18 mm	30.57
0020	22 mm	30.57
0050	Spare cutting wheel for 15 + 22 mm (PU 1 piece)	2.06 (per PU)
0055	Spare cutting wheel for 12 + 18 mm (PU 1 piece)	2.06 (per PU)
		(592)



Pipe Cutters

Design: Zinc-die-cast body, high alloy steel cutting wheel, deburring blade in the handle.

Application: For clean cutting of copper, brass and thin walled steel tubing.

Part No.	For pipe ∅	7204	7209
0005	1/8–1.1/8." (3–30 mm)	9.45	–
0001	Spare cutting wheel (PU 1 piece)	–	1.13 (per PU)
		(574)	(574)

7204 0005





7209 0001

Pipe Cutters

Design: Compact, telescopic zinc die-cast pipe cutter, even narrow working radius, 4 guide rollers with undercut to prevent jumping or sideslip, spare cutting wheels in the metal handle.

Application: For accurate cutting of copper, brass, aluminium and thin-walled steel tubing, also INOX.

Part No.	For pipe ∅	7202	7209
0005	1/4–1.3/8." (6–35 mm)	19.56	–
0001	Spare cutting wheel (PU 1 piece)	–	1.13 (per PU)
		(574)	(574)

format professional quality

7202 0005





7209 0001

Pipe Cutters - Automatic

Design: Zinc die-cast body, high-alloy steel cutting wheel, with automatic feed. Two rollers for precise guiding, no jumping, no sideslip, deburring knife in the handle.

Application: For clean cutting of copper, brass and thin-walled steel tubing.

Part No.	For pipe ∅	7208	7209
0005	1/8–1.3/8." (3–35 mm)	13.49	–
0001	Spare cutting wheel (PU 1 piece)	–	1.13 (per PU)
		(574)	(574)

format professional quality

7208 0005





7209 0001

TUBE CUTTERS 35

Design: Sturdy telescopic tube cutter, constantly small working radius of 123 mm, feed synchronously with turning, easy and quick adjustment of the working range, metal handle, two grooved rollers for cutting close to flared ends, retractable internal deburrer, spare cutting wheel in handle.

Application: For precise cutting of copper, brass, alloy, thin-walled steel tubes as well as PVC rigid plastic and plastic-coated tubes.

Part No.	For pipe ∅	7207 ROTHENBERGER
0005	1/4–1.3/8." (6–35 mm)	24.65
0010	Spare cutting wheel (PU 5 pieces)	12.11 (per PU)
		(592)

ROTHENBERGER

7207 0005





7207 0010

INOX PIPE CUTTERS 30

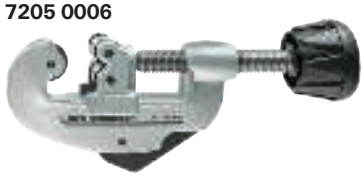
Design: Sturdy monoblock body, two grooved rollers for cutting close to flared ends, metal handle, fold-away internal deburrer, spare cutting wheel in handle.

Application: For precise cutting of stainless steel tubes.

Part No.	For pipe ∅	7205 ROTHENBERGER
0006	1/8–1.1/8." (3–30 mm)	18.84
0010	Spare cutting wheel (PU 5 pieces)	18.28 (per PU)
		(592)

ROTHENBERGER

7205 0006





7205 0010

Pipe Cutters INOX

Design: Zinc die-cast body, stainless steel cutting wheel. 4 grooved rollers from stainless steel for cutting close to flared ends **prevent coming off or slipping.** Pressure control is effected by an easy-running telescopic adjusting device. **Retractable internal deburrer.** Large-sized metal handle with spare cutting wheel (included in the scope of supply).

Application: For precise cutting of stainless steel pipes in confined spaces.

Part No.	For pipe ∅	7202	7209
1005	1/4"–1.3/8." (3–35 mm)	21.52	–
0001	Spare cutting wheel (PU 1 piece)	–	1.13 (per PU)
		(574)	(574)

format professional quality

7202 1005





7209 0001

INOX PIPE CUTTERS 35

Design: Sturdy telescopic pipe cutter, constantly small working radius of 123 mm, precise telescope guide, hardened cutting wheel made of high-alloy steel, 2 stainless steel grooved rollers for cutting close to flared ends, burr-free cutting, retractable internal deburrer, spare cutting wheel in metal handle.

Application: For precise cutting of stainless steel pipes.

Part No.	For pipe ∅	7205 ROTHENBERGER
0505	1/4–1.3/8." (6–35 mm)	30.12
0510	Spare cutting wheel (PU 5 pieces)	18.84 (per PU)
		(592)

ROTHENBERGER

7205 0505





7205 0510

Pipe Cutters 35 MSR for Multi-layer Composite Pipe

Design: Sturdy telescopic tube cutter, constantly small working radius of 123 mm, feed synchronously with turning, easy and quick adjustment of working range, metal handle, two grooved rollers for cutting close to flared ends, retractable internal deburrer, spare cutting wheel in handle.

Application: For multi-layer composite tubes.

Part No.	For pipe ∅	7211 ROTHENBERGER
0005	1/4–1.1/4." (6–32 mm)	27.22
0010	Spare cutting wheel (PU 5 pieces)	16.79 (per PU)
		(592)

ROTHENBERGER

7211 0005





7211 0010

Pipe Cutters for steel pipes up to 2."

Design: With one cutting wheel and two guide rollers, cutting wheel made of high alloy steel, also available for cast pipe on request.

Application: For right-angled pipe cutting.

7206 Pipe Cutters - Steel

7213 Steel Pipe Cutters SUPER

Part No.	For pipe ∅	7206	7213 ROTHENBERGER
0005	1/8–2." (10–60 mm)	46.24	52.45
0010	Spare cutting wheel (PU 1 piece)	3.24 (per PU)	–
0010	Spare cutting wheel (PU 3 pieces)	–	13.11 (per PU)
		(574)	(592)

7206 0005



format professional quality



7206 0010

7213 0005



ROTHENBERGER



7213 0010

Pipe Cutters ENORM

Design: Sturdy design, wide rollers for safe guiding of the cutting wheel on the pipe, with strong bolts, torsion-free, spindle with fine thread for pressure adjustment, hardened cutting wheel made of high-alloy steel, burr-free cutting, immediate cutting of threads.

Application: For steel pipes, when changing the cutting wheel also suitable for cutting cast iron pipes.

Part No.	For pipe ∅	7215 ROTHENBERGER
0005	2.–4." (60–115 mm)	137.74
0010	Spare cutting wheel for steel (PU 2 pieces)	15.48 (per PU)
0015	Spare cutting wheel for cast iron (PU 1 piece)	12.40 (per PU)
		(592)

ROTHENBERGER

7215 0005





7215 0010

Pipe Cutters Combination incl. Quick Adjustment for Plastic and Copper

Design: Aluminium die-cast body, high-alloy steel cutting wheel, quick push-button spindle adjustment, fitted with cutting wheel for plastic, spare cutting wheels for copper and thin-walled steel piping in the handle.

Application: For clean cuts on plastic, copper and thin-walled steel piping.

Part No.	For pipe ∅	7210 format
0005	1/4"–2.5/8." (6–67 mm)	35.49
0010	Spare cutting wheel for plastic (PU 1 piece)	2.56 (per PU)
0015	Spare cutting wheel for copper (PU 1 piece)	1.54 (per PU)

(574)

format professional quality

7210 0005







7210 0010 7210 0015

Plastic Pipe Cutters

Design: Aluminium monoblock, high-quality DURAMANT surface finish with special epoxy coating, smooth-running, precise, right-angled cut with automatic return motion, hardened cutting wheels with special grinding for various wall thickness sizes, quick adjustment by ratchet telescopic guide, removable internal deburrer, retractable in base body, turnable HSS blade adapts to the contours of the workpiece.

Application: Ratchet telescopic pipe cutter for PVC, PE, PE-X, VPE, PB and PVDF pipes as well as sound absorbing drain pipes.

Part No.	For pipe ∅	7219 ROTHENBERGER
0005	1/4–2.5/8." (6–67 mm)	58.71
0010	Standard spare cutting wheel (PU 3 pieces)	16.06 (per PU)

(592)

ROTHENBERGER

7219 0005





7219 0010

Plastic Pipe Shears ROCUT® 26 TC

Design: Precise one-hand cutter, powerful cutting of thick-walled pipes requiring minimum effort.

Application: For separating and cutting to length of PE, PE-X, PP, VPE, PB and PVDF pipes.

Part No.	For pipe ∅	7212 ROTHENBERGER
0100	0–1.1/4." (0–26 mm)	16.00

(592)

ROTHENBERGER



Plastic Pipe Shears ROCUT® 42 TC

Design: Precise one-hand cutter, powerful cutting of thick-walled pipes requiring minimum effort, wide pipe support for precise point cutting, quick return motion of cutter at the push of a button.

Application: For separating and cutting to length of PE, PE-X, PP, VPE, PB and PVDF pipes.

Part No.	For pipe ∅	7212 ROTHENBERGER
0150	0–1.5/8." (0–42 mm)	34.79
0305	Stainless steel spare blade	28.49

(592)

ROTHENBERGER



Plastic Pipe Shears ROCUT® 50 TC

Design: Stainless steel blade, wide pipe support for precise point cutting. Powerful cutting of thick-walled pipes requiring minimum effort. The release lever permits controlled opening of the blade at the push of a button. Rubber-coated handles for safe cutting.

Application: For precise one-hand cut, for separating and cutting of PE, PE-X, PP, VPE, PB and PVDF pipes.

Part No.	For pipe ∅	7212 ROTHENBERGER
0170	0–2." (0–50 mm)	43.91
0175	Stainless steel spare blade	24.66

(592)

ROTHENBERGER



Plastic Pipe Shears ROCUT® 63

ROTHENBERGER

Design: Plastic pipe shears for easy and effortless one-hand cutting, blade and ratchet feed from both sides, wide pipe rest for right-angled cut, changeable specially hardened blade, perfectly suitable for preparing socket welding.

Application: For separating and cutting to length of PE, PP, VPE, PB and PVDF pipes.

Part No.	For pipe ∅	7212 ROTHENBERGER
0200	0–2.“ (0–63 mm)	70.08
0210	Stainless steel spare blade	40.85
		(592)



Plastic Pipe Shears ROCUT® 75 TC

ROTHENBERGER

Design: Stainless steel blade, wide pipe support for precise point cutting. Powerful cutting of thick-walled pipes requiring minimum effort. The release lever permits controlled opening of the blade at the push of a button. Rubber-coated handles for safe cutting.

Application: For precise one-hand cut, for separating and cutting of PE, PE-X, PP, VPE, PB and PVDF pipes.

Part No.	For pipe ∅	7212 ROTHENBERGER
0190	0–3.“ (0–75 mm)	107.78
0195	Stainless steel spare blade	58.93
		(592)



Plastic Pipe Shears ROCUT® 35 S

ROTHENBERGER

Design: Precise one-hand cutter, powerful cutting of thick-walled pipes requiring minimum effort, wide pipe rest for precise point cutting, quick return motion of blade at the push of a button.

Application: For separating and cutting to length of PE, PE-X, PP, VPE, PB and PVDF pipes.

Part No.	For pipe ∅	7212 ROTHENBERGER
0250	1/4–1.3/8.“ (6–35 mm)	26.41
0300	Stainless steel spare blade	11.87
		(592)



Plastic Pipe Cutting and Chamfering Tools ROCUT®

ROTHENBERGER

Design: Set in plastic case, effortless high-precision cutting and chamfering (15°) in one step, offset insertion of the cutter shank allows 90° cutting of pipes without chamfering, continuous adjustment of pipe pressure, insert plastic clamping jaws allow use with different pipe diameters, clamping jaws with compensating spring ensure central clamping of pipes, universal holder for special accessories.

Application: For right-angled and straight cutting and chamfering of thin and thick-walled PVC, PE, PP, VPE, PB and PVDF pipes as well as sound absorbing drain pipes.

Set includes: Basic unit, internal deburrer, set of clamping jaws, standard cutter shank with carbide cutter for cutting and chamfering 15°.

Part No.	For pipe ∅	7216 ROTHENBERGER	Range of use mm
0005	1.1/2–4.“ (32–110 mm)	222.59	50, 75, 110
		(591)	

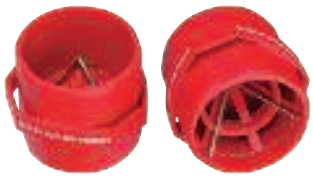


Internal and External Reamers

Design: For quick deburring of copper, aluminium and soft steel pipes, the special position of 3 ground and hardened cutters allow chatter-free operation.

ROTHENBERGER

Part No.	For pipe ∅	7232 ROTHENBERGER
0105	1/8–1.3/8." (4–35 mm)	5.51 (592)



Internal and External Reamers INOX

Design: With ground and hardened steel blades for chatter-free operation.

Application: For deburring copper and stainless steel pipes.

ROTHENBERGER

Part No.	For pipe ∅	7232 ROTHENBERGER
0108	1/4"–1.3/8." (6–35 mm)	34.32 (592)

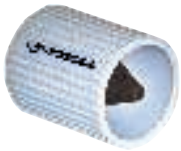


Universal Internal and External Deburrers

Design: For quick deburring of copper, aluminium, soft steel, steel and stainless steel pipes, with ground cutting edges made of hardened special steel, chatter-free operation.

ROTHENBERGER

Part No.	For pipe ∅	7232 ROTHENBERGER
0110	1/2–2." (10–54 mm)	65.27 (592)



Expander Sets ROCAM® Power Torque

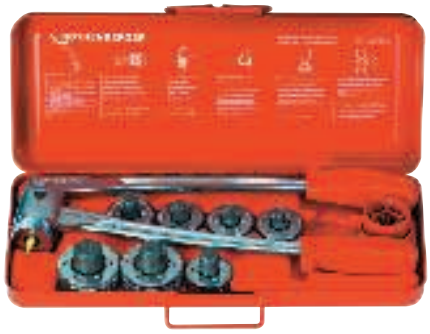
Design: Sturdy and wear-resistant holder with optimized power transmission. Forged aluminium body for good handling and low weight. The long lever arms reduce the required effort and enlarge the working range. Automatic mandrel return. The internal toggle lever is perfectly protected against soiling. The capillary cutter is precisely adjusted by means of the KSO tangent screw. The ergonomic plastic handles prevent slipping and squeezing.

ROTHENBERGER

Scope of supply in sturdy sheet steel case: Expander ROCAM® EXPANDER Power Torque (part no. 7218 0201), riveted expander heads and internal and external reamer (part no. 7232 0105).

Application: For expanding, reducing and calibrating pipes made of copper, aluminium, precision steel and stainless steel. For profitable installation of pipes without fittings in community facilities, heating, gas, refrigeration and air conditioning engineering. No costs for fittings, warehousing and procurement. Furthermore, the costs arising for working time, solder, soldering joints and energy are reduced by 50 %. Sleeves can be made of the pipe rests. In addition, security is increased by reduction of joints.

Soft and medium-hard copper ∅ 8–42 mm max. wall thickness 1.6 mm,
Soft aluminium ∅ 8–28 mm max. wall thickness 1.6 mm,
Soft precision steel ∅ 8–28 mm max. wall thickness 1.6 mm,
Soft stainless steel ∅ 8–22 mm max. wall thickness 1.0 mm.



Part No.	For pipe ∅ mm	7218 ROTHENBERGER
0006	12, 15, 18, 22	246.33
0011	12, 15, 18, 22, 28	275.99 (591)

Expander ROCAM® Power Torque

Design: Expander ROCAM® Power Torque without expander head and sheet steel case.



Part No.	For pipe ∅ mm	7218 ROTHENBERGER
0201	42	137.50 (591)

Riveted Expander Heads

Design: For producing precision socket ends to standard.

ROTHENBERGER

Part No.	For pipe ∅ mm	7218 ROTHENBERGER	Wall thickness mm
0205	12	77.77	max. Cu 1.2, Al 1.2, Fe 1.2, Inox 1.0 mm
0210	15	77.77	max. Cu 1.2, Al 1.2, Fe 1.2, Inox 1.0 mm
0215	18	77.77	max. Cu 1.2, Al 1.2, Fe 1.2, Inox 1.0 mm
0220	22	77.77	max. Cu 1.2, Al 1.5, Fe 1.5, Inox 1.0 mm
0225	28	103.10 (591)	max. Cu 1.5, Al 1.5, Fe 1.5, Inox – mm



T-Extractor Sets

ROTHENBERGER

Design: In sheet steel case, for efficient pipe installation without fittings, 67 % saving of soldering joints, solder and effort, installation of branches at pipes already installed without requiring disassembly or additional screw connections.

Application: Manual production of branches or T-pieces at pipes made of hard, medium and soft copper (max. wall thickness 2.5 mm), aluminium (max. wall thickness 2.5 mm) as well as soft steel (max. wall thickness 2.5 mm).

Set includes: T-extractor, special ratchet, special drill UNIDRILL® Automatik 42 and cam pincer.

Part No.	For pipe ∅ mm	7220 ROTHENBERGER
0005	12–15–18–22	285.91 (591)



Electric-hydraulic Pressing Machines ROMAX® PRESSLINER ECO

ROTHENBERGER

Design: Trend-setting battery-operated press machine offers the professional cost-efficient operation and is suitable for radial pressing of various tube and fitting systems. Optimized press cycle of 6 seconds minimizes material stress. High torque 12 v DC motor, high-performance hydraulic pump with special hydraulic valve, high-capacity storage battery with12 v/2.0 Ah allows up to 147 press cycles for press fittings 32 mm MLP, extremely powerful 12 v/3.0 Ah storage battery NiMH optionally available. LED reading of battery charge. Universal quick charge device, charging only 1 hour incl. low-charge protection, no destruction through memory effect, suitable for storage batteries 3.0 Ah. Low weight of 3.5 kg only, centre of gravity in the handle, effortless working. DUO switch system, easy-to-reach touch switch in any work position, easy to use thanks to anti-slip surface. Effortless in overhead work environments, shafts and floor area. Continuous 270° rotating press clamp holding fixture for optimized work in confined areas. Controlled pressing sequence by touch of a switch, quality of pressings is ensured. Automatic return of the piston once the pressing cycle is finished. Emergency switch with instant interruption of the press cycle, automatic motor switch-off and return of the piston. Universal press clamp holding fixture, for Rothenberger quality press clamps and many other system manufacturers.

Application: For electric-hydraulic pressing of tubes with diameters ranging from 12–54 mm, suitable for almost any standard fitting system.







Part No.	Design	7224 ROTHENBERGER
0050	In case without press clamps.	873.99 ◊
0055	With press clamps Set SV 15 – 22 – 28 mm for Seppelfricke, Viega, Simplex, Nussbaum, NiroSan, IBP.	1,026.20 ◊
0060	With press clamps Set M 15 – 22 – 28 mm forr Mannesmann, Hage, Woeste, Sanha.	1,026.20 ◊ (594)

Electric-hydraulic 230 v Pressing Machines ROMAX® AC ECO

ROTHENBERGER

Design: Cost-efficient mains-operated pressing machine with innovative electric-hydraulic drive perfectly suitable for use on construction sites. Optimal press speed also for plastic press systems. Robust 230 v/50–60 Hz motor, constant shearing force of 32 kN, cable length approx. 5 m. Well-balanced weight ratio, centre of gravity in handle, low weight approx. 3.5 kg, safety hold in any work position, ideal for one-hand operation. DUO switch system, easy-to-reach touch switch in any work position, easy to use due to anti-slip surface. Press clamp holding fixture rotating by 270°, controlled press cycle for high quality pressing, automatic return of the piston once the press cycle is finished. Emergency switch with instant interruption of the press cycle, automatic motor switch-off and return of the piston. Universal press clamp holding fixture, for Rothenberger quality press clamps and many other system manufacturers.

Application: For electric-hydraulic pressing of fittings of up to 54 mm diameter.







Part No.	Design	7231 ROTHENBERGER
0005	In case without press clamps.	763.45 ◊
0010	With press clamps. Set SV 15 – 22 – 28 mm for Seppelfricke, Viega, Simplex, Nussbaum, NiroSan, IBP.	999.95 ◊
0015	With press clamps. Set M 15 – 22 – 28 mm for Mannesmann, Hage, Woeste, Sanha.	999.95 ◊
		(594)

Press Clamps

ROTHENBERGER

Design: Forged, heavy-duty steel with high flexibility and elasticity of extension thanks to special hardening procedure. To ensure the high quality standard, each press clamp is provided with a batch number and checked. Furthermore, the press clamps have a colour code and are marked with size and contour in order to avoid confusion.

Application: For all pressing machines with compatible press clamp holders and a constant axial shearing force of 32–34 kN. For pressing of fittings with ∅ 12–54 mm.

Note: To ensure the proper functioning of the press clamps, we recommend a yearly inspection of the pressing machine and maintenance of the press clamps.

7233 **Type/press clamps M, colour code red.**

7235 **Type/press clamps SV, colour code white.**

Part No.	Nominal width DN	7233 ROTHENBERGER	7235 ROTHENBERGER
0012	12	109.98 ◊	109.98 ◊
0015	15	109.98 ◊	109.98 ◊
0018	18	109.98 ◊	109.98 ◊
0022	22	109.98 ◊	109.98 ◊
0028	28	109.98 ◊	109.98 ◊
0035	35	109.98 ◊	109.98 ◊
0042	42	334.81 ◊	202.74 ◊
0054	54	334.81 ◊	202.74 ◊
		(594)	(594)

Further press clamps available on request.



7233



7235

Sheet Metal Pipe Pull-in Pliers

ROTHENBERGER

Design: Self-opening, 2 lower jaws, 1 upper jaw, handles PVC coated.

Application: For joining of sheet metals, thickness up to 1 mm, by corrugation at the pipe end.

Part No.	Length mm	7225 ROTHENBERGER
0005	250	23.76
		(591)



Standard Pipe Benders

ROTHENBERGER

Design: Bender with scale from 0 to 180°, in 30° steps, clamping device for enhanced support of the pipe.

Application: Accurate bending up to 180° of soft copper, aluminium, soft steel and brass pipes.

Part No.	Nominal dimension mm	7228 ROTHENBERGER	Radius r mm	Length mm
0095	12	40.54	36	390
0100	15	55.33	54	450
0105	18	83.44	66	480
		(592)		



Pipe Benders MINIBEND

ROTHENBERGER

Design: Especially for refrigeration work, bending of 3 pipe sizes with small radius with one unit, with bending radius indication 45°/90°/135°/180° with graduation in 15° steps, torsion-free.

Application: Precise two-hand bending up to 180° of soft steel, brass and copper pipes.

Part No.	For pipe ∅ mm	7228 ROTHENBERGER
0110	6 – 8 – 10	35.83
		(592)



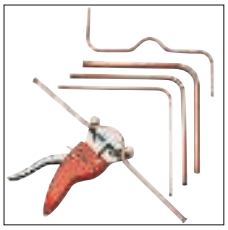
Pipe Benders

ROTHENBERGER

Design: One-hand bender for precise bending up to 90°, with bending inserts in sheet steel case. High-precision bending also in confined spaces, mechanical ratchet feed, diversity of bends possible in any location. Bending segments can easily be changed due to bayonet locking.

Application: For bending soft, coated copper, soft aluminium and soft precision steel pipes.

Part No.	For pipe ∅ mm	7224 ROTHENBERGER
0110	6 – 8 – 10 – 12	167.19
		(591)





Pipe Benders MAXI

ROTHENBERGER

Design: One-hand bender for precise bending up to 90°, with bending inserts in sheet steel case. Body in resistant cast iron, light-weight and handy, ideal in confined spaces, mechanical ratchet feed, diversity of bends possible in any location. Counter shackles with two turnable counter fixtures with excellent gliding ability, for easy and quick change.

Application: For bending of soft copper and aluminium tubing, soft, coated copper, soft steel and thin-walled stanless steel pipes.

Part No.	For pipe ∅ mm	7224 ROTHENBERGER
0100	12 – 15 – 18 – 22	137.51
0105	14 – 16 – 18 – 20 – 25	157.31
		(591)





Pipe Benders ROBEND® H+W PLUS

ROTHENBERGER

Design: For precise cold bending up to 180°, without deformation or creasing, vice bending according to DIN EN 1057 with ⌀ 8–28 mm, in sheet steel case.

Application: For bending of hard, medium and soft copper, coated copper and soft steel pipes, aluminium, brass, thin-walled copper and stainless steel pipes as well as stainless steel pipes for press-fitting systems plumbing/heating.

Set includes: Pipe benders according to the respective pipe dimensions and bending spray (150 ml).






Part No.	For pipe ⌀ mm	7229 ROTHENBERGER
0005	12 – 15 – 18 – 22	468.81
0010	15 – 18 – 22	383.92

(591)

Eccentric V-Bending Tools

Dako

Design: For bending up to 90°, with self-locking eccentric quick clamp, angular stop continuously adjustable, connections for longitudinal stop and bending lever extension (not included in supply), bending plate with sharp and round edge R 4, 100 mm working height, customized bending plates available as accessories.

Max. bending capacity:	cold mm	warm mm
Flat bar steel DIN 1017	100 x 10	100 x 22
	65 x 12	75 x 25
	50 x 14	35 x 30
Square bar steel DIN 1014	22	30
Round bar steel DIN 1013	25	30
Angular steel DIN 1028	100 x 10	100 x 20

Max. bending capacity regarding dimensions of material ST 37 up to strength 400 N/mm^2 (SI unit).



Part No.	7234
0001	752.96 ◊

(575)

Hydraulic Pipe Benders

Dako

Design: Manual or electro-hydraulic operation, with open bending frame, for bending gas and water pipes DIN 2440/41, boiler pipe DIN 2448, railing pipes, tank pipes DIN 2442 (from size 2“) and flat steel for string wreaths (from size 2“) at various power levels.


7237 0100–0200


7237 0300–0400

Part No.	Design	7237	Size inch	Number of inserts
0100	Manual-hydraulic	929.14 ◊	1.1/4	5 for gas and water pipes
0200	Manual-hydraulic	1,272.70 ◊	2	7 for gas and water pipes
0300	Electro-hydraulic 230 v	1,943.77 ◊	2	7 for gas and water pipes
0400	Electro-hydraulic 380–415 v	1,854.08 ◊	2	7 for gas and water pipes

(575)

Steel Bending Inserts up to 90°

Design: For boiler pipes with normal wall thickness, DIN 2448, phosphatised.

Part No.	Bending insert mm	7238	Bending radius mm
0025	25	175.12 ◊	115
0030	30	194.36 ◊	140
0032	32	142.84 ◊	140
0038	38	259.14 ◊	170
		(575)	

Part No.	Bending insert mm	7238	Bending radius mm
0044	44.5	316.74 ◊	190
0048	48.3	292.62 ◊	220
0051	51	311.23 ◊	220
		(575)	



Grey Cast Bending Inserts up to 90°

Design: For gas and water pipes, DIN 2440/2441, black coated.

Part No.	Bending insert inch	7239	Bending radius mm
0025	3/8	14.46 ◊	45
0050	1/2	16.58 ◊	50
0075	3/4	18.69 ◊	65
0100	1	22.76 ◊	90
		(575)	

Part No.	Bending insert inch	7239	Bending radius mm
0125	1.1/4	29.45 ◊	115
0150	1.1/2	57.54 ◊	140
0200	2	96.63 ◊	200
		(575)	



Assembly Posts

Design: For bender up to 3“, turnable, coated.

Part No.	Height mm	7241	Design
0480	480	83.77 ◊	For manual bender 1.1/4“ up to 2“
0680	680	122.71 ◊	For manual benders 2“ and electric benders 1.1/4“ up to 3“
		(575)	



Ratchet Threaders

ROTHENBERGER

Design: Torsion-free aluminium construction, cutting jaws made of tempered steel for long service life, optimised cutting edge geometry, closed ratchet mechanism with fine teeth, reduced ratchet angle of 22.5°, with quick-change cutting heads BSPT right according to DIN 2999, 1/2 – 3/4 – 1 – 1.1/4", reversible ratchet R/L, in case.

Part No.	7251 ROTHENBERGER
0005	133.18 (592)



Electric Threaders SUPERTRONIC Economy

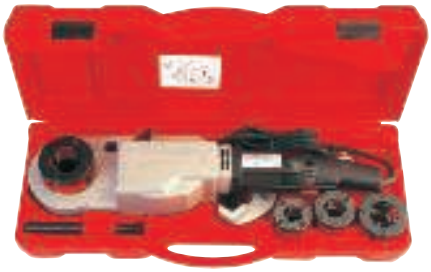
ROTHENBERGER

Design: Universal threading machine, die-cast aluminium housing with resistant epoxy coating, due to compact dimensions also suitable for areas which are difficult to access, can also be used without vice, cutting head support for small octagon 1/4–1.1/4" with retaining ring locking, dust-proof gear housing with maintenance-free permanent lubrication, in plastic case.

Application: For quick and effortless production of precise and safe threaded joints to standard.

Set includes: Counter holder, 4 quick-change cutting heads 1/2 – 3/4 – 1 – 1.1/4" BSPT right to DIN 2999.

Part No.	7252 ROTHENBERGER
0005	631.63 (594)



Electric Threaders SUPERTRONIC 2000

ROTHENBERGER

Design: Universal threading machine, die-cast aluminium housing with resistant epoxy coating, due to compact dimensions also suitable for areas which are difficult to access, can also be used without vice, cutting head support for large octagon 1/4–1.1/4" by monoblock adapter or ROFIX adapter. Dust-proof gear housing with maintenance-free permanent lubrication, in plastic case.

Application: For quick and effortless production of precise and safe threaded joints to standard.

Set includes: Adapter, counter holder, cutting heads 1/2 – 3/4 – 1 – 1.1/4 – 1.1/2 – 2" BSPT right and 200 ml cutting fluid.

Part No.	7252 ROTHENBERGER
0010	1,005.35 (594)



Thread Roughing Tools

ROTHENBERGER

Design: Roughing tool 3/8–2", all-steel forged, with hardened castors, uniform and gentle roughing of the entire circumference.

Application: For efficient roughing of threads for hemp/Teflon sealing.

Part No.	Length mm	7254 ROTHENBERGER
0005	335	58.79 (592)



Test Pumps RP 50/PR 50 INOX

ROTHENBERGER

Design: Pressure test using water or oil. Sturdy hinge with long shank for lever for precise and low-wear power transmission to the pressure piston. With lubrication nipple, constant pressure level due to twin valve system and valve spindles with rust-proof ball head. Test hose with steel reinforced material for reduction of measurement errors. Pressure gauge can be read from above, fine scale, with 3 international measurement units (bar, psi, MPa). Maximum indicator for accurate pressure test.

Application: Filling and testing in one step - indispensable test device for each plumber. For precise and quick pressure test and/or tightness test of pipes and containers in public health and heating engineering, boiler and container construction as well as filling of solar systems.

Scope of supply: Test pump, reinforced hose, twin valve system and locking lever.

7270 0005 Test pump RP 50. Body from sheet metal, galvanized, 5-year rust-through warranty.

7270 0010 Test pump RP 50 INOX. Body from stainless steel.



Part No.	Control and pressure range	7270 ROTHENBERGER	Container volume l	Suction volume ml/stroke	Connection Inch
0005	0–60 bar with 1 bar graduation 0–860 psi with 20 psi graduation 0–6 Mpa with 0,1 Mpa graduation	201.29	12	45	R 1/2
0010	0–60 bar with 1 bar graduation 0–860 psi with 20 psi graduation 0–6 Mpa with 0,1 Mpa graduation	258.82	12	45	R 1/2

(591)

Universal Gas Pressure Testing Units ROTEST GW

ROTHENBERGER

Design: Measuring instrument mounted in sturdy sheet steel case, self-testing pressure pump, with check valve and pressure gauge (⌀ 60 mm), 0-4 bar, fine scale, accuracy 0.1 bar graduation, measuring accuracy conforms to the requirements of DVGW-TRGI 96. Leak test of drinking water installations according to DIN 1988 (TRW) with compressed air as combined initial and principle test with 3 bar/110 mbar.

Application: Combined testing unit for leak tests of gas pipes and units with operating pressure of up to 100 mbar. Initial test according to DVGW-TRGI 96 7.1.2 with test pressure of 1.0 bar, principle test with water column according to DVGW-TRI 96 7.1.3 with test pressure of 110 mbar. For adjusting atmospheric burners and blower burners from 0–30 mbar. Liquid gas test (low-pressure) with test pressure of 40–60 mbar according to TRF 96 9.4. Extension pipe for liquid gas test propane/butane with test pressure of 150 mbar according to TRF 96 9.4. Suitable for measurement of loss in domestic gas installations.

Scope of supply: Pressure pump 4 bar, pressure vessel, rubber blower, transparent test hose, 4-piece pipe, with gas test plug and one-pipe counter.



Part No.	7273 ROTHENBERGER
0005	423.88

(594)

Gas Leak Detectors ROTEST® ELECTRONIC 2

ROTHENBERGER

Design: Sturdy, splash-proof housing IP 54, processor-controlled, optical and acoustic indication, conventional batteries, indication of battery state, flexible measuring probe on gooseneck, 420 mm, illuminated sensor head, manual zero adjustment of measuring sensitivity, device incl. batteries in portable plastic case.

Application: Tracing of gas within rooms as well as leaks in piping, also in confined spaces. For almost any burnable gas such as acetone, butane, methane, propane and natural gas.



Part No.	7274 ROTHENBERGER
0006	288.15

(594)

Steel Tube Frames – Fret Saw

Design: With patented chuck, black varnish, with nickel-plated jaws.

Part No.	Jaw projection mm	7245
0300	300	2.05 (555)



Metal Fret Saw Blades

Design: With round back, precision toothing, 13 cm long.

Part No.	Dimensions	7243	PU
0011	1	1.38 (per PU)	12
0012	2	1.38 (per PU)	12
0013	3	1.38 (per PU)	12
0014	4	1.38 (per PU)	12
0015	5	1.57 (per PU)	12
0017	7	1.93 (per PU)	12

(555)



Hand Saws

Design: Blade made of cold-rolled stainless steel strip, teeth cut on forward stroke, precision set and cross-ground, tooth tips induction hardened, high quality, closed hardwood handle.

Application: For all dry natural wood types, particle, standard and wood core plywood.

Part No.	Blade length mm	7250
0350	350	6.62
0450	450	7.52
0550	550	8.52

(555)



Hand Saws JETCUT® SP

Design: Speedy sawing due to revolutionary teeth, hard point toothing for longer service life. DynaGrip handle, 45° and 90° angle setting, blade thickness 0.8 mm.

Part No.	Blade length mm	7255
0401	400	9.75
0451	450	10.46
0501	500	11.07

(581)



Hand Saws JETCUT FINE

Design: Fine grouped teeth with 3 cutting edges. Hard-point teeth for prolonged use without sharpening. Ergonomic DynaGrip handle, 45° and 90° stop from bi-metal for high stability and comfort.

Application: For particularly clean and precise sawing of hard and soft wood as well as laminated boards.

Part No.	Blade length mm	7257	Teeth/inch	Blade thickness mm
0400	380	9.75	11	0,7
0450	450	10.46	11	0,7

(581)



Hand Saws JETCUT® FatMax® appliflon®

Design: Ergonomic handle, 45° und 90° stop, hard-point teeth for prolonged use without sharpening, agressive teeth with 3 cutting edges for speedy and precise sawing, Appliflon coating for quick sawing and corrosion protection, with plastic rail to protect saw blade against damage during storage, 7 teeth per inch, blade thickness 1 mm.

Application: For all types of wood and PVC.

Part No.	Blade length mm	7256
0400	400	14.51
0450	500	16.91
		(581)



Keyhole Saws

Design: Blade made of alloyed tool steel, sharpened teeth, open hardwood handle.

Application: For all dry natural wood types, particle, standard and wood core plywood.

Part No.	Blade length mm	7258
0300	300	4.14
		(555)



Keyhole Saws FAT MAX®

Design: Aggressive teeth with 3 cutting edges, teeth cut on forward and backward stroke and sharpened tip as well as extra thick blade. Ergonomic DynaGrip handle with large soft cushion, 45° and 90° stop from bi-metal for high stability and comfort.
Supplied with holster.

Application: Ideal for cutting of plaster boards.

Part No.	Length mm	7259	Blade thickness mm
0301	302	10.68	1,2
		(581)	



Gent's Back Saws

Design: Made of alloyed tool steel.

Application: In mitre blocks and for straight cuts.

Part No.	Blade length mm	7260	Design
0005	250	2.02	Straight
0010	250	2.53	Depressed centre
		(555)	

7260 0005



7260 0010



Japanese Saws

Design: Aggressive grouped teeth with 3 cutting edges. One side with rough toothing, the other side with fine toothing. Hard-point teeth for prolonged use without sharpening. The saw blade is very flexible and can be resharpened. Easy change of blade without tool at the push of the button. Ergonomic DynaGrip handle from bi-metal for high stability and comfort.

Application: For extremely fast and precise drawing cut of wood, plaster, plaster boards, laminated wood and PVC.

Part No.	Blade length mm	7269
0270	270	19.30
1270	Spare blade	14.48
		(581)



Log Saws

Design: High clearance, symmetrical form, high-frequency welded precision steel pipe, painted, quick clamping lever, blade made of cold-rolled stainless steel strip, crossed and sharpened, rip toothed.

Application: Particularly suitable for rough cutting of all natural wood types and greenheart wood. Saw blade with grouped teeth for processing dry wood.

format professional quality

Part No.	Design	7262	Length mm
0003	–	5.61	610
0005	–	5.39	762
0010	–	6.82	915
0013	Spare blade with rip toothing	1.65	610
0015	Spare blade with rip toothing	1.49	762
0020	Spare blade with rip toothing	1.67	915
0023	Spare blade with grouped teeth	1.65	610
0025	Spare blade with grouped teeth	1.80	762
0030	Spare blade with grouped teeth	2.02	915
		(555)	





Rip toothed for rough cutting of all natural wood types and greenheart wood.



Grouped teeth for dry wood.

Log Saws

Design: With log saw blade, rip toothed and additional metal blade.

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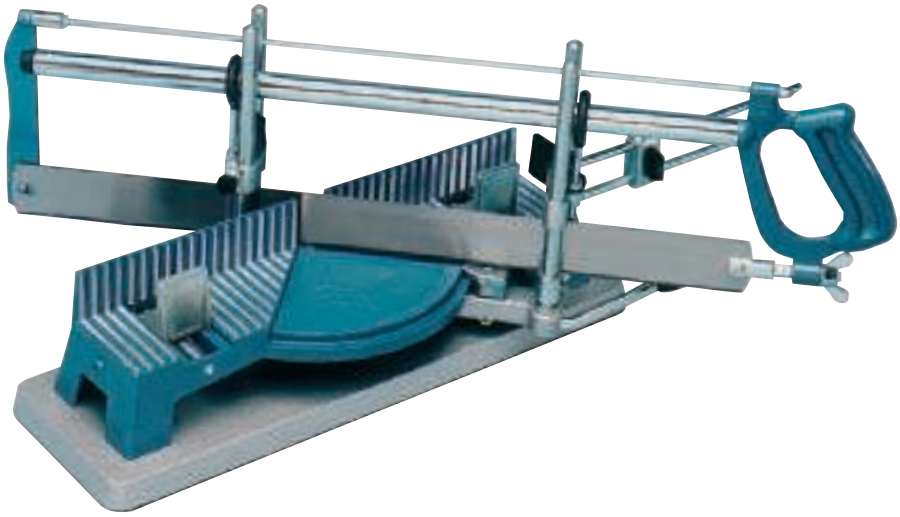
Part No.	Design	7263	Blade length mm
0005	–	4.74	300
0010	Spare blade with rip toothing	1.08	300
		(581)	



Spare blade for metal see part no. 2750 0010 on page 2/81.

Precision Mitre Saws

Design: For wood, plastic and metal work, solid and stable design. Base plate made of sheet steel with anti-slip rubber feet, cast iron body, adjustable length stop right or left, cutting depth setting, log saw angle setting 45°–90°, left + right. Four guide bars ensure accurate guidance of bow. Double blade springs at the guidance bar allow the convenient suspension of the log saw when not used, with two material clamps, double clamping of the bow through clamping screws and wire, including universal blade (wood, LM and plastic), hardened teeth.



Part No.	Type	7264	Cutting width at 45° mm	Cutting width at 90° mm	Cutting height mm	Table length mm	Blade size mm
0005	P I	55.66	75	125	100	300	420 x 40
0010	P III	73.81 (555)	110	160	120	400	550 x 45

Mitre Saw Blades

Design: Made of alloyed tool steel, teeth set for wood/aluminium; corrugated teeth for metal, teeth inductively hardened.

Part No.	For material	7264	Dimensions mm
0015	Wood	3.98	420 x 40 x 1.8
0020	Wood	5.36 (555)	550 x 45 x 1.8

Part No.	For material	7264	Dimensions mm
0025	Iron	4.63	420 x 40 x 1.0
0030	Iron	6.47 (555)	550 x 45 x 1.0

Part No.	For material	7264	Dimensions mm
0035	Aluminium	6.48	420 x 40 x 1.5
0040	Aluminium	8.26 (555)	550 x 45 x 1.5

Mitre Blocks

Design: With two 45° mitre sections, 90° angle section, made of steamed beechwood, indents glued or glued and screwed.

Part No.	Length mm	7266	Cutting width mm	Cutting height mm	Design
0300	300	8.90	62	37	Indents glued
0400	400	25.36 (577)	80	60	Glued and screwed



Scrapers

Design: Made of hardened and polished steel, angular form.

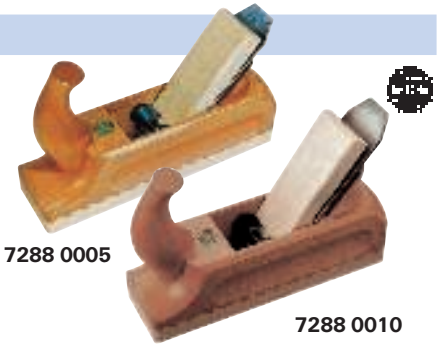
Part No.	Dimension mm	7280	Thickness mm	Length mm
0008	0.8	0.85 (555)	60	150



Planes

Design: Common beech sole, with hand protection, impact button, varnished, with integrated wedge skewback.

Part No.	Iron width mm	7288	Design	Cut angle	Length mm
0005	48	46.58	Double plane	45°	240
0010	48	46.58	Short double plane	50°	220
0015	48	17.10 (577)	Spare plane iron with shutter	–	–



7288 0005

7288 0010

Double Cornice Planes

Design: Adjustable sole, common beech varnished.

Part No.	Iron width mm	7290	Cut angle	Length mm
0005	30	46.85 (577)	50°	270



Combination Planes Surform

Design: Can be used as plane with upright handle or as file with shifted handle, black metal body.

Part No.	Design	7291	7294	Length mm
0005	Comination plane	10.91	–	310
0005	Spare blade	–	2.75	255
0010	Half-round blade	– (581)	3.24 (581)	255

7294



7291

Standard Planes Surform

Design: With firmly mounted, ergonomic handle, black metal body.

Part No.	Design	7292	7294	Length mm
0005	Standard plane Surform	10.10	–	315
0005	Spare blade	–	2.75	255
0010	Half-round blade	– (581)	3.24 (581)	255

7294



7292

Block Surform Planes

Design: Handy tool for the machining of corners and small areas, can be used single or double-handed, one-piece metal body complete with precision blade.

Part No.	Length mm	7293
0005	155	6.58 (581)



Surform Sets

Design: 3-piece Surform set, consisting of block plane, combination plane and scraper.

Part No.	7295
0005	17.62 (581)



All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Bevel Edge Chisels

Design: Made of forged tool steel, ground surfaces, bevelled edges, polished white beech handle "Ulm Pattern".

format professional quality



Part No.	Tip width mm	7282
0004	4	5.59
0006	6	5.59
0008	8	5.59
0010	10	5.87
0012	12	5.87
0014	14	6.06
0016	16	6.17
0018	18	6.47
		(578)

Part No.	Tip width mm	7282
0020	20	7.00
0022	22	7.63
0024	24	7.81
0026	26	8.13
0028	28	8.39
0030	30	8.54
0032	32	8.76
		(578)

Bevel Edge Chisel Sets

Design: Made of forged tool steel, with side bevel, handle made of common beech, polished "Ulm Form" blade.
6-piece: 6 – 10 – 12 – 16 – 20 – 26 mm, delivered in box.

format professional quality



Part No.	7283
0060	38.61
	(578)

Carpenter's Mallets

Design: Mallet head in solid steamed beech, ergonomic ash mallet handle. Both parts glued and wedged, additionally securely doweled for size 160 mm.



Part No.	Mallet head length mm	7284
0105	105	13.11
0140	140	19.47
0160	160	21.05
		(577)

Hatchets

Design: Green varnish, blade ready for use and polished, with ash handle.

OCHSENKOPF



Part No.	Weight g	7296 OCHSENKOPF	Head length mm	Handle length mm
0600	600	17.73	105	360
0800	800	19.20	110	380
1000	1,000	22.63	125	410
		(583)		

Euro Axes

Design: Red varnish, blade ready for use and polished, with ash handle, cow foot shape.
Supplied with blade protection.

OCHSENKOPF



Part No.	Weight g	7297 OCHSENKOPF	Head length mm	Handle length mm
1250	1,250	25.79	130	700
1400	1,400	29.35	140	800
1600	1,600	31.49	145	800
		(583)		

Plastering Trowels

Design: With swans neck, blade made of case-hardened and/or stainless steel, flexible, painted wooden handle.

Part No.	Length mm	7300	Design
0160	160	3.10	Steel
0161	160	3.46	Stainless steel, rust proof
0180	180	3.24	Steel
0181	180	3.58	Stainless steel, rust proof
		(580)	



Plastering Trowels, Bern

Design: With swans neck, blade made of case-hardened and/or stainless steel, flexible, painted wooden handle.

Part No.	Length mm	7302	Design
0140	140	2.56	Steel
0141	140	2.32	Stainless steel, rust proof
		(580)	



Plastering Spatulas

Design: With straight neck, case-hardened steel blade and painted wooden handle.

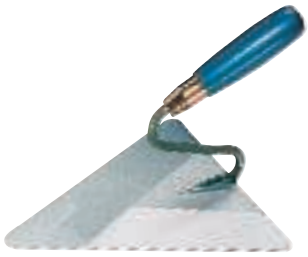
Part No.	Thickness mm	7304	Design
0040	40	2.35	Steel
0041	40	2.27	Stainless steel, rust proof
0060	60	2.47	Steel
0061	60	2.37	Stainless steel, rust proof
0080	80	2.58	Steel
0081	80	2.50	Stainless steel, rust proof
		(580)	



Plastering Trowels – Berlin Style

Design: Blade in hardened steel, tapered grinding, with varnished wooden handle.

Part No.	Length mm	7306
0200	200	8.89
0220	220	8.97
		(580)



Danish Filling Trowels with Round Neck

Design: Hardened steel blade, tapered grinding, with varnished wooden handle.

Part No.	Thickness mm	7308
0008	8	3.31
0010	10	3.31
0012	12	3.39
		(580)



Plasterer's Blades

Design: Flat, pointed, grip plastic coated.

Part No.	Width mm	7309
0010	10	1.08
0016	16	1.23
0020	20	1.35
		(580)



Smoothing Trowels

Design: With curved, painted wooden handle, blade thickness 0.7 mm, made of case-hardened and/or stainless steel.

7310 **Straight edged blade.**

7312 **Blade serrated on both sides, teeth 6 x 6 mm.**

Part No.	Dimensions mm	7310	7312	Design
0280	280 x 130	2.49	2.73	Steel
0281	280 x 130	3.58 (580)	3.84 (580)	Stainless steel, rust proof


7310

7312

Floats

7314 **Design:** Made of plastic material, light-weight, deformation resistant.

7316 **Design:** Made of multi-layers of glued wood, deformation resistant, with ground edges, handle glued and tacked.

Part No.	Dimensions mm	7314	7316
0140	280 x 140	1.52	2.78
0180	320 x 180	1.94 (580)	– (580)


7314


7316

Painter's Spatulas

Design: Flat-oval handle.

Part No.	Thickness mm	7320
0020	20	0.86
0030	30	0.89
0040	40	0.90
0050	50	0.97
0060	60	0.98
0080	80	1.19
0100	100	1.50 (580)



Glue Spatulas

Design: Fine toothing.

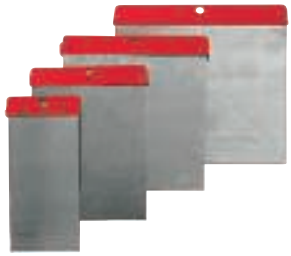
Part No.	Thickness mm	7322
0180	180	0.78 (580)



Japanese Spatulas Sets

Design: Made of spring band steel with plastic back, 4 pieces.

Part No.	Set contents	7324
0005	50 – 80 – 100 – 120 mm	0.82 (580)



Plaster Bowls

Design: Black rubber.

Part No.	Dimensions mm	7326
0005	130 x 97	0.70 (580)



Plummets

Design: Iron, pear-shaped, polished with detachable brass knob.

Part No.	Design g	7328
0006	300	4.01 (580)



Plaster's Marking Lines

Design: Wound up on handy plastic roll, moisture-resistant, round braiding, with light-stability feature, flame retardant, decay resistant, strength approx. 15 kg.

Part No.	Dimensions mm	7328	Length m
0011	1.0	0.86	50
0015	2.0	2.17 (580)	100



Line Marking Dispensers

Design: Heavy-duty zinc die-cast housing with crank, anti-slip epoxy-powder coating, steel guard at the line exit, spare line.

Part No.	Length m	7329
1005	30	5.81 (580)



Line Marking Dispenser

Design: Robust plastic housing, slidable lateral chalk dispenser. Foldable crank for wind-up, with locking mechanism, completely rust-proof.

Part No.	Length m	7327
0020	20	17.16 (581)



Line Marking Dispensers FatMax®

Design: Marking line set 30 m, incl. 115 g of chalk.

Part No.	7329
0005	14.16 (581)



Line Marking Chalk

Design: For line marking roller, flat, space saving form, ecological natural stone-based line marking chalk.

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Part No.	Colour	7331	Set contents g
1005	blue	1.97	250
1010	red	1.97	250
1015	blue	2.75	500
1020	red	2.75	500
		(580)	



Line Marking Chalk

Design: Very adhesive chalk, hardly water soluble.

STANLEY

Part No.	Colour	7331	Set contents g
0005	blue	2.65	115
0010	red	2.65	115
0015	blue	3.86	225
0020	red	3.86	225
		(581)	



Carpet Knives, Lock Blade

Design: Lock blade, with 3 blades and protection cap.

STANLEY

Part No.	7333
0005	3.38
	(581)



Carpet Knives, Adjustable Blade

Design: Blade can be adjusted in 5 positions, with 3 blades.

STANLEY

Part No.	7333
0010	3.88
	(581)



Safety Knives

Design: Precise zinc die cast housing for ergonomic cutting. The blade is retracted automatically by means of a spring, when the feed mechanism is released or the knife is put aside. Supplied with special, rounded high-performance blades.

Application: As GS safety blade.

STANLEY

Part No.	Length mm	7333
0100	155	5.99
		(581)



Spare Blades

Application: For cutting of cardboard, paper, leather etc.

STANLEY

Part No.	Dimensions mm	7333 STANLEY	Set contents
0500	50 x 19 x 0.45	12.24	Plastic box with 100 pieces
0506	50 x 19 x 0.45	1.89	Dispenser with 10 pieces
		(581)	



Trapezoidal Blades for Universal Knives

Application: For general and **heavy-duty** cutting of carpet, vinyl and other materials for which a stronger and more resistant blade is required.

STANLEY

Part No.	Dimensions mm	7334 STANLEY	Set contents
0600	62 x 19 x 0.65	18.76	Plastic box with 100 pieces
0606	62 x 19 x 0.65	2.37	Dispenser with 10 pieces
		(581)	



Notched Blades for Universal Knives

Application: For general cutting of cardboard, paper, leather etc.

STANLEY

Part No.	Dimensions mm	7333 STANLEY	Set contents
0510	62 x 19 x 0.65	23.19	Plastic box with 100 pieces
0516	62 x 19 x 0.65	3.36	Dispenser with 10 pieces
		(581)	



Professional Knives

Design: Bi-metal handle for secure grip, suitable for heavy cutting jobs. Swing-out magazine for max. 8 blades, 3 blades included in supply. Quick change of blade without tool.

STANLEY

Part No.	7335 STANLEY
0005	8.53
	(581)



FatMax® Knives

Design: Light-weight metal cast iron housing, with DynaGrip handle from bi-material for anti-slip cutting. Quick change of blade without tool. Spare blade magazine with up to 3 blades in handle. Supplied with 3 spare blades.

STANLEY

Part No.	Length mm	7337 STANLEY
0006	165	10.66
		(581)



Professional Combination Knives

Design: 2 in 1 knife for versatile use. Retractable trapezoidal blade, curved bi-metal handle in hard metal for ergonomic cutting.

STANLEY

Part No.	7339 STANLEY
0010	22.82
	(581)



Hobby Knives

Design: With round metal handle and locking mechanism.
Supplied with 2 spare blades (part no. 7348).

Application: For precise cutting.

Part No.	Length mm	7348
0010	110	5.59 (581)



Spare Blades for Hobby Knives

Design: With straight blade.

Part No.	Length mm	7348	Set contents
0100	60	1.74	Dispenser with 3 pieces
0110	60	18.57	Plastic box with 50 pieces
		(581)	

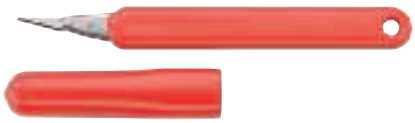


Deco Knives

Design: Aluminium deburring knife, with 1 blade, in plastic cover.

Application: For deburring of plastic parts.

Part No.	7340
0005	2.09 (578)



Spare Blades for Deco Knives

Part No.	Set contents	7340
0500	Plastic box, 100 each	10.10 (578)



Retractable Knives

Design: Sturdy, practical knife, plastic with steel guide and integrated blade storage.
Blade is secured in the extended position by a clamping system. Fitted with 3 break-off blades.

Part No.	Blade width mm	7342
0018	18	2.64 (578)



Retractable Knives

Design: Plastic material with metal blade guide, push-button actuation, 2 spare blades in handle.

Part No.	Blade width mm	7343
0010	18	3.84 (578)



Spare Blades for Retractable Knives

Application: Suitable for FORMAT retractable knife 73420018 and 73430010.

Part No.	Blade width mm	7345	Design	Set contents
0005	18	1.75	Standard	Dispenser with 10 blades
0010	18	2.42	TIN-coated	Dispenser with 10 blades
		(578)		



SM Cutters

Design: Plastic, the detachable end serves to safely break-off the blunt blade.

Part No.	Blade width mm	7341
0005	9	1.24
0010	18	1.96
		(581)



Interlock Cutters

Design: Cutter complete in metal, fixing of blade in cutting position due to interlock system.

Part No.	Blade width mm	7347
0005	9	3.54
0010	18	4.74
		(581)



Cutters MPO

Design: Plastic housing with stainless steel blade guide for easy cutting, stability and long service life. Ergonomic handle.
The blade is fixed by a screw ensuring more safety and precision.

Part No.	Blade width mm	7347
0105	9	3.24
0110	18	4.25
		(581)



Cutters with Magazine

Design: ABS plastics, stainless steel blade guide, automatic locking of the blade, automatic blade change through blade magazine in the handle, with 4 standard blades.

Part No.	Blade width mm	7347
0505	18	7.44
		(581)



Break-off Blades

Design: Suitable for all cutters with break-off blades.

Part No.	Blade width mm	7341	Set contents
0505	9	14.49	Dispenser with 100 blades
0506	9	2.05	Dispenser with 10 blades
0510	18	17.34	Dispenser with 100 blades
0511	18	2.65	Dispenser with 10 blades
		(581)	



Hard Metal Glass Cutters

Design: Hard metal wheel and wooden handle.

Application: Perfectly suitable for thick and hard glass and for tiles.

Part No.	Description	7346
0005	Glass cutter complete	7.55
0011	Hard metal spare wheel*	3.50
		(579)

* Packs of 10 in plastic box



Multi-function Pocket Knives

Spartan

Design: Standard model, includes large and small blade, cork screw, tin opener with mini screwdriver, cap lifter with screwdriver, wire stripper, reamer-punch, key-ring, tweezers, toothpick.

Part No.	7351
0005	7.97 (582)



Huntsman

Design: Further development of the original Swiss Army Knife includes the following tools: large and small blade, scissors, wood saw, cork screw, tin opener with mini screwdriver, cap lifter with screwdriver, wire stripper, reamer, key-ring, tweezers, toothpick.

Part No.	7352
0005	14.19 (582)



Trailmaster

Design: Lock knife for particularly demanding jobs, with 111 mm shell length a little longer than the conventional pocket knife, ergonomic design includes the following tools: lock blade, Phillips screwdriver, tin opener with mini screwdriver, cap lifter with screwdriver, wire stripper, wood saw, reamer-punch, key-ring, tweezers, toothpick.

Part No.	7353
0005	16.56 (582)



Midnite Manager Rubin

Design: Mini tool with integrated ball pen, the lead can be projected by means of a slide, ergonomic design. Additional LED allows writing even at night.
Further tools: blade, scissors, nail file, screwdriver, cap lifter, magnetic Phillips screwdriver, wire stripper, key-ring.

Part No.	7355
0005	15.38 (582)



Combination Tools Swiss Tool X

Design: Made of solid stainless steel, all tools are accommodated in two plier handles and can be opened, locked and released individually. The hidden plier head unfolds, when the two handles are folded out. The Swiss Tool comprises the following tools: pliers, screwdriver (2, 3, 5 and 7.5 mm), wire cutter, cap lifter, blade, scissors, metal file, metal saw, wood saw, reamer-punch, Phillips screwdriver for small cross recess screws, wood chisel/scraper, strong nail puller, wire bending pliers, wire stripper, wire scraper, tin opener, metre rule, sleeve presser.

Part No.	Weight g	7357
0005	280	62.08 (582)



Tool Boxes

Design: Plastic, with aluminium carrying handle, 2 storage compartments.

Part No.	Dimensions mm	7351
1001	440 x 255 x 210	3.65 (587)



Brass Padlocks

Design: With 2 keys, hardened steel shackle, strong latch, brass lock body.

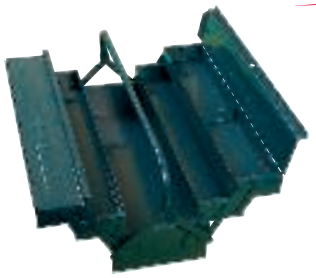
Part No.	Dimensions mm	7356	Thickness mm
0031	30	2.65	5
0041	40	3.65	6.5
0051	50	5.48 (587)	8



Steel Plate Tool Boxes

Design: Made of high quality sheet steel, hammer enamel finish, with fold-down carrying handle, tool box locks automatically when you raise the carrying handle. Can be locked with a padlock.

Part No.	Design	7358	Dimensions mm
0430	5-piece	16.27	430 x 200 x 200
0530	5-piece	18.27	530 x 200 x 200
0600	5-piece	21.85 (587)	600 x 200 x 200



Sheet-steel Tool Boxes

Design: Made of blue steel plate, stove enamelled, with removable, compartmentalised small parts tray. Easy to carry with large handles, perforated drawing pocket integrated into the lid, internal walls clad with special hardboard, can be locked with a padlock, splash-proof, weather-proof.

Part No.	Outside/inside length mm	7360	Outside/inside depth mm	Outside/inside height mm	Weight kg
0005	690/678	68.06	360/350	312/247	15
0010	833/822	83.23	440/432	343/278	20
0015	910/900	97.58	532/520	432/368	25
0020	985/975	81.40 (587)	360/347	302/236	19



Aluminium Storage Chests

Design: Top with circumferential rubber seal, robust hinges and fastening straps. Hinged latches can be additionally secured with pins or padlocks. Large carrying handles (load per handle 35 kg) make it easy to transport. Stacks easily thanks to special corners and base profile. The base dimensions are designed to fit pallets.

Part No.	Outside/inside length mm	7362	Outside/inside depth mm	Outside/inside height mm	Weight kg
0005	600/ 500	112.08	400/350	240/220	4.5
0010	600/ 550	130.94	400/350	400/380	5.3
0015	800/ 750	145.62	400/350	340/310	6.1
0020	800/ 750	196.49	600/550	400/380	8.1
0025	800/ 750	209.49	600/550	600/580	9.6
0030	900/ 850	181.81	500/450	380/350	7.7
0035	1,200/1,150	363.62 (587)	800/750	500/480	15.4



Cases with 25 Boxes

Design: Unbreakable plastic with transparent cover. The boxes of 3 different sizes can be removed individually. Due to the special design, the cover fixes the boxes during transport when closed, even if boxes are missing.
Supplied empty.

Part No.	Dimensions mm	7400
0025	423 x 334 x 52	15.31 (581)



Cases with 8 Deep Boxes

Design: Unbreakable plastic with transparent cover. The boxes of 2 different sizes can be removed individually. Due to the special design, the cover fixes the boxes during transport when closed, even if boxes are missing.
Supplied empty.

Part No.	Dimensions mm	7401
0008	423 x 334 x 105	18.63 (581)



Tool Boxes

Design: Servicing tool box with convenient sheet steel insert, extra-high lid for large-sized tools, stainless steel latches, can be secured with a padlock.

Part No.	Dimensions mm	7361	Weight kg
0005	502 x 178 x 203	61.40 (537)	4.0



Tool Boxes

Design: 2 drawers can be completely drawn out, drawers are latched simultaneously by closing the lid, spacious compartment for large-sized items, ergonomic handle for the comfortable carrying of the case, drawers can be exchanged at any time, can be secured by a padlock.

Part No.	Dimensions mm	7361	Weight kg
0010	527 x 216 x 241	86.99 (537)	8.2



Tool Boxes

Design: 3 drawers can be completely drawn out, drawers are latched simultaneously by closing the lid, spacious compartment for large-sized items, ergonomic handle for the comfortable carrying of the case, drawers can be exchanged at any time, can be secured by a padlock.

Part No.	Dimensions mm	7361	Weight kg
0015	527 x 216 x 305	112.49 (537)	9.8



Tool Boxes

Design: 3 drawers can be completely drawn out, drawers are latched simultaneously by closing the lid, dividers for holding small parts, spacious compartments, hollow lid, stable piano hinge, rust-resistant latches, comfortable handle for transport, splash-water-resistant surface and feet to protect against damage when placed on the ground, lockable.

Part No.	Dimensions mm	7361	Weight kg
0020	527 x 222 x 343	107.37 (537)	10.7



Tool Boxes

Design: Coloured polypropylene, impact and rust-resistant, splash-water resistant surface protects content against humidity, latches and hinges made of metal, piano hinge throughout width, a spacious and tidy solution in easy reach.

Part No.	Dimensions mm	7359	Weight kg
0005	584 x 267 x 254	33.95	2.7
0010	660 x 267 x 254	43.12 (537)	3.4



Tool Boxes

Design: 3 drawers, all drawers are locked simultaneously by closing the lid, coloured polypropylene, impact and rust-resistant, splash-water resistant surface protects content against humidity, latches and hinges made of metal, piano hinge throughout width, metal drawer casing, lid designed to hold tools, with handle and metal hinges, stackable design.

Part No.	Dimensions mm mm	7359	Weight kg
0100	584 x 260 x 349	72.21 (537)	7.1



Mobile Service Stations

Design: The mobile service station includes 3 separate elements. The side panels of the upper element are made of varnished steel with rounded edges from shock-resistant plastic.
The cover from stainless steel is fitted with a prism-shaped recess where workpieces can be placed and processed. 2 steel locks as well as one eyelet for padlocks provide more safety and prevent unintended opening during transport.
The element in the middle has a deep and flat drawer.
The basic element is provided with 2 large rubber wheels and a handle from aluminium with ergonomic soft cushion. Furthermore, it features a large compartment which can be opened to the front for electric tools etc. The elements are fixed by clamping devices attached at the side. It is further possible to attach spirit levels, hand saws or other items by means of the belts.

Note: Padlock see (part no. 7356).

Part No.	Dimensions mm	7402 STANLEY	Weight kg
0010	579 x 367 x 759	118.25 (581)	23.9



Tool Cases

Design: Neat's leather, black.

Tool holders on front, back and centre wall, transparent compartment in cover, bottom slides, adjustable, removable strap, snap-in lock.

Part No.	Inside dimensions mm	7369
0005	220 x 140 x 250	46.68 (589)



Universal Cases "New Classic"

Design: ABS plastics, Neat's leather, black.

Edges reinforced with aluminium corners, bottom slides, insert locks (supplied empty).

Part No.	Inside dimensions mm	7363
0005	360 x 110 x 170	20.25
0010	390 x 170 x 230	41.17 (590)



Tool and Assembly Carriers

Design: Real leather, black textured.

Reinforced sides and base , bottom slides, reinforced corners, retaining rings, adjustable tool holders on the rear panel.

Part No.	Inside dimensions mm	7364
0005	370 x 110 x 250	37.30 (589)



Tool and Assembly Carriers

Design: Leather/HDPE, black textured.

Aluminium reinforced body, bottom slides, front folds partially open, back has injection moulded loop holder, front pocket, ring caps, insert locks.

Part No.	Inside dimensions mm	7367
0005	420 x 160 x 250	57.23 (589)



Tool and Assembly Carriers

Design: Real leather, black textured.

Aluminium reinforced body, bottom slides, retaining rings, front folds partially, front and back with tool holders, snap-in locks.

Part No.	Inside dimensions mm	7368
0005	440 x 185 x 300	86.82 (589)



Tool and Assembly Carriers

Design: Real leather, black textured.

Aluminium reinforced body, bottom slides, retaining rings, back folds open partially, tool holders on front, rear and central walls, snap-in locks, 2 straps.

Part No.	Inside dimensions mm	7370
0005	460 x 210 x 340	118.85 (589)



Tool and Assembly Carriers

Design: Neat's leather, black.

Bottom slides, reinforced corners, adjustable, removable central wall with row of loops on the front side and clamping compartment on the rear side, walls and base reinforced, base tray made of steel sheet, front folds open to reveal tool holders, pocket for small parts.

Part No.	Inside dimensions mm	7374
0005	400 x 140 x 280	74.58 (589)



Carrying Straps for Tool and Assembly Carrier

Design: Adjustable polyester strap including 2 clips and shoulder pad.

Part No.	Dimensions mm	7375
0005	1120 x 20	8.64 (589)



Universal Carriers

Design: ABS plastic, front, back and flap made of real leather, black.

Bottom slides, front with tool holder folds open, rear and sides with tool holding loops.

Part No.	Inside dimensions mm	7377
0005	390 x 180 x 310	74.13 (589)



Tool Cases "Top-Line"

Design: Neat's leather, black.

Aluminium-reinforced case, bottom slides, snap-in locks, front, rear and centre wall with tool holders, transparent compartment in cover (supplied empty).

Part No.	Inside dimension mm	7378
0005	220 x 140 x 250	68.74 (590)



Cases with Drawers "Top Line"

Design: Neat's leather/Con Pearl®, black.

Bottom slides, unfolding front wall, rear wall with CP-7 tool holder, 5-piece drawer insert, carrying insert, 90 mm intermediate compartment behind drawers, steel sheet bottom shell, galvanized, snap-in locks, supplied empty.

Part No.	Inside dimensions mm	7373 PARAT
0005	410 x 220 x 310	158.38 (590)



Tool Cases "Top Line"

Design: Neat's leather, black.

Unfolding front wall, snap-in locks, bottom shell in steel sheet, clamp compartment, tool holders on centre and rear wall, pocket for small items on front wall (supplied empty).

Part No.	Inside dimensions mm	7379 PARAT
0005	415 x 165 x 275	140.26 (590)

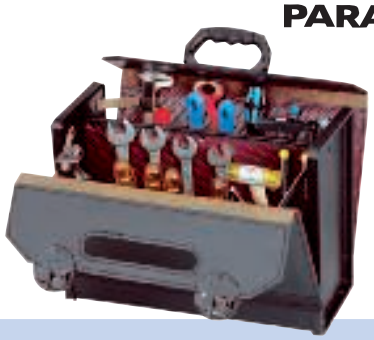


Tool Cases "Top Line"

Design: ABS plastics/neat's leather black.

Front and rear wall partially unfolding, snap-in locks, front and rear of centre wall with tool holders, front and rear wall with insert compartments, supplied empty.

Part No.	Inside dimensions mm	7381 PARAT
0005	420 x 185 x 315	114.31 (590)



Tool Cases "Top Line"

Design: Neat's leather, black.

Front and rear wall partially unfolding, snap-in locks, surrounding strap, plastic compartment with cover in bottom, front, centre and rear wall with tool holders, front pocket, supplied empty.

Part No.	Inside dimensions mm	7383 PARAT
0005	450 x 190 x 340	185.73 (590)



Tool Cases with Drawers "Top Line"

Design: Neat's leather, black.

Unfolding front wall, rear wall partially unfolding, aluminium angles. Snap-in locks, 4-piece drawer insert, carrying insert, centre and rear wall with tool holders, supplied empty.

Part No.	Inside dimensions mm	7385 PARAT
0005	410 x 190 x 280	149.50 (590)



Roll-up Bags

Design: Leather imitation, black.

With buckle, supplied empty.

Part No.	Outside dimensions mm	7387	Design
0000	550 x 315	4.89	12-piece
0003	660 x 315	5.88	15-piece
0005	750 x 330	6.58 (590)	20-piece



Tool Cases Big-Twin

Design: ABS plastic, black, with ergonomic handle. Bottom shell height 58 mm. With metal hinges and aluminium frame with D rings for shoulder straps (part no. 7375). The lid and base tray can be opened separately. The sturdy panel in the middle which can be fitted from both sides is fixed and provided with elastic loops and 12 small pockets. Lid holders with hinges at both sides lock at 45° and 90°. With 3-digit combination lock and 2 tension jacks for fixing the lid.

Fitted with:
2 panels with 6 large tool pockets, can be fixed at the push of the button.

Part No.	Inside dimensions mm	7386	Weight g
0005	445 x 105 x 350	178.90 (525)	6,600





Executive Cases

Design: Aluminium, with combination lock and internal division, load approx. 25 kg.

Part No.	Inside dimensions mm	7389
0005	460 x 330 x 120	64.75 (587)



Hard Cases

Design: ABS plastic, black.

1 document compartment, 2 tool panels made of lightweight, sturdy plastic with individual tool holders, internal double aluminium frame, latching hinges with open lid support function, base tray.

Part No.	Inside dimensions mm	7391
0005	450 x 165 x 305	193.32 (589)



Hard Cases

Design: ABS plastic, black.

Rigid ABS shells, aluminium frame, heavy-duty handle, tilt-disabling cylinder locks (cannot open when tilted), metal hinges, tool carrier with 15 insert compartments on the front side and 6 insert compartments and clamping compartment for documents on the reverse side, base tray with dividers and flush fitting cover with 6 insert compartments.

Part No.	Inside dimensions mm	7393
0005	460 x 160 x 310	106.16 (589)



Hard Cases

Design: ABS plastic, black.

Rigid ABS shells, double aluminium frame, galvanised metal hinges with latches and cylinder locks, 2-side tool panel with 25 insert compartments, clamping compartment 400 mm, tool panel with insert compartments on 1 side, on the front and backs, with document compartment, base tray 58 mm, with dividers, flush fitting cover with 15 insert compartments, clamping compartment 400 mm.

Part No.	Inside dimensions mm	7395
0005	460 x 165 x 310	164.72 (589)



Hard Cases

Design: ABS plastic, black.

Rigid ABS shells, aluminium frame, tilt-disabling cylinder locks (cannot open when tilted), 88 mm deep base tray with lid, 1 tool panel and 1 lid each with CP-7 tool holders, 11 mm, 15 mm and 26 mm, 1 document compartment in the lid.

Part No.	Inside dimensions mm	7388
0005	470 x 190 x 355	201.20 (589)



Hard Cases

Design: ABS plastic, black.

Rigid ABS shells, aluminium frame, tilt-disabling cylinder locks (cannot open when tilted) 88 mm base tray with lid, can be divided up as required, 1 tool panel with 32 insert compartments, 1 x 400 mm clamping compartment, 1 lid with 13 insert compartments, 1 x 270 mm clamping compartment, 1 document compartment in the lid.

Part No.	Inside dimensions mm	7390
0005	470 x 180 x 360	166.71 (589)



Hard Cases

Design: ABS plastic, black.

Impact-resistant case shells, hardened aluminium frame, metal hinges, cylinder locks, stable lid hold, 2-side tool panel with 21 insert compartments and integrated document compartment, ABS base tray with dividers, cover panel with 6 large insert compartments.

Part No.	Inside dimensions mm	7382
0005	460 x 160 x 310	70.60 (588)



Roller Cases Classic

Design: X-ABS plastic, black.

Extremely impact-resistant, admissible as hand luggage on airlines, double aluminium frame, tilt-disabling cylinder locks, snap-in hinges, bottom glides, 88 mm high bottom tray with cover, dividers, 1 tool panel with 25 insert compartments, 1 clamping compartment 400 mm, 1 tool panel with 10 insert compartments, 1 cover with 15 insert compartments, 1 clamping compartment 400 mm, 1 document compartment in lid (supplied empty).

Part No.	Inside dimensions mm	7392 PARAT
0005	470 x 210 x 360	222.74 (590)





Roller Cases Cargo

Design: X-ABS plastic, black.

Extremely impact-resistant, admissible as hand luggage on airlines, aluminium frame PARAT, tilt-disabling cylinder locks with secure position mechanism, bottom glides, 88 mm high bottom tray with cover, dividers, 2 tool panels and 1 cover with 2 CP-7 tool holders ⌀ 11 mm, 1 CP-7- tool holder ⌀ 15 mm and 1 tool holder ⌀ 26 mm, 1 document compartment in lid (supplied empty).

Part No.	Inside dimensions mm	7396 PARAT
0005	470 x 210 x 355	270.91 (590)





Paratool – Mobile Service Stations

Design: Xenoy plastics, anthracite-grey.

Robust shell made of break-proof Xenoy plastics, featuring a load of max. 40 kg plus filling, Telescope handle with triple pull-out (max. 1,050 mm), 140 mm ball-bearing rubber wheels, Parat flip-barrel locks. Allows ergonomic working on medium take-out height of 600 mm, transport and lifting function incl. one-hand operation, supplied empty.

7397 **Interior fitted with:**
1 tool panel with 25 insert compartments,
1 clamp compartment 400 mm,
1 tool panel with 15 insert compartments,
1 clamp compartment 400 mm,
1 internal tray with cover, height 22–54 mm, 4 divisions,
1 deposit tray, with insert compartments and internal tray.

7399 **Interior fitted with:**
2 tool panels with CP-7 tool holders ∅ 11 mm,
1 CP-7 tool holder ∅ 15 and 26 mm each,
1 internal tray with cover, height 22–54 mm, 4 divisions,
1 document compartment with cover,
1 deposit tray, with CP-7 tool holders and internal tray.

Part No.	Inside dimensions mm	7397 PARAT	7399 PARAT
0005	465 x 210 x 355	241.69 (590)	245.78 (590)



7397



7399



Step 1

Classic tool case.



Step 2

Pull out telescope handle and move on.



Step 3

Lift case and load more luggage.



Step 4

Open shell and the tools are ready for use – the pulled-out base ensures high stability.

Overview – Group 8

New in the product range:

Abrasive belts and fibre grinding disks with ceramic grain



Please pay attention to our extended range of products and innovations in all areas of this group:

- Soft grinding disks FUSION for fine grinding results
- Cutting disks with small diameters
- Extra-thin cutting disks
- Clamping flanges for higher safety when using thin cutting disks
- New diamond cutting disk assortment
- Waterproof abrasive sheets
- Extension of product range regarding abrasive belts and non-woven abrasive cloth belts
- Extension of product range regarding COMBIDISC® abrasives
- Fan grinding disks for cool grinding
- Right angle flap disks
- Flap wheels for satinising machines


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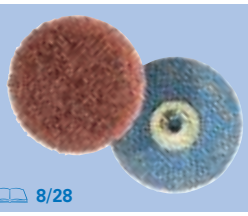


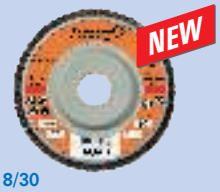
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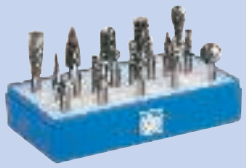

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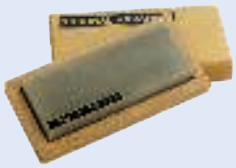

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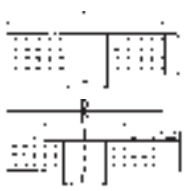
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Grinding Wheels

8006 **Design: Normal corundum** for simple grinding jobs, for roughing of iron and steel with moderate hardness, cast steel, crucible cast steel, for grinding of hardened natural steel, colour: grey.

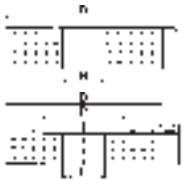
8009 **Design: Silicium carbide** for manual grinding of short-chipping or non-chipping material, (brittle material), non-metals such as stone, porcelain, resin). For tough and greasy material (rubber, brass, coal) and for extremely hard material (hard metal, chill cast iron), colour: green.

8012 **Design: Special fused alumina,** for manual grinding of long-chipping material (alloyed steel, SS and HSS tools), colour: pink.



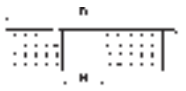


8006





8009





8012

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8006	○	●	○	○	●	○	○	○
8009	●	○	●	○	●	○	●	○
8012	○	●	○	●	○	○	○	○

Part No.		0010	0020	0030	0040	0050	0060
Dimensions	mm	150 x 20 x 32/20	150 x 20 x 32/20	175 x 25 x 32/20	175 x 25 x 32/20	175 x 25 x 51/20	175 x 25 x 51/20
8006	Normal Corundum	6.51	6.51	9.87	9.87	9.87	9.87
Grain size		36	60	36	60	36	60
Hardness		P	M	P	M	P	M

(810)

Part No.		0070	0090	0100	0110	0120	0130
Dimensions	mm	200 x 25 x 32/20	200 x 25 x 32/20	200 x 25 x 51	200 x 25 x 51	200 x 32 x 32/20	200 x 32 x 32/20
8006	Normal Corundum	12.77	12.77	12.77	12.77	14.34	14.34
Grain size		36	60	36	60	36	60
Hardness		P	M	P	M	P	M

(810)

Part No.		0080	0140	0150	0160	0170	0180	0190	0200
Dimensions	mm	200 x 32 x 51	200 x 32 x 51	250 x 32 x 51	250 x 32 x 51	300 x 40 x 76	300 x 40 x 76	300 x 40 x 76*	300 x 40 x 76*
8006	Normal Corundum	14.34	14.34	24.12	24.12	31.21	31.32	42.18	42.18
Grain size		36	60	36	60	36	60	36	60
Hardness		P	M	P	M	P	M	P	M

* with cut-out 125 x 19 mm

(810)

Part No.		0010	0020	0030	0040	0050
Dimensions	mm	150 x 20 x 32/20	175 x 25 x 32/20	175 x 32 x 32	200 x 25 x 32/20	200 x 25 x 51
8009	Silicium Carbide	8.30	12.59	14.60	16.31	16.31
Grain size		80	80	80	80	80
Hardness		J	J	J	J	J

(810)

Part No.		0060	0070	0080	0090	0100
Dimensions	mm	200 x 32 x 32/20	200 x 32 x 51	250 x 32 x 51	300 x 40 x 76	300 x 40 x 76*
8009	Silicium Carbide	22.20	22.20	33.20	48.49	53.87
Grain size		80	80	80	80	80
Hardness		J	J	J	J	J

* with cut-out 125 x 19 mm

(810)

Part No.		0010	0020	0030	0050
Dimensions	mm	150 x 20 x 32/20	175 x 25 x 32/20	175 x 25 x 51	200 x 25 x 32/20
8012	Special fused alumina	7.12	10.81	10.81	15.30
Grain size		60	60	60	60
Hardness		M	M	M	M

(810)

Part No.		0060	0070	0080	0090
Dimensions	mm	200 x 25 x 51	200 x 32 x 51	250 x 32 x 51	300 x 40 x 76
8012	Special fused alumina	15.30	17.40	28.51	41.63
Grain size		60	60	60	60
Hardness		M	M	M	M

(810)

Technical instructions see appendix group 10.

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Grinding Wheels/Wheel Cups/Dressing Stones

Bushing Pairs for Grinding Wheels



Design: From plastic material.
Supplied in plastic bag with one right and one left bushing each.

Application: For reducing bore ⌀ of grinding wheels for the respective support.

Part No.		2012	2013	2016	3216	3220	3225	5132	7651
Outer ⌀	**mm**	**20**	**20**	**20**	**32**	**32**	**32**	**51**	**76**
8013	paire	0.51	0.51	0.51	0.55	0.55	0.55	0.63	0.94
Inner ⌀	mm	12	13	16	16	20	25	32	51

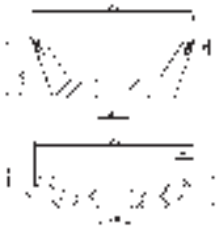
(810)

Diamond Grinding Wheels

Application: Resin-bonded diamond grinding wheels for grinding carbide and HSS-tools. The special resin bonding enables use of the wheels in both dry and wet grinding applications and results in high removal rates.

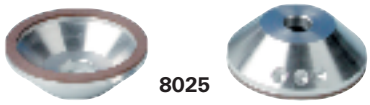
8023 **Design:** Resin bonding type 11 V9.

8025 **Design:** Resin bonding type 12 A2.





8023



8025

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Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8023/8025	○	●	●	○	○	○	○	○

Part No.	D mm	8023	8025	X mm 8023	X mm 8025	U mm 8023	W mm 8025	T mm 8023	T mm 8025	H mm	Composition %	Grain size
0010	100	112.57	123.66	2	3	10	10	40	32	20	100	D 76
0020	100	112.57	123.66	2	3	10	10	40	32	20	100	D 126
0030	125	–	168.86	–	3	–	10	–	40	32	75	D 126
0040	150	–	191.88	–	3	–	10	–	40	32	75	D 126
		(815)	(815)									

Other sizes and designs available on request.

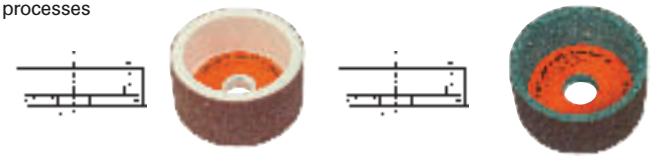
Wheel Cups

8015 **Design:** Special fused alumina, colour: white.

Application: For grinding of engraving blanks on engraving blank grinding machines. Edge hardening is required for those work processes which require a particularly good edge stability of the grinding wheel, as the workpiece is mainly guided via the edge of the wheels. A thin resin coating is applied on the edge to be protected similar to resin-bonded wheels.

8021 **Design:** Silicium carbide, colour: green.

Application: For grinding of engraving blanks on engraving blank grinding machines. Edge hardening is required for those work processes which require a particularly good edge stability of the grinding wheel, as the workpiece is mainly guided via the edge of the wheels. A thin resin coating is applied on the edge to be protected similar to resin-bonded wheels.



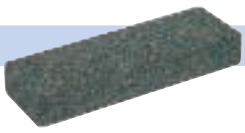
8015 8021

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8015	○	●	○	●	○	○	○	○
8021	●	●	●	○	○	●	●	○

Part No.	Dimensions D x T x H mm	8015	8021	Grain size	Hardness
0010	100 x 50 x 20 Hole 80 x 40	12.92 (810)	13.77 (810)	80	K

Dressing Stones for Grinding Wheels

Design: Rectangular, large-grain silicium-carbide block for dressing of grinding wheels or for coarse grinding of steel, iron, granite and artificial stone.



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8501	○	●		○	○	●	●	○

Part No.	Dimensions mm	8501	Grain size
0150	150 x 50 x 25	3.39 (861)	16
0200	200 x 50 x 25	4.05 (861)	16

8 Abrasives

Dressing Rods

Dressing Tools

Design: Tip from large-grain silicon carbide. With plastic sleeve and wooden handle.

Application: Alternative to dressing rods. For economical dressing, sharpening and profiling of grinding wheels. Also suitable for rough grinding of steel, granite and artificial stones.



Part No.	Length x ∅ mm	8502
0005	400 x 25	7.55 (861)

Tetrabor® Dressing Rods for Grinding Wheels

Design: Tetrabor® dressing rods are manufactured from sintered boric carbide. The exceptional hardness (approx. 35,000 N/mm²) and abrasive resistance of boric carbide enable the economical dressing of grinding wheels. They do not tear the grain out of the bonding, but cut it smoothly. For the dressing of grinding wheels of max. 300 mm ∅.

Important: Dressing to be effected with the edge only, not with the surfaces.



Part No.	Dimensions mm	8504	Design
0005	75 x 12 x 6	40.61	Dressing rod
0010	230	26.00 (861)	Holder without dressing rod

Dressing Rods for Grinding Wheels

Application: The dressing roll with hand holder and hardened steel axis breaks the grains of the used material off the grinding wheel, i.e. in the correct amount until concentricity and optimal grip of the surface is obtained.



Part No.	Roll width mm	8493 Dressing rod	8496 Spare roll
0005	36 x 12	24.95	9.91
0010	55 x 24	34.45	15.64
0015	55 x 50	47.93 (861)	24.80 (861)

Rondor Dressing Rods for Grinding Wheels

Design: Dressing gyro rod made of silicium carbide, with ball bearing, steel grip.

Application: For the precise rounding, profiling and sharpening of tool grinding wheels.



Part No.	Dimensions	8507 Dressing rod	8510 Spare roll	For grinding wheels ∅ up to mm	Spare gyro-∅ mm
0005	00	65.37	10.46	200	35
0010	0	71.68	17.58	250	45
0015	1	80.36 (861)	20.97 (861)	300	55

Multiple-diamond Dressing Rods

Design: High composition of sintered-in diamond grain, approx. 2.5 carat, diamond cylinder set in shank, universal type, with plastic handle.



Part No.	Diamond content/ Carat weight approx.	8531	Diamond attachment diameter x length mm	Total length mm
0005	2.50	40.11 (859)	8 x 12	200

Technical instructions see group 10, appendix.

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Dressing Rods

Dressing Rods for Diamond Grinding Wheels

Design: With approx. 48 individual diamonds of approx. 3.5 carats, set in 4 rows, embedded in the working surface. With plastic handle. Dressing surface 40 x 10 mm.

Application: For manual profiling and dressing of grinding wheels. Suitable for dry use.

8533 **Design:** Diamond setting face 180°.

8536 **Design:** Diamond setting lateral 90°.



Part No.	Total length mm	8533	8536
0005	220	66.86 (859)	66.86 (859)

Single-diamond Dressing Rods

Design: Single-crystal dressing diamond embedded in shank, block-type, firmly intergrown crystal form, almost no inclusions, only few occasional hairline cracks, no cracks.

Application: For profiling and dressing of ceramic-laminated grinding wheels. The dressing rod should be fixed so as to create an angle of between 5° and 15° to the centre of the grinding wheel. Dressing work with diamonds should preferably be carried out in wet conditions and by applying sufficient coolant, as they are sensitive to high temperatures and shock.
As the diamond becomes worn, it can be rotated by 90°.



Part No.	Diamond content/ Carat weight	8512	Design	For grinding wheels ∅ mm
0025	0.25	20.47	MK0	150
0050	0.50	35.81	MK0	300
0075	0.75	59.69	MK0	400
0100	1.00	84.85	MK0	500
0150	1.50	110.44	MK0	750
1025	0.25	20.47	MK1	150
1050	0.50	35.81	MK1	300
1075	0.75	59.69 (859)	MK1	400

Part No.	Diamond content/ Carat weight	8512	Design	For grinding wheels ∅ mm
1100	1.00	84.85	MK1	500
1150	1.50	110.44	MK1	750
2025	0.25	20.47	Shank parallel ∅ 8 x 80 mm	150
2050	0.50	35.81	Shank parallel ∅ 8 x 80 mm	300
2075	0.75	59.69	Shank parallel ∅ 8 x 80 mm	400
2100	1.00	84.85	Shank parallel ∅ 8 x 80 mm	500
2150	1.50	110.44 (859)	Shank parallel ∅ 8 x 80 mm	750

Dressing Rods with Multiple Diamonds

Design: Diamonds are set in a special sintered bond enabling their complete use without the need for resetting.

Application: The dressing rod incorporating multiple diamonds is a convenient dressing tool for the rough dressing of grinding wheels up to a grain size of 100.

8515 **MK0**

8518 **MK1**

8521 **Cyl. shank ∅ 8 x 80 mm**



Part No.	Diamond content/ carat weight approx.	8515	8518	8521	Design 8515	Design 8518	Design 8521
0005	1.00	67.38 (859)	67.38 (859)	67.38 (859)	MK0	MK1	Shank, cyl. ∅ 8 x 80 mm

Multiple-diamond Dressing Rods

Design: High composition of sintered-in diamond grain (approx. 2.5 carat). Diamond cylinder set in shank (preventing diamond loss), universal type.

Application: Efficient tool for dressing of flat grinding wheel surfaces due to the large number of working tips. These dressing rods are used in a straight position without inclination, so as to enable full use of the diamond grain. This type of diamond does not require resetting, is robust and can be fully exhausted. Not suitable for profiling work.
Suitable for wheels of grain size 36–120.

Please note: Sufficient supply of coolant before and during the dressing process maximises the service life.

8524 **MK0**

8527 **MK1**

8530 **Cyl. shank ∅ 10 x 80 mm**



Part No.	Diamond content/ Carat weight approx.	8524	8527	8530	Diamond attachment ∅ x length mm
0005	2.50	40.11 (859)	40.11 (859)	40.11 (859)	8 x 12

Grinding Disks

Product Lines PFERD Grinding Disks

For various grinding and cutting operations, PFERD offers three product lines of grinding disks, cutting disks and flap wheels. Differences:

Universal line PS-FORTE
For multi-purpose use in industry and craft.

Performance line SG-ELASTIC
For professional use in industry and craft.

Special/High-performance line SG-PLUS
For special tasks in industry.

Important note for processing of stainless steel.

For **processing of stainless steel,** we generally recommend only **non-ferrous and sulphur-free tools.** Furthermore, after using a tool for normal steel, the latter should not be used for stainless steel afterwards. Normal steel residues remain on the tool. These residues destroy each stainless steel alloy and thus cause rust formation on the stainless steel workpiece to be processed. Even sparks which may occur during processing of normal steel may destroy stainless steel alloys.

Grinding Disks for Steel and Cast Iron

Design: Medium hardness, standard bore hole 22.2 mm.

Application: Universal disk for all metal work.
Long durability and excellent grinding performance.

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8027	○	●		○	○	○	○	○

Part No.	∅ x Thickness mm	8027	Design	Max. RPM 1/min	PU
0115	115 x 6	0.92	Depressed centre	13,300	10
0125	125 x 6	0.98	Depressed centre	12,200	10
0180	180 x 6	1.61	Depressed centre	8,500	10
0181	180 x 8	1.83	Depressed centre	8,500	10
0230	230 x 8	2.71 (820)	Depressed centre	6,600	10

Grinding Disks for Steel and Cast Iron

Design: Fibre reinforced resin bond for long service life and high grinding performance. Standard bore hole 22.23 mm.

PFERD

8035 **PS-FORTE**
Corundum (A30), soft, for steel and cast iron. Ideal for **surface grinding** as well as weld and edge processing.

8038 **SG-ELASTIC**
Corundum (A24), hard, for universal steel processing. Ideal for **deburring** as well as weld and edge processing.



8035



8038

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8035/8038	○	●		○	○	○	○	○

Part No.	∅ x Thickness mm	8035	8038	Design	Max. RPM 1/min	PU
0115	115 x 7.2	1.30	1.97	Depressed centre	13,300	10
0125	125 x 7.2	1.67	2.63	Depressed centre	12,200	10
0178	178 x 7.2	2.12	3.19	Depressed centre	8,600	10
0179	178 x 8.3	2.76	3.58	Depressed centre	8,600	10
0230	230 x 8.3	4.65 (825)	5.76 (825)	Depressed centre	6,600	10

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Grinding Disks for Stainless Steel

Design: Corundum (A24), soft, fibre reinforced resin bond for long service life and high grinding performance. Standard bore hole 22.23 mm.

Application: For universal machining of stainless steel.



format professional quality

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8041	○	○		●		○	○	○

Part No.	∅ x Thickness mm	8041	Design	Max. RPM 1/min	PU
0115	115 x 6	1.11	Depressed centre	13,300	10
0125	125 x 6	1.22	Depressed centre	12,200	10
0180	180 x 6	2.15	Depressed centre	8,500	10
		(820)			

Grinding Disks for Stainless Steel

Design: Corundum (A30), soft, fibre reinforced resin bond for long service life and high grinding performance. **No filling materials containing iron, sulphur or chlorine.** Standard hole 22.23 mm.

8050 **PS-FORTE**
Ideal for **surface grinding** as well as weld and edge treatment.

8053 **SG-ELASTIC**
Ideal for **deburring** as well as weld and edge treatment.

PFERD



8050



8053

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8050/8053	○	○		●		○	○	○

Part No.	∅ x Thickness mm	8050	8053	Design	Max. RPM 1/min	PU
0115	115 x 7.2	1.46	2.17	Depressed centre	13,300	10
0125	125 x 7.2	1.87	2.93	Depressed centre	12,200	10
0180	178 x 7.2	2.34	3.49	Depressed centre	8,600	10
0181	178 x 8.3	–	3.96	Depressed centre	8,600	10
0231	230 x 8.3	5.22	6.37	Depressed centre	6,600	10
		(825)	(825)			

Grinding Disks for Casting Skin

SG-ELASTIC
Design: Corundum and silicon carbide (AC30), hard, with fibre reinforced resin bond for long service life and high grinding performance. Standard bore hole 22.23 mm.

Application: For machining of casting skin with sand inclusions, cast iron (grey cast iron and spheroidal graphite iron). For edge as well as surface treatment. Dimensionally stable in particular in pipeline applications.

PFERD



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8054	○				●	○	○	○

Part No.	∅ x Thickness mm	8054	Design	Max. RPM 1/min	PU
0178	178 x 7.2	3.57	Depressed centre	8,600	10
0230	230 x 7.2	4.91	Depressed centre	6,600	10
		(825)			

Grinding Disks for Aluminium

SG-ELASTIC
Design: Corundum (A24), soft, fibre reinforced resin bond for long service life and high grinding performance. Standard bore hole 22.23 mm.

Application: For universal machining of aluminium and other soft non-ferrous metals causing clogging of the tool.

PFERD



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8056	●							

Part No.	∅ x Thickness mm	8056	Design	Max. RPM 1/min	PU
0115	115 x 7.2	2.30	Depressed centre	13,300	10
0125	125 x 7.2	3.14	Depressed centre	12,200	10
0178	178 x 7.2	3.76 (825)	Depressed centre	8,600	10

Grinding Disks for Steel and Stainless Steel

FUSION
Design: This grinding disk combines the long service life of a grinding disk with the fine grinding performance of a flap wheel. Corundum (A60), soft, with fibre reinforced resin bond for long service life and high grinding performance. **No filling materials containing iron, sulphur or chlorine.** Standard hole 22.23 mm. **It is possible to dress the edge of the grinding disk for the respective application.**

Application: For machining of steel and stainless steel in container construction, construction engineering, locksmith's shops and steel construction. **Especially for machining of fillet welds.** The extremely flat grinding angle allows grinding in only two steps.

RHODIUS Schleifwerkzeuge



8057 **Thickness 4.0 mm.**

8058 **Thickness 6.5 mm.**

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8057/8058		●		●				

Part No.	∅ mm	8057 RHODIUS	8058 RHODIUS	Grain	Design	Max. RPM 1/min	PU
0040	125	1.45	1.70	40	Depressed centre	12,200	10
0060	125	1.45	1.70	60	Depressed centre	12,200	10
0080	125	1.45 (836)	1.70 (836)	80	Depressed centre	12,200	10

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Cutting Disks

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Small Cutting Disks

SG-ELASTIC
Design: Corundum (A46/60), soft, with fibre reinforced resin bond for long service life and high grinding performance. **No filling materials containing iron, sulphur and chlorine.**

Application: For cool machining of steel, INOX, high-temperature steel, cast iron and non-ferrous metals on electric and pneumatic flat grinding machines. Ideal for confined space.

Note: Please order support for cutting disks separately.



PFERD

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8109	○	●		●	●			

Part No.	∅ x Thickness mm	8109	Hole mm	Design	Max. RPM 1/min	PU
4011	40 x 1.1	1.07	6	Flat	38,200	50
4021	40 x 2.1	1.07	6	Flat	38,200	50
5011	50 x 1.1	1.26	6	Flat	30,600	50
5021	50 x 2.1	1.26	6	Flat	30,600	50
		(835)				

Part No.	∅ x Thickness mm	8109	Hole mm	Design	Max. RPM 1/min	PU
6511	65 x 1.1	1.30	6	Flat	23,500	50
6530	65 x 3.0	1.30	10	Flat	23,500	50
7611	76 x 1.1	1.56	6	Flat	20,100	50
7621	76 x 2.1	1.56	10	Flat	20,100	50
		(835)				

Holders for Small Cutting Disk

Design: Sturdy design with highest resistance to breakage.

Application: For clamping of small cutting disks.

Note: Please observe the maximum speed indicated in the instruction leaflet.



Part No.	Tool bore hole ∅ mm	8109	Shank ∅ mm	Clamping range mm
0606	6	5.96	6	0–4
0610	10	5.96	6	0–4
		(868)		

Cutting Disks for Steel

Design: Corundum (A60 in case of thickness 1.0 mm), hard, corundum (A46 in case of thickness 1.6–1.9 mm), hard and corundum (A24 in case of thickness 2.5–3.0 mm), hard, with fibre reinforced resin bond for long service life and high grinding performance. Standard bore hole 22.23 mm.

Application: For universal metal working. The thin cutting disks (1.0 mm thickness) are perfectly suitable for quick, comfortable and low-burr cutting, the thicknesses 1.6 to 1.9 for universal cutting operations and the thicknesses 2.5 to 3.0 mm for long service life and high side stability.

Note: For more safety and higher side stability when using cutting disks with ∅ from 178 mm, we recommend to use clamping flanges, see (part no. 8110 0010).



format professional quality

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8059		●			○			

Part No.	∅ x Thickness mm	8059	Design	Max. RPM 1/min	PU
0113	115 x 1	0.68	Straight	13,300	25
0114	115 x 1.6	0.70	Straight	13,300	25
0115	115 x 2.5	0.55	Depressed centre	13,300	25
0123	125 x 1	0.75	Straight	12,200	25
0124	125 x 1.6	0.77	Straight	12,200	25
		(830)			

Part No.	∅ x Thickness mm	8059	Design	Max. RPM 1/min	PU
0125	125 x 2.5	0.60	Depressed centre	12,200	25
0179	180 x 1.6	1.23	Straight	8,500	25
0180	180 x 3	0.81	Straight	8,500	25
0229	230 x 1.9	1.70	Straight	6,600	25
0230	230 x 3	1.12	Straight	6,600	25
		(830)			

Cutting Disks for Steel

Design: Corundum (A60), fibre reinforced resin bond for long service life and high grinding performance. Standard bore hole 22.23 mm.

Application: For cutting of sheet metal, profiles and solid material from steel. The thin cutting disks (1.0 mm thickness) are perfectly suitable for quick, comfortable and low-burr cutting, the thicknesses 1.6 to 2.4 for universal cutting operations and the thicknesses 3.0 to 3.2 mm for long service life and high side stability.

Note: For more safety and higher side stability when using cutting disks with ⌀ from 178 mm, we recommend to use clamping flanges, see (part no. 8110 0010).

8065 **PS-FORTE**
Soft design.

8071 **SG-ELASTIC**
Hard design.

PFERD



8065



8071

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8065/8071		●			○			

Part No.	⌀ mm	8065	Thickness mm	Design	Max. RPM 1/min	PU
0114	115	0.86	1	Straight	13,300	25
0115	115	0.86	1.6	Straight	13,300	25
0116	115	0.75	2.4	Depressed centre	13,300	25
0124	125	0.97	1	Straight	12,200	25
0125	125	0.98	1.6	Straight	12,200	25
0126	125	0.88	2.4	Depressed centre	12,200	25
0177	178	1.42	1.6	Straight	8,600	25
0178	178	1.07	3	Straight	8,600	25
0229	230	2.13	1.9	Straight	6,600	25
0230	230	1.50	3	Straight	6,600	25
		(835)				

Part No.	⌀ mm	8071	Thickness mm	Design	Max. RPM 1/min	PU
0115	115	1.42	1	Straight	13,300	25
0117	115	1.48	1.6	Flat	13,300	25
0116	115	1.34	2.4	Depressed centre	13,300	25
0125	125	1.64	1	Straight	12,200	25
0127	125	1.70	1.6	Flat	12,200	25
0126	125	1.54	2.4	Depressed centre	12,200	25
0177	178	2.08	1.6	Straight	8,600	25
0178	178	2.47	3.2	Straight	8,600	25
0229	230	3.10	1.9	Straight	6,600	25
0230	230	3.65	3.2	Straight	6,600	25
		(835)				

Cutting Disks for Stainless Steel

Design: Fibre reinforced resin bond for long service life and high grinding performance. **No filling materials containing iron, sulphur or chlorine.** Standard bore hole 22.23 mm.

Note: For more safety and higher side stability when using cutting disks with ⌀ from 178 mm, we recommend to use clamping flanges, see (part no. 8110 0010).

8077 Corundum (A24), ideal for cutting of heat-sensitive and hard steel as well as stainless steel.

8085 Corundum (A46 and/or A60), hard, ideal for cutting of thin sheet metal as well as thin-walled profiles and pipes from stainless steel. Convenient and effortless cutting with reduced burr formation and low material consumption.

format professional quality



8077



8085

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8077/8085		○		●				

Part No.	⌀ mm	8077	Thickness mm	Design	Max. RPM 1/min	PU
0115	115	0.60	2.5	Depressed centre	13,300	25
0125	125	0.70	2.5	Depressed centre	12,200	25
0180	180	0.98	3	Straight	8,500	25
		(830)				

Part No.	⌀ mm	8085	Thickness mm	Design	Max. RPM 1/min	PU
0115	115	0.75	1	Straight	13,300	25
0116	115	0.77	1.6	Straight	13,300	25
0125	125	0.81	1	Straight	12,200	25
0126	125	0.82	1.6	Straight	12,200	25
0180	180	1.26	1.6	Straight	8,500	25
0230	230	1.79	1.9	Straight	6,600	25
		(830)				

Cutting Disks for Stainless Steel – Extra Thin



PFERD

SG-PLUS X-Slim
Design: Corundum (A60), hard, with fibre reinforced resin bond for highest cutting performance with excellent service life and cool cut.
No filling materials containing iron, sulphur or chlorine.
Standard bore hole 22.23 mm.

Application: For machining of stainless steel. Especially for cool and burr-free cutting of thin sheet metal, profiles, pipes and solid material. Due to the narrow cut, only low contact pressure is required.

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8097		○		●				

Part No.	∅ x Thickness mm	8097	Design	Max. RPM 1/min	PU
0115	115 x 0.8	2.28	Depressed centre	13,300	25
0125	125 x 0.8	2.52	Depressed centre	12,200	25
		(835)			

Cutting Disks for Stainless Steel

PFERD

Design: Corundum (A24, A46 and/or A60), fibre reinforced resin bond for long service life and high grinding performance.
No filling materials containing iron, sulphur or chlorine.
Standard bore hole 22.23 mm.

Application: For cutting of sheet metal, profiles and solid material from steel and stainless steel. The thin cutting disks (1.0 mm thick) are perfectly suitable for quick, comfortable and low-burr cutting; and thicknesses of 1.6 to 2.5 mm for universal cutting operations.

Note: For more safety and higher side stability when using cutting disks with ∅ from 178 mm, we recommend to use clamping flanges, see (part no. 8110 0010).



8090



8096

8090 **PS-FORTE**
Soft design.

8096 **SG-ELASTIC**
Hard design.

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8090/8096		○		●				

Part No.	∅ x Thickness mm	8090	Design	Max. RPM 1/min	PU
0114	115 x 1	0.90	Straight	13,300	25
0115	115 x 1.6	0.90	Straight	13,300	25
0116	115 x 2.4	0.82	Straight	13,300	25
0124	125 x 1	1.03	Straight	12,200	25
0125	125 x 1.6	1.03	Straight	12,200	25
0126	125 x 2.4	0.94	Straight	12,200	25
0177	178 x 1.6	1.48	Straight	8,600	25
0178	178 x 2.5	1.16	Straight	8,600	25
0229	230 x 1.9	2.21	Straight	6,600	25
0230	230 x 2.5	1.60	Straight	6,600	25
		(835)			

Part No.	∅ x Thickness mm	8096	Design	Max. RPM 1/min	PU
0115	115 x 1	1.46	Straight	13,300	25
0116	115 x 1.6	1.50	Straight	13,300	25
0117	115 x 2.4	1.38	Depressed centre	13,300	25
0125	125 x 1	1.68	Straight	12,200	25
0126	125 x 1.6	1.74	Straight	12,200	25
0127	125 x 2.4	1.59	Depressed Centre	12,200	25
0177	178 x 1.6	2.16	Straight	8,600	25
0178	178 x 2.5	2.54	Straight	8,600	25
0229	230 x 1.9	3.16	Straight	6,600	25
0230	230 x 2.5	3.73	Straight	6,600	25
		(835)			

Cutting Disks for Stainless Steel Casting



PFERD

SG-ELASTIC
Design: Corundum (A24), soft, with fibre reinforced resin bond for highest cutting performance, excellent service life and cool cut.
No filling materials containing iron, sulphur or chlorine.
Standard bore hole 22.23 mm.

Application: For stainless steel casting. Especially for cutting of solid material. Ideal for pneumatic turbine grinding machines and strong high-frequency and electric right angle grinders.

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8098		○		●	○			

Part No.	∅ x Thickness mm	8098	Design	Max. RPM 1/min	PU
0230	230 x 2.9	3.87	Depressed centre	6,600	25
0231	230 x 2.9	3.87	Flat	6,600	25
		(835)			

Cutting Disks

Cutting Disks for Stainless Steel – Extra Thin

XT 8
Design: Corundum (A60), hard, with fibre reinforced resin bond for highest cutting performance with excellent service life and cool cut.
No filling materials containing iron, sulphur or chlorine.
Standard bore hole 22.23 mm.
KWU homologation.

Application: For stainless steel. Especially for cool and burr-free cutting of thin sheet metal, profiles, pipes and solid material.
Due to the narrow cut, only low contact pressure is required.

KWU homologation (power station)

RHODIUS Schleifwerkzeuge



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8100		○		●				

Part No.	∅ x Thickness mm	8100 RHODIUS	Design	Max. RPM 1/min	PU
0115	115 x 0.8	1.12	Depressed centre	13,300	50
0125	125 x 0.8	1.29	Depressed centre	12,200	50
		(836)			

Cutting Disks for Stainless Steel

XT10
Design: Corundum (A46), hard, with fibre reinforced resin bond for highest cutting performance with excellent service life and cool cut.
No filling materials containing iron, sulphur or chlorine.
Standard bore hole 22.23 mm.
KWU homologation.

Application: For stainless steel. Especially for cool and burr-free cutting of sheet metal, profiles, pipes and solid material.
Due to the narrow cut, only low contact pressure is required.

Note: For more safety and higher side stability when using cutting disks with ∅ from 178 mm, we recommend to use clamping flanges, see (part no. 8110 0010).

KWU homologation (power station)

RHODIUS Schleifwerkzeuge



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8101		○		●				

Part No.	∅ x Thickness mm	8101 RHODIUS	Design	Max. RPM 1/min	PU
0115	115 x 1	1.05	Flat	13,300	50
0125	125 x 1	1.19	Flat	12,200	50
0230	230 x 1.9	2.49	Depressed centre	12,200	50
		(836)			

Cutting Disks for Cast Iron

SG-ELASTIC
Design: Corundum (A24), soft, with fibre reinforced resin bond for highest cutting performance with excellent service life and cool cut.
Standard bore hole 22.23 mm.

Application: For cast iron (grey cast iron and spheroidal graphite iron). Especially for cutting of solid material. Ideal for pneumatic turbine grinding machines and strong high-frequency and electric right angle grinders.

PFERD



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8072		○			●			

Part No.	∅ x Thickness mm	8072	Design	Max. RPM 1/min	PU
0230	230 x 3.2	3.54	Depressed centre	6,600	25
0231	230 x 3.2	3.54	Flat	6,600	25
		(835)			

Cutting Disks for Aluminium

SG-ELASTIC
Design: Corundum (A30), soft, with fibre reinforced resin bond for long service life and high grinding performance. **No filling materials leaving undesirable residues on the workpiece.** Standard bore hole 22.23 mm.

Application: Ideal for cutting of sheet metal, profiles and solid material from aluminium and other soft non-ferrous metals causing clogging of the tool.

Note: For more safety and higher side stability when using cutting disks with ∅ from 178 mm, we recommend to use clamping flanges, see (part no. 8110 0010).

PFERD



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8111	●			◌		◌	◌	◌

Part No.	∅ x Thickness mm	8111	Design	Max. RPM 1/min	PU
0115	115 x 2.4	1.38	Depressed Centre	13,300	25
0125	125 x 2.4	1.59 (835)	Depressed Centre	12,200	25

Part No.	∅ x Thickness mm	8111	Design	Max. RPM 1/min	PU
0178	178 x 2.9	2.54 (835)	Straight	8,600	25

Cutting Disks for Stone

Design: Silicon carbide (C24), hard, fibre reinforced resin bond for long service life and high grinding performance. Standard bore hole 22.23 mm.

Application: Ideal for cutting of natural and artificial stone. Under certain conditions also suitable for cutting of cast iron.

Note: For more safety and higher side stability when using cutting disks with ∅ from 178 mm, we recommend to use clamping flanges, see (part no. 8110 0010).

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8099				◌	○	◌	●	◌

Part No.	∅ x Thickness mm	8099	Design	Max. RPM 1/min	PU
0115	115 x 2.5	0.56	Depressed Centre	13,300	25
0125	125 x 2.5	0.62 (830)	Depressed Centre	12,200	25

Part No.	∅ x Thickness mm	8099	Design	Max. RPM 1/min	PU
0230	230 x 3	1.15 (830)	Straight	6,600	25

Cutting Disks for Stone

SG-ELASTIC
Design: Silicon carbide (C24 and/or C30), hard, fibre reinforced resin bond for long service life and high grinding performance. Standard bore hole 22.23 mm.

Application: Ideal for cutting of natural and artificial stone.

Note: For more safety and higher side stability when using cutting disks with ∅ from 178 mm, we recommend to use clamping flanges, see (part no. 8110 0010).

PFERD



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8108				◌		◌	●	◌

Part No.	∅ x Thickness mm	8108	Design	Max. RPM 1/min	PU
0115	115 x 2.4	1.35	Depressed Centre	13,300	25
0125	125 x 2.4	1.56 (835)	Depressed Centre	12,200	25

Part No.	∅ x Thickness mm	8108	Design	Max. RPM 1/min	PU
0178	178 x 3.2	2.50	Straight	8,600	25
0230	230 x 3.2	3.69 (835)	Straight	6,600	25

Clamping Flange Sets for Thin Cutting Disks

Design: From high-quality tool steel.

Application: Increases stability and precision when guiding the cutting disk, especially for thin cutting disks with ø 178/180 and 230 mm.

PFERD



Part No.	8110
0010	21.21 (835)

Clamping Flange Sets with Vibration Reducers RHODUCER

Design: From high-quality tool steel with wear-resistant coating.

Application: For conventional free-hand right angle grinders with standard flange. The coating reduces vibrations and thus allows convenient and in particular **effortless use** of roughening and cutting disks. **The stressed parts of the body are preserved and the working quality is enhanced. The occuring vibrations are reduced by up to 65 %.** Furthermore, the stability and precision during operation is increased.

RHODIUS Schleifwerkzeuge



Part No.	8112 RHODIUS
0010	22.34 (836)

Wheel Cups

SG-ELASTIC
Design: Soft design, with fibre reinforced resin bond for long service life and high grinding performance. Standard bore hole 22.23 mm.

8126 Corundum (A16), **for steel and cast iron.** For machining of surfaces and thanks to slight tilt also suitable for machining of welds.

8129 Silicon carbide (C30), **for machining of stone and natural stone** in wet and dry grinding.

PFERD



8126



8129

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8126	○	●	○	○	○	○	○	○
8129	○	○	○	○	○	○	●	○

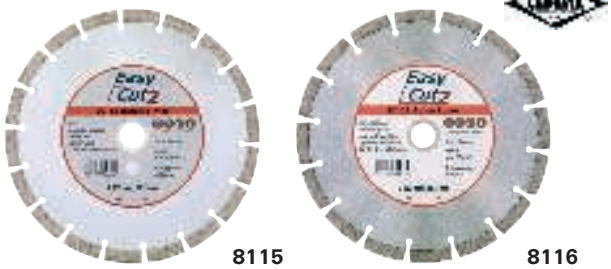
Part No.	Largest ø mm	8126	8129	Smallest ø mm	Cup height mm	Wall thickness mm	Max. speed 1/min
0110	110	8.50 (840)	9.01 (840)	90	55	20	8,600

Diamond Cutting Wheels

Design: Main blades made from high-quality steel, segmented.
Segment height 10 mm.

8115 **EC-18, with sintered segments.**
Ideal for cutting of concrete and concrete roofing tiles. Also suitable for exposed aggregate concrete, clinker, natural and artificial stone.

8116 **EC-21, with laser welded segments.**
Ideal for cutting of concrete, exposed aggregate concrete, clinker, natural and artificial stone, basalt and slate. Also suitable for granite and refractory material.



8115 8116

Part No.	∅ mm	8115	8116	Segment width mm 8115	Segment width mm 8116	Bore hole ∅ mm
0115	115	5.74	12.58	1.9	2.1	22.23
0125	125	6.33	14.94	1.9	2.1	22.23
0180	180	9.05	25.95	2.2	2.3	22.23
0230	230	12.07	28.30	2.4	2.4	22.23
0300	300	–	47.40	–	2.8	20
0305	300	–	47.40	–	2.8	25.4
0350	350	–	63.68	–	3.2	20
0355	350	–	63.68	–	3.2	25.4
		(839)	(839)			

Diamond Cutting Wheels, Extra Thin

EC-45 "extra thin"
Design: Main blades from quality steel, with closed cutting edge. High feed speed and excellent cutting edge quality.
Segment height 10 mm.

Application: Ideal for refractory material, clinker, ceramics, natural and artificial stone, glass fibre reinforced plastics, gypsum plaster board and profile sheet metal. Under certain conditions also suitable for tiles and fine stoneware. Suitable for wet and dry cutting.



Part No.	∅ mm	8118	Segment width mm	Bore hole ∅ mm
0115	115	15.52	1.2	22.23
0125	125	16.26	1.2	22.23
		(839)		

Part No.	∅ mm	8118	Segment width mm	Bore hole ∅ mm
0180	180	26.61	1.6	22.23
0230	230	40.65	1.8	22.23
		(839)		

Diamond Cutting Wheels

Design: Main blades made from high-quality steel with closed, sintered cutting edge.

8121 **EC-42 Turbo**
Ideal for cutting of concrete, exposed aggregate concrete, concrete roofing tiles, soft natural stone, basalt and slate. Furthermore also suitable for reinforced concrete, stoneware pipe, hard natural stone and granite.
Segment height 10 mm.

8122 **EC-110 Tile**
Due to good cutting edge quality ideal for cutting of tiles.
Segment height 7 mm.



8121 8122

Part No.	∅ mm	8121	8122	Segment width mm 8121	Segment width mm 8122	Bore hole ∅ mm
0115	115	6.37	7.86	2.3	1.5	22.23
0125	125	7.08	9.43	2.3	1.5	22.23
0180	180	12.03	–	2.6	–	22.23
0230	230	14.86	–	3	–	22.23
		(839)	(839)			

Grinding Blocks

Design: From pressed cork, rectangular. Top edges rounded off.

Part No.	Length mm	8165	Thickness mm	Height mm
0001	125	0.75 (843)	60	35



Rubber Grinding Blocks

Design: From rubber, 2-piece. Top face half-round.

Part No.	Dimensions mm	8168
0002	130 x 70	1.01 (843)

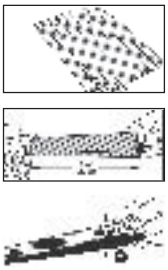


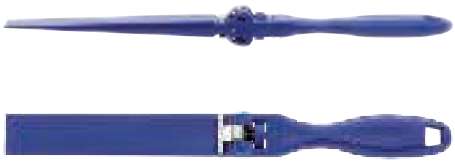
Abrasive Files

Design: From sturdy plastic material. With quick clamping device for quick and easy clamping of the abrasive material. **Width 25 mm.**

Application: Ideal for grinding operations in confined spaces. For metal as well as wood machining.

Part No.	Length mm	8166
0001	140	3.14 (854)





Abrasive Sheets, Velcro

PS 22 K
Design: Resin-bonded corundum grit (A) on paper (250 g/m^2), uniform and half-open. Excellent grain adhesion, long service life, low contact pressure and good flexibility. **Sheet size 70 x 125 mm.**

Application: Universal product for manual and automatic machining of wood and metal, especially for resinous wood.

Note: Velcro grinding blocks from microcellular rubber see (part no. 8133 1000).

KLINGSPOR



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8133		●		○		●	○	○

Part No.	Grain size	8133	PU
0080	80	10.80	100
0100	100	10.28	100
0120	120	10.28 (852)	100

Price basis = Pound/100 pieces

Part No.	Grain size	8133	PU
0150	150	10.28	100
0180	180	10.28 (852)	100

Grinding Blocks, Velcro

Design: From microcellular rubber, handy design. Bottom with strong Velcro surface.

Application: For Velcro abrasive sheets. Ideal for manual grinding of surfaces.

Part No.	Dimensions W x H x L mm	8133
1000	68 x 118 x 40	2.72 (852)



Waterproof Abrasive Sheets



KLINGSPOR

PS 11
Design: Waterproof abrasive sheet with resin-bonded silicon carbide grid (SiC) on paper (95 g/m² up to grain 180, 110 g/m² from grain 240), uniform and dense. Excellent grain adhesion, long service life, low contact pressure and good flexibility. **Sheet size 230 x 280 mm.**

Application: For paint, enamel and filler, mainly in car repair and enamelling.

Note: Grinding blocks from cork see (part no. 8165), from rubber see (part no. 8168). Abrasive file see (part no. 8166).

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8135		●		●			○	●

Part No.	Grain size	8135	PU
0120	120	31.16	50
0150	150	25.68	50
0180	180	24.12	50
0240	240	24.12	50
0320	320	24.12	50

(852)

Part No.	Grain size	8135	PU
0360	360	24.12	50
0400	400	24.12	50
0600	600	24.12	50
0800	800	24.12	50
1000	1000	24.12	50

(852)

Price basis = Pound/100 pieces

Abrasive Sheets



format professional quality

Design: Non-woven nylon web impregnated with resin-bonded corundum, sheet size 230 x 280 mm.

Application: General purpose, for first and intermediate grinding.

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8140		○		○		●	○	○

Part No.	Grain size	8140	PU
0040	40	28.71	50
0060	60	22.89	50
0080	80	20.15	50

(842)

Part No.	Grain size	8140	PU
0100	100	18.36	50
0120	120	18.36	50

(842)

Price basis = Pound/100 pieces

Abrasive Cloths, Blue



format professional quality

Design: Resin-bonded corundum grit (A) on very flexible, blue fabric, uniform and slightly open. Excellent grain adhesion, long service life, low contact pressure and good flexibility. **Sheet size 230 x 280 mm.**

Application: Universal product for machining of unalloyed steel and non-ferrous metals.

Note: Grinding blocks from cork see (part no. 8165), from rubber see (part no. 8168). Abrasive file see (part no. 8166).

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8143		●		○	○	○	○	○

Part No.	Grain size	8143	PU
0040	40	43.09	50
0060	60	38.16	50
0080	80	35.88	50
0100	100	34.18	50
0120	120	34.18	50

(842)

Part No.	Grain size	8143	PU
0150	150	34.18	50
0180	180	34.18	50
0240	240	34.18	50
0320	320	34.18	50
0400	400	34.18	50

(842)

Price basis = Pound/100 pieces

Abrasive Cloths/Abrasive Rolls

Abrasive Cloths, Brown





8146 format professional quality 8137 KLINGSPOR

Design: Resin-bonded corundum grit (A) on very flexible, brown cotton fabric. Excellent grain adhesion, long service life, low contact pressure and good flexibility. **Sheet size 230 x 280 mm.**

Application: For heavy-duty work, with straight tearing behaviour without fringes. Ideal for machining of wood, metal and steel; under certain conditions also suitable for stainless steel and plastic materials.

Note: Grinding blocks from cork see (part no. 8165), from rubber see (part no. 8168). Abrasive file see (part no. 8166).

8146 Uniform and **slightly open** grit.

8137 Uniform and **dense** grit.

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8146/8137		●		●	○	○		

Part No.	Grain size	8146	8137	PU
0040	40	57.72	75.11	50
0060	60	52.40	65.63	50
0080	80	51.64	60.65	50
0100	100	50.87	57.71	50
0120	120	50.87	57.71	50
0150	150	50.87	57.71	50
0180	180	50.87	57.71	50
		(842)	(852)	

Part No.	Grain size	8146	8137	PU
0240	240	50.87	57.71	50
0280	280	50.87	57.71	50
0320	320	50.87	57.71	50
0360	360	50.87	57.71	50
0400	400	50.87	57.71	50
0999	999	50.87	–	50
		(842)	(852)	

Price basis = Pound/100 pieces

Abrasive Rolls



format professional quality

Design: Brown, highly flexible, tear-resistant fabric, for heavy-duty work. In 50 metre rolls.

Application: For the toughest hand-sanding requirements, ideal for cleaning and polishing machine-ground workpieces, profiling work, rounded workpieces etc. in a variety of metalwork applications.

8150 Roll width 40 mm

8153 Roll width 50 mm

8156 Roll width 115 mm

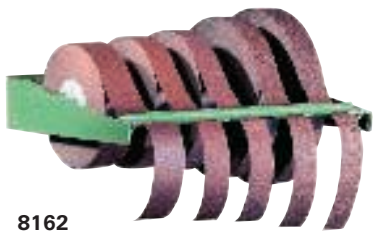
Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8150/8153/8156		●		●	○	○		

Part No.	Grain size	8150 Roll/Price	8153 Roll/Price	8156 Roll/Price
0040	40	18.89	23.50	47.00
0060	60	18.05	22.24	43.67
0080	80	17.21	21.40	41.56
0100	100	16.78	20.99	40.71
0120	120	16.78	20.99	40.71
		(842)	(842)	(842)

Part No.	Grain size	8150 Roll/Price	8153 Roll/Price	8156 Roll/Price
0150	150	16.78	20.99	40.71
0180	180	16.78	20.99	40.71
0240	240	16.78	20.99	40.71
0320	320	16.78	20.99	40.71
0400	400	16.78	20.99	40.71
		(842)	(842)	(842)

Roll Holders





format professional quality

Design: Easy to assemble for holding rolls of 50 m lengths and widths of 25 to 50 mm.

8159 8162

Part No.	8159	8162
0001	20.37	–
0005	–	67.31
	(842)	(842)

Abrasive Cloth Belts, Corundum

Design: Resin-bonded corundum grit (A) on flexible fabric, uniform and slightly open. Excellent grain adhesion, long service life, low contact pressure and good flexibility. **Resistant to oil, wax and fat.**

Application: Universal product for **alloyed and unalloyed steel as well as non-ferrous metal** on belt grinding machines. Ideal for fittings, containers etc.

8175 **Dimensions:** 6 x 520 mm
8178 **Dimensions:** 6 x 610 mm
8181 **Dimensions:** 12 x 520 mm
8184 **Dimensions:** 13 x 610 mm
8187 **Dimensions:** 28 x 533 mm
8179 **Dimensions:** 40 x 815 mm
8177 **Dimensions:** 75 x 620 mm
8217 **Dimensions:** 75 x 2,000 mm
8220 **Dimensions:** 150 x 2,000 mm

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8175/8178/8181/8184/8187/8179/8177/8217/8220	○	●		●	○	○		

Part No.		0040	0060	0080	0100	0120	0150	0240	PU
Grain size		40	60	80	100	120	150	240	
8175	6 x 520	33.97	33.97	33.97	–	33.97	–	–	100
8178	6 x 610	33.97	33.97	33.97	–	33.97	–	–	100
8181	12 x 520	33.97	33.97	33.97	–	33.97	–	–	100
8184	13 x 610	33.97	33.97	33.97	–	33.97	–	–	100
8187	28 x 533	73.87	70.23	68.59	–	67.79	–	–	20
8179	40 x 815	81.13	75.21	72.24	–	70.45	70.45	–	10
8177	75 x 620	102.44	94.14	90.00	87.64	87.64	87.64	87.64	10
8217	75 x 2,000	323.00	289.01	272.95	262.94	262.94	262.94	262.94	10
8220	150 x 2,000	588.85	521.29	489.19	468.99	468.99	468.99	468.99	10

Price basis = Pound/100 pieces

(842)

Abrasive Cloth Belts, Corundum

Design: Resin-bonded corundum grit (A) on flexible fabric, uniform and slightly open. Improved chip removal, excellent grain adhesion, long service life, low contact pressure and good flexibility.

Application: Universal product for **machining of wood** on belt grinding machines, under certain conditions also suitable for metal working.

8176 **Dimensions:** 9 x 533 mm
8205 **Dimensions:** 75 x 533 mm
8208 **Dimensions:** 100 x 560 mm
8211 **Dimensions:** 100 x 620 mm
8180 **Dimensions:** 100 x 950 mm
8214 **Dimensions:** 50 x 1,000 mm
8182 **Dimensions:** 100 x 1,000 mm

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8176/8205/8208/8211/8180/8214/8182		○				●		

Part No.		0040	0060	0080	0100	0120	0150	0240	PU
Grain size		40	60	80	100	120	150	240	
8176	9 x 533	46.72	45.54	44.94	–	44.58	–	–	10
8205	75 x 533	111.88	103.47	99.41	97.28	97.28	97.28	97.28	10
8208	100 x 560	140.16	128.90	123.70	119.93	119.93	119.93	119.93	10
8211	100 x 620	151.66	138.99	132.92	129.05	129.05	129.05	129.05	10
8180	100 x 950	174.02	156.56	148.12	–	–	–	–	10
8214	50 x 1,000	122.51	112.27	107.46	104.25	104.25	104.25	104.25	10
8182	100 x 1,000	181.26	162.57	153.54	–	148.12	–	–	10

Price basis = Pound/100 pieces

(842)

Abrasive Cloth Belts, Zirconium Corundum

Design: Resin-bonded zirconium corundum grit (ZA) on sturdy and flexible fabric, uniform and slightly open. Excellent grain adhesion, long service life, low contact pressure and good flexibility. **Resistant to oil, fat, wax and water/emulsion.**

Application: Special product for machining of alloyed and unalloyed steel as well as non-ferrous metals on belt grinding machines. Ideal for processing of containers, cast iron and forged parts, pipes, metal constructions etc.

8222 **Dimensions:** 30 x 533 mm
8223 **Dimensions:** 50 x 1,000 mm
8226 **Dimensions:** 75 x 2,000 mm
8229 **Dimensions:** 150 x 2,000 mm
8228 **Dimensions:** 75 x 3,500 mm

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8222/8223/8226/8229/8228		●		●	○			

Part No.		0024	0036	0040	0050	0060	0080	0100	0120	PU
Grain size		24	36	40	50	60	80	100	120	
8222	30 x 533	–	–	70.86	–	63.97	61.80	–	61.80	10
8223	50 x 1,000	153.78	140.33	133.94	127.50	122.12	116.48	112.89	112.89	10
8226	75 x 2,000	–	367.61	347.42	–	310.52	292.97	281.90	–	10
8229	150 x 2,000	–	678.10	638.67	–	564.06	528.81	506.93	–	10
8228	75 x 3,500	–	662.57	575.45	–	468.40	432.97	432.97	–	10

Price basis = Pound/100 pieces

(842)

Abrasive Cloth Belts, Zirconium Corundum

CS 411 Y
Design: Resin-bonded zirconium corundum grit (ZA) on sturdy and flexible **polyester fabric, uniform and dense grit.** Very good grain adhesion, long service life, low contact pressure and very good flexibility. **Resistant to oil, wax, fat and water/emulsion.**

Application: Special product for alloyed and unalloyed steel as well as non-ferrous metal and stainless steel on belt grinding machines. Furthermore, also suitable for processing of leather. Ideal for processing of containers, cast iron and forged parts, pipes, metal constructions etc.

8227 **Dimensions:** 75 x 2,000 mm
8230 **Dimensions:** 150 x 2,000 mm

KLINGSPOR



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8227/8230		●		●	●			

Part No.		0036	0040	0060	0080	0120	PU
Grain size		36	40	60	80	120	
8227	75 x 2,000	399.51	362.51	322.56	303.32	288.53	10
8230	150 x 2,000	747.22	710.23	594.82	556.35	532.67	10

Price basis = Pound/100 pieces

(852)

Abrasive Cloth Belts, Ceramic Grain

Design: Resin-bonded, **self-sharpening ceramic grain (CER) with cooling effects due to active additional coating,** on sturdy and very flexible fabric, uniform and slightly open grit. Excellent grain adhesion, **extremely long service life,** low to medium contact pressure and good flexibility. **Resistant to oil, fat, wax and water/emulsion.**

Application: For aggressive and cooling grinding of high-alloy steel, titanium and nickel alloys. Due to high hardness optimally suited for processing of hard surfaces. **The active ingredients allow cooling grinding and thus increase the chip production considerably. This provides for an extension of service life and reduces tarnishing effects on the workpiece surface.** For dry processing as well as processing with cooling agents.

8185 **Dimensions:** 75 x 2,000 mm
8186 **Dimensions:** 50 x 3,500 mm
8188 **Dimensions:** 150 x 2,000 mm

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8185/8186/8188		●	●	●	●			

Part No.		0024	0036	0040	0060	0080	0100	0120	PU
Grain size		24	36	40	60	80	100	120	
8185	75 x 2,000	805.72	685.29	616.07	461.02	409.79	–	–	10
8186	50 x 3,500	932.41	791.89	711.59	530.92	470.70	–	–	10
8188	150 x 2,000	1,558.16	1,317.29	1,179.53	870.12	766.96	732.36	732.36	10

Price basis = Pound/100 pieces

(846)

Non-woven File-type Abrasive Belts

Design: Non-woven nylon web with resin-bonded corundum.

Application: For metal, for removal of old paint and rust, surface finish.

8190 **Dimensions:** 6 x 520 mm
8193 **Dimensions:** 6 x 610 mm
8196 **Dimensions:** 12 x 520 mm
8199 **Dimensions:** 13 x 610 mm
8191 **Dimensions:** 20 x 815 mm
8202 **Dimensions:** 28 x 533 mm
8192 **Dimensions:** 30 x 533 mm
8194 **Dimensions:** 40 x 618 mm
8195 **Dimensions:** 40 x 675 mm
8197 **Dimensions:** 50 x 2,000 mm
8198 **Dimensions:** 75 x 2,000 mm

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8190/8193/8196/8199/8191/8202	○	●	○	●	●	○	○	●
8192/8194/8195/8197/8198	○	●	○	●	●	○	○	●

Part No.		0100	0180	0240	VE
Grain size		100	180	240	
8190	6 x 520	128.97	121.82	127.01	10
8193	6 x 610	150.47	141.87	149.79	10
8196	12 x 520	186.28	176.26	187.28	10
8199	13 x 610	153.36	144.74	145.73	10
8191	20 x 815	287.70	268.21	268.21	10
8202	28 x 533	273.70	255.06	271.93	10

Price basis = Pound/100 pieces

(842)

Part No.		0100	0180	0240	VE
Grain size		100	180	240	
8192	30 x 533	285.00	265.52	265.52	10
8194	40 x 618	409.36	379.11	379.11	10
8195	40 x 675	443.65	411.39	411.39	10
8197	50 x 2000	1,546.04	1,421.67	1,421.67	10
8198	75 x 2000	2,313.01	2,126.14	2,126.14	10

(842)

Fibre Grinding Disks, Corundum

Design: Strong, tear-resistant, vulcanised fibre material, standard bore diameter 22 mm and cross slit.

Application: Fibre disks are suitable for many grinding operations and for use with angle and disk grinders or flexible shaft grinders. Use with backing pad at a max. 80 m/s circumferential speed.

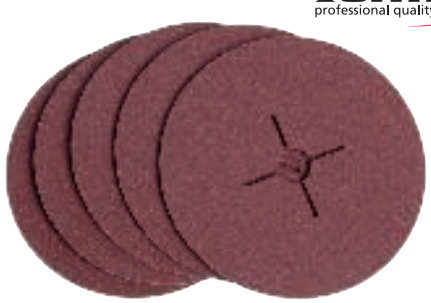
Grain size 16 : For coarse work, e.g. cleaning castings, grinding off paint.

Grain size 24– 80: Deburring, smoothing and cleaning of welded seams.

Grain size 100–120: Tolerance and fine grinding.

8232 ø 115 mm
8235 ø 125 mm
8238 ø 180 mm

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8232/8235/8238		●			○			●

Part No.		0016	0024	0036	0040	0050	0060	0080	0100	0120	PU
Grain size		16	24	36	40	50	60	80	100	120	
8232	ø 115 mm	35.98	26.32	21.92	20.32	19.78	19.21	18.44	18.44	18.44	25
8235	ø 125 mm	40.03	34.66	31.24	28.74	28.33	26.44	24.88	24.88	24.88	25
8238	ø 180 mm	76.34	57.46	51.78	50.03	48.25	42.15	41.67	41.67	41.67	25

Price basis = Pound/100 pieces

(842)

Fibre Grinding Disks for Stainless Steel

Design: Strong, tear-resistant, vulcanised fibre material. Flat, with centre hole and cross slit, standard bore hole diameter 22 mm. An abrasive coating prevents build up of deposits on the wheel during metal grinding, which could otherwise cause clogging. The abrasive layer also promotes cooling.

Application: For hard material cutting, such as, e.g. stainless steel. Fibre discs are suitable for many grinding operations, and suitable for use with angle and disk grinders or flexible shaft grinders. Use with backing pad at a max. 80 m/s circumferential speed.

8241 ø 115 mm
8244 ø 125 mm
8247 ø 180 mm

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8241/8244/8247	●	○		●	○			

Part No.		0036	0050	0060	0080	0100	0120	PU
Grain size		36	50	60	80	100	120	
8241	ø 115 mm	27.85	22.98	22.49	21.48	21.48	21.48	25
8244	ø 125 mm	35.71	32.38	30.68	28.94	28.94	28.94	25
8247	ø 180 mm	60.14	56.25	53.68	49.41	49.41	49.41	25

Price basis = Pound/100 pieces

(842)

Fibre Grinding Disks

Fibre Grinding Disks, Zirconium Corundum

Design: Strong, tear-resistant, vulcanised fibre material. Flat, with centre hole and cross slit, standard diameter bore hole 22 mm. Superb grinding performance, self-sharpening, special bond for hand-operated machines, optimal adaptability, cool grinding.

Application: For alloy steel, non-ferrous metal. For working on containers, castings, forged items, metal fabrications and plates. Suitable for use with angle grinders with backing pad at a max. 80 m/s circumferential speed.

8246 ⌀ 115 mm
8248 ⌀ 125 mm
8249 ⌀ 180 mm

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8246/8248/8249	○	●		●	○			

Part No.		0024	0036	0050	0060	0080	0120	PU
Grain size		24	36	50	60	80	120	
8246	⌀ 115 mm	48.19	42.97	33.84	28.68	26.10	26.10	25
8248	⌀ 125 mm	53.50	47.70	37.63	31.83	28.94	28.94	25
8249	⌀ 180 mm	107.41	95.39	75.39	63.63	57.86	57.86	25

Price basis = Pound/100 pieces

(842)

Fibre Grinding Disks, Zirconium Corundum

Design: High-performance disk for a wide range of applications. This disk distinguishes by excellent chipping performance. Due to active ingredients in the coating binder almost no tarnishing.

Application: For grinding INOX, carbon, building and tool steel as well as aluminium and aluminium alloys.



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8240	●	●		●	○			

Part No.		0036	0040	0060	0080	PU
Grain size		36	40	60	80	
8240	⌀ mm	40.39	37.65	36.49	30.86	50

Price basis = Pound/100 pieces

(841)

Fibre Grinding Disks, Ceramic Grain

Design: Resin-bonded, **self-sharpening ceramic grain (CER) with cooling effects due to active additional coating,** on sturdy and very flexible fabric, uniform and slightly open grit. Excellent grain adhesion, **extremely long service life,** low to medium contact pressure and good flexibility. **Resistant to oil, fat, wax and water/emulsion.** With inside hole (standard bore hole 22.23 mm) and cross slit.

Application: For aggressive and cooling grinding of high-alloy steel, titanium and nickel alloys. Due to high hardness optimally suited for processing of hard surfaces.

The active ingredients allow cooling grinding and thus increase the chip production considerably. This provides for an extension of service life and reduces tarnishing effects of the workpiece surface.
For dry processing as well as processing with cooling agents.

8233 ⌀ 115 mm
8234 ⌀ 125 mm
8236 ⌀ 180 mm

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8233/8234/8236		●	●	●	●			

Part No.		0024	0036	0040	0060	0080	0100	0120	PU
Grain size		24	36	40	60	80	100	120	
8233	⌀ 115 mm	97.59	87.21	74.07	58.01	52.75	52.75	52.75	10
8234	⌀ 125 mm	108.69	96.91	82.39	64.45	58.56	58.56	58.56	10
8236	⌀ 180 mm	217.36	193.81	164.06	129.43	117.67	117.67	117.67	10

Price basis = Pound/100 pieces

(850)

Plastic Backing Pads

Design: Flexible, with M 14 thread flange.

Application: For holding FORMAT fibre disks. Use with angle grinders at maximum circumferential speed of 80 m/s.

format professional quality



Part No.		0115	0125	0180
⌀	mm	115	125	180
8250		2.64	3.43	5.36

(842)

Supports for Fibre Grinding Disks

Design: From shock-resistant plastic with quick adjusting device and fastening holes at the base.

Application: For safe storage of fibre grinding disks up to ⌀ 230 mm and standard bore hole 22.23 mm. The support can be installed horizontally and screwed on the wall using the bore holes at the base.



Part No.	⌀ x height mm	8251
0010	180 x 300	13.44

(842)

Velcro Paper Disks, Corundum

Design: Tough E-weight paper, resin-bonded, impregnated with optimal level of corundum. Laminated with Velcro.

Application: For use with angle and disk grinders or flexible shaft grinders. For all general wood and metal grinding operations. Also suitable for flat grinding. Use with backing pad at a max. 40 m/s circumferential speed.

format professional quality

8253 ⌀ 115 mm

8256 ⌀ 125 mm



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8253/8256		●		○	○	●		○

Part No.		0040	0060	0080	0100	0120	PU
Grain size		40	60	80	100	120	
8253	⌀ 115 mm	29.31	26.07	25.25	24.47	24.47	25
8256	⌀ 125 mm	37.45	33.37	30.93	30.12	30.12	25

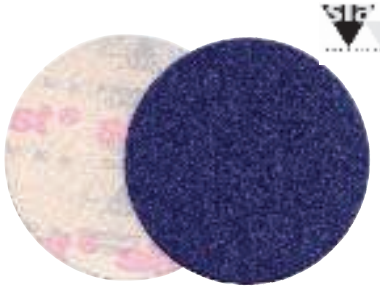
(842)

Price basis = Pound/100 pieces

Velcro Grinding Disks, Zirconium-corundum

Design: Siafast velcro disk for fast and convenient disk change. Fibre backing for grain range up to K40, harder applications are possible below this value. Coating binder with active ingredients for reducing tarnishing effect.

Application: For finishing of INOX, steel and titanium.



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8257		●	●	●	○			

Part No.		0036	0040	0060	0080	PU
Grain size		36	40	60	80	
8257	⌀ 125 mm	37.15	35.66	25.80	21.56	50

(841)

Price basis = Pound/100 pieces

Velcro-Backed Non-Woven Grinding Disks, Corundum

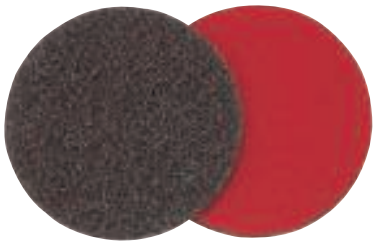
Design: Flexible, non-woven nylon web impregnated with corundum grain, laminated with Velcro.

Application: For use with angle and disk grinders or flexible shaft grinders.
For all general metalwork grinding operations, e.g.:
For polishing corroded metal surfaces.
Use with backing pad at a max. 40 m/s circumferential speed.

8449 ⌀ 115 mm

8452 ⌀ 125 mm

8455 ⌀ 150 mm



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8449/8452/8455	●	●		●	○	●		○

Part No.		0100	0180	0280	PU
Grain size		100	180	280	
8449	⌀ 115 mm	219.04	185.66	185.66	25
8452	⌀ 125 mm	293.10	248.32	248.32	25
8455	⌀ 150 mm	359.08	303.72	303.72	25

Price basis = Pound/100 pieces

(853)

Velcro Backing Pads

Design: Flexible pad with M 14 thread flange.

Application: For use with non-woven grinding disks and Velcro grinding disks, catalogue no. 8253, 8256, 8257 and Velcro grinding disks, catalogue no. 8449, 8452, 8455.
For all angle grinders up to a max. circumferential speed of 40 m/s.



Part No.		0115	0125	0150
⌀	mm	115	125	150
8259		4.42	5.22	6.13

(842)

Velcro Grinding Disks with Holes

Design: Resin-bonded abrasive sheet with optimal level of corundum, adhesive. Long durability, excellent grinding performance.

Application: Perfectly suitable for finishing wood and metal.

8260 **Design: ⌀ 125 mm, with 8 suction holes ⌀ 10 mm,** pitch circle ⌀ 65 mm. Suitable for power tools of the brands EG, Atlas Copco, Black&Decker, Bosch, DeWalt, ELU, Festool, Hitachi, Kress, Makita, Metabo, Skil.

8263 **Design: ⌀ 155 mm, with 6 suction holes ⌀ 10 mm,** pitch circle ⌀ 80 mm. Suitable for power tools of the brands Bosch, DeWalt, ELU, Hitachi, Metabo.

8237 **Design: ⌀ 150 mm, with 8 suction holes ⌀ 10 mm and centre hole ⌀ 17 mm,** ⌀ of pitch circle 120 mm. For Festool, Holz Her, Maffel and Makita power tools.



8260



8263



8237

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8260/8263/8237		●		●		●		○

Part No.		0040	0060	0080	0100	0120	0180	0240	0320	PU
Grain size		40	60	80	100	120	180	240	320	
8260	⌀ 125 mm	31,55	26,22	23,53	21,52	21,52	21,52	21,52	21,52	50
8263	⌀ 150 mm	41.14	33.59	29.97	27.23	27.23	27.23	27.23	27.23	50
8237	⌀ 150 mm	41.14	33.59	29.97	27.23	27.23	27.23	27.23	27.23	50

Price basis = Pound/100 pieces

(842)

Grinding Disks

Design: Support and tool are equipped with strong metal screwed connection, ensuring a quick tool change also in tough operations and exposure to heat.

Advantages: Easy to use, quick tool change, no gluing, no slipping, vibration-free concentric running.

Application: Tool and mould construction, model making, engineering, automotive industry, aerospace industry, engine construction and repairs, container and plant engineering.

Note: Further COMBIDISC® designs on request.

COMBIDISC® Support

Application: For holding COMBIDISC® grinding disks, non-woven circles and POLICLEAN® circles.

PFERD

8258 ⌀ 50 mm

8255 ⌀ 75 mm

Part No.	Design	8258	8255
3005	Soft	14.92	19.37
3010	Medium-hard	13.10	15.23
3015	Hard	16.76	17.86
		(849)	(849)


Soft design


Medium-hard design


Hard design

COMBIDISC® Grinding Sheet CD Corundum A

Design: Resin-bonded corundum grit (A) on tear-resistant vulcanized fibre base material, uniform and slightly open. Excellent grain adhesion, long service life, low contact pressure and good flexibility. Active ingredients in the coating provide for improved chip removal after grinding which can clearly be seen.

Application: Suitable for grinding of metals and other materials.

Note: We recommend soft grinding sheet holders in order to maintain the flexibility of the grinding sheets.

PFERD



8258 ⌀ 50 mm

8255 ⌀ 75 mm

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8258/8255	○	●		○	○	○		

Part No.	Grain size	8258	8255	PU 8258	PU 8255
4060	60	0.72	0.96	100	50
4080	80	0.72	0.96	100	50
4120	120	0.72	0.96	100	50
		(849)	(849)		

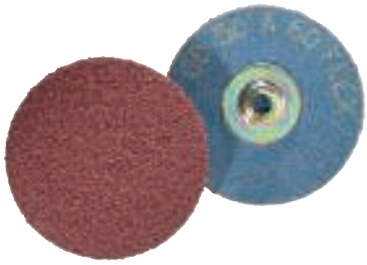
COMBIDISC® Grinding Sheet CD Corundum A-FLEX

Design: Resin-bonded corundum grit (A) on tear-resistant, **flexible** and strong vulcanized fibre base material, uniform and slightly open. Excellent grain adhesion, long service life, low contact pressure and good flexibility. Active ingredients in the coating provide for improved chip removal after grinding which can clearly be seen.

Application: Especially for grinding contours, concave and convex surfaces from metal. Ideal for tool and mould construction.

Note: We recommend soft grinding sheet holders in order to maintain the flexibility of the grinding sheets.

PFERD



8258 ⌀ 50 mm

8255 ⌀ 75 mm

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8258/8255	○	●		○	○	○		

Part No.	Grain size	8258	8255	PU 8258	PU 8255
5060	60	0.72	0.96	100	50
5080	80	0.72	0.96	100	50
5120	120	0.72	0.96	100	50
		(849)	(849)		

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

COMBIDISC® Grinding Sheet CD Corundum A-Forte

Design: Resin-bonded corundum grit (A-Forte) on tear-resistant vulcanized fibre base material, uniform and slightly open. Excellent grain adhesion, long service life, low contact pressure and good flexibility. Active ingredients in the coating provide for improved chip removal after grinding which can clearly be seen.

Application: For universal grinding of all materials. Corundum A-Forte ensures long service life and cool grinding.

8258 ⌀ 50 mm

8255 ⌀ 75 mm



PFERD

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8258/8255	○	●	○	○	○	○		

Part No.	Grain size	8258	8255	PU 8258	PU 8255
6060	60	0.74	1.03	100	50
6080	80	0.74	1.03	100	50
6120	120	0.74	1.03	100	50
		(849)	(849)		

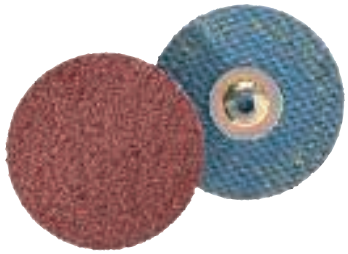
COMBIDISC® Grinding Sheet CD Corundum A-INOX-Forte

Design: Resin-bonded corundum grit (A) on tear-resistant vulcanized fibre base material, uniform and slightly open. Excellent grain adhesion, long service life, low contact pressure and good flexibility. Active ingredients in the coating provide for improved chip removal after grinding which can clearly be seen.

Application: Suitable for grinding of materials which are difficult to machine such as stainless steel, Hastelloy, Inconel etc.

8258 ⌀ 50 mm

8255 ⌀ 75 mm



PFERD

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8258/8255		●	●	●	○			

Part No.	Grain size	8258	8255	PU 8258	PU 8255
0060	60	0.79	1.15	100	50
0080	80	0.79	1.15	100	50
		(849)	(849)		

COMBIDISC® Grinding Sheet CD Zirconium Corundum Z

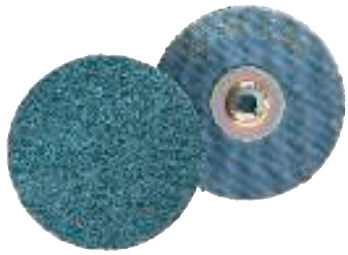
Design: Resin-bonded zirconium corundum grit (ZA) on tear-resistant vulcanized fibre base material, uniform and slightly open. Excellent grain adhesion, long service life, low contact pressure and good flexibility.

Application: For grinding work on high-temperature materials such as NiCo alloys as well as stainless steel.

Note: We recommend to use hard or medium-hard grinding sheet supports for optimum application.

8258 ⌀ 50 mm

8255 ⌀ 75 mm

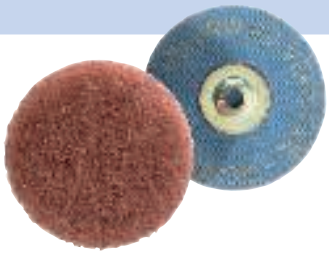


PFERD

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8258/8255	○	●	○	●	○			

Part No.	Grain size	8258	8255	PU 8258	PU 8255
1060	60	0.92	1.30	100	50
1080	80	0.92	1.30	100	50
		(849)	(849)		

COMBIDISC® Non-woven Circles CD, Soft Design



Design: Resin-bonded, soft non-woven with corundum (A) on flexible fabric. Excellent grain adhesion, open structure, long service life, low contact pressure and excellent flexibility.

Application: For fine grinding operations on surfaces, contours and for cleaning applications on metal and varnishes. Adding oil or water results in even finer surface finish, cool grinding and longer durability. The flexibility of the circles in surface grinding is determined by the hardness of the support.

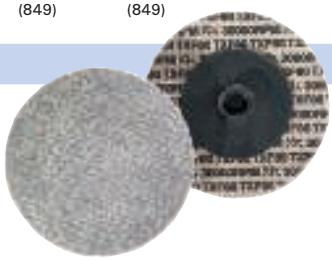
8258 ⌀ 50 mm

8255 ⌀ 75 mm

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8258/8255	○	●	○	○	○			●

Part No.	Grain size	8258	8255	PU 8258	PU 8255
2005	60	1.18 (849)	1.78 (849)	50	25
2010	80	1.23 (849)	2.00 (849)	50	25

COMBIDISC ® TX-Rondo CD Corundum A



Design: Resin-bonded corundum grit (A) on flexible fabric. Excellent grain adhesion, open structure, long service life, low contact pressure and excellent flexibility.

Application: When using this tool, surface finish results between those of backed abrasives and non-woven tools can be achieved in one operation. Ideal for machining of rust-proof and acid-resisting steel and aluminium.

8258 ⌀ 50 mm

8255 ⌀ 75 mm

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8258/8255	●	○	○	●	○			

Part No.	Grain size	8258	8255	PU
7036	36	3,55 (849)	4,18 (849)	25
7080	80	3,55 (849)	4,18 (849)	25
7120	120	3,55 (849)	4,18 (849)	25

COMBIDISC® POLICLEAN® Circles



Design: POLICLEAN® non-woven on flexible fabric. Long durability, low contact pressure and excellent flexibility.

Application: For crude cleaning operations, for removal of varnish, scales, tempering colours, rust and glue residues in face grinding.

Note: We recommend hard or medium-hard grinding sheet supports for optimum application.

8258 ⌀ 50 mm

8255 ⌀ 75 mm

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8258/8255	○	●	●	●	○			●

Part No.	PU	8258	8255
2015	10	4.20 (847)	5.99 (847)

Abrasive Blocks



Design: Soft-bonded cleaning agent with abrasive grain. Size approx. 80 x 50 x 20 mm.

Application: For polishing and sanding of all kinds of material, cleaning and maintenance. Even better results can be obtained by adding soap or petroleum.

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8443	○	●		●	●	○	○	○

Part No.	Grain size	8443
0060	60 coarse	1.68 (842)
0120	120 medium	1.68 (842)
0240	240 fine	1.68 (842)

Flap Disks

Flap Disks, Zirconium-corundum

Design: Convex fibre glass plate, cloth flaps with zirconium corundum, curve 12°, standard hole 22.2 mm.

Application: For edge and weld seam work on all metals and stainless steel, excellent price-performance ratio.

8261 ø 115 mm, convex
8264 ø 125 mm, convex
8267 ø 180 mm, convex





Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8261/8264/8267		●		●	○			

Part No.	0040	0060	0080	PU
Grain size	40	60	80	
8261 13,300 max. speed rpm ø 115 mm	1.54	1.54	1.54	10
8264 12,200 max. speed rpm ø 125 mm	1.75	1.75	1.75	10
8267 8,500 max. speed rpm ø 180 mm	3.95	3.95	3.95	10

(845)

Flap Disks, Zirconium-corundum

Design: Flat fibre glass plate, cloth flaps with zirconium corundum, standard hole 22.2 mm.

Application: Universal flap disk for deburring and finishing in all metal work applications.

8262 ø 115 mm, flat
8265 ø 125 mm, flat
8268 ø 180 mm, flat





Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8262/8265/8268		●		●	○			

Part No.	0040	0060	0080	0120	PU
Grain size	40	60	80	120	
8262 13,300 max. speed rpm ø 115 mm	1.60	1.60	1.60	1.60	10
8265 12,200 max. speed rpm ø 125 mm	1.80	1.80	1.80	1.80	10
8268 8,500 max. speed rpm ø 180 mm	3.95	3.95	3.95	–	10

(845)

Flap Disks, Zirconium-corundum

Design: Flat fibre glass plate, cloth flaps with zirconium corundum, convex 6°, standard hole 22.2 mm.

Application: General purpose product for edge and weld seam work on steel and stainless steel. Excellent durability and grinding performance.

8271 ø 115 mm, convex
8274 ø 125 mm, convex
8277 ø 180 mm, convex





Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8271/8274/8277		●		●	○			

Part No.	0040	0060	0080	0120	PU
Grain size	40	60	80	120	
8271 13,300 max. speed rpm ø 115 mm	1.67	1.67	1.67	1.67	10
8274 12,200 max. speed rpm ø 125 mm	1.83	1.83	1.83	1.83	10
8277 8,500 max. speed rpm ø 180 mm	3.64	3.64	3.64	–	10

(845)

Flap Disks, Zirconium Corundum

Design: With large zirconium corundum flaps (ZA). Heavy-duty design, resin bond, highly resistant, with flat, **fibre glass plate. No filling materials containing iron, sulphur or chlo-rine.**
Standard bore hole 22.23 mm.

Application: Special product for machining of steel and stainless steel. Considerably higher grinding performance is achieved by a higher number of heavy-duty zirconium corundum flaps.





Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8293		●		●	○			

Part No.	0040	0060	0080	PU
Grain size	40	60	80	
8293 12,200 max. speed rpm ⌀ 125 mm	2.83	2.83	2.83	10

(845)

Flap Disks for Stainless Steel

Design: Convex fibre glass plate, cloth flaps with zirconium corundum and multibond, curve 12°, standard hole 22.2 mm.

Application: Specialist product for edge and weld seam work on stainless steel.

8286 ⌀ 115 mm, convex
8289 ⌀ 125 mm, convex





Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8286/8289		○		●	○			

Part No.	0040	0060	0080	0120	PU
Grain size	40	60	80	120	
8286 13,300 max. speed rpm ⌀ 115 mm	2.15	2.15	2.15	2.15	10
8289 12,200 max. speed rpm ⌀ 125 mm	2.47	2.47	2.47	2.47	10

(845)

Flap Disks, Zirconium Corundum

VISION
Design: With zirconium corundum flaps (ZA) and three punched holes. Heavy-duty design, highly resistant resin bond with convex fibre glass plate. **No filling materials containing iron, sulphur or chlorine.**
Standard bore hole 22.23 mm.

Application: Special product for machining of steel (structural steel, Hardox, tool steel etc.) and stainless steel. Under certain conditions also suitable for varnish, filler, wood and glass fibre reinforced plastics. Thanks to the punched holes you have a clear view during grinding. Thus perfectly suitable for controlled surface and edge grinding as well as deburring and derusting. Ideal for weld seam work and machining of offset sheet metal.

8281 ⌀ 115 mm, convex
8282 ⌀ 125 mm, convex









Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8281/8282	○	●	○	●	○	○		○

Part No.	0040	0060	0080	PU
Grain size	40	60	80	
8281 13,300 max. speed rpm ⌀ 115 mm	3.57	3.57	3.57	10
8282 12,200 max. speed rpm ⌀ 125 mm	3.91	3.91	3.91	10

(836)

Polifan® Fan Grinding Disks, Corundum

Design: Multiple-use tool. For use with angle grinders of all grades. Excellent chipping performance and outstanding durability. Glass fibre plate, with corundum fabric. Standard hole 22.2 mm.

Application: For versatile grinding tasks, alloy and non-alloy steel, building steel, tool steel, high-speed steel, rust and acid-resistant steel, non-ferrous metal, e.g. aluminium, brass, etc. plastics and wood. Excellent grinding results obtained even at minimal grinding pressure.

8292 ⌀ 115 mm, flat
8295 ⌀ 125 mm, flat
8301 ⌀ 115 mm, convex
8304 ⌀ 125 mm, convex



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8292/8295/8301/8304	●	●		●	○	●	●	

Part No.	0040	0060	0080	0120	PU
Grain size	40	60	80	120	
8292 13,300 max. speed rpm ⌀ 115 mm	2.76	2.76	2.76	2.76	10
8295 12,200 max. speed rpm ⌀ 125 mm	2.99	2.99	2.99	2.99	10
8301 13,300 max. speed rpm ⌀ 115 mm	2.76	2.76	2.76	2.76	10
8304 12,200 max. speed rpm ⌀ 125 mm	2.99	2.99	2.99	2.99	10

(848)

Polifan® Fan Grinding Disks, Zirconium Corundum

Design: For demanding grinding jobs, economical use, aggressive chipping and outstand-ing durability. Glass fibre plate, with zirconium corundum fabric. Standard hole 22.2 mm.

Application: Deburring, weld treatment on edges and rounded-off edges, especially on steel and stainless steel, as well as sheets from steel and stainless steel. The best effect is achieved on efficient right angle grinders with high pressure force due to the high-performance zirconium corundum.

8310 ⌀ 115 mm, flat
8313 ⌀ 125 mm, flat
8319 ⌀ 115 mm, convex
8322 ⌀ 125 mm, convex



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8310/8313/8319/8322		●		●	○			

Part No.	0040	0060	PU
Grain size	40	60	
8310 13,300 max. speed rpm ⌀ 115 mm	3.01	3.01	10
8313 12,200 max. speed rpm ⌀ 125 mm	3.27	3.27	10

(848)

Part No.	0040	0060	PU
Grain size	40	60	
8319 13,300 max. speed rpm ⌀ 115 mm	3.01	3.01	10
8322 12,200 max. speed rpm ⌀ 125 mm	3.27	3.27	10

(848)

Polifan® Fan Grinding Disks, Zirconium Corundum

Design: Special tool for demanding grinding jobs on surfaces and fine welds. Glass fibre plate, with zirconium-corundum fabric. Standard hole 22.2 mm.

Application: Surface grinding on INOX workpieces, contour grinding on steel tubes, weld treatment on steel plate. The best effect is achieved on efficient right angle grinders with high pressure force due to the high-perform-ance zirconium corundum.

8326 ⌀ 115 mm, convex
8327 ⌀ 125 mm, convex



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8326/8327		○		●				

Part No.	0040	0060	0080	PU
Grain size	40	60	80	
8326 13,300 max. speed rpm ⌀ 115 mm	3.14	3.14	3.14	10
8327 12,200 max. speed rpm ⌀ 125 mm	3.45	3.45	3.45	10

(848)

Fan Grinding Disks/Flap Disks

POLIFAN ® Fan Grinding Disks, Corundum COOL

SG-A-COOL
Design: With corundum flaps (A) and coolant. Heavy-duty design, highly resistant resin bond with fibre glass plate.
No filling materials containing iron, sulphur or chlorine.
Standard bore hole 22.23 mm.

Application: Special product for machining of steel, stainless steel and non-ferrous metals. **Especially cool grinding by coolant flaps.** Even at low contact pressures on controllable right angle grinders cool grinding is achieved. Accordingly, perfectly suitable for machining of sheet metal and thin-walled profiles.

8294 ø 115 mm, flat
8296 ø 125 mm, flat
8297 ø 115 mm, convex
8299 ø 125 mm, convex



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8294/8296/8297/8299	○	●		●				

Part No.	0040	0060	0080	PU
Grain size	40	60	80	
8294 13,300 max. speed rpm ø 115 mm	3.14	3.14	3.14	10
8296 12,200 max. speed rpm ø 125 mm	3.45	3.45	3.45	10

(848)

Part No.	0040	0060	0080	PU
Grain size	40	60	80	
8297 13,300 max. speed rpm ø 115 mm	3.14	3.14	3.14	10
8299 12,200 max. speed rpm ø 125 mm	3.45	3.45	3.45	10

(848)

POLIFAN ® Fan Grinding Disks, Corundum COOL for Stainless Steel

SGP-CO-COOL
Design: With ceramic grain flaps (CO). Heavy-duty design, highly resistant resin bond with fibre glass plate.
No filling materials contain-ing iron, sulphur or chlorine.
Standard bore hole 22.23 mm.

Application: Special product for machining of stainless steel. **Especially cool grinding by ceramic grain flaps.** Even at low contact pressures on controllable right angle grinders cool grinding is achieved.
Accordingly, perfectly suitable for machining of sheet metal and thin-walled profiles.

8300 ø 115 mm, flat
8302 ø 125 mm, flat
8303 ø 115 mm, convex
8305 ø 125 mm, convex



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8300/8302/8303/8305		●		●				

Part No.	0040	PU
Grain size	40	
8300 13,300 max. speed rpm ø 115 mm	3.76	10
8302 12,200 max. speed rpm ø 125 mm	4.09	10

(848)

Part No.	0040	PU
Grain size	40	
8303 13,300 max. speed rpm ø 115 mm	3.76	10
8305 12,200 max. speed rpm ø 125 mm	4.09	10

(848)

Right Angle Flap Disks

WSM 617
Design: The problem solver. With corundum flaps (A) and M 14 thread. The fan-like, radial arrangement of the flaps adapts perfectly to the contours of the workpiece to be machined.

Application: For machining of steel, stainless steel, paint, plastic material and wood **using the right angle grinder.** Especially for deburr-ing, while edges are rounded off. No formation of secondary burr. Furthermore, perfectly suitable for removal of surface coatings.
The second grinding operation prior to coating is no longer necessary.



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8438		●		●		●		●

Part No.	Grain size	8438	ø x width mm	Max. speed rpm
0040	40	6.29	125 x 20	12,200
0060	60	6.29	125 x 20	12,200

(852)

Part No.	Grain size	8438	ø x width mm	Max. speed rpm
0080	80	6.67	125 x 20	12,200
0120	120	6.67	125 x 20	12,200

(852)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

POLICLEAN® Disks/Spiraband Holders

POLICLEAN® Disks

Design: Non-woven for cleaning purposes and glass-fibre plate for use on angle grinders. Perfectly suitable for face grinding.



PFERD

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8329		●		●	●	●	○	

Part No.	ø mm	8329	Thickness mm	Max. speed rpm	PU
0115	115	7.42	13	10,000	5
0125	125	8.13 (847)	13	10,000	5

POLICLEAN® Disks

Design: Universal use in circumferential grinding. Easy to handle, quick change of disks, concentric and non-vibrating.



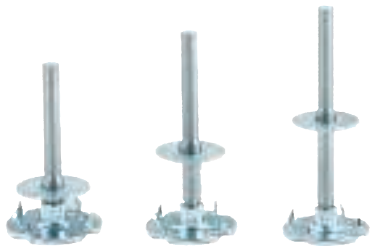
PFERD

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8332		●		●	●	●	○	

Part No.	ø mm	8332	Thickness mm	Bore hole mm	Max. speed rpm	PU
0075	75	2.02 (847)	13	6	10,000	6

Clamping Bolts for POLICLEAN® Disks

Design: For fixing POLICLEAN® disks. Set-up time is reduced notably, as no removal of the bolt from the collet of the driving equipment is required for changing the disk.



Part No.	Clamping range mm	8332	Packing	Shank ø mm
1013	13	4.65	1-fold	6
1026	26	5.00 (847)	2-fold	6

Part No.	Clamping range mm	8332	Packing	Shank ø mm
1039	39	5.41 (847)	3-fold	6

Spiraband Holders

Design: Cylindrical with 6 mm shank.

Application: For holding spirabands.



format professional quality

Part No.	ø x height mm	8328	Max. rpm 1/min
1530	15 x 30	5.62	30,000
2220	22 x 20	5.51	20,000
3030	30 x 30	6.06 (842)	13,000

Part No.	ø x height mm	8328	Max. rpm 1/min
4530	45 x 30	6.96	9,000
6030	60 x 30	9.04 (842)	6,500

Spiraband Holders, Corundum

Design: Resin-bonded corundum body, cylindrical sleeve with thick lining.

Application: Grinding and finishing of edges, profiles and drilled holes with flexible shaft and drill machines.

8331 Grain size 50
8334 Grain size 80
8337 Grain size 150



format professional quality

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8331/8334/8337		●			○	●		

Part No.		1530	2220	3030	4530	6030	PU
∅ x height	mm	15 x 30	22 x 20	30 x 30	45 x 30	60 x 30	
8331		0.25	0.18	0.29	0.37	0.42	10
8334		0.25	0.18	0.29	0.37	0.42	10
8337		0.25	0.18	0.29	0.37	0.42	10

(842)

Grinding Cap Holders

Design: A slotted rubber body receives the seamless formed grinding cap. The caps are retained during operation due to the centrifugal force.

Application: For finishing jobs in tool construction in confined areas.

PFERD



Part No.		8340 Form A	8340 Form A	8340 Form A	8343 Form C	8343 Form C	8346 Form G	8346 Form G	8349 Form L
∅ x height	mm	5 x 10	7 x 12	10 x 15	5 x 11	7 x 13	5 x 11	7 x 13	11 x 25
0510		2.82	–	–	–	–	–	–	–
0712		–	3.05	–	–	–	–	–	–
1015		–	–	3.10	–	–	–	–	–
0511		–	–	–	2.82	–	2.76	–	–
0713		–	–	–	–	3.05	–	3.05	–
1125		–	–	–	–	–	–	–	3.90
Shank ∅	mm	3	3	3	3	3	3	3	6
Opt. RPM	1/min	40,000	30,000	20,000	40,000	30,000	40,000	30,000	20,000

(849)

Grinding Caps

Design: Corundum body, resin-bonded, seamless formed, for use on grinding cap holders.

PFERD

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8352/8355/8358/8261/8364/8367		●			○	○		
8370/8373		●			○	○		



Part No.	Grain size	8352 Form A	8355 Form A	8358 Form A	8361 Form C	8364 Form C	8367 Form G	8370 Form G	8373 Form L
∅ x height mm		5 x 10	7 x 12	10 x 15	5 x 11	7 x 13	5 x 11	7 x 13	11 x 25
0060	60	–	0.38	0.40	–	0.38	–	0.38	0.53
0080	80	0.36	–	–	0.36	–	0.36	–	–
0150	150	0.36	0.38	0.40	0.36	0.38	0.36	0.38	0.53
Suitable for grinding cap holders		8340	8340	8340	8343	8343	8346	8346	8349

(849)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Flap Wheels

Design: With 6 mm shank for attaching all varieties of drives with clamping jaw fastenings to portable machines.

The flaps fit the contours of the tool being used.

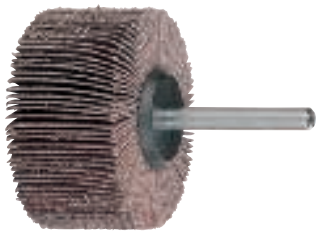
Flap Wheels for Steel, Wood and Plastics

Design: Flaps with of resin-bonded corundum.

Application: In tool and model making, container and apparatus engineering for finishing work on standard steel, aluminium, wood and plastics.

8388	30 x 10 mm
8391	30 x 15 mm
8394	40 x 15 mm
8397	40 x 20 mm
8400	50 x 20 mm
8406	60 x 30 mm
8409	60 x 50 mm
8412	80 x 40 mm

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8388/8391/8394/8397/8400	○	●			○	●		
8406/8409/8412	○	●			○	●		

Part No.	Grain size	8388	8391	8394	8397	8400	8406	8409	8412	PU
∅ x height mm		30 x 10	30 x 15	40 x 15	40 x 20	50 x 20	60 x 30	60 x 50	80 x 40	
0040	40	1.04	1.08	1.13	1.19	1.49	1.89	2.63	3.27	10
0060	60	1.04	1.08	1.13	1.19	1.49	1.89	2.63	3.27	10
0080	80	1.04	1.08	1.13	1.19	1.49	1.89	2.63	3.27	10
0120	120	1.04	1.08	1.13	1.19	1.49	1.89	2.63	3.27	10
0150	150	1.04	1.08	1.13	1.19	1.49	1.89	2.63	3.27	10
0180	180	1.04	1.08	1.13	1.19	1.49	1.89	2.63	3.27	10
0240	240	1.04	1.08	1.13	1.19	1.49	1.89	2.63	3.27	10
0320	320	1.04	1.08	1.13	1.19	1.49	1.89	2.63	3.27	10
∅ x height	mm	30 x 10	30 x 15	40 x 15	40 x 20	50 x 20	60 x 30	60 x 50	80 x 40	
Recommended max. speed RPM	1/min	15,500	15,000	12,000	12,000	8,000	8,000	8,000	6,000	
max. speed RPM	1/min	25,500	25,500	19,100	19,100	15,300	12,700	12,700	9,600	

(851)

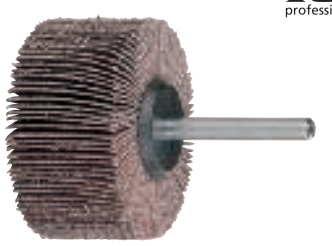
Flap Wheels for Use with Stainless Steel

Design: Cloth flaps with corundum and additional multibond. With 6 mm clamping shank.

Application: In mould and model construction, production of containers and apparatus, for machining of tool steel, stainless stell, high-alloy stainless steel, stainless steel sheet metal.

8413	30 x 10 mm
8414	40 x 20 mm
8416	50 x 20 mm
8417	60 x 30 mm
8419	80 x 40 mm

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8413/8414/8416/8417/8419		○		●				

Part No.	Grain size	8413	8414	8416	8417	8419	PU
∅ x height mm		30 x 10	40 x 20	50 x 20	60 x 30	80 x 40	
0040	40	1.22	1.35	1.65	1.80	3.65	10
0060	60	1.22	1.35	1.65	1.80	3.65	10
0080	80	1.22	1.35	1.65	1.80	3.65	10
0120	120	1.22	1.35	1.65	1.80	3.65	10
0180	180	1.22	1.35	1.65	1.80	3.65	10
∅ x height	mm	30 x 10	40 x 20	50 x 20	60 x 30	80 x 40	
Recommended max. speed RPM	1/min	15,500	12,000	8,000	8,000	6,000	
max. speed RPM	1/min	25,500	19,100	15,300	12,700	9,600	

(851)

Interleaved Flap Wheels

Design: Interleaved flap wheels are constructed with a circular arrangement of non-woven abrasive and cloth with resin-bonded corundum in equal proportions around a central hub. Excellent for achieving good surface finish. With 6 mm steel shank.
Grain 60–150: Corundum
Grain 240: Silicon-carbide

Application: For use with portable machines with collet fixture, working on steel, stainless steel, aluminium and plastics.

8415 50 x 30 mm
8418 60 x 30 mm
8422 75 x 45 mm
8425 100 x 45 mm

format professional quality



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8415/8418/8422/8425	●	●		●		●		

Part No.	Grain size	8415	8418	8422	8425	PU
∅ x height mm		50 x 30	60 x 30	80 x 50	100 x 50	
0060	60	3.43	5.32	7.68	8.94	10
0100	100	3.43	5.32	7.68	8.94	10
0150	150	3.43	5.32	7.68	8.94	10
0240	240	3.43	5.32	7.68	8.94	10
∅ x height	mm	50 x 30	60 x 30	80 x 50	100 x 50	
max. speed RPM	1/min	12,000	10,000	8,000	6,000	

(853)

POLINOX® fine grinding tools can be used on almost any material. They are predominantly used for cleaning and finishing work and for creating special surface effects.

Application: For depolishing and burnishing of metal, depolishing non-ferrous metal, cleaning oxidised non-ferrous metal, seamless depolishing of stainless steel, roughing plastic for preparing surface for gluing application.

POLINOX® Flap Wheels

Design: The flaps of this grinding tool are in radial arrangement. The flaps are tightly packed for long durability. With 6 mm shank.

Application: Ideal for surface treatment.

8440 40 x 20 mm
8441 50 x 30 mm
8442 60 x 50 mm
8443 80 x 50 mm

PFERD



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8440/8441/8442/8443	●	●		●		●		

Part No.	Grain size	8440	8441	8442	8443	PU
∅ x height mm		40 x 20	50 x 30	60 x 50	80 x 50	
0100	100	4.44	5.36	5.66	7.12	10
0180	180	4.44	5.36	5.66	7.12	10
0280	280	4.44	5.36	5.66	7.12	10
∅ x height	mm	40 x 20	50 x 30	60 x 50	80 x 50	
Recommended max. speed RPM	1/min	7,500	6,000	5,000	4,000	
max. speed RPM	1/min	15,000	12,000	10,000	7,500	

(847)

POLINOX® Flap Wheels

Design: This tool comprises several wavy non-woven fabric strips wound around a core. With 6 mm shank.

Application: The waviness of the non-woven material enables the seamless depolishing of surfaces.



PFERD

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8444	●	●		●	○	●	○	○

Part No.		0100	0180	0280
Grain size	**mm**	**100**	**180**	**280**
8444		**17.96**	**17.96**	**17.96**
∅ x height	mm	100 x 50	100 x 50	100 x 50
PU		5	5	5
∅ x height	mm	100 x 50	100 x 50	100 x 50
Recommended max. speed RPM	1/min	3,000	3,000	3,000
max. speed RPM	1/min	6,000	6,000	6,000

(847)

Non-woven Abrasive Rolls

Design: Highly flexible non-woven suitable for surfaces and roundings. For all surfaces, extremely uniform finish. Roll length: 10 m.

Application: For all conventional grinding operations in metal working, e.g.: Polishing of corroded metal surfaces. Wet and dry operation.

8435 **Design:** Corundum.

8436 **Design:** Silicon-carbide.



format professional quality

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8435	●	●		○	○	●	○	○
8436	●	●			●	●		

Part No.	Design	8435	Grain size	Roll width mm
0120	**Medium A**	19.85	120	115
0180	**Fine A**	18.21	180	115
0320	**Very Fine A**	18.21	320	115
		(844)		

Part No.	Design	8436	Grain size	Roll width mm
0320	**Super Ultra Fine XS**	18.21	800	115
		(844)		

Abrasive Wool

Design: Alternative to steel wool. Innovation in non-woven abrasive product range. Broad range of applications, suitable for any material. Convenient portioning, reaches the tiniest corner or the widest surface. Rust-proof, flame-retardant, can be used with most acids.

Supplied in 4 l workshop pack.



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8432	●	●	○	○	○	●	○	○

Part No.	Design	8432
0005	**Coarse**	30.19
0010	**Medium**	30.19
		(841)

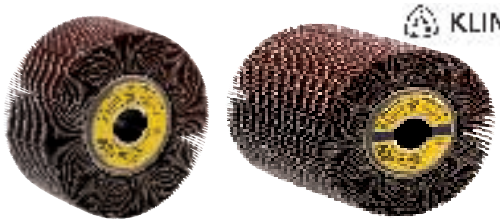
Part No.	Design	8432
0015	**Fine**	30.19
		(841)

Flap Wheels

Design: Used for a large variety of surface finishing applications. The fan-like, radial arrangement of the flaps of corundum-grit fabric adapts perfectly to the contours of the workpiece, ⌀ 19 mm bore hole.

Application: For grinding of metal, wood, plastic, paint, lacquer and filler-covered surfaces.

8445 100 x 50 mm
8446 100 x 100 mm



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8445/8446		●				●		●

Part No.	Grain size	8445	8446	Max. speed 1/min
0040	40	10.72	19.07	3,700
0060	60	10.72	19.07	3,700
0080	80	11.76	20.95	3,700
0120	120	11.76	20.95	3,700
0180	180	12.80	22.78	3,700
0240	240	14.64	25.89	3,700
		(852)	(852)	

Flap Wheels

NCW 600
Design: Combination of abrasive and non-woven with corundum grit (A).
Bore hole ⌀ 19 mm.

Application: For an extremely fine grinding result in metal and stainless steel working. Under certain conditions also suitable for plastic material. For use on all conventional satinising machines.

8423 100 x 50 mm
8424 100 x 100 mm



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8423/8424		●		●		○		

Part No.	Grain size	8423	8424	Max. speed 1/min
0080	80	9.93	14.79	3,700
0100	100	9.93	14.79	3,700
0150	150	9.93	14.79	3,700
0180	180	9.93	14.79	3,700
		(852)	(852)	

Non-woven Flap Wheels

NFW 600
Design: Non-woven with corundum grit (A).
Bore hole ⌀ 19 mm.

Application: Especially suitable for matting, satinising and final finish of metal. For use on all conventional satinising machines.

8426 100 x 50 mm
8427 100 x 100 mm



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8426/8427		●		●				

Part No.	Grain	8426	8427	Max. speed 1/min
0010	Coarse	9.32	14.00	3,700
0020	Medium	9.32	14.00	3,700
0030	Very fine	9.32	14.00	3,700
		(852)	(852)	

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Carbide Burrs (rotary) DIN 8032/8033 – Shank ∅ 6 mm

Design: Carbide burrs are made of solid carbide up to and including ∅ 6 mm; with larger diameters, the carbide head is brazed onto the shark.

Application: An optimum motor speed and driving power (pneumatic, electrical, flexible shaft) are essential for efficient operation. We therefore recommend the following:

1. Work with speeds as high as possible. Exception: Working speeds of less than 3,000 rpm are permitted for stationary use or for countersinking operations.
2. Use only knock-free collet chucks; knocking and chattering of the tools lead to premature wear.
3. Reduce the speed significantly for poorly conducting materials such as stainless steels, titanium alloys etc., to prevent damage to the tool. Avoid bluing of the shank and the tool.
4. If only a small amount of material must be cut (deburring, chamfering, light surface finishing), the speed can be doubled.
5. Use lubricants (grease, petroleum, chalk etc.) with soft materials, to avoid clogging the teeth.

Most solid carbide rotary burrs can be resharpened! Small and miniature mills can however not be resharpened.

Toothing C / 3 PLUS (= DIN MX)



Toothing 5 (in accordance with DIN F)



Toothing 3 (in accordance with DIN MY)



Toothing aluminium



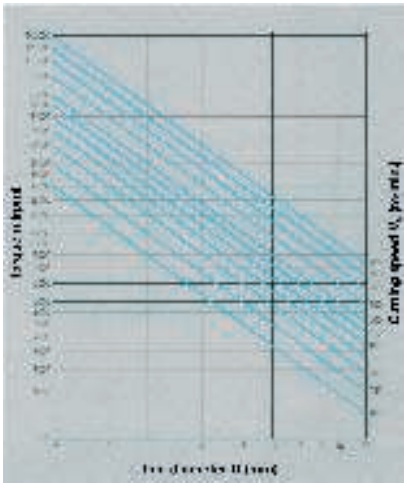
Toothing 4 (in accordance with DIN MX)



Toothing, special aluminium



Recommended cutting speeds for carbide rotary burrs



The cutting speeds are shown in the diagram by blue diagonal lines. The vertical corresponding to the tool diameter intersects the specified cutting speed (diagonal). Starting from this point, the speed of the burr and the machine can be read off in rpm at the horizontal on the left.

Example: Carbide burr, toothing C, diameter 12 mm.
Rough cutting of non-case hardened and non-tempered steels.
Cutting speed: 450–600 m/min. Torque: 12,000–16,000 rpm.

Wear goggles!

Wear ear defenders in case of high noise levels!

Material groups			Machining example	Toothing	Cutting speed
Steel and cast steel materials	Non-case hardened, non-tempered steels up to 1,200 N/mm² (< 35 HRC)	Structural steels, carbon steels, tool steels, unalloyed steels, hardened steels, cast steel	Rough cutting = high material removal rate	**3**	450–600 m/min
				C / 3 PLUS	450–600 m/min
			Fine cutting, e.g. deburring	**3**	500–600 m/min
	Hardened, tempered steels over 1,200 N/mm² (> 35 HRC)	Tool steels, machining steels, alloyed steels, cast steel	Rough cutting = high material removal rate	**3**	250–350 m/min
				C / 3 PLUS	250–350 m/min
				4	250–350 m/min
			Fine cutting, e.g. deburring	**5**	400 m/min
Stainless steels	Rust and acid-resistant steels	Austenitic and ferritic stainless steels	Rough cutting = high material removal rate	**C / 3 PLUS**	250–350 m/min
				4	250–350 m/min
			Fine cutting, e.g. deburring	**5**	350–450 m/min
Non-ferrous metals	Soft non-ferrous metals	Aluminium alloys, brass, copper, zinc	Rough cutting = high material removal rate	**Aluminium**	600–900 m/min
				Special aluminium	400–500 m/min
			Fine cutting, e.g. deburring	**Aluminium**	800–900 m/min
	Hard non-ferrous metals	Bronze, titanium/ titanium alloys, very hard aluminium alloys (high Si content)	Rough cutting = high material removal rate	**3**	250–350 m/min
				4	250–350 m/min
			Fine cutting, e.g. deburring	**3**	350–450 m/min
	Heat-resistant materials	Nickel-based alloys, Ni-Co alloys (engine and turbine manufacturing)	Rough cutting = high material removal rate	**C / 3 PLUS**	300–450 m/min
				4	300–450 m/min
			Fine cutting, e.g. deburring	**5**	350–500 m/min
Cast iron materials		Grey cast iron, nodular cast iron	Rough cutting = high material removal rate	**3**	450–600 m/min
				C / 3 PLUS	450–600 m/min
			Fine cutting, e.g. deburring	**3**	500–600 m/min
Other/plastics		Glass fibre-reinforced plastics, thermoplastics, hard rubber	Rough cutting = high material removal rate	**Aluminium**	500–900 m/min
				Special aluminium	500–900 m/min
			Fine cutting, e.g. deburring	**Aluminium**	500–900 m/min

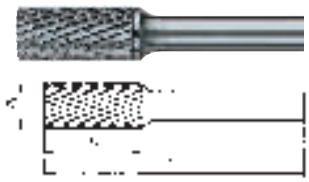
Rule of thumb for use: The harder the material, the finer the toothing.

Carbide Burrs (rotary) DIN 8032/8033 – Shank ∅ 6 mm

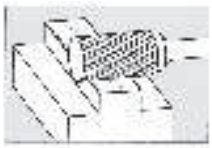
format professional quality PFERD

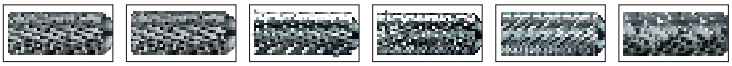
Cylindrical Form ZYA, without Serration

2500 Toothing C
2501 Toothing 3 PLUS
2502 Toothing 3
2504 Toothing 4
2506 Toothing 5
2508 Toothing aluminium special



Cylindrical ZYA



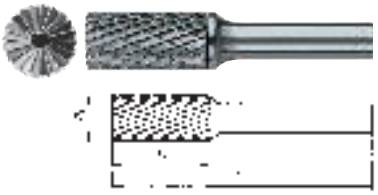


Part No.	Form	2500 Toothing C	2501 Toothing 3 PLUS	2502 Toothing 3	2504 Toothing 4	2506 Toothing 5	2508 Toothing aluminium	Head ∅ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	ZYA 0413	7.78	13.67	–	16.41	13.67	–	4	13	55
0010	ZYA 0616	7.78	13.67	13.67	16.41	13.67	8.82	6	16	55
0015	ZYA 0820	10.10	18.99	18.99	22.80	18.99	–	8	20	60
0020	ZYA 1013	10.52	17.35	–	20.82	17.35	–	10	13	53
0025	ZYA 1020	9.68	21.59	21.59	25.51	21.59	–	10	20	60
0030	ZYA 1225	16.99	27.64	27.64	33.43	27.64	16.37 ●	12	25	65
0035	ZYA 1625	21.41 (230)	35.27 (234)	35.27 (234)	42.54 (234)	– (234)	– (230)	16	25	65

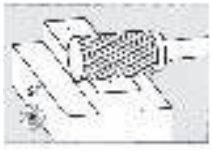
● ∅ 8 mm shank

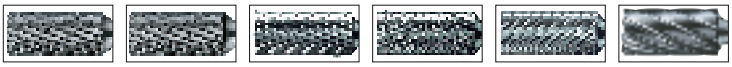
Cylindrical Form ZYA-S, Serrated

2510 Toothing C
2511 Toothing 3 PLUS
2512 Toothing 3
2514 Toothing 4
2516 Toothing 5
2518 Toothing aluminium



Cylindrical ZYA-S



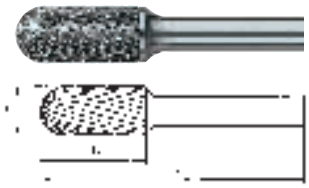


Part No.	Form	2510 Toothing C	2511 Toothing 3 PLUS	2512 Toothing 3	2514 Toothing 4	2516 Toothing 5	2518 Toothing aluminium	Head ∅ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	ZYA-S 0413	8.45	15.49	–	18.59	15.49	–	4	13	55
0010	ZYA-S 0616	8.45	14.62	14.62	17.52	14.62	8.82	6	16	55
0015	ZYA-S 0820	11.17	21.13	21.13	25.31	21.13	–	8	20	60
0020	ZYA-S 1013	11.55	–	–	–	–	–	10	13	53
0025	ZYA-S 1020	11.96	24.33	24.33	29.17	24.33	12.75 ✱●	10	20	60
0027	ZYA-S 1025	–	27.49	–	–	–	–	10	25	65
0030	ZYA-S 1225	18.69	30.68	30.68	36.82	30.68	16.35 ✱●	12	25	65
0035	ZYA-S 1625	23.53 (230)	39.52 (234)	39.52 (234)	47.42 (234)	39.52 (234)	– (230)	16	25	65

✱ Teeth cannot be resharpened ● ∅ 8 mm shank

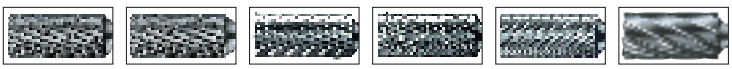
Ball Nose Form WRC

2520 Toothing C
2521 Toothing 3 PLUS
2522 Toothing 3
2524 Toothing 4
2526 Toothing 5
2528 Toothing aluminium



Ball nose WRC





Part No.	Form	2520 Toothing C	2521 Toothing 3 PLUS	2522 Toothing 3	2524 Toothing 4	2526 Toothing 5	2528 Toothing aluminium	Head ∅ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	WRC 0413	8.99	16.13	–	19.47	–	–	4	13	55
0010	WRC 0616	8.99	15.79	15.79	18.79	15.79	10.29 ✱●	6	16	55
0015	WRC 0820	11.05	22.17	22.17	27.06	22.17	–	8	20	60
0020	WRC 1020	12.10	22.48	22.48	27.66	22.48	–	10	20	60
0025	WRC 1025	16.08	28.28	28.28	33.94	–	–	10	25	65
0030	WRC 1225	19.06	34.02	34.02	40.13	34.02	13.89 ✱●	12	25	65
0035	WRC 1625	23.96 (230)	40.72 (234)	40.72 (234)	49.83 (234)	– (234)	– (230)	16	25	65

✱ Teeth cannot be resharpened ● ∅ 8 mm shank

Technical description see page 8/39.

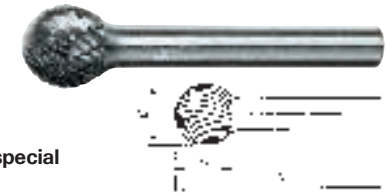
All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Carbide Burrs (rotary) DIN 8032/8033 – Shank ⌀ 6 mm

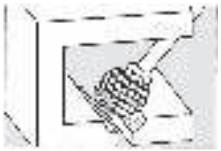
format professional quality PFERD

Spherical Form KUD

2530 Toothing C
2531 Toothing 3 PLUS
2532 Toothing 3
2534 Toothing 4
2536 Toothing 5
2538 Toothing aluminium
2540 Toothing aluminium special



Spherical KUD



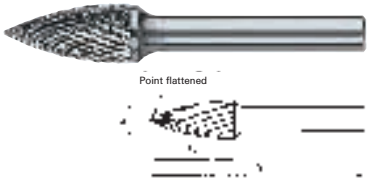


Part No.	Form	2530 Toothing C	2531 Toothing 3 PLUS	2532 Toothing 3	2534 Toothing 4	2536 Toothing 5	2538 Toothing aluminium	2540 Toothing alum. special	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	KUD 0403	8.31	13.99	–	–	13.99	–	–	4	3.6	45
0010	KUD 0605	8.31	13.28	13.28	15.96	13.28	–	–	6	5.4	45
0015	KUD 0807	8.93	15.21	15.21	17.62	15.21	–	7.51	8	7	47
0020	KUD 1009	9.94	15.79	15.79	18.22	15.79	–	–	10	9	49
0025	KUD 1210	13.42	21.59	21.59	25.51	21.59	9.97 ✱ ●	–	12	10.8	50
0030	KUD 1614	16.62	28.88	–	35.27	28.88	–	–	16	14.3	54
0035	KUD 2018	19.64	40.73	40.73	–	–	–	–	20	18	58
		(230)	(234)	(234)	(234)	(234)	(230)	(230)			

✱ Teeth cannot be resharpened ● ⌀ 8 mm shank

Bullet-Shaped SPG (drop arch)

2542 Toothing C
2543 Toothing 3 PLUS
2544 Toothing 3
2546 Toothing 4
2548 Toothing 5



Tree SPG

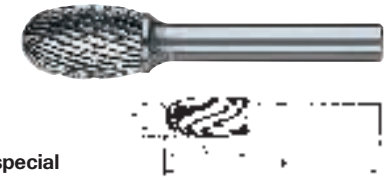




Part No.	Form	2542 Toothing C	2543 Toothing 3 PLUS	2544 Toothing 3	2546 Toothing 4	2548 Toothing 5	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	SPG 0618	9.43	15.21	15.21	17.36	15.21	6	18	55
0010	SPG 1020	12.65	24.90	24.90	30.08	24.90	10	20	60
0015	SPG 1225	17.19	28.90	28.90	34.69	28.90	12	25	65
0020	SPG 1230	19.37	32.04	32.04	38.43	32.04	12	30	70
0025	SPG 1630	23.96	39.74	39.74	48.89	–	16	30	70
		(230)	(234)	(234)	(234)	(234)			

Oval Form TRE

2550 Toothing C
2551 Toothing 3 PLUS
2552 Toothing 3
2554 Toothing 4
2556 Toothing 5
2558 Toothing aluminium special



Oval TRE





Part No.	Form	2550 Toothing C	2551 Toothing 3 PLUS	2552 Toothing 3	2554 Toothing 4	2556 Toothing 5	2558 Toothing aluminium special	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	TRE 0610	10.10	17.53	–	–	17.53	10.29	6	10	50
0010	TRE 0813	11.11	–	–	26.28	–	–	8	13	53
0015	TRE 1016	12.10	25.38	–	30.44	–	–	10	16	56
0020	TRE 1220	17.76	26.28	26.28	31.44	26.28	14.69 ●	12	20	60
0025	TRE 1625	24.65	–	–	46.34	–	–	16	25	65
		(230)	(234)	(234)	(234)	(234)	(230)			

● ⌀ 8 mm shank









Technical description see page 8/39.

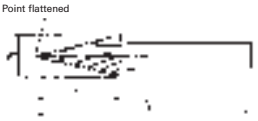
Carbide Burrs (rotary) DIN 8032/8033 – Shank ∅ 6 mm

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Pointed Cone Form SKM

2560 Toothing C
2561 Toothing 3 PLUS
2562 Toothing 3
2564 Toothing 4
2566 Toothing 5





Ponted cone SKM



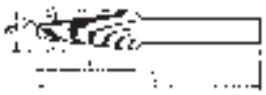


Part No.	Form	2560 Toothing C	2561 Toothing 3 PLUS	2562 Toothing 3	2564 Toothing 4	2566 Toothing 5	Head ∅ d_1 mm	Bit length l_2 mm	Angle	Total length l_1 mm
0005	SKM 0618	9.62	15.21	15.21	18.24	15.21	6	18	18°	55
0010	SKM 1020	15.21	18.51	18.51	22.22	18.51	10	20	28°	60
0015	SKM 1225	19.06	28.28	28.28	33.92	28.28	12	25	26°	65
		(230)	(234)	(234)	(234)	(234)				

Ball Nose Cone Form KEL

2568 Toothing C
2569 Toothing 3 PLUS
2570 Toothing 3
2572 Toothing 4
2574 Toothing 5
2576 Toothing aluminium
2578 Toothing aluminium special





Ball nose KEL





Part No.	Form	2568 Toothing C	2569 Toothing 3 PLUS	2570 Toothing 3	2572 Toothing 4	2574 Toothing 5	2576 Aluminium	2578 Aluminium special	Head ∅ d_1 mm	Bit length l_2 mm	Angle α	Total length l_1 mm
0005	KEL 1020	15.13	25.06	25.06	29.74	–	–	15.21	10	20	14°	60
0010	KEL 1225	16.81	35.03	35.03	41.32	–	–	–	12	25	14°	65
0015	KEL 1230	18.48	–	38.19	47.25	38.19	14.88 ✱●	–	12	30	14°	70
0020	KEL 1630	33.37	–	–	50.70	–	–	–	16	30	14°	70
		(230)	(234)	(234)	(234)	(234)	(230)	(230)				

✱ Teeth cannot be resharpened ● ∅ 6 mm shank

Ball Nose Tree Form RBF

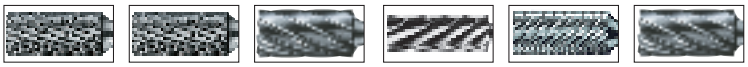
2580 Toothing C
2581 Toothing 3 PLUS
2582 Toothing 3
2584 Toothing 4
2586 Toothing 5
2588 Toothing aluminium





Ball nose tree RBF





Part No.	Form	2580 Toothing C	2581 Toothing 3 PLUS	2582 Toothing 3	2584 Toothing 4	2586 Toothing 5	2588 Aluminium	Head ∅ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	RBF 0618	9.43	15.66	15.66	17.89	15.66	13.06	6	18	55
0010	RBF 0820	10.66	25.36	25.36	30.43	–	–	8	20	60
0015	RBF 1020	11.86	25.67	25.67	31.00	25.67	–	10	20	60
0020	RBF 1225	17.56	29.78	29.78	35.73	29.78	12.42 ✱●	12	25	65
0025	RBF 1630	24.20	–	40.94	50.34	–	–	16	30	70
		(230)	(234)	(234)	(234)	(234)	(230)			

✱ Teeth cannot be resharpened ● ∅ 8 mm shank

Technical description see page 8/39.

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Carbide Burrs (rotary) DIN 8032/8033 – ⌀ 6 mm Shank

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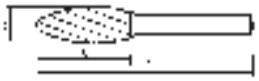
Flame Form B

2590 Toothing C

2591 Toothing 3 PLUS

2592 Toothing 3





Flame B









Part No.	Form	2590 Toothing C	2591 Toothing 3 PLUS	2592 Toothing 3	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	B 0820	11.00	22.75	22.75	8	20	60
0010	B 1230	25.37	32.57	32.57	12	30	70
0015	B 1635	35.01	–	–	16	35	75
		(230)	(234)	(234)			

Angular Form WKN

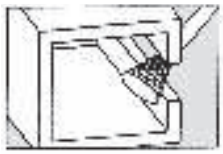
2598 Toothing 3



without serration



Angular WKN





Part No.	Form	2598 Toothing 3	Head ⌀ d_1 mm	Bit length l_2 mm	Angle α	Total length l_1 mm
0005	WKN 1013	28.31	10	13	10°	53
0010	WKN 1213	31.04	12	13	20°	53
0015	WKN 1613	37.58	16	13	30°	53
		(234)				

Solid Carbide Rotary Burr Sets – ⌀ 6 mm Shank

Design: 10-piece set in plastic box, toothing C.

format professional quality



Part No.	Contents/set	2600
0010	ZYA 0820, ZYA 1020, WRC 0820, WRC 1020, SPG 1020, SPG 1225, KUD 0807, KUD 1009, RBF 0820, KEL 1020	126.55
		(230)

Technical description see page 8/39.

Solid Carbide Miniature Rotary Burrs, DIN 8032/8033 – Shank ⌀ 3 mm

format professional quality

PFERD

Cylindrical Form ZYA





Note: ZYA-S serrated.

2602 Toothing C

2604 Toothing 4

2606 Toothing 5



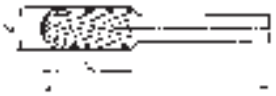




Part No.	Shape	2602 Toothing C	2604 Toothing 4	2606 Toothing 5	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	ZYA 0210	4.84	9.12	7.65	2	10	40
0010	ZYA 0313	4.84	7.65	7.65	3	13	43
0015	ZYA 0607	7.35	–	8.43	6	7	37
0020	ZYA 0613	7.35	–	8.43	6	13	43
0025	ZYA-S 0607	7.35	–	9.36	6	7	37
0020	ZYA-S 0613	–	9.36	–	6	13	43
		(230)	(234)	(234)			

Ball nose Form WRC





2602 Toothing C

2604 Toothing 4

2606 Toothing 5







Part No.	Shape	2602 Toothing C	2604 Toothing 4	2606 Toothing 5	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0030	WRC 0210	4.84	8.50	8.50	2	10	40
0035	WRC 0313	4.97	8.50	8.50	3	13	43
0040	WRC 0613	7.35	10.26	10.26	6	13	43
		(230)	(234)	(234)			

Spherical Form KUD



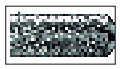


2602 Toothing C

2604 Toothing 4

2606 Toothing 5







Part No.	Shape	2602 Toothing C	2604 Toothing 4	2606 Toothing 5	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0045	KUD 0302	4.97	8.50	8.50	3	2	33
0050	KUD 0403	–	10.26	10.26	4	3	34
0055	KUD 0605	7.35	10.26	10.26	6	5	35
		(230)	(234)	(234)			

Technical description see page 8/39.

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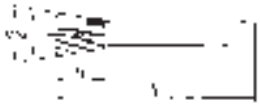
Solid Carbide Miniature Rotary Burrs, DIN 8032/8033 – Shank ⌀ 3 mm

format professional quality

PFERD

Angular Form WKN





2602 Toothing C
2606 Toothing 5





Part No.	Shape	2602 Toothing C	2606 Toothing 5	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0060	WKN 0307	5.59	8.07	3	7 (8°)	37
0065	WKN 0607	7.35	8.90	6	7 (10°)	37
		(230)	(234)			

Oval Form TRE





2602 Toothing C
2606 Toothing 5

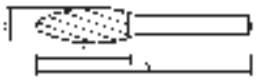




Part No.	Shape	2602 Toothing C	2606 Toothing 5	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0070	TRE 0307	4.97	8.50	3	7	37
0075	TRE 0610	7.35	9.36	6	10	40
		(230)	(234)			

Flame Form B





2602 Toothing C
2606 Toothing 5





Part No.	Shape	2602 Toothing C	2606 Toothing 5	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0080	3B 0307	4.97	8.50	3	7	37
0085	3B 0613	10.87	10.26	6	13	43
		(230)	(234)			

Pointed Cone Form SKM

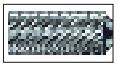




2602 Toothing C
2604 Toothing 4
2606 Toothing 5







Part No.	Shape	2602 Toothing C	2604 Toothing 4	2606 Toothing 5	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0090	SKM 0307	4.97	–	8.50	3	7 (22°)	37
0095	SKM 0311	4.97	8.50	8.50	3	11 (14°)	41
0100	SKM 0613	7.35	–	9.36	6	13 (26°)	43
		(230)	(234)	(234)			

Technical description see page 8/39.

Solid Carbide Miniature Rotary Burrs, DIN 8032/8033 – Shank ⌀ 3 mm

Ball Nose Form RBF (Tree Form)



2602 Toothing C
2604 Toothing 4
2606 Toothing 5





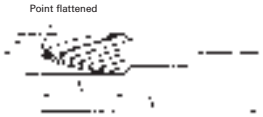


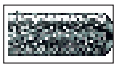
Part No.	Shape	2602 Toothing C	2604 Toothing 4	2606 Toothing 5	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0105	RBF 0307	4.97	–	8.50	3	7	37
0110	RBF 0613	7.35	9.36	9.36	6	13	43
		(230)	(234)	(234)			

Bullet Shaped SPG



2602 Toothing C
2604 Toothing 4
2606 Toothing 5




Part No.	Shape	2602 Toothing C	2604 Toothing 4	2606 Toothing 5	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0115	SPG 0307	4.97	8.50	8.50	3	7	37
0120	SPG 0313	4.97	8.50	8.50	3	13	43
0125	SPG 0613	7.35	9.36	9.36	6	13	43
		(230)	(234)	(234)			

Solid Carbide Miniature Rotary Burr Sets – ⌀ 3 mm Shank

Design: 15-piece set in plastic box, toothing C.



Part No.	Contents/set	2601
0015	ZYA 0210, ZYA 0313, ZYA 0607, ZYA 0613, WRC 0210, WRC 0313, KUD 0403, WKN 0307, TRE 0307, TRE 0610, 3B 0307, SKM 0613, RBF 0307, RBF 0613, SPG 0307	104.09
		(230)

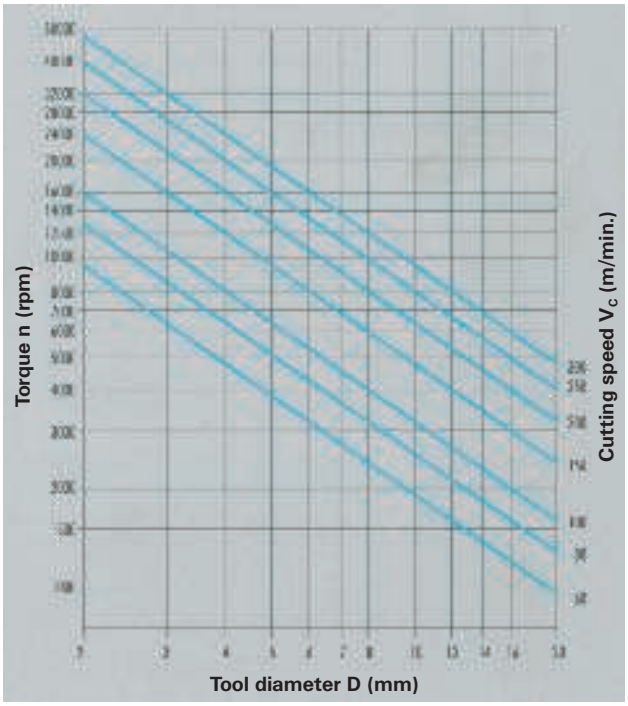
HSS Burrs – Shank ⌀ 6 mm

Recommended applications:

1. Compared to solid carbide burrs, HSS burrs are to be used at lower speeds.
2. For low-speed applications.
3. For soft materials, HSS burrs are the economical alternative to solid carbide burrs.
4. The toughness of the high-speed steel (HSS) results in high stability of the toothed cutter.

PFERD

Recommended cutting speeds for HSS burrs







Toothing 1 without chip breaker



Toothing 3 with chip breaker



Toothing 5 without chip breaker



The cutting speeds are shown in the diagram by blue diagonal lines. The vertical corresponding to the tool diameter intersects the specified cutting speed (diagonal). Starting from this point, the speed of the burr and the machine can be read off in rpm at the horizontal on the left.

Example: HSS burr, toothing 1, tool diameter 12 mm,
rough cutting of non-ferrous metals.
Cutting speed: 200–300 m/min.
Torque: 5,300–8,000 rpm.

	Material groups		Machining example	Toothing	Cutting speed
Steel and cast steel materials	Non-case hardened, non-tempered steels up to 1200 N/mm² (< 35 HRC)	Structural steels, carbon steels, tool steels, unalloyed steels, hardened steels, cast steel	Rough cutting = high material removal rate	3	60– 80 m/min
			Fine cutting, e.g. deburring	3	80–100 m/min
				5	60– 80 m/min
	Rust and acid-resistant steels	Austenitic and ferritic stainless steels	Rough cutting = high material removal rate	1	60– 80 m/min
			Fine cutting, e.g. deburring	1	80–100 m/min
Non-ferrous metals	Soft non-ferrous metals	Aluminium alloys, brass, copper, zinc	Rough cutting = high material removal rate	1	200–300 m/min
			Fine cutting, e.g. deburring		
Cast iron materials		Grey cast iron, nodular cast iron	Rough cutting = high material removal rate	3	60– 80 m/min
			Fine cutting, e.g. deburring	3	80–100 m/min
				5	80–100 m/min
Other/plastics		Glass fibre-reinforced plastics, thermoplastics, hard rubber	Rough cutting = high material removal rate	1	200–300 m/min
			Fine cutting, e.g. deburring	1	250–300 m/min

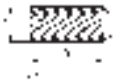
Solid Carbide Burrs, ∅ 6 mm Shank

Cylindrical Form A, with Serration



2610 Toothing 1
2612 Toothing 3
2614 Toothing 5





Part No.	Shape	2610 Toothing 1	2612 Toothing 3	2614 Toothing 5	Head ∅ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	A 0413 ST	–	5.02	–	4	13	60
0010	A 0616 ST	4.77	4.77	4.77	6	16	60
0015	A 0820 ST	–	5.57	–	8	20	60
0020	A 1013 ST	–	7.92	–	10	13	53
0025	A 1020 ST	–	8.93	–	10	20	60
0030	A 1225 ST	10.26	10.26	10.26	12	25	65
0035	A 1625 ST	–	13.18	–	16	25	65
		(236)	(236)	(236)			

Ball Nose Form C



2616 Toothing 1
2618 Toothing 3





Part No.	Shape	2616 Toothing 1	2618 Toothing 3	Head ∅ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	C 0616	4.77	4.77	6	16	60
0010	C 0820	–	5.57	8	20	60
0015	C 1020	–	8.96	10	20	60
0020	C 1225	–	10.26	12	25	65
		(236)	(236)			

Tree Form K



2622 Toothing 3





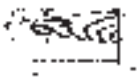
Part No.	Shape	2622 Toothing 3	Head ∅ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	K 0618	4.77	6	18	60
0010	K 1020	9.24	10	20	60
0015	K 1225	9.83	12	25	65
0020	K 1630	13.18	16	30	70
		(236)			

Ball Nose Cone Form L



2624 Toothing 3





Part No.	Shape	2624 Toothing 3	Head ∅ d_1 mm	Bit length l_2 mm	Angle α	Total length l_1 mm
0005	L 1230	10.26	12	30	14°	70
0010	L 1630	13.18	16	30	14°	70
		(236)				

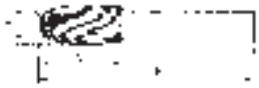
Technical description see page 8/47.

Solid Carbide Burrs, ⌀ 6 mm Shank

Oval Form O

2626 Toothing 3







Part No.	Shape	2626 Toothing 3	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	O 1220	9.24	12	20	60
0010	O 1625	13.18	16	25	65
		(236)			

Ball Nose Form F

2628 Toothing 1
2630 Toothing 3
2632 Toothing 5







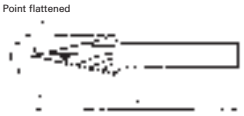




Part No.	Shape	2628 Toothing 1	2630 Toothing 3	2632 Toothing 6	Head ⌀ d_1 mm	Bit length l_2 mm	Total length l_1 mm
0005	F 0403	–	4.91	–	4	3.6	55
0010	F 0605	–	4.77	–	6	5.4	55
0015	F 0807	7.92	7.92	7.92	8	7	55
0020	F 1009	–	9.24	–	10	9	49
0025	F 1210	–	11.06	11.06	12	10.8	51
0030	F 1614	–	13.18	–	16	14.3	54
* without chip breaker		(236)	(236)	(236)			

Pointed Cone Form G

2634 Toothing 1
2636 Toothing 3





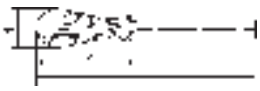




Part No.	Shape	2634 Toothing 1	2636 Toothing 3	Head ⌀ d_1 mm	Bit length l_2 mm	Angle α	Total length l_1 mm
0005	G 0618	–	4.77	6	18	14°	60
0010	G 1020	7.92	7.92	10	20	28°	60
0015	G 1225	–	10.26	12	25	27°	65
		(236)	(236)				

Club Form HSS 64

2640 Toothing 3



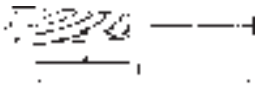




Part No.	Description	2640 Toothing 3	Max. head ⌀ mm	Bit length l_2 mm	Total length l_1 mm
0005	HSS 64	10.26	12	30	70
		(236)			

Angular Form HSS 63

2641 Toothing 3







Part No.	Description	2641 Toothing 3	Min. head ⌀ mm	Max. head ⌀ mm	Bit length l_2 mm	Angle α	Total length l_1 mm
0005	HSS 63	10.26	8	12	30	7°	70
		(236)					

Technical description see page 8/47.

HSS Burrs

HSS Burr Sets

Design: 10-piece set in plastic box, toothing 3, shank ⌀ 6 mm.

Part No.	Description	2652	Contents/set
0010	82 HSS	110.88	W 1220, A 1013 ST, L 1020, HSS 45, G 1020, A 1625 ST, K 1630, L 1630, O 1625, F 1614
		(236)	



Design: 18-piece sets in plastic box, toothing 3, shank ⌀ 6 mm.

Part No.	Description	2653	Contents/set
0018	83 HSS	147.99	A 0616 ST, C 0616, K 0618, G 0618, HSS 55, O 0610, F 0403, F 0807, F 1210, F 1614, O 1220, K 1225, HSS 63, HSS 64, K 1230, G 1225, C 1225, A 1225 ST
		(236)	



HSS Light Metal Burrs

Design: Female thread M 10, suited for work arbors with 6 mm or 8 mm ⌀ shanks, special teeth.

Application: For deburring of light cast metal objects.

Part No.	Description	2642	Max. head ⌀ mm	Head length mm	Total length mm
0005	HSS 119	21.50	20	53	62
0010	HSS 120*	20.12	20	45	54
* with chip breaker		(236)			





Work Arbors

Application: For tools with female thread.

Part No.	Description	2644	Shank ⌀ mm	Length mm	Thread
0006	6/10	2.93	6	40	M 10
0008	8/10	4.57	8	40	M 10
		(236)			



HSS Engraving Burrs

Design: Total length 60 mm, special teeth, shank ⌀ 6 mm.

Part No.	Description	2650	Head ⌀ mm	Head length mm	Angle α
0001	301	4.82	3	2.7	–
0010	305	5.18	3	4.5	–
0013	306	5.18	3	4.5	34°
0016	307	5.18	3	4.5	–
0019	311	4.82	6	7.8	–
		(236)			


301


305


306


307


311

Technical description see page 8/47.

Special Fused Alumina Corundum Polishing Points

Design: Special fused alumina corundum, pink AR, hardness 0 (medium), ceramic bonding, 5 v, for universal use, dimensionally stable, firm edges.

Application: For steel, cast steel, welds. Recommended circumferential speed 15–40 m/s.

PFERD

Cylindrical Burrs ZY – ∅ 3 mm Shank, Grain Fine

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8450	○	●	○	○	○	○	○	○

Part No.	0205	0306	0408	0510	0613	0810	0816
Type	ZY 0205	ZY 0306	ZY 0408	ZY 0510	ZY 0613	ZY 0810	ZY 0816
8450	1.04	0.90	0.90	0.90	0.94	0.90	0.92
Head ∅ x Head height D x T mm	2 x 5	3 x 6	4 x 8	5 x 10	6 x 13	8 x 10	8 x 16
Grain Coarse	100	100	100	100	100	80	80
PU	10	10	10	10	10	10	10

(855)



8450

Arch-pointed Nose Burrs SP – ∅ 3 mm Shank, Grain Fine

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8462	○	●	○	○	○	○	○	○

Part No.	0306	0510
Type	SP 0306	SP 0510
8462	1.04	1.11
Head ∅ x Head height D x T mm	3 x 6	5 x 10
Grain Fine	100	100
PU	10	10

(855)



8462

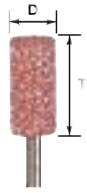
Cylindrical Burrs ZY – ∅ 6 mm Shank, Grain Coarse

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8453	○	●	○	○	○	○	○	○

Part No.	0510	0613	0816	1020	1032	1325	1604	1632
Type	ZY 0510	ZY 0613	ZY 0816	ZY 1020	ZY 1032	ZY 1325	ZY 1604	ZY 1632
8453	0.90	0.94	0.92	1.04	1.27	1.19	0.93	1.27
Head ∅ x Head height D x T mm	5 x 10	6 x 13	8 x 16	10 x 20	10 x 32	13 x 25	16 x 4	16 x 32
Grain Fine	60	60	46	46	46	46	46	30
PU	10	10	10	10	10	10	10	10

Part No.	2004	2025	2032	2513	2532	3216	3232	4020	5025
Type	ZY 2006	ZY 2025	ZY 2032	ZY 2513	ZY 2532	ZY 3216	ZY 3232	ZY 4020	ZY 5025
8453	1.11	1.22	1.37	1.22	1.54	1.39	1.74	1.56	2.11
Head ∅ x Head height D x T mm	20 x 6	20 x 25	20 x 32	25 x 13	25 x 32	32 x 16	32 x 32	40 x 20	50 x 25
Grain Fine	46	30	30	30	30	24	24	24	24
PU	10	10	10	10	10	5	5	5	5

(855)



8453

Cylindrical Burrs ZY – ∅ 6 mm Shank, Grain Fine

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8456	○	●	○	○	○	○	○	○

Part No.	0510	0613	0816	1020	1032
Type	ZY 0510	ZY 0613	ZY 0816	ZY 1020	ZY 1032
8456	0.90	0.94	0.92	1.04	1.27
Head ∅ x Head height D x T mm	5 x 10	6 x 13	8 x 16	10 x 20	10 x 32
Grain Fine	100	100	80	80	80
PU	10	10	10	10	10

Part No.	1325	1632	2025	2532
Type	ZY 1325	ZY 1632	ZY 2025	ZY 2532
8456	1.19	1.27	1.22	1.54
Head ∅ x Head height D x T mm	13 x 25	16 x 32	20 x 25	25 x 32
Grain Fine	80	60	60	60
PU	10	10	10	10

Technical information see appendix Group 10.

(855)



8456

Special Fused Alumina Corundum Polishing Points

PFERD

Arch-pointed Nose Burrs SP – ∅ 6 mm Shank, Grain Coarse

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8465	○	●	○	○	○	○	○	○

Part No.	0306	0510	0816	1320	2032
Type	SP 0306	SP 0510	SP 0816	SP 1320	SP 2032
8465	1.04	1.11	1.12	1.33	1.82
Head ∅ x Head height D x T mm	3 x 6	5 x 10	8 x 16	13 x 20	20 x 32
Grain Coarse	100	60	46	46	30
PU	10	10	10	10	10

(855)



8465

Spherical Burrs KU – ∅ 6 mm Shank, Grain Coarse

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8468	○	●	○	○	○	○	○	○

Part No.	0808	1010	1313	1616	2020
Type	KU 08	KU 10	KU 13	KU 16	KU 20
8468	1.11	1.12	1.18	1.38	1.56
Head ∅ mm	8	10	13	16	20
Grain Coarse	46	46	46	30	30
PU	10	10	10	10	10

(855)



8468

Conical Burrs KE – ∅ 6 mm Shank, Grain Coarse

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8471	○	●	○	○	○	○	○	○

Part No.	1025	1645	2032	2545
Type	KE 1025	KE 1645	KE 2032	KE 2545
8471	1.33	2.11	1.68	2.11
Head ∅ x Head height D x T mm	10 x 25	16 x 45	20 x 32	25 x 45
Grain Coarse	46	46	30	30
PU	10	10	10	10

(855)



8471

Tool Grinding Burrs – ∅ 6 mm Shank, Grain Coarse

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8459	○	●	○	○	○	○	○	○

Part No.	0703	0705	0706	0708
Type	703	705	706	708
8459	1.04	1.04	1.04	1.04
Head ∅ x Head height D x T mm	3 x 8	5 x 8	6 x 10	8 x 12
Grain Coarse	100	80	80	80
PU	10	10	10	10

(855)



8459

Technical information see appendix Group 10.

Special Fused Alumina Polishing Point Sets

Design: Special fused alumina corundum, pink AR, hardness O (medium), ceramic bonding 5 V, for universal use, dimensionally stable, firm edges.

8474

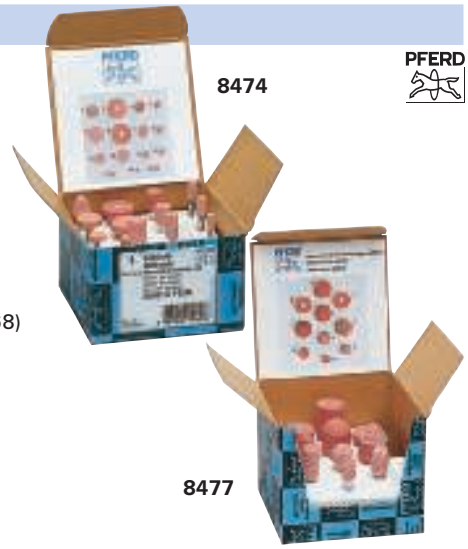
Grain size fine. Shank ⌀ 3 mm.

11 polishing points
cylindrical form (part no. 8450)
ZY 0510 (2 pcs.), ZY 0810 (2 pcs.), ZY 1604 (2 pcs.), ZY 0408, ZY 0613, ZY 0802, ZY 1013, ZY 1303
1 polishing point
round nose
WR 0510
1 polishing point
spherical form
KU 05
2 polishing points
arch-pointed form (part no. 8462)
SP 0306, SP 0816

8477

Grain size coarse. Shank ⌀ 6 mm.

5 polishing points cylindrical form
(part no. 8453)
ZY 1013, ZY 1320, ZY 2006, ZY 2013, ZY 2025
1 polishing point round nose form WR 2025
1 polishing point conical form WK 2025
1 polishing point spherical form (part no. 8468)
KU 16
1 polishing point arch-pointed nose form
(part no. 8465) SP 1320
1 polishing point conical form (part no. 8471)
KE 2020



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8474/8477	○	●	○	○	○	○	○	○

Part No.	Quantity	8474
0001	15 pcs.	16.46 (855)

Part No.	Quantity	8477
0001	10 pcs.	14.26 (855)

Normal Corundum Polishing Points with ⌀ 6 mm Shank

Design: Normal alumina corundum AN, hardness N, resin-bonded, brown.

Application: For steel, especially rust and acid-proof steel (INOX). Recommended circumferential speed 20–40 m/s.

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8480	○	●	○	○	○	○	○	○

Part No.	Type	8480	Head ⌀ x Head height D x T mm	Grain Coarse	PU
0816	ZY 0816	0.97	8 x 16	46	10
1020	ZY 1020	1.19	10 x 20	46	10
1032	ZY 1032	1.27	10 x 32	46	10
1325	ZY 1325	1.19	13 x 25	46	10
1632	ZY 1632	1.27	16 x 32	30	10
2025	ZY 2025	1.22	20 x 25	30	10
4020	ZY 4020	1.56	40 x 20	24	5
5013	ZY 5013	1.68	50 x 13	30	5
5025	ZY 5025	2.11 (855)	50 x 25	24	5



Corundum-blend Polishing Points with ⌀ 6 mm Shank

Design: Corundum-blend ADW, hardness M, ceramic bond.

Application: For steel, cast steel and stainless steel. Recommended circumferential speed 20–40 m/s.

8482 Cylindrical points ZY
8484 Arch points SP

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8482/8484	○	●	○	○	○	○	○	○

Part No.	Type	8482	8484	Head ⌀ x Head height D x T mm	Grain Coarse	PU
1632	ZY 1632	1.27	–	16 x 32	30	10
2025	ZY 2025	1.22	–	20 x 25	30	10
2032	SP 2032	–	1.82	20 x 32	30	10
2040	ZY 2040	1.60	–	20 x 40	30	10
3232	ZY 3232	1.74 (855)	– (855)	32 x 32	24	5



Technical information see appendix Group 10.

Poliflex® Fine Polishing Points

Design: Hard, yellow-brownish colour, special fused alumina corundum K 120, premium surface quality and long life. Recommended circumferential speed max. 50 m/s.

Application: For finishing of cold and hot-forming steel, rust and acid-proof steel and precision grinding of all metals.

Description: Best suited for precision grinding, for preparing of polishing jobs, rounding of edges. The fine polishing points can be conveniently profiled with planing tools.



PFERD

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8440	○	●	○	●	●			

Part No.	ø mm	8440	Height mm	Shank ø mm	PU
0610	6	1.93	10	3	10
0812	8	2.02	12	3	10
1015	10	2.02	15	3	10
1220	12	2.02 (847)	20	3	10

Part No.	ø mm	8440	Height mm	Shank ø mm	PU
1530	15	2.50	30	6	10
2030	20	2.53	30	6	10
2515	25	2.32	15	6	10
3030	30	3.60 (847)	30	6	5

Diamond Grinding Points

Design: Electro-deposited diamonds, ideal for the fast removal of material. Universal grain size: D 126 – medium (in accordance with FEPA standard).

Application: For tool and production grinding of hard materials. Diamond points – pre-sintered and finish-sintered – are employed in the machining of hard metal and ceramics. Other areas of application are: Finishing of fibre glass reinforced plastics and similar material, graphite, ferrite, cast iron, glass and some non-ferrous metals.

Note: To avoid thermal damage of edges of the workpiece and to extend the service life of the tool, we recommend to use cooling lubricants.

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8486/8467/8489/8490	○	●	●	●	●	○	○	

Cylindrical Form

Part No.	ø x height mm	8486	8467	Total length mm 8486	Total length mm 8467	Shank ø mm 8486	Shank ø mm 8467
0010	1 x 4	5.30	5.13	45	40	3	3
0014	1.4 x 4	–	5.47	–	40	–	3
0015	1.5 x 4	5.30	–	45	–	3	–
0019	2 x 4	–	6.38	–	40	–	3
0020	2 x 5	5.30	–	45	–	3	–
0029	3 x 4	–	7.03	–	40	–	3
0030	3 x 5	5.30	–	45	–	3	–
0040	4 x 5	6.58	7.15	45	50	3	3
0049	5 x 5	–	8.56	–	50	–	3
0050	5 x 6	7.53	–	45	–	3	–
0060	6 x 6	7.83	9.71	45	60	3	6
0069	8 x 8	–	12.39	–	60	–	6
0080	8 x 10	10.64	–	70	–	6	–
0090	10 x 8	–	14.40	–	60	–	6
0100	10 x 10	12.06	–	70	–	6	–
0110	12 x 8	–	17.02	–	60	–	6
0120	12 x 10	13.97 (857)	23.72 (858)	70	66	6	6



8486 format professional quality



8467 PFERD

Spherical Form

Part No.	ø x height mm	8489	8490	Total length mm 8489	Total length mm 8490	Shank ø mm
0010	1	–	6.64	–	45	3
0020	2	6.13	8.29	45	45	3
0030	3	6.37	8.38	45	45	3
0040	4	6.37	9.39	45	45	3
0050	5	6.37	12.07	45	45	3
0060	6	10.64	14.19	70	45	3
0080	8	12.26	17.91	70	60	6
0100	10	14.94	23.16	70	60	6
0120	12	18.63 (857)	29.13 (858)	70	60	6



8489 format professional quality



8490 PFERD

Felt Pointers with ∅ 6 mm Shank

Application: Felt polishing tools are used together with abrasive paste for surface finishing of preground workpieces.

PFERD

Part No.	Type	8602	Head ∅ mm	Head length mm	Shank length mm	PU
0010	ZYA	2.19	10	14	40	10
0020	ZYA	3.80	20	25	40	10
0030	SPK	2.71	15	20	40	10
0040	WRC	3.49	20	25	40	10
0050	TRE	2.23	10	14	40	10
0060	KEL	3.49	20	25	40	10
0070	KEL	4.38	25	30	40	10
0080	KEL	5.93	30	35	40	10
		(868)				



Felt Grinding Wheels

Application: Felt polishing tools are used together with abrasive paste for surface finishing of preground workpieces.

PFERD

Part No.	∅ mm	8599	Thickness mm	Hole mm
0080	80	5.02	10	10
0100	100	14.67	20	10
0125	125	20.22	20	20
0150	150	30.41	25	20
0200	200	61.95	30	20
		(868)		

Work arbours see page 8/36.



Fabric Grinding Wheels

Application: For polishing of hollow and profiled objects (e.g. for the automotive and fittings industry, engineering and plant construction, aluminium and wood finishing.)

PFERD

8597 **Hard design:** For prepolishing of steel and stainless steel, aluminium, brass and nonferrous metal.

8596 **Soft design:** For mirror finish of all metals and plastic material.

Part No.	∅ mm	8597	8596	Thickness mm	Hole mm
0080	80	2.13	1.79	10	10
0100	100	2.39	2.00	10	10
0125	125	3.05	2.61	10	20
0150	150	4.29	3.05	10	20
0200	200	7.52	5.51	10	20
		(868)	(868)		



Work Arbors

Application: For holding of fabric rings and felt disks.

PFERD

Part No.	Shank ∅ mm	8600	Hole mm
0010	8	5.74	10
0020	12	15.68	20
0030	MK1	23.63	20
		(868)	



Grinding Points

Grinding files from special fused alumina ceramic bond are used in mould and tool construction, machine and apparatus construction, for grinding of tools or deburring, for fine-finishing of injection-moulded, compression and cast iron tools and predominantly on all tools for the plastics industry.

For machining and grinding of diverse tools, precision measuring instruments, templates and similar items. To be used dry, with water or oil.

Grinding Files – Special Fused Alumina

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8546/8549/8552/8555/8567/8558	○	●	○	○	●	○	○	○

Grinding Files, Square



Part No.		0015	0025	0035	0040	0045	0055	0060	0065	0070	0075
Dimensions	mm	6 x 100	8 x 100	10 x 100	10 x 100	10 x 100	13 x 150	13 x 150	16 x 150	16 x 150	16 x 150
8546		2.01	2.20	2.20	2.20	2.20	2.99	2.99	3.27	3.27	3.27
Design		Fine (F)	Medium (M)	Coarse (G)	Medium (M)	Fine (F)	Medium (M)	Fine (F)	Coarse (G)	Medium (M)	Fine (F)
Grain size		360	220	120	220	360	220	360	120	220	360

(865)

Grinding Files, Three-square



Part No.		0010	0015	0025	0030	0035	0040	0045	0050	0055	0060	0065	0070	0075
Dimensions	mm	6 x 100	6 x 100	8 x 100	8 x 100	10 x 100	10 x 100	10 x 100	13 x 150	13 x 150	13 x 150	16 x 150	16 x 150	16 x 150
8549		2.53	2.53	2.80	2.80	2.80	2.80	2.80	3.57	3.57	3.57	3.79	3.79	3.79
Design		Medium (M)	Fine (F)	Medium (M)	Fine (F)	Coarse (G)	Medium (M)	Fine (F)	Coarse (G)	Medium (M)	Fine (F)	Coarse (G)	Medium (M)	Fine (F)
Grain size		220	360	220	360	120	220	360	120	220	360	120	220	360

(865)

Grinding Files, Round



Part No.		0025	0030	0040	0045
Dimensions	mm	8 x 100	8 x 100	10 x 100	10 x 100
8552		3.12	3.12	3.12	3.12
Design		Medium (M)	Fine (F)	Medium (M)	Fine (F)
Grain size		220	360	220	360

(865)

Grinding Files, Half-round



Part No.		0040	0045	0055
Dimensions	mm	10 x 100	10 x 100	13 x 150
8555		2.80	2.80	3.57
Design		Medium (M)	Fine (F)	Medium (M)
Grain size		220	360	220

(865)

Grinding Files, Blade Form



Part No.		0100	0105
Dimensions	mm	25 x 3/1 x 100	25 x 3/1 x 100
8567		2.75	2.75
Design		Medium (M)	Fine (F)
Grain size		220	360

(865)

Grinding Files, Flat



Part No.		0010	0035	0045	0040	0070	0075
Dimensions	mm	6 x 3 x 100	10 x 5 x 100	10 x 5 x 100	10 x 5 x 100	16 x 8 x 150	16 x 8 x 150
8558		1.78	2.01	2.01	2.01	2.91	2.91
Design		Medium (M)	Coarse (G)	Fine (F)	Medium (M)	Medium (M)	Fine (F)
Grain size		220	120	360	220	220	360

(865)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Grinding Points

Grinding files from silicium carbide ceramic bond are used in mould and tool construction, machine and apparatus construction, for grinding of tools or deburring, for fine finishing of injection-moulded, compression and cast iron tools and predominantly on all tools for the plastics industry.

For finishing tools from solid carbide metal and aluminium, bronze, glass, stone, grey cast iron and similar material. To be used dry, with water or oil.

Grinding Files Silicium Carbide

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8573/8576/8579/8582/8588/8585	●	○	●	◌	●	●	●	◌

Grinding Files, Square



Part No.		0025	0040	0045	0055	0060	0070	0075
Dimensions	**mm**	**8 x 100**	**10 x 100**	**10 x 100**	**13 x 150**	**13 x 150**	**16 x 150**	**16 x 150**
8573		2.34	2.34	2.34	3.17	3.17	3.43	3.43
Design		Medium (M)	Medium (M)	Fine (F)	Medium (M)	Fine (F)	Medium (M)	Fine (F)
Grain size		220	220	360	220	360	220	360

(865)

Grinding Files, Three-square



Part No.		0010	0015	0025	0030	0035	0040	0045	0050	0055	0060	0065	0070	0075
Dimensions	**mm**	**6 x 100**	**6 x 100**	**8 x 100**	**8 x 100**	**10 x 100**	**10 x 100**	**10 x 100**	**13 x 150**	**13 x 150**	**13 x 150**	**16 x 150**	**16 x 150**	**16 x 150**
8576		2.68	2.68	2.94	2.94	3.01	3.01	3.01	3.77	3.77	3.77	3.99	3.99	3.99
Design		Medium (M)	Fine (F)	Medium (M)	Fine (F)	Coarse (G)	Medium (M)	Fine (F)	Coarse (G)	Medium (M)	Fine (F)	Coarse (G)	Medium (M)	Fine (F)
Grain size		220	360	220	360	120	220	360	120	220	360	120	220	360

(865)

Grinding Files, Round



Part No.		0025	0040	0045
Dimensions	**mm**	**8 x 100**	**10 x 100**	**10 x 100**
8579		3.28	3.35	3.35
Design		Medium (M)	Medium (M)	Fine (F)
Grain size		220	220	360

(865)

Grinding Files, Half-round



Part No.		0040	0060
Dimensions	**mm**	**10 x 100**	**13 x 150**
8582		2.94	3.77
Design		Medium (M)	Fine (F)
Grain size		220	360

(865)

Grinding Files, Blade Form



Part No.		0105
Dimensions	**mm**	**25 x 3/1 x 100**
8588		2.87
Design		Fine (F)
Grain size		360

(865)

Grinding Files, Flat



Part No.		0010	0015	0040	0045	0070	0075
Dimensions	**mm**	**6 x 3 x 100**	**6 x 3 x 100**	**10 x 5 x 100**	**10 x 5 x 100**	**16 x 8 x 150**	**16 x 8 x 150**
8585		1.89	1.89	2.11	2.11	3.04	3.04
Design		Medium (M)	Fine (F)	Medium (M)	Fine (F)	Medium (M)	Fine (F)
Grain size		220	360	220	360	220	360

(865)

Grinding Points

The original Arkansas natural stone is perfectly suitable for sharpening of very fine and sensitive cutting edges.
The exceptionally even structure, fineness and hardness are the preconditions for gentle and exact cutting, in concert with low wear.

The stones are best used with thin-bodied oil or rock oil.

Hard Arkansas Files

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8574/8577/8580/8583/8589/8586	●	○	●	○	●	●	●	○



Grinding Files, Square

Part No.		0005	0010	0015	0020	0025
Dimensions	mm	6 x 100	10 x 100	13 x 100	13 x 150	16 x 150
8574		3.06	5.26	6.54	9.13	15.50

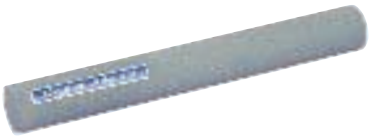
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Grinding Files, Three-square

Part No.		0005	0010	0015	0020	0025
Dimensions	mm	6 x 100	10 x 100	13 x 100	13 x 150	16 x 150
8577		3.86	5.70	6.54	11.07	13.52

(865)



Grinding Files, Round

Part No.		0005	0010	0015
Dimensions	mm	6 x 100	10 x 100	13 x 100
8580		5.67	8.97	11.54

(865)



Grinding Files, Half-round

Part No.		0010
Dimensions	mm	10 x 100
8583		7.33

(865)



Grinding Files, Blade Form

Part No.		0070
Dimensions	mm	25 x 3/1 x 100
8589		8.60

(865)



Grinding Files, Flat

Part No.		0005	0010	0015
Dimensions	mm	6 x 3 x 100	10 x 5 x 100	13 x 6 x 100
8586		3.47	4.22	5.30

(865)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

Smoothing File Assortments

Design: 5-piece set in wooden box. Arrangement of frequently used grinding files ranging from coarse to very fine grinding.

Part No.	Contents of set	8592
0005	1 special fused alumina corundum three-square 10 x 100 mm, fine, medium, coarse 1 special fused alumina corundum round 10 x 100 mm, medium 1 hard Arkansas three-square 10 x 100 mm	18.53
		(865)



Grindstones Super Arkansas

Design: For grinding of joiner's knives and standard cutting tools, 1 side extra fine, 1 side coarse.

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8570	○	●	●	○	○	○	○	○

Part No.	Dimensions mm	8570
0005	100 x 50 x 20	3.23
0010	115 x 60 x 20	4.39
0015	125 x 50 x 20	4.21
0020	130 x 70 x 20	4.21
0025	150 x 50 x 25	4.89
0030	200 x 50 x 25	6.74
		(865)



Grindstones Silicon Carbide

Design: Silicon carbide, universal stone for wet and dry grinding, 1 side coarse, 1 side fine.

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8571	○	●	●	○	○	○	○	○

Part No.	Dimensions mm	8571
0015	125 x 50 x 20	4.50
0025	150 x 50 x 25	5.82
0030	200 x 50 x 25	6.74
		(865)



Grindstones Original Arkansas Natural Stone

Design: Proven natural grindstone in wooden box, even structure, extreme fineness and hardness. For precision grinding of tools.

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8591	○	●	●	○	○	○	○	○

Part No.	Dimensions mm	8591
0005	100 x 40 x 20	7.05
0010	175 x 50 x 25	22.75
		(865)



MACOLAEPP Hand Apparatuses

Design: With plastic handle, total length 125 mm, lapping area 60 x 20 x 10 mm.

Application: For grinding of cutting edges, for removing the built-up edge, for prolonging the tool life.



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8593	○	○	●	○	○	○	○	○

Part No.	Grain size	8593	Grain µm	Use
0180	180 (yellow)	26.54	130	For hard metal tools with large cross sections
0220	220 (blue)	26.54	100	For hard metal tools with medium cross sections
0360	360 (red)	26.54	50	For small-sized hard metal and natural steel tools
0500	500 (green)	26.54	25	For very small hard metal and natural steel tools
		(867)		

MACOLAEPP Paste

Application: MACOLAEPP paste for machine and hand lapping are concentrates which are to be diluted at a ratio from 1:5 to 1:100 before use. 100 g tubes.



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8605	○	○	●	○	○	○	○	○

Part No.	Grain size	8605	Grain size µm
0120	120	21.82	180
0180	180	21.82	130
0220	220	22.64	100
0360	360	23.39	50
0500	500	24.34	25
		(867)	

Part No.	Grain size	8605	Grain size µm
0750	750	26.22	10
1000	1000	26.73	5
1500	1500	27.99	3
2000	2000	29.00	1
		(867)	

Grinding Paste, Oil-soluble

Application: For grinding of workpieces from steel, non-ferrous metals and plastics. The paste can be thinned or removed with oil. Supplied in 250 g tins.



Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8608	○	●	●	○	○	●	○	○

Part No.	Description	8608	Grain size
0001	No. 1	7.31	Coarse for first grind
0002	No. 2	7.31	Medium
0003	No. 3	7.31	Fine for grind finish
		(869)	

Grinding and Polishing Paste – Monoblocks

Design: First-grind compound, strong touch feature (with fine corundum) **1 kg blocks** for iron and non-ferrous metals, plastics.

Application: For use on felt, skin, lapping disks and brushes.



8611 0001



8611 0002



8611 0003

Part No.	Aluminium	Steel	Carbide	INOX	Cast iron	Plastic GFRP wood	Stone	Varnish
8611	○	●	●	○	○	●	○	○

Part No.	Material	8611
0001	White polish compound for fine and soft metals, compressed parts	8.56
0002	Blue polish compound for VA steel	7.26
0003	Polish compound supra-white, ultra-fine quality for acrylic, fine and soft metals.	7.26
		(869)

All stocked articles available within 24 hours by UPS Express. All prices in Pounds excluding VAT per piece (if not stated otherwise).

NEW

Guaranteed High Measure of Quality

The new FORMAT ceramic grain grinding tools – particularly suited for aggressive but cooling grinding.

- Very long service life due to self-sharpening ceramic grain
- Aggressive cutting for faster machining
- Perfectly suitable for finishing of high-alloy steel, titanium and nickel alloys due to the special hardness.

For further abrasives see page 8/16 ff.

format
professional quality



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Overview – Group 9

Product range:

Ex-proof torchers



Riveting equipment



Workshop equipment




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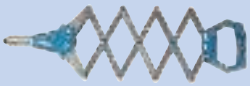

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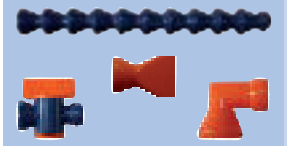

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Lamps **9/2–9/3**

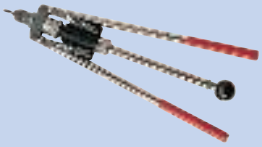

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Soldering Irons **9/4–9/8**
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Torch Pen Lights

Design: Inspection lamp with convenient clip, housing made of ABS, extremely bright xenon bulb, water-, air-, dust-proof, 2–3 h lighting time, range approx. 50 m, incl. 2 alkaline AAA/LR03 micro batteries.

Part No.	Dimensions mm	9054
0006	120 x 17 x 15	14.71
0101	Spare bulb	8.59
		(596)



Fibre Optics Attachments for Pen Light

Design: Flexible optical fibre attachment for precise lighting of areas which are difficult to access.

Part No.	9059
0006	8.22
	(596)

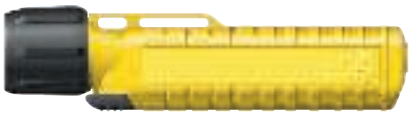




Torches

Design: Universal torch and head lamp, ABS housing, extremely bright xenon bulb, water-, air-, dust-proof, 4–5 h lighting time, range approx. 100–120 m, incl. 4 alkaline AA/LR06 mignon batteries.

Part No.	Dimensions mm	9056
0007	157 x 40 x 27	23.09
0101	Spare bulb	9.56
		(596)



Torches

Design: Compact electric torch, ABS housing, extremely bright xenon bulb, water-, air-, dust-proof, with spring-supported and anti-slip belt/jacket clip, 4–6 h lighting time, range approx. 100–140 m, incl. 3 alkaline C/LR14 baby batteries.

Part No.	Dimensions mm	9057
0006	218 x 50 x 40	31.10
0101	Spare bulb	13.21
		(596)



Site Lamps

Design: With current distributor and weather-resistant rubber cabling for outdoor use. Portable, anti-dazzle lamp incorporating 3 current distributors and on/off light switch. Lamp can be tilted and clamped at any angle (bulb not included).

Part No.	Capacity W	9046	Cable length m
0005	200	59.69	5
		(909)	



Spare Bulbs for Site Lamp

Design: Shock-proof, very useful for mobile applications.

Part No.	Capacity W	9047
0006	200	4.68
		(910)



Haloflex Machine and Workplace Lamps

Design: Multi-purpose lamp with flexible arm. Safety transformer in the lamp stand as well as On/Off switch at the head. As spread-beam lamp or point lamp. Including bulb, terminal screw and screws for machine, table, wall or ceiling fastening. Low voltage 12 v, 20 W, mains voltage 230 v, 50 Hz. Colour of lamp: Black.

Accessories: Strong magnetic clamp for fixing on metal surfaces.

Part No.	Design	9049
0005	Flexible arm, approx. 450 mm in length, connection cable 1.6 m, wide arc lamp*	53.44
0010	Flexible arm, approx. 450 mm in length, connecting cable 1.6 m, spot lamp	57.52
0015	Wide arc lamp PU = 5 pcs.	6.43
0020	Spot lamp PU = 5 pcs.	11.25
		(920)

* on request, wide arc lamp also available in protection class IP 54.



Kaliflex Workshop and Workplace Lamps

Design: High-quality, universal cold light lamp with sturdy, flexible, coated arm, length 0.7 m, flexible moving of the lamp head, high stability, 11 W fluorescent tube for soft, low-shadow, anti-glare light, ballast integrated in the lamp stand, On/Off switch at the lamp head, 3 m rubber hose line and coated, shaped plug. Mains voltage 230 v, 50 Hz. Colour: Black.

Scope of supply: Terminal screw and screws for machine, table, wall or ceiling fastening, fluorescent tube.

Part No.	Design	9052
0005	Kaliflex lamp	85.42
0010	Spare fluorescent tube PU = 2 tubes	13.66
0015	Spare terminal screw	8.85
		(920)



Magnetic Clamps

Design: Strong magnetic clamp for fixing on metal surfaces.

Application: Suitable for Haloflex and Kaliflex workplace lamps.

Part No.	9049
0025	18.35
	(920)



Fine Soldering Irons

Design: With ERSADUR long-life soldering tip, pencil-shaped, 230 v. Light and handy soldering iron for modern electronic applications, with internally heated tip, highly effective with low power consumption. Due to slim design also suitable for areas which are difficult to access, e.g. inside devices.



Type 260 BD

Part No.	Efficiency W	9130	Heating-up time approx. s	Soldering tip Shape °C	Design
0016	16	22.94	60	350	–
0020	Spare soldering tips	4.74	–	–	Tip chamfered
0025	Spare soldering tips	4.74	–	–	Pencil-shaped
0030	Spare soldering tips	4.74	–	–	Chisel-shaped
		(933)			

Application Tips:

9130 0020 Tip chamfered

9130 0025 Pencil-shaped

9130 0030 Chisel-shaped

Universal Soldering Irons

Design: With ERSADUR long-life soldering tip, chisel-shaped, straight, plastic support disk, 230 v. Multi-purpose use in radio and television engineering, electronics, labs or amateur.



Type KD

Part No.	Efficiency W	9133	Heating-up time approx. s	Soldering tip Shape °C	Design
0030	30	20.34	2	380	–
0045	40	21.41	2	420	–
0035	Spare soldering tips	4.53	–	–	Chisel-shaped, straight
0040	Spare soldering tips	4.53	–	–	Chisel-shaped, bent
		(933)			

Application Tips:



9133 0035 Chisel-shaped, straight

9133 0040 Chisel-shaped, bent

Soldering Irons

Design: With ERSADUR long-life soldering tip, bent, 230 v. Where higher heat is needed e.g. copper wires, 2.5 to 6 mm² cross section.

Part No.	Capacity W	9136	Heating-up time approx. min	Soldering tip temperature °C
1050	50	35.41	3	400
1080	80	39.96	3	410
1150	150	44.72	3	450
		(933)		



Type JD



9136 0051, 9136 0081, 9136 0151

9136 0083, 9136 0158

Spare Soldering Tips

Part No.	Shape	9136	For soldering irons W
0051	Chisel-shaped, bent	5.11	50
0081	Chisel-shaped, bent	7.53	80
0151	Chisel-shaped, bent	8.52	150
		(933)	

Part No.	Shape	9136	For soldering irons W
0083	Chisel-shaped, straight	7.53	80
0158	Chisel-shaped, straight	7.79	150
		(933)	

Hammer Soldering Irons

Design: With non-scaling soldering tip, 230 v. Tip finished at the shank to avoid scaling in the heating element. Features similar to copper tip.

Application: Especially suitable for installation work as well as soldering of collectors and copper rails, car body rework and lead panes.



Part No.	Capacity W	9140	Heating-up time approx. min	Soldering tip temperature °C
0200	200	94.55	5	470
0300	300	110.24	5	470
0550	550	165.80	7	600
		(933)		

Spare Soldering Tips

Part No.	Shape	9141
0201	Non-scaling, suitaible for 9140 0200	28.85
0301	Non-scaling, suitaible for 9140 0300	38.99
0551	Non-scaling, suitaible for 9140 0550	64.98
		(933)

Application Tips:



9141 0201 **9141 0301** **9141 0551**

Soldering Guns

Design: Light quick-soldering gun, without transformer, with internally heated ERSADUR long-life soldering tip. Extremely short heating-up and cooling-down time. Perfectly suitable for service and repair work.

Type Multisprint 960 ED



Part No.	Power rating, heated up, approx. W	9143	Heating-up power rating approx. W	Heating-up time s
0075	75	34.51 (933)	150	20

Soldering Stations – Analog

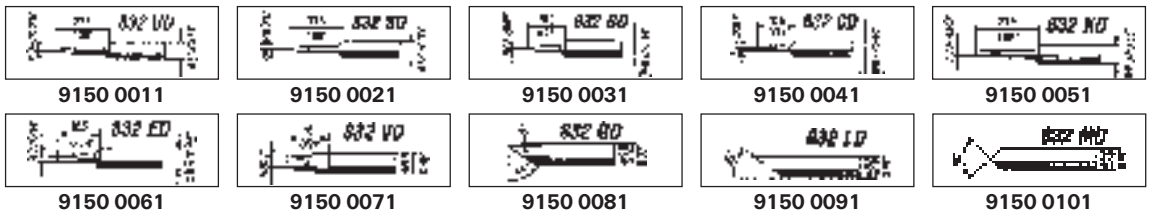
Design: Multi-purpose use, with electronic temperature control, consisting of: electronic station, soldering iron with tip and holder.



Part No.		0060
Type		**Analog 60**
9146		123.24
Soldering station		**ANA 603**
Power supply	V	230
Control system		Resistronic
Secondary voltage	V	24
Power rating	W	60
Temperature range	°C	150–450
Soldering iron		**Basic Tool 60**
Voltage	V	24
Power rating (350 °C)	W	60
Heating-up power rating	W	190
Heating-up time (350 °C)	s	approx. 60

(933)

Spare Soldering Tips



9150 0011 | 9150 0021 | 9150 0031 | 9150 0041 | 9150 0051

9150 0061 | 9150 0071 | 9150 0081 | 9150 0091 | 9150 0101

Part No.	Design	9150	Type
0011	Pencil-shaped, extended, ∅ 0.4 mm	6.54	UD
0021	Pencil-shaped, extended, ∅ 0.8 mm	6.54	SD
0031	Pencil-shaped, ∅ 1.0 mm	6.54	BD
0041	Chisel-shaped, ∅ 2.2 mm	6.54	CD
0051	Chisel-shaped, extended, ∅ 2.2 mm	6.54	KD
0061	Chisel-shaped, ∅ 3.2 mm	6.54	ED
0071	Chisel-shaped, ∅ 5.0 mm	11.02	VD
0081	Chamfered, 14 mm, 35° angle	11.83	GD
0091	Chamfered, 17 mm, 35° angle	11.83	LD
0101	Chamfered on both sides, 8 mm	11.83	MD

(933)

Gas Soldering Sets Independent 75

Design: The ergonomic gas soldering iron with chisel-shaped soldering tip is perfectly suitable for repair and maintenance work where no power supply is available. The ERSA Independent is operated with conventional butane lighter gas. Continuously adjustable power rating, piezo ignition, heating-up time (to 183 °C) approx. 30 s.

Scope of supply: Gas soldering set Independent 75 including gas soldering iron with soldering tip 2.4 mm, chisel-shaped, support, cleaning sponge, sponge container, plastic case.



Part No.	Power rating W	9153	Soldering tip temperature °C	Weight g
0011	15–75	51.80 (933)	max. 580	73

Gas Soldering Sets Independent 130

Scope of supply: Gas soldering set Independent 130 including gas soldering iron with soldering tip 2.4 mm, chisel-shaped, soldering tip 1.0 mm, chisel-shaped, cleaning sponge, sponge container.



Part No.	Power rating W	9156	Soldering tip temperature °C	Weight g
0011	25–130	72.86 (933)	max. 580	121

Solder Wires

Design: Solder wire S 321, S-Pb60Sn40. Flux residues should be removed after soldering, if possible. Fluxing agent according to DIN 29454-1 2.1.2.A.

Application: For soldering on metals, excluding aluminium, e.g. tins, brass cans, copper kettles/boilers, batteries etc., but not suitable for soldering applications in electric and electronic engineering.



Part No.	Design	9163 1	ø mm
0010	100-g-reel	1.60	2.0
0025	250-g-reel	3.94	2.0
0050	500-g-reel	7.36	2.0
		(939)	

Solder Wires

Design: Solder wire HS 10, S-Pb60Sn40, with activated resin fluxing agent, non-corrosive on non-ferrous metal, quick spread of solder, fluxing agent to DIN 29454-1 1.1.2.B.

Application: For soldering applications in electric and electronic engineering as well as electrical installation and automotive engineering, for soldering on copper, brass, silver as well as surfaces made of silver, cadmium, nickel and tin.



Part No.	Design	9166 1	ø mm
0010	100-g-reel	1.60	2.0
0025	250-g-reel	3.94	2.0
		(939)	

Solder Wires

Design: Solder wire HF 32, S-Sn60Pb38Cu2, with halide-free activated colophonium fluxing agent. The flux residues are transparent, dry, hard and non-corrosive. Fluxing agent to DIN EN 29454-1 1.1.3.B 3.5 % (percent in weight 3.5 ± 0.5 %).

Application: For soldering applications in electronic and electric engineering, communications engineering and miniature technics.



Part No.	Design	9169 1	ø mm
0010	100-g-reel	1.98	1.0
0025	250-g-reel	4.54	1.0
		(939)	

Fittings Solder Wires

Application: For soldering of cold and hot water installations, radiators up to 110 °C, heating oil lines, in food industry, for refrigeration and air-conditioning technology.

9173 **Design:** Solid, DVGW GW 2, to DIN 29453, S-Sn97Cu3.

9116 **Design:** Quality soft solder, S-Sn97Cu3, melting range 230–250 °C, can be used with solder paste ROSOL 3.



9173 9116

Part No.	Design	9173 1	9116 ROTHENBERGER	ø mm
0025	250-g-reel	5.43	–	3.0
0040	250-g-reel	–	4.99	3.0
		(939)	(592)	

Solder Pastes

Application: For soldering of cold and hot water installations, radiators up to 110 °C, heating oil lines, in food industry, for refrigeration and air-conditioning technology.

9176 **Design:** S-Sn97Cu3, to DIN EN 29453, DVGW no. FL 019 and DIN 29454-1 3.31.1.C, DVGW GW 7 2.1.2, class 8, 5c, grain size 75 µm, metal content: 60 %.

9116 **Design:** Quality soft solder agent, metal content: S-Sn97Cu3, can only be used with fittings solder 3.



9176 9116

Part No.	Design	9176 1	9116 ROTHENBERGER
0025	250-g-bottle	12.92	–
0030	250-g-bottle	–	7.94
		(939)	(592)

Tin Solders

Design: Tin content: 40 %, three-square rods, approx. 250 g, to DIN EN 29453, extruded.

Part No.	Dimensions approx. mm	9180 1	Weight per rod
0010	11 x 440	2.53 (939)	approx. 250 g



Solder Pastes

Design: To DIN EN 29454-1 3.1.1.C.

Application: For the soft soldering of tinplate and lead-plated sheet metal, for tin-plating copper and brass, not suitable for use in electric or electronic engineering (contains zinc chloride, irritating).

Part No.	Design	9183 1
0005	50-g-tin	0.75
0010	100-g-tin	1.11 (939)



Soldering Pastes

Design: To DIN EN 29454-1 3.1.1.C, for fittings solder 97.

Application: For the soft soldering of copper tube installations and general soldering work (contains zinc chloride, irritating), class 8, 65 c.

Part No.	Design	9186 1
0007	70-ml-tube	1.54 (939)



Soldering Fluids

Design: To DIN EN 39454-1 3.1.1.A.

Application: For the soft soldering of iron, steel, copper, brass as well as general soldering work (contains zinc chloride, irritating).

Part No.	Design	9189 1
0005	50-ml-bottle	1.30
0500	0.5-l-bottle	4.39 (939)



Brushes for Soldering Fluid

Design: Flat, tinplate, natural bristles.

Application: For applying solder paste, welding paste, hydrochloric acid, drilling or grinding oil, soap suds etc.

Part No.	Width mm	9192 1
0010	25	0.22 (939)



Soldering Stones

Application: For cleaning soldering tips, in tin.

Part No.	Dimensions mm	9195 1
0020	100 x 45 x 20	2.08 (939)



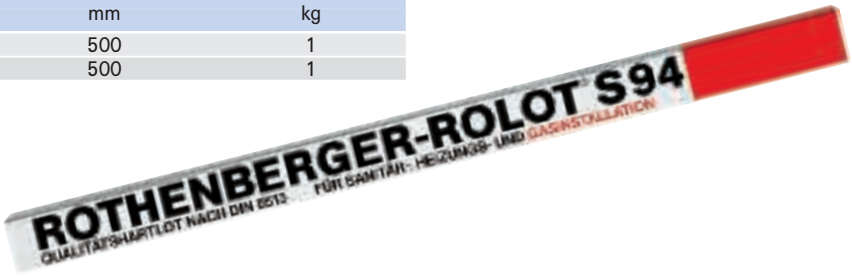
Brazing Solders ROLOT® S 94

ROTHENBERGER

Design: High-quality brazing solder **to DIN 8513,** standard solder for normally stressed copper tube installations, in particular capillar soldered joints in case of copper tube installations without fitting, in 1 kg cardboard box.

Application: Solderable materials: Copper, red bronze, brass, bronze. Fluxing agent for brass, red bronze, bronze with LP 5.

Part No.	Square	9116 ROTHENBERGER	Length	PU
	mm	kg	mm	kg
0020	2 x 2	12.87	500	1
0025	3 x 3	12.56	500	1
		(592)		



Silver Fillers for Brazing

Design: 45 % silver content, to DIN 8513, L-Ag45Sn, DVGW GW2 3.2 + 4.3.2.

Application: For copper, cold and hot water installations and gas installation, operating temperature 670 °C. 25 rods/8g each, in one tube.

Part No.	Dimensions ∅	9198	PU
	mm	Bar	
0015	1.5 x 500	3.43	25
		(939)	



Cleaning Pads ROVLIES®

ROTHENBERGER

Design: Metal-free, solvent-resistant, elastic, for wet and dry use, removes oxide layers, corrosion as well as dirt.

Application: For quick, mark-free cleaning of soldering joints on copper tubes according to DVGW.

Part No.	Design	9917 ROTHENBERGER
0010	1 package includes 10 pads	1.68
		(592)



Flame Protection Mats

ROTHENBERGER

Design: Protection up to 1,000 °C against soldering flame and welding heat, melting point is 840 °C when the operating flame is directly asserted, asbestos-free, very flexible, good formability.

Part No.	Dimensions mm	9119 ROTHENBERGER
0010	330 x 500	22.87
		(592)



Welding Accessories

Gas Lighters

Design: Zinc-plated steel, to DIN 3017.

Part No.	Design	9199
0005	Gas lighter with flat file	1.42
0010	Gas lighter with roller file	1.49
0015	Spark metals for gas lighter (PU 50 pieces)	8.29
		(942)



Pole Screw Clamps

Design: For connecting earth cable, cast iron, with wing screw.

Part No.	Jaw projection mm	9245	Load up to A
0005	80	6.36	400
0010	80	8.53	600
		(945)	



Earth Terminals

Part No.	Design	9234
0040	400 ampere with brass tape	2.52
0060	600 ampere with copper netting	2.73
		(942)



Welding Tongs

Design: Standard design, top and bottom part made of brass, insulation made of Duroplast.

Part No.	Load up to A	9231
0020	200	4.09
0030	300	5.17
0040	400	6.06
0060	600	7.68
		(942)



Earth Cable Sets

Design: Length 5 m, including earth terminal and plug.

Part No.	Load up to A	9233	Cable mm^2	Plug for cable mm^2
0005	200	14.08	16	10–25
0010	200	21.04	25	10–25
0015	200	22.23	25	35–50
0020	400	38.32	35	35–50
		(942)		



Welding Cable Sets

Design: Length 5 m, including welding tongs and plug.

Part No.	Load up to A	9235	Cable mm^2	Plug for cable mm^2
0005	200	16.35	16	10–25
0010	200	23.30	25	10–25
0015	200	24.50	25	35–50
0020	400	35.67	35	35–50
		(942)		



Welder's Hammers

Design: All-steel, with circular tube.

Part No.	Weight g	9237
0010	approx. 400	2.20
		(945)



Welder's Shields Optrel Solarmatic Comfort®

Design: Automatic shade protection from DIN 4 to DIN 9–13, manual continuous adjustment between DIN 9 and 13 using outside potentiometer rotary knob, water-proof according to IP 67, exception: potentiometer. Total weight 480 g.

Switching time from dark to light: 0.4 ms at room temperature
0.1 ms at 55 °C

With opening time regulator: Switching time dark-light, selection among "slow" 0.3–0.6 s and "fast" 0.1–0.35 s, powered by solar cells, no change of battery required.

Part No.	9206
0005	234.27
	(946)

IP 67

optrel



Accessories

Design: For optrel welder's shield.

Part No.	Design	9206	PU
0010	Front lens, outside	19.03	10
0015	Protective lens, inside	5.74	5
0020	Sweatband, cotton, with Velcro	6.14	2
		(946)	

Magnetic Welding Mirrors

Design: With rectangular steel mirror, nickel-plated, 80 x 70 x 1.0 mm, high-performance magnetic clamp, with screwed soft iron pole shoes: **Adherence 40 kp.** Pole shoes with V-block pole face on one side for tubes and curvatures, plane pole face on the other side for flat surfaces. Due to flexible spiral holder and self-clamping ball bearing it can be adjusted in any position with only one hand.

Part No.	9225
0010	6.29
	(945)



Hand Welding Mirrors

Design: With rectangular steel mirror, nickel-plated, 80 x 70 x 1.0 mm, steel wire handle chromium-plated. Total length 470 mm.
Can be adjusted in any position due to self-clamping ball pivot.

Part No.	9228
0010	2.75
	(945)



Spare Mirrors

Design: For magnetic welding mirror and hand welding mirror.

Part No.	9228
0020	0.56
	(945)



Hand Riveters

Hand Riveters NTH

Design: Aluminium die casting, with opening spring.
Operating range: Aluminium up to ⌀ 5 mm.

Part No.	Length mm	9304	Working stroke mm
0005	260	11.01 (960)	8



Hand Riveters NTS

Design: With opening spring and 4 different nose pieces, operating range: Aluminium up to ⌀ 5 mm, stainless steel up to 4 mm ⌀.

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Part No.	Length mm	9305 GESIPA	Working stroke mm
0005	275	22.49 (960)	8



Hand Riveters NTX

Design: With spring for automatic pin ejection, high-quality die-cast aluminium, forged steel handle, narrow head enables working in confined spaces. Operating range: Aluminium up to 5 mm ⌀, stainless steel up to 4 mm ⌀.

format professional quality

Part No.	Length mm	9300	Working stroke mm
0005	260	31.86 (961)	8



Hand Riveters Flipper

Design: Robust, sturdy hand riveter with collecting box, single-handed operation, requires 40 % less force. Operating range: aluminium up to 5 mm ⌀, stainless steel up to 4 mm ⌀.

format professional quality

Part No.	Length mm	9306	Working stroke mm
0005	212	33.84 (961)	16.2



Hand Riveters – Nietboy

Design: Hand riveter NTS and aluminium/steel blind rivets 4 x 6, 4 x 8 and 4 x 12 mm, 1 helix drill and washers, 1 wrench, size 10, in practical case.

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Part No.	9302 GESIPA	
0005	29.09 (960)	



Blind Rivet Boxes

Design: Hand riveter NTX and aluminium/steel blind rivet. 12 blind rivet dimensions: 3 x 5, 3 x 7, 3 x 8, 3 x 10, 3 x 12, 4 x 5. 4 x 6, 4 x 8, 4 x 10 and 4 x 12 mm, copper/steel blind rivet 3 x 6 and 4 x 6 mm, in steel-plated lidded box.

format professional quality

Part No.	9303	
0005	87.06 (961)	



Lever Riveting Tools HN 2

Design: For operating ranges up to ⌀ 6.4 mm for any material, low effort due to lever transmission, mandrel collecting box.

Tipping: Nose pieces 16/29, 16/32, 16/36, 16/40, 16/45.

Nose piece table:

Rivet ⌀	Materials	Nose piece
3 and 3.2	Aluminium, Cu, stainless steel, Stinox	16/24
4	Aluminium, Cu	16/24
4	Steel, Cap aluminium, Cu	16/27
4	Stainless steel, Stinox	16/29
5 and 4.8	Aluminium, Cap aluminium and Cu	16/29
5 and 4.8	Steel	16/32
5 and 4.8	Stainless steel Stinox	16/36
6	Aluminium	16/36
6	Steel	16/40
6.4	Aluminium, steel	16/45

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Part No.	Length mm	9309 GESIPA	Working stroke mm
0005	570	132.38 (960)	10

Riveting Tools SN 2

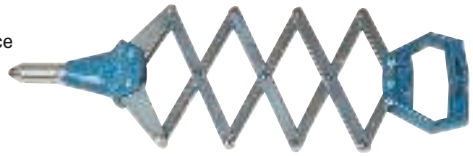
Design: Operating range up to ⌀ 6.4 mm for all materials.

Tipping: Nose pieces 16/29, 16/32, 16/36, 16/45, 1 installation wrench.

Nose piece table:

Rivet ⌀	Materials	Nose piece
3 and 3.2	Aluminium, Cu, steel, stainless steel, Stinox	16/24
4	Aluminium, Cu	16/24
4	Steel, CAP aluminium, Cu	16/27
4	Stainless steel, Stinox	16/29
5 and 4.8	Aluminium, CAP aluminium and Cu	16/29
5 and 4.8	Steel	16/32
5 and 4.8	Stainless steel, Stinox	16/36
6	Aluminium	16/36
6	Steel	16/40
6.4	Aluminium, steel	16/45

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Part No.	Working stroke mm	9312 GESIPA	Length opened mm	Length closed mm
0005	11	136.01 (960)	832	294

Pneumatic-hydraulic Riveting Tools PH 2

Design: Operating range up to ⌀ 5 mm for all materials, quick sequence of operations due to quick-ventilating valve, low-noise pneumatics, operating pressure 6 bar, hose connection 1/4" (⌀ 6 mm).

Tipping: Nose piece 16/24, 16/27, 16/29, 16/32, 16/36, 1 set of jaws, 1 collecting box, 1 installation wrench.

Nose piece table:

Rivet ⌀	Materials	Nose piece
2.4	Aluminium	16/18
3.2	CAP aluminium and Cu	16/18
3 and 3.2	Aluminium, Cu, steel, stainless steel, Stinox	16/23
4	Aluminium, Cu	16/23
4	Steel, CAP aluminium	16/27
4	Stainless steel, Stinox	16/29
5 and 4.8	Aluminium, CAP aluminium and Cu	16/29
5 and 4.8	Steel	16/32
5	Stainless steel, Stinox	16/36



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Part No.	Working stroke mm	9315 GESIPA	Air consumption l per rivet	Setting force N
0005	15	441.97 (963)	1.2–1.8	8850

Riveting Tools TAURUS 2 – Pneumatic-hydraulic

Design: Operating range up to ⌀ 5 mm for all materials and aluminium up to ⌀ 6 mm, stroke set for quick sequence of strokes, removable mandrel collecting box with integrated protection, holders for different nose pieces in the bottom, hose connection 1/4" (⌀ 6 mm).

Tipping: Nose piece 17/27, 17/29, 17/32, 17/36, 1 installation wrench each: size 12/14 and 14/17, 1 bottle of hydraulic oil 100 ml, 1 oil refill container.

Nose piece table:

Rivet ⌀	Materials	Nose piece
2.4	Aluminium	17/18
3.2	CAP aluminium, CAP Cu	17/18
3 and 3.2	Aluminium, Cu, steel, stainless steel, Stinox	17/24
4	Aluminium, Cu, CAP aluminium, CAP Cu	17/24
4	Steel, aluminium/aluminium, PG aluminium	17/27
4	Stainless steel, Stinox, PG steel	17/29
5 and 4.8	Aluminium, CAP aluminium and Cu, PG aluminium	17/29
5 and 4.8	Steel, aluminium/aluminium	17/32
5 and 4.8	Stainless steel, Stinox, PG steel	17/36
6	Steel	17/40
6.4	Aluminium	17/40
6.5	Steel, aluminium/aluminium	17/45
8	Aluminium 17/45	



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Part No.	Working stroke mm	9316 GESIPA	Air consumption l per rivet	Setting force N
0005	18	615.23 (963)	2.3	9000

Blind Riveting Tools TAURUS 3 – Pneumatic-hydraulic

Design: Operating range up to ⌀ 6.4 mm for all materials, aligned working stroke for quick sequence of operations, removable mandrel collecting box with integrated protection, holders for different nose pieces in the bottom, hose connection 1/4" (⌀ 6 mm).

Tipping: Nose piece 17/36, 17/40, 17/45, 1 installation wrench each: size 12/14 and 14/17, 1 bottle of hydraulic oil 100 ml, 1 oil refill container.

Nose piece table:

Rivet ⌀	Materials	Nose piece
2.4	Aluminium	17/18
3.2	CAP aluminium, CAP Cu	17/18
3 and 3.2	Aluminium, Cu, steel, stainless steel, Stinox	17/24
4	Aluminium, Cu, CAP aluminium, CAP Cu	17/24
4	Steel, aluminium/aluminium, PG aluminium	17/27
4	Stainless steel, Stinox, PG steel	17/29
5 and 4.8	Aluminium, CAP aluminium and Cu, PG aluminium	17/29
5 and 4.8	Steel, aluminium/ aluminium	17/32
5 and 4.8	Stainless steel, Stinox, PG steel	17/36
6	Aluminium	17/36
6	Steel	17/40
6.4	Aluminium	17/40
6.5	Steel, aluminium/aluminium	17/45
8	Aluminium	17/45



Part No.	Working stroke mm	9317 GESIPA	Air consumption l per rivet	Setting force N
0005	25	882.67 (963)	4.8	14000

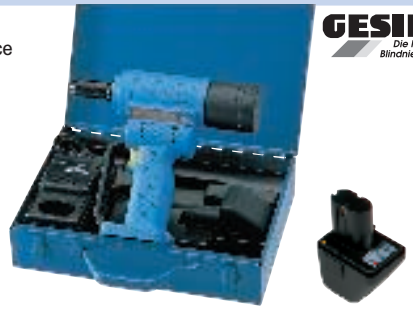
Battery-operated Riveting Tools AccuBird®

Design: Operating range up to ⌀ 5 mm for all materials, balanced position of gravity centre for low-fatigue operation, immediate resetting after riveting operation, compact, shock-proof housing for all applications. Weight 2.2 kg.

Tipping: Nose pieces 17/24, 17/27, 17/29, 17/32, 1 installation wrench, 1 quick-change battery 12 v–1.7 Ah, 1 fast battery recharger 12 v, **in sheet steel case**.

Nose piece table:

Rivet ⌀	Materials Piece/Charging	Nose piece
2.4	Aluminium 1,900	17/18
3 and 3.2	Aluminium 1,300	17/24
3 and 3.2	Steel 1,100	17/24
3 and 3.2	Stainless steel 1,000	17/24
4	Aluminium 1,000	17/24
4	Steel 900	17/27
4	Stainless steel 800	17/29
4.8 and 5	Aluminium 700	17/29
4.8 and 5	Steel 500	17/32
4.8 and 5	Stainless steel 400	17/36



Part No.	Working stroke mm	9320 GESIPA	Setting force N
0005	20	578.28 (964)	8500

Spare Batteries

Design: Quick-change rechargeable battery for riveting tool AccuBird®, 12 v–1.7 Ah.

Part No.	9321 GESIPA
0006	100.94 (966)

Battery-operated Riveters Power Bird®

Design: Operating range up to ⌀ 6.4 mm for all materials, balanced position of gravity centre for low-fatigue operation, immediate resetting after riveting operation, compact, shock-proof housing for all applications. Weight 2.2 kg.

Tipping: Nose pieces 17/32, 17/36, 17/40, 17/45, 1 installation wrench, 1 quick-change battery 12 v–2.0 Ah, 1 fast battery recharger 12 v, **in sheet steel case**.

Nose piece table:

Rivet ⌀	Steel Piece/Charging	Nose piece
4.8 and 5	Aluminium 420	17/32
4.8 and 5	Stainless steel 400	17/36
6	Steel 220	17/40
6.4	Aluminium 300	17/45
6.4	Steel 180	17/45



Part No.	Working stroke mm	9318 GESIPA	Setting force N
0005	20	700.92 (964)	13000

Spare Batteries

Design: Quick-change battery for riveter Power Bird®, 12 v–2.0 Ah.

Part No.	9319 GESIPA
0005	109.12 (966)

Quick Recharger

Part No.	9322 GESIPA
0005	87.90 (966)

Design: Quick recharging device for AccuBird®, PowerBird® and FireBird®. Input voltage: 230 v/ 50 Hz. Recharging time approx. 1 h (complete recharge). Weight: 1.4 kg.



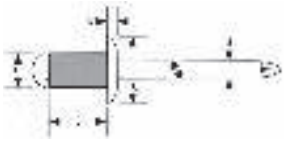
Blind Rivets – Aluminium/Steel Standard, Flat, Round Head

Material: Hollow rivet aluminium Alu AlMg 3, mandrel: galvanised steel.

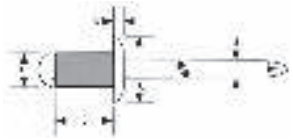
Hollow rivet: Alu AlMg 3 | Mandrel: Galvanised steel

Part No.	Rivet shank D_1 x L mm	9323 ‰ format	9324 ‰ GESIPA	Material thickness mm	PU
0305	3 x 5	14.49	–	1.5– 2.5	500
0306	3 x 6	14.68	–	2.5– 3.5	500
0307	3 x 7	15.03	–	3.5– 4.5	500
0308	3 x 8	16.52	–	4.5– 5.0	500
0310	3 x 10	18.02	–	5.0– 7.0	500
0312	3 x 12	20.18	–	7.0– 9.0	500
0314	3 x 14	–	24.53	9.0–11.0	500
0316	3 x 16	–	28.46	11.0–13.0	500
3206	3.2 x 6	–	16.35	1.5– 3.5	500
3208	3.2 x 8	–	18.24	3.5– 5.0	500
3210	3.2 x 10	–	19.50	5.0– 7.0	500
3212	3.2 x 12	–	22.80	7.0– 9.0	500
3214	3.2 x 14	–	25.80	9.0–11.0	500
3216	3.2 x 16	–	30.19	11.0–13.0	500
0405	4 x 5	–	18.24	0.5– 1.5	500
0406	4 x 6	16.84	–	1.5– 3.0	500
0407	4 x 7	17.51	–	3.0– 4.0	500
0408	4 x 8	18.20	–	4.0– 5.0	500
0410	4 x 10	20.52	–	5.0– 6.5	500
0412	4 x 12	23.68	–	6.5– 8.5	500
0414	4 x 14	–	14.07	8.5–10.5	500
0416	4 x 16	29.70	–	10.5–12.5	500
		(965)	(962)		

Part No.	Rivet shank D_1 x L mm	9323 ‰ format	9324 ‰ GESIPA	Material thickness mm	PU
0418	4 x 18	30.35	–	12.5–14.5	500
0420	4 x 20	–	37.11	14.5–16.5	500
0425	4 x 25	–	45.13	16.5–21.5	500
4808	4.8 x 8	–	26.89	2.5– 4.5	500
4810	4.8 x 10	–	28.29	4.5– 6.0	500
4812	4.8 x 12	–	32.07	6.0– 8.0	500
4814	4.8 x 14	–	35.07	8.0–10.0	500
4816	4.8 x 16	–	39.47	10.0–12.0	500
4818	4.8 x 18	–	47.33	12.0–14.0	500
4820	4.8 x 22	–	53.46	14.0–15.0	250
4825	4.8 x 25	–	58.97	15.0–20.0	250
0508	5 x 8	26.02	–	2.5– 4.5	500
0510	5 x 10	27.37	–	4.5– 6.0	500
0512	5 x 12	29.70	–	6.0– 8.0	500
0514	5 x 14	32.53	–	8.0–10.0	500
0516	5 x 16	–	39.80	10.0–12.0	500
0518	5 x 18	–	48.28	12.0–14.0	500
0520	5 x 20	–	54.40	14.0–15.0	250
0525	5 x 25	–	61.02	15.0–20.0	250
0530	5 x 30	–	69.97	20.0–25.0	100
0535	5 x 35	–	81.74	25.0–30.0	100
		(965)	(962)		



9323 format professional quality



9324

Blind Rivets Aluminium/Steel, Countersunk Head

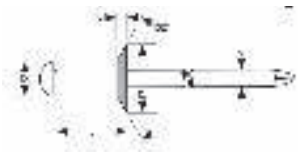
Material: Hollow rivet aluminium AlMg 3, mandrel: galvanised steel.

Hollow rivet: Alu AlMg 3 | Mandrel: Galvanised steel

GESIPA® Die Profis der Blindniettechnik

Part No.	Rivet shank D_1 x L mm	9325 ‰ GESIPA	Material thickness mm	PU
0408	4 x 8	20.14	3.0–5.0	500
0410	4 x 10	22.80	5.0–6.5	500
		(962)		

Part No.	Rivet shank D_1 x L mm	9325 ‰ GESIPA	Material thickness mm	PU
0412	4 x 12	25.47	6.5–8.5	500
		(962)		



PolyGrip® Multi-purpose Blind Rivets – Aluminium/Steel, Standard Flat, Round Head

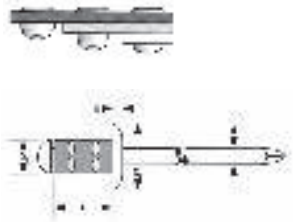
Material: Hollow rivet aluminium AlMg 2.5, mandrel: galvanised steel.

Hollow rivet: Alu AlMg 2,5 | Mandrel: Galvanised steel

GESIPA® Die Profis der Blindniettechnik

Part No.	Rivet shank D_1 x L mm	9327 ‰ GESIPA	Material thickness mm	PU
3208	3.2 x 8	19.35	0.5–5.0	1000
3295	3.2 x 9.5	20.44	1.5–6.5	1000
3211	3.2 x 11	22.64	3.0–8.0	1000
0410	4 x 10	23.76	0.5–6.5	500
0413	4 x 13	28.29	3.5–9.5	500
		(962)		

Part No.	Rivet shank D_1 x L mm	9327 ‰ GESIPA	Material thickness mm	PU
0417	4 x 17	34.90	7.0–13.0	500
4810	4.8 x 10	30.19	0.5– 6.5	500
4815	4.8 x 15	39.62	4.5–11.0	500
4817	4.8 x 17	44.97	6.5–13.0	500
4825	4.8 x 25	62.26	11.0–19.5	250
		(962)		



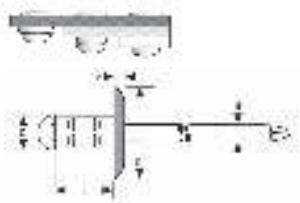
PolyGrip® Multi-purpose Blind Rivets – Aluminium/Steel, Large Head

Material: Hollow rivet aluminium AlMg 2.5, mandrel: galvanised steel.

Hollow rivet: Alu AlMg 2,5 | Mandrel: Galvanised steel

Part No.	Rivet shank D_1 x L mm	9329 ‰ GESIPA	Material thickness mm	PU
0410	4 x 10	35.70	0.5–6.5	500
4810	4.8 x 10	44.65	0.5–6.5	250
		(962)		

Part No.	Rivet shank D_1 x L mm	9329 ‰ GESIPA	Material thickness mm	PU
4815	4.8 x 15	54.71	4.5–11.0	250
4817	4.8 x 17	57.53	6.5–13.0	250
		(962)		



CAP Blind Rivets Aluminium/Steel, Standard, Air/Water-tight

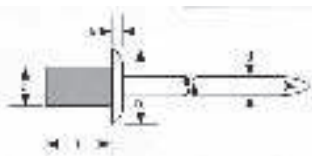
Material: Hollow rivet aluminium AlMg 5, mandrel: steel-phosphate finish.

Hollow rivet: Alu AlMg 5 | Mandrel: Steel-phosphate

GESIPA® Die Profis der Blindniettechnik

Part No.	Rivet shank D_1 x L mm	9330 ‰ GESIPA	Material thickness mm	PU
3265	3.2 x 6.5	27.99	0.5–2.0	500
3208	3.2 x 8	28.29	2.0–3.5	500
3295	3.2 x 9.5	28.46	3.5–5.0	500
0408	4 x 8	33.96	0.5–3.5	500
0495	4 x 9.5	34.90	3.5–5.0	500
0411	4 x 11	37.58	5.0–6.5	500
		(962)		

Part No.	Rivet shank D_1 x L mm	9330 ‰ GESIPA	Material thickness mm	PU
0412	4 x 12.5	38.99	6.5–8.0	500
4895	4.8 x 9.5	40.10	3.5–5.0	500
4811	4.8 x 11	40.88	5.0–6.5	500
4812	4.8 x 12.5	41.37	6.5–8.0	500
4814	4.8 x 14	44.50	8.0–9.5	500
		(962)		



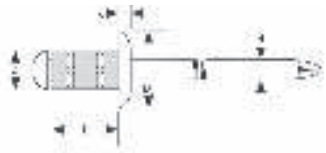
PolyGrip® Multi-purpose Blind Rivets – Aluminium/Nirosta, Standard Flat, Round Head

Material: Hollow rivet aluminium AlMg 2.5, mandrel: Nirosta.

Hollow rivet: Alu AlMg 2,5 | Mandrel: Stainless steel A2

GESIPA® Die Profis der Blindniettechnik





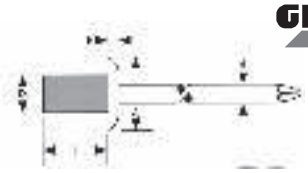
Part No.	Rivet shank D_1 x L mm	9331 ‰ GESIPA	Material thickness mm	PU
0410	4 x 10	39.80	0.5– 6.5	500
0413	4 x 13	45.76	3.5– 9.5	500
4810	4.8 x 10	59.28	0.5– 6.5	500
4815	4.8 x 15	67.46	4.5–11	500
		(962)		

CAP Blind Rivets Aluminium/Nirosta, Standard, Air/Water-tight

Material: Hollow rivet aluminium AlMg 5, mandrel: Nirosta.

Hollow rivet: Alu AlMg 5 | Mandrel: Nirosta

GESIPA® Die Profis der Blindniettechnik



Part No.	Rivet shank D_1 x L mm	9332 ‰ GESIPA	Material thickness mm	PU
3265	3.2 x 6.5	45.90	0.5–2.0	500
3208	3.2 x 8	47.33	2.0–3.5	500
3295	3.2 x 9.5	48.28	3.5–5.0	500
0408	4 x 8	64.46	0.5–3.5	500
0495	4 x 9.5	66.20	3.5–5.0	500
0411	4 x 11	67.46	5.0–6.5	500
0412	4 x 12.5	67.92	6.5–8.0	500
4895	4.8 x 9.5	74.06	3.5–5.0	500
		(962)		

Part No.	Rivet shank D_1 x L mm	9332 ‰ GESIPA	Material thickness mm	PU
4811	4.8 x 11	78.75	5.0–6.5	500
4812	4.8 x 12.5	81.29	6.5–8.0	500
		(962)		

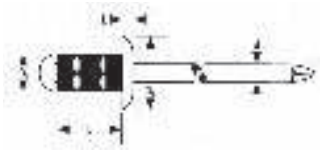
PolyGrip® Multi-purpose Blind Rivets – Steel/Steel, Standard Flat, Round Head

Material: Hollow rivet, mandrel: galvanised steel.

Hollow rivet: Galvanized steel | Mandrel: Galvanised steel

GESIPA® Die Profis der Blindniettechnik





Part No.	Rivet shank D_1 x L mm	9333 ‰ GESIPA	Material thickness mm	PU
0410	4 x 10	36.64	1.0– 6.5	500
0413	4 x 13	45.45	4.5– 9.0	500
0417	4 x 17	60.39	8.5–13.0	500
4815	4.8 x 15	58.02	6.0–11.0	500
		(962)		

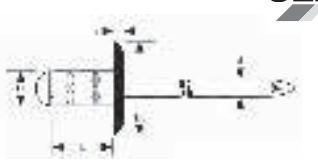
PolyGrip® Multi-purpose Blind Rivets – Steel/Steel, Large Head

Material: Hollow rivet: galvanised steel, mandrel: galvanised steel.

Hollow rivet: Galvanized steel | Mandrel: Galvanised steel

GESIPA® Die Profis der Blindniettechnik



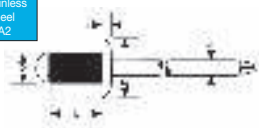


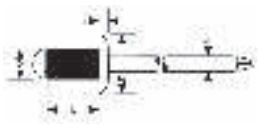
Part No.	Rivet shank D_1 x L mm	9334 ‰ GESIPA	Material thickness mm	PU
0413	4 x 13	54.54	4.5–9.0	500
		(962)		

Blind Rivets Stainless Steel A2, Standard, Flat, Round Head

Material: Hollow rivet: stainless steel A2, mandrel: stainless steel A2.

Hollow rivet: Stainless steel A2 | Mandrel: Stainless steel A2





9326 format professional quality EDELSTAHL Rostfrei

9335 GESIPA® Die Profis der Blindniettechnik EDELSTAHL Rostfrei

Part No.	Rivet shank D_1 x L mm	9326 ‰	9335 ‰ GESIPA	Material thickness mm	PU
0306	3 x 6	–	55.99	1.0– 3.0	500
0308	3 x 8	–	61.65	3.0– 5.0	500
0310	3 x 10	–	70.62	5.0– 6.5	500
0312	3 x 12	–	90.25	6.5– 8.5	500
3206	3.2 x 6	–	57.23	1.0– 3.0	500
3208	3.2 x 8	–	63.05	3.0– 5.0	500
3210	3.2 x 10	–	72.64	5.0– 6.5	500
0406	4 x 6	71.39	–	1.0– 2.5	500
0408	4 x 8	80.06	–	2.5– 4.5	500
0410	4 x 10	88.58	–	4.5– 6.5	500
0412	4 x 12	97.07	–	6.5– 8.5	500
0414	4 x 14	–	113.07	8.5–10.5	500
0416	4 x 16	–	126.57	10.5–12.0	500
0420	4 x 20	–	157.86	12.0–16.0	500
0425	4 x 25	–	197.96	16.0–21.0	500
4808	4.8 x 8	–	124.20	2.0– 4.0	500
4810	4.8 x 10	–	131.92	4.0– 6.0	500
		(965)	(962)		

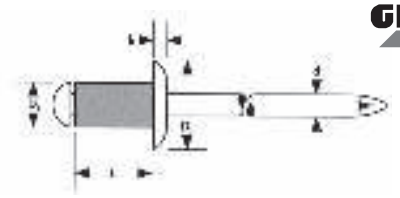
Part No.	Rivet shank D_1 x L mm	9326 ‰	9335 ‰ GESIPA	Material thickness mm	PU
4812	4.8 x 12	–	145.29	6.0– 8.0	500
4814	4.8 x 14	–	154.07	8.0– 9.5	500
0508	5 x 8	–	128.46	2.0– 4.0	500
0510	5 x 10	–	136.16	4.0– 6.0	500
0512	5 x 12	–	147.79	6.0– 8.0	500
0514	5 x 14	–	156.28	8.0– 9.5	500
0516	5 x 16	–	164.62	9.5–11.0	500
0520	5 x 20	–	193.07	11.0–15.0	250
0525	5 x 25	–	226.09	15.0–20.0	250
0530	5 x 30	–	256.28	20.0–25.0	100
		(965)	(962)		

Blind Rivets – Copper/Bronze, Standard, Flat, Round Head

Material: Hollow rivet: copper, mandrel: bronze.

Part No.	Rivet shank D_1 x L mm	9336 ‰ GESIPA	Material thickness mm	PU
0308	3 x 8	45.45 (962)	3.0–5.0	500

Hollow rivet: Copper | Mandrel: Bronze



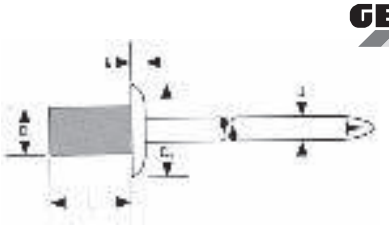
GESIPA® Die Profis der Blindniettechnik

CAP Blind Rivets Copper/Nirosta, Standard, Air/Water-tight

Material: Hollow rivet: Cu alloy, mandrel: stainless steel.

Part No.	Rivet shank D_1 x L mm	9337 ‰ GESIPA	Material thickness mm	PU
3206	3.2 x 6	62.74	0.5–1.5	500
3275	3.2 x 7.5	65.41 (962)	1.5–3.0	500

Hollow rivet: Cu alloy | Mandrel: Stainless steel



GESIPA® Die Profis der Blindniettechnik

Blind Rivet Nut Sets GBM 10

Design: Convenient stroke adjustment through knurled nut with stroke scale. Exchange of thread mandrels possible without tool. Uses blind rivet nuts up to M 6 aluminium, M 5 steel, brass and stainless steel. Supplied including thread mandrel M 5.

Part No.	Design	9338 GESIPA	Length mm
0010	Blind rivet nut tool M 5	47.17 (967)	260
0105	Spare thread mandrel M 5	6.60 (966)	–
0106	Spare thread mandrel M 6	6.60 (966)	–
0205	Spare nose piece M 5	4.88 (966)	–
0206	Spare nose piece M 6	4.88 (966)	–

GESIPA® Die Profis der Blindniettechnik



Blind Rivet Nut Tools GBM 30

Design: Convenient stroke adjustment through knurled nut with stroke scale. With quick-twist feature for speedy screwing and releasing of the thread mandrel. Exchange of thread mandrels possible without tool. Uses blind rivet nuts from M 5 to M 10 steel, brass and stainless steel.

Part No.	Design	9339 GESIPA	Length mm
0010	Blind rivet nut tool M 5	216.51 (967)	470
0015	Blind rivet nut tool M 6	216.51 (967)	470
0020	Blind rivet nut tool M 8	216.51 (967)	470
0025	Blind rivet nut tool M 10	216.51 (967)	470
0105	Spare thread mandrel M 5	23.43 (966)	–
0106	Spare thread mandrel M 6	23.43 (966)	–
0108	Spare thread mandrel M 8	23.43 (966)	–
0110	Spare thread mandrel M 10	23.43 (966)	–
0205	Spare nose piece M 5	14.16 (966)	–
0206	Spare nose piece M 6	14.16 (966)	–
0208	Spare nose piece M 8	14.16 (966)	–
0210	Spare nose piece M 10	14.16 (966)	–

GESIPA® Die Profis der Blindniettechnik

Blind Rivet Nut Sets

Design: Blind rivet nut set for craftsmen, workshops, locksmiths etc.

Content: Various blind rivet nuts, dimensions M 4–M 6, aluminium alloy for material thickness 0.25–3 mm, 1 hand riveter GBM 10 with mandrel and nose piece M 5, additional mandrels and nose pieces M 4 and M 6.

Part No.	9328 GESIPA
0500	98.59 (967)

GESIPA® Die Profis der Blindniettechnik



Blind Rivet Nut Sets, Battery-operated

Blind Rivet Nut Tools FireBird® – Battery-operated

Design: Electric-mechanical fitting tool for blind rivet nuts. For use with blind rivet nuts from M 3 to M 10 aluminium and from M 3 to M 8 steel.

Scope of supply: 1 thread mandrel and nose piece of each size: M 4, M 5, M 6; 1 quick-recharging battery 12 v; 1 quick recharger 12 v, **in sheet steel case.**

Part No.	Setting force N	9340 GESIPA
0005	13000	801.39 (964)

Spare rechargeable battery see 9319, quick recharger see 9322.



Blind Rivet Nuts Aluminium

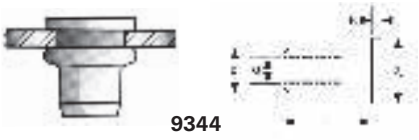
Material: AlMg 3.

9344 **Design:** Standard, flat, round head.

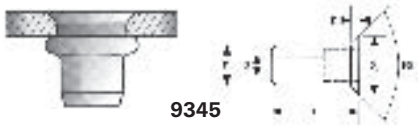
9345 **Design:** Countersunk, 90°.

Alu AlMg 3

Part No.	Internal thread	9344 ‰ GESIPA	9345 ‰ GESIPA	Rivet shank D_1 x L mm 9344	Rivet shank D_1 x L mm 9345	Hole ø mm	For material thickness mm 9344	For material thickness mm 9345	PU
0030	M 5 x 0.8	59.75	64.94	7 x 11.5	7 x 13.5	7.1	0.25–3.0	1.5–4.0	500
0050	M 6 x 1.0	96.87	103.14	9 x 15.5	9 x 17	9.1	0.25–3.5	1.5–4.5	250
0065	M 8 x 1.25	125.47 (968)	134.12 (968)	11 x 17	11 x 18.5	11.1	0.25–3.5	1.5–4.5	100



9344



9345

Blind Rivets Steel

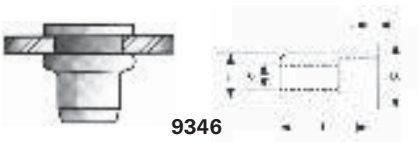
Material: Steel, galvanised and yellow chromated.

9346 **Design:** Standard, flat, round head.

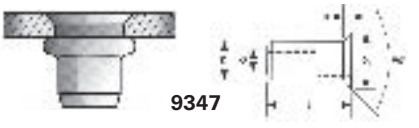
9347 **Design:** Countersunk head, 90°.

Galvanised steel and yellow chromatised

Part No.	Internal thread	9346 ‰ GESIPA	9347 ‰ GESIPA	Rivet shank D_1 x L mm 9346	Rivet shank D_1 x L mm 9347	Hole ø mm	For material thickness mm 9346	For material thickness mm 9347	PU
0030	M 5 x 0.8	111.48	114.94	7 x 11.5	7 x 13.5	7.1	0.25–3.0	1.5–4.0	500
0050	M 6 x 1.0	158.18	160.37	9 x 15.5	9 x 17	9.1	0.25–3.5	1.5–4.5	250
0065	M 8 x 1.25	210.05 (968)	201.56 (968)	11 x 17	11 x 18.5	11.1	0.25–3.5	1.5–4.5	100



9346



9347

Coolant Hose Sets 1/4“

Design: Flexible line system made of high-quality granular polymer. The system is compatible with other systems. Set contents:
2 segment hoses (10 joint pieces) 150 mm (part no. 9600 0006)
1 flat nozzle, width 24 mm (part no. 9600 0026)
3 round nozzles ø 1.6; 3.2; 6.4 mm (part no. 9600 0011, 0016 and 0021)
2 nipples R 1/8“ and 1/4“ (part no. 9600 0036 and 0041)

Application: For cooling workpieces and tools on all machine tools, e.g. drilling, milling, turning, grinding, eroding etc.



Part No.	Design	9600
0002	8 pcs.	6.49 (991)

Components and Additional Parts

Part No.	Description	9600 Package	Package	Dimensions	
0006	Segment hose (10 joint pieces)	5.32	2 pcs.	150 mm	
0011	Round nozzles	3.54	4 pcs.	ø 1.6 mm	
0016	Round nozzles	3.54	4 pcs.	ø 3.2 mm	
0021	Round nozzles	3.54	4 pcs.	ø 6.4 mm	
0026	Flat nozzles	5.28	2 pcs.	Width 24 mm	
0031	Flat nozzles	5.37	2 pcs.	Width 30 mm	
0036	Nipples	3.54	4 pcs.	R 1/8“	
0041	Nipples	3.54	4 pcs.	R 1/4“	
0046	Y fittings	5.28	2 pcs.	1/4“	
0051	Stop valves for segment hose	8.72	2 pcs.	1/4“	
0056	Stop valves with male thread	8.72	2 pcs.	1/4“	
0061	Stop valves with female thread	8.72	2 pcs.	1/4“	
0066	Non-return valves	8.72	2 pcs.	1/4“	
0071	Elbow connections	4.92	2 pcs.	1/4“	
0076	T pieces	5.66	2 pcs.	1/4“	
0081	Installation pliers	9.95	1 pcs.	1/4“	

(991)

Coolant Hose Sets 1/2“

Design: Flexible line system made of high-quality granular polymer. Compatible with other systems. Set contents:
2 segment hoses (6 joint pieces each) 140 mm (part no. 9605 0006)
1 flat nozzle width 32 mm (part no. 9605 0026)
3 round nozzles ø 6.4; 9.5; 12.7 mm (part no. 9605 0011, 0016 and 0021)
2 nipples R 3/8“ and 1/2“ (part no. 9605 0041 und 0046)

Application: For cooling workpieces and tools on all machine tools, e.g. drilling, milling, turning, grinding, eroding etc.



Part No.	Contents	9605 Set
0002	8 pcs.	7.31 (991)

Components and Additional Parts

Part No.	Description	9605 Package	Package	Dimensions	
0006	Segment hose (6 joint pieces)	6.22	2 pcs.	140 mm	
0011	Round nozzles	3.86	4 pcs.	ø 6.4 mm	
0016	Round nozzles	3.86	4 pcs.	ø 9.5 mm	
0021	Round nozzles	3.86	4 pcs.	ø 12.7 mm	
0026	Flat nozzles	5.97	2 pcs.	Width 32 mm	
0031	Flat nozzles	6.70	2 pcs.	Width 40 mm	
0036	Flat nozzles	6.00	2 pcs.	Width 60 mm	
0041	Nipples	3.86	4 pcs.	R 3/8“	
0046	Nipples	3.86	4 pcs.	R 1/2“	
0051	Y fittings (reducers)	5.97	2 pcs.	1/2“ to 2 x 1/4“	
0056	Y fittings	5.97	2 pcs.	1/2“	
0061	Reducers	4.17	2 pcs.	1/2“ to 1/4“	
0066	Stop valve for segment hose	10.99	2 pcs.	1/2“	
0071	Stop valve with male thread	10.99	2 pcs.	1/2“	
0076	Stop valve with female thread	10.99	2 pcs.	1/2“	
0081	Elbow connections	5.66	2 pcs.	1/2“	
0086	T pieces	6.36	2 pcs.	1/2“	
0091	Installation pliers	9.95	1 pcs.	1/2“	

(991)

Chip Hooks

Design: With conical mandrel, tip bent by 90° and shield.

Application: For removing long chips. The large protective shield prevents injuries of the hand.

Part No.	Length mm	9608
0301	300	11.35
0501	500	12.30
		(991)



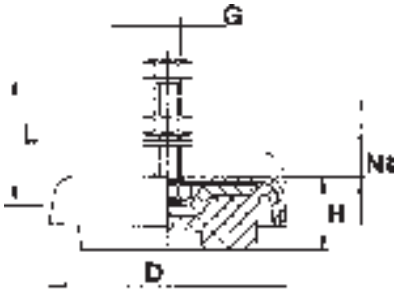
Machine Bearing Elements Level-Mount®

Design: The high-quality elastomer body made of unvulcanized rubber dampens oscillations, impacts and structure-borne noise, interfering effects on machine or surroundings are reduced or eliminated; trouble-free operation, convenient assembly, integrated height adjustment, maintenance-free, oil- and ageing-resistant.

Application: For flexible and anchorage-free installation of machines, equipment and aggregates.

Selection references: Determine type of machine, number of fixing points = number of elements, determine load per element (machine weight: fixing points), compare screw size with location hole, selection of elements according to table below.

Part No.	Type LM	9650 EFFBE
0600	1-11	17.46
2000	3-33	33.50
4000	5-55	49.62
5500	6-66	89.81
8000	7-77	148.30
		(986)





Type LM		1-11	3-33	5-55	6-66	7-77
Diameter	D	80 mm	120 mm	160 mm	185 mm	228 mm
Height	H	25 mm	32 mm	35 mm	39 mm	54 mm
Thread diameter	G	M 10	M 12	M 16 x 1.5	M 20 x 1.5	M 24 x 1.5
Standard screw length	L	80 mm	90 mm	100 mm	120 mm	140 mm
Levelling height	Ni	15 mm	20 mm	20 mm	20 mm	20 mm
Max. machine base thickness		43 mm	44 mm	44 mm	58 mm	70 mm
Weight		0.4 kg	1.1 kg	2.2 kg	4.0 kg	8.0 kg
Presses general (up to 100 strokes/minute)		450	1000	2000	3500	6500
Turning lathes		220	420	1000	2000	3000
Milling machines		300	600	1500	2800	3600
Surface grinding machines		220	420	1000	2000	3000
Machines general		480	1200	3000	4000	7200
Max. static load		600 kg	2000 kg	4000 kg	5500 kg	8000 kg

The loads indicated in the table are standard values determined on the basis of high stability and anchorage-free installation of machines.

High-pressure Grease Guns

Design: Steel, surface-finished, with pointed and hollow nose piece, thread M 10 x 1, suitable for oil and grease, with extractable tube.

Part No.	Set contents ml	9540
0080	80	3.75
0150	150	4.94
0300	300	5.82
		(983)



Hand-Lever Grease Guns

Design: DIN 1283. Heavy-duty industrial design, lacquered steel tube press unit, painted, grease is emitted each time the hand-lever is opened. Separable press enables easy cleaning, can be filled with loose grease, grease cartridges or filling devices.

Nominal capacity: 500 g, internal container dimensions (D x L): 54 x 235 mm, supply thread: M 10 x 1, compatible cartridge capacity: 400 g in accordance with DIN 1284, dispensing rate: approx. 1.2 ccm at 400 bar counter pressure.

Part No.	Design	9543
0005	No accessories	8.94
		(982)



Hand-Lever Grease Gun Sets

Design: DIN 1283, lacquered steel cylinder press unit, separable press enables easy cleaning, can be filled with loose grease, grease cartridge or filling devices.

Nominal capacity: 500 g, internal container dimensions (D x L): 54 x 235 mm, supply thread M 10 x 1, compatible cartridge capacity: 400 g in accordance with DIN 1284, dispensing rate: approx. 1.2 ccm at 400 bar counter-pressure.

Part No.	Set contents	9546
0005	Grease gun/reinforced hose/ hydraulic nose piece	11.74
		(982)



Accessories for Format Hand-Lever Grease Guns



9549 0010



9549 0015



9549 0020



9549 0030



9549 0005 + 9549 0008



9549 0025

Part No.	Design	9549
0005	Reinforced hose M 10 x 1, 300 mm (no end piece), bursting pressure 850 bar, DIN 1283	2.67
0008	Reinforced hose M 10 x 1, 500 mm (without mouth piece), bursting pressure 850 bar, DIN 1283	2.78
0010	Hydraulic gripper jaws M 10 x 1	0.90
0015	Push-fit coupler M 10 x 1 for flat lubricating nipple 16 mm	2.28
0020	Push-fit coupler M 10 x 1 for flat lubricating nipple 22 mm	7.42
0025	Pipe nozzle M 10 x 1, curved, with hollow end	0.93
0030	Pipe nozzle M 10 x 1, curved, with pointed end	0.85
		(982)

Pocket Tool Oilers



Design: Bottle made of oil-, petrol- and acid-resistant polyethylene, brass spray tube with turn-lock fastener at the tip.

Part No.	Set contents ml	9551
0010	50	1.90 (983)

Plastic Oilers



Design: Bottle made of oil-, petrol- and acid-resistant polyethylene, brass spray tube with turn-lock fastener at the tip, telescopic.

Part No.	Set contents ml	9553
0125	125	1.53
0250	250	1.65
0500	500	1.61 (983)

Force-Feed Oilers



Design: Container made from die-cast zinc. Oiling is possible in any position due to dual-action metal pump. Oil is applied in drops by gently raising the lever.

Part No.	Set contents ml	9552	Dimensions	Pipe length mm	Overall height mm
0001	500	11.54	1	165	325
0002	300	10.46	2	165	300
0003	200	10.04 (982)	3	135	245

Force-Feed Oilers



Design: Container made from oil and fracture-resistant polythene. Single action brass pressure pump. Oil is applied in drops by gently raising the lever.

Part No.	Set contents ml	9555	Dimensions	Pipe length mm	Overall height mm
0001	500	6.82	1	165	330
0002	300	5.56	2	165	300
0003	200	4.91 (982)	3	135	245

Liquid Atomisers



Design: Container made from die-cast zinc. Oiling is possible in any position due to dual-action metal pump.

Part No.	Set contents ml	9558	Dimensions
0001	500	13.26	1
0002	300	12.11	2
0003	200	11.54 (982)	3

Professional Atomisers



Design: For chemicals, detergents, solvents and cleaning agents, polyethylene bottle.

Part No.	Set contents ml	9561
0750	750	4.36 (983)

Oil Cans

Design: Tinplate, with hinged cover and captive tube plug, sturdy carrying handle, double-flared bottom and welded seam, high stability.



Part No.	Set contents l	9564
0003	3	13.28
0005	5	13.97
0010	10	14.44
		(983)

Measuring Cups Plastic

Design: Oil- and acid-resistant polyethylene, fracture-proof, high stability, with spout and graduation.



Part No.	Set contents l	9567
0010	1	2.79
0020	2	3.17
		(983)

Plastic Petrol Cans

Design: Sturdy and shock-proof can made of red polyethylene (HDPE) with FLA. The flexible spout made of polypropylene (PP) with integrated ventilation is maintained at the can. The cap is fixed by means of a strap.
TÜV approved, with UN/BAM homologation.
Supplied with spout 195 mm x ⌀ 20 mm.

Application: For all types of liquid fuels.



Part No.	Set contents l	9565	Dimensions mm	Weight empty g
0005	5	3.99	331 x 185 x 237	640
0010	10	6.89	329 x 195 x 319	820
0020	20	11.57	385 x 229 x 410	1270
		(983)		

Measuring Cups Tinplate

Design: Tinplate, high stability, with high overflow edge for safe pouring.

9568 **Design:** Rigid spout, calibratable.

9569 **Design:** Flexible spout, not calibratable.



9568



9569

Part No.	Set contents l	9568	9569
0005	0.5	3.46	–
0010	1	4.25	6.99
0020	2	5.37	7.55
		(983)	(983)

Funnels

Design: Oil- and acid-resistant polyethylene, fracture-proof.



Part No.	Diameter mm	9570	Set contents l
0050	50	0.36	0.05
0075	75	0.38	0.09
0100	100	0.42	0.25
0120	120	0.48	0.27
0150	150	0.82	0.7
		(983)	

* with high edge and changeable sieve.

Part No.	Diameter mm	9570	Set contents l
0160	160*	2.34	1.3
0200	200*	1.90	2.9
0250	250*	2.91	3.2
0260	Set including one funnel each of 50, 75, 100, 120	1.30	–
		(983)	

Plastic Funnels

Design: Oil- and acid-resistant polyethylene, with changeable sieve, fracture-proof, high overflow edge.

9579 **Design:** Suitable for cars with catalytic converter, with flexible spout.

9580 **Design:** Tube tip can be cut off, tube bent.



9579



9580

Part No.	Diameter mm	9579	9580	Set contents l
0160	160	2.27	5.36	1.3
		(983)	(983)	

Funnels

Design: Tinplate, high edge, convenient handle, changeable sieve, air grooves.

Part No.	Diameter mm	9573	Set contents l
0160	160	3.50	1.2
0200	200	6.02	3.2
		(983)	



PRESSOL

Flexible Spouts

Design: Oil-, petrol- and acid-resistant metal, for polyethylene and metal funnels.

Part No.	Length mm	9576
0300	300	2.93
		(983)



PRESSOL

Fill-up Devices

Design: Cover can be pushed up enabling look inside the bucket. The filling connection is inclined allowing easy filling of grease guns with inclined nipple.

Application: For filling lever grease guns and compressed air grease guns.

Part No.	Suitable for bucket approx. kg	9582	For bucket inside mm	For max. bucket height mm
0005	5	57.82	180–210	380
0010	10	60.68	210–240	380
0015	15	62.11	240–270	380
0025	25	80.64	310–335	550
0050	50	84.93	365–385	550
		(990)		

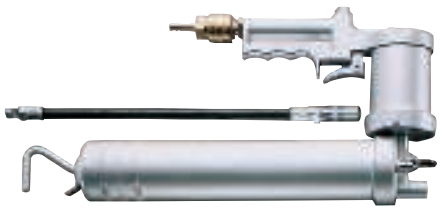


PRESSOL

Compressed Air Grease Guns

Design: With reinforced hose and 4-jaw nose piece. Pressure transmission 1:50, supply pressure 2–8 bar, recommended operating pressure 6 bar, can be filled up using fill-up device, cartridge or loose grease, with suspension eye and nipple. Connection thread M 10 x 1.

Part No.	Quantity per stroke cm^3	9585	Set contents cm^3
0500	0.8	30.64	500
		(990)	



PRESSOL

Greasing Devices

Design: With hand pump, length 530 mm, removable one-hand gun, piston and hose 1.5 m, one-hand gun 125 ccm with nozzle tube, 4-jaw nose piece with ball valve, operating pressure 260 bar, max. pressure 520 bar, quantity per hub 0.4 ccm, connection thread M 10 x 1.

Part No.	Suitable for bucket approx. kg	9588	For bucket inside mm	For max. bucket height mm
0005	5	87.77	180–210	380
0010	10	91.36	210–240	380
0015	15	92.07	240–270	380
		(990)		



PRESSOL

Compressed Air Greasing Devices

Design: Mobile with cart, air motor and pump, pressure transmission 50:1, 360° hinged grease gun, nozzle tube and nose piece, 2 m high-pressure hose and piston. 6 mm compressed air hose connection.

Part No.	Suitable for bucket approx. kg	9591	For bucket inside mm	For max. bucket height mm
0010	10	508.72 ◊	210–240	380
0015	15	527.12 ◊	240–270	380
0025	25	605.32 ◊	310–335	640
		(990)		

Technical Data:

For compressors: 80 l/min and more

Recommended air pressure: 6 bar

Lubricants: Consistency up to class 2 according to NLGI and low temperatures recommended

Max. quantity: 1,100 g/min



Hand Marking Punches

Design: Standard font, superb quality, supplied as a set in plastic box.

Application: For marking and labelling workpieces.

9720 **Number punches in sets 0–9.**

9721 **Letter punches in sets A–Z (capital letters).**

Part No.	Digit punches Font size mm	9720 Set	9721 Set
0002	2	3.57	10.71
0003	3	3.71	11.14
0004	4	3.95	11.88
0005	5	4.46	13.36
0006	6	4.77	14.33
0008	8	6.58	19.73
0010	10	8.76	26.29
		(988)	(988)



9720



9721

Engraving Devices "Vibroscript"

Design: Maintenance-free and double-insulated, 230 v/50 Hz. Power input 9 W, short operation 10 min., engraving tool oscillation 6,000/min. The engraving depth can be adjusted to the material hardness using the locking screw. Supplied with cable and carbide engraving tool. Use of the diamond point is recommended for hard materials or large-sized engraving (not included in the scope of supply).

Application: For engraving iron, steel, non-ferrous metals, stone, ceramics, glass, wood etc.

Part No.	Description	9724
0005	Engraving device complete	70.75
0010	Carbide engraving tool	5.51
0015	Diamond point	56.60
0020	Spare cable, 2 m	5.51
		(989)



Label Markers DYMO LP 250

Design: Hand-held device with ABC keyboard. Depending on the tape width, the marking device can print two lines, horizontally and vertically. 4 different fonts: Arial narrow, normal, broad and big with 2 different, automatically set character sizes. 5 framing options, underlining function for highlighting the text. 5 different type faces including normal, italic, contour, shadow, mirror, vertical and bold type.
The LP 250 is either operated by 6 AA batteries or by the optional mains adapter.
Supplied without batteries and without mains adapter.

Specification: Tape width (mm) 6, 9, 12 D1 tapes, no. of lines 1–2, characters in display 13, no. of font heights 2, max. font height (mm) 3.9/5.5, no. of frames yes, background shading yes, background pattern no, label storage yes, consecutive numbering yes, label length adjustable yes, several copies yes, bar code no, euro converter no, change of section no.



Part No.	9729
0010	51.53 (992)

Marking Devices DYMO LM 450

Design: Table-top unit with DYMO LM 450 keyboard. Easy operation, automatic tape cutting and tightening. Semi-graphical display with 16 memory spaces and with graphic symbols on the glass. Numerous fonts, 10 personal favourites, 10 last saved labels, 10 memory spaces. Integrated RACE function, PC connection. Supplied without batteries and without mains adapter.

Specification: Tape widths (mm) 6, 9, 12, 19, 24 D1 tapes, no. of lines 1–5, characters in display 2 x 16, no. of font heights 5, no. of number of font types 5, max. font height (mm) 13.5, no. of frames 6, background shading yes, background pattern yes, label storage 10, consecutive numbering yes, label length adjustable yes, several copies yes, bar codes yes, date/time yes, PC connection yes USB, mirror writing yes, tape cut automatic.



Part No.	9734
0010	130.21 (992)

DYMO Adapters

Design: For LP 250 and LM 450.



Part No.	9733
0005	23.67 (992)

DYMO D1 Tapes

Design: Tape cartridges with self-adhesive tape for label makers.
Tape length 7 m.

9735 Tape width 12 mm.
9738 Tape width 19 mm.
9741 Tape width 24 mm.



Part No.	Design	9735	9738	9741
0005	Tape black on transparent	11.55	–	–
0010	Tape blue on transparent	11.55	–	–
0015	Tape red on transparent	11.55	–	–
0020	Tape black on white	12.13	15.42	16.94
0025	Tape blue on white	12.13	–	–
0030	Tape red on white	12.13	–	–
0035	Tape black on blue	12.13	–	–
0040	Tape black on red	12.13	–	–
0045	Tape black on yellow	12.13	–	–
0050	Tape black on green	12.13 (992)	– (992)	– (992)

Marking Devices, Pencil, Chalk

Tool Tags

Design: Brass, punched, edge with bead-shaped engraving, without inscription.

Part No.	Size ∅ mm	9755
0005	27	0.45 (996)

Other materials, shapes and sizes as well as inscription available on request.



Carpenter's Pencils

Design: Oval, red polished, not sharpened.

LYRA

Part No.	Length mm	9758 LYRA
0180	180	0.53
0240	240	0.62
0300	300	0.78 (996)



Chalk Sleeves

Design: Octagonal housing, with push mechanics, for chalks of 12 mm ∅.

LYRA

Part No.	9759 LYRA
0005	5.66 (996)



Forester's and Signing Chalk

Design: Hexagonal, wrapped in paper, for wood, iron, rubber, cardboard, stone, textiles.

LYRA

Part No.	Colour	9761 LYRA Dozen	Dimensions mm	PU
0006	Yellow	5.39	120 x 12	12
0011	Red	5.39	120 x 12	12
0016	Blue	5.39	120 x 12	12
0021	White	5.39 (996)	120 x 12	12



Blackboard Chalk

Design: White, wrapped in paper.

LYRA

Part No.	Colour	9764 LYRA Dozen	Dimensions mm	PU
0005	White	0.70 (996)	90 x 12	12



Chalk for Industrial Applications

Design: White, not wrapped in paper, not sharpened. For wood, steel, cast iron and rough surfaces, easy to remove.

LYRA

Part No.	Colour	9767 LYRA Box	Dimensions mm	PU
0006	White	10.38 (996)	100 x 20	100

Marking Devices, Pencil, Chalk

Soapstone Chalk

Design: Fire-resistant, for glowing iron, sheet metal and steel.

Part No.	Dimensions mm	9770 LYRA Box	PU
0006	100 x 10	7.86 (996)	50



Felt Tip Pencils

Design: For smooth and porous surfaces, difficult to remove, water-proof, refillable, aluminium housing.

Part No.	Colour	9773 LYRA	Line width approx. mm
0005	Black	0.77	2–6
0010	Red	0.77	2–6
0015	Blue	0.77 (996)	2–6



Felt Tip Pencils Grosso

Design: For smooth and porous surfaces, difficult to remove, water-proof, refillable, aluminium housing.

Part No.	Colour	9775 LYRA	Line width approx. mm
0005	Black	2.43	4–12
0010	Red	2.43	4–12
0015	Blue	2.43 (996)	4–12



Deco Pens

Design: Pen for varnished surface finishes, alcohol-based. Perfect for smooth surfaces such as glass, china, enamelled and plastic surfaces.

Part No.	Colour	9776 LYRA
0005	Black	1.49 (996)



Marking Pastes

Design: Marking paste, permanent, in tube.

Part No.	Colour	9774 LYRA	Set contents ml
0005	White	2.27	50
0010	Red	2.27	50
0015	Yellow	2.27 (996)	50



Zinc Spray

Design: TÜV-approved, zinc primer for metallic surfaces.

Technical specification: 99 % pure zinc, heat-resistant up to 490 °C, salt-water resistant tested according to DIN 50 021 and DIN 53 167. Colour: grey, high pigment content, 90 % zinc in dry film, quick-drying, can be covered with a paint layer, conductive, suitable for spot welding.

Application: Suitable for exhaust pipes, air intake fittings, pipe bends, heat exchangers, auto repair and car body construction.
For repairing damaged hot-galvanised parts, welds, steel construction, steel structures, steel doors, crash barriers, smoke explorers and thermally stressed parts.

Part No.	Design	9778 E-COLL	PU
1400	400-ml spray can	3.50 (980)	12



Zinc Aluminium Spray

Design: Offers premium corrosion protection for all metallic surfaces, economical use, quick-drying, can be painted without the need for further primer. Versatile use due to resistant, flexible protective film, non-greasing, conductive and can be welded.

Technical specification: Heat resistant up to approx. +500 °C. Best results at room temperature (above 16 °C). Silvery luster, dust-dry at 20 °C in 15 minutes.

Application: Long-term protection for plain and electro-plated iron, for rework on zinc-coated parts and for coatings of welded and drilled areas.

Part No.	Design	9780 E-COLL	PU
1400	400-ml spray can	3.38 (980)	12



Zinc Powder Paint

Design: Double protection against corrosion, adheres on metal, is waterproof and anti-corrosive. The zinc content provides cathodic corrosion protection for the metal surface, while the resin film offers extra protection. Dilution with conventional synthetic thinner, nitro thinner or universal diluting agent.

Technical specification: Zinc powder paint E-COLL contains approx. 95 % zinc and approx. 5 % resin.

Application: Suitable for car body construction, for repairing damaged zinc-plated parts, for coating drilled and welded areas. Can be used as conductive intermediate layer in spot welding, as primer for water and weather-stressed equipment and for the protection of steel structures, pipelines, ships, steel construction, steel structures, oil rigs, sea containers etc.

Part No.	Design	9782 E-COLL	PU
1800	800-g can	7.05 (980)	12



Aluminium Spray

Design: Heat-resistant corrosion protection.

Technical specification: Heat resistant up to approx. +800 °C. Contains 99.5 % pure aluminium. Colour: Silvery luster, light, chromium effect, dust-dry at 20 °C in 10 minutes.

Application: For car wheel rims, exhaust pipes, truck superstructures. For air-condition systems, heating systems, turbines, pipes, containers and to ensure that the colour is identical with the fresh zinc-coating after the zinc spray is applied.

Part No.	Design	9784 E-COLL	PU
1400	400-ml spray can	2.97 (980)	12



Parting Agents for Welding Applications

Primer Spray

Design: Long-term corrosion protection. Optimal protection against rust, economical, quick-drying.

Technical specification: With non-hazardous pigments. Colour: grey.

Application: For metal, wood, plastic and after welding.

Part No.	Design	9788 E-COLL	PU
1400	400-ml spray can	4.40 (980)	12



Anti-splatter Spray

Design: Prevents sticking and baking on gas nozzles and on the surface of the workpiece. Workpieces can be varnished, electro-plated, burnished and anodised without any problems.

Technical Specification: Silicium-free. Colour: transparent.

Application: Protects weld nozzles and has a parting effect in arc welding and electric welding.

Part No.	Design	9792 E-COLL	PU
1400	400-ml spray can	1.57 (980)	12



Silicone Spray

Design: For automotive, household, workshop and leisure equipment. Develops an extremely solid oil, slip and protective film. Protects against humidity and rust. Universally used: greases, protects, impregnates. Eliminates jamming, creaking, sticking.

Technical specification: Temperature-resistant -50 °C to +250 °C. New: Solvent-free!

Application: Release agent for plastics technology, all thermoplastics and thermoset plastics, rubber (except for silicone rubber), for arc welding and electrode welding: Release and slip agent for the paper, wood, printing and packaging industry, plastic foam and textile industry, assembly aid. Service and care product in automotive applications.

Part No.	Design	9794 E-COLL	PU
1400	400-ml spray can	1.86 (980)	12



Rust Removers

Design: After spraying and short interaction, it releases rusted screws, bolts, nuts and machine parts. Prevents new rust development and protects against wear.

Technical specification: With especially developed combination of solid particles and lubricant on molybdenum-sulphide basis and selected basic substances. Temperature resistance: -30 °C to +50 °C.

Application: Good penetration behaviour, excellent releasing feature, e.g. of screws, bolts, chain links, joints, levers, springs, valves, hinges or locks. Prevents the development of new rust, reduces wear, also suitable for cylindrical locks.

Part No.	Design	9798 E-COLL	PU
1300	400-ml spray can	2.02 (980)	12



Leakage Detectors

Design: Leakage test device for pressurised systems. For detecting leakage in gas and compressed air systems, with special anti-corrosion effect. Suitable for compressed air, coolants, acetylene, butane, natural gas, carbon dioxide, oxygen, propane gas, town gas, nitrogen, hydrogen, ammonia.

Technical specification: Non-poisonous according to DIN-DVGW.

Application: For detecting leakages in pressurised pipes and containers, e.g. compressors, steel cylinders, fittings, shut-off valves, respiratory equipment, gas and arc welding equipment, Bunsen burners, valves, screwed connections, compress-air brakes etc.



Part No.	Design	9800 E-COLL	PU
1400	400-ml spray can	1.80 (980)	12

Atomizers

Design: Atomizer E-COLL with Viton seal and plastic nozzle.

Technical Specification: Feed capacity 1.5 ml each stroke, adjustable nozzle, 26.5 cm height, 11 cm wide.

Application: Suitable for light chemicals, solvents and cleaning agents, (particularly for brake cleaners) and forming oil.



Part No.	Design	9802 E-COLL
0005	1-l atomizer, empty	2.76 (980)

Atomizers

Design: Atomizer E-COLL with Viton seal and plastic nozzle.

Technical Specification: High-performance air pump for developing pressure. Precision brass nozzle, can be turned to all sides. Stable container with fill level reading. Safety valve to protect against overpressure. Height 34 cm, width 14.5 cm.

Application: Suitable for light chemicals, solvents and cleaning agents, (particularly for brake cleaners) and forming oil.



Part No.	Design	9804 E-COLL
0005	1.5-l atomiser, empty	21.23 (980)

Pressurised Adhesive Grease

Design: For lubricating friction and antifriction bearings also in mixed friction areas, to be used for all friction speeds that allow lubrication. Corrosion protection of friction parts, especially ropes. Outstanding corrosion protection against agressive water, gas and lyes.

Technical specification: Temperature resistance: -25 °C to +80 °C, protects against sea water and saline air, good chemical resistance.

Application: Open transmission gears, screws, hinges, antifriction bearings and water pumps, hydroturbines, lock gates, car wash plants, cylinder guides, thread spindles, worms in underwater equipment, offshore components, hoisting equipment, container and trailer lashing systems, yachts and components for shipyards.



Part No.	Design	9810 E-COLL	PU
1300	300-ml spray can	4.79 (980)	12

Multi-purpose Grease

Design: With colloide graphite. Universal grease. For lubricating friction and antifriction bearings also in mixed friction areas, to be used for all friction speeds that allow lubrication. Reduces friction and wear also at high loads. Protects bearing against damaging soiling. Anticorrosive, maintains lubricating effect also in sea water environments.

Technical Specification: With long-life ingredient combinations, also functioning in emergencies, lithium base saponification. Temperature resistance: -30 °C to +130 °C, resin-free, consistency graduation to DIN 51818: LGI class 2. Possible designation to DIN 51502: KLF2K-30.

Application: For agricultural machines, construction equipment, excavators, lorries, tractors, stone breakers, juggernauts etc., elevators, loading equipment, conveyor belts and water pumps.



Part No.	Design	9814 E-COLL	PU
1400	400-g cartridge	1.60 (980)	12

Multi-purpose Grease – Light

Design: Universal grease. For lubricating friction and antifriction bearings also in mixed friction areas, to be used for all friction speeds that allow lubrication.
Reduces friction and wear also at high loads. Protects bearing against damaging soiling. Anticorrosive, maintains lubricating effect also in sea water environments.

Technical Specification: With long-life ingredient combinations, lithium base saponification, liquifying point > 180 °C. Temperature resistance: -30 °C to +120 °C (for a short time max. +140 °C), consistency graduation to DIN 51818: LGI class 2. Possible designation to DIN 51502: KLF2K-30.

Application: Feed in conventional pipe cross sections of central lubrication systems possible, life-long lubrication of automotive bearings, suitable as car grease in construction and agricultural machinery, electric motor bearings, conveyor ball bearings and axle ball bearings of trains.



Part No.	Design	9816 E-COLL	PU
1400	400-g cartridge	1.57 (980)	12

Assembly Paste/Copper Paste

Design: For high temperatures. E-COLL assembly paste creates an effective lubricating anti-seizing film, protects against corrosion and rusty fits. Due to the high solid lubricant content, a copper graphite-coated surface is created when pressure is applied. This is a perfect protection against weld marks and wear.

Technical Specification: Offers best anti-seizing and releasing effects up to +1,100 °C, as well as wear protection. Made from neutral base substances, special additives and metal grind. On copper basis.

Application: For screws, bolts, nuts, for plug-in and bayonet connections which are exposed to extremely high temperatures; assembly lubrication of connections at combustion engines, flanged and screwed fittings, lubrication of wearing bushes, also in case of penetrating water.

Part No.	Design	9818 E-COLL	PU
0100	100-g tube	3.64 (980)	20



Special Vaseline

Design: White, highly purified, pharmaceutical, tacking vaseline.

Technical Specification: Acid-free, non-poisonous (DAB), good tacking behaviour. Liquifying point: approx. +55 °C, solidifying point: approx. -50 °C.

Application: As anti-seize agent, corrosion protection and skin care. For lubricating, preserving, sealing, insulating, as well as leather care.

Part No.	Design	9820 E-COLL	PU
1080	80-ml tube	1.60	12
1750	750-ml can	6.04 (980)	1



9820 1080



9820 1750

Lubrication Spray

Design: White, E-COLL lubrication spray is a universal lubricant for all areas of industry, as well as for maintenance and care in workshop, garage or household. Prevents wear, eliminates creaking. Corrosion protection.

Technical Specification: Temperature resistance: -25 °C to +120 °C.

Application: Conveyor ball bearings, electric motor bearings, axle ball bearings in trains, life-long lubrication of automotive bearings, suitable as car grease in construction and agricultural machinery, chains, drive wheels and door hinges etc.

Part No.	Design	9822 E-COLL	PU
1300	300-ml spray can	3.36 (980)	10



Teflon Spray

Design: Made of Teflon® DuPont®. Teflon spray is a solid-drying, permanent anti-seize, lubricating and slip agent on Teflon basis.

Technical Specification: Grease-free. Temperature resistance: -80 °C to +260 °C.

Application: For lubricating saw blades and threads, drawers and instruments, slides and conveyor systems. Highly effective parting agent in wood, plastic and rubber applications.

Part No.	Design	9824 E-COLL	PU
1400	400-ml spray can	4.18 (980)	12



Cutting Oil Spray

Design: For all-round use. Provides optimal cooling. Excellent cooling property, for long tool life, excellent greasing performance, high-quality surfaces, can be sprayed from any position, with less effort, effective under high loads, high cutting speed possible.

Technical Specification: Temperature resistance: up to +180 °C, free from chlorine and silicone.

Application: Drilling, nibbling, milling, sawing, lathing etc.

Part No.	Design	9829 E-COLL	PU
1005	400-ml spray can	3.80 (980)	12



Drilling Oil

Design: White, absolutely stable and homogenous emulsion. Non-sensitive to water hardness (calcification etc). Almost resistant to microbial infest. Physiologically harmless when used properly.

Technical Specification: EP emulsion with mineral oil content, chlorine-free.

Use of Concentrate: Milling: approx. 8 % (1 l of concentrate in 11 l of water), sawing, lathing, drilling: approx. 10 % (1 l of concentrate in 10 l of water), thread cutting: approx. 10 % (1 l of concentrate in 10 l of water), long tool life.

Application: Emulsifying for drilling, lathing, milling, sawing and thread cutting. Suitable for aluminium, non-ferrous metals and other alloys, cast iron and stainless steel.

Part No.	Design	9826 E-COLL	PU
1010	1-l bottle	5.39 (980)	20



High-performance Cooling Lubricant Concentrate

Design: Biologically stable. The concentrate is thoroughly stirred in the preparation bath and forms a very stable emulsion for easy handling. A long tool life and outstanding surface quality are obtained with this medium. In addition, good corrosion protection, long durability of the emulsion and non-irritant to skin.

Technical Specification: This cooling lubricant with mineral content is free of nitride and chlorine, as well as free of PCB and PCT combinations and bacteria. The concentrate reacts to alkaline.

Use of Concentrate: Milling: approx. 3 % (1 l of concentrate in 11 l of water), sawing, lathing, drilling: approx. 5 % (1 l of concentrate in 19 l of water), thread cutting: approx. 8 % (1 l of concentrate in 11 l of water), long tool life.

Application: For drilling, lathing, milling, sawing, grinding and thread cutting.

Part No.	Design	9828 E-COLL	PU
1015	5-l canister	26.15 (980)	1



Hand Refractometers/Brake Cleaner/Spirit

Hand Refractometers

Design: High-quality and easy-to-read measuring scale. Fitted with temperature compensation. Scope of supply: Protective wallet from imitation leather, pipette, microfibre cloth, adjusting tool and reference liquid.

Application: Quick control of emulsion concentration of coolants and lubricants. It is thereby possible to use the optimum concentration of liquids offering the following advantages:

1. Better utilisation of machine tools
2. Increased service life of tools
3. Avoidance of rust by emulsions with low concentration
4. Possibility to vary emulsion concentrations according to the requirements, also during operation. According to (TRGS-611).
5. Cost saving



Part No.	Measuring range %	9606
0011	0–32	155.76 (991)

Brake Cleaner

Design: Universally used cleaning agent, with degreasing effect due to special solvents. Removes even the toughest dirt thoroughly and gently. Dries quickly.

Technical Specification: Free from aromatic and halogenated hydrocarbons (CKW, FCKW). Free from acetone, butanol, ethylene acetate and similar. 98 % substance purity, contains CO_2 fuel gas.

Application: Cleaning of drum and disk brakes, brake pads, springs, jaws, couplings, linings, pressure plates and general coupling components, gears, carburettors, fuel pumps, engine components etc.



Part No.	Design	9832 E-COLL	PU
1500	500-ml spray can	1.71 (980)	10

Methylated Spirit

Design: Due to the high alcohol content, E-COLL methylated spirit is ideal for cleaning and degreasing, for diluting lacquers, can be used as solvent and defreezer.

Technical Specification: 94 % vol. alcohol ethyl alcohol, highly ignitable.

Application: For cleaning and degreasing of glass, plastics, chromium, rubber. For diluting spirit varnish, as defreezing agent in windscreen washer systems (1:2).



Part No.	Design	9836 E-COLL	PU
1010	1-l bottle	1.96 (980)	12

Lamp Oil/White Spirit/Hand Wash

Lamp Oil

Design: Very slowly evaporating cleaning agent. Also serves as corrosion protection for metals. For metal processing industry and car repair shops, for removing rust and removing preservation coatings. Oil to be used for metal treatment and as release agent for moulds and punched parts. Can be applied conventionally or sprayed.

Technical Specification: Mineral oil product, tax-privileged, must not be used as fuel, for heating or as lubricant.

Application: For removing oil and grease residue on motors, engines, gear boxes, machines and tar.

Part No.	Design	9842 E-COLL	PU
1010	1-l can	2.76 (980)	12



White Spirit

Design: Diluting and cleaning agent for paint shops and do-it-yourself. Perfectly suitable for cleaning parquet and linoleum floors and as cleaner for paint brushes etc. Suitable for thinning of oil paints, synthetic and other lacquers due to the slow evaporation. Can be used with a paint brush, in roll, dip and spray applications.

Technical Specifications: Mineral oil product, tax-privileged, must not be used as fuel, for heating or as lubricant.

Application: For cleaning paint brushes and paint rolls, etc., for removing dirt, grease and paint stains and for thinning lacquers, can be applied on wooden and tiled floors, glass and textiles.

Part No.	Design	9844 E-COLL	PU
1010	1-l can	2.75 (980)	12



Cream Hand Wash

Design: Phosphate-free cream hand wash for removing extreme dirt; for quick and gentle skin cleaning.

Technical Specification: Mild tenside and skin-care ingredients ensure gentle skin cleaning. With skin protective protein hydrolyzate, which protects the skin from drying out. Biodegradable, pH neutral, soap-free.

Application: For extreme dirt, also for removing substances such as fresh paints, tar, which cannot be removed with solvent-free hand cleaning agents.

Part No.	Design	9848 E-COLL	PU
1005	500-ml can	2.30	27
1010	1-l bottle	4.43 (980)	10



9848 1005



9848 1010

Pumps

Design: Pump for 1l bottle of cream hand wash and liquid hand soap E-COLL.

Part No.	9850
0005	6.45 (980)



Dispensers

Design: Dispensing system for Hand Wash Paste E-COLL.

Part No.	Design	9856
0010	Paste dispenser, plastic	34.10 (980)



Hand Wash Paste

Design: Sand-free hand wash paste with good cleaning results, refatting.

Technical Specification: Biologically non-hazardous, since phosphate-free and degradable. Combination of mild, gentle surfactants (detergents), skin care and organic exfoliates. The fine soft wood granulate, mostly in cubic form reduces clogging of drain pipes.

Application: Preferred for medium to extreme soiling caused by oil and pigment-based substances.

Part No.	Design	9854 E-COLL	PU
1005	500-ml box	0.89	27
1020	10-l bucket	9.06 (980)	1



9854 1005



9854 1020

Peltor Ear Muffs H 4 A 300

Design: Very lightweight and comfortable to wear. With its extremely flat ear cups, the H 4 A model can be used for a wide range of applications. Further, it can be conveniently combined with other protective gear. Weight: 130 g, (5.3 oz.), noise reduction: SNR value: 24 dB(A), sound level: high 31dB(A), medium 21dB(A), low 12 dB(A), SNR value: 24 dB(A).

Part No.	9875
0005	9.37
	(973)



Peltor Hearing Protectors Optime I H 510 A

Design: Stainless spring steel, soft cushioning – very comfortable even with permanent use. The appropriate protection in workshops, vocational colleges, printing shops, textile industry, lawn mowing etc. Sound level: high 32 dB(A), medium 25 dB(A), low 15 dB(A), SNR value: 27 dB(A). Weight: 180 g.

Part No.	Article	9870
0005	Hearing protector	10.65
0010	Hygiene kit	3.47
		(973)



Peltor Hearing Protectors Optime III H 540 A

Design: Double-casting hearing protector for extremely noisy environments. Optimal protection, while at the same time light-weight and comfortable to wear. It offers maximum high-frequency muffling. Sound level: high 40 dB(A), medium 32 dB(A), low 23 dB(A), SNR value: 35 dB(A). Weight: 285 g.

Part No.	9874
0005	15.87
	(973)



E.A.R. Hearing Protectors Flexicap

Design: Highly flexible and compatible. Can be worn in the neck, over the head or under the chin. Sound level: high 26 dB(A), medium 19 dB(A), low 17 dB(A), SNR value: 23 dB(A).

Part No.	PU Piece	9876
0005	10	4.18
		(973)



E.A.R. Hearing Protector Caps 200

Design: Hearing protector with strap and excellent wearing comfort. Sound level: high 27 dB(A), medium 19 dB(A), low 17 dB(A), SNR value: 23 dB(A).

Part No.	PU Piece	9880
0005	10	2.98
		(973)



Spare Plugs for Flexicap and Caps 200

Part No.	PU pair	9876
0010	10	1.26
		(973)

E.A.R. Plugs Ultrafit

Design: Ear plugs are made with a triple-flange design, with safety cord.
Features: Easy to clean and especially durable.
Sound level: high 33 dB(A), medium 28 dB(A), low 25 dB(A), SNR value: 32 dB(A).

Part No.	PU pair	9878
0005	50	1.23 (973)



E.A.R. Plugs Classic II

Design: In carton. Sound level: high 30 dB(A), medium 24 dB(A), low 22 dB(A), SNR value: 28 dB(A).

Part No.	PU pack	9882
0005	5 pairs per box	0.68 (973)



E.A.R. Plugs Classic II

Design: In dispenser box, 1 pair each. Sound level: high 30 dB(A), medium 24 dB(A), low 22 dB(A), SNR value: 28 dB(A).

Part No.	PU box	9884
0005	250 pairs per box	28.77 (973)



3M Dust Masks 8710E FF P1

Design: Without breath-out valve to protect against inert particles.
Not permitted for cancer-causing substances and micro organisms.
With stretchable straps for adapting to individual head sizes.

Part No.	PU carton	9886 3M
0005	20 pieces per carton	0.98 (974)



3M Dust Masks 8822 FF P2

Design: With Cool Flow breath-out valve to protect against solid particles or low-hazardous dust particles, to be used e.g. for cement grinding, cleaning of dovecotes etc.

Part No.	PU carton	9888 3M
0005	10 pieces per carton	2.58 (974)



3M Dust Masks 8825 FF P2 D

Design: With Cool Flow breath-out valve to protect against solid and liquid particles, e.g. smoke particles occurring in welding operations, quartz-containing dusts, excellent wearing comfort.

Part No.	PU carton	9890 3M
0005	5 pieces per carton	6.11 (974)



3M Dust Masks 8835 FF P3 D

Design: With Cool Flow breath-out valve to protect against toxic and highly toxic solid particles as well as aerosols, use in garbage incinerating plants, coking plants, foundries ets. Comfortable to wear.

Part No.	PU carton	9892 3M
0005	5 pieces per carton	7.03 (974)



3M Dust Masks 4255 FF A2 P3 D

Design: (EN 405) protection against gases and vapours of organic combinations and particles.

Application: Appropriate mask for paint spraying operations.

Part No.		9894 3M
0005		22.72 (974)



Dust Masks 7010/FF P1

Design: Without valve, for non-toxic and mildly toxic fine dust up to 4-fold the permitted limit (MAK value = Maximal workplace concentration).

Part No.	PU carton	9896
0005	20 pieces per carton	0.68 (975)



Dust Masks 7020/FF P2

Design: Without valve. For use when working with carcinogenic substances, e.g. oak and beech wood dust, mineral wool fibres or asbestos and smoke. Up to 10-fold the permitted limit value (MAK value = Maximum workplace concentration).

Part No.	PU carton	9898
0005	20 pieces per carton	0.74 (975)



Dust Masks 7021/FF P2 Valve

Design: With valve. For use when working with carcinogenic substances, e.g. oak and beech wood dust, mineral wool fibres or asbestos and smoke. Up to 10-fold the permitted limit value (MAK value = Maximum workplace concentration).

Part No.	PU carton	9900
0005	12 pieces per carton	1.18 (975)



Dust Masks 7031/FF P3 Valve

Design: With valve. The more toxic or carcinogenic a substance is, the lower is its limit value. To prevent that this value is exceeded, filters of this protection class are to be employed, up to 30-fold the limit value (MAK value = Maximum workplace concentration).

Part No.	PU carton	9902
0005	5 pieces per carton	3.65 (975)



Half Masks Polimask GAMMA

Design: With filter connection, special thread 95 mm, anatomically shaped mask made of soft, skin-friendly EPDM, adapts precisely to any face shape. Spectacle-adjusted breath outlet, novel 4-point straps for optimum weight distribution. Excellent fit, low-weight, comfortable due to short distance between filter and mask.



Part No.	9904
0005	21.30 (975)



Combination Filters 230 A1-P3

Design: Spare filter for half mask Polimask. Protects against organic gases and vapours, with a boiling point of over 65 °C and particle (P3).

Part No.	PU pack	9906
0005	2 pieces each pack	21.30 (975)

Dust Particle Filters 230 P3

Design: Spare filter for half mask Polimask. Protects against toxic and highly-toxic particles.

Part No.	PU pack	9908
0005	2 pieces each pack	12.54 (975)

Multi-purpose Combination Filters 230 A2B2E2K1-P3

Design: Spare filter for half mask Polimask. Protects against organic gases and vapours, with a boiling point of over 65 °C and anorganic gases and vapours, sulphur dioxide, ammonia gases and particles (P3).

Part No.	PU pack	9910
0005	1 piece each pack	15.22 (975)

Safety Goggles Pulsafe Millennia

Design: This curve 9 lens, so far exclusively used for sport safety goggles, is used for the first time for safety goggles. Orthoscopic and fatigue-free view and a very wide field of vision are characteristics that ensure durable use of the PULSAFE Millennia spectacles. Additional comfort is provided by the ergonomically designed side arms, which distribute the pressure required for a good fit to the sides of the face. Length adjustment of the side arms is therefore not needed. Polycarbonate lenses, anti-scratch coating, EN 166. Supplied with strap.

Part No.	Side arm colour	9912
0005	Black	4.72
0010	Blue	4.72
0015	Burgundy	4.72
		(976)



Single-lens Spectacles Targa, Transparent

Design: High-quality, sportive single-lens spectacles, EN 166, polycarbonate lens, anti-mist and scratch resistant, soft side arms, sportive design, ensure best fit. The side arms are three-fold height-adjustable, nylon frame.

Part No.	Side arm colour	9924
0005	Black	7.01
		(976)



Single-lens Spectacles Viper, Transparent

Design: High-quality, sportive single-lens spectacles, EN 166, anti-scratch polycarbonate lens, optimum fit. The side arms are three-fold height-adjustable.

Part No.	Side arm colour	9922
0005	Blue/black	5.13
		(976)



Safety Goggles Welding

Design: Safety goggles for welders with anti-mist and anti-scratch lens and good protection of eyes. Green-tinted lenses (protection class 5). Soft materials in the area of nose, front and temples offer very good wearing comfort. Side arm length and height adjustable. Perfect fit. Marking "T" for "extremely high temperatures", according to EN 166:2001.

Application: For welding, brazing and flame-cutting. Protection against flying particles, splashes of caustic liquids or hazardous radiation.

Part No.	Side arm colour	9918
0005	Blue/black	8.48
		(976)



Leather Gloves

Design: With reinforced palm, light colour. Protection class 1.



Part No.	Size	9926	PU pair
0005	10	0.72 (997)	12

Cowhide Gloves

Design: Natural, high-quality glove. Protection class 1.



Part No.	Size	9928	PU pair
0005	10	2.02 (997)	12

Knit Gloves

Design: Fine knit, partly coated with polyurethane, offers perfect fit, safe grip, good touching sense, liquid-proof, washable, for work in high-tech industry and in laboratories, knit wrist. Protection class II. (EN 388).



Part No.	Size	9930	PU pair
0005	7	1.23	12
0010	8	1.24	12
0015	9	1.26	12
0020	10	1.27 (997)	12

Welding Gloves

Design: 5-finger cowhide glove, approx. 1 mm thick, sewn with Kevlar yarn and with long split leather cuff, 35 cm long, approved to EN 388, type 12. Protection class II.



Part No.	Size	9932	PU pair
0010	10	6.81 (997)	1

Welding Gloves Shagreen/Split Leather

Design: Made of shagreen/split leather, with long cuff, approx. 35 cm long.



Part No.	Size	9934	PU pair
0005	10	2.54 (997)	1

Safety Gloves PolyTRIX® BN FKV 1914

Design: Blue (class II). Material: 100 % polyamide, knit, light and kind to the skin, offers good wearing comfort, breathable, no seam. Can be worn on both sides, washable at max. 30 °C. Finger tips are sealed with transparent PVC. This ensures a secure grip for the user when holding smooth items, increases the durability of the glove.



Part No.	Size	9938 Pair	PU pair
0005	7	2.13	10
0010	8	2.13	10
0015	9	2.13	10
0020	10	2.13 (998)	10

High Visibility Vests

Design: According to EN 471, with 2 circumferential reflecting stripes, universal size, waist: approx. 126 cm.

Part No.	Design	9940	Colour
0005	Cotton mix fabric	6.96	Orange
0010	PVC	6.96	Orange
		(977)	



First Aid Kit QUICK, No. 67070

SÖHNGEN®

Design: Made of shock-proof ABS with rubber seals, transparent covers for protecting the assortment, variable arrangement of items due to separators, can be lead sealed, 90° stop through wall fixture: approx. 26 x 17 x 11 cm, orange, incl. wall fixture and filling to DIN 13157.

Part No.	Design	9942 SÖHNGEN®
0005	First aid kit	42.46
0010	72-piece assortment	13.77
		(977)



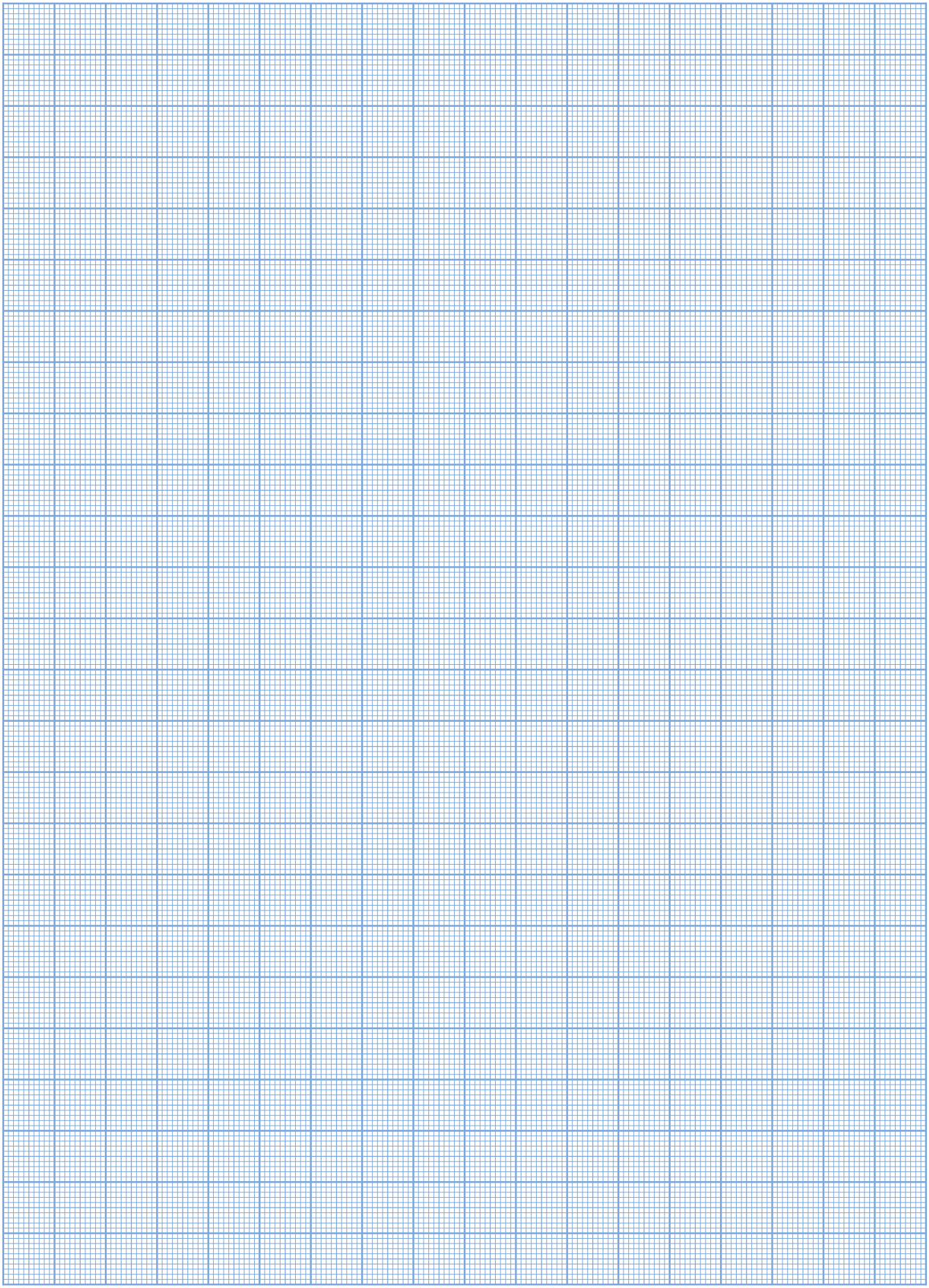
First Aid Kit SAN, No. 67075

SÖHNGEN®

Design: Made of shock-proof ABS with rubber seals, transparent covers for protecting the assortment, variable arrangement of items due to separators, can be lead sealed, 90° stop through wall fixture: approx. 31 x 21 x 13 cm, orange, incl. wall fixture and filling to DIN 13157.

Part No.	Design	9944 SÖHNGEN®
0005	First aid kit	61.30
0010	130-piece Refill assortment	22.46
		(977)





Overview – Group 10

 10/09	 10/13	 10/14	Drilling Tools, Countersinks	**10/2–10/15**
 10/16	10/16	10/16	Reamers	**10/16–10/18**
 10/19	 10/20	 10/31	Tapping Jigs, Cutting Tools	**10/19–10/32**
 10/39	 10/42	 10/52	Milling Tools	**10/33–10/59**
 10/60	 10/61	 10/62	Sawing Tools	**10/60–10/62**
 10/63	 10/63	 10/68	Lathe Chucks, Machine Spindle Heads, VDI Tool Holders	**10/63–10/70**
 10/71	 10/71	 10/72	Length Measuring Techniques, Measuring Units	**10/71–10/72**
 10/75	 10/75	 10/75	Surface Technology	**10/73–10/76**
 10/77	 10/78	 10/80	DIN List	**10/77–10/82**

Recommended Applications for Twist Drills ≦ 3 x D Drilling Depth

Preferably choose tools with feed series numbers in **bold.**

Drill ∅ mm	Feed Code 1	2	3	4	5	6	7	8	9
	f (mm/RPM)								
0.50	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
1.00	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
2.00	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
2.50	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
3.15	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
4.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
5.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0200	0.250
6.30	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
8.00	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
50.00	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.250
63.00	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
80.00	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

Twist drills DIN 1897 from page 1/9
Twist drills DIN 8037 from page 1/40

Material group	Material examples Numbers in bold = material number in accordance with DIN EN 10 027	Tensile strength N/mm²	Hardness	Coolant
General structural steels	**1.0035** St 33. **1.0254** St 37.0, **1.0486** StE 285, **1.0345** H1, **1.0425** H2	≤500		■
	1.0050 St 50-2, **1.0070** St 70-2, **1.8937** WStE500	≤500-850		■
Machine steels	**1.0718** 9SMnPb28, **1.0723** 15 S20, **1.0736** 9 SMn36	≤850		■
	1.0727 45 S20, **1.0728** 60 S20, **1.0757** 45SPb20	850-1000		■
Unalloyed tempering steels	**1.0402** C22, **1.1178** Ck30	≤750		■
	1.0503 C45, **1.1191** Ck45	700-850		■
	1.0601 C60, **1.1221** Ck60	850-1000		■
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-1000		■
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		■
Unalloyed hardened steels	**1.0301** C10, **1.1121** Ck10, **1.1140** Cm15	≤750		■
Alloyed hardened steels	**1.5919** 15CrNi6, **1.7012** 13Cr2, **1.7015** 15Cr13	850-1000		●
	1.5752 14NiCr14, **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		●
Nitrided steels	**1.8504** 34CrA16, **1.8506** 34CrAlS5, **1.8509** 41CrAlMo7	≤850-1000		■
	1.8507 34CrAlMo5, **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7	1000-1200		●
Tool steels	**1.1750** C75W, **1.2067** 100Cr6, **1.2307** 29CrMoV	≤850		■
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	850-1000		●
High-speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤650-1000		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 50CrV4		≤330 HB	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X2CrMoS17, **1.4105** X4CrMoS18, **1.4305**	≤850		●
austenitic	**1.4301** X5CrNi1810, **1.4541** X6CrNiTi1810, **1.4571** X6CrNiMoTi1712 2	≤850		●
martensitic	**1.4057** X20CrNi17 2, **1.4122** X35CrMo17, **1.4521** X2CrMoTi18 2	≤850		●
Hardened steels	–		≤40-48 HRC	●
	–		≤48-60 HRC	●
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		●
Cast iron	**GG 10 ... GG 20**		≤240 HB	■ ○
	GG 25 ... GG 45		≤300 HB	■ ○
Nodulised cast iron and malleable	GTW 35, GTS 55, GGG 50		≤240 HB	■
cast iron	GTW 65, GTS 70, GGG 70		≤300 HB	■
Chilled castings	–		≤350 HB	■
Titanium and titanium alloys	**3.7024** Ti99,5, **3.7114** TiA15Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiA16Zr5, **3.7164** TiA16V4, **3.7184** TiA14Mo4Sn2,5, - TiA18Mo1V1	850-1200		●
Aluminium and aluminium alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤10% Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		■
>10% Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		■
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450		○
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■
Brass, short chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		■
Brass, long chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		■
Bronzes, short chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		■ ●
	2.0790 CuNi18Zn19Pb	≤600-850		●
Bronzes, long chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl1 1Ni, **2.1247** CuBe2	850-1000		●
Plastics, duroplastic	Bakelite, Resopal, Pertinax, Moltopren			○
Plastics, thermoplastic	Plexiglas, Hostalen, Novodur, Makralon			■ ○
Plastics, aramide fibre reinforced	Kevlar			○
glass/carbon fibre reinforced	GFRP/CFRP			○

Coolant: ■ emulsion; ● oil; ○ air

All stocked articles available within 24 hours by UPS Express.

Recommended Applications for Twist Drills ≦ 3 x D Drilling Depth

Parallel shank	HSS Type N	HSS Type N		HSSE Co5 Type INOX		HSSE Co5 Type INOX TiN	HSSE Co5 Type INOX F		HSCO Type INOX TiN		Carbure Type N
DIN 1897 R	1055	1056		1058		1061	1062		1063		–
DIN 8037 R	–	–		–		–	–		–		1191

R right-hand cutting
○ bright
● steam tempered
◓ lands nitrided
TiN TiN coating
FIRE Fire coating









v_c m/min	VR-Code	VR-Code	v_c m/min	VR-Code	TiN F v_c m/min		VR-Code	VR-Code	v_c m/min	VR-Code	v_c m/min	VR-Code
36	**6**	**6**	–	–	–	–	–	–	48	**6**	–	–
28	**5**	**5**	–	–	–	–	–	–	42	**5**	–	–
36	6	6	–	–	–	–	–	–	54	**6**	80	4
28	5	5	30	**5**	40	52	5	6	42	**5**	70	3
36	**5**	**5**	–	–	–	–	–	–	45	**6**	–	–
28	**5**	**5**	30	5	40	52	5	6	38	**6**	–	–
–	–	–	22	**4**	28	36	**4**	**5**	26	**5**	–	–
–	–	–	20	**4**	25	32	**4**	**5**	20	4	–	–
–	–	–	16	**3**	20	26	**3**	**4**	18	3	–	–
36	**6**	**6**	–	–	–	–	–	–	42	**6**	–	–
–	–	–	18	**4**	22	29	**4**	**5**	22	4	–	–
–	–	–	14	**3**	18	23	**3**	**4**	16	3	–	–
–	–	–	16	**4**	20	26	**4**	**5**	20	4	–	–
–	–	–	12	**3**	15	19	**3**	**4**	15	3	–	–
18	4	4	20	**4**	25	22	**4**	**5**	20	**4**	–	–
–	–	–	12	**3**	15	19	**3**	**4**	15	**3**	–	–
–	–	–	12	**3**	15	19	**3**	**4**	14	3	–	–
–	–	–	10	**2**	12	16	**2**	**3**	–	–	25	**2**
–	–	–	16	4	20	26	4	5	20	**4**	–	–
–	–	–	12	3	15	19	**3**	**4**	14	**3**	–	–
–	–	–	14	**3**	18	23	**3**	**4**	16	**4**	–	–
–	–	–	–	–	5	7	1	2	–	–	20	3
–	–	–	–	–	–	–	–	–	–	–	10	2
–	–	–	8	1	10	13	1	2	–	–	–	–
36	**6**	**6**	40	6	50	65	6	7	48	**6**	90	4
28	6	6	30	**6**	40	52	**6**	**7**	42	**6**	80	4
32	**6**	**6**	36	6	45	59	6	7	42	**6**	80	4
23	6	6	28	**6**	32	42	6	7	30	**6**	70	4
–	–	–	10	3	12	16	3	4	–	–	10	**1**
–	–	–	12	2	15	19	2	3	–	–	–	–
–	–	–	8	2	10	13	2	3	–	–	–	–
–	–	–	–	–	–	–	–	–	70	**7**	–	–
–	–	–	–	–	–	–	–	–	70	**7**	–	–
70	7*	7*	–	–	–	–	–	–	85	**7**	–	–
55	6*	6*	–	–	–	–	–	–	70	**6**	–	–
90	6*	6*	–	–	–	–	–	–	70	6	–	–
36	5*	5*	–	–	–	–	–	–	32	**5**	–	–
–	–	–	–	–	–	–	–	–	63	**5**	180	5
45	5*	5*	–	–	–	–	–	–	40	**5**	180	5
36	4*	4*	40	4	50	60	5	6	50	**4**	–	–
32	4*	4*	36	**4**	45	59	**4**	**5**	35	**4**	–	–
28	4*	30	30	4	40	52	4	5	32	**4**	–	–
–	–	–	25	4	32	42	**4**	**5**	28	**4**	–	–
18	4	4	20	4	–	–	–	–	25	**4**	–	–
28	**5***	**5***	–	–	–	–	–	–	15	**4**	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–

* use only bright drills and/or drills with bright ground flutes.

Recommended Applications for Twist Drills ≦ 5 x D Drilling Depth

Preferably choose tools with feed series numbers in **bold.**

Drill ø mm	Feed Code 1	2	3	4	5	6	7	8	9
	f (mm/RPM)								
0.50	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
1.00	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
2.00	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
2.50	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
3.15	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
4.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
5.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0200	0.250
6.30	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
8.00	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
50.00	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.250
63.00	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
80.00	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

Twist drills DIN 338 from page 1/12

Material group	Material examples. Numbers in bold = material number in accordance with DIN EN 10 027	Tensile strength N/mm²	Hardness	Coolant
General structural steels	**1.0035** St 33, **1.0254** St 37.0, **1.0486** StE 285, **1.0345** H1, **1.0425** H2	≤500		✦
	1.0050 St 50-2, **1.0070** St 70-2, **1.8937** WStE500	≤500-850		✦
Machine steels	**1.0718** 9SMnPb28, **1.0723** 15 S20, **1.0736** 9 SMn36	≤850		✦
	1.0727 45 S20, **1.0728** 60 S20, **1.0757** 45SPb20	850-1000		✦
Unalloyed tempering steels	**1.0402** C22, **1.1178** Ck30	≤750		✦
	1.0503 C45, **1.1191** Ck45	700-850		✦
	1.0601 C60, **1.1221** Ck60	850-1000		✦
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-1000		✦
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		✦
Unalloyed hardened steels	**1.0301** C10, **1.1121** Ck10, **1.1140** Cm15	≤750		✦
Alloyed hardened steels	**1.5919** 15CrNi6, **1.7012** 13Cr2, **1.7015** 15Cr13	850-1000		●
	1.5752 14NiCr14, **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		●
Nitrided steels	**1.8504** 34CrA16, **1.8506** 34CrAlS5, **1.8509** 41CrAlMo7	≤850-1000		✦
	1.8507 34CrAlMo5, **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7	1000-1200		●
Tool steels	**1.1750** C75W, **1.2067** 100Cr6, **1.2307** 29CrMoV	≤850		✦
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	850-1000		●
High-speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤650-1000		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 50CrV4		≤330 HB	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X2CrMoS17, **1.4105** X4CrMoS18, **1.4305**	≤850		●
austenitic	**1.4301** X5CrNi1810, **1.4541** X6CrNiTi1810, **1.4571** X6CrNiMoTi1712 2	≤850		●
martensitic	**1.4057** X20CrNi17 2, **1.4122** X35CrMo17, **1.4521** X2CrMoTi18 2	≤850		●
Hardened steels	–		≤40-48 HRC	●
	–		≤48-60 HRC	●
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		●
Cast iron	**GG 10 ... GG 20**		≤240 HB	✦ ○
	GG 25 ... GG 45		≤300 HB	✦ ○
Nodulised cast iron and	GTW 35, GTS 55, GGG 50		≤240 HB	✦
malleable cast iron	GTW 65, GTS 70, GGG 70		≤300 HB	✦
Chilled castings	–		≤350 HB	✦
Titanium and titanium alloys	**3.7024** Ti99,5, **3.7114** TiA15Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiA16Zr5, **3.7164** TiA16V4, **3.7184** TiA14Mo4Sn2,5, - TiA18Mo1V1	850-1200		●
Aluminium and aluminium alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		✦
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		✦
Al cast alloys ≤10% Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		✦
>10% Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		✦
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450		○
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		✦
Brass, short chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		✦
Brass, long chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		✦
Bronzes, short chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		✦ ●
	2.0790 CuNi18Zn19Pb	≤600-850		●
Bronzes, long chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl1 1Ni, **2.1247** CuBe2	850-1000		●
Plastic, duroplastic	Bakelite, Resopal, Pertinax, Moltopren			○
Plastic, thermoplastic	Plexiglas, Hostalen, Novodur, Makralon			✦ ○
Plastics, aramide fibre reinforced	Kevlar			○
glass/carbon fibre reinforced	GFRP/CFRP			○

Coolant: ✦ emulsion; ● oil; ○ air

Recommended Applications for Twist Drills ≦ 5 x D Drilling Depth

R right-hand cutting
○ bright
● steam tempered
◓ lands nitrided
TiN TiN coating
FIRE Fire coating

Parallel shank	HSS Type N ●	HSS Type N ●	HSS Type W ○	HSS Type N TiN	HSS Type N ◓	HSSE Co5 Type TF ◓	HSSE Co5 Type Ti ○	HSSE Type Ti ○	HSSE Co5 Type INOX ○	HSSE Type INOX ○	HSSE Co5 Type Ti TiN	HSSE Type Ti FIRE	HSSE Co5 Type INOX TiN
DIN 338 R	1001	1002	1010	1004	1005	1022	1013	1014	1025	1026	1016	1017	1018



v_c m/min	VR Code	VR Code	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	VR Code	VR Code	VR Code	VR Code	VR Code	TiN FIRE v_c m/min	VR Code	VR Code	TiN v_c m/min	VR Code
32	**6**	**6**	–	40	**6**	–	–	–	–	–	–	–	– –	–	–	45	**6**
25	**5**	**5**	–	32	**5**	–	–	–	–	–	–	–	– –	–	–	35	**5**
32	6	6	–	40	6	–	–	–	–	–	–	–	– –	–	–	50	**6**
25	5	5	–	32	5	28	5	**5**	–	–	–	–	– –	–	–	40	**5**
32	**5**	**5**	–	40	**5**	–	–	–	–	–	–	–	– –	–	–	42	**6**
25	**5**	**5**	–	32	**5**	28	5	5	–	–	–	–	– –	–	–	35	**6**
–	–	–	–	16	4	15	**4**	4	–	–	–	–	– –	–	–	22	**5**
–	–	–	–	20	4	18	**4**	**4**	–	–	–	–	– –	–	–	18	4
–	–	–	–	–	–	14	3	**3**	3	3	–	–	18 23	3	**4**	15	3
32	6	6	–	40	**6**	–	–	–	–	–	–	–	– –	–	–	40	**6**
–	–	–	–	18	4	**16**	**4**	4	–	–	–	–	– –	–	–	20	4
–	–	–	–	–	–	12	3	**3**	3	3	–	–	15 20	3	4	15	3
–	–	–	–	15	4	**14**	**4**	4	–	–	–	–	– –	–	5	18	4
–	–	–	–	–	–	10	3	**3**	3	3	–	–	13 17	3	4	12	3
16	4	4	–	20	4	18	**4**	4	–	–	–	–	– –	–	5	18	**4**
–	–	–	–	–	–	10	3	**3**	3	3	–	–	13 17	3	4	13	**3**
–	–	–	–	–	–	10	3	**3**	3	3	–	–	13 17	3	4	13	3
–	–	–	–	–	–	8	2	–	**2**	**2**	–	–	10 12	**2**	**2**	–	–
–	–	–	–	–	–	14	4	**4**	4	4	**4**	**4**	18 23	4	5	18	**4**
–	–	–	–	–	–	10	3	–	**3**	**3**	3	3	13 18	**3**	**3**	13	**3**
–	–	–	–	–	–	12	3	3	**3**	**3**	3	3	15 20	**3**	**4**	15	**4**
–	–	–	–	–	–	–	–	–	–	–	–	–	4 6	**1**	**1**	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	– –	–	–	–	–
–	–	–	–	–	–	6	–	–	1	1	–	–	8 10	1	1	–	–
32	**6**	**6**	–	40	**6**	36	6	6	–	–	–	–	– –	–	–	45	**6**
25	6	6	–	30	6	28	**6**	6	–	–	–	–	– –	–	–	36	**6**
28	**6**	**6**	–	35	**6**	30	6	6	–	–	–	–	– –	–	–	40	**6**
20	6	6	–	25	6	22	**6**	6	–	–	–	–	– –	–	–	28	**6**
–	–	–	–	–	–	8	3	3	3	3	–	–	10 13	**3**	**3**	–	–
–	–	–	–	–	–	10	–	–	**2**	**2**	2	2	13 15	**2**	**2**	–	–
–	–	–	–	–	–	6	–	–	**2**	**2**	–	–	8 10	**2**	**2**	–	–
80	–	–	**7**	–	–	90	–	–	–	–	**7**	**7**	– –	–	–	70	**7**
80	–	–	**7**	–	–	90	–	–	–	–	**7**	**7**	– –	–	–	70	**7**
63	7*	7*	7	80	7	70	–	7	–	–	7	7	– –	–	–	85	**7**
50	6*	6*	–	70	**6**	55	–	6	–	–	6	6	– –	–	–	70	**6**
80	6*	6*	–	100	6	–	–	–	–	–	–	–	– –	–	–	70	6
32	5*	5*	**5**	40	5	36	5*	5	–	–	5	5	– –	–	–	32	**5**
–	–	–	–	–	–	–	–	–	–	–	–	–	– –	–	–	63	**5**
40	5*	5*	–	50	5	45	5*	4	–	–	5	5	– –	–	–	40	**5**
32	4*	4*	–	40	**4**	36	4*	–	–	–	–	–	– –	–	–	50	**4**
28	4*	4*	–	36	**4**	30	4*	–	–	–	–	–	– –	–	–	35	**4**
25	4*	4*	–	32	**4**	28	4*	4	–	–	**4**	**4**	– –	–	5	32	**4**
–	–	–	–	25	**4**	22	4*	**4**	–	–	**1**	**1**	28 30	4	4	28	**4**
16	4	4	–	20	4	18	4	4	–	–	–	–	– –	–	–	25	**4**
25	5*	5*	5	32	5	–	–	–	–	–	–	–	– –	–	–	15	**4**
–	–	–	–	–	–	–	–	–	–	–	–	–	– –	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	– –	–	–	–	–

* use only bright drills and/or drills with bright ground flutes.

Recommended Applications for Twist Drills

Preferably choose tools with feed series numbers in **bold.**

Drill ⌀ mm	Feed Code 1	2	3	4	5	6	7	8	9
	f (mm/RPM)								
0.50	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
1.00	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
2.00	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
2.50	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
3.15	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
4.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
5.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0200	0.250
6.30	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
8.00	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
50.00	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.250
63.00	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
80.00	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

Parallel shank	Morse taper shank
DIN 1869 R	–
DIN 338 R	–
–	DIN 1870 R
–	DIN 345 R

Twist drills DIN 338 from page 1/12
Twist drills DIN 1869 from page 1/23
Twist drills DIN 1870 from page 1/29
Twist drills DIN 345 from page 1/25

Material group	Material examples. Numbers in bold = material number in accordance with DIN EN 10 027	Tensile strength N/mm²	Hardness	Coolant
General structural steels	**1.0035** St 33, **1.0254** St 37.0, **1.0486** StE 285, **1.0345** H1, **1.0425** H2	≤500		✦
	1.0050 St 50-2, **1.0070** St 70-2, **1.8937** WStE500	≤500-850		✦
Machine steels	**1.0718** 9SMnPb28, **1.0723** 15 S20, **1.0736** 9 SMn36	≤850		✦
	1.0727 45 S20, **1.0728** 60 S20, **1.0757** 45SPb20	850-1000		✦
Unalloyed tempering steels	**1.0402** C22, **1.1178** Ck30	≤750		✦
	1.0503 C45, **1.1191** Ck45	700-850		✦
	1.0601 C60, **1.1221** Ck60	850-1000		✦
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-1000		✦
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		✦
Unalloyed hardened steels	**1.0301** C10, **1.1121** Ck10, **1.1140** Cm15	≤750		✦
Alloyed hardened steels	**1.5919** 15CrNi6, **1.7012** 13Cr2, **1.7015** 15Cr13	850-1000		●
	1.5752 14NiCr14, **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		●
Nitrided steels	**1.8504** 34CrA16, **1.8506** 34CrAlS5, **1.8509** 41CrAlMo7	≤850-1000		✦
	1.8507 34CrAlMo5, **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7	1000-1200		●
Tool steels	**1.1750** C75W, **1.2067** 100Cr6, **1.2307** 29CrMoV	≤850		✦
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	850-1000		●
High-speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤650-1000		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 50CrV4		≤330 HB	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X2CrMoS17, **1.4105** X4CrMoS18, **1.4305**	≤850		●
austenitic	**1.4301** X5CrNi1810, **1.4541** X6CrNiTi1810, **1.4571** X6CrNiMoTi1712 2	≤850		●
martensitic	**1.4057** X20CrNi17 2, **1.4122** X35CrMo17, **1.4521** X2CrMoTi18 2	≤850		●
Hardened steels	–		≤40-48 HRC	●
	–		≤48-60 HRC	●
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		●
Cast iron	**GG 10 ... GG 20**		≤240 HB	✦ ○
	GG 25 ... GG 45		≤300 HB	✦ ○
Nodulised cast iron and	GTW 35, GTS 55, GGG 50		≤240 HB	✦
malleable cast iron	GTW 65, GTS 70, GGG 70		≤300 HB	✦
Chilled castings	–		≤350 HB	✦
Titanium and titanium alloys	**3.7024** Ti99,5, **3.7114** TiA15Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiA16Zr5, **3.7164** TiA16V4, **3.7184** TiA14Mo4Sn2,5, - TiA18Mo1V1	850-1200		●
Aluminium and aluminium alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		✦
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		✦
Al cast alloys ≤10% Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		✦
>10% Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		✦
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450		○
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		✦
Brass, short chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		✦
Brass, long chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		✦
Bronzes, short chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		✦ ●
	2.0790 CuNi18Zn19Pb	≤600-850		●
Bronzes, long chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl1 1Ni, **2.1247** CuBe2	850-1000		●
Plastics, duroplastic	Bakelite, Resopal, Pertinax, Moltopren			○
Plastics, thermoplastic	Plexiglas, Hostalen, Novodur, Makralon			✦ ○
Plastics, aramide fibre reinforced	Kevlar			○
glass/carbon fibre reinforced	GFRP/CFRP			○

Coolant: ✦ emulsion; ● oil; ○ air

≦ 5 x D Drilling Depth > 10 x D Drilling Depth

- R — right-hand cutting
- steam tempered
- lands nitrided
- bright

TiN — TiN coating

TiAlN — TiAlN-2 coating on TiAN-TiN base. **Combines the advantages of Tin, TiAN and TiCN coatings to ensure a wide range of applications.**

	HSS Type N	HSS Type N	HSS Type TF	HSS Type GT100 TiN	HSS-E Type INOX	HSS-E Co5 Type TF TiAlN	M42 Type N TiAlN
	–	–	1067	1068	–	1071	–
	–	–	–	–	–	–	1020
	–	–	1092	–	–	–	–
	1080	1081	–	–	1082	–	–
							

v_c m/min	VR Code	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code
32	**6**	**6**	22	**5**	28	**5**	–	–	–	–	–	–
25	**5**	**5**	18	**4**	22	**4**	–	–	–	–	–	–
32	6	6	22	**5**	28	**5**	–	–	–	–	–	–
25	5	5	18	4	22	**4**	–	–	30	**4**	–	–
32	**5**	**5**	22	**4**	28	**4**	–	–	–	–	–	–
25	**5**	**5**	18	**4**	22	**4**	–	–	–	–	42	4
–	–	–	–	–	16	**3**	–	–	21	**3**	–	–
–	–	–	12	3	15	**3**	–	–	21	**3**	–	–
–	–	–	–	–	10	2	–	–	17	**2**	23	4
32	6	6	22	**5**	28	**5**	–	–	–	–	–	–
–	–	–	10	3	12	**3**	–	–	18	**3**	–	–
–	–	–	–	–	10	2	–	–	15	**2**	20	4
–	–	–	8	3	10	**3**	–	–	15	**3**	–	–
–	–	–	–	–	8	2	–	–	12	**2**	17	4
16	4	4	12	3	12	**3**	–	–	21	**3**	–	–
–	–	–	6	2	8	**2**	–	–	12	**2**	17	4
–	–	–	6	2	8	**2**	–	–	12	**2**	17	4
–	–	–	–	–	6	**1**	–	–	9	**1**	13	**3**
–	–	–	8	3	10	3	14	**4**	17	**3**	–	–
–	–	–	–	–	8	2	10	3	12	**2**	–	–
–	–	–	–	–	10	2	12	3	15	**2**	20	4
–	–	–	–	–	–	–	–	–	3	1	6	**2**
–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	6	1	–	–	7	**1**	11	**2**
32	**6**	**6**	22	**5**	28	**5**	–	–	–	–	–	–
25	6	6	18	5	25	**5**	–	–	30	**5**	–	–
28	**6**	**6**	20	**5**	25	**5**	–	–	–	–	–	–
20	6	6	14	5	18	5	–	–	24	**5**	–	–
–	–	–	–	–	6	2	–	–	7	2	13	**4**
–	–	–	–	–	8	1	10	2	12	**1**	–	–
–	–	–	–	–	6	1	–	–	7	**1**	11	3
–	–	–	–	–	70	6	90	**7**	–	–	–	–
–	–	–	–	–	70	6	90	**7**	–	–	–	–
63	7*	7*	45	**6**	55	**6**	70	7	50	6	–	–
50	6*	6*	36	**5**	45	**5**	55	6	40	5	–	–
80	6*	6*	55	**5**	70	**5**	–	–	–	–	–	–
32	5*	5*	22	**4**	28	**4**	36	5	36	4	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–
40	5*	5*	28	**4**	36	**4**	45	5	40	4	–	–
32	4*	4*	22	3	28	3	–	–	–	–	–	–
28	4*	4*	20	**3**	25	**3**	–	–	–	–	–	–
25	4*	4*	18	**3**	22	**3**	28	**4**	30	3	–	–
–	–	–	–	–	18	**3**	22	**1**	29	**3**	–	–
16	4	4	12	**3**	15	**3**	–	–	21	3	–	–
25	5*	5*	18	4	22	4	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–

* use only bright drills and/or drills with bright ground flutes.

Recommended Applications for Twist Drills ≦ 10 x D Drilling Depth

Preferably choose tools with feed series numbers in **bold.** If the length of the flute allows it, sizes DIN 338 and DIN 345 can also be used for drilling depths ≤ 10 x D.

Drill Ø mm	Feed Code 1	2	3	4	5	6	7	8	9
	f (mm/RPM)								
0.50	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
1.00	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
2.00	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
2.50	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
3.15	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
4.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
5.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0200	0.250
6.30	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
8.00	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
50.00	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.250
63.00	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
80.00	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

Parallel shank	Morse taper shank	HSS Type N	HSS Type N		HSS-E Co5 Type TF
DIN 340 R	–	**1045**	**1046**		**1051**
–	DIN 341 R	**1089**			–

Twist drills DIN 340 from page 1/22
Twist drills DIN 341 from page 1/28



R right-hand cutting
steam tempered
lands nitrided

Material group	Material examples. Numbers in bold = material number in accordance with DIN EN 10 027	Tensile strength N/mm²	Hardness	Coolant	v_c m/min	VR Code	VR Code	v_c m/min	VR Code
General structural steels	**1.0035** St 33, **1.0254** St 37.0, **1.0486** StE 285, **1.0345** H1, **1.0425** H2	≤500		■	28	6	6	–	–
	1.0050 St 50-2, **1.0070** St 70-2, **1.8937** WStE500	≤500-850		■	22	5	5	–	–
Machine steels	**1.0718** 9SMnPb28, **1.0723** 15 S20, **1.0736** 9 SMn36	≤850		■	28	6	6	–	–
	1.0727 45 S20, **1.0728** 60 S20, **1.0757** 45SPb20	850-1000		■	22	5	5	24	**5**
Unalloyed tempering	**1.0402** C22, **1.1178** Ck30	≤750		■	28	5	5	–	–
steels	**1.0503** C45, **1.1191** Ck45	700-850		■	22	5	5	24	5
	1.0601 C60, **1.1221** Ck60	850-1000		■	–	–	–	16	**4**
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr4, **1.7030** 28Cr4	850-1000		■	–	–	–	16	**4**
	1.5710 36NiCr6, **1.7035** 41C4, **1.7225** 42CrMo4	1000-1200		■	–	–	–	12	**3**
Unalloyed hardened steels	**1.0301** C10, **1.1121** Ck10, **1.1140** Cm15	≤750		■	28	6	6	–	–
Alloyed hardened steels	**1.5919** 15CrNi6, **1.7012** 13Cr2, **1.7015** 15Cr13	850-1000		●	–	–	–	14	**4**
	1.5752 14NiCr14, **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		●	–	–	–	10	**3**
Nitrided steels	**1.8504** 34CrA16, **1.8506** 34CrAlS5, **1.8509** 41CrAlMo7	≤850-1000		■	–	–	–	12	**4**
	1.8507 34CrAlMo5, **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7	1000-1200		●	–	–	–	8	**3**
Tool steels	**1.1750** C75W, **1.2067** 100Cr6, **1.2307** 29CrMoV	≤850		■	14	4	4	16	**4**
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	850-1000		●	–	–	–	8	**3**
High-speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≤650-1000		●	–	–	–	8	**3**
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 50CrV4		≤330 HB	●	–	–	–	6	2
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X2CrMoS17, **1.4105** X4CrMoS18, **1.4305**	≤850		●	–	–	–	12	**4**
austenitic	**1.4301** X5CrNi1810, **1.4541** X6CrNiTi1810, **1.4571** X6CrNiMoTi1712 2	≤850		●	–	–	–	8	2
martensitic	**1.4057** X20CrNi17 2, **1.4122** X35CrMo17, **1.4521** X2CrMoTi18 2	≤850		●	–	–	–	10	**3**
Hardened steels	–		≤40-48 HRC	●	–	–	–	–	–
	–		≤48-60 HRC	●	–	–	–	–	–
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		●	–	–	–	–	–
Cast iron	**GG 10 ... GG 20**		≤240 HB	■ ○	28	6	6	30	6
	GG 25 ... GG 45		≤300 HB	■ ○	22	6	6	24	**6**
Nodulised cast iron and	GTW 35, GTS 55, GGG 50		≤240 HB	■	22	6	6	24	6
malleable cast iron	GTW 65, GTS 70, GGG 70		≤300 HB	■	18	6	6	20	**6**
Chilled castings	–		≤350 HB	■	–	–	–	–	–
Titanium and titanium	**3.7024** Ti99,5, **3.7114** TiA15Sn2,5, **3.7124** TiCu2	≤850		●	–	–	–	–	–
alloys	**3.7154** TiA16Zr5, **3.7164** TiA16V4, **3.7184** TiA14Mo4Sn2,5, - TiA18Mo1V1	850-1200		●	–	–	–	–	–
Aluminium and aluminium alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■	–	–	–	–	–
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■	–	–	–	–	–
Al cast alloys ≤ 10% Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		■	55	7*	7*	60	7
>10% Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		■	45	6*	6*	50	6
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450		○	70	6*	6*	–	–
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■	28	5*	5*	30	5
Brass, short chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		■	–	–	–	–	–
Brass, long chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		■	34	5*	5*	38	5
Bronzes, short chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		■ ●	28	4*	4*	–	–
	2.0790 CuNi18Zn19Pb	≤600-850		●	22	4*	4*	–	–
Bronzes, long chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●	22	4*	4*	24	4
	2.0980 CuAl1 1Ni, **2.1247** CuBe2	850-1000		●	–	–	–	20	**4**
Plastics, duroplastic	Bakelite, Resopal, Pertinax, Moltopren			○	14	4	4	16	4
Plastics, thermoplastic	Plexiglas, Hostalen, Novodur, Makralon			■ ○	22	5*	5*	–	–
Plastics, aramide fibre reinforced	Kevlar			○	–	–	–	–	–
glass/carbon fibre reinforced	GFRP/CFRP			○	–	–	–	–	–

* use only bright drills and/or drills with bright ground flutes.

Coolant: ■ emulsion; ● oil; ○ air

Speeds for Core Drill Bits

For HSS-Co-Eco

Material		Unalloyed steel max. 700 N/mm²	Alloyed steel max. 1,000 N/mm²	Aluminium alloy
V_c = m/mm		30	20	30
Coolant		Cutting oil	Cutting oil	Cutting oil
ø mm	ø inch	RPM	RPM	RPM
12	15/32	796	531	796
13	33/64	735	490	735
14	35/64	682	455	682
15	19/32	637	425	637
16	5/8	597	398	597
17	43/64	562	375	562
18	45/64	531	354	531
19	3/4	503	335	503
20	25/32	478	318	478
21	53/64	455	303	455
22	7/8	434	290	434
23	29/32	415	277	415
24	15/16	398	265	398
25	63/64	382	255	382
26	1. 1/32	367	245	367
27	1. 1/16	354	236	354
28	1. 3/32	341	227	341
29	1. 9/64	329	220	329
30	1. 3/16	318	212	318
31	1. 7/32	308	205	308
32	1. 17/64	299	199	299
33	1. 19/64	290	193	290
34	1. 11/32	281	187	281
35	1. 3/8	273	182	273
36	1. 27/64	265	177	265
37	1. 29/64	258	172	258
38	1. 1/2	251	168	251
39	1. 17/32	245	163	245
40	1. 37/64	239	159	239
41	1. 39/64	233	155	233
42	1. 21/32	227	152	227
43	1. 11/16	222	148	222
44	1. 47/64	217	145	217
45	1. 25/32	212	142	212
46	1. 13/16	208	138	208
47	1. 55/64	203	136	203
48	1. 57/64	199	133	199
49	1. 15/16	195	130	195
50	1. 31/32	191	127	191

Core drill bits page 1/59.

When machining Hardox we recommend ASP 30 /ASP 60 core drill bits. Use pure cutting oil and reduce the speed by approx. 10 %, see column "Alloyed steel up to 1,000 N/mm²". Only use magnetic drilling machines with strong supporting features or upright drilling and milling machines.





Recommended Applications for Drills for Removable Plates

RT 800 WP · General Technical Information

- Preferably use tools with feed series numbers in **bold.**
- When drilling clearance holes, make sure the guide chamfers are in engagement.
- For the 7 x D size, we recommend entering with equal pointed angle of 140° or greater to at least 2/3 of the cutting edge diameter.
- The tools should not be used in interrupted cutting (flutes, transverse drilling). For interrupted cutting (max. 0.2 x D) we recommend to reduce the feed, if possible.
- RT 800 tools are, other than the conventional removable plate drills, also suitable for drilling sheet metal packages.
- When changing the cutting plate, we recommend to replace also the straining screw so far used by the supplied PA-coated screw. If only sluggish screwing is possible, remove the screw again and remove excessive PA coating.

Drill ⌀ mm	Feed Code								
	1	2	3	4	5	6	7	8	9
	f (mm/RPM)								
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250

Drills for removable plate from page 1/30

Surfaces:

TiN Fire coating

Material coolants:

- Emulsion
- Oil
- Air

Material group	Material examples. Numbers in bold = material number in accordance with DIN EN 10 027	Tensile strength N/mm²	Hardness	Coolant
General structural steels	**1.0035** S185 (St 33), **1.0486** P275N (StE 285), **1.0345** P235GH(H1), **1.0425** P265GH(H2),	≤500		✚
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH(WStE500)	>500-850		✚
Machine steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9 SMn36)	≤850		✚
	1.0727 46S20 (45 S20), **1.0728** (60 S20), **1.0757** 46SPb20 (45SPb20)	850-1000		✚
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤750		✚
	1.0503 C45, **1.1191** C45E (Ck45)	700-850		✚
	1.0601 C60, **1.1221** C60E (Ck60)	850-1000		✚
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-1000		✚
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		✚
Unalloyed hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		✚
Alloyed hardened steels	**1.7043** 38CR4	850-1000		●
	1.5752 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		●
Nitrided steels	**1.8504** 34CrA16	≥850-1000		✚
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	1000-1200		●
Tool steels	**1.1750** C75W, **1.2067** 100Cr6, **1.2307** 29CrMoV	≤850		✚
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	850-1000		●
High-speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 50CrV4		≤330 HB	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X2CrMoS17, **1.4105** X4CrMoS18, **1.4305** X8CrNiS18-9	≤850		●
austenitic	**1.4301** X5CrNi18-10, **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17 12 2	≤850		●
martensitic	**1.4057** X20CrNi 17 2 (X17CrNi 16-2), **1.4122** X35CrMo17-1, **1.4521** X2CrMoTi18-2	≤850		●
Hardened steels	–		≤40-48 HRC	●
	–		>48-60 HRC	●
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		●
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)		≤240 HB	✚ ○
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)		<300 HB	✚ ○
Nodulised cast iron and malleable cast iron	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)		≤240 HB	✚
	0.7070 EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		<300 HB	✚
Chilled castings	–		≤350 HB	✚
Titanium and titanium alloys	**3.7024** Ti99,5, **3.7114** TiA15Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiA16Zr5, **3.7164** TiA16V4, **3.7184** TiA14Mo4Sn2,5, - TiA18Mo1V1	850-1200		●
Aluminium and aluminium alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		✚
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		✚
Al cast alloys ≤ 10% Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		✚
>10% Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		✚
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450		○
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		✚
Brass, short chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		✚
Brass, long chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		✚
Bronzes, short chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		✚ ●
	2.0790 CuNi18Zn19Pb	>600-850		●
Bronzes, long chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl11Ni, **2.1247** CuBe2	850-1000		●
Plastics, duroplastic	Bakelite, Resopal, Pertinax, Moltopren		–	○
Plastics, thermoplastic	Plexiglas, Hostalen, Novodur, Makralon		–	✚ ○
Plastics, aramide fibre reinforced	Kevlar		–	○
glass/carbon fibre reinforced	GFRP/CFRP		–	○

Coolant: ✚ emulsion; ● oil; ○ air

Recommended Applications for Drills for Removable Plates

GÜHRING

	1093		1095		1096
					
≤3xD With removable plates		**≤5xD** With removable plates		**≤7xD** With removable plates	
v_c m/min	Feed Code	v_c m/min	Feed Code	v_c m/min	Feed Code
130	**6**	125	**6**	120	**5**
110	**5**	105	**5**	105	**4**
130	**7**	125	**7**	120	**6**
110	**6**	105	**6**	105	**5**
130	**6**	125	**6**	120	**5**
125	**6**	120	**6**	110	**5**
110	**5**	105	**5**	100	**4**
110	**6**	105	**6**	100	**5**
90	**5**	85	**5**	85	**4**
130	**7**	125	**7**	120	**6**
110	**6**	105	**6**	100	**5**
70	**4**	70	**4**	70	**4**
105	5	105	5	105	4
70	4	70	4	70	3
55	5	55	5	55	4
50	4	50	4	50	3
55	3	55	3	55	2
50	2	50	2	50	2
55	3	55	3	55	2
40	3	40	3	40	2
35	3	35	3	35	2
25	2	25	2	25	1
25	2	25	2	25	1
210	**7**	195	**7**	195	**6**
155	**7**	145	**7**	145	**6**
155	**7**	145	**7**	145	**6**
130	**6**	120	**6**	120	**5**
35	2	35	2	35	2
40	3	40	3	40	2
35	2	35	2	35	1
290	7	260	7	260	6
260	7	260	7	260	6
235	7	220	7	220	6
195	**7**	180	**7**	180	**6**
260	7	260	7	260	6
105	6	105	6	105	5
270	7	270	7	270	6
180	6	180	6	180	5
105	6	105	6	105	5
85	6	85	6	85	5
65	6	65	6	65	5
55	5	55	5	55	4
105	5	105	5	105	4
105	5	105	5	105	4
105	5	105	5	105	4
105	5	105	5	105	4

Cutting material	HM-UF
Surface	TiAlN
Article no.	1097



Mainly for machining of: Standard steels

RT 800 WP

If you carry out drilling operations mainly in a diameter range of 16.0 to 40.5 mm, you should opt for the removable plate drilling system RT 800 WP. The nickel-plated supports have cooling ducts, the plates are made of fine-grain carbide. Compared with the soldered carbide tools, the RT 800 WP provided above average results. Also in terms of accuracy and surface quality of the bore hole, the drilling system RT 800 WP offers cutting edge technology:

- Extreme stiffness and optimal chip removal through compact design and twisted chipping area, dimensioned for drilling depths 3 x D, 5 x D and 7 x D.
- High efficiency through long feeds and 2-cut ratio tip geometry.
- Exceptional drilling quality through lands located at the side of the removable plate.
- Indexing through stop screw in the tool holder. The straining screw ensures a positive and firm fit.

The removable plate can be easily and quickly exchanged in the clamped tool holder.
The cutting values for the material are shown on the left.

Recommended Applications for Solid Carbide SuperLine Twist Drills

Preferably use tools with feed series numbers in **bold.**

Drill ∅ mm	Feed Code 1	2	3	4	5	6	7	8	9
	f (mm/RPM)								
0.50	0.004	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.019
1.00	0.006	0.008	0.012	0.014	0.016	0.018	0.020	0.023	0.025
2.00	0.020	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125
2.50	0.025	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160
3.15	0.032	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.160
4.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.200
5.00	0.040	0.050	0.063	0.080	0.100	0.125	0.160	0200	0.250
6.30	0.050	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315
8.00	0.063	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.315
10.00	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.400
12.50	0.080	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500
16.00	0.100	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630
20.00	0.125	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.630
25.00	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	0.800
31.50	0.160	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000
40.00	0.200	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250
50.00	0.250	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.250
63.00	0.315	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600
80.00	0.400	0.500	0.630	0.800	1.000	1.250	1.600	1.600	2.000

Solid carbide SuperLine from page 1/42.

General: Extremely important is that for safety reasons no drill must rotate at a speed of higher than n = 6,000 RPM without support. Centrifugal forces could otherwise lead to the fracture of the long tools before they have reached the surface of the workpiece!

Instructions for use of the 12xD drill: Centring results in exceptionally true alignment of the bore holes. An acute angle of ≥ 140° on at least 2/3 of the cutting edge diameter is recommended. **Minimum coolant pressure** is 40 bar.

Material group	Material examples. Numbers in bold = material number in accordance with DIN EN 10 027	Tensile strength N/mm²	Hardness	Coolant
General structural steels	**1.0035** St 33, **1.0254** St 37.0, **1.0486** StE 285, **1.0345** H1, **1.0425** H2	≤500		✦
	1.0050 St 50-2, **1.0070** St 70-2, **1.8937** WStE500	≤500-850		✦
Machine steels	**1.0718** 9SMnPb28, **1.0723** 15 S20, **1.0736** 9 SMn36	≤850		✦
	1.0727 45 S20, **1.0728** 60 S20, **1.0757** 45SPb20	850-1000		✦
Unalloyed tempering steels	**1.0402** C22, **1.1178** Ck30	≤750		✦
	1.0503 C45, **1.1191** Ck45	700-850		✦
	1.0601 C60, **1.1221** Ck60	850-1000		✦
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-1000		✦
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		✦
Unalloyed hardened steels	**1.0301** C10, **1.1121** Ck10, **1.1140** Cm15	≤750		✦
Alloyed hardened steels	**1.5919** 15CrNi6, **1.7012** 13Cr2, **1.7015** 15Cr13	≤850-1000		●
	1.5752 14NiCr14, **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		●
Nitrided steels	**1.8504** 34CrA16, **1.8506** 34CrAlS5, **1.8509** 41CrAlMo7	≤850-1000		✦
	1.8507 34CrAlMo5, **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7	1000-1200		●
Tool steels	**1.1750** C75W, **1.2067** 100Cr6, **1.2307** 29CrMoV	≤850		✦
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	850-1000		●
High-speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	650-1000		●
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 50CrV4		≤330 HB	●
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X2CrMoS17, **1.4105** X4CrMoS18, **1.4305**	≤850		●
austenitic	**1.4301** X5CrNi1810, **1.4541** X6CrNiTi1810, **1.4571** X6CrNiMoTi1712 2	≤850		●
martensitic	**1.4057** X20CrNi17 2, **1.4122** X35CrMo17, **1.4521** X2CrMoTi18 2	≤850		●
Hardened steels	–		≤40-48 HRC	●
	–		≤48-60 HRC	●
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		●
Cast iron	**GG 10 ... GG 20**		≤240 HB	✦ ○
	GG 25 ... GG 45		≤300 HB	✦ ○
Nodulised cast iron and	GTW 35, GTS 55, GGG 50		≤240 HB	✦
malleable cast iron	GTW 65, GTS 70, GGG 70		≤300 HB	✦
Chilled castings	–		≤350 HB	✦
Titanium and titanium alloys	**3.7024** Ti99,5, **3.7114** TiA15Sn2,5, **3.7124** TiCu2	≤850		●
	3.7154 TiA16Zr5, **3.7164** TiA16V4, **3.7184** TiA14Mo4Sn2,5, - TiA18Mo1V1	850-1200		●
Aluminium and aluminium alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		✦
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		✦
Al cast alloys ≤ 10% Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		✦
>10% Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		✦
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450		○
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		✦
Brass, short chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		✦
Brass, long chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		✦
Bronzes, short chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		✦ ●
	2.0790 CuNi18Zn19Pb	≤600-850		●
Bronzes, long chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●
	2.0980 CuAl1 1Ni, **2.1247** CuBe2	850-1000		●
Plastics, duroplastic	Bakelite, Resopal, Pertinax, Moltopren			○
Plastics, thermoplastic	Plexiglas, Hostalen, Novodur, Makralon			✦ ○
Plastics, aramide fibre reinforced	Kevlar			○
glass/carbon fibre reinforced	GFRP/CFRP			○

Coolant: ✦ emulsion; ● oil; ○ air

Drilling Depths: ≦ 3 x D ≦ 5 x D ≦ 7 x D ≦ 10 x D ≦ 12 x D

R right-hand cutting
○ Fire Coating
FIRE Bright
UF Ultra-fine grain

Letter codes defining the type:
G = for cast iron, AlSi alloys
U = Universal, blends, carbon steels

Cutting material	solid carbide		solid carbide		solid carbide		solid carbide		solid carbide		solid carbide		solid carbide		solid carbide
Cutting material	HM-UF		HM-UF		HM-UF		HM-UF		HM-UF		HM-UF		HM-UF		HM-UF
Carbide use gr.	K/P		K/P		K/P		K/P		K		K/P		K		K/P
Type	RT100U		RT100U		RT100U		RT100U		FT200G		RT100U		RT150GG		RT100U
Shank forms	HA/HE**		HA/HE**		HA/HE**		HA/HE**		HA		HA/HE**		HA		HA
Surface	FIRE		FIRE		FIRE		○		FIRE		FIRE		FIRE		FIRE
Drilling depth	3 x D		3 x D		5 x D		5 x D		5 x D		7 x D		10 x D		12 x D
Inside cooling	without		with		without		with		without		with		with		with
	2 cutting edges		2 cutting edges		2 cutting edges		2 cutting edges		2 cutting edges		2 cutting edges		2 cutting edges		2 cutting edges
Order no.	1200		1206		1212		1218		1233		1224		1230		1228
Order no.	1203**		1209**		1215**		1221**		–		1227**		–		–



v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code
130	**7**	145	**7**	130	**7**	145	**7**	–	–	145	**6**	–	–	90	**6**
110	**6**	120	**6**	110	**6**	120	**6**	–	–	120	**5**	–	–	80	**5**
145	**8**	170	**8**	145	**8**	170	**8**	–	–	170	**7**	–	–	100	**7**
110	**7**	145	**8**	110	**7**	145	**8**	–	–	145	**7**	–	–	90	**7**
120	**7**	130	**8**	120	**7**	130	**8**	–	–	130	**7**	–	–	90	**7**
110	**7**	125	**7**	110	**7**	125	**7**	–	–	125	**6**	–	–	90	**6**
105	**7**	120	**7**	105	**7**	120	**7**	–	–	120	**6**	–	–	80	**6**
105	**7**	120	**7**	105	**7**	120	**7**	–	–	120	**6**	–	–	80	**6**
100	**6**	105	**7**	100	**6**	105	**7**	–	–	105	**6**	–	–	80	**6**
130	**8**	145	**8**	130	**8**	145	**8**	–	–	145	**7**	–	–	90	**7**
120	**7**	120	**7**	120	**7**	120	**7**	–	–	120	**6**	–	–	80	**6**
85	**5**	85	**5**	85	**5**	85	**5**	–	–	85	**4**	–	–	60	**4**
100	6	110	**7**	100	6	105	**7**	–	–	110	**6**	–	–	60	**6**
90	5	105	**5**	90	5	100	**5**	–	–	105	**4**	–	–	50	**4**
65	6	80	6	65	6	70	6	–	–	80	5	–	–	50	5
55	5	65	5	55	5	55	5	–	–	65	4	–	–	40	4
–	–	60	4	–	–	60	5	–	–	60	4	–	–	35	4
45	3	60	3	45	3	60	3	–	–	60	2	–	–	35	2
55	4	60	5	55	4	60	5	–	–	60	4	–	–	40	4
45	4	55	5	45	4	55	5	–	–	55	4	–	–	40	4
45	3	45	5	45	3	50	5	–	–	45	4	–	–	40	4
45	3	55	3	45	3	55	3	–	–	55	2	–	–	–	–
25	2	35	2	25	2	35	2	–	–	35	1	–	–	–	–
25	4	35	4	25	4	35	4	–	–	35	3	–	–	–	–
210	**8**	210	**9**	210	**8**	210	**9**	100	**6**	210	**8**	120	**6**	120	**8**
155	**8**	160	**9**	155	**8**	180	**9**	80	**6**	180	**8**	100	**6**	120	**8**
155	**7**	140	**9**	145	**7**	160	**9**	80	**6**	160	**8**	90	**6**	90	**8**
125	**7**	130	**8**	125	**7**	130	**8**	70	**6**	130	**7**	80	**6**	80	**7**
35	**3**	40	**3**	35	**3**	40	**3**	–	–	40	**2**	40	**2**	–	–
40	4	45	4	40	4	40	4	–	–	40	3	–	–	–	–
35	3	40	4	35	3	40	4	–	–	40	2	–	–	–	–
260	**9**	310	**9**	260	**9**	310	**9**	180	**7**	310	8	410	**8**	150	8
260	**9**	310	**9**	260	**9**	310	**9**	160	**7**	310	8	410	**8**	150	8
220	**9**	260	**9**	235	**9**	260	**9**	150	**7**	260	8	380	**8**	150	8
180	**8**	220	**9**	170	**8**	220	**9**	120	**6**	220	8	330	**8**	80	8
260	**8**	280	**8**	260	**8**	280	**8**	180	**6**	280	**7**	–	–	150	**7**
105	**7***	125	**7***	105	**7***	125	**7***	–	–	125	**6**	–	–	80	6
270	**8**	325	**8**	270	**8**	325	**8**	180	**6**	325	**7**	280	7	120	**7**
180	**7**	220	**7**	180	**7**	220	**7**	–	–	220	**6**	–	–	120	**6**
105	**6***	125	**7***	105	**6***	125	**7***	–	–	125	6	110	6	40	6
85	**6***	105	**6***	85	**6***	105	**6***	–	–	105	5	80	5	–	–
80	**5***	90	**6***	80	**5***	90	**6***	–	–	90	5	–	–	–	–
60	**5***	80	**6***	60	**5***	80	**6***	–	–	80	5	–	–	40	5
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

* use tools with extreme taper.

Application for FORMAT Conical Drills for Sheet Metal

FORMAT conical drills for sheet metal are designed for deburr-free drilling of sheet metal, pipes and profiled steel.
The tool is suitable for material thickness from 0.1 mm.
The robust construction has a wide rake angle, a small clearance angle and a relief grind.

FORMAT conical sheet metal drills can be used on controllable hand drilling machines or on upright drilling machines. No centre punching is needed.

Adequate lubrication during drilling is to be ensured.

Standard speeds for FORMAT conical sheet metal drills

Material		Structural steel	CrNi steel	Non-ferrous steel	Plastics duroplasts thermo-plasts
Material thickness Size	ø mm	0.1–2 mm n = RPM	0.1–1 mm n = RPM	0.1–5 mm n = RPM	max. 10 mm n = RPM
1	3–14	800–500	600–400	2000–1500	3000–2000
2	8–20	600–300	400–200	1500– 800	2000–1500
3	16–30	400–200	200– 10	1000– 500	1500–1000
4	26–40	300–150	100– 80	500– 300	1000– 500

Material		Structural steel	CrNi steel	Non-ferrous steel	Plastics duroplasts thermo-plasts
Material thickness Size	ø mm	0.1–2 mm n = RPM	0.1–1 mm n = RPM	0.1–5 mm n = RPM	max. 10 mm n = RPM
5	36–50	200–100	80– 50	30–200	500– 200
6	46–60	100– 50	50	200–100	400– 200
A	4–22.5	450–250	200–100	1000–700	2000–1200
L	4–30	400–200	200–100	1000–500	1500–1000

Conical drills for sheet metal see page 1/56.

Application for FORMAT Stepped Drills

FORMAT stepped drills are used for generating cylindrical holes, which are then deburred in the next step. The FORMAT stepped drill replaces a complete set of twist drills. Spot drilling and centre punching are no longer needed, punching is effected by the FORMAT stepped drill itself. The desired hole diameter can easily be determined by counting the individual steps or by the indications on the laser scale (DBGM). Various sizes with precisely adjusted diameters ensure the accurate drilling of bore holes for PG screws.

FORMAT stepped drills can be used on adjustable hand drilling machines. However, we recommend drilling on stationary machines. The tools are axially and radially relief ground and may be reground before the rake.

Adequate lubrication during drilling is to be ensured.

Standard speeds for FORMAT stepped drills

ø mm	Structural steel	CrNi steel	Non-ferrous steel	Plastics
4–12	800–500	400–250	1500–1000	2000–1500
14–20	500–300	250–150	1000– 600	1500– 800
21–30	300–200	150–100	600– 400	800– 500

ø mm	Structural steel	CrNi steel	Non-ferrous steel	Plastics
30–40	200–150	100–70	400–300	500–350
40–50	150–100	70–50	300–200	350–250
50–60	100– 50	50	200–100	250–150

Stepped drills see page 1/57.

FORMAT Countersinks/FORMAT Countersink Bits

Rake and clearance angles ensure correct and smooth countersinking on almost any material used in the machining of metal. Should however the result not be satisfactory, we will carry out countersinking tests in order to offer improved solutions. Experience has shown that by using our FORMAT countersinks and FORMAT countersink bits, better results are obtained at lower speed and with longer feeds.

Material	Cutting speed V_c	Feed S (mm/RPM) for countersinks						Coolant/lubricant
		5	10	16	25	40	63	
Unalloyed steel max. 700 N/mm²	20– 28	0.05–0.7	0.09–0.12	0.12–0.16	0.16–0.20	0.20–0.25	0.25–0.36	Emulsion
Unalloyed steel max. 900 N/mm²	18– 25	0.04–0.05	0.06–0.08	0.09–0.12	0.12–0.16	0.16–0.20	0.20–0.28	Emulsion
Unalloyed steel max. 1,250 N/mm²	6– 10	manual	0.04–0.06	0.07–0.09	0.09–0.11	0.11–0.14	0.14–0.18	Emulsion
Stainless steel	5– 12	manual	0.04–0.06	0.07–0.09	0.09–0.11	0.11–0.14	0.14–0.18	Emulsion
Grey-cast iron max. 200 HB	14– 25	0.07–0.10	0.12–0.16	0.16–0.20	0.20–0.25	0.25–0.32	0.25–0.32	Dry
Grey-cast iron max. 240 HB	8– 14	0.06–0.09	0.10–0.12	0.12–0.16	0.16–0.20	0.20–0.25	0.25–0.36	Dry
Copper and Cu alloy	36– 50	0.04–0.09	0.10–0.12	0.12–0.16	0.16–0.20	0.20–0.25	0.25–0.36	Emulsion or cutting oil
Brass short chipping MS 58	50– 80	0.08–0.11	0.12–0.16	0.16–0.20	0.20–0.25	0.25–0.32	0.32–0.40	Emulsion or cutting oil
Brass long chipping MS 63	30– 50	0.08–0.11	0.12–0.16	0.16–0.20	0.20–0.25	0.25–0.32	0.32–0.40	Emulsion or cutting oil
Aluminium alloy, long chipping	40– 80	0.08–0.11	0,12–0.16	0.16–0.20	0.20–0.25	0.25–0.32	0.32–0.40	Emulsion
Aluminium alloy, short chipping + Silumin	25– 50	0.06–0.09	0.10–0.12	0.12–0.16	0.16–0.20	0.20–0.25	0.25–0.36	Emulsion
Magnesium alloys	60–100	0.10–0.14	0.16–0.20	0.20–0.25	0.25–0.32	0.32–0.40	0.40–0.50	Dry (no water)
Plastics (thermoplastics)	20– 40	0.05–0.08	0.09–0.12	0.12–0.16	0.16–0.20	0.20–0.25	0.25–0.36	Compressed air
Plastics (thermoset plastics)	10– 20	0.04–0.06	0.07–0.09	0.10–0.12	0.12–0.16	0.16–0.20	0.20–0.25	Compressed air

Countersinks from page 1/68.

Standard Use Value for Counterbore Combination Systems

Cutting details	Material	Cutting speed V_c	Feed f
HSS/E countersink	Low-alloy steel e.g. C45 High-alloy steel e.g. 42CrMo4V Stainless steel X10CrNiS189 Copper and brass Aluminium	 20–25 m/mn 12–15 m/mn 6–10 m/mn 20–30 m/mn 20–40 m/mn	0.12–0.25 mm/RPM (small ∅ = low-speed feed large ∅ = high-speed feed)
S. carbide countersink	Grey cast iron Brass	50 m/mn 50 m/mn	

For diameters below 17 mm we recommend to choose lower feed values than indicated in the table. The above values are standard values, provided that stable machining conditions and proper tools are used.
We recommend to start with a medium feed value and adjust it according to the result obtained.

GFS Counterbore Combination System

Cutting speed (m/min)

Tensile strength N/mm²		HSS	Solide carbide	WP
Steel	< 600	15–35	60–130	70–130
Steel	<1,000	12–22	40–110	60–100
Steel	>1,000	5–15	30– 90	45– 90
Cast steel		10–20	30– 90	45– 90
Chromium-nickel steel/Nirosta/V4a, etc.		6–15	20– 60	30– 60
Grey cast iron		10–30	40–100	70–110
Aluminium and al. alloys		40–80	100–300	100–200
Brass		20–60	50–150	80–200

The defined values refer to the strength of normal structural steel. Please note in particular the high wear of special steel, alloyed tool steel, heat-resistant steel, etc. The cutting speed should therefore be reduced accordingly.

Feed

Countersink < ∅ 16 mm environ 0.12 mm/RPM
Countersink ∅ 17–25 mm environ 0.15 mm/RPM
Countersink ∅ 26–40 mm environ 0.20 mm/RPM

For values exceeding the above, depending on strength and composition of the workpiece to be machined, however in principle 0.15 to 0.3 mm/RPM (aluminium max. 0.5 mm/RPM). Proper cooling is of great significance. Cutting speed should not be too low, otherwise there is a risk of fracture. Always check whether the bore hole matches the solid pilot, i.e. the solid pilot must be moved smoothly in the hole.

For grey cast iron or brass preferably use carbide-tipped countersinks. For structural steel, tool steel, chromium nickel steel etc. we recommend the use of countersinks of high-speed steel.

We also offer hard material coatings such as TiN, TiCN or TiAlN, which may be useful in many cases. Cutting performance can be multiplied while cutting values remain constant.

General

Greatest care should be taken to select the matching size for the respective boring process. Best results are achieved when the largest possible clamping shank and the largest possible solid pilot are employed. For the machining of materials which are difficult to chip, the holder with the smallest clamping shank should not be combined with the largest countersink (e.g. holder OMK1/countersink ∅ 16.5 or holder 1 MK2/countersink ∅ 27.5).

Working with the GFS counterbore tool requires a secure fastening of the workpiece on the machine. Improper fastening of the workpiece has a negative effect on the cutting performance. This roughing-chipping operation results in strong cutting forces which might break loose from the workpiece and cause damage both to workpiece and machine.

All safety regulations are to be observed when working with GFS tools, only skilled personnel qualified for this job are allowed to work with the tools.

Counterbore combination systems from page 1/73.

Cutting Speed and Feed (Standard Value)

User guidelines for FORMAT HSS-E Reamers

Material	Cutting speed = v_c Feed = f RPM = n	Reamer diameter mm 5	8	10	15	20	25	30	40	50
Steel **max. 70 kp/mm²**	v_c = m/min. f = mm/R n = RPM	8–12 0.10 700	8–12 0.15 500	8–12 0.20 400	8–12 0.25 250	8–12 0.30 200	8–12 0.30 160	8–12 0.35 125	8–12 0.40 90	8–12 0.50 80
Steel **70–90 kp/mm²**	v_c = m/min. f = mm/R n = RPM	6–8 0.10 500	6–8 0.15 400	6–8 0.20 350	6–8 0.25 220	6–8 0.30 160	6–8 0.30 125	6–8 0.35 90	6–8 0.40 80	6–8 0.50 65
Steel **over 90 kp/mm²**	v_c = m/min. f = mm/R n = RPM	4–6 0.08 400	4–6 0.10 300	4–6 0.15 250	4–6 0.20 160	4–6 0.25 125	4–6 0.25 100	4–6 0.30 80	4–6 0.35 65	4–6 0.40 50
Cast iron **max. 90 kp/mm²**	v_c = m/min. f = mm/R n = RPM	4–6 0.08 400	4–6 0.10 300	4–6 0.15 250	4–6 0.20 160	4–6 0.25 125	4–6 0.25 100	4–6 0.30 80	4–6 0.35 65	4–6 0.40 50
Cast iron **over 90 kp/mm²**	v_c = m/min. f = mm/R n = RPM	2–4 0.06 250	2–4 0.10 180	2–4 0.15 125	2–4 0.20 80	2–4 0.25 65	2–4 0.25 50	2–4 0.30 40	2–4 0.32 32	2–4 0.40 25
Cast iron **Malleable cast iron** **max. 200 HB**	v_c = m/min. f = mm/R n = RPM	6–10 0.15 600	6–10 0.20 450	6–10 0.25 375	6–10 0.30 230	6–10 0.32 180	6–10 0.40 140	6–10 0.50 100	6–10 0.60 80	6–10 0.70 65
Cast iron **Malleable cast iron** **over 200 HB**	v_c = m/min. f = mm/R n = RPM	4–6 0.10 400	4–6 0.15 300	4–6 0.20 250	4–6 0.25 160	4–6 0.25 125	4–6 0.32 100	4–6 0.40 80	4–6 0.50 65	4–6 0.60 50
Copper	v_c = m/min. f = mm/R n = RPM	8–12 0.15 700	8–12 0.20 500	8–12 0.20 400	8–12 0.25 250	8–12 0.30 200	8–12 0.32 160	8–12 0.35 125	8–12 0.40 90	8–12 0.50 80
Brass **brittle** **MS 58**	v_c = m/min. f = mm/R n = RPM	14–20 0.20 1000	14–20 0.25 800	14–20 0.30 500	14–20 0.35 300	14–20 0.40 250	14–20 0.40 200	14–20 0.45 180	14–20 0.50 125	14–20 0.60 90
Brass **tough** **from MS 63**	v_c = m/min. f = mm/R n = RPM	8–12 0.15 700	8–12 0.20 500	8–12 0.25 400	8–12 0.30 250	8–12 0.35 200	8–12 0.35 160	8–12 0.40 125	8–12 0.45 90	8–12 0.50 80
Titanium alloys	v_c = m/min. f = mm/R n = RPM	4–6 0.06 400	4–6 0.10 300	4–6 0.15 250	4–6 0.18 160	4–6 0.20 125	4–6 0.25 100	4–6 0.30 80	4–6 0.32 65	4–6 0.40 50
Lightweight alloys	v_c = m/min. f = mm/R n = RPM	14–20 0.15 1000	14–20 0.18 800	14–20 0.20 500	14–20 0.25 300	14–20 0.30 250	14–20 0.30 200	14–20 0.35 180	14–20 0.40 125	14–20 0.40 90
Silumin	v_c = m/min. f = mm/R n = RPM	8–12 0.15 700	8–12 0.18 500	8–12 0.20 400	8–12 0.25 250	8–12 0.30 200	8–12 0.30 160	8–12 0.35 125	8–12 0.40 90	8–12 0.40 80
Plastics **hard**	v_c = m/min. f = mm/R n = RPM	4–6 0.20 400	4–6 0.25 300	4–6 0.30 250	4–6 0.35 160	4–6 0.40 125	4–6 0.45 100	4–6 0.45 80	4–6 0.50 65	4–6 0.50 50
Plastics **soft**	v_c = m/min. f = mm/R n = RPM	6–10 0.25 600	6–10 0.30 450	6–10 0.35 375	6–10 0.40 230	6–10 0.45 180	6–10 0.50 140	6–10 0.55 100	6–10 0.60 80	6–10 0.60 65

User guidelines for FORMAT carbide tipped/solid carbide FORMAT Reamers

Steel **max. 70 kp/mm²**	v_c = m/min. f = mm/R n = RPM	10–15 0.15 800	10–15 0.18 600	10–15 0.20 450	10–15 0.25 280	10–15 0.30 230	10–15 0.30 180	10–15 0.35 150	10–15 0.40 100	10–15 0.50 80
Steel **70–90 kp/mm²**	v_c = m/min. f = mm/R n = RPM	8–12 0.12 700	8–12 0.15 500	8–12 0.15 400	8–12 0.18 250	8–12 0.20 200	8–12 0.20 160	8–12 0.25 125	8–12 0.30 90	8–12 0.40 80
Steel **over 90 kp/mm²**	v_c = m/min. f = mm/R n = RPM	6–10 0.08 600	6–10 0.10 450	6–10 0.12 375	6–10 0.15 230	6–10 0.18 180	6–10 0.20 140	6–10 0.25 100	6–10 0.30 80	6–10 0.40 65
Cast iron **max. kp/mm²**	v_c = m/min. f = mm/R n = RPM	8–15 0.12 800	8–15 0.15 600	8–15 0.18 450	8–15 0.20 280	8–15 0.25 230	8–15 0.25 180	8–15 0.30 150	8–15 0.35 100	8–15 0.40 80

Reamers from page 1/82.

Cont. overleaf

Cutting Speed and Feed (Standard Value)

cont.

format professional quality

User guidelines for FORMAT carbide tipped/solid carbide FORMAT Reamers

Material	Cutting speed = v_c Feed = f RPM = n	Reamer diameter mm								
		5	8	10	15	20	25	30	40	50
Steel over 90 kp/mm²	v_c = m/min. f = mm/R n = RPM	4–8 0.10 500	4–8 0.12 400	4–8 0.15 350	4–8 0.18 220	4–8 0.20 160	4–8 0.20 125	4–8 0.25 90	4–8 0.30 80	4–8 0.35 65
Cast iron Malleable cast iron max. 200 HB	v_c = m/min. f = mm/R n = RPM	12–15 0.20 800	12–15 0.25 600	12–15 0.30 450	12–15 0.35 280	12–15 0.40 230	12–15 0.45 180	12–15 0.50 150	12–15 0.60 100	12–15 0.70 80
Cast iron Malleable cast iron over 200 HB	v_c = m/min. f = mm/R n = RPM	8–12 0.15 700	8–12 0.20 500	8–12 0.25 400	8–12 0.30 250	8–12 0.30 200	8–12 0.35 160	8–12 0.40 125	8–12 0.50 90	8–12 0.60 80
Copper	v_c = m/min. f = mm/R n = RPM	20–40 0.25 2500	20–40 0.30 1500	20–40 0.35 1200	20–40 0.45 800	20–40 0.50 600	20–40 0.50 450	20–40 0.55 400	20–40 0.60 300	20–40 0.70 230
Brass Red brass	v_c = m/min. f = mm/R n = RPM	20–40 0.14 2500	20–40 0.17 1500	20–40 0.20 1200	20–40 0.20 800	20–40 0.25 600	20–40 0.25 450	20–40 0.30 400	20–40 0.30 300	20–40 0.35 230
Lightweight metal	v_c = m/min. f = mm/R n = RPM	20–40 0.15 2500	20–40 0.20 1500	20–40 0.25 1200	20–40 0.30 800	20–40 0.35 600	20–40 0.40 450	20–40 0.45 400	20–40 0.50 300	20–40 0.55 230
Plastics	v_c = m/min. f = mm/R n = RPM	20–35 0.30 2200	20–35 0.35 1300	20–35 0.40 1100	20–35 0.45 700	20–35 0.50 500	20–35 0.50 400	20–35 0.55 350	20–35 0.60 250	20–35 0.70 200

Hole Size for Reaming

(Standard value or pilot drill value)

Material	Hole ∅ mm				
	3–5	6–10	11–20	21–30	over 30
Steel max. 70 kp/mm² Steel over 70 kp/mm²	0.1–0.2 0.1–0.2	0.2 0.2	0.2–0.3 0.2	0.3–0.4 0.3	0.4–0.5 0.3–0.4
Cast steel Grey cast iron Malleable cast iron	0.1–0.2 0.1–0.2 0.1–0.2	0.2 0.2 0.2	0.2 0.2–0.3 0.3	0.2–0.3 0.3–0.4 0.4	0.3–0.4 0.4–0.5 0.5
Copper Brass, bronze Lightweight metal	0.1–0.2 0.1–0.2 0.1–0.2	0.2–0.3 0.2 0.2–0.3	0.3–0.4 0.2–0.3 0.3–0.4	0.4–0.5 0.3 0.4–0.5	0.5 0.3–0.4 0.5
Plastics hard Plastics soft	0.1–0.2 0.1–0.2	0.3 0.2	0.4 0.2	0.4–0.5 0.3	0.5 0.3–0.4

If using shell end reamers we recommend to increase the above value up to max. 50 %. This is due to the type of operation and the helix of this type of reamer.

For adjustable reamers and reamers with incorporated cutters, the value in the table must be reduced by approx. 30 %.

If especially precise holes are required or if hard materials are machined, divide the working process into pre-reaming and final reaming.

If the value is too small, the tool may get stuck or break or becomes blunt.

Coolants and Lubricants for Reaming

Material machined		Material machined	
Tool steels	Drilling oil emulsion	Brass	Dry, drilling oil emulsion
Alloyed steel	Drilling oil emulsion, cutting oil	Bronze	Dry, drilling oil emulsion
Special steels, stainless	Drilling oil, cutting oil	Copper	Drilling oil emulsion
Heat-resistant			
Cast steel	Drilling oil emulsion	Red brass	Dry, drilling oil emulsion
Cast iron	Dry	Aluminium	Drilling oil emulsion, petroleum
Chilled castings	Drilling oil emulsion	Silumin	Drilling oil emulsion, petroleum
Malleable cast iron	Dry, drilling oil emulsion	Plastics	Dry

Reamers from page 1/82.

Fitting Table for 1/100 Machine Reamers similar to DIN 212

format professional quality

Hole ∅ in mm	C 8	C 9	C 10	C 11	CD 7	D 7	D 8	D 9	D 10	D 11	D 12	E 7	E 8	E 9	EF 8	F 7	F 8	F 9
1.0	1.07	1.07	1.08	1.10	1.04	1.02	1.03	–	1.04	1.06	1.08	1.02	1.02	1.03	1.02	1.01	1.01	1.02
2.0	2.07	2.07	2.08	2.10	2.04	2.02	2.03	–	2.04	2.06	2.08	2.02	2.02	2.03	2.02	2.01	2.01	2.02
3.0	3.07	3.07	3.08	3.10	3.04	3.02	3.03	–	3.04	3.06	3.08	3.02	3.02	3.03	3.02	3.01	3.01	3.02
4.0	4.08	4.09	–	–	4.05	4.04	4.04	4.05	4.06	4.08	4.10	–	4.03	4.04	4.03	–	4.02	4.03
5.0	5.08	5.09	–	–	5.05	5.04	5.04	5.05	5.06	5.08	5.10	–	5.03	5.04	5.03	–	5.02	5.03
6.0	6.08	6.09	–	–	6.05	6.04	6.04	6.05	6.06	6.08	6.10	–	6.03	6.04	6.03	–	6.02	6.03
7.0	7.09	7.10	–	–	7.06	7.05	7.05	7.06	7.08	7.10	–	7.03	7.04	7.05	7.03	7.02	7.03	–
8.0	8.09	8.10	–	–	8.06	8.05	8.05	8.06	8.08	8.10	–	8.03	8.04	8.05	8.03	8.02	8.03	–
9.0	9.09	9.10	–	–	9.06	9.05	9.05	9.06	9.08	9.10	–	9.03	9.04	9.05	9.03	9.02	9.03	–
10.0	10.09	10.10	–	–	10.06	10.05	10.05	10.06	10.08	10.10	–	10.03	10.04	10.05	10.03	10.02	10.03	–
11.0	–	–	–	–	–	11.06	–	11.08	11.10	–	–	11.04	11.05	11.06	–	–	11.03	11.04
12.0	–	–	–	–	–	12.06	–	12.08	12.10	–	–	12.04	12.05	12.06	–	–	12.03	12.04

Hole ∅ in mm	F 10	G 6	G 7	H 5	H 6	H 7	H 8	H 9	H 10	H 11	H 12	H 13	J 6	J 7	J 8	JS 7	JS 8	JS 9
1.0	–	–	1.01	1.00	1.00	–	1.01	–	1.02	1.04	1.06	1.09	1.00	1.00	1.00	1.00	1.00	1.00
2.0	–	–	2.01	2.00	2.00	–	2.01	–	2.02	2.04	2.06	2.09	2.00	2.00	2.00	2.00	2.00	2.00
3.0	–	–	3.01	3.00	3.00	–	3.01	–	3.02	3.04	3.06	3.09	3.00	3.00	3.00	3.00	3.00	3.00
4.0	4.04	4.01	4.01	4.00	4.00	–	4.01	4.02	4.03	4.05	4.08	–	4.00	4.00	4.00	4.00	4.00	4.00
5.0	5.04	5.01	5.01	5.00	5.00	–	5.01	5.02	5.03	5.05	5.08	–	5.00	5.00	5.00	5.00	5.00	5.00
6.0	6.04	6.01	6.01	6.00	6.00	–	6.01	6.02	6.03	6.05	6.08	–	6.00	6.00	6.00	6.00	6.00	6.00
7.0	7.05	7.01	7.01	7.00	7.00	7.01	7.01	7.02	7.04	7.06	7.10	–	7.00	7.00	7.00	7.00	7.00	–
8.0	8.05	8.01	8.01	8.00	8.00	8.01	8.01	8.02	8.04	8.06	8.10	–	8.00	8.00	8.00	8.00	8.00	–
9.0	9.05	9.01	9.01	9.00	9.00	9.01	9.01	9.02	9.04	9.06	9.10	–	9.00	9.00	9.00	9.00	9.00	–
10.0	10.05	10.01	10.01	10.00	10.00	10.01	10.01	10.02	10.04	10.06	10.10	–	10.00	10.00	10.00	10.00	10.00	–
11.0	11.06	11.01	–	11.00	–	11.01	11.02	11.03	11.05	11.07	–	–	11.00	11.00	11.00	11.00	11.00	–
12.0	12.06	12.01	–	12.00	–	12.01	12.02	12.03	12.05	12.07	–	–	12.00	12.00	12.00	12.00	12.00	–

Hole ∅ in mm	K 6	K 7	K 8	M 6	M 7	M 8	N 6	N 7	N 8	P 6	P 7	P 8	R 6	R 7	S 6	S 7	U 6	U 7
1.0	–	–	0.99	–	–	0.99	0.99	0.99	0.99	0.99	0.99	0.99	–	–	0.98	0.98	0.98	0.98
2.0	–	–	1.99	–	–	1.99	1.99	1.99	1.99	1.99	1.99	1.99	–	–	1.98	1.98	1.98	1.98
3.0	–	–	2.99	–	–	2.99	2.99	2.99	2.99	2.99	2.99	2.99	–	–	2.98	2.98	2.98	2.98
4.0	4.00	4.00	4.00	3.99	–	3.99	3.99	3.99	3.99	–	–	3.98	–	–	3.98	3.98	–	–
5.0	5.00	5.00	5.00	4.99	–	4.99	4.99	4.99	4.99	–	–	4.98	–	–	4.98	4.98	–	–
6.0	6.00	6.00	6.00	5.99	–	5.99	5.99	5.99	5.99	–	–	5.98	–	–	5.98	5.98	–	–
7.0	–	7.00	7.00	6.99	6.99	6.99	–	6.99	6.99	–	–	–	6.98	6.98	–	–	6.97	6.97
8.0	–	8.00	8.00	7.99	7.99	7.99	–	7.99	7.99	–	–	–	7.98	7.98	–	–	7.97	7.97
9.0	–	9.00	9.00	8.99	8.99	8.99	–	8.99	8.99	–	–	–	8.98	8.98	–	–	8.97	8.97
10.0	–	10.00	10.00	9.99	9.99	9.99	–	9.99	9.99	–	–	–	9.98	9.98	–	–	9.97	9.97
11.0	–	11.00	11.00	10.99	10.99	10.99	–	10.99	10.99	10.98	10.98	10.97	–	–	10.97	10.97	–	–
12.0	–	12.00	12.00	11.99	11.99	11.99	–	11.99	11.99	11.98	11.98	11.97	–	–	11.97	11.97	–	–

Hole ∅ in mm	X 7	X 8	X 9	Z 7	Z 8	Z 9	Z 10	ZA 7	ZA 8	ZA 9	ZB 8	ZB 9
1.0	–	0.97	0.97	0.97	0.97	–	0.96	0.96	–	–	0.95	0.95
2.0	–	1.97	1.97	1.97	1.97	–	1.96	1.96	–	–	1.95	1.95
3.0	–	2.97	2.97	2.97	2.97	–	2.96	2.96	–	–	2.95	2.95
4.0	3.97	–	3.96	3.96	3.96	3.95	3.95	3.96	–	–	3.94	3.94
5.0	4.97	–	4.96	4.96	4.96	4.95	4.95	4.96	–	–	4.94	4.94
6.0	5.97	–	5.96	5.96	5.96	5.95	5.95	5.96	–	–	5.94	5.94
7.0	–	6.96	6.95	6.96	6.95	–	6.94	6.94	6.94	–	–	6.92
8.0	–	7.96	7.95	7.96	7.95	–	7.94	7.94	7.94	–	–	7.92
9.0	–	8.96	8.95	8.96	8.95	–	8.94	8.94	8.94	–	–	8.92
10.0	–	9.96	9.95	9.96	9.95	–	9.94	9.94	9.94	–	–	9.92
11.0	10.96	10.95	–	10.95	10.94	–	10.93	–	10.93	–	10.90	10.90
12.0	11.96	11.95	–	11.95	11.94	–	11.93	–	11.93	–	11.90	11.90

Machine reamer similar to DIN 212 on page 1/85.

Hand Thread Taps

Set

Ⓥ Taper tap
Ⓜ Second tap
Ⓕ Bottoming tap
○ Bright

General steels ≤ 800 N/mm²

Rust/acid-resistant steel

format professional quality



Through and blind hole threads

Cutting material			HSS	HSS	HSS	HSS-E
Type			Type N	Type N	Type N	Type INOX
Surface			○	○	○	○
					Left-hand thread	
						
Thread type	Tolerance field	DIN (standard)				
M	ISO 2 6H	DIN **352**	**1604** (set) consisting of: **1600** Ⓥ **1601** Ⓜ **1603** Ⓕ M1...M30	–	**1612** (set) M3...M20	**1618** (set) M2...M20
MF	ISO 2 6H	DIN **2181**	–	**1627** (set) consisting of: **1625** Ⓥ **1626** Ⓕ M2...M52	–	–
UNC	2B	DIN **2184-2**	**1647** (set) Nr. 1-64...1-8	–	–	–
UNF	2B	DIN **2184-2**	–	**1650** (set) Nr. 0-80...1-12	–	–
BSW	–	DIN **2184-2**	**1635** (set) W 1/8...W1	–	–	–
Pipe thread G	–	DIN **5157**	–	**1640** (set) consisting of: **1638** Ⓥ **1639** Ⓕ G 1/8...G2	–	–

Material examples:

for Type VA-1618

Material to DIN DIN EN 10027	Short description	Material to DIN DIN EN 10027	Short description	Material to DIN DIN EN 10027	Short description
Structural steel		Hardened steel		Sulphured steel	
1.0035	S 185 (St 33)	1.0401	(C 15)	1.4104	X 14 CrMo S 17
1.0039	S 235 JRH	1.7016	17Cr3	1.4105	X 6 CrMo S 17
1.0036	S 235 JRG 1+CR	1.7131	16MnCr5	1.4305	X 8CrNi S 18-9
1.0060	E 335 (St 60-2)	1.5919	15CrNi6	–	–
Machine steel		Tempering steel		Austenitic steel	
1.0718	11SMnPb30	1.0402	C 22	1.4300	X 12 CrNi 18-8
1.0721	10S20	1.1151	C22E (Ck 22)	1.4301	X 5 CrNi 18-10
1.0758	60SPb20	1.0503	C 45	1.4541	X 6 CrNiTi 18-10
1.0726	35S20	1.1191	C45E (Ck 45)	–	–
–	–	–	–	Martensitic steel	
–	–	–	–	1.4057	X 17 CrNi 16-2
–	–	–	–	1.4112	X 90 CrMoV 18
–	–	–	–	1.4006	X 12 Cr 13
–	–	–	–	Ferritic steel	
–	–	–	–	1.4000	X 6 Cr 13
–	–	–	–	1.4008	GX 8CrNi 13
–	–	–	–	1.4113	X 6 CrMo 17-1

Spiral Point Machine Taps

General steels
≤ 800 N/mm²

○ bright
● steam-tempered

Standard values
for uncoated tools:
V_c ≤ 15 m/min
for coated tools:
V_c ≤ 30 m/min

Through thread

Thread depth			≤ 1.5 x D	≤ 1.5 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D
Cutting material			HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Type/form			Type N/C	Type N/C	Type N/B	Type N/B	Type N/B	Type N/B	Type N/B
Surface			○	○	○	○	■	■	○
									Left-hand thread 
Thread type	Tolerance field	DIN (standard)							
M	ISO 2 6H	DIN **371**	–	–	–		**1676**• M1...10	**1677**• M1...M10	**1737**• M3...10
M	ISO 2 6H	DIN **376**	–	–	–		**1679**• M3...30	**1680**• M12...M30	–
MF	ISO 2 6H	DIN **374**	–	–	–		**1753**• M3 x 0.35 up to M30 x 1.5	**1754**• M3 x 0.35 up to M30 x 1.5	–
UNC	2B	Similar to DIN **371**	–	–	**1768**• No. 2-56 up to $^3/_8$-16		–		–
UNC	2B	Similar to DIN **376**	–	–	**1768**• No. $^7/_{16}$-14 up to 1-8			–	–
UNF	2B	Similar to DIN **374**	–	–	**1772**• No. 10-32 up to 1-12			–	–
Pipe thread G	–	DIN **5156**	–	–	**1763**• G $^1/_8$...G1 $^1/_2$	**1764**• G $^1/_8$...G1 $^1/_2$		–	–
M	ISO 2 6H	DIN **352**	–	–	**1673**• M2...M20			–	–
Pg	–	DIN **40432**	**1777** Pg7...Pg36	–	–			–	–
NPT	–	Company standard	–	**1670** $^1/_{16}$...1"	–			–	–
M	ISO 2 6H	DIN **357**	–	–	**1750*** M3...M16			–	–

• Recommended tools for use.
* Nut tap

Material examples: Yellow band

Material no. to DIN EN 10 027	Short description	Material no. to DIN EN 10 027	Short description
Structural steel		Machine steel	
1.0035	S 185 (St 33)	1.0401	(C 15)
1.0039	S 235 JRH	1.7016	17 Cr3
1.0036	S 235JRG1+CR	1.7131	16MnCr5
1.0060	E 335 (St 60-2)	1.5919	15CrNi6
Machine steel		Tempering steel	
1.0718	11SMnPb30	1.0402	C 22
1.0721	10S20	1.1151	C22E (Ck 22)
1.0758	60SPb20	1.0503	C 45
1.0726	35S20	1.1191	C45E (Ck 45)

Spiral Point Machine Taps

General steels
≤ 800 N/mm²

○ bright
■ steam-tempered

Standard values
for uncoated tools:
$V_c \leq 15$ m/min
for coated tools:
$V_c \leq 30$ m/min

Blind thread

Thread depth			≤ 1.5 x D	≤ 1.5 x D	≤ 1.5 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D
Cutting material			HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Type/form			Type N/C	Type N/C	NR15/C	Type NR40/C	Type NR40/C	Type NR40/C	Type NR40/C
Surface			○	○	○	○	○	■	■
									
Thread type	Tolerance field	DIN (standard)							
M	ISO 2 6H	DIN **371**	–	–	–	–		**1682**• M2...10	**1681**• M2...M10
M	ISO 2 6H	DIN **376**	–	–	–	–		**1682**• M12...30	**1681**• M12...M30
MF	ISO 2 6H	DIN **374**	–	–	–	–		**1755**• M4 x 0.5 up to M30 x 1.5	**1751**• M4 x 0.5 up to M30 x 1.5
UNC	2B	Similar to DIN **371**	–	–	–	**1770**• No. 4-40 up to $^3/_8$-16		–	
UNC	2B	Similar to DIN **376**	–	–	–	**1770**• No. $^7/_{16}$-14 up to 1-8		–	
UNF	2B	Similar to DIN **374**	–	–	–	**1774**• No. 10-32 up to 1-12		–	
Pipe thread G	–	DIN **5156**	–	–	–	**1765**• G $^1/_8$...G $1^1/_2$	**1767**• G $^1/_8$...G $1^1/_2$	–	
M	ISO 2 6H	DIN **352**	–	–	**1738** M3...20	–		–	
Pg	–	DIN **40432**	**1777** Pg7...36	–	–	–		–	
NPT	–	Company standard	–	**1670** $^1/_{16}$...1"	–	–		–	

• Recommended tools for use.

Material examples: Yellow band

Material no. to DIN EN 10027	Short description	Material no. to DIN EN 10027	Short description
Structural steel		Machine steel	
1.0035	S 185 (St 33)	1.0401	(C 15)
1.0039	S 235 JRH	1.7016	17 Cr3
1.0036	S 235JRG1+CR	1.7131	16MnCr5
1.0060	E 335 (St 60-2)	1.5919	15CrNi6
Machine steel		Tempering steel	
1.0718	11SMnPb30	1.0402	C 22
1.0721	10S20	1.1151	C22E (Ck 22)
1.0758	60SPb20	1.0503	C 45
1.0726	35S20	1.1191	C45E (Ck 45)

Spiral Point Machine Taps

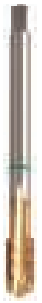
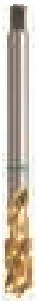
Universal application
< 1,000 N/mm²

Standard values
for uncoated tools: $V_c \leq 15$ m/min
for coated tools: $V_c \leq 30$ m/min

○ bright
● steam-tempered
TiN TiN coating
TiCN TiCN coating

Definition of types:
NR 40: type N, right-hand flute, 40°

Through thread | Blind thread

Thread depth			≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D
Cutting material			HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Type/form			N/B	N/B	NR40/C	NR40/C	NR40/C	NR40/C
Surface			●	TiN	TiN	TiN	TiN	TiCN
								
Thread type	Tolerance field	DIN (standard)						
M	ISO 2 6H	DIN **371**	**1683**• M2…10	–	**1684**• M2…10	–	**1700**• M3...10	**1685** M3...10
M	ISO 3 6G	DIN **371**	–	–	–	–	–	–
M	ISO 2 6H	DIN **376**	**1683**• M12…24	–	**1684**• M12…30	–	**1700**• M12...20	**1685** M12...20
M	ISO 3 6G	DIN **376**	–	–	–	–	–	–
MF	ISO 2 6H	DIN **374**	–	**1760**• M3 x 0.35 up to M30 x 1.5	–	**1761**• M3 x 0.35 up to M24 x 1.5	–	–

• Recommended tools for use.

Material examples: Green band

Material no. to DIN EN 10027	Short description	Material no. to DIN EN 10027	Short description
Structural steel		Tempering steel	
1.0035	S185 (St33)	1.0402	C22
1.0421	St 52.0	1.1151	C22E
1.0067	RSt 37-1	1.0503	C45
1.0425	P265GH	1.0601	C60
Machine steel		Nitrided steel	
1.0711	9S20	1.8504	34CrAl6
1.0718	11SMnPb30	1.8507	34CrAlMo5
1.0727	46S20	1.8509	41CrAlmo7
1.0728	(60 S 20)	1.8515	31CrMo12
–	–	1.8550	34CrAlNi4
Hardened steel		Spheroidal graphite cast iron	
1.7131	16MnCr5	0.7040	EN-GJS-400-15
1.6523	21NiCrMo2-2	0.7060	EN-GJS-600-3
1.7321	20MoCr4	–	–
1.7325	25MoCr4	–	–

Spiral Point Machine Taps

Rust/acid-resistant steel

○ bright
● steam-tempered

TiN TiN coating
TiCN TiCN coating

Standard values
for uncoated tools:
$V_c \leq 10$ m/min
for coated tools:
$V_c \leq 15$ m/min

Definition of types:
type INOX R40: type INOX, right-hand flute, 40°

Through thread  Blind thread

Thread depth			≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D
Cutting material			HSS-E	HSS-E	HSS-E	PM	HSS-E	HSS-E	HSS-E	HSS-E
Type/form			INOX	INOX	INOX	INOX	INOX	INOX	INOX	INOX
Surface			○	●	TiN	○	○	TiCN	●	●
Thread type	Tolerance field	DIN (standard)								
M	ISO 2	DIN	1686•/1687•	–	1698•	1694•	1690/1688	1692	–	–
	6H	**371**	M2…10	–	M3…10	M3…10	M3...10	M3…10		
M	ISO 3	DIN	–	–	–	–	–	–	1691•	–
	6G	371							M3…10	
M	ISO 2	DIN	1686•/1687•	–	1698•	1694•	1690/1688	1692	–	–
	6H	376	M12…20		M12…20	M12	M12...20	M12…20		
M	ISO 3	DIN	–	–	–	–	–	–	1691•	–
	6G	376							M12…20	–
MF	ISO 2	DIN	–	1757•/1758•	–	–	–	–	1759•	1752•
	6H	374		M4 x 0.5 up to M24 x 1.5					M3 x 0.35 up to M24 x 1.5	M3 x 0.35 up to M24 x 1.5
Pipe thread G	–	DIN 5156	–	–	–	–	–	–	1766• G 1/8-G1	–

• Recommended tools for use.

Material examples: Blue band

Material no. to DIN EN 10027	Short description	Material no. to DIN EN 10027	Short description
Sulphured steel		Martensitic steel	
1.4005	X 12 CrS 13	1.4057	X 17 CrNi 16-2
1.4104	X 14 CrMo S 17	1.4112	X 90 CrMoV 18
1.4105	X 6 CrMo S 17	1.4006	X 12 Cr 13
1.4305	X 8 CrNi S 8-9		
Austenitic steel		Ferritic steel	
1.4300	X 12 CrNi 18-8	1.4000	X 6 Cr 13
1.4301	X 5 CrNi 18-10	1.4008	GX7CrNiMo 12-1
1.4541	X 6 CrNiTi 18-10	1.4113	X 6 CrMo 17-1

Spiral Point Machine Taps

High-strength steel 800–1400 N/mm²

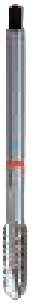
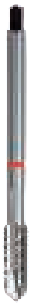
○ bright

TiCN TiCN coating

Standard values
for uncoated tools:
$V_c \leq 15$ m/min
for coated tools:
$V_c \leq 20$ m/min

Definition of types:
HR 40: type H, right-hand flute, 40°
AZ: With offset teeth

Through thread | Blind thread

Thread depth			≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D
Cutting material			HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E	HSS-E
Type/form			Type H/B	Type H/B	Type H/B	Type H/B AZ	Type HR40/C	Type HR40/C	Type HR40/C
Surface			○	○	TiCN	○	○	○	TiCN
									
Thread type	Tolerance field	DIN (standard)							
M	ISO 2	DIN	**1705**•	**1706**•	**1710**•	**1728**	**1712**•	**1713**•	**1718**•
	6H	**371**	M3...M10	M3...M10	M2...M10	M3...M10	M3...M10	M3...M10	M3...M10
M	ISO 2	DIN	**1705**•	**1706**•	**1710**•	**1728**	**1712**•	**1713**•	**1718**•
	6H	**376**	M12...M20	M12...M20	M12...M20	M12...M20	M12...M20	M12...M20	M12...M20
MF	ISO 2	DIN	–	–	–	–	–	–	**1762**•
	6H	**374**							M3x0.35...M24x1.5

• Recommended tools for use.

Material examples: Red band

Material no. to DIN EN 10027	Short description	Material no. to DIN EN 10027	Short description
Tempering steel		High-speed steel	
1.6511	36 CrNiMo 4	1.3343	HS 6-5-2
1.7033	34 Cr 4	1.3344	HS 6-5-3
1.7225	41 CrMo 4	1.3243	HS 6-5-2-5
		1.3247	HS 2-19-1-8
Cold-cutting steel alloy			
1.2316	X 36 CrMo 17		
1.2067	10 S20		

Spiral Point Machine Taps

○ Aluminium and Al alloys

○ bright
● steam-nitrided

Definition of types:
Al aluminium
AlR45 type Al, right-hand flute, 45°
GG grey cast iron

Standard values
for uncoated tools:
$V_c \leq 15$ m/min
for coated tools:
$V_c \leq 30$ m/min

◎ Cast material

Standard values
for uncoated tools:
$V_c \leq 20$ m/min
for coated tools:
$V_c \leq 30$ m/min

≤ 10 % Si

Through thread | Blind thread | Through thread and Blind thread

Thread depth			≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D	≤ 3 x D
Cutting material			HSS E	HSS E	HSS E	HSS E	HSS E	HSS E	HSS E
Type/form			Type Al/B	Type Al/B	Type AlR45/C	Type AlR45/C	Type GG/C	Type GG/C	Type GG/C
Surface			○	○	○	○	●	●	●
									
Thread type	Tolerance field	DIN (standard)							
M	ISO 2	DIN	**1722**•	**1723**•	**1725**•	**1726**•	–		–
	6H	**371**	M3...M10	M3...M10	M1,6...M10	M1,6...M10			
M	6HX	DIN	–		–		**1731**•	**1732**•	–
		371					M3...M10	M3...M10	
M	ISO 2	DIN	**1722**•	**1723**•	**1725**•	**1726**•	–		–
	6H	**376**	M12...M20	M12...M20	M12...M24	M12...M24			
M	6HX	DIN	–		–		**1731**•	**1732**•	–
		376					M12...M20	M12...M20	
MF	6HX	DIN	–	–	–				**1756**•
		374							M4 x 0.5...M24 x 1.5

• Recommended tools for use.

Material examples: Black band

Material no. to DIN EN 10027	Short description	Material no. to DIN EN 10027	Short description
Pure aluminium alloy		Aluminium alloy ≤ 10 % Si	
3.0250	Al 99,5H	3.2134	GD-AlSi5Cu1Mg
3.0280	Al 99,8H	3.2162	GD-AlSi8Cu3
3.3308	Al 99,9Mg0,5	3.2373	G-AlSi9Mg
Al wrought alloy		Aluminium alloy > 10 % Si	
3.2315	AlMgSi1	3.2581	G-AlSi12
3.1655	AlCuMgPb	3.2583	G-AlSi12Cu
3.4335	AlZn4,5Mg1	3.2581	G-AlSi10Mg

White band

Material no. to DIN EN 10027	Short description
Grey cast iron	
0.6015 (GG15)	EN-GJL-150
0.6025 (GG25)	EN-GJL-250
0.6040 (GG40)	EN-JLZ
Malleable cast iron	
0.8035	EN-GJMW-350-4
0.8040	EN-GJMW-400-5
0.8135	EN-GJMB-350-10
Spheroidal graphite cast iron	
0.7040 (GGG40)	EN-GJS-400-15
0.7060 (GGG60)	EN-GJS-600-3
Cast iron with vermicular graphite	
–	GGV

Fluteless Taps

TIN TIN coating **with** lubrication flutes

TICN TiCN coating **with** lubrication flutes

For through threads and blind threads

Cutting material			HSS E	HSS E	HSS E PM	HSS E PM	HSS-E	HSS-E
Type/form			Type N/C	Type N/C	Type INOX	Type INOX	Type N/C	Type N/C
Surface			TIN	TIN	TIN	TIN	TICN	TICN
								
Thread type	Tolerance field	DIN (standard)						
M	6HX	DIN	1780•		1787		1784	
		371	M3...M10		M3...M10		M3...M10	
M	6HX	DIN	1780•		1787		1784	
		376	M12...M16		M12...M16		M12...M16	
M	6GX	DIN	1783•					
		371	M3...M10					
M	6GX	DIN	1783•					
		376	M12					
MF	6HX	DIN		1785•		1789		1788
		374		M6x0.75–M20x1.5		M6x0.75–M20x1.5		M6x0.75–M20x1.5
MF	6GX	DIN						
		374	–	–	–	–	–	–

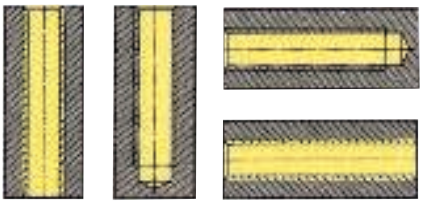
• Recommended tools for use.

Suitable for all malleable materials:

- Structural steel
- Tempering steel
- Hardened steel
- Machine steel
- Cold-cutting steel
- Hot-cutting steel
- Stainless steel
- Aluminium
- Aluminium alloy
- Copper
- Copper alloy

Core hole types

With lubrication holes for thread ≥ 1 x D



Machine Fluteless Taps

format professional quality

Fluteless taps are tools designed for chip-free production of internal threads. In this case, the material is deformed in the thread area similar to when rolling external threads.

Fluteless taps therefore offer the following advantages:

- low risk of breakage thanks to heavy duty design
- broad application range: through and blind holes, broad range of materials
- no chipping
- no false cutting
- greater tensile strength
- better thread surface
- longer life
- higher cutting speeds

Fluteless taps are particularly well suited to processing stamped and pressed parts made of long chipping and cold forming materials, e.g. steels with at least 10 % elasticity, aluminium and aluminium alloys with max. 10 % Si content, zinc and aluminium die castings and long chipping non-ferrous metal alloys.

Choose larger core hole diameters than with tap cutting tools.

Lubrication is of great importance.
Lubrication must suffice to ensure that there is never material in contact with the thread flanks and that the required torque is maintained for the forming operation.

Use lubricating coolants containing graphite or oils.

Design and production details:

Outer contour and forming lead largely determine the performance of the former. Numerous tests have shown that formers with optimum pressure point geometry and number ensure longest service life and best measuring accuracy.

We can achieve even greater quality, if the whole former geometry is produced in a single clamping operation and with one grinding disk – directed via a special roller. There are no pitch errors at the thread peaks during the form lead transitions as in the case with conventional grinding processes.

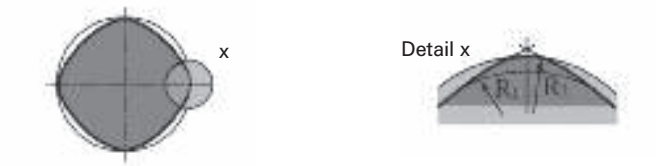
Suitable for all malleable materials such as:

- structural steels
- tempering steels
- hardened steels
- machine steels
- cold forming steels
- hot forming steels
- nitrided steels
- stainless steels
- aluminium
- aluminium alloys
- copper
- copper alloys

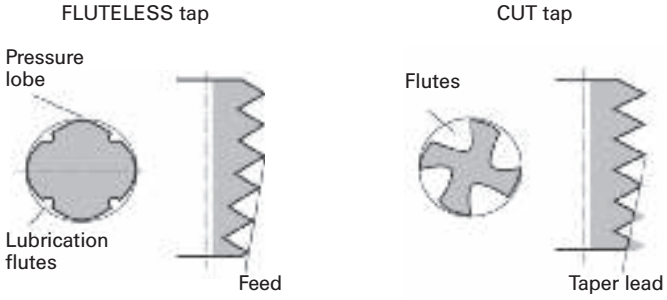
Machine fluteless tap from page 1/132.

Tool Geometry

Former cross-section



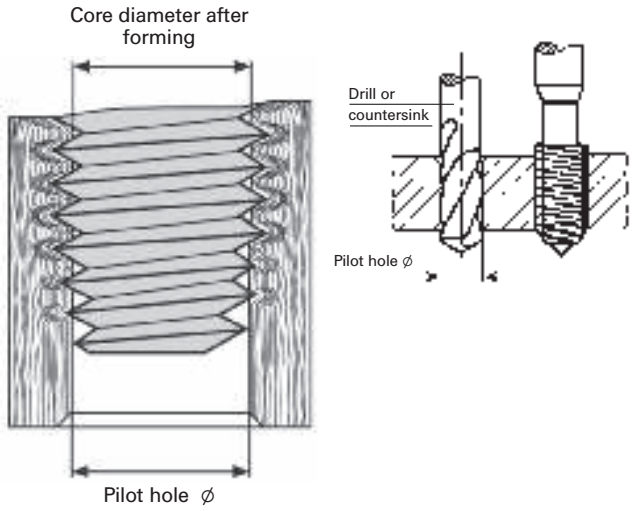
Non-chipping internal thread production (thread forming) as compared to tap cutting.





Fluteless Tapping

With the recommended pilot bore diameter, a nut core diameter within the nut core tolerance range in accordance with DIN 13 part 50 is given. The material must, however, be malleable.
The most favourable pilot bore diameter should be determined individually in a test.



Core Hole Diameter for Thread Cutting

Metric ISO coarse thread DIN 336

Nominal ø	Lead P mm	Core hole ø mm	Core ø nut thread min. mm	Core ø nut thread max. mm
M 1	0.25	**0.75**	0.729	–
M 1.1	0.25	**0.85**	0.829	–
M 1.2	0.25	**0.95**	0.929	–
M 1.4	0.30	**1.10**	1.075	–
M 1.6	0.35	**1.25**	1.221	1.321
M 1.8	0.35	**1.45**	1.421	1.521
M 2	0.40	**1.60**	1.567	1.679
M 2.2	0.45	**1.75**	1.713	1.838
M 2.5	0.45	**2.05**	2.013	2.138
M 3	0.50	**2.50**	2.459	2.599
M 3.5	0.60	**2.90**	2.850	3.010
M 4	0.70	**3.30**	3.242	3.422
M 4.5	0.75	**3.70**	3.688	3.878
M 5	0.80	**4.20**	4.134	4.334
M 6	1.00	**5.00**	4.917	5.153
M 7	1.00	**6.00**	5.917	6.153
M 8	1.25	**6.80**	6.647	6.912
M 9	1.25	**7.80**	7.647	7.912
M 10	1.50	**8.50**	8.376	8.676
M 11	1.50	**9.50**	9.376	9.676
M 12	1.75	**10.20**	10.106	10.441
M 14	2.00	**12.00**	11.835	12.210
M 16	2.00	**14.00**	13.835	14.210
M 18	2.50	**15.50**	15.294	15.744
M 20	2.50	**17.50**	17.294	17.744
M 22	2.50	**19.50**	19.294	19.744
M 24	3.00	**21.00**	20.752	21.252
M 27	3.00	**24.00**	23.752	24.252
M 30	3.50	**26.50**	26.211	26.771
M 33	3.50	**29.50**	29.211	29.771
M 36	4.00	**32.00**	31.670	32.270
M 39	4.00	**35.00**	34.670	35.270
M 42	4.50	**37.50**	37.129	37.799
M 45	4.50	**40.50**	40.129	40.799
M 48	5.00	**43.00**	42.587	43.297
M 52	5.00	**47.00**	46.587	47.287
M 56	5.50	**50.50**	50.046	50.796

Metric ISO fine thread DIN 336

Nominal x Lead ø	P mm	Core hole ø mm	Core ø nut thread min. mm	Core ø nut thread max. mm
M 2.5 x	0.35	**2.15**	2.121	2.221
M 3 x	0.35	**2.65**	2.621	2.721
M 3.5 x	0.35	**3.15**	3.121	3.221
M 4 x	0.50	**3.50**	3.459	3.599
M 4.5 x	0.50	**4.00**	3.959	4.099
M 5 x	0.50	**4.50**	4.459	4.599
M 5.5 x	0.50	**5.00**	4.959	5.099
M 6.0 x	0.75	**5.20**	5.188	5.378
M 7.0 x	0.75	**6.20**	6.188	6.378
M 8.0 x	0.75	**7.20**	7.188	7.378
M 8.0 x	1.00	**7.00**	6.917	7.153
M 9.0 x	0.75	**8.20**	8.188	8.378
M 9.0 x	1.00	**8.00**	7.917	8.153
M 10 x	0.75	**9.20**	9.188	9.378
M 10 x	1.00	**9.00**	8.917	9.153
M 10 x	1.25	**8.80**	8.647	8.912
M 11 x	0.75	**10.20**	10.188	10.378
M 11 x	1.00	**10.00**	9.917	10.153
M 12 x	1.00	**11.00**	10.917	11.153
M 12 x	1.25	**10.80**	10.647	10.912
M 12 x	1.50	**10.50**	10.376	10.676
M 14 x	1.00	**13.00**	12.917	13.153
M 14 x	1.25	**12.80**	12.647	12.912
M 14 x	1.50	**12.50**	12.376	12.676
M 15 x	1.00	**14.00**	13.917	14.153
M 15 x	1.50	**13.50**	13.376	13.676
M 16 x	1.00	**15.00**	14.197	15.153
M 16 x	1.50	**14.50**	14.376	14.676
M 17 x	1.00	**16.00**	15.917	16.153
M 17 x	1.50	**15.50**	15.376	15.676
M 18 x	1.00	**17.00**	16.917	17.153
M 18 x	1.50	**16.50**	16.376	16.676
M 18 x	2.00	**16.00**	15.835	16.210
M 20 x	1.00	**19.00**	18.917	19.153
M 20 x	1.50	**18.50**	18.376	18.676
M 20 x	2.00	**18.00**	17.835	18.210
M 22 x	1.00	**21.00**	20.917	21.153
M 22 x	1.50	**20.50**	20.376	20.676
M 22 x	2.00	**20.00**	19.835	20.210
M 24 x	1.00	**23.00**	22.917	23.153

Nominal x Lead ø	P mm	Core hole ø mm	Core ø nut thread min. mm	Core ø nut thread max. mm
M 24 x	1.50	**22.50**	22.376	22.676
M 24 x	2.00	**22.00**	21.835	22.210
M 25 x	1.00	**24.00**	23.917	24.153
M 25 x	1.50	**23.50**	23.376	23.676
M 25 x	2.00	**23.00**	23.835	23.210
M 27 x	1.00	**26.00**	25.917	26.153
M 27 x	1.50	**25.50**	25.376	25.676
M 27 x	2.00	**25.00**	24.835	25.210
M 28 x	1.00	**27.00**	26.917	27.153
M 28 x	1.50	**26.50**	26.376	26.676
M 28 x	2.00	**26.00**	25.853	26.210
M 30 x	1.00	**29.00**	28.917	29.153
M 30 x	1.50	**28.35**	26.376	28.676
M 30 x	2.00	**28.00**	27.835	28.210
M 30 x	3.00	**27.00**	26.752	27.252
M 32 x	1.50	**30.50**	30.376	30.676
M 32 x	2.00	**30.00**	29.835	30.210
M 33 x	1.50	**31.50**	31.376	31.676
M 33 x	2.00	**31.00**	30.835	31.210
M 33 x	3.00	**30.00**	29.752	30.252
M 35 x	1.50	**33.50**	33.376	33.676
M 36 x	1.50	**34.50**	34.376	34.676

Thread DIN 336 (ISO 5864)

Nominal ø	Lead P mm	Core hole ø mm	Core ø nut thread min. mm	Core ø nut thread max. mm
Nr. 1	– 64	**1.50**	1.425	1.582
Nr. 2	– 56	**1.85**	1.694	1.872
Nr. 3	– 48	**2.10**	1.941	2.146
Nr. 4	– 40	**2.35**	2.385	2.156
Nr. 5	– 40	**2.65**	2.697	2.487
Nr. 6	– 32	**2.85**	2.642	2.896
Nr. 8	– 32	**3.50**	3.302	3.531
Nr. 10	– 24	**3.90**	3.683	3.962
Nr. 12	– 24	**4.50**	4.343	4.597
Nr. 1/4	– 20	**5.10**	4.976	5.268
5/16	– 18	**6.60**	6.411	6.734
3/8	– 16	**8.00**	7.805	8.164
7/16	– 14	**9.40**	9.149	9.550
1/2	– 13	**10.80**	10.584	11.013
9/16	– 12	**12.20**	11.996	12.456
5/8	– 11	**13.50**	13.376	13.868
3/4	– 10	**16.50**	16.299	16.833
7/8	– 9	**19.50**	19.169	19.748
1	– 8	**22.25**	21.963	22.598
1 1/8	– 7	**25.00**	24.648	25.349
1 1/4	– 7	**28.00**	27.823	28.524
1 3/8	– 6	**30.75**	30.343	21.120
1 1/2	– 6	**34.00**	33.518	34.295
1 3/4	– 5	**39.50**	38.951	39.814
2	– 4.5	**45.00**	44.689	45.598

Core Hole Diameter for Thread Cutting

In fluteless tapping core diameter tolerance range 7H is advisable (see DIN 13, part 50).

Metric ISO coarse thread

Nominal ø	Lead mm	Core hole ø mm	Nominal ø	Lead mm	Core hole ø mm
M 1	0.25	**0.88**	M 4.5	0.75	**4.15**
M 1.1	0.25	**0.98**	M 5.0	0.80	**4.65**
M 1.2	0.25	**1.08**	M 6.0	1.00	**5.55**
M 1.4	0.30	**1.25**	M 7.0	1.00	**6.55**
M 1.6	0.35	**1.45**	M 8.0	1.25	**7.40**
M 1.7	0.35	**1.55**	M 9.0	1.25	**8.40**
M 1.8	0.35	**1.65**	M 10	1.50	**9.25**
M 2.0	0.40	**1.80**	M 11	1.50	**10.25**
M 2.2	0.45	**2.00**	M 12	1.75	**11.20**
M 2.3	0.40	**2.10**	M 14	2.00	**13.10**
M 2.5	0.45	**2.30**	M 16	2.00	**15.10**
M 2.6	0.45	**2.40**	M 18	2.50	**16.90**
M 3.0	0.50	**2.80**	M 20	2.50	**18.90**
M 3.5	0.60	**3.25**			
M 4.0	0.70	**3.70**			

Metric ISO fine thread

Nominal ø	x	Lead mm	Core hole ø mm	Nominal ø	x	Lead mm	Core hole ø mm
M 5	x	0.50	**4.75**	M 12	x	1.50	**11.30**
M 5.5	x	0.50	**5.25**	M 14	x	1.00	**13.55**
M 6	x	0.75	**5.65**	M 14	x	1.25	**13.40**
M 7	x	0.75	**6.65**	M 14	x	1.50	**13.30**
M 8	x	0.75	**7.65**	M 15	x	1.00	**13.55**
M 8	x	1.00	**7.55**	M 15	x	1.50	**14.30**
M 9	x	0.75	**8.65**	M 16	x	1.00	**15.55**
M 9	x	1.00	**8.55**	M 16	x	1.50	**15.30**
M 10	x	0.75	**9.65**	M 17	x	1.00	**16.55**
M 10	x	1.00	**9.55**	M 17	x	1.50	**16.30**
M 10	x	1.25	**9.40**	M 18	x	1.00	**17.55**
M 11	x	0.75	**10.65**	M 18	x	1.50	**17.30**
M 11	x	1.00	**10.55**	M 18	x	2.00	**17.10**
M 12	x	1.00	**11.55**	M 20	x	1.00	**19.55**
M 12	x	1.25	**11.40**				

Core Hole Diameter for Thread Cutting

UNF thread DIN 336 (ISO 5864)

Nominal ø	Lead per inch	Core hole ø mm	Core ø nut thread min. mm	Core ø nut thread max. mm
Nr. 1 –	72	**1.55**	1.473	1.613
Nr. 2 –	64	**1.90**	1.755	1.913
Nr. 3 –	56	**2.15**	2.024	2.197
Nr. 4 –	48	**2.40**	2.271	2.459
Nr. 5 –	44	**2.70**	2.550	2.741
Nr. 6 –	40	**2.95**	2.819	3.023
Nr. 8 –	36	**3.50**	3.404	3.607
Nr. 10 –	32	**4.10**	3.962	4.166
Nr. 12 –	28	**4.70**	4.496	4.724
1/4 –	28	**5.50**	5.367	5.580
5/16 –	24	**6.90**	6.792	7.038
3/8 –	24	**8.50**	8.379	8.626
7/16 –	20	**9.90**	9.739	10.030
1/2 –	20	**11.50**	11.326	11.618
9/16 –	18	**12.90**	12.761	13.084
5/8 –	18	**14.50**	14.348	14.671
3/4 –	16	**17.50**	17.330	17.689
7/8 –	14	**20.40**	20.262	20.663
1 –	12	**23.25**	23.109	23.569
1 1/8 –	12	**26.50**	26.284	26.744
1 1/4 –	12	**29.50**	29.459	29.919
1 3/8 –	12	**32.75**	32.634	33.094
1 1/2 –	12	**36.00**	35.809	36.269

BSW (Whitworth) thread

Nominal ø	Lead per inch	Core hole ø mm	Core ø nut thread min. mm	Core ø nut thread max. mm
W 1/8	40	**2.50**	–	–
W 5/32	32	**3.20**	–	–
W 3/16	24	**3.60**	–	–
W 1/4	20	**5.10**	4.744	5.224
W 5/16	18	**6.50**	6.151	6.661
W 3/8	16	**7.90**	7.512	8.052
W 7/16	14	**9.20**	8.809	9.379
W 1/2	12	**10.50**	10.015	10.610
W 5/8	11	**13.50**	12.948	13.598
W 3/4	10	**16.25**	15.831	16.538
W 7/8	9	**19.25**	18.647	19.411
W 1	8	**22.00**	21.375	22.185
W 1 1/8	7	**24.50**	23.976	24.879
W 1 1/4	7	**27.75**	27.151	28.054
W 1 3/8	6	**30.50**	29.558	30.555
W 1 1/2	6	**33.50**	32.733	33.730
W 1 5/8	5	**35.50**	34.834	35.921
W 1 3/4	5	**39.00**	38.009	39.096
W 2	4.5	**44.50**	43.643	44.823

(Whithworth) pipe thread (to DIN-ISO 228) DIN 336

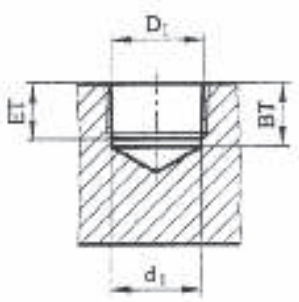
Nominal ø	Lead per inch	Core hole ø mm	Core ø nut thread min. mm	Core ø nut thread max. mm
G 1/16	28	**6.80**	6.561	6.843
G 1/8	28	**8.80**	8.566	8.848
G 1/4	19	**11.80**	11.445	11.890
G 3/8	19	**15.25**	15.395	14.950
G 1/2	14	**19.00**	18.631	19.172
G 5/8	14	**21.00**	20.587	21.128
G 3/4	14	**24.50**	24.117	24.658
G 7/8	14	**28.25**	27.877	28.418
G 1	11	**30.75**	30.291	30.931
G 1 1/8	11	**35.50**	34.939	35.579
G 1 1/4	11	**39.50**	38.952	39.592
G 1 1/2	11	**45.25**	44.845	45.485
G 1 3/4	11	**51.00**	50.788	51.428
G 2	11	**57.00**	56.656	57.296

Steel-armoured pipe thread to DIN 40430

Nominal ø	Lead per inch	Core hole ø mm	Core ø nut thread min. mm	Core ø nut thread max. mm
Pg 7.0	20	**11.40**	11.280	11.430
Pg 9.0	18	**14.00**	13.860	14.010
Pg 11.0	18	**17.30**	17.260	17.410
Pg 13.5	18	**19.00**	19.060	19.210
Pg 16.0	18	**21.30**	21.160	21.310
Pg 21.0	16	**26.90**	26.780	27.030
Pg 29.0	16	**35.50**	35.480	35.730
Pg 36.0	16	**45.50**	45.480	45.730
Pg 42.0	16	**52.50**	52.480	52.730
Pg 48.0	16	**57.80**	57.780	58.030

NPT American conical pipe thread taper 1: 16

Nominal size	Core hole ø parallel d_1 mm	Core hole ø conical D_1 mm	Notch depth ET mm	Drilling depth min. BT mm
1/16 – 27	**6.15**	**6.39**	9.29	10.7
1/8 – 27	**8.40**	**8.74**	9.32	10.8
1/4 – 18	**11.10**	**11.36**	13.52	15.6
3/8 – 18	**14.30**	**14.80**	13.83	16.0
1/2 – 14	**17.90**	**18.32**	18.07	20.8
3/4 – 14	**23.30**	**23.67**	18.55	21.3
1 – 11.5	**29.00**	**29.69**	22.29	25.6
1 1/4 – 11.5	**37.70**	**38.45**	22.80	26.1
1 1/2 – 11.5	**43.70**	**44.52**	22.80	26.1
2 – 11.5	**55.60**	**56.56**	23.20	26.5
2 1/2 – 8.0	**66.30**	**67.62**	31.57	36.3
3 – 8.0	**82.30**	**83.52**	33.74	38.5



Core Hole Diameter for Thread Cutting

UNC thread

UNC Short description inch	Core hole ø mm
Nr. 5 – 40	**2.90**
Nr. 6 – 32	**3.15**
Nr. 8 – 32	**3.80**
Nr. 10 – 24	**4.35**
Nr. 12 – 24	**5.00**
1/4 – 20	**5.75**
5/16 – 18	**7.30**
3/8 – 16	**8.80**
7/16 – 14	**10.30**
1/2 – 13	**11.80**
9/16 – 12	**13.30**
5/8 – 11	**14.80**
3/4 – 10	**17.90**
7/8 – 9	**20.95**
1 – 8	**24.00**

UNF thread

UNF Short description inch	Core hole ø mm
Nr. 4 – 48	**2.60**
Nr. 5 – 44	**2.90**
Nr. 6 – 40	**3.20**
Nr. 8 – 36	**3.85**
Nr. 10 – 32	**4.45**
Nr. 12 – 28	**5.10**
1/4 – 28	**5.95**
5/16 – 24	**7.45**
3/8 – 24	**9.00**
7/16 – 20	**10.50**
1/2 – 20	**12.10**
9/16 – 18	**13.65**
5/8 – 18	**15.25**
3/4 – 16	**18.30**
1 – 12	**24.45**

BSW (Whitworth) thread DIN 11

Nominal ø inch	Number of threads inch	Core hole ø mm
W 1/4	20	**5.65**
W 5/16	18	**7.15**
W 3/8	16	**8.65**
W 7/16	14	**10.10**
W 1/2	12	**11.50**
W 5/8	11	**14.55**
W 3/4	10	**17.60**
W 7/8	9	**19.25**

(Whitworth) pipe thread (to DIN-ISO 228)

Nominal ø inch	Number of threads inch	Core hole ø mm
G 1/16	28	**7.30**
G 1/8	28	**9.20**
G 1/4	19	**12.40**
G 3/8	19	**15.90**
G 1/2	14	**19.90**
G 5/8	14	**21.90**
G 3/4	14	**25.40**
G 1	11	**32.00**
G 1 1/4	11	**40.70**

Setting Cutting Dies

Place the cutting die carefully into the seat. Any chips adhering to the cutting die or the seat will mean that the die is not flush and the thread will be cut off-centre. The locking screws arranged radially around the die stock must be tightened very gently to secure the cutting die. This will prevent out-of-true cutting and insufficient cutting. To ensure good cutting results, select the rake angle to suit the material being cut.

The following rule applies to thread cutting: long chipping materials require a greater rake angle, short chipping materials require a smaller rake angle. If your order does not specify material characteristics we will supply a cutting die with a rake angle for steels of medium tensile strength.

Normal Taper Lead

Normal Taper Lead: The standard HSS cutting dies for steel have a taper lead length of approx. 1.75 x the pitch. We supply VA cutting dies with a taper lead length of approx. 2 x the pitch. Cutting dies for brass have a taper lead length of approx. 1.25 x the pitch.

Short Taper Lead: If threads are to be cut close to the collar we can supply short taper leads of approx. 1.25 x the pitch. A shorter taper lead cannot be achieved through surface grinding as the required taper lead ⌀ is then too small and the cutting die will not cut correctly.

Long Taper Lead: If the workpiece permits, working with a long taper lead gives better cutting results, especially with materials which are difficult to machine. We therefore supply cutting dies with a taper lead length of approx. 3 x the pitch on request.

Cutting Speeds

The following cutting speeds are guide values only. Optimum values can be determined only through testing, since they depend not only on the material to be machined but also on the quality of the coolant and/or lubricant, as well as the overall condition of the machine. If the cutting speed is too high, this may result in a shorter life of the cutting die and reduces the dimensional accuracy and surface quality of the threads.

Relief Ground Cutting Dies

Relief ground cutting dies (with relief ground thread) can last many times the normal service life of a cutting die. The cutting torque is less and there is less tendency for cold fusion. We supply this design ≥ thread ⌀ approx. 16 mm on request.

Cutting dies from page 1/134.

Rake Angle

To obtain good cutting results, select the rake angle to suit the material to be cut. The following rule applies to thread cutting: Long chipping materials require a greater rake angle, short chipping materials require a smaller rake angle. If no material characteristics are specified in your order, we will supply a cutting die with a rake angle for steels of medium tensile strength.

Helical Lead Taper

The helical lead taper allows the chips to escape freely to the front and reduces the cutting torque. This prevents chips from blocking the chip holes.

The result is an improved surface quality of the cut thread and a longer tool service life. **Cutting dies which are used on machines must therefore be ordered with helical lead tapers.** HSS cutting dies are available from thread ⌀ 3 mm with helical lead taper. All VAs are supplied from thread ⌀ 2 mm with helical lead tapers.

Coolants and Lubricants

A maximum volume of coolant or lubricant is to be directed at the cutting point to carry away the cutting heat and reduce friction.

The coolant jet must wash away the chips in the cutting die until the thread cutting process repeats. This will ensure a good surface quality and protect the tool. Please refer to the table below for recommended coolants and lubricants.

HSSE Cutting Dies

These are made of high alloyed sintered high-speed steel (ASP-Steel). VA cutting dies are designed to cut threads in steels up to 1,200 N/mm^2, particularly for stainless and acid-resistant steels, tempering steels, hardened steels etc. Can also be used with easily machined steels e.g. machine steels. Substantially longer service life and higher cutting speeds than with HSS cutting dies are possible. We also supply accordingly shaped HSSE cutting dies for other materials, e.g. for red brass **(HSSE-RG nitr.)**, or brass (HSSE-Ms) etc. on request.

Guide Values for Cutting Speed, Coolants, Lubricants and Rake Angle. Details on Selecting Cutting Dies.

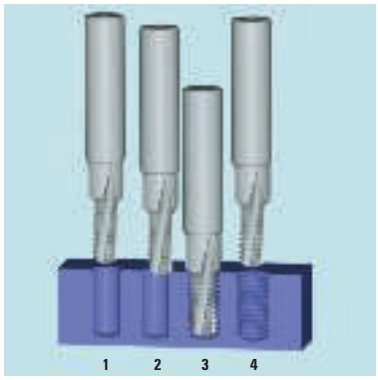
Materials being processed		Cutting speed guides in m/min	Coolants Lubricants	Rake Angle	Dies to use
Gen. structural steel Machine steels	St 37-2, St 50-2 usw.	8–12	Cutting oil	17–22°	HSS
Free cutting steel	9 S Mn 28, 9 S MnPb 28 usw.	10–14	Cutting oil	17–22°	HSS
Hardened steels	C 15, Ck 15, 16 MnCr 5 usw.	6–10	Cutting oil, spec. cutting oil	17–22°	HSS E (HSS nitr.)
Tempering steels	C 35 Pb, C 45 usw.	5– 8	Cutting oil, spec. cutting oil	13–18°	HSS E
Rust and acid resist. steels	X12CrMoS17, X12CrNiS188 usw.	4– 6	Special cutting oil	13–18°	HSS E
Grey cast iron	GG 15, GG 25	5– 8	Cutting oil, petroleum	8–12°	HSS nitr. GG
Brass, short chipping Ms 58	CuZn 39 Pb 2, CuZn 40 Pb 2	20–30	Cutting oil	3– 7°	HSS-Ms
Brass, long chipping Ms 60	CuZn 20, CuZn 37	12–18	Cutting oil	10–15°	HSS-Ms
Bronze	CuSn 8	5– 8	Cutting oil, emulsion	8–12°	HSS-Bz
Red brass	G-CuSn 5 Zn Pb	7–11	Cutting oil, emulsion	8–12°	HSS nitr. Rg
Copper	E-Cu 57, SF-Cu	11–15	Cutting oil, emulsion	23–28°	HSS-Cu
Aluminium alloy, long chipping	AlCuMg 1, AlMg 3 Si	15–25	Spec. cutting oil, petroleum	23–28°	HSS-Alu
Aluminium alloy, short chipping	GD-AlSi 8 Cu 3, GD AlSi 12	8–12	Spec. cutting oil, petroleum	13–18°	HSS E

Carbide Thread Milling Cutters, Face Milling Cutters and/or Countersinks

The following types are available at short notice:

GF U and GFS U thread milling cutter with face

1 Tool moves to start position centrically over the bore hole
2 Circularly countersink the 45° land
3 Perform thread milling
4 Move to start position and finish operation

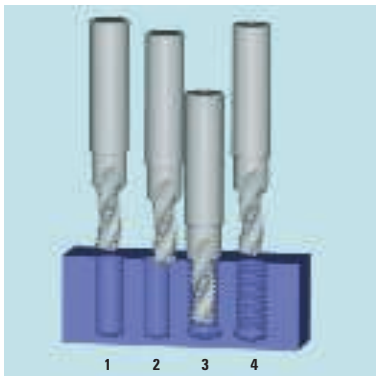






BGF U bore thread milling cutter with face countersink land

1 Tool moves to start position centrically over the bore hole
2 Drill core hole
3 Circularly countersink the 45° land
4 Perform thread milling
5 Move to start position and finish operation

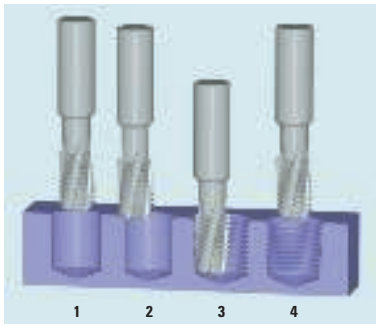






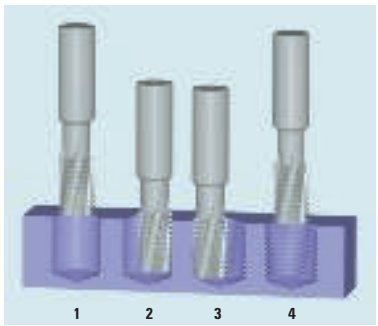
GFM U 45° land with face countersink

1 Tool moves to start position centrically over the bore hole
2 Circularly countersink the 45° land
3 Perform thread milling
4 Move to start position and finish operation



GFM ST face milling with face cutter

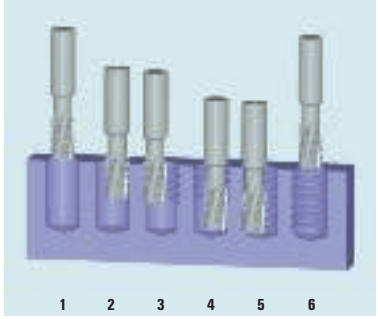
1 Tool moves to start position centrically over the bore hole
2 Face cutting with mill
3 Perform thread milling
4 Move to start position and finish operation



Solid carbide thread milling cutter from page 1/142.

GFM UST face milling with face cutter and 45° land with face countersink

1 Tool moves to start position centrically over the bore hole
2 Face cutting with mill
3 Circularly countersink the 45° land
3 Perform thread milling
4 Move to start position and finish operation



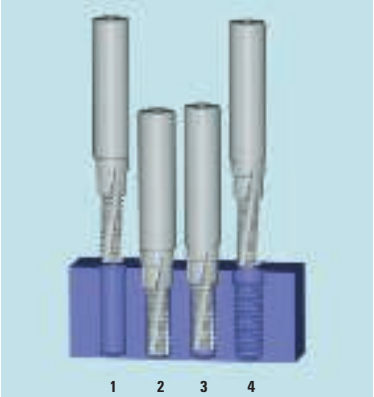
Carbide Thread Milling Cutters, Face Milling Cutters and/or Countersinks

The following types are available at short notice:

GFS S thread milling cutter with parallel protective countersink Variant 1

Variant 1
1 Tool moves to start position centrically over the bore hole
2 Execute protective countersink
3 Perform thread milling
4 Move to start position and finish operation

Variant 2
1 Tool moves to start position centrically over the bore hole
2 Perform thread milling with circularly countersinking the protective countersink
3 Move to start position and finish operation





The option with parallel countersinks includes 2 machining variants.

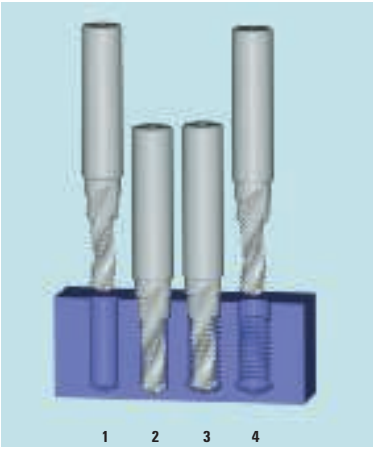
In variant 1, the countersink diameter corresponds to the dimension of the protective countersink to be produced. The countersink is generated by drilling axially.

In variant 2, the protective countersink dimension is generated during the thread cutting process. In this case, the countersink diameter is relatively smaller.

BGF S bore thread milling cutter with parallel protective countersink

Variant 1
1 Tool moves to start position centrically over the bore hole
2 Drill bore hole with circularly countersinking the protective countersink
3 Perform thread milling
4 Move to start position and finish operation

Variant 2
1 Tool moves to start position centrically over the bore hole
2 Drill bore hole
3 Perform thread milling with circularly countersinking the protective countersink
4 Move to start position and finish operation





The option with parallel protective countersink includes 2 machining variants.

In variant 1, the countersink diameter corresponds to the protective countersink dimension to be produced. The countersink is generated during the core drilling process.

In variant 2, the protective countersink dimension is produced radially during the thread cutting process. In this case, the countersink diameter is relatively smaller.

Recommended applications and cutting details for solid carbide thread milling cutters GF/GFM/GFS/BGF

Material main group	Material sub group	Tensile strength	Cutting speed Milling Bright Vc [m/min]	Cutting speed Milling TiAlN/TiCN Vc [m/min]	Feed Milling fz [mm/tooth]*	Feed Drilling** with BGF fz [mm/RPM]*
1.Steel	1.1 Unalloyed steel	≤ 500 N/mm²	60–100	80–150	0.02–0.15	
	1.2 Low-alloy steel	> 500 ≤ 800 N/mm²	50– 80	60–120	0.02–0.1	
	1.3 High-alloy steel	> 800 ≤ 1,200 N/mm²	40– 60	60–100	0.01–0.08	
2. Stainless steel	2.1 Sulphured	≤ 850 N/mm²	40– 60	80–100	0.04–0.1	
	2.2 Austenitic	≤ 850 N/mm²	30– 50	60– 80	0.04–0.08	
	2.3 Ferritic/martensitic	≤1,000 N/mm²	20– 40	50– 60	0.04–0.07	
3. Cast iron	3.1 Grey cast iron	≤ 500 N/mm²	70– 90	100–160	0.05–0.15	0.05–0.25
	3.2 Grey cast iron	> 500 ≤ 1,000 N/mm²	60– 80	100–140	0.03–0.1	0.05–0.25
	3.3 Malleable/spheroidal graphite cast iron	≤ 700 N/mm²	70– 90	100–140	0.05–0.15	0.05–0.25
	3.4 Malleable/spheroidal graphite cast iron	> 700 ≤ 1,000 N/mm²	60– 80	80–120	0.03–0.1	0.05–0.2
4. Aluminium	4.1 Al, unalloyed	≤ 350 N/mm²	100–250	300–400	0.05–0.25	0.05–0.4
	4.2 Al < 0.5 % Si	≤ 500 N/mm²	100–250	300–400	0.05–0.25	0.05–0.4
	4.3 Al, Si ≧ 0.5% < 10%	≤ 400 N/mm²	100–250	300–400	0.05–0.25	0.05–0.4
	4.4 Al, Si ≧ 10%	≤ 400 N/mm²	100–200	250–300	0.05–0.15	0.05–0.3
5. Copper	5.1 Copper unalloyed	≤ 350 N/mm²	200–250	300–400	0.1 –0.25	
	5.2 Short chipping brass	≤ 700 N/mm²	150–200	250–300	0.05–0.15	
	5.3 Long chipping brass	≤ 700 N/mm²	150–200	250–300	0.05–0.15	
6. Titanium	6.1 Titanium unalloyed	≤ 700 N/mm²	60– 80	80– 90	0.05–0.1	
	6.2 Titanium alloy	≤ 900 N/mm²	40– 50	60– 70	0.03–0.08	
	6.3 Titanium alloy	> 900 ≤ 1,250 N/mm²	30– 40	50– 60	0.01 –0.05	

Cutting speeds drilling
We recommend to use the values indicated for cutting "bright". Use the lower values for long chipping material.

* The feeds apply to nominal thread ∅ ≥ 5 mm. For nominal thread ∅ < 5 mm, the feeds must be reduced accordingly.

** For long chipping material, relieving may be necessary once or several times!

Coating Surface Finish

Because of the good characteristics of tools made of high-speed steel or solid carbide, they are delivered bright, without any additional surface finish. For certain applications it is however recommended to enhance wear resistance, diminish slippage resistance and proneness to build-ups.

In the coating of our tools we distinguish between sold carbide coating: TiN, TiN2, TiAIN, TiAIN2, TiCN, Fire, Vallorbinox, Granit Al, Granit Dry PM.

TiN Coating (titanium nitride)

Optical feature: Gold colour

Proven, reasonably-priced, all-round coating for achieving excellent results.

TiN2 Coating (titanium nitride)

Optical feature: Gold colour

High cutting speeds, wet and dry machining, higher performance, improved efficiency. TiN2 distinguishes by its extreme toughness, as well as high thermal and chemical stability.

TiAIN Coating (titanium aluminium nitride)

Optical feature: Black-purple colour

Special coating for chipping operations on abrasive materials (cast iron, AlSi) and/or high temperature stress, also used without cooling or with limited cooling, as in case of deep drilling or small diameters. It should be noted that only at high cutting speeds, the TiAIN coating will lead to significantly higher performance.

TiCN Coating (titanium carbon nitride)

Optical feature: Grey-purple colour

Multi-layer coating with laminate structure. Improved results are obtained in the machining of steel, in uninterrupted cuts, materials which are difficult to machine or where above-average requirements to hardness and toughness are to be met.

TiAIN2 Fire Coating

Optical feature: Red-purple colour

Multi-layer TiAIN coating with gradient structure. Universal coating with at least 2 times higher efficiency than that of TiN. Combines the advantages of TiN, TiAIN and TiCN. Excellent – almost “fireproof” – heat insulation. Good toughness.

Vallorbinox

Optical feature: Gold colour

Valorbe milling cutters recommended for the machining of rust and acid-resistant steel, titanium and Hasteloy.

Granite Al

Optical feature: Grey colour

Valorbe milling cutters recommended for the machining of aluminium, aluminium alloy and plastics.

Granite Dry PM

Optical feature: Gold colour

Valorbe milling cutters recommended for the machining of tool steel up to 1,300 N/mm^2, steel alloy, Inconel, titanium alloy and Hardox.

New Material Abbreviations to DIN EN

Material	Abbreviation old	Abbreviation **NEW**
–	St 45.8 (replaced)	P265
	St 42.8 (replaced)	P265
–	–	X10CrMoVNb9-1
–	–	X10Ni9
–	–	X11CrMo5+I
–	–	X12Ni5
–	–	X20CrMoNiV11-1
–	–	8CrMo5-5
–	–	8MoB5-4
–	–	9NiCuMoNb5-6-4
–	–	11CrMo9-10+NT
–	–	11MnNi4-2
–	–	12MoCrV6-2-2
–	–	13CrMo4-5+N
–	–	13CrMo5-5
–	–	13MnNi5-2
–	–	20CrMoV13-5-5
–	–	26CrMo4-2
1.0022	St 01Z	–
1.0035	St 33	S185
1.0039	St 37-2	S235JRH
1.0044	St 44-2	S275JR
1.0050	St 50-2	E295
1.0060	St 60-2	E335
1.0070	St 70-2	E360
1.0114	St 37-3U	S235J0
1.0226	St 02Z	DX51D
1.0242	StE 250-2Z	S250GD
1.0244	StE 280-2Z	S280GD
1.0250	StE 320-3Z	S320GD
1.0301	C 10	–
1.0302	C 10 Pb	–
1.0306	St 06 Z	DX54D
1.0312	St 15	DC05 [Fe P05]
1.0319	RRStE 210.7	L210GA
1.0322	–	DX56D
1.0330	St 12 [St 2]	DC01 [Fe P01]
1.0333	USt 13	–
1.0338	St 14 [St 4]	DC04 [Fe P04]
1.0345	H I	P235GH
1.0347	RRSt 13 [RRSt 3]	DC03 [Fe P03]
1.0348	UH I	P195GH
1.0350	St 03Z	DX52D
1.0355	St 05Z	DX53D
1.0356	TTSt 35 N	P215NL
1.0358	St 05 Z	–
1.0401	C 15	–
1.0402	C 22	C22
1.0403	C 15 Pb	–
1.0406	C 25	C25
1.0419	St 52.0	L355
1.0425	H II	P265GH
1.0429	StE 290.7 TM	L290MB
1.0457	StE 240.7	L245NB
1.0459	RRStE 240.7	L245GA
1.0461	StE 255	S255N
1.0473	19 Mn 6	P355GH
1.0481	17 Mn 4	P295GH
1.0484	StE 290.7	L290NB
1.0486	StE 285	P275N
1.0501	C 35	C35
1.0503	C 45	C45
1.0505	StE 315	P315N
1.0511	C 40	C40
1.0528	C 30	C30
1.0529	StE 350-3Z	S350GD
1.0535	C 55	C55
1.0539	StE 355N	S355NH
1.0540	C 50	C50
1.0547	St 52-3U	S355J0H
1.0582	StE 360.7	L360NB
1.0601	C 60	C60
1.0710	15 S 10	–
1.0715	9 SMn 28	11SMn30
1.0718	9 SMnPb 28	11SMnPb30
1.0721	10 S 20	10S20
1.0722	10 S Pb 20	10SPb20
1.0726	35 S 20	35S20
1.0727	45 S 20	46S20
1.0728	60 S 20	–
1.0736	9 SMn 36	11SMn37
1.0737	9 SMnPb 36	11SMnPb37
1.0756	35 SPb 20	35SPb20
1.0757	45 SPb 20	46SPb20
1.0760	–	38SMn26
1.0761	–	38SMnPb26
1.0762	–	44SMn28
1.0763	–	44SMnPb28
1.0873	–	DC06 [Fe P06]
1.1103	EStE 255	S255NL1
1.1105	EStE 315	S315NL1
1.1121	Ck 10	C10E
1.1141	Ck 15	C15E
1.1151	Ck 22	C22E
1.1158	Ck 25	C25E
1.1170	28 Mn 6	28Mn6
1.1178	Ck 30	C30E
1.1181	Ck 35	C35E
1.1186	Ck 40	C40E
1.1191	Ck 45	C45E
1.1203	Ck 55	C55E
1.1206	Ck 50	C50E
1.1221	Ck 60	C60E
1.1241	Cm 50	C50R
1.1750	C 75 W	C75W
1.2067	102 Cr 6	102Cr6
1.3243	S6-5-2-5	S 6-5-2-5
1.3343	S6-5-2	S 6-5-2
1.3344	S6-5-3	S 6-5-3
1.4000	X6Cr 13	X6Cr13
1.4002	X6CrAl 13	X6CrAl13
1.4003	X2Cr 11	X2CrNi12
1.4005	–	X12CrS13
1.4006	X10Cr 13	X12Cr13
1.4016	X6Cr 17	X6Cr17
1.4021	X20Cr 13	X20Cr13
1.4028	X30Cr 13	X30Cr13
1.4031	X38Cr 13	X38Cr13
1.4034	X46Cr 13	X46Cr13
1.4037	X65Cr 13	X65Cr13
1.4057	X20CrNi 17 2	X17CrNi16-2
1.4104	X12CrMoS 17	X14CrMoS17
1.4105	X4CrMoS 18	X6CrMoS17
1.4109	X65CrMo 14	X70CrMo15
1.4110	X55CrMo 14	X55CrMo14
1.4112	X90CrMoV 18	X90CrMoV18
1.4113	X6CrMo 17 1	X6CrMo17-1
1.4116	X45CrMoV 15	X50CrMoV15
1.4120	X20CrMo 13	X20CrMo13
1.4122	X35CrMo 17	X39CrMo17-1
1.4125	X105CrMo 17	X105CrMo17
1.4301	X5CrNi 18 10	X5CrNi18-10
1.4303	X5CrNi 18 12	X4CrNi18-12
1.4305	X10CrNiS 18 9	X8CrNiS18-9
1.4306	X2CrNi 19 11	X2CrNi19-11
1.4310	X12CrNi 17 7	X10CrNi18-8
1.4311	X2CrNiN 18 10	X2CrNiN18-10
1.4313	X4CrNi 13 4	X3CrNiMo13-4
1.4318	X2CrNiN 18 7	X2CrNiN18-7
1.4335	X1CrNi 25 21	X1CrNi25-21
1.4361	X1CrNiSi 18 15	X1CrNiSi18-15-4
1.4362	X2CrNiN 23 4	X2CrNiN23-4
1.4401	X5CrNiMo17 12 2	X5CrNiMo17-12-2
1.4404	X2CrNiMo17 13 2	X2CrNiMo17-12-2
1.4410	X10CrNiMo 18 9	X2CrNiMoN25-7-4
1.4418	X4CrNiMo 16 5	X4CrNiMo16-5-1
1.4435	X2CrNiMo 18 14 3	X2CrNiMo18-14-3
1.4436	X5CrNiMo17 13 3	X3CrNiMo17-13-3
1.4438	X2CrNiMo18 16 4	X2CrNiMo18-15-4
1.4460	X4CrNiMo 27 5 2	X3CrNiMoN27-5-2
1.4462	X2CrNiMoN22 5 3	X2CrNiMoN22-5-3
1.4509	X6CrTiNb 18	X2CrTiNb18
1.4510	X6CrTi 17	X3CrTi17
1.4511	X6CrNb 17	X3CrNb17
1.4512	X6CrTi 12	X2CrTi12
1.4520	X1CrTi 15	X2CrTi17
1.4521	X2CrMoTi 18 2	X2CrMoTi18-2
1.4522	X2CrMoNb 18 2	X2CrMoNb18-2
1.4532	X7CrNiMoAl 15 7	X8CrNiMoAl15-7-2
1.4541	X6CrNiTi 18 10	X6CrNiTi18-10
1.4542	X5CrNiCuNb 17 4	X5CrNiCuNb16-4
1.4550	X6CrNiNb 18 10	X6CrNiNb18-10
1.4558	X2NiCrAlTi 32 20	X2NiCrAlTi32-20
1.4567	X3CrNiCu 18 9 X	X3CrNiCu18-9-4
1.4568	X7CrNiAl 17 7	X7CrNiAl17-7
1.4577	X3CrNiMoTi 25 25	X3CrNiMoTi25-25
1.4592	X1CrMoTi 29 4	X2CrMoTi29-4
1.4713	X10CrAl 7	X10CrAlSi7
1.4724	X10CrAl 13	X10CrAlSi13
1.4742	X10CrAl 18	X10CrAlSi18
1.4762	X10CrAl 24	X10CrAlSi25
1.4821	X20CrNiSi 25 4	X20CrNiSi25-4
1.4828	X15CrNiSi 20 12	X15CrNiSi20-12
1.4833	X7CrNi 23 14	X7CrNi23-12
1.4841	X15CrNiSi 25 20	X15CrNiSi25-21
1.4845	X12CrNi 25 21	X12CrNi25-21
1.4864	X12NiCrSi 36 16	X12NiCrSi35-16
1.4878	X12CrNiTi 18 9	X10CrNiTi18-10
1.5026	55 Si 7	55Si7
1.5131	50 MnSi 4	50MnSi4
1.5415	15 Mo 3	16Mo3
1.5530	21 MnB 5	20MnB5
1.5531	30 MnB 5	30MnB5
1.5532	38 MnB 5	38MnB5
1.5637	10 Ni 14	12Ni14
1.5710	36 NiCr 6	36NiCr6
1.5715	–	16NiCrS4
1.5752	14 NiCr 14	15NiCr13
1.6210	15 MnNi 6 3	15MnNi6-3
1.6211	16 MnNi 6 3	16MnNi6-3
1.6310	20 MnMoNi 5 5	20MnMoNi5-5
1.6311	20 MnMoNi 4 5	20MnMoNi4-5
1.6341	11 NiMoV 5 3	11NiMoV5-3
1.6368	15 NiCuMoNb 5	15NiCuMoNb5
1.6511	36 CrNiMo 4	36CrNiMo4
1.6523	21 NiCrMo 2	21NiCrMo2-2
1.6526	21 NiCrMoS 2	21NiCrMoS2-2
1.6580	30 CrNiMo 8	30CrNiMo8
1.6582	34 CrNiMo 6	34CrNiMo6
1.6587	17 CrNiMo 6	18CrNiMo7-6
1.7003	38 Cr 2	38Cr2
1.7006	46 Cr 2	46Cr2
1.7016	17 Cr 3	17Cr3
1.7023	38 CrS 2	38CrS2
1.7025	46 CrS 2	46CrS2
1.7030	28 Cr 4	28Cr4
1.7033	34 Cr 4	34Cr4
1.7034	37 Cr 4	37Cr4
1.7035	41 Cr 4	41Cr4
1.7036	28 CrS 4	28CrS4
1.7037	34 CrS 4	34CrS4
1.7038	37 CrS 4	37CrS4
1.7039	41 CrS 4	41CrS4
1.7131	16 MnCr 5	16MnCr5
1.7139	16 MnCrS 5	16MnCrS5
1.7147	20 MnCr 5	20MnCr5
1.7149	20 MnCrS 5	20MnCrS5
1.7176	55 Cr 3	55Cr3
1.7182	27 MnCrB 5 2	27MnCrB5-2
1.7185	33 MnCrB 5 2	33MnCrB5-2
1.7189	39 MnCrB 6 2	39MnCrB6-2
1.7213	25 CrMoS 4	25CrMoS4
1.7218	25 CrMo 4	25CrMo4
1.7220	34 CrMo 4	34CrMo4
1.7225	42 CrMo 4	42 CrMo 4

Cont. overleaf

New Material Abbreviations to DIN EN

Material	Abbreviation old	Abbreviation **NEW**
1.7226	34 CrMoS 4	34CrMoS4
1.7227	42 CrMoS 4	42CrMoS4
1.7228	50 CrMo 4	50CrMo4
1.7264	20 CrMo 5	20CrMo5
1.7321	20 MoCr 4	20MoCr4
1.7323	20 MoCrS 4	20MoCrS4
1.7333	22 CrMoS 3 5	22CrMoS3-5
1.7335	13 CrMo 4 4	13CrMo4-5
1.7362	12 CrMo 19 5	12CrMo19-5
1.7380	10 CrMo 9 10	10CrMo9-10
1.7383	–	11CrMo9-10
1.8159	50 CrV 4	51CrV4
1.8504	34 CrAl 6	34CrAl6
1.8519	31 CrMoV 9	31CrMoV9
1.8550	34 CrAlNi 7	34CrAlNi7
1.8807	13 MnNiMoV 5 4	13MnNiMoV5-4
1.8812	18 MnMoV 5 2	18MnMoV5-2
1.8815	18 MnMoV 6 3	18MnMoV6-3

Material	Abbreviation old	Abbreviation **NEW**
1.8821	StE 355 TM	P355M
1.8824	StE 420 TM	P420M
1.8826	StE 460 TM	P460M
1.8828	EStE 420 TM	P420ML2
1.8831	EStE 460 TM	P460ML2
1.8832	TStE 355 TM	P355ML1
1.8835	TStE 420 TM	P420ML1
1.8837	TStE 460 TM	P460ML1
1.8879	StE ...	P690Q
1.8880	WStE ...	P690QH
1.8881	TStE ...	P690QL1
1.8882	10 MnTi 3	10MnTi3
1.8888	EStE ...	P690QL2
1.8900	StE 380	S380N
1.8901	StE 460	S460N
1.8902	StE 420	S420N
1.8903	TStE 460	S460NL
1.8905	StE 460	P460N

Material	Abbreviation old	Abbreviation **NEW**
1.8907	StE 500	S500N
1.8910	TStE 380	S380NL
1.8911	EStE 380	S380NL1
1.8912	TStE 420	S420NL
1.8913	EStE 420	S420NL1
1.8915	TStE 460	P460NL1
1.8917	WStE 500	S500NL
1.8918	EStE 460	P460NL2
1.8919	EStE 500	S500NL1
1.8930	WStE 380	P380NH
1.8932	WStE 420	P420NH
1.8935	WStE 460	P460NH
1.8937	TStE 500	P500NH
1.8972	StE 415.7	L415NB
1.8973	StE 415.7 TM	L415MB
1.8975	StE 445.7 TM	L450MB
1.8977	StE 480.7 TM	L485MB
1.8978	StE 550.7 TM	L555MB

Table for Comparisons of Hardness

Rm (N/mm²)	HRC	HB30	HV10
240		71	75
255		76	80
270		81	85
285		86	90
305		90	95
320		95	100
335		100	105
350		105	110
370		109	115
385		114	120
400		119	125
415		124	130
430		128	135
450		133	140
465		138	145
480		143	150
495		147	155
510		152	160
530		157	165
545		162	170
560		166	175
575		171	180
595		176	185
610		181	190
625		185	195
640		190	200
660		195	205
675		199	210
690		204	215
705		209	220
720		214	225
740		219	230
755		223	235
770		228	240
785		233	245
800	22	238	250
820	23	242	255
835	24	247	260
860	25	255	268
870	26	258	272
900	27	266	280

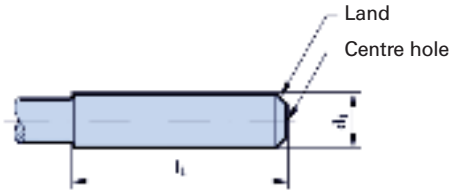
Rm (N/mm²)	HRC	HB30	HV10
920	28	273	287
940	29	278	293
970	30	287	302
995	31	295	310
1020	32	301	317
1050	33	311	327
1080	34	319	336
1110	35	328	345
1040	36	337	355
1170	37	346	364
1200	38	354	373
1230	39	363	382
1260	40	372	392
1300	41	383	403
1330	42	393	413
1360	43	402	423
1400	44	413	434
1440	45	424	446
1480	46	435	458
1530	47	449	473
1570	48	460	484
1620	49	472	497
1680	50	488	514
1730	51	501	527
1790	52	517	544
1845	53	532	560
1910	54	549	578
1980	55	567	596
2050	56	584	615
2140	57	607	639
2180	58	622	655
	59		675
	60		698
	61		720
	62		745
	63		773
	64		800
	65		829
	66		864
	67		900
	68		940

Formulas

Symbol	Description	Metric	Formulas
v_c	Cutting speed	m/min	$v_c = \frac{\pi \cdot DC \cdot n}{1000}$
D_c	Cutter diameter	mm	
n	RPM	RPM	$n = \frac{v_c \cdot 1000}{\pi \cdot D_c}$
f	Feed/revolution	mm/a	$f = \frac{v_f}{n}$
v_f	Feed rate	mm/min	$v_f = n \cdot z_n \cdot f_z$
f_z	Feed/tooth	mm/d	$f_z = \frac{V_f}{n \cdot z_n}$
z_n	No. of teeth		
Q	Chipping capacity	cm^3/mn	$Q = \frac{a_p \cdot a_e \cdot f}{1000}$
a_p	Cutting depth	mm	
a_e	Cutting width	mm	
T	Machining time	mn	$T = \frac{l_f}{v_f}$
l_f	Cutting length	mm	
$D_{(eff)}$	Effective diameter	mm	$D_{(eff)} = 2 \cdot \sqrt{D \cdot ap - ap^2}$
$D_{(eff)}$	Effective diameter at tilting angle β	mm	$D_{(eff)} = D \cdot \sin\left[\beta + \arccos\left(\frac{D-2a_p}{D}\right)\right]$

Parallel Shanks for High-speed Steel Tools DIN 1835 (excerpt)

Smooth — Form A

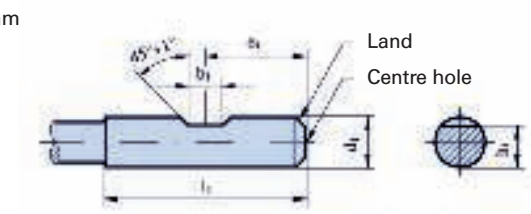


Dimension in mm

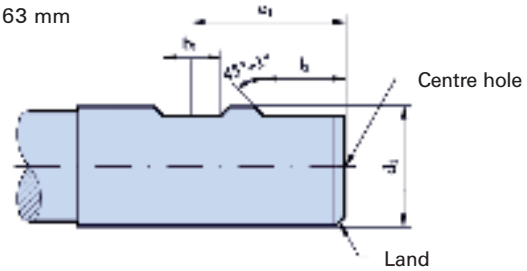
d_1 h8	l_1 +2 0
3	28
4	28
5	28
6	36
8	36
10	40
12	45
16	48
20	50
25	56
32	60
40	70
50	80
63	90

With lateral flat — Form B

With **one** flat
for
$d_1 = 6 \ldots 20$ mm



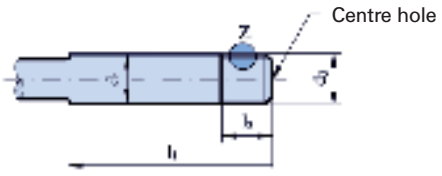
With **two** flats
for
$d_1 = 25 \ldots 63$ mm



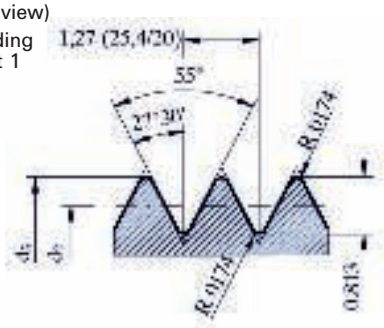
Dimension in mm

d_1 h6	b_1 +0.05 0	e_1 0 -1	h_1 h13	l_1 +2 0	l_2 +1 0	Centre hole Form R DIN 332 part 1
6	4.2	18	4.8	36	–	1.6 x 2.5
8	5.5	18	6.6	36	–	1.6 x 3.35
10	7	20	8.4	40	–	1.6 x 3.35
12	8	22.5	10.4	45	–	1.6 x 3.35
16	10	24	14.2	48	–	2.0 x 4.25
20	11	25	18.2	50	–	2.5 x 5.3
25	12	32	23	56	17	2.5 x 5.3
32	14	36	30	60	19	3.15 x 6.7
40	14	40	38	70	19	3.15 x 6.7
50	18	45	47.8	80	23	3.15 x 6.7
63	18	50	60.8	90	23	3.15 x 6.7

With torque thread — Form D



Detail Z
(shown as sectional view)
thread profile according
to DIN ISO 228 part 1

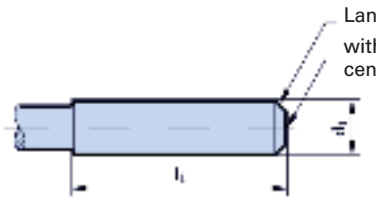


Dimension in mm

d_1 h8	d_3	Side limits	d_2	Side limits	l_1 +2 0	l_3 +2 0	Centre hole Form R DIN 332 part 1
6	5.9	0 -0.1	5.087	0 -0.1	36	10	1.6 x 2.5
10	9.9	0 -0.1	9.087	0 -0.1	40	10	1.6 x 3.35
12	11.9	0 -0.1	11.087	0 -0.1	45	10	1.6 x 3.35
16	15.9	0 -0.1	15.087	0 -0.1	48	10	2.0 x 4.25
20	19.9	0 -0.15	19.087	0 -0.15	50	15	2.5 x 5.3
25	24.9	0 -0.15	24.087	0 -0.15	56	15	2.5 x 5.3
32	31.9	0 -0.15	31.087	0 -0.15	60	15	3.15 x 6.7

Parallel Shanks for Carbide Twist Drills and End Mills DIN 6536 (excerpt)

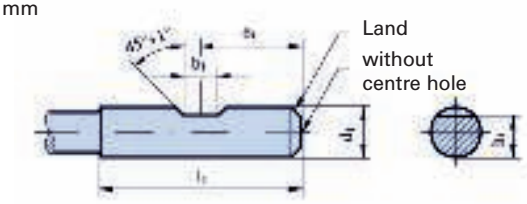
Smooth — Form HA



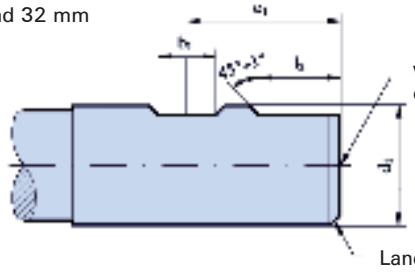
Dimension in mm	
d_1 h6	l_1 +2 0
2	28
3	28
4	28
5	28
6	36
8	36
10	40
12	45
14	45
16	48
18	48
20	50
25	56
32	60

With lateral flat — Form HB

With **one** flat
for
$d_1 = 6$ and 20 mm



With **two** flats
for
$d_1 = 25$ and 32 mm

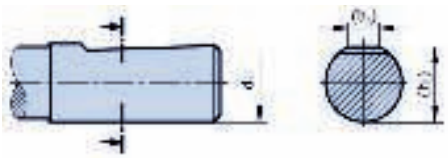


Dimension in mm					
d_1 h6	b_1 +0.05 0	e_1 0 -1	h_1 h11	l_1 +2 0	l_2 +1 0
6	4.2	18	5.1	36	–
8	5.5	18	6.9	36	–
10	7	20	8.5	40	–
12	8	22.5	10.4	45	–
14	8	22.5	12.7	45	–
16	10	24	14.2	48	–
18	10	24	16.2	48	–
20	11	25	18.2	50	–
25	12	32	23	56	17
32	14	36	30	60	19

With inclined clamping face without cooling ducts* — Form HE

For $d_1 = 6$ ... 20 mm

For $d_1 = 25$ and 32 mm



Dimension in mm								
d_1 h6	(b_2)	(b_3)	h_2 h11	(h_3)	l_1 +2 0	l_4 0 -1	l_5 Nominal dimension	r_2 min.
6	4.3	–	5.1	–	36	25	18	1.2
8	5.5	–	6.9	–	36	25	18	1.2
10	7.1	–	8.5	–	40	28	20	1.2
12	8.2	–	10.4	–	45	33	22.5	1.2
14	8.1	–	12.7	–	45	33	22.5	1.2
16	10.1	–	14.2	–	48	36	24	1.6
18	10.8	–	16.2	–	48	36	24	1.6
20	11.4	–	18.2	–	50	38	25	1.6
25	13.6	9.3	23.0	24.1	56	44	32	1.6
32	15.5	9.9	30.0	31.2	60	48	35	1.6

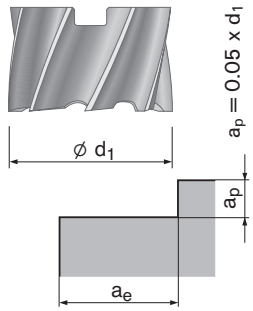
* Design: Parallel shanks to DIN 6535 are construed with or without cooling ducts.
Use of the specific design for different tools and dimensions and
the description of the cooling ducts are indicated in the respective dimensional standards.

Shell End Mills

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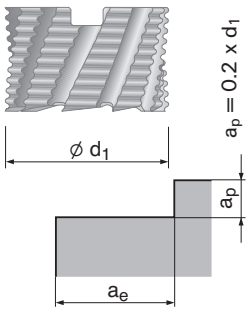
Standard values for the feed per tooth f_z in mm

Type N



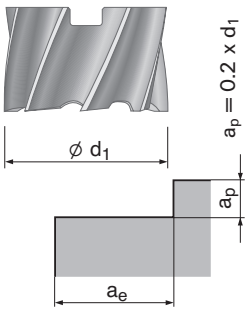
$a_e = 0.75 \times d_1$

Type NF, HR, NR



$a_e = 0.75 \times d_1$

Type W



$a_e = 0.75 \times d_1$

ø d_1	Uncoated	Coated	Uncoated	Coated	Uncoated
30	0.043		0.056		
35	0.046		0.060		
40	0.049	0.054	0.064	0.070	0.060
50	0.055	0.060	0.071	0.078	0.066
60	0.060		0.077		
63	0.061	0.067	0.079	0.087	0.074
75	0.066		0.086		
80	0.065	0.071	0.084	0.092	0.078
90	0.061		0.080		
100	0.059	0.065	0.076	0.084	0.071
125	0.054		0.070		0.065

Please note that the value f_z from the above table must be multiplied with the respective correction factor.
For these factors, see the table on page 10/48–49.

General formula:

$f_{z\ cutting} = f_{z\ table}$ x corrective factor

Other bore type milling cutters

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Standard values for the feed per tooth f_z in mm

Cylindrical milling cutters

d_1 x b	f_z	d_1 x b	f_z
50 x 4	0.020	100 x 10	0.028
50 x 5	0.020	100 x 12	0.036
50 x 6	0.020	100 x 14	0.036
50 x 8	0.025	100 x 16	0.036
50 x 10	0.025	100 x 18	0.039
63 x 1.6	0.006	100 x 20	0.039
63 x 2	0.010	125 x 1.6	0.008
63 x 2.5	0.012	125 x 2	0.012
63 x 3	0.015	125 x 2.5	0.016
63 x 4	0.020	125 x 3	0.018
63 x 5	0.022	125 x 4	0.022
63 x 6	0.022	125 x 5	0.025
63 x 8	0.022	125 x 6	0.027
63 x 10	0.026	125 x 8	0.029
80 x 1.6	0.006	125 x 10	0.029
80 x 2	0.012	125 x 12	0.037
80 x 2.5	0.015	125 x 14	0.037
80 x 3	0.020	125 x 16	0.037
80 x 4	0.024	125 x 18	0.042
80 x 5	0.024	125 x 20	0.042
80 x 6	0.024	160 x 2	0.012
80 x 8	0.027	160 x 2.5	0.014
80 x 10	0.027	160 x 3	0.016
80 x 12	0.034	160 x 4	0.020
80 x 16	0.034	160 x 5	0.022
100 x 1.6	0.006	160 x 6	0.024
100 x 2	0.012	160 x 8	0.028
100 x 2.5	0.014	160 x 10	0.030
100 x 3	0.016	160 x 12	0.038
100 x 4	0.020	160 x 14	0.038
100 x 5	0.024	160 x 16	0.045
100 x 6	0.024	160 x 18	0.045
100 x 8	0.028	160 x 20	0.045

Concave milling cutters

d_1 x r	f_z convex	d_1 x r	f_z convex
50 x 1.0	0.012	50 x 1.0	0.020
50 x 1.5	0.014	50 x 2.0	0.025
50 x 2.0	0.018	63 x 3.0	0.032
63 x 2.5	0.024	63 x 4.0	0.036
63 x 3.0	0.025	63 x 5.0	0.042
63 x 3.5	0.028	80 x 6.0	0.050
63 x 4.0	0.030	80 x 8.0	0.066
63 x 4.5	0.032	100 x 10.0	0.080
63 x 5.0	0.034		
80 x 5.5	0.038		
80 x 6.0	0.042		
80 x 6.5	0.048		
80 x 7.0	0.052		
80 x 7.5	0.055		
80 x 8.0	0.060		
100 x 8.5	0.066		
100 x 9.0	0.074		
100 x 10.0	0.080		

Double equal-angle milling cutters

d_1 x angle α	f_z
50 x 45°	0.026
63 x 45°	0.030
80 x 45°	0.034
100 x 45°	0.038
50 x 60°	0.026
63 x 60°	0.030
80 x 60°	0.034
100 x 60°	0.038
50 x 90°	0.038
63 x 90°	0.044
80 x 90°	0.048
100 x 90°	0.054

Single angle milling cutters

d_1 x angle α	f_z
40 x 45°	0.018
50 x 45°	0.024
63 x 45°	0.026
80 x 45°	0.033
50 x 60°	0.024
63 x 60°	0.026
80 x 60°	0.033
100 x 60°	0.037

Woodruff cutters

∅ x width	f_z
13.5 x 2.0	0.014
13.5 x 2.5	0.014
13.5 x 3.0	0.016
13.5 x 4.0	0.016
16.5 x 2.5	0.017
16.5 x 3.0	0.017
16.5 x 4.0	0.017
16.5 x 5.0	0.017
19.5 x 3.0	0.018
19.5 x 4.0	0.018
19.5 x 5.0	0.018
22.5 x 4.0	0.019
22.5 x 5.0	0.019
22.5 x 6.0	0.024
25.5 x 5.0	0.019
25.5 x 6.0	0.024
25.5 x 8.0	0.024
28.5 x 5.0	0.022
28.5 x 6.0	0.026
28.5 x 8.0	0.026
32.5 x 5.0	0.022
32.5 x 6.0	0.028
32.5 x 8.0	0.028

T-slot cutters

∅ x width	f_z
12.5 x 6.0	0.012
16.0 x 8.0	0.015
18.0 x 8.0	0.020
21.0 x 9.0	0.030
25.0 x 11.0	0.030
28.0 x 12.0	0.030
32.0 x 14.0	0.030
36.0 x 16.0	0.031
40.0 x 18.0	0.032
45.0 x 20.0	0.035
50.0 x 22.0	0.038

Dovetail cutters

d_1	f_z
16.0	0.010
20.0	0.012
22.0	0.013
25.0	0.014
28.0	0.015
32.0	0.016
38.0	0.018
50.0	0.023

Corner-rounding cutters

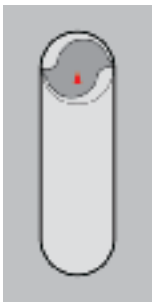
radius	f_z
1.0	0.014
1.5	0.015
2.0	0.016
2.5	0.017
3.0	0.018
4.0	0.020
5.0	0.022
6.0	0.027
8.0	0.040
10.0	0.052
12.0	0.058
16.0	0.073

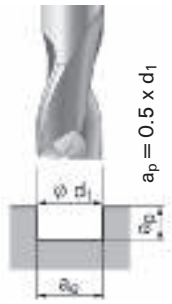
Milling of Key Waysand Slots with Short HSS Slot Drills

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Standard values for the feed per tooth f_z in mm

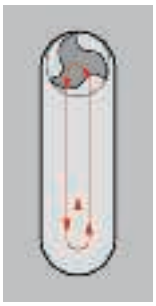
Full-size milling (in one cut)

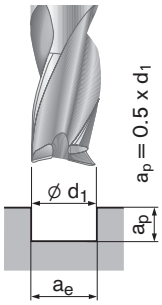




$a_e = d_1$

Undersize milling (multiple-cut)





$a_e = d_1$

Drill milling



ø d_1	Full-size milling (in one cut)		Undersize milling (multiple-cut)				Drill milling			
			Roughing		Finishing					
	Uncoated	Coated	Uncoated	Coated	Uncoated	Coated	Uncoated	Coated	Uncoated	Coated
2	0.005	0.006	0.005	0.006	0.008	0.009	0.003	0.003	0.002	0.002
3	0.009	0.010	0.009	0.010	0.015	0.016	0.004	0.005	0.003	0.003
4	0.012	0.013	0.012	0.013	0.022	0.024	0.006	0.007	0.004	0.004
5	0.016	0.017	0.016	0.017	0.030	0.033	0.008	0.009	0.005	0.006
6	0.020	0.022	0.020	0.022	0.039	0.043	0.010	0.011	0.007	0.007
8	0.026	0.029	0.026	0.029	0.055	0.061	0.013	0.014	0.009	0.010
10	0.034	0.037	0.034	0.037	0.075	0.082	0.017	0.019	0.011	0.012
12	0.040	0.044	0.040	0.044	0.093	0.101	0.020	0.022	0.013	0.015
14	0.049	0.054	0.049	0.054	0.117	0.118	0.024	0.027	0.016	0.018
16	0.056	0.062	0.056	0.062	0.135	0.135	0.028	0.031	0.019	0.021
18	0.065	0.072	0.065	0.072	0.151	0.151	0.033	0.036	0.022	0.024
20	0.071	0.078	0.071	0.078	0.167	0.167	0.035	0.039	0.024	0.026
22	0.080	0.088	0.080	0.088	0.184	0.184	0.040	0.044	0.027	0.029
25	0.089	0.098	0.089	0.098	0.208	0.208	0.044	0.049	0.030	0.033
28	0.103		0.103		0.233		0.051		0.034	
32	0.118		0.118		0.265		0.059		0.039	
36	0.137		0.137		0.265		0.068		0.046	
40	0.133		0.133		0.265		0.067		0.044	
45	0.134		0.134		0.265		0.067		0.045	
50	0.131		0.131		0.265		0.065		0.044	

Please note that the value f_z from the above table must be multiplied with the corresponding correction factor.
For these factors, see the table on page 10/50–10/51.

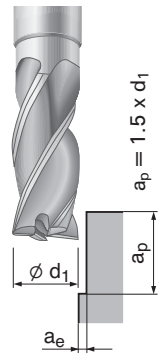
General formula:

$f_{z\ milling} = f_{z\ table}$ x correction factor

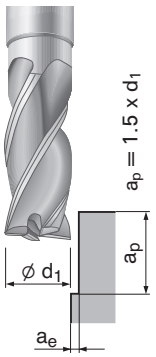
Milling of HSS-E End Mills, Extra Short and Short Design

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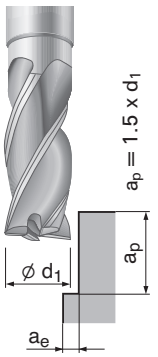
Standard values for the feed per tooth f_z in mm



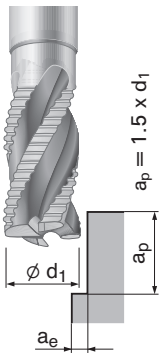
$a_e = 0.2–0.3$ mm



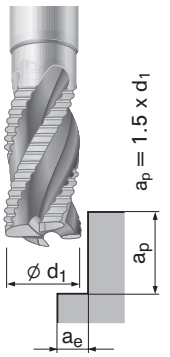
$a_e = 0.1 \times d_1$



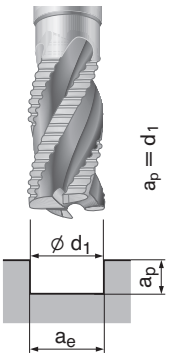
$a_e = 0.25 \times d_1$



$a_e = 0.25 \times d_1$



$a_e = 0.5 \times d_1$



$a_e = d_1$

$\varnothing d_1$	Uncoated	Coated	Uncoated	Coated	Uncoated	Coated	Uncoated	Coated	Uncoated	Coated	Uncoated	Coated
2	0.008	0.009	0.008	0.009	0.008	0.009						
3	0.011	0.012	0.011	0.012	0.009	0.010						
4	0.017	0.018	0.014	0.015	0.013	0.014	0.015	0.016	0.013	0.014	0.011	0.012
5	0.024	0.026	0.018	0.020	0.014	0.015	0.019	0.021	0.016	0.018	0.014	0.016
6	0.032	0.035	0.022	0.024	0.015	0.017	0.024	0.027	0.020	0.022	0.018	0.019
8	0.047	0.051	0.029	0.032	0.020	0.022	0.032	0.036	0.027	0.030	0.024	0.026
10	0.065	0.072	0.037	0.041	0.026	0.028	0.042	0.047	0.035	0.039	0.031	0.034
12	0.084	0.091	0.044	0.049	0.031	0.034	0.051	0.057	0.043	0.047	0.037	0.041
14	0.100	0.106	0.054	0.059	0.037	0.041	0.063	0.069	0.053	0.058	0.045	0.050
16	0.111	0.121	0.061	0.067	0.042	0.046	0.072	0.079	0.060	0.066	0.052	0.057
18	0.126	0.136	0.070	0.077	0.048	0.053	0.084	0.093	0.071	0.078	0.061	0.067
20	0.141	0.151	0.076	0.083	0.052	0.057	0.092	0.100	0.077	0.084	0.066	0.073
22	0.160	0.166	0.085	0.094	0.059	0.065	0.117	0.114	0.087	0.096	0.075	0.082
25	0.170	0.188	0.095	0.104	0.065	0.072	0.136	0.129	0.100	0.108	0.084	0.093
28	0.196	0.210	0.109	0.120	0.075	0.083	0.157	0.150	0.114	0.125	0.098	0.108
32	0.212	0.240	0.124	0.137	0.086	0.094	0.184	0.173	0.131	0.145	0.113	0.125
36	0.224	0.240	0.144	0.159	0.099	0.109	0.170	0.187	0.142	0.162	0.126	0.140
40	0.240	0.240	0.157	0.173	0.108	0.120	0.200	0.194	0.154	0.170	0.132	0.146
45	0.240	0.240	0.157	0.173	0.108	0.120	0.200	0.220	0.170	0.180	0.140	0.160
50	0.240	0.240	0.157	0.173	0.108	0.120	0.200	0.220	0.170	0.180	0.140	0.160
56	0.240	0.240	0.157	0.173	0.108	0.120	0.200	0.220	0.170	0.180	0.140	0.160
63	0.240	0.240	0.157	0.173	0.108	0.120	0.200	0.220	0.170	0.180	0.140	0.160

Please note that the value f_z from the above table must be multiplied with the corresponding correction factor.
For these factors, see the table on page 10/50–10/51.

General formula:

$$f_{z\ milling} = f_{z\ table} \times \text{correction factor}$$

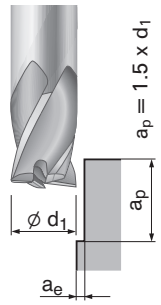
$$f_{z\ drilling} = \frac{f_{z\ milling}}{\text{number of teeth}}$$

Milling of HSS-E End Mills and Slot Drills, Short and Long Design

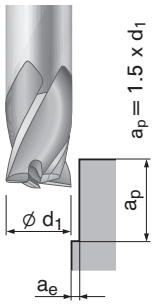
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Standard values for the feed per tooth f_z in mm

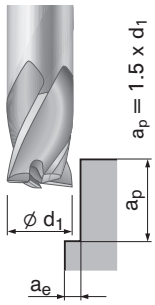
(Do not use these values for milling of hard materials!)



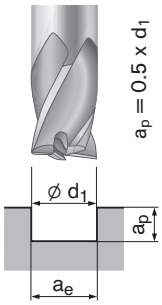
$a_e = 0.2–0.3$ mm



$a_e = 0.1 \times d_1$



$a_e = 0.25 \times d_1$



$a_e = d_1$

$\varnothing d_1$	Uncoated	Coated	Uncoated	Coated	Uncoated	Coated	Uncoated	Coated
2	0.006	0.008	0.006	0.008	0.004	0.005	0.003	0.004
3	0.010	0.012	0.010	0.012	0.007	0.008	0.005	0.007
4	0.013	0.016	0.011	0.014	0.009	0.010	0.007	0.009
5	0.017	0.020	0.013	0.017	0.011	0.013	0.008	0.011
6	0.020	0.024	0.015	0.020	0.013	0.015	0.010	0.013
8	0.027	0.032	0.020	0.027	0.018	0.020	0.013	0.018
10	0.033	0.040	0.025	0.033	0.022	0.025	0.017	0.022
12	0.040	0.048	0.030	0.040	0.027	0.030	0.020	0.027
14	0.047	0.056	0.035	0.047	0.031	0.035	0.023	0.031
16	0.053	0.064	0.040	0.053	0.036	0.040	0.027	0.036
18	0.060	0.072	0.045	0.060	0.040	0.045	0.030	0.040
20	0.067	0.080	0.050	0.067	0.044	0.050	0.033	0.044
25	0.083	0.100	0.083	0.083	0.056	0.063	0.042	0.056

Please note that the value f_z from the above table must be multiplied with the corresponding correction factor.
For these factors, see the table on page 10/50–10/51.

General formula:

$$f_{z\ milling} = f_{z\ table} \times \text{correction factor}$$

$$f_{z\ drilling} = \frac{f_{z\ milling}}{\text{number of teeth}}$$

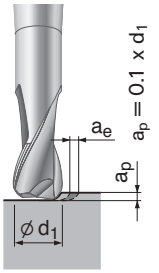
Solid Carbide Ball Nose and Radius Cutters, Short and Long Design

format professional quality

Standard values for the feed per tooth f_z in mm

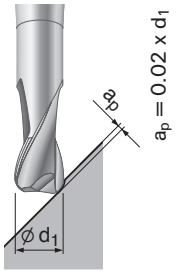
(Do not use these values for the milling of hard materials)

Roughing

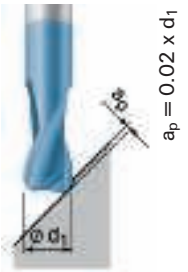


$a_e = 0.2 \times d_1$

Finishing



Milling of hard materials



$\varnothing d_1$	Uncoated	Coated	Uncoated	Coated	Coated
2	0.010	0.015	0.009	0.010	0.005
3	0.018	0.020	0.010	0.015	0.010
4	0.025	0.030	0.018	0.020	0.015
5	0.035	0.040	0.025	0.030	0.020
6	0.055	0.060	0.045	0.050	0.030
8	0.075	0.080	0.065	0.070	0.050
10	0.090	0.100	0.075	0.080	0.070
12	0.110	0.120	0.090	0.100	0.090
16	0.135	0.150	0.110	0.120	0.100
18	0.145	0.160	0.125	0.140	0.110
20	0.165	0.180	0.135	0.150	0.120

Please note that the value f_z from the above table must be multiplied with the corresponding correction factor.
For these factors, see the table on page 10/50–10/51.

General formula:

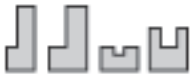
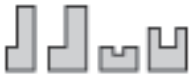
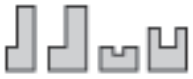
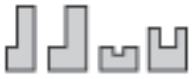
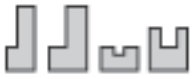
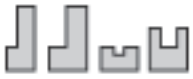
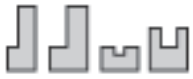
$f_{z\ milling} = f_{z\ table}$ x correction factor

"Vallorbinox®" line				⌀ 2.0 mm				⌀ 3.0 mm				⌀ 4.0 mm				⌀ 5.0 mm			
				0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1
Material	**Type**	**Article/Catalogue no.**	**Z**	**n = 6365**				**n = 4245**				**n = 3185**				**n = 2545**			
Stainless steel ferrit. 400–640 N/mm²	**N** vc = 20–65 Tab.: 40 m/mn	**2161**	3 fz	0.009	0.008	0.008	0.005	0.014	0.012	0.012	0.007	0.019	0.016	0.016	0.010	0.024	0.020	0.020	0.013
			vf	180	150	150	95	180	150	150	95	180	150	150	100	180	150	150	100
	NR vc = 20–65 Tab.: 40 m/mn	**2170**	3 fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Stainless steel martensit. 730–1100 N/mm²	**N** vc = 20–55 Tab.: 40 m/mn	**2161**	3 fz	0.009	0.008	0.006	0.005	0.014	0.012	0.009	0.007	0.019	0.016	0.013	0.009	0.024	0.020	0.016	0.012
			vf	180	150	120	90	180	150	120	90	180	150	120	90	180	150	120	90
	NR vc = 20–55 Tab.: 40 m/mn	**2170**	3 fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Stainless steel austenit. 440–780 N/mm²	**N** vc = 25–50 Tab.: 40 m/mn	**2161**	3 fz	0.007	0.006	0.006	0.005	0.010	0.009	0.009	0.008	0.014	0.012	0.012	0.010	0.017	0.014	0.014	0.013
			vf	130	110	110	100	130	110	110	100	130	110	110	100	130	110	110	100
	NR vc = 25–50 Tab.: 40 m/mn	**2170**	3 fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Titanium alloy 370–420 N/mm²	**N** vc = 10–50 Tab.: 35 m/mn			**n = 5570**				**n = 3715**				**n = 2785**				**n = 2230**			
		2161	3 fz	0.016	0.012	0.012	–	0.024	0.018	0.018	–	0.032	0.024	0.024	–	0.041	0.030	0.030	–
			vf	265	200	200	–	265	200	200	–	265	200	200	–	265	200	200	–

"Granit® Al" line				⌀ 2.0 mm				⌀ 3.0 mm				⌀ 4.0 mm				⌀ 5.0 mm			
				0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1
Material	**Type**	**Article/Catalogue no.**	**Z**	**n = 47745**				**n = 31830**				**n = 23875**				**n = 19100**			
Aluminium alloy low Si 250–610 N/mm²	**W** vc = 50–400 Tab.: 300 m/mn	**2162**	3 fz	0.038	0.024	0.024	0.015	0.057	0.037	0.037	0.025	0.076	0.049	0.049	0.033	0.095	0.061	0.061	0.042
			vf	5425	3400	3400	2200	5425	3500	3500	2395	5425	3500	3500	2395	5425	3500	3500	2395
	WR	**2152. 2153**	3 fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
				n = 31830				**n = 21220**				**n = 15915**				**n = 12730**			
	W vc = 50–250 Tab.: 200 m/mn	**2167**	3 fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
			L vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
			Z	**n = 23870**				**n = 15915**				**n = 11935**				**n = 9550**			
Aluminium alloy high Si 160–420 N/mm²	**W** vc = 50–200 Tab.: 150 m/mn	**2162**	3 fz	0.039	0.024	0.024	0.017	0.058	0.036	0.036	0.026	0.078	0.048	0.048	0.034	0.097	0.060	0.060	0.043
			vf	2795	1720	1720	1220	2793	1720	1720	1220	2795	1720	1720	1220	2795	1720	1720	1220
	WR	**2152. 2153**	3 fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
				n = 14325				**n = 9550**				**n = 7160**				**n = 5730**			
	W vc = 50–150 Tab.: 90 m/mn	**2167**	3 fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			L vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			Z	**n = 19100**				**n = 12730**				**n = 9550**				**n = 7640**			
Copper 380–420 N/mm²	**W** vc = 50–165 Tab.: 120 m/mn	**2162. 2167**	3 fz	0.014	0.013	0.012	0.011	0.022	0.019	0.019	0.016	0.029	0.025	0.025	0.022	0.036	0.031	0.031	0.027
			vf	830	720	710	630	830	720	710	630	830	720	710	630	830	720	710	630
	WR	**2152. 2153**	3 fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Recommended Cutting Values

⌀ 6.0 mm				⌀ 10.0 mm				⌀ 16.0 mm				⌀ 20.0 mm				⌀ 25.0 mm				⌀ 32.0 mm				⌀ 40.0 mm			
																											
0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1
n = 2120				**n = 1275**				**n = 795**				**n = 635**				**n = 510**				**n = 400**							
0.028	0.024	0.024	0.017	0.047	0.039	0.039	0.027	0.075	0.063	0.063	0.044	0.094	0.078	0.079	0.055	0.118	0.098	0.098	0.069	0.150	0.125	0.125	0.088	–	–	–	–
180	150	150	105	180	150	150	105	180	150	150	105	180	150	150	105	180	150	150	105	180	150	150	105	–	–	–	–
0.039	0.031	0.031	0.020	0.065	0.052	0.052	0.033	0.105	0.084	0.084	0.052	0.131	0.105	0.105	0.065	0.164	0.131	0.131	0.082	0.208	0.167	0.167	0.104	–	–	–	–
250	200	200	125	250	200	200	125	250	200	200	125	250	200	200	125	250	200	200	125	250	200	200	125	–	–	–	–
0.031	0.023	0.028	0.014	0.052	0.039	0.047	0.023	0.084	0.063	0.075	0.037	0.105	0.078	0.094	0.047	0.130	0.098	0.118	0.059	0.188	0.125	0.150	0.075	–	–	–	–
200	150	180	90	200	150	180	90	200	150	180	90	200	150	180	90	200	150	180	90	200	150	180	90	–	–	–	–
0.039	0.031	0.035	0.017	0.065	0.052	0.058	0.028	0.105	0.084	0.092	0.046	0.131	0.104	0.115	0.057	0.164	0.131	0.144	0.072	0.208	0.170	0.183	0.092	–	–	–	–
250	200	220	110	250	200	220	110	250	200	220	110	250	200	220	110	250	200	220	110	250	200	220	110	–	–	–	–
0.020	0.017	0.017	0.016	0.034	0.029	0.029	0.026	0.054	0.046	0.046	0.041	0.068	0.057	0.057	0.052	0.085	0.072	0.072	0.065	0.108	0.092	0.092	0.083	–	–	–	–
130	110	110	100	130	110	110	100	130	110	110	100	130	110	110	100	130	110	110	100	130	110	110	100	–	–	–	–
0.024	0.020	0.020	0.019	0.039	0.034	0.034	0.031	0.062	0.054	0.054	0.050	0.078	0.068	0.068	0.062	0.098	0.085	0.085	0.078	0.125	0.108	0.108	0.010	–	–	–	–
150	130	130	120	150	130	130	120	150	130	130	120	150	130	130	120	150	130	130	120	150	130	130	120	–	–	–	–
n = 1860				**n = 1115**				**n = 695**				**n = 555**				**n = 445**				**n = 350**							
0.048	0.035	0.035	–	0.079	0.060	0.060	–	0.153	0.096	0.096	–	0.192	0.119	0.119	–	0.240	0.150	0.150	–	0.305	0.190	0.190	–	–	–	–	–
265	200	200	–	265	200	200	–	320	200	200	–	320	200	200	–	320	200	200	–	320	200	200	–	–	–	–	–

⌀ 6.0 mm				⌀ 10.0 mm				⌀ 16.0 mm				⌀ 20.0 mm				⌀ 25.0 mm				⌀ 32.0 mm				⌀ 40.0 mm			
																											
0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1	0.25	0.5	0.5	1
n = 15915				**n = 9550**				**n = 5965**				**n = 4775**				**n = 3820**				**n = 2985**				**n = 2385**			
0.114	0.073	0.073	0.050	0.189	0.122	0.122	0.084	0.303	0.196	0.196	0.134	0.379	0.244	0.244	0.167	0.474	0.305	0.305	0.209	0.606	0.391	0.391	0.257	0.758	0.489	0.489	0.321
5425	3500	3500	2395	5425	3500	3500	2395	5425	3500	3500	2395	5425	3500	3500	2395	5425	3500	3500	2395	5425	3500	3500	2300	5425	3500	3500	2300
0.160	0.114	0.114	0.080	0.267	0.190	0.190	0.133	0.427	0.304	0.304	0.212	0.534	0.379	0.379	0.265	0.667	0.474	0.474	0.332	0.854	0.607	0.607	0.424	1.067	0.758	0.758	0.531
7645	5430	5430	3800	7645	5430	5430	3800	7645	5430	5430	3800	7645	5430	5430	3800	7645	5430	5430	3800	7645	5430	5430	3800	7645	5430	5430	3800
n = 10610				**n = 6365**				**n = 3975**				**n = 3180**				**n = 2545**				**n = 1990**				**n = 1590**			
0.047	0.038	0.038	0.028	0.079	0.063	0.063	0.047	0.126	0.101	0.101	0.075	0.158	0.126	0.126	0.094	0.197	0.157	0.157	0.117	0.252	0.201	0.201	0.150	0.316	0.251	0.251	0.187
1500	1210	1210	890	1500	1210	1210	890	1500	1210	1210	890	1500	1210	1210	890	1500	1210	1210	890	1500	1210	1210	890	1500	1210	1210	890
n = 7960				**n = 4775**				**n = 2980**				**n = 2385**				**n = 1910**				**n = 1490**				**n = 1195**			
0.117	0.072	0.072	0.051	0.195	0.120	0.120	0.085	0.312	0.192	0.192	0.136	0.390	0.240	0.240	0.170	0.487	0.300	0.300	0.213	0.624	0.384	0.384	0.273	0.780	0.480	0.480	0.341
2795	1720	1720	1220	2795	1720	1720	1220	2795	1720	1720	1220	2795	1720	1720	1220	2795	1720	1720	1220	2795	1720	1720	1220	2795	1720	1720	1220
0.147	0.114	0.114	0.079	0.245	0.190	0.190	0.132	0.392	0.304	0.304	0.211	0.490	0.380	0.380	0.264	0.613	0.475	0.475	0.330	0.784	0.608	0.608	0.422	0.980	0.760	0.760	0.528
3510	2720	2720	1890	3510	2720	2720	1890	3510	2720	2720	1890	3510	2720	2720	1890	3510	2720	2720	1890	3510	2720	2720	1890	3510	2720	2720	1890
n = 4775				**n = 2865**				**n = 1790**				**n = 1430**				**n = 1145**				**n = 895**				**n = 715**			
0.055	0.050	0.042	0.030	0.092	0.083	0.070	0.050	0.147	0.133	0.112	0.080	0.183	0.167	0.140	0.100	0.229	0.208	0.175	0.125	0.293	0.267	0.223	0.160	0.366	0.333	0.279	0.200
785	715	600	430	785	715	600	430	785	715	600	430	785	715	600	430	785	715	600	430	785	715	600	430	785	715	600	430
n = 6365				**n = 3820**				**n = 2385**				**n = 1910**				**n = 1530**				**n = 1195**				**n = 955**			
0.043	0.038	0.037	0.033	0.072	0.063	0.062	0.055	0.116	0.101	0.099	0.088	0.145	0.126	0.124	0.110	0.181	0.157	0.155	0.137	0.232	0.201	0.198	0.176	0.29	0.251	0.248	0.22
830	720	710	630	830	720	710	630	830	720	710	630	830	720	710	630	830	720	710	630	830	720	710	630	830	720	710	630
0.058	0.052	0.047	0.042	0.096	0.087	0.079	0.070	0.154	0.140	0.126	0.112	0.192	0.175	0.157	0.140	0.240	0.218	0.196	0.175	0.307	0.279	0.251	0.223	0.384	0.349	0.314	0.279
1100	1000	900	800	1100	1000	900	800	1100	1000	900	800	1100	1000	900	800	1100	1000	900	800	1100	1000	900	800	1100	1000	900	800

"Granit®-Dry PM" line				⌀ 2.0 mm				⌀ 3.0 mm				⌀ 4.0 mm				⌀ 5.0 mm			
				0.15	0.5	0.5	1	0.15	0.5	0.5	1	0.15	0.5	0.5	1	0.15	0.5	0.5	1
Material	**Type**	**Article/Catalogue no.**	**Z**																
Alloyed steel 950–1200 N/mm²	**N** vc = 20–50 Tab.: 40 m/mn	**2168**	4* fz	0.017	0.007	0.007	–	0.026	0.011	0.011	–	0.035	0.014	0.014	–	0.043	0.018	0.018	–
			vf	440	180	180	–	440	180	180	–	440	180	180	–	440	180	180	–
		2180	4* fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			L vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
				n = 4775				**n = 3185**				**n = 2385**				**n = 1910**			
	HR vc = 20–50 Tab.: 30 m/mn	**2218**	4* fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
		2228	4* fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			L vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Alloyed steel 1200–1400 N/mm²	**N** vc = 15–40 Tab.: 30 m/mn	**2168**	4* fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
		2180	4* fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			L vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			Z	**n = 3980**				**n = 2665**				**n = 1990**				**n = 1590**			
	HR vc = 15–40 Tab.: 25 m/mn	**2218**	4* fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
		2228	4* fz	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
			L vf	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Dry machining

0.15: 0.8 x vc, 0.8 x vf

0.5: 0.8 x vc, 0.7 x vf

0.5: 0.8 x vc, 0.7 x vf

1: 0.8 x vc, 0.6 x vf

∅ 6.0 mm				∅ 10.0 mm				∅ 16.0 mm				∅ 20.0 mm				∅ 25.0 mm				∅ 32.0 mm				∅ 40.0 mm			
																											
0.15	0.5	0.5	1	0.15	0.5	0.5	1	0.15	0.5	0.5	1	0.15	0.5	0.5	1	0.15	0.5	0.5	1	0.15	0.5	0.5	1	0.15	0.5	0.5	1
n = 2120				**n = 1275**				**n = 795**				**n = 635**				**n = 510**				**n = 400**							
0.052	0.021	0.021	–	0.086	0.035	0.035	–	0.138	0.057	0.057	–	0.173	0.071	0.071	–	0.172	0.071	0.071	–	–	–	–	–	–	–	–	–
440	180	180	–	440	180	180	–	440	180	180	–	440	180	180	–	440	180	180	–	–	–	–	–	–	–	–	–
0.033	0.019	–	–	0.055	0.031	–	–	0.088	0.057	–	–	0.110	0.071	–	–	0.110	0.063	–	–	0.140	0.080	–	–	–	–	–	–
280	160	–	–	280	160	–	–	280	160	–	–	280	160	–	–	280	160	–	–	280	160	–	–	–	–	–	–
n = 1590				**n = 955**				**n = 595**				**n = 475**				**n = 380**				**n = 300**							
0.083	0.050	0.035	0.031	0.139	0.084	0.063	0.058	0.222	0.134	0.109	0.101	0.278	0.168	0.147	0.136	0.347	0.209	0.183	0.171	0.204	0.178	0.156	0.144	–	–	–	–
530	320	220	200	530	320	240	220	530	320	260	240	530	320	280	260	530	320	280	260	530	320	280	260	–	–	–	–
0.047	0.028	0.025	0.013	0.079	0.047	0.041	0.027	0.126	0.075	0.067	0.036	0.157	0.094	0.084	0.045	0.196	0.118	0.105	0.056	0.166	0.100	0.089	0.047	–	–	–	–
300	180	160	85	300	180	160	85	300	180	160	85	300	180	160	85	300	180	160	85	300	180	160	85	–	–	–	–
0.053	0.022	0.022	–	0.088	0.037	0.037	–	0.141	0.059	0.059	–	0.175	0.073	0.073	–	0.176	0.073	0.073	–	–	–	–	–	–	–	–	–
335	140	140	–	335	140	140	–	335	140	140	–	335	140	140	–	335	140	140	–	–	–	–	–	–	–	–	–
0.033	0.019	–	–	0.055	0.031	–	–	0.088	0.057	–	–	0.111	0.071	–	–	0.111	0.063	–	–	0.140	0.081	–	–	–	–	–	–
210	120	–	–	210	120	–	–	210	120	–	–	210	120	–	–	210	120	–	–	210	120	–	–	–	–	–	–
n = 1325				**n = 795**				**n = 495**				**n = 400**				**n = 320**				**n = 250**							
0.083	0.045	0.028	0.021	0.138	0.075	0.047	0.035	0.221	0.121	0.116	0.075	0.276	0.151	0.157	0.113	0.346	0.188	0.196	0.141	0.293	0.160	0.166	0.120	–	–	–	–
440	240	150	110	440	240	150	110	440	240	230	150	440	240	250	180	440	240	250	180	440	240	250	180	–	–	–	–
0.047	0.028	0.025	–	0.079	0.047	0.041	–	0.126	0.075	0.066	–	0.157	0.094	0.081	–	0.195	0.117	0.102	–	0.166	0.100	0.086	–	–	–	–	–
250	150	130	–	250	150	130	–	250	150	130	–	250	150	130	–	250	150	130	–	250	150	130	–	–	–	–	–

Recommended Cutting Values V_c in m/min

format professional quality

1	Steel materials	Tensile strength	Material description	Material no.	Tensile strength in the core	Correction factor (x f_z)
1.1	Cold extruding steels, magnetic soft iron	≤400 N/mm²	Q-St37-3 R-Fe80	1.0123 1.1014		1.2
1.2	Machine steels, general structural steels	≤600 N/mm²	9SMnPb28 St37-2	1.0718 1.0037	500 – 700 N/mm² 340 – 470 N/mm²	1.2
1.3	Machine steels, structural steels, alloyed steels, cast steel	≤850 N/mm²	St70-2 GS-25CrMo4	1.0070 1.7218	700 – 900 N/mm² 650 – 950 N/mm²	1.1
1.4	Hardened steels, tempering steels, nitrided steels, cold working steels	≤1100 N/mm²	16MnCr5 Ck45 100Cr6 X155CrVMo12-1	1.7131 1.1191 1.3505 1.2379	500 – 700 N/mm² 600 – 800 N/mm² 700 – 900 N/mm² 900 – 1100 N/mm²	1.0
1.5	Tempering steels, nitrided steels, hot working steels, hardened steels up to 44 HRC	≤1400 N/mm²	42CrMo4V X30WCrV5-3 X38CrMoV5-3	1.7225 1.2567 1.2367	1200 – 1400 N/mm² 1100 N/mm² 900 – 1100 N/mm²	0.9
1.6	Hardened steels > 44 – 55 HRC		55NiCrMoV6	1.2713	47 – 52 HRC	
1.7	Hardened steels > 55 – 60 HRC		45WCrV7	1.2542	56 – 57 HRC	
1.8	Hardened steels > 60 – 63 HRC		X155CrVMo12-1	1.2379	60 – 63 HRC	
1.9	Hardened steels > 63 – 66 HRC		X210CrW12	1.2436	63 – 64 HRC	
1.10	Stainless steels, acid-resistant steels, heat-resistant steels	≤850 N/mm²	X10NiCrAlTi32-20 [INCOLOY800] X12CrNiTi18-9 X6CrNiMoTi17-12-2	1.4876 1.4878 1.4571	610 – 850 N/mm² 500 – 700 N/mm² 500 – 730 N/mm²	1.0
1.11	Rust/acid/heat-resistant steels	≤1100 N/mm²	X45SiCr4	1.4704	900 – 1100 N/mm²	0.9
1.12	Rust/acid/heat-resistant steels	≤1400 N/mm²	X5NiCrTi26-15	1.4980	1200 N/mm²	0.8
1.13	Special steel materials		FerroTiC Hardox500		800 – 900 N/mm² 1300 – 1400 N/mm²	
2	**Cast materials**					
2.1	Cast iron		GG 20 GG 30	0.6020 0.6030	120 – 220 HB 220 – 270 HB	1.1
2.2	Cast iron with nodulised cast iron		GGG 40 GGG 70	0.7040 0.7070	400 N/mm² 700 – 1050 N/mm²	1.0
2.3	Cast iron with vermicular graphite		GGV (80 % Perlit) GGV (100 % Perlit)		220 HB 230 HB	1.0
2.4	Malleable cast iron		GTW 40 GTS 65	0.8040 0.8165	360 – 420 N/mm² 580 – 650 N/mm²	1.0
2.5	Chilled castings up to 400 HB				400 HB	
3	**Copper, copper alloy, bronze, brass**					
3.1	Pure copper and low alloy copper	≤500 N/mm²	E-Cu	2.0060	250 – 350 N/mm²	1.2
3.2	Copper and zinc alloys (brass) (long chipping)		CuZn40 [Ms60] CuZn37 [Ms63]	2.0360 2.0321	340 – 490 N/mm² 310 – 550 N/mm²	1.1
3.3	Copper-zinc alloy (brass) (short chipping)		CuZn39Pb2 [Ms58]	2.0380	380 – 500 N/mm²	1.1
3.4	Copper and aluminium alloy (alu. bronze) (long chipping) Copper and tin alloy (Bronze) (long chipping)		CuAl10Ni	2.0966	500 – 800 N/mm²	1.1
3.5	Copper and tin alloys (Bronze) (short chipping)		GCuSn5ZnPb [Rg5] GCuSn7ZnPb [Rg7]	2.1096 2.1090	150 – 300 N/mm² 150 – 300 N/mm²	1.2
3.6	Special copper alloys up to Q18		Ampco16		630 N/mm²	1.0
3.7	Special copper alloys over Q18		Ampco20		600 N/mm²	
4	**Nickel/cobalt alloys**					
4.1	Nickel/cobalt alloys, heat-resistant	≤850 N/mm²	NiCu30Fe [MONEL400]	2.4360	420 – 610 N/mm²	1.0
4.2	Nickel/cobalt alloys, highly heat-resistant	850 – 1400 N/mm²	NiCr19NbMo [INCONEL718]	2.4668	850 – 1190 N/mm²	0.9
4.3	Nickel/cobalt alloys, highly heat-resistant	>1400 N/mm²	Haynes 25 (L605)		1550 – 2000 N/mm²	
5	**Aluminium alloys**					
5.1	Aluminium wrought alloys		Al 99.5 [F13] AlCuMg1 [F39]	3.0255 3.1325	100 – 250 N/mm² 300 – 500 N/mm²	1.5
5.2	Aluminium cast alloys ≤ 5% Si		G-AlMg3	3.3541	130 – 190 N/mm²	1.3
5.3	Aluminium cast alloys > 5% - ≤ 12% Si		GD-AlSi9Cu3 GD-AlSi12	3.2163 3.2582	240 – 310 N/mm² 220 – 300 N/mm²	1.3
5.4	Aluminium cast alloys >12% Si		G-AlSi17Cu4		180 – 250 N/mm²	1.3
6	**Magnesium alloys**					
6.1	Magnesium wrought alloys		MgAl6	3.5662	300 – 500 N/mm²	1.3
6.2	Magnesium cast alloys		GMgAl9Zn1	3.5912	300 – 500 N/mm²	1.5
7	**Titanium, titanium alloys**					
7.1	Pure titanium, titanium alloys	≤900 N/mm²	Ti3 [Ti99.4] TiAl6V4	3.7055 3.7164	700 N/mm² 700 – 900 N/mm²	1.0
7.2	Titanium alloys	900 – 1250 N/mm²	TiAl4Mo4Sn2	3.7185	900 – 1250 N/mm²	0.8
8	**Plastics**					
8.1	Duroplastics (short chipping)		BAKELIT		110 N/mm²	2.0
8.2	Thermoplastics (long chipping)		HOSTALEN		80 N/mm²	2.0
8.3	Fibre reinforced plastics		CFK/GFK/AFK		800 – 1500 N/mm²	
9	**Materials for special applications**					
9.1	Graphite		C-8000		60 N/mm²	0.7
9.2	Wolfram copper alloys		W-Cu 80/20		230 – 250 HV	1.0

10 Technical Appendix

Milling tools from page 2/5.

Recommended Cutting Values V_c in m/min

format professional quality

Shell end mill/HSS-E		Slot cutter/HSS-E		T-slot/shaping cutter HSS-E		Correction factor	Solid carbide milling cutter	
Uncoated design	TiCN-coated design	Uncoated design	TiCN-coated design	Uncoated design	TiCN-coated design		Uncoated design	TiCN-coated design
20 – 35	55 – 70	30 – 40	60 – 80	30 – 40	60 – 80	1.2	160 – 190	200 – 240
25 – 30	50 – 60	29 – 33	54 – 66	29 – 33	54 – 66	1.2	120 – 160	170 – 200
23 – 28	45 – 65	26 – 31	50 – 62	26 – 31	50 – 62	1.1	100 – 120	150 – 180
18 – 23	40 – 50	20 – 26	45 – 53	20 – 26	45 – 53	1.0	90 – 110	120 – 140
14 – 18	25 – 30	15 – 20	28 – 35	15 – 20	28 – 35	0.8	70 – 90	90 – 120
						0.7		80 – 110
						1.1		80 – 100
						1.0		70 – 90
						0.9		60 – 80
9 – 16	18 – 27	10 – 18	20 – 30	10 – 18	20 – 30	1.0	70 – 80	80 – 100
	13 – 18	9 – 14	14 – 20	9 – 14	14 – 20	0.9		50 – 80
	9 – 13	7 – 12	10 – 14	7 – 12	10 – 14	0.7		40 – 60
						0.7		30 – 40
20 – 25	30 – 40	23 – 28	35 – 47	23 – 28	35 – 47	1.1	110 – 130	140 – 160
19 – 23	30 – 35	21 – 26	32 – 40	21 – 26	32 – 40	1.1	100 – 110	120 – 150
16 – 20	25 – 30	18 – 22	28 – 32	18 – 22	28 – 32	1.0	70 – 90	100 – 120
27 – 36	40 – 55	30 – 40	45 – 60	30 – 40	45 – 60	1.1	115 – 130	150 – 180
						0.8		70 – 80
35 – 55	60 – 90	40 – 60	70 – 100	40 – 60	70 – 100	1.2	160 – 220	250 – 300
100 – 120	145 – 160	110 – 130	160 – 180	110 – 130	160 – 180	1.1	200 – 220	240 – 270
90 – 110	135 – 150	100 – 120	150 – 170	100 – 120	150 – 170	1.1	180 – 200	230 – 260
20 – 30	25 – 40	25 – 35	30 – 50	25 – 35	30 – 50	1.2	140 – 180	200 – 240
100 – 120	160 – 180	120 – 140	180 – 200	120 – 140	180 – 200	1.2	220 – 240	280 – 320
	16 – 21	12 – 18	18 – 23	12 – 18	18 – 23	1.0		60 – 80
						0.7		15 – 20
	9 – 16	6 – 9	10 – 18	6 – 9	10 – 18	1.1		60 – 70
	8 – 13	5 – 7	9 – 14	5 – 7	9 – 14	1.0		40 – 60
						0.7		30 – 40
130 – 120		150 – 250	250 – 350	150 – 250	250 – 350	1.9	500 – 550	600 – 700
90 – 130		100 – 150	150 – 200	100 – 150	150 – 200	1.8	450 – 500	500 – 600
55 – 65			130 – 160		130 – 160	1.6		250 – 350
			60 – 90		60 – 90	1.5		150 – 200
90 – 110		100 – 120	200 – 240	100 – 120	200 – 240	1.8	450 – 550	500 – 600
90 – 110		100 – 120	200 – 240	100 – 120	200 – 240	1.9	450 – 500	500 – 600
	18 – 23	15 – 18	20 – 25	15 – 18	20 – 25	1.0	80 – 100	100 – 120
	14 – 18	10 – 13	15 – 20	10 – 13	15 – 20	0.9		70 – 80
25 – 45		30 – 50	60 – 80	30 – 50	60 – 80	2.0	100 – 130	130 – 160
90 – 130		100 – 150	220 – 250	100 – 150	220 – 250	2.0	180 – 210	250 – 350
						1.0	80 – 100	100 – 140
			40 – 60		40 – 60	1.0		200 – 240
	18 – 27		20 – 30		20 – 30	1.1	70 – 90	90 – 120

format professional quality GÜHRING

Gürolotse Milling Tools
Recommended applications

Tools with feed series code numbers in **bold** print
(Preferably select VR code).



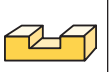


For mini slot cutters art. no. 2472 and 2474
use the cutting values art. no. 2468.

Cutter Ø	Feed code															
	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
	f_z (mm/tooth)															
2.00	0.001	0.001	0.001	0.002	0.002	0.004	0.005	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.018	0.020
3.00	0.002	0.002	0.003	0.003	0.004	0.007	0.010	0.010	0.010	0.015	0.016	0.013	0.019	0.022	0.024	0.030
5.00	0.005	0.006	0.007	0.009	0.010	0.014	0.020	0.020	0.022	0.025	0.026	0.026	0.028	0.030	0.032	0.038
6.00	0.006	0.008	0.009	0.011	0.013	0.017	0.024	0.025	0.027	0.031	0.029	0.033	0.039	0.036	0.041	0.047
8.00	0.010	0.012	0.014	0.016	0.019	0.024	0.032	0.032	0.035	0.042	0.042	0.047	0.053	0.052	0.058	0.064
10.00	0.013	0.015	0.018	0.021	0.025	0.030	0.038	0.039	0.044	0.050	0.053	0.059	0.065	0.066	0.073	0.080
12.50	0.016	0.018	0.022	0.026	0.030	0.036	0.046	0.048	0.052	0.059	0.063	0.072	0.079	0.085	0.090	0.100
16.00	0.020	0.023	0.027	0.032	0.038	0.045	0.054	0.058	0.063	0.071	0.079	0.088	0.095	0.100	0.110	0.120
20.00	0.023	0.028	0.033	0.038	0.045	0.057	0.066	0.073	0.080	0.090	0.097	0.100	0.110	0.120	0.130	0.140

Cooling
- Emulsion
- Oil
- Air

Slot Cutters/Slot Cutters Long

Cutting material	HM-UF	HM-UF	HM-UF	HM-UF
Standard	6527	Company standard	6527	6527
Type	N	N	N	NH
Surface	TiAlN	TiAlN	TiAlN	TiAlN
Works no.	**2466 (HB)**	**2482 (HB)**	**2468 (HB)**	**2476 (HB)**
Number of cutting edges	2 cutting edges	2 cutting edges	3 cutting edges	3 cutting edges
				
Application	 $a_e = 1 \times D$ $a_p = 1 \times D$	 $a_e = 1 \times D$ $a_p = 2 \times D$	 $a_e = 1 \times D$ $a_p = 1 \times D$	 $a_e = 1 \times D$ $a_p = 0.5 \times D$

Material group	Material examples	Tensile strength N/mm²	Hardness	Coolant	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code
General structural steels	**1.0035** S185, **1.0486** P275N, **1.0345** P235GH, **1.0425** P265GH	≤500		●	85-105	**42**	72-88	**39**	85-105	**42**	94-116	**43**
	1.0050 E295, **1.0070** E360, **1.8937** P500NH	>500-850		●	81-99	**41**	67-83	**38**	81-99	**41**	89-109	**42**
Machine steels	**1.0718** 11SMnPb30, **1.0736** 11SMn37	≤850		●	85-105	**41**	72-88	**38**	85-105	**41**	94-116	**42**
	1.0727 46 S20, **1.0728** 60 S20, **1.0757** 46SPb20	850-1000		●	63-77	**42**	54-66	**39**	63-77	**42**	69-85	**43**
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E	≤700		●	85-105	**41**	72-88	**38**	85-105	**41**	94-116	**42**
	1.0503 C45, **1.1191** C45E	700-850		●	76-94	**41**	63-77	**38**	76-94	**41**	84-104	**42**
	1.0601 C60, **1.1221** C60E	850-1000		●	63-77	**42**	54-66	**39**	63-77	**42**	69-85	**43**
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-1000		●	76-94	**42**	63-77	**39**	76-94	**42**	84-104	**43**
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		●	63-77	**42**	54-66	**39**	63-77	**42**	69-85	**43**
Unalloyed hardened steels	**1.0301** C10, **1.1121** C10E	≤750		●	90-110	**41**	67-83	**38**	90-110	**41**	99-121	**42**
Alloyed hardened steels	**1.7043** 38Cr4	850-1000		●	76-94	**41**	63-77	**38**	76-94	**41**	84-104	**42**
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		●	54-66	**42**	45-55	**39**	54-66	**42**	59-73	**43**
Nitrided steels	**1.8504** 34CrAl6	≥850-1000		●	85-105	**41**	72-88	**38**	85-105	**41**	94-116	**42**
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	1000-1200		●	76-94	**40**	63-77	**37**	76-94	**40**	84-104	**41**
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		●	76-94	**41**	63-77	**38**	76-94	**41**	84-104	**42**
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	850-1000		●	63-77	**40**	54-66	**37**	63-77	**40**	69-85	**41**
High-speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		●	45-55	**42**	40-50	**39**	45-55	**42**	49-61	**43**
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4		≤330 HB	●	45-55	**40**			45-55	**40**	49-61	**41**
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18	≤850		●	45-55	**42**			45-55	**42**	49-61	**43**
austenitic	9 **1.4301** X5CrNi18-10, **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17 12 2	≤850		●	40-50	**40**			40-50	**40**	45-55	**41**
martensitic	**1.4057** X20CrNi17-2, **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18 2	≤850		●	36-44	**41**			36-44	**41**	39-49	**42**
Hardened steels	–		≤40-48 HRC	●	45-55	**40**			45-55	**40**	49-61	**41**
			>48-60 HRC	●								
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		●	27-33	**40**			27-33	**40**	29-37	**41**
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)		≤240 HB	● ○	108-132	**41**	94-116	**38**	108-132	**41**	118-146	**42**
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)		<300 HB	● ○	99-121	**40**	85-105	**37**	99-121	**40**	108-134	**41**
Nodulised cast iron and malleable cast iron	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)		≤240 HB	●	90-110	**41**	81-99	**38**	90-110	**41**	99-121	**42**
	0.7070 EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		<300 HB	●	81-99	**40**	67-83	**37**	81-99	**40**	89-109	**41**
Chilled castings	–		≤350 HB	●	54-66	**40**			54-66	**40**	59-73	**41**
Titanium and titanium alloys	**3.7024** Ti99.5, **3.7114** TiAl5Sn2.5, **3.7124** TiCu2	≤850		●	45-55	**40**	58-72	**37**	45-55	**40**	49-61	**41**
	3.7154 TiAl6Zr5, **3.7164** TiAl6V4, **3.7184** TiAl4Mo4Sn2.5, - TiAl8Mo1V1	850-1200		●	36-44	**40**	31-39	**37**	36-44	**40**	39-49	**41**
Aluminium and aluminium alloys	**3.0255** Al99.5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		●	405-495	**43**	342-418	**40**	405-495	**43**	445-545	**44**
Aluminium wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1.5	≤450		●	495-605	**43**	432-528	**40**	495-605	**43**	544-666	**44**
Aluminium cast alloy ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		●	198-242	**42**	171-209	**39**	198-242	**42**	217-267	**43**
>10 % Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		●	162-198	**43**	135-165	**40**	162-198	**43**	178-218	**44**
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450		○	225-275	**44**	198-242	**41**	225-275	**44**	247-303	**45**
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		●	108-132	**43**	90-110	**40**	108-132	**43**	118-146	**44**
Brass, short chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		●	90-110	**43**	85-105	**40**	90-110	**43**	99-121	**44**
Brass, long chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		●	81-99	**42**	63-77	**39**	81-99	**42**	89-109	**43**
Bronzes, short chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		● ●	90-110	**42**	85-105	**39**	90-110	**42**	99-121	**43**
	2.0790 CuNi18Zn19Pb	>600-850		●	72-88	**41**	58-72	**38**	72-88	**41**	79-97	**42**
Bronzes, long chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●	72-88	**42**	58-72	**39**	72-88	**42**	79-97	**43**
	2.0980 CuAl11Ni, **2.1247** CuBe2	850-1000		●	63-77	**40**			63-77	**40**	69-85	**41**
Plastics, duroplastic	Bakelit, Resopal, Pertinax, Moltopren		–	○	108-132	**40**			108-132	**40**	118-146	**41**
Plastics, thermoplastic	Plexiglas, Hostalen, Novodur, Macrolon		–	● ○	99-121	**40**			99-121	**40**	108-134	**41**
Plastics, aramide fibre reinforced			–	○								
glass/carbon fibre reinforced			–	○								
		a_p with f_z correction			1.5 x D = 75% 2 x D = 50%		3 x D = 50%		1.5 x D = 75% 2 x D = 50%		1 x D = 75% 1.5 x D = 50%	

	End Mills – Finishing/Fine Finish					End Mills – Roughing				Copying
HM-UF	HM-UF	HM-UF	HM-UF	HM-UF	HM-UF	HM-UF	HM-UF	HM-UF	HM-UF	HM-UF
6527	6527	6527	6527	Company standard	6527	6527	6527	6527	6527	6527
W	W	Ratio-N	N	N	NH	NH	Ratio-N	W	WR	N
2478/2480 (HB)	2478/2480 (HB)	2460-2462 (HB)	2470 (HB)	2471 (HB)	2484 (HB)	2476 (HB)	2460/2462 (HB)	2478/2480 (HB)	2469 (HB)	2464 (HB)
2 cutting edges	2 cutting edges	4 cutting edges	4 cutting edges	4 cutting edges	Multiple cutting edges	3 cutting edges	4 cutting edges	2 cutting edges	2 cutting edges	2 cutting edges
										
										
$a_e = 1$ x D $a_p = 0.5$ x D	$a_e = 0.1$ x D $a_p = 1.0$ x D	$a_e = 0.1$ x D $a_p = 1.0$ x D	$a_e = 0.1$ x D $a_p = 1.0$ x D	$a_e = 0.1$ x D $a_p = 2.0$ x D	$a_e = 0.02$ x D $a_p = 1.5$ x D	$a_e = 0.5$ x D $a_p = 1.0$ x D	$a_e = 0.5$ x D $a_p = 1.0$ x D	$a_e = 0.5$ x D $a_p = 1.0$ x D	$a_e = 0.5$ x D $a_p = 1.0$ x D	$a_e = 0.05$ x D $a_p = 0.05$ x D
v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code
				212-260	**49**	157-193	**48**	103-127	**43**	171-209	**48**	121-149	**49**	170-208	**51**					153-187	**48**
				194-238	**48**	144-176	**47**	94-116	**42**	157-193	**47**	112-138	**48**	157-193	**50**					144-176	**47**
				212-260	**48**	157-193	**47**	103-127	**42**	171-209	**47**	121-149	**48**	170-208	**50**					153-187	**47**
				158-194	**47**	117-143	**46**	81-99	**41**	126-154	**46**	90-110	**47**	126-154	**49**					153-187	**46**
				212-260	**48**	157-193	**47**	103-127	**42**	171-209	**47**	121-149	**48**	170-208	**50**					135-165	**47**
				194-238	**48**	144-176	**47**	90-110	**42**	153-187	**47**	108-132	**48**	151-185	**50**					135-165	**47**
				158-194	**47**	117-143	**46**	76-94	**41**	126-154	**46**	90-110	**47**	126-154	**49**					117-143	**46**
				188-230	**47**	139-171	**46**	90-110	**41**	153-187	**46**	108-132	**47**	151-185	**49**					126-154	**46**
				158-194	**46**	117-143	**45**	76-94	**40**	126-154	**45**	90-110	**46**	126-154	**48**					153-187	**45**
				236-290	**48**	175-215	**47**	99-121	**42**	189-231	**47**	135-165	**48**	189-231	**50**					198-242	**47**
				188-230	**48**	139-171	**47**	90-110	**42**	153-187	**47**	108-132	**48**	151-185	**50**					171-209	**47**
				139-171	**47**	103-127	**46**	67-83	**41**	117-143	**46**	81-99	**47**	113-139	**49**					108-132	**46**
				212-260	**48**	157-193	**47**	103-127	**42**	171-209	**47**	121-149	**48**	170-208	**50**					144-176	**47**
				194-238	**46**	144-176	**45**	90-110	40	153-187	**45**	108-132	**46**	151-185	**48**					135-165	**45**
				188-230	**48**	139-171	**47**	90-110	**42**	153-187	**47**	108-132	**48**	151-185	**50**					135-165	**47**
				158-194	**46**	117-143	**45**	76-94	40	126-154	**45**	90-110	**46**	126-154	**48**					117-143	**45**
				121-149	**47**	90-110	**46**	58-72	41	94-116	**46**	67-83	**47**	94-116	**49**					85-105	**46**
				121-149	**46**	90-110	**45**			94-116	**45**	67-83	**46**	94-116	**48**					85-105	**45**
				121-149	47	90-110	**46**			94-116	**46**	67-83	**47**	94-116	49					85-105	**46**
				103-127	46	76-94	**45**			81-99	**45**	58-72	**46**	81-101	48					76-94	**45**
				97-119	47	72-88	**46**			76-94	**46**	54-66	**47**	75-93	49					67-83	**46**
				61-75	**24**	45-55	**23**			49-61	43	31-39	44	44-54	**46**					49-61	**44**
				72-90	46	54-66	**45**			54-66	45	40-50	46	56-70	48					49-61	45
				255-313	**48**	189-231	**47**	135-165	42	220-270	47	157-193	48	220-270	**50**					198-242	**47**
				255-313	**47**	189-231	**46**	121-149	41	202-248	46	144-176	47	201-247	**49**					189-231	**46**
				231-283	**48**	171-209	**47**	112-138	42	180-220	47	130-160	48	182-224	**50**					171-209	**47**
				194-238	**47**	144-176	**46**	94-116	41	157-193	46	112-138	47	157-193	**49**					144-176	**46**
				134-164	**45**	99-121	**44**					76-94	45	107-131	**47**					99-121	44
				121-149	46	90-110	**45**	58-72	40	94-116	45	67-83	46	94-116	48						
				97-119	45	72-88	**44**	45-55	39	76-94	44	54-66	45	75-93	47						
297-363	**46**	342-418	**51**			765-935	50	450-550	45	810-990	50	585-715	49	819-1001	51	297-363	**46**	450-550	**47**	720-880	50
360-440	**46**	414-506	**50**			720-880	49	540-660	44	720-880	50	720-880	49	1008-1232	51	360-440	**46**	522-638	**47**	855-1045	50
144-176	**45**	165-203	**49**			373-457	48	225-275	43	405-495	48	288-352	47	403-493	49	144-176	**45**	216-264	**45**	342-418	48
117-143	**46**	135-165	**50**			306-374	49	180-220	44	324-396	49	225-275	48	315-385	50	117-143	**46**	171-209	**46**	288-352	49
171-209	**47**	197-241	**51**			432-528	50	270-330	45	450-550	50	333-407	49	466-570	51	171-209	**47**	243-297	**47**	405-495	50
81-99	**46**	93-115	**50**			198-242	49	135-165	44	216-264	49	153-187	48	214-262	50	81-99	**46**	117-143	**46**	180-220	49
72-88	**46**	82-102	**49**			180-220	48	108-132	43	198-242	48	144-176	47	201-247	49	72-88	**46**	108-132	**45**	171-209	48
67-83	**45**	77-95	**49**			144-176	48	90-110	43	162-198	48	117-143	47	163-201	49	67-83	**45**	99-121	**45**	162-198	48
72-88	**45**	82-102	**49**			180-220	48	108-132	43	198-242	48	144-176	47	201-247	49	72-88	**45**	103-127	**45**	180-220	48
63-77	**44**	72-90	**48**			135-165	47			153-187	47	108-132	46	151-185	48	63-77	**44**	90-110	**44**	171-209	47
63-77	**45**	72-90	**48**			135-165	47			153-187	47	108-132	46	151-185	48	63-77	**45**	90-110	**44**	198-242	47
54-66	**43**	62-76	**47**			117-143	46			126-154	46	90-110	45	126-154	47	54-66	**43**	81-99	**43**	189-231	46
81-99	**43**	93-115	**47**			198-242	46			216-264	46	153-187	45	214-262	**47**	81-99	**43**	112-138	**43**		
72-88	**43**	82-102	**47**			180-220	46			198-242	46	144-176	45	201-247	**47**	72-88	**43**	103-127	**43**		
1 x D = 75% 1.5 x D = 50%		2 x D = 50%		2 x D = 50%		2 x D = 50%		3 x D = 50%		2 x D = 75%		0.5 x D = 120% 2 x D = 50%		0.5 x D = 120% 2 x D = 50%		0.5 x D = 120% 2 x D = 50%		0.5 x D = 120% 2 x D = 50%			

format professional quality GÜHRING

Gürolotse Milling Tools
Recommended applications

Tools with feed series code numbers in **bold** print
(Preferably select VR code).

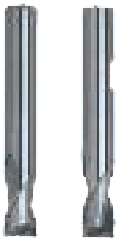
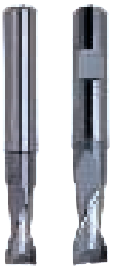
a_e = Cutting width
a_p = Cutting depth



a_e = 1.0 x D

Cutter Ø	Feed code															
	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
	f_z (mm/tooth)															
2.00	0.001	0.001	0.001	0.002	0.002	0.004	0.005	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.018	0.020
3.00	0.002	0.002	0.003	0.003	0.004	0.007	0.010	0.010	0.010	0.015	0.016	0.013	0.019	0.022	0.024	0.030
5.00	0.005	0.006	0.007	0.009	0.010	0.014	0.020	0.020	0.022	0.025	0.026	0.026	0.028	0.030	0.032	0.038
6.00	0.006	0.008	0.009	0.011	0.013	0.017	0.024	0.025	0.027	0.031	0.029	0.033	0.039	0.036	0.041	0.047
8.00	0.010	0.012	0.014	0.016	0.019	0.024	0.032	0.032	0.035	0.042	0.042	0.047	0.053	0.052	0.058	0.064
10.00	0.013	0.015	0.018	0.021	0.025	0.030	0.038	0.039	0.044	0.050	0.053	0.059	0.065	0.066	0.073	0.080
12.50	0.016	0.018	0.022	0.026	0.030	0.036	0.046	0.048	0.052	0.059	0.063	0.072	0.079	0.085	0.090	0.100
16.00	0.020	0.023	0.027	0.032	0.038	0.045	0.054	0.058	0.063	0.071	0.079	0.088	0.095	0.100	0.110	0.120
20.00	0.023	0.028	0.033	0.038	0.045	0.057	0.066	0.073	0.080	0.090	0.097	0.100	0.110	0.120	0.130	0.140

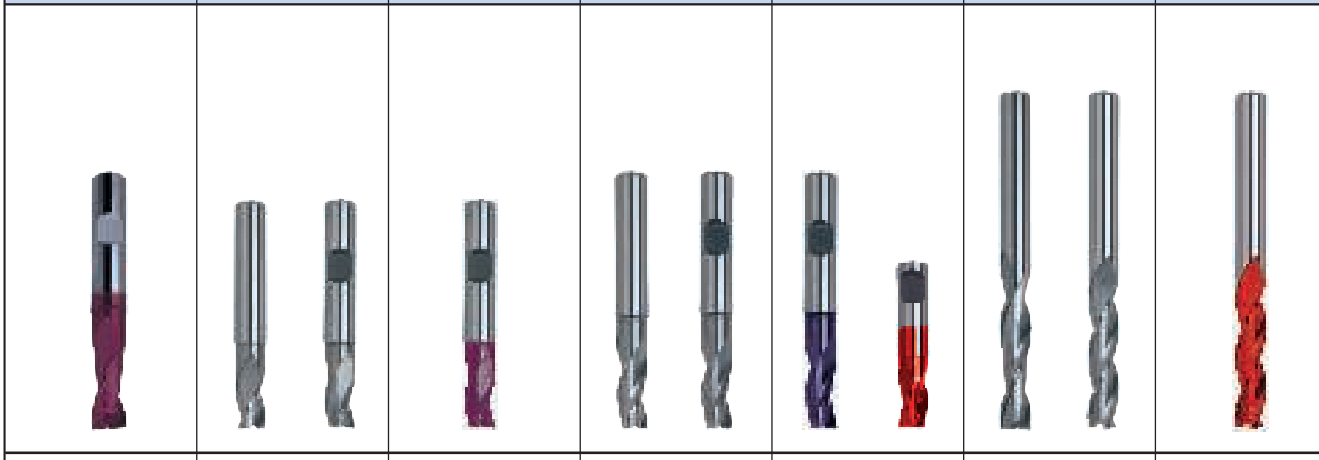
Cooling
- Emulsion
- Oil
- Air

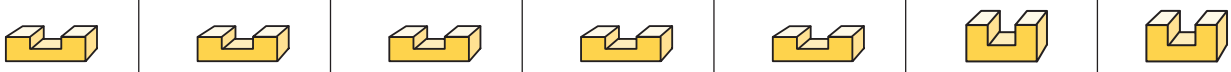
	Slot milling		
Cutting material	HM-UF	HM-UF	HM-UF
Standard	6527	6527	6527
Type	N	N	N
Surface		TiAlN	
Works no.	2315 (HA) 2321 HB)	2339 (HB)	2327 (HA) 2333 (HB)
Number of cutting edges	2 cutting edges	2 cutting edges	2 cutting edges
			
Application	 a_p = 0.5 x D	 a_p = 0.5 x D	 a_p = 1 x D

Material group	Material examples	Tensile strength N/mm²	Hardness	Coolant	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code
General structural steels	**1.0035** S185, **1.0486** P275N, **1.0345** P235GH, **1.0425** P265GH	≤500		○	59-73	**43**	98-120	**43**	51-63	**42**
	1.0050 E295, **1.0070** E360, **1.8937** P500NH	>500-850		○	55-69	**41**	93-115	**42**	48-60	**40**
Machine steels	**1.0718** 11SMnPb30, **1.0736** 11SMn37	≤850		○	59-73	**41**	98-120	**42**	51-63	**40**
	1.0727 46 S20, **1.0728** 60 S20, **1.0757** 46SPb20	850-1000		○	43-53	**42**	72-90	**43**	37-47	**41**
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E	≤700		○	59-73	**41**	98-120	**42**	51-63	**40**
	1.0503 C45, **1.1191** C45E	700-850		○	53-65	**41**	88-108	**42**	45-57	**40**
	1.0601 C60, **1.1221** C60E	850-1000		○	43-53	**42**	72-90	**43**	37-47	**41**
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-1000		○	53-65	**42**	88-108	**43**	45-57	**41**
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		○	43-53	**42**	72-90	**43**	37-47	**41**
Unalloyed hardened steels	**1.0301** C10, **1.1121** C10E	≤750		○	62-76	**41**	103-127	**42**	54-66	**40**
Alloyed hardened steels	**1.7043** 38Cr4	850-1000		●	53-65	**41**	88-108	**42**	45-57	**40**
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		●	36-46	**42**	62-76	**43**	32-40	**41**
Nitrided steels	**1.8504** 34CrAl6	≥850-1000		○	59-73	**41**	98-120	**42**	51-63	**40**
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	1000-1200		●	53-65	**40**	88-108	**41**	45-57	**39**
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		○	53-65	**41**	88-108	**42**	45-57	**40**
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6	850-1000		●	43-53	**40**	72-90	**41**	37-47	**39**
High-speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		●	31-39	**42**	52-64	**43**	27-33	**41**
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4	≤330 HB		●	31-39	**40**	52-64	**41**	27-33	**39**
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17	≤850		●	31-39	**42**	52-64	**43**	27-33	**41**
austenitic	**1.4301** X5CrNi18-10, **1.4541** X6CrNiTi18-10	≤850		●	27-35	**40**	46-58	**41**	24-30	**39**
martensitic	**1.4057** X20CrNi17-2, **1.4122** X39CrMo17-1	≤850		●	25-31	**41**	41-51	**42**	21-27	**40**
Hardened steels	–	≤40-48 HRC		●	31-39	**40**	52-64	**41**	27-33	**39**
		>48-60 HRC		●						
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		●	18-24	**40**	31-39	**41**	16-20	**39**
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)	≤240 HB		○ ○	74-92	**41**	124-152	**42**	64-80	**40**
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	<300 HB		○ ○	68-84	**40**	114-140	**41**	59-73	**39**
Nodulised cast iron and	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)	≤240 HB		○	62-76	**41**	103-127	**42**	54-66	**40**
malleable cast iron	**0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)	<300 HB		○	55-69	**40**	93-115	**41**	48-60	**39**
Chilled castings	–	≤350 HB		○	36-46	**40**	62-76	**41**	32-40	**39**
Titanium and titanium alloys	**3.7024** Ti99.5, **3.7114** TiAl5Sn2.5, **3.7124** TiCu2	≤850		●	31-39	**40**	52-64	**41**	27-33	**39**
	3.7154 TiAl6Zr5, **3.7164** TiAl6V4, **3.7184** TiAl4Mo4Sn2.5	850-1200		●	25-31	**40**	41-51	**41**	21-27	**39**
Aluminium and aluminium alloys	**3.0255** Al99.5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		○	279-343	43	466-570	44	243-297	42
Aluminium wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si	≤450		○	342-418	43	569-697	44	297-363	42
Aluminium cast alloy ≤ 10% Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		○	136-168	42	227-279	43	118-146	41
> 10% Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○	111-137	43	186-228	44	97-119	42
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450		○	155-191	44	259-317	45	135-165	43
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		○	74-92	43	124-152	44	64-80	42
Brass, short chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		○	62-76	43	103-127	44	54-66	42
Brass, long chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0.5	≤600		○	55-69	42	93-115	43	48-60	41
Bronzes, short chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		○ ●	62-76	42	103-127	43	54-66	41
	2.0790 CuNi18Zn19Pb	>600-850		●	49-61	41	82-102	42	43-53	40
Bronzes, long chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●	49-61	42	82-102	43	43-53	41
	2.0980 CuAl11Ni, **2.1247** CuBe2	850-1000		●	43-53	40	72-90	41	37-47	39
Plastic, duroplastic	Bakelit, Resopal, Pertinax, Moltopren		–	○	74-92	40	124-152	41	64-80	39
Plastic, thermoplastic	Plexiglas, Hostalen, Novodur, Macrolon		–	○ ○	68-84	40	114-140	41	59-73	39
		a_p with f_z correction			1 x D = 75%		1 x D = 75%		1.5 x D = 75% 2 x D = 50%	

Slot milling

HM-UF	HM-UF	HM-UF	HM-UF	HM-UF	HM-UF	HM-UF
6527	6527	6527	6527	6527 WN	WN WN	WN
N	N	N	N	N	N	N
TiAlN		TiAlN		TiAlN nano		nano
2342 (HB)	2318 (HA) 2324 (HB)	2345 (HB)	2330 (HA) 2336 (HB)	2348 (HB) 2353 (HB)	2357 (HA) 2354 (HA)	2355 (HA)
2 cutting edges	3 cutting edges	3 cutting edges	3 cutting edges	3 cutting edges	2 cutting edges/3 cutting edges	3 cutting edges





a_p = 1 x D	a_p = 0.5 x D	a_p = 0.5 x D	a_p = 1 x D	a_p = 1 x D	a_p = 2 x D**	a_p = 2 x D**

v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code
85-105	**42**	59-73	**43**	98-120	**43**	51-63	**42**	85-105	**42**	43-53	39	72-88	39
81-99	**41**	55-69	**41**	93-115	**42**	48-60	**40**	81-99	**41**	40-50	37	67-83	38
85-105	**41**	59-73	**41**	98-120	**42**	51-63	**40**	85-105	**41**	43-53	37	72-88	38
63-77	**42**	43-53	**42**	72-90	**43**	37-47	**41**	63-77	**42**	32-40	38	54-66	39
85-105	**41**	59-73	**41**	98-120	**42**	51-63	**40**	85-105	**41**	43-53	37	72-88	38
76-94	**41**	53-65	**41**	88-108	**42**	45-57	**40**	76-94	**41**	37-47	37	63-77	38
63-77	**42**	43-53	**42**	72-90	**43**	37-47	**41**	63-77	**42**	32-40	38	54-66	39
76-94	**42**	53-65	**42**	88-108	**43**	45-57	**41**	76-94	**42**	37-47	38	63-77	39
63-77	**42**	43-53	**42**	72-90	**43**	37-47	**41**	63-77	**42**	32-40	38	54-66	39
90-110	**41**	62-76	**41**	103-127	**42**	54-66	**40**	90-110	**41**	40-50	37	67-83	38
76-94	**41**	53-65	**41**	88-108	**42**	45-57	**40**	76-94	**41**	37-47	37	63-77	38
54-66	**42**	36-46	**42**	62-76	**43**	32-40	**41**	54-66	**42**	27-33	38	45-55	39
85-105	**41**	59-73	**41**	98-120	**42**	51-63	**40**	85-105	**41**	43-53	37	72-88	38
76-94	**40**	53-65	**40**	88-108	**41**	45-57	**39**	76-94	**40**	37-47	36	63-77	37
76-94	**41**	53-65	**41**	88-108	**42**	45-57	**40**	76-94	**41**	37-47	37	63-77	38
63-77	**40**	43-53	**40**	72-90	**41**	37-47	**39**	63-77	**40**	32-40	36	54-66	37
45-55	**42**	31-39	**42**	52-64	**43**	27-33	**41**	45-55	**42**	24-30	38	40-50	39
45-55	**40**	31-39	**40**	52-64	**41**	27-33	**39**	45-55	**40**				
45-55	**42**	31-39	**42**	52-64	**43**	27-33	**41**	45-55	**42**				
40-50	**40**	27-35	**40**	46-58	**41**	24-30	**39**	40-50	**40**				
36-44	**41**	25-31	**41**	41-51	**42**	21-27	**40**	36-44	**41**				
45-55	**40**	31-39	**40**	52-64	**41**	27-33	**39**	45-55	**40**				
27-33	**40**	18-24	**40**	31-39	**41**	16-20	**39**	27-33	**40**				
108-132	**41**	74-92	**41**	124-152	**42**	64-80	**40**	108-132	**41**	56-70	37	94-116	38
99-121	**40**	68-84	**40**	114-140	**41**	59-73	**39**	99-121	**40**	51-63	36	85-105	37
90-110	**41**	62-76	**41**	103-127	**42**	54-66	**40**	90-110	**41**	48-60	37	81-99	38
81-99	**40**	55-69	**40**	93-115	**41**	48-60	**39**	81-99	**40**	40-50	36	67-83	37
54-66	**40**	36-46	**40**	62-76	**41**	32-40	**39**	54-66	**40**				
45-55	**40**	31-39	**40**	52-64	**41**	27-33	**39**	45-55	**40**	35-43	36	58-72	37
36-44	**40**	25-31	**40**	41-51	**41**	21-27	**39**	36-44	**40**	18-24	36	31-39	37
405-495	43												
495-605	43												
198-242	42												
162-198	43												
225-275	44												
108-132	43												
90-110	43												
81-99	42												
90-110	42												
72-88	41												
72-88	42												
63-77	40												
108-132	40												
99-121	40												

1.5 x D = 75% 2 x D = 50%	1 x D = 75%	1 x D = 75%	1.5 x D = 75% 2 x D = 50%	1.5 x D = 75% 2 x D = 50%	3 x D = 50%	3 x D = 50%

** in case of high cutting depths vibrations v_c and f_z are to be reduced additionally.

format professional quality

GÜHRING

Gürolotse Roughing/Finishing

Recommended applications

Tools with feed series code numbers in **bold** print
(Preferably select VR code).

a_e = Cutting width
a_p = Cutting depth



$a_e = 0.5 \times D$



$a_e = 0.1 \times D$



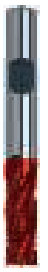
$a_e = 0.02–0.05 \times D$



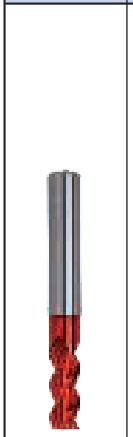
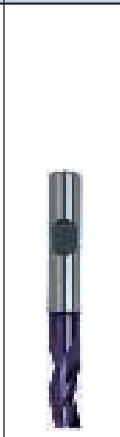
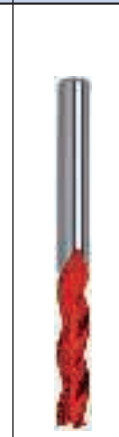
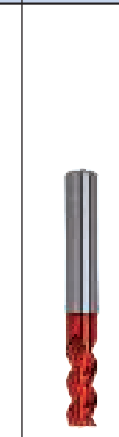
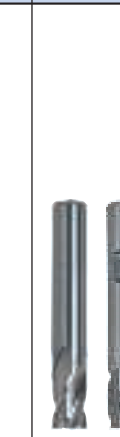
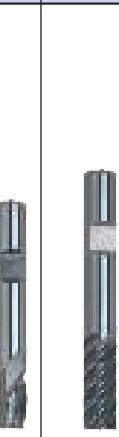
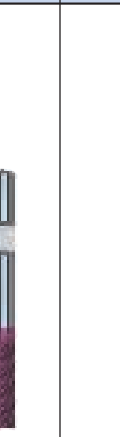
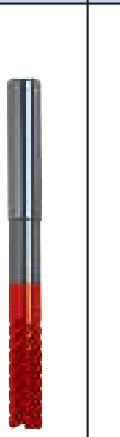
$a_e = 0.1 \times D$

Cutter Ø	Feed code															
	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
	f_z (mm/tooth)															
2.00	0.001	0.001	0.001	0.002	0.002	0.004	0.005	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.018	0.020
3.00	0.002	0.002	0.003	0.003	0.004	0.007	0.010	0.010	0.010	0.015	0.016	0.013	0.019	0.022	0.024	0.030
5.00	0.005	0.006	0.007	0.009	0.010	0.014	0.020	0.020	0.022	0.025	0.026	0.026	0.028	0.030	0.032	0.038
6.00	0.006	0.008	0.009	0.011	0.013	0.017	0.024	0.025	0.027	0.031	0.029	0.033	0.039	0.036	0.041	0.047
8.00	0.010	0.012	0.014	0.016	0.019	0.024	0.032	0.032	0.035	0.042	0.042	0.047	0.053	0.052	0.058	0.064
10.00	0.013	0.015	0.018	0.021	0.025	0.030	0.038	0.039	0.044	0.050	0.053	0.059	0.065	0.066	0.073	0.080
12.50	0.016	0.018	0.022	0.026	0.030	0.036	0.046	0.048	0.052	0.059	0.063	0.072	0.079	0.085	0.090	0.100
16.00	0.020	0.023	0.027	0.032	0.038	0.045	0.054	0.058	0.063	0.071	0.079	0.088	0.095	0.100	0.110	0.120
20.00	0.023	0.028	0.033	0.038	0.045	0.057	0.066	0.073	0.080	0.090	0.097	0.100	0.110	0.120	0.130	0.140

Cooling
- Emulsion
- Oil
- Air

	Roughing			
Cutting material	HM-UF	HM-UF	HM-UF	HM-UF
Standard	6527	6527	6527	6527
Type	VR	NRf	HR	NRf
Surface		TiAlN	TiAlN	TiAlN
Works no.	**2358 (HB)**	**2389 (HB)**	**2393 (HB)**	**2391 (HB)**
Number of cutting edges	3 cutting edges	4 cutting edges	4 cutting edges	4 cutting edges
				
Application	 $a_p = 1 \times D$	 $a_p = 1 \times D$	 $a_p = 1 \times D$	 $a_p = 1 \times D$

Material group	Material examples	Tensile strength N/mm²	Hardness	Coolant	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code
General structural steels	**1.0035** S185, **1.0486** P275N, **1.0345** P235GH, **1.0425** P265GH	≤500		●			97-119	**49**			97-119	**49**
	1.0050 E295, **1.0070** E360, **1.8937** P500NH	>500-850		●			90-110	**48**			90-110	**48**
Machine steels	**1.0718** 11SMnPb30, **1.0736** 11SMn37	≤850		●			97-119	**48**			97-119	**48**
	1.0727 46 S20, **1.0728** 60 S20, **1.0757** 46SPb20	850-1000		●			72-88	**47**			72-88	**47**
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E	≤700		●			97-119	**48**			97-119	**48**
	1.0503 C45, **1.1191** C45E	700-850		●			86-106	**48**			86-106	**48**
	1.0601 C60, **1.1221** C60E	850-1000		●			72-88	**47**			72-88	**47**
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-1000		●			86-106	**47**			86-106	**47**
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		●			72-88	**46**	72-88	46	72-88	**46**
Unalloyed hardened steels	**1.0301** C10, **1.1121** C10E	≤750		●			108-132	**48**			108-132	**48**
Alloyed hardened steels	**1.7043** 38Cr4	850-1000		●			86-106	**48**	86-106	48	86-106	**48**
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		●			64-80	**47**	64-80	47	64-80	**47**
Nitrided steels	**1.8504** 34CrAl6	≥850-1000		●			97-119	**48**	97-119	48	97-119	**48**
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	1000-1200		●			86-106	**46**	86-106	46	86-106	**46**
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		●			86-106	**48**	86-106	48	86-106	**48**
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6	850-1000		●			72-88	**46**	72-88	46	72-88	**46**
High-speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		●			54-66	**47**	54-66	47	54-66	**47**
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4	≤330 HB		●					54-66	26		
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17	≤850		●			54-66	**47**	54-66	47	54-66	**47**
austenitic	**1.4301** X5CrNi18-10, **1.4541** X6CrNiTi18-10	≤850		●			46-58	**46**	46-58	46	46-58	**46**
martensitic	**1.4057** X20CrNi17-2, **1.4122** X39CrMo17-1	≤850		●			43-53	**47**	43-53	47	43-53	**47**
Hardened steels	–	≤40-48 HRC		●			25-31	**44**	25-31	**44**	25-31	**44**
		>48-60 HRC		●							18-22	**41**
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		●			32-40	46	32-40	**46**	32-40	46
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)	≤240 HB		● ○			126-154	**48**	126-154	48	126-154	**48**
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	<300 HB		● ○			115-141	47	115-141	**47**	115-141	47
Nodulised cast iron and	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)	≤240 HB		●			104-128	**48**	104-128	48	104-128	**48**
malleable cast iron	**0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)	<300 HB		●			90-110	47	90-110	**47**	90-110	47
Chilled castings	–	≤350 HB		●					61- 75	**45**		
Titanium and titanium alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		●			54-66	**46**			54-66	**46**
	3.7154 TiAl6Zr5, **3.7164** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5	850-1200		●			43-53	**45**			43-53	**45**
Aluminium and aluminium alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		●	450-550	**47**						
Aluminium wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si	≤450		●	522-638	**47**						
Aluminium cast alloy ≤ 10% Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		●	216-264	**45**						
> 10% Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		●	171-209	**46**						
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450		○	243-297	**47**						
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		●	117-143	**46**						
Brass, short chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		●	108-132	**45**						
Brass, long chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		●	99-121	**45**						
Bronzes, short chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		● ●	103-127	**45**						
	2.0790 CuNi18Zn19Pb	>600-850		●	90-110	**44**						
Bronzes, long chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●	90-110	**44**						
	2.0980 CuAl11Ni, **2.1247** CuBe2	850-1000		●	81-99	**43**						
Plastic, duroplastic	Bakelit, Resopal, Pertinax, Moltopren		–	○	112-138	**43**						
Plastic, thermoplastic	Plexiglas, Hostalen, Novodur, Macrolon		–	● ○	103-127	**43**						
		a_p with f_z correction			0.5 x D = 120% 2 x D = 50%		0.5 x D = 120%		0.5 x D = 120%		2 x D = 50%	

Slot milling						Roughing		Finishing		Fine Finish									
HM-UF		HM-UF		HM-UF		HM-UF		HM-UF		HM-UF		HM-UF				HM-UF		HM-UF	
6527		6527		WN		6527		6527		6527		6527				WN		WN	
NH		N		N		NH		N		NH		NH		H		H		H	
2362 (HA)		2348 (HB)		2355 (HA)		2362 (HA)		2366-2363 (HA)		2381 /HB)		2384 (HB)		2385 (HA)		2388 (HA)		2386 (HA)	
3 cutting edges		3 cutting edges		3 cutting edges		3 cutting edges		2369-2372 (HA)		6–8 cutting edges		6–8 cutting edges		6–8 cutting edges		6 cutting edges		6–8 cutting edges	
																					
 $a_p = 0.5 \times D$		 $a_p = 1 \times D$		 $a_p = 2 \times D$		 $a_p = 1 \times D$		 $a_p = 1 \times D$		 $a_p = 1.5 \times D$		 $a_p = 1.5 \times D$		 $a_p = 0.5 \times D$		 $a_p = 1.5 \times D$		 $a_p = 1.5 \times D$		 $a_p = 3 \times D$	
v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code	v_c m/min	VR Code
94-116	**43**	85-105	**42**	72-88	39	121-149	**49**	94-116	**47**	102-126	**47**	171-209	**48**								
89-109	**42**	81-99	**41**	67-83	38	112-138	**48**	86-106	**46**	94-116	**46**	157-193	**47**								
94-116	**42**	85-105	**41**	72-88	38	121-149	**48**	94-116	**46**	102-126	**46**	171-209	**47**								
69-85	**43**	63-77	**42**	54-66	39	90-110	**47**	70-86	**45**	75-93	**45**	126-154	**46**								
94-116	**42**	85-105	**41**	72-88	38	121-149	**48**	94-116	**46**	102-126	**46**	171-209	**47**								
84-104	**42**	76-94	**41**	63-77	38	108-132	**48**	86-106	**46**	91-113	**46**	153-187	**47**								
69-85	**43**	63-77	**42**	54-66	39	90-110	**47**	70-86	**45**	75-93	**45**	126-154	**46**								
84-104	**43**	76-94	**42**	63-77	39	108-132	**47**	83-103	**45**	91-113	**45**	153-187	**46**								
69-85	**43**	63-77	**42**	54-66	39	90-110	**46**	70-86	**44**	75-93	**44**	126-154	**45**								
99-121	**42**	90-110	**41**	67-83	38	135-165	**48**	105-129	**46**	113-139	**46**	189-231	**47**								
84-104	**42**	76-94	**41**	63-77	38	108-132	**48**	83-103	**46**	91-113	**46**	153-187	**47**								
59-73	**43**	54-66	**42**	45-55	39	81-99	**47**	62-76	**45**	70-86	**45**	117-143	**46**								
94-116	**42**	85-105	**41**	72-88	38	121-149	**48**	94-116	**46**	102-126	**46**	171-209	**47**								
84-104	**41**	76-94	**40**	63-77	37	108-132	**46**	86-106	**44**	91-113	**44**	153-187	**45**								
84-104	**42**	76-94	**41**	63-77	38	108-132	**48**	83-103	**46**	91-113	**46**	153-187	**47**								
69-85	**41**	63-77	**40**	54-66	37	90-110	46	70-86	**44**	75-93	**44**	126-154	**45**	126-154	46	126-154	45	126-154	44	126-154	42
49-61	**43**	45-55	**42**	40-50	39	67-83	**47**	54-66	**45**	56-70	**45**	94-116	**46**	94-116	47	94-116	46	94-116	45	94-116	43
49-61	**41**	45-55	**40**			67-83	**46**	54-66	**44**	56-70	44	94-116	45	94-116	**46**	94-116	**45**	94-116	**44**	94-116	**42**
49-61	**43**	45-55	**42**			67-83	**47**	54-66	**45**	56-70	**45**	94-116	**46**								
45-55	**41**	40-50	**40**			58-72	**46**	45-57	**44**	48-60	**44**	81-99	**45**								
39-49	**42**	36-44	**41**			54-66	**47**	43-53	**45**	45-57	**45**	76-94	**46**								
49-61	**41**	45-55	**40**			31-39	**44**	31-39	**42**	29-37	**42**	49-61	**43**	49-61	44	49-61	43	49-61	42	49-61	40
														40-50	**41**	40-50	**40**	40-50	**39**	40-50	**37**
29-37	**41**	27-33	**40**			40-50	46	32-40	**44**	32-40	**44**	54-66	**45**								
118-146	**42**	108-132	**41**	94-116	38	157-193	**48**	113-139	**46**	132-162	**46**	220-270	**47**	220-270	48	220-270	47	220-270	46	220-270	44
108-134	**41**	99-121	**40**	85-105	37	144-176	**47**	113-139	**45**	121-149	**45**	202-248	**46**	202-248	47	202-248	46	202-248	45	202-248	43
99-121	**42**	90-110	**41**	81-99	38	130-160	**48**	102-126	**46**	108-132	**46**	180-220	**47**	180-220	48	180-220	47	180-220	46	180-220	44
89-109	**41**	81-99	**40**	67-83	37	112-138	**47**	86-106	**45**	94-116	**45**	157-193	**46**	157-193	47	157-193	46	157-193	45	157-193	43
59-73	**41**	54-66	**40**			76-94	45	59-73	**43**					99-121	**45**	99-121	**44**	99-121	**43**	99-121	**41**
49-61	**41**	45-55	**40**	58-72	37	67-83	46	54-66	**44**	56-70	**44**	94-116	**45**								
39-49	**41**	36-44	**40**	31-39	37	54-66	45	43-53	**43**	45-57	**43**	76-94	**44**								
								459-561	49	486-594	49	810-990	50								
								432-528	48	432-528	49	720-880	50								
217-267	43							224-274	47	243-297	47	405-495	48								
178-218	44							183-225	48	194-238	48	324-396	49								
								259-317	49	270-330	49	450-550	50								
118-146	44							118-146	48	129-159	48	216-264	49								
99-121	44							108-132	47	118-146	47	198-242	48								
								86-106	47	97-119	47	162-198	48								
99-121	43							108-132	47	118-146	47	198-242	48								
79-97	42							81-99	46	91-113	46	153-187	47								
								81-99	46	91-113	46	153-187	47								
								70-86	45	75-93	45	126-154	46								
								118-146	45	129-159	45	216-264	46								
								108-132	45	118-146	45	198-242	46								
1 x D = 75% 1.5 x D = 50%		1.2 x D = 75% 2 x D = 50%		3 x D = 50%		0.5 x D = 120% 2 x D = 50%		2 x D = 50%		2 x D = 75%		2 x D = 75%		–		2 x D = 75%		2 x D = 75%		4 x D = 50%	

format professional quality

GÜHRING

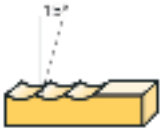
Gürolotse Roughing/Finishing
Recommended applications

Tools with feed series code numbers in **bold** print
(Preferably select VR code).

a_e = Cutting width
a_p = Cutting depth



a_e = 0.02–0.05 x D



To enhance the surface quality the angle should be 10°–15°.

Cutter Ø	Feed code															
	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
	f_z (mm/tooth)															
2.00	0.001	0.001	0.001	0.002	0.002	0.004	0.005	0.006	0.007	0.008	0.010	0.012	0.014	0.016	0.018	0.020
3.00	0.002	0.002	0.003	0.003	0.004	0.007	0.010	0.010	0.010	0.015	0.016	0.013	0.019	0.022	0.024	0.030
5.00	0.005	0.006	0.007	0.009	0.010	0.014	0.020	0.020	0.022	0.025	0.026	0.026	0.028	0.030	0.032	0.038
6.00	0.006	0.008	0.009	0.011	0.013	0.017	0.024	0.025	0.027	0.031	0.029	0.033	0.039	0.036	0.041	0.047
8.00	0.010	0.012	0.014	0.016	0.019	0.024	0.032	0.032	0.035	0.042	0.042	0.047	0.053	0.052	0.058	0.064
10.00	0.013	0.015	0.018	0.021	0.025	0.030	0.038	0.039	0.044	0.050	0.053	0.059	0.065	0.066	0.073	0.080
12.50	0.016	0.018	0.022	0.026	0.030	0.036	0.046	0.048	0.052	0.059	0.063	0.072	0.079	0.085	0.090	0.100
16.00	0.020	0.023	0.027	0.032	0.038	0.045	0.054	0.058	0.063	0.071	0.079	0.088	0.095	0.100	0.110	0.120
20.00	0.023	0.028	0.033	0.038	0.045	0.057	0.066	0.073	0.080	0.090	0.097	0.100	0.110	0.120	0.130	0.140

Cooling
- Emulsion
- Oil
- Air

	Roughing	
Cutting material	HM-UF	HM-UF
Standard	6527	6527
Type	N	N
Surface		TiAlN
Works no.	**2416 (HB)**	**2419 (HB)**
Number of cutting edges	4 cutting edges	4 cutting edges
		
Application	 a_p = 0.05 x D	 a_p = 0.05 x D

Material group	Material examples	Tensile strength N/mm²	Hardness	Coolant	v_c m/min	VR Code	v_c m/min	VR Code
General structural steels	**1.0035** S185, **1.0486** P275N, **1.0345** P235GH, **1.0425** P265GH	≤500		○	91-113	**47**	153-187	**48**
	1.0050 E295, **1.0070** E360, **1.8937** P500NH	>500-850		○	86-106	**46**	144-176	**47**
Machine steels	**1.0718** 11SMnPb30, **1.0736** 11SMn37	≤850		○	91-113	**46**	153-187	**47**
	1.0727 46 S20, **1.0728** 60 S20, **1.0757** 46SPb20	850-1000		○	91-113	**45**	153-187	**46**
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E	≤700		○	81-99	**46**	135-165	**47**
	1.0503 C45, **1.1191** C45E	700-850		○	81-99	**46**	135-165	**47**
	1.0601 C60, **1.1221** C60E	850-1000		○	70-86	**45**	117-143	**46**
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-1000		○	75-93	**45**	126-154	**46**
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		○	91-113	**44**	153-187	**45**
Unalloyed hardened steels	**1.0301** C10, **1.1121** C10E	≤750		○	118-146	**46**	198-242	**47**
Alloyed hardened steels	**1.7043** 38Cr4	850-1000		●	102-126	**46**	171-209	**47**
	1.5752 15NiCr13, **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		●	64-80	**45**	108-132	**46**
Nitrided steels	**1.8504** 34CrAl6	≥850-1000		○	86-106	**46**	144-176	**47**
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	1000-1200		●	81-99	**44**	135-165	**45**
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		○	81-99	**46**	135-165	**47**
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6	850-1000		●	70-86	**44**	177-143	**45**
High-speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		●	51-63	**45**	85-105	**46**
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4	≤330 HB		●	51-63	**44**	85-105	**45**
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17	≤850		●	51-63	**45**	85-105	**46**
austenitic	**1.4301** X5CrNi18-10, **1.4541** X6CrNiTi18-10	≤850		●	45-57	**44**	76-94	**45**
martensitic	**1.4057** X20CrNi17-2, **1.4122** X39CrMo17-1	≤850		●	40-50	**45**	67-83	**46**
Hardened steels	–	≤40-48 HRC		●	29-37	**43**	49-61	**44**
		>48-60 HRC		●				
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		●	29-37	44	49-61	45
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)	≤240 HB		○ ○	118-146	**46**	198-242	**47**
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	<300 HB		○ ○	113-139	**45**	189-231	**46**
Nodulised cast iron and	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)	≤240 HB		○	102-126	**46**	171-209	**47**
malleable cast iron	**0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)	<300 HB		○	86-106	**45**	144-176	**46**
Chilled castings	–	≤350 HB		○	59-73	43	99-121	44
Titanium and titanium alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2.5, **3.7124** TiCu2	≤850		●				
	3.7154 TiAl6Zr5, **3.7164** TiAl6V4, **3.7184** TiAl4Mo4Sn2.5	850-1200		●				
Aluminium and aluminium alloys	**3.0255** Al99.5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		○				
Aluminium wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si	≤450		○				
Aluminium cast alloy ≤ 10% Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		○				
> 10% Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		○				
Magnesium alloys	MgMn2, G-MgAl8Zn1, G-MgAl6Zn3	≤450		○				
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		○				
Brass, short chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		○				
Brass, long chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0.5	≤600		○				
Bronzes, short chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		○ ●				
	2.0790 CuNi18Zn19Pb	>600-850		●				
Bronzes, long chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		●				
	2.0980 CuAl11Ni, **2.1247** CuBe2	850-1000		●				
Plastic, duroplastic	Bakelit, Resopal, Pertinax, Moltopren		–	○				
Plastic, thermoplastic	Plexiglas, Hostalen, Novodur, Macrolon		–	○ ○				

a_p with f_z correction

When using these tools for side milling or trimming, the respective cutting values under "Roughing" are to be applied.

Tolerance DIN ISO 286

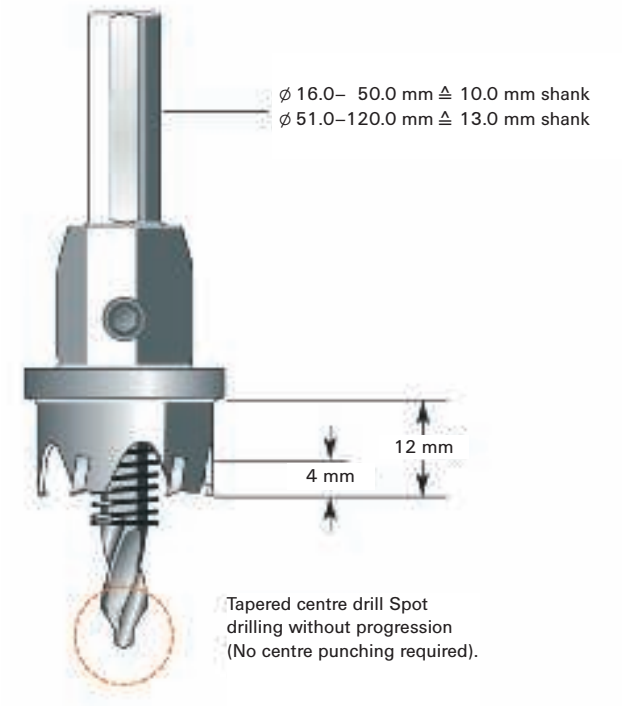
Tolerance: Position and quality

Outer dimensions

	Nominal dimensions in mm/tolerances in µm									
	from 1 to 3	over 3 to 6	over 6 to 10	over 10 to 18	over 18 to 30	over 30 to 50	over 50 to 80	over 80 to 120	over 120 to 180	over 180 to 250
d 9	-20	-30	-40	-50	-65	-80	-100	-120	-145	-170
	-45	-60	-76	-93	-117	-142	-174	-207	-245	-285
d 11	-20	-30	-40	-50	-65	-80	-100	-120	-145	-170
	-80	-105	-130	-160	-195	-240	-290	-340	-395	-460
e 8*	-14	-20	-25	-32	-40	-50	-60	-72	-85	-100
	-28	-38	-47	-59	-73	-89	-106	-126	-148	-172
f 8	-6	-10	-13	-16	-20	-25	-30	-36	-43	-50
	-20	-28	-35	-43	-53	-64	-76	-96	-106	-122
f 9	-6	-10	-13	-16	-20	-25	-30	-36	-43	-50
	-31	-40	-49	-59	-72	-87	-104	-123	-143	-165
h 6	0	0	0	0	0	0	0	0	0	0
	-6	-8	-9	-11	-13	-16	-19	-22	-25	-29
h 7	0	0	0	0	0	0	0	0	0	0
	-10	-12	-15	-15	-21	-25	-30	-35	-40	-46
h 8	0	0	0	0	0	0	0	0	0	0
	-14	-18	-22	-27	-33	-39	-46	-54	-63	-72
h 9	0	0	0	0	0	0	0	0	0	0
	-25	-30	-36	-43	-52	-62	-74	-87	-100	-115
h 10	0	0	0	0	0	0	0	0	0	0
	-40	-48	-58	-70	-84	-100	-120	-140	-160	-185
h 11	0	0	0	0	0	0	0	0	0	0
	-60	-75	-90	-110	-130	-160	-190	-220	-250	-290
h 12	0	0	0	0	0	0	0	0	0	0
	-100	-120	-150	-180	-210	-250	-300	-350	-400	-460
js 11	+30	+38	+45	+55	+65	+80	+95	+110	+125	+145
	-30	-38	-45	-55	-65	-80	-95	-110	-125	-145
js 14	+125	+150	+180	+215	+260	+310	+370	+435	+500	+575
	-125	-150	-180	-215	-260	-310	-370	-435	-500	-575
js 16	+300	+375	+450	+550	+650	+800	+950	+1100	+1250	+1450
	-300	-375	-450	-550	-650	-800	-950	-1100	-1250	-1450
k 10	+40	+48	+58	+70	+84	+100	+120	+140	+160	+185
	0	0	0	0	0	0	0	0	0	0
k 11	+60	+75	+90	+110	+130	+160	+190	+220	+250	+290
	0	0	0	0	0	0	0	0	0	0
k 12	+90	+120	+150	+180	+210	+250	+300	+350	+400	+460
	0	0	0	0	0	0	0	0	0	0
k 16	+600	+750	+900	+1100	+1300	+1600	+1900	+2200	+2500	+2900
	0	0	0	0	0	0	0	0	0	0

* Cutters with tolerance e8 produce a feather key groove with tolerance P9 in one cutting operation.

Solid Carbide Keyhole Saws – Flat Cut





List of Speeds for Solid Carbide Tools

	Speed in RPM					
m/min	25	30	40	50	60	70
ø	1			2		3
15	531	637	849	1062	1274	1486
16	498	597	796	995	1194	1393
17	468	562	749	937	1124	1311
18	442	531	708	885	1062	1238
19	419	503	670	838	1006	1173
20	398	478	637	796	955	1115
25	318	382	510	637	764	892
30	265	318	425	531	637	743
35	227	273	364	455	546	637
40	199	239	318	398	478	557
45	177	212	283	354	425	495
50	159	191	255	318	382	446
55	145	174	232	290	347	405
60	133	159	212	265	318	372
65	122	147	196	245	294	343
70	114	136	182	227	273	318
80	100	119	159	199	239	279
90	88	106	142	177	212	248
100	80	96	127	159	191	223
110	72	87	116	145	174	203
120	66	80	106	133	159	186
130	61	73	98	122	147	171
140	57	68	91	114	136	159
150	53	64	85	106	127	149

1 Recommended cutting speed for stainless steel

2 Recommended cutting speed for structural steel ST 37

3 Recommended cutting speed for aluminium

All solid carbide keyhole saws are equipped with an ejector spring. The rebored material is thereby ejected automatically.

Flat cut design for material thickness of max. 4 mm

Format carbide-tipped keyhole saws for hand and upright drilling machines are multi-purpose cutters suitable for **stainless steel of max. 2 mm**, unalloyed steel of max. 4 mm, asbestos, glass fibre and plastics, PVC, aluminium, zinc, gypsum, and light-weight boards.

- High concentricity due to stable construction.
- CAD-optimised rake angle with special grind for best cutting performance and long life.
- Fast removal of the drilling core due to ejector spring.
- Carbide tipped design allows several regrinding operations.
- Repair of Format keyhole saws possible. Broken teeth can be replaced.
- Exchangeable centre drill.

Another speciality:

From 16.0 to 30.0 mm ø, the keyhole saw is manufactured from a single piece. From 31.0 mm ø, we use specially-hardened holders to pick up the torsion forces in case of high loads to avoid premature shearing of the receiving shank.

Solid carbide keyhole saws see page 2/71.

Table – Selection of Tooth Pitches for HSS and Segmental Circular Saw Blades

format professional quality

Material:

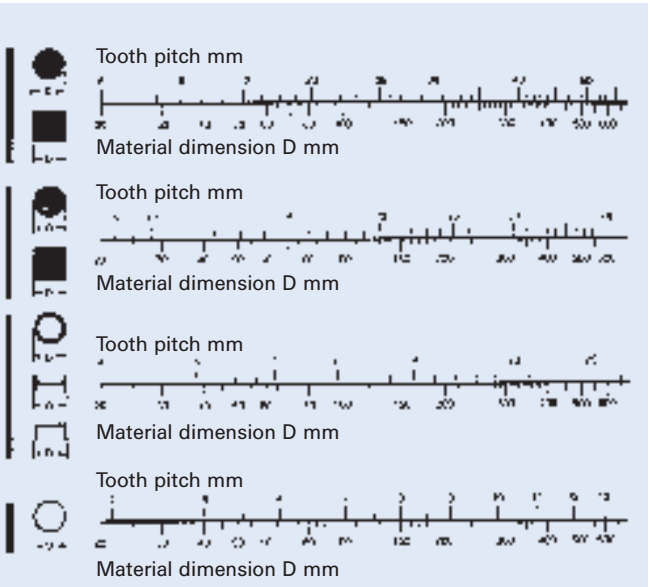


Table – Rake and Draft Angle, Cutting Speed

Material	Tensile Strength N/mm²	Rake and draft angle	Cutting speed m/min
Unalloyed steel			
St 33, St 34, St 37	330– 450	18–20/8	24–60
St 42, St 50, St 52	450– 600	18/8	18–32
C 10 G, C 15 G, C 22 N, C 35 N	450– 600	18/8	18–32
St 60, St 70, C 45 N, C 60 N	600– 850	15/8	14–22
Alloyed steel			
15 Cr 3	500– 700	15/8	
16 Mn Cr 5, 20 Mn Cr 5	600– 800	15/6	12–24
37 Mn St 5, 42 Mn V 7	750– 850	15/6	
50 CrV 4, 35 Ni Cr 18	800– 900		
14 Ni Cr 14	600– 700	15/6	10–16
34 Cr Ni Mo 6, 22 Ni Cr 14	700– 800		
Special steel			
High tensile strength	1000–1200		5–8
High speed steel	800– 900	12/6	8–12
Stainless steel	500– 700		6–10
Rolled extrusions			
DIN 1024/25/26	340– 450	18/8	24–36
Steel pipes	500– 600	15/8	18–36
Cast steel DIN 1681			
GS 38, GS 45	380– 450	18/8	14–22
GS 52, GS 60	520– 600	15/8	8–16
Cast iron			
GG 12, GG 30	120– 300	15/6	14–25
Non-ferrous metals			
Copper		20/10	200–400
Zinc alloys		25/10	100–200
Bronze	up to 600	5–10/10	40–120
Brass		10–15/8	200–300
Alpaca		20/10	20–75
Aluminium alloys			
Magnesium alloys		25/10	500–2000

Secondary Holes for Various Sawing Machines

Saw make	Saw blade ∅ mm	Hole ∅ mm	Secondary holes required
Adige	200–250	32	2/9/50 + 2/8/45
	300–315	32	2/9/50 + 2/11/63
	315–350	40	2/8/55 + 4/12/64
	400–425	50	4/15/80
Baier	175–250	32	4 offset keyways
Berg & Schmid	225–300	32	No
	250–350	32	2/12/64
	315–350	40	2/12/64
	425	50	4/15/80
BEWO	225–300	32	2/8/45
	315–370	40	2/8/55 + 4/12/64
Eisele	210–275	32	2/8/45
	210–275	40	2/8/55
	300–350	40	2/8/55 + 4/12/64
	400–425	40	2/15/80 + 4/12/64
Häberle	225–350	40	2/8/55
I. B. P.	200–350	32	2/11/63
Kaltenbach	250	32	No
	350–450	50	4/15/80
MEP	200–350	32	2/11/63
Trennjäger	250	32	2/9/50
	250–275	40	4/11/63
	315–400	50	4/14/85 + 4/15/80
	400–460	60	8/16/90 + 4/18/100
Ulmia	250	32	No
	250–400	40	4/11/63
Wagner	210–275	32	4/9/50
	315	40	4/11/63
Wahlen	250–350	40	2/8/55 + 4/11/63
Weidmann	225–300	32	2/8/45
	275–350	40	2/8/55 + 4/12/64

This data corresponds to the average values determined in practical tests using sawing machines of different makes. The tooth pitch and circumferential speed may vary slightly depending on the make of machine.

Metal/segmental circular saw blades from page 2/66.

Notes for the Use of Bi-metal Band Saws

Design:

1) Feed of a new band saw

The feed affects the service life significantly. We recommend the following values in the feed:

- Set 100 % of the normal cutting speed (m/min.) depending on the material quality.
- Set the initial feed only to 50 % of the correct value.
- Slowly increase to the full speed after cutting an area of approx. 500 cm².

2) Selection of the number and shape of the teeth in accordance with the tables on the right.

2.1) Tooth shape and rake angle

Combination toothing: Highly suitable for varying material due to a wider area of application. Reduces vibrations, therefore very suitable for lighter weight and older machines.

2.2) Rake angle

- Pipes, extrusions and smaller material cross sections should be sawn with a robust tooth tip (= 0° rake angle/standard tooth).
- Larger material cross sections and long chipping, tough materials should be sawn with a positive rake angle (10° peg tooth).

2.3) Cutting speed and feed

The cutting speeds and the feed are dependent on the tensile strength of the material being sawn.

- The form of the chips indicates whether feed is correct or not.
- A loose, rolling chip is an indication of the correct cutting pressure.
- A thick blue chip means that the cutting pressure is too high.

Recommended tooth pitches for solid material
Combination toothing

Material cross section mm	Tooth pitch, teeth per inch
up to 30	10/14
20– 50	8/12
25– 60	6/10
35– 80	5/ 8
50– 100	4/ 6
70– 120	4/ 5
80– 150	3/ 4
130– 350	2/ 3
250– 600	1.4/ 2
500–1200	0.75–1.25
1000–3000	0.55–0.75

Recommended tooth pitch for pipes

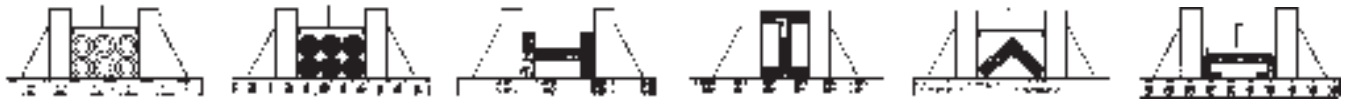


Wall thickness s mm	Pipe external ∅ D mm: Tooth pitch Z (teeth per inch)										
	20	40	60	80	100	120	150	200	300	400	500
2	14	14	14	14	14	14	10–14	10–14	8–12	8–12	6–10
3	14	14	10–14	10–14	10–14	14–14	8–12	8–12	6–10	6–10	5–8
4	14	14	10–14	10–14	8–12	8–12	8–12	8–12	5–8	5–8	4–6
5	14	10–14	10–14	10–14	8–12	8–12	8–12	6–10	5–8	5–8	4–6
6	14	10–14	10–14	8–12	8–12	8–12	8–12	5–8	5–8	4–6	4–6
8	14	10–14	8–12	8–12	8–12	6–10	6–10	5–8	4–6	4–6	4–6
10	–	8–12	6–10	6–10	6–10	5–8	5–8	4–6	4–6	4–6	3–4
12	–	8–12	6–10	6–10	5–8	5–8	4–6	4–6	4–6	3–4	3–4
15	–	8–12	6–10	5–8	5–8	4–6	4–6	4–6	3–4	3–4	3–4
20	–	–	6–10	5–8	4–6	4–6	4–6	3–4	3–4	3–4	2–3
30	–	–	–	4–6	4–6	4–6	3–4	3–4	3–4	2–3	2–3
50	–	–	–	–	–	3–4	3–4	3–4	2–3	2–3	2–3
75	–	–	–	–	–	–	–	2–3	2–3	2–3	2–3
100	–	–	–	–	–	–	–	–	2–3	2–3	1.4–2
150	–	–	–	–	–	–	–	–	–	2–3	1.4–2
> 200	–	–	–	–	–	–	–	–	–	–	1.4–2

For thin walled pipes (up to approx. 8 mm wall thickness) use tooth pitch with 0° rake angle wherever possible.

If two or more pipes are to be cut side by side, apply the above table using the double wall thickness s.

Material	Cutting speed m/min	Cutting performance in cm²/min on a surface of (mm) 25 ∅	50 ∅	75 ∅	100 ∅	150 ∅	200 ∅
Structural steel/machining steel	80–90	25–35	40–50	50–60	55–70	70–90	75–85
Hardened steels/tempering steels	45–75	20–25	25–35	30–40	35–50	40–60	40–50
Unalloyed tool steels/roller bearing steels	40–60	20–25	25–35	30–35	30–40	40–50	40–50
Alloyed tool steels/high-speed steels	30–40	15–20	20–25	25–30	30–35	30–35	30–35
Stainless steels	20–35	10–15	15–20	15–20	15–20	15–20	15–20
Heat-resistant steels/highly heat-resistant alloys	15–20	5–10	5–10	7–13	5–15	5–15	5–15



Clamping workpieces:

Clamp material so that

– it cannot vibrate
– a constant gripping length is obtained in the case of extrusions, T-beams etc.

If using an adjustable frame machine, clamp in the material as shown in sketches 4, 5 and 6.

When sawing pipe and rods in bundles, spot weld material ends.

Band saw blades, 2/79.

Design of Lathe Chucks

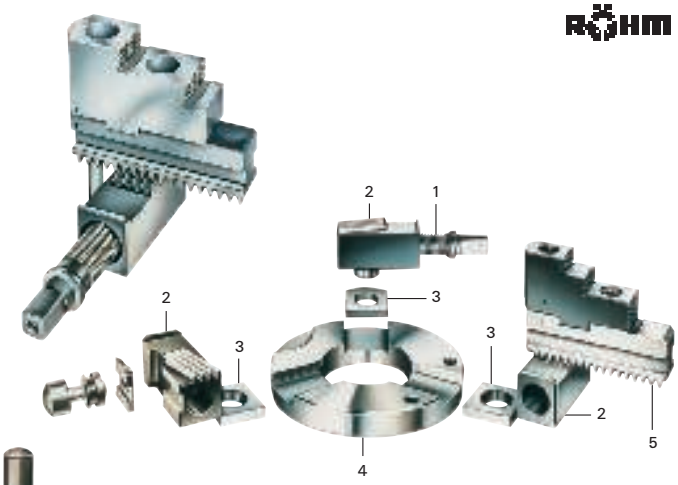
Wedge Lathe Chucks Duro

This chuck is used successfully where high clamping force, high concentricity and reliable repeatability are required.

The chuck must be lubricated regularly using special grease.

Mode of operation: Due to the tangential position of the threaded spindle (1) the force is transmitted by a wedge (2) which is provided with a female thread. The wedge moves the driving ring via a cross-head (3). Two further crossheads in driving ring (4) transmit the force to the other two wedges. The wedges provided with a diagonal profile and the basic jaws (5) interlock and ensure precise self-centring.

Order no. 3090–3094

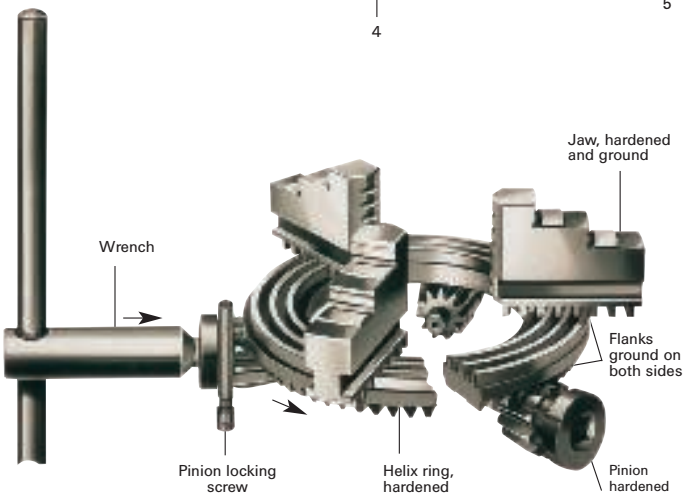


Lathe Chucks with Helix Ring DIN 6350

By means of the helix ring the jaws can be adjusted continuously, covering the entire clamping range.

Recommended speed, clamping forces, accuracy, unbalance etc. are in compliance with DIN 6386 part 1, class I. Helix ring drop-forged, balanced, hardened. Flanks ground on both sides. Lubrication by nipple.

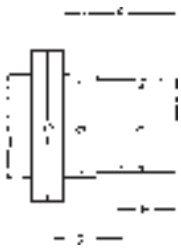
Order no. 3001–3021



Machine Spindle Heads to DIN

DIN 800, with thread

A Tol. medium	B_g5	C Min. dimension	D	E	F
	mm	mm	mm	mm	mm
M 20	21	30	6.3	10	20
M 24	25	36	8	12	24
M 33	34	50	9	14	30
M 39	40	56	10	16	35
M 45	46	67	11	18	40
M 52	55	80	12	20	45
M 60	62	90	14	22	50
M 76 x 6	78	112	16	30	63
M 105 x 6	106	150	20	40	80





Form A: Thread **and** clearance hole **in flange (without** inner hole circle).

Form B: Threaded and clearance holes **in flange** (outer hole circle) **and** threaded holes in **inner hole circle.**

DIN 55021 from taper size 4 with driving tenon

Spindle head size	A	B	C	D	No. of holes on outer hole circle (F 1)		F 1 (outer hole circle)	No. of holes inner hole circle (F 2) E 2	F 2 (inner hole circle)
	mm	mm	mm	mm	E 1	G	mm		mm
3	102	53.985	11	16	3 x M10	3 x 10.5	75	–	–
4	112	63.525	11	20	3 x M10	3 x 10.5	85	–	–
5	135	82.575	13	22	7 x M10	4 x 10.5	104.8	8 x M10	61.9
6	170	106.390	14	25	7 x M12	4 x 13	133.4	8 x M12	82.6
8	220	139.735	16	28	7 x M16	4 x 17	171.4	8 x M16	111.1
11	290	196.885	18	35	12 x M20	6 x 21	235	11 x M20	165.1
15	380	285.800	20	42	12 x M24	6 x 25	330.2	11 x M24	247.6
20	520	412.800	21	48	12 x M24	6 x 25	463.6	11 x M24	368.3





Lathe chucks from page 3/2.

Machine Spindle Heads to DIN

Form A: Threaded holes in flange (outer hole circle) **without** inner hole circle.

Form B: Threaded holes in flange (outer hole circle) **and** in inner hole circle.

DIN 55026 from taper size 4 with driving tenon

Spindle head size	A mm	B mm	C_1 mm	C_2 mm	D mm	No. of holes on outer hole circle (F 1) E 1	F 1 (outer hole circle) mm	No. of holes inner hole circle (F 2) E 2	F 2 (inner hole circle) mm
3	92	53.983	11	–	16	3 x M10	70.6	–	–
4	108	63.521	11	–	20	11 x M10	82.6	–	–
5	133	82.573	13	14.289	22	11 x M10	104.8	8 x M10	61.9
6	165	106.385	14	15.875	25	11 x M12	133.4	8 x M12	82.6
8	210	139.731	16	17.462	28	11 x M16	171.4	8 x M16	111.1
11	280	196.883	18	19.05	35	11 x M20	235	8 x M20	165.1
15	380	285.791	19	20.638	42	12 x M24	330.2	11 x M24	247.6
20	520	412.795	21	22.225	48	12 x M24	463.6	11 x M24	368.3





DIN 55027 and 55022 from taper size 4 with driving tenon
Bayonet lock (ISO 702/II)

Spindle head size	A mm	B mm	C mm	D mm	No. of holes x E mm	F mm
3	102	53.985	11	16	3 x 21	75
4	112	63.525	11	20	3 x 21	85
5	135	82.575	13	22	4 x 21	104.8
6	170	106.390	14	25	4 x 23	133.4
8	220	139.735	16	28	4 x 29	171.4
11	290	196.885	18	35	6 x 36	235
15	400	285.800	19	42	6 x 43	330.2
20	540	412.800	21	48	6 x 43	463.6





Machine Spindle Heads to DIN

DIN 55029 and ASA B 5.9 D1, cam-lock (ISO 702/II)

Spindle head size	A mm	B mm	C mm	D mm	E mm	F mm
3	92.1	53.985	11.1	31.8	3 x 15.1	70.66
4	117.5	63.525	11.1	33.3	3 x 16.7	82.55
5	146	82.575	12.7	38.1	6 x 19.8	104.8
6	181	106.390	14.3	44.5	6 x 23	133.4
8	225.4	139.735	15.9	50.8	6 x 26.2	171.4
11	298.5	196.885	17.5	60.3	6 x 31	235
15	403	285.8	19	69.9	6 x 35.7	330.2





Lathe chucks from page 3/2.

Machine Spindle Heads to ASA B 5.9

From taper size 4 with driving tenon

Spindle head size	A	B	C -0.025	D	No. of holes on outer hole circle (F 1) E 1	F 1 (outer hole circle)	No. of holes inner hole circle (F 2) E 2	F 2 (inner hole circle)
	mm	mm	mm	mm		mm	**Type A1/Type B1**	mm
5	133.4	82.575	14.288	22.2	11x7/16-14UNC	104.8	8x7/16-14UNC	61.9
6	165.1	106.390	15.875	25.4	11x1/2 -13UNC	133.4	8x1/2 -13UNC	82.6
8	209.5	139.735	17.462	28.6	11x5/8 -11UNC	171.4	8x5/8 -11UNC	111.1
11	279.4	196.885	19.05	34.9	11x3/4 -10UNC	235	8x3/4 -10UNC	165.1
15	318	285.8	20.638	41.3	12x7/8 - 9UNC	330.2	11x7/8 - 9UNC	247.6

A1 Threaded holes in flange (outer hole circle) and in inner hole circle
B1 Clearance holes in flange (outer hole circle), threaded holes in inner hole circle





From taper size 4 with driving tenon

Spindle head size	A	B	C	D	No. of holes on outer hole circle (F 1) E 1	No. of holes outer hole circle (F 1) G	F 1 (inner hole circle)
	mm	mm	mm	mm	**Type A2**	**Type B2**	mm
3	92.1	53.985	11.1	15.9	3 x 7/16 – 14 UNC	3 x 11.9	70.66
4	108	63.525	11.1	19	11 x 7/16 – 14 UNC	11 x 11.9	82.55
5	133.4	82.575	12.7	22.2	11 x 7/16 – 14 UNC	11 x 11.9	104.8
6	165.1	106.390	14.3	25.4	11 x 1/2 – 13 UNC	11 x 13.5	133.4
8	209.5	139.735	15.9	28.6	11 x 5/8 – 11 UNC	11 x 16.7	171.4
11	279.4	196.885	17.5	34.9	11 x 3/4 – 10 UNC	11 x 20.2	235
15	381	285.8	19	41.3	12 x 7/8 – 9 UNC	12 x 23.4	330.2

A2 Threaded holes in flange (outer hole circle) without inner hole circle

B2 Clearance holes in flange (outer hole circle)



Type L, long taper

Spindle head size	A + 0.051 mm	B mm	C mm	D mm	Driving spring
L00	69.850	3 3/4- 6 UNS	50.800	14.288	9.525 □ x 38.1
L0	82.550	4 1/2- 6 UNS	60.325	15.875	9.525 □ x 44.45
L1	104.775	6 - 6 UNS	73.025	19.050	15.875 □ x 60.32
L2	133.350	7 3/4- 5 UNS	85.725	25.400	19.05 □ x 73.2
L3	165.100	10 3/8-10 UNS	98.425	28.575	25.4 □ x 82.55

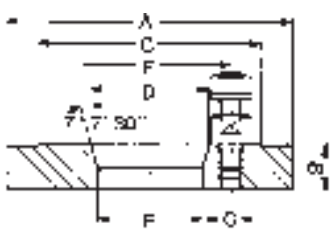




Dimensions for Short Taper Cast Iron Flange

Short taper size	3	4	5	6	8	11
C	98	117	146	181	225	298
D	53.985	63.525	82.575	106.390	139.735	196.885
E	51.2	60.6	79.4	103	135.7	192.5
F	75 (70.66)*	85 (82.55)*	104.8	133.4	171.4	235
G DIN 55027	M 10	M 10	M 10	M 12	M 16	M 20
G DIN 55029 UNF	7/16 – 20	7/16 – 20	1/2 – 20	5/8 – 18	3/4 – 16	7/8 – 14
Studs	3	3	4	4	4	6
Stud bolts	3	3	4	4	4	6
Cam-lock bolts	3	3	6	6	6	6

* Dimensions to DIN 55029 cam-lock bolts.



Power-operated lathe chucks and clamping devices, hydraulic or pneumatic with accessories available on request.

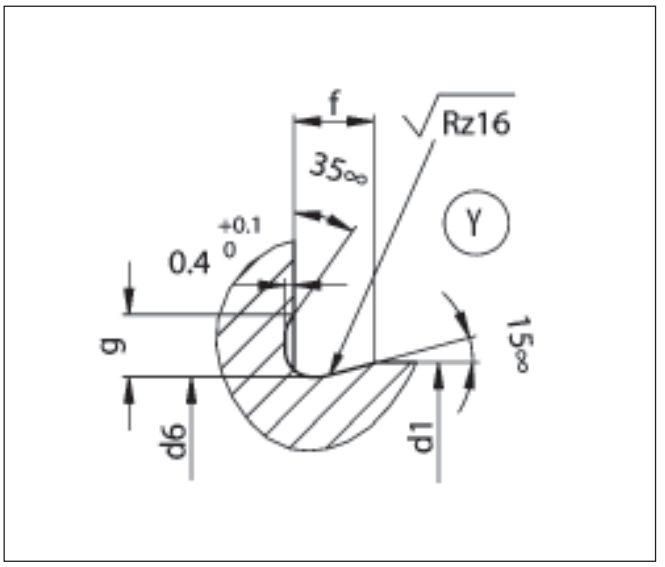
Dimensions A + B see article 3080 and 3082.

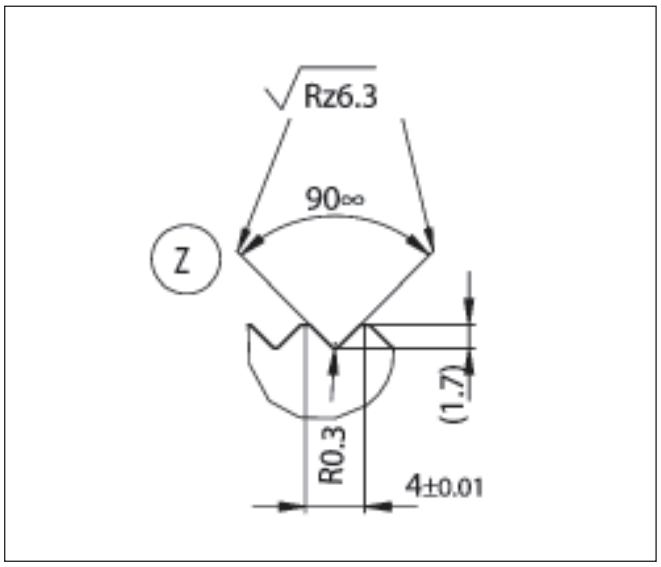
Lathe chucks from page 3/2.
Short taper cast iron flange on page 3/7.

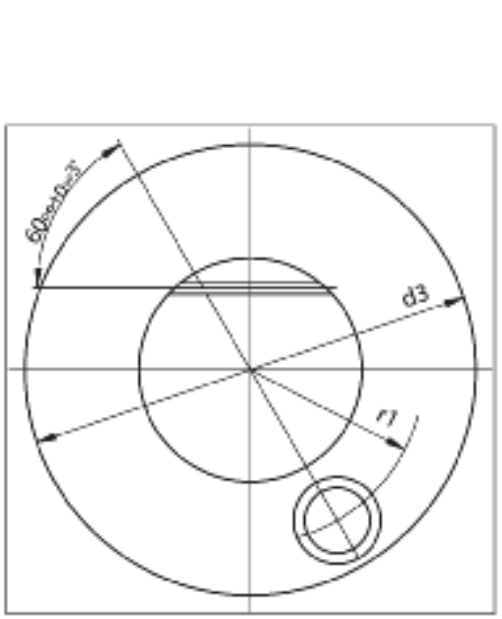
Technical Instructions

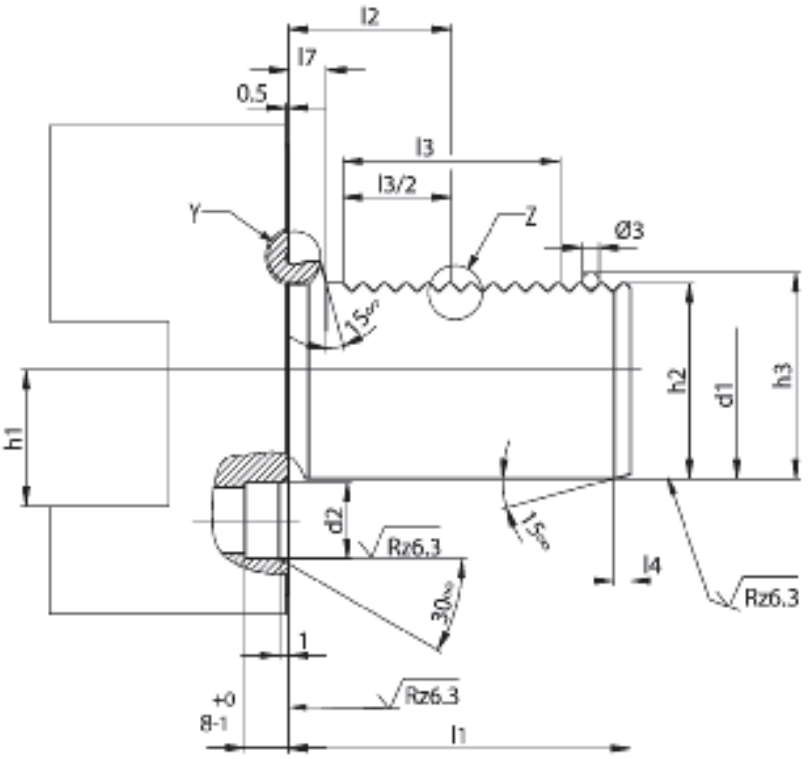
KINTEK

DIN 69880









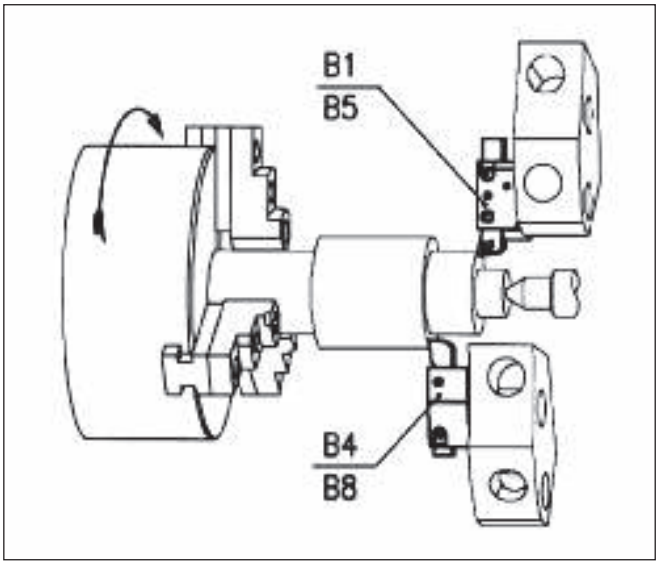
d1 h6	l1 ± 0.3	d2	d3	d6 – 0.1	f	g	h1 max.	h2 ± 0.1	h3 ± 0.1	l2 ± 0.05	l3 min.	l4 + 1	l7	r1 ± 0.02
16	32	8 H6	40	15.4	2.0	1.7	12	15.0	16.92	12.7	16	2	3.5	14.5
20	40	10 H6	50	19.1	2.4	2.0	16	18.0	19.92	21.7	24	2	7.0	18.0
25	48	10 H6	58	24.1	2.4	2.0	16	23.5	25.42	21.7	24	2	7.0	21.0
30	55	14 H8	68	29.1	2.4	2.0	20	27.0	28.92	29.7	40	2	7.0	25.0
40	63	14 H8	83	38.7	3.7	2.8	25	36.0	37.92	29.7	40	3	7.0	32.0
50	78	16 H8	98	48.7	3.7	2.8	32	45.0	46.92	35.7	48	3	8.0	37.0
60	94	16 H8	123	58.7	4.3	3.7	32	55.0	56.92	43.7	56	4	10.0	48.0
80	124	20 H8	158	78.7	4.3	3.7	40	72.0	73.92	59.7	80	4	10.0	65.0

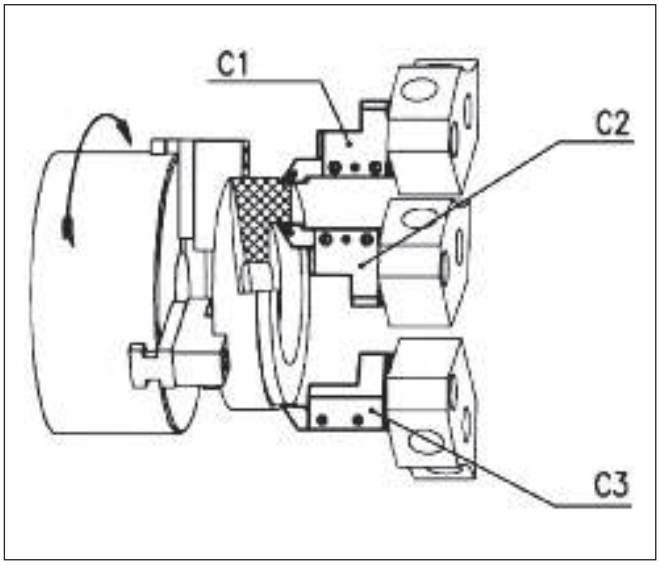
VDI tool holder from page 3/12.

Use of VDI Tool Holders with Right-hand Motion

KINTEK

DIN 69880

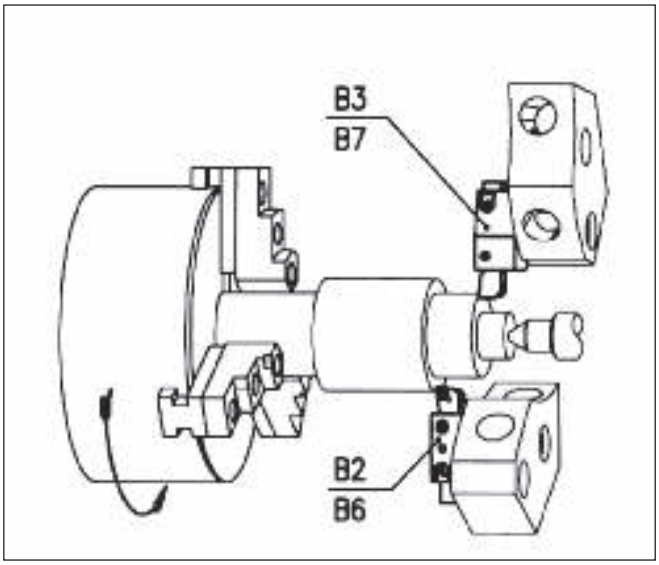


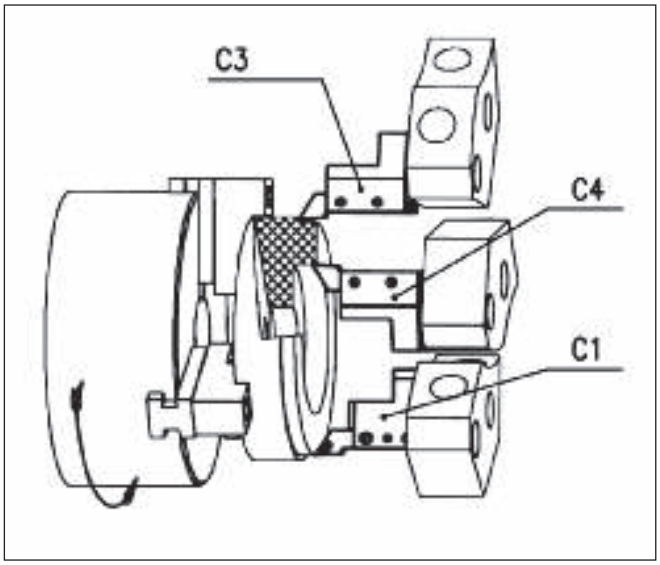


Use of VDI Tool Holders with Left-hand Motion

KINTEK

DIN 69880





Morse Taper Shanks for Milling Machines and Machining Centres
Adapter sizes and design features

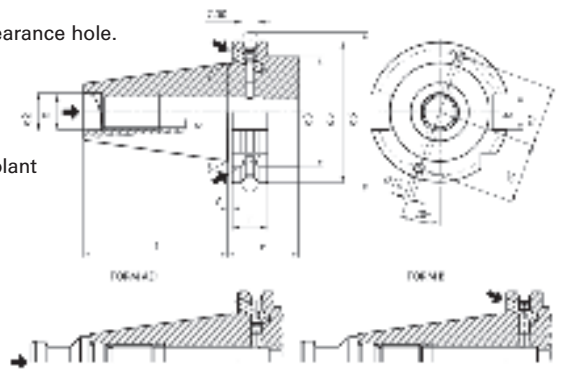
KINTEK

Accuracy: Taper to DIN 234, taper angle:
Tolerance AT 3 DIN 7178 part 1 and to DIN 2080, part 1/DIN 69871,
other tolerances to DIN 7160 and DIN 7168.
Surface roughness of the taper RA < 0.001 mm.

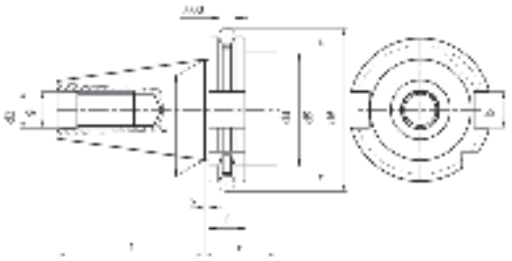
DIN 69871 Part 1

Form A
without clearance hole.

Form AD
with clearance hole for central coolant feed.



Form B
with lateral coolant holes, tightening bolt to DIN 69872, ISO 7388/II-B or with ring groove.

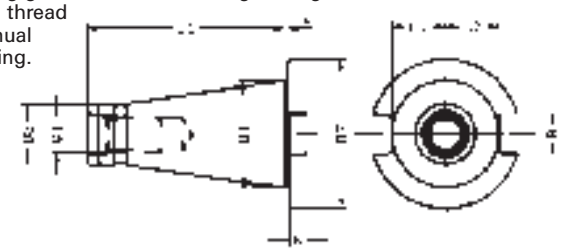


Size	SK 40	SK 50
d1	44.45	69.85
d3	17	25
d6	63.55	97.50
d8	50	80
d9	4	6
e1	27	42
e2	5	7

Size	SK 40	SK 50
f2	35	35
f3	19.1	19.1
l1	68.40	101.75
l6	22.80	35.50
l7	25.00	37.70
g1	M 16	M 24

DIN 2080

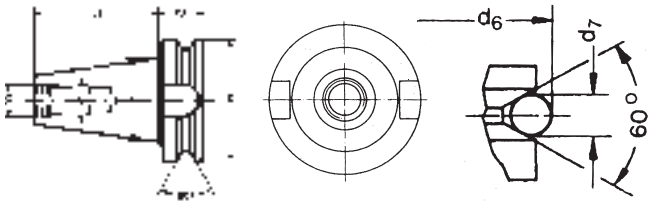
With ring groove for automatic tightening and internal thread for manual tightening.



Size	SK 40	SK 50
D 1	44.45	69.85
D 2	25.30	39.60
D 7	63.00	97.50
A	1.60	3.20
B	16.10	25.70
K	10	12
L 1	93.40	126.80
L 7	22.50	35.30
G 1	M 16	M 24

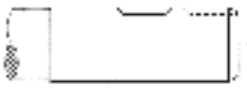
JIS 6339 (formerly MAS BT)

Tightening bolt to JIS standard.



Size	SK 40	SK 50
D 1	44.45	69.85
D 3	17	25
D 9	63	100
F 3	27	38
L 1	65.40	101.80
G 1	M 16	M 24
d_6	63.55	97.5
d_7	7	7

Design of Tool Shanks to DIN 1835 or DIN 6536

	Form A or HA	Form B or HB	Form E or HE
Shank ⌀ 6 to 20 mm			
Shank ⌀ 25 to 32 mm			
	Smooth shank	Weldon shank	Whistle notch shank

Overview – HSK Forms A, C, + F to DIN 69893

Adapter sizes and design features

To satisfy the highest demands on accuracy and stiffness, the new interface HSK offers significant advantages over conventional steel angle tapers.

Out of the six different shank designs (form A – form F), the forms A and C are preferably used for automatic tool change.

Material: Alloyed hardened steel with a tensile strength in the core of at least 800 N/mm².

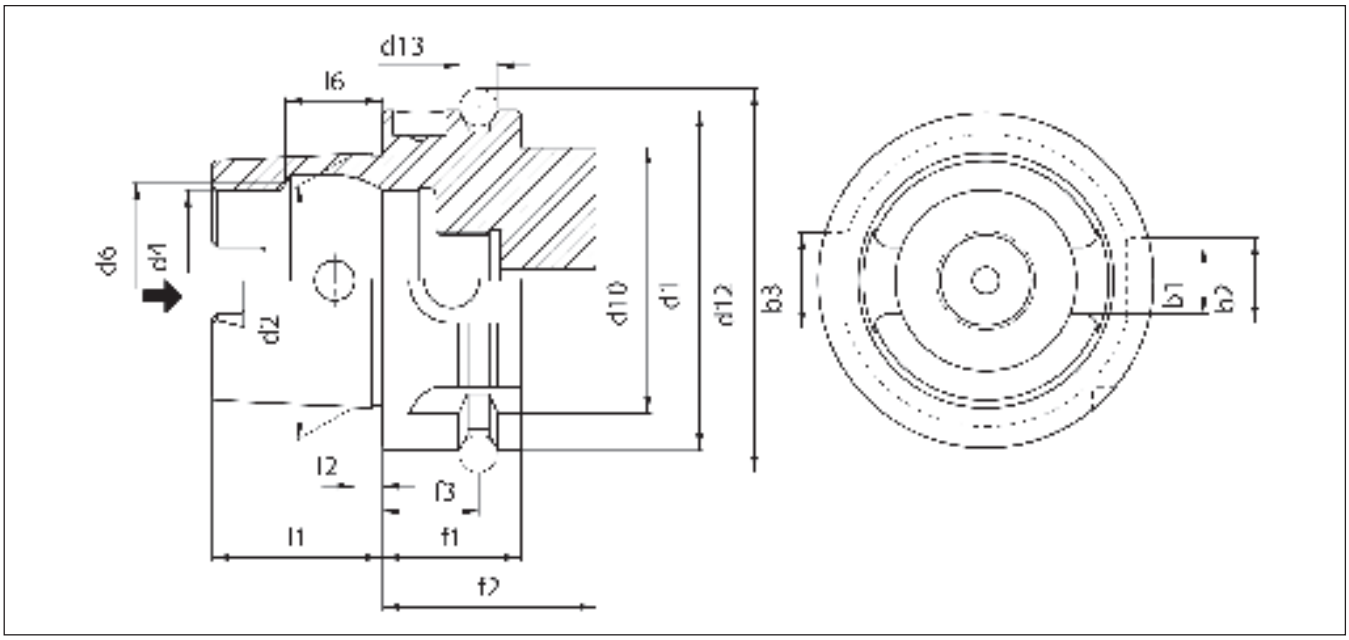
Design: Hardness HRc 58 ± 2.

Accuracy: Concentricity HSK to tool holder < 0.005 mm.

Advantages:
- High repeatability in tool change
- Suitable for high speeds
- Firm axial positioning due to flat design
- No tightening bolt required

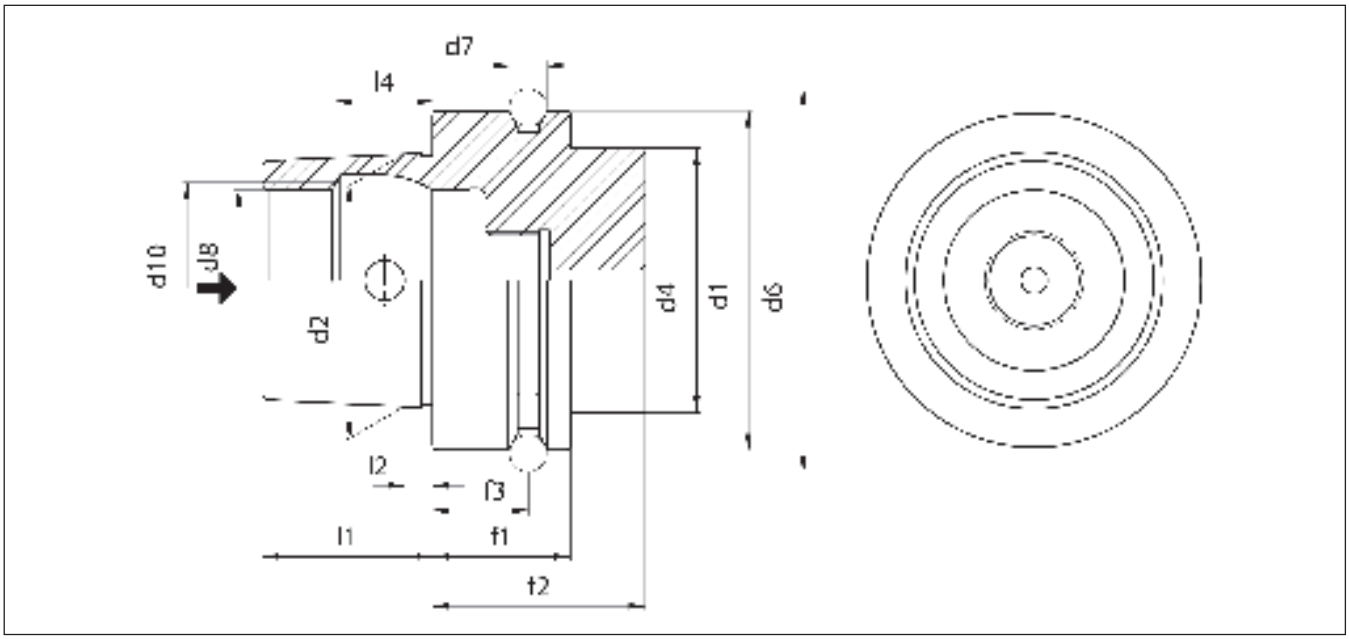
DIN 69893 A + C

KINTEK



DIN 69893 E

KINTEK



Forms A / C / E		
HSK size d_1-mm	Taper ∅ d_2-mm	Shank length l_1-mm
40	30	20
50	38	25
63	48	32
100	75	50

Forms B / D / F		
HSK size d_1-mm	Taper ∅ d_2-mm	Shank length l_1-mm
40	24	16
50	30	20
63	38	25
100	60	40

Tightening Bolts

format professional quality

Dimensions mm						Degree	G	M	For steep angle tapers	DIN
d_1	d_2	d_3	d_4	L_1	L_2					
19	14	17	7	54	26	15°	M 16	–	SK 40	69872 A
28	21	25	11.5	74	34	15°	M 24	–	SK 50	69872 A
19	14	17	7	54	26	15°	M 16	–	SK 40	69872 B sealed
28	21	25	11.5	74	34	15°	M 24	–	SK 50	69872 B sealed
18.95	12.95	17	7.3	44.5	16.4	45°	M 16	–	SK 40	ISO 7388 II B
29.1	19.6	25	11.5	65.5	25.55	45°	M 24	–	SK 50	ISO 7388 II B
15	10	17	–	60	35	45°	M 16	–	SK 40	JIS B 6339 45°
15	10	17	–	60	35	60°	M 16	–	SK 40	JIS B 6339 60°
15	10	17	–	60	35	90°	M 16	–	SK 40	JIS B 6339 90°
25	21.1	17	–	53	25	–	M 16	–	SK 40	Ott ring groove with internal hole
25	21.1	17	–	53	25	–	M 16	16	SK 40	Ott ring groove with internal thread M 16
S 20 x 2	–	17	–	58	30	–	M 16	–	SK 40	Cover

Tightening Bolts page 3/55.

DIN 69872 A



DIN 69872 B



ISO 7388 II B



JIS B 6339 – 45°



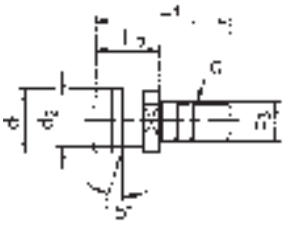
JIS B 6339 – 60°



JIS B 6339 – 90°

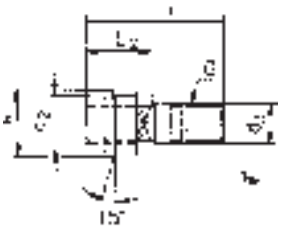


Ott ring groove



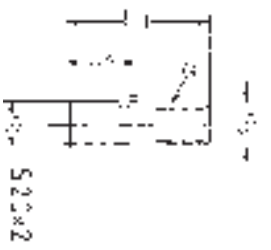
With internal hole

Ott ring groove



With internal thread M 16

Cover S 20 x 2



Working Standards – Extract from DIN Standard 866

3.1 Pitch

The pitch step (term in accordance with DIN 2268) may be 1 mm, 10 mm or 100 mm, individual pitch sections can be supplied with a smaller pitch step by agreement.
The division must be penetrating up to the edge of the pitch and visually straight, parallel, of an equal width within itself and compared with others at right angles to the edge of the pitch. It must be sharp-edged and burr-free.

Width of division, form A: 70 up to 100 µm

Width of division, form B: 100 up to 150 µm

The numbering should start at the left of zero if the edge of the pitch is towards the viewer when the scale is positioned for use.

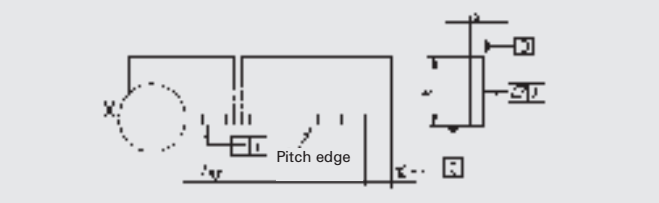




Table 2: Tolerance classes in accordance with DIN 2268

Form	Total given length l_N, O						
	500	1000	1500	2000	3000	4000	5000
A	TK 40/0	TK 40/0	TK 60/0	TK 60/0	TK 80/0	TK 100/0	TK 120/0
B	TK 100/0	TK 100/0	TK 150/0	TK 150/0	TK 200/0	TK 250/0	TK 300/0

Note: If using a DIN 866 – A – 500 – 1 line standard, the space between any two pitches may not vary more than plus/minus 40 µm from the set dimension. As this requirement applies to any pitch section, the deviation span over the entire length of the pitch fmax, whose position depends on the zero line of the reference point, shall not exceed the value 40 µm. The numerical values in Table 2 are the limit values for the deviation spans.

3.2 Form and Position Tolerances

Form A: The following values apply to the straightness tolerance of the pitch edge and the flatness tolerance of the surface with the pitch:

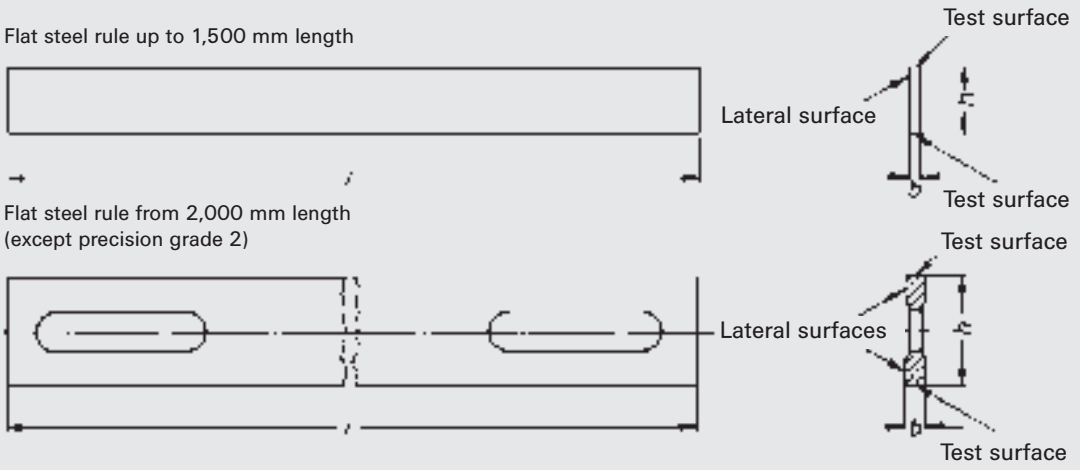
$$\frac{t}{mm} = 0.02 + 0.1\ \frac{l_N, O}{m}.$$

For form B $\frac{t}{mm} = 0.04 + 0.2\ \frac{l_N, O}{m}.$

Table 3. Rectangularity tolerances

l_N, O	500	1000	1500	2000	3000	4000	5000
l_R	0.1	0.1	0.15	0.15	0.2	0.25	0.3

Rules – Extract from DIN Standard 874



2.1.1 Flatness Tolerance

The flatness tolerances t_e of the test surfaces are determined using the formulae in accordance with Table 2. The length is entered l in mm.

Table 2: Formulae for flatness tolerances of the test surfaces

Precision grade	Flatness tolerance t_e in µm
00	$1 + \frac{l}{150}$
0	$2 + \frac{l}{100}$
1	$4 + \frac{l}{60}$
2	$8 + \frac{l}{40}$

2.1.2 Parallelism Tolerance

The parallelism tolerance of the test surfaces is equal to double the corresponding flatness tolerance. The parallelism tolerance of the lateral surfaces is six times the flatness tolerance of the measurement surfaces specified in Table 3. The tolerances in Table 3 are the rounded up tolerances determined using the formula in Table 2.

Table 3: Flatness tolerances

l	Flatness tolerance t_e in µm at precision grades			
± 2	00	0	1	2
to 500	4	7	12	21
750	6	9.5	17	27
1000	8	12	21	33
1500	–	17	29	46
2000	–	22	37	58
2500	–	27	46	71
3000	–	32	54	83
4000	–	42	71	108
5000	–	–	87	133

These values apply at a reference temperature of 20 °C.

The flatness tolerance of the lateral surfaces is equal to three times the flatness tolerances of the test surfaces specified in Table 3.

2.5 Design

The test surfaces of the flat steel rules, precision grade 2, are usually fine ground. The test surfaces on flat rules made of steel, precision grades 00 and 0, are additionally scraped or lapped. Those in precision grade 1 are additionally scraped, if the tolerances cannot be obtained through fine grinding.

3. Testing

3.1 Measuring the Deviation from Flatness

The deviation from flatness is measured against a reference surface whose own deviation from flatness is less than 50 % of the flatness tolerances specified in Table 3.

The rule being tested is supported at those points at which the slightest bending of the rule occurs. Where there is a constant cross-section, these supporting points are spaced as shown in Figure 2.

The deviation from flatness can be measured e.g. with gauge blocks in accordance with DIN 861 sheet 1 and/or test mandrels between the reference plane and the facing test surface of the flat steel rule. When testing on fold, the measuring results are not subject to interference from bending.

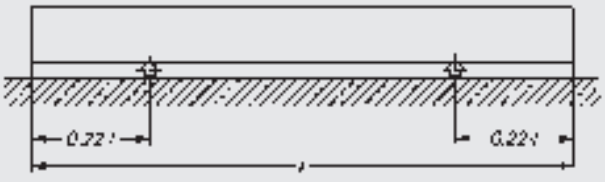


Figure 2: Support at points of slightest bending

3.2 Measuring the Deviation from Parallelism

The deviation from parallelism can be determined in the same test set-up as in Section 3.1 with the aid of a DIN 879 dial gauge on the upper test surface of the flat steel rule.

Flat steel rules can also be tested with measuring instruments whose max. error = 20 % of the parallelism tolerance of the rules, e.g. micrometer with dial gauge or external micrometer.

GEDORE

Dimensional units

Important symbols with examples

Giga	G	1 000 000 000	$=10^9$	e.g.: 1 GW = 1 billion Watt
Mega	M	1 000 000	$=10^6$	1 MW = 1 million watt
Kilo	k	1 000	$=10^3$	1 kw = 1000 watt
Milli	m	0.001	$=10^{-3}$	1 mm = 1 thousandth metre
Mikro	µ	0.000001	$=10^{-6}$	1 µm = 1 millionth metre
Nano	n	0.000 000 001	$=10^{-9}$	1 nm = 1 billionth metre

Important SI units with conversions in old, still used units

Length	Metres	m		
Mass	Kilograms	kg		
Time	Seconds	s		
Force	Newton	N	= kg m/s²	1 N = 0.102 kp
Torque	Newtonmeters	N•m		9.81 N•m = 1 kpm
Energy (Work)	Joules	J	= N•m	
Heat quantity	Joules	J		1 J = 0.239 cal
Power	Watts	W	= N•m/s	1 kW = 1.36 PS = 860 kcal/h
Pressure	Pascal	Pa	= N/m²	100 000 Pa = 1 bar = 10 mWS
Electrical current	Amperes	A		
Temperature	Kelvin	K		1 K = 1 °C

Torque conversion factors of given dimensional units x factor = required unit

given unit	required unit					
	= Ncm	= N•m	= kpcm	= kpm	= lbf.in.	= lbf.ft
Ncm	**1**	0.01	0.10197	0.00102	0.0885	0.00738
Nm	**100**	1	10.197	0.10197	8.851	0.7376
kpcm	**9.807**	0.09807	1	0.01	0.868	0.0723
kpm	**980.07**	9.807	100	1	86.796	7.233
lbf.in.	**11.298**	0.11298	1.152	0.01152	1	0.0833
lbf.ft.	**135.58**	1.3558	13.825	0.13825	12	1

Material properties

	Density g/cm³	Expansion 1/°C	Melting point °C	Elasticity module N/mm²
Aluminium	2.7	0.000024	660.1	72 000
Lead	11.3	0.000029	327.3	16 000
Iron (Steel)	7.86	0.000012	1540	210 000
Gold	19.3	0.000014	1063	79 000
Copper	8.9	0.000017	1083	126 000
Zinc	7.1	0.000026	419	94 000
Glass	2.2–2.9	0.000008	800–1500	68 000
Air	0.0013	0.0036		
Wood	0.5–0.7			10 000
Plastics:				
PS	1.05	0.00008		3400
PP	0.9	0.00018		1 200
ABS	1.05	0.00010		2500

Example 1: Expansion of a 100 mm steel body heated to 10 °C.
Length x added expansion value x °C heated =
100 mm x 0.000012 x 10 = 0.012 mm = 12 µm

Example 2: Elastic expansion, $\varepsilon = \sigma/E$.
A 100 mm long ABS body is stretched by $\sigma = 50$ N/mm².
The expansion is: 100 mm x 0.02 = 2 mm.

Example 3: Two steel plates with a total thickness of 20 mm are clamped with a screw fastener at $\sigma = 50$ N/mm² : $\varepsilon = 50 : 210{,}000 = 0.00024$. The compression in the surrounding area of the screw connection is 20 mm x 0.00024 = 0.0048 mm = 5 µm. The elastic compression causes a constant pre-tension on the screw fastening. A correctly tightened screw fastening is self-locking.

Conversion tables Inches into decimal inches and mm

in.	dec. in.	mm
0	0	0
1/64	0.015625	0.3969
1/32	0.03125	0.7938
3/64	0.046875	1.1906
1/16	0.0625	1.5875
5/64	0.078125	1.9844
3/32	0.09375	2.3812
7/64	0.109375	2.7781
1/8	**0.125**	**3.1750**
9/64	0.140625	3.5719
5/32	0.15625	3.9688
11/64	0.171875	4.3656
3/16	0.1875	4.7625
13/64	0.203125	5.1594
7/32	0.21875	5.5562
15/64	0.234375	5.9531

in.	dec. in.	mm
1/4	**0.25**	**6.3500**
17/64	0.265625	6.7469
9/32	0.28125	7.1438
19/62	0.296875	7.5406
5/16	0.3125	7.9375
21/64	0.328125	8.3344
11/32	0.34375	8.7312
23/64	0.359375	9.1281
3/8	**0.375**	**9.5250**
25/64	0.390625	9.9219
13/32	0.40625	10.3188
27/64	0.421875	10.7156
7/16	0.4375	11.1125
29/64	0.453125	11.5094
15/32	0.46875	11.9062
31/64	0.484375	12.3031

in.	dec. in	mm
1/2	**0.5**	**12.7000**
33/64	0.515625	13.0969
17/32	0.53125	13.4938
35/64	0.546875	13.8906
9/16	0.5625	14.2875
37/64	0.578125	14.6844
19/32	0.59375	15.0812
39/64	0.609375	15.4781
5/8	**0.625**	**15.8750**
41/64	0.640625	16.2719
21/32	0.65625	16.6688
43/64	0.671875	17.0656
11/16	0.6875	17.4625
45/64	0.703125	17.8594
23/32	0.71875	18.2562
47/64	0.734375	18.6531

in.	dec. in	mm
3/4	**0.75**	**19.0500**
49/64	0.765625	19.4469
25/32	0.78125	19.8438
51/64	0.796875	20.2406
13/16	0.8125	20.6375
53/64	0.828125	21.0344
27/32	0.84375	21.4312
55/64	0.859375	21.8281
7/8	**0.875**	**22.2250**
57/64	0.890625	22.6219
29/32	0.90625	23.0188
59/64	0.921875	23.4156
15/16	0.9375	23.8125
61/64	0.953125	24.2094
31/32	0.96875	24.6062
63/64	0.984375	25.0031
1	1	25.4

Newton-Metres N•m in Foot-Pounds lbf.ft. (1 N•m = 0.738 lbf.ft.)

Nm	0	1	2	3	4	5	6	7	8	9
	ft.-lbs.									
0	0	0.74	1.48	2.21	2.95	3.69	4.43	5.17	5.90	6.64
10	7.38	8.12	8.86	9.59	10.33	11.07	11.81	12.54	13.28	14.02
20	14.76	15.50	16.2	16.97	17.71	18.45	19.19	19.93	20.65	21.40
30	22.14	22.88	23.62	24.35	25.10	25.83	26.57	27.31	28.04	28.78
40	29.52	30.26	31.00	31.73	32.47	33.21	33.95	34.69	35.42	36.16
50	36.90	37.64	38.38	39.11	39.85	40.59	41.33	42.07	42.80	43.54
60	44.28	45.02	45.76	46.49	47.23	47.97	48.71	49.45	50.18	50.92
70	51.66	52.40	53.14	53.87	54.61	55.35	56.09	56.83	57.56	58.30
80	59.04	59.78	60.52	61.25	62.00	62.73	63.47	64.21	64.94	65.68
90	66.42	67.16	67.90	68.63	69.37	70.11	70.85	71.59	72.32	73.06
100	73.80	74.54	75.28	76.01	76.75	77.49	78.23	78.97	79.70	80.44

Foot-Pounds lbf.ft in Newton-metres N•m (1 lbf.ft = 1.356 N•m)

ft.lbs.	0	1	2	3	4	5	6	7	8	9
	Nm									
0	0	1.36	2.71	4.07	5.42	6.78	8.14	9.49	10.85	12.20
10	13.56	14.92	16.27	17. 63	18.98	20.34	21.70	23.05	24.41	25.76
20	27.12	28.48	29.83	31. 19	32.54	33.90	35.26	36.61	37.97	39.32
30	40.68	42.04	43.39	44.75	46.10	47. 46	48.82	50.17	51.53	52.88
40	54.24	55.60	56.59	58.31	59.66	61. 02	62.38	63.73	65.09	66.44
50	67.80	69.16	70.51	71. 87	73.22	74.58	75.94	77.29	78.65	80.00
60	81.36	82.72	84.07	85.43	86.78	88.14	89.50	90.85	92.21	93.56
70	94.92	96.28	97.63	98.99	100.34	101.70	103.06	104.41	105.77	107.12
80	108.48	109.94	111.19	112.55	113.90	115.26	116.62	117.97	119.33	120.68
90	122.04	123.40	124.75	126.11	127.46	128.82	130.18	131.53	132.89	134.24
100	135.60	136.96	138.31	136.67	141.02	142.38	143.74	145.09	146.45	147.80

(1 lbf.ft. = 12 lbf.in.)

Newton-Metres N•m in Kilopond-Metres kpm (1 N•m = 0.102 kpm)

Nm	0	10	20	30	40	50	60	70	80	90
	kpm									
0	0.00	1.02	2.04	3.06	4.08	5.10	6.12	7.14	8.16	9.18
100	10.20	11.22	12.24	13.26	14.28	15.30	16.31	17.33	18.35	19.37
200	20.39	21.41	22.43	23.45	24.47	25.49	26.51	27.53	28.55	29.57
300	30.59	31.61	32.63	33.65	34.67	35.69	36.71	37.73	38.75	39.77
400	40.79	41.81	42.83	43.85	44.87	45.89	46.91	47.93	48.95	49.97
500	50.99	52.00	53.02	54.04	55.06	56.08	57.10	58.12	59.14	60.16
600	61.18	62.20	63.22	64.24	65.26	66.28	67.30	68.32	69.34	70.36
700	71.38	72.40	73.42	74.44	75.46	76.48	77.50	78.52	79.54	80.56
800	81.58	82.60	83.62	84.64	85.66	86.68	87.70	88.71	89.73	90.75
900	91.77	92.79	93.81	94.83	95.85	96.87	97.89	98.91	99.93	100.95
1000	101.97	102.99	104.01	105.03	106.05	107.07	108.09	109.11	110.13	111.15

Table for Friction Coefficients μ_{total}

Surface condition		μ_{total} when lubricated		
Screw	**Nut**	Un-lubricated	**Oiled**	MoS_2
Mn-phosphated	Non final treatment	0.14 –0.18	0.14 –0.15	
No final treatment	Non final treatment	0.14 –0.18	0.14 –0.17	
Zn phosphated	**Non final treatment**	0.14 –0.21	0.14 –0.17	
electro-zinc plated, approx. 8 µm	Non final treatment	0.125–0.18	0.125–0.17	0.10–0.12
electro-cadmium plated, approx. 7 µm	**Non final treatment**	0.08 –0.12	0.08 –0.11	
electro-zinc plated, approx. 8 µm	electro-zinc plated, approx. 5 µm	0.125–0.17	0.14 –0.19	
electro-cadmium plated, approx. 7 µm	**electro-cadmium plated, approx. 6 µm**	0.08 –0.12	0.10 –0.15	

GEDORE

Pre-tensioning forces and tightening torques in the case of different friction values

Guide values for thread friction value μ
You need to know the friction value in order to precisely determine initial spring tension and tightening torque. It sems impossible however to specity guaranteed friction values and particularly their distribution given the variety of surface and lubrication conditions. The friction value is affected by the following: the surfaces and the quality of the materials to be screw-fastened, the type and method of lubrication, the sliding path resulting from the flexibility, the tightening method, i.e. the number and speed of thightening operations and finally the tightening path – hard or soft screw-fastening. The sum of these points represents a greater or lesser degree of uncertainty. The friction values of even DIN screws from different suppliers can vary, depending on screw batch, stock holing and particularly on the use of oil or grease in the assembly process. Please note that ~ 80 to 90 % of the tightening torque in most screwing operations is used to overcome the friction in the screw.

Important note:
For this reason we can only recommend friction values. We expressly remind you that the following table gives only guide values. This table cannot replace a thorough screw calculation. This applies in particular for safety-related parts, or parts subject to official directives or which meet sealing requirements. The table should be used only if the manufacturer of the screws or fastening elements has provided no information about the required tightening torque.

Guide values for thread friction value μ 0.14

	Set screws with metric ISO fine thread in accordance with D 13 Part 12 (selection)												
	4.6		5.6		6.8		8.8		10.9		12.9		
	Initial spring tension = F_{sp} Torque = M_A												
	F_{sp} N	M_A N•m	F_{sp} N	M_A N•m	F_{sp} N	M_A N•m	F_{sp} N	M_A N•m	F_{sp} N	M_A N•m	F_{sp} N	M_A N•m	
M 2	**338**	0.130	**422**	0.163	**675**	0.261	**901**	0.348	**1267**	0.489	**1520**	0.587	**4**
M 2.5	**563**	0.269	**703**	0.336	**1125**	0537	**1500**	0.716	**2110**	1.007	**2532**	1.209	**5**
M 3	**845**	0.480	**1056**	0.600	**1689**	0.961	**2253**	1.281	**3168**	1.801	**3801**	2.161	**5.5**
M 3.5	**1133**	0.754	**1416**	0.942	**2266**	1.507	**3021**	2.009	**4248**	2.826	**5098**	3.391	**6**
M 4	**1463**	1.115	**1829**	1.393	**2927**	2.229	**3902**	2.972	**5487**	4.180	**6585**	5.016	**7**
M 4.5	**1901**	1.621	**2376**	2.026	**3801**	3.242	**5068**	4.323	**7127**	6.079	**8553**	7.295	**7**
M 5	**2395**	2.261	**2994**	2.827	**4790**	4.523	**6387**	6.030	**8982**	8.480	**10778**	10.176	**7+8**
M 6	**3379**	3.843	**4224**	4.803	**6758**	7.685	**9011**	10.247	**12671**	14.410	**15205**	17.292	**8+10**
M 8	**6202**	9.349	**7753**	11.686	**12404**	18.698	**16539**	24.931	**23258**	35.059	**27909**	42.070	**10+13**
M 10	**9876**	18.54	**12345**	23.18	**19752**	37.09	**26336**	49.45	**37034**	69.54	**44441**	83.44	**13-17**
M 12	**14400**	32.37	**18000**	40.46	**28801**	64.74	**38401**	86.32	**54001**	121.38	**64801**	145.66	**15-19**
M 14	**19775**	51.77	**24719**	64.71	**39551**	103.54	**52734**	138.06	**74158**	194.14	**88989**	232.97	**22+24**
M 16	**27221**	80.62	**34027**	100.77	**54443**	161.24	**72591**	214.98	**102080**	302.32	**122497**	362.78	**21+24**
M 18	**33078**	111.09	**41347**	138.86	**66155**	222.17	**88207**	296.23	**124041**	416.58	**148850**	499.89	**27**
M 20	**42534**	157.46	**53167**	196.82	**85067**	314.91	**113423**	419.88	**159501**	590.46	**191401**	708.55	**27-34**
M 22	**53175**	215.1	**66469**	268.9	**106350**	430.2	**141800**	573.7	**199406**	806.7	**239288**	968.0	**32-41**
M 24	**61248**	272.1	**76560**	340.1	**122497**	544.2	**163329**	725.6	**229681**	1020.3	**275617**	1224.4	**36+41**
M 27	**80670**	399.9	**100837**	499.9	**161339**	799.9	**215119**	1066.5	**302512**	1499.7	**363014**	1799.7	**41+46**
M 30	**98027**	541.7	**122533**	677.2	**196054**	1083.4	**261405**	1444.6	**367600**	2031.5	**441120**	2437.7	**46+50**
M 33	**122241**	738.5	**152801**	923.2	**244482**	1477.1	**325976**	1969.4	**458404**	2769.5	**550084**	3323.4	**50+55**
M 36	**143413**	948.0	**179266**	1185.0	**286826**	1896.0	**382434**	2528.0	**537798**	3555.0	**645358**	4265.9	**55+60**
M 39	**172420**	1229	**215525**	1536	**344839**	2457	**459786**	3276	**646574**	4607	**775888**	5529	**60+65**
M 42	**197407**	1519	**246758**	1899	**394813**	3038	**526417**	4050	**740275**	5696	**888329**	6835	**65**
M 45	**231206**	1898	**289007**	2373	**462412**	3796	**616549**	5062	**867022**	7118	**1040426**	8541	**70**
M 48	**260008**	2282	**325010**	2853	**520015**	4565	**693354**	6086	**975029**	8559	**1170035**	10271	**75**
M 52	**312056**	2954	**390070**	3692	**624112**	5907	**832149**	7876	**1170209**	11076	**1404251**	13292	**80**
M 56	**359843**	3672	**449804**	4591	**719686**	7345	**959581**	9793	**1349411**	13772	**1619293**	16526	**85**
M 60	**420651**	4582	**525813**	5728	**841301**	9164	**1121735**	12219	**1577440**	17183	**1892928**	20619	**90**
M 64	**475860**	5536	**594825**	6920	**951720**	11071	**1268960**	14.762	**1784476**	20759	**2141371**	24911	**95**
M 68	**545427**	6720	**681784**	8400	**1090855**	13440	**1454473**	17.919	**2045353**	25199	**2454423**	30239	**100**
Set screws with metric ISO coarse thread in accordance with D in 13 Part 12 (selection)													
M 8x1	**6805**	10.08	**8507**	12.60	**13611**	20.15	**18148**	26.87	**25520**	37.79	**30624**	45.35	**10+13**
M 10x1	**11418**	20.83	**14272**	26.04	**22835**	41.66	**30447**	55.55	**42816**	78.11	**51379**	93.73	**13-17**
M 12x1.5	**15312**	34.01	**19140**	42.51	**30624**	68.02	**40832**	90.69	**57420**	127.54	**68904**	153.05	**15-19**
M 14x1.5	**21934**	56.25	**27418**	70.32	**43868**	112.51	**58491**	150.01	**82253**	210.96	**98703**	253.15	**22+24**
M 16x1.5	**29741**	86.50	**37177**	108.12	**59483**	172.99	**79310**	230.66	**111530**	324.36	**133836**	389.23	**21+24**
M 18x1.5	**38733**	125.95	**48417**	157.44	**77467**	251.91	**103289**	335.88	**145250**	472.33	**174300**	566.80	**27**
M 20x1.5	**48910**	175.9	**61138**	219.8	**97820**	351.7	**130427**	468.9	**183413**	659.4	**220096**	791.3	**27-34**
M 22x1.5	**60272**	237.4	**75340**	296.8	**120543**	474.8	**160724**	633.1	**226019**	890.3	**271223**	1068.3	**32-41**
M 24x1.5	**72818**	311.8	**91022**	389.8	**145635**	623.7	**194180**	831.6	**273066**	1169.4	**327680**	1403.3	**36+41**

μ_{total} = average friction value for thread and head support
P = pitch of thread
F_{sp} = axial initial spring tension in the screw at 90 % utilisation of the screwing length limit (determined in accordance with the shape change hypothesis)
M_A = Tightening torque during assembly

Important note: Please read our notes on the guide values for the friction values above. The values given in the table, taking into account the friction values, apply only for set screws (expansion screws usually require lower tightening values). The effective friction diameter in the screw head support was determined at 1.3 x external thread diameter. It can therefore be used only with conventional set screws, usually hex and cylinder head screws (e.g. DIN EN ISO 4014, 4017, 4762, DIN 7984). If using with screws with a higher tensile strength (8.8 up to 12.9) and clamped parts made of "soft" materials we strongly advise testing the max. surface compression beneath the screw head.

Comparison table for hardness and tensile strength according to Vickers, Brinell and Rockwell [1)]

[1)] Hardness values determined using different hardness tests on different materials are not fully comparable.
[2)] The Rockwell values given to one decimal point are used only for interpolation and are to be rounded up to whole numbers for the end result.

Vickers hardness	Brinell hardness	Rockwell hardness[2)]		Tensile strength
HV 30	HB 30	HRB	HRC	σB N/mm²
85	80.7	36.4	–	270
85	85	42.4	–	290
90	90	47.4	–	310
95	95	52.0	–	320
100	100	56.4	–	340
105	105	60.0	–	360
110	110	63.4	–	380
115	115	66.4	–	390
120	120	69.4	–	410
125	125	72.0	–	420
130	130	74.4	–	440
135	135	76.4	–	460
140	140	78.4	–	470
145	145	80.4	–	490
150	150	82.2	–	500
155	155	83.8	–	520
160	160	85.4	–	540
165	165	86.8	–	550
170	170	88.2	–	570
175	175	89.6	–	590
180	180	90.8	–	600
185	185	91.8	–	620
200	190	91.5	–	640
195	195	94.0	–	660
200	200	95.0	–	670
205	205	95.8	–	680
210	210	96.6	–	710
225	214	96.6	–	720
220	220	98.2	–	730
225	225	99.0	–	750
230	230	–	19.2	760
235	235	–	20.2	780
240	240	–	21.2	800

Vickers hardness	Brinell hardness	Rockwell hardness[2)]		Tensile strength
HV 30	HB 30	HRB	HRC	σB N/mm²
245	245	–	22.1	820
250	250	–	23.0	830
255	255	–	23.8	850
260	260	–	24.6	870
265	265	–	25.4	880
280	266	–	27.1	900
275	275	–	26.9	920
280	280	–	27.6	940
285	285	–	28.3	950
290	290	–	29.0	970
295	295	–	29.6	990
300	300	–	30.3	1010
310	310	–	31.5	1040
320	320	–	32.7	1080
330	330	–	33.8	1110
340	340	–	34.9	1140
350	350	–	36.0	1170
360	359	–	37.0	1200
370	368	–	38.0	1230
380	376	–	38.9	1260
390	385	–	39.8	1290
400	392	–	40.7	1320
410	400	–	41.5	1350
420	408	–	42.4	1380
430	415	–	43.2	1410
440	423	–	44.0	1430
450	430	–	44.8	1460
460	–	–	45.6	(1490)
470	–	–	46.3	(1520)
480	–	–	47.0	(1550)
490	–	–	47.7	(1580)
500	–	–	48.3	(1600)
510	–	–	49.1	(1630)

Vickers hardness	Brinell hardness	Rockwell hardness[2)]		Tensile strength
HV 30	HB 30	HRB	HRC	σB N/mm²
520	–	–	49.7	(1660)
530	–	–	50.4	(1690)
540	–	–	51.0	(1710)
550	–	–	51.6	(1740)
560	–	–	52.2	(1770)
570	–	–	52.8	(1790)
580	–	–	53.3	(1820)
590	–	–	53.9	(1850)
600	–	–	54.4	(1870)
610	–	–	55.0	(1900)
620	–	–	55.5	(1930)
630	–	–	56.0	(1950)
640	–	–	56.5	(1980)
650	–	–	57.0	(2000)
660	–	–	57.5	(2030)
670	–	–	58.0	(2050)
680	–	–	58.5	(2080)
690	–	–	59.0	(2110)
700	–	–	59.5	(2130)
720	–	–	60.4	(2170)
740	–	–	61.2	(2220)
760	–	–	62.0	(2260)
780	–	–	62.8	(2300)
800	–	–	63.6	–
820	–	–	64.3	–
840	–	–	65.0	–
860	–	–	65.7	–
880	–	–	66.3	–
900	–	–	66.9	–
920	–	–	67.5	–
940	–	–	68.0	–

GEDORE

Tightening values/test torques

Non-binding screw tightening torques N•m (Newton Metres)

These tightening torques are guide values for metric coarse thread in accordance with DIN 13 and head support measurements in accordance with DIN 912, 931, 934, 6912, 7984 and 7990. They give a utilisation limit of the screwing length of 90 %. Based on a friction value of 0.14 (new screw, no final treatment, un-lubricated).
Please note: In extreme cases, e.g. in the case of screws lubricated with MOS2 paste and fasteners which have been cadmium plated on both sides, the tightening value should be reduced by approx. 20 %

Allen key test torques in accordance with DIN 899 (minimum guaranteed values)

N•m (1 kpm ≈ 10 N•m)

	Tightening values for quality class in accordance with DIN 267							Allen key test torques in accordance with DIN 899 (minimum guaranteed values)								With square socket in accordance with DIN 3120				
																6.3	10	12.5	20	25
	4.6	5.6	6.9	8.8	10.9	12.9														
M 2	0.123	0.162	0.314	0.373	0.520	0.628	4			1.90					10.4					
M 2.3*	0.196	0.265	0.510	0.598	0.843	1.010	4.5			2.64					12.6					
M 2.6*	0.284	0.373	0.726	0.863	1.20	1.451	5			3.55					15.1					
M 3	0.441	0.588	1.128	1.344	1.88	2.256	5.5			4.64				2.32	17.8					
(M 3.5)	0.677	0.902	1.736	2.060	2.893	3.481	6	17.6	7.4	5.92		17.6		2.96	20.6	23.2				
M 4	1.000	1.344	2.599	3.040	4.315	5.148	7	25.2	11.4	9.12		25.2		4.56	26.8	33.2				
M 5	1.916	2.648	5.099	6.031	8.483	10.200	8 9	34.5 45.5	16.6 23.0	13.3 18.4		34.5 45.5	34.5 45.5	6.65 9.20	33.6 41.1	45.5 59.9	94.1 119.2			
M 6	3.432	4.511	8.728	10.300	14.710	17.652	10	58.1	31.0	24.8	58.1	58.1	58.1	12.4	49.1	76.7	147			
(M 7)	5.590	7.453	14.220	17.162	24.517	28.439	11 12	72.7 89.1	40.4 51.5	32.3 41.2	72.7 89.1	72.7 89.1	72.7 89.1	16.1 20.6	57.8 67.0	96 118	178 212			
M 8	8.238	10.787	21.575	25.497	35.304	42.168	13 14	107 128	64.5 79.4	51.6 63.5	107 128	107 128	107 128	25.8 31.7	68.6 68.6	141 169	249 288			
M 10	16.67	21.57	42.16	50.014	70.608	85.317	15 16 17	150 175 201	96.2 115 134	77.0 92.3 107	150 175 201	150 175 201	150 175 201	38.5 46.1 53.5		198 225 225	331 377 425			
M 12	28.44	38.246	73.550	87.279	122.60	147.10	18 19 20	230 261 294	160 186 215	128 149 172	230 261 294	230 261 294	230 261 294	64.0 74.5 86.0		225 225 225	477 531 569	569 –		
(M 14)	45.11	60.801	116.70	138.30	194.20	235.40	21 22 23	330 368 408	247 281 319	198 225 255	330 368 408	330 368 408	330 368 408	99.0 112 127		225 225	569 569 569	– 569 569		
M 16	69.63	93.163	178.50	210.80	299.10	357.90	24 25 26	451 496 544	359 402 449	287 322 359	451 496 544	451 496 544	451 496 544	143 161 179			569 569 569	569 583 624		
(M 18)	95.12	127.50	245.20	289.30	411.90	490.30	27 28	594 647	499 552	399 442	594 647	594 647	594 647	199 221			569 569	665 707		
(M 20)	135.3	180.45	384.1	411.9	578.60	696.30	30	760	670	536	760	760	760	268			569	795		
(M 22)	182.4	245.16	470.70	559.00	784.50	941.40	32 34	884 1019	804 951	643 761	884 1019	884 1019	884 1019	321 381			569 569	888 984		
M 24	230.5	308.91	598.20	711.0	1000	1196	36	1165	1117	894	1165	1165	1165	447				1084	1677	
(M 27)	343.2	460.90	887.5	1049	1481	1775	41	1579	1442	1154	1579	1579	1579	577				1353	1910	
M 30	465.8	622.7	1206	1422	2010	2403	46	2067	1816	1453	2067	2067	2067	726				1569	2143	
(M 33)	632.5	848.30	1628	1932	2716	3266	50	2512	2145	1716	2512	2512	2512	858				1569	2329	
M 36	814.0	1089	2099	2481	3491	4197	55	3140		2077	3140	3140	3140	1038				1569	2562	
(M 39)	1059	1412	2716	3226	4531	5443	60	3849		2471	3849		3849	1235				1569	2795	
M 42	1304	1746	3364	3991	5609	6727	65	4021			4021		4021	1422					2795	
(M 45)	1638	2177	4207	4992	7012	8414	70	4658			4658		4658	1618					2795	
M 48	1981	2638	5080	6021	8473	10150	75	5394					5394	1765					2795	
(M 52)	2540	3393	6541	7747	10885	13092	80	6178					6178	1912					2795	
M 56	3168	4227	8149	9650	13582	16279	85	6963					6963	2059						
(M 60)	3932	5247	10101	11964	16867	20202	90	7845					7845	–						
M 64	4737	6306	12160	14416	20300	24320	95	8336					8336	–						

The corresponding test torques derive from the theoretical loading capacity of the driving square.

* These values are not included in DIN ISO 272 and should therefore be avoided along with those values in brackets where possible.

Note:
Assignment of key widths to the thread diameters on the basis of various standards, see page 10/50.
We expressly remind you that the values in the column "Allen key test torques in accordance with DIN 899" are minimum guaranteed values.

Screws from M 39 in qualities 4.6, 5.6, 6.9, 8.8, 10.9 and 12.9 are not standardised.

Please note:
Manual socket wrenches are unsuitable for use on impact drivers and may cause accidents.

GEDORE

Key widths and thread diameter

	M					Key Width Across Flats		Thread ø Diameter of Thread							Thread ø Diameter of Bolts		Key Width Across Flats	
								Unified Standard		America. National Standard Ansi B 18.2.1…1972 Ansi B 18.2.2…1972								
										Nuts			Bolts + Screws					
mm	Germany (BRD) metric in accordance with DIN ISO 272	France NFE 27…311 (69) 27…411 (69)	Sweden 2164…1967 and ISO SMS 2175…1971	Metric for carbide fasteners in accordance with DIN 6914…6915	"AF	Inches, inches	mm	Normal Series BS 1768	Heavy Series BS 1769	**Square Bolt,** Hex Bolt Hex Cap Screw (Finished Hex Bolt) Lag Screw	Heavy Hex Bolt Heavy Hex Screw Heavy Structural Bolt	**Hex Flat,** Hex Flat Jam Hex, Hex Jam, Hex Slotted Hex Thick, Hex Thick Slotted Hex Castle	**Heavy Square,** Heavy Hex Flat, Heavy Hex Flat Jam, Heavy Hex, Heavy Hex Jam, Heavy Hex, Slotted	Square Nut	Thick	BS 916 1083	Inches, inches	mm
2.5	1																	
3	1.4u1.2																	
3.2																		
4	2		2 u. 2.2		**5/32**	0.1562	3.97								**8 BA**		0.152	3.86
4.5	2.3														**7 BA**		0.172	4.37
5	2.5		2.5		**3/16**	0.1875	4.7								**6 BA**		0.193	4.90
5.5	3	3	3 u. 3.5		**7/32**	0.2187	5.56								**5 BA**		0.220	5.59
6	3.5	3.5			**1/4**	0.2500	6.35								**4 BA**		0.248	6.30
															1/16 W		0.256	6.90
7	4	4	4 u. 4.5		**9/32**	0.2812	7.1								**3 BA**		0.282	7.16
							4			No. 10					**3/32 W**		0.297	7.54
7+ 8	5	5	5		**5/16**	0.3125	7.9								**2 BA**		0.324	8.23
9	5 Alt				**11/32**	0.3438	8.7								**1/8 W**	(3/16)	0.340	8.64
					3/8	0.3750	**9**.52								**1 BA**		0.365	9.27
8+10	6	6	6		**13/32**	0.4062	10.32			1/4*					**0 BA**	(7/32)	0.413	10.49
11	7	7	7		**7/16**	0.4375	11.1	1/4		1/4		1/4		1/4	**3/16 W**	1/4	0.445	11.30
12							1											
10+13	8	8	8		**1/2**	0.5000	12.70	5/16		5/16		5/16	1/4		**1/4 W**	5/16	0.525	13.34
14*	8 Alt				**9/16**	0.5625	14.29	3/8		3/8		3/8	3/8	5/16				
15	10 KFZ				**19/32**	0.5938	15.08								**5/16 W**	3/8	0.600	15.24
16					**5/8**	0.6250	15.88	7/16		7/16				3/8				
13+15+17	10	10	10		**11/16**	0.6875	17.46	7/16				7/16	3/8					
18															**3/8 W**	7/16	0.710	18.03
15+18+19	12	12	12		**3/4**	0.7500	19.05	1/2		1/2		1/2	7/16	7/16				
20*					**25/32**	0.7812	19.84											
18+21					**13/16**	0.8125	20.64	9/16		9/16				1/2	**7/16 W**	1/2	0.820	20.83
22+24	14	14	14	12	**7/8**	0.8750	22.22	9/16	1/2		1/2	9/16	1/2					
23*																		
21+24	16	16	16		**15/16**	0.9375	23.81	5/8		5/8		5/8	9/16		**1/2 W**	9/16	0.920	23.37
25*+27					**1.**	1.0000	25.40							5/8				
26*																		
27	18	18	18	16	**1.1/16**	1.0625	26.99		5/8		5/8		5/8		**9/16 W**	5/8	1.010	25.65
27+28*+30															**5/8 W**	(11/16)	1.100	27.94
					1.1/8	1.1250	28.58	3/4		3/4		3/4		3/4				
27+30+34	20	20	20		**1.3/16**	1.1875	30.16								**11/16 W**	3/4	1.200	30.48
32+36+41	22	22	22	20	**1.1/4**	1.2500	31.75		3/4		3/4		3/4					
					1.5/16	1.3125	33.34	7/8		7/8		7/8		7/8	**3/4 W**	7/8	1.300	33.02
34	22				**1.3/8**	1.3750	34.92								**13/16 W**	(15/16)	1.390	35.31
36+41	24	24	24	22	**1.7/16**	1.4375	36.51		7/8		7/8		7/8					
38*					**1.1/2**	1.5000	38.10	1.		1.		1.		1.	**7/8 W**	1.	1.480	37.59
41+46	27	27	27	24	**1.5/8**	1.6250	41.28		1.		1.		1.		**1. W**			
					1.11/16	1.6875	42.86	1.1/8		1.1/8		1.1/8		1.1/8		1.1/8	1.670	42.42
					1.3/4	1.7500	44.45											
46+50	30	30	30	27	**1.13/16**	1.8125	46.04		1.1/8		1.1/8		1.1/8		**1.1/8 W**	1.1/4	1.86	47.24
					1.7/8	1.8750	47.62	1.1/4		1.1/4		1.1/4		1.1/4				
50+55	33	33	33		**2.**	2.0000	50.80		1.1/4		1.1/4		1.1/4					
					2.1/16	2.0625	52.39	1.3/8		1.3/8		1.3/8		1.3/8	**1.1/4 W**	1.3/8	2.050	52.07
55+60	36	36	36		**2.3/16**	2.1875	55.56		1.3/8		1.3/8		1.3/8					
					2.1/4	2.2500	57.15											
60+65	39	39	39		**2.3/8**	2.3750	60.32	1.1/2	1.1/2	1.1/2	1.1/2	1.1/2	1.1/2	1.1/2	**1.3/8 W**	1.1/2	2.220	56.39
					2.7/16	2.4375	61.91			1.5/8					**1.1/2 W**	1.5/8	2.410	61.2
65	42	42	42		**2.9/16**	2.5625	65.09				1.5/8		1.5/8		**1.5/8 W**	1.3/4	2.580	65.53
					2.5/8	2.3750	66.68	1.3/4		1.3/4								
70	45	45	45		**2.3/4**	2.7500	69.85		1.3/4		1.3/4		1.3/4		**1.3/4 W**	2.	2.76	70.1
					2.13/16	2.8125	71.44			1.7/8								
75	48	48	48		**2.15/16**	2.9375	74.61				1.7/8		1.7/8					
					3	3.0000	76.20	2.		2.					**(1.7/8 W)**			76.7
80	52	52	52		**3.1/8**	3.1250	79.38		2.		2.		2.			2.1/4	3.150	80.01
85	56	56	56		**3.3/8**	3.3750	85.72			2.1/4					**2. W**			
90	60	60	60		**3.1/2**	3.5000	88.90				2.1/4		2.1/4			2.1/2	3.550	90.17
95	64	64	64		**3.3/4**	3.7500	95.25			2.1/2								
					3.7/8	3.8750	98.42				2.1/2		2.1/2			2.3/4	3.890	98.81
100	68	68	68															
105	72	72	72		**4.1/8**	4.1250	104.78			2.3/4						3.	4.180	106.17
110	76	76	76		**4.1/4**	4.2500	107.95				2.3/4		2.3/4					
115	80	80	80		**4.1/2**	4.5000	114.30			3.						3.1/4	4.530	115.06
120	85	85	85		**4.5/8**	4.6250	117.48				3.		3.					
125					**4.7/8**	4.8750	123.82			3.1/4						3.1/2	4.850	123.19
					5.	5.0000	127.00						3.1/4					
130	90	90	90		**5.1/4**	5.2500	133.35			3.1/2			3.1/2			3.3/4	5.180	131.57
135	95	95	95		**5.3/8**	5.3750	136.52						3.1/2					
140					**5.5/8**	5.6250	142.88			3.3/4			3.3/4			4.	5.550	140.97
145	100	100	100		**5.3/4**	5.7500	146.05						3.3/4					
150	105	105	105		**6.**	6.0000	152.40			4.			4.					
155	110	110	110		**6.1/8**	6.1250	155.58						4.			4.1/2	6.380	162.05
160																		
165	115	115	115															
170	120	120	120															
175*	ø																	
180	125																	
185	130																	
200	140																	
210	150																	

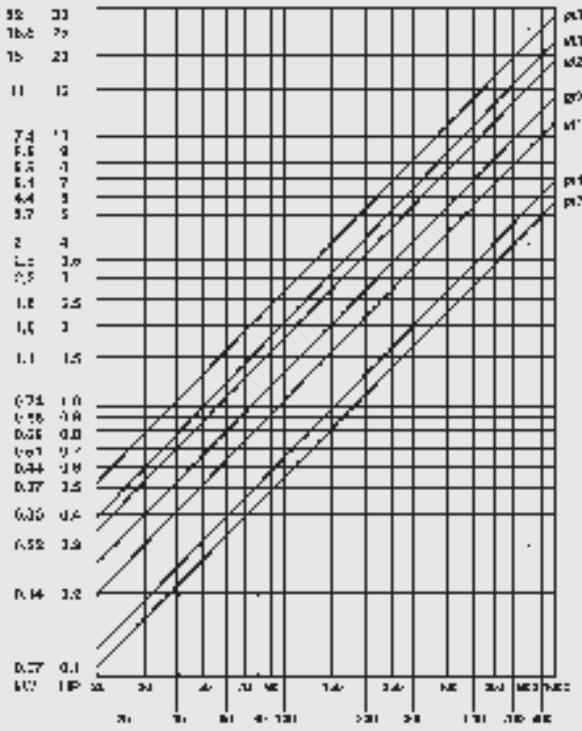
*** not standardised**

Technical Specifications for Scratch Brushes

Circumferential speeds

min^{-1}	Diameter in mm								
	20	40	50	80	100	125	150	180	200
800				3.35	4.19	5.23	6.28	7.53	8.37
900			2.35	3.77	4.71	5.88	7.06	8.48	9.41
1.150			3.01	4.81	6.01	7.52	9.02	10.83	12.03
1.200	1.26	2.51	3.14	5.02	6.28	7.85	9.41	11.30	12.55
1.400	1.46	2.93	3.66	5.86	7.32	9.15	10.98	13.18	14.64
1.500	1.57	3.14	3.92	6.28	7.85	9.81	11.77	14.13	15.69
1.800	1.88	3.77	4.71	7.54	9.41	11.77	14.12	16.95	18.83
2.000	2.09	4.19	5.23	8.37	10.26	13.08	15.69	18.84	20.92
2.500	2.62	5.23	6.54	10.47	13.08	16.35	19.61	23.55	26.15
2.800	2.93	5.86	7.32	11.72	14.64	18.31	21.97	26.37	29.29
3.000	3.14	6.28	7.85	12.56	15.69	19.62	23.54	28.26	31.38
3.200	3.35	6.70	8.37	13.40	16.74	20.92	25.10	30.14	33.47
3.500	3.66	7.33	9.15	14.65	18.31	22.89	27.46	32.97	36.61
4.000	4.19	8.37	10.46	16.75	20.92	26.16	31.38	37.68	41.84
4.500	4.70	9.42	11.77	18.84	23.54	29.43	35.30	42.40	47.07
5.000	5.23	10.47	13.08	20.93	26.15	32.70	39.23	47.10	52.33
5.400	5.65	11.30	14.12	22.94	28.24	35.31	42.36	50.67	56.48
6.000	6.28	12.56	15.69	25.12	31.38	39.24	47.07	56.52	62.76
7.000	7.33	14.66	18.31	29.31	36.61	45.78	54.92	65.94	73.22
8.000	8.37	16.75	20.92	33.94	41.48	52.32	62.76	75.36	83.73
9.000	9.42	18.84	23.54	37.68	47.07	58.86	70.61	84.78	94.20
10.000	10.47	20.93	26.17	41.86	52.33	65.40	78.50	94.20	
12.500	13.08	26.17	32.71	52.33	65.42	81.75	98.13		
15.000	15.70	31.40	39.25	62.80					
17.500	18.32	36.63	45.79	73.26					
20.000	20.93	41.87	52.33	83.73					
22.500	23.55	47.10	58.88	94.20					
25.000	26.17	52.33	65.42	104.66					

Power consumption guide values for scratch brushes



→ Working width in mm

Comparison Table Swiss Cut/German Cut

Precision files 4″/100 mm – 8″/200 mm

Swiss cut	**00**	**0**	**1**	**2**	**3**	**4**	**5**	**6**
Number of cuts/teeth per cm	**16**	**20**	**25**	**31**	**38**	**46**	**56**	**68**
= German cut								
For files 4″/100 mm	1	–	2	3	–	4	5	6
For files 5″/125 mm	1	2	–	3	–	4	5	6
For files 6″/150 mm	1	2	3	–	4	5	6	8
For files 8″/200 mm	1	2	3	4	–	5	6	8

Swiss cut	**00**	**0**	**1**	**2**	**3**	**4**
Number of cuts/teeth per cm	**12**	**16**	**20**	**25**	**31**	**38**
= German cut						
For files 10″/250 mm	1	2	3	–	4	5

Needle files

Swiss cut	**00**	**0**	**1**	**2**	**3**	**4**
Number of cuts/teeth per cm	**20**	**25**	**31**	**38**	**46**	**56**
= German cut	00	1	2	3	4	5

Tool Grinding Wheels

Structure of the abrasive wheel

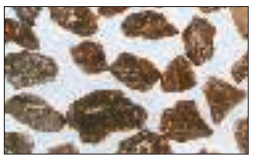
Grinding wheels
A grinding wheel comprises abrasive, bond and air voids. The abrasive is the actual tool, the bond serves to retain the tool. To be able to evaluate the characteristics of a grinding wheel, one has to take into account the grain size of the abrasive and the volume of the bond (degree of hardness) The symbols of the grinding wheel types are in accordance with international standards.

Abrasive
4 groups of synthetic abrasives are used:

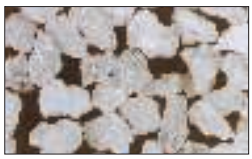
1. **Corundum (aluminium oxide)**
2. **Silicium carbide**
3. **Diamond**
4. **Boron nitride**

Generally speaking, corundum is suitable for high-tensile material such as steel, forged iron malleable cast iron. Silicium carbide is the proven agent for low-tensile material such as cast iron, copper, natural stone, solid carbide, etc. Diamond is today used for grinding solid carbides. Boron nitride, a new and effective abrasive has been developed for high-alloy steel.

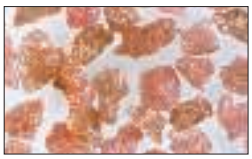




NK = normal corundum, high toughness



EK = special fused alumina, white, very hard and brittle



EKD = special fused alumina, pink, very hard, higher grain toughness than EK



SCg = SiC, green, extremely hard and brittle



KA bzw. ..Z = zirkonic corundum, very high mechanical strength

Hardness and Heat Resistance

Abrasive	Hardness kp/mm²	Heat resistance °C	For grinding applications
Diamond	7,000	650	Solid carbide, ceramics and other short-chipping materials
Boron nitride	4,700	1,400	High-speed steel with a tensile strength from 500 to 2,000 k.p/mm²
Silicium carbide	2,500	1,200	Grey cast iron, austenitic stainless steel (solid carbide grinding block)
Corundum (Aluminium oxide)	2,100	2,000	Steel, cast steel, non-ferrous metals

Each main group of grinding wheels also comprises special types with slightly different features. Firstly, one should know the main differences and the applications they are most suitable for.

Order details:

In order to evaluate the requirements for a certain type of grinding and to select the appropriate grinding wheel, a fine tuning of grinding wheel, workpiece, the selected process, working conditions are needed and the requirements for the specific grinding application should be known.

The following details are therefore required:

For first orders:

Form and dimension of the abrasive wheel, in case of special profiles and shapes add a sketch. Details about the **workpiece** to be ground including material, e.g. steel hardened or unhardened, grey cast iron, bronze, solid carbide, etc. and details about shape and size of the workpiece and of the surfaces to be ground. Sometimes it is also relevant to define additives, etc.

Selected **finishing** (grinding) **process**, e.g. free-hand grinding or machine grinding (surface grinding, internal grinding, cylindrical grinding surface, etc.). Available grinding machines, type, condition of machine (setting), speed or circumferential speed of the wheel, type of feed, information whether longitudinal or in-feed grinding is used, also important to know is how the dressing or re-profiling of the grinding wheel is effected. Information on dry or wet grinding, type of coolant. What are the specific requirements, e.g. abrasion result, surface quality, high dimensional accuracy, cool grinding required (otherwise risk of cracks or “soft skin” feature).

The question is therefore:

What is ground and how is the grinding effected, where (on which machine) is the grinding performed, what are the specific requirements for the wheel? Ask for expert advice.

In order to be able to evaluate your specific grinding requirements, we need to know your specific circumstances or operating conditions which deviate from the standard condition. Knowledge about the grinding wheel you were satisfied with will also be helpful or, if available, let us have a sample or a left-over part.

For repeat orders:

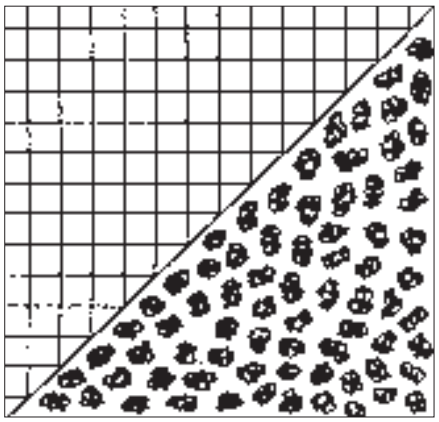
Briefly indicate the previous supply while adding a label with the data of the previously purchased abrasive wheel including details on quality and dimensions.

Tool Grinding Wheels

Grain size

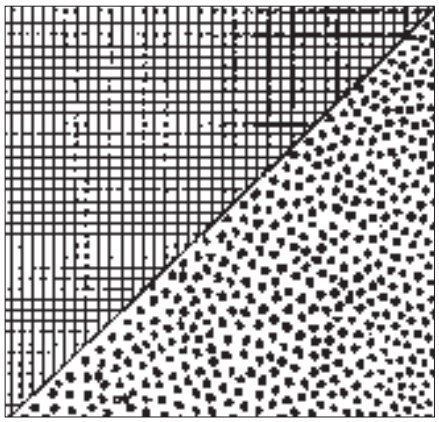
Grain sizes are indicated with a number ranging from 8 (rather coarse) to 400 (very fine) according to the international sieve classification.

Sieve with 8 meshes/inch



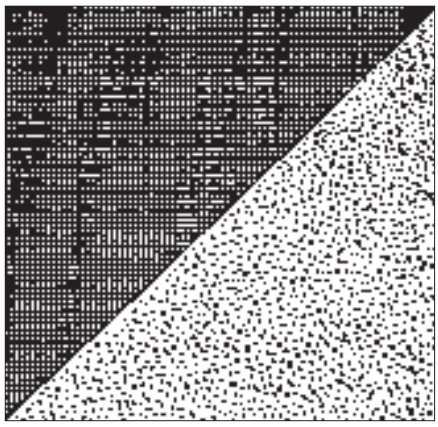
Grain Size: 8

Sieve with 24 meshes/ inch



Grain Size: 24

Sieve with 60 meshes/ inch



Grain Size: 60

The abrasive is melted in an electric melting furnace. The abrasive blocks are then broken and by sieving split into the above grain sizes. The respective grain size is determined by the number of meshes per inch in the sieve through which the grain passed. For example, an abrasive which passes through a sieve with 8 meshes per inch but remains on the next sieve with 10 meshes is classified as grain size 8. The illustrations above show grain size 8, 24 and 60.

Very fine grains (mesh 280–1,200) are determined according to a photo-sediment method.

Coarse	Medium	Fine	Very fine
8	30	80	180
10	36	90	220
12	46	100	240
14	54	120	280
16	60	150	320
20	–	–	400
24	–	–	–

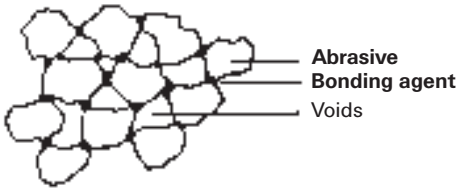
Generally speaking, by doubling the grain number, the mean diameter of the grain will almost be halved. However, the number of grains in each surface area of the grinding tool is approx. 4 times larger in this case.

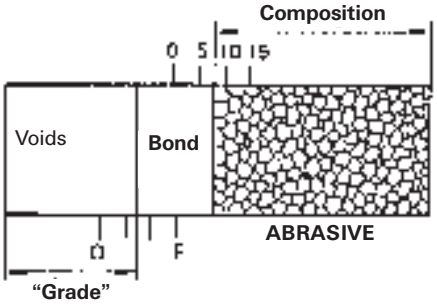
In principle:
Coarse grains for higher abrasion, larger workpieces, softer material, larger contact faces.

Finer grains for greater surface evenness, smaller workpieces, harder material, smaller contact areas.

Hardness and Composition

Below is an example of a quality grade shown on a ceramic grinding tool. The principle structure of a ceramic grinding tool. Grinding wheels of diverse hardness are manufactured, i.e. the grains are bonded in various compositions at different toughness. The bonding strength is mainly changed by varying the quantity of the bonding agent. The most important method to enhance the bonding strength is by increasing the quantity of the bonding agent, while the air voids are simultaneously reduced. This is called: enhancing the grade of the wheel. Letters signify the grade. The quantity of the bonding agent can be increased by reducing the amount of abrasive. The composition is indicated with numbers. The ratio of bonding agent quantity, amount of voids and abrasive is shown in this figure. The first letters in the alphabet indicate that the wheels are very soft (C, D, E), while the letters at the end of the alphabet (T, U, V) indicate that the wheels are very hard. The strength of the grinding wheel is, among others, dependent on the grain size.





Letters indicate the grade as follows:

Very soft	C D E F G
Soft	H I J K
Medium	L M N O
Hard	P Qu R S
Very hard	T U W Z

Common grain sizes for tool grinding (abrasive block)

Special fused alumina (EK)	grain 046	hardness M/K
	grain 060	hardness M/K
	grain 080	hardness L/K

Common grain sizes for solid carbide (abrasive block)

Silicium carbide (SC)	grain 046/60	hardness Jot
	grain 080	hardness Jot
	grain 100/120	hardness Jot

Common grain sizes for rough grinding

Normal corundum (NK)	grain 024	hardness Q
	grain 036	hardness P

Order example: Grinding wheel special fused alumina

Diameter x width x bore hole
(if required dimension of recess width x depth
Grain size x hardness x abrasive x bond

Dimensions	Grain	Hardness	Abrasive	Bond
300 x 40 x 76 (A. 130 x 20)	46	M	EK	Ceramic

Handling of Individual Dressing Diamonds



Unused
before use



Stop!
Intervene now



Too late!
Diamond lost



Pitch 5–12
Setting
Max 0.02–0.05 mm



Max. 0.5–1.5 mm
Width of working
edge



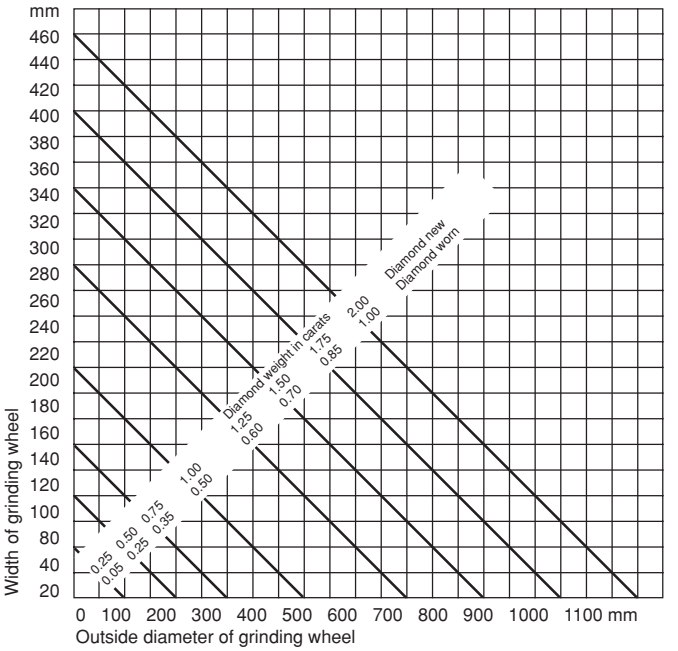
Turn 90°,
new cutting
edge obtained

Further, please note:
– dresser, lateral feed
0.05–0.2 mm/h

– sufficient continuous
cooling

– protect the diamond
at all times from impact
and shock

Economical dressing with individual diamonds starts with the selection of the right sized diamond in relation to the diameter and width of the grinding wheel.



Notes

Grinding Points

PFERD quality, certified to DIN ISO 9001

Applications: PFERD polishing points distinguish by their constant, superior chipping efficiency and long service life while achieving high surface quality of the workpiece. Polishing points matching the respective application are chosen from a broad spectrum of grain types, grain sizes and hardness grades, featuring high dimensional stability and tolerance.

The precise concentricity of PFERD polishing points
- reduces the risk of health hazards for the user
- is gentle to drive units
- allows smooth operation
- prevents chatter marks
- reduces wear.

The grain types and hardness grades recommended for various materials are shown in the list below.
We distinguish between **edge and flat surface grinding.**

Recommendations for optimising the selection of polishing points.

	Edge finishing/ robust use	**Flat surface grinding/ universal use**
Recommended:	Hard bond	Soft bond
Hardness:	N, O, R, T	L, H, I, J, K, M
Advantage:	Premium edge stability, long life, less tool wear	Premium abrasion output, short grinding time, low labour costs
Conclusion:	Economical solution of the grinding task: edge grinding and robust use at low-speed driving machines in relation to the tool ∅ = saving of costs.	Costs incurred through higher tool consumption are more than compensated by saved labour costs = saving of costs.
Precondition:		Higher input speed in relation to the tool ∅.

Material properties	Poor thermal conductivity				Soft	
Polishing point bonding	Hard				Hard	
Bond (Resin, ceramics)	Resin-bonded polishing points		Ceramic-bonded polishing points			
Abbr. grain type	AN		ADW		AR	
Abrasive grain type	Normal corundum		Corundum blend		Special fused alumina	
Colour abrasive wheel	Brown		Red/white		Pink	
Behaviour	Long service life		Versatile use, good grinding result		Dimensional stability, edge stability, universal	
Hardness	N		M		O	
Required input speed	Low + Medium		Medium		Low	
Recommended circumferential speed	30–40	20–30	30–40	20–30	25–40	15–25
Definition of grind speed in relation to polishing point (acc. to Fig. page 8/19)						
Edge grinding (K) / flat surface grinding (F)	K	F	K	F	K	F
Steel						
Unalloyed steel	❍	●	❍	●	●	●
Structural steel	❍	●	❍	●	●	●
Tool steel	●	●	●	●	●	❍
Rapid cutting steel	●	●	●	●	●	❍
Stainless steel						
Rust and acid-proof steel	●	●	❍	●	❍	
High-alloy stainless steel	●	●	●	❍	❍	
Cast material						
Cast steel, general	●	●	❍	❍	❍	
Cast steel, high-alloy	●	●	●	❍	●	
Grey-cast iron	●	●	●	●	❍	
Spheroidal graphite cast iron	●	●	●	❍	❍	
Non-ferrous metal						
Aluminium	❍		●	●		
Copper	●	❍	●			
Brass, bronze	●	❍	●			
High-temperature resistant Ni-Co alloy	●	❍				
Titanium, titanium alloy		❍	❍			
Others						
Plastics, soft			❍			
Rubber						
Plastics, hard, glass-fibre reinforced plastics						
Wood						
Glass, ceramics						
Solid carbide						
Build-up weld						

Definition of types: ● perfectly suitable
❍ suitable

Safety Instructions – Polishing Points

Safety Instructions: All PFERD polishing points are designed for a cicumferential speed of maximum 50 m/s (DSA no. 287 and 288). The so-called turned-down speed is dependent on the following factors:

- Shape and dimension of the polishing point
- Diameter of the steel shank
- Open shank length L_o (see sketch)

The maximum speeds for various shank lengths and shank diameters are defined in EN 12413 **(DIN 69170)**. They are to be observed by all means to prevent the shank from bending. The speeds for L_o of 10, 15, and 20 mm of the respective polishing point are indicated on each packing unit of PFERD polishing points. Irrespective of the length of the shank, the collet of the machine must get hold of at least 10 mm of the shank (see sketch L_3). Ensure good concentricity and accurate clamping function.

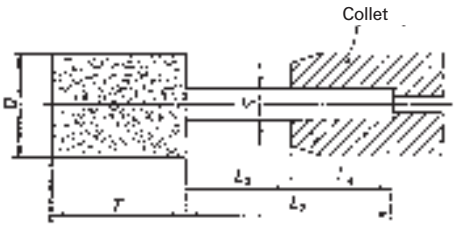
Safety recommendations:



Wear safety goggles!

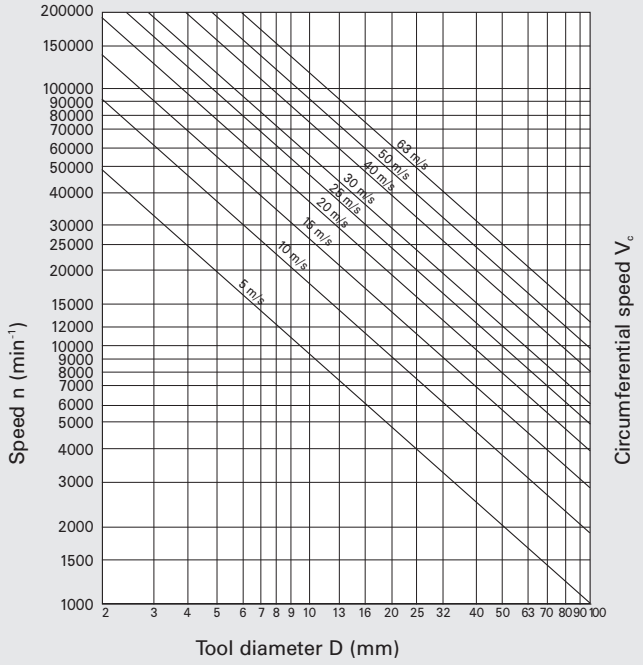


Wear ear protection
in case of high noise!



Tables with the permitted maximum speeds for the entire PFERD polishing point range can be obtained on request.

Recommended circumferential speeds for polishing points and abrasive wheels



Hardness	Recommended circumferential speed
M	20–40 m/s
N	20–40 m/s
O	15–40 m/s

We recommend these circumferential speeds for the specified hardness.

Please observe the speeds indicated on the note included in the package.

Circumferential speeds are depicted by blue diagonal straight lines.

The vertical line for the relevant tool diameter meets the defined circumferential speed (diagonal). The respective speed for grinding tool and machine is indicated in min^{-1} on the left edge of the horizontal line.

Example:

- Polishing point ∅ 20 mm.
- Recommended circumferential speed for hardness O = 15–40 m/s
- From the table you take the speed: 14,000–38,000 min^{-1}

Lower circumferential speeds are recommended for **material which is difficult to chip**, since they increase the grinding performance of the polishing point. A broad range of grain types of different hardness allow optimisation of all grinding work.

List of DIN Standards

DIN	ISO	Page	Article
1		9/10	Athermal Protective Lenses
9		1/82-83	Pin Reamers, Hand Taper Reamers
133		5/80	Open End Slugging Spanners
206 B		1/82	Hand Reamers
208 B/C		1/85–86	Machine Reamers
212 B/D/E		1/85–87	Machine Reamers
217		1/84	Shell Holders for Reamers
219		1/84	Shell Reamers
229/230		4/53	Morse Taper Gauges
238		3/23	Drill Arbours
311		1/84	Bridge Reamers
317		3/24	Drill Drifts
327		2/12	3 Flute Slot Drills
327 D		2/9	2 Flute Slot Drills
333 A		1/34	Centre Drills
333 B		1/35	Centre Drills
333 R		1/34	Centre Drills
334 C		1/71	Countersinks
335 C		1/68–70	Countersinks
335 D		1/71	Countersinks
338		1/12–21, 41, 109	Drills, Parallel Shank
340		1/22–23	Drills, Parallel Shank, Long
341		1/28	Bushing Drills
343		1/27	Core Drills with Morse Taper Shank
345		1/25–27	Morse Taper Shank Drills
352		1/103–104, 109, 111	Hand Taps
357	26H	1/122	Machine Taps
371	26H	1/114–122, 132	Machine Taps
373		1/66–67	Counterbores
374	26H, 26HX	1/123–127, 133	Machine Taps
376	26H, 26HX	1/114–121, 132	Machine Taps
377		1/141	Tap Extension Bars
382		1/135–136	Die Nuts
403		2/94–96	Knurl Wheels
508		3/78	T-slots
787		3/76	T-bolts
806		3/18	Lathe centres
838	3318/1085/10104	5/78	Double-ended ring wrenches
842 A		2/8	Single Angle Milling Cutters
844 B		2/27	Ball Nose Cutters
844 K + L		2/10, 13–24, 29	End Mills
847		2/8	Double Equal-angle Milling Cutters
850 D		2/25	Woodruff Cutters
851 AB		2/25	T-slot Cutters
855		2/7	Milling Cutters
856		2/7	Milling Cutters
859		1/82	Adjustable Hand Reamers
861	3650	4/48–50	Gauge Blocks
862		4/2–6, 8–9, 11–12, 15–17, 84	Calliper Gauges
863		4/17, 19–24, 27–28	Micrometers
866		4/77	Steel Rules
874		4/77–78	Precision Rules
875		4/18, 62-65	Squares
876		4/45, 49	Granite Surface Plates
878		4/29–30	Dial Gauges
885 A		2/6	Side and Face Milling Cutters
894		5/72	Single Open End Wrenches
895		5/72	Metric Open End Wrenches

	DIN	ISO	Page	Article
	896 B	2236/1085	5/83	Double Socket Wrenches
	900		5/71, 84	Tommy Bars
	911	2936	5/88–90	Hexagon Screwdrivers
	911 L	2936 L	5/90, 92	Hexagon Screwdrivers, Long
	1041		6/109	Machinist's Hammer
	1042		6/110	Sledge Hammers
	1283		9/27	Hand-lever Grease Guns
	1544		4/58	Metal Foils, Steel
	1810 A		5/86	Nose Wrenches
	1810 B		5/86	Pin Wrenches
	1814		1/140	Adjustable Tap Wrenches
	1833 C/D		2/26	Dovetail Cutters
	1834 A		2/7	Side and Face Milling Cutters
	1837/1838		2/62–63	Metal Circular Saw Blades
	1840		2/65	HSS Circular Saw Blades
	1869		1/23–24	Extra-long Series Drills, Morse Taper
	1870		1/29	Extra-long Series Drills, Morse Taper
	1880		2/5	Shell End Mills
	1889 K		2/28	Ball-nose Multi-flute Cutters
	1897		1/9–11	Stub Drills
	1898 A		1/24	Taper Pin Hole Drills
	1899 A		1/8	Micro Drills
	2079		4/53	Steep Taper Plug Gauges
	2080		4/53	Steep Taper Sleeve Gauges
	2084		3/52	Milling Arbour Rings
	2179		1/83	Machine Taper Reamers
	2181		1/105–106	Hand Taps
	2184		1/106–108	Hand Taps
	2185		3/23	Drill sleeves
	2187		3/23	Extension sleeves
	2245		4/51	Limit Plug Gauges
	2250 C		4/51	Setting Ring Gauges
	2270		4/36	Lever Dial Gauges
	2280–2299		4/52–53	Thread Gauges
	3110	3318/1085	5/70–71	Metric Open End Wrenches
	3113 A		5/73–75	Combination Wrenches
	3113 B		5/75	Combination Wrenches
similar to	3116		5/86	Two-hole Nut Twisters, Adjustable
	3117 A		5/85	Adjustable Single End Open Wrenches
	3118		5/82	Open Double End Ring Wrenches
	3119	6788	6/133	Four-way Socket Wrenches
	3123 A	3316	6/6	T-handle with Slide
	3123 B	3316	6/6, 12	Extensions
	3123 C	3316	6/12	Universal Joints
	3123 E	3315	6/7	Square Handles
	3124	2725	6/7, 13	Socket Bits
	3129		6/40–43	Socket Bits
	4951		2/85	Lathe Tools
	4952		2/85	Lathe Tools
	4953		2/86	Lathe Tools
	4954		2/86	Carbide Lathe Tools
	4955		2/86	Carbide Lathe Tools
	4956		2/86	Carbide Lathe Tools
	4960		2/87	Carbide Lathe Tools
	4961		2/87	Carbide Lathe Tools
	4963		2/87	Carbide Lathe Tools
	4964	5421	2/82–83	Tool Bits Form A + B + D
	4965		2/87	Lathe Tools

List of DIN Standards

	DIN	ISO	Page	Article
	4971	1	2/88	Carbide Lathe Tools
	4972	2	2/88	Carbide Lathe Tools
	4973	8	2/89	Carbide Lathe Tools
	4974	9	2/89	Carbide Lathe Tools
	4975	10	2/89	Carbide Lathe Tools
	4976	4	2/89	Carbide Lathe Tools
	4977	5	2/89	Carbide Lathe Tools
	4978	3	2/90	Carbide Lathe Tools
	4980	6	2/90	Carbide Lathe Tools
	4981	7	2/90	Carbide Lathe Tools
	5108		6/111	Brick Hammers
	5109		6/111	Brick Hammers
	5111		6/109	Handles for Machinist's Hammers
similar to	5130		6/114	Copper Hammers
	5156		1/128–129	Machine Taps
	5157		1/107	Hand Taps
	5234 A		7/23	Pipe Wrenches
	5234 B		7/23	Corner Pipe Wrenches
	5235		5/20	Adjusting Pliers
	5254		5/28, 30	Internal Circlip Pliers
	5256		5/28–30	External Circlip Pliers
	5745		5/17–22, 27	Mechanic's Pliers
	5746		5/14–16, 27	Combination Pliers
	5749		5/24–27	Diagonal Side Cutting Pliers
	6314		3/84	Clamps
	6315 B		3/84	Clamps
	6316		3/84	Clamps
	6318		3/86	Stepped Jack
	6319		3/80	Spherical Washers and Conical Seats
	6323		3/79	Slot Tenons
	6328		3/24	Clamping Sleeves
	6330 B		3/79	Hexagon Nuts
	6331		3/79	Hexagon Nuts
	6335		6/94	Rivet Head Formers
	6340		3/80	Washers
	6350		3/2–3	Lathe Chucks
	6379		3/77	Studs
	6434		6/122	Rivet Setters
	6450		6/120	Pin Punches
	6451		6/118	Crosscut Chisels
	6453		6/118	Flat Chisels
	6458		6/120	Drift Punches
	6475		6/111	Club Hammers
	6499 A		3/52	Collets
	6499 B	15488	3/42, 50–52	Collets
	6518 B		2/26	Corner Rounding Cutters
	6527 K + L		2/40–56, 58	Solid Carbide End Mills
	6537		1/45, 49	Solid Carbide Jobber Drills
	6539		1/41	Solid Carbide Jobber Drills
	6911		5/94	Hexagon Screwdrivers
	7162/7163		4/51	Double Side Gap Gauges
	7200 A		7/18–19	Wad Punches
	7239 C		6/112	Roofing Hammers
	7254 A		6/118	Flat Chisels, Flattened Oval
	7254 B		6/118	Mason Chisels, Octagonal
	7255		6/119	Car Body Chisels
	7256		6/118	Pointed Mason Chisels
	7261 A		6/95	Flat Files

DIN	ISO	Page	Article
7261 C		6/95	Three-square Files
7261 D		6/95	Square Files
7261 E		6/96	Half-round Files
7261 F		6/96	Found Files
7261 G		6/97	Knife Files
7261 H		6/97	Lathe Files
7262 A		6/98	Saw Files
7262 F		6/98	Mill Saw Files
7263 A		6/99	Flat Wood Rasps
7263 C		6/99	Half-round Wood Rasps
7263 E		6/99	Round Wood Rasps
7264 A		6/99	Flat Milled Tooth Files
7264 F		6/99	Half-round Hollow Milled Tooth Files
7283		6/97	Key Files
7444		5/80	Slugging box spanners
8032/8033		8/40–46	Carbide burrs
8037		1/40	Carbide Tipped Drills
8093		1/88	Carbide Machine Reamers
8094		1/89	Carbide Machine Reamers
8350 A		6/106	Flat Scrapers
8350 C		6/106	Three-square Scrapers
8513		9/8	Brazing Solder
8976		5/63–65, 7/20–22	Water Pump Pliers
9242		5/14	Construction Pliers
9243		5/14	Carpenter's Pliers
9654		5/31–34	Electrician's Diagonal Side Cutting Pliers
9655		5/35	Electrician's Gripping Pliers
13157		9/45	First Aid Kit
22417		5/83	Three-square wrenches
22568		1/133, 134–137	Cutting Dies
24231		1/134	Cutting Dies
40432		1/131	Machine Taps
40434		1/136	Cutting Dies
55022		3/7	Short Taper Cast Iron Flanges
55027		3/2–3, 7–8	Short Taper Cast Iron Flanges
55029		3/3, 7–8	Short Taper Cast Iron Flanges
69880		3/12–14, 59	NC Tool Holders
69893 A		3/59	Quick-change Chucks

Catalogue prices in EUR

Part No.	€
1001 0020	1,83
1001 0030	1,31
1001 0040	1,07
1001 0050	0,85
1001 0060	0,82
1001 0070	0,79
1001 0080	0,76
1001 0090	0,71
1001 0100	0,79
1001 0110	0,69
1001 0120	0,79
1001 0130	0,68
1001 0140	0,71
1001 0150	0,63
1001 0160	0,58
1001 0170	0,63
1001 0180	0,58
1001 0190	0,58
1001 0200	0,44
1001 0210	0,58
1001 0220	0,54
1001 0230	0,54
1001 0240	0,60
1001 0250	0,60
1001 0260	0,58
1001 0270	0,58
1001 0280	0,63
1001 0290	0,63
1001 0300	0,54
1001 0310	0,65
1001 0320	0,65
1001 0330	0,65
1001 0340	0,65
1001 0350	0,60
1001 0360	0,65
1001 0370	0,69
1001 0380	0,79
1001 0390	0,72
1001 0400	0,60
1001 0410	0,79
1001 0420	0,69
1001 0430	0,79
1001 0440	0,79
1001 0450	0,71
1001 0460	0,79
1001 0470	0,80
1001 0480	0,80
1001 0490	0,82
1001 0500	0,79
1001 0510	0,85
1001 0520	0,85
1001 0530	0,85
1001 0540	0,99
1001 0550	0,96
1001 0560	1,02
1001 0570	1,06
1001 0580	1,07
1001 0590	1,07
1001 0600	0,96
1001 0610	1,15
1001 0620	1,15
1001 0630	1,15
1001 0640	1,24
1001 0650	1,15
1001 0660	1,31
1001 0670	1,34
1001 0680	1,56
1001 0690	1,56
1001 0700	1,40
1001 0710	1,58
1001 0720	1,65
1001 0730	1,65
1001 0740	1,69

Part No.	€
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1001 0770	1,81
1001 0780	1,83
1001 0790	1,84
1001 0800	1,56
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1001 0870	2,41
1001 0880	2,47
1001 0890	2,57
1001 0900	2,28
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1001 0920	2,57
1001 0930	2,85
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1001 0960	2,85
1001 0970	2,85
1001 0980	3,48
1001 0990	3,48
1001 1000	2,69
1001 1020	3,42
1001 1050	3,83
1001 1080	5,01
1001 1100	4,08
1001 1120	5,09
1001 1150	4,47
1001 1180	5,76
1001 1200	5,01
1001 1220	6,71
1001 1250	5,59
1001 1280	7,51
1001 1300	6,11
1001 1320	8,02
1001 1350	7,10
1001 1380	10,32
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1001 1480	12,51
1001 1500	9,07
1001 1520	21,34
1001 1550	9,99
1001 1580	22,87
1001 1600	10,74
1002 0001	73,14
1002 0003	154,04
1002 0005	44,57
1002 0007	64,89
1002 0009	99,76
1002 0020	2,95
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1002 0040	1,81
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1002 0150	0,93
1002 0160	0,88
1002 0170	0,88
1002 0180	0,82
1002 0190	0,85

Part No.	€
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1002 0220	0,85
1002 0230	0,87
1002 0240	0,85
1002 0250	0,85
1002 0260	0,88
1002 0270	0,88
1002 0280	0,88
1002 0290	0,88
1002 0300	0,77
1002 0310	0,98
1002 0320	0,98
1002 0330	0,98
1002 0340	0,98
1002 0350	0,85
1002 0360	1,04
1002 0370	1,09
1002 0380	1,10
1002 0390	1,13
1002 0400	0,88
1002 0410	1,24
1002 0420	1,09
1002 0430	1,24
1002 0440	1,24
1002 0450	1,13
1002 0460	1,31
1002 0470	1,34
1002 0480	1,31
1002 0490	1,42
1002 0500	1,10
1002 0510	1,42
1002 0520	1,43
1002 0530	1,43
1002 0540	1,69
1002 0550	1,56
1002 0560	1,72
1002 0570	1,72
1002 0580	1,72
1002 0590	1,80
1002 0600	1,56
1002 0610	1,94
1002 0620	1,94
1002 0630	1,95
1002 0640	2,08
1002 0650	1,91
1002 0660	2,13
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1002 0680	2,57
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1002 0810	3,29
1002 0820	3,29
1002 0830	3,53
1002 0840	3,53
1002 0850	3,29
1002 0860	3,87
1002 0870	3,87
1002 0880	4,02
1002 0890	4,17
1002 0900	3,59
1002 0910	4,17
1002 0920	4,25

Part No.	€
1002 0930	4,32
1002 0940	4,32
1002 0950	4,13
1002 0960	4,69
1002 0970	4,80
1002 0980	5,04
1002 0990	5,04
1002 1000	4,32
1002 1020	5,47
1002 1050	5,56
1002 1080	7,89
1002 1100	6,44
1002 1120	8,05
1002 1150	7,02
1002 1180	9,06
1002 1200	7,89
1002 1220	10,65
1002 1250	8,82
1002 1280	11,86
1002 1300	9,69
1002 1320	12,60
1002 1350	11,14
1002 1380	16,21
1002 1400	12,60
1002 1420	18,43
1002 1450	13,31
1002 1480	19,36
1002 1500	14,52
1002 1520	24,24
1002 1550	15,50
1002 1580	26,16
1002 1600	16,95
1004 0100	1,83
1004 0110	1,78
1004 0120	1,84
1004 0130	1,73
1004 0140	1,67
1004 0150	1,54
1004 0160	1,48
1004 0170	1,48
1004 0180	1,31
1004 0190	1,37
1004 0200	1,12
1004 0210	1,32
1004 0220	1,37
1004 0230	1,37
1004 0240	1,39
1004 0250	1,84
1004 0260	1,48
1004 0270	1,48
1004 0280	1,48
1004 0290	1,48
1004 0300	1,23
1004 0310	1,54
1004 0320	1,54
1004 0330	1,58
1004 0340	1,56
1004 0350	1,39
1004 0360	1,69
1004 0370	1,78
1004 0380	1,84
1004 0390	1,91
1004 0400	1,48
1004 0410	2,02
1004 0420	1,78
1004 0430	2,03
1004 0440	2,03
1004 0450	1,84
1004 0460	2,03
1004 0470	2,08
1004 0480	2,11
1004 0490	2,25
1004 0500	1,83

Part No.	€
1004 0510	2,28
1004 0520	2,30
1004 0530	2,30
1004 0540	2,55
1004 0550	2,55
1004 0560	2,60
1004 0570	2,68
1004 0580	2,69
1004 0590	2,69
1004 0600	2,52
1004 0610	3,02
1004 0620	3,02
1004 0630	3,07
1004 0640	3,37
1004 0650	3,07
1004 0660	3,47
1004 0670	3,58
1004 0680	4,21
1004 0690	4,21
1004 0700	3,70
1004 0710	4,27
1004 0720	4,35
1004 0730	4,35
1004 0740	4,57
1004 0750	4,16
1004 0760	4,87
1004 0770	4,87
1004 0780	4,87
1004 0790	4,91
1004 0800	4,16
1004 0810	5,09
1004 0820	5,18
1004 0830	5,51
1004 0840	5,59
1004 0850	5,34
1004 0860	6,05
1004 0870	6,05
1004 0880	6,05
1004 0890	6,10
1004 0900	5,80
1004 0910	6,71
1004 0920	6,71
1004 0930	6,76
1004 0940	6,76
1004 0950	6,71
1004 0960	7,13
1004 0970	7,13
1004 0980	7,37
1004 0990	7,37
1004 1000	7,04
1004 1010	9,75
1004 1020	8,27
1004 1050	8,27
1004 1080	13,56
1004 1100	9,18
1004 1120	14,27
1004 1150	9,54
1004 1180	16,98
1004 1200	10,19
1004 1220	19,81
1004 1250	11,15
1004 1280	22,16
1004 1300	11,39
1004 1400	21,74
1004 1450	23,66
1004 1500	25,56
1004 1550	29,37
1004 1600	30,13
1005 0020	6,47
1005 0030	5,36
1005 0040	4,10
1005 0050	3,53
1005 0060	3,61

Part No.	€
1005 0070	3,24
1005 0080	3,02
1005 0090	2,98
1005 0100	2,58
1005 0110	2,65
1005 0120	2,93
1005 0130	2,76
1005 0140	2,61
1005 0150	2,41
1005 0160	2,61
1005 0170	2,68
1005 0180	2,61
1005 0190	2,68
1005 0200	2,19
1005 0210	2,82
1005 0220	2,82
1005 0230	2,82
1005 0240	2,87
1005 0250	2,32
1005 0260	2,98
1005 0270	2,98
1005 0280	2,99
1005 0290	2,99
1005 0300	2,32
1005 0310	3,02
1005 0320	2,61
1005 0330	2,65
1005 0340	3,24
1005 0350	2,58
1005 0360	3,35
1005 0370	3,35
1005 0380	3,35
1005 0390	3,61
1005 0400	2,79
1005 0410	3,61
1005 0420	3,61
1005 0430	3,61
1005 0440	3,65
1005 0450	3,61
1005 0460	3,78
1005 0470	3,84
1005 0480	3,91
1005 0490	4,02
1005 0500	3,42
1005 0510	4,02
1005 0520	4,10
1005 0530	4,13
1005 0540	4,50
1005 0550	4,82
1005 0560	4,63
1005 0570	4,63
1005 0580	4,63
1005 0590	4,63
1005 0600	4,50
1005 0610	5,12
1005 0620	5,18
1005 0630	5,18
1005 0640	5,62
1005 0650	5,06
1005 0660	5,62
1005 0670	5,62
1005 0680	6,16
1005 0690	6,16
1005 0700	5,31
1005 0710	7,32
1005 0720	7,32
1005 0730	7,32
1005 0740	7,32
1005 0750	5,72
1005 0760	8,84
1005 0770	8,84
1005 0780	8,84
1005 0790	8,84

Part No.	€
1005 0800	7,02
1005 0810	8,84
1005 0820	9,39
1005 0830	9,39
1005 0840	9,81
1005 0850	7,02
1005 0860	10,41
1005 0870	10,41
1005 0880	11,09
1005 0890	11,75
1005 0900	9,07
1005 0910	12,19
1005 0920	13,09
1005 0930	13,42
1005 0940	14,33
1005 0950	10,66
1005 0960	14,95
1005 0970	14,95
1005 0980	14,95
1005 0990	14,95
1005 1000	10,13
1005 1020	14,33
1005 1050	14,95
1005 1080	30,19
1005 1100	16,46
1005 1120	33,55
1005 1150	21,04
1005 1180	36,59
1005 1200	23,78
1005 1220	37,80
1005 1250	28,35
1005 1280	43,91
1005 1300	30,19
1007 0100	0,14
1007 0110	0,16
1007 0120	0,16
1007 0130	0,16
1007 0140	0,16
1007 0150	0,16
1007 0160	0,17
1007 0170	0,17
1007 0180	0,17
1007 0190	0,17
1007 0200	0,17
1007 0210	0,17
1007 0220	0,17
1007 0230	0,17
1007 0240	0,17
1007 0250	0,17
1007 0260	0,17
1007 0270	0,17
1007 0280	0,17
1007 0290	0,17
1007 0300	0,17
1007 0310	0,17
1007 0320	0,17
1007 0330	0,19
1007 0340	0,19
1007 0350	0,17
1007 0360	0,20
1007 0370	0,20
1007 0380	0,20
1007 0390	0,20
1007 0400	0,20
1007 0410	0,24
1007 0420	0,24
1007 0430	0,24
1007 0440	0,24
1007 0450	0,24
1007 0460	0,24
1007 0470	0,24
1007 0480	0,24
1007 0490	0,24

Catalogue prices in EUR

Part No.	€
1007 0500	0,24
1007 0510	0,27
1007 0520	0,27
1007 0530	0,27
1007 0540	0,27
1007 0550	0,27
1007 0560	0,28
1007 0570	0,28
1007 0580	0,28
1007 0590	0,28
1007 0600	0,28
1007 0610	0,33
1007 0620	0,33
1007 0630	0,33
1007 0640	0,33
1007 0650	0,33
1007 0660	0,38
1007 0670	0,38
1007 0680	0,38
1007 0690	0,38
1007 0700	0,38
1007 0710	0,46
1007 0720	0,46
1007 0730	0,46
1007 0740	0,46
1007 0750	0,46
1007 0760	0,55
1007 0770	0,55
1007 0780	0,55
1007 0790	0,55
1007 0800	0,55
1007 0810	0,55
1007 0820	0,55
1007 0830	0,55
1007 0840	0,55
1007 0850	0,55
1007 0860	0,68
1007 0870	0,68
1007 0880	0,68
1007 0890	0,68
1007 0900	0,68
1007 0910	0,77
1007 0920	0,77
1007 0930	0,77
1007 0940	0,77
1007 0950	0,77
1007 0960	0,93
1007 0970	0,93
1007 0980	0,93
1007 0990	0,93
1007 1000	0,93
1007 1020	1,02
1007 1050	1,02
1007 1100	1,15
1007 1150	1,29
1007 1200	1,50
1007 1250	1,51
1007 1300	1,73
1007 1350	2,57
1007 1400	2,57
1007 1450	2,91
1007 1500	3,09
1007 1550	3,47
1007 1600	3,47
1010 0100	1,58
1010 0110	1,51
1010 0120	1,51
1010 0130	1,51
1010 0140	1,51
1010 0150	1,51
1010 0160	1,37
1010 0170	1,40
1010 0180	1,37

Part No.	€
1010 0190	1,37
1010 0200	1,10
1010 0210	1,31
1010 0220	1,31
1010 0230	1,31
1010 0240	1,37
1010 0250	1,12
1010 0260	1,37
1010 0270	1,40
1010 0280	1,56
1010 0290	1,56
1010 0300	1,23
1010 0310	1,56
1010 0320	1,40
1010 0330	1,40
1010 0340	1,56
1010 0350	1,48
1010 0360	1,56
1010 0370	1,58
1010 0380	1,73
1010 0390	1,73
1010 0400	1,51
1010 0410	1,73
1010 0420	1,56
1010 0430	2,11
1010 0440	2,11
1010 0450	1,89
1010 0460	2,11
1010 0470	2,11
1010 0480	2,11
1010 0490	2,11
1010 0500	2,02
1010 0510	2,28
1010 0520	2,35
1010 0530	2,35
1010 0540	2,52
1010 0550	2,30
1010 0560	2,72
1010 0570	2,72
1010 0580	2,72
1010 0590	2,72
1010 0600	2,72
1010 0610	2,72
1010 0620	2,72
1010 0630	2,96
1010 0640	2,96
1010 0650	2,79
1010 0660	3,34
1010 0670	3,37
1010 0680	3,58
1010 0690	3,58
1010 0700	3,21
1010 0710	4,43
1010 0720	4,43
1010 0730	4,43
1010 0740	4,43
1010 0750	3,67
1010 0760	4,87
1010 0770	4,87
1010 0780	4,87
1010 0790	5,69
1010 0800	4,11
1010 0820	6,05
1010 0850	4,74
1010 0880	7,10
1010 0900	5,09
1010 0920	8,00
1010 0950	6,02
1010 0980	9,26
1010 1000	6,35
1010 1020	9,61
1010 1050	7,76
1010 1100	9,26

Part No.	€
1010 1150	10,46
1010 1200	11,32
1010 1250	11,32
1010 1300	13,36
1013 0100	1,15
1013 0110	1,06
1013 0120	1,06
1013 0130	1,06
1013 0140	1,06
1013 0150	0,98
1013 0160	1,06
1013 0170	1,06
1013 0180	1,06
1013 0190	1,06
1013 0200	0,98
1013 0210	0,99
1013 0220	0,99
1013 0230	0,99
1013 0240	1,06
1013 0250	1,07
1013 0260	1,13
1013 0270	1,20
1013 0280	1,20
1013 0290	1,23
1013 0300	1,15
1013 0310	1,20
1013 0320	1,20
1013 0330	1,23
1013 0340	1,40
1013 0350	1,37
1013 0360	1,37
1013 0370	1,37
1013 0380	1,50
1013 0390	1,54
1013 0400	1,45
1013 0410	1,51
1013 0420	1,50
1013 0430	1,58
1013 0440	1,58
1013 0450	1,54
1013 0460	1,56
1013 0470	1,56
1013 0480	1,56
1013 0490	1,58
1013 0500	1,58
1013 0510	1,65
1013 0520	1,65
1013 0530	1,65
1013 0540	2,11
1013 0550	2,02
1013 0560	2,21
1013 0570	2,21
1013 0580	2,21
1013 0590	2,21
1013 0600	2,08
1013 0610	2,47
1013 0620	2,47
1013 0630	2,47
1013 0640	2,68
1013 0650	2,46
1013 0660	2,68
1013 0670	2,68
1013 0680	2,85
1013 0690	2,85
1013 0700	2,60
1013 0710	3,50
1013 0720	3,50
1013 0730	3,50
1013 0740	3,50
1013 0750	2,72
1013 0760	4,21
1013 0770	4,21
1013 0780	4,21

Part No.	€
1013 0790	4,21
1013 0800	3,23
1013 0810	4,02
1013 0820	4,02
1013 0830	4,21
1013 0840	4,21
1013 0850	3,34
1013 0860	4,95
1013 0870	4,95
1013 0880	5,09
1013 0890	5,09
1013 0900	4,33
1013 0910	5,53
1013 0920	5,53
1013 0930	6,03
1013 0940	6,03
1013 0950	4,39
1013 0960	6,17
1013 0970	6,17
1013 0980	6,32
1013 0990	6,32
1013 1000	4,95
1013 1010	8,51
1013 1020	6,99
1013 1050	6,99
1013 1080	14,13
1013 1100	8,80
1013 1120	15,58
1013 1150	10,28
1013 1180	17,03
1013 1200	10,46
1013 1220	17,66
1013 1250	13,51
1013 1280	20,55
1013 1300	15,14
1014 0001	207,32
1014 0003	445,11
1014 0005	117,09
1014 0007	179,28
1014 0009	296,34
1014 0100	2,65
1014 0110	2,72
1014 0120	2,98
1014 0130	2,82
1014 0140	2,68
1014 0150	2,46
1014 0160	2,68
1014 0170	2,72
1014 0180	2,68
1014 0190	2,72
1014 0200	2,22
1014 0210	2,90
1014 0220	2,90
1014 0230	2,90
1014 0240	2,93
1014 0250	2,38
1014 0260	2,99
1014 0270	2,99
1014 0280	3,04
1014 0290	3,04
1014 0300	2,38
1014 0310	3,12
1014 0320	2,68
1014 0330	2,72
1014 0340	3,29
1014 0350	2,65
1014 0360	3,35
1014 0370	3,42
1014 0380	3,47
1014 0390	3,65
1014 0400	2,87
1014 0410	3,65
1014 0420	3,65

Part No.	€
1014 0430	3,65
1014 0440	3,72
1014 0450	3,65
1014 0460	3,91
1014 0470	3,91
1014 0480	4,02
1014 0490	4,10
1014 0500	3,53
1014 0510	4,10
1014 0520	4,21
1014 0530	4,21
1014 0540	4,63
1014 0550	4,87
1014 0560	4,69
1014 0570	4,69
1014 0580	4,69
1014 0590	4,69
1014 0600	4,58
1014 0610	5,26
1014 0620	5,26
1014 0630	5,26
1014 0640	5,72
1014 0650	5,18
1014 0660	5,72
1014 0670	5,72
1014 0680	6,36
1014 0690	6,36
1014 0700	5,43
1014 0710	7,45
1014 0720	7,45
1014 0730	7,45
1014 0740	7,45
1014 0750	5,84
1014 0760	9,21
1014 0770	9,21
1014 0780	9,21
1014 0790	9,21
1014 0800	7,20
1014 0810	9,21
1014 0820	9,64
1014 0830	9,64
1014 0840	10,00
1014 0850	7,20
1014 0860	10,66
1014 0870	10,66
1014 0880	11,42
1014 0890	12,08
1014 0900	9,39
1014 0910	12,51
1014 0920	13,42
1014 0930	13,73
1014 0940	14,95
1014 0950	10,98
1014 0960	15,55
1014 0970	15,55
1014 0980	15,55
1014 0990	15,55
1014 1000	10,55
1014 1010	18,30
1014 1020	14,95
1014 1050	15,55
1014 1080	32,32
1014 1100	16,77
1014 1120	32,32
1014 1150	21,64
1014 1180	38,41
1014 1200	24,40
1014 1220	39,01
1014 1250	28,67
1014 1280	31,11
1014 1300	31,11
1016 0100	3,87
1016 0110	3,87

Part No.	€
1016 0120	4,08
1016 0130	4,00
1016 0140	3,87
1016 0150	3,70
1016 0160	3,87
1016 0170	3,87
1016 0180	3,87
1016 0190	3,87
1016 0200	3,56
1016 0210	4,00
1016 0220	4,00
1016 0230	4,00
1016 0240	4,08
1016 0250	3,59
1016 0260	4,08
1016 0270	4,08
1016 0280	4,17
1016 0290	4,17
1016 0300	3,59
1016 0310	4,17
1016 0320	3,87
1016 0330	3,87
1016 0340	4,33
1016 0350	3,87
1016 0360	4,33
1016 0370	4,43
1016 0380	4,43
1016 0390	4,52
1016 0400	4,00
1016 0410	4,52
1016 0420	4,52
1016 0430	4,52
1016 0440	4,61
1016 0450	4,52
1016 0460	4,71
1016 0470	4,82
1016 0480	4,82
1016 0490	4,90
1016 0500	4,43
1016 0510	4,90
1016 0520	4,90
1016 0530	4,98
1016 0540	5,24
1016 0550	5,42
1016 0560	5,24
1016 0570	5,24
1016 0580	5,24
1016 0590	5,24
1016 0600	5,09
1016 0610	8,02
1016 0620	8,02
1016 0630	8,02
1016 0640	8,30
1016 0650	7,94
1016 0660	8,30
1016 0670	8,30
1016 0680	8,76
1016 0690	8,76
1016 0700	8,13
1016 0710	9,59
1016 0720	9,59
1016 0730	9,59
1016 0740	9,59
1016 0750	8,41
1016 0760	10,85
1016 0770	10,85
1016 0780	10,85
1016 0790	10,85
1016 0800	9,37
1016 0820	11,03
1016 0850	9,37
1016 0880	12,29
1016 0900	10,85

Part No.	€
1016 0920	13,73
1016 0950	12,08
1016 0980	15,01
1016 1000	11,77
1016 1010	13,73
1016 1020	14,82
1016 1050	15,01
1016 1080	20,24
1016 1100	16,10
1016 1120	22,16
1016 1150	19,53
1016 1180	25,18
1016 1200	21,33
1016 1220	21,37
1016 1250	24,55
1016 1280	33,15
1016 1300	26,00
1017 0100	7,69
1017 0150	7,37
1017 0200	7,13
1017 0250	7,26
1017 0300	7,26
1017 0310	8,10
1017 0320	7,69
1017 0330	7,69
1017 0350	7,69
1017 0400	7,86
1017 0410	8,69
1017 0420	8,69
1017 0450	8,69
1017 0500	8,52
1017 0510	9,25
1017 0520	9,25
1017 0550	10,13
1017 0580	9,83
1017 0600	9,65
1017 0650	15,29
1017 0680	16,49
1017 0700	15,58
1017 0750	15,89
1017 0800	17,67
1017 0850	17,67
1017 0900	19,78
1017 1000	21,28
1017 1020	26,07
1017 1050	26,37
1017 1100	28,16
1017 1150	33,56
1017 1200	36,56
1017 1250	41,34
1017 1300	43,14
1018 0100	3,34
1018 0110	3,64
1018 0120	3,58
1018 0130	3,64
1018 0140	3,70
1018 0150	3,47
1018 0160	3,47
1018 0170	3,75
1018 0180	3,70
1018 0190	3,70
1018 0200	3,58
1018 0210	3,75
1018 0220	3,94
1018 0230	3,81
1018 0240	3,58
1018 0250	3,64
1018 0260	3,81
1018 0270	4,03
1018 0280	3,98
1018 0290	4,03
1018 0300	3,87
1018 0310	4,27

Catalogue prices in EUR

Part No.	€
1018 0320	4,17
1018 0330	4,27
1018 0340	4,57
1018 0350	4,63
1018 0360	4,69
1018 0370	4,69
1018 0380	4,93
1018 0390	5,04
1018 0400	4,80
1018 0410	4,93
1018 0420	4,93
1018 0430	5,28
1018 0440	5,28
1018 0450	5,17
1018 0460	5,45
1018 0470	5,45
1018 0480	5,56
1018 0490	5,64
1018 0500	5,51
1018 0510	5,64
1018 0520	5,64
1018 0530	6,21
1018 0540	6,79
1018 0550	6,55
1018 0560	6,91
1018 0570	6,91
1018 0580	6,91
1018 0590	7,02
1018 0600	6,68
1018 0610	7,50
1018 0620	7,39
1018 0630	7,26
1018 0640	7,39
1018 0650	7,97
1018 0660	8,21
1018 0670	8,33
1018 0680	9,02
1018 0690	9,15
1018 0700	9,02
1018 0710	9,97
1018 0720	9,97
1018 0730	10,43
1018 0740	10,43
1018 0750	9,50
1018 0760	11,37
1018 0770	11,14
1018 0780	11,25
1018 0790	11,84
1018 0800	10,77
1018 0810	11,72
1018 0820	11,61
1018 0830	11,61
1018 0840	12,19
1018 0850	11,01
1018 0880	12,90
1018 0900	12,19
1018 0930	13,14
1018 0950	12,77
1018 0980	14,88
1018 1000	14,41
1018 1020	16,65
1018 1050	16,76
1018 1100	17,36
1018 1150	19,22
1018 1200	20,52
1018 1250	21,34
1018 1300	22,74
1020 0100	3,92
1020 0150	3,70
1020 0200	3,53
1020 0250	3,59
1020 0300	3,59
1020 0310	4,11
1020 0320	3,92
1020 0330	3,92
1020 0350	3,92
1020 0400	4,00
1020 0410	4,47
1020 0420	4,47
1020 0450	4,47
1020 0500	4,39
1020 0510	4,87
1020 0520	4,87
1020 0550	5,39
1020 0580	5,21
1020 0600	5,09
1020 0650	7,89
1020 0680	8,73
1020 0700	8,10
1020 0750	8,39
1020 0800	9,36
1020 0850	9,36
1020 0900	10,76
1020 1000	11,70
1020 1020	14,65
1020 1050	14,84
1020 1100	16,00
1020 1150	19,47
1020 1200	21,29
1020 1250	24,26
1020 1300	26,10
1022 0100	2,17
1022 0110	2,25
1022 0120	2,25
1022 0130	2,21
1022 0140	2,25
1022 0150	2,02
1022 0160	2,03
1022 0170	2,03
1022 0180	2,03
1022 0190	2,03
1022 0200	1,84
1022 0210	2,02
1022 0220	2,02
1022 0230	2,02
1022 0240	2,02
1022 0250	1,89
1022 0260	2,02
1022 0270	2,16
1022 0280	2,21
1022 0290	2,21
1022 0300	1,98
1022 0310	2,16
1022 0320	2,25
1022 0330	2,33
1022 0340	2,60
1022 0350	2,16
1022 0360	2,52
1022 0370	2,60
1022 0380	2,74
1022 0390	2,90
1022 0400	2,35
1022 0410	2,90
1022 0420	2,72
1022 0430	3,04
1022 0440	3,04
1022 0450	2,79
1022 0460	3,21
1022 0470	3,21
1022 0480	3,21
1022 0490	3,31
1022 0500	2,91
1022 0510	3,31
1022 0520	3,48
1022 0530	3,48
1022 0540	3,73
1022 0550	3,48
1022 0560	3,76
1022 0570	3,76
1022 0580	3,83
1022 0590	4,10
1022 0600	3,83
1022 0610	4,10
1022 0620	4,30
1022 0630	4,79
1022 0640	4,79
1022 0650	4,21
1022 0660	4,87
1022 0670	4,87
1022 0680	5,06
1022 0690	5,34
1022 0700	4,49
1022 0710	7,04
1022 0720	7,04
1022 0730	7,04
1022 0740	7,04
1022 0750	5,29
1022 0760	7,72
1022 0770	7,72
1022 0780	7,72
1022 0790	7,72
1022 0800	5,95
1022 0810	8,22
1022 0820	8,51
1022 0830	9,07
1022 0840	9,07
1022 0850	6,74
1022 0860	10,13
1022 0870	10,13
1022 0880	10,13
1022 0890	10,36
1022 0900	7,76
1022 0910	10,95
1022 0920	11,89
1022 0930	11,89
1022 0940	11,89
1022 0950	8,41
1022 0960	12,49
1022 0970	13,64
1022 0980	13,64
1022 0990	13,64
1022 1000	9,59
1022 1020	13,28
1022 1050	12,06
1022 1100	14,79
1022 1150	17,37
1022 1200	18,35
1022 1250	22,63
1022 1300	22,63
1025 0100	1,10
1025 0150	1,31
1025 0200	1,07
1025 0250	1,07
1025 0300	1,12
1025 0310	1,37
1025 0320	1,32
1025 0330	1,37
1025 0350	1,20
1025 0400	1,34
1025 0410	1,67
1025 0420	1,54
1025 0450	1,58
1025 0500	1,67
1025 0510	2,06
1025 0520	1,95
1025 0550	1,98
1025 0580	2,17
1025 0600	2,19
1025 0650	2,36
1025 0680	2,85
1025 0700	2,50
1025 0750	3,02
1025 0800	3,24
1025 0850	3,58
1025 0900	3,83
1025 1000	4,11
1025 1020	7,36
1025 1050	6,79
1025 1100	7,36
1025 1150	7,84
1025 1200	9,18
1025 1250	22,68
1025 1300	24,98
1026 0007	197,80
1026 0009	324,54
1026 0100	3,53
1026 0110	3,61
1026 0120	3,91
1026 0130	3,78
1026 0140	3,61
1026 0150	3,29
1026 0160	3,61
1026 0170	3,65
1026 0180	3,61
1026 0190	3,65
1026 0200	2,99
1026 0210	3,84
1026 0220	3,84
1026 0230	3,84
1026 0240	3,91
1026 0250	3,17
1026 0260	4,02
1026 0270	4,02
1026 0280	4,10
1026 0290	4,10
1026 0300	3,17
1026 0310	4,21
1026 0320	3,61
1026 0330	3,61
1026 0340	4,38
1026 0350	3,53
1026 0360	4,58
1026 0370	4,58
1026 0380	4,69
1026 0390	4,82
1026 0400	3,78
1026 0410	4,82
1026 0420	4,87
1026 0430	4,87
1026 0440	4,95
1026 0450	4,82
1026 0460	5,18
1026 0470	5,31
1026 0480	5,31
1026 0490	5,62
1026 0500	4,69
1026 0510	5,62
1026 0520	5,62
1026 0530	5,72
1026 0550	6,65
1026 0560	6,36
1026 0570	6,36
1026 0580	6,36
1026 0590	6,36
1026 0600	6,16
1026 0610	7,02
1026 0620	7,02
1026 0630	7,02
1026 0640	7,73
1026 0650	6,88
1026 0660	7,73
1026 0670	7,73
1026 0680	8,41
1026 0690	8,41
1026 0700	7,32
1026 0710	9,94
1026 0720	9,94
1026 0730	9,94
1026 0740	9,94
1026 0750	7,86
1026 0770	12,08
1026 0780	12,08
1026 0790	12,08
1026 0800	9,64
1026 0810	12,08
1026 0820	12,80
1026 0830	12,80
1026 0840	13,42
1026 0850	9,51
1026 0860	14,02
1026 0870	14,02
1026 0880	15,25
1026 0890	15,84
1026 0900	12,19
1026 0910	17,37
1026 0920	17,99
1026 0950	14,33
1026 0970	21,04
1026 0980	21,04
1026 1000	13,73
1026 1010	23,47
1026 1020	19,53
1026 1050	20,73
1026 1080	42,07
1026 1100	22,24
1026 1120	43,30
1026 1150	28,67
1026 1180	49,99
1026 1200	32,32
1028 0001	47,09
1028 0003	101,41
1028 0005	29,42
1028 0007	44,57
1028 0009	45,91
1029 0001	106,90
1029 0003	241,64
1029 0005	75,73
1029 0007	119,50
1029 0009	162,23
1030 0001	92,47
1030 0003	189,95
1030 0005	53,16
1030 0007	83,38
1030 0009	116,68
1031 0001	22,13
1031 0003	52,61
1031 0005	10,02
1031 0007	21,31
1031 0009	22,96
1031 0170	83,51
1032 0007	125,10
1032 0009	195,21
1033 0007	143,67
1033 0009	226,53
1034 0001	12,08
1034 0003	21,81
1034 0005	6,49
1034 0007	12,08
1034 0009	9,07
1035 1050	1,61
1035 1100	1,73
1035 1150	1,89
1035 1200	2,09
1035 1250	2,11
1035 1300	2,46
1035 1350	3,42
1035 1351	3,26
1035 1400	3,42
1035 1401	3,42
1035 1450	3,65
1035 1451	3,76
1035 1500	3,83
1035 1501	3,78
1035 1550	4,17
1035 1551	4,30
1035 1600	4,17
1035 1601	4,28
1036 0001	11,51
1036 0003	20,71
1036 0005	6,14
1036 0007	11,50
1036 0009	8,65
1037 0001	24,51
1037 0005	2,57
1037 0010	3,12
1037 0015	2,02
1040 0010	4,19
1040 0015	4,10
1040 0020	3,21
1040 0025	2,87
1040 0030	2,72
1040 0035	2,46
1040 0040	2,06
1040 0045	2,28
1040 0050	2,00
1040 0055	2,11
1040 0060	1,92
1040 0065	2,25
1040 0070	1,84
1040 0075	2,06
1040 0080	1,95
1040 0085	2,11
1040 0090	1,95
1040 0095	2,17
1040 0100	1,95
1040 0105	2,19
1040 0110	2,25
1040 0115	2,35
1040 0120	2,06
1040 0125	2,36
1040 0130	2,06
1040 0135	2,21
1040 0140	2,11
1040 0145	2,28
1042 0100	5,15
1045 0100	2,03
1045 0150	1,45
1045 0200	0,98
1045 0250	1,02
1045 0300	1,07
1045 0310	1,32
1045 0320	1,12
1045 0330	1,24
1045 0350	1,23
1045 0400	1,37
1045 0410	1,61
1045 0420	1,37
1045 0450	1,54
1045 0500	1,72
1045 0510	2,25
1045 0520	1,91
1045 0550	2,00
1045 0580	2,00
1045 0600	2,16
1045 0650	2,30
1045 0680	3,32
1045 0700	2,72
1045 0750	3,21
1045 0800	3,21
1045 0850	3,70
1045 0900	3,92
1045 0950	4,71
1045 1000	4,61
1045 1050	6,54
1045 1100	6,76
1045 1150	7,51
1045 1200	8,54
1045 1250	8,54
1045 1300	9,02
1046 0100	3,31
1046 0150	2,36
1046 0200	1,61
1046 0250	1,69
1046 0300	1,70
1046 0310	2,13
1046 0320	1,84
1046 0330	2,08
1046 0350	2,03
1046 0400	2,25
1046 0410	2,61
1046 0420	2,27
1046 0450	2,54
1046 0500	2,82
1046 0510	3,10
1046 0520	3,15
1046 0550	3,24
1046 0580	3,31
1046 0600	3,51
1046 0650	3,78
1046 0680	5,40
1046 0700	4,43
1046 0750	5,23
1046 0800	5,23
1046 0850	6,03
1046 0900	6,30
1046 0950	7,58
1046 1000	7,48
1046 1050	10,66
1046 1100	10,95
1046 1150	12,29
1046 1200	13,88
1046 1250	13,88
1046 1300	14,68
1048 0100	0,46
1048 0150	0,49
1048 0200	0,52
1048 0250	0,52
1048 0300	0,54
1048 0310	0,58
1048 0320	0,58
1048 0330	0,58
1048 0350	0,58
1048 0400	0,65
1048 0410	0,71
1048 0420	0,71
1048 0450	0,71
1048 0500	0,72
1048 0510	0,80
1048 0520	0,80
1048 0550	0,80
1048 0580	0,90
1048 0600	0,90
1048 0650	0,95
1048 0680	1,12
1048 0700	1,12
1048 0750	1,39
1048 0800	1,67
1048 0850	1,75
1048 0900	1,89
1048 0950	2,33
1048 1000	2,65

Catalogue prices in EUR

Part No.	€
1048 1050	3,07
1048 1100	3,07
1048 1150	3,76
1048 1200	3,83
1048 1250	4,38
1048 1300	4,38
1051 0100	5,01
1051 0150	4,79
1051 0200	3,73
1051 0250	3,92
1051 0300	4,10
1051 0310	5,01
1051 0320	4,87
1051 0330	5,29
1051 0350	5,95
1051 0400	5,17
1051 0410	5,58
1051 0420	5,75
1051 0450	6,11
1051 0500	6,11
1051 0510	7,23
1051 0520	7,53
1051 0550	7,32
1051 0580	8,22
1051 0600	7,61
1051 0650	8,58
1051 0680	10,54
1051 0700	9,59
1051 0750	11,32
1051 0800	10,54
1051 0850	13,28
1051 0900	13,07
1051 0950	17,97
1051 1000	19,53
1051 1050	26,52
1051 1100	29,44
1051 1150	35,88
1051 1200	36,10
1051 1250	40,46
1051 1300	42,59
1052 0250	19,92
1052 0300	23,34
1052 0400	25,22
1052 0500	30,82
1052 0600	34,26
1052 0800	55,42
1052 1000	74,10
1052 1200	93,43
1055 0100	0,58
1055 0150	0,54
1055 0200	0,65
1055 0250	0,65
1055 0300	0,65
1055 0310	0,65
1055 0320	0,65
1055 0330	0,65
1055 0340	0,65
1055 0350	0,65
1055 0400	0,79
1055 0410	0,85
1055 0420	0,85
1055 0450	0,96
1055 0500	1,06
1055 0510	1,13
1055 0520	1,31
1055 0550	1,31
1055 0570	1,31
1055 0580	1,31
1055 0600	1,32
1055 0650	1,48
1055 0680	1,65
1055 0700	1,65
1055 0800	2,02

Part No.	€
1055 0850	2,25
1055 0900	2,57
1055 1000	3,07
1055 1100	3,42
1055 1200	4,33
1056 0100	1,24
1056 0150	1,12
1056 0200	0,82
1056 0250	0,96
1056 0300	0,96
1056 0310	1,24
1056 0320	1,21
1056 0330	1,24
1056 0340	1,54
1056 0350	1,12
1056 0400	1,12
1056 0410	1,35
1056 0420	1,34
1056 0450	1,35
1056 0500	1,45
1056 0510	2,16
1056 0520	2,16
1056 0550	1,91
1056 0570	2,52
1056 0580	2,52
1056 0600	1,91
1056 0650	2,27
1056 0680	3,58
1056 0700	2,72
1056 0800	3,15
1056 0850	4,55
1056 0900	4,17
1056 1000	5,02
1056 1100	9,25
1056 1200	11,73
1058 0100	0,65
1058 0110	0,65
1058 0120	0,60
1058 0130	0,60
1058 0140	0,60
1058 0150	0,60
1058 0160	0,71
1058 0170	0,71
1058 0180	0,71
1058 0190	0,71
1058 0200	0,71
1058 0210	0,69
1058 0220	0,71
1058 0230	0,71
1058 0240	0,71
1058 0250	0,71
1058 0260	0,71
1058 0270	0,71
1058 0280	0,71
1058 0290	0,71
1058 0300	0,71
1058 0310	0,71
1058 0320	0,71
1058 0330	0,71
1058 0340	0,71
1058 0350	0,71
1058 0360	0,80
1058 0370	0,80
1058 0380	0,80
1058 0390	2,25
1058 0400	1,17
1058 0410	1,17
1058 0420	1,17
1058 0430	1,17
1058 0440	2,47
1058 0450	1,31
1058 0460	1,31
1058 0470	1,31

Part No.	€
1058 0480	1,31
1058 0490	1,31
1058 0500	1,31
1058 0510	1,31
1058 0520	1,50
1058 0530	1,48
1058 0540	1,48
1058 0550	1,48
1058 0560	1,54
1058 0570	1,65
1058 0580	1,54
1058 0590	1,81
1058 0600	1,58
1058 0610	1,72
1058 0620	1,84
1058 0630	1,98
1058 0640	1,81
1058 0650	1,81
1058 0660	1,84
1058 0670	2,25
1058 0680	2,02
1058 0690	2,17
1058 0700	2,02
1058 0710	2,46
1058 0720	2,57
1058 0730	3,02
1058 0740	2,35
1058 0750	2,28
1058 0760	3,47
1058 0770	3,21
1058 0780	2,85
1058 0790	3,32
1058 0800	2,71
1058 0810	3,29
1058 0820	3,02
1058 0830	3,50
1058 0840	3,47
1058 0850	2,96
1058 0860	3,37
1058 0870	3,75
1058 0880	3,64
1058 0890	4,00
1058 0900	3,29
1058 0910	4,27
1058 0920	3,81
1058 0930	4,08
1058 0940	4,63
1058 0950	3,58
1058 0960	4,43
1058 0970	4,38
1058 0980	4,17
1058 0990	5,91
1058 1000	3,98
1058 1020	4,21
1058 1050	4,47
1058 1080	5,80
1058 1100	5,09
1058 1120	6,32
1058 1150	5,67
1058 1180	6,25
1058 1200	6,17
1058 1250	6,90
1058 1280	8,54
1058 1300	7,18
1058 1350	8,06
1058 1380	10,46
1058 1400	8,05
1058 1450	9,36
1058 1480	19,14
1058 1500	9,47
1058 1550	9,61
1058 1600	10,98
1058 1650	29,94

Part No.	€
1058 1700	25,07
1058 1750	24,95
1058 1800	23,77
1058 1850	38,32
1058 1900	30,41
1058 1950	50,46
1058 2000	47,57
1061 0100	3,07
1061 0110	3,20
1061 0120	3,20
1061 0130	3,20
1061 0140	3,20
1061 0150	3,21
1061 0160	3,53
1061 0170	3,53
1061 0180	3,53
1061 0190	3,21
1061 0200	2,85
1061 0210	2,85
1061 0220	3,21
1061 0230	3,29
1061 0240	3,29
1061 0250	3,20
1061 0260	3,29
1061 0270	3,29
1061 0280	3,29
1061 0290	3,29
1061 0300	3,02
1061 0310	3,29
1061 0320	3,23
1061 0330	3,23
1061 0340	3,29
1061 0350	3,07
1061 0360	3,51
1061 0370	3,51
1061 0380	3,51
1061 0390	3,51
1061 0400	3,21
1061 0410	3,32
1061 0420	3,32
1061 0430	3,51
1061 0440	3,51
1061 0450	3,31
1061 0460	4,17
1061 0470	4,17
1061 0480	4,17
1061 0490	4,17
1061 0500	3,58
1061 0510	4,30
1061 0520	4,30
1061 0530	4,30
1061 0540	4,30
1061 0550	3,87
1061 0560	4,33
1061 0570	4,33
1061 0580	4,33
1061 0590	4,33
1061 0600	4,08
1061 0610	5,04
1061 0620	5,04
1061 0630	5,04
1061 0640	5,04
1061 0650	5,04
1061 0660	6,55
1061 0670	6,55
1061 0680	6,55
1061 0690	6,55
1061 0700	6,05
1061 0710	6,32
1061 0720	6,32
1061 0730	6,32
1061 0740	6,32
1061 0750	6,32

Part No.	€
1061 0770	7,04
1061 0780	7,04
1061 0790	7,04
1061 0800	6,55
1061 0810	7,84
1061 0820	7,84
1061 0830	7,84
1061 0840	7,84
1061 0850	7,84
1061 0860	7,94
1061 0870	7,94
1061 0880	7,94
1061 0900	7,94
1061 0910	9,69
1061 0920	9,69
1061 0930	9,69
1061 0950	10,90
1061 0960	10,90
1061 0970	10,90
1061 0980	10,90
1061 0990	10,90
1061 1000	9,69
1061 1020	9,95
1061 1050	10,74
1061 1100	11,03
1061 1150	12,87
1061 1180	8,27
1061 1200	13,88
1061 1250	13,88
1061 1300	21,56
1061 1350	29,18
1061 1380	24,81
1061 1400	29,18
1061 1450	35,31
1061 1500	33,86
1061 1550	41,86
1061 1575	26,71
1061 1600	49,80
1061 1650	53,94
1061 1700	45,34
1061 1750	44,87
1061 1775	27,85
1061 1800	42,78
1061 1850	68,92
1061 1900	54,75
1061 1950	90,83
1061 1975	33,17
1061 2000	85,68
1062 0100	7,86
1062 0110	7,69
1062 0120	7,69
1062 0130	7,69
1062 0140	7,69
1062 0150	7,56
1062 0160	7,37
1062 0170	7,37
1062 0180	7,37
1062 0190	7,37
1062 0200	7,13
1062 0210	7,37
1062 0220	7,56
1062 0230	7,56
1062 0240	7,69
1062 0250	7,26
1062 0260	7,69
1062 0270	7,86
1062 0280	7,86
1062 0290	7,86
1062 0300	7,37
1062 0310	7,86
1062 0320	7,69
1062 0330	7,97
1062 0340	7,86

Part No.	€
1062 0350	7,86
1062 0360	7,97
1062 0370	8,10
1062 0380	7,97
1062 0390	8,10
1062 0400	8,10
1062 0410	8,28
1062 0420	8,10
1062 0430	8,38
1062 0440	8,52
1062 0450	8,28
1062 0460	8,69
1062 0470	8,82
1062 0480	9,01
1062 0490	9,42
1062 0500	8,52
1062 0510	9,83
1062 0520	10,73
1062 0530	11,45
1062 0540	11,86
1062 0550	9,65
1062 0560	12,58
1062 0570	12,88
1062 0580	12,88
1062 0590	13,50
1062 0600	9,65
1062 0610	13,50
1062 0620	14,98
1062 0630	16,77
1062 0640	18,27
1062 0650	15,29
1062 0660	20,66
1062 0670	20,98
1062 0680	21,28
1062 0690	21,28
1062 0700	16,49
1062 0710	21,58
1062 0720	22,18
1062 0730	22,18
1062 0740	22,46
1062 0750	17,37
1062 0770	23,37
1062 0780	24,27
1062 0790	24,27
1062 0800	16,77
1062 0810	24,87
1062 0820	25,47
1062 0830	26,37
1062 0840	27,26
1062 0850	18,27
1062 0860	27,86
1062 0870	28,76
1062 0880	29,37
1062 0900	18,87
1062 0910	29,96
1062 0920	31,17
1062 0930	31,77
1062 0950	19,47
1062 0960	31,77
1062 0970	32,95
1062 0980	32,95
1062 0990	33,56
1062 1000	21,28
1062 1020	27,86
1062 1050	29,37
1062 1100	31,17
1062 1150	33,56
1062 1180	53,94
1062 1200	37,75
1062 1250	38,35
1062 1300	39,56
1062 1350	44,34
1062 1380	70,12

Part No.	€
1062 1400	42,54
1062 1450	50,94
1062 1500	49,14
1062 1550	59,93
1062 1575	52,15
1062 1600	52,15
1062 1650	77,30
1062 1700	68,31
1062 1750	77,30
1062 1775	91,68
1062 1800	73,13
1062 1850	76,09
1062 1900	77,30
1062 1950	91,68
1062 1975	91,68
1062 2000	79,10
1063 0100	4,22
1063 0110	4,22
1063 0120	4,33
1063 0130	4,57
1063 0140	4,17
1063 0150	3,98
1063 0160	4,11
1063 0170	4,17
1063 0180	4,11
1063 0190	4,11
1063 0200	3,47
1063 0210	4,22
1063 0220	4,22
1063 0230	3,58
1063 0240	4,27
1063 0250	3,75
1063 0260	4,39
1063 0270	4,69
1063 0280	4,33
1063 0290	4,63
1063 0300	3,94
1063 0310	4,17
1063 0320	3,98
1063 0330	3,98
1063 0340	4,57
1063 0350	3,98
1063 0360	4,93
1063 0370	4,50
1063 0380	4,80
1063 0390	5,51
1063 0400	4,46
1063 0410	5,17
1063 0420	4,46
1063 0430	5,10
1063 0440	5,51
1063 0450	5,10
1063 0460	5,17
1063 0470	5,51
1063 0480	5,80
1063 0490	5,87
1063 0500	4,93
1063 0510	5,45
1063 0520	5,87
1063 0530	6,11
1063 0540	6,50
1063 0550	5,56
1063 0560	6,68
1063 0570	7,10
1063 0580	6,79
1063 0590	7,15
1063 0600	5,99
1063 0610	7,02
1063 0620	7,02
1063 0630	7,39
1063 0640	7,39
1063 0650	7,02
1063 0660	7,73

Catalogue prices in EUR

Part No.	€
1063 0670	7,97
1063 0680	8,55
1063 0690	8,44
1063 0700	7,86
1063 0710	9,50
1063 0720	9,73
1063 0730	9,73
1063 0740	9,86
1063 0750	8,21
1063 0760	10,43
1063 0770	10,54
1063 0780	10,54
1063 0790	10,43
1063 0800	9,73
1063 0810	12,43
1063 0820	13,01
1063 0830	13,14
1063 0840	13,14
1063 0850	11,37
1063 0880	14,32
1063 0900	11,61
1063 0930	13,14
1063 0950	12,77
1063 0980	15,23
1063 1000	12,54
1063 1020	15,94
1063 1050	15,12
1063 1100	16,76
1063 1150	19,34
1063 1200	18,87
1063 1250	20,76
1063 1300	20,76
1063 1350	22,05
1063 1400	27,55
1064 0250	0,96
1064 0300	0,82
1064 0310	0,85
1064 0320	0,85
1064 0330	0,85
1064 0350	0,90
1064 0400	1,10
1064 0410	1,10
1064 0420	1,10
1064 0450	1,13
1064 0480	1,31
1064 0500	1,23
1064 0510	1,40
1064 0520	1,40
1064 0600	1,61
1067 0001	5,78
1067 0003	7,78
1067 0005	5,78
1067 0007	7,89
1067 0009	5,91
1067 0011	8,41
1067 0013	10,57
1067 0015	6,38
1067 0017	8,91
1067 0019	6,79
1067 0021	8,91
1067 0023	12,80
1067 0025	7,40
1067 0027	11,03
1067 0029	7,40
1067 0031	10,77
1067 0033	14,68
1067 0035	11,37
1067 0037	12,43
1067 0038	12,60
1067 0039	10,57
1067 0040	11,73
1067 0041	13,59
1067 0042	15,45

Part No.	€
1067 0043	13,21
1067 0045	15,81
1067 0047	23,64
1067 0049	17,03
1067 0051	24,87
1067 0053	18,16
1067 0054	23,37
1067 0055	18,81
1067 0056	26,93
1067 0057	25,59
1067 0059	37,58
1067 0061	37,72
1067 0063	45,58
1067 0065	56,68
1068 0001	20,99
1068 0005	20,99
1068 0009	20,99
1068 0015	22,18
1068 0019	22,74
1068 0025	23,63
1068 0029	23,63
1068 0035	41,42
1068 0038	46,65
1068 0039	41,99
1068 0040	44,34
1068 0043	46,65
1068 0049	52,49
1068 0053	54,83
1068 0055	55,41
1071 0007	22,16
1071 0009	8,98
1071 0011	22,60
1071 0013	29,01
1071 0015	19,80
1071 0017	23,31
1071 0019	10,06
1071 0021	24,21
1071 0023	32,84
1071 0025	12,05
1071 0027	26,22
1071 0029	11,70
1071 0031	19,59
1071 0033	34,35
1071 0037	29,44
1071 0038	18,63
1071 0039	19,31
1071 0040	30,10
1071 0041	30,76
1071 0042	32,87
1071 0043	20,95
1071 0045	36,32
1071 0047	40,37
1071 0049	23,88
1071 0051	35,69
1071 0053	32,56
1071 0054	39,53
1071 0055	32,87
1071 0056	41,17
1071 0057	42,73
1071 0059	55,00
1071 0060	45,68
1080 1000	8,22
1080 1025	11,97
1080 1050	8,47
1080 1075	11,80
1080 1100	8,73
1080 1125	11,09
1080 1150	10,06
1080 1175	11,64
1080 1200	9,07
1080 1225	11,80
1080 1250	9,58
1080 1275	11,80

Part No.	€
1080 1300	9,94
1080 1325	12,14
1080 1350	11,28
1080 1375	12,82
1080 1400	10,46
1080 1425	11,47
1080 1450	10,95
1080 1475	16,77
1080 1500	11,64
1080 1525	15,53
1080 1550	12,49
1080 1575	14,22
1080 1600	12,49
1080 1625	19,12
1080 1650	13,51
1080 1675	19,12
1080 1700	14,00
1080 1725	17,62
1080 1750	14,40
1080 1775	17,80
1080 1800	15,06
1080 1825	18,14
1080 1850	12,14
1080 1875	19,06
1080 1900	16,25
1080 1925	20,35
1080 1950	18,84
1080 1975	21,22
1080 2000	17,29
1080 2025	23,25
1080 2050	18,32
1080 2075	20,81
1080 2100	19,50
1080 2125	26,27
1080 2150	22,41
1080 2175	25,31
1080 2200	21,69
1080 2225	26,00
1080 2250	23,42
1080 2275	26,66
1080 2300	25,50
1080 2325	32,15
1080 2350	25,31
1080 2375	34,90
1080 2400	26,52
1080 2425	39,47
1080 2450	27,53
1080 2475	38,34
1080 2500	29,26
1080 2525	42,46
1080 2550	30,43
1080 2575	39,71
1080 2600	33,69
1080 2625	45,77
1080 2650	32,49
1080 2675	51,30
1080 2700	33,53
1080 2725	50,23
1080 2750	34,57
1080 2775	49,16
1080 2800	36,93
1080 2825	55,09
1080 2850	45,52
1080 2875	51,30
1080 2900	40,01
1080 2925	56,95
1080 2950	41,04
1080 2975	52,38
1080 3000	40,01
1080 3025	58,09
1080 3050	48,94
1080 3075	61,80
1080 3100	47,44

Part No.	€
1080 3125	63,25
1080 3150	54,07
1080 3175	61,03
1080 3200	50,04
1080 3250	57,49
1080 3300	53,64
1080 3350	59,42
1080 3400	62,86
1080 3450	69,49
1080 3500	63,90
1080 3550	73,98
1080 3600	68,81
1080 3650	77,38
1080 3700	75,27
1080 3750	84,88
1080 3800	79,74
1080 3850	95,76
1080 3900	87,22
1080 3950	109,45
1080 4000	90,63
1080 4100	97,46
1080 4200	106,03
1080 4300	112,83
1080 4400	118,00
1080 4500	123,12
1080 4600	128,27
1080 4700	136,79
1080 4800	140,24
1080 4900	147,06
1080 5000	150,46
1081 1000	12,55
1081 1025	19,22
1081 1050	13,07
1081 1075	18,43
1081 1100	13,61
1081 1125	18,95
1081 1150	15,48
1081 1175	18,68
1081 1200	13,88
1081 1225	20,29
1081 1250	14,68
1081 1275	18,95
1081 1300	15,21
1081 1325	19,77
1081 1350	17,10
1081 1375	20,55
1081 1400	16,02
1081 1425	24,82
1081 1450	16,82
1081 1475	27,22
1081 1500	17,88
1081 1525	25,09
1081 1550	19,22
1081 1575	24,02
1081 1600	19,22
1081 1625	29,89
1081 1650	20,84
1081 1675	26,16
1081 1700	21,61
1081 1725	28,29
1081 1750	22,14
1081 1775	27,22
1081 1800	23,22
1081 1825	30,95
1081 1850	25,09
1081 1875	29,89
1081 1900	25,09
1081 1925	34,70
1081 1950	28,82
1081 1975	33,61
1081 2000	26,43
1081 2025	38,98
1081 2050	28,29

Part No.	€
1081 2075	37,89
1081 2100	29,89
1081 2125	41,09
1081 2150	34,16
1081 2175	38,43
1081 2200	33,09
1081 2225	41,09
1081 2250	36,30
1081 2275	41,09
1081 2300	38,98
1081 2325	46,45
1081 2350	38,43
1081 2375	53,93
1081 2400	41,09
1081 2425	57,65
1081 2450	42,16
1081 2475	58,72
1081 2500	45,38
1081 2525	59,77
1081 2550	46,45
1081 2575	60,86
1081 2600	51,77
1081 2625	64,59
1081 2650	50,18
1081 2675	78,47
1081 2700	51,77
1081 2725	73,14
1081 2750	52,84
1081 2775	75,80
1081 2800	56,59
1081 2825	77,93
1081 2850	69,93
1081 2875	86,47
1081 2900	61,38
1081 2925	83,27
1081 2950	63,52
1081 2975	80,61
1081 3000	61,38
1081 3025	82,20
1081 3050	75,25
1081 3075	87,54
1081 3100	73,14
1081 3125	98,75
1081 3150	83,27
1081 3175	86,47
1081 3200	76,88
1081 3250	88,07
1081 3300	82,73
1081 3350	91,81
1081 3400	96,61
1081 3450	106,75
1081 3500	98,20
1081 3550	114,23
1081 3600	105,68
1081 3650	118,50
1081 3700	115,31
1081 3750	130,25
1081 3800	122,77
1081 3850	147,33
1081 3900	135,58
1081 3950	168,68
1081 4000	139,84
1081 4100	149,47
1081 4200	164,41
1081 4300	172,95
1081 4400	182,56
1081 4500	188,95
1081 4600	196,43
1081 4700	211,40
1081 4800	215,65
1081 4900	225,27
1081 5000	232,72
1082 1000	36,59

Part No.	€
1082 1020	37,80
1082 1050	37,80
1082 1080	48,79
1082 1100	39,01
1082 1120	51,83
1082 1150	48,16
1082 1180	45,12
1082 1200	41,45
1082 1220	56,72
1082 1250	43,30
1082 1300	46,95
1082 1350	54,89
1082 1380	62,20
1082 1400	49,99
1082 1425	74,39
1082 1450	58,54
1082 1475	73,79
1082 1500	59,76
1082 1525	76,21
1082 1550	57,31
1082 1575	64,01
1082 1600	62,20
1082 1625	84,15
1082 1650	64,01
1082 1675	68,29
1082 1700	59,76
1082 1750	65,85
1082 1775	59,76
1082 1800	67,69
1082 1825	79,88
1082 1850	65,85
1082 1875	83,54
1082 1900	70,12
1082 1925	89,63
1082 1950	76,21
1082 1975	93,29
1082 2000	75,62
1082 2025	107,34
1082 2050	81,71
1082 2075	103,65
1082 2100	89,63
1082 2150	92,09
1082 2175	134,14
1082 2200	95,73
1082 2250	117,68
1082 2300	104,90
1082 2350	117,09
1082 2400	121,35
1082 2450	111,59
1082 2500	159,75
1082 2550	159,75
1082 2600	143,91
1082 2650	162,19
1082 2700	158,54
1082 2750	168,30
1082 2800	176,83
1082 2850	210,99
1082 2900	176,83
1082 2950	197,57
1082 3000	168,30
1082 3050	215,87
1082 3100	208,53
1082 3150	221,95
1082 3200	235,35
1082 3300	235,35
1082 3400	226,85
1082 3500	279,28
1083 1000	2,82
1083 1050	2,88
1083 1100	3,04
1083 1150	3,09
1083 1200	3,04
1083 1250	3,39

Part No.	€
1083 1300	3,56
1083 1350	3,87
1083 1400	3,95
1083 1450	4,17
1083 1500	4,63
1083 1550	4,80
1083 1600	4,60
1083 1650	5,42
1083 1700	5,23
1083 1750	5,42
1083 1800	5,95
1083 1850	6,47
1083 1900	5,84
1083 1950	6,90
1083 2000	6,22
1083 2050	7,62
1083 2100	7,42
1083 2150	8,55
1083 2200	8,36
1083 2250	9,28
1083 2300	9,61
1083 2350	10,43
1083 2400	10,43
1083 2450	10,95
1083 2500	10,22
1083 2550	12,52
1083 2600	12,52
1083 2650	12,74
1083 2700	13,56
1083 2750	13,56
1083 2800	13,56
1083 2850	15,66
1083 2900	15,23
1083 2950	16,18
1083 3000	15,88
1083 3050	18,79
1083 3100	17,94
1083 3150	20,35
1083 3200	20,35
1083 3250	24,00
1083 3300	24,00
1083 3350	25,06
1083 3400	24,21
1083 3450	27,97
1083 3500	24,43
1083 3550	28,19
1083 3600	26,30
1083 3650	30,48
1083 3700	27,14
1083 3750	32,57
1083 3800	29,86
1083 3850	37,56
1083 3900	31,72
1083 3950	39,66
1083 4000	33,39
1083 4100	39,66
1083 4200	41,12
1083 4300	45,09
1083 4400	45,71
1083 4500	48,42
1083 4600	49,27
1083 4700	52,20
1083 4800	56,35
1083 4900	57,39
1083 5000	59,06
1085 0780	21,78
1085 0880	25,22
1085 0980	23,99
1085 1000	22,43
1085 1075	28,33
1085 1100	23,99
1085 1175	27,09
1085 1200	23,99

Catalogue prices in EUR

Part No.	€
1085 1275	31,15
1085 1300	26,48
1085 1375	31,15
1085 1400	26,78
1085 1475	34,26
1085 1500	29,89
1085 1575	34,89
1085 1600	30,82
1085 1675	38,62
1085 1700	33,00
1085 1775	37,99
1085 1800	33,61
1085 1870	40,48
1085 1900	37,36
1085 1970	39,86
1085 2000	37,36
1085 2070	47,33
1085 2100	44,21
1085 2170	47,33
1085 2200	44,21
1085 2270	49,83
1085 2300	49,19
1085 2370	54,18
1085 2400	51,06
1085 2470	55,42
1085 2500	54,18
1085 2570	60,40
1085 2600	57,93
1085 2670	74,10
1085 2700	66,02
1085 2770	68,50
1085 2800	66,64
1085 2870	82,20
1085 2900	74,10
1085 2970	77,85
1085 3000	76,59
1089 1000	12,82
1089 1050	13,17
1089 1100	13,48
1089 1150	13,48
1089 1200	13,48
1089 1250	13,66
1089 1300	13,66
1089 1350	15,23
1089 1400	15,39
1089 1450	19,50
1089 1500	19,31
1089 1550	18,81
1089 1600	20,18
1089 1650	21,20
1089 1700	21,03
1089 1750	24,10
1089 1800	23,91
1089 1850	28,84
1089 1900	26,35
1089 1950	30,22
1089 2000	28,89
1089 2050	36,19
1089 2100	32,95
1089 2150	38,97
1089 2200	35,88
1089 2250	39,66
1089 2300	37,28
1089 2400	45,77
1089 2500	46,18
1089 2600	53,00
1089 2700	56,76
1089 2800	63,24
1089 2900	73,11
1089 3000	72,78
1089 3100	96,09
1089 3200	101,59
1089 3300	101,59

Part No.	€
1089 3400	127,43
1089 3500	123,78
1089 3600	142,27
1089 3700	160,73
1089 3800	153,34
1089 3900	164,40
1089 4000	171,80
1089 4500	288,21
1089 5000	288,21
1092 1080	26,71
1092 1090	29,18
1092 1100	30,81
1092 1105	37,56
1092 1110	35,91
1092 1115	37,75
1092 1120	38,18
1092 1125	39,41
1092 1130	39,83
1092 1135	45,97
1092 1140	44,71
1092 1145	46,38
1092 1150	48,89
1092 1155	53,35
1092 1160	50,90
1092 1165	51,33
1092 1170	52,53
1092 1175	55,03
1092 1180	57,05
1092 1185	60,02
1092 1190	64,04
1092 1195	69,38
1092 1200	73,51
1092 1205	93,18
1092 1210	84,56
1092 1220	88,67
1092 1230	104,71
1092 1240	117,01
1092 1250	119,05
1092 1260	127,28
1092 1280	147,78
1092 1300	170,40
1092 2080	40,89
1092 2085	45,61
1092 2090	46,04
1092 2100	46,53
1092 2105	58,23
1092 2110	53,28
1092 2115	56,48
1092 2120	64,58
1092 2130	67,74
1092 2135	72,26
1092 2140	72,26
1092 2145	72,73
1092 2150	73,11
1092 2155	76,32
1092 2160	74,95
1092 2165	85,84
1092 2170	80,84
1092 2175	87,18
1092 2180	90,80
1092 2185	90,80
1092 2190	99,37
1092 2195	112,91
1092 2200	111,56
1092 2210	119,67
1092 2220	142,27
1092 2230	144,52
1092 2240	162,57
1092 2250	164,84
1092 2260	191,95
1092 2280	225,84
1092 2300	261,97
1093 0001	235,07

Part No.	€
1093 0002	235,07
1093 0011	251,42
1093 0012	251,42
1093 0021	251,42
1093 0022	251,42
1093 0031	271,85
1093 0032	271,85
1093 0041	290,26
1093 0042	290,26
1093 0051	290,26
1093 0052	290,26
1093 0061	318,87
1093 0062	318,87
1095 0001	251,42
1095 0002	251,42
1095 0011	271,85
1095 0012	271,85
1095 0021	271,85
1095 0022	271,85
1095 0031	290,26
1095 0032	290,26
1095 0041	331,13
1095 0042	331,13
1095 0051	331,13
1095 0052	331,13
1095 0061	361,78
1095 0062	361,78
1096 0001	271,85
1096 0002	271,85
1096 0011	290,26
1096 0012	290,26
1096 0021	290,26
1096 0022	290,26
1096 0031	331,13
1096 0032	331,13
1096 0041	384,27
1096 0042	384,27
1096 0051	384,27
1096 0052	384,27
1096 0061	414,93
1096 0062	414,93
1096 3006	2,19
1096 3007	2,19
1096 3508	2,19
1096 4009	2,19
1096 4510	2,19
1096 5011	2,19
1097 0160	82,31
1097 0165	82,31
1097 0170	82,31
1097 0175	82,31
1097 0180	82,31
1097 0185	82,31
1097 0190	82,31
1097 0195	82,31
1097 0200	82,31
1097 0205	86,04
1097 0210	86,04
1097 0215	86,04
1097 0220	86,04
1097 0225	86,04
1097 0230	99,74
1097 0235	99,74
1097 0240	99,74
1097 0245	99,74
1097 0250	99,74
1097 0254	99,74
1097 0255	99,74
1097 0260	132,17
1097 0265	132,17
1097 0270	132,17
1097 0275	132,17
1097 0280	132,17

Part No.	€
1097 0285	132,17
1097 0290	132,17
1097 0295	132,17
1097 0300	150,89
1097 0305	150,89
1097 0310	150,89
1097 0315	150,89
1097 0320	150,89
1097 0325	150,89
1097 0330	150,89
1097 0335	150,89
1097 0340	150,89
1097 0345	150,89
1097 0350	175,80
1097 0360	175,80
1097 0370	175,80
1097 0375	175,80
1097 0380	175,80
1097 0390	175,80
1097 0400	175,80
1097 0405	175,80
1100 0030	8,02
1100 0040	9,14
1100 0050	11,47
1100 0060	13,43
1100 0080	15,47
1100 0100	23,34
1103 0030	7,53
1103 0040	7,76
1103 0050	8,39
1103 0060	8,65
1103 0080	10,32
1103 0100	13,28
1103 0120	17,03
1106 0030	7,75
1106 0040	10,77
1106 0050	13,29
1106 0060	12,69
1106 0080	16,00
1106 0100	24,13
1109 0030	9,72
1109 0040	10,60
1109 0050	10,85
1109 0060	19,67
1109 0080	18,05
1109 0100	22,18
1109 0120	23,09
1112 0030	11,50
1112 0040	13,34
1112 0050	16,82
1112 0060	18,84
1112 0080	31,30
1112 0100	48,24
1115 0030	11,54
1115 0040	13,39
1115 0050	16,22
1115 0060	18,76
1115 0080	23,56
1115 0100	49,01
1120 0100	1,15
1120 0125	1,15
1120 0160	1,21
1120 0200	1,37
1120 0250	1,61
1120 0315	2,09
1120 0400	2,98
1120 0500	4,16
1120 0630	5,53
1120 0800	9,02
1120 1000	18,93
1121 0050	4,33
1121 0080	4,17
1121 0100	3,78

Part No.	€
1121 0125	4,49
1121 0160	3,78
1121 0200	3,70
1121 0250	4,33
1121 0315	6,08
1121 0400	8,69
1121 0500	12,55
1121 0630	18,43
1121 0800	28,82
1121 1000	57,11
1123 0100	3,47
1123 0125	3,47
1123 0160	3,65
1123 0200	3,84
1123 0250	4,03
1123 0315	4,61
1123 0400	5,58
1126 0100	2,11
1126 0160	2,11
1126 0200	2,30
1126 0250	2,69
1126 0315	3,47
1126 0400	4,80
1126 0500	6,73
1126 0630	8,27
1129 0100	1,34
1129 0125	1,34
1129 0160	1,65
1129 0200	1,73
1129 0250	1,89
1129 0315	2,57
1129 0400	3,24
1129 0500	5,09
1129 0630	7,26
1132 0100	2,79
1132 0125	2,79
1132 0160	1,94
1132 0200	2,16
1132 0250	2,80
1132 0315	3,07
1132 0400	5,17
1132 0500	6,66
1132 0630	10,22
1140 0300	1,15
1140 0400	1,39
1140 0500	1,83
1140 0600	2,79
1140 0800	4,13
1140 1000	5,95
1140 1200	8,36
1140 1600	16,14
1140 2000	24,79
1143 0300	1,15
1143 0400	1,39
1143 0500	1,83
1143 0600	2,79
1143 0800	4,13
1143 1000	5,95
1143 1200	8,36
1143 1600	16,14
1143 2000	24,79
1146 0500	3,37
1146 0600	4,43
1146 0800	5,67
1146 1000	7,50
1146 1200	10,28
1146 1600	18,07
1146 2000	26,71
1149 0500	3,37
1149 0600	4,43
1149 0800	5,67
1149 1000	7,50
1149 1200	10,28

Part No.	€
1149 1600	18,07
1149 2000	26,71
1152 0500	4,13
1152 0600	5,18
1152 0800	6,44
1152 1000	8,27
1152 1200	11,43
1152 1600	19,22
1152 2000	27,86
1155 0500	4,13
1155 0600	5,18
1155 0800	6,44
1155 1000	8,27
1155 1200	11,43
1155 1600	19,22
1155 2000	27,86
1156 0600	13,70
1156 0800	14,69
1156 1000	19,25
1156 1200	24,00
1158 0600	13,70
1158 0800	14,69
1158 1000	19,25
1158 1200	24,00
1170 0300	10,05
1170 0400	10,93
1170 0500	12,47
1170 0600	13,20
1170 0800	20,51
1170 1000	29,45
1170 1200	39,25
1170 1600	55,20
1170 2000	86,18
1172 0600	17,28
1172 0800	28,10
1172 1000	38,68
1172 1200	50,68
1172 1600	69,28
1174 0400	10,05
1174 0500	10,93
1174 0600	11,91
1174 0800	16,36
1174 1000	19,33
1174 1200	22,88
1174 1600	61,80
1174 2000	82,59
1176 0600	16,08
1176 0800	24,03
1176 1000	28,63
1176 1200	34,40
1176 1600	75,96
1180 0100	18,54
1180 0125	20,41
1180 0160	19,64
1180 0200	21,31
1180 0250	24,05
1180 0315	32,08
1180 0400	35,71
1180 0500	62,21
1180 0630	90,59
1185 0100	2,46
1185 0110	2,46
1185 0120	2,65
1185 0130	2,65
1185 0140	2,65
1185 0150	2,65
1185 0160	2,77
1185 0170	2,77
1185 0180	2,77
1185 0190	2,77
1185 0200	3,23
1185 0210	2,91
1185 0220	2,91

Part No.	€
1185 0230	2,91
1185 0240	2,91
1185 0250	2,91
1185 0260	3,84
1185 0270	3,84
1185 0280	3,84
1185 0290	3,84
1185 0300	3,84
1185 0310	5,31
1185 0320	5,31
1185 0330	5,31
1185 0340	5,31
1185 0350	5,31
1185 0360	6,08
1185 0370	6,08
1185 0380	6,08
1185 0390	6,08
1185 0400	6,08
1185 0410	6,62
1185 0420	6,62
1185 0430	6,91
1185 0440	6,91
1185 0450	6,91
1185 0460	7,45
1185 0470	7,45
1185 0480	7,45
1185 0490	7,45
1185 0500	7,45
1185 0510	9,84
1185 0520	9,84
1185 0530	10,76
1185 0540	10,76
1185 0550	9,84
1185 0560	11,37
1185 0570	11,37
1185 0580	10,38
1185 0590	11,37
1185 0600	10,38
1185 0650	12,76
1185 0680	15,45
1185 0700	14,92
1185 0750	18,07
1185 0800	20,32
1185 0850	25,52
1185 0900	26,13
1185 0950	28,74
1185 1000	29,81
1185 1020	35,04
1185 1050	35,04
1185 1100	38,81
1185 1200	45,19
1188 0100	3,39
1188 0110	3,39
1188 0120	3,84
1188 0130	3,84
1188 0140	3,84
1188 0150	3,84
1188 0160	5,23
1188 0170	5,23
1188 0180	5,23
1188 0190	5,23
1188 0200	5,23
1188 0210	4,84
1188 0220	4,84
1188 0230	4,84
1188 0240	4,84
1188 0250	4,84
1188 0260	6,54
1188 0270	6,54
1188 0280	6,54
1188 0290	6,54
1188 0300	6,54
1188 0310	7,45

Catalogue prices in EUR

Part No.	€
1188 0320	7,45
1188 0330	7,45
1188 0340	7,45
1188 0350	7,45
1188 0360	8,46
1188 0370	8,46
1188 0380	8,46
1188 0390	8,46
1188 0400	8,46
1188 0410	8,76
1188 0420	8,76
1188 0430	11,69
1188 0440	11,69
1188 0450	10,60
1188 0460	12,22
1188 0470	12,22
1188 0480	12,22
1188 0490	12,22
1188 0500	11,69
1188 0510	16,98
1188 0520	16,98
1188 0530	16,98
1188 0540	16,98
1188 0550	16,98
1188 0560	18,14
1188 0570	18,14
1188 0580	18,14
1188 0590	18,14
1188 0600	16,52
1188 0650	20,21
1188 0680	23,06
1188 0700	23,99
1188 0750	23,06
1188 0800	28,67
1188 0850	33,52
1188 0900	34,05
1188 0950	37,74
1188 1000	41,96
1188 1020	51,03
1188 1050	48,42
1188 1100	59,49
1188 1200	69,17
1191 0200	7,72
1191 0220	9,14
1191 0250	7,72
1191 0260	9,14
1191 0280	9,14
1191 0290	9,14
1191 0300	7,59
1191 0310	8,88
1191 0320	8,88
1191 0330	8,88
1191 0340	8,88
1191 0350	6,76
1191 0360	7,76
1191 0370	7,76
1191 0380	7,76
1191 0390	7,76
1191 0400	6,76
1191 0410	7,86
1191 0420	7,86
1191 0430	7,86
1191 0440	7,86
1191 0450	7,04
1191 0480	7,86
1191 0500	6,90
1191 0510	7,86
1191 0520	8,58
1191 0540	8,58
1191 0550	7,32
1191 0580	8,58
1191 0600	7,32
1191 0650	7,76

Part No.	€
1191 0680	7,86
1191 0700	8,30
1191 0750	8,58
1191 0800	8,58
1191 0850	10,55
1191 0900	9,29
1191 0950	11,26
1191 1000	11,81
1191 1020	18,02
1191 1050	13,39
1191 1100	11,81
1191 1150	15,78
1191 1200	13,64
1191 1250	18,02
1191 1300	16,92
1191 1350	22,25
1191 1400	21,69
1191 1500	25,07
1191 1600	28,71
1200 0300	23,44
1200 0317	23,44
1200 0325	23,44
1200 0330	23,44
1200 0350	23,44
1200 0357	23,44
1200 0370	23,44
1200 0380	23,44
1200 0397	23,44
1200 0400	23,44
1200 0420	23,44
1200 0437	23,44
1200 0450	23,44
1200 0460	23,44
1200 0465	23,44
1200 0476	23,44
1200 0480	23,44
1200 0500	23,44
1200 0516	23,44
1200 0550	23,44
1200 0555	23,44
1200 0556	23,44
1200 0570	23,44
1200 0580	23,44
1200 0595	23,44
1200 0600	23,44
1200 0635	23,44
1200 0650	23,44
1200 0675	23,44
1200 0680	23,44
1200 0700	23,44
1200 0714	23,44
1200 0740	23,44
1200 0750	23,44
1200 0754	23,44
1200 0780	23,44
1200 0794	23,44
1200 0800	23,44
1200 0833	26,30
1200 0850	26,30
1200 0873	26,30
1200 0880	26,30
1200 0900	26,30
1200 0913	26,30
1200 0925	26,30
1200 0930	26,30
1200 0950	26,30
1200 0952	26,30
1200 0992	26,30
1200 1000	26,30
1200 1020	39,23
1200 1050	39,23
1200 1100	39,23
1200 1120	39,23

Part No.	€
1200 1150	39,23
1200 1200	39,23
1200 1250	52,60
1200 1300	52,60
1200 1350	52,60
1200 1400	52,60
1200 1450	67,90
1200 1500	67,90
1200 1550	67,90
1200 1600	67,90
1203 0300	24,40
1203 0317	24,40
1203 0325	26,78
1203 0330	24,40
1203 0350	24,40
1203 0357	24,40
1203 0370	24,40
1203 0380	24,40
1203 0397	24,40
1203 0400	24,40
1203 0420	24,40
1203 0437	24,40
1203 0450	24,40
1203 0460	24,40
1203 0476	24,40
1203 0480	24,40
1203 0500	24,40
1203 0516	24,40
1203 0550	24,40
1203 0556	24,40
1203 0570	24,40
1203 0580	24,40
1203 0595	24,40
1203 0600	24,40
1203 0635	24,40
1203 0650	24,40
1203 0675	24,40
1203 0680	24,40
1203 0700	24,40
1203 0714	24,40
1203 0740	24,40
1203 0750	24,40
1203 0754	24,40
1203 0780	24,40
1203 0794	24,40
1203 0800	24,40
1203 0833	27,27
1203 0850	27,27
1203 0873	27,27
1203 0880	27,27
1203 0900	27,27
1203 0913	27,27
1203 0930	27,27
1203 0950	27,27
1203 0952	27,27
1203 0992	27,27
1203 1000	27,27
1203 1020	40,94
1203 1050	40,94
1203 1100	40,94
1203 1120	40,94
1203 1150	40,94
1203 1200	40,94
1203 1250	54,52
1203 1300	54,52
1203 1350	54,52
1203 1400	54,52
1203 1450	70,79
1203 1500	70,79
1203 1550	70,79
1203 1600	70,79
1206 0300	29,65
1206 0317	29,65

Part No.	€
1206 0325	29,65
1206 0330	29,65
1206 0350	29,65
1206 0357	29,65
1206 0380	29,65
1206 0397	29,65
1206 0400	32,04
1206 0420	32,04
1206 0437	32,04
1206 0450	32,04
1206 0460	32,04
1206 0465	32,04
1206 0476	32,04
1206 0480	32,04
1206 0500	32,04
1206 0516	32,04
1206 0550	32,04
1206 0555	32,04
1206 0556	32,04
1206 0570	32,04
1206 0580	32,04
1206 0595	32,04
1206 0600	32,04
1206 0635	43,52
1206 0650	43,52
1206 0675	43,52
1206 0680	43,52
1206 0700	43,52
1206 0714	43,52
1206 0740	43,52
1206 0750	43,52
1206 0754	43,52
1206 0780	43,52
1206 0794	43,52
1206 0800	43,52
1206 0833	48,76
1206 0850	48,76
1206 0873	48,76
1206 0880	48,76
1206 0900	48,76
1206 0913	48,76
1206 0925	48,76
1206 0930	48,76
1206 0950	48,76
1206 0952	48,76
1206 0980	48,76
1206 0992	48,76
1206 1000	48,76
1206 1020	69,82
1206 1032	69,82
1206 1050	69,82
1206 1070	69,82
1206 1100	69,82
1206 1111	69,82
1206 1120	69,82
1206 1150	69,82
1206 1170	69,82
1206 1191	69,82
1206 1200	69,82
1206 1250	97,57
1206 1270	97,57
1206 1300	97,57
1206 1350	97,57
1206 1370	97,57
1206 1400	97,57
1206 1429	119,07
1206 1450	119,07
1206 1470	119,07
1206 1500	119,07
1206 1550	119,07
1206 1570	119,07
1206 1600	119,07
1206 1650	191,28

Part No.	€
1206 1700	191,28
1206 1750	191,28
1206 1800	191,28
1206 1850	208,99
1206 1900	208,99
1206 1950	208,99
1206 2000	208,99
1209 0300	30,60
1209 0317	30,60
1209 0325	30,60
1209 0330	30,60
1209 0350	30,60
1209 0357	30,60
1209 0380	30,60
1209 0397	30,60
1209 0400	33,47
1209 0420	33,47
1209 0437	33,47
1209 0450	33,47
1209 0460	33,47
1209 0476	33,47
1209 0480	33,47
1209 0500	33,47
1209 0516	33,47
1209 0550	33,47
1209 0556	33,47
1209 0570	33,47
1209 0580	33,47
1209 0595	33,47
1209 0600	33,47
1209 0635	45,43
1209 0650	45,43
1209 0675	45,43
1209 0680	45,43
1209 0700	45,43
1209 0714	45,43
1209 0740	45,43
1209 0750	45,43
1209 0754	45,43
1209 0780	45,43
1209 0794	45,43
1209 0800	45,43
1209 0833	50,69
1209 0850	50,69
1209 0873	50,69
1209 0880	50,69
1209 0900	50,69
1209 0913	50,69
1209 0930	50,69
1209 0950	50,69
1209 0952	50,69
1209 0980	50,69
1209 0992	50,69
1209 1000	50,69
1209 1020	72,69
1209 1032	72,69
1209 1050	72,69
1209 1070	72,69
1209 1100	72,69
1209 1111	72,69
1209 1120	72,69
1209 1150	72,69
1209 1170	72,69
1209 1191	72,69
1209 1200	72,69
1209 1250	101,39
1209 1270	101,39
1209 1300	101,39
1209 1350	101,39
1209 1370	101,39
1209 1400	101,39
1209 1429	123,85
1209 1450	123,85

Part No.	€
1209 1470	123,85
1209 1500	123,85
1209 1550	123,85
1209 1570	123,85
1209 1600	123,85
1209 1650	198,92
1209 1700	198,92
1209 1750	198,92
1209 1800	198,92
1209 1850	217,10
1209 1900	217,10
1209 1950	217,10
1209 2000	217,10
1212 0300	26,78
1212 0317	26,78
1212 0325	26,78
1212 0330	26,78
1212 0350	26,78
1212 0357	26,78
1212 0370	26,78
1212 0380	26,78
1212 0397	26,78
1212 0400	26,78
1212 0420	26,78
1212 0437	26,78
1212 0450	26,78
1212 0460	26,78
1212 0465	26,78
1212 0476	26,78
1212 0480	26,78
1212 0500	26,78
1212 0516	26,78
1212 0550	26,78
1212 0555	26,78
1212 0556	26,78
1212 0580	26,78
1212 0595	26,78
1212 0600	26,78
1212 0635	27,27
1212 0650	27,27
1212 0675	27,27
1212 0680	27,27
1212 0700	27,27
1212 0714	27,27
1212 0740	27,27
1212 0750	27,27
1212 0754	27,27
1212 0780	27,27
1212 0794	27,27
1212 0800	27,27
1212 0833	30,12
1212 0850	30,12
1212 0873	30,12
1212 0880	30,12
1212 0900	30,12
1212 0913	30,12
1212 0925	30,12
1212 0930	30,12
1212 0950	30,12
1212 0952	30,12
1212 0980	30,12
1212 0992	30,12
1212 1000	30,12
1212 1020	44,94
1212 1050	44,94
1212 1100	44,94
1212 1150	44,94
1212 1200	44,94
1212 1250	59,31
1212 1300	59,31
1212 1350	59,31
1212 1400	59,31
1212 1450	76,99

Part No.	€
1212 1500	76,99
1212 1550	76,99
1212 1600	76,99
1215 0300	28,23
1215 0317	28,23
1215 0325	28,23
1215 0330	28,23
1215 0350	28,23
1215 0357	28,23
1215 0370	28,23
1215 0380	28,23
1215 0397	28,23
1215 0400	28,23
1215 0420	28,23
1215 0437	28,23
1215 0450	28,23
1215 0460	28,23
1215 0476	28,23
1215 0480	28,23
1215 0500	28,23
1215 0516	28,23
1215 0550	28,23
1215 0556	28,23
1215 0580	28,23
1215 0595	28,23
1215 0600	28,23
1215 0635	29,17
1215 0650	29,17
1215 0675	29,17
1215 0680	29,17
1215 0700	29,17
1215 0714	29,17
1215 0740	29,17
1215 0750	29,17
1215 0754	29,17
1215 0780	29,17
1215 0794	29,17
1215 0800	29,17
1215 0833	32,53
1215 0850	32,53
1215 0873	32,53
1215 0880	32,53
1215 0900	32,53
1215 0913	32,53
1215 0930	32,53
1215 0950	32,53
1215 0952	32,53
1215 0980	32,53
1215 0992	32,53
1215 1000	32,53
1215 1020	47,81
1215 1050	47,81
1215 1100	47,81
1215 1150	47,81
1215 1200	47,81
1215 1250	63,59
1215 1300	63,59
1215 1350	63,59
1215 1400	63,59
1215 1450	82,26
1215 1500	82,26
1215 1550	82,26
1215 1600	82,26
1218 0300	38,26
1218 0317	38,26
1218 0325	38,26
1218 0330	38,26
1218 0350	38,26
1218 0357	38,26
1218 0380	38,26
1218 0397	38,26
1218 0400	41,13
1218 0420	41,13

Catalogue prices in EUR

Part No.	€
1218 0437	41,13
1218 0450	41,13
1218 0460	41,13
1218 0465	41,13
1218 0476	41,13
1218 0480	41,13
1218 0500	41,13
1218 0516	41,13
1218 0550	41,13
1218 0555	41,13
1218 0556	41,13
1218 0580	41,13
1218 0595	41,13
1218 0600	41,13
1218 0635	45,43
1218 0650	45,43
1218 0675	45,43
1218 0680	45,43
1218 0700	45,43
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1250 1121	3,56
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1250 1246	6,35
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1250 1426	4,71
1250 1431	5,06
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1250 1660	11,84
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1250 2020	10,73
1250 2045	13,43
1250 2245	19,91
1250 2445	22,24
1250 2645	23,92
1250 2845	28,79
1250 3045	31,19
1253 0005	16,82
1253 0010	10,95
1256 0005	5,95
1256 0010	5,95
1256 0015	9,67
1256 0020	9,78
1259 0300	1,31
1259 0400	1,20
1259 0500	1,24
1259 0600	1,34
1259 0700	1,59
1259 0800	1,54
1259 0900	1,83
1259 1000	2,25
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1261 0120	5,54
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1261 0140	10,49
1261 1000	11,99
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1262 0010	11,67
1262 0012	8,35
1262 0015	8,68
1262 0020	11,95
1262 0025	17,73
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1263 0080	4,69
1263 0100	6,21
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1265 1234	27,59
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1265 1454	36,48
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1265 1854	38,59
1265 1894	47,42
1265 2032	32,57
1265 2052	39,83
1265 2092	46,24
1265 2232	35,19
1265 2252	41,31
1265 2432	35,83
1265 2452	41,72
1265 2532	36,87
1265 2552	42,16
1265 2592	59,20
1265 2837	43,22
1265 2857	47,42
1265 2867	50,56
1265 3057	48,48
1265 3257	52,67
1265 3557	57,44
1265 3837	57,13
1265 3857	72,07
1265 4057	84,31
1266 0120	61,19
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1266 0160	73,87
1266 0180	79,08
1266 0200	80,67
1266 0250	91,87
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1266 0300	99,70
1267 0010	23,29
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1268 0005	3,34
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1271 0801	41,80

Catalogue prices in EUR

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1274 0680	72,73
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1275 0010	3,59
1275 0050	7,94
1275 0055	7,94
1275 0680	25,33
1275 0820	32,57
1285 1000	4,35
1285 1500	5,07
1285 2000	6,10
1285 2500	6,54
1285 3000	7,65
1285 3200	8,44
1285 3500	8,84
1285 4000	12,33
1288 0300	1,02
1288 0400	1,02
1288 0500	1,12
1288 0600	1,15
1288 0700	1,23
1288 0800	1,46
1288 0900	1,58
1288 1000	1,64
1288 1100	1,76
1288 1200	1,75
1289 0005	6,21
1291 0845	8,02
1291 1045	8,02
1291 1245	8,80
1291 1445	9,89
1291 1645	10,76
1291 1845	11,80
1291 2045	12,65
1294 0800	4,00
1294 1000	4,39
1294 1200	5,61
1294 1400	6,71
1294 1600	8,19
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1294 2000	12,77
1294 2200	14,13
1294 2400	18,74
1295 0800	4,05
1295 1000	4,79
1295 1200	6,08
1295 1400	7,25
1295 1600	8,55
1295 1800	11,84
1295 2000	13,73
1295 2200	15,53
1295 2400	19,92
1295 2600	23,70
1295 2800	25,52
1295 3000	28,81
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1297 0800	6,63
1297 1000	6,91
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1300 0030	15,72
1300 0040	29,52
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1301 0015	31,17
1301 0080	61,93
1303 0010	9,67
1303 0020	13,61
1303 0030	28,37
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1303 0050	86,28
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1303 0070	31,55
1306 0100	41,64
1307 0100	102,44
1309 0100	62,39
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1314 0015	25,69
1314 0030	40,84
1315 0010	12,95
1315 0020	15,17
1315 0030	25,59
1315 0040	43,64
1315 0050	33,15
1315 0060	33,15
1315 0070	33,44
1316 0010	28,63
1316 0015	38,41
1316 0030	54,34
1316 0035	86,48
1316 0038	70,02
1317 0100	92,03
1318 0100	64,02
1319 0100	124,22
1321 0050	8,06
1321 0100	3,58
1321 0150	0,44
1323 0600	3,75
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1325 0800	4,69
1326 0120	14,85
1326 0130	14,85
1326 0140	14,85
1326 0150	17,44
1326 0160	17,96
1326 0170	18,68
1326 0180	19,15
1326 0190	20,57
1326 0200	21,53
1326 0210	22,49
1326 0220	20,79
1326 0230	24,14
1326 0240	25,12
1326 0250	26,08
1326 0260	26,76
1326 0270	27,50
1326 0280	28,48
1326 0290	29,39
1326 0300	29,59
1326 0310	33,45
1326 0320	37,04
1326 0330	40,16
1326 0340	44,70
1326 0350	48,98
1326 0360	53,01
1326 0370	54,98
1326 0380	56,87
1326 0390	58,57
1326 0400	60,21
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1326 0420	65,08
1326 0430	67,50
1326 0440	71,16
1326 0450	74,21
1326 0460	77,87
1326 0470	81,51
1326 0480	83,93
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1326 0500	88,78
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1327 0130	21,03
1327 0140	21,03
1327 0150	25,12
1327 0160	26,76
1327 0170	28,48
1327 0180	30,10
1327 0190	32,04
1327 0200	32,73
1327 0210	34,43
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1327 0230	36,08
1327 0240	37,04
1327 0250	37,77
1327 0260	39,64
1327 0270	41,38
1327 0280	43,00
1327 0290	44,70
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1327 0330	55,90
1327 0340	59,50
1327 0350	60,46
1327 0360	65,08
1327 0370	66,29
1327 0380	68,12
1327 0390	69,95
1327 0400	72,37
1327 0410	74,81
1327 0420	77,87
1327 0430	80,28
1327 0440	82,72
1327 0450	85,16
1327 0460	88,18
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1327 0480	94,89
1327 0490	97,32
1327 0500	99,15
1327 2019	99,41
1327 3019	99,41
1327 4019	150,62
1327 5019	150,62
1328 0100	127,84
1330 0005	90,55
1331 0005	152,87
1331 0010	152,87
1331 0015	161,52
1331 0020	209,93
1332 0005	47,14
1332 0010	44,12
1332 0015	54,02
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1332 0035	67,00
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1334 0003	15,01
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1334 0007	14,76
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1334 0011	15,80
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1335 0011	34,78
1335 0015	51,85
1350 0201	980,25
1350 0202	1.103,13
1350 0203	1.218,33
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1350 0302	1.135,43
1350 0303	1.218,33
1350 0304	1.687,80
1350 0401	1.155,86
1350 0402	1.299,03
1350 0403	1.513,04
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1350 0502	1.339,74
1350 0503	1.553,61
1350 0504	1.894,28
1351 0001	46,65
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1351 0003	53,90
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1352 0004	62,59
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1353 0003	39,85
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1354 0200	2.271,02
1355 0300	2.738,17
1356 0400	3.607,73
1357 0030	244,16
1357 0040	295,31
1357 0041	330,09
1357 0050	337,62
1357 0051	365,43
1357 0904	212,42
1358 0005	89,11
1358 0010	94,04
1358 0015	96,50
1359 0005	99,11
1359 0010	104,33
1359 0015	106,36
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1360 0010	85,35
1360 0015	89,11
1361 0005	89,84
1361 0010	96,64
1361 0015	99,26
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1365 1612	57,96
1365 1808	60,57
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1365 1812	60,57
1365 1814	60,57
1367 0001	81,43
1367 0002	88,97
1367 0003	141,72
1368 0010	1.014,16
1368 0016	1.014,16
1370 0005	822,75
1370 0010	840,86
1370 0015	881,57
1370 0020	935,77
1370 0025	1.017,20
1370 0030	1.050,38
1370 0035	1.122,69
1370 0040	1.517,54
1372 0005	114,19
1372 0010	114,19
1372 0015	114,19
1372 0020	114,19
1374 0005	36,37
1374 0010	36,37
1374 0015	39,12
1374 0020	63,61
1376 4020	300,67
1376 4025	300,67
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1378 0005	179,39
1378 0010	183,16
1378 0015	187,65
1378 0020	188,37
1378 0025	195,90
1378 0030	195,90
1378 0035	201,13
1378 0040	210,25
1378 0045	200,40
1378 0050	217,07
1378 0055	225,32
1378 0060	229,08
1378 0065	240,39
1378 0070	258,50
1400 0300	6,96
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1400 0500	6,52
1400 0600	6,99
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1400 1200	14,06
1403 0300	6,96
1403 0400	6,14
1403 0500	6,52
1403 0600	6,99
1403 0800	10,13
1403 1000	12,66
1403 1200	14,06
1406 0300	6,96
1406 0400	6,14
1406 0500	6,52
1406 0600	6,99
1406 0800	10,13
1406 1000	12,66
1406 1200	14,06
1409 0005	59,80
1409 0010	59,80
1409 0015	59,80
1412 1000	24,92
1412 1200	25,52
1412 1400	30,11
1412 1600	34,18
1412 1800	40,87
1412 2000	47,33
1412 2200	63,20
1412 2400	68,06
1415 1000	27,50
1415 1200	27,89
1415 1400	33,89
1415 1600	37,15
1415 1800	44,37
1415 2000	51,82
1415 2200	65,77
1415 2400	74,77
1420 0630	2,95
1420 0830	3,47
1420 1040	3,98
1420 1240	5,36
1420 1650	7,76
1420 2050	9,18
1422 0005	49,50
1425 0100	4,11
1425 0140	5,31
1425 0210	9,20
1425 0275	16,84
1425 0350	22,48
1425 0440	29,28
1425 0480	41,96
1425 0530	79,73
1425 0640	94,41
1427 0005	51,52
1430 0430	3,51
1430 0500	3,51
1430 0600	3,51
1430 0630	3,51
1430 0730	3,78
1430 0800	3,78
1430 0830	3,78
1430 1000	4,03
1430 1040	4,03
1430 1150	4,60
1430 1240	4,60
1430 1340	5,75
1430 1500	5,75
1430 1650	5,75
1430 1900	8,06
1430 2050	8,06
1430 2300	11,70
1430 2500	11,70
1430 3000	14,55
1430 3100	14,55
1430 4000	25,39
1433 0430	5,58
1433 0500	5,58
1433 0600	5,58
1433 0630	5,58
1433 0730	6,05
1433 0800	6,05
1433 0830	6,05
1433 1000	6,71
1433 1040	6,71
1433 1240	7,76
1433 1500	8,93
1433 1650	9,64
1433 1900	12,25
1433 2050	12,82
1433 2500	17,04
1433 3000	21,55
1433 3100	21,55
1433 4000	36,86
1436 0630	4,90
1436 0830	5,12
1436 1040	5,24
1436 1240	5,87
1436 1500	6,57
1436 1650	6,57
1436 2050	8,85
1436 2500	12,17
1436 3100	15,10
1440 0005	39,94
1442 0005	58,79
1444 0005	46,81
1445 0630	18,95
1445 0830	19,89
1445 1040	21,78
1445 1240	22,74
1445 1650	28,41
1445 2050	39,82
1446 0630	23,69
1446 0830	24,63
1446 1040	27,45
1446 1240	31,39
1446 1650	36,97
1446 2050	51,16
1448 0630	8,58
1448 0830	9,84
1448 1040	11,29
1448 1240	14,62
1448 1650	19,14
1448 2050	25,94
1448 2500	36,45
1450 1650	20,27
1450 2050	23,42
1450 2500	23,99
1450 3000	27,17
1450 3100	27,94
1450 3400	27,94
1450 3700	32,22
1450 4000	40,71
1450 4500	51,17
1450 5000	50,67
1450 6300	83,07
1450 8000	95,46
1453 2500	28,44
1453 3100	37,26
1453 3700	53,44
1453 4000	53,35
1453 5000	80,03
1453 6300	128,74
1453 8000	147,97
1456 0630	4,87
1456 0800	5,06
1456 1000	6,22
1456 1250	6,55
1456 1600	8,14
1456 2000	11,37
1456 2500	15,70
1456 3150	26,27
1456 4000	43,06
1459 0630	7,36
1459 0800	7,69
1459 1000	9,53
1459 1250	10,33
1459 1600	12,65
1459 2000	17,23
1459 2500	22,95
1459 3150	35,80
1462 0630	6,44
1462 0830	6,69
1462 1040	8,00
1462 1240	8,44
1462 1650	10,76
1462 2050	15,56
1462 2500	20,77
1465 0630	6,44
1465 0830	6,69
1465 1040	8,00
1465 1240	8,44
1465 1650	10,76
1465 2050	15,56
1465 2500	20,77
1468 1250	8,80
1468 1650	10,58
1468 2050	13,21
1468 2500	16,57
1470 0005	373,40
1470 0010	323,13
1470 0015	323,13
1470 0020	451,69
1470 0025	451,69
1470 0030	703,00
1470 0035	703,00
1473 0005	58,97

Catalogue prices in EUR

Part No.	€
1473 0010	50,97
1473 0015	52,24
1473 0020	61,98
1473 0025	65,09
1473 0030	73,63
1473 0035	73,63
1475 0005	65,09
1475 0010	73,63
1477 0500	31,80
1477 0550	31,80
1477 0600	31,80
1477 0650	31,80
1477 0700	31,80
1477 0750	31,80
1477 0800	31,80
1477 0850	31,80
1477 0900	31,80
1477 0950	31,80
1479 0240	11,58
1479 0250	11,58
1479 0260	11,58
1479 0270	11,58
1479 0280	11,58
1479 0290	11,58
1479 0300	11,58
1479 0310	11,58
1479 0320	11,58
1479 0330	11,58
1479 0340	11,58
1479 0350	11,58
1479 0360	11,58
1479 0370	11,58
1479 0380	11,58
1479 0390	11,58
1479 0400	11,58
1479 0410	11,58
1479 0420	11,58
1479 0430	11,58
1479 0440	11,58
1479 0450	11,58
1481 0800	19,55
1481 0850	19,55
1481 0900	22,25
1481 0950	22,25
1481 1000	22,25
1481 1050	22,25
1481 1100	24,26
1481 1150	24,26
1481 1200	24,26
1481 1250	24,26
1481 1300	28,38
1481 1350	28,38
1481 1400	28,38
1481 1450	28,38
1481 1500	31,11
1481 1550	31,11
1481 1600	31,11
1481 1650	31,11
1483 0400	7,59
1483 0410	7,59
1483 0420	7,59
1483 0430	7,59
1483 0450	7,59
1483 0480	7,59
1483 0490	7,59
1483 0500	7,59
1483 0530	7,59
1483 0550	8,35
1483 0580	8,35
1483 0590	8,35
1483 0600	8,35
1483 0610	8,35
1483 0640	8,35

Part No.	€
1483 0650	8,35
1483 0660	8,35
1483 0670	8,35
1483 0680	8,35
1483 0690	8,35
1483 0700	8,46
1483 0740	8,46
1483 0750	8,46
1483 0760	8,46
1483 0780	8,46
1483 0790	8,46
1483 0800	8,46
1483 0820	8,46
1483 0840	8,46
1483 0850	8,46
1483 0900	8,46
1483 0950	8,77
1483 0990	8,77
1483 1000	8,77
1483 1020	8,77
1483 1050	8,77
1483 1100	8,77
1483 1150	8,77
1485 1400	29,69
1485 1450	29,69
1485 1500	29,69
1485 1550	29,69
1485 1600	33,08
1485 1650	33,08
1485 1700	33,08
1485 1750	33,08
1485 1800	37,11
1485 1850	37,11
1485 1900	37,11
1485 1950	37,11
1485 2000	41,09
1485 2050	41,09
1485 2100	41,09
1485 2150	41,09
1485 2200	44,53
1485 2250	44,53
1485 2300	44,53
1485 2350	44,53
1485 2400	48,51
1485 2450	48,51
1485 2500	48,51
1485 2550	48,51
1485 2600	51,94
1485 2650	51,94
1485 2700	51,94
1485 2750	51,94
1487 0660	8,46
1487 0670	8,46
1487 0680	8,46
1487 0690	8,46
1487 0700	8,46
1487 0740	8,46
1487 0750	8,46
1487 0760	8,46
1487 0780	8,46
1487 0790	8,46
1487 0800	9,51
1487 0820	9,51
1487 0840	9,51
1487 0850	10,51
1487 0900	10,51
1487 0950	10,51
1487 0990	10,79
1487 1000	10,79
1487 1020	10,79
1487 1050	10,79
1487 1100	10,79
1487 1150	10,79

Part No.	€
1487 1200	10,79
1487 1250	11,78
1487 1300	11,78
1487 1350	11,78
1487 1400	11,78
1487 1450	11,78
1487 1500	11,78
1487 1550	12,41
1487 1600	12,41
1487 1650	12,41
1487 1700	12,41
1487 1750	12,41
1487 1800	12,41
1489 2400	50,18
1489 2450	50,18
1489 2500	50,18
1489 2550	50,18
1489 2600	56,15
1489 2650	56,15
1489 2700	56,15
1489 2750	56,15
1489 2800	57,58
1489 2850	57,58
1489 2900	57,58
1489 2950	57,58
1489 3000	58,89
1489 3050	58,89
1489 3100	58,89
1489 3200	58,89
1489 3300	61,60
1489 3400	61,60
1489 3500	61,60
1489 3600	61,60
1489 3700	74,53
1489 3800	74,53
1489 3900	74,53
1489 4000	74,53
1489 4100	101,62
1489 4200	101,62
1489 4300	101,62
1489 4400	101,62
1489 4500	104,93
1489 4600	104,93
1489 4700	104,93
1489 4800	104,93
1489 4900	134,00
1489 5000	134,00
1489 5100	134,00
1489 5200	134,00
1489 5300	148,38
1489 5400	148,38
1489 5500	148,38
1489 5600	148,38
1489 5700	170,62
1489 5800	170,62
1489 6000	170,62
1489 6200	170,62
1489 6400	170,62
1489 6500	170,62
1489 6600	170,62
1491 1000	14,13
1491 1020	14,13
1491 1050	14,13
1491 1100	14,13
1491 1150	14,13
1491 1200	14,13
1491 1250	14,13
1491 1300	14,13
1491 1350	14,13
1491 1400	16,35
1491 1450	16,35
1491 1500	16,35
1491 1550	16,35

Part No.	€
1491 1600	16,35
1491 1650	17,01
1491 1700	17,01
1491 1750	17,01
1491 1800	17,01
1491 1850	17,01
1491 1900	17,55
1491 1950	17,55
1491 2000	17,55
1491 2050	17,55
1491 2100	17,55
1491 2150	18,43
1491 2200	18,43
1491 2250	18,43
1491 2300	18,43
1491 2350	18,43
1491 2400	19,81
1491 2450	19,81
1491 2500	19,81
1491 2550	26,57
1491 2600	26,57
1491 2650	26,57
1491 2700	26,57
1491 2750	26,57
1491 2800	26,57
1491 2850	26,57
1491 2900	26,57
1491 2950	26,57
1491 3000	26,57
1491 3300	33,52
1491 3500	33,52
1491 3800	37,15
1491 4000	37,15
1500 0200	8,74
1500 0250	8,90
1500 0300	8,79
1500 0350	10,30
1500 0400	7,94
1500 0450	9,51
1500 0500	9,26
1500 0550	10,19
1500 0600	9,10
1500 0650	10,43
1500 0700	9,99
1500 0750	11,37
1500 0800	10,30
1500 0850	12,38
1500 0900	11,73
1500 0950	12,68
1500 1000	12,17
1500 1100	13,59
1500 1200	14,58
1500 1300	21,50
1500 1400	23,37
1500 1500	24,65
1500 1600	25,66
1500 1700	27,22
1500 1800	30,07
1500 1900	32,30
1500 2000	31,64
1500 2200	36,70
1500 2400	42,38
1500 2500	43,38
1500 2600	46,19
1500 2800	59,19
1500 3000	62,34
1500 3200	68,97
1503 0400	29,94
1503 0500	33,09
1503 0600	35,20
1503 0700	42,54
1503 0800	42,54
1503 0900	45,16

Part No.	€
1503 1000	45,70
1503 1100	56,19
1503 1200	53,05
1503 1300	60,94
1503 1400	62,50
1503 1500	64,09
1503 1600	80,36
1503 1800	84,56
1503 1900	86,65
1503 2000	89,28
1503 2200	106,09
1503 2400	116,62
1503 2500	116,62
1503 3000	151,27
1505 0005	57,89
1505 0010	57,89
1505 0015	57,89
1505 0020	63,87
1505 0025	63,87
1505 0030	63,87
1505 0035	71,85
1505 0040	79,82
1505 0045	81,83
1505 0050	89,82
1505 0055	107,78
1505 0060	115,09
1505 0065	133,07
1505 0070	146,02
1505 0075	189,08
1505 0080	267,87
1508 0300	10,32
1508 0400	11,73
1508 0500	12,33
1508 0600	14,90
1508 0800	23,07
1508 1000	32,59
1508 1200	41,45
1508 1300	48,23
1508 1400	50,94
1508 1600	57,55
1508 2000	74,67
1510 0200	13,25
1510 0250	15,81
1510 0300	14,40
1510 0400	14,52
1510 0500	15,48
1510 0600	17,75
1510 0800	26,48
1510 1000	33,86
1510 1200	42,30
1512 1000	26,79
1512 1200	29,07
1512 1300	29,07
1512 1400	29,72
1512 1500	31,30
1512 1600	32,90
1512 1700	38,75
1512 1800	41,96
1512 2000	46,18
1512 2100	48,07
1512 2200	51,00
1512 2500	58,43
1512 2800	71,03
1512 3000	81,35
1513 0050	16,98
1517 2500	51,61
1517 2600	53,64
1517 2700	70,21
1517 2800	55,74
1517 2900	73,90
1517 3000	54,67
1517 3200	61,20
1517 3400	66,67

Part No.	€
1517 3500	66,67
1517 3600	69,76
1517 3700	88,67
1517 3800	72,47
1517 4000	72,47
1517 4200	75,21
1517 4400	101,86
1517 4500	101,86
1517 4600	110,08
1517 4700	110,08
1517 4800	105,70
1517 5000	97,76
1520 0013	75,84
1520 0016	82,86
1520 0019	99,45
1520 0022	123,67
1525 0200	8,88
1525 0250	9,36
1525 0300	10,47
1525 0350	12,29
1525 0400	10,47
1525 0450	12,29
1525 0500	11,47
1525 0600	11,29
1525 0700	12,74
1525 0800	12,74
1525 0900	17,12
1525 1000	16,14
1525 1100	20,68
1525 1200	19,36
1528 0800	31,80
1528 1000	26,70
1528 1100	30,21
1528 1200	27,66
1528 1300	32,43
1528 1400	32,43
1528 1500	34,97
1528 1600	34,97
1528 1700	38,78
1528 1800	38,78
1528 1900	43,23
1528 2000	40,07
1528 2200	45,77
1528 2400	57,24
1528 2500	57,24
1528 2600	61,05
1528 2800	67,39
1528 3000	71,21
1528 3200	96,00
1531 0100	9,59
1531 0120	9,37
1531 0140	8,73
1531 0150	7,45
1531 0160	8,24
1531 0180	8,24
1531 0200	6,99
1531 0220	8,71
1531 0250	6,99
1531 0280	9,02
1531 0300	6,27
1531 0320	8,55
1531 0350	7,32
1531 0400	6,99
1531 0450	7,32
1531 0500	7,45
1531 0550	8,47
1531 0600	7,59
1531 0650	8,98
1531 0700	8,98
1531 0750	9,97
1531 0800	9,26
1531 0850	11,73
1531 0900	11,73

Part No.	€
1531 0950	11,81
1531 1000	10,95
1531 1100	16,14
1531 1200	16,77
1531 1300	18,63
1531 1400	19,31
1531 1500	19,91
1531 1600	20,88
1531 1700	24,35
1531 1800	25,00
1531 1900	29,42
1531 2000	27,15
1534 0300	14,77
1534 0400	15,75
1534 0500	17,44
1534 0600	18,49
1534 0800	23,58
1534 1000	28,05
1534 1200	40,38
1537 1000	16,49
1537 1100	18,07
1537 1200	17,72
1537 1300	18,63
1537 1400	18,98
1537 1500	23,07
1537 1600	23,37
1537 1700	25,00
1537 1800	25,96
1537 1900	27,53
1537 2000	27,53
1537 2200	30,95
1537 2400	36,70
1537 2500	37,64
1537 2600	40,46
1537 2800	44,62
1537 3000	46,19
1537 3200	60,76
1540 1000	40,37
1540 1200	43,58
1540 1400	51,96
1540 1500	58,10
1540 1600	59,71
1540 1800	65,87
1540 2000	69,76
1545 0100	13,20
1545 0101	13,20
1545 0102	13,20
1545 0103	13,20
1545 0150	9,75
1545 0151	11,39
1545 0152	11,39
1545 0153	11,39
1545 0160	11,07
1545 0170	11,07
1545 0180	11,07
1545 0190	11,07
1545 0197	12,05
1545 0198	12,05
1545 0199	12,05
1545 0200	9,80
1545 0201	12,30
1545 0202	12,30
1545 0203	12,30
1545 0210	11,26
1545 0220	11,26
1545 0230	11,26
1545 0240	11,26
1545 0247	12,30
1545 0248	12,30
1545 0249	12,30
1545 0250	9,59
1545 0251	12,30
1545 0252	12,30

Catalogue prices in EUR

Part No.	€
1545 0253	12,30
1545 0260	11,72
1545 0270	11,72
1545 0280	11,72
1545 0290	11,72
1545 0297	12,76
1545 0298	12,76
1545 0299	12,76
1545 0300	8,79
1545 0301	12,76
1545 0302	12,76
1545 0303	12,76
1545 0310	11,07
1545 0320	11,07
1545 0330	11,07
1545 0340	11,07
1545 0350	9,59
1545 0360	12,30
1545 0370	12,30
1545 0380	12,30
1545 0390	12,30
1545 0397	13,43
1545 0398	13,43
1545 0399	13,43
1545 0400	9,37
1545 0401	13,43
1545 0402	13,43
1545 0403	13,43
1545 0410	12,05
1545 0420	12,05
1545 0430	12,05
1545 0440	12,05
1545 0450	10,19
1545 0460	12,08
1545 0470	12,08
1545 0480	12,08
1545 0490	12,08
1545 0497	13,66
1545 0498	13,66
1545 0499	13,66
1545 0500	9,61
1545 0501	13,66
1545 0502	13,66
1545 0503	13,66
1545 0510	12,55
1545 0520	12,55
1545 0530	12,55
1545 0540	12,55
1545 0550	11,26
1545 0560	12,08
1545 0570	12,08
1545 0580	12,08
1545 0590	12,08
1545 0597	13,66
1545 0598	13,66
1545 0599	13,66
1545 0600	10,43
1545 0601	14,00
1545 0602	14,00
1545 0603	14,00
1545 0610	12,84
1545 0620	12,82
1545 0630	12,82
1545 0640	12,82
1545 0650	12,82
1545 0660	12,82
1545 0670	12,82
1545 0680	12,82
1545 0690	12,82
1545 0700	12,82
1545 0710	13,80
1545 0720	13,80
1545 0730	13,80

Part No.	€
1545 0740	13,80
1545 0750	13,80
1545 0760	14,41
1545 0770	14,41
1545 0780	14,41
1545 0790	14,41
1545 0797	14,00
1545 0798	14,00
1545 0799	14,00
1545 0800	12,30
1545 0801	14,00
1545 0802	14,00
1545 0803	14,00
1545 0810	17,04
1545 0820	17,04
1545 0830	17,04
1545 0840	17,04
1545 0850	15,47
1545 0860	16,10
1545 0870	16,10
1545 0880	16,10
1545 0890	16,10
1545 0900	14,62
1545 0901	17,84
1545 0902	17,84
1545 0903	17,84
1545 0910	16,27
1545 0920	16,27
1545 0930	16,27
1545 0940	16,27
1545 0950	16,25
1545 0960	16,27
1545 0970	16,66
1545 0980	16,66
1545 0990	16,66
1545 0997	17,84
1545 0998	17,84
1545 0999	17,84
1545 1000	15,47
1545 1001	17,84
1545 1002	17,84
1545 1003	17,84
1545 1100	21,33
1545 1197	27,34
1545 1198	27,34
1545 1199	27,34
1545 1200	22,00
1545 1300	23,31
1545 1400	24,21
1545 1500	25,06
1545 1600	25,78
1545 1700	30,37
1545 1800	31,30
1545 1900	36,62
1545 2000	35,17
1546 0100	13,55
1546 0120	14,33
1546 0140	14,33
1546 0150	12,05
1546 0160	15,17
1546 0180	17,12
1546 0200	13,99
1546 0220	18,25
1546 0250	16,14
1546 0280	18,85
1546 0300	16,62
1546 0320	19,55
1546 0350	18,60
1546 0400	19,18
1546 0450	22,48
1546 0500	23,12
1546 0600	28,04
1546 0700	33,56

Part No.	€
1546 0800	35,48
1546 0900	40,38
1546 1000	28,98
1546 1100	36,15
1546 1200	33,22
1549 1000	35,52
1549 1100	38,10
1549 1200	35,83
1549 1300	38,75
1549 1400	41,64
1549 1500	45,85
1549 1600	47,44
1549 1700	51,96
1549 1800	48,73
1549 1900	58,10
1549 2000	54,24
1549 2200	62,26
1549 2400	77,46
1549 2500	77,46
1549 2600	85,19
1549 2800	107,46
1549 3000	100,71
1581 0098	25,40
1581 0099	25,40
1581 0100	25,40
1581 0101	25,40
1581 0102	25,40
1581 0103	25,40
1581 0148	29,53
1581 0149	29,53
1581 0150	29,53
1581 0151	29,53
1581 0152	29,53
1581 0198	29,53
1581 0199	29,53
1581 0200	29,53
1581 0201	29,53
1581 0202	29,53
1581 0203	29,53
1581 0240	29,53
1581 0250	29,53
1581 0297	29,53
1581 0298	29,53
1581 0299	29,53
1581 0300	29,53
1581 0301	29,53
1581 0302	29,53
1581 0303	29,53
1581 0310	29,53
1581 0320	29,53
1581 0330	29,53
1581 0340	29,53
1581 0350	29,53
1581 0360	29,53
1581 0370	29,53
1581 0380	29,53
1581 0390	29,53
1581 0397	29,53
1581 0398	29,53
1581 0399	29,53
1581 0400	29,53
1581 0401	29,53
1581 0402	29,53
1581 0403	29,53
1581 0410	36,48
1581 0420	36,48
1581 0430	36,48
1581 0440	36,48
1581 0450	36,48
1581 0460	36,48
1581 0470	36,48
1581 0480	36,48
1581 0490	36,48

Part No.	€
1581 0497	36,48
1581 0498	36,48
1581 0499	36,48
1581 0500	36,48
1581 0501	36,48
1581 0502	36,48
1581 0503	36,48
1581 0510	36,48
1581 0520	36,48
1581 0530	36,48
1581 0540	36,48
1581 0550	36,48
1581 0560	36,48
1581 0570	36,48
1581 0580	36,48
1581 0590	36,48
1581 0597	36,48
1581 0598	36,48
1581 0599	36,48
1581 0600	36,48
1581 0601	36,48
1581 0602	36,48
1581 0603	36,48
1581 0610	45,36
1581 0620	45,36
1581 0630	45,36
1581 0640	45,36
1581 0650	45,36
1581 0660	45,36
1581 0670	45,36
1581 0680	45,36
1581 0690	45,36
1581 0700	45,36
1581 0710	45,36
1581 0720	45,36
1581 0730	45,36
1581 0740	45,36
1581 0750	45,36
1581 0760	45,36
1581 0770	45,36
1581 0780	45,36
1581 0790	45,36
1581 0797	45,36
1581 0798	45,36
1581 0799	45,36
1581 0800	45,34
1581 0801	45,36
1581 0802	45,36
1581 0803	45,36
1581 0810	55,66
1581 0820	55,66
1581 0830	55,66
1581 0840	55,66
1581 0850	55,66
1581 0860	55,66
1581 0870	55,66
1581 0880	55,66
1581 0890	55,66
1581 0900	55,66
1581 0910	55,66
1581 0920	55,66
1581 0930	55,66
1581 0940	55,66
1581 0950	55,66
1581 0960	55,66
1581 0970	55,66
1581 0980	55,66
1581 0990	55,66
1581 0997	55,66
1581 0998	55,66
1581 0999	55,66
1581 1000	55,66
1581 1001	55,66

Part No.	€
1581 1002	55,66
1581 1003	55,66
1581 1197	72,95
1581 1198	72,95
1581 1199	72,95
1581 1200	72,95
1581 1201	72,95
1581 1202	72,95
1581 1203	72,95
1600 0010	7,50
1600 0012	6,99
1600 0014	6,35
1600 0016	5,86
1600 0017	6,02
1600 0020	4,47
1600 0022	4,91
1600 0023	4,91
1600 0025	3,70
1600 0026	4,27
1600 0030	2,03
1600 0035	4,02
1600 0040	2,03
1600 0045	5,07
1600 0050	2,19
1600 0060	2,19
1600 0070	4,74
1600 0080	2,46
1600 0090	6,22
1600 0100	2,90
1600 0110	8,39
1600 0120	3,64
1600 0140	5,80
1600 0160	7,18
1600 0180	12,38
1600 0200	13,14
1600 0220	15,75
1600 0240	16,65
1600 0270	24,54
1600 0300	29,75
1601 0010	7,50
1601 0012	6,99
1601 0014	6,35
1601 0016	5,86
1601 0017	6,02
1601 0020	4,47
1601 0022	4,91
1601 0023	4,91
1601 0025	3,70
1601 0026	4,27
1601 0030	2,03
1601 0035	4,02
1601 0040	2,03
1601 0045	5,07
1601 0050	2,19
1601 0060	2,19
1601 0070	4,74
1601 0080	2,46
1601 0090	6,22
1601 0100	2,90
1601 0110	8,39
1601 0120	3,64
1601 0140	5,80
1601 0160	7,18
1601 0180	12,38
1601 0200	13,14
1601 0220	15,75
1601 0240	16,65
1601 0270	24,54
1601 0300	29,75
1603 0010	7,50
1603 0012	6,99
1603 0014	6,35
1603 0016	5,86

Part No.	€
1603 0017	6,02
1603 0020	4,47
1603 0022	4,91
1603 0023	4,91
1603 0025	3,70
1603 0026	4,27
1603 0030	2,03
1603 0035	4,02
1603 0040	2,03
1603 0045	5,07
1603 0050	2,19
1603 0060	2,19
1603 0070	4,74
1603 0080	2,46
1603 0090	6,22
1603 0100	2,90
1603 0110	8,39
1603 0120	3,64
1603 0140	5,80
1603 0160	7,18
1603 0180	12,38
1603 0200	13,14
1603 0220	15,75
1603 0240	16,65
1603 0270	24,54
1603 0300	29,75
1604 0010	22,41
1604 0012	20,90
1604 0014	19,07
1604 0016	17,64
1604 0017	18,02
1604 0020	13,39
1604 0022	14,74
1604 0023	14,74
1604 0025	11,15
1604 0026	12,80
1604 0030	6,17
1604 0035	11,95
1604 0040	6,17
1604 0045	15,29
1604 0050	6,54
1604 0060	6,54
1604 0070	14,22
1604 0080	7,36
1604 0090	18,66
1604 0100	8,68
1604 0110	25,12
1604 0120	10,90
1604 0140	17,44
1604 0160	21,55
1604 0180	37,01
1604 0200	39,39
1604 0220	47,28
1604 0240	49,88
1604 0270	73,55
1604 0300	89,29
1612 0030	19,47
1612 0040	19,66
1612 0050	19,66
1612 0060	20,07
1612 0080	24,37
1612 0100	30,21
1612 0120	35,58
1612 0140	50,56
1612 0160	57,46
1612 0180	79,29
1612 0200	71,28
1618 0020	27,39
1618 0025	24,21
1618 0030	17,89
1618 0035	22,16
1618 0040	17,89
1618 0050	18,95

Part No.	€
1618 0060	20,02
1618 0080	22,16
1618 0100	27,39
1618 0120	34,24
1618 0140	47,41
1618 0160	36,86
1618 0200	55,82
1625 0001	9,69
1625 0003	6,46
1625 0005	6,46
1625 0007	4,30
1625 0009	4,30
1625 0011	4,30
1625 0013	4,30
1625 0015	4,30
1625 0017	4,19
1625 0019	5,24
1625 0021	5,53
1625 0023	5,15
1625 0025	4,90
1625 0027	6,99
1625 0029	6,93
1625 0031	5,59
1625 0033	5,59
1625 0035	7,26
1625 0037	6,76
1625 0039	6,76
1625 0041	6,55
1625 0043	9,28
1625 0045	9,09
1625 0047	8,24
1625 0049	11,80
1625 0051	10,38
1625 0053	10,82
1625 0055	10,05
1625 0057	13,21
1625 0059	11,89
1625 0061	15,29
1625 0063	13,77
1625 0065	12,93
1625 0067	18,29
1625 0069	19,83
1625 0071	16,14
1625 0073	16,92
1625 0075	13,07
1625 0077	19,85
1625 0079	24,57
1625 0081	24,77
1625 0083	25,40
1625 0085	28,19
1625 0087	26,40
1625 0089	35,08
1625 0091	28,89
1625 0093	33,63
1625 0095	33,56
1625 0097	38,45
1625 0099	44,78
1625 0101	38,37
1625 0103	41,45
1625 0105	43,86
1625 0107	47,61
1625 0109	50,04
1625 0111	47,61
1625 0113	67,33
1625 0115	66,94
1625 0117	61,02
1625 0119	74,40
1625 0121	73,28
1625 0123	74,04
1625 0125	77,98
1625 0127	81,55
1625 0129	92,96
1625 0131	89,43

Catalogue prices in EUR

Part No.	€
1625 0133	96,59
1626 0001	9,69
1626 0003	6,46
1626 0005	6,46
1626 0007	4,30
1626 0009	4,30
1626 0011	4,30
1626 0013	4,30
1626 0015	4,30
1626 0017	4,19
1626 0019	5,24
1626 0021	5,53
1626 0023	5,15
1626 0025	4,90
1626 0027	6,99
1626 0029	6,93
1626 0031	5,59
1626 0033	5,59
1626 0035	7,26
1626 0037	6,76
1626 0039	6,76
1626 0041	6,55
1626 0043	9,28
1626 0045	9,09
1626 0047	8,24
1626 0049	11,80
1626 0051	10,38
1626 0053	10,82
1626 0055	10,05
1626 0057	13,21
1626 0059	11,89
1626 0061	15,29
1626 0063	13,77
1626 0065	12,93
1626 0067	18,29
1626 0069	19,83
1626 0071	16,14
1626 0073	16,92
1626 0075	13,07
1626 0077	19,85
1626 0079	24,57
1626 0081	24,77
1626 0083	25,40
1626 0085	28,19
1626 0087	26,40
1626 0089	35,08
1626 0091	28,89
1626 0093	33,63
1626 0095	33,56
1626 0097	38,45
1626 0099	44,78
1626 0101	38,37
1626 0103	41,45
1626 0105	43,86
1626 0107	47,61
1626 0109	50,04
1626 0111	47,61
1626 0113	67,33
1626 0115	66,94
1626 0117	61,02
1626 0119	74,40
1626 0121	73,28
1626 0123	74,04
1626 0125	77,98
1626 0127	81,55
1626 0129	92,96
1626 0131	89,43
1626 0133	96,59
1627 0001	19,36
1627 0003	12,90
1627 0005	12,90
1627 0007	8,57
1627 0009	8,57
1627 0011	8,57
1627 0013	8,57
1627 0015	8,57
1627 0017	8,41
1627 0019	10,46
1627 0021	11,03
1627 0023	10,32
1627 0025	9,80
1627 0027	17,66
1627 0029	13,86
1627 0031	11,21
1627 0033	11,21
1627 0035	14,58
1627 0037	13,47
1627 0039	13,47
1627 0041	13,14
1627 0043	18,57
1627 0045	18,18
1627 0047	16,47
1627 0049	23,58
1627 0051	20,77
1627 0053	21,64
1627 0055	20,10
1627 0057	26,43
1627 0059	23,77
1627 0061	30,56
1627 0063	27,52
1627 0065	25,88
1627 0067	36,62
1627 0069	39,71
1627 0071	32,29
1627 0073	33,80
1627 0075	26,13
1627 0077	39,72
1627 0079	49,16
1627 0081	49,52
1627 0083	50,76
1627 0085	56,37
1627 0087	52,73
1627 0089	70,10
1627 0091	57,79
1627 0093	67,19
1627 0095	67,08
1627 0097	76,83
1627 0099	89,60
1627 0101	76,75
1627 0103	82,88
1627 0105	87,71
1627 0107	95,19
1627 0109	100,12
1627 0111	95,22
1627 0113	134,68
1627 0115	133,89
1627 0117	122,00
1627 0119	148,77
1627 0121	146,57
1627 0123	148,07
1627 0125	155,93
1627 0127	163,09
1627 0129	186,01
1627 0131	178,81
1627 0133	193,10
1635 0001	11,47
1635 0003	13,01
1635 0005	11,84
1635 0007	14,74
1635 0009	12,22
1635 0011	15,03
1635 0013	16,33
1635 0015	23,17
1635 0017	24,33
1635 0019	37,44
1635 0021	33,99
1635 0023	47,41
1635 0025	63,16
1635 0027	78,97
1638 0001	5,59
1638 0003	6,82
1638 0005	8,96
1638 0007	13,04
1638 0009	17,44
1638 0011	21,62
1638 0013	29,94
1638 0015	36,16
1638 0017	85,10
1638 0019	106,01
1638 0021	155,80
1639 0001	5,59
1639 0003	6,82
1639 0005	8,96
1639 0007	13,04
1639 0009	17,44
1639 0011	21,62
1639 0013	29,94
1639 0015	36,16
1639 0017	85,10
1639 0019	106,01
1639 0021	155,80
1640 0001	11,21
1640 0003	13,64
1640 0005	17,97
1640 0007	26,08
1640 0009	34,93
1640 0011	43,23
1640 0013	59,90
1640 0015	72,34
1640 0017	169,42
1640 0019	212,81
1640 0021	309,16
1647 0001	18,44
1647 0003	18,44
1647 0005	15,53
1647 0007	14,10
1647 0009	13,94
1647 0011	13,69
1647 0013	14,10
1647 0015	14,60
1647 0017	15,66
1647 0019	12,55
1647 0021	16,60
1647 0023	19,15
1647 0025	22,51
1647 0027	26,84
1647 0029	37,93
1647 0031	35,00
1647 0033	50,54
1647 0035	63,68
1647 0037	81,65
1650 0001	15,40
1650 0003	13,86
1650 0005	13,12
1650 0007	12,08
1650 0009	10,65
1650 0011	10,22
1650 0013	10,22
1650 0015	9,78
1650 0017	10,22
1650 0019	10,88
1650 0021	9,47
1650 0023	11,95
1650 0025	12,84
1650 0027	16,41
1650 0029	17,75
1650 0031	25,70
1650 0033	23,86
1650 0035	33,80
1650 0037	40,38
1650 0039	57,27
1651 0001	4,43
1651 0003	4,43
1651 0005	4,43
1651 0007	4,43
1651 0009	6,08
1651 0011	7,29
1651 0020	31,63
1652 0050	118,19
1652 0100	136,93
1670 0001	10,46
1670 0003	12,40
1670 0005	15,62
1670 0007	18,44
1670 0009	25,12
1670 0011	33,86
1670 0013	47,41
1673 0020	9,51
1673 0030	3,98
1673 0040	3,98
1673 0050	4,10
1673 0060	4,35
1673 0080	5,07
1673 0100	6,55
1673 0120	9,10
1673 0160	20,77
1673 0200	33,53
1676 0010	19,03
1676 0012	18,27
1676 0014	14,40
1676 0016	12,84
1676 0018	12,84
1676 0020	7,25
1676 0025	7,09
1676 0030	5,29
1676 0040	5,43
1676 0050	5,61
1676 0060	5,61
1676 0080	6,52
1676 0100	8,06
1677 0010	14,44
1677 0012	14,44
1677 0014	13,64
1677 0016	13,25
1677 0018	10,84
1677 0020	9,25
1677 0025	9,25
1677 0030	7,62
1677 0040	7,92
1677 0050	8,22
1677 0060	8,22
1677 0080	9,43
1677 0100	11,83
1679 0030	6,17
1679 0040	6,17
1679 0050	6,41
1679 0060	6,41
1679 0080	7,78
1679 0100	9,47
1679 0120	11,03
1679 0140	15,29
1679 0160	15,80
1679 0180	24,74
1679 0200	24,57
1679 0220	32,11
1679 0240	33,01
1679 0270	41,06
1679 0300	51,16
1680 0120	16,05
1680 0140	22,07
1680 0160	23,28
1680 0180	35,71
1680 0200	35,71
1680 0220	46,53
1680 0240	48,15
1680 0270	59,36
1680 0300	75,82
1681 0020	11,62
1681 0025	10,84
1681 0030	9,43
1681 0040	9,43
1681 0050	9,83
1681 0060	9,83
1681 0080	11,62
1681 0100	13,84
1681 0120	17,84
1681 0140	24,05
1681 0160	25,26
1681 0180	38,08
1681 0200	38,08
1681 0220	54,95
1681 0240	50,15
1681 0270	68,99
1681 0300	82,62
1682 0020	6,82
1682 0025	6,66
1682 0030	5,06
1682 0040	5,15
1682 0050	5,26
1682 0060	5,26
1682 0080	6,28
1682 0100	8,11
1682 0120	10,71
1682 0140	15,14
1682 0160	17,09
1682 0180	22,19
1682 0200	24,10
1682 0220	30,98
1682 0240	30,54
1682 0270	41,14
1682 0300	50,95
1683 0020	9,06
1683 0030	7,45
1683 0040	7,70
1683 0050	7,94
1683 0060	7,94
1683 0080	9,28
1683 0100	11,47
1683 0120	15,66
1683 0140	21,64
1683 0160	22,52
1683 0180	34,92
1683 0200	34,92
1683 0220	45,49
1683 0240	46,81
1684 0020	11,26
1684 0022	11,95
1684 0023	12,60
1684 0025	10,57
1684 0026	11,73
1684 0030	9,28
1684 0035	9,72
1684 0040	9,28
1684 0050	9,51
1684 0060	9,51
1684 0080	11,26
1684 0100	13,47
1684 0120	17,44
1684 0140	23,37
1684 0160	24,74
1684 0180	37,09
1684 0200	37,09
1684 0220	53,44
1684 0240	49,01
1684 0270	67,10
1684 0300	80,81
1685 0030	12,38
1685 0040	12,60
1685 0050	12,80
1685 0060	13,26
1685 0080	15,26
1685 0100	18,57
1685 0120	23,00
1685 0140	32,22
1685 0160	32,04
1685 0200	48,57
1686 0020	5,18
1686 0030	6,05
1686 0040	6,22
1686 0050	6,22
1686 0060	6,38
1686 0080	7,26
1686 0100	8,68
1686 0120	11,03
1686 0140	16,14
1686 0160	16,51
1686 0200	24,92
1687 0020	10,84
1687 0030	8,82
1687 0040	9,04
1687 0050	9,04
1687 0060	9,25
1687 0080	10,62
1687 0100	12,63
1687 0120	16,05
1687 0140	23,66
1687 0160	24,05
1687 0200	36,10
1688 0030	9,25
1688 0040	9,43
1688 0050	9,83
1688 0060	10,03
1688 0080	11,83
1688 0100	14,24
1688 0120	18,03
1688 0140	25,67
1688 0160	26,48
1688 0200	39,71
1690 0030	5,95
1690 0040	6,11
1690 0050	6,36
1690 0060	6,36
1690 0080	6,74
1690 0100	8,57
1690 0120	9,62
1690 0140	13,55
1690 0160	18,25
1690 0200	27,39
1691 0030	9,06
1691 0040	9,28
1691 0050	9,51
1691 0060	9,72
1691 0080	11,47
1691 0100	13,89
1691 0120	13,69
1691 0140	19,01
1691 0160	25,61
1691 0200	38,87
1692 0030	16,14
1692 0040	15,66
1692 0050	16,14
1692 0060	16,14
1692 0080	17,88
1692 0100	22,52
1692 0120	31,19
1692 0160	35,80
1692 0200	53,00
1694 0030	6,52
1694 0040	6,74
1694 0050	7,23
1694 0060	7,32
1694 0080	8,21
1694 0100	9,36
1694 0120	10,47
1698 0030	10,57
1698 0040	11,78
1698 0050	12,06
1698 0060	14,76
1698 0080	15,86
1698 0100	21,56
1698 0120	24,18
1698 0160	22,82
1698 0200	38,62
1700 0030	8,13
1700 0040	8,68
1700 0050	8,93
1700 0060	11,03
1700 0080	12,08
1700 0100	15,12
1700 0120	23,69
1700 0160	32,57
1700 0200	48,37
1705 0030	5,95
1705 0040	5,95
1705 0050	6,28
1705 0060	6,28
1705 0080	7,21
1705 0100	8,76
1705 0120	11,43
1705 0140	14,41
1705 0160	16,14
1705 0180	23,51
1705 0200	23,69
1706 0030	8,62
1706 0040	8,62
1706 0050	9,04
1706 0060	9,04
1706 0080	10,41
1706 0100	12,63
1706 0120	16,65
1706 0140	20,87
1706 0160	23,66
1706 0180	34,08
1706 0200	34,51
1710 0020	23,77
1710 0025	23,56
1710 0026	23,56
1710 0030	11,77
1710 0040	10,47
1710 0050	10,74
1710 0060	11,77
1710 0080	13,17
1710 0100	15,99
1710 0120	26,84
1710 0140	49,42
1710 0160	52,05
1710 0200	64,23
1712 0030	6,35
1712 0040	6,52
1712 0050	6,79
1712 0060	6,79
1712 0080	7,18
1712 0100	9,10
1712 0120	12,65
1712 0140	17,72
1712 0160	17,55
1712 0180	25,12
1712 0200	25,94
1713 0030	9,43
1713 0040	9,83
1713 0050	10,03

Catalogue prices in EUR

Part No.	€
1713 0060	10,22
1713 0080	11,83
1713 0100	14,24
1713 0120	18,44
1713 0140	25,67
1713 0160	25,26
1713 0180	41,71
1713 0200	39,31
1718 0030	22,37
1718 0040	23,04
1718 0050	23,50
1718 0060	23,92
1718 0080	27,78
1718 0100	33,66
1718 0120	42,01
1718 0160	69,06
1718 0200	88,53
1722 0030	6,05
1722 0040	6,05
1722 0050	6,22
1722 0060	6,22
1722 0080	7,26
1722 0100	8,68
1722 0120	12,47
1722 0140	14,57
1722 0160	17,23
1722 0180	23,17
1722 0200	25,25
1723 0030	7,73
1723 0040	8,02
1723 0050	8,22
1723 0060	8,22
1723 0080	9,43
1723 0100	11,83
1723 0120	15,06
1723 0140	21,26
1723 0160	21,26
1723 0180	33,69
1723 0200	32,89
1725 0016	10,38
1725 0020	9,06
1725 0025	8,57
1725 0030	5,56
1725 0040	5,59
1725 0050	5,69
1725 0060	5,69
1725 0080	6,28
1725 0100	8,06
1725 0120	11,97
1725 0140	14,79
1725 0160	16,51
1725 0180	23,17
1725 0200	25,25
1725 0240	39,31
1726 0016	12,63
1726 0020	10,62
1726 0025	10,03
1726 0030	8,82
1726 0040	8,82
1726 0050	9,04
1726 0060	9,04
1726 0080	10,62
1726 0100	12,63
1726 0120	18,03
1726 0140	21,26
1726 0160	24,87
1726 0180	33,69
1726 0200	36,90
1726 0240	44,53
1728 0030	9,47
1728 0040	9,47
1728 0050	8,76
1728 0060	8,90
1728 0080	9,94
1728 0100	11,89
1728 0120	14,79
1728 0140	21,66
1728 0160	21,07
1728 0180	33,37
1728 0200	32,38
1731 0030	5,17
1731 0040	5,29
1731 0050	5,29
1731 0060	5,29
1731 0080	5,91
1731 0100	7,50
1731 0120	11,26
1731 0140	13,61
1731 0160	14,74
1731 0180	21,31
1731 0200	23,17
1732 0030	8,02
1732 0040	8,22
1732 0050	8,43
1732 0060	8,43
1732 0080	9,83
1732 0100	12,03
1732 0120	14,63
1732 0140	22,07
1732 0160	21,26
1732 0180	34,08
1732 0200	33,69
1734 0030	4,82
1734 0040	5,01
1734 0050	5,01
1734 0060	5,34
1734 0080	5,70
1734 0100	6,93
1735 0030	6,99
1735 0040	7,26
1735 0050	7,26
1735 0060	7,73
1735 0080	8,22
1735 0100	10,03
1737 0030	7,67
1737 0040	7,67
1737 0050	8,13
1737 0060	8,13
1737 0080	9,29
1737 0100	11,59
1738 0030	1,98
1738 0040	1,98
1738 0050	2,06
1738 0060	2,16
1738 0080	2,82
1738 0100	3,70
1738 0120	4,82
1738 0160	25,61
1738 0200	38,45
1750 0030	8,58
1750 0035	9,97
1750 0040	8,58
1750 0050	9,29
1750 0060	9,62
1750 0080	12,47
1750 0100	14,00
1750 0120	18,60
1750 0140	23,86
1750 0160	27,04
1751 0001	14,03
1751 0003	14,44
1751 0005	14,63
1751 0007	14,24
1751 0009	20,44
1751 0011	15,84
1751 0013	14,24
1751 0015	19,85
1751 0017	15,66
1751 0019	19,06
1751 0021	18,66
1751 0023	24,05
1751 0025	17,25
1751 0027	24,05
1751 0029	24,87
1751 0031	22,46
1751 0033	28,08
1751 0035	27,67
1751 0037	30,48
1751 0039	38,90
1751 0041	35,71
1751 0043	46,13
1751 0045	59,76
1751 0047	72,20
1751 0049	81,02
1752 0001	15,66
1752 0003	14,03
1752 0005	14,44
1752 0007	15,06
1752 0009	15,25
1752 0011	15,66
1752 0013	15,66
1752 0015	15,66
1752 0017	16,65
1752 0019	21,26
1752 0021	20,05
1752 0023	25,67
1752 0025	30,48
1752 0027	38,08
1752 0029	41,31
1752 0031	51,33
1752 0033	60,97
1753 0001	9,81
1753 0003	9,62
1753 0005	9,47
1753 0007	8,11
1753 0009	8,05
1753 0011	10,77
1753 0013	9,36
1753 0015	8,76
1753 0017	12,90
1753 0019	9,81
1753 0021	10,60
1753 0023	11,59
1753 0025	12,33
1753 0027	11,03
1753 0029	15,29
1753 0031	14,57
1753 0033	14,41
1753 0035	17,37
1753 0037	16,51
1753 0039	19,81
1753 0041	25,25
1753 0043	23,17
1753 0045	24,37
1753 0047	26,49
1753 0049	41,75
1753 0051	42,08
1754 0001	14,24
1754 0003	14,03
1754 0005	13,84
1754 0007	14,03
1754 0009	13,84
1754 0011	19,45
1754 0013	15,25
1754 0015	13,84
1754 0017	19,45
1754 0019	14,24
1754 0021	18,44
1754 0023	16,85
1754 0025	18,85
1754 0027	16,05
1754 0029	22,07
1754 0031	21,26
1754 0033	20,87
1754 0035	25,26
1754 0037	24,05
1754 0039	28,49
1754 0041	36,90
1754 0043	33,69
1754 0045	46,94
1754 0047	44,92
1754 0049	81,02
1754 0051	75,82
1755 0001	10,14
1755 0003	9,97
1755 0005	8,11
1755 0007	8,05
1755 0009	10,77
1755 0011	9,36
1755 0013	8,76
1755 0015	12,90
1755 0017	9,81
1755 0019	10,60
1755 0021	12,33
1755 0023	12,33
1755 0025	11,47
1755 0027	14,79
1755 0029	15,09
1755 0031	14,10
1755 0033	17,64
1755 0035	17,47
1755 0037	22,63
1755 0039	25,78
1755 0041	23,86
1755 0043	28,10
1755 0045	34,00
1755 0047	55,14
1755 0049	56,76
1756 0003	13,69
1756 0005	13,47
1756 0009	13,47
1756 0013	14,79
1756 0015	13,69
1756 0017	13,89
1756 0019	16,33
1756 0021	15,91
1756 0023	20,33
1756 0025	23,37
1756 0027	27,85
1756 0029	33,11
1756 0031	34,00
1756 0033	37,55
1757 0001	9,97
1757 0003	10,13
1757 0005	11,32
1757 0007	12,32
1757 0009	11,89
1757 0011	12,06
1757 0013	14,00
1757 0015	16,52
1757 0017	17,37
1757 0019	21,07
1757 0021	24,19
1757 0023	29,59
1757 0025	32,08
1757 0027	34,56
1758 0001	12,63
1758 0003	13,25
1758 0005	14,63
1758 0007	16,05
1758 0009	15,66
1758 0011	15,84
1758 0013	18,44
1758 0015	17,25
1758 0017	22,87
1758 0019	27,67
1758 0021	31,67
1758 0023	36,90
1758 0025	42,93
1758 0027	55,35
1759 0001	18,54
1759 0003	12,80
1759 0005	12,63
1759 0007	10,24
1759 0009	10,14
1759 0011	13,61
1759 0013	12,16
1759 0015	11,89
1759 0017	12,68
1759 0019	16,36
1759 0021	15,40
1759 0023	19,86
1759 0025	23,34
1759 0027	29,09
1759 0029	31,63
1759 0031	36,07
1759 0033	40,38
1760 0001	16,33
1760 0003	16,14
1760 0005	15,91
1760 0007	19,85
1760 0009	19,64
1760 0013	20,98
1760 0015	19,64
1760 0017	23,85
1760 0019	26,49
1760 0021	25,61
1760 0023	32,67
1760 0025	35,80
1760 0027	47,71
1760 0029	57,44
1760 0031	59,63
1760 0033	62,24
1760 0035	73,77
1760 0037	83,49
1760 0039	84,36
1761 0001	17,66
1761 0003	11,29
1761 0005	11,89
1761 0007	11,89
1761 0009	12,14
1761 0013	21,64
1761 0015	20,10
1761 0017	25,18
1761 0019	27,85
1761 0021	26,93
1761 0023	34,00
1761 0025	39,31
1761 0027	47,27
1761 0029	60,07
1761 0031	65,36
1761 0033	68,86
1762 0001	17,70
1762 0003	17,70
1762 0005	18,10
1762 0007	18,44
1762 0009	18,79
1762 0013	19,53
1762 0015	19,53
1762 0017	20,25
1762 0019	24,57
1762 0021	24,57
1762 0023	30,37
1762 0025	37,19
1762 0027	41,91
1762 0029	55,28
1762 0031	56,37
1762 0033	62,87
1763 0001	10,36
1763 0003	13,69
1763 0005	17,37
1763 0007	23,17
1763 0009	36,86
1763 0011	51,61
1763 0015	85,33
1763 0017	117,59
1764 0001	15,06
1764 0003	20,44
1764 0005	26,48
1764 0007	35,30
1764 0009	54,95
1764 0011	77,00
1764 0015	123,54
1764 0017	170,08
1765 0001	11,43
1765 0003	15,12
1765 0005	16,65
1765 0007	24,57
1765 0009	39,67
1765 0011	60,01
1765 0015	137,66
1765 0017	189,63
1766 0001	17,44
1766 0003	24,73
1766 0005	30,46
1766 0007	39,75
1766 0009	61,82
1766 0011	94,50
1767 0001	16,65
1767 0003	22,07
1767 0005	27,67
1767 0007	37,69
1767 0009	57,74
1767 0011	86,63
1767 0015	139,58
1767 0017	195,74
1768 0001	9,62
1768 0003	8,10
1768 0005	7,10
1768 0007	6,76
1768 0009	6,55
1768 0011	6,38
1768 0013	7,10
1768 0015	8,13
1768 0017	7,26
1768 0019	8,36
1768 0021	9,47
1768 0023	11,77
1768 0025	12,80
1768 0027	16,65
1768 0029	21,56
1768 0031	26,84
1768 0033	35,11
1770 0001	8,10
1770 0003	7,94
1770 0005	7,53
1770 0007	7,94
1770 0009	8,10
1770 0011	9,62
1770 0013	9,07
1770 0015	9,62
1770 0017	10,95
1770 0019	15,03
1770 0021	14,79
1770 0023	21,07
1770 0025	20,88
1770 0027	25,75
1770 0029	31,39
1770 0031	42,08
1772 0001	8,00
1772 0003	9,62
1772 0005	9,97
1772 0007	9,81
1772 0009	10,19
1772 0011	12,98
1772 0013	12,98
1772 0015	17,55
1772 0017	22,82
1772 0019	28,57
1772 0021	37,93
1774 0001	9,62
1774 0003	10,95
1774 0005	11,73
1774 0007	12,32
1774 0009	12,68
1774 0011	15,03
1774 0013	15,23
1774 0015	22,63
1774 0017	20,88
1774 0019	26,52
1774 0021	32,93
1774 0023	46,40
1777 0001	17,55
1777 0003	22,29
1777 0005	18,71
1777 0007	18,60
1777 0009	33,86
1777 0011	49,16
1777 0013	66,35
1777 0015	119,32
1780 0001	9,81
1780 0003	9,81
1780 0005	10,36
1780 0007	10,36
1780 0009	12,11
1780 0011	15,62
1780 0013	18,81
1780 0015	30,90
1783 0001	15,75
1783 0003	15,75
1783 0005	16,41
1783 0007	16,36
1783 0009	19,86
1783 0011	25,36
1783 0013	30,19
1784 0001	17,84
1784 0003	15,66
1784 0005	16,25
1784 0007	20,87
1784 0009	23,28
1784 0011	28,89
1784 0013	33,69
1784 0015	50,94
1785 0001	28,24
1785 0003	28,24
1785 0005	29,59
1785 0007	30,46
1785 0009	35,86
1785 0011	37,28
1785 0013	38,05
1785 0015	38,18
1785 0017	48,76
1785 0019	57,93
1785 0021	65,93
1787 0001	23,66
1787 0003	24,48
1787 0005	26,48
1787 0007	31,67
1787 0009	35,30
1787 0011	45,72
1787 0013	53,74

Catalogue prices in EUR

Part No.	€
1787 0015	88,25
1788 0001	30,89
1788 0003	31,28
1788 0005	28,89
1788 0007	31,28
1788 0009	41,31
1788 0011	37,69
1788 0015	38,51
1788 0017	55,35
1788 0019	61,77
1788 0021	76,21
1789 0001	42,12
1789 0003	46,53
1789 0005	42,53
1789 0007	47,72
1789 0009	48,15
1789 0011	58,56
1789 0015	56,16
1789 0017	93,05
1789 0019	109,12
1789 0021	111,49
1790 1000	62,07
1790 1500	82,39
1790 2000	62,07
1790 2500	80,67
1791 1000	127,61
1791 2000	127,61
1792 1000	64,17
1792 1500	85,84
1792 2000	64,17
1792 2500	85,84
1793 1000	90,72
1793 2000	98,55
1795 0100	26,59
1795 0120	51,30
1795 0200	161,52
1795 0220	74,09
1800 0020	10,85
1800 0025	10,10
1800 0030	9,20
1800 0040	9,20
1800 0050	9,20
1800 0060	9,20
1800 0070	16,30
1800 0080	10,02
1800 0090	21,42
1800 0100	12,41
1800 0120	16,19
1800 0140	16,62
1800 0160	21,67
1800 0180	22,77
1800 0200	22,77
1800 0220	33,39
1800 0240	33,39
1800 0270	52,26
1800 0300	52,26
1801 0030	20,02
1801 0040	18,98
1801 0050	16,88
1801 0060	16,88
1801 0080	18,59
1801 0100	22,24
1801 0120	29,52
1804 0020	28,79
1804 0025	24,77
1804 0030	18,90
1804 0040	17,91
1804 0050	16,65
1804 0060	16,65
1804 0080	19,99
1804 0100	23,88
1804 0120	31,85
1808 0030	20,35
1808 0040	19,29
1808 0050	17,91
1808 0060	17,91
1808 0080	19,70
1808 0100	23,83
1808 0120	31,53
1808 0160	41,23
1808 0200	41,23
1811 0001	16,66
1811 0003	16,66
1811 0005	14,99
1811 0007	14,99
1811 0009	14,99
1811 0011	13,20
1811 0012	17,88
1811 0013	20,19
1811 0015	15,01
1811 0017	14,35
1811 0018	19,80
1811 0019	17,70
1811 0021	16,71
1811 0023	17,91
1811 0025	22,11
1811 0027	23,92
1811 0029	20,29
1811 0031	23,44
1811 0033	23,92
1811 0035	20,29
1811 0037	33,31
1811 0039	28,19
1811 0041	40,51
1811 0043	28,18
1811 0045	33,31
1811 0047	28,19
1811 0049	54,01
1811 0051	41,06
1811 0053	41,06
1811 0055	61,06
1811 0057	61,06
1814 0001	15,88
1814 0003	16,93
1814 0005	14,58
1814 0007	17,26
1814 0009	14,03
1814 0011	15,88
1814 0013	18,90
1814 0015	19,86
1814 0017	23,83
1814 0019	25,94
1814 0021	31,34
1814 0023	31,34
1814 0025	51,42
1814 0027	51,42
1817 0001	17,91
1817 0003	18,87
1817 0005	25,34
1817 0007	25,34
1817 0009	35,93
1817 0011	40,81
1817 0013	53,99
1817 0015	55,83
1820 0001	20,66
1820 0003	20,49
1820 0005	19,72
1820 0007	18,24
1820 0009	16,65
1820 0011	16,07
1820 0013	15,29
1820 0015	15,29
1820 0017	15,97
1820 0019	14,68
1820 0021	16,65
1820 0023	19,86
1820 0025	19,86
1820 0027	24,96
1820 0029	25,94
1820 0031	33,00
1820 0033	33,00
1820 0035	53,47
1820 0037	53,47
1822 0015	14,99
1822 0017	15,75
1822 0019	14,68
1822 0021	16,65
1822 0023	19,86
1822 0025	19,86
1822 0027	24,96
1822 0031	33,00
1822 0033	33,00
1822 0035	48,65
1822 0037	50,16
1825 0001	33,52
1825 0003	33,52
1825 0005	39,88
1825 0007	39,88
1825 0009	53,38
1825 0011	78,86
1825 0013	78,86
1825 0015	176,16
1828 0001	35,14
1828 0003	35,14
1828 0005	35,86
1828 0007	47,31
1828 0009	47,31
1828 0011	78,25
1828 0013	100,17
1831 0040	14,41
1831 0050	14,13
1831 0060	14,13
1831 0080	15,20
1831 0100	18,95
1831 0120	25,18
1831 0160	32,59
1831 0200	34,18
1834 0001	22,71
1834 0003	25,78
1834 0005	33,89
1834 0007	33,89
1834 0009	59,88
1834 0011	73,52
1834 0013	101,59
1834 0015	137,20
1848 0040	18,36
1848 0050	18,36
1848 0060	18,81
1848 0080	19,78
1848 0100	19,78
1848 0120	22,07
1848 0160	33,04
1848 0200	40,65
1849 0040	0,87
1849 0050	1,09
1849 0060	1,42
1849 0080	1,64
1849 0100	1,64
1849 0120	2,06
1849 0160	2,93
1849 0200	3,26
1850 0001	7,25
1850 0003	11,15
1850 0005	9,58
1850 0007	13,42
1851 0050	51,22
1852 0030	18,36
1852 0040	18,36
1852 0050	18,36
1852 0060	18,81
1852 0080	19,78
1852 0100	19,78
1852 0120	22,07
1852 0140	30,43
1852 0160	33,04
1853 0030	0,87
1853 0040	0,87
1853 0050	1,09
1853 0060	1,42
1853 0080	1,64
1853 0100	1,64
1853 0120	2,06
1853 0140	2,39
1853 0160	2,93
1854 0010	133,13
1854 0020	262,99
1854 0030	133,13
1854 0040	289,08
1855 0001	0,80
1855 0002	0,80
1855 0003	0,98
1855 0004	1,21
1855 0005	1,48
1855 0006	2,28
1855 0007	3,59
1855 0008	5,62
1856 0005	8,99
1856 0010	6,39
1857 0001	1,04
1857 0002	1,07
1857 0003	1,28
1857 0004	1,54
1857 0005	2,00
1857 0006	3,35
1858 0005	11,80
1858 0010	8,47
1860 0001	3,09
1860 0003	3,20
1860 0005	3,31
1860 0007	5,21
1860 0009	8,65
1860 0011	15,21
1860 0013	25,04
1861 0005	10,66
1861 0007	13,62
1861 0009	21,03
1861 0011	29,85
1861 0013	45,12
1861 0015	45,41
1861 0017	94,44
1863 0001	4,00
1863 0003	4,00
1863 0005	4,55
1863 0007	5,32
1863 0009	6,39
1863 0011	11,69
1863 0013	22,87
1866 0001	2,00
1866 0003	2,16
1866 0005	2,16
1866 0007	2,30
1866 0009	3,37
1866 0011	4,55
1866 0013	4,55
1866 0015	7,04
1866 0017	7,04
1866 0019	7,65
1866 0021	7,65
1866 0023	16,13
1866 0025	16,13
1870 0210	1,83
1870 0270	1,83
1870 0340	1,83
1870 0430	2,38
1870 0490	1,98
1870 0550	1,98
1870 0620	2,57
1870 0700	2,57
1870 0800	3,04
1870 0900	3,04
1870 1100	4,88
1870 1200	5,09
1870 1450	7,28
1870 1600	10,91
1870 1800	13,26
1870 2000	17,04
1873 0005	542,89
1873 0010	816,97
1873 0015	1.100,26
1873 0020	1.996,28
1874 0050	1.112,93
1875 0115	40,41
1875 0116	40,41
1875 0117	40,41
1875 0420	43,50
1875 0421	43,50
1875 0422	43,50
1875 0423	43,50
1875 0440	46,62
1875 0441	46,62
1875 0443	46,62
1875 0445	49,74
1875 0461	102,56
1875 0462	102,56
1878 0005	390,87
1878 0010	390,87
1878 0015	478,00
1878 0020	478,00
1878 0025	831,19
1878 0030	831,19
1879 0005	332,51
1879 0010	359,67
1879 0015	420,73
1879 0020	631,12
1880 0060	132,30
1880 0080	144,21
1880 0100	160,49
1880 0120	203,87
1880 0140	233,15
1880 0160	265,69
1881 0060	143,21
1881 0080	158,33
1881 0100	174,48
1881 0120	215,82
1881 0140	261,34
1881 0160	274,32
1882 0080	187,61
1882 0100	237,49
1882 0103	226,64
1882 0120	268,93
1882 0123	242,91
1882 0160	304,73
1882 0163	321,91
1882 0200	442,43
1882 0203	471,73
1882 0206	458,72
1883 0005	164,49
1883 0010	200,07
1883 0015	236,19
1883 0020	261,18
1884 0080	210,37
1884 0100	260,25
1884 0103	249,42
1884 0120	297,12
1884 0123	252,13
1884 0160	314,65
1884 0163	324,73
1884 0200	446,76
1884 0203	474,01
1884 0204	496,63
1885 0015	150,60
1885 0020	206,73
1886 0020	177,25
1886 0030	146,96
1886 0040	126,77
1886 0050	130,14
1886 0060	142,10
1886 0080	175,74
1886 0100	205,66
1886 0120	272,62
1886 0140	336,55
1886 0160	411,71
1887 0001	48,90
1887 0004	45,58
1887 0007	48,90
1887 0010	48,90
1887 0013	48,90
1887 0016	45,58
1887 0019	48,90
1887 0022	45,58
1887 0025	48,90
1887 0028	48,90
1887 0031	48,90
1887 0034	45,58
1887 0037	48,90
1887 1001	19,45
1887 1004	17,80
1887 1016	17,80
1887 1019	19,45
1887 1022	17,80
1887 1028	19,45
1887 1031	19,45
1887 1034	17,80
1887 1037	19,45
1888 0020	194,07
1888 0030	163,78
1888 0040	146,95
1888 0050	150,32
1888 0060	153,55
1888 0080	184,31
1888 0100	217,35
1888 0120	283,77
1888 0140	371,32
1888 0160	444,98
1889 0001	60,02
1889 0004	64,46
1889 0007	64,46
1889 0010	64,46
1889 0013	60,02
1889 0016	64,46
1889 0019	60,02
1889 0022	64,46
1889 0025	60,02
1889 0028	64,46
1889 0031	60,02
1889 0034	64,46
1889 0037	60,02
1889 0040	64,46
1889 1001	23,91
1889 1007	26,66
1889 1010	26,66
1889 1013	23,91
1889 1016	23,91
1889 1019	23,91
1889 1025	23,91
1889 1031	23,91
1889 1040	23,91
1890 0020	177,25
1890 0030	146,96
1890 0040	126,77
1890 0050	130,14
1890 0060	142,10
1890 0080	175,74
1890 0100	205,66
1890 0120	272,62
1890 0140	336,55
1890 0160	411,71
1891 0020	194,07
1891 0030	163,78
1891 0040	146,95
1891 0050	150,32
1891 0060	153,55
1891 0080	184,31
1891 0100	217,35
1891 0120	283,77
1891 0140	371,32
1891 0160	444,98
1892 0030	235,57
1892 0040	205,29
1892 0050	199,69
1892 0060	192,95
1892 0080	240,06
1892 0100	289,44
1892 0120	409,45
1892 0140	559,77
1892 0160	609,15
1893 0030	252,39
1893 0040	224,36
1893 0050	219,89
1893 0060	220,99
1893 0080	269,25
1893 0100	319,73
1893 0120	440,87
1893 0140	594,56
1893 0160	643,92
1894 0030	235,57
1894 0040	205,29
1894 0050	199,69
1894 0060	179,44
1894 0080	223,26
1894 0100	269,17
1894 0120	380,80
1894 0140	559,77
1894 0160	609,15
1895 0030	252,39
1895 0040	224,36
1895 0050	219,89
1895 0060	205,52
1895 0080	250,39
1895 0100	297,33
1895 0120	410,02
1895 0140	594,56
1895 0160	643,92
1896 0040	272,62
1896 0050	266,99
1896 0060	260,25
1896 0080	310,73
1896 0100	364,58
1896 0120	474,53
1896 0140	610,25
1896 0160	692,15
1897 0040	291,66
1897 0050	287,19
1897 0060	289,44
1897 0080	341,02
1897 0100	394,87
1897 0120	505,94
1897 0140	643,92
1897 0160	726,93
1898 0040	272,62
1898 0050	266,99

Catalogue prices in EUR

Part No.	€
1898 0060	242,03
1898 0080	288,98
1898 0100	339,07
1898 0120	441,32
1898 0140	610,25
1898 0160	692,15
1899 0040	291,66
1899 0050	287,19
1899 0060	269,17
1899 0080	317,16
1899 0100	367,23
1899 0120	470,53
1899 0140	643,92
1899 0160	726,93
1903 0005	159,47
1903 0010	267,26
1903 0015	206,62
1903 0020	307,69
1906 0005	179,68
1906 0010	288,60
1906 0015	220,11
1906 0020	283,00
1909 0005	359,35
1909 0010	388,55
1912 0005	323,41
1912 0010	376,20
1915 0005	441,33
1915 0010	481,76
1918 0002	254,91
1918 0005	195,39
1918 0010	218,99
1918 0015	258,28
1918 0020	269,51
1923 0020	164,82
1923 0030	208,39
1923 0040	327,30
1924 0001	100,08
1924 0004	100,08
1924 0007	116,55
1924 0010	116,55
1924 0013	116,55
1924 0016	145,99
1924 0019	145,99
1924 0022	145,99
1924 0025	145,99
1926 0001	279,03
1926 0004	279,03
1926 0007	326,12
1926 0010	326,12
1926 0013	326,12
1926 0016	408,52
1926 0019	408,52
1926 0022	408,52
2010 0001	38,93
2010 0004	51,23
2010 0007	70,78
2010 0010	106,00
2010 0013	168,13
2013 0001	55,74
2013 0004	73,30
2013 0007	110,52
2013 0010	162,40
2013 0013	239,92
2016 0001	58,35
2016 0004	66,91
2016 0007	85,68
2016 0010	138,33
2019 0001	47,33
2019 0004	63,17
2019 0007	77,30
2019 0010	111,86
2019 0013	172,75

Part No.	€
2022 0001	47,33
2022 0004	63,17
2022 0007	76,92
2022 0010	117,54
2022 0013	172,34
2025 0001	71,87
2025 0004	95,82
2025 0007	116,09
2025 0010	156,40
2025 0013	239,86
2028 0001	61,41
2028 0004	81,92
2028 0007	110,31
2028 0010	153,39
2028 0013	211,03
2031 0001	84,20
2031 0004	108,53
2031 0007	148,90
2031 0010	185,33
2031 0013	264,03
2043 0001	51,63
2043 0004	51,63
2043 0007	51,63
2043 0010	51,63
2043 0013	51,63
2043 0016	51,63
2043 0019	51,63
2043 0022	51,63
2043 0025	51,63
2043 0028	51,63
2043 0031	76,14
2043 0034	72,67
2043 0037	74,69
2043 0040	76,72
2043 0043	83,38
2043 0046	89,96
2043 0049	93,92
2043 0052	93,92
2043 0055	96,66
2043 0058	100,52
2043 0061	107,23
2043 0064	117,79
2043 0067	128,32
2043 0070	157,09
2043 0073	157,09
2043 0076	160,38
2043 0079	169,58
2043 0082	179,19
2043 0085	189,90
2043 0088	221,59
2049 0001	50,12
2049 0004	51,77
2049 0007	52,59
2049 0010	59,25
2049 0013	62,61
2049 0019	59,25
2049 0022	59,25
2049 0025	65,09
2049 0028	73,47
2049 0031	81,82
2049 0040	75,96
2049 0043	77,62
2049 0046	82,64
2049 0049	84,34
2049 0052	96,00
2049 0058	118,53
2049 0067	102,69
2049 0070	111,87
2049 0073	119,37
2049 0076	127,72
2049 0079	143,58
2049 0082	151,09
2049 0085	178,64

Part No.	€
2049 0088	176,97
2049 0094	148,59
2049 0097	161,12
2049 0100	173,63
2049 0103	195,35
2049 0106	207,05
2049 0109	225,40
2049 0112	238,75
2049 0115	238,75
2049 0118	267,12
2049 0121	282,13
2049 0124	302,21
2049 0127	337,24
2049 0130	343,93
2052 0001	47,72
2052 0004	48,24
2052 0007	53,39
2052 0010	55,41
2052 0013	60,87
2052 0016	70,47
2052 0019	64,17
2052 0022	79,95
2052 0025	78,67
2052 0028	99,81
2052 0031	91,33
2052 0034	121,09
2052 0037	121,65
2052 0040	102,60
2052 0043	129,06
2052 0046	167,23
2052 0049	167,69
2052 0052	175,66
2055 0001	65,77
2055 0004	69,54
2055 0007	79,05
2055 0010	87,74
2055 0013	94,91
2055 0016	119,13
2055 0019	155,31
2055 0022	198,32
2058 0001	51,64
2058 0004	60,10
2058 0007	82,69
2058 0010	120,65
2058 0013	51,64
2058 0016	60,10
2058 0019	82,69
2058 0022	129,15
2058 0025	52,49
2058 0028	64,58
2058 0031	89,59
2058 0034	140,46
2061 0001	49,94
2061 0004	61,24
2061 0007	79,27
2061 0010	116,33
2061 0013	61,24
2061 0016	79,27
2061 0019	116,33
2061 0022	175,00
2100 0300	7,65
2100 0400	7,65
2100 0500	7,65
2100 0600	8,06
2100 0700	8,55
2100 0800	11,88
2103 0300	11,69
2103 0400	11,69
2103 0500	11,69
2103 0600	11,97
2103 0700	12,58
2103 0800	14,49
2106 0100	9,75

Part No.	€
2106 0150	9,18
2106 0200	4,49
2106 0250	4,49
2106 0280	5,01
2106 0300	4,11
2106 0350	4,44
2106 0380	5,06
2106 0400	4,44
2106 0450	4,11
2106 0480	5,97
2106 0500	4,44
2106 0550	5,06
2106 0575	5,53
2106 0600	4,35
2106 0650	5,84
2106 0675	6,32
2106 0700	6,10
2106 0750	6,10
2106 0775	6,10
2106 0800	5,95
2106 0850	6,65
2106 0870	6,65
2106 0900	7,92
2106 0950	7,92
2106 0970	7,92
2106 1000	6,46
2106 1050	10,51
2106 1100	9,58
2106 1170	10,51
2106 1200	8,54
2106 1270	12,77
2106 1300	12,05
2106 1370	14,84
2106 1400	11,18
2106 1450	17,21
2106 1500	13,56
2106 1570	18,36
2106 1600	12,49
2106 1650	18,90
2106 1700	16,49
2106 1770	20,95
2106 1800	17,01
2106 1900	18,51
2106 1970	24,02
2106 2000	18,43
2106 2170	32,22
2106 2200	24,35
2106 2370	33,99
2106 2400	30,27
2106 2500	30,27
2112 0200	10,76
2112 0250	11,53
2112 0280	11,62
2112 0300	8,13
2112 0350	10,76
2112 0380	12,13
2112 0400	8,13
2112 0450	9,26
2112 0480	12,13
2112 0500	8,62
2112 0550	9,26
2112 0575	12,13
2112 0600	8,62
2112 0650	13,45
2112 0700	13,45
2112 0750	13,45
2112 0775	14,66
2112 0800	11,29
2112 0850	14,74
2112 0900	14,74
2112 0970	16,77
2112 1000	16,77
2112 1050	21,72

Part No.	€
2112 1100	21,72
2112 1170	23,14
2112 1200	15,55
2112 1300	19,06
2112 1400	18,87
2112 1500	27,53
2112 1600	24,03
2112 1700	33,01
2112 1800	31,82
2112 2000	33,89
2113 0200	12,52
2113 0250	14,06
2113 0300	12,52
2113 0350	14,06
2113 0400	12,52
2113 0450	14,06
2113 0500	12,52
2113 0550	14,06
2113 0600	13,61
2113 0800	16,84
2113 1000	19,86
2113 1200	26,48
2113 1400	31,80
2113 1600	35,37
2113 1800	43,14
2113 2000	56,05
2115 0200	10,93
2115 0250	9,32
2115 0300	7,86
2115 0350	9,28
2115 0400	8,22
2115 0450	9,58
2115 0500	7,92
2115 0550	9,47
2115 0600	8,65
2115 0650	11,51
2115 0700	11,53
2115 0750	11,62
2115 0800	10,03
2115 0850	13,12
2115 0900	11,78
2115 0950	11,45
2115 1000	10,95
2115 1100	13,51
2115 1200	11,80
2115 1300	17,97
2115 1400	15,91
2115 1500	20,46
2115 1600	20,07
2115 1700	23,48
2115 1800	23,15
2115 1900	25,14
2115 2000	25,09
2115 2200	40,49
2115 2400	50,84
2115 2500	50,84
2116 0200	9,58
2116 0250	9,58
2116 0300	9,58
2116 0350	9,58
2116 0400	9,58
2116 0450	9,58
2116 0500	9,58
2116 0550	9,58
2116 0600	9,58
2116 0650	12,60
2116 0700	12,60
2116 0750	12,60
2116 0800	12,60
2116 0850	12,60
2116 0900	12,60
2116 1000	12,60
2116 1200	15,73

Part No.	€
2116 1400	19,47
2116 1600	21,83
2116 1800	26,98
2116 2000	31,28
2118 0200	8,57
2118 0300	8,27
2118 0400	8,27
2118 0500	8,27
2118 0600	8,27
2118 0700	12,87
2118 0800	11,80
2118 0900	12,87
2118 1000	12,33
2118 1100	16,08
2118 1200	15,01
2118 1300	20,36
2118 1400	18,24
2118 1500	19,31
2118 1600	19,31
2118 1700	26,81
2118 1800	26,81
2118 1900	26,81
2118 2000	26,81
2118 2200	53,63
2118 2400	57,93
2118 2500	52,56
2118 3000	83,66
2122 0300	13,17
2122 0400	13,17
2122 0500	13,17
2122 0600	13,17
2122 0700	18,40
2122 0800	15,72
2122 1000	16,82
2122 1200	23,66
2122 1400	27,61
2122 1600	31,20
2122 2000	42,64
2124 0300	8,57
2124 0400	8,27
2124 0500	8,27
2124 0600	8,27
2124 0700	12,33
2124 0800	12,33
2124 0900	12,87
2124 1000	12,87
2124 1100	16,08
2124 1200	16,08
2124 1300	19,83
2124 1400	19,83
2124 1500	20,36
2124 1600	20,93
2124 1700	27,88
2124 1800	27,88
2124 1900	28,93
2124 2000	28,93
2124 2200	54,75
2124 2400	64,37
2124 2500	64,37
2124 3000	94,39
2127 0100	11,36
2127 0150	5,39
2127 0180	5,39
2127 0200	4,73
2127 0230	4,73
2127 0250	4,73
2127 0280	4,73
2127 0300	4,73
2127 0330	4,73
2127 0350	4,73
2127 0380	4,73
2127 0400	4,73
2127 0430	4,73

Part No.	€
2127 0450	4,73
2127 0480	4,73
2127 0500	4,73
2127 0530	4,73
2127 0550	4,73
2127 0575	4,73
2127 0600	4,73
2127 0700	6,22
2127 0750	6,22
2127 0800	6,22
2127 0900	6,98
2127 1000	6,98
2131 0150	8,63
2131 0200	8,63
2131 0250	8,63
2131 0280	8,63
2131 0300	8,63
2131 0400	8,63
2131 0500	8,63
2131 0600	8,63
2131 0800	10,71
2131 1000	10,71
2133 0200	5,39
2133 0250	5,39
2133 0300	5,39
2133 0350	5,39
2133 0400	5,39
2133 0450	5,39
2133 0500	5,39
2133 0550	5,39
2133 0600	5,39
2133 0700	6,76
2133 0800	6,76
2133 0900	7,72
2133 1000	7,72
2137 0200	9,23
2137 0250	9,23
2137 0300	9,23
2137 0400	9,23
2137 0500	9,23
2137 0600	9,23
2137 0800	11,51
2137 1000	13,26
2139 0200	6,98
2139 0250	6,98
2139 0300	6,98
2139 0400	6,98
2139 0500	6,98
2139 0600	6,98
2143 0200	13,12
2143 0250	13,12
2143 0300	13,12
2143 0400	13,12
2143 0500	13,12
2143 0600	13,12
2144 0800	32,41
2144 1000	34,85
2144 1200	43,04
2144 1600	54,84
2144 2000	134,91
2144 2500	97,92
2145 0150	7,51
2145 0200	5,53
2145 0250	6,14
2145 0300	5,34
2145 0350	6,71
2145 0400	5,34
2145 0450	6,14
2145 0500	5,51
2145 0550	6,71
2145 0600	5,51
2145 0650	8,93
2145 0700	8,76

Catalogue prices in EUR

Part No.	€
2145 0750	8,93
2145 0800	7,80
2145 0850	9,17
2145 0900	9,62
2145 0950	9,58
2145 1000	7,43
2145 1100	10,95
2145 1200	9,75
2145 1300	14,25
2145 1400	13,86
2145 1500	14,85
2145 1600	13,36
2145 1800	18,74
2145 2000	21,04
2145 2200	32,73
2145 2400	38,07
2145 2500	37,89
2145 2600	54,51
2145 2800	55,22
2145 3000	63,43
2145 3200	67,87
2151 0200	9,58
2151 0250	9,88
2151 0300	9,88
2151 0350	9,92
2151 0400	9,92
2151 0450	9,92
2151 0500	10,80
2151 0550	10,16
2151 0600	10,80
2151 0650	12,77
2151 0700	12,25
2151 0800	13,31
2151 0850	16,18
2151 0900	15,34
2151 1000	13,59
2151 1100	18,95
2151 1200	16,60
2151 1300	26,49
2151 1400	23,42
2151 1500	25,36
2151 1600	23,56
2151 1800	34,84
2151 2000	34,84
2152 0600	36,84
2152 0800	43,41
2152 1000	48,02
2152 1200	54,98
2152 1400	69,60
2152 1600	74,25
2152 2000	114,46
2152 2500	164,98
2153 0600	40,15
2153 0800	44,78
2153 1000	50,27
2153 1200	57,53
2153 1400	74,84
2153 1600	76,51
2153 2000	124,36
2153 2500	180,31
2154 0300	7,50
2154 0350	7,50
2154 0400	7,50
2154 0450	7,50
2154 0500	7,50
2154 0550	7,50
2154 0600	7,50
2154 0650	10,03
2154 0700	10,03
2154 0750	10,03
2154 0800	10,03
2154 0850	10,03
2154 0900	10,03
2154 0950	10,03
2154 1000	10,03
2154 1200	13,29
2154 1400	14,85
2154 1600	17,48
2154 1800	22,41
2154 2000	26,74
2154 2200	29,81
2154 2500	42,98
2154 2800	67,69
2154 3000	72,50
2154 3200	81,81
2155 0300	13,36
2155 0350	13,62
2155 0400	13,36
2155 0450	13,62
2155 0500	13,36
2155 0550	13,62
2155 0600	13,36
2155 0650	19,22
2155 0700	19,67
2155 0800	19,31
2155 0850	21,31
2155 0900	19,91
2155 1000	21,37
2155 1100	28,15
2155 1200	27,31
2155 1300	34,18
2155 1400	33,88
2155 1500	35,83
2155 1600	36,52
2155 1800	44,60
2155 2000	54,95
2158 0600	12,35
2158 0700	13,61
2158 0800	13,77
2158 0900	15,17
2158 1000	16,32
2158 1100	21,22
2158 1200	19,33
2158 1400	22,79
2158 1500	26,29
2158 1600	26,29
2158 1800	36,16
2158 2000	37,47
2159 0600	14,60
2159 0800	18,00
2159 1000	20,10
2159 1200	21,15
2159 1400	25,61
2159 1600	28,19
2159 1800	34,43
2159 2000	37,06
2159 2500	55,83
2160 0300	9,02
2160 0400	9,32
2160 0500	9,67
2160 0600	9,89
2160 0700	10,16
2160 0800	10,76
2160 0900	11,45
2160 1000	11,77
2160 1200	13,39
2160 1400	15,21
2160 1600	15,75
2160 1800	27,86
2160 2000	27,33
2160 2200	32,56
2160 2400	38,79
2160 2500	40,24
2161 0200	16,14
2161 0300	16,14
2161 0400	16,14
2161 0500	16,14
2161 0600	22,29
2161 0800	32,45
2161 1000	36,19
2161 1200	41,22
2161 1400	49,17
2161 1600	56,05
2161 2000	67,46
2161 2500	101,00
2162 0200	17,12
2162 0300	17,12
2162 0400	17,12
2162 0500	17,12
2162 0600	27,39
2162 0800	36,19
2162 1000	38,40
2162 1200	49,91
2162 1400	63,24
2162 1600	67,46
2162 1800	83,05
2162 2000	99,63
2162 2500	143,47
2163 0600	11,61
2163 0800	12,65
2163 1000	13,81
2163 1200	15,69
2163 1400	17,80
2163 1600	18,43
2163 1800	24,18
2163 2000	29,50
2163 2200	40,73
2163 2400	43,38
2163 2500	53,25
2164 0600	13,26
2164 0700	17,48
2164 0800	15,99
2164 0900	19,23
2164 1000	17,01
2164 1100	21,48
2164 1200	18,24
2164 1400	21,23
2164 1500	25,00
2164 1600	24,26
2164 1800	30,46
2164 2000	33,48
2165 0600	31,33
2165 0700	32,85
2165 0800	34,38
2165 0900	35,89
2165 1000	37,41
2165 1100	38,93
2165 1200	40,49
2165 1400	41,96
2165 1500	43,52
2165 1600	45,01
2165 1800	46,56
2165 2000	48,07
2167 0600	34,10
2167 0800	45,68
2167 1000	48,02
2167 1200	62,57
2167 1400	78,70
2167 1600	84,61
2167 2000	124,36
2167 2500	179,09
2168 0500	17,78
2168 0600	17,78
2168 0800	23,64
2168 1000	24,89
2168 1200	29,85
2168 1400	43,50
2168 1600	41,42
2168 2000	60,48
2168 2500	96,28
2169 0300	5,43
2169 0350	5,43
2169 0400	4,95
2169 0450	5,43
2169 0500	4,95
2169 0550	5,43
2169 0600	4,61
2169 0650	6,39
2169 0700	6,39
2169 0750	6,39
2169 0800	5,65
2169 0850	6,93
2169 0900	6,96
2169 0950	6,93
2169 1000	6,55
2169 1050	9,47
2169 1100	9,47
2169 1150	9,47
2169 1200	9,09
2169 1300	13,70
2169 1400	12,21
2169 1500	13,86
2169 1600	12,65
2169 1800	15,92
2169 2000	17,09
2169 2200	24,48
2169 2400	29,86
2169 2500	29,86
2169 2600	32,40
2169 2800	34,27
2169 3000	45,31
2169 3200	43,03
2170 1200	51,57
2170 1400	61,58
2170 1600	70,25
2170 2000	84,47
2170 2500	126,22
2175 0300	9,34
2175 0400	9,34
2175 0500	9,34
2175 0600	9,34
2175 0700	10,76
2175 0800	10,76
2175 0900	13,29
2175 1000	12,32
2175 1200	15,37
2175 1300	24,29
2175 1400	24,29
2175 1500	25,33
2175 1600	23,50
2175 1800	30,46
2175 2000	31,96
2176 0300	12,57
2176 0400	12,57
2176 0500	12,57
2176 0600	12,57
2176 0800	17,48
2176 1000	18,43
2176 1200	21,78
2176 1400	29,61
2176 1600	33,66
2176 1800	43,99
2176 2000	49,82
2176 2500	74,07
2178 0500	6,76
2178 0600	6,74
2178 0700	8,79
2178 0800	8,57
2178 0900	9,42
2178 1000	8,79
2178 1100	12,13
2178 1200	11,09
2178 1400	14,25
2178 1600	15,81
2178 1800	19,50
2178 2000	22,70
2178 2200	27,15
2178 2400	41,39
2178 2500	41,39
2178 2600	51,06
2178 2800	48,84
2178 3000	51,72
2178 3200	50,92
2179 0600	18,90
2179 0800	25,91
2179 1000	27,25
2179 1200	32,24
2179 1400	43,85
2179 1600	49,82
2179 1800	65,13
2179 2000	73,77
2179 2500	113,62
2180 1200	34,41
2180 1400	50,16
2180 1600	47,71
2180 2000	69,60
2180 2500	110,85
2184 0600	11,18
2184 0700	13,03
2184 0800	11,73
2184 0900	14,14
2184 1000	11,73
2184 1100	16,22
2184 1200	13,73
2184 1400	17,14
2184 1600	19,50
2184 1800	21,85
2184 2000	23,92
2184 2200	30,15
2184 2500	31,96
2187 0600	15,28
2187 0800	17,75
2187 1000	18,90
2187 1200	21,25
2187 1400	23,70
2187 1600	27,92
2187 1800	32,30
2187 2000	36,60
2187 2500	49,33
2188 0400	19,39
2188 0500	19,36
2188 0600	19,39
2188 0700	23,51
2188 0800	20,41
2188 0900	23,51
2188 1000	19,67
2188 1200	26,55
2188 1400	27,11
2188 1600	30,84
2188 1800	36,49
2188 2000	45,49
2188 2200	61,52
2188 2500	65,87
2188 2800	80,81
2188 3000	84,11
2190 0600	10,13
2190 0700	12,68
2190 0800	11,01
2190 0900	14,85
2190 1000	11,77
2190 1100	16,27
2190 1200	12,47
2190 1300	19,62
2190 1400	16,02
2190 1500	20,43
2190 1600	19,31
2190 1700	25,96
2190 1800	20,79
2190 1900	28,84
2190 2000	22,30
2190 2200	28,68
2190 2400	33,00
2190 2500	32,78
2191 0400	31,20
2191 0500	31,20
2191 0600	31,20
2191 0800	33,82
2191 1000	37,64
2191 1200	46,89
2191 1400	61,33
2191 1600	56,61
2191 1800	83,24
2191 2000	84,09
2191 2500	140,08
2191 3000	184,20
2196 0600	14,30
2196 0700	21,31
2196 0800	17,80
2196 0900	21,31
2196 1000	17,80
2196 1100	24,16
2196 1200	22,02
2196 1300	31,70
2196 1400	28,07
2196 1500	31,34
2196 1600	30,65
2196 1800	28,59
2196 2000	33,55
2196 2200	41,91
2196 2500	39,72
2199 0600	14,69
2199 0800	15,21
2199 1000	16,16
2199 1200	19,37
2199 1400	21,85
2199 1600	24,54
2199 1800	28,51
2199 2000	33,44
2199 2500	47,96
2200 0600	19,59
2200 0800	20,59
2200 1000	21,20
2200 1200	22,62
2200 1400	24,90
2200 1600	36,07
2200 1800	38,60
2200 2000	46,73
2208 0800	29,31
2208 1000	31,63
2208 1200	34,00
2208 1600	43,04
2208 2000	59,31
2214 0400	20,60
2214 0500	20,60
2214 0600	19,48
2214 0700	35,37
2214 0800	25,59
2214 0900	28,22
2214 1000	27,09
2214 1100	36,08
2214 1200	32,41
2214 1300	47,34
2214 1400	45,61
2214 1500	61,83
2214 1600	54,62
2214 1800	63,68
2214 2000	71,65
2214 2200	91,70
2214 2500	105,70
2214 3000	150,05
2214 3200	182,53
2217 0600	10,57
2217 0800	12,22
2217 1000	13,20
2217 1200	14,62
2217 1400	16,08
2217 1600	17,29
2217 1800	21,94
2217 2000	25,58
2217 2500	34,27
2217 3200	48,20
2218 1000	41,03
2218 1200	49,23
2218 1400	71,80
2218 1600	68,36
2218 1800	92,31
2218 2000	99,73
2218 2500	158,84
2218 3200	229,02
2223 0400	17,06
2223 0500	17,06
2223 0600	14,82
2223 0800	15,37
2223 1000	18,02
2223 1200	20,99
2223 1400	24,92
2223 1600	26,65
2223 1800	31,00
2223 2000	34,84
2223 2200	48,20
2223 2500	69,10
2223 2800	73,73
2223 3000	73,73
2226 0600	16,71
2226 0800	19,36
2226 1000	20,85
2226 1200	23,20
2226 1400	25,18
2226 1600	30,24
2226 1800	35,19
2226 2000	41,55
2226 2500	56,53
2226 3200	77,71
2227 1000	39,41
2227 1200	43,69
2227 1400	52,23
2227 1600	54,95
2227 1800	75,47
2227 2000	81,65
2227 2500	130,57
2228 1200	63,06
2228 1400	91,93
2228 1600	87,48
2228 2000	127,69
2228 2500	203,27
2228 3200	293,15
2232 0600	17,10
2232 0800	19,07
2232 1000	20,35
2232 1200	23,88
2232 1600	30,37
2232 2000	35,19
2232 2500	60,01
2232 3200	93,87
2235 0600	22,62
2235 0800	24,54
2235 1000	25,74
2235 1200	28,55
2235 1600	37,91
2235 2000	47,45
2235 2500	75,73

Catalogue prices in EUR

Part No.	€
2235 3200	119,86
2250 0001	22,52
2250 0004	22,52
2250 0007	22,52
2250 0010	22,52
2250 0013	32,19
2250 0016	32,19
2250 0019	32,19
2250 0022	32,19
2250 0025	34,32
2250 0028	34,32
2250 0031	34,32
2250 0034	38,62
2250 0037	38,62
2250 0040	38,62
2250 0043	39,71
2250 0046	39,71
2250 0052	39,71
2250 0055	46,13
2250 0058	46,13
2250 0064	46,13
2250 0067	55,79
2250 0070	55,79
2250 0073	55,79
2253 0001	25,75
2253 0004	28,93
2253 0007	34,32
2253 0010	40,76
2253 0013	50,42
2253 0016	57,93
2253 0019	68,64
2253 0022	99,76
2253 0025	123,34
2253 0028	150,16
2253 0031	171,63
2256 0160	24,66
2256 0200	28,93
2256 0220	32,19
2256 0250	39,71
2256 0280	46,13
2256 0320	54,70
2256 0380	83,66
2256 0500	126,57
2257 0160	24,66
2257 0200	28,93
2257 0220	32,19
2257 0250	39,71
2257 0280	46,13
2257 0320	54,70
2257 0380	83,66
2257 0500	126,57
2258 0160	24,66
2258 0200	28,89
2258 0220	32,19
2258 0250	39,71
2258 0280	46,13
2258 0320	54,70
2258 0380	83,66
2258 0500	126,57
2259 0160	24,66
2259 0200	28,93
2259 0220	32,19
2259 0250	39,71
2259 0280	46,13
2259 0320	54,70
2259 0380	83,66
2259 0500	126,57
2262 0100	16,08
2262 0150	16,08
2262 0200	16,08
2262 0250	17,18
2262 0300	17,70
2262 0400	19,31
2262 0500	20,93
2262 0600	27,88
2262 0800	34,32
2262 1000	45,05
2262 1200	63,30
2262 1600	112,64
2300 0020	28,22
2300 0030	22,61
2300 0040	19,75
2300 0050	16,93
2300 0060	16,93
2300 0070	16,25
2300 0080	15,85
2300 0090	15,85
2300 0100	14,13
2300 0150	13,09
2300 0200	14,13
2310 0200	10,43
2310 0300	11,12
2310 0400	13,53
2310 0500	17,35
2310 0600	18,38
2310 0800	29,18
2310 1000	45,13
2310 1200	57,94
2315 0200	10,10
2315 0300	8,94
2315 0400	8,37
2315 0500	8,37
2315 0600	8,29
2315 0800	9,90
2315 1000	16,36
2315 1200	23,54
2315 1400	32,30
2315 1600	39,08
2315 1800	56,62
2315 2000	66,24
2318 0200	10,07
2318 0250	10,93
2318 0300	10,07
2318 0350	10,93
2318 0400	9,83
2318 0500	9,83
2318 0600	9,54
2318 0700	12,43
2318 0800	11,26
2318 0900	20,36
2318 1000	18,33
2318 1200	26,70
2318 1400	36,30
2318 1600	43,87
2318 1800	63,83
2318 2000	74,17
2321 0200	11,63
2321 0300	10,46
2321 0400	9,90
2321 0500	9,90
2321 0600	9,62
2321 0800	11,35
2321 1000	18,33
2321 1200	25,52
2321 1400	34,71
2321 1600	43,09
2321 1800	60,61
2321 2000	70,21
2324 0200	11,54
2324 0300	11,54
2324 0400	11,26
2324 0500	11,26
2324 0600	11,11
2324 0800	12,79
2324 1000	20,36
2324 1200	28,73
2324 1400	38,69
2324 1600	47,89
2324 1800	67,80
2324 2000	78,17
2327 0200	13,08
2327 0280	13,08
2327 0300	11,54
2327 0380	12,91
2327 0400	10,85
2327 0480	12,91
2327 0500	10,85
2327 0575	12,91
2327 0600	10,60
2327 0675	15,94
2327 0700	14,36
2327 0775	15,94
2327 0800	12,61
2327 0900	23,94
2327 0970	26,31
2327 1000	21,18
2327 1100	33,11
2327 1170	43,87
2327 1200	29,90
2327 1370	45,45
2327 1400	41,49
2327 1600	50,25
2327 1800	71,79
2327 2000	83,72
2330 0200	13,00
2330 0300	13,00
2330 0400	12,54
2330 0500	12,54
2330 0600	12,36
2330 0700	15,94
2330 0800	14,36
2330 0900	26,31
2330 1000	23,54
2330 1100	37,08
2330 1200	33,89
2330 1400	46,25
2330 1600	55,02
2330 1800	80,59
2330 2000	94,12
2333 0600	12,13
2333 0800	14,12
2333 1000	23,13
2333 1200	31,91
2333 1400	43,87
2333 1600	54,24
2333 1800	75,78
2333 2000	87,74
2336 0600	14,76
2336 0800	20,36
2336 1000	29,90
2336 1200	43,09
2336 1400	56,62
2336 1600	70,21
2336 1800	106,09
2336 2000	111,67
2339 0200	14,36
2339 0300	13,95
2339 0400	13,47
2339 0500	13,47
2339 0600	13,00
2339 0800	17,53
2339 1000	25,52
2339 1200	36,30
2339 1400	50,25
2339 1600	59,03
2339 1800	87,74
2339 2000	93,33
2342 0200	17,95
2342 0250	17,95
2342 0280	19,94
2342 0300	17,53
2342 0380	19,94
2342 0400	16,75
2342 0480	19,94
2342 0500	16,75
2342 0575	19,94
2342 0600	16,36
2342 0700	27,12
2342 0775	25,95
2342 0800	21,94
2342 0900	38,29
2342 0970	38,29
2342 1000	31,91
2342 1170	55,85
2342 1200	45,45
2342 1400	62,20
2342 1600	74,18
2342 1800	110,08
2342 2000	116,46
2343 0400	34,33
2343 0500	34,33
2343 0600	34,33
2343 0800	39,72
2343 1000	50,67
2343 1200	75,67
2343 1600	104,04
2343 2000	176,79
2344 0400	38,71
2344 0500	38,71
2344 0600	38,71
2344 0800	46,20
2344 1000	67,27
2344 1200	93,39
2344 1600	144,99
2344 2000	238,86
2345 0200	13,95
2345 0300	13,95
2345 0400	13,47
2345 0500	13,47
2345 0600	13,00
2345 0800	17,53
2345 1000	25,52
2345 1200	36,30
2345 1400	47,89
2345 1600	59,03
2345 1800	87,74
2345 2000	93,33
2348 0300	17,53
2348 0400	16,75
2348 0500	16,75
2348 0600	16,36
2348 0800	21,94
2348 1000	31,91
2348 1200	45,45
2348 1400	59,03
2348 1600	74,17
2348 1800	110,08
2348 2000	116,46
2351 0050	9,77
2351 0060	11,77
2351 0080	10,37
2351 0100	7,45
2351 0120	10,23
2351 0150	7,45
2351 0180	10,23
2351 0200	9,27
2351 0250	9,77
2351 0300	9,27
2351 0350	10,23
2351 0400	9,27
2351 0450	10,23
2351 0500	9,27
2351 0550	10,23
2351 0575	10,23
2351 0600	9,27
2351 0675	12,54
2351 0700	11,42
2351 0775	12,54
2351 0800	12,40
2351 0870	20,78
2351 0900	18,89
2351 0970	20,78
2351 1000	23,79
2351 1200	24,03
2352 0050	11,71
2352 0060	13,76
2352 0080	12,36
2352 0100	9,44
2352 0120	12,19
2352 0150	9,44
2352 0180	12,19
2352 0200	11,24
2352 0250	11,71
2352 0300	11,24
2352 0350	12,19
2352 0400	11,24
2352 0450	12,19
2352 0500	11,24
2352 0550	12,19
2352 0575	12,19
2352 0600	11,24
2352 0675	15,22
2352 0700	14,04
2352 0775	15,22
2352 0800	15,08
2352 0870	23,76
2352 0900	21,85
2352 0970	23,76
2352 1000	26,73
2352 1200	27,44
2353 0030	20,18
2353 0040	18,47
2353 0050	15,56
2353 0060	15,56
2353 0080	12,70
2353 0100	10,66
2353 0120	16,40
2353 0150	10,66
2353 0180	16,40
2353 0200	14,09
2353 0250	14,43
2353 0300	14,09
2353 0350	14,43
2353 0400	14,09
2353 0450	16,40
2353 0500	15,91
2353 0550	16,40
2353 0575	18,03
2353 0600	15,91
2353 0675	24,49
2353 0700	21,48
2353 0775	22,35
2353 0800	21,91
2353 0870	33,94
2353 0900	32,22
2353 0970	34,37
2353 1000	31,36
2353 1200	37,82
2353 1400	51,56
2353 1600	66,16
2353 1800	79,93
2353 2000	106,57
2354 0300	15,88
2354 0400	17,53
2354 0500	19,55
2354 0600	24,73
2354 0800	31,91
2354 1000	44,67
2354 1200	70,21
2354 1600	125,22
2354 2000	167,51
2355 0300	30,51
2355 0400	33,94
2355 0500	37,38
2355 0600	48,13
2355 0800	61,87
2355 1000	81,66
2355 1200	116,88
2355 1600	218,29
2357 0300	16,75
2357 0400	18,72
2357 0500	20,36
2357 0600	26,31
2357 0800	33,89
2357 1000	47,05
2357 1200	74,17
2357 1600	132,38
2358 0600	31,91
2358 0800	34,71
2358 1000	41,49
2358 1200	51,85
2358 1600	78,95
2358 2000	146,78
2360 0300	12,72
2360 0400	12,72
2360 0500	12,72
2360 0600	12,33
2360 0700	15,70
2360 0800	14,76
2360 0900	23,76
2360 1000	24,95
2360 1200	35,89
2360 1400	45,13
2360 1600	59,61
2360 1800	71,80
2360 2000	90,03
2361 0300	14,45
2361 0400	14,45
2361 0500	14,45
2361 0600	14,01
2361 0700	18,01
2361 0800	17,08
2361 0900	26,32
2361 1000	27,48
2361 1200	38,86
2361 1400	48,51
2361 1600	63,90
2361 1800	79,69
2361 2000	97,87
2362 0300	18,90
2362 0400	18,47
2362 0500	18,47
2362 0600	19,34
2362 0700	24,92
2362 0800	24,92
2362 0900	37,38
2362 1000	35,67
2362 1200	55,01
2362 1400	67,89
2362 1600	91,08
2362 1800	112,59
2362 2000	146,96
2363 0200	13,32
2363 0300	11,90
2363 0400	9,90
2363 0500	9,90
2363 0600	9,62
2363 0800	11,45
2363 1000	19,14
2363 1200	27,53
2363 1400	37,47
2363 1600	45,45
2363 1800	65,42
2363 2000	76,60
2366 0200	15,88
2366 0300	14,27
2366 0400	11,90
2366 0500	11,90
2366 0600	11,63
2366 0700	15,62
2366 0800	13,80
2366 0900	25,95
2366 1000	22,76
2366 1100	36,30
2366 1200	32,72
2366 1400	44,67
2366 1600	54,24
2366 1800	78,17
2366 2000	90,92
2369 0200	14,76
2369 0300	13,38
2369 0400	11,42
2369 0500	11,42
2369 0600	11,26
2369 0800	13,00
2369 1000	21,18
2369 1200	29,53
2369 1400	39,88
2369 1600	49,47
2369 1800	69,41
2369 2000	80,59
2372 0600	13,08
2372 0800	15,35
2372 1000	24,73
2372 1200	34,71
2372 1400	47,05
2372 1600	58,26
2372 1800	82,19
2372 2000	94,92
2375 0200	14,63
2375 0300	14,63
2375 0400	14,63
2375 0500	14,49
2375 0600	14,49
2375 0800	19,58
2375 1000	24,53
2375 1200	33,49
2375 1400	54,26
2375 1600	62,41
2375 1800	76,18
2375 2000	97,42
2378 0600	15,29
2378 0800	20,68
2378 1000	28,66
2378 1200	39,97
2378 1400	57,57
2378 1600	70,75
2378 1800	93,82
2378 2000	120,35
2379 0300	18,96
2379 0400	18,96
2379 0500	18,96
2379 0600	18,96
2379 0800	20,35
2379 1000	30,54
2379 1200	47,21
2379 1400	56,42
2379 1600	75,87
2379 1800	97,07
2379 2000	118,93
2381 0600	17,95

Catalogue prices in EUR

Part No.	€
2381 0800	20,72
2381 1000	33,89
2381 1200	44,67
2381 1600	79,78
2381 2000	114,08
2384 0600	21,18
2384 0800	24,73
2384 1000	39,49
2384 1200	52,64
2384 1600	94,12
2384 2000	134,82
2385 0600	31,27
2385 0800	36,10
2385 1000	61,87
2385 1200	84,22
2385 1600	148,68
2385 2000	213,14
2386 0600	36,53
2386 0800	41,67
2386 1000	70,48
2386 1200	98,83
2386 1600	185,63
2386 2000	273,29
2388 0600	30,51
2388 0800	35,67
2388 1000	62,74
2388 1200	87,65
2388 1600	156,41
2389 0600	55,01
2389 0800	67,03
2389 1000	73,05
2389 1200	86,79
2389 1600	137,51
2389 2000	206,26
2391 0600	75,64
2391 0800	84,22
2391 1000	91,96
2391 1200	109,14
2391 1600	173,60
2391 2000	257,81
2393 0600	52,64
2393 0800	60,61
2393 1000	66,24
2393 1200	78,17
2393 1600	124,43
2393 2000	186,67
2405 0300	18,83
2405 0400	18,83
2405 0500	18,83
2405 0600	18,38
2405 0800	21,27
2405 1000	33,70
2405 1200	48,25
2405 1600	77,21
2405 2000	122,45
2410 0100	18,35
2410 0120	18,35
2410 0150	18,35
2410 0200	16,27
2410 0300	15,97
2410 0400	14,39
2410 0500	14,39
2410 0600	14,39
2410 0800	17,05
2410 1000	21,81
2410 1200	32,24
2410 1400	39,81
2410 1600	53,47
2410 1800	64,53
2410 2000	93,94
2413 0100	20,29
2413 0150	20,29
2413 0200	19,14
2413 0300	19,97
2413 0400	18,26
2413 0500	18,26
2413 0600	18,26
2413 0800	21,76
2413 1000	28,22
2413 1200	39,30
2413 1400	51,64
2413 1600	60,58
2413 1800	71,67
2413 2000	104,34
2416 0300	18,72
2416 0400	18,33
2416 0500	18,72
2416 0600	18,33
2416 0800	21,54
2416 1000	27,53
2416 1200	41,49
2416 1600	65,42
2416 2000	103,68
2419 0600	21,54
2419 0800	25,15
2419 1000	31,91
2419 1200	47,89
2419 1400	61,15
2419 1600	74,98
2422 0050	25,52
2422 0080	25,52
2422 0100	23,94
2422 0150	23,13
2422 0200	23,13
2422 0300	23,94
2422 0400	24,73
2422 0500	24,73
2422 0600	25,52
2422 0800	31,91
2422 1000	43,09
2422 1200	58,26
2422 1600	97,33
2425 0300	38,29
2425 0400	42,25
2425 0500	43,87
2425 0600	46,25
2425 0800	56,62
2425 1000	73,37
2425 1200	110,08
2425 1600	169,10
2428 0200	52,95
2428 0300	49,89
2428 0400	47,54
2428 0500	53,32
2428 0600	63,36
2428 0800	67,62
2428 1000	71,53
2428 1200	104,00
2431 0100	59,81
2431 0200	62,28
2431 0300	59,27
2431 0400	56,27
2431 0500	61,58
2431 0600	73,87
2431 0601	63,51
2431 0800	80,31
2431 0801	83,68
2431 1000	89,35
2431 1001	115,95
2431 1200	147,78
2431 1201	175,42
2433 0605	30,16
2433 0610	30,16
2433 0615	30,97
2433 0805	46,66
2433 0810	46,66
2433 0815	49,06
2433 0820	49,06
2433 1005	58,73
2433 1010	58,73
2433 1015	61,12
2433 1020	61,12
2433 1210	77,21
2433 1215	79,63
2433 1220	79,63
2433 1620	131,93
2433 2025	133,52
2434 0305	30,51
2434 0405	30,93
2434 0505	30,93
2434 0610	33,53
2434 0810	41,67
2434 1015	56,72
2434 1215	76,50
2434 1620	127,19
2435 0610	61,01
2435 0810	74,77
2435 1015	96,24
2435 1215	143,53
2435 1620	223,45
2440 0400	13,88
2440 0600	20,08
2440 0800	23,92
2440 1000	30,30
2440 1200	41,45
2441 0400	18,25
2441 0600	24,10
2441 0800	31,03
2441 1000	38,70
2441 1200	51,11
2442 0400	13,88
2442 0600	20,08
2442 0800	23,92
2442 1000	30,30
2442 1200	41,45
2443 0400	18,25
2443 0600	24,10
2443 0800	31,03
2443 1000	38,70
2443 1200	51,11
2444 0300	18,81
2444 0400	20,81
2444 0600	29,58
2445 0200	12,60
2445 0300	12,77
2445 0400	15,53
2445 0500	20,08
2445 0600	25,75
2445 0800	31,96
2447 0200	12,60
2447 0300	12,77
2447 0400	15,53
2447 0500	20,08
2447 0600	25,75
2447 0800	31,96
2451 0050	69,14
2451 0100	69,14
2451 0150	69,14
2451 0200	69,14
2451 0250	71,62
2451 0300	71,62
2451 0400	77,35
2451 0500	110,30
2460 0600	17,80
2460 0800	25,31
2460 1000	35,63
2460 1200	46,87
2460 1400	58,13
2460 1600	76,88
2460 1800	112,52
2460 2000	117,20
2462 0600	21,58
2462 0800	30,00
2462 1000	44,07
2462 1200	56,26
2462 1400	75,00
2462 1600	98,45
2462 1800	135,95
2462 2000	150,02
2464 0400	25,31
2464 0500	25,31
2464 0600	25,31
2464 0800	31,88
2464 1000	42,19
2464 1200	56,26
2466 0200	17,80
2466 0300	17,80
2466 0400	16,87
2466 0500	16,87
2466 0600	15,92
2466 0700	26,26
2466 0800	21,58
2466 0900	37,50
2466 1000	31,88
2466 1200	45,00
2466 1400	61,90
2466 1600	75,00
2466 1800	107,82
2466 2000	112,52
2468 0200	17,80
2468 0300	17,80
2468 0400	16,87
2468 0500	16,87
2468 0600	15,92
2468 0700	26,26
2468 0800	21,58
2468 0900	37,50
2468 1000	31,88
2468 1200	45,00
2468 1400	61,90
2468 1600	75,00
2468 1800	107,82
2468 2000	112,52
2469 0800	33,77
2469 1000	41,25
2469 1200	50,62
2469 1600	76,88
2469 2000	145,33
2470 0200	19,70
2470 0300	20,63
2470 0400	20,63
2470 0500	21,58
2470 0600	21,58
2470 0700	25,31
2470 0800	25,31
2470 0900	32,82
2470 1000	40,32
2470 1200	54,38
2470 1400	69,38
2470 1600	91,90
2470 1800	117,20
2470 2000	145,33
2471 0300	20,63
2471 0400	23,45
2471 0500	25,31
2471 0600	31,88
2471 0800	32,82
2471 1000	46,87
2471 1200	75,00
2471 1400	90,03
2471 1600	112,52
2471 1800	126,58
2471 2000	148,33
2472 0050	12,19
2472 0060	12,19
2472 0080	9,84
2472 0100	8,14
2472 0120	12,66
2472 0150	8,14
2472 0180	12,66
2472 0200	10,79
2472 0250	11,25
2472 0300	10,79
2472 0350	11,25
2472 0400	10,79
2472 0450	12,66
2472 0500	12,19
2472 0550	12,66
2472 0575	14,06
2472 0600	12,19
2472 0675	18,76
2472 0700	16,87
2472 0775	17,34
2472 0800	16,87
2472 0870	26,26
2472 0900	24,84
2472 0970	26,26
2472 1000	24,40
2472 1200	29,07
2472 1400	39,86
2472 1600	51,58
2472 1800	61,90
2472 2000	82,53
2474 0100	9,84
2474 0120	12,19
2474 0150	9,84
2474 0180	12,19
2474 0200	13,61
2474 0250	14,06
2474 0300	13,61
2474 0350	13,61
2474 0400	13,61
2474 0450	14,54
2474 0500	13,61
2474 0550	14,54
2474 0575	14,54
2474 0600	13,61
2474 0675	19,22
2474 0700	18,76
2474 0775	18,76
2474 0800	18,76
2474 0870	25,31
2474 0900	23,91
2474 0970	25,78
2474 1000	24,84
2476 0300	15,92
2476 0400	15,92
2476 0500	15,92
2476 0600	15,92
2476 0700	21,58
2476 0800	20,63
2476 0900	31,88
2476 1000	30,00
2476 1200	45,00
2476 1400	56,26
2476 1600	76,88
2476 1800	93,78
2476 2000	121,91
2478 0300	12,19
2478 0400	12,19
2478 0500	12,19
2478 0600	12,19
2478 0800	14,06
2478 1000	18,76
2478 1200	29,07
2478 1400	38,45
2478 1600	44,07
2478 1800	58,13
2478 2000	76,88
2480 0300	14,99
2480 0400	14,99
2480 0500	14,99
2480 0600	14,99
2480 0800	16,87
2480 1000	29,07
2480 1200	42,19
2480 1400	50,62
2480 1600	69,38
2480 1800	78,75
2480 2000	107,82
2482 0300	17,80
2482 0400	19,70
2482 0500	20,63
2482 0600	20,63
2482 0800	40,32
2482 1000	48,75
2482 1200	75,00
2482 1400	91,90
2482 1600	121,91
2482 1800	145,33
2482 2000	164,08
2484 0600	20,63
2484 0800	24,40
2484 1000	37,50
2484 1200	50,62
2484 1400	69,38
2484 1600	91,90
2484 1800	107,82
2484 2000	126,58
2500 0005	9,95
2500 0010	9,95
2500 0015	12,93
2500 0020	13,47
2500 0025	12,40
2500 0030	21,75
2500 0035	27,41
2501 0005	17,50
2501 0010	17,50
2501 0015	24,30
2501 0020	22,21
2501 0025	27,64
2501 0030	35,37
2501 0035	45,14
2502 0010	17,50
2502 0015	24,30
2502 0025	27,64
2502 0030	35,37
2502 0035	45,14
2504 0005	21,01
2504 0010	21,01
2504 0015	29,18
2504 0020	26,65
2504 0025	32,65
2504 0030	42,79
2504 0035	54,45
2506 0005	17,50
2506 0010	17,50
2506 0015	24,30
2506 0020	22,21
2506 0025	27,64
2506 0030	35,37
2508 0010	11,29
2508 0030	20,95
2510 0005	10,82
2510 0010	10,82
2510 0015	14,30
2510 0020	14,79
2510 0025	15,31
2510 0030	23,92
2510 0035	30,11
2511 0005	19,83
2511 0010	18,71
2511 0015	27,04
2511 0025	31,14
2511 0027	35,19
2511 0030	39,26
2511 0035	50,59
2512 0010	18,71
2512 0015	27,04
2512 0025	31,14
2512 0030	39,26
2512 0035	50,59
2514 0005	23,80
2514 0010	22,43
2514 0015	32,40
2514 0025	37,34
2514 0030	47,12
2514 0035	60,70
2516 0005	19,83
2516 0010	18,71
2516 0015	27,04
2516 0025	31,14
2516 0030	39,26
2516 0035	50,59
2518 0010	11,29
2518 0025	16,32
2518 0030	20,93
2520 0005	11,51
2520 0010	11,51
2520 0015	14,14
2520 0020	15,48
2520 0025	20,59
2520 0030	24,40
2520 0035	30,67
2521 0005	20,65
2521 0010	20,21
2521 0015	28,38
2521 0020	28,78
2521 0025	36,19
2521 0030	43,55
2521 0035	52,12
2522 0010	20,21
2522 0015	28,38
2522 0020	28,78
2522 0025	36,19
2522 0030	43,55
2522 0035	52,12
2524 0005	24,92
2524 0010	24,05
2524 0015	34,63
2524 0020	35,41
2524 0025	43,44
2524 0030	51,36
2524 0035	63,79
2526 0010	20,21
2526 0015	28,38
2526 0020	28,78
2526 0030	43,55
2528 0010	13,17
2528 0030	17,78
2530 0005	10,63
2530 0010	10,63
2530 0015	11,43
2530 0020	12,73
2530 0025	17,18
2530 0030	21,28
2530 0035	25,14
2531 0005	17,91
2531 0010	16,99
2531 0015	19,47
2531 0020	20,21

Catalogue prices in EUR

Part No.	€
2531 0025	27,64
2531 0030	36,97
2531 0035	52,13
2532 0010	16,99
2532 0015	19,47
2532 0020	20,21
2532 0025	27,64
2532 0035	52,13
2534 0010	20,43
2534 0015	22,55
2534 0020	23,33
2534 0025	32,65
2534 0030	45,14
2536 0005	17,91
2536 0010	16,99
2536 0015	19,47
2536 0020	20,21
2536 0025	27,64
2536 0030	36,97
2538 0025	12,76
2540 0015	9,61
2542 0005	12,06
2542 0010	16,19
2542 0015	22,00
2542 0020	24,79
2542 0025	30,67
2543 0005	19,47
2543 0010	31,88
2543 0015	37,00
2543 0020	41,01
2543 0025	50,87
2544 0005	19,47
2544 0010	31,88
2544 0015	37,00
2544 0020	41,01
2544 0025	50,87
2546 0005	22,22
2546 0010	38,51
2546 0015	44,40
2546 0020	49,19
2546 0025	62,57
2548 0005	19,47
2548 0010	31,88
2548 0015	37,00
2548 0020	41,01
2550 0005	12,93
2550 0010	14,22
2550 0015	15,48
2550 0020	22,73
2550 0025	31,55
2551 0005	22,44
2551 0015	32,49
2551 0020	33,64
2552 0020	33,64
2554 0010	33,64
2554 0015	38,97
2554 0020	40,24
2554 0025	59,31
2556 0005	22,44
2556 0020	33,64
2558 0005	13,17
2558 0020	18,81
2560 0005	12,32
2560 0010	19,47
2560 0015	24,40
2561 0005	19,47
2561 0010	23,69
2561 0015	36,19
2562 0005	19,47
2562 0010	23,69
2562 0015	36,19
2564 0005	23,34
2564 0010	28,44
2564 0015	43,42
2566 0005	19,47
2566 0010	23,69
2566 0015	36,19
2568 0005	19,37
2568 0010	21,51
2568 0015	23,66
2568 0020	42,71
2569 0005	32,08
2569 0010	44,84
2570 0005	32,08
2570 0010	44,84
2570 0015	48,89
2572 0005	38,07
2572 0010	52,89
2572 0015	60,48
2572 0020	64,89
2574 0015	48,89
2576 0015	19,04
2578 0005	19,47
2580 0005	12,06
2580 0010	13,64
2580 0015	15,18
2580 0020	22,48
2580 0025	30,98
2581 0005	20,05
2581 0010	32,46
2581 0015	32,85
2581 0020	38,12
2582 0005	20,05
2582 0010	32,46
2582 0015	32,85
2582 0020	38,12
2582 0025	52,40
2584 0005	22,90
2584 0010	38,95
2584 0015	39,67
2584 0020	45,74
2584 0025	64,43
2586 0005	20,05
2586 0015	32,85
2586 0020	38,12
2588 0005	16,71
2588 0020	15,89
2590 0005	14,08
2590 0010	32,48
2590 0015	44,81
2591 0005	29,12
2591 0010	41,69
2592 0005	29,12
2592 0010	41,69
2598 0005	36,24
2598 0010	39,74
2598 0015	48,10
2600 0010	161,99
2601 0015	133,23
2602 0005	6,19
2602 0010	6,19
2602 0015	9,40
2602 0020	9,40
2602 0025	9,40
2602 0030	6,19
2602 0035	6,36
2602 0040	9,40
2602 0045	6,36
2602 0055	9,40
2602 0060	7,15
2602 0065	9,40
2602 0070	6,36
2602 0075	9,40
2602 0080	6,36
2602 0085	13,91
2602 0090	6,36
2602 0095	6,36
2602 0100	9,40
2602 0105	6,36
2602 0110	9,40
2602 0115	6,36
2602 0120	6,36
2602 0125	9,40
2604 0005	11,67
2604 0010	9,80
2604 0020	11,99
2604 0030	10,88
2604 0035	10,88
2604 0040	13,14
2604 0045	10,88
2604 0050	13,14
2604 0055	13,14
2604 0095	10,88
2604 0110	11,99
2604 0115	10,88
2604 0120	10,88
2604 0125	11,99
2606 0005	9,80
2606 0010	9,80
2606 0015	10,79
2606 0020	10,79
2606 0025	11,99
2606 0030	10,88
2606 0035	10,88
2606 0040	13,14
2606 0045	10,88
2606 0050	13,14
2606 0055	13,14
2606 0060	10,33
2606 0065	11,39
2606 0070	10,88
2606 0075	11,99
2606 0080	10,88
2606 0085	13,14
2606 0090	10,88
2606 0095	10,88
2606 0100	11,99
2606 0105	10,88
2606 0110	11,99
2606 0115	10,88
2606 0120	10,88
2606 0125	11,99
2610 0010	6,11
2610 0030	13,14
2612 0005	6,43
2612 0010	6,11
2612 0015	7,13
2612 0020	10,14
2612 0025	11,43
2612 0030	13,14
2612 0035	16,87
2614 0010	6,11
2614 0030	13,14
2616 0005	6,11
2618 0005	6,11
2618 0010	7,13
2618 0015	11,47
2618 0020	13,14
2622 0005	6,11
2622 0010	11,83
2622 0015	12,58
2622 0020	16,87
2624 0005	13,14
2624 0010	16,87
2626 0005	11,83
2626 0010	16,87
2628 0015	10,14
2630 0005	6,28
2630 0010	6,11
2630 0015	10,14
2630 0020	11,83
2630 0025	14,16
2630 0030	16,87
2632 0015	10,14
2632 0025	14,16
2634 0010	10,14
2636 0005	6,11
2636 0010	10,14
2636 0015	13,14
2640 0005	13,14
2641 0005	13,14
2642 0005	27,52
2642 0010	25,75
2644 0006	3,75
2644 0008	5,84
2650 0001	6,17
2650 0010	6,63
2650 0013	6,63
2650 0016	6,63
2650 0019	6,17
2652 0010	141,92
2653 0018	189,43
2655 0001	9,39
2655 0004	9,39
2655 0007	8,57
2655 0010	8,57
2655 0013	8,10
2655 0016	8,10
2655 0019	8,10
2655 0022	8,10
2655 0025	8,91
2655 0028	9,75
2655 0031	10,10
2655 0034	10,66
2655 0037	11,61
2655 0040	13,37
2655 0043	15,59
2655 0046	17,83
2655 0049	9,75
2655 0052	9,75
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2655 0061	8,68
2655 0064	8,68
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2655 0076	9,97
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2655 0082	11,37
2655 0085	12,43
2655 0088	14,77
2655 0091	17,25
2655 0094	19,36
2655 0097	10,33
2655 0100	10,33
2655 0103	9,39
2655 0106	9,39
2655 0109	9,04
2655 0112	9,04
2655 0115	9,04
2655 0118	9,04
2655 0121	9,97
2655 0124	10,33
2655 0127	11,14
2655 0130	12,08
2655 0133	12,90
2655 0136	16,43
2655 0139	18,52
2655 0142	20,18
2655 0145	11,26
2655 0148	11,26
2655 0151	10,79
2655 0154	10,79
2655 0157	10,10
2655 0160	10,10
2655 0163	10,10
2655 0166	10,10
2655 0169	10,10
2655 0172	10,66
2655 0175	11,61
2655 0178	12,90
2655 0181	14,77
2655 0184	17,72
2655 0187	21,94
2655 0190	24,16
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2655 0196	13,26
2655 0199	12,08
2655 0202	12,08
2655 0205	11,37
2655 0208	11,37
2655 0211	11,37
2655 0214	11,37
2655 0217	11,37
2655 0220	12,43
2655 0223	13,37
2655 0226	14,44
2655 0229	16,43
2655 0232	18,99
2655 0235	24,98
2655 0238	28,38
2655 0241	14,44
2655 0244	13,84
2655 0247	13,84
2655 0250	13,26
2655 0253	13,26
2655 0256	13,26
2655 0259	13,26
2655 0262	12,90
2655 0265	14,44
2655 0268	15,48
2655 0271	16,43
2655 0274	18,07
2655 0277	22,87
2655 0280	28,85
2655 0283	32,37
2655 0286	16,30
2655 0289	16,30
2655 0292	15,72
2655 0295	15,72
2655 0298	15,72
2655 0301	15,72
2655 0304	15,25
2655 0307	16,19
2655 0310	17,83
2655 0313	21,36
2655 0316	23,22
2655 0319	28,38
2655 0322	34,97
2655 0325	39,17
2655 0328	18,43
2655 0331	18,43
2655 0334	18,43
2655 0337	18,43
2655 0340	17,83
2655 0343	21,59
2655 0346	23,81
2655 0349	26,76
2655 0352	28,85
2655 0355	39,17
2655 0358	43,86
2655 0361	51,27
2655 0364	28,15
2655 0367	28,15
2655 0370	28,15
2655 0373	26,40
2655 0376	27,44
2655 0379	28,85
2655 0382	30,51
2655 0385	34,02
2655 0388	50,92
2655 0391	59,46
2655 0394	66,39
2655 0397	38,92
2655 0400	36,49
2655 0403	37,42
2655 0406	38,59
2655 0409	43,20
2655 0412	49,19
2655 0415	69,06
2655 0418	81,88
2655 0421	93,32
2655 0424	54,20
2655 0427	50,92
2655 0430	54,67
2655 0433	58,18
2655 0436	65,91
2655 0439	73,66
2655 0442	104,17
2655 0445	123,98
2655 0448	142,98
2655 0451	72,53
2655 0454	79,35
2655 0457	90,78
2655 0460	100,01
2655 0463	145,06
2655 0466	172,19
2655 0469	202,58
2655 0472	143,81
2655 0475	161,88
2655 0478	208,44
2655 0481	254,06
2655 0484	301,34
2656 0205	11,37
2656 0208	11,37
2656 0211	11,37
2656 0214	11,37
2656 0217	11,37
2656 0220	12,43
2656 0223	13,37
2656 0226	14,44
2656 0229	16,43
2656 0232	18,99
2656 0235	24,98
2656 0238	28,38
2656 0250	13,26
2656 0253	13,26
2656 0256	13,26
2656 0259	13,26
2656 0262	12,90
2656 0265	14,44
2656 0268	15,48
2656 0271	16,43
2656 0274	18,07
2656 0277	22,87
2656 0280	28,85
2656 0283	32,37
2656 0292	15,72
2656 0295	15,72
2656 0298	15,72
2656 0301	15,72
2656 0304	15,25
2656 0307	16,19
2656 0310	17,83
2656 0313	21,36
2656 0316	23,22
2656 0319	28,38
2656 0322	34,97
2656 0325	39,17
2656 0328	18,43
2656 0331	18,43
2656 0334	18,43
2656 0337	18,43
2656 0340	17,83
2656 0343	21,59
2656 0346	23,85
2656 0349	26,76
2656 0352	28,85
2656 0355	39,17
2656 0358	43,86
2656 0361	51,27
2656 0364	28,15
2656 0367	28,15
2656 0370	28,15
2656 0373	26,40
2656 0376	27,44
2656 0379	28,85
2656 0382	30,51
2656 0385	34,02
2656 0388	50,92
2656 0391	59,46
2656 0394	66,39
2656 0397	38,92
2656 0400	36,49
2656 0403	37,42
2656 0406	38,59
2656 0409	43,20
2656 0412	49,19
2656 0415	69,06
2656 0418	81,88
2656 0421	93,32
2656 0427	50,92
2656 0430	54,67
2656 0433	58,18
2656 0436	65,91
2656 0439	73,66
2656 0442	104,17
2656 0445	123,98
2656 0448	142,98
2656 0451	72,53
2656 0454	79,35
2656 0457	90,78
2656 0460	100,01
2656 0463	145,06
2656 0466	172,19
2656 0469	202,58
2656 0472	143,81
2656 0475	161,88
2656 0478	208,44
2656 0481	254,06
2656 0484	301,34
2657 0214	14,77
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2657 0274	21,36
2657 0277	27,09
2657 0280	32,37
2657 0283	36,13
2657 0301	19,36

Catalogue prices in EUR

Part No.	€
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2657 0307	20,18
2657 0310	20,88
2657 0313	25,34
2657 0316	27,44
2657 0319	33,08
2657 0322	38,84
2657 0325	44,68
2657 0337	21,36
2657 0340	21,59
2657 0343	25,34
2657 0346	26,76
2657 0349	28,38
2657 0352	31,44
2657 0355	43,16
2657 0358	47,38
2657 0361	54,67
2657 0370	30,51
2657 0373	31,44
2657 0376	31,89
2657 0379	32,73
2657 0382	33,08
2657 0385	37,42
2657 0388	56,42
2657 0391	61,93
2657 0394	71,08
2657 0397	38,12
2657 0400	38,12
2657 0403	40,78
2657 0406	41,12
2657 0409	46,21
2657 0412	52,54
2657 0415	74,26
2657 0418	84,42
2657 0421	99,21
2657 0430	59,82
2657 0433	61,11
2657 0436	70,15
2657 0439	78,83
2657 0442	111,08
2657 0445	131,84
2657 0448	150,73
2657 0451	76,45
2657 0454	83,60
2657 0457	94,93
2657 0460	105,08
2657 0463	150,13
2657 0466	179,00
2657 0469	209,38
2657 0472	152,49
2657 0475	171,49
2657 0478	213,95
2657 0481	258,41
2657 0484	310,01
2658 0005	64,37
2658 0010	64,37
2658 0015	64,37
2658 0020	64,37
2658 0025	64,37
2658 0030	64,37
2658 0035	91,98
2658 0040	91,98
2670 0001	45,60
2670 0003	45,60
2670 0005	48,20
2670 0007	48,20
2670 0009	56,31
2670 0011	56,31
2670 0013	54,92
2670 0015	54,92
2670 0017	54,92
2670 0019	54,92
2670 0021	78,86
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2670 0025	78,86
2670 0027	78,86
2670 0029	78,86
2670 0031	78,86
2670 0033	93,10
2670 0035	93,10
2670 0037	93,10
2670 0039	100,09
2670 0041	100,09
2670 0043	100,09
2670 0045	120,72
2670 0047	120,72
2670 0049	120,72
2670 0051	203,13
2670 0053	203,13
2670 0055	203,13
2670 0057	406,22
2670 0059	406,22
2672 0001	65,17
2672 0003	65,17
2672 0005	67,95
2672 0007	67,95
2672 0009	82,26
2672 0011	82,26
2672 0013	79,30
2672 0015	79,30
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2672 0051	290,52
2672 0053	290,52
2672 0055	290,52
2672 0057	555,25
2672 0059	555,25
2674 0005	105,62
2674 0007	105,62
2674 0009	109,46
2674 0011	109,46
2674 0013	108,01
2674 0015	108,01
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2674 0019	108,01
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2674 0041	179,25
2674 0043	179,25
2675 0005	6,19
2675 0010	6,19
2675 0015	6,19
2677 0001	151,33
2677 0004	151,33
2677 0007	151,33
2677 0010	187,58
2677 0013	187,58
2677 0016	187,58
2677 0019	187,58
2677 0022	203,77
2677 0025	203,77
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2677 0046	227,51
2677 0049	343,51
2677 0052	343,51
2677 0055	343,51
2680 0001	66,01
2680 0004	75,66
2680 0007	66,01
2680 0010	75,66
2680 0016	80,94
2680 0019	78,44
2680 0031	90,63
2680 0034	91,60
2680 0037	91,60
2680 0040	100,53
2680 0043	91,60
2680 0046	100,53
2680 0055	114,93
2680 0061	123,09
2680 0064	162,56
2685 0005	162,29
2685 0010	200,32
2685 0015	162,29
2685 0020	205,40
2685 0025	229,49
2685 0030	252,32
2685 0035	219,35
2685 0040	205,40
2685 0045	218,07
2685 0050	379,10
2685 0055	91,29
2685 0060	101,43
2700 0140	2,99
2700 0160	2,72
2700 0170	2,80
2700 0190	2,87
2700 0200	2,87
2700 0210	2,95
2700 0220	2,98
2700 0240	3,09
2700 0250	3,39
2700 0270	3,51
2700 0290	3,75
2700 0300	3,98
2700 0320	4,08
2700 0330	4,19
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2700 0520	4,71
2700 0540	4,74
2700 0570	4,95
2700 0590	5,36
2700 0600	5,40
2700 0640	5,43
2700 0650	5,48
2700 0670	5,58
2700 0680	5,91
2700 0700	5,91
2700 0730	6,00
2700 0760	6,17
2700 0790	6,47
2700 0830	6,82
2700 0860	7,09
2700 0890	7,37
2700 0920	7,72
2700 0950	8,02
2700 0980	8,28
2700 1020	8,66
2700 1050	9,50
2700 1140	10,63
2700 1270	12,02
2700 1400	13,56
2700 1520	20,52
2701 0140	9,97
2701 0160	7,97
2701 0170	7,97
2701 0190	7,97
2701 0210	7,97
2701 0220	7,97
2701 0240	7,97
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2701 0380	8,93
2701 0400	8,93
2701 0410	8,93
2701 0430	8,93
2701 0440	11,20
2701 0460	11,20
2701 0480	11,20
2701 0510	11,20
2701 0520	13,80
2701 0540	13,80
2701 0570	13,80
2701 0590	13,80
2701 0600	13,80
2701 0640	14,87
2701 0650	14,87
2701 0670	14,87
2701 0680	14,87
2701 0700	14,87
2701 0730	14,87
2701 0760	15,37
2701 0790	15,50
2701 0830	15,50
2701 0860	15,50
2701 0890	15,50
2701 0920	17,91
2701 0950	21,17
2701 0980	22,22
2701 1020	23,29
2701 1050	25,26
2701 1140	45,68
2701 1270	56,39
2701 1400	67,46
2701 1520	78,80
2703 0005	4,05
2703 0010	8,36
2703 0015	8,36
2704 0005	11,36
2704 0010	19,20
2704 0015	19,47
2704 0020	17,70
2704 0025	33,52
2706 0005	9,36
2706 0010	12,22
2709 0635	1,46
2710 0635	3,45
2710 0640	3,87
2711 0001	12,57
2711 0003	14,84
2711 0005	12,95
2711 0007	17,89
2712 0005	7,50
2713 0007	52,73
2713 0008	52,56
2713 0009	57,28
2713 0012	66,81
2714 0007	90,31
2714 0008	156,11
2714 0009	103,07
2714 0012	228,74
2715 0160	17,21
2715 0170	17,21
2715 0180	17,21
2715 0200	17,81
2715 0210	17,81
2715 0220	17,81
2715 0230	18,33
2715 0240	18,60
2715 0250	18,60
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2715 0270	19,48
2715 0280	21,23
2715 0290	21,23
2715 0300	21,23
2715 0310	25,77
2715 0320	25,77
2715 0330	26,11
2715 0340	26,11
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2715 0370	28,11
2715 0380	28,11
2715 0390	28,11
2715 0400	28,11
2715 0410	28,10
2715 0420	29,17
2715 0430	29,34
2715 0440	29,34
2715 0450	29,34
2715 0460	31,26
2715 0470	32,13
2715 0480	32,13
2715 0490	32,13
2715 0500	33,80
2715 0510	33,80
2715 0520	34,85
2715 0530	35,11
2715 0540	35,45
2715 0550	35,45
2715 0560	38,16
2715 0570	38,95
2715 0580	38,95
2715 0590	39,30
2715 0600	39,30
2715 0650	42,53
2715 0680	44,64
2715 0700	44,64
2715 0750	55,82
2715 0800	59,30
2715 0850	63,49
2715 0900	67,76
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2715 1000	75,02
2715 1100	147,33
2715 1150	147,33
2715 1200	147,33
2717 0600	1,98
2717 0800	2,55
2722 0180	30,27
2722 0190	30,27
2722 0200	31,39
2722 0210	31,33
2722 0220	31,33
2722 0230	32,24
2722 0240	32,87
2722 0250	32,87
2722 0260	34,22
2722 0270	34,22
2722 0280	35,28
2722 0290	35,28
2722 0300	35,28
2722 0310	41,55
2722 0320	41,55
2722 0330	43,03
2722 0340	43,50
2722 0350	43,50
2722 0360	43,96
2722 0370	43,96
2722 0380	43,96
2722 0390	44,45
2722 0400	44,45
2722 0410	50,64
2722 0420	51,23
2722 0430	51,57
2722 0440	51,57
2722 0450	51,57
2722 0460	54,95
2722 0470	55,99
2722 0480	55,99
2722 0490	56,53
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2722 0900	119,92
2722 0910	119,92
2722 0920	119,92
2722 0930	121,07
2722 0940	121,07
2722 0950	129,23
2722 0960	129,23
2722 0970	131,56
2722 0980	132,73
2722 0990	132,73
2722 1000	132,73
2724 0600	1,98
2724 0800	2,96
2726 0002	46,40
2726 0003	53,39
2728 0200	27,42
2728 0210	26,82
2728 0220	26,82
2728 0230	26,82
2728 0240	26,82
2728 0250	26,82
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2728 0280	35,41
2728 0300	35,41
2728 0320	40,89
2728 0340	40,89
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2728 0370	45,23
2728 0390	45,23
2728 0400	45,23
2728 0420	52,23
2728 0450	52,23
2728 0460	58,81
2728 0470	58,81
2728 0500	58,81
2728 0550	66,32
2728 0600	93,56
2730 0600	2,50
2730 0800	3,48
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2735 0005	3,50
2735 0006	6,39
2735 0010	3,78
2735 0015	3,50
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2735 0026	3,78
2735 0030	6,27
2735 0035	1,81
2735 0040	2,46
2735 0045	5,15
2735 0050	2,69
2735 0055	3,50
2735 0060	3,50
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2735 0075	3,78
2735 0085	4,57
2735 0090	6,69
2735 0095	6,69
2735 0100	4,57
2735 0105	4,91
2735 0110	5,94
2736 0005	3,65
2736 0006	6,71
2736 0010	3,97
2736 0015	3,65
2736 0020	4,19

Catalogue prices in EUR

Part No.	€
2736 0026	3,97
2736 0027	1,89
2736 0028	2,72
2736 0035	1,89
2736 0040	2,57
2736 0041	5,18
2736 0045	3,28
2736 0047	2,72
2736 0050	3,15
2736 0051	6,71
2736 0052	8,08
2736 0053	6,54
2736 0054	6,71
2736 0055	3,65
2736 0060	3,65
2736 0065	4,68
2736 0066	5,64
2736 0070	3,65
2736 0071	5,80
2736 0075	3,97
2736 0085	4,93
2736 0086	6,54
2736 0090	7,88
2736 0091	6,54
2736 0095	7,88
2736 0100	4,93
2736 0101	4,73
2736 0105	5,80
2736 0106	6,71
2736 0107	16,63
2736 0108	11,03
2736 0109	11,03
2736 0111	6,27
2738 0005	15,26
2738 0010	15,26
2738 0015	8,73
2738 0020	10,90
2738 0025	15,26
2738 0030	15,26
2741 0005	3,40
2741 0020	3,40
2741 0025	4,57
2741 0030	5,39
2744 0010	5,32
2744 0020	9,01
2744 0025	6,36
2744 0035	6,36
2744 0040	9,61
2744 0045	6,36
2744 0050	6,39
2744 0056	10,54
2744 0061	7,45
2744 0066	10,16
2744 0075	6,36
2744 0080	9,61
2745 0010	15,72
2745 0013	20,74
2745 0016	25,04
2745 0025	12,77
2745 0030	10,28
2745 0035	12,77
2745 0040	16,65
2745 0045	12,77
2745 0050	12,77
2745 0078	16,65
2745 0080	25,04
2745 0100	33,52
2745 0110	33,52
2745 0120	14,62
2749 0020	1,73
2750 0005	0,61
2750 0010	0,61
2750 0015	0,61

Part No.	€
2751 0001	0,61
2752 0001	7,21
2752 0004	7,21
2752 0007	7,21
2752 0010	7,21
2752 0013	7,88
2752 0016	7,88
2752 0019	7,88
2752 0022	7,88
2752 0025	6,36
2752 0028	6,36
2752 0031	6,36
2752 0034	6,36
2752 0037	6,36
2752 0040	7,88
2752 0043	7,88
2752 0046	7,88
2752 0049	7,88
2752 0052	7,88
2752 0053	9,70
2752 0055	10,06
2752 0058	10,06
2752 0061	10,06
2752 0063	13,18
2752 0064	10,06
2752 0065	13,18
2752 0067	18,19
2752 0070	18,19
2752 0073	18,96
2752 0076	18,96
2752 0079	15,62
2752 0082	15,62
2752 0085	15,62
2752 0088	20,79
2752 0091	20,79
2752 0094	23,33
2752 0097	23,33
2752 0100	23,83
2752 0103	23,83
2753 0001	7,53
2753 0004	7,53
2753 0007	7,53
2753 0010	7,53
2753 0013	8,65
2753 0016	8,65
2753 0019	8,65
2753 0022	8,65
2753 0025	7,21
2753 0028	7,21
2753 0031	7,21
2753 0034	7,21
2753 0037	7,21
2753 0040	9,04
2753 0043	9,04
2753 0046	9,04
2753 0049	9,04
2753 0052	9,04
2753 0054	10,98
2753 0055	10,14
2753 0058	10,14
2753 0061	10,14
2753 0062	15,20
2753 0064	10,14
2753 0066	15,20
2753 0067	17,88
2753 0070	17,88
2753 0073	22,02
2753 0076	22,02
2753 0079	16,68
2753 0082	16,68
2753 0085	16,68
2753 0088	20,92
2753 0091	20,92

Part No.	€
2753 0094	22,18
2753 0097	22,18
2753 0100	28,57
2753 0103	28,57
2754 0025	7,21
2754 0031	7,21
2754 0065	12,43
2754 0066	12,43
2754 0073	22,02
2754 0076	22,02
2754 0088	20,92
2754 0094	22,18
2754 0100	28,57
2760 0001	9,50
2760 0002	11,28
2760 0003	11,28
2760 0004	9,50
2760 0005	11,47
2760 0006	11,47
2760 0007	10,60
2760 0008	11,47
2760 0009	12,46
2760 0010	10,60
2760 0011	10,62
2760 0012	10,62
2760 0013	14,69
2760 0014	13,17
2760 0015	13,17
2760 0016	14,69
2760 0017	12,46
2760 0018	12,46
2760 0019	15,53
2760 0020	16,84
2760 0021	16,84
2760 0022	15,53
2760 0023	16,84
2760 0024	19,89
2760 0025	16,93
2760 0026	19,89
2760 0027	19,89
2760 0028	16,93
2760 0029	17,48
2760 0030	17,48
2760 0031	20,21
2760 0032	19,89
2760 0033	19,89
2760 0034	20,21
2760 0037	20,21
2760 0040	20,21
2760 0043	20,21
2760 0046	20,74
2760 0049	20,74
2760 0052	20,74
2760 0055	20,74
2760 0058	20,74
2760 0061	21,48
2760 0064	21,48
2760 0067	21,48
2760 0070	21,48
2760 0073	21,48
2760 0076	21,48
2760 0079	22,76
2760 0082	22,76
2760 0085	22,76
2760 0088	22,76
2760 0091	22,76
2760 0094	22,76
2760 0095	23,83
2760 0096	23,83
2760 0097	25,99
2760 0098	23,83
2760 0099	23,83
2760 0100	25,99

Part No.	€
2760 0103	25,99
2760 0106	25,99
2760 0109	25,99
2760 0112	25,99
2760 0115	27,07
2760 0118	27,07
2760 0121	27,07
2760 0124	27,07
2760 0127	27,07
2760 0130	27,07
2760 0133	34,59
2760 0135	34,59
2760 0137	34,59
2760 0139	36,08
2760 0141	36,08
2760 0143	36,08
2760 0145	37,89
2760 0147	37,89
2760 0149	37,89
2760 0200	48,94
2760 0203	48,94
2760 0206	48,94
2760 0209	54,73
2760 0212	54,73
2760 0215	54,73
2760 0218	62,37
2760 0221	62,37
2760 0224	62,37
2761 0001	9,70
2761 0004	9,70
2761 0007	10,82
2761 0010	10,82
2761 0013	10,84
2761 0016	10,84
2761 0019	11,53
2761 0022	11,53
2761 0025	11,70
2761 0028	11,70
2761 0031	11,70
2761 0034	12,73
2761 0037	12,73
2761 0040	12,73
2761 0043	14,69
2761 0046	14,69
2761 0049	16,44
2761 0052	16,44
2761 0055	17,39
2761 0058	17,39
2761 0061	18,90
2761 0064	18,90
2761 0067	18,90
2761 0070	18,99
2761 0073	18,99
2761 0076	19,62
2761 0079	19,62
2761 0082	24,16
2761 0085	24,16
2761 0088	24,16
2761 0091	24,16
2761 0094	24,16
2761 0097	24,54
2761 0100	24,54
2761 0103	24,54
2761 0106	24,54
2761 0109	24,54
2761 0112	25,20
2761 0115	25,20
2761 0118	25,20
2761 0121	25,20
2761 0124	25,20
2761 0127	26,13
2761 0130	26,13
2761 0133	26,13

Part No.	€
2761 0136	26,13
2761 0139	26,13
2761 0142	26,13
2761 0145	27,72
2761 0148	27,72
2761 0151	27,72
2761 0154	27,72
2761 0157	27,72
2761 0160	27,72
2761 0163	29,04
2761 0166	29,04
2761 0169	29,04
2761 0172	29,04
2761 0175	31,74
2761 0178	31,74
2761 0181	31,74
2761 0184	31,74
2761 0187	31,74
2761 0190	31,74
2761 0193	33,08
2761 0196	33,08
2761 0199	33,08
2761 0202	33,08
2761 0205	33,08
2761 0208	33,08
2761 0211	41,85
2761 0214	41,85
2761 0217	41,85
2761 0220	43,71
2761 0223	43,71
2761 0226	43,71
2761 0229	45,91
2761 0232	45,91
2761 0235	45,91
2761 0238	57,99
2761 0241	57,99
2761 0244	57,99
2761 0247	64,91
2761 0250	64,91
2761 0253	64,91
2761 0256	74,07
2761 0259	74,07
2761 0262	74,07
2765 0001	51,30
2765 0004	51,30
2765 0007	51,30
2765 0010	51,30
2765 0013	51,30
2765 0016	51,30
2765 0019	51,30
2765 0022	51,30
2765 0025	51,30
2765 0028	51,30
2765 0031	51,30
2765 0034	51,30
2765 0037	51,30
2765 0040	51,30
2765 0043	51,30
2765 0046	51,30
2765 0049	51,30
2765 0052	51,30
2765 0055	57,69
2765 0058	57,69
2765 0061	57,69
2765 0064	57,69
2765 0067	57,69
2765 0070	57,69
2765 0073	57,69
2780 0001	2,13
2780 0004	2,17
2780 0007	2,52
2780 0010	2,91
2780 0013	2,80

Part No.	€
2780 0016	3,31
2780 0019	3,20
2780 0022	3,69
2780 0025	4,13
2780 0028	4,82
2780 0031	6,10
2780 0034	7,67
2780 0037	6,14
2780 0040	7,45
2780 0043	9,07
2780 0046	11,03
2780 0049	10,30
2780 0052	12,55
2780 0055	15,12
2780 0058	20,21
2780 0061	25,15
2780 0064	27,88
2780 0067	34,60
2782 0001	3,53
2782 0004	3,42
2782 0007	3,02
2782 0010	3,42
2782 0013	4,47
2782 0016	5,04
2782 0019	5,76
2782 0022	6,49
2782 0025	7,78
2782 0028	9,18
2782 0031	5,65
2782 0034	6,73
2782 0037	8,06
2782 0040	9,01
2782 0043	11,20
2782 0046	14,27
2782 0049	7,34
2782 0052	8,28
2782 0055	9,80
2782 0058	11,59
2782 0061	14,40
2782 0064	17,53
2782 0067	14,27
2782 0070	17,31
2782 0073	21,56
2782 0076	26,21
2782 0079	33,20
2782 0082	32,92
2782 0085	40,54
2782 0088	47,60
2782 0091	58,79
2784 0001	4,95
2784 0004	7,34
2784 0007	8,33
2784 0010	10,85
2784 0013	14,73
2784 0016	6,22
2784 0019	9,42
2784 0022	5,73
2784 0025	8,57
2784 0028	9,36
2784 0031	11,59
2784 0034	18,81
2784 0037	22,85
2784 0040	11,47
2784 0043	13,61
2784 0046	11,94
2784 0049	16,96
2784 0052	20,38
2784 0055	16,76
2784 0058	24,02
2784 0061	28,84
2784 0064	32,35
2786 0001	8,55
2786 0004	12,55

Part No.	€
2786 0007	15,97
2786 0010	17,10
2786 0013	22,24
2786 0016	17,66
2786 0019	22,79
2786 0022	27,92
2786 0025	24,79
2786 0028	29,93
2786 0031	26,21
2786 0034	35,89
2786 0037	38,18
2786 0040	47,31
2788 0001	4,05
2788 0004	4,96
2788 0007	6,14
2788 0010	11,17
2788 0013	17,26
2788 0016	22,79
2788 0019	20,38
2788 0022	35,34
2790 0001	3,70
2790 0004	4,00
2790 0007	3,31
2790 0010	3,59
2790 0013	5,83
2790 0016	5,83
2790 0019	5,83
2790 0022	6,55
2790 0025	6,38
2790 0028	8,14
2790 0031	8,27
2790 0034	9,42
2790 0037	12,38
2790 0040	15,91
2790 0043	25,40
2790 0046	49,80
2790 0049	56,87
2792 0001	2,47
2792 0004	2,74
2792 0007	2,74
2792 0010	4,16
2792 0013	3,76
2792 0016	5,65
2792 0019	7,28
2792 0022	6,44
2792 0025	12,98
2792 0028	14,43
2792 0031	19,22
2792 0034	20,95
2792 0037	27,78
2792 0040	28,04
2792 0043	37,11
2792 0046	64,28
2794 0001	4,61
2794 0004	4,82
2794 0007	5,62
2794 0010	6,84
2794 0013	6,84
2794 0016	8,51
2794 0019	10,57
2794 0022	13,42
2794 0025	16,49
2794 0028	21,55
2794 0031	25,80
2794 0034	28,27
2794 0037	34,30
2794 0040	40,19
2794 0043	46,45
2794 0046	95,08
2796 0001	11,78
2796 0004	15,40
2796 0007	20,84
2796 0010	24,82

Catalogue prices in EUR

Part No.	€
2796 0013	41,66
2796 0016	67,02
2796 0019	88,75
2810 0003	2,60
2810 0005	2,91
2810 0007	3,37
2810 0009	4,36
2810 0011	6,28
2810 0013	9,43
2812 0003	2,60
2812 0005	2,91
2812 0007	3,37
2812 0009	4,36
2812 0011	6,28
2812 0013	9,43
2814 0003	2,60
2814 0005	2,91
2814 0007	3,37
2814 0009	4,36
2814 0011	6,28
2814 0013	9,43
2816 0003	2,60
2816 0005	2,91
2816 0007	3,37
2816 0009	4,36
2816 0011	6,28
2816 0013	9,43
2818 0003	2,77
2818 0005	3,02
2818 0007	3,50
2818 0009	4,44
2818 0011	6,32
2818 0013	9,50
2820 0003	2,77
2820 0005	3,02
2820 0007	3,50
2820 0009	4,44
2820 0011	6,32
2820 0013	9,50
2822 0003	2,77
2822 0005	3,02
2822 0007	3,50
2822 0009	4,44
2822 0011	6,32
2822 0013	9,50
2824 0003	2,77
2824 0005	3,02
2824 0007	3,50
2824 0009	4,44
2824 0011	6,32
2824 0013	9,50
2826 0001	12,82
2826 0003	14,24
2826 0005	15,56
2826 0007	17,45
2826 0009	23,07
2826 0011	29,17
2828 0001	12,82
2828 0003	14,24
2828 0005	15,56
2828 0007	17,45
2828 0009	23,07
2828 0011	29,17
2830 0001	13,69
2830 0003	14,82
2830 0005	16,30
2830 0007	22,90
2830 0009	26,21
2830 0011	32,60
2832 0001	13,69
2832 0003	14,82
2832 0005	16,30
2832 0007	22,90
2832 0009	26,21
2832 0011	32,60
2834 0001	2,71
2834 0003	3,02
2834 0005	3,56
2834 0007	4,36
2834 0009	5,29
2834 0011	7,26
2834 0013	10,93
2836 0001	2,71
2836 0003	3,02
2836 0005	3,56
2836 0007	4,36
2836 0009	5,29
2836 0011	7,26
2836 0013	10,93
2838 0001	12,55
2838 0003	15,34
2838 0005	18,11
2838 0007	21,42
2838 0009	30,60
2838 0011	44,10
2840 0001	10,25
2840 0003	11,39
2840 0005	13,69
2840 0007	15,97
2840 0009	18,79
2840 0011	26,21
2840 0013	38,18
2842 0001	2,71
2842 0003	3,02
2842 0005	3,56
2842 0007	4,36
2842 0009	5,29
2842 0011	7,26
2842 0013	10,93
2844 0001	2,71
2844 0003	3,02
2844 0005	3,56
2844 0007	4,36
2844 0009	5,29
2844 0011	7,26
2844 0013	10,93
2846 0001	12,55
2846 0003	15,34
2846 0005	18,11
2846 0007	21,42
2846 0009	30,60
2846 0011	46,02
2848 0001	10,25
2848 0003	11,39
2848 0005	13,69
2848 0007	15,97
2848 0009	18,79
2848 0011	26,21
2848 0013	38,18
2850 0001	2,79
2850 0003	3,26
2850 0005	3,95
2850 0007	5,23
2852 0001	2,79
2852 0003	3,26
2852 0005	3,95
2852 0007	5,23
2854 0001	14,82
2854 0003	15,97
2854 0005	21,66
2854 0007	27,34
2854 0009	39,89
2856 0001	2,91
2856 0003	3,58
2856 0005	4,27
2856 0007	5,80
2856 0009	9,07
2856 0011	15,61
2858 0001	2,91
2858 0003	3,58
2858 0005	4,27
2858 0007	5,80
2858 0009	9,07
2858 0011	15,61
2860 0001	15,72
2860 0003	16,87
2860 0005	22,79
2860 0007	29,07
2860 0009	42,18
2862 0001	3,58
2862 0003	4,60
2862 0005	6,39
2862 0007	9,75
2864 0001	3,58
2864 0003	4,60
2864 0005	6,39
2864 0007	9,75
2866 0001	3,58
2866 0003	4,60
2866 0005	6,39
2866 0007	9,75
2868 0001	3,58
2868 0003	4,60
2868 0005	6,39
2868 0007	9,75
2870 0001	15,37
2870 0003	19,37
2870 0005	24,16
2870 0007	33,63
2872 0001	15,37
2872 0003	19,37
2872 0005	24,16
2872 0007	33,63
2874 0001	3,15
2874 0003	3,58
2874 0005	3,98
2874 0007	5,45
2876 0001	3,15
2876 0003	3,58
2876 0005	3,98
2876 0007	5,45
2878 0001	3,15
2878 0003	3,58
2878 0005	3,98
2878 0007	5,45
2880 0001	3,15
2880 0003	3,58
2880 0005	3,98
2880 0007	5,45
2882 0001	2,68
2882 0003	2,91
2882 0005	3,53
2882 0007	4,39
2882 0009	6,02
2882 0011	9,18
2884 0001	2,68
2884 0003	2,91
2884 0005	3,53
2884 0007	4,39
2884 0009	6,02
2884 0011	9,18
2886 0001	2,68
2886 0003	2,91
2886 0005	3,53
2886 0007	4,39
2886 0009	6,02
2886 0011	9,18
2888 0001	2,68
2888 0003	2,91
2888 0005	3,53
2888 0007	4,39
2888 0009	6,02
2888 0011	9,18
2890 0001	14,82
2890 0003	16,18
2890 0005	20,63
2890 0007	25,53
2890 0009	32,26
2892 0001	14,82
2892 0003	16,18
2892 0005	20,63
2892 0007	25,53
2892 0009	32,26
2894 0001	2,60
2894 0003	2,87
2894 0005	3,47
2894 0007	4,44
2894 0009	6,14
2896 0001	2,60
2896 0003	2,87
2896 0005	3,47
2896 0007	4,44
2896 0009	6,14
2898 0001	2,60
2898 0003	2,87
2898 0005	3,47
2898 0007	4,44
2898 0009	6,14
2900 0001	2,60
2900 0003	2,87
2900 0005	3,47
2900 0007	4,44
2900 0009	6,14
2902 0001	17,31
2902 0003	19,94
2902 0005	21,89
2902 0007	32,70
2902 0009	48,45
2904 0001	17,31
2904 0003	19,94
2904 0005	21,89
2904 0007	32,70
2904 0009	48,45
2906 0001	7,53
2906 0003	8,02
2906 0005	9,43
2906 0007	10,54
2906 0009	12,82
2906 0011	16,36
2908 0001	7,53
2908 0003	8,02
2908 0005	9,43
2908 0007	10,54
2908 0009	12,82
2908 0011	16,36
2910 0001	22,79
2910 0003	27,34
2910 0005	29,63
2910 0007	38,76
2910 0009	43,86
2912 0001	16,76
2912 0003	19,04
2912 0005	20,85
2912 0007	24,62
2912 0009	26,66
2912 0011	36,35
2912 0013	42,18
2913 0001	7,53
2913 0003	8,02
2913 0005	9,43
2913 0007	10,54
2913 0009	12,82
2913 0011	16,36
2914 0001	7,53
2914 0003	8,02
2914 0005	9,43
2914 0007	10,54
2914 0009	12,82
2914 0011	16,36
2915 0001	5,62
2915 0003	5,92
2915 0005	7,17
2915 0007	8,17
2915 0009	9,47
2915 0011	11,80
2916 0001	5,62
2916 0003	5,92
2916 0005	7,17
2916 0007	8,17
2916 0009	9,47
2916 0011	11,80
2920 0006	20,76
2920 0008	22,48
2920 0010	24,66
2920 0012	27,52
2920 0016	32,63
2920 0020	40,62
2935 0100	14,25
2936 0100	40,34
2937 0100	34,27
2937 0105	34,27
2937 0110	34,27
2938 0100	69,32
2938 0105	69,32
2938 0110	95,79
2940 0100	128,50
2940 0105	134,74
2940 0110	146,43
2945 0001	13,55
2945 0003	13,55
2945 0005	13,55
2945 0009	15,34
2945 0011	15,34
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2945 0051	17,21
2945 0053	17,21
2945 0055	17,21
2945 0063	21,74
2945 0067	21,74
2946 0003	13,55
2946 0005	13,55
2946 0011	15,34
2946 0013	15,34
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2946 0051	17,21
2946 0053	17,21
2946 0055	17,21
2946 0065	21,74
2946 0067	21,74
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2947 0005	13,55
2947 0011	15,34
2947 0017	15,34
2947 0021	15,34
2947 0023	15,34
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2947 0055	17,21
2947 0065	21,74
2948 0005	28,04
2948 0007	28,04
2948 0009	28,04
2949 0003	28,44
2949 0005	28,44
2952 0100	229,21
2952 0105	231,56
2952 0110	274,93
2952 0115	274,93
2952 0120	274,93
2952 0125	274,93
2953 0100	520,27
2953 0105	578,67
2955 0100	637,09
2955 0105	695,50
2955 0110	695,50
2959 0081	225,48
2960 0001	14,63
2960 0002	15,34
2960 0003	14,63
2960 0004	15,34
2960 0005	17,21
2960 0006	15,34
2960 0007	17,21
2960 0009	21,74
2960 0011	21,74
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2960 0015	21,74
2960 0017	21,74
2961 0001	14,63
2961 0002	15,34
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2961 0004	15,34
2961 0005	17,21
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2961 0007	17,21
2961 0009	21,74
2961 0011	21,74
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2961 0015	21,74
2961 0017	21,74
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2966 0068	7,26
2966 0069	80,70
2966 0070	80,70
2966 0072	29,97
2966 0074	7,50
2966 0100	146,29
2966 0105	161,41
2966 0110	181,58
2966 0115	221,93
2966 0120	262,28
2966 0125	312,73
2966 0140	7,40
2966 0143	7,40
2966 0146	12,49
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2966 0152	7,40
2966 0160	277,42
2966 0165	307,69
2966 0170	353,08
2966 0175	438,83
2966 0180	580,06
2966 0183	7,40
2966 0186	7,40
2966 0189	7,40
2966 0192	7,40
2966 0193	134,51
2966 0194	168,13
2966 0195	201,76
2966 0196	187,35
2966 0197	209,44
2966 0198	312,24
2966 0200	80,70
2966 0205	60,53
2966 0210	90,80
2966 0215	60,53
2966 0220	80,70
2966 0225	90,80
2966 0230	80,70
2966 0235	121,05
2966 0240	80,70
2966 0245	100,88
2966 0250	141,23
2966 0255	121,05
2966 0260	141,23
2966 0265	161,41
2966 0270	141,23
2966 0275	191,68
2966 0280	90,80
2966 0285	90,80
2966 0290	100,88
2966 0295	121,05

Catalogue prices in EUR

Part No.	€
2966 0300	151,33
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2966 0310	317,05
2966 0400	201,76
2966 0405	221,93
2966 0410	302,64
2966 0415	403,52
2966 0420	706,15
2966 0500	90,80
2966 0505	90,80
2966 0510	95,84
2966 0515	95,84
2966 0520	100,88
2966 0525	100,88
2966 0530	110,97
2966 0535	110,97
2966 0550	146,03
2966 0555	177,74
2966 0560	206,56
2966 0565	225,78
2966 0570	293,03
2966 0575	103,76
2966 0580	187,35
2966 0585	124,90
2966 0590	206,56
2966 0595	156,60
2966 0600	6,73
2966 0603	6,73
2966 0606	11,06
2966 0609	11,53
2966 0612	11,53
2966 0615	11,53
2966 0621	12,98
2966 0700	110,97
2966 0705	131,15
2966 0710	151,33
2966 0715	201,76
2966 0720	302,64
2966 0730	278,62
2966 0800	8,46
2966 0803	8,46
2966 0806	12,49
2966 0809	12,98
2966 0812	12,98
2966 0815	12,98
2966 0818	14,90
2966 0900	237,07
2966 0905	282,46
2966 0910	373,26
2966 0915	524,57
2966 0920	605,27
2966 0925	756,60
2966 1100	267,34
2966 1105	353,08
2966 1110	403,52
2966 1115	302,64
2966 1120	403,52
2966 1125	504,39
2966 1130	816,64
2966 1200	85,76
2966 1205	95,84
2966 1210	95,84
2966 1215	95,84
2966 1220	100,88
2966 1225	110,97
2966 1230	126,11
2966 1235	141,23
2966 1244	3,81
2966 1248	5,07
2966 1300	6,25
2966 1303	6,25
2966 1306	6,25
2966 1309	6,73
2966 1312	6,73
2966 1315	6,73
2966 1318	7,40
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2966 1418	8,90
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2966 1424	8,90
2966 1500	131,15
2966 1505	151,33
2966 1510	176,54
2966 1515	226,99
2966 1520	252,20
2966 1525	302,64
2966 1600	75,66
2966 1605	126,11
2966 1610	100,88
2966 1615	126,11
2966 1620	75,66
2966 1715	95,84
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2966 1846	94,15
2966 1848	103,76
2966 1850	103,76
2966 1852	103,76
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2966 1856	115,29
2966 1858	115,29
2966 1860	115,29
2966 1862	115,29
2966 1870	182,54
2966 1875	240,19
2966 1880	182,54
2966 1885	240,19
2966 1900	218,57
2966 1905	218,57
2966 1910	218,57
2966 1915	248,00
2966 1920	248,00
2966 1925	248,00
2966 1930	302,64
2966 1935	302,64
2966 1940	302,64
2966 1945	311,05
2966 1950	311,05
2966 1955	311,05
2966 1960	311,05
2966 1965	348,88
2966 1970	348,88
2966 1975	348,88
2966 1980	365,69
2966 1985	365,69
2966 1990	365,69
2966 1995	365,69
2966 2000	365,69
2966 2005	407,73
2966 2010	407,73
2966 2015	407,73
2966 2020	407,73
2966 2025	407,73
2966 2030	428,74
2966 2035	428,74
2966 2040	441,35
2966 2045	441,35
2966 3000	315,25
2966 3005	315,25
2966 3010	315,25
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2966 3065	588,46
2966 3200	9,61
2966 3203	9,61
2966 3206	11,29
2966 3209	11,29
2966 3212	11,29
2966 3215	11,29
2966 3218	10,41
2966 3221	10,41
2966 3224	14,02
2966 3227	14,02
2966 3230	14,02
2966 3233	14,02
2966 3236	10,82
2966 3239	10,82
2966 3242	14,82
2966 3245	14,82
2966 3248	14,82
2966 3251	14,82
2966 3254	11,21
2966 3257	11,21
2966 3260	15,62
2966 3263	15,62
2966 3266	15,62
2966 3269	15,62
2966 3272	11,21
2966 3275	11,21
2966 3278	17,22
2966 3281	17,22
2966 3284	17,22
2966 3287	17,22
2966 3290	11,21
2966 3293	11,21
2966 3296	16,42
2966 3299	16,42
2966 3302	16,42
2966 3305	16,42
2966 3308	12,01
2966 3311	12,01
2966 3314	18,02
2966 3317	18,02
2966 3320	18,02
2966 3323	18,02
2966 4000	210,17
2966 4005	226,98
2966 4010	243,80
2966 4100	5,60
2966 4105	5,60
2966 4110	6,17
2966 4115	6,17
2966 5000	151,32
2966 5100	10,82
2966 5105	14,02
2966 6000	84,07
2966 6005	100,88
2966 6010	100,88
2966 6015	126,11
2966 6100	84,07
2966 6105	100,88
2966 6110	100,88
2966 6115	126,11
2966 6200	50,44
2966 6205	67,25
2966 6210	109,29
2966 6215	75,67
2966 6220	92,48
2966 6225	126,11
2966 6300	50,44
2966 6305	71,47
2966 6310	109,29
2966 6315	75,67
2966 6320	92,48
2966 6325	126,11
2966 6400	92,48
2966 6405	100,88
2966 6410	109,29
2966 6415	100,88
2966 6420	126,11
2966 6425	151,32
2966 6500	3,91
2966 6503	3,91
2966 6506	3,91
2966 6509	8,41
2966 6512	3,91
2966 6515	3,91
2966 6518	3,91
2966 6521	4,75
2966 6524	4,75
2966 6527	4,75
2966 6530	9,25
2966 6533	4,75
2966 6536	4,75
2966 6539	4,75
2966 7000	75,67
2966 7005	75,67
2966 7010	75,67
2966 7015	75,67
2966 7020	100,88
2966 7025	109,29
2966 7030	75,67
2966 7035	100,88
2966 7040	109,29
2966 7100	5,21
2966 7103	5,21
2966 7112	5,60
2966 7115	5,60
2966 7130	4,50
2966 7133	4,50
2966 7136	4,50
2966 7139	8,49
2966 7142	4,50
2966 7145	4,50
2966 7148	4,50
2966 8000	470,77
2966 8005	470,77
2966 8010	470,77
2966 8015	470,77
2966 8020	470,77
2966 9000	168,13
2966 9200	168,13
2966 9300	5,53
2966 9303	5,53
2966 9306	5,53
2966 9309	5,53
2966 9312	5,53
2966 9315	5,53
2966 9318	9,33
2966 9400	58,85
2966 9405	58,85
2966 9410	58,85
2966 9415	58,85
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2966 9425	58,85
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2966 9435	58,85
2966 9440	75,67
2966 9445	75,67
2966 9450	75,67
2966 9455	84,07
2966 9460	84,07
2966 9465	84,07
2966 9470	84,07
2966 9475	84,07
2966 9480	84,07
2966 9485	84,07
2966 9490	84,07
2966 9495	92,48
2966 9500	92,48
2966 9505	92,48
2966 9510	92,48
2966 9515	92,48
2966 9600	3,99
2966 9603	3,99
2966 9606	3,99
2966 9609	8,31
2966 9612	3,99
2966 9615	3,99
2966 9618	3,99
2966 9621	4,67
2966 9624	4,67
2966 9627	4,67
2966 9630	9,25
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2966 9709	75,67
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2966 9736	100,88
2966 9739	100,88
2966 9742	100,88
2966 9745	100,88
2966 9748	117,69
2966 9751	117,69
2966 9754	117,69
2966 9757	117,69
2966 9760	117,69
2966 9763	134,51
2966 9766	134,51
2966 9770	100,08
2966 9772	100,08
2966 9774	112,09
2966 9776	120,09
2966 9778	120,09
2966 9780	128,10
2966 9782	152,12
2966 9784	232,18
2966 9786	264,21
2966 9788	280,22
2966 9790	304,24
2966 9800	134,51
2966 9803	134,51
2966 9805	134,51
2966 9806	134,51
2966 9809	134,51
2966 9812	134,51
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2966 9827	142,92
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2966 9833	142,92
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2966 9839	142,92
2966 9842	142,92
2966 9845	142,92
2966 9848	142,92
2966 9851	142,92
2966 9854	142,92
2966 9857	151,32
2966 9860	151,32
2966 9863	151,32
2966 9866	151,32
2966 9869	151,32
2966 9872	151,32
2966 9875	176,54
2966 9878	176,54
2966 9881	176,54
2966 9884	176,54
2966 9887	176,54
2966 9890	176,54
2966 9893	176,54
2966 9896	176,54
2966 9899	176,54
2966 9902	176,54
2966 9905	176,54
2966 9908	210,17
2966 9911	210,17
2966 9914	210,17
2966 9917	226,98
2966 9920	226,98
2966 9923	226,98
2966 9926	226,98
2966 9929	294,24
2966 9932	294,24
2966 9935	294,24
2966 9938	294,24
2966 9941	294,24
2966 9944	336,26
2966 9947	336,26
2966 9950	336,26
2966 9953	336,26
2967 0100	7,21
2967 0103	7,21
2967 0106	7,21
2967 0109	8,01
2967 0112	8,01
2967 0115	8,01
2968 0000	32,55
2968 0005	32,55
2968 0010	35,86
2968 0015	35,86
2968 0033	4,32
2968 0034	7,52
2968 0035	5,04
2968 0036	2,24
2968 0038	2,21
2968 0039	3,52
2968 0040	2,56
2968 0041	4,16
2968 0042	5,12
2968 0043	3,69
2968 0044	3,20
2968 0045	3,36
2968 0046	3,36
2968 0047	3,98
2968 0048	3,20
2968 0049	4,32
2968 0050	3,20
2968 0051	2,24
2968 0052	3,94
2968 0053	3,94
2968 0054	2,48
2968 0055	0,43
2968 0056	4,97
2968 0057	20,65
2968 0058	20,65
2968 0059	7,46
2968 0100	3,27
2968 0103	3,27
2968 0106	3,27
2968 0109	3,26
2968 0112	3,26
2968 0115	3,26
2968 0118	3,26
2968 0121	3,26
2968 0124	6,60
2968 0127	5,04
2968 0130	6,60
2968 0133	5,04
2968 0137	6,94
2968 0139	5,30
2968 0200	32,55
2968 0205	32,55
2968 0210	35,86
2968 0215	35,86
2968 0220	40,62
2968 0225	40,62
2968 0300	3,81
2968 0303	3,81
2968 0306	3,81
2968 0309	3,81
2968 0312	3,81
2968 0315	3,81
2968 0318	3,81
2968 0321	6,73
2968 0324	5,30
2968 0327	6,52
2968 0330	4,55
2968 0400	35,86
2968 0405	35,86
2968 0410	40,62
2968 0415	40,62
2968 0500	4,36
2968 0503	4,36
2968 0506	4,36
2968 0509	4,36
2968 0512	4,36
2968 0515	4,36
2968 0518	4,36
2968 0521	4,36
2968 0524	4,36
2968 0527	4,36
2968 0530	4,36
2968 0533	4,36
2968 0536	4,36

Catalogue prices in EUR

Part No.	€
2968 0539	4,96
2968 0542	4,96
2968 0545	4,36
2968 0548	4,36
2968 0600	35,86
2968 0605	35,86
2968 0610	40,62
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2968 0650	35,86
2968 0655	35,86
2968 0660	40,62
2968 0665	40,62
2968 0700	6,26
2968 0703	6,26
2968 0706	6,26
2968 0709	6,26
2968 0712	6,26
2968 0715	6,26
2968 0718	6,26
2968 0721	6,26
2968 0724	6,26
2968 0727	6,26
2968 0730	6,26
2968 0733	6,26
2968 0736	6,26
2968 0739	6,26
2968 0742	6,26
2968 0750	3,74
2968 0753	3,74
2968 0756	3,74
2968 0759	3,74
2968 0762	3,74
2968 0765	3,74
2968 0800	35,86
2968 0805	35,86
2968 0810	40,62
2968 0815	40,62
2968 0850	77,82
2968 0855	77,82
2968 0860	82,91
2968 0865	82,91
2968 0900	4,62
2968 0903	4,62
2968 0906	4,62
2968 0909	4,62
2968 0912	4,62
2968 0915	5,38
2968 0918	5,38
2968 0950	5,50
2968 0953	5,50
2968 0956	5,50
2968 0959	5,50
2968 0962	5,50
2968 0965	5,50
2968 0968	5,50
2968 0971	5,50
2968 1000	58,85
2968 1005	58,85
2968 1010	58,85
2968 1015	58,85
2968 1020	58,85
2968 1025	58,85
2968 1030	71,47
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2968 1050	71,47
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2968 1060	142,92
2968 1070	142,92
2968 1100	2,93
2968 1103	2,78
2968 1106	2,78
2968 1109	2,93
2968 1112	2,93
2968 1115	2,78
2968 1118	2,78
2968 1121	2,78
2968 1124	2,78
2968 1127	6,46
2968 1130	4,90
2968 1133	6,12
2968 1136	4,70
2968 1200	67,25
2968 1205	67,25
2968 1210	84,87
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2968 1300	54,65
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2968 1400	2,93
2968 1403	2,78
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2968 1412	2,78
2968 1415	2,78
2968 1418	6,12
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2968 1500	88,28
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2968 1530	180,74
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2969 0840	145,91
2969 0850	3,68
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2969 2009	9,12
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2969 3005	135,11
2969 3010	140,50
2969 3015	142,67
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2969 3110	62,69
2969 3112	65,94
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2971 0020	783,37
2971 0025	1.159,04
2971 0030	1.083,30
2973 0005	104,69
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2974 0005	22,16
2974 0010	22,16
2974 0015	22,16
2974 0020	22,16
2974 0025	22,16
2975 0005	6,76
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2977 0045	24,03
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2980 0015	149,43
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2988 0005	7,51
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2991 0005	9,01
2991 0010	9,01
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2992 0005	294,37
2992 0010	337,91
2992 0015	352,91
2992 0020	367,94
2992 0025	431,03
2992 0030	623,25
2992 0035	738,89
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2992 0050	1.417,69
2992 0055	1.479,28
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2993 0005	45,47
2993 0010	55,81
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2993 0025	109,32
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2993 0060	51,92
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2993 0070	32,78
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2993 0085	43,87
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2994 0056	70,19
2994 0059	76,79
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2994 0106	93,89
2994 0109	93,89
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2994 0150	80,05
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2994 0156	109,29
2994 0159	109,29
2995 0005	185,55
2995 0010	35,11
2995 0015	48,04
2995 0020	81,99
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2995 0103	27,37
2995 0109	27,37
2995 0112	66,17
2995 0115	66,17
2995 0121	28,63
2995 0124	71,79
2995 0127	71,79
2995 0133	29,59
2995 0136	65,89
2995 0139	65,89
2995 0203	41,14
2995 0206	73,36
2995 0209	73,36
2995 0215	43,68
2995 0218	77,68
2995 0221	77,68
2995 0227	44,94
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2995 0233	73,36
2995 0239	47,78
2995 0242	74,81
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2995 0252	56,49
2995 0254	86,31
2995 0260	71,52
2995 0263	96,37
2995 0266	96,37
2995 0300	27,37
2995 0306	27,37
2995 0309	66,17
2995 0312	66,17
2995 0318	28,63
2995 0321	71,79
2995 0324	71,79
2995 0330	29,59
2995 0333	65,89
2995 0336	65,89
2995 0406	43,68
2995 0412	44,94
2995 0415	73,36
2995 0421	47,78
2995 0424	74,81
2995 0430	56,49

Catalogue prices in EUR

Part No.	€
2995 0433	86,31
2995 0439	71,52
2995 0442	96,37
2996 0004	28,16
2996 0010	30,22
2996 0016	30,85
2996 0019	77,68
2996 0100	43,51
2996 0103	46,04
2996 0106	46,99
2996 0109	50,96
2996 0112	59,33
2996 0115	75,01
2997 0004	28,16
2997 0007	70,19
2997 0013	30,22
2997 0016	77,68
2997 0019	77,68
2997 0025	30,85
2997 0028	77,68
2997 0031	77,68
2997 0037	35,12
2997 0040	84,88
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2997 0050	87,75
2997 0056	58,07
2997 0059	100,68
2997 0103	46,99
2997 0109	50,96
2997 0115	59,33
2997 0118	75,01
2997 0203	30,85
2997 0206	77,68
2997 0212	35,12
2997 0215	84,88
2997 0221	43,35
2997 0224	87,75
2997 0230	58,07
2998 0005	34,67
2998 0010	45,47
2998 0015	73,36
2998 0100	15,54
2998 0105	19,85
2998 0110	19,85
2998 0115	27,06
2998 0120	27,06
2998 0125	27,06
2998 0130	27,06
2998 0200	31,10
2998 0203	54,23
2998 0206	38,78
2998 0209	62,56
2998 0212	44,80
2998 0215	65,45
2998 0218	52,78
2998 0221	74,81
2998 0224	64,35
2998 0227	81,99
2998 0230	73,12
2998 0233	96,37
2998 0236	83,13
2998 0239	92,35
2998 0300	31,10
2998 0303	54,23
2998 0306	38,78
2998 0309	62,56
2998 0312	44,80
2998 0315	65,45
2998 0318	52,78
2998 0321	74,81
2998 0324	64,35
2998 0327	81,99
2998 0330	73,12
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2998 0336	92,35
2998 0400	32,78
2998 0403	74,81
2998 0406	40,48
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2998 0412	86,31
2998 0415	55,56
2998 0418	106,44
2998 0421	67,43
2998 0424	115,08
2998 0427	76,79
2998 0430	122,26
2998 0433	87,73
2998 0436	101,59
2998 0439	152,37
2998 0500	32,78
2998 0503	56,96
2998 0506	40,48
2998 0509	46,80
2998 0512	68,78
2998 0515	55,56
2998 0518	79,12
2998 0521	67,43
2998 0524	86,31
2998 0527	76,79
2998 0530	101,59
2998 0600	32,78
2998 0603	40,48
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2998 0612	67,43
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3001 0080	331,14
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3001 0125	443,99
3001 0160	508,46
3001 0200	590,19
3001 0250	752,57
3001 0315	1.234,08
3002 0080	347,17
3002 0100	451,33
3002 0125	511,70
3002 0160	581,56
3002 0200	663,29
3002 0250	843,78
3002 0315	1.352,24
3003 0400	2.697,29
3003 0500	5.729,97
3003 0630	7.758,54
3004 0400	2.990,00
3004 0500	7.360,13
3004 0630	10.016,77
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3008 0005	677,30
3008 0007	677,30
3008 0009	865,34
3008 0011	865,34
3008 0013	1.333,06
3008 0015	1.333,06
3010 0001	622,76
3010 0003	622,76
3010 0005	740,06
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3010 0009	1.014,13
3010 0011	1.014,13
3010 0013	1.459,85
3010 0015	1.459,85
3012 0001	4.191,27
3012 0003	4.191,27
3014 0001	714,88
3014 0003	814,07
3014 0005	923,63
3014 0007	923,63
3014 0009	1.203,32
3014 0011	1.322,23
3014 0013	1.481,38
3014 0015	1.788,92
3014 0017	2.508,26
3014 0019	2.282,63
3014 0021	2.648,50
3014 0023	4.408,76
3014 0025	4.408,76
3017 0080	530,51
3017 0100	490,68
3017 0125	537,22
3017 0160	640,08
3017 0200	756,54
3017 0250	1.041,51
3017 0315	1.549,87
3017 0400	2.933,07
3017 0500	6.898,73
3019 0080	536,62
3019 0100	661,22
3019 0125	693,74
3019 0160	744,56
3019 0200	866,92
3019 0250	1.237,86
3019 0315	2.124,10
3019 0400	3.951,43
3019 0500	8.016,68
3021 0001	841,51
3021 0003	953,51
3021 0005	1.026,27
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3021 0009	1.084,62
3021 0011	1.084,62
3021 0013	1.663,31
3021 0015	1.513,70
3021 0017	2.615,99
3021 0019	2.615,99
3021 0021	2.786,74
3021 0023	2.831,45
3021 0025	4.864,07
3024 0080	85,61
3024 0100	96,41
3024 0125	109,76
3024 0160	119,02
3024 0200	132,53
3024 0250	168,84
3024 0315	288,73
3028 0080	59,31
3028 0100	59,31
3028 0125	70,42
3028 0160	89,79
3028 0200	102,62
3028 0250	133,30
3028 0315	198,85
3036 0100	113,38
3036 0125	128,84
3036 0160	139,76
3036 0200	145,57
3036 0250	195,97
3036 0315	337,21
3036 0400	379,30
3036 5063	885,20
3038 0080	151,18
3038 0100	154,30
3038 0125	159,72
3038 0160	171,31
3038 0200	191,96
3038 0250	246,16
3038 0315	418,72
3038 0400	555,31
3038 5063	1.177,51
3040 0100	65,70
3040 0125	77,67
3040 0160	98,30
3040 0200	111,41
3040 0250	145,57
3040 0315	217,70
3040 0400	267,49
3040 5063	529,50
3042 0080	99,73
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3042 0160	132,67
3042 0200	152,02
3042 0250	197,09
3042 0315	285,99
3042 0400	348,39
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3048 0100	106,56
3048 0125	121,08
3048 0160	131,39
3048 0200	145,57
3048 0250	184,22
3048 0315	316,89
3048 0400	416,89
3048 5063	885,20
3050 0080	151,18
3050 0100	140,42
3050 0125	159,72
3050 0160	171,31
3050 0200	191,96
3050 0250	246,16
3050 0315	418,72
3050 0400	505,31
3050 5063	1.177,51
3052 0100	189,44
3052 0125	190,66
3052 0160	221,55
3052 0200	249,81
3052 0250	337,63
3052 0315	450,84
3052 0400	688,05
3052 0500	1.160,43
3052 5063	1.347,22
3054 0100	285,99
3054 0125	269,33
3054 0160	324,21
3054 0200	354,29
3054 0250	453,48
3054 0315	653,89
3054 0400	1.082,78
3054 0500	1.666,14
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3056 0125	57,17
3056 0160	57,17
3056 0200	66,22
3056 0250	95,73
3056 0315	137,85
3056 0400	191,14
3056 5063	379,30
3058 0100	72,78
3058 0125	77,05
3058 0160	84,67
3058 0200	86,70
3058 0250	124,58
3058 0315	181,62
3058 0400	276,85
3058 5063	496,16
3060 0080	6,30
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3060 0125	10,62
3060 0160	10,06
3060 0250	22,14
3060 0315	28,00
3060 0400	38,47
3060 0500	47,90
3061 0080	7,40
3061 0100	9,00
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3061 0160	11,45
3061 0200	11,71
3061 0250	13,49
3061 0315	19,08
3061 0400	28,56
3061 0500	35,86
3062 0080	37,80
3062 0100	41,13
3062 0125	41,95
3062 0160	45,94
3062 0200	49,77
3062 0250	59,31
3062 0315	62,16
3062 0400	144,46
3062 0500	239,79
3065 0005	56,86
3068 0001	0,46
3068 0004	0,46
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3068 0010	0,46
3068 0013	0,46
3068 0016	1,26
3068 0019	3,03
3070 0001	0,46
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3070 0013	0,98
3070 0016	4,38
3072 0001	0,53
3072 0004	0,58
3072 0007	0,63
3072 0010	0,65
3072 0013	0,74
3072 0016	1,54
3072 0019	1,93
3072 0022	2,59
3074 0001	394,94
3074 0004	484,17
3074 0007	544,95
3074 0010	1.244,58
3078 0001	14,93
3078 0004	24,75
3078 0007	46,74
3078 0010	71,49
3078 0013	113,51
3078 0016	278,88
3080 0001	154,30
3080 0004	144,27
3080 0007	158,45
3080 0010	153,30
3080 0013	190,63
3080 0016	191,92
3080 0019	235,78
3080 0022	252,49
3080 0025	319,53
3080 0028	375,22
3080 0031	451,66
3080 0034	670,57
3080 0037	678,28
3082 0001	436,61
3082 0004	227,85
3082 0007	233,14
3082 0010	233,14
3082 0013	264,04
3082 0016	275,63
3082 0019	323,38
3082 0022	369,74
3082 0025	522,80
3082 0028	462,42
3082 0031	645,56
3082 0034	740,48
3082 0037	787,03
3090 0001	1.908,83
3090 0004	2.217,60
3090 0007	3.118,05
3090 0010	4.614,07
3090 0013	6.951,58
3092 0001	2.512,32
3092 0004	2.512,32
3092 0007	2.567,20
3092 0010	2.778,60
3092 0013	2.559,08
3092 0016	2.882,27
3092 0019	3.636,36
3092 0022	3.333,51
3092 0025	4.805,13
3092 0028	4.866,10
3092 0031	4.526,66
3092 0034	7.136,55
3092 0037	7.256,48
3094 0001	2.516,40
3094 0004	2.550,94
3094 0007	2.672,90
3094 0010	2.837,54
3094 0013	2.878,19
3094 0016	2.985,92
3094 0019	3.701,41
3094 0022	3.382,30
3094 0025	4.912,86
3094 0028	4.351,85
3094 0031	5.002,29
3094 0034	7.234,12
3094 0037	7.305,25
3100 0160	147,05
3100 0200	192,83
3100 0250	217,89
3100 0315	269,12
3100 0400	443,92
3102 0160	35,39
3102 0200	43,84
3102 0250	66,99
3102 0315	97,41
3102 0400	163,71
3104 0160	180,36
3104 0200	224,81
3104 0250	270,55
3104 0315	409,17
3104 0400	668,73
3108 0001	0,39
3108 0004	0,39
3108 0007	0,39
3108 0010	1,79
3110 0001	32,32
3110 0004	39,13
3110 0007	61,58
3110 0010	73,96
3110 0013	98,53
3112 0001	65,61
3112 0004	74,76
3112 0007	92,52
3112 0010	120,00
3112 0013	167,72
3114 0001	4,87
3114 0004	4,87
3114 0007	5,01
3114 0010	5,97
3114 0013	9,15
3117 0001	47,58
3117 0004	75,60
3117 0007	145,67
3117 0010	288,02
3117 0013	844,36
3120 0001	490,88
3120 0003	588,65
3120 0005	613,24
3120 0007	656,95
3120 0009	839,48
3120 0011	864,89
3130 0010	190,30
3130 0020	280,60
3130 0030	431,62
3133 0005	50,14
3133 0010	51,40
3133 0015	78,47
3133 0020	78,47
3133 0025	80,05
3133 0030	124,29
3133 0035	134,63
3136 0005	54,48
3136 0010	89,58
3136 0015	141,89
3139 0005	66,36
3139 0010	101,43
3139 0015	171,97
3139 0020	182,67
3142 0005	26,72
3142 0010	28,07
3142 0015	34,51
3142 0020	38,34
3142 0025	43,65
3142 0030	46,13
3145 0005	12,02
3145 0010	12,53
3145 0015	22,73
3145 0020	27,49
3146 0005	88,15
3146 0010	110,55
3146 0015	133,21
3148 0001	2,84
3148 0003	3,17
3148 0005	4,18
3148 0007	18,55
3148 0009	23,71
3148 0011	31,66
3148 0013	15,89
3148 0015	20,25
3148 0017	24,66
3148 0019	3,10
3148 0021	3,76
3148 0023	5,25
3148 0027	2,17
3148 0029	2,75
3148 0031	3,36
3164 0005	63,92
3164 0010	64,85
3164 0015	71,78
3173 0005	64,29
3173 0010	67,47
3173 0015	72,35
3174 0005	64,29
3174 0010	62,59
3174 0015	62,59
3174 0020	64,29
3174 0025	64,29
3174 0030	64,29
3174 0035	64,29
3174 0040	72,18
3174 0045	69,16
3174 0050	69,16
3174 0055	69,16
3174 0060	69,16

Catalogue prices in EUR

Part No.	€
3174 0065	71,96
3177 0005	87,57
3177 0010	80,58
3177 0015	84,34
3182 0005	66,91
3182 0010	66,91
3182 0015	66,91
3182 0020	66,91
3182 0025	66,91
3182 0030	66,91
3182 0035	73,09
3182 0040	73,09
3182 0045	73,09
3182 0050	73,09
3182 0055	73,09
3182 0060	73,09
3182 0065	73,09
3182 0070	74,41
3182 0075	74,41
3182 0080	74,41
3182 0085	74,41
3182 0090	74,41
3182 0095	74,41
3182 0100	74,41
3182 0105	74,41
3183 0005	85,20
3183 0010	86,38
3183 0015	89,94
3183 0020	89,94
3185 0005	79,28
3185 0010	79,28
3185 0015	79,28
3185 0020	79,28
3185 0025	82,84
3185 0030	82,84
3185 0035	88,75
3191 0005	17,43
3191 0010	17,43
3191 0015	30,49
3192 0005	7,49
3192 0010	7,49
3192 0015	8,44
3206 0005	348,00
3206 0010	244,72
3206 0015	348,00
3206 0020	238,28
3206 0025	247,94
3206 0030	247,94
3206 0035	255,99
3300 0005	94,18
3300 0010	110,35
3300 0015	140,78
3300 0020	210,25
3303 0005	66,84
3303 0010	80,61
3303 0015	96,14
3303 0020	118,26
3303 0025	180,61
3306 0005	101,81
3306 0010	135,10
3306 0015	182,62
3306 0020	213,99
3306 0025	306,36
3307 0005	362,78
3307 0010	477,90
3307 0015	507,02
3307 0020	780,36
3307 0025	1.170,79
3309 0005	624,09
3309 0010	785,74
3309 0015	1.509,51
3312 0005	458,56
3312 0010	496,61
3312 0015	670,60
3312 0020	1.053,07
3315 0005	336,77
3315 0010	399,53
3315 0015	443,27
3315 0020	529,79
3315 0025	733,38
3320 0005	141,75
3320 0010	169,27
3320 0015	220,67
3320 0020	370,10
3325 0040	193,19
3325 0045	209,29
3325 0050	222,61
3325 0055	269,28
3325 0060	279,69
3325 0065	300,66
3325 0070	524,09
3325 0075	557,42
3325 0080	1.252,92
3330 0005	12,18
3330 0010	15,18
3330 0015	25,28
3330 0020	48,13
3333 0005	43,82
3333 0010	59,33
3333 0015	79,97
3333 0020	140,35
3336 0005	55,72
3336 0010	71,72
3336 0015	93,90
3340 0005	810,12
3340 0010	890,29
3340 0015	826,71
3340 0020	908,50
3340 0025	849,63
3340 0030	849,63
3340 0035	1.056,64
3340 0040	1.056,64
3350 0005	1.439,59
3350 0010	1.594,71
3400 0004	11,82
3400 0007	11,82
3400 0010	15,53
3400 0019	15,53
3400 0022	15,53
3400 0025	15,53
3400 0028	24,15
3403 0001	23,20
3403 0013	22,76
3403 0016	23,20
3403 0031	44,41
3403 0034	74,68
3404 0001	15,53
3405 0001	13,24
3406 0005	0,90
3406 0010	0,91
3406 0015	1,48
3406 0020	4,58
3412 0001	20,73
3412 0004	20,73
3412 0007	26,60
3412 0010	32,00
3412 0025	20,73
3412 0028	26,60
3412 0031	20,73
3412 0034	26,60
3412 0037	32,00
3412 0040	35,90
3415 0007	37,83
3415 0013	29,41
3415 0016	29,51
3415 0019	29,41
3415 0022	29,51
3415 0028	37,83
3415 0034	37,83
3415 0037	47,11
3415 0040	50,12
3418 0001	32,61
3418 0004	39,47
3418 0007	42,92
3418 0010	42,92
3421 0010	97,50
3421 0013	93,90
3421 0016	99,86
3421 0019	115,65
3421 0022	115,65
3422 0010	97,99
3422 0013	97,99
3422 0016	103,70
3422 0019	119,85
3422 0022	119,85
3427 0001	32,75
3427 0004	32,75
3427 0007	38,05
3427 0010	30,03
3427 0013	38,05
3427 0016	38,05
3430 0001	29,18
3430 0004	29,18
3430 0007	35,15
3430 0010	35,15
3435 0001	139,38
3435 0004	108,05
3435 0007	108,05
3435 0010	108,05
3435 0013	117,74
3435 0016	117,74
3435 0019	125,10
3435 0022	125,10
3435 0025	133,69
3435 0028	133,69
3435 0031	143,28
3435 0034	163,25
3435 0037	163,25
3438 0007	193,35
3439 0002	252,77
3439 0006	379,16
3439 0008	252,77
3439 0011	379,16
3439 0014	252,77
3439 0017	379,16
3439 0020	220,57
3439 0023	314,76
3439 0026	252,77
3439 0029	379,16
3439 0032	252,77
3439 0035	379,16
3439 0038	252,77
3439 0041	379,16
3439 0044	220,57
3439 0047	314,76
3440 0002	353,40
3440 0006	456,44
3440 0008	353,40
3440 0011	456,44
3440 0014	353,40
3440 0017	456,44
3440 0020	321,20
3440 0023	396,06
3440 0026	353,40
3440 0029	456,44
3440 0032	353,40
3440 0035	456,44
3440 0038	353,40
3440 0041	456,44
3440 0044	321,20
3440 0047	396,06
3440 0050	353,40
3440 0053	456,44
3440 0056	353,40
3440 0060	456,44
3441 0001	157,56
3441 0004	169,50
3441 0007	195,68
3441 0010	195,68
3442 0202	252,77
3442 0205	252,77
3442 0208	252,77
3442 0211	220,57
3442 0214	252,77
3442 0217	252,77
3442 0220	252,77
3442 0223	220,57
3442 0226	252,77
3442 0229	353,40
3442 0232	353,40
3442 0235	353,40
3442 0238	321,20
3442 0241	353,40
3442 0244	353,40
3442 0247	353,40
3442 0250	321,20
3442 0253	353,40
3442 0256	353,40
3442 0302	183,54
3442 0305	210,91
3443 0002	183,54
3443 0005	210,91
3443 0602	64,89
3443 0605	64,89
3443 0608	64,89
3443 0611	64,89
3443 0614	64,89
3443 0617	64,89
3443 0620	83,72
3443 0623	83,72
3443 0626	83,72
3443 0629	83,72
3443 0632	83,72
3443 0635	83,72
3443 0638	83,72
3443 0641	83,72
3443 0644	83,72
3444 0001	157,56
3444 0004	160,45
3444 0007	166,70
3444 0010	157,00
3444 0101	111,58
3444 0104	111,58
3444 0107	111,58
3444 0110	111,58
3444 0113	111,58
3444 0116	111,58
3444 0119	111,58
3444 0122	111,58
3444 0125	111,58
3444 0128	163,02
3444 0131	163,02
3444 0134	163,02
3444 0137	163,02
3444 0140	163,02
3444 0143	163,02
3444 0146	163,02
3444 0149	163,02
3444 0152	163,02
3444 0155	163,02
3445 0001	103,60
3445 0004	139,10
3445 0007	103,60
3445 0010	139,10
3445 0013	103,60
3445 0016	139,10
3445 0019	103,60
3445 0022	139,10
3445 0025	103,60
3445 0028	139,10
3445 0031	103,60
3445 0034	139,10
3445 0037	103,60
3445 0040	139,10
3445 0043	103,60
3445 0046	139,10
3445 0049	103,60
3445 0052	139,10
3446 0001	155,05
3446 0004	190,54
3446 0007	155,05
3446 0010	190,54
3446 0013	155,05
3446 0016	190,54
3446 0019	155,05
3446 0022	190,54
3446 0025	155,05
3446 0028	190,54
3446 0031	155,05
3446 0034	190,54
3446 0037	155,05
3446 0040	190,54
3446 0043	155,05
3446 0046	190,54
3446 0049	155,05
3446 0052	190,54
3446 0055	155,05
3446 0058	190,54
3449 0001	116,48
3449 0004	116,48
3449 0007	116,48
3449 0010	116,48
3449 0013	116,48
3449 0016	116,48
3449 0019	116,48
3449 0022	116,48
3449 0025	116,48
3450 0001	156,90
3450 0004	145,84
3452 0001	22,62
3452 0004	31,89
3452 0007	33,68
3453 0001	28,10
3453 0003	32,66
3453 0005	37,02
3455 0001	2,58
3455 0004	2,58
3455 0007	2,25
3455 0010	2,66
3455 0013	2,58
3455 0016	2,58
3455 0019	2,76
3455 0022	4,16
3455 0025	3,65
3455 0028	3,56
3455 0031	3,85
3455 0034	3,86
3455 0037	7,83
3455 0040	7,94
3455 0043	8,50
3460 0001	15,06
3460 0004	15,06
3460 0007	18,73
3460 0010	25,21
3460 0013	28,88
3463 0001	3,28
3463 0004	5,04
3463 0007	4,63
3463 0010	7,83
3463 0013	7,53
3463 0016	7,22
3463 0019	15,83
3463 0022	15,83
3463 0025	16,25
3463 0028	15,46
3463 0031	41,01
3463 0034	41,01
3463 0037	36,18
3463 0040	34,94
3466 0001	7,08
3466 0004	8,68
3466 0007	8,68
3466 0010	8,68
3466 0013	11,65
3466 0016	9,00
3466 0019	10,33
3466 0022	13,15
3466 0025	16,41
3466 0028	11,73
3466 0031	16,59
3466 0034	21,53
3466 0037	18,30
3466 0040	36,72
3466 0043	18,21
3466 0046	21,53
3466 0049	40,46
3466 0052	39,35
3469 0001	1,75
3469 0004	2,16
3469 0007	3,40
3469 0010	7,01
3469 0013	11,45
3472 0001	34,62
3472 0004	47,52
3476 0001	17,70
3476 0003	17,70
3476 0005	17,70
3476 0007	17,70
3476 0009	17,70
3476 0011	17,70
3476 0013	17,70
3476 0015	17,70
3476 0017	19,95
3476 0019	19,95
3476 0021	19,95
3476 0023	19,95
3476 0025	19,95
3476 0027	19,95
3476 0029	19,95
3476 0031	19,95
3476 0033	26,49
3476 0035	26,49
3476 0037	26,49
3476 0039	26,49
3476 0041	26,49
3476 0043	26,49
3476 0045	26,49
3476 0047	39,10
3476 0049	39,10
3476 0051	39,10
3476 0053	39,10
3476 0055	39,10
3476 0059	39,10
3476 0061	39,10
3480 0005	270,73
3480 0010	351,47
3483 0005	307,09
3483 0010	253,67
3483 0015	276,42
3483 0018	319,58
3483 0020	338,98
3486 0005	307,09
3486 0010	253,67
3486 0015	276,42
3486 0020	319,58
3522 0005	175,41
3522 0010	180,96
3523 0001	244,72
3523 0004	301,07
3523 0007	254,38
3523 0010	309,12
3524 0001	272,09
3524 0004	328,44
3524 0007	280,14
3524 0010	336,49
3525 0005	175,41
3525 0010	180,96
3528 0005	175,41
3528 0010	180,96
3529 0005	225,40
3529 0010	236,67
3530 0005	272,09
3530 0010	283,36
3531 0005	188,37
3531 0010	198,03
3531 0015	233,45
3531 0020	244,72
3534 0005	188,37
3534 0010	198,03
3534 0015	233,45
3534 0020	244,72
3535 0001	225,40
3535 0004	272,09
3535 0007	236,67
3535 0010	283,36
3540 4006	41,75
3540 4008	39,76
3540 4010	39,76
3540 4012	39,76
3540 4014	39,76
3540 4016	39,76
3540 4018	39,76
3540 4020	39,76
3540 4025	43,74
3540 4032	47,73
3540 5006	60,65
3540 5008	58,66
3540 5010	58,66
3540 5012	58,66
3540 5014	58,66
3540 5016	58,66
3540 5018	58,66
3540 5020	58,66
3540 5025	61,64
3540 5032	67,61
3542 0001	33,89
3542 0004	43,43
3542 0007	75,56
3542 0010	32,53
3542 0013	42,37
3542 0016	72,58
3542 0019	32,53
3542 0022	42,93
3542 0025	72,58
3542 0028	33,44
3542 0031	43,50
3542 0034	72,58
3542 0037	33,44
3542 0040	42,37
3542 0043	72,58
3542 0046	32,99

Catalogue prices in EUR

Part No.	€
3542 0049	42,37
3542 0052	72,58
3542 0055	33,44
3542 0058	42,37
3542 0061	72,58
3542 0064	32,99
3542 0067	42,37
3542 0070	72,58
3542 0073	37,03
3542 0076	39,54
3544 0001	51,50
3544 0004	69,61
3544 0007	99,43
3544 0010	50,54
3544 0013	66,62
3544 0016	96,04
3544 0019	50,54
3544 0022	63,88
3544 0025	96,04
3544 0028	50,54
3544 0031	68,45
3544 0034	96,04
3544 0037	50,54
3544 0040	65,71
3544 0043	96,04
3544 0046	50,54
3544 0049	65,71
3544 0052	96,04
3544 0055	50,54
3544 0058	65,71
3544 0061	96,04
3544 0064	50,54
3544 0067	65,71
3544 0070	96,04
3544 0073	53,45
3544 0076	99,43
3544 0079	56,37
3544 0082	101,68
3547 0002	275,31
3547 0005	540,16
3547 0008	275,31
3547 0011	540,16
3547 0014	275,31
3547 0017	540,16
3547 0020	252,77
3547 0023	540,16
3547 0026	275,31
3547 0029	540,16
3547 0032	275,31
3547 0035	540,16
3547 0038	275,31
3547 0041	540,16
3547 0044	252,77
3547 0047	540,16
3547 0050	275,31
3548 0001	123,89
3548 0004	123,89
3548 0007	123,89
3548 0010	123,89
3548 0013	123,89
3548 0016	123,89
3548 0019	123,89
3548 0022	123,89
3549 0001	126,78
3549 0004	160,12
3549 0007	126,78
3549 0010	160,12
3549 0013	126,78
3549 0016	160,12
3549 0019	126,78
3549 0022	160,12
3549 0025	126,78
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3549 0034	160,12
3549 0037	126,78
3549 0040	160,12
3549 0043	126,78
3549 0046	160,12
3549 0049	126,78
3549 0052	160,12
3549 0401	139,66
3549 0404	139,66
3549 0407	139,66
3549 0410	139,66
3549 0413	139,66
3549 0416	139,66
3549 0419	139,66
3549 0422	139,66
3549 0501	97,80
3549 0504	97,80
3549 0507	97,80
3549 0510	97,80
3549 0513	97,80
3549 0516	97,80
3549 0519	97,80
3551 0001	199,96
3551 0004	199,96
3551 0007	199,96
3551 0010	199,96
3551 0013	199,96
3551 0016	199,96
3551 0019	199,96
3551 0022	199,96
3551 0025	199,96
3551 0028	199,96
3559 0001	67,47
3559 0004	65,60
3559 0007	65,60
3559 0010	65,60
3559 0013	65,60
3559 0016	65,60
3559 0019	65,60
3559 0022	65,60
3559 0025	69,34
3559 0028	74,38
3559 0031	95,86
3560 4006	45,69
3560 4008	43,93
3560 4010	41,00
3560 4012	43,93
3560 4014	43,93
3560 4016	43,93
3560 4018	43,93
3560 4020	43,93
3560 4025	52,72
3560 4032	57,51
3562 0001	123,17
3562 0004	123,17
3562 0007	123,17
3562 0010	123,17
3562 0013	123,17
3562 0016	123,17
3562 0019	123,17
3562 0022	123,17
3563 4006	36,15
3563 4008	36,15
3563 4010	36,15
3563 4012	36,15
3563 4014	36,15
3563 4016	36,15
3563 4018	36,15
3563 4020	36,15
3563 4025	42,94
3563 4032	45,19
3563 5006	62,15
3563 5008	62,15
3563 5010	62,15
3563 5012	62,15
3563 5014	62,15
3563 5016	62,15
3563 5018	62,15
3563 5020	62,15
3563 5025	64,40
3563 5032	70,06
3564 0001	49,71
3564 0004	63,63
3564 0007	83,52
3564 0010	49,71
3564 0013	63,63
3564 0016	83,52
3564 0019	49,71
3564 0022	63,63
3564 0023	83,52
3564 0025	50,69
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3565 0019	107,60
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3565 0025	111,36
3566 0005	90,72
3566 0010	19,61
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3567 0001	206,07
3567 0007	307,37
3567 0009	410,97
3568 0001	231,39
3568 0009	437,44
3569 0004	313,11
3569 0019	518,01
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3572 4250	54,24
3572 4320	49,71
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3595 0410	251,48
3595 0415	314,36
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3601 5016	85,91
3601 5022	85,91
3601 5027	85,91
3601 5032	82,95
3601 5040	99,31
3606 4160	47,53
3606 4161	67,61
3606 4220	47,53
3606 4221	67,61
3606 4270	49,43
3606 4271	69,61
3606 4320	54,05
3606 4321	99,28
3606 4400	59,07
3606 4401	101,68
3606 5160	69,20
3606 5220	69,20
3606 5270	71,18
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3610 4022	63,37
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3610 4032	72,07
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3611 5040	113,16
3613 4022	63,56
3613 4027	67,80
3613 4032	69,20
3613 4040	81,92
3613 5022	91,81
3613 5027	93,21
3613 5032	104,51
3613 5040	112,98
3618 4022	50,85
3618 4027	52,96
3618 4032	54,99
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3618 5022	67,23
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3619 0001	74,85
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3619 0037	120,05
3622 4022	52,88
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3622 4032	54,05
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Catalogue prices in EUR

Part No.	€
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3630 0109	5,93
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3630 0115	5,93
3630 0118	6,25
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3632 0013	18,11
3632 0016	22,54
3632 0019	28,68
3632 0022	45,29
3632 0025	13,58
3632 0028	13,58
3632 0031	16,61
3632 0034	16,61
3632 0037	21,14
3632 0040	27,18
3632 0043	34,72
3632 0046	54,34
3632 0049	83,32
3632 0052	13,58
3632 0055	13,58
3632 0058	16,61
3632 0061	19,62
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3632 0076	105,67
3632 0079	15,10
3632 0082	18,11
3632 0085	21,14
3632 0088	21,14
3632 0091	27,18
3632 0094	37,73
3632 0097	45,29
3632 0100	73,96
3632 0103	114,71
3632 0106	19,62
3632 0109	19,62
3632 0112	25,66
3632 0115	25,66
3632 0118	33,22
3632 0121	46,80
3632 0124	55,84
3632 0127	93,59
3632 0130	141,89
3634 0001	114,71
3634 0004	126,79
3634 0007	135,85
3634 0010	156,98
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3634 0019	190,19
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3634 0025	274,72
3634 0028	304,90
3642 0060	6,41
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3642 0120	7,21
3642 0160	7,21
3642 0200	9,12
3642 0250	9,91
3642 0320	10,87
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3644 0160	22,42
3644 0250	23,22
3644 0320	21,63
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3646 0160	46,45
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3646 0320	46,45
3646 0400	51,24
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3667 4016	59,33
3668 5040	122,57
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3670 0010	45,74
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3672 0007	52,47
3672 0010	54,35
3672 4001	41,75
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3672 5005	68,96
3673 0004	72,11
3673 0007	72,11
3673 0010	71,66
3674 5016	81,47
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3682 4001	41,75
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3685 5004	88,53
3685 5005	104,37
3686 5001	79,87
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3695 2040	327,06
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3712 0109	215,55
3712 0115	137,36
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3715 0001	105,67
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3715 0013	103,55
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3715 0088	105,67
3715 0091	192,29
3715 0097	107,77
3715 0100	232,45
3717 0001	146,86
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3717 0013	139,48
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3717 0088	141,58
3717 0091	202,86
3717 0097	143,69
3717 0100	232,45
3718 0001	97,21
3718 0003	156,38
3718 0007	97,21
3718 0008	152,15
3718 0013	99,31
3718 0015	156,38
3720 0001	95,10
3720 0003	147,93
3720 0004	211,31
3720 0007	90,86
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3720 0010	211,31
3720 0013	90,86
3720 0015	147,93
3720 0016	221,88
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3720 0022	232,45
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3722 0004	221,88
3722 0007	89,09
3722 0010	236,67
3722 0013	131,02
3722 0016	243,01
3722 0019	133,12
3722 0022	264,15
3723 0001	108,66
3723 0004	137,36
3723 0007	113,17
3723 0010	141,58
3723 0013	115,45
3723 0016	141,58
3724 0001	107,77
3724 0004	173,29
3724 0007	107,77
3724 0010	173,29
3724 0013	107,77
3724 0016	173,29
3724 0019	122,57
3724 0022	177,50
3725 0001	115,45
3725 0004	144,11
3725 0007	117,71
3725 0010	144,11
3725 0013	122,24
3725 0016	150,66
3725 0019	126,77
3725 0022	157,22
3725 0025	126,77
3725 0028	176,87
3727 0001	158,48
3727 0004	232,45
3727 0007	158,48
3727 0010	232,45
3727 0013	158,48
3727 0016	238,79
3727 0019	176,58
3727 0022	243,01
3727 0025	179,62
3727 0028	249,36
3728 0001	103,30
3728 0003	131,02
3728 0007	101,43
3728 0008	126,79
3728 0013	105,67
3728 0015	131,02
3730 0001	95,10
3730 0003	126,79
3730 0004	137,36
3730 0007	97,21
3730 0008	139,48
3730 0010	137,36
3730 0013	103,55
3730 0015	139,48
3730 0016	139,48
3730 0019	105,67
3730 0021	152,15
3730 0022	141,58
3730 0025	127,09
3730 0027	156,38
3730 0028	145,81
3732 0001	135,24
3732 0003	162,72
3732 0004	166,93
3732 0007	137,36
3732 0008	162,72
3732 0010	166,93
3732 0013	139,48
3732 0015	169,05
3732 0016	171,17
3732 0019	142,64
3732 0021	181,74
3732 0022	173,29
3732 0025	145,81
3732 0027	192,29
3732 0028	177,50
3734 0001	106,93

Catalogue prices in EUR

Part No.	€
3734 0004	106,93
3734 0007	116,01
3735 0001	111,37
3735 0004	111,37
3735 0007	116,01
3735 0010	131,90
3737 0001	139,48
3737 0004	131,90
3737 0007	147,93
3737 0010	147,93
3738 0001	105,67
3738 0004	109,04
3738 0007	113,68
3738 0010	129,54
3738 0013	139,48
3738 0016	136,08
3738 0019	140,95
3738 0022	154,05
3745 0005	6.592,95
3745 0010	6.592,95
3745 0015	8.241,19
3745 0020	9.784,78
3745 0025	9.784,78
3745 0030	11.741,73
3747 0005	549,41
3747 0010	565,11
3747 0015	565,11
3747 0020	722,09
3747 0025	549,41
3747 0030	549,41
3747 0035	612,20
3747 0040	612,20
3747 0045	769,18
3747 0050	769,18
3755 0001	28,37
3755 0003	16,94
3755 0005	16,94
3755 0008	16,94
3755 0010	16,49
3757 0016	64,00
3757 0020	51,24
3757 0030	88,10
3757 0035	142,00
3759 0005	182,53
3759 0010	230,90
3770 0005	242,26
3770 0010	253,58
3775 0005	404,67
3777 0000	255,31
3777 0004	19,00
3777 0008	32,07
3777 0010	255,31
3801 0095	78,79
3803 0110	175,49
3805 0085	36,56
3805 0100	48,37
3805 0120	65,59
3807 0080	105,04
3807 0100	178,27
3807 0125	269,43
3807 0160	451,13
3809 0100	292,50
3809 0125	439,81
3810 0110	301,67
3810 0135	317,21
3810 0160	494,45
3823 0092	434,18
3823 0113	525,84
3823 0135	671,37
3823 0160	846,18
3825 0006	275,22
3825 0011	334,99
3825 0016	433,56

Part No.	€
3828 0113	760,20
3828 0135	915,71
3828 0160	1.314,09
3828 0200	1.792,37
3828 0250	2.178,98
3830 0006	301,23
3830 0011	356,93
3830 0016	456,94
3830 0021	564,66
3830 0026	572,39
3832 0113	1.227,40
3832 0135	1.516,13
3832 0160	2.006,48
3834 0006	237,84
3834 0011	294,98
3834 0016	333,38
3836 1125	684,64
3836 1152	809,06
3836 1153	951,16
3836 1175	1.240,98
3838 0092	2.516,40
3838 0113	2.498,09
3838 0135	2.813,16
3838 0160	3.805,08
3840 0092	25,25
3840 0113	25,53
3840 0135	40,11
3840 0160	56,49
3840 0200	102,06
3840 0250	166,92
3841 0092	63,79
3841 0113	69,32
3841 0135	81,13
3841 0160	112,28
3841 0200	182,61
3841 0250	247,78
3842 0113	54,78
3842 0135	69,32
3842 0160	89,46
3844 0125	3.518,48
3845 1092	2.500,14
3845 2125	2.705,43
3845 4160	4.120,13
3845 6200	5.254,34
3846 0005	2.195,24
3846 0010	565,88
3846 0015	673,40
3846 0125	779,10
3847 0005	78,07
3848 1110	22,82
3848 1115	29,82
3848 1120	63,44
3848 1125	59,01
3848 2050	56,23
3848 2070	59,82
3848 2100	77,40
3851 0050	553,89
3851 0070	609,18
3851 0120	35,49
3851 0140	35,49
3851 0160	36,23
3851 0180	35,49
3851 0200	45,68
3851 0220	51,85
3851 2012	39,38
3851 2014	37,92
3851 2016	37,92
3851 2018	37,92
3851 2020	39,87
3851 2022	95,24
3856 0125	2.666,81
3858 0000	2.642,41
3858 0005	2.069,22

Part No.	€
3858 0015	2.752,17
3858 0020	3.398,55
3858 0025	4.146,56
3869 0001	37,21
3869 0003	38,26
3869 0005	39,29
3869 0007	40,53
3869 0009	42,09
3869 0011	43,75
3869 0013	49,12
3869 0015	50,37
3869 0017	51,42
3869 0019	53,39
3870 0001	319,22
3870 0003	491,28
3870 0005	534,80
3870 0007	567,96
3875 0030	170,70
3875 0045	247,36
3877 0070	318,31
3877 0090	649,64
3877 0120	967,94
3879 0060	312,41
3879 0070	413,84
3879 0090	742,11
3881 0070	2.089,54
3881 0090	3.333,51
3883 0250	547,56
3883 0300	834,82
3883 0350	967,65
3883 0400	1.416,85
3883 0500	1.908,66
3885 0150	131,60
3885 0200	172,10
3885 0275	303,70
3885 0300	374,55
3885 0400	552,74
3885 0500	918,23
3887 0150	172,10
3887 0200	251,06
3887 0275	406,95
3887 0300	581,67
3887 0400	837,20
3887 0500	1.364,88
3899 0001	14,40
3899 0004	15,03
3899 0007	16,38
3899 0010	17,62
3899 0013	18,76
3899 0016	21,46
3899 0019	27,06
3899 0022	27,67
3899 0025	28,53
3899 0028	28,19
3899 0031	28,93
3899 0034	29,96
3900 5001	4,74
3900 5002	4,81
3900 5003	5,18
3900 5005	5,18
3900 5006	5,34
3900 5007	5,65
3900 5010	5,18
3900 5020	5,23
3900 5025	5,46
3900 5030	5,65
3900 5040	5,65
3900 5050	5,95
3900 5055	6,32
3900 5060	6,48
3900 5061	6,90
3900 5063	7,47
3900 5070	5,76

Part No.	€
3900 5080	6,13
3900 5085	6,48
3900 5090	6,74
3900 5091	7,11
3900 5092	7,11
3900 5093	7,53
3900 5094	7,82
3900 5095	6,90
3900 5096	7,74
3900 5097	8,30
3900 5098	10,27
3900 5100	7,53
3900 5110	8,30
3900 5115	8,72
3900 5120	9,17
3900 5125	11,52
3900 5130	7,93
3900 5140	8,40
3900 5145	8,75
3900 5150	9,54
3900 5155	11,71
3900 5160	11,71
3900 5170	12,44
3900 5172	14,74
3900 5175	18,36
3900 5177	11,71
3900 5180	12,65
3900 5182	15,03
3900 5185	18,76
3900 5188	17,94
3900 5190	20,23
3900 5200	23,75
3900 5210	32,24
3901 0001	0,44
3901 0003	0,56
3901 0005	0,65
3901 0006	0,65
3901 0007	0,68
3901 0008	0,82
3901 0009	1,19
3901 0010	0,75
3901 0011	1,07
3901 0020	0,96
3901 0030	1,26
3901 0040	2,00
3901 0050	0,98
3901 0060	1,05
3901 0070	1,17
3901 0080	1,31
3901 0090	1,59
3901 0100	1,96
3901 0110	1,26
3901 0115	1,42
3901 0120	1,61
3901 0125	1,84
3901 0130	2,14
3901 0135	3,36
3901 0140	1,77
3901 0150	1,89
3901 0160	1,93
3901 0170	2,19
3901 0180	2,87
3901 0190	4,11
3901 0192	2,66
3901 0194	3,83
3901 0196	5,34
3901 0198	8,09
3901 0200	2,91
3901 0210	3,76
3901 0220	5,55
3901 0230	6,55
3901 0240	8,26
3901 0250	11,81

Part No.	€
3901 0260	4,80
3901 0270	6,13
3901 0280	9,35
3901 0290	12,23
3901 0300	5,08
3901 0310	6,02
3901 0320	8,98
3901 0330	12,86
3902 0005	1,03
3902 0010	1,09
3902 0020	1,12
3902 0030	1,42
3902 0040	1,82
3902 0050	2,24
3902 0060	3,54
3902 0070	3,78
3902 0080	7,11
3903 0010	2,68
3903 0020	2,64
3903 0030	2,85
3903 0040	3,10
3903 0050	3,90
3903 0060	4,95
3903 0070	7,05
3903 0080	8,40
3903 0090	16,19
3904 0003	3,08
3904 0005	3,22
3904 0010	3,24
3904 0015	4,25
3904 0020	4,53
3904 0030	7,47
3904 0035	12,23
3904 0040	11,62
3905 0010	17,94
3905 0020	16,38
3905 0030	16,38
3905 0040	16,38
3905 0050	16,38
3905 0060	5,76
3905 0070	20,34
3905 0080	23,43
3905 0090	24,15
3905 5010	14,93
3905 5020	12,34
3905 5025	21,16
3905 5030	21,46
3905 5040	21,46
3905 5050	21,46
3905 5060	20,34
3905 5070	31,31
3905 5080	35,33
3905 5090	38,76
3905 6000	25,06
3905 6100	27,58
3905 6200	30,08
3905 7000	41,76
3905 7100	42,77
3905 7200	43,77
3905 7300	30,08
3905 8000	236,67
3905 8100	236,67
3905 8200	268,57
3905 8300	273,11
3905 8400	279,14
3905 8500	51,33
3905 8600	54,23
3905 8700	39,95
3905 8800	41,35
3905 8900	44,17
3905 9000	48,51
3905 9100	42,77
3905 9200	47,09

Part No.	€
3906 0005	0,30
3906 0010	0,30
3906 0020	0,42
3906 0030	0,42
3906 0040	0,49
3906 0050	0,49
3906 0060	0,72
3906 0070	0,72
3906 0080	0,84
3906 0090	1,51
3906 0100	1,52
3906 0110	2,54
3906 0120	2,54
3906 0130	2,50
3907 0200	0,46
3907 0205	0,63
3907 0210	0,68
3907 0215	1,23
3907 0220	2,14
3907 0225	2,24
3907 0230	3,40
3908 0005	0,96
3908 0010	0,96
3908 0020	1,12
3908 0030	1,12
3908 0040	1,31
3908 0050	1,31
3908 0060	1,93
3908 0070	1,93
3908 0080	2,33
3908 0090	3,27
3908 0100	4,43
3908 0110	6,13
3908 0120	6,13
3908 0130	7,11
3909 0005	0,39
3909 0010	0,40
3909 0020	0,46
3909 0030	0,54
3909 0040	0,63
3909 0050	0,72
3909 0060	0,95
3909 0070	1,23
3909 0080	1,52
3909 0090	1,86
3910 0010	0,35
3910 0020	0,46
3910 0030	0,56
3910 0040	0,84
3910 0050	0,81
3910 0060	1,35
3910 0070	2,07
3911 0010	0,35
3911 0020	0,51
3911 0030	0,56
3911 0040	0,96
3911 0050	0,98
3911 0060	1,61
3911 0070	2,68
3912 0010	0,79
3912 0020	0,79
3912 0030	0,98
3912 0040	1,51
3912 0050	1,51
3912 0060	2,14
3912 0070	3,73
3913 0010	78,77
3913 0020	84,49
3913 0030	96,92
3913 0040	105,21
3913 0050	117,13
3913 0060	137,34
3913 0070	144,08

Part No.	€
3913 0075	216,11
3913 0080	229,06
3913 0090	261,19
3914 0012	17,31
3914 0014	16,68
3914 0016	17,94
3914 0018	18,55
3914 0020	19,60
3914 0022	20,74
3915 0010	126,96
3915 0020	127,49
3915 0025	153,91
3915 0030	175,18
3915 0035	236,83
3915 0040	264,30
3916 0010	352,40
3916 0020	401,12
3916 0030	418,72
3916 0040	542,06
3916 0050	551,39
3916 0070	542,06
3917 0000	6,09
3917 0010	6,58
3917 0020	6,74
3917 0030	7,39
3917 0040	10,12
3917 0050	15,28
3917 0060	27,86
3917 0070	28,81
3917 0080	29,52
3917 0090	29,89
3917 0100	30,56
3917 0110	31,97
3917 0120	39,46
3917 0130	56,09
3917 0140	72,57
3917 0150	72,57
3917 0160	78,93
3917 0170	63,54
3917 0180	17,94
3917 0190	17,94
3917 0200	13,18
3917 0210	18,29
3917 0220	21,79
3917 0230	95,64
3917 0240	145,30
3917 0250	23,43
3917 0260	23,24
3917 0270	23,52
3917 0280	24,24
3917 0290	23,99
3917 0300	24,41
3917 0310	31,26
3917 0320	30,99
3917 0330	31,36
3917 0340	46,87
3917 0350	46,87
3917 0360	85,58
3917 0370	85,58
3917 0380	72,98
3917 0390	73,80
3917 0400	77,44
3917 0410	81,76
3917 0420	105,18
3917 0430	130,69
3917 0440	167,60
3917 0450	171,78
3917 0460	315,81
3917 0470	414,96
3918 0007	3,59
3918 0009	4,55
3918 0011	5,08
3918 0014	6,07

Catalogue prices in EUR

Part No.	€
3918 0016	6,90
3918 0018	8,45
3918 0020	11,18
3918 0022	16,19
3918 0024	20,11
3919 0007	7,00
3919 0009	8,51
3919 0011	8,51
3919 0013	13,27
3919 0014	9,91
3919 0017	17,31
3919 0018	15,66
3919 0021	28,19
3919 0022	24,97
3920 0007	6,55
3920 0009	7,82
3920 0011	8,40
3920 0014	9,54
3920 0018	15,33
3920 0022	22,51
3921 0007	5,20
3921 0009	5,23
3921 0011	5,95
3921 0014	7,16
3921 0015	8,30
3921 0016	10,59
3921 0018	10,06
3921 0019	11,71
3921 0020	16,91
3921 0022	15,45
3921 0024	20,95
3921 0026	26,95
3922 0009	10,78
3922 0011	13,16
3922 0014	14,74
3922 0018	21,16
3922 0022	34,74
3924 0010	18,97
3924 0012	21,88
3924 0014	21,88
3924 0015	30,28
3924 0018	31,62
3924 0022	50,07
3925 0011	25,60
3925 0014	29,75
3925 0015	29,75
3925 0017	40,34
3925 0018	40,34
3925 0020	64,26
3925 5010	42,28
3925 5020	47,78
3926 0010	2,96
3926 0020	5,39
3926 0030	13,39
3927 0001	126,96
3928 0050	12,76
3928 0095	20,34
3928 0140	26,13
3928 0185	35,86
3928 0230	42,51
3928 0275	47,78
3928 0320	59,61
3929 0052	25,10
3929 0070	26,85
3929 0100	30,59
3929 0140	53,39
3929 0200	125,95
3929 0300	190,70
3929 0460	230,62
3930 0001	22,80
3930 0003	34,32
3930 0010	196,93
3930 0020	423,92
3930 0030	1.103,81
3931 5012	34,51
3931 5014	35,14
3931 5016	37,94
3931 5018	37,94
3932 0010	5,76
3932 0030	11,52
3932 0050	19,81
3932 0070	25,39
3932 0090	7,82
3933 0019	189,68
3933 0026	263,25
3934 0012	70,47
3934 0014	76,20
3934 0016	81,88
3934 0018	100,03
3934 0020	107,29
3934 0022	176,19
3935 0000	18,39
3935 0010	20,14
3935 0020	25,76
3935 0030	35,95
3936 0000	10,34
3936 0010	11,73
3936 0020	15,47
3936 0030	18,27
3936 0040	24,41
3936 0050	39,27
3936 0060	55,56
3937 0010	11,73
3937 0020	15,47
3937 0030	18,27
3937 0040	24,41
3937 0050	39,27
3937 0060	55,56
3938 0010	13,51
3938 0020	16,92
3938 0030	18,39
3939 0000	9,36
3939 0010	13,51
3939 0020	15,05
3939 0030	18,80
3939 0040	24,31
3939 0050	38,75
3940 0000	9,36
3940 0010	13,51
3940 0020	15,05
3940 0030	18,80
3940 0040	25,76
3940 0050	40,92
3941 0020	16,31
3941 0030	20,04
3942 0000	20,67
3942 0010	21,72
3942 0020	22,35
3942 0030	26,92
3942 0050	40,81
3943 0030	33,02
3943 0050	48,70
3943 0070	108,01
3944 0010	18,60
3944 0030	20,88
3944 0050	35,63
3945 0010	7,49
3945 0030	8,73
3945 0050	12,16
3946 0010	15,91
3946 0020	17,76
3946 0030	26,58
3946 0040	3,12
3946 0045	3,12
3946 0050	3,17
3946 0060	3,20
3946 0070	3,31
3946 0080	3,90
3946 0090	6,90
3946 0100	0,68
3946 0110	0,70
3946 0120	0,77
3946 0130	0,79
3946 0140	1,12
3947 0010	134,47
3947 0020	145,92
3947 0030	152,15
3947 0040	214,45
3948 0020	78,07
3948 0030	88,87
3948 0040	96,99
3948 0050	113,73
3949 0000	16,52
3949 0010	23,26
3949 0020	25,87
3949 0030	31,89
3950 0010	177,49
3950 0020	183,59
3950 0030	189,72
3951 0040	177,49
3951 0050	183,59
3951 0060	189,72
3952 0010	56,09
3953 0010	18,78
3954 0020	19,85
3954 0030	22,84
3954 0050	36,87
3955 0010	162,02
3955 0020	316,98
3956 0010	6,20
3956 0012	6,20
3956 0014	6,20
3956 0016	6,20
3956 0018	6,20
3957 0000	3,38
3957 0010	4,20
3957 0020	4,81
3957 0030	6,97
3957 0050	14,75
3958 0010	855,82
3958 0020	993,18
3958 0030	1.098,83
3958 0040	1.616,55
3958 0050	1.775,03
3958 0060	1.912,38
3959 0010	982,61
3959 0020	1.145,32
3959 0030	1.246,75
3959 0040	1.726,43
3959 0050	2.001,13
3959 0060	2.345,58
3960 0010	707,89
3960 0020	929,78
3960 0030	1.187,59
3960 0040	1.479,19
3961 0010	2.457,56
3961 0020	2.778,76
3965 0010	496,58
3965 0020	469,12
3966 0010	972,04
3966 0020	902,30
3968 0165	972,04
3968 0205	1.223,50
3968 0255	1.622,88
3968 0305	2.273,72
3969 0150	1.542,59
3969 0200	1.977,89
3969 0250	2.377,27
3969 0300	3.716,98
3969 0350	4.974,31
3970 0010	467,01
3970 0020	718,46
3970 0030	581,11
3972 0012	15,14
3972 0015	20,28
3974 0006	3,69
3974 0008	4,04
3974 0010	4,25
3974 0013	4,94
3974 0016	5,83
3974 0020	8,07
3974 0025	15,02
3974 0032	27,91
3974 0040	53,80
3975 0010	1,45
3975 0013	1,58
3975 0016	1,79
3975 0020	2,24
3975 0025	2,47
3975 0032	2,80
3975 0040	3,69
3976 0010	1,23
3976 0013	1,35
3976 0016	1,58
3976 0020	2,01
3976 0025	2,24
3976 0032	2,57
3976 0040	3,36
3977 0030	8,19
3977 0040	11,22
3977 0045	16,14
3977 0057	39,24
3978 0017	2,47
3978 0020	3,03
3978 0027	5,83
3978 0035	9,42
3978 0065	43,72
3979 0019	2,47
3979 0028	3,92
3979 0038	6,16
3980 0012	1,79
3980 0019	2,70
3980 0025	5,37
3980 0031	10,87
3982 0010	49,67
3982 0020	104,60
3983 0010	344,44
3984 0010	145,81
3984 0020	204,98
3985 0010	9,19
3985 0020	16,26
3987 0020	1.098,83
3987 0030	1.796,17
3989 0010	929,78
3989 0020	1.394,66
3989 0030	2.313,87
3991 0020	42,26
3991 0030	50,72
3991 0040	50,72
3991 0120	57,05
3991 0130	68,46
3991 0140	68,46
3991 0220	73,96
3991 0230	88,76
3991 0240	88,76
3991 0520	15,86
3991 0530	23,77
3991 0725	0,32
3991 0726	0,32
3991 0740	0,49
3991 0741	0,49
3994 0125	2.005,52
3994 0160	2.052,16
3997 0010	1.183,35
3997 0020	2.211,74
3997 0030	2.282,18
4001 0150	15,61
4001 0151	15,61
4001 0155	16,24
4001 0156	16,24
4002 0150	26,57
4002 0151	23,91
4002 0155	31,87
4002 0156	31,87
4002 0200	164,40
4002 0300	234,75
4004 0100	14,04
4004 0105	14,35
4005 0150	21,77
4005 0151	21,77
4005 0155	25,50
4005 0156	25,50
4008 0150	26,99
4008 0151	26,99
4008 0155	27,53
4008 0156	27,53
4009 0150	37,82
4009 0155	39,31
4011 0150	24,73
4012 0150	89,36
4013 0150	28,89
4013 0151	31,66
4014 0075	12,92
4015 0150	71,28
4016 0150	38,24
4016 0151	39,31
4016 0152	74,36
4017 0150	39,31
4020 0150	85,40
4020 0200	138,78
4020 1150	135,47
4020 1200	156,17
4020 2150	69,28
4021 0150	142,92
4021 0151	134,66
4022 0150	150,94
4022 0200	213,33
4022 0300	273,70
4023 0150	189,32
4024 0100	124,90
4024 0150	177,99
4024 0200	255,57
4024 0300	322,18
4025 0002	79,00
4025 0102	53,53
4025 0232	53,53
4027 0357	1,05
4027 2032	1,05
4030 0300	156,03
4030 0305	156,03
4030 0500	403,81
4030 0505	403,81
4030 0800	510,44
4030 0805	510,44
4030 1000	677,67
4030 1005	677,67
4031 0300	184,78
4031 0305	184,78
4031 0500	457,66
4031 0505	457,66
4031 0800	568,58
4031 0805	568,58
4031 1000	744,75
4031 1500	1.597,65
4031 1505	1.597,63
4031 2000	2.424,56
4034 0250	149,68
4034 0255	149,68
4034 0300	161,51
4034 0305	161,51
4034 0500	479,20
4034 0505	479,20
4034 0800	677,67
4034 0805	677,67
4034 1000	811,86
4034 1005	811,86
4034 1500	1.708,49
4034 1505	1.708,49
4035 0250	176,61
4035 0255	176,61
4035 0300	188,46
4035 0305	188,46
4035 0500	531,98
4035 0505	531,98
4035 0800	744,75
4035 0805	744,75
4035 1000	880,29
4035 1005	880,29
4035 1500	1.811,27
4035 1505	1.811,27
4038 0500	631,05
4038 0501	743,37
4038 0505	631,05
4038 0506	743,37
4038 0800	907,69
4038 0805	907,69
4038 1000	1.367,63
4038 1001	2.012,99
4038 1500	2.106,18
4038 2000	3.145,50
4038 3000	4.121,41
4039 0300	214,95
4039 0305	214,94
4041 0250	12,60
4041 0300	15,07
4041 0500	30,15
4041 0501	31,24
4041 0502	53,95
4041 0800	45,22
4041 0801	71,17
4041 1000	54,92
4041 1001	94,45
4041 1002	119,09
4041 1500	167,02
4041 1501	180,69
4041 2000	279,28
4045 1016	150,08
4045 2016	201,01
4045 2620	301,88
4046 1016	412,56
4046 2016	478,98
4048 6300	137,50
4048 6500	232,72
4048 6600	262,61
4048 7001	27,44
4048 7002	52,52
4048 7003	83,06
4050 0160	138,04
4050 0250	178,22
4050 0300	225,14
4055 4030	600,37
4057 0300	424,39
4057 0500	621,51
4058 0300	468,23
4058 0500	696,73
4059 0300	438,10
4059 0600	781,87
4060 0300	391,13
4060 0600	667,15
4061 0500	596,35
4061 0800	976,92
4061 1000	1.124,34
4062 0800	1.054,66
4062 1000	1.214,10
4068 0500	669,17
4068 1000	926,77
4068 1500	1.029,40
4068 2000	2.007,48
4070 1150	187,57
4070 1200	196,82
4070 1300	202,86
4071 1150	267,26
4071 1200	280,95
4071 1300	285,78
4074 0250	3.606,31
4076 0200	22,31
4076 0205	23,22
4076 0300	42,49
4076 0305	43,75
4076 0500	73,94
4076 0505	76,65
4076 0800	397,48
4076 1000	573,56
4077 0080	21,25
4077 0085	22,26
4077 0200	57,37
4077 0205	60,81
4077 0300	80,73
4077 0305	83,16
4078 0200	63,74
4078 0205	66,22
4078 0300	77,54
4078 0305	81,43
4078 0500	187,57
4078 0800	448,79
4078 1000	613,81
4079 0200	91,74
4079 0205	69,48
4079 0300	105,40
4079 0305	90,13
4080 1200	278,93
4080 1300	324,52
4080 1500	420,60
4080 2000	2.102,98
4081 0150	434,05
4081 0300	532,47
4081 0500	613,32
4081 1200	101,45
4081 1300	118,11
4081 1400	44,49
4082 0300	560,14
4084 0300	466,92
4084 0500	533,31
4085 0025	279,34
4090 0100	267,24
4090 0150	312,97
4090 0300	503,98
4093 0010	124,67
4093 0030	176,19
4093 0050	61,88
4093 0080	61,88
4093 0120	71,14
4093 0150	102,53
4094 0004	71,61
4094 0014	105,88
4095 0006	86,96
4095 0016	130,20
4100 0025	17,20
4100 0050	18,92
4100 0075	20,39

Catalogue prices in EUR

Part No.	€
4100 0100	22,52
4100 0125	27,63
4100 0150	30,92
4100 0175	34,53
4100 0200	39,85
4103 0004	93,47
4105 0025	19,32
4105 0050	22,31
4105 0075	25,50
4105 0100	29,73
4107 0025	44,63
4107 0050	48,88
4107 0075	54,16
4107 0100	56,30
4108 0001	26,57
4109 0025	214,34
4109 0050	274,96
4109 0075	380,14
4109 0100	438,10
4110 0025	732,60
4110 0050	742,77
4111 1025	93,33
4111 1050	107,21
4111 1075	122,08
4111 1100	140,96
4113 0050	265,21
4113 0100	299,76
4113 0150	345,49
4113 0200	395,27
4113 0250	449,14
4113 0300	507,05
4114 0400	826,09
4114 0500	907,39
4114 0600	1.005,95
4114 0700	1.106,56
4114 0800	1.205,10
4114 0900	1.303,68
4114 1000	1.425,60
4115 0400	63,00
4115 0500	87,38
4115 0600	121,94
4115 0700	156,47
4115 0800	195,09
4115 0900	237,77
4115 1000	280,44
4116 0025	27,42
4116 0050	27,42
4116 0075	28,46
4116 0100	29,47
4116 0125	30,49
4116 0150	34,56
4116 0175	38,62
4116 0200	42,68
4116 0250	50,82
4116 0300	68,08
4116 0400	89,41
4116 0500	110,74
4119 0025	112,60
4119 0050	125,35
4119 0075	131,71
4119 0100	148,70
4120 0025	57,37
4120 0050	63,74
4120 0075	74,36
4120 0100	82,86
4120 0125	97,72
4120 0150	101,97
4121 0025	33,99
4122 0025	250,99
4122 0050	261,14
4122 0075	281,47
4122 0100	307,88
4122 0125	336,33

Part No.	€
4122 0150	366,82
4123 1001	94,55
4123 1002	81,29
4123 1003	81,29
4123 1005	81,29
4123 1006	81,29
4123 1007	94,50
4123 2001	102,62
4123 2002	89,41
4123 2003	89,41
4123 2004	89,41
4123 2005	89,41
4123 2006	89,41
4123 2007	102,62
4124 1025	58,92
4124 1050	59,96
4124 1075	60,95
4124 1100	61,99
4124 1125	63,00
4124 2025	58,92
4124 2050	59,96
4124 2075	60,95
4124 2100	65,03
4124 2125	66,05
4125 0015	127,45
4125 0020	133,84
4125 0035	157,20
4125 0050	191,19
4125 1025	127,45
4125 1045	167,83
4125 1065	191,19
4126 0003	99,63
4126 0015	52,31
4126 0025	62,88
4130 1045	119,54
4131 0010	264,02
4131 0110	170,75
4132 0010	454,39
4132 0110	372,52
4133 0030	47,81
4133 0050	53,11
4133 0075	59,48
4133 0100	64,80
4134 0055	674,70
4140 0250	392,21
4140 0450	483,67
4140 0850	608,67
4140 1250	724,48
4140 1450	773,26
4143 0035	84,98
4143 0050	84,98
4143 0160	91,35
4150 1004	1.362,57
4150 2012	1.049,07
4150 2020	784,56
4152 0004	822,03
4152 0012	537,99
4152 0020	401,89
4162 0080	444,73
4162 0100	408,57
4162 0125	408,57
4162 0160	408,57
4162 0200	416,90
4162 0250	460,01
4162 0350	657,34
4162 0500	668,45
4162 0650	800,47
4162 0800	800,47
4162 1000	1.015,89
4162 1250	1.022,81
4162 1500	1.195,15
4162 1750	1.518,98
4162 2000	1.735,76

Part No.	€
4162 2250	2.338,91
4162 2500	2.488,97
4162 2750	2.633,54
4162 3000	2.750,25
4166 0080	1.239,02
4166 0100	1.239,02
4166 0125	1.253,84
4166 0160	1.271,64
4166 0200	1.271,64
4166 0250	1.526,56
4166 0350	1.754,78
4166 0500	1.825,95
4166 0650	2.030,49
4166 0800	2.030,49
4166 1000	2.140,15
4166 1250	2.232,04
4166 1500	2.303,19
4166 1750	2.516,61
4166 2000	2.676,68
4168 0080	1.461,36
4168 0100	1.428,72
4168 0125	1.508,75
4168 0160	1.529,50
4168 0200	1.621,43
4168 0250	1.731,10
4168 0350	1.879,29
4168 0500	1.926,73
4168 0650	1.977,13
4168 0800	1.977,13
4168 1000	2.107,51
4168 1250	2.205,35
4168 1500	2.338,75
4168 1750	2.475,08
4168 2000	2.584,77
4170 0100	110,30
4170 0125	110,30
4170 0200	110,30
4170 0500	160,74
4170 3000	173,34
4172 0080	300,70
4172 0100	300,70
4172 0125	300,70
4172 0160	300,70
4172 0200	300,70
4172 0250	358,28
4172 0350	531,02
4172 0500	598,20
4172 0650	700,53
4172 0800	700,53
4172 1000	866,88
4172 1250	886,11
4172 1500	1.014,06
4172 1750	1.142,02
4172 2000	1.206,00
4175 0012	756,26
4175 0020	486,48
4175 0040	853,98
4175 0100	1.727,09
4178 0102	1.753,64
4178 0203	2.120,39
4178 0503	2.924,15
4178 1003	3.252,22
4178 1502	2.727,87
4178 2002	3.646,23
4178 2004	5.689,86
4180 0102	1.772,58
4180 0203	2.095,68
4180 0205	2.585,00
4180 0503	2.744,86
4180 1003	3.073,86
4180 1006	4.663,42
4180 1502	2.744,86
4180 2002	3.669,68

Part No.	€
4180 2004	6.017,34
4200 0010	17,54
4203 0010	34,32
4205 0005	65,71
4207 0010	44,94
4210 0010	85,63
4212 0030	89,78
4215 0030	98,72
4215 0050	132,53
4215 0100	333,27
4218 0003	42,81
4220 3203	60,48
4220 4003	40,36
4222 0810	99,12
4222 1010	114,82
4225 4001	116,83
4225 5805	136,34
4225 8005	174,58
4228 4403	98,11
4228 6101	162,31
4228 6110	98,11
4230 0010	102,53
4232 4001	180,02
4232 5801	180,02
4235 0101	151,45
4235 1001	186,06
4236 0001	0,70
4236 0002	3,12
4236 0003	3,52
4236 0004	4,32
4236 0005	4,32
4236 0006	5,34
4236 0007	4,13
4236 0008	2,52
4236 0010	5,34
4236 0011	5,34
4236 0012	5,34
4236 0013	5,34
4236 0014	5,34
4236 0015	5,74
4236 0016	2,52
4237 0001	3,73
4237 0002	21,04
4237 0003	34,32
4237 0004	67,92
4237 0005	40,15
4237 0006	18,22
4237 0009	9,36
4237 0015	43,77
4238 0010	3,33
4238 0020	3,33
4238 0030	3,33
4238 0040	3,33
4238 0050	3,33
4238 0060	3,33
4238 0070	3,33
4238 0080	3,33
4238 0090	3,33
4238 0100	3,33
4239 0005	7,95
4239 0010	5,93
4241 0126	199,24
4242 0125	289,80
4242 0126	364,26
4242 0250	332,06
4242 0251	394,45
4242 0500	702,36
4242 0501	774,81
4242 1000	800,98
4242 1001	875,44
4245 0125	450,80
4245 0250	480,99
4246 0001	8,45

Part No.	€
4246 0002	31,40
4246 0003	111,09
4246 0004	9,66
4246 0005	179,11
4247 0001	301,88
4247 0010	217,35
4247 1001	332,06
4247 1010	234,26
4248 0232	99,02
4250 0008	85,51
4252 1033	108,17
4252 1036	98,91
4252 1040	85,44
4252 1043	120,24
4252 1046	100,12
4252 1402	136,34
4252 2031	108,17
4252 2034	123,67
4252 2047	121,05
4252 3032	111,60
4252 3045	129,10
4252 3048	123,06
4255 0008	87,85
4256 0001	16,12
4256 0011	84,53
4257 0001	20,63
4257 0005	8,75
4257 0012	7,75
4257 0015	15,00
4257 0035	12,18
4258 0005	314,97
4258 0008	283,76
4259 0125	13,09
4259 0360	17,12
4260 0015	98,72
4260 0045	114,42
4262 0050	117,02
4262 0100	146,81
4262 0503	166,34
4265 0010	131,62
4265 0011	151,74
4266 0020	468,11
4266 0021	468,11
4266 0050	538,95
4266 0051	538,95
4267 0020	482,60
4267 0040	482,60
4268 0015	468,11
4268 0020	468,11
4268 0030	468,11
4268 0040	468,11
4268 0050	468,11
4269 0030	468,11
4269 0040	468,11
4269 0050	468,11
4269 0060	468,11
4269 0070	482,60
4269 0080	482,60
4270 0065	538,95
4270 0090	538,95
4270 0120	620,66
4271 0025	482,60
4271 0030	482,60
4271 0040	482,60
4271 0050	482,60
4276 0125	377,35
4276 1001	27,02
4276 2001	34,72
4285 0135	35,93
4286 0100	42,49
4287 1000	20,46
4287 1070	65,70
4289 0280	28,14

Part No.	€
4291 0370	59,48
4292 0008	17,54
4292 0010	17,54
4293 0430	166,90
4293 1000	27,88
4295 0045	56,65
4297 0059	94,89
4300 0200	156,19
4302 0200	228,25
4304 0284	308,35
4306 0320	754,20
4308 0320	634,08
4310 0320	612,71
4315 0050	659,44
4315 0075	866,34
4315 0100	2.010,35
4350 0000	13,02
4350 0001	10,03
4350 0002	11,01
4350 0003	11,01
4350 0004	11,01
4350 0005	11,01
4350 0006	11,01
4350 0007	11,01
4350 0008	11,01
4350 0009	11,01
4350 0010	11,01
4350 0011	10,50
4350 0012	10,50
4350 0013	10,50
4350 0014	10,50
4350 0015	10,50
4350 0016	10,50
4350 0017	10,50
4350 0018	10,50
4350 0019	10,50
4350 0020	10,50
4350 0021	10,50
4350 0022	10,50
4350 0023	10,50
4350 0024	10,50
4350 0025	10,50
4350 0026	10,50
4350 0027	10,50
4350 0028	10,50
4350 0029	10,50
4350 0030	10,50
4350 0031	10,50
4350 0032	10,50
4350 0033	10,50
4350 0034	10,50
4350 0035	10,50
4350 0036	10,50
4350 0037	10,50
4350 0038	10,50
4350 0039	10,50
4350 0040	10,50
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4350 0042	10,50
4350 0043	10,50
4350 0044	10,50
4350 0045	10,50
4350 0046	10,50
4350 0047	10,50
4350 0048	10,50
4350 0049	10,50
4350 0050	10,50
4350 0051	10,50
4350 0052	10,50
4350 0053	10,50
4350 0054	10,50
4350 0055	10,50
4350 0056	10,50

Part No.	€
4350 0057	10,50
4350 0058	10,50
4350 0059	10,50
4350 0060	10,50
4350 0061	10,50
4350 0062	10,50
4350 0063	10,50
4350 0064	10,50
4350 0065	10,03
4350 0066	10,03
4350 0067	10,03
4350 0068	10,03
4350 0069	10,03
4350 0070	10,03
4350 0071	10,03
4350 0072	10,50
4350 0073	10,50
4350 0074	10,50
4350 0075	10,50
4350 0076	10,50
4350 0077	10,50
4350 0078	10,50
4350 0079	10,50
4350 0080	10,50
4350 0081	15,02
4350 0082	15,02
4350 0083	15,02
4350 0084	15,02
4350 0085	15,02
4350 0086	15,02
4350 0087	15,02
4350 0088	15,02
4350 0089	15,02
4350 0090	15,02
4350 0091	15,02
4350 0092	15,02
4350 0093	15,02
4350 0094	15,02
4350 0095	15,02
4350 0096	15,02
4350 0097	15,02
4350 0098	15,02
4350 0099	15,02
4350 0100	15,02
4350 0101	15,02
4350 0102	15,02
4350 0103	15,02
4350 0104	15,02
4350 0105	15,02
4350 0106	15,02
4350 0107	15,02
4350 0108	15,02
4350 0109	15,02
4350 0110	15,02
4350 0111	15,02
4350 0112	16,01
4350 0113	17,03
4350 0114	18,03
4350 0115	20,02
4350 0116	22,03
4350 0117	24,03
4350 0118	25,04
4350 0119	26,04
4350 0120	27,02
4350 0125	70,09
4350 0150	106,14
4350 0175	140,18
4350 0200	162,21
4350 0250	186,24
4350 0300	204,24
4350 0350	230,28
4350 0400	250,32
4350 0450	280,35

Catalogue prices in EUR

Part No.	€
4350 0500	300,37
4350 0600	520,64
4350 0700	580,70
4350 0800	700,86
4350 0900	921,13
4350 1000	1.101,35
4351 0000	9,22
4351 0001	6,49
4351 0002	8,02
4351 0003	8,02
4351 0004	8,02
4351 0005	8,02
4351 0006	8,02
4351 0007	8,02
4351 0008	8,02
4351 0009	8,02
4351 0010	8,02
4351 0011	7,00
4351 0012	7,00
4351 0013	7,00
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4351 0061	7,00
4351 0062	7,00
4351 0063	7,00
4351 0064	7,00
4351 0065	6,02
4351 0066	6,02

Part No.	€
4351 0067	6,02
4351 0068	6,02
4351 0069	6,02
4351 0070	6,02
4351 0071	6,02
4351 0072	7,00
4351 0073	7,00
4351 0074	7,00
4351 0075	7,00
4351 0076	7,00
4351 0077	7,00
4351 0078	7,00
4351 0079	7,00
4351 0080	7,00
4351 0081	8,02
4351 0082	8,02
4351 0083	8,02
4351 0084	8,02
4351 0085	8,02
4351 0086	8,02
4351 0087	8,02
4351 0088	8,02
4351 0089	8,02
4351 0090	8,02
4351 0091	8,02
4351 0092	8,02
4351 0093	8,02
4351 0094	8,02
4351 0095	8,02
4351 0096	8,02
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4351 0106	8,02
4351 0107	8,02
4351 0108	8,02
4351 0109	8,02
4351 0110	8,02
4351 0111	8,02
4351 0112	10,03
4351 0113	10,50
4351 0114	11,01
4351 0115	12,02
4351 0116	13,02
4351 0117	14,04
4351 0118	16,01
4351 0119	16,52
4351 0120	18,03
4351 0125	44,05
4351 0150	64,09
4351 0175	80,10
4351 0200	94,13
4351 0250	113,14
4351 0300	130,17
4351 0350	178,22
4351 0400	176,21
4351 0450	228,27
4351 0500	200,25
4351 0600	300,37
4351 0700	360,45
4351 0800	400,49
4351 0900	500,61
4351 1000	600,74
4352 0000	5,01
4352 0001	4,01
4352 0002	5,01
4352 0003	5,01

Part No.	€
4352 0004	5,01
4352 0005	5,01
4352 0006	5,01
4352 0007	5,01
4352 0008	5,01
4352 0009	5,01
4352 0010	5,01
4352 0011	4,01
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4352 0014	4,01
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4352 0040	4,01
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4352 0067	4,01
4352 0068	4,01
4352 0069	4,01
4352 0070	4,01
4352 0071	4,01
4352 0072	4,52
4352 0073	4,52
4352 0074	4,52
4352 0075	4,52
4352 0076	4,52

Part No.	€
4352 0077	4,52
4352 0078	4,52
4352 0079	4,52
4352 0080	4,52
4352 0081	5,01
4352 0082	5,01
4352 0083	5,01
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4352 0110	5,01
4352 0111	5,01
4352 0112	6,02
4352 0113	6,49
4352 0114	7,00
4352 0115	8,02
4352 0116	8,51
4352 0117	9,01
4352 0118	10,03
4352 0119	10,50
4352 0120	12,02
4352 0125	35,04
4352 0150	44,05
4352 0175	55,06
4352 0200	73,10
4352 0250	84,11
4352 0300	100,12
4352 0350	160,20
4352 0400	140,18
4352 0450	208,25
4352 0500	164,20
4352 0600	230,28
4352 0700	250,32
4352 0800	300,37
4352 0900	380,47
4352 1000	440,55
4360 0032	274,05
4360 0047	403,62
4360 0087	611,80
4360 0103	781,76
4361 0032	180,58
4361 0047	233,68
4361 0087	403,62
4361 0103	477,98
4362 0032	95,60
4362 0047	159,34
4362 0087	233,68
4362 0103	286,79
4372 0032	1.131,39
4372 0047	1.902,32

Part No.	€
4372 0087	3.253,97
4373 0032	1.001,23
4373 0047	1.531,88
4373 0087	2.553,11
4380 0100	162,02
4380 0200	177,10
4380 0400	243,51
4382 0004	163,01
4382 0010	163,01
4382 0016	179,11
4382 0020	219,36
4386 0001	645,02
4388 0010	1.201,46
4390 0001	12,74
4390 0002	14,81
4390 0003	20,74
4390 0004	30,07
4390 0005	34,39
4395 0005	512,79
4395 0010	1.136,01
4402 0002	25,68
4402 0003	22,29
4402 0004	20,10
4402 0005	18,75
4402 0006	18,75
4402 0007	19,43
4402 0008	20,10
4402 0009	20,78
4402 0010	21,61
4402 0011	22,29
4402 0012	22,97
4402 0013	23,65
4402 0014	24,33
4402 0015	25,00
4402 0016	25,68
4402 0017	26,36
4402 0018	27,04
4402 0019	27,85
4402 0020	27,85
4402 0021	29,20
4402 0022	29,88
4402 0023	30,56
4402 0024	31,24
4402 0025	31,92
4402 0026	31,92
4402 0027	33,27
4402 0028	34,08
4402 0030	34,76
4402 0032	37,49
4402 0033	38,85
4402 0034	39,53
4402 0035	40,36
4402 0036	41,04
4402 0037	41,72
4402 0038	43,07
4402 0040	44,43
4402 0042	45,92
4402 0044	48,63
4402 0045	49,48
4402 0046	51,34
4402 0047	52,85
4402 0048	54,21
4402 0050	55,56
4402 0052	58,30
4402 0055	61,14
4402 0058	65,34
4402 0060	68,05
4402 0062	70,92
4402 0065	72,95
4402 0068	77,83
4402 0070	79,19
4402 0072	82,58
4402 0075	86,14

Part No.	€
4402 0080	91,70
4402 0085	100,89
4402 0090	108,04
4402 0095	113,84
4402 0100	121,01
4406 0004	117,60
4406 0005	117,60
4406 0006	117,60
4406 0007	106,93
4406 0008	106,93
4406 0009	106,93
4406 0010	106,93
4406 0011	113,33
4406 0012	113,33
4406 0013	113,33
4406 0014	74,33
4406 0015	119,74
4406 0016	119,74
4406 0017	119,74
4406 0018	119,74
4406 0019	130,44
4406 0020	130,44
4406 0021	130,44
4406 0022	130,44
4406 0023	132,58
4406 0024	132,58
4406 0025	132,58
4406 0026	132,58
4406 0027	132,58
4406 0028	134,71
4406 0030	134,71
4406 0032	134,71
4406 0033	141,14
4406 0034	141,14
4406 0035	141,14
4406 0036	141,14
4406 0037	141,14
4406 0038	141,14
4406 0040	149,69
4406 0042	149,69
4406 0044	160,37
4406 0045	160,37
4406 0046	160,37
4406 0048	160,37
4406 0050	171,06
4406 0052	171,06
4406 0055	171,06
4406 0058	186,03
4406 0060	186,03
4406 0062	186,03
4406 0065	203,13
4406 0068	203,13
4406 0070	203,13
4406 0075	220,24
4406 0080	239,49
4406 0085	245,90
4406 0090	245,90
4406 0095	256,59
4406 0100	256,59
4411 0030	69,78
4411 0035	46,09
4411 0040	45,00
4411 0045	45,00
4411 0050	44,08
4411 0060	43,16
4411 0070	43,16
4411 0080	43,16
4411 0090	43,16
4411 0100	43,16
4411 0110	44,08
4411 0120	45,00
4411 0130	46,09
4411 0140	46,09

Part No.	€
4411 0150	47,01
4411 0160	47,93
4411 0170	48,85
4411 0180	48,85
4411 0190	49,77
4411 0200	50,68
4411 0210	51,60
4411 0220	51,60
4411 0230	52,52
4411 0240	53,44
4411 0250	54,53
4411 0260	55,48
4411 0270	55,48
4411 0280	56,37
4411 0300	58,21
4411 0320	59,15
4411 0340	60,99
4411 0350	60,99
4411 0360	62,06
4411 0380	63,90
4411 0400	64,84
4411 0420	68,49
4411 0440	72,34
4411 0450	74,18
4411 0460	76,02
4411 0480	79,89
4411 0500	83,56
4411 0520	86,32
4411 0550	92,01
4411 0580	97,72
4411 0600	101,39
4411 0620	105,22
4411 0650	111,65
4411 0680	118,26
4411 0700	123,05
4411 0750	133,33
4411 0800	144,53
4411 0850	162,53
4411 0880	173,73
4411 0900	181,26
4411 0920	187,86
4411 0950	199,06
4411 0980	209,34
4411 1000	216,87
4411 1250	271,40
4411 1500	325,78
4411 1750	473,24
4411 2000	621,64
4416 0016	91,77
4416 0018	83,96
4416 0020	78,68
4416 0022	81,11
4416 0025	67,81
4416 0030	59,22
4416 0035	60,09
4416 0040	55,78
4416 0050	54,40
4416 0060	52,61
4416 0080	54,40
4416 0100	58,32
4416 0120	62,39
4416 0140	67,22
4416 0160	72,06
4416 0180	77,77
4416 0200	83,34
4416 0220	88,18
4416 0240	99,31
4416 0270	110,64
4416 0300	122,52
4416 0330	138,93
4416 0360	150,06
4416 0390	158,99
4416 0420	109,57

Catalogue prices in EUR

Part No.	€
4416 0421	98,11
4416 0450	117,73
4416 0451	106,29
4416 0480	126,83
4416 0481	114,76
4421 0301	104,10
4421 0401	101,59
4421 0402	92,38
4421 0502	88,59
4421 0602	88,00
4421 0603	64,79
4421 0703	64,79
4421 0802	91,35
4421 0803	64,79
4421 0804	59,83
4421 0904	64,97
4421 1003	71,44
4421 1004	63,15
4421 1104	70,00
4421 1204	68,58
4421 1206	62,41
4421 1404	72,80
4421 1406	66,63
4421 1504	85,07
4421 1506	80,37
4421 1604	77,46
4421 1606	69,78
4421 1804	81,11
4421 1806	73,98
4421 1807	84,79
4421 2004	86,65
4421 2006	79,38
4421 2007	84,39
4421 2204	96,29
4421 2206	87,39
4421 2207	93,89
4421 2404	103,53
4421 2406	93,89
4421 2407	99,51
4421 2506	100,47
4421 2606	103,60
4421 2706	102,48
4421 2707	108,33
4421 2806	109,88
4421 3004	132,50
4421 3006	113,77
4421 3007	119,28
4421 3206	121,36
4421 3306	124,49
4421 3307	127,64
4421 3506	130,29
4421 3606	133,44
4421 3607	137,35
4421 3609	149,30
4421 3806	144,42
4421 3907	154,94
4421 4006	152,27
4421 4007	161,68
4421 4206	90,74
4421 4207	93,56
4421 4209	109,57
4421 4216	83,52
4421 4217	86,03
4421 4219	101,11
4421 4506	96,38
4421 4507	99,23
4421 4509	115,70
4421 4516	88,40
4421 4517	91,85
4421 4519	106,73
4421 4806	102,03
4421 4807	105,02
4421 4809	122,13
4421 4816	88,40
4421 4817	96,88
4421 4819	112,57
4426 0010	125,74
4426 0012	119,11
4426 0014	109,29
4426 0016	96,23
4426 0018	85,33
4426 0020	85,33
4426 0025	64,58
4426 0030	50,27
4426 0035	47,05
4426 0040	45,98
4426 0050	45,98
4426 0060	45,98
4426 0080	47,05
4426 0100	54,73
4426 0120	63,53
4426 0140	69,93
4426 0160	77,63
4426 0180	88,53
4426 0200	98,37
4426 0220	107,14
4426 0240	114,84
4426 0270	127,86
4426 0300	140,07
4426 0330	153,10
4426 0360	165,07
4426 0390	179,42
4426 0420	194,58
4426 0450	206,57
4426 0480	218,75
4427 0010	125,74
4427 0012	119,11
4427 0014	109,29
4427 0016	96,23
4427 0018	85,33
4427 0020	85,33
4427 0025	64,58
4427 0030	50,27
4427 0035	47,05
4427 0040	45,98
4427 0050	45,98
4427 0060	45,98
4427 0080	47,05
4427 0100	54,73
4427 0120	63,53
4427 0140	69,93
4427 0160	77,63
4427 0180	88,53
4427 0200	98,37
4427 0220	107,14
4427 0240	114,84
4427 0270	127,86
4427 0300	140,07
4427 0330	153,10
4427 0360	165,07
4427 0390	179,42
4427 0420	194,58
4427 0450	206,57
4427 0480	218,75
4431 0402	70,98
4431 0502	70,98
4431 0602	72,08
4431 0603	54,73
4431 0703	54,73
4431 0802	75,49
4431 0803	56,88
4431 0804	52,39
4431 0904	54,73
4431 1003	62,23
4431 1004	59,02
4431 1104	61,16
4431 1204	66,72
4431 1206	65,67
4431 1404	72,28
4431 1406	69,93
4431 1504	73,35
4431 1506	73,35
4431 1604	78,68
4431 1606	76,54
4431 1804	86,38
4431 1806	83,19
4431 2004	91,94
4431 2006	89,60
4431 2007	89,60
4431 2204	102,86
4431 2206	96,23
4431 2207	96,23
4431 2404	108,19
4431 2406	102,86
4431 2407	102,86
4431 2506	106,05
4431 2606	109,29
4431 2706	112,70
4431 2707	112,70
4431 2806	114,84
4431 3004	130,00
4431 3006	122,54
4431 3007	122,54
4431 3206	128,95
4431 3306	132,37
4431 3307	132,37
4431 3506	137,70
4431 3606	141,14
4431 3607	141,14
4431 3609	153,10
4431 3806	148,62
4431 3907	152,05
4431 4006	156,32
4431 4007	156,32
4431 4206	162,95
4431 4207	162,95
4431 4209	174,91
4431 4506	171,72
4431 4507	171,72
4431 4509	186,88
4431 4806	182,61
4431 4807	182,61
4431 4809	197,79
4432 0402	70,98
4432 0502	70,98
4432 0602	72,08
4432 0603	54,73
4432 0703	54,73
4432 0802	75,49
4432 0803	56,88
4432 0804	52,39
4432 0904	54,73
4432 1003	62,23
4432 1004	59,02
4432 1104	61,16
4432 1204	66,72
4432 1206	66,72
4432 1404	72,28
4432 1406	69,93
4432 1504	77,63
4432 1506	73,35
4432 1604	78,68
4432 1606	76,54
4432 1804	86,38
4432 1806	83,19
4432 2004	91,94
4432 2006	89,60
4432 2007	89,60
4432 2204	102,86
4432 2206	96,23
4432 2207	96,23
4432 2404	108,19
4432 2406	102,86
4432 2407	102,86
4432 2506	106,05
4432 2606	109,29
4432 2706	112,70
4432 2707	112,70
4432 2806	114,84
4432 3004	130,00
4432 3006	122,54
4432 3007	122,54
4432 3206	128,95
4432 3306	132,37
4432 3307	132,37
4432 3506	137,70
4432 3606	141,14
4432 3607	141,14
4432 3609	153,10
4432 3806	148,62
4432 3907	152,05
4432 4006	156,32
4432 4007	156,32
4432 4206	162,95
4432 4207	162,95
4432 4209	174,91
4432 4506	171,72
4432 4507	171,72
4432 4509	186,88
4432 4806	182,61
4432 4807	182,61
4432 4809	197,79
4436 0000	72,01
4436 0001	75,73
4436 0002	84,70
4436 0003	100,91
4436 0004	126,09
4436 0005	187,36
4438 0000	180,14
4438 0001	175,57
4438 0002	171,17
4438 0003	207,09
4438 0004	256,57
4438 0005	346,72
4440 0000	104,08
4440 0001	106,88
4440 0002	120,79
4440 0003	146,69
4440 0004	180,32
4440 0005	252,53
4442 0000	280,88
4442 0001	275,58
4442 0002	270,13
4442 0003	324,19
4442 0004	399,74
4442 0005	540,25
4444 0030	162,01
4444 0040	198,10
4444 0050	279,10
4446 0030	261,14
4446 0040	342,15
4446 0050	567,20
4451 0050	1,14
4453 0055	2,36
4453 0060	2,36
4455 0001	2,59
4457 0001	2,59
4459 0001	7,02
4459 0002	7,02
4460 0001	173,99
4461 0020	12,78
4463 0012	12,92
4467 0052	3,22
4467 0058	4,18
4471 0003	48,21
4471 0005	64,03
4472 0006	61,92
4472 0015	85,40
4472 0030	176,14
4472 0045	276,48
4472 0060	437,68
4473 0015	8,07
4473 0030	8,63
4475 0010	86,96
4476 0150	17,89
4476 0300	54,88
4479 0007	5,72
4479 0015	6,72
4479 0025	6,72
4480 0001	19,60
4481 0001	14,54
4482 0010	51,15
4482 0020	51,15
4482 0030	51,15
4483 0008	1,07
4483 0013	1,33
4483 0020	2,40
4483 0021	4,38
4485 0020	10,06
4487 0013	7,79
4487 0020	11,57
4489 0000	72,10
4489 0001	24,47
4489 0002	21,00
4489 0003	7,65
4489 0004	7,65
4489 0005	5,37
4489 0006	6,34
4489 0007	8,58
4489 0008	7,02
4489 0009	8,58
4489 0010	5,37
4489 0012	9,01
4489 0015	5,18
4489 0018	9,01
4489 0020	5,18
4489 0025	5,18
4489 0030	5,18
4489 0035	5,72
4489 0040	5,18
4489 0045	6,34
4489 0050	5,18
4489 0060	7,96
4489 0070	7,96
4489 0080	7,96
4489 0090	7,96
4489 0100	7,96
4490 0100	171,87
4491 0001	1,68
4494 0025	19,62
4494 0050	11,36
4494 0075	11,41
4494 0100	11,11
4494 0150	11,39
4494 0200	11,81
4494 0250	13,23
4494 0300	15,03
4494 0400	17,06
4494 0500	18,81
4496 0025	15,59
4496 0050	14,88
4496 0075	16,56
4496 0100	18,64
4496 0150	22,66
4496 0200	26,71
4496 0250	30,15
4496 0300	33,99
4496 0400	36,49
4496 0500	42,23
4498 0025	27,32
4498 0050	22,45
4498 0075	22,10
4498 0100	22,96
4498 0150	26,39
4498 0200	31,40
4498 0250	33,65
4498 0300	35,93
4498 0400	37,89
4498 0500	41,16
4499 0001	32,10
4502 0035	16,64
4502 0060	13,97
4504 0006	34,42
4504 0008	35,39
4504 0010	35,39
4504 0015	38,45
4507 0024	53,15
4507 0025	29,44
4508 0007	26,39
4508 0010	29,65
4513 1002	165,95
4513 2002	206,48
4520 0019	299,22
4520 1928	355,04
4522 0175	534,17
4525 0020	75,71
4525 0030	75,71
4527 0010	21,42
4530 0003	10,33
4530 0005	11,29
4530 0007	12,23
4533 0030	65,98
4535 0007	80,89
4535 0010	90,44
4535 0100	25,81
4535 0500	24,10
4535 0600	24,10
4535 0700	24,10
4535 0800	24,10
4537 0001	369,95
4601 0100	2,33
4601 0150	2,91
4601 0200	3,68
4601 0250	3,87
4601 0300	4,62
4601 0400	5,64
4601 0500	6,90
4601 0750	10,57
4601 1000	14,33
4602 0100	4,17
4602 0150	4,95
4602 0200	6,49
4602 0250	8,42
4602 0300	9,01
4602 0400	12,60
4602 0500	16,49
4602 0750	25,20
4602 1000	38,75
4603 0075	4,06
4603 0100	4,92
4603 0150	6,30
4603 0200	9,10
4603 0250	12,50
4603 0300	15,91
4603 0400	24,29
4603 0500	34,13
4603 0750	59,78
4603 1000	89,67
4604 0075	5,34
4604 0100	6,62
4604 0150	9,92
4604 0200	12,71
4604 0250	18,13
4604 0300	22,93
4604 0400	35,49
4604 0500	45,03
4604 0750	85,19
4604 1000	127,03
4605 0075	4,92
4605 0100	5,76
4605 0150	7,86
4605 0200	10,78
4605 0250	16,12
4605 0300	21,12
4605 0400	50,82
4605 0500	71,73
4606 0075	6,20
4606 0100	8,02
4606 0150	12,06
4606 0200	15,37
4606 0250	20,93
4606 0300	27,76
4606 0400	82,20
4606 0500	116,57
4607 0075	6,63
4607 0100	8,17
4607 0150	11,97
4607 0200	18,83
4607 0250	30,43
4607 0300	40,57
4607 0400	128,52
4607 0500	147,96
4608 0075	12,39
4608 0100	14,95
4608 0150	19,22
4608 0200	27,34
4608 0250	41,63
4608 0300	48,04
4608 0400	152,44
4608 0500	194,29
4609 0050	15,17
4609 0075	17,73
4609 0100	19,53
4609 0150	28,40
4609 0200	37,68
4610 0050	16,43
4610 0075	20,28
4610 0100	25,41
4610 0150	33,09
4610 0200	53,38
4615 0300	42,12
4615 0500	52,68
4615 1000	90,56
4621 0050	12,71
4621 0075	16,77
4621 0100	18,25
4621 0150	30,43
4621 0200	39,08
4622 0050	32,83
4622 0075	39,87
4622 0100	44,57
4622 0150	53,27
4622 0200	72,75
4623 0100	64,91
4625 0025	13,46
4625 0040	13,46
4627 0005	85,40
4631 0100	23,38
4631 0150	27,44
4631 0200	34,58
4631 0250	52,62

Catalogue prices in EUR

Part No.	€
4631 0300	60,10
4633 0050	8,17
4633 0075	10,40
4633 0100	12,22
4634 0120	12,36
4634 0150	12,79
4634 0200	17,50
4635 0120	11,48
4635 0150	14,07
4635 0200	17,89
4636 0120	15,37
4636 0150	18,76
4636 0200	26,02
4637 0300	11,53
4637 0400	14,19
4637 0500	17,40
4638 0600	9,91
4638 0800	12,92
4638 1000	16,70
4639 0600	13,02
4639 0800	15,94
4639 1000	19,60
4641 0200	34,91
4641 0250	39,48
4641 0300	44,28
4642 0200	6,09
4642 0300	10,15
4643 0250	34,34
4643 0300	39,06
4651 0080	10,01
4651 0120	11,64
4651 0150	14,04
4651 0200	18,81
4651 0300	38,05
4653 0100	21,67
4653 0150	25,17
4653 0200	31,87
4653 0250	38,24
4653 0300	43,56
4655 0150	134,02
4655 0200	158,13
4655 0300	162,16
4655 1150	30,56
4655 1200	34,58
4655 1300	38,87
4657 0001	47,48
4660 0200	986,13
4660 1200	70,44
4660 1300	104,65
4660 1500	122,76
4671 0005	2,63
4672 0002	16,36
4673 0001	3,19
4673 0002	4,50
4675 0010	19,99
4675 0020	28,32
4675 0025	35,11
4675 0030	38,80
4676 0010	20,97
4676 0020	29,44
4676 0025	34,76
4676 0030	40,37
4676 0050	67,08
4677 0010	11,87
4677 0020	18,46
4677 0025	22,00
4677 0030	25,06
4678 0020	31,22
4678 0025	39,78
4678 0030	40,09
4678 0050	54,06
4679 0025	38,52
4679 0030	48,21

Part No.	€
4679 0050	59,85
4680 0020	26,58
4680 0025	29,66
4680 0030	31,82
4680 0050	39,66
4681 0020	22,66
4681 0030	26,57
4685 0002	4,17
4685 0003	5,32
4685 0005	10,29
4685 0008	19,48
4686 0003	3,94
4686 0005	6,30
4687 0003	7,93
4689 0002	4,64
4689 0003	5,37
4691 0003	2,82
4691 0005	6,62
4693 0003	5,37
4693 0005	9,61
4696 0003	10,50
4696 0005	14,58
4696 0006	15,94
4697 0015	26,92
4698 0002	6,83
4698 0003	7,67
4699 0005	11,62
4699 0006	16,99
4699 0008	18,25
4699 0010	22,66
4706 0300	150,34
4706 0400	171,06
4706 0500	199,24
4707 0300	128,80
4707 0430	171,06
4707 0600	136,85
4708 0300	311,94
4708 0500	346,15
4709 0450	200,45
4709 0600	213,33
4710 0100	174,09
4711 0400	466,90
4712 0400	603,75
4715 1030	109,29
4717 1030	132,46
4717 1045	154,88
4719 1001	130,06
4719 1002	62,42
4721 1001	294,63
4721 1002	336,07
4722 1001	114,47
4722 1002	229,23
4723 0010	636,09
4723 0020	1.735,83
4723 0030	2.012,15
4723 0040	1.607,87
4723 0050	1.027,64
4726 0040	13,60
4726 0060	15,51
4726 0080	19,27
4727 0030	7,67
4727 0040	8,33
4727 0050	8,86
4727 0060	9,29
4727 0080	10,33
4727 0100	11,39
4727 0150	20,84
4727 0180	23,42
4727 0200	24,19
4728 0030	13,09
4728 0040	13,90
4728 0050	14,46
4728 0060	15,24

Part No.	€
4728 0080	17,31
4728 0100	20,37
4728 0150	38,64
4728 0200	50,89
4729 0040	19,81
4729 0060	21,89
4729 0080	28,47
4729 0100	30,50
4731 0025	20,69
4732 0060	147,11
4732 0080	151,29
4733 0020	25,06
4733 0060	47,25
4733 0080	53,31
4733 0100	62,76
4733 0180	83,77
4733 0200	91,35
4735 1150	163,21
4735 1200	183,51
4735 1300	215,93
4735 2150	206,92
4735 2200	250,46
4735 2300	298,59
4735 3150	190,19
4735 3200	212,15
4735 3300	255,89
4736 1150	245,02
4736 1200	288,73
4736 2150	273,67
4736 2200	304,64
4736 3150	413,44
4736 3200	472,87
4736 3250	516,79
4737 0025	8,51
4751 0100	1,00
4751 0150	1,05
4751 0200	1,05
4751 0250	1,23
4751 0300	1,38
4751 0330	3,38
4751 0500	2,78
4751 0530	6,13
4751 1000	4,53
4751 1001	12,46
4751 1500	18,73
4751 2000	24,57
4752 0300	40,71
4752 0700	49,32
4752 1100	61,93
4752 1500	75,04
4752 1900	89,79
4752 2300	103,18
4753 0500	22,73
4753 1000	52,13
4753 1500	107,66
4753 2000	300,76
4753 3000	737,29
4755 0500	15,30
4755 1000	30,59
4755 1500	71,26
4755 2000	104,14
4755 3000	297,61
4756 0500	22,26
4756 1000	42,49
4756 2000	129,55
4757 0500	12,60
4757 1000	27,39
4757 2000	85,19
4759 0500	18,25
4759 1000	34,27
4760 0300	7,82
4760 0600	11,64
4760 1000	17,55

Part No.	€
4761 0075	6,51
4761 0100	7,37
4761 0125	8,65
4761 0150	9,92
4761 0200	12,50
4761 0300	24,97
4770 0630	651,33
4770 0800	1.079,79
4770 1000	1.463,67
4770 1200	1.700,18
4770 1500	2.508,66
4770 2000	2.827,91
4771 0630	750,75
4771 0800	1.244,29
4771 1000	1.642,74
4771 1200	1.953,82
4771 1500	2.893,05
4771 2000	3.273,52
4772 0300	156,71
4772 0400	173,72
4772 0401	255,61
4772 0500	421,54
4772 0630	421,54
4772 0631	637,65
4772 0800	737,21
4772 1000	1.086,07
4772 1001	1.894,48
4772 1200	1.894,48
4772 1500	3.479,61
4772 2000	4.473,74
4773 0300	180,78
4773 0400	194,92
4773 0401	290,87
4773 0500	478,00
4773 0630	478,00
4773 0631	726,60
4773 0800	843,10
4773 1000	1.259,72
4773 1001	2.144,54
4773 1200	2.144,54
4773 1500	3.924,38
4773 2000	5.191,69
4774 0800	1.375,69
4774 1000	1.508,41
4774 1001	1.540,33
4774 1200	1.540,33
4774 1500	1.772,58
4774 2000	1.903,98
4775 0630	547,05
4775 0631	575,19
4775 0800	603,10
4775 1000	612,08
4775 1001	710,64
4775 1200	647,52
4775 1500	752,17
4775 2000	962,73
4781 0300	132,63
4781 0301	151,62
4781 0400	261,28
4781 0500	355,79
4781 0800	672,63
4781 1000	1.676,97
4781 1200	1.839,58
4781 1500	3.266,39
4783 0300	101,85
4783 0301	114,84
4783 0400	166,25
4783 0500	270,66
4783 0800	525,70
4783 1000	1.070,49
4783 1200	1.243,03
4783 1500	2.288,63
4784 0400	266,16

Part No.	€
4784 0500	301,47
4784 0800	357,63
4784 1000	419,91
4784 1200	486,43
4784 1500	593,69
4785 1100	66,73
4785 1150	89,79
4785 1200	151,45
4785 3100	47,99
4785 3150	69,69
4785 3200	115,26
4786 0050	79,50
4786 0075	113,72
4786 0100	180,13
4801 0175	0,84
4802 0250	1,28
4803 0150	1,07
4804 0250	9,50
4805 0150	6,30
4805 1150	2,45
4806 0165	14,19
4806 1165	6,21
4807 0080	6,04
4807 0250	10,68
4807 1080	6,04
4807 1250	10,68
4810 0001	8,17
4811 0150	2,75
4811 0200	4,10
4811 0250	5,37
4811 0300	6,32
4812 0150	3,17
4812 0200	4,57
4812 0250	5,88
4812 0300	7,05
4813 0150	2,91
4813 0200	3,85
4813 0250	4,94
4815 0150	2,91
4815 0200	3,17
4815 0250	4,20
4815 0300	5,18
4816 0150	2,91
4816 0200	3,17
4816 0250	4,20
4816 0300	5,18
4817 0200	11,71
4817 0250	13,67
4817 0300	15,59
4820 0300	48,76
4820 1300	4,17
4821 0200	18,15
4822 0050	70,25
4822 0100	108,89
4822 0200	197,63
4822 1000	8,70
4823 0200	54,08
4823 0300	70,09
4831 0300	73,20
4831 0500	112,54
4831 1300	8,44
4831 1500	16,87
4832 0300	95,60
4832 1300	21,25
4833 0300	466,85
4833 0600	624,26
4833 1300	83,49
4833 1600	139,35
4833 2001	69,84
4833 2005	119,09
4834 0106	126,79
4836 0300	193,64
4836 0500	244,27

Part No.	€
4836 2065	68,39
4836 2120	77,18
4836 3001	44,45
4838 0300	273,39
4838 0600	346,96
4838 2001	99,14
4838 2005	117,11
4838 3001	78,79
4840 0300	201,83
4840 0600	212,43
4840 1300	21,25
4840 1600	29,73
4842 0300	673,30
4842 0600	786,85
4842 1300	80,19
4842 1600	133,79
4842 3001	67,06
4862 0015	73,47
4862 0030	73,47
4863 0015	52,33
4865 0030	196,23
4867 0060	114,21
4869 0065	124,78
4890 1001	33,04
4890 1002	37,66
4891 1001	38,13
4891 1002	38,13
4893 1001	71,24
4893 1002	71,23
4906 0001	30,15
4909 4002	102,88
4909 5000	104,48
4909 6000	75,93
4914 0001	346,03
4918 0001	327,62
5003 0100	187,88
5003 0125	219,91
5003 0150	394,98
5006 0125	37,17
5006 0135	37,26
5006 0150	40,69
5009 0100	200,69
5009 0125	200,69
5009 0150	273,28
5013 0100	102,87
5013 0120	120,84
5013 0140	162,96
5013 0160	202,37
5013 0180	234,38
5014 0120	129,97
5014 0140	172,95
5014 0160	212,84
5015 0115	109,76
5015 0125	120,42
5015 0126	128,99
5015 0135	146,32
5015 0150	164,03
5018 0100	46,94
5018 0120	46,94
5021 0100	34,23
5021 0120	39,90
5021 0140	43,24
5021 0160	47,16
5021 0180	48,83
5028 0120	25,50
5028 0140	31,31
5028 0160	34,76
5028 0180	38,24
5029 0120	24,33
5029 0140	26,04
5029 0160	27,83
5029 0180	30,12

Part No.	€
5031 0100	204,19
5031 0120	204,19
5031 0140	204,19
5031 0160	204,19
5031 0180	204,19
5032 0100	176,42
5032 0120	176,42
5032 0140	176,42
5032 0160	176,42
5035 0120	348,18
5037 0010	144,55
5037 0020	186,60
5039 0010	100,33
5039 0020	133,35
5040 0010	6,53
5040 0020	12,90
5042 0010	234,87
5044 0010	161,61
5045 0120	204,19
5045 0140	204,19
5045 0160	204,19
5045 0180	204,19
5048 0100	101,50
5048 0120	131,01
5048 0140	182,93
5048 0160	244,30
5048 0180	263,27
5049 0120	358,61
5054 0100	35,53
5054 0120	47,18
5054 0140	61,95
5054 0160	71,12
5054 0180	75,97
5074 5100	4,25
5074 5125	4,69
5074 5150	5,27
5075 5100	13,02
5075 5115	14,54
5075 5120	15,07
5075 5125	15,56
5075 5135	16,59
5075 5140	17,08
5075 5150	17,33
5075 5160	18,24
5075 5175	18,73
5075 5180	18,87
5076 5100	15,31
5076 5115	16,50
5076 5120	16,91
5076 5125	17,33
5076 5135	18,11
5076 5140	18,53
5076 5150	19,32
5076 5160	20,11
5076 5175	21,32
5076 5180	21,72
5077 5100	15,31
5077 5115	16,50
5077 5120	16,91
5077 5125	17,33
5077 5135	18,11
5077 5140	18,53
5077 5150	19,32
5077 5160	20,11
5077 5175	21,32
5077 5180	21,72
5078 5100	11,81
5078 5125	14,72
5078 5135	16,07
5078 5150	17,52
5081 0100	6,55
5081 0115	6,93
5081 0120	7,42

Catalogue prices in EUR

Part No.	€
5081 0125	7,65
5081 0135	8,37
5081 0140	8,51
5081 0150	8,80
5081 0160	9,31
5081 0175	10,03
5081 0180	10,15
5082 0100	4,01
5082 0125	4,57
5082 0150	5,34
5083 0046	144,90
5083 0080	338,10
5084 0046	144,90
5084 0080	338,10
5089 0100	11,50
5089 0120	13,02
5089 0145	17,61
5089 0160	19,41
5090 0130	13,34
5091 0010	4,57
5091 0012	6,00
5091 0016	7,18
5091 0020	9,99
5091 0025	12,16
5091 0030	15,12
5091 0040	18,52
5091 0050	18,92
5091 0060	20,06
5091 0080	22,58
5091 0100	25,34
5091 0125	27,39
5091 0150	30,12
5091 0200	36,79
5091 0250	44,73
5092 0010	7,12
5092 0012	9,43
5092 0016	11,13
5092 0020	15,58
5092 0025	18,95
5092 0030	23,59
5092 0040	28,84
5092 0050	29,40
5092 0060	31,10
5092 0080	35,04
5092 0100	39,25
5092 0125	43,31
5092 0150	47,44
5092 0200	57,93
5093 0180	47,62
5093 0200	60,99
5095 0001	4,64
5095 0002	5,64
5095 0003	7,05
5095 0004	10,06
5095 0005	14,49
5097 0040	25,01
5097 0060	27,06
5097 0080	36,23
5098 0005	6,93
5099 0005	39,87
5100 0012	30,54
5100 0016	33,51
5100 0020	38,27
5100 0025	44,31
5100 0030	52,19
5100 0040	54,65
5100 0050	59,12
5100 0060	61,50
5102 0160	17,36
5102 0200	23,47
5102 0250	28,42
5102 0300	35,51
5102 0400	41,20
5102 0500	44,26
5102 0600	46,81
5103 0025	51,82
5103 0030	53,03
5103 0050	67,41
5103 0080	78,05
5103 0100	87,89
5103 0125	102,32
5103 0150	114,21
5104 0010	5,69
5104 0020	6,74
5104 0030	7,77
5105 0010	11,29
5105 0020	13,37
5105 0030	15,45
5106 0010	8,44
5106 0012	10,52
5106 0016	12,64
5106 0020	17,19
5106 0025	20,76
5106 0030	25,90
5106 0040	30,08
5106 0050	32,34
5106 0060	34,16
5106 0080	41,25
5106 0100	46,27
5107 0020	19,58
5107 0030	20,63
5109 0030	108,43
5109 0040	114,01
5109 0050	118,98
5109 0060	123,39
5109 0080	131,32
5109 0100	142,00
5112 0006	21,49
5112 0010	30,19
5112 0012	36,28
5112 0015	40,20
5112 0020	50,75
5113 0025	39,15
5114 0030	80,22
5115 0005	27,37
5115 0010	43,70
5116 0016	12,58
5116 0030	12,97
5116 0060	13,51
5117 0012	15,05
5117 0016	15,51
5117 0020	16,05
5117 0025	16,61
5119 0060	79,64
5119 0500	12,02
5120 0025	52,54
5121 0009	127,33
5121 0012	144,36
5122 0005	9,66
5122 0010	10,68
5122 0015	15,30
5122 0020	23,75
5122 0025	41,06
5123 0030	26,72
5123 0060	32,20
5124 0020	28,16
5130 0180	6,02
5130 0200	7,07
5130 0225	8,58
5130 0250	10,47
5133 0160	9,08
5133 0180	9,36
5133 0210	10,05
5133 0225	11,52
5133 0250	13,65
5133 0300	19,99
5136 0220	7,75
5136 0250	8,93
5136 0280	10,03
5139 0220	10,43
5139 0250	11,41
5139 0280	12,44
5139 0300	14,74
5143 0300	20,97
5144 0110	15,91
5145 0160	6,97
5145 0180	7,54
5145 0200	9,00
5148 0160	10,50
5148 0180	10,94
5148 0200	12,81
5149 0160	7,51
5149 0180	7,70
5149 0200	9,00
5150 0160	11,62
5150 0180	11,80
5150 0200	13,55
5151 0160	12,44
5151 0180	13,09
5151 0200	14,58
5152 0140	8,98
5152 0160	9,08
5152 0180	9,66
5152 0200	11,11
5153 0160	13,74
5153 0180	14,81
5153 0200	16,77
5154 0160	16,00
5154 0180	17,20
5154 0200	19,16
5155 0160	22,14
5155 0190	24,57
5156 0180	14,53
5156 0200	15,80
5156 0225	18,73
5157 0180	12,88
5157 0200	13,55
5158 0180	20,56
5158 0200	21,84
5158 0225	24,47
5159 0200	14,63
5160 0160	6,67
5163 0160	9,99
5166 0160	11,74
5168 0140	11,31
5168 0160	11,52
5169 0125	9,26
5169 0140	9,36
5169 0160	9,84
5170 0140	13,95
5170 0160	14,58
5171 0160	16,73
5175 0160	6,86
5178 0160	9,87
5180 0160	11,78
5181 0125	9,26
5181 0140	9,26
5181 0160	9,66
5181 0180	12,29
5182 0140	13,55
5182 0160	14,30
5183 0160	16,35
5184 0140	11,01
5184 0160	11,22
5186 0130	17,75
5187 0140	11,52
5187 0160	11,90
5187 0190	13,65
5190 0140	16,08
5190 0160	16,77
5190 0190	18,53
5193 0140	11,62
5193 0160	12,09
5195 0140	16,08
5195 0160	16,59
5195 0190	18,73
5198 0160	11,41
5199 0160	11,36
5200 0140	15,80
5200 0160	16,08
5201 0160	17,75
5202 0160	19,81
5203 0005	20,56
5203 0010	22,63
5203 0015	22,72
5203 0020	19,13
5204 0005	10,99
5204 0010	12,92
5209 0010	17,55
5214 0160	6,86
5215 0160	10,61
5217 0160	13,28
5218 0140	11,62
5218 0160	11,69
5219 0140	15,31
5219 0160	15,73
5220 0160	17,75
5221 0140	13,37
5221 0160	13,55
5222 0160	13,65
5223 0160	19,99
5226 0200	8,16
5227 0200	11,36
5230 0200	14,58
5232 0200	9,57
5233 0200	13,39
5236 0200	16,08
5239 0200	15,42
5240 0200	16,87
5242 0200	19,02
5245 0200	21,84
5251 0200	17,45
5252 0200	18,73
5254 0200	22,03
5257 0200	24,68
5278 0250	28,18
5280 0160	14,53
5281 0140	18,03
5281 0160	19,02
5281 0200	23,59
5284 0180	11,22
5284 0200	14,14
5287 0200	33,36
5290 0125	6,53
5290 0140	7,30
5290 0160	7,82
5290 0180	9,14
5292 0125	8,54
5292 0140	9,52
5292 0160	10,50
5292 0180	12,44
5293 0125	9,50
5293 0140	10,80
5293 0160	11,27
5293 0180	12,78
5296 0125	11,32
5296 0140	11,32
5296 0160	13,72
5296 0180	15,42
5299 0110	11,52
5299 0125	11,52
5299 0140	11,62
5299 0160	11,80
5299 0180	12,97
5300 0125	13,95
5300 0140	14,14
5300 0160	14,53
5300 0180	15,59
5302 0125	16,49
5302 0140	16,59
5302 0160	17,27
5302 0180	18,92
5305 0125	18,13
5305 0140	18,34
5305 0160	19,71
5305 0180	21,16
5308 0160	28,67
5311 0180	21,56
5312 0200	19,41
5314 0160	10,08
5314 0180	10,69
5314 0200	12,22
5315 0160	12,22
5315 0180	12,99
5315 0200	15,23
5317 0160	13,51
5317 0180	14,26
5317 0200	16,08
5320 0160	15,65
5320 0180	16,92
5320 0200	19,51
5322 0140	17,27
5322 0160	17,75
5322 0180	19,60
5322 0200	20,88
5322 0250	24,96
5323 0140	14,53
5323 0160	14,91
5323 0180	16,38
5323 0200	18,03
5323 0250	22,42
5324 0160	21,84
5324 0180	23,89
5324 0200	25,06
5324 0250	30,43
5325 0160	24,19
5325 0180	26,13
5325 0200	27,69
5325 0250	35,40
5326 0140	16,28
5326 0160	16,38
5326 0180	17,75
5327 0010	27,23
5327 0020	34,28
5327 0030	40,74
5327 0500	12,85
5328 0160	28,00
5329 0005	12,85
5329 0010	12,85
5329 0015	12,85
5330 0160	29,44
5332 0005	25,06
5332 0010	29,65
5332 0025	28,47
5335 0005	22,52
5335 0010	23,99
5336 0010	23,59
5338 0006	25,25
5338 0011	30,22
5338 0016	25,46
5338 0018	27,90
5338 0019	27,21
5338 0021	27,21
5338 0022	28,58
5341 0006	15,12
5341 0016	16,96
5341 0021	17,06
5344 0006	16,77
5344 0010	19,13
5344 0016	15,70
5344 0020	17,55
5348 0005	14,56
5350 0003	29,16
5350 0005	31,29
5350 0010	30,71
5350 0016	31,69
5350 0021	32,08
5350 0025	34,91
5352 0005	12,85
5354 0005	10,71
5354 0010	10,71
5354 0015	11,15
5354 0020	11,39
5356 0006	20,88
5356 0011	20,88
5356 0016	20,88
5356 0021	22,52
5356 0030	24,78
5356 0040	26,72
5361 0015	97,13
5362 0005	22,72
5362 0010	22,72
5362 0015	22,72
5362 0020	24,57
5363 0005	36,09
5363 0010	40,08
5363 0015	35,00
5363 0020	39,10
5363 0025	35,00
5363 0030	39,10
5363 0040	30,14
5363 0045	30,14
5363 0050	30,14
5364 0005	37,43
5364 0010	41,44
5364 0015	36,47
5364 0020	40,48
5364 0025	36,47
5364 0030	40,48
5364 0040	31,61
5364 0045	31,61
5364 0050	31,61
5365 0005	33,83
5366 0015	105,02
5368 0005	26,72
5368 0010	26,92
5368 0015	28,86
5368 0020	28,67
5368 0025	30,03
5368 0030	28,67
5371 0005	16,66
5371 0008	18,24
5371 0010	17,27
5371 0013	18,81
5380 0165	19,71
5381 0165	31,89
5382 0200	40,57
5383 0200	30,91
5389 0230	36,94
5390 0180	20,37
5390 0230	26,79
5392 0500	80,15
5395 0597	88,38
5396 0600	139,09
5397 0600	168,11
5400 0010	72,45
5400 0020	80,76
5400 0260	322,00
5400 0265	234,47
5403 0251	163,99
5403 0281	220,13
5404 0720	514,43
5406 0250	179,46
5406 0280	238,65
5410 0445	172,01
5410 0600	213,55
5413 0005	11,38
5414 0005	14,19
5415 0005	21,33
5417 0005	33,11
5420 0005	11,38
5421 0190	28,53
5423 0005	65,42
5423 0010	25,17
5423 0015	27,18
5424 0005	18,10
5426 0185	2,63
5429 0195	3,22
5430 0195	3,48
5432 0160	6,04
5433 0195	9,61
5434 0180	9,08
5435 0180	9,36
5438 0155	24,10
5441 0005	5,64
5441 0010	1,72
5442 0005	9,36
5442 0010	1,30
5444 0005	35,23
5444 0010	5,34
5445 0005	153,67
5447 0005	9,52
5448 0120	7,30
5448 1005	2,54
5448 1010	2,54
5448 1015	2,54
5448 1020	2,54
5449 0160	9,22
5450 0160	12,74
5452 0160	10,99
5453 0160	14,58
5454 0160	13,20
5455 0160	15,31
5456 0160	17,69
5459 0160	20,04
5468 0005	58,36
5468 0010	18,11
5470 0005	25,94
5474 0005	12,79
5474 0010	46,11
5478 0005	44,84
5480 0005	53,64
5480 0010	13,16
5480 0015	3,03
5480 0020	1,75
5483 0005	78,38
5486 0005	62,39
5486 0010	24,15
5489 0005	127,80
5489 0010	46,29
5490 0005	67,66
5495 0005	59,38
5497 0005	87,85
5497 0010	86,78
5497 1005	42,02
5497 1010	42,02
5499 0005	12,71
5500 0005	17,31
5501 0006	13,98
5503 0006	26,13
5504 0005	32,38

Catalogue prices in EUR

Part No.	€
5506 0005	154,96
5508 0005	83,18
5509 0005	96,44
5509 0010	96,44
5509 0015	123,15
5510 0005	83,18
5510 0010	83,18
5510 0015	95,76
5510 0020	95,76
5510 0025	78,00
5512 0005	129,45
5512 0015	136,20
5515 0005	161,00
5518 0000	22,42
5518 0005	68,32
5518 0010	68,32
5521 0005	169,05
5524 0005	128,17
5524 0010	138,41
5527 0005	165,03
5529 0005	63,28
5529 0010	96,04
5530 0005	16,01
5530 0010	16,01
5531 0005	79,00
5531 0010	68,32
5534 0005	23,12
5536 0005	116,32
5536 0010	114,00
5536 0013	100,84
5536 0014	104,63
5536 0015	90,48
5537 0005	185,36
5538 0005	253,52
5539 0005	161,00
5540 0005	278,18
5541 0005	33,55
5543 0005	112,32
5544 0005	113,93
5545 0005	34,04
5546 0005	110,39
5547 0005	201,93
5549 0005	265,30
5550 0005	264,04
5551 0005	267,66
5552 0005	33,22
5553 0005	46,29
5554 0005	322,00
5555 0005	40,86
5556 0005	50,72
5557 0005	161,18
5558 0005	40,86
5559 0005	69,44
5560 0005	422,63
5563 0005	5,08
5564 0005	0,89
5564 0010	1,03
5565 0005	1,86
5566 0050	70,46
5567 0005	46,97
5569 0050	22,14
5570 0005	13,09
5571 0010	36,23
5572 0050	55,95
5573 0005	103,65
5575 0005	19,53
5584 0005	75,27
5585 0100	104,25
5585 0200	169,45
5585 0300	143,69
5586 0005	12,88
5587 0005	89,57
5587 0050	113,10

Part No.	€
5587 0100	129,82
5587 0250	193,20
5588 0005	12,22
5590 0005	9,22
5593 0150	17,12
5593 0180	18,10
5593 0250	19,13
5593 0300	26,32
5593 0400	45,62
5593 0560	74,41
5594 0005	5,34
5595 0010	4,32
5595 0015	5,74
5595 0020	7,25
5596 0005	46,29
5598 0160	7,07
5598 0250	8,35
5598 0315	15,35
5599 0175	8,38
5599 0240	7,39
5599 0300	15,65
5600 0005	0,44
5600 0010	1,10
5600 0015	2,12
5600 0020	2,12
5600 0025	3,03
5600 0030	6,44
5600 0035	13,69
5601 0005	19,53
5602 0240	12,46
5603 0005	19,53
5605 0180	13,37
5605 0250	14,19
5605 0300	21,35
5607 0180	24,13
5607 0250	25,17
5607 0300	32,46
5608 0250	21,84
5608 0300	29,75
5609 0250	27,49
5609 0300	35,44
5610 0005	0,56
5610 0010	1,10
5610 0020	2,12
5610 0025	3,03
5611 0250	24,27
5612 0250	20,56
5613 0250	32,08
5614 0000	9,08
5614 0001	9,08
5614 0002	9,66
5614 0003	10,92
5614 0004	18,53
5615 0001	10,34
5615 0011	10,34
5615 0021	10,52
5615 0031	11,62
5615 0041	19,81
5616 0010	41,42
5617 0000	6,98
5617 0001	6,49
5617 0002	6,86
5617 0003	9,96
5617 0004	17,12
5618 0005	92,05
5619 0000	11,41
5619 0001	11,41
5619 0002	11,99
5619 0003	13,55
5619 0004	23,21
5620 0000	9,00
5620 0001	7,07
5620 0002	7,70

Part No.	€
5620 0003	10,71
5620 0004	17,59
5621 0005	92,05
5622 0000	13,16
5622 0001	12,37
5622 0002	13,65
5622 0003	14,91
5622 0004	25,85
5623 0001	7,37
5623 0011	6,86
5623 0021	7,56
5623 0031	10,61
5623 0041	17,75
5624 0051	92,54
5625 0001	12,97
5625 0011	12,97
5625 0021	13,16
5625 0031	14,53
5625 0041	24,85
5626 0001	9,22
5626 0011	7,51
5626 0021	8,16
5626 0031	11,36
5626 0041	18,18
5627 0051	92,54
5628 0001	14,33
5628 0011	13,55
5628 0021	14,91
5628 0031	16,38
5628 0041	28,18
5629 0010	54,79
5630 0180	7,84
5630 0250	8,16
5630 0300	13,76
5631 0000	10,52
5631 0001	9,94
5631 0002	10,92
5631 0003	11,90
5631 0004	20,67
5632 0001	11,41
5632 0011	10,83
5632 0021	11,90
5632 0031	13,16
5632 0041	22,52
5633 0175	15,02
5633 0240	16,89
5633 0280	25,88
5633 0300	35,25
5636 0250	27,18
5639 0178	15,03
5640 0100	13,86
5640 0150	15,00
5640 0225	19,55
5642 0280	13,90
5645 0280	13,97
5648 0280	15,61
5651 0100	40,85
5651 0200	44,92
5657 0110	52,78
5658 0200	32,52
5661 0100	63,70
5663 0110	59,62
5664 0200	35,84
5665 0200	35,05
5666 0200	30,47
5674 0460	48,20
5674 0461	22,33
5674 0610	62,88
5674 0611	30,78
5674 0760	84,02
5674 0761	47,20
5674 0910	116,25
5674 0911	55,09

Part No.	€
5677 0950	88,39
5677 0951	45,78
5694 0250	12,48
5695 0250	16,96
5696 0250	21,46
5700 0025	1,28
5700 0040	1,35
5700 0050	1,35
5700 0055	1,45
5700 0060	1,58
5700 0080	1,65
5700 0090	1,72
5700 0100	1,72
5700 0105	1,75
5700 0120	1,96
5700 0125	1,79
5700 0135	2,10
5700 0140	2,17
5700 0145	2,33
5700 0150	2,42
5700 0160	2,54
5700 0170	2,68
5700 0180	3,17
5700 0185	2,82
5700 0195	3,03
5700 0210	3,41
5700 0230	3,76
5700 0235	4,46
5700 0245	4,01
5700 0255	4,67
5700 0270	4,92
5700 0280	5,16
5700 0290	6,11
5700 0300	7,05
5700 0310	7,67
5700 0320	8,02
5700 0335	15,56
5703 0002	4,01
5703 0005	4,01
5703 0010	4,01
5703 0015	3,12
5703 0025	2,63
5703 0027	3,12
5703 0030	3,34
5703 0034	3,45
5703 0040	2,68
5703 0050	3,26
5703 0052	3,62
5703 0053	3,62
5703 0055	3,05
5703 0057	3,57
5703 0060	4,08
5703 0067	4,20
5703 0070	4,15
5703 0072	4,20
5703 0080	3,66
5703 0090	4,11
5703 0100	4,11
5703 0105	4,46
5703 0115	4,66
5703 0120	4,55
5703 0125	3,94
5703 0135	4,55
5703 0140	4,25
5703 0145	5,11
5703 0150	5,20
5703 0160	5,01
5703 0165	6,46
5703 0170	6,04
5703 0180	6,88
5703 0185	5,86
5703 0195	6,46
5703 0205	7,47

Part No.	€
5703 0210	6,81
5703 0220	8,35
5703 0225	7,82
5703 0230	7,82
5703 0235	9,22
5703 0245	9,01
5703 0255	10,96
5703 0270	10,96
5703 0280	10,96
5703 0285	12,53
5703 0290	19,64
5703 0300	19,64
5703 0310	23,17
5703 0320	26,15
5703 0325	30,49
5703 0335	34,88
5703 0340	48,58
5706 0005	15,05
5706 0010	18,06
5706 0020	30,99
5709 0005	31,08
5709 0015	45,40
5709 0017	65,43
5709 0020	65,38
5709 0025	44,99
5709 0030	72,63
5712 0005	3,40
5712 0010	3,75
5712 0015	3,94
5712 0020	4,60
5712 0025	4,81
5712 0030	5,23
5712 0035	5,37
5712 0040	5,81
5712 0050	7,14
5712 0055	7,14
5712 0065	8,07
5712 0070	9,96
5712 0075	12,23
5713 0005	3,08
5713 0010	3,08
5713 0015	3,08
5713 0020	3,08
5713 0025	3,08
5713 0030	3,08
5713 0035	3,47
5713 0040	3,47
5713 0045	3,47
5713 0050	3,47
5713 0055	3,66
5713 0060	3,66
5713 0065	4,43
5714 0005	15,21
5714 0010	15,54
5714 0015	20,02
5714 0020	17,59
5714 0025	20,02
5714 0030	20,02
5714 0035	23,31
5714 0040	23,31
5714 0045	28,70
5714 0050	31,64
5714 0055	34,30
5714 0060	38,26
5715 0006	1,73
5715 0007	1,73
5715 0008	1,73
5715 0009	1,75
5715 0010	1,75
5715 0011	1,96
5715 0012	2,07
5715 0013	2,07
5715 0014	2,14

Part No.	€
5715 0015	2,68
5715 0016	2,70
5715 0017	2,17
5715 0018	4,25
5715 0019	2,66
5715 0022	3,12
5715 0024	4,18
5715 0025	4,39
5715 0027	4,94
5715 0030	5,93
5715 0032	6,58
5715 0034	11,69
5715 0036	9,08
5715 0038	10,15
5715 0041	10,96
5715 0046	14,39
5715 0050	18,41
5715 0055	20,77
5715 0060	26,51
5715 0065	31,66
5715 0070	40,39
5715 0075	47,78
5715 0080	60,22
5715 0085	82,23
5715 0090	99,30
5715 0095	138,15
5715 0100	144,39
5715 0105	198,35
5715 0110	207,94
5715 0115	283,99
5715 0120	289,21
5716 0015	2,43
5716 0020	3,12
5716 0025	3,89
5716 0030	5,62
5716 0035	8,66
5717 0005	1,77
5717 0015	1,77
5717 0020	1,77
5717 0030	1,87
5717 0035	2,15
5717 0040	2,15
5717 0045	2,15
5717 0055	2,38
5717 0060	2,42
5717 0065	2,68
5717 0070	2,50
5717 0075	2,85
5717 0080	3,68
5717 0085	2,80
5717 0090	3,89
5717 0095	3,97
5717 0100	3,54
5717 0105	4,53
5717 0110	3,97
5717 0120	4,73
5717 0125	5,58
5717 0130	5,88
5717 0135	6,35
5717 0145	8,10
5717 0150	8,10
5717 0155	8,10
5717 0160	10,73
5717 0165	10,73
5717 0170	13,14
5717 0175	17,48
5717 0180	18,06
5717 0185	24,78
5717 0190	29,51
5717 0195	35,12
5720 0006	1,54
5720 0007	1,63
5720 0008	1,65

Part No.	€
5720 0009	1,68
5720 0110	1,75
5720 0111	1,93
5720 0120	2,10
5720 0130	2,17
5720 0140	2,24
5720 0150	2,33
5720 0160	2,63
5720 0170	2,89
5720 0180	3,12
5720 0190	3,27
5720 0200	3,75
5720 0211	4,01
5720 0220	4,08
5720 0240	4,57
5720 0270	6,42
5720 0300	7,60
5720 0320	8,33
5720 0360	15,35
5723 0002	6,14
5723 0004	6,14
5723 0005	6,14
5723 0006	4,06
5723 0007	4,06
5723 0008	4,17
5723 0009	4,34
5723 0010	6,14
5723 0015	6,14
5723 0020	6,14
5723 0025	6,14
5723 0110	4,31
5723 0111	4,73
5723 0120	5,06
5723 0130	5,06
5723 0140	5,46
5723 0150	5,81
5723 0160	6,20
5723 0170	6,00
5723 0180	7,16
5723 0190	7,02
5723 0200	8,47
5723 0211	8,70
5723 0220	9,71
5723 0230	10,06
5723 0240	10,92
5723 0250	10,92
5723 0255	11,22
5723 0270	12,65
5723 0280	14,51
5723 0290	14,81
5723 0300	15,10
5723 0320	16,54
5723 0360	31,71
5725 0005	4,83
5725 0010	4,83
5725 0015	4,88
5725 0020	4,95
5725 0025	5,32
5725 0030	5,90
5725 0035	6,28
5725 0040	7,23
5725 0045	8,19
5725 0050	8,49
5725 0055	9,50
5725 0060	10,78
5725 0065	12,43
5725 0070	12,16
5725 0800	61,08
5726 0005	16,57
5726 0015	23,78
5726 0025	28,74
5729 0010	53,55
5729 0020	61,69

Catalogue prices in EUR

Part No.	€
5729 0030	102,66
5732 0008	5,41
5732 0009	5,72
5732 0010	6,67
5732 0011	6,67
5732 0012	6,67
5732 0013	6,67
5732 0014	8,05
5732 0015	8,05
5732 0016	9,49
5732 0017	9,49
5732 0018	11,71
5732 0019	11,71
5732 0021	13,44
5732 0022	13,44
5732 0024	14,93
5732 0027	19,16
5732 0030	30,29
5732 0032	36,65
5732 0033	45,87
5732 0034	45,87
5732 0036	45,87
5732 0041	52,22
5732 0046	84,58
5733 0010	60,38
5733 0015	170,42
5735 0000	4,95
5735 0005	4,95
5735 0006	4,73
5735 0007	4,73
5735 0008	4,67
5735 0009	5,25
5735 0010	5,25
5735 0011	5,64
5735 0012	5,95
5735 0013	6,46
5735 0014	6,53
5735 0015	7,70
5735 0016	8,33
5735 0017	8,61
5735 0018	9,64
5735 0019	10,10
5735 0020	10,69
5735 0021	11,11
5735 0022	12,46
5735 0023	13,46
5735 0024	14,07
5735 0025	14,79
5735 0026	14,95
5735 0027	15,93
5735 0028	18,15
5735 0029	19,37
5735 0030	20,35
5735 0032	21,30
5735 0033	24,15
5735 0034	27,60
5735 0036	36,68
5735 0038	43,86
5735 0041	45,62
5735 0046	63,81
5735 0050	78,45
5735 0055	97,84
5735 0060	135,89
5736 0000	52,50
5736 0005	69,37
5736 0010	78,52
5736 0015	132,70
5738 0005	7,37
5738 0010	7,53
5738 0015	7,70
5738 0020	7,93
5738 0025	8,40
5738 0030	9,00

Part No.	€
5738 0035	9,31
5738 0040	9,75
5738 0045	10,31
5738 0050	10,87
5738 0055	11,57
5738 0060	11,81
5738 0065	16,24
5738 0070	18,53
5738 0075	40,88
5738 0080	45,50
5738 0085	53,48
5739 0015	1,63
5739 0030	1,79
5739 0040	1,79
5739 0055	2,10
5739 0065	2,17
5739 0075	2,29
5739 0090	2,36
5739 0095	2,42
5739 0110	2,54
5739 0120	2,54
5739 0125	2,70
5739 0135	2,82
5739 0145	2,82
5739 0155	3,48
5739 0165	3,48
5739 0180	4,29
5739 0190	4,59
5739 0200	4,29
5739 0210	4,62
5739 0225	4,92
5739 0240	5,43
5739 0245	6,70
5739 0250	6,06
5739 0260	7,37
5739 0270	7,37
5739 0290	10,57
5739 0295	10,57
5739 0300	10,75
5739 0315	11,39
5740 0005	10,89
5740 0010	10,89
5740 0015	11,50
5740 0020	11,50
5740 0025	11,81
5740 0030	11,81
5740 0035	13,70
5740 0040	13,70
5740 0045	16,28
5740 0050	16,28
5740 0055	17,48
5740 0060	17,48
5740 0065	25,87
5740 0070	30,56
5741 0005	39,41
5741 0010	131,39
5742 0005	6,88
5742 0015	5,67
5742 0020	6,88
5742 0030	5,78
5742 0040	6,69
5742 0045	7,49
5742 0055	6,32
5742 0057	7,47
5742 0065	7,75
5742 0067	8,05
5742 0068	8,10
5742 0075	6,70
5742 0080	7,82
5742 0090	7,82
5742 0095	7,96
5742 0100	9,10
5742 0110	8,89

Part No.	€
5742 0120	7,25
5742 0125	8,89
5742 0135	8,19
5742 0145	9,96
5742 0155	9,52
5742 0165	8,98
5742 0170	12,22
5742 0180	11,95
5742 0190	13,91
5742 0200	10,55
5742 0210	12,74
5742 0215	14,26
5742 0225	13,91
5742 0227	16,22
5742 0230	15,10
5742 0240	14,26
5742 0245	16,05
5742 0250	15,75
5742 0252	20,42
5742 0255	18,62
5742 0260	18,15
5742 0270	18,15
5742 0280	20,74
5742 0290	31,62
5742 0295	31,62
5742 0300	36,73
5742 0315	38,96
5742 0317	44,99
5742 0320	52,22
5742 0325	66,12
5742 0330	105,16
5742 0335	204,17
5742 0340	342,91
5742 0345	433,00
5743 0005	57,05
5743 0010	188,02
5744 0005	10,87
5744 0010	11,25
5744 0015	11,95
5744 0020	12,22
5744 0025	12,76
5744 0030	13,16
5744 0035	13,97
5744 0040	14,58
5744 0045	15,98
5744 0050	16,59
5744 0055	17,40
5744 0060	17,99
5745 0005	2,96
5745 0010	1,86
5745 0015	3,73
5745 0020	4,53
5745 0025	3,52
5746 0010	140,07
5746 0015	212,89
5748 0005	20,88
5748 0010	25,52
5748 0020	44,08
5751 0005	59,48
5751 0007	86,45
5751 0015	91,95
5751 0020	120,44
5751 0025	80,08
5751 0030	120,12
5754 0010	1,45
5754 0015	1,58
5754 0030	1,58
5754 0035	1,79
5754 0045	1,93
5754 0055	1,93
5754 0060	2,15
5754 0070	2,21
5754 0075	2,15

Part No.	€
5754 0090	2,24
5754 0100	2,73
5754 0110	2,73
5754 0120	3,05
5754 0130	3,50
5754 0140	3,68
5754 0155	3,85
5754 0165	4,87
5754 0175	6,83
5757 0010	7,30
5757 0015	7,54
5757 0030	6,95
5757 0035	7,14
5757 0040	7,89
5757 0045	8,19
5757 0060	8,87
5757 0070	9,03
5757 0075	8,68
5757 0080	9,03
5757 0090	9,03
5757 0100	9,15
5757 0110	9,15
5757 0115	10,05
5757 0117	12,16
5757 0120	10,59
5757 0130	11,10
5757 0140	11,80
5757 0150	12,92
5757 0155	12,71
5757 0160	14,61
5757 0165	14,25
5757 0167	17,34
5757 0175	17,34
5757 0185	25,78
5757 0190	25,78
5757 0195	31,34
5757 0200	44,38
5757 0205	55,27
5760 0010	30,92
5762 0008	23,22
5762 0010	23,45
5762 0012	25,18
5762 0013	29,07
5762 0014	26,81
5762 0017	33,44
5762 0020	38,12
5763 0005	67,60
5763 0015	123,11
5765 0008	10,19
5765 0009	11,22
5765 0010	10,99
5765 0011	11,22
5765 0012	11,43
5765 0013	12,48
5765 0014	12,48
5765 0015	11,22
5765 0017	13,98
5765 0019	16,85
5765 0022	18,92
5765 0024	23,19
5765 0030	30,42
5766 0024	18,41
5766 0027	18,95
5766 0030	20,35
5766 0032	21,54
5766 0034	28,28
5766 0036	27,62
5766 0041	32,10
5766 0046	37,66
5766 0050	44,12
5766 0055	47,53
5766 0060	63,14
5766 0065	67,92

Part No.	€
5766 0070	81,03
5766 0075	87,03
5766 0080	107,84
5766 0085	107,84
5766 0090	208,44
5766 0095	228,43
5767 0005	15,07
5767 0010	22,00
5767 0015	32,81
5767 0020	44,03
5768 0005	9,38
5768 0010	10,87
5768 0015	9,64
5768 0020	10,78
5768 0025	11,48
5768 0030	12,11
5768 0035	17,31
5770 0027	13,86
5770 0030	14,84
5770 0032	15,24
5770 0036	17,69
5770 0041	23,64
5770 0046	28,56
5770 0050	33,01
5770 0055	41,28
5770 0060	44,54
5770 0065	55,91
5770 0070	70,70
5770 0075	76,53
5770 0080	92,47
5770 0085	99,94
5770 0090	138,15
5770 0095	144,39
5770 0100	274,09
5770 0105	297,66
5770 0110	301,72
5770 0115	402,22
5770 0120	416,85
5772 0005	1,77
5772 0010	1,89
5772 0015	2,14
5772 0020	2,05
5772 0025	2,40
5772 0030	2,31
5772 0035	2,68
5772 0040	2,89
5772 0045	3,26
5772 0050	2,50
5772 0055	2,98
5772 0060	3,26
5772 0065	3,26
5772 0070	3,73
5772 0075	3,55
5772 0080	4,22
5772 0085	4,73
5772 0090	6,09
5772 0095	9,66
5772 0100	31,15
5773 0024	11,57
5773 0027	14,18
5773 0030	16,59
5773 0032	17,82
5773 0034	18,80
5773 0036	22,00
5773 0041	28,75
5773 0046	30,89
5773 0050	35,82
5773 0055	39,71
5773 0060	42,82
5773 0065	55,98
5773 0070	61,69
5773 0075	66,87
5773 0080	94,68

Part No.	€
5773 0085	115,29
5773 0090	138,86
5773 0095	156,75
5773 0100	176,10
5773 0105	220,78
5773 0110	238,16
5773 0115	258,90
5773 0120	567,98
5775 0005	28,47
5776 0011	12,09
5776 0012	14,30
5776 0013	15,28
5776 0014	15,28
5776 0015	15,28
5776 0016	18,41
5776 0017	15,28
5776 0019	19,27
5778 0005	1,30
5778 0006	1,49
5778 0008	1,68
5778 0010	2,03
5778 0012	3,03
5778 0014	4,01
5778 0016	8,42
5778 0018	10,12
5778 0020	14,77
5779 0010	11,81
5779 0011	12,08
5779 0012	13,13
5779 0013	13,13
5779 0014	13,70
5779 0015	14,32
5779 0016	15,70
5779 0017	15,70
5779 0018	17,47
5779 0019	17,47
5781 0005	4,71
5784 0004	1,59
5784 0005	1,72
5784 0006	1,82
5784 0008	2,10
5784 0010	2,33
5784 0012	2,77
5784 0016	4,03
5790 0060	3,12
5790 0070	3,12
5790 0080	2,77
5790 0090	2,77
5790 0100	2,77
5790 0110	3,12
5790 0120	3,40
5790 0130	3,80
5790 0140	4,13
5790 0150	4,67
5790 0160	5,55
5790 0170	5,79
5790 0180	5,95
5790 0190	6,48
5790 0210	8,16
5790 0220	8,16
5790 0240	10,59
5790 0270	13,67
5790 0300	18,08
5790 0320	18,08
5790 0340	20,44
5790 0360	22,68
5790 0600	76,72
5790 1200	51,12
5797 0250	17,08
5800 0050	3,55
5800 0055	3,55
5800 0060	3,55
5800 0070	3,96

Part No.	€
5800 0080	4,04
5800 0090	4,24
5800 0100	4,29
5800 0110	5,04
5800 0120	5,15
5800 0130	5,30
5801 0050	6,32
5801 0055	6,32
5801 0060	6,69
5801 0070	7,02
5801 0080	9,03
5801 0100	9,63
5801 0130	11,90
5803 0055	6,67
5803 0060	6,79
5803 0070	7,21
5803 0080	7,40
5803 0090	7,70
5803 0100	8,73
5803 0110	9,42
5803 0120	9,64
5803 0130	11,52
5806 0055	3,59
5806 0060	3,66
5806 0070	3,68
5806 0080	3,75
5806 0090	3,78
5806 0100	3,97
5806 0110	4,17
5806 0120	4,24
5806 0130	4,67
5806 0140	4,76
5806 0150	5,18
5806 0160	5,27
5806 0170	5,18
5806 0171	7,05
5809 0060	10,27
5809 0070	10,73
5809 0080	11,22
5812 0020	5,16
5812 0025	6,69
5812 0030	8,07
5812 0036	10,01
5818 0020	14,44
5818 0025	15,47
5818 0030	19,90
5818 0036	29,19
5818 0040	41,84
5818 0045	65,33
5820 0250	21,25
5821 0005	6,20
5821 0010	6,30
5821 0015	6,30
5821 0020	6,76
5821 0025	6,76
5821 0030	7,61
5821 0035	7,61
5821 0040	9,01
5821 0045	9,01
5821 0050	11,32
5821 0055	11,32
5821 0060	16,14
5821 0065	16,14
5821 0070	23,07
5821 0075	23,07
5821 0080	60,87
5821 0085	60,87
5823 0005	7,56
5823 0010	7,56
5823 0015	7,56
5823 0020	7,56
5823 0025	8,58
5823 0030	8,58

Catalogue prices in EUR

Part No.	€
5823 0035	9,42
5823 0040	9,42
5823 0045	11,24
5823 0050	11,24
5823 0055	13,74
5823 0060	13,74
5823 0065	20,69
5823 0070	20,69
5823 0075	26,29
5823 0080	26,29
5823 0085	65,17
5823 0090	65,17
5825 0030	16,80
5825 0040	16,80
5825 0050	19,30
5825 0060	19,30
5825 0080	20,18
5827 0005	4,01
5828 0005	3,94
5830 0006	22,49
5830 0008	27,13
5830 0010	30,42
5830 0012	37,07
5830 0016	53,39
5830 0020	72,89
5831 0008	6,25
5831 0009	6,67
5831 0010	6,25
5831 0011	6,67
5831 0012	6,46
5831 0013	6,25
5831 0014	7,49
5831 0017	7,25
5831 0018	8,33
5831 0019	8,21
5831 0021	8,21
5831 0022	8,21
5831 0024	10,31
5831 0027	10,31
5831 0030	14,44
5831 0032	14,44
5831 0036	16,42
5831 0041	16,42
5832 0009	6,49
5832 0010	6,49
5832 0012	7,49
5832 0014	7,49
5832 0017	8,21
5832 0019	8,21
5840 0007	0,18
5840 0009	0,18
5840 0013	0,09
5840 0015	0,09
5840 0020	0,11
5840 0025	0,11
5840 0030	0,12
5840 0035	0,16
5840 0040	0,18
5840 0045	0,26
5840 0050	0,26
5840 0055	0,32
5840 0060	0,35
5840 0070	0,47
5840 0080	0,58
5840 0090	0,72
5840 0100	0,84
5840 0120	1,26
5840 0140	2,15
5840 0170	3,57
5840 0190	4,74
5840 0220	7,49
5840 0240	11,27
5840 0270	14,19
5840 0300	23,70
5840 0320	33,60
5840 0360	47,32
5841 0005	0,11
5841 0010	0,11
5841 0015	0,11
5841 0020	0,12
5841 0025	0,14
5841 0030	0,16
5841 0035	0,21
5841 0040	0,30
5841 0045	0,35
5841 0050	0,40
5841 0055	0,54
5841 0060	0,68
5841 0065	0,98
5841 0070	1,23
5841 0075	1,93
5841 0080	2,29
5841 0085	3,64
5841 0090	5,09
5841 0095	7,81
5841 0100	13,42
5844 0020	0,19
5844 0025	0,23
5844 0030	0,28
5844 0040	0,42
5844 0050	0,51
5844 0060	0,67
5844 0080	0,96
5844 0100	1,44
5844 0120	1,86
5844 0140	2,99
5844 0170	5,76
5844 0190	7,60
5847 0005	4,17
5847 0010	4,10
5847 0013	4,20
5847 0015	4,85
5847 0020	6,30
5847 0025	5,44
5847 0030	6,98
5847 0035	3,20
5847 0040	6,90
5847 0045	3,48
5847 0050	12,09
5847 0055	10,71
5847 0060	15,82
5847 0065	17,83
5850 0005	1,37
5850 0010	1,44
5850 0015	1,17
5850 0020	1,35
5850 0025	1,54
5850 0030	1,35
5850 0035	1,54
5850 0040	1,72
5850 0045	1,54
5850 0050	1,66
5850 0055	1,82
5850 0060	1,66
5850 0065	1,82
5850 0070	1,94
5850 0080	2,01
5850 0085	2,21
5850 0090	2,35
5850 0095	4,17
5856 0015	0,32
5856 0020	0,35
5856 0025	0,40
5856 0030	0,47
5856 0040	0,67
5856 0050	0,79
5856 0060	1,09
5856 0070	1,30
5856 0080	1,54
5856 0100	2,12
5856 0120	3,10
5858 0005	12,34
5858 0010	9,71
5859 0005	0,86
5859 0015	0,86
5859 0025	1,05
5859 0035	1,58
5859 0050	1,58
5859 0060	1,93
5859 0070	2,10
5859 0075	2,38
5859 0085	2,70
5859 0090	3,06
5859 0100	4,60
5860 0005	2,52
5860 0015	2,52
5860 0025	2,45
5860 0035	2,38
5860 0050	2,64
5860 0060	2,99
5860 0070	4,01
5860 0085	5,01
5860 0090	6,76
5861 0005	0,56
5861 0015	0,56
5861 0025	0,56
5861 0035	0,68
5861 0050	0,72
5861 0060	0,89
5861 0070	1,16
5861 0075	1,44
5861 0085	1,86
5861 0090	2,57
5861 0100	3,48
5863 0009	16,38
5865 0005	0,72
5865 0010	0,72
5865 0015	0,75
5865 0020	2,12
5865 0025	2,19
5865 0030	2,33
5865 0035	2,73
5865 0040	3,80
5865 0045	4,99
5865 0050	4,74
5865 0100	22,72
5866 0009	23,87
5867 0005	2,64
5867 0010	2,87
5867 0020	2,92
5867 0030	2,98
5867 0040	3,26
5867 0050	3,99
5867 0060	5,04
5867 0070	6,86
5867 0080	8,75
5867 0090	10,06
5868 0005	25,18
5869 0009	11,39
5870 0010	2,68
5870 0020	2,68
5870 0030	2,71
5870 0040	3,01
5870 0050	3,66
5870 0060	4,62
5870 0070	6,30
5871 0005	22,93
5872 0005	2,71
5872 0015	2,56
5872 0025	2,47
5872 0035	2,38
5872 0050	2,64
5872 0060	2,99
5872 0070	4,20
5872 0085	5,20
5872 0090	6,83
5874 0030	0,28
5874 0040	0,32
5874 0050	0,42
5874 0060	0,51
5874 0080	0,86
5874 0100	1,33
5874 0120	1,91
5874 0140	3,01
5874 0170	4,94
5875 0005	22,03
5876 0060	1,03
5876 0070	1,03
5876 0080	1,03
5876 0090	1,03
5876 0100	1,03
5876 0150	1,05
5876 0200	1,05
5876 0250	1,05
5876 0270	1,07
5876 0300	1,14
5876 0400	1,35
5876 0450	1,49
5876 0500	1,72
5876 0550	2,36
5876 0600	3,20
5877 0005	10,66
5877 0010	9,63
5879 0001	1,61
5879 0002	1,61
5879 0003	1,61
5879 0004	1,61
5879 0005	1,61
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5879 0025	1,61
5880 0005	2,94
5880 0010	3,01
5880 0015	3,03
5880 0020	3,17
5880 0025	3,24
5880 0030	3,57
5880 0035	3,29
5880 0040	3,75
5880 0045	3,38
5880 0050	3,92
5880 0055	3,38
5880 0060	4,17
5880 0065	3,62
5881 0090	1,23
5881 0100	1,23
5881 0150	1,23
5881 0200	1,45
5881 0250	1,56
5881 0270	1,61
5881 0300	1,75
5881 0400	1,75
5881 1800	18,04
5882 0090	2,26
5882 0100	2,42
5882 0150	2,50
5882 0200	2,56
5882 0250	2,70
5882 0270	2,78
5882 0300	2,84
5882 0400	3,12
5882 1800	22,24
5883 0005	2,12
5883 0010	2,12
5883 0020	2,15
5883 0030	2,15
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5883 0070	2,49
5883 0080	2,56
5883 0090	2,78
5883 0100	3,05
5883 0105	3,52
5886 0005	4,13
5886 0010	4,13
5886 0020	4,08
5886 0030	4,11
5886 0035	4,08
5886 0040	4,17
5886 0050	4,24
5886 0060	4,32
5886 0070	4,57
5886 0080	5,01
5886 0090	5,27
5886 0100	5,93
5886 0105	7,02
5887 0080	1,56
5887 0090	1,63
5887 0100	1,70
5887 0150	1,77
5887 0200	1,89
5887 0250	1,96
5887 0270	2,01
5887 0300	2,15
5887 0400	2,24
5888 0005	16,99
5895 0050	5,76
5895 0060	6,06
5895 0070	6,30
5895 0080	7,53
5895 0090	7,46
5895 0100	8,96
5895 0105	10,75
5897 0050	5,64
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5897 0070	6,09
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5898 0020	6,69
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5898 0070	6,74
5898 0080	7,37
5898 0090	7,81
5898 0100	8,72
5902 0005	14,91
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5904 0020	4,46
5904 0025	4,69
5904 0030	5,44
5904 0040	6,13
5904 0100	29,49
5905 0005	5,36
5905 0006	4,73
5905 0007	4,73
5905 0008	4,73
5905 0009	4,73
5905 0010	4,87
5905 0015	4,94
5905 0020	4,99
5905 0025	5,09
5905 0027	5,36
5905 0030	5,60
5905 0040	5,95
5905 0045	7,42
5906 0008	5,51
5906 0009	5,51
5906 0010	5,86
5906 0015	5,86
5906 0020	5,93
5906 0025	6,32
5906 0027	6,90
5906 0030	7,23
5906 0040	8,23
5908 0005	28,75
5909 0005	43,86
5910 0005	37,96
5911 0005	37,94
5915 0002	5,78
5915 0003	5,78
5915 0004	6,74
5915 0005	6,74
6003 0010	64,56
6003 0020	103,93
6003 0030	120,72
6006 0010	110,11
6006 0020	137,17
6007 0010	83,70
6007 0020	108,64
6007 0030	130,41
6009 0010	128,29
6009 0020	190,38
6009 0030	211,12
6009 0040	224,28
6010 0010	83,74
6010 0020	83,74
6010 0030	66,85
6010 0040	66,85
6012 0010	18,10
6013 0010	27,83
6015 0050	3,27
6015 0075	3,31
6015 0105	3,31
6015 0150	3,31
6016 0055	5,06
6016 0100	5,20
6016 0120	9,57
6016 0150	5,27
6016 0300	7,25
6018 0010	18,41
6020 0010	3,68
6021 0010	6,95
6022 0010	35,19
6023 0010	37,43
6024 0020	35,18
6025 0010	15,12
6026 0010	20,70
6027 0020	3,68
6028 0010	5,53
6030 0010	2,42
6033 0020	8,03
6034 0010	15,59
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6040 0120	3,43
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6048 0020	4,73
6048 0030	4,73
6048 0040	4,73
6049 0010	2,80
6049 0020	2,80

Catalogue prices in EUR

Part No.	€
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6049 0040	3,01
6050 0010	4,73
6050 0020	4,73
6050 0030	4,73
6050 0040	4,73
6051 0010	2,98
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6053 0020	4,39
6053 0025	4,39
6053 0027	4,39
6053 0030	4,39
6053 0040	4,39
6054 0008	5,27
6054 0009	5,27
6054 0010	5,27
6054 0015	5,27
6054 0020	5,27
6054 0025	5,27
6054 0027	5,27
6054 0030	5,27
6054 0040	5,92
6054 0100	84,51
6055 0010	108,80
6055 0020	159,43
6055 0030	187,71
6055 0040	218,42
6055 0050	250,67
6056 0010	87,80
6057 0010	20,77
6057 0050	2,33
6058 0010	21,54
6059 0010	45,34
6059 0020	43,51
6059 0510	50,05
6060 0125	4,34
6060 0250	5,69
6061 0075	6,30
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6061 0305	11,22
6061 5000	23,35
6062 0010	7,60
6063 0010	8,98
6064 0010	9,87
6065 0010	18,29
6066 0010	3,22
6067 0010	5,95
6068 0010	3,52
6069 0010	5,95
6070 0006	2,05
6070 0007	1,87
6070 0008	1,87
6070 0009	1,87
6070 0010	1,87
6070 0011	1,93
6070 0013	1,93
6070 0014	1,93
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6070 0018	2,05
6070 0019	2,12
6070 0022	2,24
6071 0006	4,67
6071 0007	4,67
6071 0008	4,67
6071 0009	4,67
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6071 2025	5,13
6071 3005	7,00
6071 3007	7,77
6071 3010	8,16
6071 3015	8,44
6071 4005	8,30
6071 4010	8,30
6071 4015	8,30
6071 4105	9,47
6071 4110	9,47
6071 4115	9,47
6071 5005	6,81
6071 5010	6,81
6071 5015	6,81
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6071 6035	6,76
6071 6040	6,76
6071 7014	22,12
6072 0010	96,16
6072 0020	122,20
6073 0005	22,00
6073 0500	31,55
6074 0010	100,19
6074 0020	160,56
6074 0031	218,68
6074 0040	368,29
6075 0010	115,27
6075 0100	154,42
6076 0010	10,99
6077 0010	100,19
6077 0020	160,56
6077 0031	218,68
6078 0020	25,52
6080 0010	24,55
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6087 0010	78,49
6088 0010	25,94
6089 0010	4,55
6092 0010	1,68
6093 0020	2,57
6095 0075	4,15
6095 0125	4,39
6095 0250	5,93
6096 0063	6,88
6096 0076	6,88
6096 0125	7,39
6096 0180	8,28
6096 0250	10,12
6097 0125	17,52
6097 0250	19,41
6098 0010	28,89
6098 0020	31,89
6100 0020	7,82
6101 0010	10,45
6103 0010	10,01
6104 0020	18,66
6106 0010	3,52
6107 0020	6,49
6108 0010	6,37
6109 0020	8,31
6111 0081	2,14
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6111 0190	2,35
6111 0210	2,35
6111 0220	2,35
6111 0240	2,68
6111 0271	3,13
6111 0301	3,13
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6111 0341	3,13
6113 0081	4,78
6113 0091	4,78
6113 0101	4,08
6113 0111	4,39
6113 0121	4,39
6113 0131	4,08
6113 0141	4,52
6113 0150	4,52
6113 0160	4,52
6113 0170	4,80
6113 0180	5,15
6113 0190	4,80
6113 0200	5,23
6113 0210	5,65
6113 0220	5,27
6113 0230	5,79
6113 0240	5,81
6113 0250	6,69
6113 0260	6,34
6113 0271	7,30
6113 0280	7,79
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6113 0321	7,82
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6114 0131	4,08
6114 0141	4,52
6114 0150	4,52
6114 0160	4,52
6114 0170	4,80
6114 0180	5,15
6114 0190	4,80
6114 0200	5,23
6114 0210	5,65
6114 0220	5,27
6114 0230	5,79
6114 0240	5,81
6114 0250	6,84
6114 0260	6,53
6114 0271	7,49
6114 0280	7,96
6114 0290	8,31
6114 0301	8,02
6114 0321	8,02
6116 0010	4,95
6116 0020	5,44
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6116 0080	5,22
6116 0090	5,22
6116 0100	5,55
6116 0110	5,55
6116 0120	5,55
6116 0130	6,20
6116 0140	6,20
6116 0150	6,67
6116 0160	6,67
6116 0170	8,19
6116 0180	8,19
6116 0190	8,51
6116 0200	8,73
6117 0012	23,80
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6118 0140	6,25
6118 0170	6,67
6118 0190	7,16
6118 0220	7,77
6118 0240	8,65
6118 0270	8,75
6119 0100	10,82
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6119 0130	10,82
6119 0140	11,25
6119 0150	12,08
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6119 0170	12,08
6119 0180	12,53
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6119 0210	12,65
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6119 0240	13,16
6119 0270	14,70
6119 0300	15,35
6119 0320	15,98
6121 0010	3,13
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6121 0012	3,13
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6121 0016	3,41
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6121 0020	4,36
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6124 0140	7,02
6124 0141	9,71
6124 0170	7,79
6124 0190	8,09
6126 0010	53,08
6127 0010	60,76
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6128 0010	150,24
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6135 0400	15,61
6136 0020	9,40
6137 0010	17,76
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6142 0010	16,56
6143 0022	6,76
6143 0024	7,02
6143 0027	7,60
6143 0030	7,93
6143 0032	8,03
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6143 0036	10,50
6143 0038	10,87
6143 0041	12,60
6143 0046	14,42
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6143 0055	20,32
6143 0060	23,94
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6144 0032	10,59
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6144 0034	13,44
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6144 0038	13,58
6144 0041	21,25
6144 0046	22,31
6144 0050	26,88
6144 0055	30,54
6144 0060	35,51
6145 0010	875,96
6146 0018	10,97
6146 0019	9,71
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6146 0030	10,59
6146 0032	10,59
6146 0033	13,44
6146 0036	13,44
6146 0038	13,58
6146 0041	21,25
6146 0046	22,31
6146 0050	26,88
6146 0055	30,54
6146 0060	35,51
6147 0010	14,86
6148 0000	12,69
6148 0005	14,86
6148 0010	15,79
6148 0015	17,06
6149 0010	57,61
6151 0010	127,09
6152 0010	73,87
6153 0010	117,41
6153 0020	142,61
6154 0200	20,23
6154 0400	27,11
6156 0010	56,32
6157 0010	11,10
6157 0205	37,56
6157 0405	52,24
6158 0010	18,20
6159 0010	128,05
6161 0010	21,77
6162 0010	26,32
6163 0036	25,17
6163 0041	29,10
6163 0046	34,11
6163 0050	38,19
6163 0055	46,39
6163 0060	53,08
6163 0065	62,90
6163 0070	67,11
6163 0075	76,53
6163 0080	77,53
6165 0040	195,95
6165 0043	394,08
6165 0054	175,93
6166 0047	365,65
6166 0090	818,27
6166 0092	1.495,13
6166 0175	1.699,90
6170 0010	975,10
6170 0015	1.118,25
6170 0020	1.811,23
6170 0040	493,06
6170 0050	549,41
6170 0070	831,16
6170 0100	352,19
6170 0120	1.098,83
6170 0130	1.030,40
6170 0140	1.106,88
6172 0100	279,69
6172 0200	638,37
6173 0005	153,00
6173 0010	68,71
6173 0015	53,99
6173 0020	124,25
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6173 0030	157,24
6173 0035	189,26
6173 0040	104,41
6173 0045	106,03
6173 0050	188,91
6173 0055	215,25
6174 1000	132,79
6174 1200	154,79
6178 0008	3,52
6178 0010	3,52
6178 0011	3,52
6178 0012	3,52
6178 0013	3,52
6178 0014	3,52
6178 0015	3,87
6178 0017	3,87
6178 0019	3,87
6180 0005	41,79
6182 0075	4,01
6182 0150	5,25
6184 0005	14,53
6186 0005	7,28

Catalogue prices in EUR

Part No.	€
6187 0005	0,51
6187 0010	0,51
6188 0005	0,81
6188 0010	0,81
6190 0010	3,80
6190 0011	3,80
6190 0012	3,80
6190 0013	3,80
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6190 0015	4,24
6190 0016	4,24
6190 0017	4,24
6190 0018	4,24
6190 0019	4,24
6190 0021	5,06
6190 0022	5,37
6190 0024	6,34
6190 0027	8,70
6190 0030	9,08
6192 0010	6,90
6192 0013	7,30
6192 0014	7,30
6192 0017	7,68
6192 0019	7,68
6192 0022	9,00
6192 0024	9,77
6192 0027	11,03
6194 0005	44,08
6196 0125	8,93
6196 0250	10,52
6198 0005	16,08
6199 0005	7,28
6200 0010	12,15
6201 0005	0,51
6201 0010	0,51
6202 0005	0,81
6202 0010	0,81
6204 0017	9,33
6204 0018	9,33
6204 0019	9,54
6204 0021	10,10
6204 0022	10,10
6204 0024	10,10
6204 0027	10,96
6204 0030	10,96
6204 0032	12,04
6204 0034	14,88
6204 0036	14,88
6204 0038	15,56
6204 0041	17,99
6206 0017	15,94
6206 0019	15,94
6206 0022	15,94
6206 0024	16,29
6206 0027	16,29
6206 0030	19,11
6206 0032	19,72
6206 0034	25,32
6206 0036	25,32
6206 0038	27,14
6206 0041	29,93
6208 0005	52,90
6210 0175	29,21
6210 0250	36,52
6210 0330	38,12
6212 0005	34,20
6213 0005	12,99
6214 0005	18,64
6215 0005	0,51
6216 0005	0,81
6218 0027	16,49
6218 0030	16,49
6218 0032	16,49
6218 0034	18,32
6218 0036	18,32
6218 0041	21,70
6218 0046	24,87
6218 0050	30,24
6218 0055	36,80
6218 0060	48,06
6220 0027	25,62
6220 0030	25,80
6220 0032	25,80
6220 0034	28,07
6220 0036	28,07
6220 0041	33,69
6220 0046	39,67
6222 0175	46,22
6222 0250	55,16
6222 0330	64,91
6224 0005	71,98
6226 0005	28,42
6227 0005	0,51
6228 0005	0,81
6229 0005	394,31
6229 0010	398,44
6229 0015	504,21
6229 0020	575,87
6230 0035	362,88
6230 0040	333,69
6230 0050	356,67
6230 0060	356,67
6232 0010	198,45
6233 0005	22,23
6233 0010	22,44
6233 0015	22,77
6233 0020	24,05
6233 0025	24,68
6233 0030	26,18
6234 0005	234,01
6234 0010	272,27
6234 0015	302,26
6234 0020	330,73
6234 0025	378,60
6234 0026	508,45
6234 0027	673,40
6234 0030	714,07
6234 0035	874,46
6234 0040	875,18
6234 0045	1.511,28
6234 0050	1.728,34
6236 0005	53,34
6236 0010	55,67
6236 0015	71,12
6236 0020	105,23
6236 0025	274,24
6238 0100	117,32
6238 0105	120,93
6238 0110	105,58
6238 0115	106,44
6239 0005	53,24
6239 0010	53,24
6239 0015	76,56
6240 0100	518,79
6241 0006	151,76
6241 0011	173,85
6241 0016	178,87
6241 0020	165,78
6241 0025	178,06
6241 0030	204,65
6241 0035	321,91
6241 0040	531,25
6241 0045	602,72
6241 0050	227,19
6241 0060	237,34
6241 0070	259,16
6242 0011	124,64
6242 0016	130,76
6242 0020	136,85
6242 0026	153,48
6242 0030	157,33
6242 0035	179,67
6242 0040	267,07
6244 0007	26,22
6244 0008	26,22
6244 0009	26,22
6244 0010	26,22
6244 0011	26,22
6244 0012	26,22
6244 0013	26,22
6244 0014	26,22
6244 0015	26,22
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6244 0017	26,22
6244 0018	26,22
6244 0019	26,22
6244 0113	29,91
6244 0114	29,91
6244 0115	29,91
6244 0116	29,91
6244 0117	29,91
6244 0118	29,91
6244 0119	29,91
6244 0121	35,82
6244 0122	35,82
6244 0124	35,82
6244 0127	35,82
6244 0130	40,30
6244 0132	40,30
6245 0007	27,65
6245 0008	27,65
6245 0010	27,65
6245 0011	27,65
6245 0012	27,65
6245 0013	27,65
6245 0014	27,65
6245 0015	27,65
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6245 0122	36,54
6245 0124	36,54
6245 0127	36,54
6245 0130	41,14
6245 0132	41,14
6245 0134	45,17
6245 0136	45,17
6245 0141	45,17
6246 0010	29,10
6246 0011	29,10
6246 0012	29,10
6246 0013	29,10
6246 0014	29,10
6246 0017	29,10
6246 0018	29,10
6246 0019	29,10
6246 0022	29,10
6247 0010	63,84
6247 0020	66,54
6247 0030	66,54
6247 0040	96,44
6248 0010	26,78
6248 0020	26,78
6248 0030	28,63
6248 0040	47,78
6249 0010	27,65
6249 0020	58,00
6250 0010	21,63
6250 0020	25,60
6251 0010	1.513,89
6251 0030	1.561,11
6252 0010	1.069,30
6252 0020	1.136,84
6254 0005	2.514,80
6254 0011	2.514,80
6254 0015	2.514,80
6254 0021	2.514,80
6254 0023	2.894,36
6254 0025	2.894,47
6254 0030	2.894,47
6254 0035	2.894,47
6254 0038	3.284,45
6254 0040	3.284,45
6254 0045	3.284,45
6254 0050	3.284,45
6256 0201	474,27
6256 0300	506,38
6256 1200	547,12
6256 1300	581,09
6260 0035	1,35
6260 0045	1,45
6260 0055	1,77
6260 0070	2,03
6260 0090	2,64
6260 0100	3,13
6260 0120	4,10
6260 0140	5,16
6264 0035	4,11
6264 0045	4,69
6264 0055	6,18
6264 0070	7,54
6264 0090	10,01
6264 0100	12,32
6264 0120	16,08
6264 0140	20,53
6266 0025	1,45
6266 0030	1,44
6266 0035	1,54
6266 0040	1,75
6266 0045	1,75
6266 0055	2,12
6266 0070	2,68
6266 0090	2,82
6266 0100	3,89
6266 0120	6,23
6268 0040	2,01
6268 0055	2,17
6268 0065	2,78
6270 0015	2,01
6270 0020	2,01
6270 0025	2,07
6270 0030	2,42
6270 0032	3,06
6270 0034	3,61
6270 0035	2,71
6270 0037	2,91
6270 0038	4,43
6270 0040	3,05
6270 0041	4,01
6270 0045	4,94
6270 0048	6,56
6270 0050	4,11
6270 0055	4,78
6270 0058	5,50
6270 0060	5,86
6270 0063	7,40
6270 0064	6,04
6270 0065	6,62
6270 0066	4,85
6270 0068	6,53
6270 0080	7,75
6270 0090	7,26
6270 0100	9,22
6270 0120	12,50
6275 0035	3,38
6275 0045	3,92
6275 0055	4,99
6275 0060	6,07
6275 0070	9,07
6275 0091	8,21
6275 0100	9,10
6276 0035	2,31
6276 0045	2,68
6276 0055	3,31
6276 0070	4,04
6276 0090	4,99
6276 0100	5,81
6276 0120	7,77
6277 0030	4,38
6277 0035	4,60
6277 0040	4,85
6277 0055	6,41
6277 0065	7,81
6277 0080	10,38
6277 0100	13,18
6278 0025	1,79
6278 0030	1,77
6278 0035	1,91
6278 0040	2,33
6278 0055	2,68
6278 0065	3,38
6278 0080	4,55
6282 0025	3,59
6282 0030	3,64
6282 0035	3,85
6282 0040	4,60
6282 0045	5,25
6282 0055	5,15
6282 0060	5,65
6282 0065	6,90
6282 0070	7,61
6282 0080	7,60
6282 0081	7,60
6282 0100	9,61
6286 0001	5,11
6286 0002	7,25
6286 0003	10,89
6286 0004	15,91
6287 0005	5,06
6287 0010	7,26
6287 0015	10,90
6290 0001	1,79
6290 0002	1,79
6292 0001	1,79
6292 0002	2,29
6292 0003	3,19
6292 0004	5,90
6300 0000	1,79
6300 0001	1,87
6300 0002	2,43
6300 0003	2,94
6302 0001	3,31
6302 0002	4,34
6302 0003	7,09
6303 0001	3,66
6303 0002	2,75
6303 0003	7,09
6304 0000	3,22
6304 0001	4,15
6304 0002	5,55
6304 0003	7,42
6304 0005	3,38
6304 0010	5,74
6304 0020	7,60
6325 0000	3,89
6325 0001	5,08
6325 0002	6,81
6325 0003	10,45
6327 0000	4,69
6327 0001	5,44
6327 0002	7,49
6327 0003	11,27
6328 0000	2,05
6328 0001	2,24
6328 0002	2,82
6328 0003	4,10
6330 0101	1,86
6330 0102	2,42
6330 0103	3,36
6331 0001	1,54
6331 0002	1,79
6332 0000	4,11
6332 0001	4,88
6332 0002	6,83
6332 0003	7,53
6333 0001	6,62
6333 0002	8,45
6336 0001	1,96
6336 0002	2,36
6336 0003	3,05
6337 0000	4,87
6337 0001	5,88
6337 0002	8,07
6337 0003	12,51
6339 0005	699,28
6339 0010	514,61
6340 0000	4,08
6340 0001	4,94
6340 0002	6,67
6340 0003	9,17
6340 0004	11,83
6340 0011	5,65
6340 0021	6,13
6340 0022	7,49
6340 0032	8,28
6341 0000	5,36
6341 0001	6,16
6341 0002	8,56
6341 0003	13,09
6343 0001	2,15
6343 0002	2,71
6343 0003	4,04
6344 0001	4,78
6344 0002	6,69
6344 0003	7,30
6345 0001	7,12
6345 0002	9,43
6350 0010	30,29
6350 0020	22,45
6350 0030	22,45
6350 0070	17,47
6350 0080	17,47
6350 0090	33,27
6350 0100	24,61
6350 0110	30,29
6350 0140	27,81
6350 0150	27,81
6350 0160	27,13
6350 0165	27,13
6352 0010	31,03
6352 0015	31,45
6354 0010	12,44
6354 0030	23,78
6354 0035	23,84
6354 0040	12,13
6354 0050	14,68
6354 0070	7,49
6354 0080	7,39
6354 0090	16,85
6354 0100	16,28
6354 0110	13,13
6354 0120	13,65
6354 0130	13,69
6355 0005	48,20
6355 0010	13,11
6355 0100	2,01
6355 0105	2,10
6355 0110	2,17
6355 0115	2,63
6355 0120	2,70
6355 0125	4,04
6355 0130	2,28
6355 0135	3,10
6355 0140	2,71
6355 0145	3,71
6355 0152	2,94
6355 0155	2,92
6355 0160	2,92
6355 0165	2,99
6355 0170	3,10
6355 0180	3,75
6355 0190	3,75
6355 0200	3,75
6355 0210	3,75
6360 0005	2,91
6360 0010	3,36
6360 0015	4,20
6362 0005	3,20
6362 0015	5,64
6363 0005	3,78
6366 0008	3,62
6366 0010	3,22
6366 0012	2,94
6366 0015	2,57
6366 0018	2,57
6366 0020	2,29
6366 0021	2,40
6366 0025	2,28
6366 0030	2,31
6366 0031	2,43
6366 0035	2,24
6366 0040	2,54
6366 0041	2,66
6368 0005	3,10
6368 0010	2,57
6368 0015	3,13
6368 0020	3,17
6369 0012	2,87
6369 0015	2,87
6369 0018	2,57
6369 0020	2,57
6369 0025	2,40
6369 0030	2,45
6369 0035	2,91
6369 0040	3,19
6370 0000	2,66
6370 0001	2,96
6371 0005	3,59
6371 0010	3,10
6371 0015	3,45

Catalogue prices in EUR

Part No.	€
6372 0001	4,66
6372 0002	4,66
6372 0003	4,66
6372 0004	4,66
6372 0005	4,27
6372 0006	3,50
6372 0007	3,97
6372 0008	3,97
6372 0009	4,04
6372 0010	4,04
6372 0015	4,17
6372 0020	4,17
6373 0000	3,71
6373 0001	3,97
6373 0008	3,94
6373 0009	4,13
6373 0010	4,13
6373 0015	4,27
6373 0020	4,27
6374 0007	3,71
6374 0009	3,17
6374 0013	2,77
6374 0015	2,66
6374 0020	2,43
6374 0025	2,43
6374 0030	2,24
6375 0004	4,87
6375 0005	4,69
6375 0006	4,06
6375 0007	4,17
6375 0008	4,17
6375 0009	4,25
6375 0010	4,25
6376 0015	3,80
6376 0020	3,50
6376 0025	3,24
6376 0030	3,17
6377 0050	7,00
6377 0055	7,00
6378 0020	5,23
6378 0025	4,57
6378 0030	4,57
6378 0032	4,57
6378 0035	4,87
6378 0040	4,87
6378 0045	4,95
6378 0050	4,95
6378 0055	4,95
6379 0005	4,24
6380 0005	14,79
6381 0005	20,04
6382 0005	6,88
6384 0005	19,93
6384 0010	23,15
6387 0005	140,84
6388 0005	272,06
6389 0212	4,94
6390 0005	7,37
6393 0020	34,13
6394 0022	34,13
6395 0218	20,53
6396 0275	13,70
6397 0232	15,54
6399 0005	39,97
6401 0005	39,97
6403 0005	7,75
6403 0010	8,54
6403 0015	9,42
6403 0020	9,42
6405 0005	15,10
6405 0010	16,45
6405 0015	17,75
6405 0020	16,85
6405 0025	20,13
6407 0005	2,70
6407 0010	2,82
6408 0005	6,30
6408 0010	9,10
6409 0005	1,94
6409 0010	2,82
6411 0005	5,01
6413 0005	6,88
6416 0005	9,68
6417 0005	12,58
6418 0005	16,80
6419 0005	19,29
6420 0005	18,32
6421 0005	0,39
6421 0010	0,39
6421 0015	0,39
6421 0020	0,39
6422 0005	14,14
6423 0005	1,51
6423 0010	1,51
6423 0015	1,51
6423 0020	1,51
6423 0025	1,51
6423 0030	1,51
6423 0035	1,51
6424 0005	0,26
6424 0010	0,26
6424 0015	0,26
6425 0005	0,35
6425 0010	0,35
6425 0015	0,35
6426 0005	0,26
6426 0010	0,26
6426 0015	0,26
6427 0005	0,35
6427 0010	0,35
6427 0015	0,35
6428 0005	14,14
6428 0010	14,35
6429 0005	1,03
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6429 0035	1,45
6430 0010	2,63
6430 0015	2,63
6430 0020	2,63
6431 0001	0,37
6431 0002	0,37
6431 0003	0,37
6431 0004	0,37
6432 0005	1,79
6432 0010	1,79
6432 0015	1,79
6433 0005	0,37
6433 0010	0,37
6433 0015	0,37
6433 0020	0,37
6433 0025	0,37
6433 0030	0,37
6433 0035	0,37
6434 0005	1,79
6434 0010	1,79
6434 0015	1,79
6435 0002	1,03
6435 0003	1,03
6435 0004	1,03
6435 0005	1,03
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6438 0040	1,63
6439 0005	1,79
6439 0010	1,79
6439 0015	1,79
6440 0010	0,89
6440 0020	0,89
6440 0025	0,89
6440 0030	0,89
6440 0040	0,89
6441 0005	1,86
6441 0010	1,86
6441 0015	1,86
6441 0020	2,70
6441 0025	1,86
6441 0030	2,70
6441 0035	1,86
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6441 0045	2,70
6442 0005	2,12
6442 0010	2,12
6442 0015	2,12
6442 0020	2,12
6442 0030	2,12
6442 0035	2,12
6443 0005	2,28
6443 0010	2,64
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6445 0015	2,28
6445 0020	2,64
6445 0025	2,28
6445 0030	2,64
6446 0005	0,63
6446 0010	0,63
6446 0015	0,63
6446 0020	0,63
6446 0030	0,63
6446 0035	0,63
6447 0005	0,98
6447 0010	0,98
6447 0015	0,98
6448 0005	0,98
6448 0010	0,98
6448 0015	0,98
6449 0003	0,49
6449 0004	0,49
6449 0005	0,49
6449 0010	0,49
6449 0015	0,49
6449 0020	0,49
6449 0025	0,49
6449 0030	0,49
6449 0035	0,49
6450 0005	1,96
6450 0010	1,96
6450 0015	1,96
6450 0020	1,96
6450 0025	1,96
6450 0030	1,96
6450 0035	3,27
6451 0003	1,87
6451 0005	1,87
6451 0010	1,87
6451 0015	1,87
6451 0020	1,87
6451 0025	1,87
6451 0030	1,87
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6455 0040	3,85
6456 0005	2,73
6456 0010	2,73
6456 0015	2,73
6457 0000	2,22
6457 0005	2,22
6457 0010	2,22
6457 0015	2,22
6457 0020	2,22
6457 0025	2,22
6457 0030	2,22
6458 0005	2,73
6458 0010	2,73
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6459 0025	4,71
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6460 0006	2,36
6460 0011	2,36
6460 0016	2,36
6460 0021	2,36
6460 0026	2,36
6460 0031	2,36
6460 0036	2,85
6460 0041	2,85
6460 0046	2,47
6460 0051	2,78
6460 0056	2,78
6462 0005	1,87
6462 0010	1,87
6462 0015	1,87
6462 0020	3,99
6462 0025	3,99
6462 0030	4,52
6464 0005	1,33
6464 0010	1,33
6464 0015	1,33
6464 0020	1,33
6466 0005	1,33
6466 0010	1,33
6466 0015	1,33
6466 0020	1,33
6468 0005	1,89
6468 0010	1,89
6468 0015	1,89
6468 0020	1,89
6468 0025	1,89
6470 0005	2,17
6470 0010	2,17
6470 0015	2,17
6470 0020	2,17
6470 0025	2,17
6470 0030	2,17
6470 0035	2,17
6470 0040	2,17
6480 0003	5,95
6480 0005	7,46
6480 0010	14,95
6480 0014	6,20
6480 0015	17,59
6480 0030	15,98
6482 0040	45,31
6482 0045	66,19
6482 0055	43,73
6482 0060	24,94
6482 0065	24,94
6482 0070	25,97
6482 0080	34,11
6482 0090	23,74
6482 0100	30,63
6482 0110	30,59
6482 0120	26,12
6482 0130	21,25
6482 0200	27,09
6482 0210	28,23
6482 0220	27,09
6483 0020	79,21
6484 0005	6,62
6485 0010	6,88
6486 0005	26,08
6488 0005	9,50
6490 0005	12,53
6492 0005	8,03
6494 0005	4,52
6494 0010	4,52
6494 0015	4,52
6494 0020	4,52
6494 0025	4,52
6494 0030	4,52
6494 0035	4,52
6494 0040	4,52
6494 0045	4,52
6494 0050	4,52
6494 0055	4,52
6494 0060	4,52
6494 0065	4,52
6494 0070	4,52
6494 0075	4,52
6494 0080	4,52
6494 0085	4,52
6495 0005	61,02
6496 0005	25,46
6496 0010	32,92
6496 0015	44,71
6496 0020	47,13
6496 0025	73,64
6501 0005	11,99
6501 0010	11,99
6501 0015	11,01
6501 0020	18,13
6501 0025	6,25
6503 0005	13,06
6503 0010	12,29
6503 0015	13,27
6503 0020	12,97
6505 0005	16,19
6505 0010	13,95
6505 0015	8,49
6505 0020	11,69
6505 0025	12,69
6505 0030	12,29
6505 0035	13,84
6505 0040	11,69
6505 0045	11,52
6505 0050	10,52
6507 0005	15,42
6507 0010	15,59
6507 0015	15,91
6507 0020	15,51
6509 0005	1,96
6511 0005	7,61
6511 0010	11,41
6511 0015	7,61
6511 0020	6,04
6511 0025	6,72
6511 0030	7,81
6511 0035	10,92
6513 0005	10,83
6513 0010	7,61
6513 0015	10,24
6513 0020	7,81
6515 0005	15,12
6515 0010	15,80
6515 0015	11,90
6515 0020	12,69
6517 0005	11,62
6517 0010	13,74
6517 0015	13,74
6525 0010	12,58
6526 0010	13,09
6527 0010	9,07
6527 0020	10,06
6530 0101	1,86
6530 0102	1,94
6530 0103	1,98
6530 0151	2,01
6530 0152	2,05
6530 0153	2,17
6530 0201	2,40
6530 0202	2,54
6530 0203	2,68
6530 0251	3,24
6530 0252	3,40
6530 0253	3,75
6530 0301	4,34
6530 0302	4,62
6530 0303	4,92
6530 0351	5,99
6530 0352	6,23
6530 0353	6,53
6532 0151	2,87
6532 0152	2,91
6532 0153	3,05
6532 0201	3,43
6532 0202	3,59
6532 0203	3,71
6532 0251	4,31
6532 0252	4,46
6532 0253	4,85
6534 0151	2,98
6534 0152	3,05
6534 0153	3,22
6534 0201	3,59
6534 0202	3,75
6534 0205	3,97
6534 0251	4,52
6534 0252	4,66
6534 0253	5,01
6542 0101	2,22
6542 0102	2,40
6542 0103	2,61
6542 0151	2,61
6542 0152	2,70
6542 0153	2,80
6542 0201	3,17
6542 0202	3,27
6542 0203	3,41
6542 0251	4,46
6542 0252	4,69
6542 0253	5,16
6542 0301	6,51
6542 0302	6,72
6542 0303	6,95
6544 0151	3,50
6544 0152	3,59
6544 0153	3,71
6544 0201	4,20
6544 0202	4,31
6544 0203	4,52
6548 0151	2,14
6548 0152	2,31
6548 0153	2,54
6548 0201	2,59
6548 0202	2,73
6548 0203	2,91
6548 0251	3,33
6548 0252	3,52
6548 0253	3,78
6548 0301	4,92
6548 0302	5,16
6548 0303	5,41
6549 0151	3,03
6549 0152	3,22
6549 0153	3,45
6549 0201	3,61
6549 0202	3,75
6549 0203	3,94
6554 0151	3,48
6554 0152	3,61
6554 0153	3,71
6554 0201	4,04
6554 0202	4,25
6554 0203	4,48
6554 0251	5,53
6554 0252	5,74
6554 0253	6,02
6554 0301	7,21
6554 0302	7,47
6554 0303	7,82
6556 0151	3,99
6556 0152	4,13
6556 0153	4,24
6556 0201	4,67
6556 0202	4,81

Catalogue prices in EUR

Part No.	€
6556 0203	5,18
6556 0251	6,16
6556 0252	6,34
6556 0253	6,60
6558 0151	4,43
6558 0152	4,57
6558 0153	4,67
6558 0201	5,13
6558 0202	5,36
6558 0203	5,60
6558 0251	6,70
6558 0252	6,93
6558 0253	7,23
6560 0101	1,86
6560 0102	2,05
6560 0103	2,21
6560 0151	1,86
6560 0152	2,05
6560 0153	2,21
6560 0201	2,22
6560 0202	2,40
6560 0203	2,61
6560 0251	3,05
6560 0252	3,24
6560 0253	3,48
6560 0301	3,99
6560 0302	4,34
6560 0303	4,69
6562 0151	2,71
6562 0152	2,91
6562 0153	3,10
6562 0201	3,22
6562 0202	3,43
6562 0203	3,62
6562 0251	4,11
6562 0252	4,31
6562 0253	4,57
6566 0200	24,40
6566 0250	32,88
6568 0200	32,06
6568 0250	40,01
6568 0300	53,04
6570 0500	42,37
6572 0200	10,94
6572 0250	13,60
6575 0250	14,30
6575 0300	18,46
6578 0005	2,84
6578 0010	2,84
6578 0015	3,20
6578 0020	3,05
6578 0025	3,47
6578 0030	2,92
6581 0102	6,77
6582 0100	22,00
6584 0002	3,38
6587 0125	2,91
6587 0150	3,22
6587 0200	4,81
6590 0250	7,86
6599 0150	1,09
6599 0201	1,09
6599 0203	1,09
6599 0204	1,09
6600 0010	22,66
6600 0020	22,66
6600 0030	18,13
6602 0250	10,61
6603 0250	13,49
6603 0300	18,53
6604 0200	8,44
6605 0250	7,16
6606 0200	6,56

Part No.	€
6606 0250	8,72
6606 0300	11,24
6607 0200	5,71
6607 0250	7,49
6608 0200	4,53
6608 0250	5,65
6610 0251	17,83
6610 0252	19,55
6610 0301	22,44
6610 0302	23,14
6610 0303	24,27
6610 0351	31,73
6610 0352	33,25
6611 0250	19,62
6611 0300	23,49
6615 0001	58,29
6616 0351	35,86
6616 0352	38,47
6620 0100	7,35
6620 0101	7,68
6620 0102	7,91
6620 0103	8,79
6620 0104	9,12
6620 0150	8,07
6620 0151	8,65
6620 0152	8,94
6620 0153	9,78
6620 0154	10,61
6620 0200	11,43
6620 0201	11,92
6620 0202	12,57
6620 0203	13,09
6620 0204	14,23
6623 0150	8,94
6623 0151	9,36
6623 0152	10,33
6623 0200	12,57
6623 0201	13,20
6623 0202	14,40
6623 0250	17,75
6623 0251	18,67
6623 0252	20,42
6626 0150	10,12
6626 0151	10,62
6626 0152	11,81
6626 0200	13,93
6626 0201	14,70
6626 0202	16,00
6626 0250	20,02
6626 0251	21,05
6626 0252	23,10
6629 0150	10,12
6629 0151	10,62
6629 0152	11,81
6629 0200	13,90
6629 0201	14,70
6629 0202	16,03
6631 0100	6,79
6631 0102	7,33
6631 0150	7,35
6631 0151	7,74
6631 0152	8,07
6631 0153	8,47
6631 0200	9,78
6631 0201	10,12
6631 0203	11,24
6634 0101	10,50
6634 0150	11,24
6634 0151	12,16
6634 0152	12,39
6634 0153	12,67
6634 0200	14,04
6634 0201	14,79

Part No.	€
6634 0203	15,86
6637 0150	9,45
6637 0151	9,80
6637 0153	10,76
6637 0200	12,57
6637 0201	13,02
6637 0203	14,42
6640 0100	13,72
6640 0101	14,11
6640 0102	15,66
6640 0150	15,86
6640 0151	16,66
6640 0152	17,48
6640 0153	19,02
6640 0154	22,24
6640 0200	21,19
6640 0201	22,07
6640 0202	23,24
6640 0203	25,32
6640 0250	24,68
6640 0251	25,92
6640 0252	26,93
6643 0152	24,27
6644 0200	19,90
6644 0202	21,89
6645 0150	13,49
6645 0152	14,74
6647 0160	50,38
6647 0200	63,25
6649 0160	54,92
6649 0200	70,39
6650 0160	3,99
6650 0161	3,99
6650 0162	3,99
6650 0163	4,24
6650 0260	5,15
6650 0261	5,15
6650 0262	5,15
6650 1160	4,57
6650 1161	4,57
6650 1162	4,57
6650 1163	4,76
6650 1200	6,27
6650 1201	6,27
6650 1202	6,27
6650 2160	4,27
6650 2161	4,27
6650 2162	4,27
6650 2163	4,46
6650 2200	5,72
6650 2201	5,72
6650 2202	5,72
6650 3160	4,27
6650 3161	4,27
6650 3162	4,27
6650 3163	4,46
6650 3200	5,72
6650 3201	5,72
6650 3202	5,72
6650 4160	3,99
6650 4161	3,99
6650 4162	3,99
6650 4164	4,24
6650 4200	5,15
6650 4201	5,15
6650 4202	5,15
6650 5160	4,27
6650 5161	4,27
6650 5162	4,27
6650 5163	4,46
6650 6160	4,57
6650 6161	4,57
6650 6162	4,57

Part No.	€
6650 7160	4,27
6650 7161	4,27
6650 7162	4,27
6650 8160	4,57
6650 8161	4,57
6650 8162	4,57
6655 0005	10,26
6655 0010	10,26
6655 0015	10,26
6655 0020	10,26
6655 0025	9,08
6655 0030	9,08
6655 0035	9,08
6655 0040	10,26
6655 0045	9,61
6655 0050	10,26
6655 0055	9,08
6656 0005	29,52
6656 0010	29,52
6656 0015	29,52
6656 0020	26,01
6656 0025	26,01
6656 0215	140,56
6657 0005	11,38
6657 0010	11,38
6657 0015	11,38
6657 0020	11,38
6657 0025	11,38
6657 0030	11,38
6657 0035	11,38
6657 0040	11,38
6657 0045	11,38
6657 0050	11,38
6657 0055	11,38
6658 0140	56,79
6659 0140	124,95
6660 0140	54,95
6665 0140	95,32
6670 0005	27,34
6670 0010	29,12
6670 0015	31,50
6670 0020	22,38
6670 0025	20,69
6675 0215	116,15
6681 0001	2,54
6681 0100	15,24
6682 0060	0,49
6682 0080	0,18
6682 0090	0,21
6682 0100	0,23
6682 0110	0,25
6682 0120	0,30
6682 0130	0,33
6682 0140	0,37
6682 0160	0,47
6685 0005	38,73
6686 0005	38,73
6687 0900	0,61
6687 0901	0,61
6687 1101	0,88
6687 1102	0,88
6687 1251	1,10
6687 1252	1,10
6687 1253	1,10
6689 0005	1,23
6689 0010	1,23
6689 0015	1,49
6689 0020	1,49
6689 0025	1,75
6689 0030	1,75
6690 0100	3,78
6690 0150	4,06
6690 0200	4,64

Part No.	€
6690 0250	4,95
6692 0150	7,58
6694 0200	4,64
6696 0200	4,64
6696 0250	4,95
6696 0300	6,79
6698 0010	44,45
6698 0020	21,33
6699 0150	5,79
6700 0010	24,24
6704 0010	10,17
6705 0010	12,32
6706 0010	29,49
6707 0010	20,37
6708 0010	12,93
6709 0010	26,32
6710 0010	21,49
6711 0010	17,54
6712 0010	19,20
6713 0010	7,56
6713 0050	34,35
6713 0100	14,47
6713 0200	19,30
6713 0300	10,61
6713 0400	4,83
6713 0500	1,10
6713 0600	1,26
6714 0005	29,54
6715 0005	33,13
6716 0010	43,61
6717 0010	101,08
6718 0010	33,53
6718 0015	31,54
6718 0020	75,99
6718 0021	14,39
6719 0010	5,95
6719 0020	9,77
6719 0100	6,84
6719 0110	6,84
6719 0120	6,84
6719 0130	6,84
6719 0200	1,05
6719 0210	1,10
6719 0220	1,05
6719 0230	1,33
6719 0240	1,17
6719 0250	1,84
6719 0260	1,23
6719 0270	1,42
6719 0280	1,59
6719 0290	4,11
6719 0300	6,95
6719 0400	7,16
6719 0410	10,61
6719 0500	19,36
6719 0510	11,99
6719 0520	12,83
6719 0530	17,41
6719 0540	24,80
6719 0600	4,81
6719 0610	6,34
6719 0700	15,05
6719 0710	16,28
6719 0720	18,74
6719 0810	17,54
6719 0820	19,27
6729 0150	5,95
6730 0150	3,33
6732 0150	7,05
6733 0150	3,57
6734 0001	9,71
6734 0005	0,63
6734 0010	0,30

Part No.	€
6734 0015	0,25
6738 0300	17,43
6740 0300	5,74
6742 0010	2,80
6750 0501	35,42
6751 0501	29,10
6772 0200	17,36
6772 0300	18,27
6772 0500	21,16
6772 0800	26,25
6772 1000	29,37
6773 0100	5,44
6773 0200	5,44
6773 0300	6,11
6773 0400	6,62
6773 0500	7,11
6773 0600	8,24
6773 0800	9,24
6773 1000	11,46
6773 1500	14,58
6773 2000	19,20
6775 0050	6,48
6775 0100	6,39
6775 0200	6,39
6775 0300	7,12
6775 0400	7,77
6775 0500	8,38
6775 0600	9,87
6775 0800	11,08
6775 1000	13,13
6775 1500	16,80
6775 2000	21,53
6776 0300	18,11
6776 0500	21,79
6776 0800	27,32
6776 1000	30,75
6777 0100	7,49
6777 0200	7,49
6777 0300	8,31
6777 0400	9,03
6777 0500	9,91
6777 0600	11,59
6777 0800	13,04
6777 1000	15,40
6777 1500	19,86
6777 2000	25,45
6778 0200	12,64
6778 0300	14,00
6778 0500	16,33
6778 0800	20,39
6778 1000	24,47
6779 0301	4,59
6779 0501	6,35
6779 0801	7,21
6779 1001	9,68
6780 0100	10,12
6780 0200	10,68
6780 0300	11,15
6780 0400	12,09
6780 0450	11,99
6780 0500	13,11
6780 0600	15,28
6780 0800	17,19
6780 1000	20,35
6780 1500	25,67
6780 2000	32,73
6781 0003	24,40
6781 0004	28,26
6781 0005	34,84
6781 0006	41,74
6781 0008	56,67
6781 0010	67,97
6782 0600	22,89

Part No.	€
6783 1000	11,22
6783 1250	11,59
6783 1500	12,60
6783 2000	15,93
6785 1020	7,56
6785 1022	8,26
6785 1025	8,73
6785 1028	9,56
6787 0600	12,69
6788 0450	17,83
6789 0500	6,69
6790 0100	3,83
6790 0200	3,90
6790 0300	4,60
6790 0400	4,80
6790 0450	27,28
6790 0500	5,13
6790 0600	5,81
6790 0800	6,34
6790 1000	7,35
6790 1500	8,26
6790 2000	9,31
6791 0600	12,69
6793 0600	12,32
6794 0600	15,52
6795 0050	1,66
6795 0100	1,65
6795 0200	1,68
6795 0300	1,77
6795 0400	1,91
6795 0500	2,01
6795 0600	2,43
6795 0800	2,52
6795 1000	2,63
6795 1500	2,82
6795 2000	3,01
6796 0100	2,68
6796 0200	2,73
6796 0300	2,92
6796 0400	3,08
6796 0500	3,43
6796 0600	3,99
6796 0800	4,39
6796 1000	4,78
6796 1500	5,71
6796 2000	6,72
6797 0501	1,82
6798 3000	8,03
6798 4000	8,31
6798 5001	10,76
6798 8001	13,39
6799 1001	2,01
6799 1500	2,07
6799 2000	2,15
6800 0005	0,12
6800 0010	0,16
6800 0015	0,19
6800 0020	0,25
6800 0025	0,32
6800 0030	0,40
6800 0035	0,49
6800 0040	0,70
6800 0045	0,86
6801 0100	0,54
6801 0200	0,54
6801 0300	0,65
6801 0400	0,68
6801 0500	0,75
6801 0600	0,79
6801 0800	0,84
6801 1000	0,84
6801 1500	0,96
6801 2000	1,02

Catalogue prices in EUR

Part No.	€
6802 0060	9,92
6802 0070	11,95
6802 0080	15,05
6802 0090	19,32
6802 0100	26,90
6803 0600	25,62
6805 0250	12,58
6805 0500	20,81
6805 0750	28,68
6805 1000	36,49
6805 1500	51,54
6805 2000	65,01
6805 3000	89,09
6805 4000	117,27
6805 5000	143,96
6807 0250	9,49
6807 0500	13,69
6807 0750	18,87
6807 1000	22,58
6807 1500	32,01
6808 0005	1,91
6808 0010	1,96
6808 0015	2,59
6808 0020	2,73
6808 0025	4,06
6808 0030	5,92
6811 0000	3,38
6811 0005	4,15
6811 0010	5,23
6811 0015	7,40
6811 0020	11,29
6811 0022	0,32
6811 0025	0,51
6811 0030	0,84
6811 0035	1,30
6811 0040	1,93
6811 0042	0,77
6811 0045	0,79
6811 0050	0,88
6811 0055	1,00
6811 0060	1,10
6812 0030	12,11
6812 0040	15,23
6812 0050	20,63
6812 0060	26,76
6812 0080	47,53
6814 0030	14,79
6814 0040	20,76
6814 0050	32,34
6814 0060	41,98
6814 0080	70,44
6816 0030	13,42
6816 0040	17,97
6816 0050	26,46
6816 0060	34,34
6816 0080	58,94
6817 0030	5,15
6817 0040	6,81
6817 0050	9,92
6817 0060	12,50
6817 0080	24,76
6818 0030	2,98
6818 0040	3,12
6818 0050	3,78
6818 0060	4,08
6818 0080	5,02
6819 0030	2,12
6819 0040	2,78
6819 0050	3,68
6819 0060	5,32
6819 0080	9,31
6820 0030	2,12
6820 0040	4,01
6820 0050	6,04
6820 0060	8,58
6821 0030	3,48
6821 0040	5,53
6821 0050	9,52
6821 0060	12,93
6821 0080	20,76
6822 0030	4,46
6822 0040	6,44
6822 0050	10,83
6822 0060	14,37
6822 0080	24,97
6823 0030	3,24
6823 0040	5,16
6823 0050	7,96
6823 0060	11,08
6823 0080	20,41
6825 0025	14,53
6825 0030	15,14
6825 0035	16,33
6825 0040	19,37
6825 0050	23,84
6825 0060	38,75
6827 0030	18,57
6827 0035	19,44
6827 0040	22,72
6827 0050	28,35
6827 0060	45,20
6828 0040	27,88
6828 0050	34,39
6828 0060	55,79
6829 0025	2,56
6829 0031	2,94
6829 0041	3,57
6829 0060	4,46
6830 0025	1,68
6830 0030	1,87
6830 0035	2,15
6830 0040	2,70
6830 0050	3,36
6830 0060	5,64
6832 0005	22,21
6832 0010	2,29
6833 0030	23,12
6833 0035	23,63
6834 0080	111,44
6834 0100	171,69
6836 0080	11,67
6836 0100	19,13
6838 0080	11,10
6838 0100	14,12
6840 0100	2,43
6840 0125	2,52
6840 0150	2,61
6840 0175	3,19
6840 0200	3,62
6840 0250	4,25
6840 0300	4,74
6842 0125	2,52
6842 0150	2,98
6842 0175	3,22
6842 0200	3,78
6842 0250	4,74
6842 0300	6,02
6844 0250	4,08
6844 0300	4,57
6844 0400	5,55
6844 0500	7,65
6844 0600	9,52
6846 0250	3,78
6846 0300	4,18
6846 0400	5,43
6846 0500	7,05
6848 0250	4,08
6848 0300	4,57
6848 0400	5,55
6848 0500	7,65
6848 0600	12,23
6850 0005	4,01
6850 0010	5,88
6851 0005	1,96
6854 0200	2,01
6854 0250	2,29
6854 0300	2,80
6855 0002	4,45
6855 0003	4,45
6855 0004	4,45
6855 0005	4,45
6855 0006	4,45
6856 0002	6,00
6856 0003	6,00
6858 0100	1,96
6860 0002	0,91
6860 0003	1,00
6860 0004	1,00
6860 0005	1,00
6860 0006	1,00
6860 0008	1,00
6860 0010	1,14
6860 0012	1,61
6861 0005	12,60
6863 0002	1,42
6863 0003	1,35
6863 0004	1,35
6863 0005	1,35
6863 0006	1,35
6863 0007	1,42
6863 0008	1,42
6863 0009	1,42
6863 0010	1,42
6863 0012	1,65
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6867 0014	2,05
6867 0018	2,05
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6867 0034	2,05
6867 0039	2,05
6867 0059	2,05
6869 0005	21,95
6869 0010	20,32
6874 0100	0,91
6874 0120	0,96
6874 0121	1,09
6874 0150	1,19
6876 0120	6,97
6876 0130	11,03
6878 0100	16,99
6878 0105	18,04
6878 0110	19,92
6878 0200	2,68
6878 0205	3,69
6878 0210	4,45
6879 0005	30,98
6879 0010	32,03
6879 0015	34,37
6879 0500	100,22
6880 0005	14,46
6882 0005	3,61
6883 0010	3,82
6889 0002	1,35
6889 0003	1,35
6889 0004	1,35
6889 0005	1,93
6889 0006	2,03
6889 0500	8,56
6890 0002	1,37
6890 0003	1,38
6890 0004	1,44
6890 0005	1,82
6890 0006	2,35
6890 0500	9,22
6901 0060	23,87
6902 0100	28,49
6902 0120	44,54
6902 0160	66,17
6902 0250	90,04
6903 0060	17,40
6903 0065	17,40
6903 0080	20,39
6903 0090	39,03
6903 0130	59,61
6903 0180	81,62
6904 0090	36,09
6904 0120	40,57
6904 0160	64,47
6904 0201	71,52
6904 0250	95,22
6904 0350	130,66
6905 0090	46,10
6905 0120	49,75
6905 0160	87,05
6905 0200	94,68
6905 0250	159,67
6905 0350	173,99
6905 0520	256,10
6905 0650	465,33
6905 0750	982,14
6906 0090	52,45
6906 0120	56,12
6906 0160	98,91
6906 0200	106,75
6906 0250	179,67
6906 0350	194,27
6907 0150	67,04
6908 0100	74,01
6908 0140	112,82
6908 1100	63,37
6908 1140	80,08
6908 1141	92,26
6909 0050	61,23
6909 0090	94,19
6910 0080	66,66
6910 0100	76,90
6910 0150	103,46
6911 0090	115,64
6911 0100	143,34
6911 0135	144,04
6911 0150	165,08
6912 0101	40,57
6912 0120	60,76
6912 0160	88,59
6912 0250	118,14
6913 0060	23,08
6913 0065	23,38
6913 0080	27,81
6913 0090	53,34
6913 0130	78,35
6913 0180	107,43
6914 0090	54,65
6914 0120	83,91
6914 0160	103,55
6914 0200	163,12
6915 0090	66,66
6915 0120	71,77
6915 0160	127,14
6915 0200	139,30
6916 0375	414,14
6916 0520	568,38
6916 0650	596,40
6917 0100	67,24
6917 0150	98,63
6917 0200	142,21
6917 0250	290,66
6917 0350	947,75
6918 0150	79,31
6919 0010	300,91
6920 0015	311,82
6920 0021	364,67
6921 0011	92,94
6921 0015	106,94
6922 0012	27,42
6922 0014	27,42
6922 0016	24,05
6922 0019	24,15
6922 0023	31,61
6922 0030	33,71
6922 0040	38,54
6922 0046	46,57
6922 0058	60,38
6922 0070	77,67
6922 0100	117,85
6923 0001	26,85
6923 0002	42,61
6923 0003	86,66
6924 0000	16,63
6924 0003	57,68
6925 0000	74,48
6926 0046	497,39
6926 0070	738,41
6926 0110	961,17
6927 0046	316,26
6927 0070	457,89
6927 0110	681,89
6928 0061	55,55
6928 0075	64,82
6928 0115	111,20
6928 0155	169,16
6929 0150	35,46
6929 0200	58,24
6929 0250	86,17
6929 0300	130,31
6930 0060	128,28
6930 0075	165,08
6930 0115	249,99
6930 0155	365,63
6931 0018	31,29
6932 0020	72,84
6932 0022	49,47
6933 0019	54,58
6934 0010	33,13
6934 0018	41,44
6934 0027	42,70
6935 0022	94,19
6935 0036	185,68
6936 0090	26,57
6936 0150	49,65
6936 0200	82,79
6937 0190	37,08
6937 0250	45,50
6937 0300	68,30
6937 0301	105,88
6937 0400	127,51
6937 0500	134,47
6938 0001	14,30
6938 0002	13,72
6938 0003	21,05
6938 0004	21,95
6938 0005	41,34
6960 0330	32,01
6962 0005	26,55
6962 0010	25,97
6964 0220	25,41
6965 0180	36,10
6966 0220	17,47
6968 0250	45,03
6970 0016	25,64
6970 0020	25,64
6971 0014	16,24
6972 0285	34,13
6972 0900	12,60
6973 0005	216,46
6974 0001	23,28
6974 0002	13,70
6975 0005	23,47
6976 0005	20,51
6978 0005	71,59
6980 0005	44,85
6985 0008	7,82
6985 0012	9,64
6985 0016	13,44
6985 0020	19,09
6985 0024	27,65
6986 0024	28,79
7000 0001	0,86
7002 0001	1,30
7004 0002	0,56
7004 0003	0,65
7004 0004	0,75
7004 0005	0,88
7004 0006	0,95
7006 0002	1,38
7006 0003	1,61
7006 0004	1,87
7006 0005	2,15
7006 0006	2,40
7008 0002	1,30
7008 0003	1,45
7008 0004	1,75
7008 0005	1,96
7010 0001	2,35
7010 0005	4,81
7011 0150	51,40
7011 0178	58,80
7011 0200	68,60
7012 0010	1,14
7012 0020	2,75
7012 0030	2,75
7013 0012	3,83
7013 0015	3,83
7013 0018	3,83
7013 0022	3,83
7013 0028	6,30
7014 0015	5,04
7014 0020	5,08
7014 0025	5,25
7015 0012	6,30
7015 0015	6,20
7015 0018	6,20
7015 0022	6,56
7015 0028	7,89
7016 0100	7,58
7016 0125	8,44
7016 0150	11,08
7016 0178	13,98
7016 0200	17,62
7017 0005	4,48
7017 0010	4,53
7017 0015	4,57
7017 0020	3,38
7017 0025	3,41
7017 0030	3,47
7017 0035	3,52
7017 0040	3,59
7017 0045	3,62
7017 0050	3,68
7018 0125	18,80
7018 0150	26,88
7018 0178	32,88
7018 0200	36,70
7019 0015	4,66
7019 0020	4,66
7019 0025	4,38
7019 0030	4,45
7019 0035	4,53
7019 0040	4,62
7019 0045	4,69
7019 0050	4,74
7020 0115	4,95
7020 0125	5,76
7020 0178	9,50
7020 1115	10,47
7020 1125	11,85
7020 1178	26,27
7021 0005	1,35
7021 0010	1,38
7021 0015	1,44
7021 0020	1,47
7021 0025	1,52
7021 0030	1,54
7021 0035	1,58
7021 0040	1,63
7021 0045	1,65
7021 0050	1,68
7022 0100	4,81
7022 0115	8,86
7022 1115	12,71
7022 1116	14,28
7023 0115	17,20
7023 0125	19,37
7023 0178	22,87
7024 0030	2,15
7024 0040	2,31
7024 0050	3,17
7024 0061	3,29
7024 0071	3,41
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7025 0101	6,32
7025 1100	12,97
7026 0030	2,89
7026 0040	3,52
7026 0050	4,92
7026 0060	5,30
7026 0070	5,72
7028 0030	2,99
7028 0040	3,47
7028 0050	4,59
7028 0060	5,30
7028 0070	5,60
7030 0075	4,36
7031 0063	9,49
7032 0060	3,24
7032 0080	8,61
7033 0065	6,77
7034 0060	6,30
7034 0080	11,74
7036 0005	4,69
7036 0010	4,48
7038 0005	9,08
7038 0010	8,54
7040 0080	10,01
7040 0081	9,92
7040 0082	9,78
7040 0100	10,89
7040 0101	10,78
7040 0102	10,57

Catalogue prices in EUR

Part No.	€
7042 0081	21,14
7043 0024	9,24
7044 0010	1,52
7044 0017	1,61
7044 0025	2,14
7044 0030	2,89
7045 0020	8,75
7045 0023	9,08
7046 0010	1,94
7046 0017	2,75
7046 0025	3,57
7046 0030	4,34
7047 0020	12,85
7047 0023	13,35
7048 0010	0,25
7048 0020	0,30
7048 0030	0,39
7048 0040	0,51
7048 0060	0,63
7050 0001	0,51
7050 0011	0,56
7050 0021	0,93
7050 0031	1,16
7050 0041	1,56
7050 0050	2,57
7052 0010	0,14
7052 0020	0,16
7052 0030	0,18
7052 0040	0,18
7054 0011	0,39
7054 0021	0,44
7054 0031	0,56
7054 0041	0,72
7060 0250	11,17
7060 0300	13,88
7062 0260	17,01
7062 0280	19,20
7064 0260	17,01
7064 0280	19,20
7066 0300	18,66
7066 0350	22,03
7068 0260	20,69
7070 0260	20,67
7073 0250	12,34
7073 0275	13,28
7073 0300	14,84
7075 0250	12,34
7075 0275	13,28
7075 0300	14,84
7077 0240	28,72
7078 0240	32,34
7079 0240	28,72
7080 0240	32,34
7081 0281	24,55
7082 0260	20,83
7084 0260	20,83
7086 0210	21,14
7086 0211	21,14
7087 0190	6,49
7087 0191	6,83
7087 0261	30,21
7088 0225	14,16
7089 0261	30,21
7090 0235	9,01
7091 0190	6,53
7091 0191	6,90
7094 0200	7,51
7094 0250	10,41
7095 0201	5,13
7096 0125	5,86
7097 0005	22,84
7097 0250	19,72
7097 0255	6,32
7098 0005	29,44
7098 0155	4,64
7098 0180	5,46
7098 0200	6,62
7099 0005	31,50
7099 0010	20,25
7100 0190	10,27
7101 0006	5,36
7101 0011	6,06
7101 0016	5,74
7101 0021	6,06
7102 0225	6,98
7103 0225	47,15
7104 0225	50,80
7105 0225	87,06
7106 0200	6,13
7106 0250	8,30
7107 0160	4,57
7107 0180	5,39
7110 0120	104,44
7110 0150	119,21
7110 0180	168,16
7110 0300	358,79
7114 0150	326,83
7114 0250	444,36
7114 0500	315,56
7114 0800	431,48
7114 1701	957,95
7114 2601	1.440,95
7115 0005	27,69
7115 0010	16,87
7115 0015	6,00
7115 0020	6,00
7115 0025	15,63
7115 0030	34,91
7115 0035	20,46
7115 0040	6,00
7115 0045	6,63
7115 0050	43,35
7115 0055	22,89
7115 0060	7,21
7115 0065	10,85
7115 0070	22,89
7115 0075	62,62
7115 0080	33,71
7115 0085	20,46
7115 0090	9,33
7115 0095	4,88
7116 0012	11,53
7116 0015	11,95
7116 0016	12,16
7116 0018	13,56
7116 0020	13,56
7116 0021	13,56
7116 0022	14,42
7116 0023	14,42
7116 0025	16,87
7116 0028	16,22
7116 0029	17,94
7116 0030	17,94
7116 0032	17,94
7116 0035	20,49
7116 0037	22,63
7116 0038	22,63
7116 0040	28,18
7116 0047	33,85
7116 0051	41,11
7116 0054	44,31
7116 0060	51,24
7117 0012	20,18
7117 0015	22,52
7117 0016	17,29
7117 0018	18,36
7117 0020	18,36
7117 0021	18,36
7117 0022	19,53
7117 0023	19,53
7117 0025	21,67
7117 0028	21,14
7117 0029	22,73
7117 0030	22,73
7117 0032	22,73
7117 0035	25,52
7117 0037	27,76
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7117 0040	33,64
7117 0047	38,97
7117 0051	45,90
7117 0054	49,21
7117 0060	57,65
7118 0006	0,65
7118 0008	0,75
7118 0010	0,75
7118 0011	0,86
7118 0012	1,93
7118 0016	3,20
7119 0005	1.347,78
7119 0152	133,23
7119 0160	133,23
7119 0186	133,23
7119 0204	133,23
7119 0225	133,23
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7119 0320	133,23
7119 0350	133,23
7120 0002	3,29
7120 0003	3,29
7120 0004	3,29
7120 0005	3,29
7120 0006	3,27
7120 0007	3,27
7120 0008	3,50
7120 0009	3,62
7120 0010	3,89
7120 0011	4,39
7120 0012	4,95
7120 0013	5,36
7120 0014	5,79
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7120 0016	6,76
7120 0017	7,56
7120 0018	7,75
7120 0019	8,38
7120 0020	9,00
7120 0022	10,15
7120 0024	10,83
7120 0025	12,06
7120 0026	13,30
7120 0028	15,98
7120 0030	16,66
7120 0032	18,73
7120 0035	19,83
7120 0040	27,98
7121 0010	110,25
7121 0020	122,24
7123 0200	24,96
7123 0400	27,18
7123 0600	29,38
7123 1000	5,23
7123 1010	8,05
7124 0005	25,17
7124 0010	28,46
7124 0015	30,75
7125 0250	89,62
7140 0010	18,31
7140 0015	24,17
7140 0020	37,24
7140 0030	73,54
7140 0040	103,78
7143 0005	37,42
7143 0510	97,13
7143 0515	141,86
7143 0520	218,59
7143 0530	563,22
7147 0005	33,81
7147 0007	38,05
7147 0010	15,14
7147 0012	16,08
7148 0010	18,31
7148 0015	24,17
7148 0020	37,24
7149 0005	62,39
7151 0006	39,34
7152 0010	18,18
7152 0015	22,82
7152 0020	35,65
7152 0030	54,37
7152 0500	75,15
7153 0005	31,36
7153 0010	43,05
7153 0015	54,06
7153 0020	75,64
7153 0030	116,10
7155 0005	44,31
7156 0180	37,26
7156 0250	42,70
7156 0300	50,02
7157 0180	39,48
7157 0250	45,73
7158 0005	44,31
7161 0005	23,43
7161 0010	3,17
7163 0235	22,37
7163 0500	36,09
7165 0005	43,42
7165 0010	18,22
7166 0006	159,13
7167 0005	13,95
7169 0005	58,68
7171 0005	16,12
7173 0005	23,43
7176 0005	31,36
7181 0005	15,79
7181 0500	29,37
7183 0005	15,79
7183 0500	29,37
7189 0005	48,27
7191 0005	119,72
7193 0006	90,34
7194 0006	97,13
7195 0005	1.303,47
7196 0006	1.996,96
7196 0100	2.853,39
7197 0005	35,77
7197 0010	27,49
7197 0015	33,01
7197 0020	28,58
7197 0025	39,04
7197 0030	28,58
7197 0033	38,52
7197 0035	30,80
7197 0040	36,30
7197 0045	27,49
7197 0050	44,01
7197 0055	58,35
7197 0060	55,04
7197 0065	63,63
7197 0070	73,78
7197 0075	167,44
7197 0080	215,90
7197 0085	38,40
7197 0090	38,40
7197 0095	3,26
7197 0100	3,78
7198 0005	43,59
7198 0010	78,28
7199 0005	675,27
7200 0005	9,15
7200 0050	12,83
7200 0055	13,53
7202 0005	25,04
7202 1005	27,55
7203 0005	17,80
7204 0005	12,09
7205 0006	24,12
7205 0010	23,40
7205 0505	38,55
7205 0510	24,12
7206 0005	59,19
7206 0010	4,15
7207 0005	31,55
7207 0010	15,51
7208 0005	17,27
7209 0001	1,45
7210 0005	45,43
7210 0010	3,27
7210 0015	1,98
7211 0005	34,84
7211 0010	21,49
7212 0100	20,48
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7212 0170	56,21
7212 0175	31,57
7212 0190	137,95
7212 0195	75,43
7212 0200	89,71
7212 0210	52,29
7212 0250	33,81
7212 0300	15,19
7212 0305	36,47
7213 0005	67,13
7213 0010	16,78
7215 0005	176,31
7215 0010	19,81
7215 0015	15,87
7216 0005	284,92
7218 0006	315,30
7218 0011	353,27
7218 0201	176,00
7218 0205	99,54
7218 0210	99,54
7218 0215	99,54
7218 0220	99,54
7218 0225	131,97
7219 0005	75,15
7219 0010	20,56
7220 0005	365,96
7224 0050	1.118,71
7224 0055	1.313,53
7224 0060	1.313,53
7224 0100	176,02
7224 0105	201,36
7224 0110	214,01
7225 0005	30,42
7227 0005	35,67
7227 0010	35,67
7227 0015	39,13
7227 0020	39,13
7227 0050	2,64
7227 0055	2,64
7228 0095	51,89
7228 0100	70,82
7228 0105	106,80
7228 0110	45,87
7229 0005	600,08
7229 0010	491,42
7231 0005	977,22
7231 0010	1.279,93
7231 0015	1.279,93
7232 0105	7,05
7232 0108	43,93
7232 0110	83,55
7233 0012	140,77
7233 0015	140,77
7233 0018	140,77
7233 0022	140,77
7233 0028	140,77
7233 0035	140,77
7233 0042	428,56
7233 0054	428,56
7234 0001	963,80
7235 0012	140,77
7235 0015	140,77
7235 0018	140,77
7235 0022	140,77
7235 0028	140,77
7235 0035	140,77
7235 0042	259,51
7235 0054	259,51
7237 0100	1.189,30
7237 0200	1.629,06
7237 0300	2.488,03
7237 0400	2.373,23
7238 0025	224,16
7238 0030	248,78
7238 0032	182,84
7238 0038	331,70
7238 0044	405,42
7238 0048	374,55
7238 0051	398,37
7239 0025	18,52
7239 0050	21,23
7239 0075	23,92
7239 0100	29,14
7239 0125	37,70
7239 0150	73,66
7239 0200	123,69
7241 0480	107,22
7241 0680	157,06
7243 0011	1,77
7243 0012	1,77
7243 0013	1,77
7243 0014	1,77
7243 0015	2,01
7243 0017	2,47
7245 0300	2,63
7250 0350	8,47
7250 0450	9,63
7250 0550	10,90
7251 0005	170,47
7252 0005	808,48
7252 0010	1.286,85
7254 0005	75,25
7255 0401	12,48
7255 0451	13,39
7255 0501	14,18
7256 0400	18,57
7256 0450	21,65
7257 0400	12,48
7257 0450	13,39
7258 0300	5,30
7259 0301	13,67
7260 0005	2,59
7260 0010	3,24
7261 0005	38,75
7261 0010	49,91
7261 0015	62,70
7261 0020	28,79
7261 0025	38,89
7261 0030	47,60
7261 0035	45,38
7261 0040	57,56
7262 0003	7,18
7262 0005	6,90
7262 0010	8,73
7262 0013	2,12
7262 0015	1,91
7262 0020	2,14
7262 0023	2,12
7262 0025	2,31
7262 0030	2,59
7263 0005	6,07
7263 0010	1,38
7264 0005	71,24
7264 0010	94,48
7264 0015	5,09
7264 0020	6,86
7264 0025	5,93
7264 0030	8,28
7264 0035	8,30
7264 0040	10,57
7265 0005	8,14
7265 0010	9,21
7265 0015	10,29
7266 0300	11,39
7266 0400	32,46
7267 0005	8,86
7267 0010	10,20
7267 0015	11,71
7268 0005	20,83
7268 0010	23,85
7268 0500	2,12
7269 0270	24,71
7269 1270	18,53
7270 0005	257,65
7270 0010	331,29
7273 0005	542,57
7274 0006	368,83
7277 0300	62,62
7277 0305	111,87
7280 0008	1,09
7282 0004	7,16
7282 0006	7,16
7282 0008	7,16
7282 0010	7,51
7282 0012	7,51
7282 0014	7,75
7282 0016	7,89
7282 0018	8,28
7282 0020	8,96
7282 0022	9,77
7282 0024	9,99
7282 0026	10,41
7282 0028	10,75
7282 0030	10,94
7282 0032	11,22
7283 0060	49,42
7284 0105	16,78
7284 0140	24,92
7284 0160	26,95
7288 0005	59,62
7288 0010	59,62
7288 0015	21,89
7290 0005	59,97
7291 0005	13,97
7292 0005	12,93
7293 0005	8,42
7294 0005	3,52

Catalogue prices in EUR

Part No.	€
7294 0010	4,15
7295 0005	22,56
7296 0600	22,70
7296 0800	24,57
7296 1000	28,96
7297 1250	33,01
7297 1400	37,57
7297 1600	40,30
7300 0160	3,97
7300 0161	4,43
7300 0180	4,15
7300 0181	4,59
7302 0140	3,27
7302 0141	2,98
7304 0040	3,01
7304 0041	2,91
7304 0060	3,17
7304 0061	3,03
7304 0080	3,31
7304 0081	3,20
7306 0200	11,38
7306 0220	11,48
7308 0008	4,24
7308 0010	4,24
7308 0012	4,34
7309 0010	1,38
7309 0016	1,58
7309 0020	1,73
7310 0280	3,19
7310 0281	4,59
7312 0280	3,50
7312 0281	4,92
7314 0140	1,94
7314 0180	2,49
7316 0140	3,55
7320 0020	1,10
7320 0030	1,14
7320 0040	1,16
7320 0050	1,24
7320 0060	1,26
7320 0080	1,52
7320 0100	1,93
7322 0180	1,00
7324 0005	1,05
7326 0005	0,89
7327 0020	21,96
7328 0006	5,13
7328 0011	1,10
7328 0015	2,78
7329 0005	18,13
7329 1005	7,44
7331 0005	3,40
7331 0010	3,40
7331 0015	4,94
7331 0020	4,94
7331 1005	2,52
7331 1010	2,52
7331 1015	3,52
7331 1020	3,52
7333 0005	4,32
7333 0010	4,97
7333 0100	7,67
7333 0500	15,66
7333 0506	2,42
7333 0510	29,68
7333 0516	4,31
7334 0600	24,01
7334 0606	3,03
7335 0005	10,92
7337 0006	13,65
7337 0100	16,92
7339 0010	29,21
7340 0005	2,68

Part No.	€
7340 0500	12,93
7341 0005	1,59
7341 0010	2,50
7341 0505	18,55
7341 0506	2,63
7341 0510	22,19
7341 0511	3,40
7342 0018	3,38
7343 0010	4,92
7345 0005	2,24
7345 0010	3,10
7346 0005	9,66
7346 0011	4,48
7347 0005	4,53
7347 0010	6,07
7347 0105	4,15
7347 0110	5,44
7347 0505	9,52
7348 0010	7,16
7348 0100	2,22
7348 0110	23,77
7351 0005	10,20
7351 1001	4,67
7352 0005	18,17
7353 0005	21,19
7355 0005	19,69
7356 0031	3,40
7356 0041	4,67
7356 0051	7,02
7357 0005	79,47
7358 0430	20,83
7358 0530	23,38
7358 0600	27,97
7359 0005	43,45
7359 0010	55,20
7359 0100	92,44
7360 0005	87,12
7360 0010	106,54
7360 0015	124,90
7360 0020	104,20
7361 0005	78,59
7361 0010	111,35
7361 0015	143,99
7361 0020	137,43
7362 0005	143,47
7362 0010	167,60
7362 0015	186,39
7362 0020	251,51
7362 0025	268,15
7362 0030	232,72
7362 0035	465,43
7363 0005	25,92
7363 0010	52,69
7364 0005	47,74
7367 0005	73,26
7368 0005	111,13
7369 0005	59,75
7370 0005	152,13
7373 0005	202,72
7374 0005	95,46
7375 0005	11,06
7377 0005	94,89
7378 0005	87,99
7379 0005	179,53
7381 0005	146,32
7382 0005	90,37
7383 0005	237,74
7385 0005	191,36
7386 0005	228,99
7387 0000	6,27
7387 0003	7,53
7387 0005	8,42
7388 0005	257,53

Part No.	€
7389 0005	82,88
7390 0005	213,40
7391 0005	247,45
7392 0005	285,11
7393 0005	135,89
7395 0005	210,84
7396 0005	346,76
7397 0005	309,37
7399 0005	314,60
7400 0025	19,60
7401 0008	23,85
7402 0010	151,36
8006 0010	8,33
8006 0020	8,33
8006 0030	12,64
8006 0040	12,64
8006 0050	12,64
8006 0060	12,64
8006 0070	16,35
8006 0080	18,36
8006 0090	16,35
8006 0100	16,35
8006 0110	16,35
8006 0120	18,36
8006 0130	18,36
8006 0140	18,36
8006 0150	30,87
8006 0160	30,87
8006 0170	40,09
8006 0180	40,09
8006 0190	53,99
8006 0200	53,99
8009 0010	10,62
8009 0020	16,12
8009 0030	18,69
8009 0040	20,88
8009 0050	20,88
8009 0060	28,42
8009 0070	28,42
8009 0080	42,49
8009 0090	62,07
8009 0100	68,95
8012 0010	9,12
8012 0020	13,84
8012 0030	13,84
8012 0050	19,58
8012 0060	19,58
8012 0070	22,28
8012 0080	36,49
8012 0090	53,29
8013 2012	0,65
8013 2013	0,65
8013 2016	0,65
8013 3216	0,70
8013 3220	0,70
8013 3225	0,70
8013 5132	0,81
8013 7651	1,21
8015 0010	16,54
8021 0010	17,62
8023 0010	144,10
8023 0020	144,10
8025 0010	158,29
8025 0020	158,29
8025 0030	216,14
8025 0040	245,61
8027 0115	1,17
8027 0125	1,26
8027 0180	2,07
8027 0181	2,35
8027 0230	3,47
8035 0115	1,66

Part No.	€
8035 0125	2,14
8035 0178	2,71
8035 0179	3,54
8035 0230	5,95
8038 0115	2,52
8038 0125	3,36
8038 0178	4,08
8038 0179	4,59
8038 0230	7,37
8041 0115	1,42
8041 0125	1,56
8041 0180	2,75
8050 0115	1,87
8050 0125	2,40
8050 0180	2,99
8050 0231	6,69
8053 0115	2,78
8053 0125	3,75
8053 0180	4,46
8053 0181	5,08
8053 0231	8,16
8054 0178	4,57
8054 0230	6,28
8056 0115	2,94
8056 0125	4,03
8056 0178	4,81
8057 0040	1,86
8057 0060	1,86
8057 0080	1,86
8058 0040	2,17
8058 0060	2,17
8058 0080	2,17
8059 0113	0,88
8059 0114	0,89
8059 0115	0,70
8059 0123	0,96
8059 0124	0,98
8059 0125	0,77
8059 0179	1,58
8059 0180	1,03
8059 0229	2,17
8059 0230	1,44
8065 0114	1,10
8065 0115	1,10
8065 0116	0,96
8065 0124	1,24
8065 0125	1,26
8065 0126	1,12
8065 0177	1,82
8065 0178	1,37
8065 0229	2,73
8065 0230	1,93
8071 0115	1,82
8071 0116	1,72
8071 0117	1,89
8071 0125	2,10
8071 0126	1,98
8071 0127	2,17
8071 0177	2,66
8071 0178	3,17
8071 0229	3,97
8071 0230	4,67
8072 0230	4,53
8072 0231	4,53
8077 0115	0,77
8077 0125	0,89
8077 0180	1,26
8085 0115	0,96
8085 0116	0,98
8085 0125	1,03
8085 0126	1,05
8085 0180	1,61
8085 0230	2,29

Part No.	€
8090 0114	1,16
8090 0115	1,16
8090 0116	1,05
8090 0124	1,31
8090 0125	1,31
8090 0126	1,21
8090 0177	1,89
8090 0178	1,49
8090 0229	2,84
8090 0230	2,05
8096 0115	1,87
8096 0116	1,93
8096 0117	1,77
8096 0125	2,15
8096 0126	2,22
8096 0127	2,03
8096 0177	2,77
8096 0178	3,26
8096 0229	4,04
8096 0230	4,78
8097 0115	2,92
8097 0125	3,22
8098 0230	4,95
8098 0231	4,95
8099 0115	0,72
8099 0125	0,79
8099 0230	1,47
8100 0115	1,44
8100 0125	1,65
8101 0115	1,35
8101 0125	1,52
8101 0230	3,19
8108 0115	1,73
8108 0125	2,00
8108 0178	3,20
8108 0230	4,73
8109 0606	7,63
8109 0610	7,63
8109 4011	1,37
8109 4021	1,37
8109 5011	1,61
8109 5021	1,61
8109 6511	1,66
8109 6530	1,66
8109 7611	2,00
8109 7621	2,00
8110 0010	27,14
8111 0115	1,77
8111 0125	2,03
8111 0178	3,26
8112 0010	28,60
8115 0115	7,35
8115 0125	8,10
8115 0180	11,59
8115 0230	15,45
8116 0115	16,10
8116 0125	19,13
8116 0180	33,22
8116 0230	36,23
8116 0300	60,67
8116 0305	60,67
8116 0350	81,52
8116 0355	81,52
8118 0115	19,86
8118 0125	20,81
8118 0180	34,06
8118 0230	52,03
8121 0115	8,16
8121 0125	9,07
8121 0180	15,40
8121 0230	19,02
8122 0115	10,06
8122 0125	12,08

Part No.	€
8126 0110	10,89
8129 0110	11,53
8133 0080	13,83
8133 0100	13,16
8133 0120	13,16
8133 0150	13,16
8133 0180	13,16
8133 1000	3,48
8135 0120	39,88
8135 0150	32,87
8135 0180	30,87
8135 0240	30,87
8135 0320	30,87
8135 0360	30,87
8135 0400	30,87
8135 0600	30,87
8135 0800	30,87
8135 1000	30,87
8137 0040	96,15
8137 0060	84,00
8137 0080	77,63
8137 0100	73,87
8137 0120	73,87
8137 0150	73,87
8137 0180	73,87
8137 0240	73,87
8137 0280	73,87
8137 0320	73,87
8137 0360	73,87
8137 0400	73,87
8140 0040	36,75
8140 0060	29,30
8140 0080	25,80
8140 0100	23,50
8140 0120	23,50
8143 0040	55,16
8143 0060	48,84
8143 0080	45,92
8143 0100	43,75
8143 0120	43,75
8143 0150	43,75
8143 0180	43,75
8143 0240	43,75
8143 0320	43,75
8143 0400	43,75
8146 0040	73,89
8146 0060	67,08
8146 0080	66,10
8146 0100	65,12
8146 0120	65,12
8146 0150	65,12
8146 0180	65,12
8146 0240	65,12
8146 0280	65,12
8146 0320	65,12
8146 0360	65,12
8146 0400	65,12
8146 0999	65,12
8150 0040	24,19
8150 0060	23,10
8150 0080	22,03
8150 0100	21,47
8150 0120	21,47
8150 0150	21,47
8150 0180	21,47
8150 0240	21,47
8150 0320	21,47
8150 0400	21,47
8153 0040	30,08
8153 0060	28,47
8153 0080	27,39
8153 0100	26,86
8153 0120	26,86

Part No.	€
8153 0150	26,86
8153 0180	26,86
8153 0240	26,86
8153 0320	26,86
8153 0400	26,86
8156 0040	60,17
8156 0060	55,90
8156 0080	53,20
8156 0100	52,12
8156 0120	52,12
8156 0150	52,12
8156 0180	52,12
8156 0240	52,12
8156 0320	52,12
8156 0400	52,12
8159 0001	26,08
8162 0005	86,15
8165 0001	0,96
8166 0001	4,03
8168 0001	1,30
8175 0040	43,49
8175 0060	43,49
8175 0080	43,49
8175 0120	43,49
8176 0040	59,80
8176 0060	58,29
8176 0080	57,52
8176 0120	57,07
8177 0040	131,13
8177 0060	120,51
8177 0080	115,20
8177 0100	112,18
8177 0120	112,18
8177 0150	112,18
8177 0240	112,18
8178 0040	43,49
8178 0060	43,49
8178 0080	43,49
8178 0120	43,49
8179 0040	103,85
8179 0060	96,27
8179 0080	92,47
8179 0120	90,18
8179 0150	90,18
8180 0040	222,74
8180 0060	200,39
8180 0080	189,60
8181 0040	43,49
8181 0060	43,49
8181 0080	43,49
8181 0120	43,49
8182 0040	232,02
8182 0060	208,09
8182 0080	196,53
8182 0120	189,60
8184 0040	43,49
8184 0060	43,49
8184 0080	43,49
8184 0120	43,49
8185 0024	1.031,33
8185 0036	877,17
8185 0040	788,57
8185 0060	590,10
8185 0080	524,53
8186 0024	1.193,48
8186 0036	1.013,62
8186 0040	910,84
8186 0060	679,58
8186 0080	602,49
8187 0040	94,55
8187 0060	89,90
8187 0080	87,80
8187 0120	86,77

Catalogue prices in EUR

Part No.	€
8188 0024	1.994,44
8188 0036	1.686,13
8188 0040	1.509,80
8188 0060	1.113,75
8188 0080	981,72
8188 0100	937,42
8188 0120	937,42
8190 0100	165,08
8190 0180	155,93
8190 0240	162,58
8191 0100	368,25
8191 0180	343,32
8191 0240	343,32
8192 0100	364,81
8192 0180	339,87
8192 0240	339,87
8193 0100	192,61
8193 0180	181,60
8193 0240	191,73
8194 0100	523,99
8194 0180	485,26
8194 0240	485,26
8195 0100	567,88
8195 0180	526,58
8195 0240	526,58
8196 0100	238,44
8196 0180	225,61
8196 0240	239,72
8197 0100	1.978,94
8197 0180	1.819,74
8197 0240	1.819,74
8198 0100	2.960,65
8198 0180	2.721,46
8198 0240	2.721,46
8199 0100	196,30
8199 0180	185,27
8199 0240	186,53
8202 0100	350,33
8202 0180	326,48
8202 0240	348,08
8205 0040	143,20
8205 0060	132,44
8205 0080	127,24
8205 0100	124,51
8205 0120	124,51
8205 0150	124,51
8205 0240	124,51
8208 0040	179,41
8208 0060	164,99
8208 0080	158,34
8208 0100	153,51
8208 0120	153,51
8208 0150	153,51
8208 0240	153,51
8211 0040	194,13
8211 0060	177,91
8211 0080	170,14
8211 0100	165,18
8211 0120	165,18
8211 0150	165,18
8211 0240	165,18
8214 0040	156,82
8214 0060	143,71
8214 0080	137,55
8214 0100	133,44
8214 0120	133,44
8214 0150	133,44
8214 0240	133,44
8217 0040	413,44
8217 0060	369,93
8217 0080	349,37
8217 0100	336,56
8217 0120	336,56
8217 0150	336,56
8217 0240	336,56
8220 0040	753,73
8220 0060	667,26
8220 0080	626,17
8220 0100	600,30
8220 0120	600,30
8220 0150	600,30
8220 0240	600,30
8222 0040	90,70
8222 0060	81,88
8222 0080	79,10
8222 0120	79,10
8223 0024	196,84
8223 0036	179,62
8223 0040	171,45
8223 0050	163,21
8223 0060	156,31
8223 0080	149,10
8223 0100	144,50
8223 0120	144,50
8226 0036	470,54
8226 0040	444,69
8226 0060	397,46
8226 0080	375,01
8226 0100	360,83
8227 0036	511,37
8227 0040	464,01
8227 0060	412,88
8227 0080	388,26
8227 0120	369,32
8228 0036	848,09
8228 0040	73.557,16
8228 0060	599,55
8228 0080	554,21
8228 0100	554,21
8229 0036	867,97
8229 0040	817,50
8229 0060	722,00
8229 0080	676,88
8229 0100	648,87
8230 0036	956,45
8230 0040	909,09
8230 0060	761,37
8230 0080	712,13
8230 0120	681,82
8232 0016	46,06
8232 0024	33,69
8232 0036	28,05
8232 0040	26,01
8232 0050	25,32
8232 0060	24,59
8232 0080	23,61
8232 0100	23,61
8232 0120	23,61
8233 0024	124,92
8233 0036	111,63
8233 0040	94,82
8233 0060	74,25
8233 0080	67,52
8233 0100	67,52
8233 0120	67,52
8234 0024	139,13
8234 0036	124,04
8234 0040	105,46
8234 0060	82,50
8234 0080	74,95
8234 0100	74,95
8234 0120	74,95
8235 0016	51,24
8235 0024	44,36
8235 0036	39,99
8235 0040	36,79
8235 0050	36,26
8235 0060	33,85
8235 0080	31,85
8235 0100	31,85
8235 0120	31,85
8236 0024	278,22
8236 0036	248,08
8236 0040	210,00
8236 0060	165,67
8236 0080	150,62
8236 0100	150,62
8236 0120	150,62
8237 0040	52,66
8237 0060	43,00
8237 0080	38,36
8237 0100	34,86
8237 0120	34,86
8237 0180	34,86
8237 0240	34,86
8237 0320	34,86
8238 0016	97,72
8238 0024	73,55
8238 0036	66,27
8238 0040	64,03
8238 0050	61,76
8238 0060	53,95
8238 0080	53,34
8238 0100	53,34
8238 0120	53,34
8240 0036	51,70
8240 0040	48,20
8240 0060	46,71
8240 0080	39,50
8241 0036	35,65
8241 0050	29,42
8241 0060	28,79
8241 0080	27,49
8241 0100	27,49
8241 0120	27,49
8244 0036	45,71
8244 0050	41,44
8244 0060	39,27
8244 0080	37,05
8244 0100	37,05
8244 0120	37,05
8246 0024	61,69
8246 0036	55,00
8246 0050	43,31
8246 0060	36,72
8246 0080	33,41
8246 0120	33,41
8247 0036	76,98
8247 0050	72,00
8247 0060	68,71
8247 0080	63,25
8247 0100	63,25
8247 0120	63,25
8248 0024	68,48
8248 0036	61,06
8248 0050	48,16
8248 0060	40,74
8248 0080	37,05
8248 0120	37,05
8249 0024	137,48
8249 0036	122,10
8249 0050	96,50
8249 0060	81,45
8249 0080	74,06
8249 0120	74,06
8250 0115	3,38
8250 0125	4,39
8250 0180	6,86
8251 0010	17,20
8253 0040	37,52
8253 0060	33,37
8253 0080	32,32
8253 0100	31,33
8253 0120	31,33
8255 0060	1,47
8255 0080	1,47
8255 1060	1,66
8255 1080	1,66
8255 2005	2,28
8255 2010	2,56
8255 2015	7,67
8255 3005	24,80
8255 3010	19,50
8255 3015	22,86
8255 4060	1,23
8255 4080	1,23
8255 4120	1,23
8255 5060	1,23
8255 5080	1,23
8255 5120	1,23
8255 6060	1,31
8255 6080	1,31
8255 6120	1,31
8255 7036	5,36
8255 7080	5,36
8255 7120	5,36
8256 0040	47,93
8256 0060	42,72
8256 0080	39,59
8256 0100	38,55
8256 0120	38,55
8257 0036	47,55
8257 0040	45,64
8257 0060	33,02
8257 0080	27,60
8258 0060	1,02
8258 0080	1,02
8258 1060	1,17
8258 1080	1,17
8258 2005	1,51
8258 2010	1,58
8258 2015	5,37
8258 3005	19,09
8258 3010	16,77
8258 3015	21,46
8258 4060	0,93
8258 4080	0,93
8258 4120	0,93
8258 5060	0,93
8258 5080	0,93
8258 5120	0,93
8258 6060	0,95
8258 6080	0,95
8258 6120	0,95
8258 7036	4,55
8258 7080	4,55
8258 7120	4,55
8259 0115	5,65
8259 0125	6,69
8259 0150	7,84
8260 0040	40,39
8260 0060	33,57
8260 0080	30,12
8260 0100	27,55
8260 0120	27,55
8260 0180	27,55
8260 0240	27,55
8260 0320	27,55
8261 0040	1,98
8261 0060	1,98
8261 0080	1,98
8262 0040	2,05
8262 0060	2,05
8262 0080	2,05
8262 0120	2,05
8263 0040	52,66
8263 0060	43,00
8263 0080	38,36
8263 0100	34,86
8263 0120	34,86
8263 0180	34,86
8263 0240	34,86
8263 0320	34,86
8264 0040	2,24
8264 0060	2,24
8264 0080	2,24
8265 0040	2,31
8265 0060	2,31
8265 0080	2,31
8265 0120	2,31
8267 0040	5,06
8267 0060	5,06
8267 0080	5,06
8268 0040	5,06
8268 0060	5,06
8268 0080	5,06
8271 0040	2,14
8271 0060	2,14
8271 0080	2,14
8271 0120	2,14
8274 0040	2,35
8274 0060	2,35
8274 0080	2,35
8274 0120	2,35
8277 0040	4,66
8277 0060	4,66
8277 0080	4,66
8281 0040	4,57
8281 0060	4,57
8281 0080	4,57
8282 0040	5,01
8282 0060	5,01
8282 0080	5,01
8286 0040	2,75
8286 0060	2,75
8286 0080	2,75
8286 0120	2,75
8289 0040	3,17
8289 0060	3,17
8289 0080	3,17
8289 0120	3,17
8292 0040	3,54
8292 0060	3,54
8292 0080	3,54
8292 0120	3,54
8293 0040	3,62
8293 0060	3,62
8293 0080	3,62
8294 0040	4,03
8294 0060	4,03
8294 0080	4,03
8295 0040	3,83
8295 0060	3,83
8295 0080	3,83
8295 0120	3,83
8296 0040	4,41
8296 0060	4,41
8296 0080	4,41
8297 0040	4,03
8297 0060	4,03
8297 0080	4,03
8299 0040	4,41
8299 0060	4,41
8299 0080	4,41
8300 0040	4,81
8301 0040	3,54
8301 0060	3,54
8301 0080	3,54
8301 0120	3,54
8302 0040	5,23
8303 0040	4,81
8304 0040	3,83
8304 0060	3,83
8304 0080	3,83
8304 0120	3,83
8305 0040	5,23
8310 0040	3,85
8310 0060	3,85
8313 0040	4,18
8313 0060	4,18
8319 0040	3,85
8319 0060	3,85
8322 0040	4,18
8322 0060	4,18
8326 0040	4,03
8326 0060	4,03
8326 0080	4,03
8327 0040	4,41
8327 0060	4,41
8327 0080	4,41
8328 1530	7,19
8328 2220	7,05
8328 3030	7,75
8328 4530	8,91
8328 6030	11,57
8329 0115	9,50
8329 0125	10,41
8331 1530	0,32
8331 2220	0,23
8331 3030	0,37
8331 4530	0,47
8331 6030	0,54
8332 0075	2,59
8332 1013	5,95
8332 1026	6,41
8332 1039	6,93
8334 1530	0,32
8334 2220	0,23
8334 3030	0,37
8334 4530	0,47
8334 6030	0,54
8337 1530	0,32
8337 2220	0,23
8337 3030	0,37
8337 4530	0,47
8337 6030	0,54
8340 0510	3,61
8340 0712	3,90
8340 1015	3,97
8343 0511	3,61
8343 0713	3,90
8346 0511	3,54
8346 0713	3,90
8349 1125	4,99
8352 0080	0,46
8352 0150	0,46
8355 0060	0,49
8355 0150	0,49
8358 0060	0,51
8358 0150	0,51
8361 0080	0,46
8361 0150	0,46
8364 0060	0,49
8364 0150	0,49
8367 0080	0,46
8367 0150	0,46
8370 0060	0,49
8370 0150	0,49
8373 0060	0,68
8373 0150	0,68
8388 0040	1,33
8388 0060	1,33
8388 0080	1,33
8388 0120	1,33
8388 0150	1,33
8388 0180	1,33
8388 0240	1,33
8388 0320	1,33
8391 0040	1,38
8391 0060	1,38
8391 0080	1,38
8391 0120	1,38
8391 0150	1,38
8391 0180	1,38
8391 0240	1,38
8391 0320	1,38
8394 0040	1,45
8394 0060	1,45
8394 0080	1,45
8394 0120	1,45
8394 0150	1,45
8394 0180	1,45
8394 0240	1,45
8394 0320	1,45
8397 0040	1,52
8397 0060	1,52
8397 0080	1,52
8397 0120	1,52
8397 0150	1,52
8397 0180	1,52
8397 0240	1,52
8397 0320	1,52
8400 0040	1,91
8400 0060	1,91
8400 0080	1,91
8400 0120	1,91
8400 0150	1,91
8400 0180	1,91
8400 0240	1,91
8400 0320	1,91
8406 0040	2,42
8406 0060	2,42
8406 0080	2,42
8406 0120	2,42
8406 0150	2,42
8406 0180	2,42
8406 0240	2,42
8406 0320	2,42
8409 0040	3,36
8409 0060	3,36
8409 0080	3,36
8409 0120	3,36
8409 0150	3,36
8409 0180	3,36
8409 0240	3,36
8409 0320	3,36
8412 0040	4,18
8412 0060	4,18
8412 0080	4,18
8412 0120	4,18
8412 0150	4,18
8412 0180	4,18
8412 0240	4,18
8412 0320	4,18
8413 0040	1,56
8413 0060	1,56
8413 0080	1,56
8413 0120	1,56
8413 0180	1,56
8414 0040	1,73
8414 0060	1,73

Catalogue prices in EUR

Part No.	€
8414 0080	1,73
8414 0120	1,73
8414 0180	1,73
8415 0060	4,39
8415 0100	4,39
8415 0150	4,39
8415 0240	4,39
8416 0040	2,12
8416 0060	2,12
8416 0080	2,12
8416 0120	2,12
8416 0180	2,12
8417 0040	2,31
8417 0060	2,31
8417 0080	2,31
8417 0120	2,31
8417 0180	2,31
8418 0060	6,81
8418 0100	6,81
8418 0150	6,81
8418 0240	6,81
8419 0040	4,67
8419 0060	4,67
8419 0080	4,67
8419 0120	4,67
8419 0180	4,67
8422 0060	9,84
8422 0100	9,84
8422 0150	9,84
8422 0240	9,84
8423 0080	12,71
8423 0100	12,71
8423 0150	12,71
8423 0180	12,71
8424 0080	18,94
8424 0100	18,94
8424 0150	18,94
8424 0180	18,94
8425 0060	11,45
8425 0100	11,45
8425 0150	11,45
8425 0240	11,45
8426 0010	11,94
8426 0020	11,94
8426 0030	11,94
8427 0010	17,92
8427 0020	17,92
8427 0030	17,92
8432 0005	38,64
8432 0010	38,64
8432 0015	38,64
8435 0120	25,41
8435 0180	23,31
8435 0320	23,31
8436 0320	23,31
8438 0040	8,05
8438 0060	8,05
8438 0080	8,54
8438 0120	8,54
8440 0100	5,69
8440 0180	5,69
8440 0280	5,69
8440 0610	2,47
8440 0812	2,59
8440 1015	2,59
8440 1220	2,59
8440 1530	3,20
8440 2030	3,24
8440 2515	2,98
8440 3030	4,60
8441 0100	6,86
8441 0180	6,86
8441 0280	6,86

Part No.	€
8442 0100	7,25
8442 0180	7,25
8442 0280	7,25
8443 0060	2,15
8443 0100	9,12
8443 0120	2,15
8443 0180	9,12
8443 0240	2,15
8443 0280	9,12
8444 0100	23,00
8444 0180	23,00
8444 0280	23,00
8445 0040	13,72
8445 0060	13,72
8445 0080	15,05
8445 0120	15,05
8445 0180	16,38
8445 0240	18,74
8446 0040	24,41
8446 0060	24,41
8446 0080	26,81
8446 0120	26,81
8446 0180	29,16
8446 0240	33,15
8449 0100	280,37
8449 0180	237,65
8449 0280	237,65
8450 0205	1,33
8450 0306	1,16
8450 0408	1,16
8450 0510	1,16
8450 0613	1,21
8450 0810	1,16
8450 0816	1,17
8452 0100	375,17
8452 0180	317,85
8452 0280	317,85
8453 0510	1,16
8453 0613	1,21
8453 0816	1,17
8453 1020	1,33
8453 1032	1,63
8453 1325	1,52
8453 1604	1,19
8453 1632	1,63
8453 2004	1,42
8453 2025	1,56
8453 2032	1,75
8453 2513	1,56
8453 2532	1,98
8453 3216	1,79
8453 3232	2,22
8453 4020	2,00
8453 5025	2,70
8455 0100	459,62
8455 0180	388,76
8455 0280	388,76
8456 0510	1,16
8456 0613	1,21
8456 0816	1,17
8456 1020	1,33
8456 1032	1,63
8456 1325	1,52
8456 1632	1,63
8456 2025	1,56
8456 2532	1,98
8459 0703	1,33
8459 0705	1,33
8459 0706	1,33
8459 0708	1,33
8462 0306	1,33
8462 0510	1,42
8465 0306	1,33

Part No.	€
8465 0510	1,42
8465 0816	1,44
8465 1320	1,70
8465 2032	2,33
8467 0010	6,56
8467 0014	7,00
8467 0019	8,17
8467 0029	9,00
8467 0040	9,15
8467 0049	10,96
8467 0060	12,43
8467 0069	15,86
8467 0090	18,43
8467 0110	21,79
8467 0120	30,36
8468 0808	1,42
8468 1010	1,44
8468 1313	1,51
8468 1616	1,77
8468 2020	2,00
8471 1025	1,70
8471 1645	2,70
8471 2032	2,15
8471 2545	2,70
8474 0001	21,07
8477 0001	18,25
8480 0816	1,24
8480 1020	1,52
8480 1032	1,63
8480 1325	1,52
8480 1632	1,63
8480 2025	1,56
8480 4020	2,00
8480 5013	2,15
8480 5025	2,70
8482 1632	1,63
8482 2025	1,56
8482 2040	2,05
8482 3232	2,22
8484 2032	2,33
8486 0010	6,79
8486 0015	6,79
8486 0020	6,79
8486 0030	6,79
8486 0040	8,42
8486 0050	9,64
8486 0060	10,03
8486 0080	13,62
8486 0100	15,44
8486 0120	17,89
8489 0020	7,84
8489 0030	8,16
8489 0040	8,16
8489 0050	8,16
8489 0060	13,62
8489 0080	15,70
8489 0100	19,13
8489 0120	23,85
8490 0010	8,51
8490 0020	10,61
8490 0030	10,73
8490 0040	12,02
8490 0050	15,45
8490 0060	18,17
8490 0080	22,93
8490 0100	29,65
8490 0120	37,29
8493 0005	31,94
8493 0010	44,10
8493 0015	61,36
8496 0005	12,69
8496 0010	20,02
8496 0015	31,75

Part No.	€
8501 0150	4,34
8501 0200	5,18
8502 0005	9,66
8504 0005	51,98
8504 0010	33,29
8507 0005	83,67
8507 0010	91,75
8507 0015	102,87
8510 0005	13,39
8510 0010	22,51
8510 0015	26,85
8512 0025	26,20
8512 0050	45,83
8512 0075	76,41
8512 0100	108,61
8512 0150	141,37
8512 1025	26,20
8512 1050	45,83
8512 1075	76,41
8512 1100	108,61
8512 1150	141,37
8512 2025	26,20
8512 2050	45,83
8512 2075	76,41
8512 2100	108,61
8512 2150	141,37
8515 0005	86,24
8518 0005	86,24
8521 0005	86,24
8524 0005	51,35
8527 0005	51,35
8530 0005	51,35
8531 0005	51,35
8533 0005	85,58
8536 0005	85,58
8546 0015	2,57
8546 0025	2,82
8546 0035	2,82
8546 0040	2,82
8546 0045	2,82
8546 0055	3,83
8546 0060	3,83
8546 0065	4,18
8546 0070	4,18
8546 0075	4,18
8549 0010	3,24
8549 0015	3,24
8549 0025	3,59
8549 0030	3,59
8549 0035	3,59
8549 0040	3,59
8549 0045	3,59
8549 0050	4,57
8549 0055	4,57
8549 0060	4,57
8549 0065	4,85
8549 0070	4,85
8549 0075	4,85
8552 0025	3,99
8552 0030	3,99
8552 0040	3,99
8552 0045	3,99
8555 0040	3,59
8555 0045	3,59
8555 0055	4,57
8558 0010	2,28
8558 0035	2,57
8558 0040	2,57
8558 0045	2,57
8558 0070	3,73
8558 0075	3,73
8567 0100	3,52
8567 0105	3,52

Part No.	€
8570 0005	4,13
8570 0010	5,62
8570 0015	5,39
8570 0020	5,39
8570 0025	6,27
8570 0030	8,63
8571 0015	5,76
8571 0025	7,46
8571 0030	8,63
8573 0025	2,99
8573 0040	2,99
8573 0045	2,99
8573 0055	4,06
8573 0060	4,06
8573 0070	4,39
8573 0075	4,39
8574 0005	3,92
8574 0010	6,74
8574 0015	8,37
8574 0020	11,69
8574 0025	19,85
8576 0010	3,43
8576 0015	3,43
8576 0025	3,76
8576 0030	3,76
8576 0035	3,85
8576 0040	3,85
8576 0045	3,85
8576 0050	4,83
8576 0055	4,83
8576 0060	4,83
8576 0065	5,11
8576 0070	5,11
8576 0075	5,11
8577 0005	4,94
8577 0010	7,30
8577 0015	8,37
8577 0020	14,18
8577 0025	17,31
8579 0025	4,20
8579 0040	4,29
8579 0045	4,29
8580 0005	7,26
8580 0010	11,48
8580 0015	14,77
8582 0040	3,76
8582 0060	4,83
8583 0010	9,38
8585 0010	2,42
8585 0015	2,42
8585 0040	2,70
8585 0045	2,70
8585 0070	3,89
8585 0075	3,89
8586 0005	4,45
8586 0010	5,41
8586 0015	6,79
8588 0105	3,68
8589 0070	11,01
8591 0005	9,03
8591 0010	29,12
8592 0005	23,71
8593 0180	33,97
8593 0220	33,97
8593 0360	33,97
8593 0500	33,97
8596 0080	2,29
8596 0100	2,56
8596 0125	3,34
8596 0150	3,90
8596 0200	7,05
8597 0080	2,73
8597 0100	3,06

Part No.	€
8597 0125	3,90
8597 0150	5,50
8597 0200	9,63
8599 0080	6,42
8599 0100	18,78
8599 0125	25,88
8599 0150	38,92
8599 0200	79,29
8600 0010	7,35
8600 0020	20,07
8600 0030	30,24
8602 0010	2,80
8602 0020	4,87
8602 0030	3,47
8602 0040	4,46
8602 0050	2,85
8602 0060	4,46
8602 0070	5,60
8602 0080	7,60
8605 0120	27,93
8605 0180	27,93
8605 0220	28,98
8605 0360	29,94
8605 0500	31,15
8605 0750	33,57
8605 1000	34,21
8605 1500	35,82
8605 2000	37,12
8608 0001	9,36
8608 0002	9,36
8608 0003	9,36
8611 0001	10,96
8611 0002	9,29
8611 0003	9,29
9046 0005	76,41
9047 0006	5,99
9049 0005	68,41
9049 0010	73,62
9049 0015	8,23
9049 0020	14,40
9049 0025	23,49
9052 0005	109,34
9052 0010	17,48
9052 0015	11,32
9054 0006	18,83
9054 0101	10,99
9056 0007	29,56
9056 0101	12,23
9059 0006	10,52
9116 0020	16,47
9116 0025	16,08
9116 0030	10,17
9116 0040	6,39
9119 0010	29,28
9130 0016	29,37
9130 0020	6,07
9130 0025	6,07
9130 0030	6,07
9133 0030	26,04
9133 0035	5,79
9133 0040	5,79
9133 0045	27,41
9136 0051	6,55
9136 0081	9,64
9136 0083	9,64
9136 0151	10,90
9136 0158	9,98
9136 1050	45,33
9136 1080	51,15
9136 1150	57,24
9140 0200	121,03
9140 0300	141,10

Part No.	€
9140 0550	212,22
9141 0201	36,93
9141 0301	49,91
9141 0551	83,18
9143 0075	44,17
9146 0060	157,75
9150 0011	8,37
9150 0021	8,37
9150 0031	8,37
9150 0041	8,37
9150 0051	8,37
9150 0061	8,37
9150 0071	14,11
9150 0081	15,14
9150 0091	15,14
9150 0101	15,14
9153 0011	66,31
9156 0011	93,26
9163 0010	2,05
9163 0025	5,04
9163 0050	9,42
9166 0010	2,05
9166 0025	5,04
9169 0010	2,54
9169 0025	5,81
9173 0025	6,95
9176 0025	16,54
9180 0010	3,24
9183 0005	0,96
9183 0010	1,42
9186 0007	1,98
9189 0005	1,66
9189 0500	5,62
9192 0010	0,28
9195 0020	2,66
9198 0015	4,39
9199 0005	1,82
9199 0010	1,91
9199 0015	10,61
9206 0005	299,86
9206 0010	24,36
9206 0015	7,35
9206 0020	7,86
9225 0010	8,05
9228 0010	3,52
9228 0020	0,72
9231 0020	5,23
9231 0030	6,62
9231 0040	7,75
9231 0060	9,84
9233 0005	18,03
9233 0010	26,93
9233 0015	28,46
9233 0020	49,05
9234 0040	3,22
9234 0060	3,50
9235 0005	20,93
9235 0010	29,82
9235 0015	31,36
9235 0020	45,66
9237 0010	2,82
9245 0005	8,14
9245 0010	10,92
9300 0005	40,78
9302 0005	37,24
9303 0005	111,44
9304 0005	14,09
9305 0005	28,79
9306 0005	43,31
9309 0005	169,45
9312 0005	174,09
9315 0005	565,72
9316 0005	787,50

Catalogue prices in EUR

Part No.	€
9317 0005	1.129,82
9318 0005	897,17
9319 0005	139,67
9320 0005	740,20
9321 0006	129,20
9322 0005	112,51
9323 0305	18,55
9323 0306	18,80
9323 0307	19,23
9323 0308	21,14
9323 0310	23,07
9323 0312	25,83
9323 0406	21,56
9323 0407	22,42
9323 0408	23,29
9323 0410	26,27
9323 0412	30,31
9323 0416	38,01
9323 0418	38,85
9323 0508	33,30
9323 0510	35,04
9323 0512	38,01
9323 0514	41,63
9324 0314	31,40
9324 0316	36,44
9324 0405	23,35
9324 0414	18,01
9324 0420	47,50
9324 0425	57,77
9324 0516	50,94
9324 0518	61,79
9324 0520	69,63
9324 0525	78,10
9324 0530	89,57
9324 0535	104,63
9324 3206	20,93
9324 3208	23,35
9324 3210	24,96
9324 3212	29,19
9324 3214	33,02
9324 3216	38,64
9324 4808	34,42
9324 4810	36,21
9324 4812	41,06
9324 4814	44,89
9324 4816	50,52
9324 4818	60,59
9324 4820	68,43
9324 4825	75,48
9325 0408	25,78
9325 0410	29,19
9325 0412	32,60
9326 0406	91,39
9326 0408	102,48
9326 0410	113,38
9326 0412	124,25
9327 0410	30,42
9327 0413	36,21
9327 0417	44,68
9327 3208	24,76
9327 3211	28,98
9327 3295	26,16
9327 4810	38,64
9327 4815	50,72
9327 4817	57,56
9327 4825	79,70
9328 0500	126,19
9329 0410	45,69
9329 4810	57,16
9329 4815	70,04
9329 4817	73,64
9330 0408	43,47
9330 0411	48,11
9330 0412	49,91
9330 0495	44,68
9330 3208	36,21
9330 3265	35,82
9330 3295	36,44
9330 4811	52,33
9330 4812	52,96
9330 4814	56,96
9330 4895	51,33
9331 0410	50,94
9331 0413	58,57
9331 4810	75,88
9331 4815	86,35
9332 0408	82,51
9332 0411	86,35
9332 0412	86,94
9332 0495	84,74
9332 3208	60,59
9332 3265	58,75
9332 3295	61,79
9332 4811	100,80
9332 4812	104,06
9332 4895	94,80
9333 0410	46,90
9333 0413	58,17
9333 0417	77,30
9333 4815	74,27
9334 0413	69,81
9335 0306	71,66
9335 0308	78,91
9335 0310	90,39
9335 0312	115,52
9335 0414	144,73
9335 0416	162,02
9335 0420	202,06
9335 0425	253,38
9335 0508	164,43
9335 0510	174,28
9335 0512	189,18
9335 0514	200,04
9335 0516	210,72
9335 0520	247,14
9335 0525	289,40
9335 0530	328,04
9335 3206	73,26
9335 3208	80,71
9335 3210	92,98
9335 4808	158,97
9335 4810	168,86
9335 4812	185,97
9335 4814	197,21
9336 0308	58,17
9337 3206	80,31
9337 3275	83,72
9338 0010	60,38
9338 0105	8,45
9338 0106	8,45
9338 0205	6,25
9338 0206	6,25
9339 0010	277,13
9339 0015	277,13
9339 0020	277,13
9339 0025	277,13
9339 0105	30,00
9339 0106	30,00
9339 0108	30,00
9339 0110	30,00
9339 0205	18,13
9339 0206	18,13
9339 0208	18,13
9339 0210	18,13
9340 0005	1.025,78
9344 0030	76,48
9344 0050	123,99
9344 0065	160,60
9345 0030	83,13
9345 0050	132,02
9345 0065	171,68
9346 0030	142,70
9346 0050	202,48
9346 0065	268,87
9347 0030	147,12
9347 0050	205,28
9347 0065	258,00
9540 0080	4,80
9540 0150	6,32
9540 0300	7,46
9543 0005	11,45
9546 0005	15,03
9549 0005	3,41
9549 0008	3,55
9549 0010	1,16
9549 0015	2,92
9549 0020	9,50
9549 0025	1,19
9549 0030	1,09
9551 0010	2,43
9552 0001	14,77
9552 0002	13,39
9552 0003	12,85
9553 0125	1,96
9553 0250	2,12
9553 0500	2,07
9555 0001	8,73
9555 0002	7,12
9555 0003	6,28
9558 0001	16,98
9558 0002	15,51
9558 0003	14,77
9561 0750	5,58
9564 0003	16,99
9564 0005	17,89
9564 0010	18,48
9565 0005	5,11
9565 0010	8,82
9565 0020	14,81
9567 0010	3,57
9567 0020	4,06
9568 0005	4,43
9568 0010	5,44
9568 0020	6,88
9569 0010	8,94
9569 0020	9,66
9570 0050	0,46
9570 0075	0,49
9570 0100	0,54
9570 0120	0,61
9570 0150	1,05
9570 0160	2,99
9570 0200	2,43
9570 0250	3,73
9570 0260	1,66
9573 0160	4,48
9573 0200	7,70
9576 0300	3,75
9579 0160	2,91
9580 0160	6,86
9582 0005	74,01
9582 0010	77,67
9582 0015	79,50
9582 0025	103,22
9582 0050	108,71
9585 0500	39,22
9588 0005	112,35
9588 0010	116,94
9588 0015	117,85
9591 0010	651,16
9591 0015	674,71
9591 0025	774,81
9600 0002	8,31
9600 0006	6,81
9600 0011	4,53
9600 0016	4,53
9600 0021	4,53
9600 0026	6,76
9600 0031	6,88
9600 0036	4,53
9600 0041	4,53
9600 0046	6,76
9600 0051	11,17
9600 0056	11,17
9600 0061	11,17
9600 0066	11,17
9600 0071	6,30
9600 0076	7,25
9600 0081	12,74
9605 0002	9,36
9605 0006	7,96
9605 0011	4,94
9605 0016	4,94
9605 0021	4,94
9605 0026	7,65
9605 0031	8,58
9605 0036	7,68
9605 0041	4,94
9605 0046	4,94
9605 0051	7,65
9605 0056	7,65
9605 0061	5,34
9605 0066	14,07
9605 0071	14,07
9605 0076	14,07
9605 0081	7,25
9605 0086	8,14
9605 0091	12,74
9606 0011	199,38
9608 0301	14,53
9608 0501	15,75
9650 0600	22,35
9650 2000	42,88
9650 4000	63,51
9650 5500	114,96
9650 8000	189,82
9703 1500	17,15
9704 1500	17,15
9705 1500	17,15
9708 0500	6,83
9708 0600	7,35
9708 0800	8,72
9720 0002	4,57
9720 0003	4,74
9720 0004	5,06
9720 0005	5,71
9720 0006	6,11
9720 0008	8,42
9720 0010	11,22
9721 0002	13,70
9721 0003	14,26
9721 0004	15,21
9721 0005	17,10
9721 0006	18,34
9721 0008	25,25
9721 0010	33,65
9724 0005	90,56
9724 0010	7,05
9724 0015	72,45
9724 0020	7,05
9729 0010	65,96
9733 0005	30,29
9734 0010	166,67
9735 0005	14,79
9735 0010	14,79
9735 0015	14,79
9735 0020	15,52
9735 0025	15,52
9735 0030	15,52
9735 0035	15,52
9735 0040	15,52
9735 0045	15,52
9735 0050	15,52
9738 0020	19,74
9741 0020	21,68
9755 0005	0,58
9758 0180	0,68
9758 0240	0,79
9758 0300	1,00
9759 0005	7,25
9761 0006	6,90
9761 0011	6,90
9761 0016	6,90
9761 0021	6,90
9764 0005	0,89
9767 0006	13,28
9770 0006	10,06
9773 0005	0,98
9773 0010	0,98
9773 0015	0,98
9774 0005	2,91
9774 0010	2,91
9774 0015	2,91
9775 0005	3,12
9775 0010	3,12
9775 0015	3,12
9776 0005	1,91
9778 1400	4,48
9780 1400	4,32
9782 1800	9,03
9784 1400	3,80
9788 1400	5,64
9792 1400	2,01
9794 1400	2,38
9798 1300	2,59
9800 1400	2,31
9802 0005	3,54
9804 0005	27,18
9810 1300	6,13
9814 1400	2,05
9816 1400	2,01
9818 0100	4,66
9820 1080	2,05
9820 1750	7,74
9822 1300	4,31
9824 1400	5,36
9826 1010	6,90
9828 1015	33,48
9829 1005	4,87
9832 1500	2,19
9836 1010	2,50
9842 1010	3,54
9844 1010	3,52
9848 1005	2,94
9848 1010	5,67
9850 0005	8,26
9854 1005	1,14
9854 1020	11,60
9856 0010	43,65
9870 0005	13,63
9870 0010	4,45
9874 0005	20,32
9875 0005	11,99
9876 0005	5,36
9876 0010	1,61
9878 0005	1,58
9880 0005	3,82
9882 0005	0,88
9884 0005	36,82
9886 0005	1,26
9888 0005	3,31
9890 0005	7,82
9892 0005	9,00
9894 0005	29,09
9896 0005	0,88
9898 0005	0,95
9900 0005	1,51
9902 0005	4,67
9904 0005	27,27
9906 0005	27,27
9908 0005	16,05
9910 0005	19,48
9912 0005	6,04
9912 0010	6,04
9912 0015	6,04
9917 0010	2,15
9918 0005	10,85
9922 0005	6,56
9924 0005	8,98
9926 0005	0,93
9928 0005	2,59
9930 0005	1,58
9930 0010	1,59
9930 0015	1,61
9930 0020	1,63
9932 0010	8,72
9934 0005	3,26
9938 0005	2,73
9938 0010	2,73
9938 0015	2,73
9938 0020	2,73
9940 0005	8,91
9940 0010	8,91
9942 0005	54,36
9942 0010	17,62
9944 0005	78,47
9944 0010	28,75