



CUTTING SOLUTIONS BY CERATIZIT

PROGRAMME EXTENSIONS

CUTTING TOOLS

2016.1

EN



Tools and Inserts for turning		
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SERVICE

CERATIZIT website

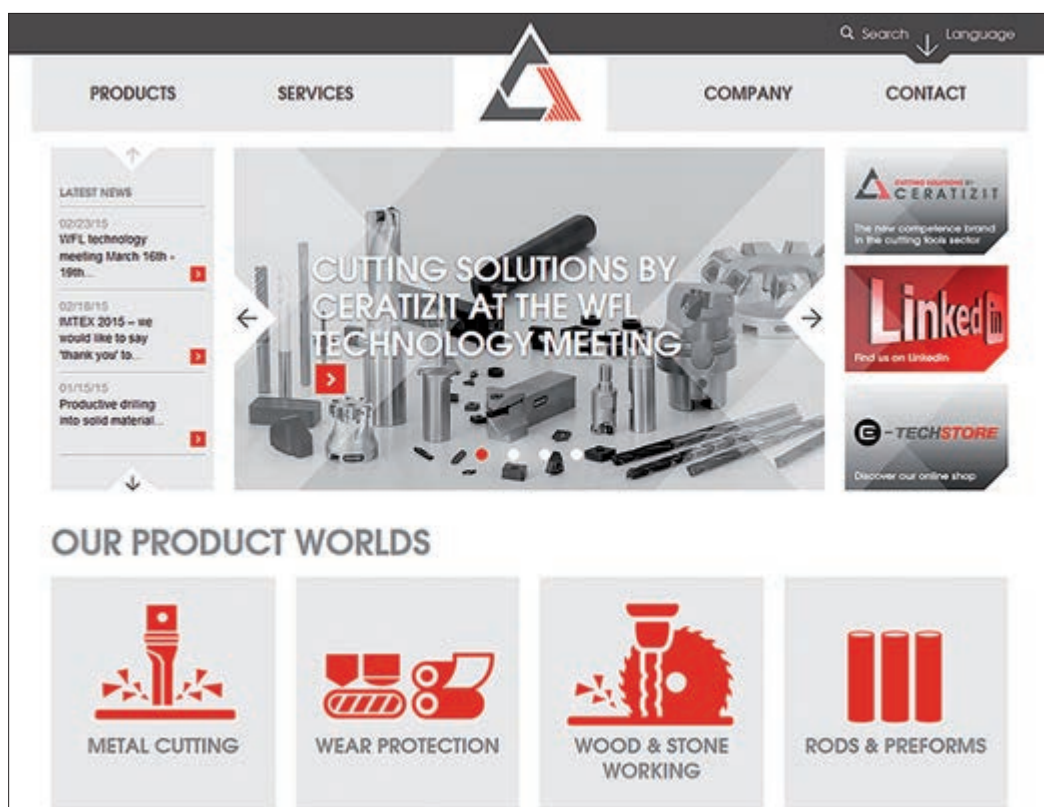
Online service

Of course we are also available for you online – around the clock! On the new CERATIZIT website you will not only find details about our innovative products, but you can also order them.

Orders can be placed in our new and improved E-TECH-STORE. With the CONFIGURATE service you can even order customised semi-standard tools.

The new CERATIZIT website

CERATIZIT's website combines a modern design with increased user-friendliness making it easy and intuitive to use on mobile devices.



CERATIZIT Product Worlds

In our various Product Worlds, you have access to over 80 pages with product details on cutting tools, rods & preforms, wear protection and wood & stone machining. Discover product videos, application examples and success stories.



E-TECHSTORE

Our online shop offers more than 25,000 standard and special products: tools with inserts and solid carbide tools for the cutting tools sector as well as products for wood and stone machining, carbide rods, blanks for slitting knives, products for the tool and die industry and focusing tubes.

Order 24/7 and check availability for all products in real time.

Everything at a glance

See all important product information at a glance, including STEP files and an overview of all customer-specific online and offline transactions with CERATIZIT. Via the 'track & trace' feature you can view the progress of your order at any time. If required you have the possibility to get in touch directly with your individual contact person.



BASKET

CUTTING TOOLS / INSERTS (MM)

- Turning
- Milling
 - Tools
 - End mills
 - Helix cutter
 - Milling cutter with threaded shank
 - Monoblock HSK
 - Shell milling cutters
 - 45°
 - A270
 - A271**
 - A273
 - A274
 - 75°
 - 90°
 - 0°
 - side & face milling cutters
 - Cartridge type cutter
- Inserts
- Drilling
 - Parting, grooving
 - Threading
 - Multi-function tools
 - Spare parts
 - Spindle nose tooling
 - System solutions

- SOLID CARBIDE TOOLS +
- SOLID CARBIDE TOOLS (CLASSIC LINE) +
- RODS P-LINE +
- SLITTING KNIFE BLANKS +
- DE AND MOLD INDUSTRY +
- FOCUSING TUBES +
- WOOD WORKING +

Home > Cutting tools / inserts (mm) > Milling > Tools > Shell milling cutters > 45° > A271

A271

SERVICE NUMBER
Free phone service number

GB: 0000 040 4877
E: 0000 040 4877
US: +1 800 783 2300
CA: +1 800 783 2300

DOWNLOAD
Product list (XLS)

Items per page: 5 1 until 5 from 5

Material no.	Description	d ₁ mm	d ₂ mm	h mm	d mm	d _A mm	a mm	z	n _{max} RPM
11651643	A271.100 R.05-17 Quantity(PCE): <input type="text" value="1"/> <input type="button" value="OK"/> <input type="button" value="X"/>	100	116,1	50	70	32	8,4	8	9900
11651649	A271.125 R.10-17 Quantity(PCE): <input type="text" value="1"/> <input type="button" value="OK"/> <input type="button" value="X"/>	125	141,1	63	80	40	8,4	10	8000
11696039	A271.160 R.12-17 Quantity(PCE): <input type="text" value="1"/> <input type="button" value="OK"/> <input type="button" value="X"/>	160	176,1	63	104	40	8,4	12	7700
11718044	A271.200 R.13-17 Quantity(PCE): <input type="text" value="1"/> <input type="button" value="OK"/> <input type="button" value="X"/>	200	216,1	63	124	60	8,4	13	6900
11718047	A271.250 R.15-17 Quantity(PCE): <input type="text" value="1"/> <input type="button" value="OK"/> <input type="button" value="X"/>	250	266,1	63	124	60	8,4	15	6100

Items per page: 5 1 until 5 from 5

SERVICE

Configure



CONFIGURATE

Your customised tool

Using the online solution CONFIGURATE, it is possible to configure a customised semi-standard tool with only a few mouse clicks.

Thanks to the new CONFIGURATE tool we are able to offer simple and easy order processing of customised solid carbide tools. You can configure a customised semi-standard tool with just a few mouse clicks in our E-TECHSTORE – 24 hours a day, 7 days a week.

Your customised tool

- Offers and orders of individual tools - as fast and easy as for any standard tool.
- Availability 24 hours a day. Order regardless of business hours, thanks to fully automated processing.
- Easy to use thanks to menu-guided navigation: obtain your individual tool in just a few steps.
- Optimised for tablet PCs and smartphones.

d₁ [mm]* 10,00

d₃ [mm]* 9,50

l₁ [mm]* 72,00

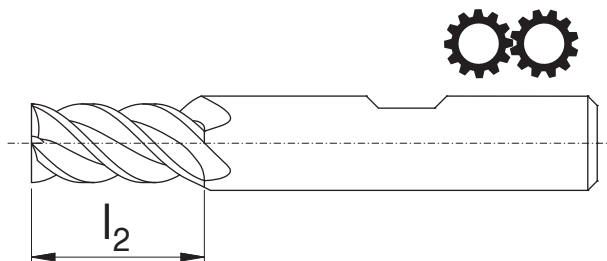
ST* DIN6535HB

l₂ [mm]* 15,00

l₃ [mm]* 30,00

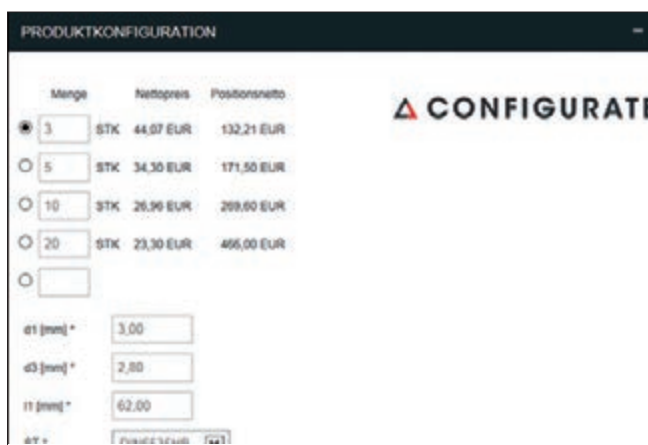
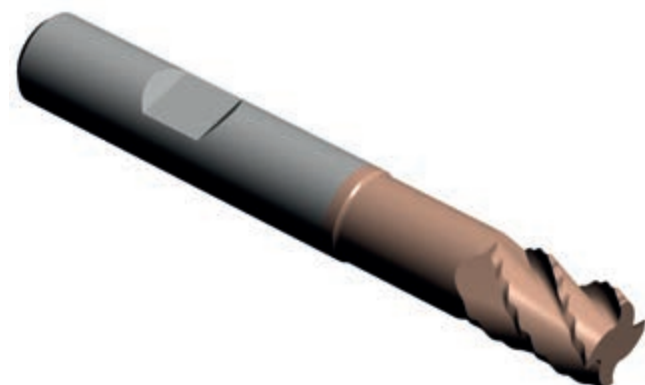
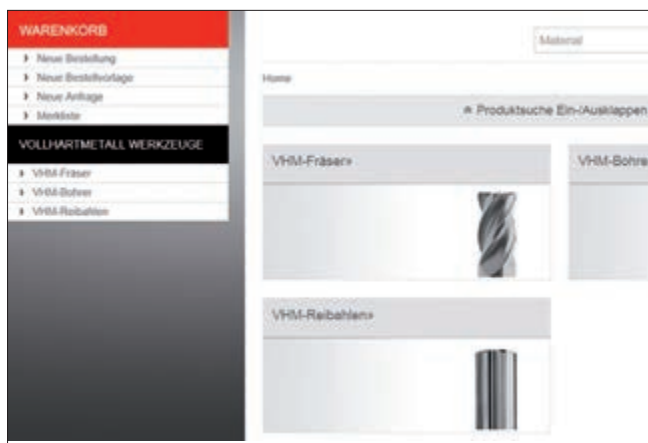
F [mm]* 0,20

a [mm]* 45,00



What to do:

- Log in as usual with your personal access data at e-techstore.com.
- Choose a basic product from our broad standard programme of solid carbide milling cutters and drills.
- Define your individual tool dimensions using the simple menu.
- The feasibility of your information will be verified at the touch of a button and you will receive scaled prices online for the quantity you require.
- You can see a true-to-scale 3D-model of your configured tool.
- Order your product immediately or receive a quotation.
- Within only a few minutes you will receive an e-mail with an order confirmation or an offer including price and delivery time. A drawing, a DXF-file and a true-to scale STEP volume model for collision analysis will also be sent to you.



Any questions? Feel free to contact us!
E-mail: configure@ceratizit.com

SERVICE

IT connection



Easier to use

Thanks to the user-friendly design and intelligent navigation you will quickly and easily find the product information you need.

We have simplified the ordering process. Recurring orders are now also possible. Furthermore we have optimised our shop for use with tablet PCs and smartphones.

In the new profile area you can manage your personal data.



Connection to your system

Want to connect your ERP system to our shop? No problem! Our e-commerce team will be happy to help. Our IT supports all common linkage formats (EDI, XML, OCI, etc.).

Don't hesitate to contact us! Our technical engineer will analyse your requirements together with you and will help you to choose the right technology.



Any questions? Feel free to contact us!

E-mail: esolutions@ceratizit.com

Tooling Academy

Get to know your tools in detail – watch them during the respective applications on machines which today are used in all production departments. To do so, we have established up-to-date machining centres for tests and training courses and the latest analysis technology at our Tooling Academy. In collaboration with you, we analyse the machinability of the materials and work pieces. Based on the findings of simulations and practical tests, we then deduce specific tool recommendations or develop specific tool solutions for you.

We have opened our first Tooling Academy in Reutte, Austria – our centre of excellence for cutting solutions. For us to also be close to our Asian customers, we have had our second Tooling Academy in Tianjin, China since 2011.

Modern equipment

Seven high-tech lathes and milling machines stand at the ready in the Tooling Academy in Reutte. Tianjin is equipped with three metal cutting machines.

- 3- and 5-axis milling machine
- HSC milling centre
- Bed-type milling machine
- Heavy milling machine
- Lathe
- Turn-mill centre
- Heavy lathe
- NC turret lathe

Additionally, we apply the latest in high-speed camera technology in order to view the machining processes in extreme slow motion. In this way, we receive detailed information about the entire machining process.



Introduction

The new CERATIZIT grade universe

10



The new CERATIZIT grade universe

As one of the most competent partners when it comes to cutting tools technology, CERATIZIT continuously optimises and revises the grade range for milling, drilling, turning, parting and grooving.

The universe

Within the universe, several galaxies represent the applications (milling, turning, drilling, parting and grooving). Every galaxy then consists of single solar systems. Each of these systems contains their own solutions for special requirements. Immersing ourselves deeper into the planetary systems, and taking a closer look at the planets they reveal themselves as our unique grade coatings - the 'Stars'.

The 'STARS'

Each of the STARS is easily recognisable by the colour of its coating and shows its strengths in the machining of specific materials and in determined applications.

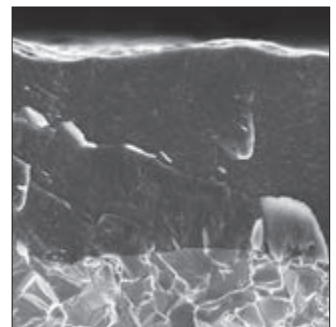
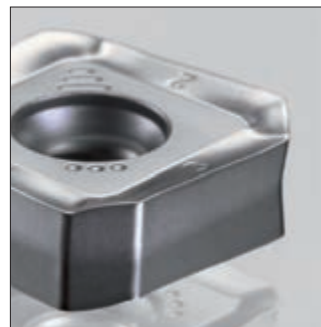
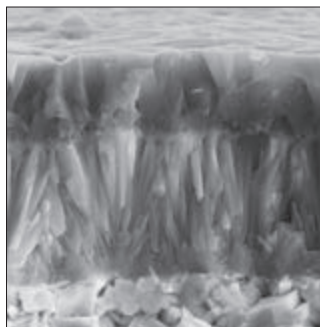
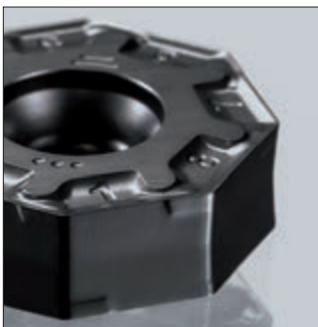


BLACKSTAR™

The BLACKSTAR™ grades are highly wear-resistant thanks to their TiN/TiCN/Al₂O₃ coatings. Due to their excellent adhesion, these coatings are particularly suitable for the machining of steel and cast iron.

SILVERSTAR™

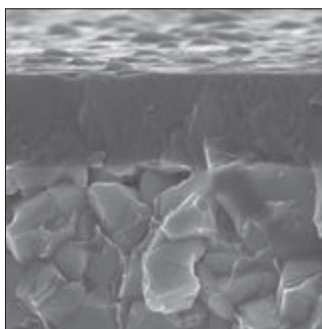
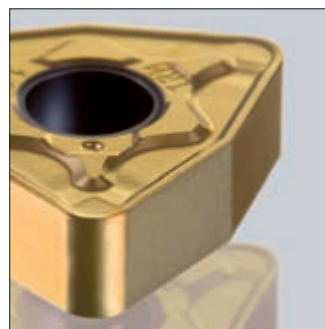
For high cutting performance in interrupted cutting actions or with difficult to machine materials, SILVERSTAR™ grades are the first choice.





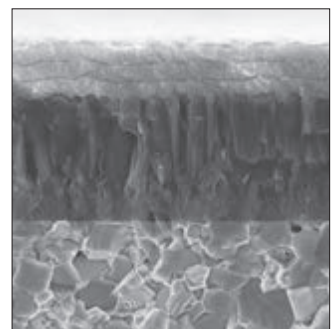
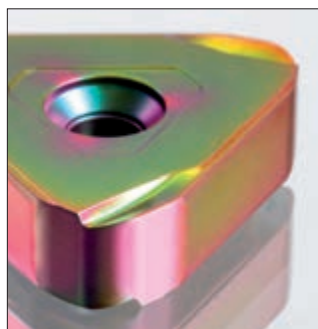
GOLDSTAR™

This all-rounder among coatings is suitable for a variety of machining operations and numerous materials. GOLDSTAR™ is characterised by the diverse application possibilities and good wear recognition through the golden-yellow colour.





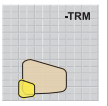
COLORSTAR™

When a combination of wear resistance and toughness is required, the multi-oxide layers of COLORSTAR™ can demonstrate their strengths. They increase reliability and edge stability with medium to high cutting speeds.

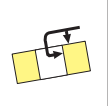

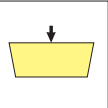





Introduction

	Product extensions	A4
	Grade overview and description	A7-A8
	Chip grooves	A9


Inserts

	MaxiLock D/N	A10-A12
	MaxiLock S	A13-A14
	Simplex P	A15

Technical information

	Cutting data	A16-A17
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Turning

Extended product range

A4



Turning of cast iron materials

With the new Blackstar™ CTCK110 grade and the proven Blackstar™ CTCK120, all applications of cast iron machining can be covered. The two grades, with three negative and one positive geometry, offer a consistent programme for all applications.

The wear-resistant turning grades can be used in the automotive and power engineering sectors, in mechanical engineering or in the railway industry in, for example, the machining of brake disks, brake drums, turbocharger housings, flywheels or bearing cases.

Blackstar™ CTCK110

The grade for a continuous cut under stable conditions: it provides maximum wear resistance for high cutting speeds, and thanks to its high temperature resistance, is also suitable for dry machining.

Blackstar™ CTCK120

The grade for unstable and difficult conditions: its tough substrate ensures process security also with interrupted cut. Being a universal grade, it can be used for all cast iron materials.



Your advantages

- ▲ Two grades covering all applications in cast iron machining
- ▲ Consistent and well-structured programme
- ▲ Blackstar™ CTCK110: highly wear-resistant grade for dry machining and high cutting data
- ▲ Blackstar™ CTCK120: universal grade for all applications, also interrupted cuts
- ▲ Ground contact face

Your benefits

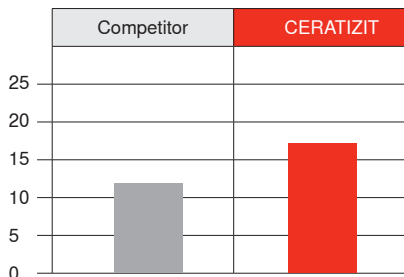
- ▲ Reduced stock inventory, resulting in lower costs
- ▲ Easy selection of the insert
- ▲ High cutting data and tool life increase productivity
- ▲ For maximum process security and less non-conforming material
- ▲ More stability of the tool holder enhances process security also in difficult machining situations

A practical example

Component: bearing pillow block / GGG40

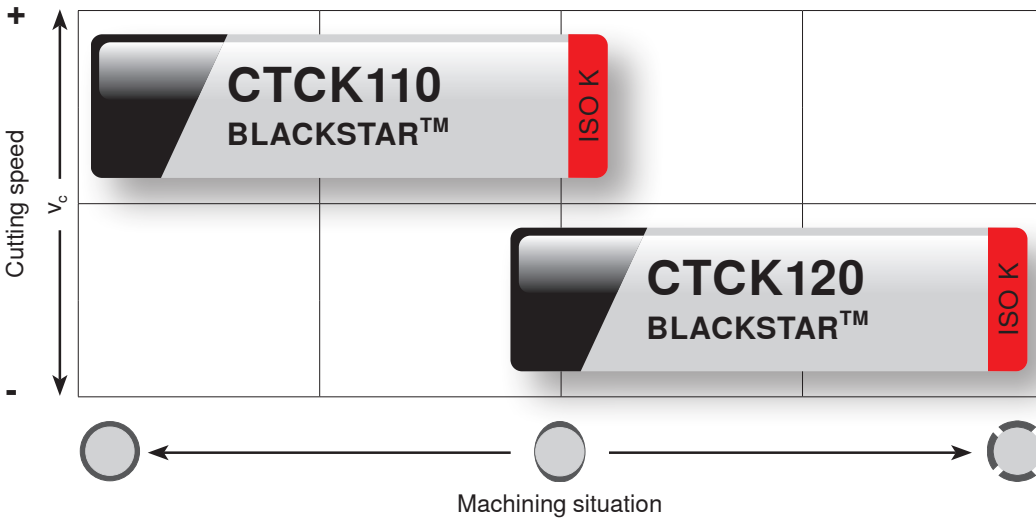
Cutting data	Competitor	CERATIZIT
Grade	K10	CTCK110
V _c (m/min)	240	240
f (mm/rev)	0,2	0,2
a _p (mm)	2,0	2,0
Quantity	12	17

Quantity



+42%

Application field

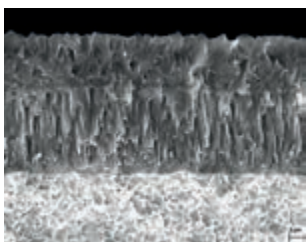


Chip grooves

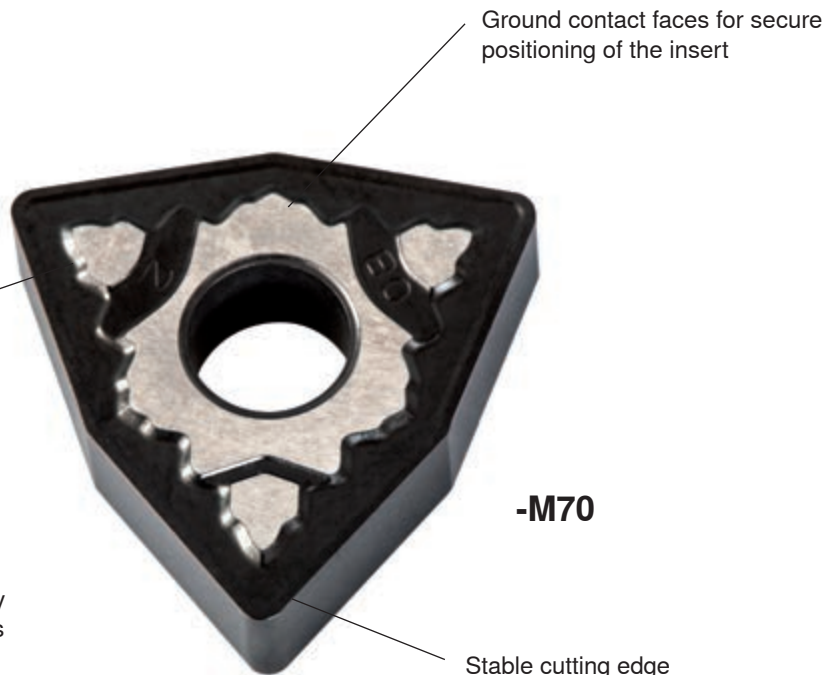
Four geometries cover the entire field of cast iron machining: proven chip grooves such as -M50 and -M70 are available as a consistent programme. These geometries are particularly suitable for turning spheroidal cast iron (GJS). The smooth standard geometries (.NMA) represent the first choice for the machining of grey cast iron (GJL) and are suitable for universal

application from finishing to roughing. Last but not least, the positive -SM geometry can be used for all types of machining from finishing to medium machining and is characterised by low cutting forces and very good chip control.

▲ BLACKSTAR™



The latest MT CVD coating and up-to-the-minute finishing processes generate an extremely hard aluminium oxide layer over a columnar TiCN coating which guarantees both the necessary toughness and cutting edge stability. Result: grades with high process security and maximum temperature resistance as well as reduced cratering ensures lower tool costs while increasing productivity.



Turning

Extended product range

A6



Negative inserts

-M50



- ▲ Medium machining
- ▲ Unstable machining situations
- ▲ Low cutting forces
- ▲ Spheroidal cast iron

-M70



- ▲ Light to medium-rough machining
- ▲ Interrupted cut
- ▲ Cast skin and forging skin
- ▲ Blanks and forged parts
- ▲ Spheroidal cast iron, grey cast iron

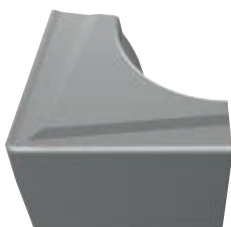
(.NMA)



- ▲ Universal machining
- ▲ Very stable
- ▲ For short chipping materials
- ▲ First choice for grey cast iron

Positive inserts

-SM



- ▲ Finishing to medium machining
- ▲ Universal application
- ▲ Unstable machining situations
- ▲ Good chip control
- ▲ Spheroidal cast iron, grey cast iron



Grade designation	Standard designation		*Type of cutting material	Application range											P	M	K	N	S	H
	ISO	ANSI		01	05	10	15	20	25	30	35	40	45	50	Steel	Stainless	Cast iron	Non-ferrous metals	Heat-resistant	Hard materials
CTCK110 BLACKSTAR™	HC-K10	C3	C																	
	HC-P05	C8	C																	
CTCK120 BLACKSTAR™	HC-K20	C2	C																	
	HC-P10	C8	C																	
				01	05	10	15	20	25	30	35	40	45	50	●	Main application				
															○	Extended application				

Grade description

A8




<p>CTCK110 BLACKSTAR™</p>	<p>HC-K10 HC-P05</p>	
	<p>Specification: Composition: Co 5.0%; mixed carbides: 2.0%; WC balance Grain size: submicron Hardness: HV₃₀ 1810 Coating specification: CVD TiCN-Al₂O₃</p> <p>Recommended application: The first choice for the machining of cast iron at high cutting speeds with continuous cut.</p>	
<p>CTCK120 BLACKSTAR™</p>	<p>HC-K20 HC-P10</p>	
	<p>Specification: Composition: Co 6.0%; TaC 2.0%; WC balance Grain size: 1 μm Hardness: HV₃₀ 1630 Coating specification: CVD TiCN-Al₂O₃</p> <p>Recommended application: The grade for cast iron machining with high toughness reserves for difficult conditions and interrupted cut.</p>	

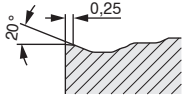
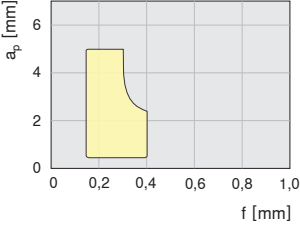
Chip grooves for negative/positive inserts




-M50

- o Medium machining
- o First choice for steel machining
- o Universal application




CNMG 120408..

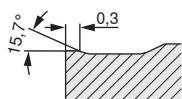
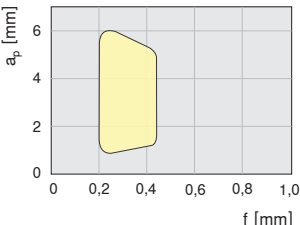
Machining conditions		
		
CTCP115	CTCP125	CTCP135
CTCP115	CTCP135	CTCP135
CTCK110	CTCK120	CTCK120




-M70

- o Light to medium roughing
- o Cast skin and forging skin
- o Stable cutting edge
- o Interrupted cut
- o For blanks and forged parts




CNMG 120408..

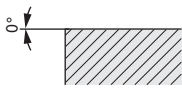
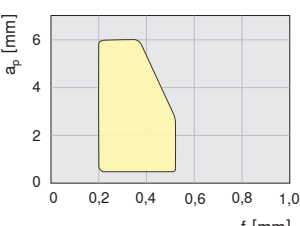
Machining conditions		
		
CTCP115	CTCP125	CTCP135
CTCP125	CTC2135	CTC2135
CTCK110 CTCP115	CTCK120	CTCK120




(.NMA)

- o Rough machining
- o Stable cutting edge
- o For short chipping materials
- o First choice for grey cast iron




CNMA 120408..

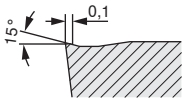
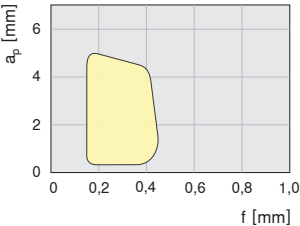
Machining conditions		
		
CTCK110	CTCK120	CTCK120




-SM

- o Medium machining
- o Universal application
- o Stable cutting edge
- o Inconsistent cutting depth
- o Wide range of applications



CCMT 09T308..

Machining conditions		
		
CTCP115	CTCP125	CTCP135
CTCP125	CTC2135	CTC2135
CTCK110	CTCK120	CTCK120

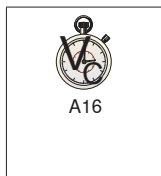
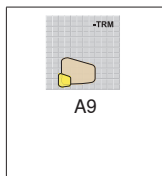
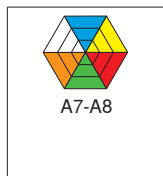
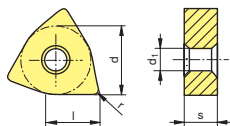
MaxiLock D/N

WN..

A12



	CTCK110	CTCK120																	d	l	s	r	d ₁
																			[mm]	[mm]	[mm]	[mm]	[mm]
-TMF	●																		12.70	8.69	4.76	0.40	5.16
-M50	●	●																	12.70	8.69	4.76	0.80	5.16
	●	●																	12.70	8.69	4.76	1.20	5.16
-M70	●	●																	12.70	8.69	4.76	0.80	5.16
	●	●																	12.70	8.69	4.76	1.20	5.16
	●	●																	12.70	8.69	4.76	1.60	5.16
WN..A	●																		12.70	8.69	4.76	0.80	5.16
	●	●																	12.70	8.69	4.76	1.20	5.16
	●	●																	12.70	8.69	4.76	1.60	5.16
	CTCK110	CTCK120																	d	l	s	r	d ₁



Cutting data

A16



	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
heat-treated		ferritic / martensitic	13	200	
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitic, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
		pearlitic	20	230	
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	-
		fibre-reinforced plastics	29	-	
		hard rubber	30	-	
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm ²	35	(320)
	Titanium alloys		pure titanium	36	R _m 440*
		alpha + beta alloys	37	R _m 1050*	
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa



Introduction



Product extensions

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Grade overview and description

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Types of milling



MaxiMill 491 shoulder milling

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Technical information



Cutting data

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Spare parts

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Milling

Extended product range

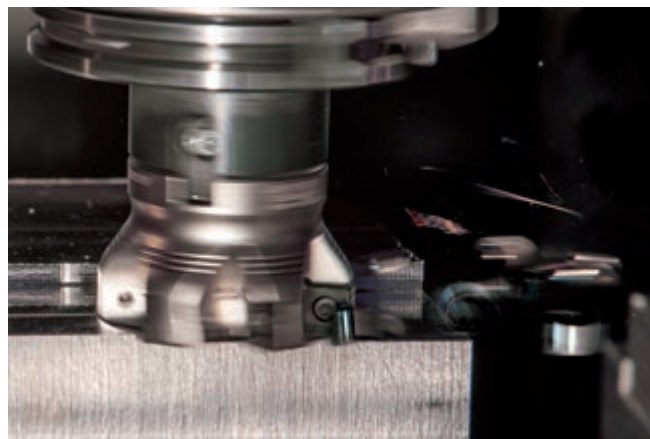
B4



MaxiMill 491 The new 90° shoulder milling system

The new MaxiMill 491 shoulder milling system from Cutting Solutions by CERATIZIT features 8 usable cutting edges per insert and shows excellent performance, quality and price-performance ratio.

Thanks to the latest grinding technology, the precision inserts can be produced with tolerance H. This enhances the service life of the cutting edge, allowing top-quality surfaces to be achieved on your component.



Reduced vibration is a particular advantage when it comes to low-power machines and thin-walled, unstable components.

Quick and easy insert mounting

Long-lasting tool body in new material and 'Hard & Tough' coating

Tools available with close or wide pitch

Exact 90° profile

TorxPlus clamping screw profile

Patented system

Chamfered coolant holes suitable for MQL, emulsion and compressed air



Your advantages

- ▲ Exact 90° profile with 8 usable cutting edges per insert
- ▲ Ground precision insert with tolerance H
- ▲ Smooth cut with low power consumption
- ▲ Outstanding surface quality
- ▲ Tool holder available in metric and inch sizing
- ▲ Universal application (e.g. face milling, shoulder milling, peripheral milling, slot milling, trochoidal slot milling)
- ▲ Tools with irregular pitch for minimum vibration during the milling operation
- ▲ Optimum chip evacuation
- ▲ Coolant arrives directly on the cutting edge; emulsion, MQL or compressed air can be used

Your benefits

- ▲ Excellent economic efficiency regarding the price per cutting edge for 90° shoulder milling
- ▲ Exact 90° profile
- ▲ Perfect axial run-out precision and concentricity
- ▲ Very good suitability for low-power machines
- ▲ Quick and easy loading of the milling cutter possible



Maximum repeatability thanks to innovative insert design with generous contact faces



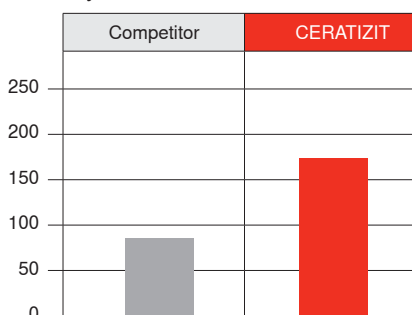
Perfectly adapted chip pockets

A practical example

Material: 1.7131 / 16MnCr5 (forged)

Cutting data	Competitor	CERATIZIT
Geometry	–	-M50
Milling cutter	–	A491.63.R.06-12
Insert	–	SNHU 12048SR-M50
V_c [m/min]	220-400	220-400
V_f [mm/rev]	1000	1000
a_p [mm]	1–3	1–3
Quantity	80	168

Quantity



+110%

Milling

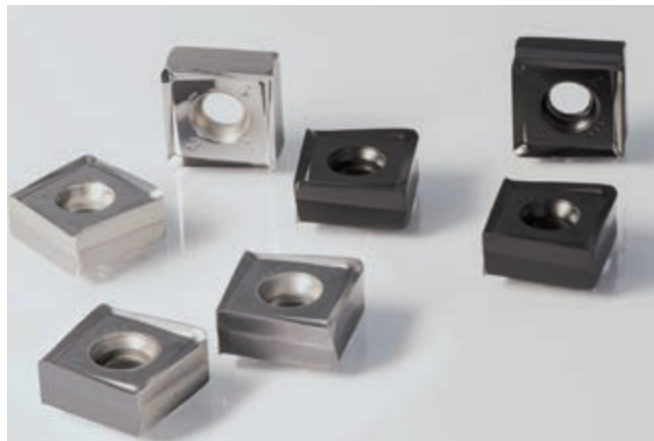
Extended product range

B6



Insert start programme

The insert start programme for ISO P steel, ISO K cast iron and ISO M stainless steel machining features the latest BLACKSTAR™ and SILVERSTAR™ manufacturing technology. For the machining of aluminium, the proven aluminium grade CTWN215 is used. The exact 90° profile is available with the most common corner radius of 0.8 mm for the time being.

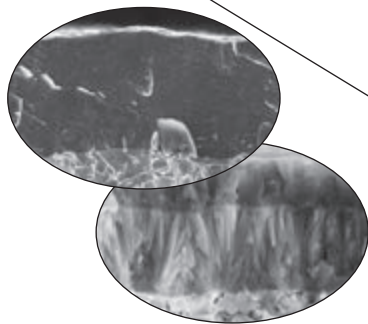


BLACKSTAR™

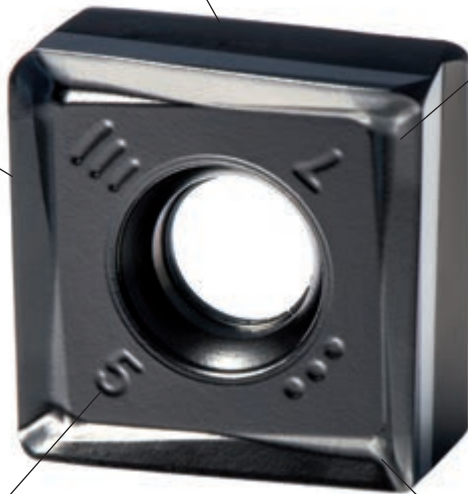
SILVERSTAR™

Precision-ground insert with tolerance H

Latest CVD and PVD grade technology



Up-to-date chip groove geometries: -F10, -F50, -M50 und -R50



8 usable cutting edges per insert with a_p max 8 mm

Numbered cutting edges with additional CERATIZIT chip groove code

MaxiMill 491 - product launch

The product launch of MaxiMill 491 will start with a 12 mm assembly size and includes \varnothing ranging from 32-160 mm. Cutting Solutions by CERATIZIT offers you shell milling cutters, end mills and milling cutters with threaded shank. The end milling cutters are available with a wide or narrow pitch. The

F-M-R chip grooves combined with the latest grade technology cover applications for a variety of materials ranging from steel to cast iron, stainless steels (ISO P K M) and aluminium.


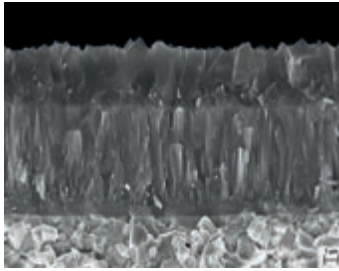



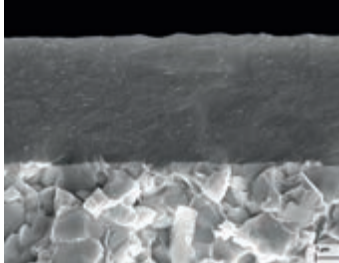
Grade overview


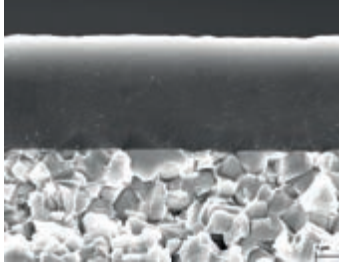
B8


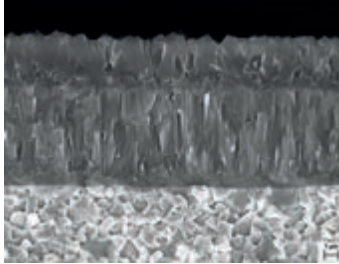


Grade designation	Standard designation		*Type of cutting material	Application range											P	M	K	N	S	H									
	ISO	ANSI		01	05	10	15	20	25	30	35	40	45	50	Steel	Stainless	Cast iron	Non-ferrous metals	Heat-resistant	Hard materials									
CTCP230 BLACKSTAR™	HC-P30	C6	C																			●							
	HC-K25	C2	C																						●				
	HC-M25	-	C																					○					
CTPP235 SILVERSTAR™	HC-P35	C5	P																				●						
	HC-M30	-	P																					○					
CTPM240 SILVERSTAR™	HC-M40	-	P																					●					
	HC-P40	C5	P																				○						
CTCK215 BLACKSTAR™	HC-K15	C3	C																						●				
CTPK220 SILVERSTAR™	HC-K20	C2	P																						●				
CTWN215	HW-N15	C3	W																							●			
	HW-K15	C3	W																						●				
				01	05	10	15	20	25	30	35	40	45	50	●	Main application													
															○	Extended application													

<p>CTCP230 BLACKSTAR™</p>	<p>HC-P30 HC-K25 HC-M25</p>	
	<p>Specification: Composition: Co 10.5%; mixed carbides 2.0%; WC balance Grain size: 1-2 μm Hardness: HV₃₀ 1400 Coating specification: CVD TiCN-Al₂O₃</p> <p>Recommended application: First choice for dry machining of steels at high cutting speeds.</p>	

<p>CTPP235 SILVERSTAR™</p>	<p>HC-P35 HC-M30</p>	
	<p>Specification: Composition: Co 10.5%; mixed carbide 2.0%; WC balance Grain size: 1-2 μm Hardness: HV₃₀ 1400 Coating specification: PVD TiAlTaN</p> <p>Recommended application: Particularly suitable for the wet machining of steels.</p>	


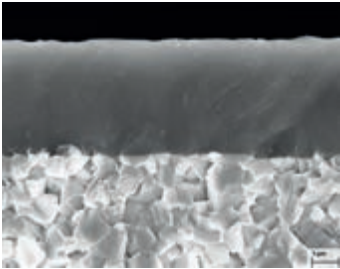

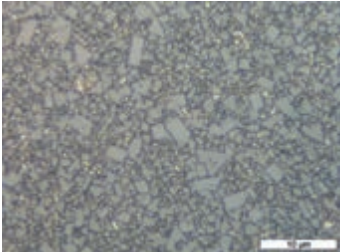
<p>CTPM240 SILVERSTAR™</p>	<p>HC-M40 HC-P40</p>	
	<p>Specification: Composition: Co 12.5%; mixed carbides 2.0%; WC balance Grain size: 1 μm Hardness: HV₃₀ 1380 Coating specification: PVD TiAlTaN</p> <p>Recommended application: The first choice for the machining of austenitic steels.</p>	

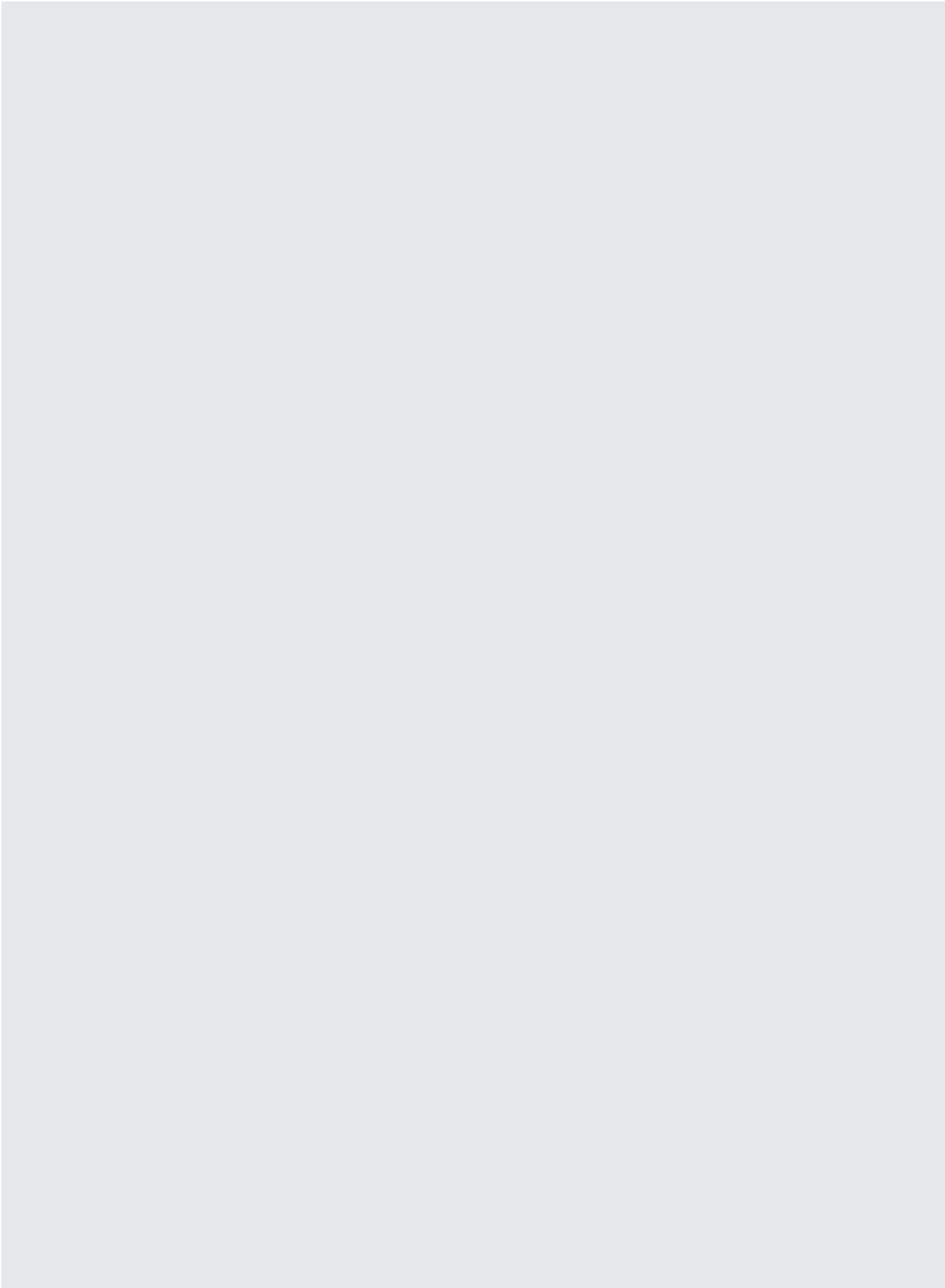
<p>CTCK215 BLACKSTAR™</p>	<p>HC-K15</p>	
	<p>Specification: Composition: Co 6.0%; mixed carbides 2.0%; WC balance Grain size: 1 μm Hardness: HV₃₀ 1630 Coating specification: CVD TiN; MT-TiCN; Al₂O₃</p> <p>Recommended application: The first choice for the machining of cast iron at high cutting speeds.</p>	

Grade description

B10



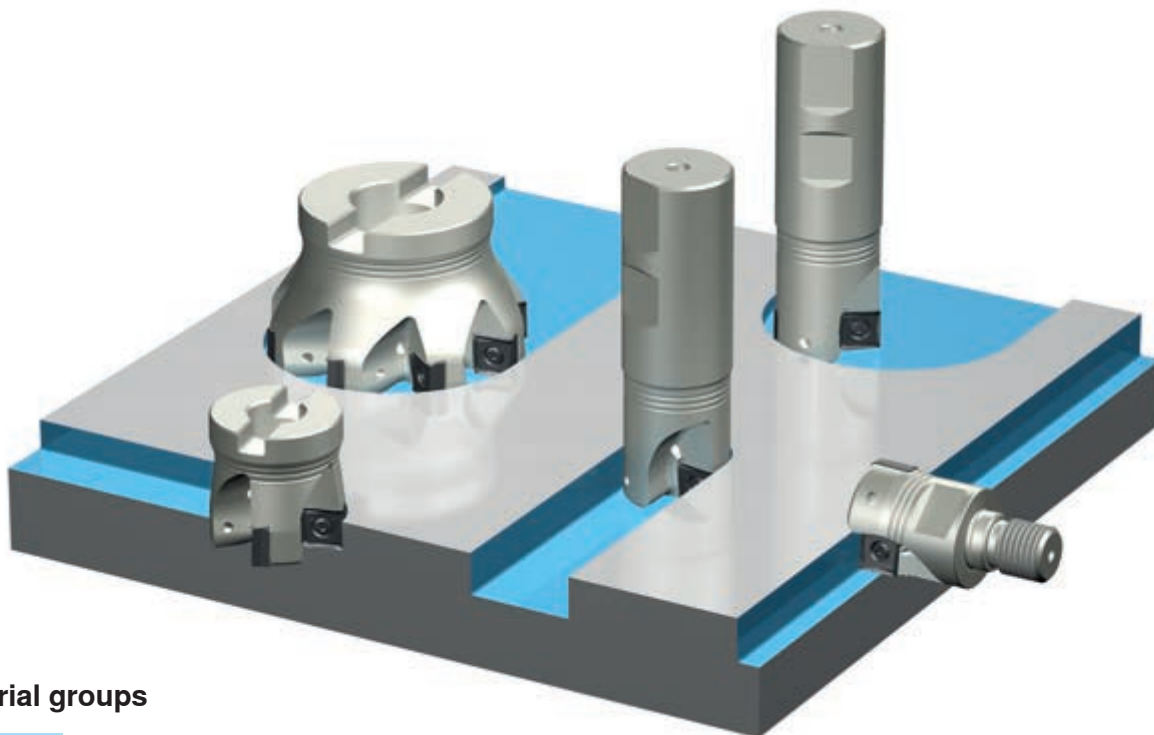
<p>CTPK220 SILVERSTAR™</p>	<p>HC-K20</p>	
	<p>Specification: Composition: Co 6.0%; mixed carbides 2.0%; WC balance Grain size: 1 μm Hardness: HV₃₀ 1630 Coating specification: PVD TiAlTaN</p> <p>Recommended application: Optimal for the machining of high-tensile cast iron materials when toughness is required.</p>	
<p>CTWN215</p>	<p>HW-N15 HW-K15</p>	
	<p>Specification: Composition: Co 6.0%; others 0.2%; WC balance Grain size: submicron Hardness: HV₃₀ 1650</p> <p>Recommended application: The uncoated carbide grade for the machining of aluminium and other non-ferrous metals.</p>	





90° shoulder milling system with 8 cutting edges per insert

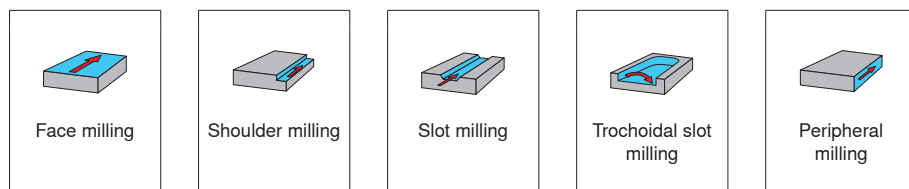
- Exact 90° profile
- Easy handling
- Ground precision insert with tolerance H



Material groups

P	●
M	○
K	●
N	●
S	●
H	

Possible applications



Detailed information


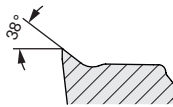



Pitch	Ø range	Inserts
	<p>Ø 32 - 160 mm</p>	<p>SNHU 12..</p>

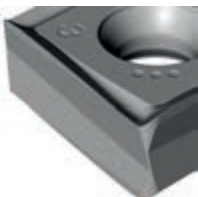
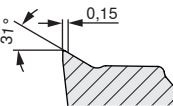



MaxiMill 491 system

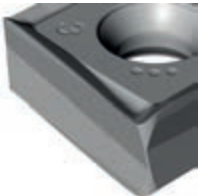
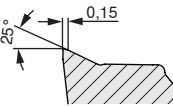



Geometry overview

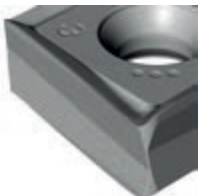
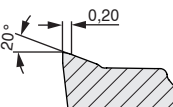



B14



-F10 <ul style="list-style-type: none"> Highly positive geometry Sharp cutting edge Low tendency to adhesion First choice for non-ferrous metals 			Machining conditions		
					
			CTWN215		
		f_z [mm]	CTWN215	CTWN215	CTWN215
		0,05 - 0,25			

-F50 <ul style="list-style-type: none"> Positive geometry Finishing and roughing First choice for stainless steel materials 			Machining conditions		
					
			CTPM240	CTPM240	
		f_z [mm]			
		0,10 - 0,20			

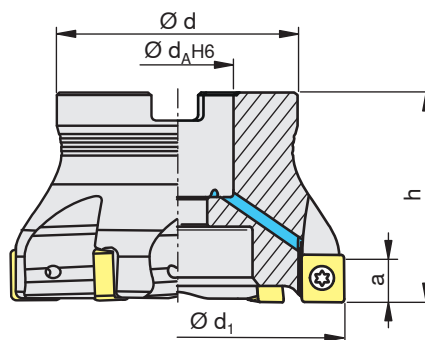
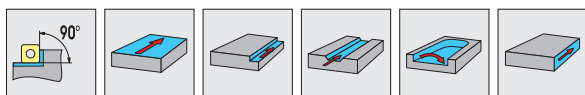
-M50 <ul style="list-style-type: none"> Universal geometry Light to medium roughing operations First choice for general steel materials 			Machining conditions		
					
				CTCP230 CTPP235	CTPP235 CTCP230
				CTPM240	CTPM240
		f_z [mm]			
		0,10 - 0,25			

-R50 <ul style="list-style-type: none"> Stable geometry Roughing For heavily interrupted cut First choice for cast iron materials 			Machining conditions		
					
				CTCK215 CTPK220	CTPK220 CTCK215
		f_z [mm]			
		0,10 - 0,30			

MaxiMill 491 system

A491-12

B15



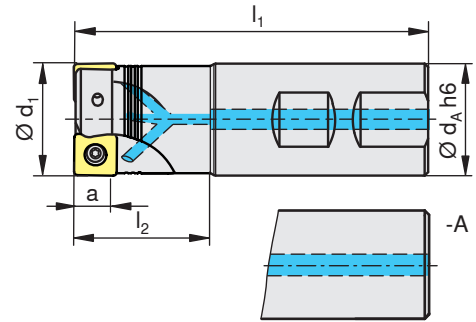
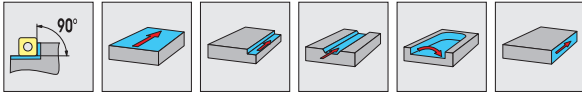
d ₁ [mm]	Type, description	h [mm]	d [mm]	d _A [mm]	a [mm]	z	n _{max} [min ⁻¹]	[Nm]		
40	A491.40.R.03-12	40	38	16	8	3	11500	3.2	SNHU 1204..	E01
40	A491.40.R.04-12	40	38	16	8	4	11500	3.2	SNHU 1204..	E01
50	A491.50.R.04-12	40	43	22	8	4	9800	3.2	SNHU 1204..	E02
50	A491.50.R.05-12	40	43	22	8	5	9800	3.2	SNHU 1204..	E02
63	A491.63.R.05-12	40	48	22	8	5	8500	3.2	SNHU 1204..	E02
63	A491.63.R.06-12	40	48	22	8	6	8500	3.2	SNHU 1204..	E02
80	A491.80.R.06-12	50	58	27	8	6	7400	3.2	SNHU 1204..	E02
80	A491.80.R.08-12	50	58	27	8	8	7400	3.2	SNHU 1204..	E02
100	A491.100.R.07-12	50	78	32	8	7	6500	3.2	SNHU 1204..	E02
100	A491.100.R.10-12	50	78	32	8	10	6500	3.2	SNHU 1204..	E02
125	A491.125.R.08-12	63	88	40	8	8	5700	3.2	SNHU 1204..	E02
125	A491.125.R.12-12	63	88	40	8	12	5700	3.2	SNHU 1204..	E02
160	A491.160.R.09-12	63	98	40	8	9	5000	3.2	SNHU 1204..	E02
160	A491.160.R.14-12	63	98	40	8	14	5000	3.2	SNHU 1204..	E02



E01	11036880	11610311	11450867	8095012000	4425
E02		11610311	11450867	8095012000	





MaxiMill 491 system

C491-12

B16



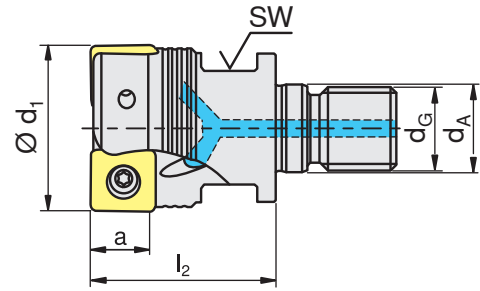
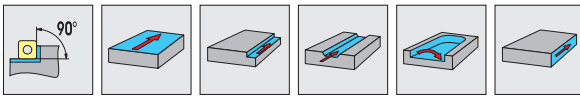
d_1 [mm]	Type, description	l_1 [mm]	l_2 [mm]	d_A [mm]	a [mm]	z	n_{max} [min ⁻¹]	[Nm]		
32	C491.32.R.02-12-A-63-250	250	63	32	8	2	10200	3.2	SNHU 1204..	E01
32	C491.32.R.02-12-B-40	102	40	32	8	2	13600	3.2	SNHU 1204..	E01

			
E01	11610311	11450867	8095012000

MaxiMill 491 system

G491-12

B17



d_1 [mm]	Type, description	l_2 [mm]	d_G [mm]	d_A [mm]	a [mm]	z	n_{max} [min ⁻¹]	[Nm]		
32	G491.32.R.02-12	35	16	17.0	8	2	13600	3.2	SNHU 1204..	E01

E01	11610311	11450867	8095012000



MaxiMill 491 system

Starting parameters for example materials

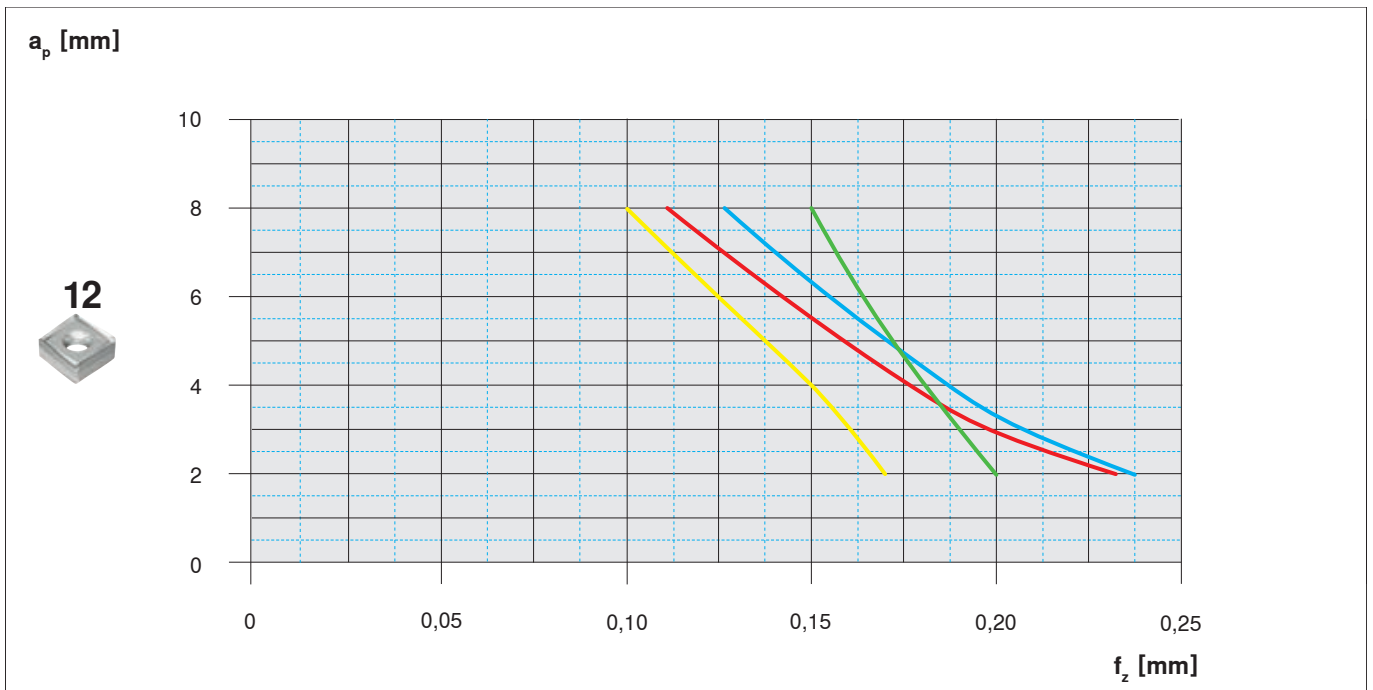
B20

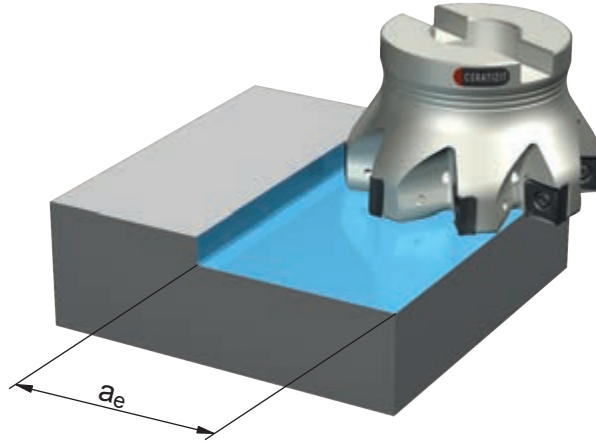


Materials				Insert		v_c [m/min]	Coolant
	1.2312	40CrMnMoS8-6	1.000 N/mm ²	SNHU 120408SR-M50	CTPP235	200	dry
	1.4571	X6CrNiMoTi17-12-2	600 N/mm ²	SNHU 120408SR-F50	CTPM240	140	dry
	5.1301	EN-GJL-250	HB 180	SNHU 120408SR-R50	CTCK215	250	dry
	3.4365	Alu	450 N/mm ²	SNHU 120408SR-F10	CTCK215	1500	Minimum quantity lubrication

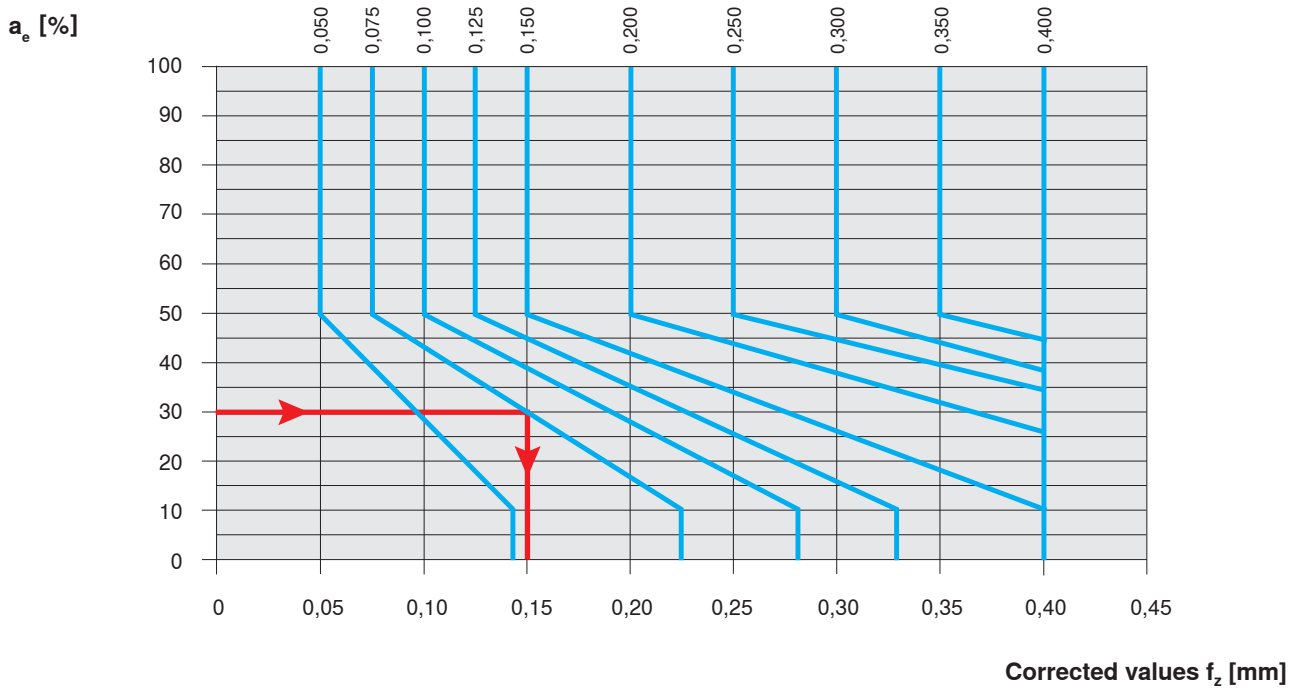


If $a_e < 50\%$ use correction list





Starting values f_z [mm] from starting parameter diagram



These parameters apply for cutting width (a_e) below 50%


Example:


Starting value [f_z] = 0.075 mm



a_e = 30%


Corrected value [f_z] = 0.15 mm



	Material	Type, description
	11036880	7818267/M8,0x30,0

	Material	Type, description	Key size	Torque moment [Nm]	Torque moment [in.lbs] [lb]
	11450867	DMSD 3,2Nm/SORT 15IP	IP15	3.2	28,3

	Material	Type, description	Key size
	8095012000	SD-T15IP-80mm	T15IP
	4425	S4/SW4	SW4

	Material	Type, description	l [mm]	Thread size	Key size
	11610311	M3,5X8,6-15IP/10008749	8.6	M3,5	T15IP

Cutting data

Grades, material

B24



	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
heat-treated		ferritic / martensitic	13	200	
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitic, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
		pearlitic	20	230	
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	-
		fibre-reinforced plastics	29	-	
		hard rubber	30	-	
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm ²	35	(320)
	Titanium alloys		pure titanium	36	R _m 440*
		alpha + beta alloys	37	R _m 1050*	
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Cutting data

Grades, material

B26



	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
heat-treated		ferritic / martensitic	13	200	
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitic, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
		pearlitic	20	230	
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	-
		fibre-reinforced plastics	29	-	
		hard rubber	30	-	
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm ²	35	(320)
	Titanium alloys		pure titanium	36	R _m 440*
		alpha + beta alloys	37	R _m 1050*	
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa



Introduction



Product extensions

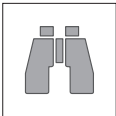
F4-F8

Solid carbide tools for drilling



Introduction

F10-F11



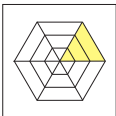
Overview

F15



Material group UN

F18-F23



Material group VA

F26-F35



Material group AL

F36-F37

Technical information



Comparison of materials

F40-F58



Application data

F40-F62

Solid carbide tools

Extended product range

F4



New deep hole drilling concept

Process security & precision to depth

Trust the deep hole drilling specialist in the market. As deep holes depend very much on the previously produced pilot hole, Cutting Solutions by CERATIZIT has optimised the drilling process with special geometries. Consequently, the chips can be evacuated without the need to peck. This allows you to shorten the cycle times and reduces the cost per hole. The adapted pilot hole drilling operation increases process security and protects the deep hole drill from wear on the cutting edges. Your added value: longer tool life.







Adapted pilot drill programme

Our deep hole drill programme includes specially developed pilot drills which guarantee top performance and process security even under difficult conditions and special drill lengths. The new pilot drills for aluminium and universal machining

are tailored to and available for our standard deep hole drills. For extra-long drilling tools (> 40xD), we have developed the 'co-pilot' drill.

New possibilities in the deep hole drilling process:

Pilot drill		Ø ranges	Drilling length	Through-coolant	Tolerances	Point angle	Guide lands	Grade
 UN	W1106	2 – 12	5xD	2x/4x 	d1 = p6 / da = h6	140°	4x	SCPP415
 AL	W1206	2 – 12	5xD	2x 	d1 = p6 / da = h6	140°	6x	SCPN435

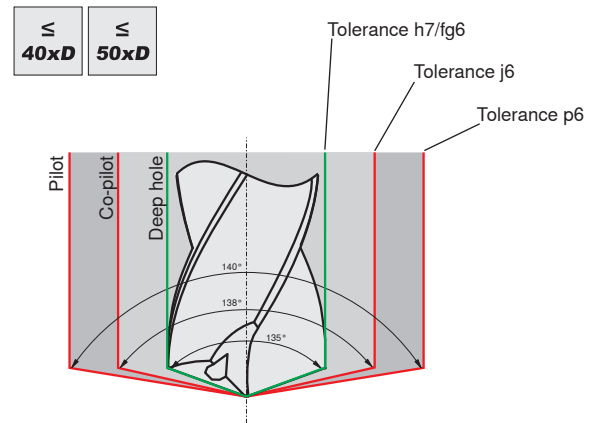
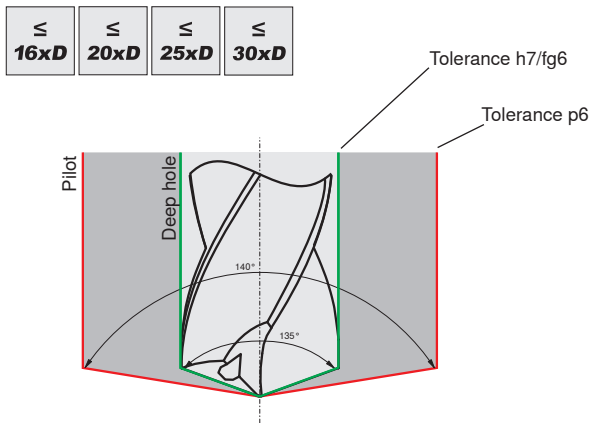
For difficult conditions for drilling depths starting at 40xD and special drilling lengths we recommend the following:

Co-pilot drill		Ø ranges	Drilling length	Through-coolant	Tolerances	Point angle	Guide lands	Grade
 UN	W1121	3 – 9	20xD	2x 	d1 = j6 / da = h6	138°	4x	SCPP415

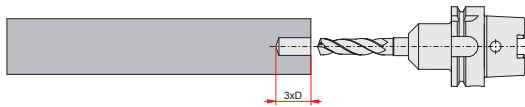
New possibilities in the deep hole drilling process

The special oversize tolerances p6 and j6 can replace your special diameters for pilot hole drilling. Adapted point angles ensure a 'softer' start of the drilling operation which leads to improved tool life. Especially for difficult drilling actions, spe-

cial drill lengths or 'problem' applications, you now have more possibilities of action.

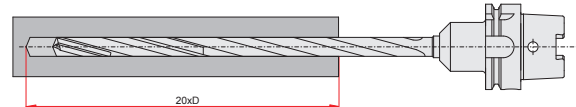


Drill the pilot hole



For the pilot hole, we recommend our W1106 drill (universal machining) or W1206 drill (aluminium). The pilot drill should have 0.02 mm larger diameter (tolerance p6) than the deep hole drill. Please ensure that the pilot hole is precise and has a minimum depth of 3xD.

Drill the co-pilot hole



For holes $\geq 40xD$, we recommend the additional use of our W1121 drill (universal machining). The co-pilot drill should have a larger diameter (tolerance j6) than the deep hole drill. Please ensure that the pilot hole is precise and has a minimum depth of 20xD, and observe the instructions for deep hole drilling up to 40xD.

Your advantages

- ▲ Protection of the cutting edges thanks to the adapted point angles (140°/138°/135°)
- ▲ Special diameters are no longer necessary thanks to the oversize tolerances p6 and j6
- ▲ Optimal drill lengths - pilot drills 5xD / co-pilot drills 20xD
- ▲ High concentricity and improved surface quality thanks to more guide lands

Benefit

- ▲ Low storage costs as special diameters no longer necessary
- ▲ Improved tool life and cutting data for high productivity
- ▲ Secure production processes thanks to increased process security and excellent hole quality

Solid carbide tools

Extended product range

F6



Drilling of micro-holes

Precise production of micro-holes

Our high-performance micro-drills complete our portfolio of solid carbide tools. These universal tools show their performance capacity on all common materials. Geometry and dimensions of the tool are particularly tailored to the require-

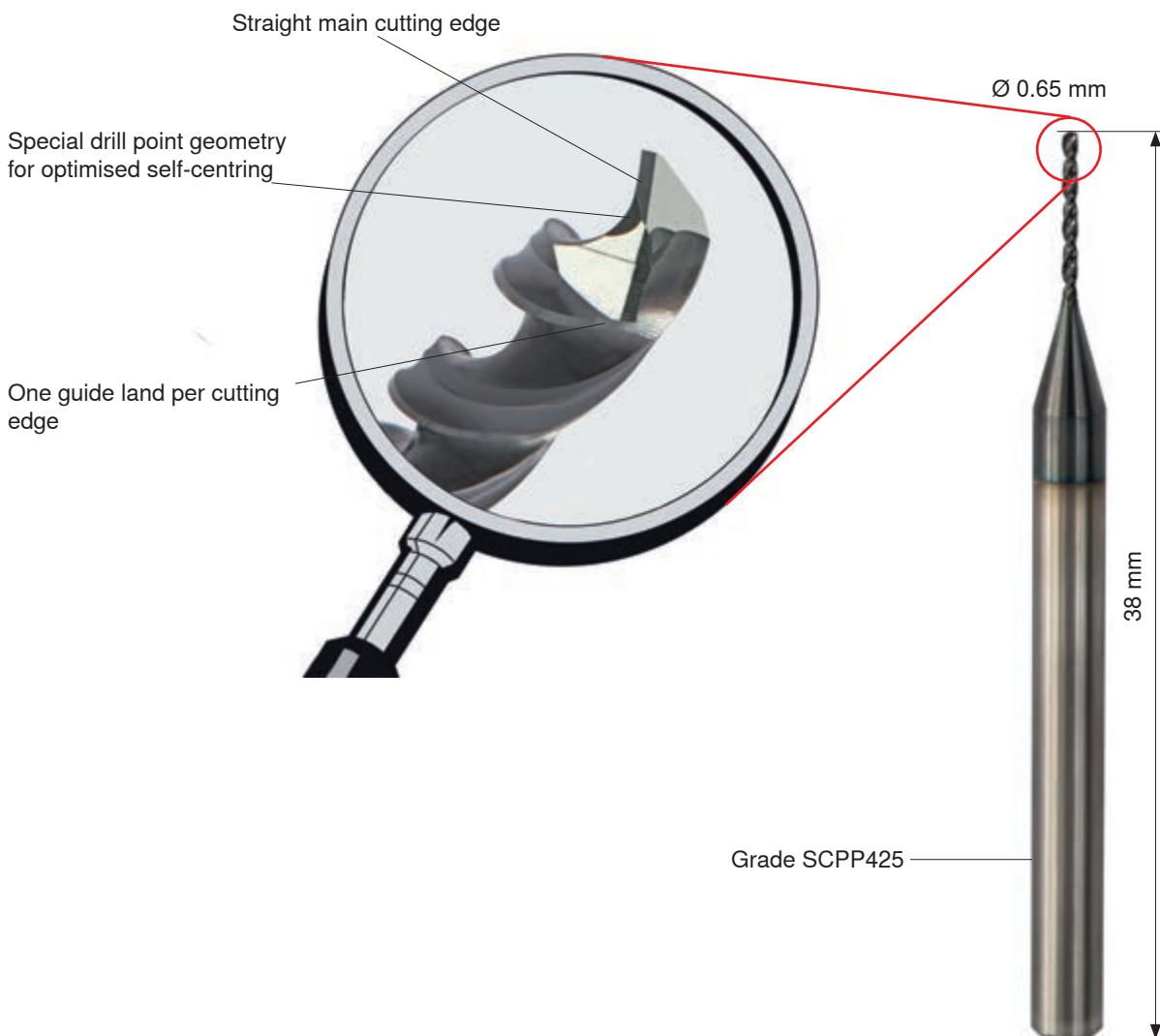
ments of micro-hole machining.

Your advantages

- ▲ Low cutting forces
- ▲ Stable cutting edge
- ▲ Suitable for universal application
- ▲ Good self-centring capability

Benefit

- ▲ Reduced tooling costs thanks to long tool life and universal application
- ▲ Very good chip formation for increased process security
- ▲ Good hole quality to obtain high-quality work pieces







Build-up of the micro-drill programme

Benefit from our wide range of high-performing solutions even for the smallest holes: for a diameter range of 0.1 mm to 2.9 mm, in steps of 0.05 mm, you can very easily select your ver-

satile micro-drill.

Micro-drill		Ø ranges	Through-coolant	Tolerances	Point angle	Guide lands	Grade
 UN	W1190	0,1 – 2,9		$d1 = +0,004 / da = h6$	140°	2x	SCPP425

Solid carbide tools

Extended product range

F8



Stainless steel machining

Our specialists for stainless steels

Enjoy continually high-quality tools with Cutting Solutions by CERATIZIT: our new 'drilling specialists' are greatly suited for stainless steel machining with their optimal geometric design and great combination of carbide and coating. Benefit from high performance for a variety of drilling depths:

we have extended our range of stainless steel drills to feature lengths from 5xD to 12xD so that you can get specific solutions for all length requirements.

New geometries

- ▲ 4 guide lands
- ▲ Straight main cutting edge
- ▲ 4 ground facets
- ▲ Grade SCPM415
- ▲ 4 coolant holes

Your advantages

- ▲ High concentricity and improved surface quality thanks to more guide lands
- ▲ Wear-resistant through stable cutting edge
- ▲ Excellent combination of solid carbide and coating to obtain wear resistance and improved chip evacuation
- ▲ Optimised and very accurate through-coolant for increased rates of chip evacuation



Your benefits

- ▲ Secure drilling process thanks to optimised chip formation and chip evacuation
- ▲ Best work piece quality due to high surface quality
- ▲ Reduced production costs through improved tool life and cutting data

Optimised through-coolant

For direct cooling of the inner part of the cutting edge, our stainless steel drills are provided with two additional coolant holes which allow for targeted cooling of the cutting edge, ensuring optimal chip evacuation due to an increased chip flow. The separate coolant holes compared to enlarged holes ensure that the core diameter is weakened less and therefore remains more stable.





Designation system - tools

Solid carbide tools for drilling

F10



TS . UN . 1125 . 0300 h7

1

2

3

4

5

1

Tool group

- HL - high-performance twist drills
- HPC - HPC twist drills
- TS - deep hole twist drills
- MB - micro-drills
- KS - twist drills for Kevlar
- A - spot drills
- PA - precision spot drills

3

Type

4

Ø d₁

0399 > Ød₁ = 3,99 mm

1000 > Ød₁ = 10,00 mm

2

Material main application

- UN - universal
- ST - steel
- VA - stainless steel
- TI - titanium
- H - hardened steel
- AL - aluminium
- V - composite materials

5

Tolerance d₁

. 25XD . 135 . IK . HA | SCPP420

┌──────────┐

6

┌──────────┐

7

┌──────────┐

8

┌──────────┐

9

┌──────────────────────────┐

10

6

Drilling depth
5XD > 5 x Ø d ₁
20XD > 20 x Ø d ₁

9

Shank
HA
HB
HE

7

Point angle

10

Grade

8

Int. coolant supply

Explanation of the table

Solid carbide tools for drilling

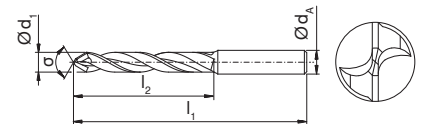
F12



UN	Material group, e.g. UN = universal
W1106	Drill for pilot hole
h7	Tolerance nominal diameter d_1
≤ 12xD	Drilling depth, for example up to 12xD
	without through coolant
	with through coolant
E	Emulsion recommended

HA 	Shanks to DIN6535-HA
HB 	Shanks to DIN6535-HB
HE 	Shanks to DIN6535-HE
HL	Tool group, for example HL = high-performance twist drills
σ 90°	Point angle
$d_1 = h7$ $d_A = h6$	Tolerance cutting edge diameter Tolerance shank diameter

UN	HPC						
$\lambda_s = 30^\circ$	$d_1 = p6$ $d_A = h6$		E	≤ 5xD	σ 140°		Application/ geometry
SCPP415		Grade					



Shank type

d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	Material
4.0	HPC.UN.1106.0400p6.5XD.140.IK.HA	6	74	36	W1106040340

Material short text

Dimensions

Material number

Grade description

Solid carbide tools for drilling

F14









SCPP415	HC-P15	
	<p>Specification: Grain size: submicron / 0.7 μm Hardness: HV₃₀ 1600 Type of coating: Ti Al C N Coating specification: multi-layer</p> <p>Recommended application: Good combination of carbide and coating for universal application</p>	




SCPP425	HC-P25	
	<p>Specification: Grain size: submicron / 0.7 μm Hardness: HV₃₀ 1600 Type of coating: Ti Al C N Coating specification: multi-layer</p> <p>Recommended application: Good combination of carbide and coating, for the machining of steels</p>	










SCPM415	HC-M15	
	<p>Specification: Grain size: submicron / 0.7 μm Hardness: HV₃₀ 1600 Type of coating: Ti Al C N Coating specification: multi-layer</p> <p>Recommended application: Good combination of carbide and coating for the machining of stainless steels, optimised chip evacuation</p>	

SCPN435	HC-N30	
	<p>Specification: Grain size: submicron / 0.5 μm Hardness: HV₃₀ 1620 Type of coating: a-C:Me Coating specification: mono-layer, DLC coating</p> <p>Recommended application: First choice for carbide and coating for the machining of non-ferrous metals</p>	

Tool type	Ø-range [mm]	Tolerance	Length	Point angle	Helix angle	Shank	Int. coolant supply	Page(s)
UN	HPC	HPC twist drills, coated						
W1106	 2.0 - 12.0	p6	\leq 5xD	σ 140°	$\lambda_s = 30^\circ$	HA 		F19

UN	TS	Deep hole twist drills, coated						
W1121	 3.0 - 9.0	j6	\leq 20xD	σ 138°	$\lambda_s = 30^\circ$	HA 		F21

UN	MB	Micro-drills, coated						
W1190	 0.1 - 2.9	0,004		σ 140°	$\lambda_s = 30^\circ$	HA 		F23



VA	HPC	HPC twist drills, coated						
W1108	 3.0 - 16.0	m6	\leq 5xD	σ 140°	$\lambda_s = 30^\circ$	HA 		F27
W1109	 3.0 - 16.0	m6	\leq 8xD	σ 140°	$\lambda_s = 30^\circ$	HA 		F31
W1112	 3.0 - 12.0	m6	\leq 12xD	σ 135°	$\lambda_s = 30^\circ$	HA 		F35

Overview

Solid carbide tools for drilling

F16



Tool type	Ø-range [mm]	Tolerance	Length	Point angle	Helix angle	Shank	Int. coolant supply	Page(s)
AL	HPC	HPC twist drills, coated						
W1206	2.0 - 12.0	p6	\leq 5xD	σ 140°	$\lambda_{cs} = 15^\circ$	HA 		F37





W1106, coated

Cutting data

F18



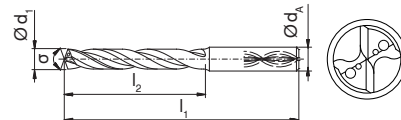
Index	Material designation	V _c [m/min]	f [mm/rev]			
			= Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
1.1.1	Machining steels	170	0,1	0,18	0,24	0,3
1.1.2		150	0,1	0,18	0,24	0,3
1.2.1	Constructional steel	170	0,1	0,18	0,24	0,3
1.2.2		150	0,1	0,18	0,24	0,3
1.2.3		130	0,09	0,16	0,22	0,28
1.3.1	Spring steel	105	0,09	0,16	0,22	0,28
1.3.2		90	0,08	0,15	0,21	0,27
1.3.3		55	0,05	0,08	0,12	0,15
2.1.1	Cementation steel	160	0,1	0,18	0,24	0,3
2.1.2		145	0,1	0,18	0,24	0,3
2.1.3		130	0,09	0,16	0,22	0,28
2.2.1	Nitriding steel	130	0,08	0,15	0,21	0,27
2.2.2		130	0,08	0,15	0,21	0,27
2.3.1	Tempered steel	145	0,09	0,16	0,22	0,28
2.3.2		130	0,08	0,15	0,21	0,27
2.3.3		130	0,09	0,16	0,22	0,28
2.3.4		130	0,08	0,15	0,21	0,27
2.3.5		105	0,08	0,15	0,21	0,27
2.3.6		65	0,05	0,08	0,12	0,15
3.1.1	Non alloyed tool steel	105	0,08	0,15	0,21	0,27
3.2.1	Tool steel for cold working	130	0,08	0,15	0,21	0,27
3.2.2		105	0,08	0,15	0,21	0,27
3.2.3		65	0,05	0,08	0,12	0,15
3.2.4		70	0,05	0,08	0,12	0,15
3.2.5		65	0,05	0,08	0,12	0,15
3.3.1	Tool steel for hot working	105	0,08	0,15	0,21	0,27
3.3.2		65	0,05	0,08	0,12	0,15
3.3.3		90	0,05	0,08	0,12	0,15
3.3.4		70	0,05	0,08	0,12	0,15
3.3.5		55	0,05	0,08	0,12	0,15
3.5.1	Hardened tool steel	< 55 HRC				
3.5.2		55–58 HRC				
3.5.3		58–60 HRC				
3.5.4		60–62 HRC				
3.5.5		62–64 HRC				
4.1.1	Stainless steel	75	0,05	0,08	0,12	0,15
4.1.2		65	0,05	0,08	0,12	0,15
4.1.3		70	0,05	0,08	0,12	0,15
4.1.4		70	0,05	0,08	0,12	0,15
4.1.5		75	0,05	0,08	0,12	0,15
4.2.1	Heat-resistant alloys	50	0,02	0,04	0,08	0,12
4.2.2		45	0,02	0,04	0,08	0,12
4.2.3		45	0,02	0,04	0,08	0,12
4.2.4		45	0,02	0,04	0,08	0,12
5.1.1	Conventional cast steel	135	0,1	0,18	0,24	0,3
5.1.2		130	0,09	0,16	0,22	0,28
5.1.3		105	0,08	0,15	0,21	0,27
5.2.1	Stainless cast steel	70	0,05	0,08	0,12	0,15
5.2.2		65	0,05	0,08	0,12	0,15
6.1.1	Cast iron with lamellar graphite	150	0,15	0,23	0,335	0,425
6.1.2		135	0,15	0,23	0,335	0,425
6.1.3		105	0,15	0,23	0,335	0,425
6.1.4		70	0,05	0,08	0,12	0,15
6.2.1	Spheroidal cast iron	120	0,125	0,2	0,25	0,35
6.2.2		105	0,125	0,2	0,25	0,35
6.2.3		80	0,05	0,08	0,12	0,15
6.3.1	GTW (white malleable cast iron)	120	0,125	0,2	0,25	0,35
6.3.2		110	0,125	0,2	0,25	0,35
6.4.1	GTS (black malleable cast iron)	120	0,125	0,2	0,25	0,35
6.4.2		110	0,125	0,2	0,25	0,35
7.1.1	Aluminium					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	Magnesium					
7.2.2						
7.3.1	Copper					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	CuZn (brass)					
7.4.2						
7.5.1	CuSn (bronze)					
7.5.2						
7.6.1	CuAlFe (Ampco)					
7.6.2						
7.8.1	Titanium					
7.8.2						
7.8.3						

W1106, coated

High-performance twist drills



UN	HPC
$\lambda_s = 30^\circ$	$d_1 = p6$ $d_A = h6$
5xD	σ 140°
SCPP415	



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
2.0	HPC.UN.1106.0200p6.5XD.140.IK.HA	4	57	21	W1106020340
2.2	HPC.UN.1106.0220p6.5XD.140.IK.HA	4	57	21	W1106022340
2.3	HPC.UN.1106.0230p6.5XD.140.IK.HA	4	57	21	W1106023340
2.4	HPC.UN.1106.0240p6.5XD.140.IK.HA	4	57	21	W1106024340
2.5	HPC.UN.1106.0250p6.5XD.140.IK.HA	4	57	21	W1106025340
2.7	HPC.UN.1106.0270p6.5XD.140.IK.HA	4	57	21	W1106027340
2.8	HPC.UN.1106.0280p6.5XD.140.IK.HA	4	57	21	W1106028340
3.0	HPC.UN.1106.0300p6.5XD.140.IK.HA	6	66	28	W1106030340
3.2	HPC.UN.1106.0320p6.5XD.140.IK.HA	6	66	28	W1106032340
3.3	HPC.UN.1106.0330p6.5XD.140.IK.HA	6	66	28	W1106033340
3.5	HPC.UN.1106.0350p6.5XD.140.IK.HA	6	66	28	W1106035340
3.8	HPC.UN.1106.0380p6.5XD.140.IK.HA	6	74	36	W1106038340
4.0	HPC.UN.1106.0400p6.5XD.140.IK.HA	6	74	36	W1106040340
4.2	HPC.UN.1106.0420p6.5XD.140.IK.HA	6	74	36	W1106042340
4.5	HPC.UN.1106.0450p6.5XD.140.IK.HA	6	74	36	W1106045340
4.8	HPC.UN.1106.0480p6.5XD.140.IK.HA	6	82	44	W1106048340
5.0	HPC.UN.1106.0500p6.5XD.140.IK.HA	6	82	44	W1106050340
5.5	HPC.UN.1106.0550p6.5XD.140.IK.HA	6	82	44	W1106055340
5.8	HPC.UN.1106.0580p6.5XD.140.IK.HA	6	82	44	W1106058340
6.0	HPC.UN.1106.0600p6.5XD.140.IK.HA	6	82	44	W1106060340
6.5	HPC.UN.1106.0650p6.5XD.140.IK.HA	8	91	53	W1106065340
6.8	HPC.UN.1106.0680p6.5XD.140.IK.HA	8	91	53	W1106068340
7.0	HPC.UN.1106.0700p6.5XD.140.IK.HA	8	91	53	W1106070340
7.5	HPC.UN.1106.0750p6.5XD.140.IK.HA	8	91	53	W1106075340
7.8	HPC.UN.1106.0780p6.5XD.140.IK.HA	8	91	53	W1106078340
8.0	HPC.UN.1106.0800p6.5XD.140.IK.HA	8	91	53	W1106080340
8.5	HPC.UN.1106.0850p6.5XD.140.IK.HA	10	103	61	W1106085340
8.8	HPC.UN.1106.0880p6.5XD.140.IK.HA	10	103	61	W1106088340
9.0	HPC.UN.1106.0900p6.5XD.140.IK.HA	10	103	61	W1106090340
9.8	HPC.UN.1106.0980p6.5XD.140.IK.HA	10	103	61	W1106098340
10.0	HPC.UN.1106.1000p6.5XD.140.IK.HA	10	103	61	W1106100340
10.2	HPC.UN.1106.1020p6.5XD.140.IK.HA	12	118	71	W1106102340
10.8	HPC.UN.1106.1080p6.5XD.140.IK.HA	12	118	71	W1106108340
11.8	HPC.UN.1106.1180p6.5XD.140.IK.HA	12	118	71	W1106118340
12.0	HPC.UN.1106.1200p6.5XD.140.IK.HA	12	118	71	W1106120340

W1121, coated

F20



Index	Material designation	V _c [m/min]	f [mm/rev]			
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 9,0	> Ø 8,0 = Ø 9,0
1.1.1	Machining steels	105	0,14	0,2	0,275	
1.1.2		95	0,1	0,15	0,2	
1.2.1	Constructional steel	105	0,14	0,2	0,275	
1.2.2		95	0,1	0,15	0,2	
1.2.3		90	0,1	0,15	0,2	
1.3.1	Spring steel					
1.3.2						
1.3.3						
2.1.1	Cementation steel	100	0,14	0,2	0,275	
2.1.2		95	0,14	0,2	0,275	
2.1.3		90	0,1	0,15	0,2	
2.2.1	Nitriding steel	90	0,1	0,15	0,2	
2.2.2		90	0,1	0,15	0,2	
2.3.1	Tempered steel	90	0,14	0,2	0,275	
2.3.2		90	0,1	0,15	0,2	
2.3.3		90	0,14	0,2	0,275	
2.3.4		90	0,1	0,15	0,2	
2.3.5		70	0,1	0,15	0,2	
2.3.6						
3.1.1	Non alloyed tool steel	70	0,1	0,15	0,2	
3.2.1	Tool steel for cold working	90	0,1	0,15	0,2	
3.2.2		70	0,1	0,15	0,2	
3.2.3		50	0,08	0,12	0,15	
3.2.4		55	0,08	0,12	0,15	
3.2.5						
3.3.1	Tool steel for hot working	70	0,1	0,15	0,2	
3.3.2		50	0,08	0,12	0,15	
3.3.3		60	0,08	0,12	0,15	
3.3.4						
3.3.5						
3.5.1	Hardened tool steel	< 55 HRC				
3.5.2		55–58 HRC				
3.5.3		58–60 HRC				
3.5.4		60–62 HRC				
3.5.5		62–64 HRC				
4.1.1	Stainless steel	70	0,08	0,12	0,15	
4.1.2		45	0,08	0,12	0,15	
4.1.3		50	0,08	0,12	0,15	
4.1.4		50	0,08	0,12	0,15	
4.1.5		70	0,08	0,12	0,15	
4.2.1	Heat-resistant alloys					
4.2.2						
4.2.3						
4.2.4						
5.1.1	Conventional cast steel	95	0,14	0,2	0,275	
5.1.2		90	0,1	0,15	0,2	
5.1.3		70	0,1	0,15	0,2	
5.2.1	Stainless cast steel	45	0,08	0,12	0,15	
5.2.2		50	0,08	0,12	0,15	
6.1.1	Cast iron with lamellar graphite	100	0,23	0,335	0,425	
6.1.2		95	0,23	0,335	0,425	
6.1.3		90	0,23	0,335	0,425	
6.1.4		70	0,08	0,12	0,15	
6.2.1	Spheroidal cast iron	100	0,2	0,25	0,35	
6.2.2		95	0,2	0,25	0,35	
6.2.3		70	0,08	0,12	0,15	
6.3.1	GTW (white malleable cast iron)	100	0,2	0,25	0,35	
6.3.2		95	0,2	0,25	0,35	
6.4.1	GTS (black malleable cast iron)	100	0,2	0,25	0,35	
6.4.2		95	0,2	0,25	0,35	
7.1.1	Aluminium					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	Magnesium					
7.2.2						
7.3.1	Copper					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	CuZn (brass)					
7.4.2						
7.5.1	CuSn (bronze)					
7.5.2						
7.6.1	CuAlFe (Ampco)					
7.6.2						
7.8.1	Titanium	30	0,03	0,065	0,085	
7.8.2		25	0,03	0,065	0,085	
7.8.3		20	0,03	0,065	0,085	

Solid carbide tools / Drilling

W1121, coated

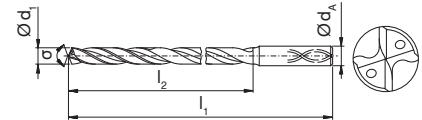
Deep hole twist drills

F21



UN	TS
$\lambda_s = 30^\circ$	$d_1 = j6$ $d_A = h6$
E	$\leq 20xD$
σ	138°
	W1106

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	TS.UN.1121.0300j6.20XD.138.IK.HA	6	130	90	W1121030340
4.0	TS.UN.1121.0400j6.20XD.138.IK.HA	6	130	90	W1121040340
4.2	TS.UN.1121.0420j6.20XD.138.IK.HA	6	160	110	W1121042340
4.5	TS.UN.1121.0450j6.20XD.138.IK.HA	6	160	110	W1121045340
4.8	TS.UN.1121.0480j6.20XD.138.IK.HA	6	160	120	W1121048340
5.0	TS.UN.1121.0500j6.20XD.138.IK.HA	6	160	120	W1121050340
5.5	TS.UN.1121.0550j6.20XD.138.IK.HA	6	185	140	W1121055340
5.8	TS.UN.1121.0580j6.20XD.138.IK.HA	6	185	140	W1121058340
6.0	TS.UN.1121.0600j6.20XD.138.IK.HA	6	185	140	W1121060340
6.5	TS.UN.1121.0650j6.20XD.138.IK.HA	8	210	160	W1121065340
6.8	TS.UN.1121.0680j6.20XD.138.IK.HA	8	210	160	W1121068340
7.0	TS.UN.1121.0700j6.20XD.138.IK.HA	8	210	160	W1121070340
7.5	TS.UN.1121.0750j6.20XD.138.IK.HA	8	230	180	W1121075340
7.8	TS.UN.1121.0780j6.20XD.138.IK.HA	8	230	180	W1121078340
8.0	TS.UN.1121.0800j6.20XD.138.IK.HA	8	230	180	W1121080340
8.5	TS.UN.1121.0850j6.20XD.138.IK.HA	10	260	195	W1121085340
8.8	TS.UN.1121.0880j6.20XD.138.IK.HA	10	290	230	W1121088340
9.0	TS.UN.1121.0900j6.20XD.138.IK.HA	10	290	230	W1121090340

W1190, coated

Cutting data

F22



Index	Material designation	V _c [m/min]	f [mm/rev]			
			= Ø 0,1 = Ø 1,0	> Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 2,9
1.1.1	Machining steels	80	0,02	0,03	0,04	0,06
1.1.2		70	0,01	0,015	0,03	0,05
1.2.1	Constructional steel	80	0,02	0,03	0,04	0,06
1.2.2		70	0,01	0,015	0,03	0,05
1.2.3		65	0,01	0,015	0,03	0,05
1.3.1	Spring steel					
1.3.2						
1.3.3						
2.1.1	Cementation steel	75	0,01	0,015	0,03	0,05
2.1.2		70	0,01	0,015	0,03	0,05
2.1.3		65	0,01	0,015	0,03	0,05
2.2.1	Nitriding steel	65	0,01	0,015	0,03	0,05
2.2.2		65	0,01	0,015	0,03	0,05
2.3.1	Tempered steel	65	0,02	0,03	0,04	0,06
2.3.2		65	0,01	0,015	0,03	0,05
2.3.3		65	0,02	0,03	0,04	0,06
2.3.4		65	0,01	0,015	0,03	0,05
2.3.5		50	0,01	0,015	0,03	0,05
2.3.6						
3.1.1	Non alloyed tool steel	50	0,01	0,015	0,03	0,05
3.2.1	Tool steel for cold working	65	0,01	0,015	0,03	0,05
3.2.2		50	0,01	0,015	0,03	0,05
3.2.3						
3.2.4						
3.2.5						
3.3.1	Tool steel for hot working	50	0,01	0,015	0,03	0,05
3.3.2						
3.3.3						
3.3.4						
3.3.5						
3.5.1	Hardened tool steel	< 55 HRC				
3.5.2		55–58 HRC				
3.5.3		58–60 HRC				
3.5.4		60–62 HRC				
3.5.5		62–64 HRC				
4.1.1	Stainless steel					
4.1.2						
4.1.3						
4.1.4						
4.1.5						
4.2.1	Heat-resistant alloys					
4.2.2						
4.2.3						
4.2.4						
5.1.1	Conventional cast steel	75	0,02	0,03	0,04	0,06
5.1.2		70	0,02	0,03	0,04	0,06
5.1.3						
5.2.1	Stainless cast steel					
5.2.2						
6.1.1	Cast iron with lamellar graphite	70	0,01	0,015	0,03	0,05
6.1.2		70	0,01	0,015	0,03	0,05
6.1.3						
6.1.4						
6.2.1	Spheroidal cast iron	70	0,01	0,015	0,03	0,05
6.2.2		70	0,01	0,015	0,03	0,05
6.2.3						
6.3.1	GTW (white malleable cast iron)	70	0,01	0,015	0,03	0,05
6.3.2		70	0,01	0,015	0,03	0,05
6.4.1	GTS (black malleable cast iron)	70	0,01	0,015	0,03	0,05
6.4.2		70	0,01	0,015	0,03	0,05
7.1.1	Aluminium	200	0,01	0,015	0,03	0,05
7.1.2		200	0,01	0,015	0,03	0,05
7.1.3		200	0,01	0,015	0,03	0,05
7.1.4		180	0,01	0,015	0,03	0,05
7.1.5		160	0,01	0,015	0,03	0,05
7.1.6		130	0,01	0,015	0,03	0,05
7.2.1	Magnesium	200	0,01	0,015	0,03	0,05
7.2.2		200	0,01	0,015	0,03	0,05
7.3.1	Copper	100	0,01	0,015	0,03	0,05
7.3.2		100	0,01	0,015	0,03	0,05
7.3.3		100	0,01	0,015	0,03	0,05
7.3.4		60	0,01	0,015	0,03	0,05
7.3.5		60	0,01	0,015	0,03	0,05
7.3.6		60	0,01	0,015	0,03	0,05
7.4.1	CuZn (brass)	120	0,01	0,015	0,03	0,05
7.4.2		160	0,01	0,015	0,03	0,05
7.5.1	CuSn (bronze)	60	0,01	0,015	0,03	0,05
7.5.2		70	0,01	0,015	0,03	0,05
7.6.1	CuAlFe (Ampco)					
7.6.2						
7.8.1	Titanium	30	0,01	0,015	0,03	0,05
7.8.2		20	0,01	0,015	0,03	0,05
7.8.3		20	0,01	0,015	0,03	0,05

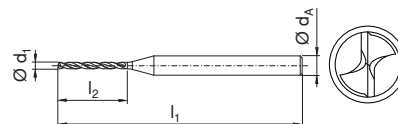
W1190, coated

Micro-drills

F23



UN	MB
$\lambda_s = 30^\circ$	$d_f = 0/0,004$ $d_A = h6$
	σ 140°
SCPP425	



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
0.1	MB.UN.1190.0010+4μ.140.HA	3	38	1.2	W1190001040
0.15	MB.UN.1190.0015+4μ.140.HA	3	38	2	W1190001540
0.2	MB.UN.1190.0020+4μ.140.HA	3	38	3.5	W1190002040
0.25	MB.UN.1190.0025+4μ.140.HA	3	38	3.5	W1190002540
0.3	MB.UN.1190.0030+4μ.140.HA	3	38	5.5	W1190003040
0.35	MB.UN.1190.0035+4μ.140.HA	3	38	5.5	W1190003540
0.4	MB.UN.1190.0040+4μ.140.HA	3	38	7	W1190004040
0.45	MB.UN.1190.0045+4μ.140.HA	3	38	7	W1190004540
0.5	MB.UN.1190.0050+4μ.140.HA	3	38	7	W1190005040
0.55	MB.UN.1190.0055+4μ.140.HA	3	38	7	W1190005540
0.6	MB.UN.1190.0060+4μ.140.HA	3	38	7	W1190006040
0.65	MB.UN.1190.0065+4μ.140.HA	3	38	7	W1190006540
0.7	MB.UN.1190.0070+4μ.140.HA	3	38	10.5	W1190007040
0.75	MB.UN.1190.0075+4μ.140.HA	3	38	10.5	W1190007540
0.8	MB.UN.1190.0080+4μ.140.HA	3	38	10.5	W1190008040
0.85	MB.UN.1190.0085+4μ.140.HA	3	38	10.5	W1190008540
0.9	MB.UN.1190.0090+4μ.140.HA	3	38	10.5	W1190009040
0.95	MB.UN.1190.0095+4μ.140.HA	3	38	10.5	W1190009540
1.0	MB.UN.1190.0100+4μ.140.HA	3	38	10.5	W1190010040
1.05	MB.UN.1190.0105+4μ.140.HA	3	38	10.5	W1190010540
1.1	MB.UN.1190.0110+4μ.140.HA	3	38	10.5	W1190011040
1.15	MB.UN.1190.0115+4μ.140.HA	3	38	10.5	W1190011540
1.2	MB.UN.1190.0120+4μ.140.HA	3	38	10.5	W1190012040
1.25	MB.UN.1190.0125+4μ.140.HA	3	38	10.5	W1190012540
1.3	MB.UN.1190.0130+4μ.140.HA	3	38	10.5	W1190013040
1.35	MB.UN.1190.0135+4μ.140.HA	3	38	10.5	W1190013540
1.4	MB.UN.1190.0140+4μ.140.HA	3	38	10.5	W1190014040
1.45	MB.UN.1190.0145+4μ.140.HA	3	38	10.5	W1190014540
1.5	MB.UN.1190.0150+4μ.140.HA	3	38	10.5	W1190015040
1.55	MB.UN.1190.0155+4μ.140.HA	3	38	10.5	W1190015540
1.6	MB.UN.1190.0160+4μ.140.HA	3	38	10.5	W1190016040
1.65	MB.UN.1190.0165+4μ.140.HA	3	38	10.5	W1190016540
1.7	MB.UN.1190.0170+4μ.140.HA	3	38	10.5	W1190017040
1.75	MB.UN.1190.0175+4μ.140.HA	3	38	10.5	W1190017540
1.8	MB.UN.1190.0180+4μ.140.HA	3	38	10.5	W1190018040
1.85	MB.UN.1190.0185+4μ.140.HA	3	38	12	W1190018540
1.9	MB.UN.1190.0190+4μ.140.HA	3	38	12	W1190019040
1.95	MB.UN.1190.0195+4μ.140.HA	3	38	12	W1190019540
2.0	MB.UN.1190.0200+4μ.140.HA	3	42	13	W1190020040
2.05	MB.UN.1190.0205+4μ.140.HA	3	42	13	W1190020540
2.1	MB.UN.1190.0210+4μ.140.HA	3	42	13	W1190021040
2.15	MB.UN.1190.0215+4μ.140.HA	3	42	13	W1190021540
2.2	MB.UN.1190.0220+4μ.140.HA	3	46	15	W1190022040
2.25	MB.UN.1190.0225+4μ.140.HA	3	46	15	W1190022540
2.3	MB.UN.1190.0230+4μ.140.HA	3	46	15	W1190023040
2.35	MB.UN.1190.0235+4μ.140.HA	3	46	15	W1190023540
2.4	MB.UN.1190.0240+4μ.140.HA	3	46	15	W1190024040
2.45	MB.UN.1190.0245+4μ.140.HA	3	46	15	W1190024540

W1190, coated

Cutting data

F24



Index	Material designation	V _c [m/min]	f [mm/rev]			
			= Ø 0,1 = Ø 1,0	> Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 2,9
1.1.1	Machining steels	80	0,02	0,03	0,04	0,06
1.1.2		70	0,01	0,015	0,03	0,05
1.2.1	Constructional steel	80	0,02	0,03	0,04	0,06
1.2.2		70	0,01	0,015	0,03	0,05
1.2.3		65	0,01	0,015	0,03	0,05
1.3.1	Spring steel					
1.3.2						
1.3.3						
2.1.1	Cementation steel	75	0,01	0,015	0,03	0,05
2.1.2		70	0,01	0,015	0,03	0,05
2.1.3		65	0,01	0,015	0,03	0,05
2.2.1	Nitriding steel	65	0,01	0,015	0,03	0,05
2.2.2		65	0,01	0,015	0,03	0,05
2.3.1	Tempered steel	65	0,02	0,03	0,04	0,06
2.3.2		65	0,01	0,015	0,03	0,05
2.3.3		65	0,02	0,03	0,04	0,06
2.3.4		65	0,01	0,015	0,03	0,05
2.3.5		50	0,01	0,015	0,03	0,05
2.3.6						
3.1.1	Non alloyed tool steel	50	0,01	0,015	0,03	0,05
3.2.1	Tool steel for cold working	65	0,01	0,015	0,03	0,05
3.2.2		50	0,01	0,015	0,03	0,05
3.2.3						
3.2.4						
3.2.5						
3.3.1	Tool steel for hot working	50	0,01	0,015	0,03	0,05
3.3.2						
3.3.3						
3.3.4						
3.3.5						
3.5.1	Hardened tool steel	< 55 HRC				
3.5.2		55–58 HRC				
3.5.3		58–60 HRC				
3.5.4		60–62 HRC				
3.5.5		62–64 HRC				
4.1.1	Stainless steel					
4.1.2						
4.1.3						
4.1.4						
4.1.5						
4.2.1	Heat-resistant alloys					
4.2.2						
4.2.3						
4.2.4						
5.1.1	Conventional cast steel	75	0,02	0,03	0,04	0,06
5.1.2		70	0,02	0,03	0,04	0,06
5.1.3						
5.2.1	Stainless cast steel					
5.2.2						
6.1.1	Cast iron with lamellar graphite	70	0,01	0,015	0,03	0,05
6.1.2		70	0,01	0,015	0,03	0,05
6.1.3						
6.1.4						
6.2.1	Spheroidal cast iron	70	0,01	0,015	0,03	0,05
6.2.2		70	0,01	0,015	0,03	0,05
6.2.3						
6.3.1	GTW (white malleable cast iron)	70	0,01	0,015	0,03	0,05
6.3.2		70	0,01	0,015	0,03	0,05
6.4.1	GTS (black malleable cast iron)	70	0,01	0,015	0,03	0,05
6.4.2		70	0,01	0,015	0,03	0,05
7.1.1	Aluminium	200	0,01	0,015	0,03	0,05
7.1.2		200	0,01	0,015	0,03	0,05
7.1.3		200	0,01	0,015	0,03	0,05
7.1.4		180	0,01	0,015	0,03	0,05
7.1.5		160	0,01	0,015	0,03	0,05
7.1.6		130	0,01	0,015	0,03	0,05
7.2.1	Magnesium	200	0,01	0,015	0,03	0,05
7.2.2		200	0,01	0,015	0,03	0,05
7.3.1	Copper	100	0,01	0,015	0,03	0,05
7.3.2		100	0,01	0,015	0,03	0,05
7.3.3		100	0,01	0,015	0,03	0,05
7.3.4		60	0,01	0,015	0,03	0,05
7.3.5		60	0,01	0,015	0,03	0,05
7.3.6		60	0,01	0,015	0,03	0,05
7.4.1	CuZn (brass)	120	0,01	0,015	0,03	0,05
7.4.2		160	0,01	0,015	0,03	0,05
7.5.1	CuSn (bronze)	60	0,01	0,015	0,03	0,05
7.5.2		70	0,01	0,015	0,03	0,05
7.6.1	CuAlFe (Ampco)					
7.6.2						
7.8.1	Titanium	30	0,01	0,015	0,03	0,05
7.8.2		20	0,01	0,015	0,03	0,05
7.8.3		20	0,01	0,015	0,03	0,05

W1190, coated

Micro-drills

F25

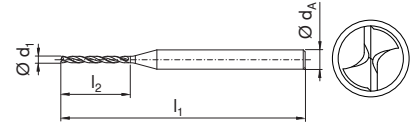



UN MB

$\lambda_s = 30^\circ$
 $d_1 = 0/0,004$
 $d_A = h6$



σ
140°



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA  Material
2.5	MB.UN.1190.0250+4μ.140.HA	3	46	15	W1190025040
2.6	MB.UN.1190.0260+4μ.140.HA	3	46	15	W1190026040
2.7	MB.UN.1190.0270+4μ.140.HA	3	46	15	W1190027040
2.8	MB.UN.1190.0280+4μ.140.HA	3	46	15	W1190028040
2.9	MB.UN.1190.0290+4μ.140.HA	3	46	15	W1190029040

W1108, coated

Cutting data

F26



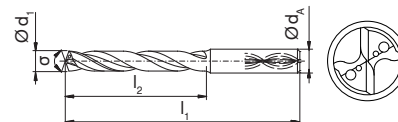
Index	Material designation	V _c [m/min]	f [mm/rev]			
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	Machining steels	170	0,18	0,24	0,3	0,35
1.1.2		150	0,18	0,24	0,3	0,35
1.2.1	Constructional steel	170	0,18	0,24	0,3	0,35
1.2.2		150	0,18	0,24	0,3	0,35
1.2.3		130	0,16	0,22	0,28	0,34
1.3.1	Spring steel	105	0,16	0,22	0,28	0,34
1.3.2		90	0,15	0,21	0,27	0,32
1.3.3		55	0,08	0,12	0,15	0,2
2.1.1	Cementation steel	160	0,18	0,24	0,3	0,35
2.1.2		145	0,18	0,24	0,3	0,35
2.1.3		130	0,16	0,22	0,28	0,34
2.2.1	Nitriding steel	130	0,15	0,21	0,27	0,32
2.2.2		130	0,15	0,21	0,27	0,32
2.3.1	Tempered steel	145	0,16	0,22	0,28	0,34
2.3.2		130	0,15	0,21	0,27	0,32
2.3.3		130	0,16	0,22	0,28	0,34
2.3.4		130	0,15	0,21	0,27	0,32
2.3.5		105	0,15	0,21	0,27	0,32
2.3.6		65	0,08	0,12	0,15	0,2
3.1.1	Non alloyed tool steel	105	0,15	0,21	0,27	0,32
3.2.1	Tool steel for cold working	130	0,15	0,21	0,27	0,32
3.2.2		105	0,15	0,21	0,27	0,32
3.2.3		65	0,08	0,12	0,15	0,2
3.2.4		70	0,08	0,12	0,15	0,2
3.2.5		65	0,08	0,12	0,15	0,2
3.3.1	Tool steel for hot working	105	0,15	0,21	0,27	0,32
3.3.2		65	0,08	0,12	0,15	0,2
3.3.3		90	0,08	0,12	0,15	0,2
3.3.4		70	0,08	0,12	0,15	0,2
3.3.5		55	0,08	0,12	0,15	0,2
3.5.1	Hardened tool steel	< 55 HRC				
3.5.2		55–58 HRC				
3.5.3		58–60 HRC				
3.5.4		60–62 HRC				
3.5.5		62–64 HRC				
4.1.1	Stainless steel	75	0,08	0,12	0,15	0,2
4.1.2		65	0,08	0,12	0,15	0,2
4.1.3		70	0,08	0,12	0,15	0,2
4.1.4		70	0,08	0,12	0,15	0,2
4.1.5		75	0,08	0,12	0,15	0,2
4.2.1	Heat-resistant alloys	50	0,04	0,08	0,12	0,16
4.2.2		45	0,04	0,08	0,12	0,16
4.2.3		45	0,04	0,08	0,12	0,16
4.2.4		45	0,04	0,08	0,12	0,16
5.1.1	Conventional cast steel	135	0,18	0,24	0,3	0,35
5.1.2		130	0,16	0,22	0,28	0,34
5.1.3		105	0,15	0,21	0,27	0,32
5.2.1	Stainless cast steel	70	0,08	0,12	0,15	0,2
5.2.2		65	0,08	0,12	0,15	0,2
6.1.1	Cast iron with lamellar graphite	150	0,23	0,335	0,425	0,52
6.1.2		135	0,23	0,335	0,425	0,52
6.1.3		105	0,23	0,335	0,425	0,52
6.1.4		70	0,08	0,12	0,15	0,2
6.2.1	Spheroidal cast iron	120	0,2	0,25	0,35	0,4
6.2.2		105	0,2	0,25	0,35	0,4
6.2.3		80	0,08	0,12	0,15	0,2
6.3.1	GTW (white malleable cast iron)	120	0,2	0,25	0,35	0,4
6.3.2		110	0,2	0,25	0,35	0,4
6.4.1	GTS (black malleable cast iron)	120	0,2	0,25	0,35	0,4
6.4.2		110	0,2	0,25	0,35	0,4
7.1.1	Aluminium					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	Magnesium					
7.2.2						
7.3.1	Copper					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	CuZn (brass)					
7.4.2						
7.5.1	CuSn (bronze)					
7.5.2						
7.6.1	CuAlFe (Ampco)					
7.6.2						
7.8.1	Titanium					
7.8.2						
7.8.3						

W1108, coated

High-performance twist drills



VA	HPC
$\lambda_s = 30^\circ$	$d_1 = m6$ $d_A = h6$
5xD	σ 140°
SCPM415	



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HPC.VA.1108.0300m6.5XD.140.IK.HA	6	66	28	W1108030340
3.1	HPC.VA.1108.0310m6.5XD.140.IK.HA	6	66	28	W1108031340
3.2	HPC.VA.1108.0320m6.5XD.140.IK.HA	6	66	28	W1108032340
3.3	HPC.VA.1108.0330m6.5XD.140.IK.HA	6	66	28	W1108033340
3.4	HPC.VA.1108.0340m6.5XD.140.IK.HA	6	66	28	W1108034340
3.5	HPC.VA.1108.0350m6.5XD.140.IK.HA	6	66	28	W1108035340
3.6	HPC.VA.1108.0360m6.5XD.140.IK.HA	6	66	28	W1108036340
3.7	HPC.VA.1108.0370m6.5XD.140.IK.HA	6	66	28	W1108037340
3.8	HPC.VA.1108.0380m6.5XD.140.IK.HA	6	74	36	W1108038340
3.9	HPC.VA.1108.0390m6.5XD.140.IK.HA	6	74	36	W1108039340
4.0	HPC.VA.1108.0400m6.5XD.140.IK.HA	6	74	36	W1108040340
4.1	HPC.VA.1108.0410m6.5XD.140.IK.HA	6	74	36	W1108041340
4.2	HPC.VA.1108.0420m6.5XD.140.IK.HA	6	74	36	W1108042340
4.3	HPC.VA.1108.0430m6.5XD.140.IK.HA	6	74	36	W1108043340
4.4	HPC.VA.1108.0440m6.5XD.140.IK.HA	6	74	36	W1108044340
4.5	HPC.VA.1108.0450m6.5XD.140.IK.HA	6	74	36	W1108045340
4.6	HPC.VA.1108.0460m6.5XD.140.IK.HA	6	74	36	W1108046340
4.7	HPC.VA.1108.0470m6.5XD.140.IK.HA	6	74	36	W1108047340
4.8	HPC.VA.1108.0480m6.5XD.140.IK.HA	6	82	44	W1108048340
4.9	HPC.VA.1108.0490m6.5XD.140.IK.HA	6	82	44	W1108049340
5.0	HPC.VA.1108.0500m6.5XD.140.IK.HA	6	82	44	W1108050340
5.1	HPC.VA.1108.0510m6.5XD.140.IK.HA	6	82	44	W1108051340
5.2	HPC.VA.1108.0520m6.5XD.140.IK.HA	6	82	44	W1108052340
5.3	HPC.VA.1108.0530m6.5XD.140.IK.HA	6	82	44	W1108053340
5.4	HPC.VA.1108.0540m6.5XD.140.IK.HA	6	82	44	W1108054340
5.5	HPC.VA.1108.0550m6.5XD.140.IK.HA	6	82	44	W1108055340
5.6	HPC.VA.1108.0560m6.5XD.140.IK.HA	6	82	44	W1108056340
5.7	HPC.VA.1108.0570m6.5XD.140.IK.HA	6	82	44	W1108057340
5.8	HPC.VA.1108.0580m6.5XD.140.IK.HA	6	82	44	W1108058340
5.9	HPC.VA.1108.0590m6.5XD.140.IK.HA	6	82	44	W1108059340
6.0	HPC.VA.1108.0600m6.5XD.140.IK.HA	6	82	44	W1108060340
6.1	HPC.VA.1108.0610m6.5XD.140.IK.HA	8	91	53	W1108061340
6.2	HPC.VA.1108.0620m6.5XD.140.IK.HA	8	91	53	W1108062340
6.3	HPC.VA.1108.0630m6.5XD.140.IK.HA	8	91	53	W1108063340
6.4	HPC.VA.1108.0640m6.5XD.140.IK.HA	8	91	53	W1108064340
6.5	HPC.VA.1108.0650m6.5XD.140.IK.HA	8	91	53	W1108065340
6.6	HPC.VA.1108.0660m6.5XD.140.IK.HA	8	91	53	W1108066340
6.7	HPC.VA.1108.0670m6.5XD.140.IK.HA	8	91	53	W1108067340
6.8	HPC.VA.1108.0680m6.5XD.140.IK.HA	8	91	53	W1108068340
6.9	HPC.VA.1108.0690m6.5XD.140.IK.HA	8	91	53	W1108069340
7.0	HPC.VA.1108.0700m6.5XD.140.IK.HA	8	91	53	W1108070340
7.1	HPC.VA.1108.0710m6.5XD.140.IK.HA	8	91	53	W1108071340
7.2	HPC.VA.1108.0720m6.5XD.140.IK.HA	8	91	53	W1108072340
7.3	HPC.VA.1108.0730m6.5XD.140.IK.HA	8	91	53	W1108073340
7.4	HPC.VA.1108.0740m6.5XD.140.IK.HA	8	91	53	W1108074340
7.5	HPC.VA.1108.0750m6.5XD.140.IK.HA	8	91	53	W1108075340
7.6	HPC.VA.1108.0760m6.5XD.140.IK.HA	8	91	53	W1108076340
7.7	HPC.VA.1108.0770m6.5XD.140.IK.HA	8	91	53	W1108077340

W1108, coated

Cutting data

F28

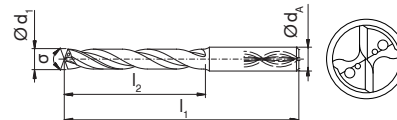


Index	Material designation	V _c [m/min]	f [mm/rev]			
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	Machining steels	170	0,18	0,24	0,3	0,35
1.1.2		150	0,18	0,24	0,3	0,35
1.2.1	Constructional steel	170	0,18	0,24	0,3	0,35
1.2.2		150	0,18	0,24	0,3	0,35
1.2.3		130	0,16	0,22	0,28	0,34
1.3.1	Spring steel	105	0,16	0,22	0,28	0,34
1.3.2		90	0,15	0,21	0,27	0,32
1.3.3		55	0,08	0,12	0,15	0,2
2.1.1	Cementation steel	160	0,18	0,24	0,3	0,35
2.1.2		145	0,18	0,24	0,3	0,35
2.1.3		130	0,16	0,22	0,28	0,34
2.2.1	Nitriding steel	130	0,15	0,21	0,27	0,32
2.2.2		130	0,15	0,21	0,27	0,32
2.3.1	Tempered steel	145	0,16	0,22	0,28	0,34
2.3.2		130	0,15	0,21	0,27	0,32
2.3.3		130	0,16	0,22	0,28	0,34
2.3.4		130	0,15	0,21	0,27	0,32
2.3.5		105	0,15	0,21	0,27	0,32
2.3.6		65	0,08	0,12	0,15	0,2
3.1.1	Non alloyed tool steel	105	0,15	0,21	0,27	0,32
3.2.1	Tool steel for cold working	130	0,15	0,21	0,27	0,32
3.2.2		105	0,15	0,21	0,27	0,32
3.2.3		65	0,08	0,12	0,15	0,2
3.2.4		70	0,08	0,12	0,15	0,2
3.2.5		65	0,08	0,12	0,15	0,2
3.3.1	Tool steel for hot working	105	0,15	0,21	0,27	0,32
3.3.2		65	0,08	0,12	0,15	0,2
3.3.3		90	0,08	0,12	0,15	0,2
3.3.4		70	0,08	0,12	0,15	0,2
3.3.5		55	0,08	0,12	0,15	0,2
3.5.1	Hardened tool steel	< 55 HRC				
3.5.2		55–58 HRC				
3.5.3		58–60 HRC				
3.5.4		60–62 HRC				
3.5.5		62–64 HRC				
4.1.1	Stainless steel	75	0,08	0,12	0,15	0,2
4.1.2		65	0,08	0,12	0,15	0,2
4.1.3		70	0,08	0,12	0,15	0,2
4.1.4		70	0,08	0,12	0,15	0,2
4.1.5		75	0,08	0,12	0,15	0,2
4.2.1	Heat-resistant alloys	50	0,04	0,08	0,12	0,16
4.2.2		45	0,04	0,08	0,12	0,16
4.2.3		45	0,04	0,08	0,12	0,16
4.2.4		45	0,04	0,08	0,12	0,16
5.1.1	Conventional cast steel	135	0,18	0,24	0,3	0,35
5.1.2		130	0,16	0,22	0,28	0,34
5.1.3		105	0,15	0,21	0,27	0,32
5.2.1	Stainless cast steel	70	0,08	0,12	0,15	0,2
5.2.2		65	0,08	0,12	0,15	0,2
6.1.1	Cast iron with lamellar graphite	150	0,23	0,335	0,425	0,52
6.1.2		135	0,23	0,335	0,425	0,52
6.1.3		105	0,23	0,335	0,425	0,52
6.1.4		70	0,08	0,12	0,15	0,2
6.2.1	Spheroidal cast iron	120	0,2	0,25	0,35	0,4
6.2.2		105	0,2	0,25	0,35	0,4
6.2.3		80	0,08	0,12	0,15	0,2
6.3.1	GTW (white malleable cast iron)	120	0,2	0,25	0,35	0,4
6.3.2		110	0,2	0,25	0,35	0,4
6.4.1	GTS (black malleable cast iron)	120	0,2	0,25	0,35	0,4
6.4.2		110	0,2	0,25	0,35	0,4
7.1.1	Aluminium					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	Magnesium					
7.2.2						
7.3.1	Copper					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	CuZn (brass)					
7.4.2						
7.5.1	CuSn (bronze)					
7.5.2						
7.6.1	CuAlFe (Ampco)					
7.6.2						
7.8.1	Titanium					
7.8.2						
7.8.3						

W1108, coated

High-performance twist drills

VA	HPC
$\lambda_s = 30^\circ$	$d_1 = m6$ $d_A = h6$
5xD	σ 140°
SCPM415	



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
7.8	HPC.VA.1108.0780m6.5XD.140.IK.HA	8	91	53	W1108078340
7.9	HPC.VA.1108.0790m6.5XD.140.IK.HA	8	91	53	W1108079340
8.0	HPC.VA.1108.0800m6.5XD.140.IK.HA	8	91	53	W1108080340
8.1	HPC.VA.1108.0810m6.5XD.140.IK.HA	10	103	61	W1108081340
8.2	HPC.VA.1108.0820m6.5XD.140.IK.HA	10	103	61	W1108082340
8.3	HPC.VA.1108.0830m6.5XD.140.IK.HA	10	103	61	W1108083340
8.4	HPC.VA.1108.0840m6.5XD.140.IK.HA	10	103	61	W1108084340
8.5	HPC.VA.1108.0850m6.5XD.140.IK.HA	10	103	61	W1108085340
8.6	HPC.VA.1108.0860m6.5XD.140.IK.HA	10	103	61	W1108086340
8.7	HPC.VA.1108.0870m6.5XD.140.IK.HA	10	103	61	W1108087340
8.8	HPC.VA.1108.0880m6.5XD.140.IK.HA	10	103	61	W1108088340
8.9	HPC.VA.1108.0890m6.5XD.140.IK.HA	10	103	61	W1108089340
9.0	HPC.VA.1108.0900m6.5XD.140.IK.HA	10	103	61	W1108090340
9.1	HPC.VA.1108.0910m6.5XD.140.IK.HA	10	103	61	W1108091340
9.2	HPC.VA.1108.0920m6.5XD.140.IK.HA	10	103	61	W1108092340
9.3	HPC.VA.1108.0930m6.5XD.140.IK.HA	10	103	61	W1108093340
9.4	HPC.VA.1108.0940m6.5XD.140.IK.HA	10	103	61	W1108094340
9.5	HPC.VA.1108.0950m6.5XD.140.IK.HA	10	103	61	W1108095340
9.6	HPC.VA.1108.0960m6.5XD.140.IK.HA	10	103	61	W1108096340
9.7	HPC.VA.1108.0970m6.5XD.140.IK.HA	10	103	61	W1108097340
9.8	HPC.VA.1108.0980m6.5XD.140.IK.HA	10	103	61	W1108098340
9.9	HPC.VA.1108.0990m6.5XD.140.IK.HA	10	103	61	W1108099340
10.0	HPC.VA.1108.1000m6.5XD.140.IK.HA	10	103	61	W1108100340
10.1	HPC.VA.1108.1010m6.5XD.140.IK.HA	12	118	71	W1108101340
10.2	HPC.VA.1108.1020m6.5XD.140.IK.HA	12	118	71	W1108102340
10.5	HPC.VA.1108.1050m6.5XD.140.IK.HA	12	118	71	W1108105340
10.8	HPC.VA.1108.1080m6.5XD.140.IK.HA	12	118	71	W1108108340
11.0	HPC.VA.1108.1100m6.5XD.140.IK.HA	12	118	71	W1108110340
11.2	HPC.VA.1108.1120m6.5XD.140.IK.HA	12	118	71	W1108112340
11.5	HPC.VA.1108.1150m6.5XD.140.IK.HA	12	118	71	W1108115340
11.8	HPC.VA.1108.1180m6.5XD.140.IK.HA	12	118	71	W1108118340
12.0	HPC.VA.1108.1200m6.5XD.140.IK.HA	12	118	71	W1108120340
12.2	HPC.VA.1108.1220m6.5XD.140.IK.HA	14	124	77	W1108122340
12.5	HPC.VA.1108.1250m6.5XD.140.IK.HA	14	124	77	W1108125340
12.8	HPC.VA.1108.1280m6.5XD.140.IK.HA	14	124	77	W1108128340
13.0	HPC.VA.1108.1300m6.5XD.140.IK.HA	14	124	77	W1108130340
13.2	HPC.VA.1108.1320m6.5XD.140.IK.HA	14	124	77	W1108132340
13.5	HPC.VA.1108.1350m6.5XD.140.IK.HA	14	124	77	W1108135340
13.8	HPC.VA.1108.1380m6.5XD.140.IK.HA	14	124	77	W1108138340
14.0	HPC.VA.1108.1400m6.5XD.140.IK.HA	14	124	77	W1108140340
14.2	HPC.VA.1108.1420m6.5XD.140.IK.HA	16	133	83	W1108142340
14.5	HPC.VA.1108.1450m6.5XD.140.IK.HA	16	133	83	W1108145340
14.8	HPC.VA.1108.1480m6.5XD.140.IK.HA	16	133	83	W1108148340
15.0	HPC.VA.1108.1500m6.5XD.140.IK.HA	16	133	83	W1108150340
15.2	HPC.VA.1108.1520m6.5XD.140.IK.HA	16	133	83	W1108152340
15.5	HPC.VA.1108.1550m6.5XD.140.IK.HA	16	133	83	W1108155340
15.8	HPC.VA.1108.1580m6.5XD.140.IK.HA	16	133	83	W1108158340
16.0	HPC.VA.1108.1600m6.5XD.140.IK.HA	16	133	83	W1108160340

W1109, coated

Cutting data

F30



Index	Material designation	V _c [m/min]	f [mm/rev]				
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0
1.1.1	Machining steels	90	0,14	0,2	0,275	0,35	
1.1.2		75	0,1	0,15	0,2	0,26	
1.2.1	Constructional steel	90	0,14	0,2	0,275	0,35	
1.2.2		75	0,1	0,15	0,2	0,26	
1.2.3		70	0,1	0,15	0,2	0,26	
1.3.1	Spring steel						
1.3.2							
1.3.3							
2.1.1	Cementation steel	80	0,14	0,2	0,275	0,35	
2.1.2		75	0,14	0,2	0,275	0,35	
2.1.3		70	0,1	0,15	0,2	0,26	
2.2.1	Nitriding steel	70	0,1	0,15	0,2	0,26	
2.2.2		70	0,1	0,15	0,2	0,26	
2.3.1	Tempered steel	75	0,14	0,2	0,275	0,35	
2.3.2		70	0,1	0,15	0,2	0,26	
2.3.3		70	0,14	0,2	0,275	0,35	
2.3.4		70	0,1	0,15	0,2	0,26	
2.3.5		55	0,1	0,15	0,2	0,26	
2.3.6							
3.1.1	Non alloyed tool steel	55	0,1	0,15	0,2	0,26	
3.2.1	Tool steel for cold working	70	0,1	0,15	0,2	0,26	
3.2.2		55	0,1	0,15	0,2	0,26	
3.2.3		32	0,1	0,15	0,2	0,26	
3.2.4							
3.2.5							
3.3.1	Tool steel for hot working	55	0,1	0,15	0,2	0,26	
3.3.2							
3.3.3							
3.3.4							
3.3.5							
3.5.1	Hardened tool steel	< 55 HRC					
3.5.2		55–58 HRC					
3.5.3		58–60 HRC					
3.5.4		60–62 HRC					
3.5.5		62–64 HRC					
4.1.1	Stainless steel	70	0,08	0,12	0,15	0,2	
4.1.2		60	0,08	0,12	0,15	0,2	
4.1.3		65	0,08	0,12	0,15	0,2	
4.1.4		65	0,08	0,12	0,15	0,2	
4.1.5		70	0,08	0,12	0,15	0,2	
4.2.1	Heat-resistant alloys						
4.2.2							
4.2.3							
4.2.4							
5.1.1	Conventional cast steel	75	0,14	0,2	0,275	0,35	
5.1.2		70	0,1	0,15	0,2	0,26	
5.1.3		55	0,1	0,15	0,2	0,26	
5.2.1	Stainless cast steel	65	0,08	0,12	0,15	0,2	
5.2.2		60	0,08	0,12	0,15	0,2	
6.1.1	Cast iron with lamellar graphite	85	0,23	0,335	0,425	0,52	
6.1.2		75	0,23	0,335	0,425	0,52	
6.1.3		70	0,23	0,335	0,425	0,52	
6.1.4		65	0,08	0,12	0,15	0,2	
6.2.1	Spheroidal cast iron	80	0,2	0,25	0,35	0,4	
6.2.2		75	0,2	0,25	0,35	0,4	
6.2.3		55	0,08	0,12	0,15	0,2	
6.3.1	GTW (white malleable cast iron)	80	0,2	0,25	0,35	0,4	
6.3.2		75	0,2	0,25	0,35	0,4	
6.4.1	GTS (black malleable cast iron)	80	0,2	0,25	0,35	0,4	
6.4.2		75	0,2	0,25	0,35	0,4	
7.1.1	Aluminium						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	Magnesium						
7.2.2							
7.3.1	Copper						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	CuZn (brass)						
7.4.2							
7.5.1	CuSn (bronze)						
7.5.2							
7.6.1	CuAlFe (Ampco)						
7.6.2							
7.8.1	Titanium						
7.8.2							
7.8.3							

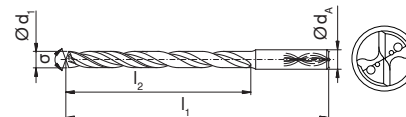
W1109, coated

High-performance twist drills

F31



VA	HPC
$\lambda_s = 30^\circ$	$d_1 = m6$ $d_A = h6$
8xD	σ 140°
SCPM415	



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HPC.VA.1109.0300m6.8XD.140.IK.HA	6	72	34	W1109030440
3.3	HPC.VA.1109.0330m6.8XD.140.IK.HA	6	72	34	W1109033440
3.4	HPC.VA.1109.0340m6.8XD.140.IK.HA	6	72	34	W1109034440
3.7	HPC.VA.1109.0370m6.8XD.140.IK.HA	6	72	34	W1109037440
3.8	HPC.VA.1109.0380m6.8XD.140.IK.HA	6	81	43	W1109038440
4.0	HPC.VA.1109.0400m6.8XD.140.IK.HA	6	81	43	W1109040440
4.1	HPC.VA.1109.0410m6.8XD.140.IK.HA	6	81	43	W1109041440
4.2	HPC.VA.1109.0420m6.8XD.140.IK.HA	6	81	43	W1109042440
4.3	HPC.VA.1109.0430m6.8XD.140.IK.HA	6	81	43	W1109043440
4.5	HPC.VA.1109.0450m6.8XD.140.IK.HA	6	81	43	W1109045440
4.6	HPC.VA.1109.0460m6.8XD.140.IK.HA	6	81	43	W1109046440
4.8	HPC.VA.1109.0480m6.8XD.140.IK.HA	6	95	57	W1109048440
4.9	HPC.VA.1109.0490m6.8XD.140.IK.HA	6	95	57	W1109049440
5.0	HPC.VA.1109.0500m6.8XD.140.IK.HA	6	95	57	W1109050440
5.1	HPC.VA.1109.0510m6.8XD.140.IK.HA	6	95	57	W1109051440
5.2	HPC.VA.1109.0520m6.8XD.140.IK.HA	6	95	57	W1109052440
5.3	HPC.VA.1109.0530m6.8XD.140.IK.HA	6	95	57	W1109053440
5.5	HPC.VA.1109.0550m6.8XD.140.IK.HA	6	95	57	W1109055440
5.8	HPC.VA.1109.0580m6.8XD.140.IK.HA	6	95	57	W1109058440
5.9	HPC.VA.1109.0590m6.8XD.140.IK.HA	6	95	57	W1109059440
6.0	HPC.VA.1109.0600m6.8XD.140.IK.HA	6	95	57	W1109060440
6.1	HPC.VA.1109.0610m6.8XD.140.IK.HA	8	114	76	W1109061440
6.2	HPC.VA.1109.0620m6.8XD.140.IK.HA	8	114	76	W1109062440
6.3	HPC.VA.1109.0630m6.8XD.140.IK.HA	8	114	76	W1109063440
6.5	HPC.VA.1109.0650m6.8XD.140.IK.HA	8	114	76	W1109065440
6.6	HPC.VA.1109.0660m6.8XD.140.IK.HA	8	114	76	W1109066440
6.7	HPC.VA.1109.0670m6.8XD.140.IK.HA	8	114	76	W1109067440
6.8	HPC.VA.1109.0680m6.8XD.140.IK.HA	8	114	76	W1109068440
7.0	HPC.VA.1109.0700m6.8XD.140.IK.HA	8	114	76	W1109070440
7.4	HPC.VA.1109.0740m6.8XD.140.IK.HA	8	114	76	W1109074440
7.5	HPC.VA.1109.0750m6.8XD.140.IK.HA	8	114	76	W1109075440
7.7	HPC.VA.1109.0770m6.8XD.140.IK.HA	8	114	76	W1109077440
7.8	HPC.VA.1109.0780m6.8XD.140.IK.HA	8	114	76	W1109078440
7.9	HPC.VA.1109.0790m6.8XD.140.IK.HA	8	114	76	W1109079440
8.0	HPC.VA.1109.0800m6.8XD.140.IK.HA	8	114	76	W1109080440
8.1	HPC.VA.1109.0810m6.8XD.140.IK.HA	10	142	95	W1109081440
8.2	HPC.VA.1109.0820m6.8XD.140.IK.HA	10	142	95	W1109082440
8.3	HPC.VA.1109.0830m6.8XD.140.IK.HA	10	142	95	W1109083440
8.5	HPC.VA.1109.0850m6.8XD.140.IK.HA	10	142	95	W1109085440
8.6	HPC.VA.1109.0860m6.8XD.140.IK.HA	10	142	95	W1109086440
8.7	HPC.VA.1109.0870m6.8XD.140.IK.HA	10	142	95	W1109087440
8.8	HPC.VA.1109.0880m6.8XD.140.IK.HA	10	142	95	W1109088440
8.9	HPC.VA.1109.0890m6.8XD.140.IK.HA	10	142	95	W1109089440
9.0	HPC.VA.1109.0900m6.8XD.140.IK.HA	10	142	95	W1109090440
9.1	HPC.VA.1109.0910m6.8XD.140.IK.HA	10	142	95	W1109091440
9.2	HPC.VA.1109.0920m6.8XD.140.IK.HA	10	142	95	W1109092440
9.3	HPC.VA.1109.0930m6.8XD.140.IK.HA	10	142	95	W1109093440
9.4	HPC.VA.1109.0940m6.8XD.140.IK.HA	10	142	95	W1109094440

W1109, coated

Cutting data

F32



Index	Material designation	V _c [m/min]	f [mm/rev]			
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	Machining steels	90	0,14	0,2	0,275	0,35
1.1.2		75	0,1	0,15	0,2	0,26
1.2.1	Constructional steel	90	0,14	0,2	0,275	0,35
1.2.2		75	0,1	0,15	0,2	0,26
1.2.3		70	0,1	0,15	0,2	0,26
1.3.1	Spring steel					
1.3.2						
1.3.3						
2.1.1	Cementation steel	80	0,14	0,2	0,275	0,35
2.1.2		75	0,14	0,2	0,275	0,35
2.1.3		70	0,1	0,15	0,2	0,26
2.2.1	Nitriding steel	70	0,1	0,15	0,2	0,26
2.2.2		70	0,1	0,15	0,2	0,26
2.3.1	Tempered steel	75	0,14	0,2	0,275	0,35
2.3.2		70	0,1	0,15	0,2	0,26
2.3.3		70	0,14	0,2	0,275	0,35
2.3.4		70	0,1	0,15	0,2	0,26
2.3.5		55	0,1	0,15	0,2	0,26
2.3.6						
3.1.1	Non alloyed tool steel	55	0,1	0,15	0,2	0,26
3.2.1	Tool steel for cold working	70	0,1	0,15	0,2	0,26
3.2.2		55	0,1	0,15	0,2	0,26
3.2.3		32	0,1	0,15	0,2	0,26
3.2.4						
3.2.5						
3.3.1	Tool steel for hot working	55	0,1	0,15	0,2	0,26
3.3.2						
3.3.3						
3.3.4						
3.3.5						
3.5.1	Hardened tool steel	< 55 HRC				
3.5.2		55–58 HRC				
3.5.3		58–60 HRC				
3.5.4		60–62 HRC				
3.5.5		62–64 HRC				
4.1.1	Stainless steel	70	0,08	0,12	0,15	0,2
4.1.2		60	0,08	0,12	0,15	0,2
4.1.3		65	0,08	0,12	0,15	0,2
4.1.4		65	0,08	0,12	0,15	0,2
4.1.5		70	0,08	0,12	0,15	0,2
4.2.1	Heat-resistant alloys					
4.2.2						
4.2.3						
4.2.4						
5.1.1	Conventional cast steel	75	0,14	0,2	0,275	0,35
5.1.2		70	0,1	0,15	0,2	0,26
5.1.3		55	0,1	0,15	0,2	0,26
5.2.1	Stainless cast steel	65	0,08	0,12	0,15	0,2
5.2.2		60	0,08	0,12	0,15	0,2
6.1.1	Cast iron with lamellar graphite	85	0,23	0,335	0,425	0,52
6.1.2		75	0,23	0,335	0,425	0,52
6.1.3		70	0,23	0,335	0,425	0,52
6.1.4		65	0,08	0,12	0,15	0,2
6.2.1	Spheroidal cast iron	80	0,2	0,25	0,35	0,4
6.2.2		75	0,2	0,25	0,35	0,4
6.2.3		55	0,08	0,12	0,15	0,2
6.3.1	GTW (white malleable cast iron)	80	0,2	0,25	0,35	0,4
6.3.2		75	0,2	0,25	0,35	0,4
6.4.1	GTS (black malleable cast iron)	80	0,2	0,25	0,35	0,4
6.4.2		75	0,2	0,25	0,35	0,4
7.1.1	Aluminium					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	Magnesium					
7.2.2						
7.3.1	Copper					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	CuZn (brass)					
7.4.2						
7.5.1	CuSn (bronze)					
7.5.2						
7.6.1	CuAlFe (Ampco)					
7.6.2						
7.8.1	Titanium					
7.8.2						
7.8.3						

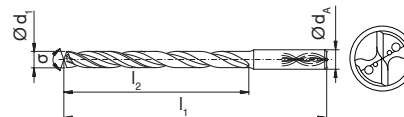
W1109, coated

High-performance twist drills

F33



VA	HPC
$\lambda_s = 30^\circ$	$d_1 = m6$ $d_A = h6$
8xD	σ 140°
SCPM415	



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
9.5	HPC.VA.1109.0950m6.8XD.140.IK.HA	10	142	95	W1109095440
9.7	HPC.VA.1109.0970m6.8XD.140.IK.HA	10	142	95	W1109097440
9.8	HPC.VA.1109.0980m6.8XD.140.IK.HA	10	142	95	W1109098440
9.9	HPC.VA.1109.0990m6.8XD.140.IK.HA	10	142	95	W1109099440
10.0	HPC.VA.1109.1000m6.8XD.140.IK.HA	10	142	95	W1109100440
10.2	HPC.VA.1109.1020m6.8XD.140.IK.HA	12	162	114	W1109102440
10.5	HPC.VA.1109.1050m6.8XD.140.IK.HA	12	162	114	W1109105440
10.8	HPC.VA.1109.1080m6.8XD.140.IK.HA	12	162	114	W1109108440
11.0	HPC.VA.1109.1100m6.8XD.140.IK.HA	12	162	114	W1109110440
11.2	HPC.VA.1109.1120m6.8XD.140.IK.HA	12	162	114	W1109112440
11.5	HPC.VA.1109.1150m6.8XD.140.IK.HA	12	162	114	W1109115440
11.8	HPC.VA.1109.1180m6.8XD.140.IK.HA	12	162	114	W1109118440
12.0	HPC.VA.1109.1200m6.8XD.140.IK.HA	12	162	114	W1109120440
12.2	HPC.VA.1109.1220m6.8XD.140.IK.HA	14	178	131	W1109122440
12.5	HPC.VA.1109.1250m6.8XD.140.IK.HA	14	178	131	W1109125440
12.8	HPC.VA.1109.1280m6.8XD.140.IK.HA	14	178	131	W1109128440
13.0	HPC.VA.1109.1300m6.8XD.140.IK.HA	14	178	131	W1109130440
13.5	HPC.VA.1109.1350m6.8XD.140.IK.HA	14	178	131	W1109135440
13.8	HPC.VA.1109.1380m6.8XD.140.IK.HA	14	178	131	W1109138440
14.0	HPC.VA.1109.1400m6.8XD.140.IK.HA	14	178	131	W1109140440
14.2	HPC.VA.1109.1420m6.8XD.140.IK.HA	16	203	152	W1109142440
14.5	HPC.VA.1109.1450m6.8XD.140.IK.HA	16	203	152	W1109145440
14.8	HPC.VA.1109.1480m6.8XD.140.IK.HA	16	203	152	W1109148440
15.0	HPC.VA.1109.1500m6.8XD.140.IK.HA	16	203	152	W1109150440
15.5	HPC.VA.1109.1550m6.8XD.140.IK.HA	16	203	152	W1109155440
15.8	HPC.VA.1109.1580m6.8XD.140.IK.HA	16	203	152	W1109158440
16.0	HPC.VA.1109.1600m6.8XD.140.IK.HA	16	203	152	W1109160440

W1112, coated

Cutting data

F34



Index	Material designation	V _c [m/min]	f [mm/rev]			
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	
1.1.1	Machining steels	90	0,14	0,2	0,275	
1.1.2		75	0,1	0,15	0,2	
1.2.1	Constructional steel	90	0,14	0,2	0,275	
1.2.2		75	0,1	0,15	0,2	
1.2.3		70	0,1	0,15	0,2	
1.3.1	Spring steel					
1.3.2						
1.3.3						
2.1.1	Cementation steel	80	0,14	0,2	0,275	
2.1.2		75	0,14	0,2	0,275	
2.1.3		70	0,1	0,15	0,2	
2.2.1	Nitriding steel	70	0,1	0,15	0,2	
2.2.2		70	0,1	0,15	0,2	
2.3.1	Tempered steel	75	0,14	0,2	0,275	
2.3.2		70	0,1	0,15	0,2	
2.3.3		70	0,14	0,2	0,275	
2.3.4		70	0,1	0,15	0,2	
2.3.5		55	0,1	0,15	0,2	
2.3.6						
3.1.1	Non alloyed tool steel	55	0,1	0,15	0,2	
3.2.1	Tool steel for cold working	70	0,1	0,15	0,2	
3.2.2		55	0,1	0,15	0,2	
3.2.3		32	0,1	0,15	0,2	
3.2.4						
3.2.5						
3.3.1	Tool steel for hot working	55	0,1	0,15	0,2	
3.3.2						
3.3.3						
3.3.4						
3.3.5						
3.5.1	Hardened tool steel	< 55 HRC				
3.5.2		55–58 HRC				
3.5.3		58–60 HRC				
3.5.4		60–62 HRC				
3.5.5		62–64 HRC				
4.1.1	Stainless steel	70	0,08	0,12	0,15	
4.1.2		60	0,08	0,12	0,15	
4.1.3		65	0,08	0,12	0,15	
4.1.4		65	0,08	0,12	0,15	
4.1.5		70	0,08	0,12	0,15	
4.2.1	Heat-resistant alloys					
4.2.2						
4.2.3						
4.2.4						
5.1.1	Conventional cast steel	75	0,14	0,2	0,275	
5.1.2		70	0,1	0,15	0,2	
5.1.3		55	0,1	0,15	0,2	
5.2.1	Stainless cast steel	65	0,08	0,12	0,15	
5.2.2		60	0,08	0,12	0,15	
6.1.1	Cast iron with lamellar graphite	85	0,23	0,335	0,425	
6.1.2		75	0,23	0,335	0,425	
6.1.3		70	0,23	0,335	0,425	
6.1.4		65	0,08	0,12	0,15	
6.2.1	Spheroidal cast iron	80	0,2	0,25	0,35	
6.2.2		75	0,2	0,25	0,35	
6.2.3		55	0,08	0,12	0,15	
6.3.1	GTW (white malleable cast iron)	80	0,2	0,25	0,35	
6.3.2		75	0,2	0,25	0,35	
6.4.1	GTS (black malleable cast iron)	80	0,2	0,25	0,35	
6.4.2		75	0,2	0,25	0,35	
7.1.1	Aluminium					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	Magnesium					
7.2.2						
7.3.1	Copper					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	CuZn (brass)					
7.4.2						
7.5.1	CuSn (bronze)					
7.5.2						
7.6.1	CuAlFe (Ampco)					
7.6.2						
7.8.1	Titanium					
7.8.2						
7.8.3						

W1112, coated

High-performance twist drills

F35



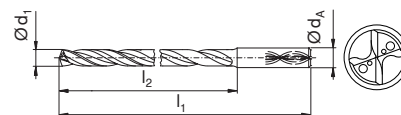
VA **HPC**

$\lambda_s = 30^\circ$
 $d_1 = m6$
 $d_A = h6$



\leq
12xD

σ
135°



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HPC.VA.1112.0300m6.12XD.135.IK.HA	6	92	54	W1112030540
3.3	HPC.VA.1112.0330m6.12XD.135.IK.HA	6	92	54	W1112033540
3.4	HPC.VA.1112.0340m6.12XD.135.IK.HA	6	92	54	W1112034540
3.5	HPC.VA.1112.0350m6.12XD.135.IK.HA	6	92	54	W1112035540
3.7	HPC.VA.1112.0370m6.12XD.135.IK.HA	6	92	54	W1112037540
3.8	HPC.VA.1112.0380m6.12XD.135.IK.HA	6	102	64	W1112038540
4.0	HPC.VA.1112.0400m6.12XD.135.IK.HA	6	102	64	W1112040540
4.2	HPC.VA.1112.0420m6.12XD.135.IK.HA	6	102	64	W1112042540
4.5	HPC.VA.1112.0450m6.12XD.135.IK.HA	6	102	64	W1112045540
4.8	HPC.VA.1112.0480m6.12XD.135.IK.HA	6	116	78	W1112048540
4.9	HPC.VA.1112.0490m6.12XD.135.IK.HA	6	116	78	W1112049540
5.0	HPC.VA.1112.0500m6.12XD.135.IK.HA	6	116	78	W1112050540
5.2	HPC.VA.1112.0520m6.12XD.135.IK.HA	6	116	78	W1112052540
5.5	HPC.VA.1112.0550m6.12XD.135.IK.HA	6	116	78	W1112055540
5.8	HPC.VA.1112.0580m6.12XD.135.IK.HA	6	116	78	W1112058540
6.0	HPC.VA.1112.0600m6.12XD.135.IK.HA	6	116	78	W1112060540
6.3	HPC.VA.1112.0630m6.12XD.135.IK.HA	8	146	108	W1112063540
6.5	HPC.VA.1112.0650m6.12XD.135.IK.HA	8	146	108	W1112065540
6.6	HPC.VA.1112.0660m6.12XD.135.IK.HA	8	146	108	W1112066540
6.8	HPC.VA.1112.0680m6.12XD.135.IK.HA	8	146	108	W1112068540
7.0	HPC.VA.1112.0700m6.12XD.135.IK.HA	8	146	108	W1112070540
7.5	HPC.VA.1112.0750m6.12XD.135.IK.HA	8	146	108	W1112075540
7.8	HPC.VA.1112.0780m6.12XD.135.IK.HA	8	146	108	W1112078540
8.0	HPC.VA.1112.0800m6.12XD.135.IK.HA	8	146	108	W1112080540
8.2	HPC.VA.1112.0820m6.12XD.135.IK.HA	10	162	120	W1112082540
8.5	HPC.VA.1112.0850m6.12XD.135.IK.HA	10	162	120	W1112085540
9.0	HPC.VA.1112.0900m6.12XD.135.IK.HA	10	162	120	W1112090540
9.5	HPC.VA.1112.0950m6.12XD.135.IK.HA	10	162	120	W1112095540
9.8	HPC.VA.1112.0980m6.12XD.135.IK.HA	10	162	120	W1112098540
10.0	HPC.VA.1112.1000m6.12XD.135.IK.HA	10	162	120	W1112100540
10.5	HPC.VA.1112.1050m6.12XD.135.IK.HA	12	204	156	W1112105540
11.0	HPC.VA.1112.1100m6.12XD.135.IK.HA	12	204	156	W1112110540
11.5	HPC.VA.1112.1150m6.12XD.135.IK.HA	12	204	156	W1112115540
11.8	HPC.VA.1112.1180m6.12XD.135.IK.HA	12	204	156	W1112118540
12.0	HPC.VA.1112.1200m6.12XD.135.IK.HA	12	204	156	W1112120540

W1206, coated

Cutting data

F36



Index	Material designation	V _c [m/min]	f [mm/rev]			
			= Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	Aluminium	360	0,125	0,2	0,25	0,35
7.1.2		360	0,125	0,2	0,25	0,35
7.1.3		400	0,125	0,2	0,25	0,35
7.1.4		400	0,15	0,23	0,3	0,38
7.1.5		360	0,15	0,23	0,3	0,38
7.1.6		350	0,125	0,2	0,25	0,35
7.2.1	Magnesium					
7.2.2						
7.3.1	Copper	160	0,02	0,04	0,06	0,09
7.3.2		160	0,125	0,2	0,25	0,35
7.3.3		160	0,125	0,2	0,25	0,35
7.3.4		160	0,125	0,2	0,25	0,35
7.3.5		160	0,125	0,2	0,25	0,35
7.3.6		160	0,125	0,2	0,25	0,35
7.4.1	CuZn (brass)	200	0,125	0,2	0,25	0,35
7.4.2		200	0,125	0,2	0,25	0,35
7.5.1	CuSn (bronze)	200	0,125	0,2	0,25	0,35
7.5.2		200	0,125	0,2	0,25	0,35
7.6.1	CuAlFe (Ampco)					
7.6.2						
7.8.1	Titanium					
7.8.2						
7.8.3						
8.1.1	Thermoplastics					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	Thermosetting plastics					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	Fibre-reinforced plastics					
8.3.2						
8.3.3						
8.3.4						
8.3.5						
8.3.6						
8.4.1	Sandwich					
8.4.2						
8.4.3						
9.1.1	Standard graphite					
9.1.2						

W1206, coated

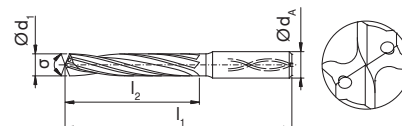
High-performance twist drills

F37



AL	HPC
$\lambda_s = 15^\circ$	$d_1 = p6$ $d_A = h6$
E	5xD
σ	140°

SCPN435



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
2.0	HPC.AL.1206.0200p6.5XD.140.IK.HA	4	57	21	W1206020360
2.2	HPC.AL.1206.0220p6.5XD.140.IK.HA	4	57	21	W1206022360
2.3	HPC.AL.1206.0230p6.5XD.140.IK.HA	4	57	21	W1206023360
2.4	HPC.AL.1206.0240p6.5XD.140.IK.HA	4	57	21	W1206024360
2.5	HPC.AL.1206.0250p6.5XD.140.IK.HA	4	57	21	W1206025360
2.7	HPC.AL.1206.0270p6.5XD.140.IK.HA	4	57	21	W1206027360
2.8	HPC.AL.1206.0280p6.5XD.140.IK.HA	4	57	21	W1206028360
3.0	HPC.AL.1206.0300p6.5XD.140.IK.HA	6	66	28	W1206030360
3.2	HPC.AL.1206.0320p6.5XD.140.IK.HA	6	66	28	W1206032360
3.3	HPC.AL.1206.0330p6.5XD.140.IK.HA	6	66	28	W1206033360
3.5	HPC.AL.1206.0350p6.5XD.140.IK.HA	6	66	28	W1206035360
3.8	HPC.AL.1206.0380p6.5XD.140.IK.HA	6	74	36	W1206038360
4.0	HPC.AL.1206.0400p6.5XD.140.IK.HA	6	74	36	W1206040360
4.2	HPC.AL.1206.0420p6.5XD.140.IK.HA	6	74	36	W1206042360
4.5	HPC.AL.1206.0450p6.5XD.140.IK.HA	6	74	36	W1206045360
4.8	HPC.AL.1206.0480p6.5XD.140.IK.HA	6	82	44	W1206048360
5.0	HPC.AL.1206.0500p6.5XD.140.IK.HA	6	82	44	W1206050360
5.5	HPC.AL.1206.0550p6.5XD.140.IK.HA	6	82	44	W1206055360
5.8	HPC.AL.1206.0580p6.5XD.140.IK.HA	6	82	44	W1206058360
6.0	HPC.AL.1206.0600p6.5XD.140.IK.HA	6	82	44	W1206060360
6.5	HPC.AL.1206.0650p6.5XD.140.IK.HA	8	91	53	W1206065360
6.8	HPC.AL.1206.0680p6.5XD.140.IK.HA	8	91	53	W1206068360
7.0	HPC.AL.1206.0700p6.5XD.140.IK.HA	8	91	53	W1206070360
7.5	HPC.AL.1206.0750p6.5XD.140.IK.HA	8	91	53	W1206075360
7.8	HPC.AL.1206.0780p6.5XD.140.IK.HA	8	91	53	W1206078360
8.0	HPC.AL.1206.0800p6.5XD.140.IK.HA	8	91	53	W1206080360
8.5	HPC.AL.1206.0850p6.5XD.140.IK.HA	10	103	61	W1206085360
8.8	HPC.AL.1206.0880p6.5XD.140.IK.HA	10	103	61	W1206088360
9.0	HPC.AL.1206.0900p6.5XD.140.IK.HA	10	103	61	W1206090360
9.8	HPC.AL.1206.0980p6.5XD.140.IK.HA	10	103	61	W1206098360
10.0	HPC.AL.1206.1000p6.5XD.140.IK.HA	10	103	61	W1206100360
10.2	HPC.AL.1206.1020p6.5XD.140.IK.HA	12	118	71	W1206102360
10.5	HPC.AL.1206.1050p6.5XD.140.IK.HA	12	118	71	W1206105360
10.8	HPC.AL.1206.1080p6.5XD.140.IK.HA	12	118	71	W1206108360
11.8	HPC.AL.1206.1180p6.5XD.140.IK.HA	12	118	71	W1206118360
12.0	HPC.AL.1206.1200p6.5XD.140.IK.HA	12	118	71	W1206120360

Notes

F38





Technical information

Material table

F40



Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
1 Machining, constructional and spring steel	1.1 Machining steels	1.1.1 up to 500 N/mm ²	1.0711	9 S 20		CF 9 S 22	220 M 07	SUM 21			G 12120	1212
			1.0715	9 SMn 28	S 250	CF 9 SMn 28	230 M 07	SUM 22	1912		G 12130	1213
			1.0718	9 SMnPb 28	S 250 Pb	CF 9 SMnPb 28		SUM 22 L	1914		G 12134	12 L 13
			1.0721	10 S 20	10 F 1	CF 10 S 20	210 M 15					1108
			1.0722	10 SPb 20	10 PbF 2	CF 10 SPb 20						11 L 08
			1.0723	15 S 20			210 A 15	SUM 32	1922			
			1.0736	9 SMn 36	S 300	CF 9 SMn 36	240 M 07				G 12150	1215
		1.0737	9 SMnPb 36	S 300 Pb	CF 9 SMnPb 36			1926		G 12144	12 L 14	
		1.0726	35 S 20	35 MF 4		212 M 36		1957		G 11400	1140	
		1.0727	45 S 20	45 MF 4		212 M 44		1973		G 11460	1146	
		1.0728	60 S 20	60 MF 4								
		1.0037	St 37-2					STKM 12 C				
		1.0044	St 44-2	E 24-2	Fe 430 B FN	4360-43 B	SM 41 B	1412				A 570 Gr. 40
		1.0116	St 37-3	E 24-3; E 24-4	Fe 360 D FF	4360-40 C		1312; 1313	St 3 kp; ps; sp			A 573 Gr. 58
	1.0144	St 44-3	E 28-3; E 28-4	Fe 430 D FF	4360-43 C	SM 41 C	1412; 1414	St 4 kp; ps; sp			A 573 Gr. 70	
	1.0050	St 50-2	A 50-2	Fe 490	4360-50 B	SS 50	2172	BSt 5 ps; sp			A 570 Gr. 50	
	1.0060	St 60-2	A 60-2	Fe 590; Fe 60-2	4360-SSE; SSC	SM 58		St 6 ps; sp				
	1.0570	St 52-3	E 36-3; E 36-4	Fe 510 B; C; D	4360-50 B	SM 50 YA	2132	17 GS				
	1.5415	15 Mo 3	15 D 3	16 Mo 3	1501-240		2912				A 204 Gr. A	
	1.5423	16 Mo 5		16 Mo 5	1503-245-420					G 45200	4520	
	1.5622	14 Ni 6	16 N 6	14 Ni 6							A 350-LF 5	
	1.5680	12 Ni 19	Z 18 N 5								2515	
	1.7335	13 CrMo 4 4	15 CD 3.5	14 CrMo 4 5	1501-620 Gr. 27		2216	12ChM; 15ChM			A 182-F11; F12	
	1.7337	16 CrMo 4 4	15 CD 4.5	14 CrMo 4 5	1501-620 Gr. 27		2216	15ChM			A 387 Gr. 12 Cl. 2	
	1.7380	10 CrMo 9 10	10 CD 9.10	12 CrMo 9 10	1501-622 Gr. 31; 45		2218			J 21890	A 182-F22	
	1.7709	21 CrMoV 5 7										
	1.7715	14 MoV 6 3			1503-660-440							
	1.7735	14 CrMoV 6 9	15 CDV 6									
	1.0904	55 Si 7	55 S 7	55 Si 8	250 A 53		2085; 2090	55S2			9255	
	1.0961	60 SiCr 7	60 SC 7	60 SiCr 8		SUP 7					9262	
	1.1231	Ck 67	XC 68	C 70	060 A 67		1770	70	G 10700	1070		
	1.1248	Ck 75	XC 75	C 75	060 A 78		1774; 1778	75	G 10780	1078; 1080		
	1.1274	Ck 101	XC 100		060 A 96	SUP 4	1870		G 10950	1095		
	1.2101	62 SiMnCr 4										
	1.2103	58 SiCr 8										
	1.7103	67 SiCr 5										
	1.7176	55 Cr 3	55 C 3	55 Cr 3	527 A 60	SUP 9 (A)	2253	50ChGA	G 51550	5155		
	1.8159	50 CrV 4	50 CV 4	51 CrV 4	735 A 50	SUP 10	2230	50ChGFA	G 61500	6150		
	1.0904	55 Si 7	55 S 7	55 Si 8	250 A 53		2085; 2090	55S2			9255	
	1.0961	60 SiCr 7	60 SC 7	60 SiCr 8		SUP 7					9262	
	1.1231	Ck 67	XC 68	C 70	060 A 67		1770	70	G 10700	1070		
	1.1248	Ck 75	XC 75	C 75	060 A 78		1774; 1778	75	G 10780	1078; 1080		
1.1274	Ck 101	XC 100		060 A 96	SUP 4	1870		G 10950	1095			
1.2101	62 SiMnCr 4											
1.2103	58 SiCr 8											
1.7103	67 SiCr 5											
1.7176	55 Cr 3	55 C 3	55 Cr 3	527 A 60	SUP 9 (A)	2253	50ChGA	G 51550	5155			
1.8159	50 CrV 4	50 CV 4	51 CrV 4	735 A 50	SUP 10	2230	50ChGFA	G 61500	6150			
1.0904	55 Si 7	55 S 7	55 Si 8	250 A 53		2085; 2090	55S2			9255		
1.0961	60 SiCr 7	60 SC 7	60 SiCr 8		SUP 7					9262		
1.1231	Ck 67	XC 68	C 70	060 A 67		1770	70	G 10700	1070			
1.1248	Ck 75	XC 75	C 75	060 A 78		1774; 1778	75	G 10780	1078; 1080			
1.1274	Ck 101	XC 100		060 A 96	SUP 4	1870		G 10950	1095			
1.2101	62 SiMnCr 4											
1.2103	58 SiCr 8											
1.7103	67 SiCr 5											
1.7176	55 Cr 3	55 C 3	55 Cr 3	527 A 60	SUP 9 (A)	2253	50ChGA	G 51550	5155			
1.8159	50 CrV 4	50 CV 4	51 CrV 4	735 A 50	SUP 10	2230	50ChGFA	G 61500	6150			
1.0904	55 Si 7	55 S 7	55 Si 8	250 A 53		2085; 2090	55S2			9255		
1.0961	60 SiCr 7	60 SC 7	60 SiCr 8		SUP 7					9262		
1.1231	Ck 67	XC 68	C 70	060 A 67		1770	70	G 10700	1070			
1.1248	Ck 75	XC 75	C 75	060 A 78		1774; 1778	75	G 10780	1078; 1080			
1.1274	Ck 101	XC 100		060 A 96	SUP 4	1870		G 10950	1095			

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA		
1 Machining, constructional and spring steel	1.3 Spring steel	hard materials for spring steel	1.2101	62 SiMnCr 4										
			1.2103	58 SiCr 8										
			1.7103	67 SiCr 5										
			1.7176	55 Cr 3	55 C 3	55 Cr 3	527 A 60	SUP 9 (A)	2253	50ChGA	G 51550	5155		
			1.8159	50 CrV 4	50 CV 4	51 CrV 4	735 A 50	SUP 10	2230	50ChGFA	G 61500	6150		
2 Cementation, nitriding and tempered steel	2.1 Cementation steel	2.1.1 up to 150 HB	1.0301	C 10	AF 34 C 10; XC 10	C 10	045 M 10	S 10 C		10	G 10100	1010		
			1.0401	C 15	AF3 7 C 12; XC 18	C 15; C 16	080 M 15			1350	G 10170	1015		
			1.1121	Ck 10	XC 10	C 10	045 M 10	S 10 C; S 9 CK	1265	08; 10	G 10100	1010		
			1.1141	Ck 15	XC 15; XC 18	C 15; C 16	080 M 15	S 15 C; S 15 CK	1370	15	G 10170	1015		
			1.7012	13 Cr 2										
		2.1.2 150 - 200 HB	1.7015	15 Cr 3	12 C 3			523 M 15	SCr 415 (H)		15Ch	G 50150	5015	
			2.1.3 above 200 HB	1.5732	14 NiCr 10	14 NC 11	16 NiCr 11		SNC 415 (H)					3415
				1.5752	14 NiCr 14	12 NC 15		655 M 13	SNC 815 (H)				G 33106	3310; 9314
		1.5860		14 NiCr 18										
		1.5919		15 CrNi 6	16 NC 6	16 CrNi 4	S 107							
		1.5920		18 CrNi 8	20 NC 6									
		1.6523		21 NiCrMo 2	20 NCD 2	20 NiCrMo 2	805 M 20	SNCM 220 (H)	2506			G 86170	8620	
		1.6587		17 CrNiMo 6	18 NCD 6	18 NiCrMo 7	820 A 16							
		1.7131		16 MnCr 5	16 MC 4	16 MnCr 5	527 M 17	SCR 415	2511	18ChG	G 51170	5115		
		1.7139	16 MnCrS 5											
	1.7147	20 MnCr 5	20 MC 5	20 MnCr 5		SMnC 420 (H)		18ChG	G 51200	5120				
	1.7149	20 MnCrS 5												
	1.7262	15 CrMo 5	12 CD 4	12 CrMo 4		SCM 415 (H)								
	1.7264	20 CrMo 5	18 CD 4			SCM 421								
	1.7271	23 CrMoB 3 3												
	1.7311	20 CrMo 2												
	1.7321	20 MoCr 4												
	1.7323	20 MoCrS 4												
	1.7325	25 MoCr 4												
	1.7326	25 MoCrS 4												
	2.2 Nitriding steel	2.2.1 up to 1000 N/ mm ²	1.8504	34 CrAl 6										
			1.8506	34 CrAlS 5								K 23745		
			1.8507	34 CrAlMo 5	30 CAD 6.12	34 CrAlMo 7	905 M 31					K 23545	A 355 Cl. D	
			1.8509	41 CrAlMo 7	40 CAD 6.12	41 CrAlMo 7	905 M 39	SACM 645	2940	38ChMJuA	K 24065	A 355 Cl. A		
		2.2.2 above 1000 N/ mm ²	1.8515	31 CrMo 12	30 CD 12	31 CrMo 12	722 M 24		2240					
			1.8519	31 CrMoV 9										
			1.8521	15 CrMoV 5 9										
			1.8523	39 CrMoV 13 9		36 CrMoV 13 9	897 M 39							
	1.8550	34 CrAlNi 7									K 52440			
	2.3 Tempered steel	2.3.1 non alloyed up to 800 N/mm ²	1.0402	C 22	AF 42 C 20	C 20; C 21	050 A 20			1450	20	G 10200	1020	
1.0406			C 25	AF 50 C 30	C 25	070 M 26						1025		
1.0501			C 35	AF 55 C 35	C 35	060 A 35			1550	35	G 10350	1035		
1.0503			C 45	AF 65 C 45	C 45	080 M 46			1650	45	G 10430	1045		
1.0511			C 40	AF 60 C 40	C 40							1040		
1.0528			C 30											
1.1151			Ck 22	XC 25; XC 18	C 20	050 A 20	S 20 C; S 20 CK		20			1023		
1.1158			Ck 25	XC 25	C 25	070 M 26	S 25 C		25	G 10250	1025			
1.1178			Ck 30											
1.1181			Ck 35	XC 38 H1;XC 32	C 35	080 M 36	S 35 C	1572	35	G 10340	1035			
1.1186			Ck 40	XC 42 H1	C 40	080 M 40	S 40 C		40			1040		
1.1191			Ck 45	XC 42	C 45	080 M 46	S 45 C	1672	45	G 10420	1045			

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Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA	
2 Cementation, nitriding and tempered steel	2.3 Tempered steel	2.3.2 non alloyed 800 - 1000 N/mm ²	1.0535	C 55	AF 70 C55	C 55	070 M 55		1655	55		1055	
			1.0540	C 50									
			1.0601	C 60	CC 55	C 60	080 A 62			60	G 10600	1060	
			1.1203	Ck 55	XC 55	C50	070 M 55	S 55 C		55		1055	
			1.1206	Ck 50	XC 48 H1		080 M 50			50		1050	
			1.1221	Ck 60	XC 60	C60	080 A 62	S 58 C	1665; 1678	60; 60G	G 10640	1060	
		2.3.3 alloyed up to 800 N/mm ²	1.1133	20 Mn 5	20 M 5	G 22 Mn 3	120 M 19	SMnC 420				G 10220	1022; 1518
			1.3505	100 Cr 6	100 C 6	100 Cr 6	534 A 99	SUJ 2	2258	SchCh 15	G 52986	52100	
			1.5120	38 MnSi 4									
			1.5121	46 MnSi 4									
			1.5141	53 MnSi 4									
			1.5710	36 NiCr 6	35 NC 6		640 A 35	SNC 236					3135
			1.6546	40 NiCrMo 2 2	40 NCD 2	40 NiCrMo 2 (KB)	311-Type 7	SNCM 240			38ChGNM	G 87400	8740
			1.6565	40 NiCrMo 6			311-Type 6	SNCM 439			40Ch2N2MA		4340
			1.7003	38 Cr 2	38 C 2	38 Cr 2							
			1.7006	46 Cr 2	42 C 2	45 Cr 2							5045
			1.7020	32 Cr 2									
			1.7030	28 Cr 4				530 A 30			30Ch		5130
			1.7033	34 Cr 4	32 C 4	34 Cr 4 (KB)	530 A 32	SCr 430 (H)			35Ch	G 51320	5132
			1.7218	25 CrMo 4	25 CD 4	25 CrMo 4 (KB)	1717 CDS 110	SCM 420; SCM 430	2225		30ChM	G 41300	4130
			1.7220	34 CrMo 4	35 CD 4	35 CrMo 4	708 A 37	SCM 432; SCCrM 3	2234		AS38ChGM	G 41350	4135; 4137
	1.7223		41 CrMo 4	42 CD 4 TS	41 CrMo 4	708 M 40	SCM 440	2244		40 ChFA	G 41420	4142; 4140	
	1.7225		42 CrMo 4	42 CD 4	42 CrMo 4	708 M 40	SCM 440 (H)	2244			G 41400	4142; 4140	
	1.7228		50 CrMo 4	50 CR MO4		708 A 47	SCM 445 (H)			50ChFA	G 41470	4150	
	1.8159		50 CrV 4	50 CV 4	51 CrV 4	735 A 50	SUP 10	2230		50ChGFA	G 61500	6150	
	2.3.4 alloyed 800 - 1000 N/mm ²		1.1157	40 Mn 4	35 M 5		150 M 36				40G	G 10390	1039
			1.1165	30 Mn 5	35 M 5		120 M 36	SMn 433 H; SCMn 2			30GSL		1330
			1.1167	36 Mn 5	40 M 5		150 M 36	SMn 438 (H); SCMn 3	2120		35G2; 35GL	G 13350	1335
			1.1170	28 Mn 6	20 M 5	C 28 Mn	150 M 28	SCMn 1			30G		1330
			1.3561	44 Cr 2									
			1.3563	43 CrMo 4									
			1.3565	48 CrMo 4				817 M 40	SNC 836				
			1.5120	38 MnSi 4									
			1.5121	46 MnSi 4									
			1.5122	37 MnSi 4									
		1.5131	50 MnSi 4										
		1.5141	53 MnSi 4										
		1.5223	42 MnV 7										
		1.5710	36 NiCr 6	35 NC 6		640 A 35	SNC 236					3135	
		1.5736	36 NiCr 10	30 NC 11	35 NiCr 9		SNC 631 (H)					3435	
		1.5755	31 NiCr 14	18 NC 13		653 M 31	SNC 836						
		1.6511	36 CrNiMo 4	40 NCD 3	38 NiCrMo 4 (KB)	816 M 40				40 ChN2MA	G 98400	9840	
1.6513		28 NiCrMo 4											
1.7003		38 Cr 2	38 C 2	38 Cr 2									
1.7006		46 Cr 2	42 C 2	45 Cr 2							5045		
1.7030		28 Cr 4				530 A 30			30Ch		5130		
1.7033		34 Cr 4	32 C 4	34 Cr 4 (KB)	530 A 32	SCr 430 (H)			35Ch	G 51320	5132		
1.7034		37 Cr 4	38 C 4	38 Cr 4	530 A 36	SCr 435 H			40Ch		5135		
1.7035		41 Cr 4	42 C 4	41 Cr 4	530 M 40	SCr 440 (H)			40Ch	G 51400	5140		
1.7218		25 CrMo 4	25 CD 4 S	25 CrMo 4 (KB)	1717 CDS 110	SCM 420; SCM 430	2225		30ChM	G 41300	4130		
1.7220		34 CrMo 4	35 CD 4	35 CrMo 4	708 A 37	SCM 432; SCCrM 3	2234		AS38ChGM	G 41350	4135; 4137		
1.7223		41 CrMo 4	42 CD 4 TS	41 CrMo 4	708 M 40	SCM 440	2244		40 ChFA	G 41420	4142; 4140		
1.7225		42 CrMo 4	42 CD 4	42 CrMo 4	708 M 40	SCM 440 (H)	2244			G 41400	4142; 4140		

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA			
2 Cementation, nitriding and tempered steel	2.3 Tempered steel	2.3.4 alloyed 800 - 1000 N/mm ²	1.7228	50 CrMo 4	50 CR MO4		708 A 47	SCM 445 (H)			50ChFA	G 41470	4150		
			1.7561	42 CrV 6											
			1.7735	14 CrMoV 6 9											
			1.8159	50 CrV 4	50 CV 4	51 CrV 4	735 A 50	SUP 10	2230	50ChGFA	G 61500	6150			
		2.3.5 alloyed 1000 - 1300 N/mm ²	1.3563	43 CrMo 4											
			1.3565	48 CrMo 4				817 M 40	SNC 836						
			1.5120	38 MnSi 4											
			1.5121	46 MnSi 4											
			1.5122	37 MnSi 4											
			1.5223	42 MnV 7											
			1.5710	36 NiCr 6	35 NC 6		640 A 35	SNC 236						3135	
			1.5736	36 NiCr 10	30 NC 11	35 NiCr 9		SNC 631 (H)						3435	
			1.5864	35 NiCr 18											
			1.6511	36 CrNiMo 4	40 NCD 3	38 NiCrMo 4 (KB)	816 M 40				40 ChN2MA	G 98400	9840		
			1.6580	30 CrNiMo 8	30 CND 8	30 NiCrMo 8	823 M 30	SNCM 431							
			1.6582	34 CrNiMo 6	35 NCD 6	35 NiCrMo 6 (KW)	817 M 40	SNCM 447	2541	38Ch2N2MA			4340		
			1.7033	34 Cr 4	32 C 4	34 Cr 4 (KB)	530 A 32	SCr 430 (H)		35Ch	G 51320	5132			
			1.7034	37 Cr 4	38 C 4	38 Cr 4	530 A 36	SCr 435 H		40Ch		5135			
			1.7035	41 Cr 4	42 C 4	41 Cr 4	530 M 40	SCr 440 (H)		40Ch	G 51400	5140			
			1.7045	42 Cr 4	42 C 4 TS	41 Cr 4	530 A 40	SCr 440	2245	40Ch		5140			
			1.7218	25 CrMo 4	25 CD 4 S	25 CrMo 4 (KB)	1717 CDS 110	SCM 420; SCM 430	2225	30ChM	G 41300	4130			
			1.7220	34 CrMo 4	35 CD 4	35 CrMo 4	708 A 37	SCM 432; SCCM 3	2234	AS38ChGM	G 41350	4135; 4137			
			1.7223	41 CrMo 4	42 CD 4 TS	41 CrMo 4	708 M 40	SCM 440	2244	40 ChFA	G 41420	4142; 4140			
			1.7225	42 CrMo 4	42 CD 4	42 CrMo 4	708 M 40	SCM 440 (H)	2244		G 41400	4142; 4140			
			1.7228	50 CrMo 4	50 CR MO4		708 A 47	SCM 445 (H)		50ChFA	G 41470	4150			
			1.7361	32 CrMo 12	30 CD 12	32 CrMo 12	722 M 24		2240						
			1.7561	42 CrV 6											
			1.7707	30 CrMoV 9											
			1.7735	14 CrMoV 6 9											
			1.8159	50 CrV 4	50 CV 4	51 CrV 4	735 A 50	SUP 10	2230	50ChGFA	G 61500	6150			
			1.8161	58 CrV 4											
			2.3.6 alloyed 1000 - 1600 N/mm ²	1.1273	90 Mn 4										
				1.5864	35 NiCr 18										
				1.6580	30 CrNiMo 8	30 CND 8	30 NiCrMo 8	823 M 30	SNCM 431						
				1.6582	34 CrNiMo 6	35 NCD 6	35 NiCrMo 6 (KW)	817 M 40	SNCM 447	2541	38Ch2N2MA		4340		
				1.6746	32 NiCrMo 14 5	35 NCD 14		830 M 31							
		1.7361		32 CrMo 12	30 CD 12	32 CrMo 12	722 M 24		2240						
		1.7707		30 CrMoV 9											
		1.7735		14 CrMoV 6 9											
		1.8161		58 CrV 4											
3 Tool steel	3.1 Non alloyed tool steel	3.1.1 general		1.1520	C 70 W1										
				1.1525	C 80 W1	Y1 90; Y1 80	C 80 KU			U8A	T 72301	W 108			
				1.1620	C 70 W2										
			1.1625	C 80 W2		C 80 KU	BW 1 B	SKC 3; SK 5; SK 6	U8; 80	T 72301	W 1				
			1.1645	C 105 W2	Y2 105	C 100 KU		SK 3	U10	T 72301					
			1.1654	C 110 W											
			1.1663	C 125 W	Y2 120	C 120 KU		SK 2	U13	T 72301	W 112				
			1.1673	C 135 W	Y2 140	C 140 KU		SK 1							
			1.1730	C 45 W	Y3 42										
			1.1740	C 60 W	Y3 55				SK 7						
			1.1744	C 67 W											
			1.1750	C 75 W				BW 1A		75		W 1			
			1.1820	C 55 W											

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Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA			
3 Tool steel	3.1 Non alloyed tool steel	3.1.1 general	1.1830	C 85 W	Y3 90			SK 5							
			1.1545	C 105 W1	Y1 105	C 100 KU			1880	U10A	T 72301	W 110			
	3.2 Tool steel for cold working	3.2.1 low alloyed up to 1000 N/mm ²	1.2067	100 Cr 6	Y 100 C 6			BL 3				T 61203	L 3		
			1.2101	62 SiMnCr 4											
			1.2103	58 SiCr 8											
			1.2108	90 CrSi 5											
			1.2162	21 MnCr 5	20 NC 5				SCR 420 H						
			1.2210	115 CrV 3	100 C 3	107 CrV 3 KU							T 61202	L 2	
			1.2330	35 CrMo 4	34 CD 4	35 CrMo 4	708 A 37				2234	35 HM	T 51620	4135	
			1.2332	47 CrMo 4	42 CD 4	40 CrMo 4	708 M 40				2244			4142	
			1.2369	81 CrMov 42 16											
			1.2419	105 WCr 6	105 WC 13	107 WCr 5 KU				SKS 31		ChWG			
			1.2510	100 MnCrW 4	90 MWCV 5	95 MnWCr 5 KU	BO 1			SKS 3	2140		T 31501	O 1	
			1.2516	120 WV 4	110 WC 20	110 W 4 KU	BF 1								
			1.2542	45 WCrV 7		45 WCrV 8 KU	BS 1				2710		T 41901	S 1	
			1.2550	60 WCrV 7	55 WC 20	55 WCrV 8 KU									
			1.2721	50 NiCr 13											
			1.2735	15 NiCr 14	10 NC 12						SNC 22			T 51606	
			1.2762	75 CrMoNiW 6 7											
			1.2826	60 MnSiCr 4											
			1.2833	100 V 1	Y1 105 V	102 V 2 KU	BW 2			SKS 43				T 72302	W 210
			1.2842	90 MnCrV 8	90 MV 8	90 MnVCr 8 KU	BO 2							T 31502	O 2
			1.2312	40 CrMnMoS 8 6											
			1.2711	54 NiCrMoV 6	55 NCDV 6										
			1.2713	55 NiCrMoV 6	55 NCDV 7						SKT 4		5ChNM	T 61206	L 6
			3.2.4 high alloyed annealed	1.2080	X 210 Cr 12	Z 200 C 12	X 210 Cr 13 KU	BD 3		SKD 1			Ch12	T 30403	D 3
				1.2083	X 42 Cr 13	Z 40 C 14	X 41 Cr 13 KU			SUS 420 J 2					
				1.2341	X 6 CrMo 4										
				1.2363	X 100 CrMoV 5 1	Z 100 CDV 5	X 100 CrMoV 5 1 KU	BA 2		SKD 12	2260			T 30102	A 2
				1.2379	X 155 CrVMo 12 1	Z 160 CDV 12	X 155 CrVMo 12 1 KU	BD 2		SKD 11				T 30402	D 2
	1.2436	X 210 CrW 12		Z 200 CW 12	X 215 CrW 12 1 KU			SKD 2	2312						
	1.2601	X 165 CrMoV 12			X 165 CrMoW 12 KU				2310						
	1.2764	X 19 NiCrMo 4													
	1.2767	X 45 NiCrMo 4		Y 35 NCD 16	42 NiCrMo 15 7										
	1.2885	X 32 CrMoCoV 3 3 3		30 DCKV 28											
	1.2316	X 36 CrMo 17			X 38 CrMo 16 1 KU										
	1.6356	X 2 NiCoMoTi 18 12 4													
	1.6358	X 2 NiCoMoTi 18 9 5													
	3.3 Tool steel for hot working	3.3.1 low alloyed up to 1200 N/mm ²		1.2311	40 CrMnMo 7										
				1.2738	40 CrMnNiMo 8										
			1.2744	57 NiCrMoV 7 7											
		3.3.2 low alloyed up to 1500 N/mm ²	1.2713	55 NiCrMoV 6	55 NCDV 7					SKT 4		5ChNM	T 61206	L 6	
			3.3.3 high alloyed annealed	1.2343	X 38 CrMoV 5 1	Z 38 CDV 5	X 37 CrMoV 5 1 KU	BH 11		SKD 6		4Ch5MFS	T 28811	H 11	
1.2344		X 40 CrMoV 5 1		Z 40 CDV 5	X 40 CrMoV 5 1 KU	BH 13		SKD 61	2242	4Ch5MF1S	T 20813	H 13			
1.2365		X 32 CrMoV 3 3		32 DCV 28	30 CrMoV 12 27 KU	BH 10		SKD 7		3Ch3M3F	T 20810	H 10			
1.2367		X 38 CrMoV 5 3													
1.2567		X 30 WCrV 5 3		Z 32 WCV 5	X 30 WCrV 5 3 KU			SKD 4							
1.2581		X 30 WCrV 9 3		Z 30 WCV 9	X 30 WCrV 9 3 KU	BH 21		SKD 5		3Ch2W8F	T 20821	H 21			
1.2706		X 3 NiCrMo 18 8 5	E-Z 2 NKD 18								K 93120				
3.3.4 high alloyed tempered		1.2709	X 2 NiCoMoTi 18 9 5												
			tempered												

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA			
3 Tool steel	3.4 High speed steel	3.4.1 general	1.3202	S 12-1-4-5							T 12015	T15			
			1.3207	S 10-4-3-10	Z 130 WKCDV 10-10-04	HS 10-4-3-10	BT 42	SKH 57							
			1.3243	S 6-5-2-5	Z 85 WDKCV 06-05-05-	HS 6-5-2-5		SKH 55	2723	R6M5K5					
			1.3246	S 7-4-2-5	Z 110 WKCDV 07-05-04	HS 7-4-2-5							T 11341	M 41	
			1.3247	S 2-10-1-8	Z 110 DKCWV 09-08-04	HS 2-9-1-8	BM 42	SKH 51					T 11342	M 42	
			1.3249	S 2-9-2-8			BM 34						T 11333	M 33; M 34	
			1.3255	S 18-1-2-5	Z 80 WKCVC 18-05-04-0	HS 18-1-1-5	BT 4	SKH 3					T 12004	T 4	
			1.3257	S 18-1-2-15											
			1.3265	S 18-1-2-10		HS 18-0-1-10	BT 5	SKH 4 A					T 12005	T 5	
			1.3302	S 12-1-4											
			1.3318	S 12-1-2											
			1.3333	S 3-3-2		HS 3-3-2									
			1.3343	S 6-5-2	Z 85 WDCVC 06-05-04-0	HS 6-5-2	BM 2	SKH 9; SKH 51	2722	R6AM5	T 11302	M 2			
			1.3344	S 6-5-3	Z 120 WDCVC 06-05-04-	HS 6-5-3	BM 4	SKH 52; SKH 53			T 11323	M 3 Cl. 2			
			1.3346	S 2-9-1	Z 85 DCWV 08-04-02-0	HS 1-8-1	BM 1			H41	T 11301	H 41; M 1			
			1.3348	S 2-9-2	Z 100 DCWV 09-04-02-	HS 2-9-2				2782	T 11307	M 7			
			1.3355	S 18-0-1	Z 80 WCV 18-04-01	HS 18-0-1	BT 1	SKH 2		R18	T 12001	T 1			
				3.5 Hardened tool steel	3.5.1 < 55 HRC		hardened								
		3.5.2 55 – 58 HRC			hardened										
		3.5.3 58 – 60 HRC			hardened										
	3.5.4 60 – 62 HRC		hardened												
	3.5.5 62 – 64 HRC		hardened												
4 Stainless steel, heat resistant alloys	4.1 Stainless steel	4.1.1 ferritic	1.4000	X 6 Cr 13	Z 6 C 13	X 6 Cr 13	403 S 17	SUS 403	2301	08Ch13	S 40300	403			
			1.4002	X 6 CrAl 13	Z 6 CA 13	X 6 CrAl 13	405 S 17	SUS 405	2302		S 40500	405			
			1.4016	X 6 Cr 17	Z 8 C 17	X 8 Cr 17	430 S 15	SUS 430	2320	12Ch17	S 43000	430			
			1.4113	X 6 CrMo 17	Z 8 CD 17.01	X 8 CrMo 17	434 S 17	SUS 434	2325		S 43400	434			
			1.4313	X 5 CrNi 13 4	Z 5 CN 13.4	X 6 CrNi 13 04	425 C 11	SCS 5	2385			CA 6-NM			
			1.4510	X 6 CrTi 17	Z 8 CT 17	X 6 CrTi 17		SUS 430 LX		08Ch17T	S 43036	XM 8; 430 Ti			
			1.4511	X 8 CrNb 17	Z 8 CNb 17	X 6 CrNb 17		SUS 430 LX							
			1.4512	X 5 CrTi 12	Z 6 CT 12	X 6 CrTi 12	409 S 19	SUH 409			S 40900	409			
			1.4006	X 10 Cr 13	Z 12 C 13	X 12 Cr 13	410 S 21	SUS 410	2302	12Ch13	S 41000	410; CA-15			
			1.4021	X 20 Cr 13	Z 20 C 13	X 20 Cr 13	420 S 37	SUS 420 J 1	2303	20Ch13	S 42000	420			
			1.4024	X 15 Cr 13	Z 13 C 13		420 S 29	SUS 410 J 1							
			1.4028	X 30 Cr 13	Z 30 C 13	X 30 Cr 13	420 S 45	SUS 420 J 2	2304	30Ch13					
			1.4031	X 38 Cr 13	Z 40 C 14	X 40 Cr 14		SUS 420 J 2	2304	40Ch13					
			1.4034	X 46 Cr 13	Z 40 C 14	X 40 Cr 14	420 S 45			40Ch13					
		1.4057	X 20 CrNi 17 2	Z 15 CN 16.02	X 16 CrNi 16	431 S 29	SUS 431	2321	20Ch17N2	S 43100	431				
		1.4108	X 100 CrMo 13												
		1.4109	X 65 CrMo 14												
		1.4112	X 90 CrMoV 18							S 44003					
		1.4113	X 6 CrMo 17	Z 8 CD 17.01	X 8 CrMo 17	434 S 17	SUS 434	2325		S 43400	434				
		1.4116	X 45 CrMoV 15												
		1.4125	X 105 CrMo 17	Z 100 CD 17	X 105 CrMo 17		SUS 440 C			S 44004	440 C				
		1.4311	X 2 CrNiN 18 10	Z 2 CN 18 .10	X 2 CrNiN 18 11	304 S 62	SUS 304 LN	2371		S 30453	304 LN				
		1.4401	X 5 CrNiMo 18 10	Z 6 CND 17.11	X 5 CrNiMo 17 12	316 S 16	SUS 316	2347		S 31600	316				
		1.4404	X 2 CrNiMo 17 13 2	Z 2 CND 17.12	X 2 CrNiMo 17 12	316 S 11	SUS 316 L	2348		S 31603	316 L				
		1.4406	X 2 CrNiMoN 17 12 2	Z 2 CND 17.12 Az	X 2 CrNiMoN 17 12	316 S 61	SUS 316 LN			S 31653	316 LN				
		1.4429	X 2 CrNiMoN 17 13 3	Z 2 CND 17.13 Az	X 2 CrNiMoN 17 13	316 S 62	SUS 316 LN	2375		S 31653	316 LN				
		1.4435	X 2 CrNiMo 18 14 3	Z 2 CND 17.13	X 2 CrNiMo 17 13	316 S 12	SCS 16; SUS 316 L	2353	03Ch17N14M2	S 31603	316 L				
		1.4436	X 5 CrNiMo 17 13 3	Z 6 CND 17.12	X 5 CrNiMo 17 13	316 S 16	SUS 316	2343		S 31600	316				

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Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA	
4 Stainless steel, heat resistant alloys	4.1 Stainless steel	4.1.3 austenitic A5 < 40%	1.4438	X 2 CrNiMo 18 16 4	Z 2 CND 19.15	X 2 CrNiMo 18 15	317 S 12	SUS 317 L	2367		S 31703	317 L	
			1.4460	X 8 CrNiMo 27 5	Z 5 CND 27.05 Az			SUS 329 J 1	2324		S 32900	329	
			1.4462	X 2 CrNiMoN 22 5	Z 2 CND 22 5 Az							S 31803	
			1.4539	X 2 NiCrMoCu 25 20 5	Z 1 CNDU 25 20							N 08904	
			1.4541	X 6 CrNiTi 18 10	Z 6 CNT 18.10	X 6 CrNiTi 18 11	321 S 12	SUS 321	2337	12Ch18N10T	S 32100	321	
			1.4542	X 5 CrNiCuNb 17 14	Z 5 CNU 17.4				SCS 24; SUS 630			S 17400	630
			1.4546	X 5 CrNiNb 18 10		X 6 CrNiNb 18 11	347 S 18					S 34800	348
			1.4550	X 6 CrNiNb 18 10	Z 6 CNNb 18.10	X 6 CrNiNb 18 11	347 S 17	SUS 347	2338	08Ch18N12B	S 34700	347	
			1.4571	X 6 CrNiMoTi 17 12 2	Z 6 CNT 17.12	X 6 CrNiMoTi 17 12	320 S 31		2350	10Ch17N13M2T	S 31635	316 Ti	
			1.4580	X 6 CrNiMoNb 17 12 2	Z 6 CNDNb 17.12	X 6 CrNiMoNb 17 12	318 S 17			08Ch16N13M2B	S 31640	316 Cb	
		4.1.4 austenitic A5 > 40%	1.4301	X 5 CrNi 18 9	Z 6 CN 18.09	X 5 CrNi 18 10	304 S 15	SUS 304	2332; 2333	08Ch18N10	S 30400	304; 304 H	
			1.4303	X 5 CrNi 18 12	Z 8 CN 18.12	X 8 CrNi 19 10	305 S 19	SUS 305		06Ch18N11	S 30500	308; 305	
			1.4306	X 2 CrNi 19 11	Z 2 CN 18.10	X 2 CrNi 18 11	304 S 12	SCS 19	2352; 2333	03Ch18N11	S 30403	304 L	
			1.4310	X 12 CrNi 17 7	Z 12 CN 17.07	X 12 CrNi 17 07	301 S 21	SUS 301			S 30100	301	
			1.4573	X 10 CrNiMoTi 18 12		X 6 CrNiMoTi 17 13	320 S 33			10Ch17N13M3T	S 31635	316 Ti	
			1.4583	X 10 CrNiMoNb 18 12		X 6 CrNiMoNb 17 13						318	
			4.1.5 martensitic	1.4005	X 12 CrS 13	Z 12 CF 13	X 12 CrS 13	416 S 21	SUS 416	2380		S 41600	416
				1.4104	X 12 CrMoS 17	Z 10 CF 17	X 10 CrS 17		SUS 430 F	2383		S 43020	430 F
		4.1.6 austenitic A5 > 40%	1.4305	X 10 CrNiS 18 9	Z 10 CNF 18.09	X 10 CrNi 18 09	303 S 21	SUS 303	2346		S 30300	303	
			1.4305	X 10 CrNiS 18 9	Z 10 CNF 18.09	X 10 CrNi 18 09	303 S 21	SUS 303	2346		S 30300	303	
	4.1.7 sulphured			sulphured									
				sulphured									
	4.2 Heat-resistant alloys	4.2.1 Fe alloys	1.4718	X 45 CrSi 9 3	Z 45 CS 9	X 45 CrSi 8	401 S 45	SUH 1		40Ch9S2	S 65007	HNV 3	
			1.4724	X 10 CrAl 13	Z 10 C 13	X 10 CrAl 12	403 S 17			10Ch13SJ			
			1.4742	X 10 CrAl 18	Z 10 CAS 18	X 8 Cr 17	430 S 15	SUS 430; SUH21				430	
			1.4747	X 80 CrNiSi 20	Z 80 CSN 20.02	X 80 CrSiNi 20	443 S 65	SUH 4			S 65006	HNV 6	
			1.4762	X 10 CrAl 24	Z 10 CAS 24	X 16 Cr 26					S 44600	446	
			1.4828	X 15 CrNiSi 20 12	Z 15 CNS 20.12		309 S 24	SUH 309		20Ch20N14S2	S 30900	309	
			1.4841	X 15 CrNiSi 25 20	Z 15 CNS 25.20	X 16 CrNiSi 25 20		SUH 310		20Ch25N20S2	S 31000	314; 310	
			1.4845	X 12 CrNi 25 21	Z 12 CN 25.20	X 6 CrNi 26 20	310 S24	SUH 310; SUS 310 S	2361		S 31008	310 S	
			1.4864	X 12 NiCrSi 36 16	Z 12 NCS 37.18		NA 17	SUH 330			N 08330	330	
			1.4871	X 53 CrMnNiN 21 9	Z 52 CMN 21.09	X 53 CrMnNiN 21 9	349 S 54	SUH 35; SUH 36		55Ch20G9AN4	S 63008	EV 8	
			1.4873	X 45 CrNiW 18 9	Z 35 CNWS 20.09	X 45 CrNiW 18 9	331 S 40	SUH 31					
			1.4876	X 10 NiCrAlTi 33 20	Z 8 NC 32.21		NA 15 (H)	NCF 800				B 163	
			1.4878	X 12 CrNiTi 18 9	Z 6 CNT 18.12 (B)	X 6 CrNiTi 18 11	321 S 20	SUS 321	2337	12Ch18N10T		321	
			1.4923	X 22 CrMoV 12 1			762						
			1.4935	X 20 CrMoWV 12 1								S 42200	
			1.4943	X 4 NiCrTi 25 15	Z 6 NCTDV 25.15 B		HR 251; HR 52; HR 51	SUH 660					
			1.4945	X 6 CrNiWNb 16 16									
			1.4962	X 12 CrNiWTi 16 3									
			1.4980	X 5 NiCrTi 26 15								S66286	
			4.2.2 Ni alloys, non hardened	1.4876	X 10 NiCrAlTi 32 20	Incoloy 800							
		2.4360		NiCu30Fe	Monel 400								
		2.4375		NiCu30Al	Monel K 500								
		2.4603		NiCr30FeMo	Hastelloy X								
		2.4617			Hastelloy B-2								
		2.4640		NiCr15Fe	Inconel 600								
2.4668		NiCr19Fe18Nb5Mg		Inconel 718									
2.4812				Hastelloy C									
2.4816	NiCr15Fe	Inconel 600			NA 14	NCF 600			N 06600				
2.4856	NiCr22Mo9Nb	Inconel 625											
2.4858	NiCr21Mo			NA 16	NCF 825			N 08825					
2.4983		Udimet 500											

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA		
4 Stainless steel, heat resistant alloys	4.2 Heat-resistant alloys	4.2.3 Ni alloys, hardened	2.4630	NiCr20Ti	Nimonic 75		HR 5							
			2.4631	NiCr20TiAl	Nimonic 80 A		HR 401; 601	NCF 80 A			N 07080			
			2.4632	NiCr20Co18Ti	Nimonic 90									
			2.4634	NiCo20Cr15MoAlTi	Nimonic 105									
			2.4662	NiCr13Mo6Ti3	Nimonic 901									
			2.4670		Nimocast 713									
			2.4674		Nimocast PK 24									
			2.4951	NiCr20Ti	Nimonic 75				HR 5					
			2.4952	NiCr20TiAl	Nimonic 80 A									
			2.4969	NiCr20Co18Ti	Nimonic 90									
		2.4973	NiCr19Co11MoTi											
		2.6554		Waspaloy										
				4.2.4 Co alloys	2.4711	CoCr20Ni15Mo								
					2.4964	CoCr20W15Ni								
2.4979	CoCr28MoNi													
2.4989	CoCr20NiW													
5 Cast steel	5.1 Conventional cast steel	5.1.1 non alloyed	1.0420	GS-38										
			1.0446	GS-45										
			1.0552	GS-52										
			1.0558	GS-60										
			1.0619	GS-C 25										
			1.1142	GS-Ck 16										
			1.1155	GS-Ck 25										
			1.1191	GS-Ck 45										
			5.1.2 low alloyed	1.1118	GS-24 Mn 6									
				1.1120	GS-20 Mn 5									
		1.1131		GS-16 Mn 5										
		1.1136		GS-24 Mn 4										
		1.1138		GS-21 Mn 5										
		1.1159		GS-46 Mn4										
		1.1165		GS-30 Mn 5										
		1.1167		GS-36 Mn 5										
		1.1168		GS-40 Mn 5										
		1.2311		GS-40 CrMnMo 7										
		1.2323		GS-48 CrMoV 6 7										
		1.2713		GS-55 NiCrMoV 6										
		1.2728		GS-20 MoNi 33 13										
		1.2887		GS-34 CoCrMoV 19 12										
		1.5015		GS-8 Mn 7										
		1.5120		GS-38 MnSi 4										
		1.5121		GS-46 MnSi 4										
		1.5122		GS-37 MnSi 5										
		1.5418		GS-20 MnMo 5 3										
		1.5419		GS-22 Mo 4										
		1.5430		GS-8 MnMo 7 4										
		1.5431		GS-12 MnMo 7 4										
		1.5475		GS-20 MnNb 5										
		1.5485		GS-20 MnNiTi 5 3										
		1.5621	GS-10 Ni 6											
		1.5633	GS-24 Ni 8											
1.5638	GS-10 Ni 14													
1.5681	GS-10 Ni 19													
1.5919	GS-15 CrNi 6													

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Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA		
5 Cast steel	5.1 Conventional cast steel	5.1.2 low alloyed	1.6219	GS-22 MnNi 5										
			1.6221	GS-13 MnNi 6 4										
			1.6309	GS-20 MnMoNi 5 5										
			1.6511	GS-36 CrNiMo 4										
			1.6515	GS-25 CrNiMo 4										
			1.6552	GS-24 CrNiMo 3 2 5										
			1.6570	GS-30 NiCrMo 8 5										
			1.6582	GS-34 CrNiMo 6										
			1.6740	GS-33 NiCrMo 7 4 4										
			1.6741	GS-38 NiCrMo 8 4 4										
			1.6748	GS-40 NiCrMo 6 5 6										
			1.6750	GS-20 NiCrMo 3 7										
			1.6759	GS-18 NiMoCr 3 6										
			1.6760	GS-22 NiMoCr 5 6										
			1.6779	GS-14 NiCrMo 10 6										
			1.6781	GS-18 NiCrMo 12 6										
			1.6783	GS-19 NiCrMo 12 6										
			1.6916	GS-12 MnNiCrMo 5 3										
			1.7131	GS-16 MnCr 5										
			1.7147	GS-20 MnCr 5										
			1.7218	GS-25 CrMo 4										
			1.7219	GS-26 CrMo 4										
			1.7220	GS-34 CrMo 4										
			1.7225	GS-42 CrMo 4										
			1.7228	GS-50 CrMo 4										
			1.7341	GS-34 CrMo 4 4										
			1.7354	GS-22 CrMo 5 4										
			1.7354	GS-17 CrMnMo 5 5										
			1.7357	GS-17 CrMo 5 5										
			1.7363	GS-12 CrMo 19 5										
			1.7377	GS-17 CrMo 9 10										
			1.7379	GS-18 CrMo 9 10										
		1.7380	GS-12 CrMo 9 10											
		1.7382	GS-19 CrMo 9 10											
		1.7706	GS-17 CrMoV 5 11											
		1.7725	GS-30 CrMoV 6 4											
		1.7755	GS-35 CrMoV 10 4											
		1.7756	GS-36 CrMoV 10 4											
		1.7903	GS-18 MnCrMo 6 3											
		1.7906	GS-19 MnCrMo 6 3											
		1.7909	GS-20 MnCrMo 6 3											
		1.8159	GS-50 CrV 4											
		5.1.3 high alloyed		1.2201	G-X 165 CrV 12									
				1.2343	G-X 38 CrMoV 5 1	Z 38 CDV 5								
1.2363	G-X 100 CrMoV 5 1			Z 100 CDV 5										
1.2365	G-X 32 CrMoV 3 3			32 DCV 28										
1.2367	G-X 40 CrMoV 5 3			Z 40 CDV 5										
1.2392	G-X 28 CrMoV 5 1													
1.2601	G-X 165 CrMoV 12													
1.2606	G-X 37 CrMoW 5 1													
1.2880	G-X 165 CrCoMo 12													
1.3401	G-X 120 Mn 12			Z 120 M 12	XG 120 Mn 12	Z 120 M 12	SCMnH 1		110G13L		A 128 (A)			
1.3966	G-X 25 MnCrNi 8 8 6													

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA		
5 Cast steel	5.1 Conventional cast steel	5.1.3 high alloyed	1.4710	G-X 30 CrSi 6										
			1.4718	G-X 45 CrSi 9 3										
			1.5662	G-X 8 Ni 9										
			1.6351	G-X 2 NiCoMoTi 17 10										
			1.7389	G-X 12 CrMo 10 1										
	5.2 Stainless cast steel	5.2.1 ferritic / martensitic	1.4001	G-X 7 Cr 13	Z 8 C 13 FF									
			1.4006	G-X 10 Cr 13	Z 10 C 13									
			1.4008	G-X 8 CrNi 13	Z 12 CN 13 M									
			1.4027	G-X 20 Cr 14	Z 20 C 13 M		420 C 29	SCS 2		20Ch13L				
			1.4034	G-X 46 Cr 13	Z 40 C 14									
			1.4059	G-X 22 CrNi 17										
			1.4085	G-X 70 Cr 29										
			1.4086	G-X 120 Cr 29										
			1.4107	G-X 8 CrNi 12										
			1.4120	G-X 20 CrMo 13										
			1.4122	G-X 35 CrMo 17										
			1.4136	G-X 70 CrMo 29 2										
			1.4138	G-X 120 CrMo 29 2										
			1.4313	G-X 5 CrNi 13 4										
			1.4339	G-X 32 CrNi 28 10										
			1.4340	G-X 40 CrNi 27 4										
			1.4405	G-X 5 CrNiMo 16 5										
			1.4407	G-X 5 CrNiMo 13 4										
			1.4414	G-X 4 CrNiMo 13 4										
			1.4464	G-X 40 CrNiMo 27 5										
			1.4540	G-X 4 CrNiCuNb 16 4										
			1.4729	G-X 40 CrSi 13										
			1.4740	G-X 40 CrSi 17										
			1.4743	G-X 160 CrSi 18										
			1.4745	G-X 40 CrSi 23										
			1.4761	G-X 120 CrSi 23										
			1.4776	G-X 40 CrSi 29										
			1.4777	G-X 130 CrSi 29										
			1.4809	G-X 40 CrNi 23 14										
			1.4820	G-X 12 CrNi 26 5										
			1.4822	G-X 40 CrNi 24 5										
			1.4823	G-X 40 CrNiSi 27 4										
			1.4825	G-X 25 CrNiSi 18 9										
			1.4826	G-X 40 CrNiSi 22 9										
			1.4832	G-X 25 CrNiSi 20 14										
			1.4837	G-X 40 CrNiSi 25 12										
			1.4840	G-X 15 CrNi 25 20										
			1.4848	G-X 40 CrNiSi 25 20										
			1.4849	G-X 40 NiCrSiNb 38 1										
			1.4852	G-X 40 NiCrNb 35 25										
			1.4855	G-X 30 CrNiSiNb 24 2										
			1.4857	G-X 40 NiCrSi 35 25										
1.4859	G-X 10 NiCrNb 32 20													
1.4865	G-X 40 NiCrSi 38 18					GX 50 NiCr 39 19	330 C 40	SCH 15; SCH 16						
1.4868	G-X 50 CrNi 30 30													
1.4873	G-X 45 CrNiW 18 9													
1.4928	G-X 12 CrNiMoCoVN 12													
1.4930	G-X 14 CrCoMo 13 10													

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Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA		
5 Cast steel	5.2 Stainless cast steel	5.2.1 ferritic / martensitic	1.4931	G-X 22 CrMoV 12 1										
			1.4957	G-X 15 CrNiCo 21 20										
			1.4968	G-X 7 CrNiNb 16 13										
			1.4988	G-X 8 CrNiMoVNb 16 1										
			1.6982	G-X 3 CrNi 13 4										
		5.2.2 austenitic	1.3941	G-X 4 CrNi 18 13										
			1.3944	G-X 5 CrNi 18 11										
			1.3951	G-X 4 CrNiMoN 22 15										
			1.3952	G-X 4 CrNiMoN 18 14										
			1.3953	G-X 2 CrNiMo 18 15										
			1.3955	G-X 12 CrNi 18 11										
			1.3959	G-X 10 CrNiNb 16 13										
			1.3964	G-X 4 CrNiMnMoN 19 1										
			1.4306	G-X 2 CrNi 18 9										
			1.4308	G-X 6 CrNi 18 9	Z 6 CN 18.10 M		304 C 15	SCS 13	2333	07Ch18N9L				CF-8
			1.4312	G-X 10 CrNi 18 8										
			1.4347	G-X 8 CrNi 26 7										
			1.4404	G-X 2 CrNiMo 18 10										
			1.4408	G-X 6 CrNiMo 18 10										
			1.4410	G-X 10 CrNiMo 18 9										
			1.4437	G-X 6 CrNiMo 18 12										
			1.4439	G-X 3 CrNiMo 17 13 5										
			1.4446	G-X 2 CrNiMo 17 13 4										
			1.4448	G-X 6 CrNiMo 17 13										
			1.4463	G-X 6 CrNiMo 24 8 2										
			1.4465	G-X 2 CrNiMoN 25 25										
			1.4500	G-X 7 NiCrMoCuNb 25										
			1.4531	G-X 2 NiCrMoCuN 20 1										
			1.4536	G-X 2 NiCrMoCuN 25 2										
			1.4552	G-X 5 CrNiNb 18 9										
			1.4580	G-X 10 CrNiMoNb 18 1										
			1.4581	G-X 5 CrNiMoNb 18 10	Z 4 CNDNb 18.12 M		GX 6 CrMoNb 20 11	318 C 17	SCS 22					
			1.4585	G-X 7 CrNiMoCuNb 18										
		1.4815	G-X 8 CrNi 19 10											
1.4927	G-X 5 CrNi 22 10													
1.6901	G-X 8 CrNi 18 10													
1.6902	G-X 6 CrNi 18 10													
1.6905	G-X 5 CrNiNb 18 10													
6 Cast iron	6.1 Cast iron with lamellar graphite	6.1.1 non alloyed up to 180 HB	6.010	GG-10	F1 10 D	G 10		FC 10	01 10-00	Sc 10		A48-20 B		
			6.015	GG-15	F1 15 D	G 15	Grade 150	FC 15	01 15-00	Sc 15		A48-25 B		
			6.020	GG-20	F1 20 D	G 20	Grade 220	FC 20	01 20-00	Sc 20		A48-30 B		
			6.025	GG-25	F1 25 D	G 25	Grade 260	FC 25	01 25-00	Sc 25		A48-40 B		
			6.030	GG-30	F1 30 D	G 30	Grade 300	FC 30	01 30-00	Sc 30		A48-45 B		
			6.035	GG-35	F1 35 D	G 35	Grade 350	FC 35	01 35-00	Sc 35		A48-50 B		
		6.040	GG-40	F1 40 D			Grade 400		01 40-00	Sc 40		A48-60 B		
		6.1.2 non alloyed above 180 HB	6.652	GGL-NiMn 13 7	L- NM 13 7		L-NiMn 13 7							
			6.655	GGL-NiCuCr 15 6 2	L-NUC 15 6 2		L-NiCuCr 15 6 2							A 436 Type 1
			6.656	GGL-NiCuCr 15 6 3	L-NUC 15 6 3		L-NiCuCr 15 6 3							A 436 Type 1b
			6.660	GGL-NiCr 20 2	L-NC 20 2		L-NiCr 20 2			05 23-00				A 436 Type 2
			6.661	GGL-NiCr 20 3	L-NC 20 3		L-NiCr 20 3							A 436 Type 2b
			6.667	GGL-NiSiCr 20 5 3	L-NSC 20 5 3		L-NiSiCr 20 5 3							
			6.667	GGL-NiSiCr 20 5 3	L-NSC 20 5 3		L-NiSiCr 20 5 3							
6.667	GGL-NiCr 30 3		L-NC 30 3		L-NiCr 30 3							A 436 Type 3		
6.680	GGL-NiSiCr 30 5 5	L-NSC 30 5 5		L-NiSiCr 30 5 5							A 436 Type 4			
6 Cast iron	6.1 Cast iron with lamellar graphite	6.1.3 alloyed	6.010	GG-10	F1 10 D	G 10		FC 10	01 10-00	Sc 10		A48-20 B		
			6.015	GG-15	F1 15 D	G 15	Grade 150	FC 15	01 15-00	Sc 15		A48-25 B		
			6.020	GG-20	F1 20 D	G 20	Grade 220	FC 20	01 20-00	Sc 20		A48-30 B		
			6.025	GG-25	F1 25 D	G 25	Grade 260	FC 25	01 25-00	Sc 25		A48-40 B		
			6.030	GG-30	F1 30 D	G 30	Grade 300	FC 30	01 30-00	Sc 30		A48-45 B		
			6.035	GG-35	F1 35 D	G 35	Grade 350	FC 35	01 35-00	Sc 35		A48-50 B		
			6.040	GG-40	F1 40 D			Grade 400		01 40-00	Sc 40		A48-60 B	
			6.652	GGL-NiMn 13 7	L- NM 13 7		L-NiMn 13 7							
			6.655	GGL-NiCuCr 15 6 2	L-NUC 15 6 2		L-NiCuCr 15 6 2							A 436 Type 1
			6.656	GGL-NiCuCr 15 6 3	L-NUC 15 6 3		L-NiCuCr 15 6 3							A 436 Type 1b
			6.660	GGL-NiCr 20 2	L-NC 20 2		L-NiCr 20 2			05 23-00				A 436 Type 2
			6.661	GGL-NiCr 20 3	L-NC 20 3		L-NiCr 20 3							A 436 Type 2b
			6.667	GGL-NiSiCr 20 5 3	L-NSC 20 5 3		L-NiSiCr 20 5 3							
			6.667	GGL-NiCr 30 3	L-NC 30 3		L-NiCr 30 3							A 436 Type 3
6.680	GGL-NiSiCr 30 5 5	L-NSC 30 5 5		L-NiSiCr 30 5 5							A 436 Type 4			

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA			
6 Cast iron	6.1 Cast iron with lamellar graphite	6.1.4 high alloyed	0.9620	G-X 260 NiCr 4 2			Grade 2 A		0512-00			A 532 I B NiCr-LC			
			0.9625	G-X 330 NiCr 4 2			Grade 2 B		0513-00			A 532 I A NiCr-HC			
			0.9630	G-X 300 CrNiSi 9 5 2			Grade 2 C; D; E		0457-00				A 532 I D Ni-HiCr		
			0.9635	G-X 330 CrMo 15 3			Grade 3 A; B						A 532 II C 15% CrMo-		
			0.9640	G-X 300 CrMoNi 15 2			Grade 3 A; B								
			0.9645	G-X 260 CrMoNi 20 2			Grade 3 C							A 532 II D 20% CrMo-	
			0.9650	G-X 260 Cr 27			Grade 3 D			0466-00				A 532 III A 25% Cr	
			0.9655	G-X 300 CrMo 27 1			Grade 3 E							A 532 III A 25% Cr	
	6.2 Spheroidal cast iron	6.2.1 non alloyed up to 180 HB	0.7033	GGG-35.3											
			0.7040	GGG-40	FGS 400-12	GS 400-12	SNG 420/12	FCD 40	0717-02	VC 42-12			60-40-18		
			0.7043	GGG-40.3	FGS 370-17	GSO 42/17	SNG 370/17		0717-15	VC 42-12					
			0.7050	GGG-50	FGS 500-7	GS 500/7	SNG 500/7	FCD 50	0727-02	VC 50-2				65-45-12	
			0.7060	GGG-60	FGS 600-3	GS 600/3	SNG 600/3	FCD 60	0732-03	VC 60-2				80-55-06	
			0.7070	GGG-70	FGS 700-2	GS 700-2	SNG 700/2	FCD 70	0737-01	VC 70-2				100-70-03	
		6.2.2 non alloyed above 180 HB	0.7080	GGG-80	FGS 800-2	GS 800-2	SNG 800/2			VC 80-2				120-90-02	
			6.2.3 alloyed	0.7652	GGG-NiMn 13 7	S-NM 13 7		S-NiMn 13 7							
				0.7660	GGG-NiCr 20 2	S-NC 20 2		S-NiCr 20 2							A 439 Type D-2
				0.7661	GGG-NiCr 20 3	S-NC 20 3		S-NiCr 20 3							A 439 Type D-2B
				0.7665	GGG-NiSiCr 20 5 2	S-NSC 20 5 2		S-NiSiCr 20 5 2							
				0.7670	GGG-Ni 22	S-N 22		S-Ni 22							A 439 Type D-2C
				0.7673	GGG-NiMn 23 4	S-NM 23 4		S-NiMn 23 4							A 439 Type D-2M
				0.7676	GGG-NiCr 30 3	S-NC 30 3		S-NiCr 30 3							A 439 Type D-3
				0.7677	GGG-NiCr 30 1	S-NC 30 1		S-NiCr 30 1							A 439 Type D-3A
				0.7680	GGG-NiSiCr 30 5 5	S-NSC 30 5 5		S-NiSiCr 30 5 5							A 439 Type D-4
				0.7683	GGG-Ni 35	S-N 35		S-Ni 35							A 439 Type D-5
			0.7685	GGG-NiCr 35 3	S-NC 35 3		S-NiCr 35 3							A 439 Type D-5B	
	6.3 GTW (white malleable cast iron)	6.3.1 up to 180 HB	0.8035	GTW-35-04											
			0.8040	GTW-40-05											
			0.8045	GTW-45-07											
		6.3.2 above 180 HB	0.8055	GTW-55											
			0.8065	GTW-65											
			6.4 GTS (black malleable cast iron)	6.4.1 up to 180 HB	0.8135	GTS-35-10	MN 35-10		B 340/12						
	0.8145	GTS-45-06					P 440/7								
6.4.2 above 180 HB	0.8155	GTS-55-04		MP 50-5		P 510/4									
	0.8165	GTS-65-02		MP 60-3		P 570/3									
0.8170	GTS-70-02	IP 70-2		P 690/2											
7 Non-ferrous metal	7.1 Aluminium	7.1.1 non alloyed	3.0205	Al99											
			3.0255	Al99.5	1050 A										
			3.0275	Al99.7											
			3.0285	Al99.8											
			3.0305	Al99.9											
			7.1.2 aluminium wrought alloys, non hardened	3.0505	AlMn0.5Mg0.5										
				3.0515	AlMn1										
				3.0517	AlMnCu										
				3.0525	AlMn1Mg0.5	3005									
				3.0526	AlMn1Mg1										
		3.0915		AlFeSi											
		3.3307		Al99.85Mg0.5											
		3.3308	Al99.5Mg0.5												
		3.3315	AlMg1	5005											
		3.3316	AlMg1.5												
		3.3317	Al99.85Mg1												

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Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA	
7 Non-ferrous metal	7.1 Aluminium	7.1.2 aluminium wrought alloys, non hardened	3.3318	Al99.9Mg1									
			3.3326	AlMg1.8									
			3.3345	AlMg4.5									
			3.3523	AlMg2.5									
			3.3525	AlMg2Mn0.3									
			3.3527	AlMg2Mn0.8									
			3.3535	AlMg3	5754								
			3.3537	AlMg2.7Mn									
			3.3545	AlMg4Mn	5086								
			3.3547	AlMg4.5Mn	5087								
			3.3549	AlMg5Mn									
		3.3555	AlMg5	5056 A									
		3.0506	AlMn0.6										
		3.0615	AlMgSiPb										
		3.1255	AlCuSiMn	2014									
		3.1305	AlCu2.5Mg0.5										
		3.1325	AlCuMg1	2017 A									
		3.1355	AlCuMg2	2024									
		3.1645	AlCuMgPb	2030									
		3.1655	AlCuBiPb	2011									
		3.2307	Al99.85MgSi										
		3.2315	AlMgSi1	6082									
		3.3206	AlMgSi0.5	6060									
		3.3208	Al99.9MgSi										
		3.3210	AlMgSi0.7	6005 A									
		3.3211	AlMg1SiCu	6061									
		3.4335	AlZn4.5Mg1	7020									
		3.4337	Al99.8ZnMg										
		3.4345	AlZnMgCu0.5										
		3.4365	AlZnMgCu1.5	7075									
		3.1371	G-AlCu4TiMg										
		3.1841	G-AlCu4Ti										
		3.2134	G-AlSi5Cu1Mg										
	3.3241	G-AlMg3Si											
	3.3261	G-AlMg5Si											
	3.3292	GD-AlMg9											
	3.3541	G-AlMg3											
	3.3543	G-AlMg3(Cu)											
	3.3561	G-AlMg5											
	3.3591	G-AlMg10											
	3.2151	G-AlSi6Cu4											
	3.2161	G-AlSi8Cu3											
	3.2341	G-AlSi5Mg											
	3.2371	G-AlSi7Mg											
3.2373	G-AlSi9Mg												
3.2381	G-AlSi10Mg												
3.2383	G-AlSi10Mg(Cu)												
3.2581	G-AlSi12												
3.2583	G-AlSi12(Cu)												
		7.1.6 aluminium cast alloys above 12% Si		G-AlSi18									
	7.2 Magnesium	7.2.1 wrought alloys	3.5200	MgMn2									
			3.5312	MgAl3Zn									

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA			
7 Non-ferrous metal	7.2 Magnesium	7.2.1 wrought alloys	3.5612	MgAl6Zn											
			3.5812	MgAl8Zn											
		7.2.2 cast alloys	3.5101	G-MgZn4SE1Zr1											
			3.5102	G-MgZn5Th2Zr1											
			3.5103	G-MgSE3Zn2Zr1											
			3.5105	G-MgTh3Zn2Zr1											
			3.5106	G-MgAg3Se2Zr1											
			3.5470	GD-MgAl4Si1											
			3.5612	GD-MgAl6Zn1											
			3.5662	G-MgAl6											
			3.5812	G-MgAl8Zn1											
		3.5912	G-MgAl9Zn1												
		7.3 Copper	7.3.1 non alloyed	2.0040	OF-Cu										
				2.0060	E-Cu57										
	2.0065			E-Cu58											
	2.0070			SE-Cu											
	2.0076			SW-Cu											
	2.0090			SF-Cu											
	7.3.2 wrought alloys, non hardened			2.0205	CuZn0.5										
				2.1160	CuPb1P										
				2.1191	CuAg0.1P										
				2.1203	CuAg0.1										
			2.1265	CuCd0.5											
			2.1266	CuCd1											
			2.1310	CuFe2P											
			2.1322	CuMg0.4											
			2.1323	CuMg0.7											
			2.1356	CuMn3											
			2.1363	CuMn2											
			2.1366	CuMn5											
			2.1491	CuAsP											
			2.1498	CuSP											
			2.1522	CuSuMnF34											
			2.1522	CuSi2Mn											
			2.1525	CuSi3Mn											
			2.1546	CuTeP											
	7.3.3 wrought alloys, hardened		2.0850	CuNi2Be											
			2.0853	CuNi1.5Si											
			2.0855	CuNi2Si											
			2.0857	CuNi3Si											
			2.1245	CuBe1.7											
			2.1247	CuBe2											
2.1248			CuBe2Pb												
2.1285			CuCo2Be												
2.1293			CuCrZr												
2.1580		CuZr													
7.3.4 CuNi alloys	2.0830	CuNi25													
	2.0842	CuNi44Mn1													
	2.0872	CuNi10Fe1Mn													
	2.0875	CuNi9Sn2													
	2.0882	CuNi30Mn1Fe													
	2.0883	CuNi30Fe2Mn2													

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Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA			
7 Non-ferrous metal	7.3 Copper	7.3.5 CuNiZn alloys, long-chipping	2.0730	CuNi12Zn24											
			2.0740	CuNi18Zn20											
			2.0742	CuNi18Zn27											
		7.3.6 CuNiZn alloys, short-chipping	2.0771	CuNi7Zn39Mn5Pb3											
			2.0780	CuNi12Zn30Pb1											
			2.0790	CuNi18Zn19Pb1											
	7.4 CuZn (brass)	7.4.1 long-chipping	2.0220	CuZn5											
			2.0230	CuZn10											
			2.0240	CuZn15											
			2.0250	CuZn20											
			2.0261	CuZn28											
			2.0265	CuZn30											
			2.0280	CuZn33											
			2.0321	CuZn37											
			2.0332	CuZn37Pb0.5											
			2.0335	CuZn36											
			2.0360	CuZn40											
			2.0372	CuZn39Pb0.5											
			7.4.2 short-chipping	2.0331	CuZn36Pb1.5										
				2.0371	CuZn38Pb1.5										
				2.0375	CuZn36Pb3										
				2.0380	CuZn39Pb2										
				2.0401	CuZn39Pb3										
				2.0402	CuZn40Pb2										
				2.0410	CuZn44Pb2										
			2.0460	CuZn20Al2											
		2.0470	CuZn28Sn1												
		2.0490	CuZn31Si1												
		2.0500	CuZn23Al6Mn4Fe3												
		2.0510	CuZn37Al1												
		2.0525	CuZn38SnAl												
		2.0530	CuZn38Sn1												
		2.0540	CuZn35Ni2												
	2.0550	CuZn40Al2													
	2.0561	CuZn40Al1													
	2.0572	CuZn40Mn1													
	2.0580	CuZn40Mn1Pb													
	7.5 CuSn (bronze)	7.5.1 long-chipping	2.1016	CuSn4											
			2.1020	CuSn6											
			2.1030	CuSn8											
			2.1080	CuSn6Zn6											
		7.5.2 short-chipping	2.1086	G-CuSn10Zn											
	2.1093		G-CuSn6ZnNi												
2.1096	G-CuSn5ZnPb														
7.6 CuAlFe (Ampco)	7.6.1 long-chipping	2.0918	CuAl5As												
		2.0920	CuAl8												
		2.0932	CuAl8Fe3												
		2.0936	CuAl10Fe3Mn2												
		2.0960	CuAl9Mn2												
		2.0966	CuAl10Ni5Fe4												
		2.0971	CuAl9Ni3Fe2												
		2.0978	CuAl11Ni6Fe5												
		Ampco 12	CuAl9Fe3												

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA			
7 Non-ferrous metal	7.6 CuAlFe (Ampco)	7.6.1 long-chipping	Ampco 16	CuAl10Fe3											
			Ampco 18	CuAl10.5Fe3.5											
			Ampco 20	CuAl11Fe4											
			Ampco 21	CuAl13Fe4.5											
			Ampco 22	CuAl14Fe5											
			Ampco 25	Zn											
			Ampco 26	Zn											
			Ampco 45	CuAl10Fe2.5Ni5Mn1.5											
			Ampco 483	CuAl9Fe4Ni4.5Mn1											
			Ampco 8	CuAl6.5Fe2.5Sn											
	Ampco M-4	CuAl10.5Fe4Ni5Mn3.5													
			7.6.2 short-chipping		Amco 8										
		7.7 Nickel	7.7.1 non alloyed	2.1504	NiAlBz										
	2.4042			Ni99CSi											
	2.4060			Ni99.6											
	2.4062			Ni99.4Fe											
			7.7.2 alloyed		Nickel										
		7.8 Titanium	7.8.1 non alloyed	3.7024	Ti99.5										
	3.7034			Ti99.7											
	3.7055			Ti99.4											
	3.7064			Ti99.2											
				7.8.2 alloyed, soft annealed	3.7114	TiAl5Sn2									
	3.7124		TiCu2												
				7.8.3 alloyed, hardened	3.7144	TiAl6Sn2Zr4Mo2									
	3.7154		TiAl6Zr5												
	3.7165		TiAl6V4		T-A 6 V		TA 10 bis TA 13					R 56400			
	3.7174		TiAl6V6Sn2												
			3.7184	TiAl4Mo4Sn2			TA 45 bis TA 51								
8 Plastics	8.1 Thermoplastics	8.1.1 polyethylene	PE	Baylon	Lacqtène	Alkathene	Eraclene	Mirason				Alathon			
			PE	Dekalen	Nalène	Carlona	Fertene	Novatec				Bakelite			
			PE	Ertalen		Escorene	Rumiten	Rexlon				Chemplex			
			PE	Hostalen				Sholex				Dylan			
			PE	Lupolen				Sumikathene				Fortiflex			
			PE	Supralen				Suntec				Marlex			
			PE	Symalen				Staflene				Microthene			
			PE	Vestolen				Yukalon				Paxon			
			PE									Petrothene			
			PE									Poly-Eth			
		PE									Rigidex				
		PE									Rotothene				
				8.1.2 polypropylene	PP	Daplen	Eltex P	Carlona P	Kastilen	Noblene				Pro-fax	
		PP	Hostalen PP		Lacqtène P	Propathene	Moplen	Poly-Pro				Rexene			
		PP	Luparen		Napryl	Procom		Sho-Allomer				Tenite			
		PP	Novolen			Propyply									
		PP	Symalen PP			Propafoil									
				8.1.3 polyvinyl chloride	PVC	Coroplast	Ekavyl	Breon	Raivinil	Nipeon	Pevikon			Dalvin	
		PVC	Hostalit			Carina	Sicron	Nipolit				Geon			
		PVC	Mipolam			Corvic	Vipla	Vinika				Kohinor			
PVC	Opalon		Scon		Viplast	Vinichlon				Marvinol					
PVC	Rhodopas		Shell PVC							Pliovic					
PVC	Soflex		Welvic							Vygen					

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Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA			
8 Plastics	8.1 Thermoplastics	8.1.3 polyvinyl chloride	PVC	Solvec											
			PVC	Supradur											
			PVC	Trosiplast											
			PVC	Trovidur											
			PVC	Vestolit											
			PVC	Vinidur											
			PVC	Vinnol											
			PVC	Vinoflex											
		PVC	Vinylite												
			8.1.4 polystyrene	PS	Hostyron	Afcolène	Lustrex	Edistir	Diarex					Carinex	
		PS		Lorkalen	Lacqrene		Lastirol	Esbrite						Dylene	
		PS		Polystyrol	Gédex		Restirol							Styron	
		PS		Styropor											Toporex
		PS		Trolitul											
			8.1.5 polymethyl methacrylate	PMMA	Acrylgas	Altulite	Diakon	Lacrilix	Delpet					Lucite	
		PMMA		Daglas		Perspex	Vedril	Shinkolite						Oroglas	
		PMMA		Degalan					Sumipex						Swedcast
		PMMA		Dewoglas											
		PMMA		Plexidur											
		PMMA		Plexiglas											
			8.1.6 Polytetrafluorethylene	PTFE	Hostafion	Soreflon	Fluon		Neoflon					Halon	
		PTFE												Teflon	
			8.1.7 polyamide	PA	Akulon	Orgamide	Maranyl	Latamid	Amilan					Amidel	
		PA		Durethan	Rilsan	Verton	Nivionplast	Leona						Capron	
		PA		Faberyl	Technyl		Renyl	Toray							Fosta Nylon
		PA		Grilamid			Sniamid	Torayca							Minlon
		PA		Grilon				Vydyne							Plaskon
		PA		Nylon											
		PA		Trogamid											
		PA		Ultramid											
		PA		Vestamid											
			8.1.8 polycarbonate	PC	Makralon	Orgalan		Sinvet	Jupilon					Merlon	
		PC		Nuclon					Novarex					Lexan	
	PC	Plastocarbon							Panlite						
		8.1.9 polyamide, thermoplastic	PI		Kerimel								Torlon		
	PI				Kinel								Ultem		
	PI				Nolimid									PI 2080	
		8.2 Thermosetting plastics	8.2.1 phenol formaldehyde	PF	Alberit			Fenochem					Biralit		
	PF			Bakelit				Formolo						Biratex	
	PF			Bulitol				Moldesile						Birax	
	PF			Durax				Vegetalite							
	PF			Durophen											
	PF			Faturan											
PF	Geax														
PF	Harex														
PF	Luphen														
PF	Pertinax														
PF	Resinol														
PF	Supraplast														
PF	Trolitan														
PF	Trolitax														

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA		
8 Plastics	8.2 Thermosetting plastics	8.2.2 melamine formaldehyde	MF	Albanit		Melmex	Melbrite		Isomin			Biramim		
			MF	Duropal		Formica	Melochem		Perstorp panel			Resimene		
			MF	Getalit			Minitrack							
			MF	Homopal			Puriplast							
			MF	Hornit										
			MF	Madurit										
			MF	Maprenal										
			MF	Melan										
			MF	Melolam										
			MF	Melopas										
			MF	Nyhamin										
			MF	Pressal										
			MF	Resart										
			MF	Resopal										
			MF	Ricolor										
			MF	Supraplast										
			MF	Trespa-Duro										
			MF	Ultrapas										
					8.2.3 urea formaldehyde	UF	Bakelite			Gabrite				
				UF		Carbait			Urochem					
				UF		Cibamin								
				UF		Kaurit								
				UF		Melocol								
				UF		Pollopas								
				8.2.4 polyurethane resin	PUR	Baydur								
					PUR	Bayfill								
					PUR	Bayfit								
					PUR	Bayflex								
					PUR	Baynat								
					PUR	Baypreg								
					PUR	Contilan								
					PUR	Desmodur								
					PUR	Elastolan								
					PUR	Elastolit								
					PUR	Elastopal								
					PUR	Elastopan								
					PUR	Elastopor								
					PUR	Moltopren								
				PUR	Vulkollan									
				8.2.5 silicone resin	SI	Baysilon								Silicone
					SI	Silastic								Textolite
					SI	Silopren								
				8.2.6 thermosetting polyimide	PI	Sintimid								Kapton
		PI										Vespel SP		
		8.2.7 unsaturated polyester resin	UP	Alpolit	Norsomix	Crystic Impel	Shimoco	Rigolac	Sonoglas			Freeflow		
			UP	Ampal	Stratyl	Uralam		Vyloglass				Haysite		
			UP	Artrite								Hetron		
			UP	Dobeckan								Rosite		
			UP	Durapreg								Selectron		
			UP	Durax										
			UP	Durodet										

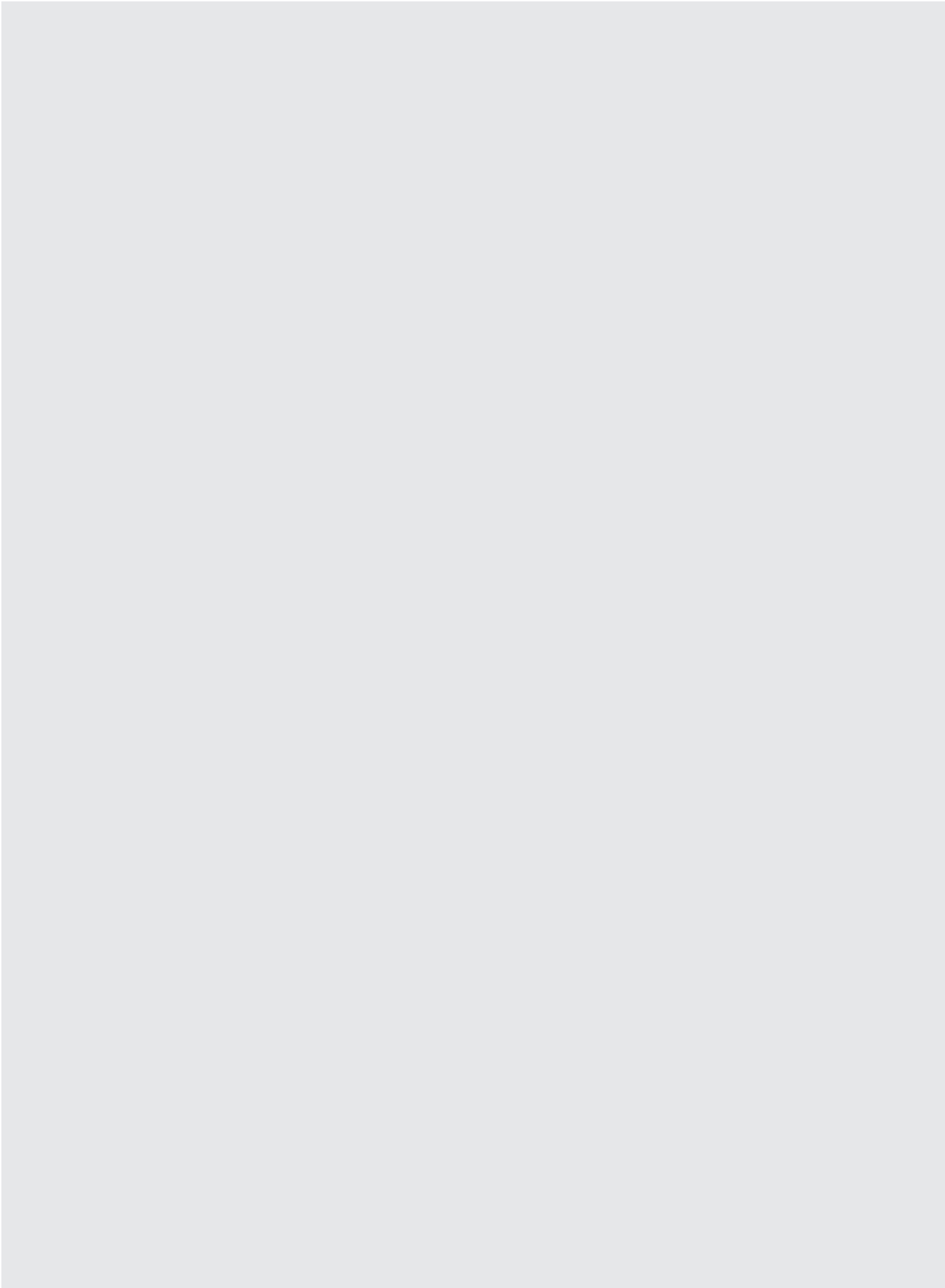
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Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA			
8 Plastics	8.2 Thermosetting plastics	8.2.7 unsaturated polyester resin	UP	Hostaset											
			UP	Keripol											
			UP	Laminac											
			UP	Leguval											
			UP	Menzolit											
			UP	Oldapal											
			UP	Palatal											
			UP	Polydur											
			UP	Polyleit											
			UP	Resipol											
			UP	Setarol											
			UP	Synolite											
			UP	Vestopal											
		UP	Vetrophen												
		UP	Viapal												
				8.2.8 epoxy resin	EP	Araldit		Epikote	Eponac	Epodite				Conapoxy	
			EP		Beckopox		Epon						Epiphane		
			EP		Duroxyn								Epocast		
			EP		Epoxin								Epolene		
			EP		Eurepox								Epolite		
			EP		Grilonit								Stycast		
			EP		Lekutherm										
			EP		Rütapox										
		8.3 Fibre-reinforced plastics	8.3.1 aramid-fibre reinforced	AFK	Kevlar										
					BFK										
				8.3.2 boron-fibre reinforced											
				8.3.3 carbon-fibre reinforced	CFK										
				8.3.4 glass-fibre reinforced	GFK										
				8.3.5 metal-fibre reinforced	MFK										
			8.3.6 synthetic-fibre reinforced	SFK											
		8.4 Sandwich	8.4.1 plastic - metal - wood	P - M - H											
					honeycomb										
			8.4.2 honeycomb												
		8.4.3 metal	metal												
9 Graphite	9.1 Standard graphite	9.1.1 standard graphite	R8340	graphite											
			R8500X	graphite											
			Techno-graph 15	graphite											
			Techno-graph 30	graphite											
			R8510	graphite											
			9.1.2 wear-resistant graphite	R8650	graphite										
		Union Poco EDM C-3		graphite											
		Union Poco EDM1		graphite											
		Union Poco EDM3		graphite											



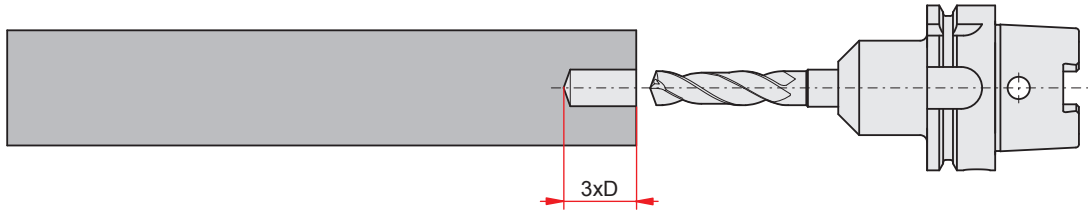
Technical information

Application of deep hole twist drills 16xØ and greater

F60



Drill the pilot hole

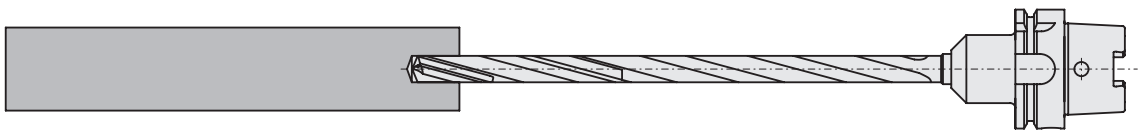


- For the pilot hole, we recommend our W1106 (for UN) or W1206 (for AL).
- The pilot drill should have a 0.02 mm larger diameter (tolerance p6) than the deep hole drill.
- Please ensure that the pilot hole is precise and has a minimum depth of 3xD.

For **difficult drilling conditions at drilling depths of 40xD and greater** we additionally recommend using our W1121 drill (for UN) as co-pilot drill.

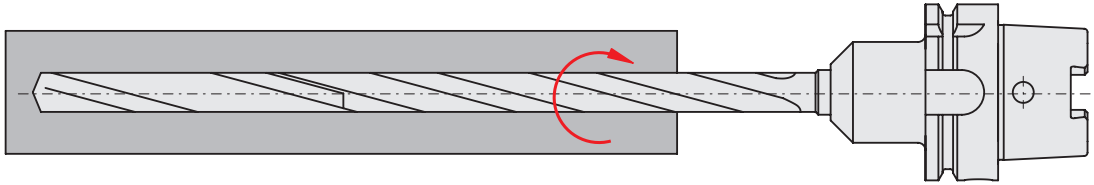
- The co-pilot drill should have a larger diameter (tolerance j6) than the deep hole drill.
- Please ensure that the pilot hole is precise and has a minimum depth of 20xD.
- Please observe the instructions on deep hole drilling up to 40xD.

Enter the pilot hole with the deep hole drill



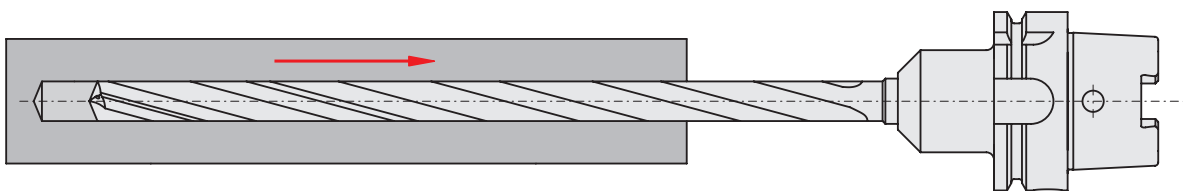
- Deep hole drilling up to 40xD
Use a low rpm ($n=300$ rev/min) as well as a low feed rate ($v_f=1000$ mm/min) when entering the pilot hole. 1-2 mm before reaching the bottom of the pilot hole, stop the feed and increase the spindle speed to the recommended value.
- Deep hole drilling, 40xD and greater
To enter the pilot hole rotate the drill in a left-hand direction at very low rpm ($n=100$ rev/min) and a low feed rate ($v_f=1000$ mm/min). 1-2 mm before reaching the bottom of the pilot hole, stop the feed and rotation. With **right-hand rotation** (i.e. the normal cutting direction) increase the spindle speed to the recommended value.

Deep hole drilling



- Increase feed rate to cycle speed.
- Drill to the desired depth without the need to peck.

Retract the drill



- Retract the drill to approximately $1x\varnothing$.
- Reduce the rpm to a low speed ($n=300$ rev/min). Use rapid feed ($v_f=3000$ mm/min) when exiting the hole.

Technical information

Application of deep hole twist drills 16x \varnothing and greater

Please note:

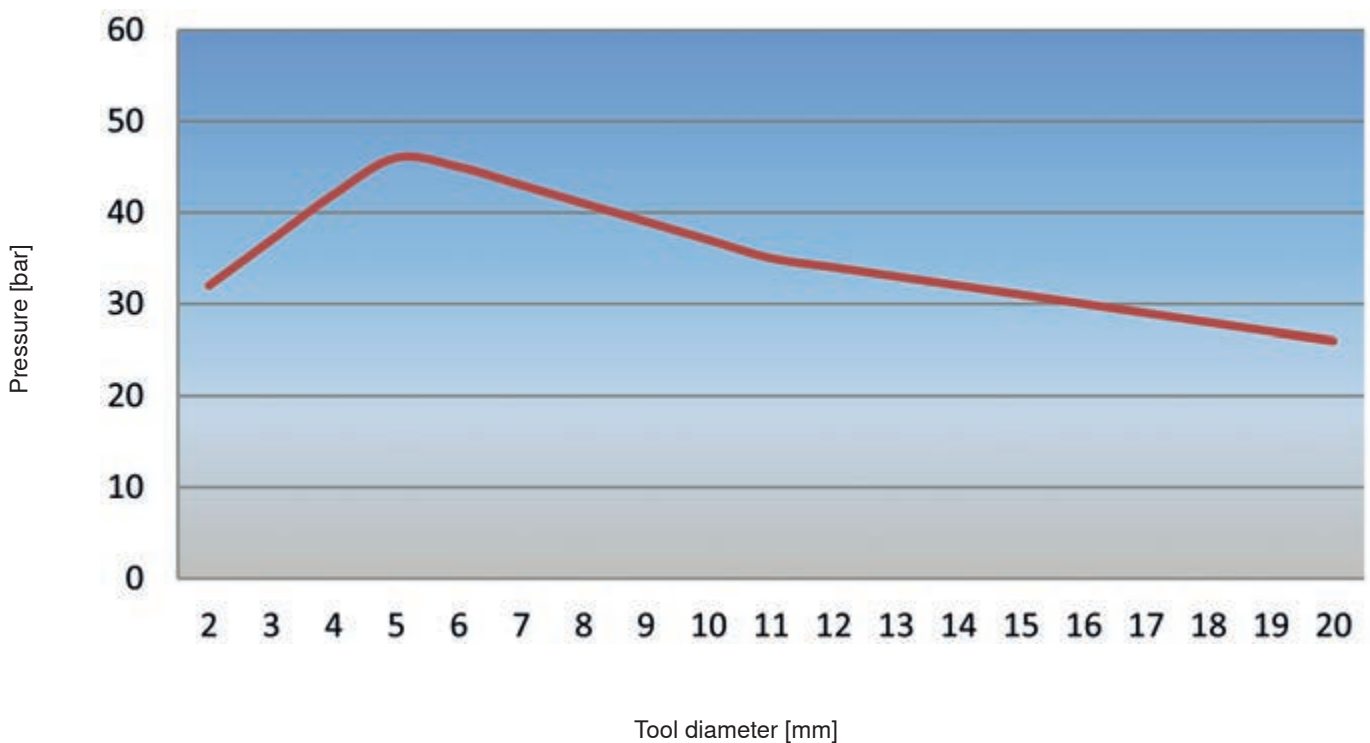
- Under unfavourable application conditions, starting from drilling depth 30x \varnothing the swarf must be removed every 3x \varnothing .
The movement to evacuate the swarf (retraction) should take place at the depth of the pilot hole.
- When the drill exits, and also when through holes are produced in transverse holes the feed rate has to be reduced by 50% due to the risk of edge chipping.
- The recommended coolant pressure can be seen in the diagram of the coolant pressure recommendations (see below).

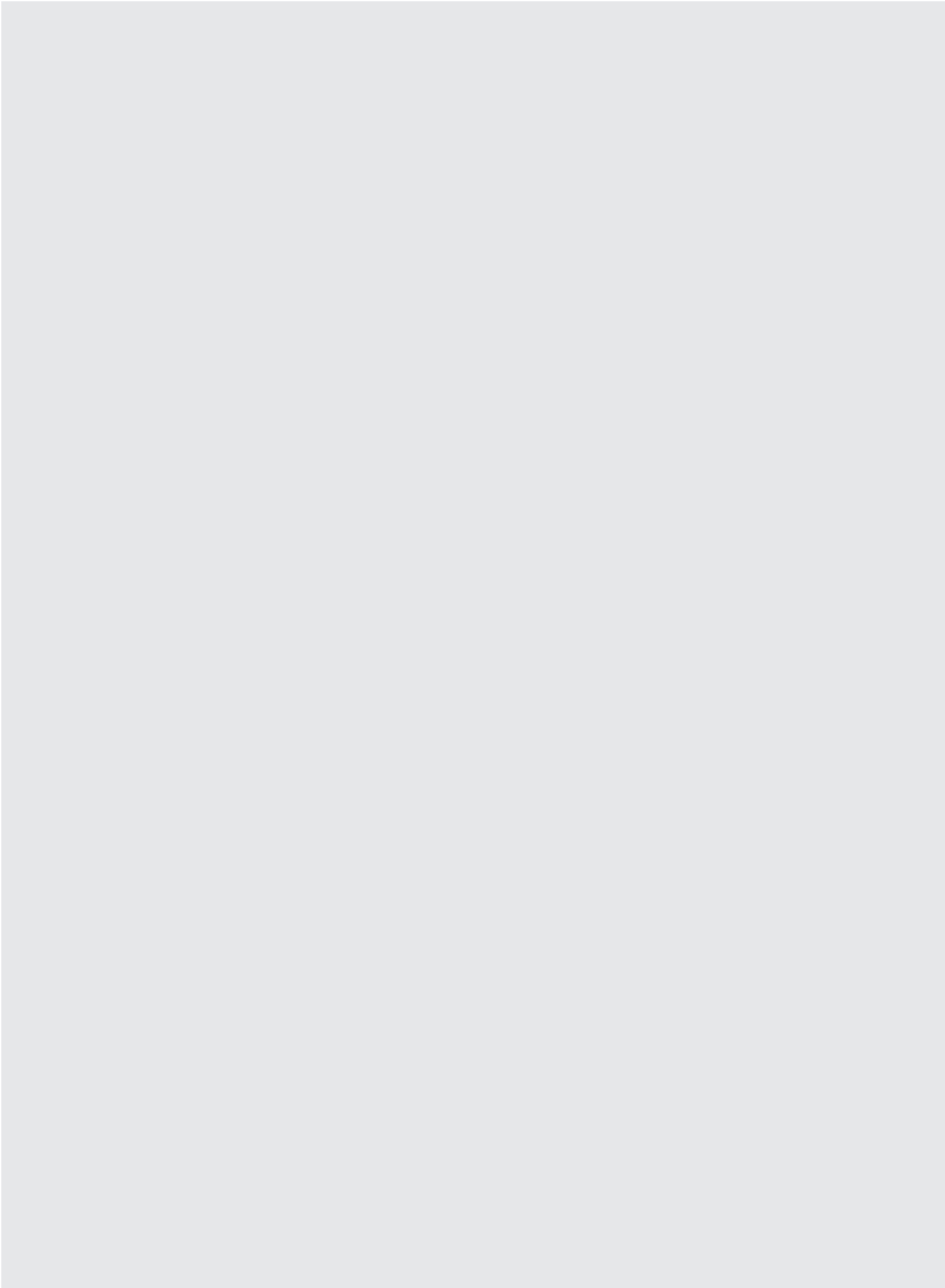


CAUTION: please ensure that deep hole drills are not moved freely at maximum revolution numbers in the machine.

Coolant pressure



The coolant pressure always depends on the machine as every machine has a different cooling system and therefore also shows different leakage. The recommended values are particularly adapted to our tools and their application fields. For our deep hole twist drills, for example, the coolant volume for steel was determined as the tools were particularly designed for this material. Should you drill other materials, the indicated coolant volume is still more than sufficient, as steel and in particular deep hole drills require the largest volume and thus the recommendation can be used in general for all drills.



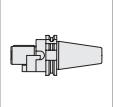
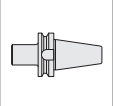
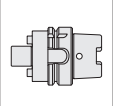
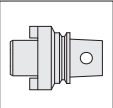




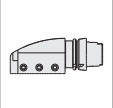

Introduction

	Product extensions	4-5
	Overview	G6-G8


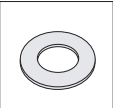
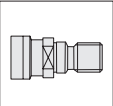
Rotating adapters

	DIN 69871	G10-G25
	MAS-BT	G26-G41
	HSK-A	G42-G51
	UTS	G52-G55


Stationary adapters

	HSK-T	G56-G65
	UTS	G66-G72

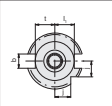

Accessories

	Collet chuck / clamping nut	G74-G85
	Sealing rings	G86-G88
	Pull studs	G89-G91

Accessories

	Other	G92-G93
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Technical information

	Dimensions of HSK adapters	G94
	Spare parts	G95-G96

Spindle nose tooling

Extended product range

G4



Spindle nose tooling from CERATIZIT

To achieve the best possible performance with our cutting tools, Cutting Solutions by CERATIZIT now offers a start programme for spindle nose tooling. Benefit from an even better

service which fully covers all possible connections between spindle and cutting edge.

Programme overview

The standard start programme for rotating and stationary tooling adapters includes over 1,200 articles, available for you ex stock.

For more details, check the overview pages.

Rotating spindle nose tools



Rotating spindle nose tools	DIN 69871	MAS-BT	HSK-A	UTS
Weldon adapters	●	●	●	●
Whistle Notch adapters	●	●	●	●
Collet chucks type ER	●	●	●	●
Collet chucks type OZ	●	●	–	–
Adapters for threaded shank milling cutters	–	–	●	–
Combination shell mill adapters	●	●	–	–
Shell mill adapters, centre bolt	●	●	●	●
Shell mill adapters, 4 bolts	●	●	–	–
Morse taper adapters MK	●	●	●	–
Test bars	●	●	●	–
Blanks	●	●	●	–

Stationary spindle nose tool



Stationary spindle nose tools	HSK-T	UTS
Shank holders	●	●
Boring bar holders	●	●
Extensions	●	●
Reductions	●	–
UTS adapters	●	–
Blanks	●	●
Test bars	–	●
Assembly sets	–	●

Start programme - and off you go!

Our initial programme covers all the common standard tools, such as Weldon, collet chucks, screw-in adapters, shell-mill adapters and more. For rotating tools we offer DIN 69871, MAS-BT and HSK (DIN 69893) adapters. For stationary tools, mainly on multi-function machines, we offer our HSK-T programme as well as the well-known UTS connection.

We manufacture special solutions for special applications upon request.

Your advantages

- ▲ Tools and adapters from one source
- ▲ A growing programme tailored to the market
- ▲ Attractive price-performance ratio
- ▲ Excellent technical advice and services

**"High-performance tools now also available for strong adapters!
Cutting Solutions by CERATIZIT -
your creative partner for competent dialogue."**



Spindle nose tooling



Overview

G6



Rotating spindle nose tools		DIN69871	MAS-BT	HSK-A	UTS
	Weldon adapters	G10-G14	G26-G30	G42-G43	G52
	Whistle Notch adapters	G15	G31	G44-G45	G53
	Collet chucks type ER	G16	G32	G46	G54
	Collet chucks type ER-D	G17	G33		
	Collet chucks type OZ	G18	G34		
	Combination shell mill adapters	G19	G35		
	Shell mill adapters, centre bolt	G20	G36	G47	G55
	Adapters for threaded shank milling cutters			G48	
	Shell mill adapters, 4 bolts	G21	G37		
	Morse taper adapters MT	G22	G38	G49	
	Morse taper adapters MK	G23	G39		
	Test bars	G24	G40	G50	
	Blanks	G25	G41	G51	

Stationary spindle nose tools		HSK-T	UTS
	Tool holders 0°	G56	G68
	Tool holders 45°	G57	
	Tool holders 90° / neutral	G58	
	Multiple shank holders	G59	G69
	Boring bar holders	G60	G67
	Extensions	G61	G70
	Reductions	G62	
	UTS adapters	G63	
	Blanks	G64	G72
	Test bars	G65	G71
	Assembly sets		G66





Accessories		
	Collets ER	G74-G78
	Collets DIN6388-B	G79-G82

Spindle nose tooling

Overview



Accessories

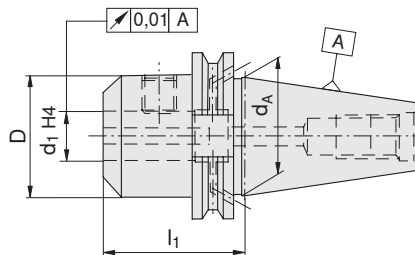
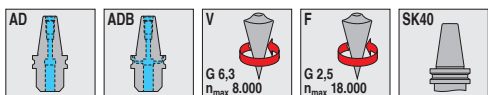
	Lock nuts ER	G83
	Lock nuts ER-D	G84
	Lock nuts OZ	G85
	Sealing rings	G86-G88
	Pull studs DIN 69871	G89
	Pull studs MAS-BT	G90
	Pull studs DIN 7388	G91
	Reducers MK	G92
	Drive rings	G93



DIN 69871

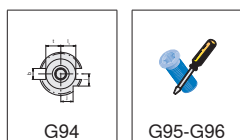
Weldon adapters

G10

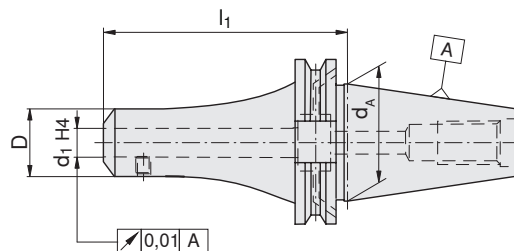
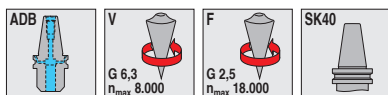



Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
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69871-ADB40-WE06-50-V	6	50	40	25	E01
69871-ADB40-WE08-50-F	8	50	40	28	E02
69871-ADB40-WE08-50-V	8	50	40	28	E02
69871-ADB40-WE10-50-F	10	50	40	35	E03
69871-ADB40-WE10-50-V	10	50	40	35	E03
69871-ADB40-WE12-50-F	12	50	40	42	E04
69871-ADB40-WE12-50-V	12	50	40	42	E04
69871-ADB40-WE14-50-F	14	50	40	44	E04
69871-ADB40-WE14-50-V	14	50	40	44	E04
69871-AD40-WE16-35-F	16	35	40	48	E05
69871-AD40-WE16-35-V	16	35	40	48	E05
69871-ADB40-WE16-63-F	16	63	40	48	E05
69871-ADB40-WE16-63-V	16	63	40	48	E05
69871-ADB40-WE18-63-F	18	63	40	50	E05
69871-ADB40-WE18-63-V	18	63	40	50	E05
69871-AD40-WE20-35-F	20	35	40	50	E06
69871-AD40-WE20-35-V	20	35	40	50	E06
69871-ADB40-WE20-63-F	20	63	40	52	E06
69871-ADB40-WE20-63-V	20	63	40	52	E06
69871-AD40-WE25-40-F	25	40	40	50	E07
69871-AD40-WE25-40-V	25	40	40	50	E07
69871-ADB40-WE25-100-F	25	100	40	65	E07
69871-ADB40-WE25-100-V	25	100	40	65	E07
69871-ADB40-WE32-100-F	32	100	40	72	E08
69871-ADB40-WE32-100-V	32	100	40	72	E08
69871-ADB40-WE40-120-V	40	120	40	90	E09




E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500
E08	8395029000	6295003200
E09		6295003200

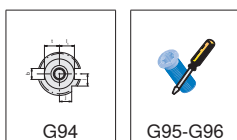


Spindle nose tools / Rotating



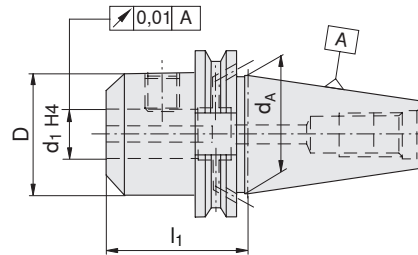
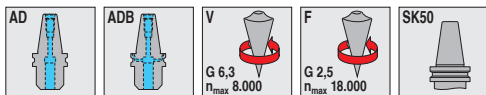
Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
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69871-ADB40-WE06-160-F	6	160	40	25	E01
69871-ADB40-WE06-160-V	6	160	40	25	E01
69871-ADB40-WE08-100-F	8	100	40	28	E02
69871-ADB40-WE08-100-V	8	100	40	28	E02
69871-ADB40-WE08-160-F	8	160	40	28	E02
69871-ADB40-WE08-160-V	8	160	40	28	E02
69871-ADB40-WE10-100-F	10	100	40	35	E03
69871-ADB40-WE10-100-V	10	100	40	35	E03
69871-ADB40-WE10-160-F	10	160	40	35	E03
69871-ADB40-WE10-160-V	10	160	40	35	E03
69871-ADB40-WE12-100-F	12	100	40	42	E04
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69871-ADB40-WE12-160-F	12	160	40	42	E04
69871-ADB40-WE12-160-V	12	160	40	42	E04
69871-ADB40-WE14-160-F	14	160	40	44	E04
69871-ADB40-WE14-160-V	14	160	40	44	E04
69871-ADB40-WE16-100-F	16	100	40	48	E05
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69871-ADB40-WE16-160-F	16	160	40	48	E05
69871-ADB40-WE16-160-V	16	160	40	48	E05
69871-ADB40-WE18-160-F	18	160	40	50	E05
69871-ADB40-WE18-160-V	18	160	40	50	E05
69871-ADB40-WE20-100-F	20	100	40	52	E06
69871-ADB40-WE20-100-V	20	100	40	52	E06
69871-ADB40-WE20-160-F	20	160	40	52	E06
69871-ADB40-WE20-160-V	20	160	40	52	E06
69871-ADB40-WE25-160-F	25	160	40	65	E07
69871-ADB40-WE25-160-V	25	160	40	65	E07

		
E01	8395003300	6295000600
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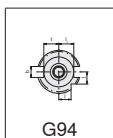
DIN 69871

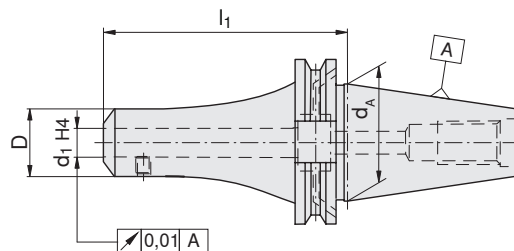
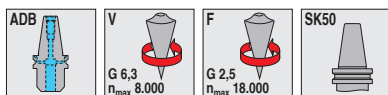
Weldon adapters







Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
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69871-ADB50-WE06-63-V	6	63	50	25	E01
69871-ADB50-WE08-63-F	8	63	50	28	E02
69871-ADB50-WE08-63-V	8	63	50	28	E02
69871-ADB50-WE10-63-F	10	63	50	35	E03
69871-ADB50-WE10-63-V	10	63	50	35	E03
69871-ADB50-WE12-63-F	12	63	50	42	E04
69871-ADB50-WE12-63-V	12	63	50	42	E04
69871-ADB50-WE14-63-F	14	63	50	44	E04
69871-ADB50-WE14-63-V	14	63	50	44	E04
69871-ADB50-WE16-63-F	16	63	50	48	E05
69871-ADB50-WE16-63-V	16	63	50	48	E05
69871-ADB50-WE18-63-F	18	63	50	50	E05
69871-ADB50-WE18-63-V	18	63	50	50	E05
69871-ADB50-WE20-63-F	20	63	50	52	E06
69871-ADB50-WE20-63-V	20	63	50	52	E06
69871-ADB50-WE25-80-F	25	80	50	65	E07
69871-ADB50-WE25-80-V	25	80	50	65	E07
69871-ADB50-WE32-100-F	32	100	50	72	E08
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69871-ADB50-WE40-120-V	40	120	50	90	E09

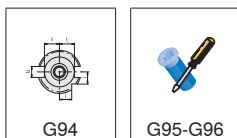
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E06	8395027200	6295002000
E07	8395029000	6295002500
E08	8395029000	6295003200
E09		6295003200





Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
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69871-ADB50-WE06-160-V	6	160	50	25	E01
69871-ADB50-WE08-100-V	8	100	50	28	E02
69871-ADB50-WE08-160-V	8	160	50	28	E02
69871-ADB50-WE10-100-V	10	100	50	35	E03
69871-ADB50-WE10-160-V	10	160	50	35	E03
69871-ADB50-WE12-100-V	12	100	50	42	E04
69871-ADB50-WE12-160-V	12	160	50	42	E04
69871-ADB50-WE14-100-V	14	100	50	44	E04
69871-ADB50-WE14-160-V	14	160	50	44	E04
69871-ADB50-WE16-100-V	16	100	50	48	E05
69871-ADB50-WE16-160-V	16	160	50	48	E05
69871-ADB50-WE18-100-V	18	100	50	50	E05
69871-ADB50-WE18-160-V	18	160	50	50	E05
69871-ADB50-WE20-100-V	20	100	50	52	E06
69871-ADB50-WE20-160-V	20	160	50	52	E06
69871-ADB50-WE25-100-V	25	100	50	65	E07
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69871-ADB50-WE32-160-V	32	160	50	72	E08

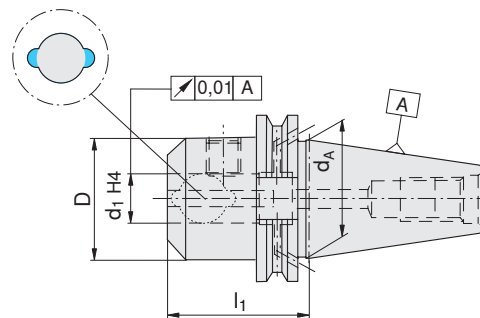
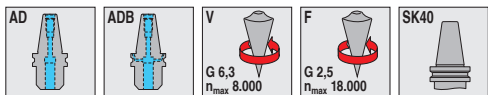
		
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DIN 69871

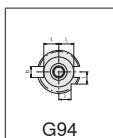
Weldon adapters with through-coolant (IK)

G14

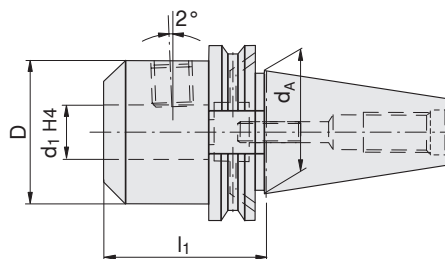
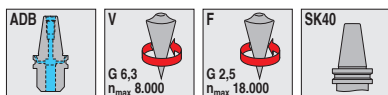



Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
69871-ADB40-WE06IK-50-F	6	50	40	25	E01
69871-ADB40-WE06IK-50-V	6	50	40	25	E01
69871-ADB40-WE08IK-50-F	8	50	40	28	E02
69871-ADB40-WE08IK-50-V	8	50	40	28	E02
69871-ADB40-WE10IK-50-F	10	50	40	35	E03
69871-ADB40-WE10IK-50-V	10	50	40	35	E03
69871-ADB40-WE12IK-50-F	12	50	40	42	E04
69871-ADB40-WE12IK-50-V	12	50	40	42	E04
69871-ADB40-WE14IK-50-F	14	50	40	44	E04
69871-ADB40-WE14IK-50-V	14	50	40	44	E04
69871-AD40-WE16IK-35-V	16	35	40	48	E05
69871-ADB40-WE16IK-63-F	16	63	40	48	E05
69871-ADB40-WE16IK-63-V	16	63	40	48	E05
69871-ADB40-WE18IK-63-F	18	63	40	50	E05
69871-ADB40-WE18IK-63-V	18	63	40	50	E05
69871-AD40-WE20IK-35-V	20	35	40	50	E06
69871-ADB40-WE20IK-63-F	20	63	40	52	E06
69871-ADB40-WE20IK-63-V	20	63	40	52	E06
69871-AD40-WE25IK-40-V	25	40	40	50	E07
69871-ADB40-WE25IK-100-F	25	100	40	65	E07
69871-ADB40-WE25IK-100-V	25	100	40	65	E07
69871-ADB40-WE32IK-100-V	32	100	40	72	E08




E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500
E08	8395029000	6295003200

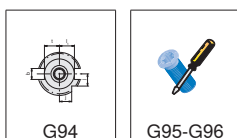


Spindle nose tools / Rotating



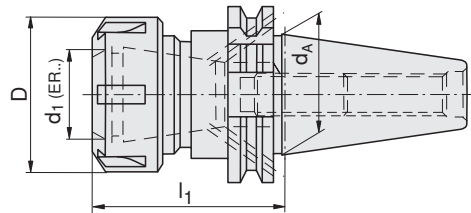
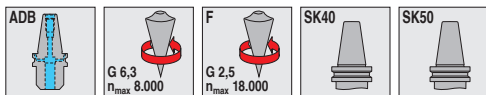
Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
69871-ADB40-WN06-50-F	6	50	40	25	E01
69871-ADB40-WN06-50-V	6	50	40	25	E01
69871-ADB40-WN08-50-F	8	50	40	28	E02
69871-ADB40-WN08-50-V	8	50	40	28	E02
69871-ADB40-WN10-50-F	10	50	40	35	E03
69871-ADB40-WN10-50-V	10	50	40	35	E03
69871-ADB40-WN12-50-F	12	50	40	42	E04
69871-ADB40-WN12-50-V	12	50	40	42	E04
69871-ADB40-WN14-50-F	14	50	40	44	E04
69871-ADB40-WN14-50-V	14	50	40	44	E04
69871-ADB40-WN16-63-F	16	63	40	48	E05
69871-ADB40-WN16-63-V	16	63	40	48	E05
69871-ADB40-WN18-63-F	18	63	40	50	E05
69871-ADB40-WN18-63-V	18	63	40	50	E05
69871-ADB40-WN20-63-F	20	63	40	52	E06
69871-ADB40-WN20-63-V	20	63	40	52	E06

		
E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000



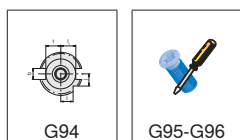
DIN 69871

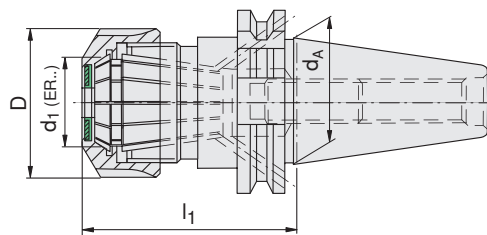
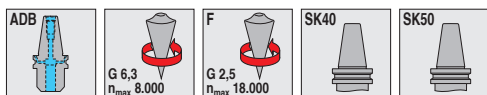
Collet chucks type ER








Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
69871-ADB40-ER16-60	16	60	40	32	E01
69871-ADB40-ER16-60-F	16	60	40	32	E01
69871-ADB40-ER16-120	16	120	40	32	E01
69871-ADB40-ER16-120-F	16	120	40	32	E01
69871-ADB40-ER25-70	25	70	40	42	E02
69871-ADB40-ER25-70-F	25	70	40	42	E02
69871-ADB40-ER25-120	25	120	40	42	E02
69871-ADB40-ER25-120-F	25	120	40	42	E02
69871-ADB40-ER32-70	32	70	40	50	E03
69871-ADB40-ER32-70-F	32	70	40	50	E03
69871-ADB40-ER32-120	32	120	40	50	E03
69871-ADB40-ER32-120-F	32	120	40	50	E03
69871-ADB40-ER40-70	40	70	40	63	E04
69871-ADB40-ER40-70-F	40	70	40	63	E04
69871-ADB50-ER25-70	25	70	50	42	E02
69871-ADB50-ER25-100	25	100	50	42	E02
69871-ADB50-ER25-160	25	160	50	42	E02
69871-ADB50-ER32-70	32	70	50	50	E03
69871-ADB50-ER32-100	32	100	50	50	E03
69871-ADB50-ER32-160	32	160	50	50	E03
69871-ADB50-ER40-70	40	70	50	63	E04
69871-ADB50-ER40-100	40	100	50	63	E04

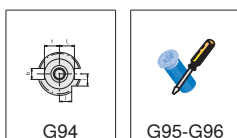
E01	6295005400		8335711600
E02	6295005500	8395001000	8335712500
E03	6295005600	8395001000	8335713200
E04	6295005700	8395001100	8335714000





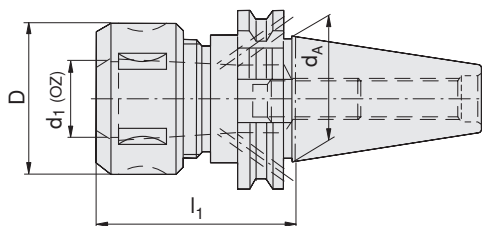
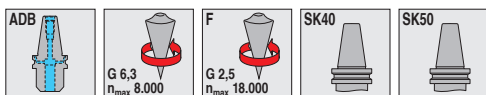
Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
69871-ADB40-ER25D-73	25	73	40	42	E01
69871-ADB40-ER25D-73-F	25	73	40	42	E01
69871-ADB40-ER25D-123	25	123	40	42	E01
69871-ADB40-ER25D-123-F	25	123	40	42	E01
69871-ADB40-ER32D-73	32	73	40	50	E02
69871-ADB40-ER32D-73-F	32	73	40	50	E02
69871-ADB40-ER32D-123	32	123	40	50	E02
69871-ADB40-ER32D-123-F	32	123	40	50	E02
69871-ADB40-ER40D-73	40	73	40	63	E03
69871-ADB40-ER40D-73-F	40	73	40	63	E03
69871-ADB40-ER40D-123	40	123	40	63	E03
69871-ADB40-ER40D-123-F	40	123	40	63	E03
69871-ADB50-ER25D-73	25	73	50	42	E01
69871-ADB50-ER25D-103	25	103	50	42	E01
69871-ADB50-ER32D-73	32	73	50	50	E02
69871-ADB50-ER32D-103	32	103	50	50	E02

			
E01	8395005500	8395001000	8335712500
E02	8395005600	8395001000	8335713200
E03	8395005700	8395001100	8335714000



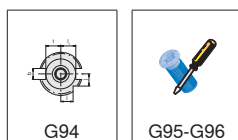
DIN 69871

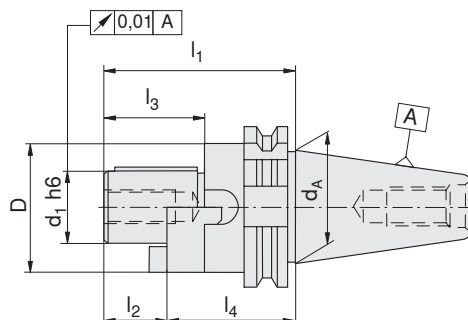
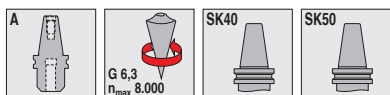
Collet chucks type OZ



Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
69871-ADB40-BC2-16-70	16	70	40	43	E01
69871-ADB40-BC2-16-70-F	16	70	40	43	E01
69871-ADB40-BC2-16-120	16	120	40	43	E01
69871-ADB40-BC2-16-120-F	16	120	40	43	E01
69871-ADB40-BC2-25-70	25	70	40	60	E02
69871-ADB40-BC2-25-70-F	25	70	40	60	E02
69871-ADB40-BC2-25-120	25	120	40	60	E02
69871-ADB40-BC2-25-120-F	25	120	40	60	E02
69871-ADB50-BC2-16-70	16	70	50	43	E01
69871-ADB50-BC2-16-100	16	100	50	43	E01
69871-ADB50-BC2-25-70	25	70	50	60	E02
69871-ADB50-BC2-25-100	25	100	50	60	E02
69871-ADB50-BC4-32-73	32	70	50	72	E03

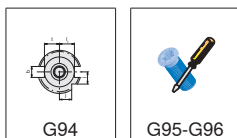
E01	6295005000	8395001000	8335411600
E02	6295005100	8395001000	8335412500
E03		8395001100	8335413200





Type, description	d ₁ [mm]	d _A [mm]	D [mm]	l ₁ [mm]	l ₂ [mm]	l ₃ [mm]	l ₄ [mm]	
69871-A40-KA16-55	16	40	32	72	17	27	55	E01
69871-A40-KA22-55	22	40	40	74	19	31	55	E02
69871-A40-KA27-55	27	40	48	76	21	33	55	E03
69871-A40-KA32-60	32	40	58	84	24	38	60	E04
69871-A40-KA40-60	40	40	70	87	27	41	60	E05
69871-A50-KA16-55	16	50	32	72	17	27	55	E01
69871-A50-KA22-55	22	50	40	74	19	31	55	E02
69871-A50-KA27-55	27	50	48	76	21	33	55	E03
69871-A50-KA32-55	32	50	58	79	24	38	55	E04
69871-A50-KA40-55	40	50	70	82	27	41	55	E05
69871-A50-KA50-70	50	50	80	100	30	46	70	E06

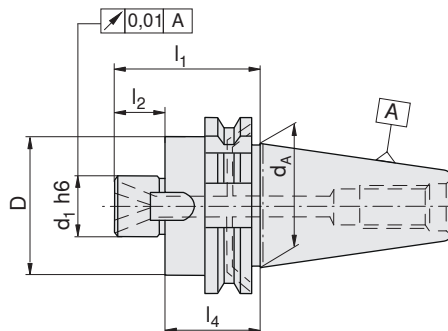
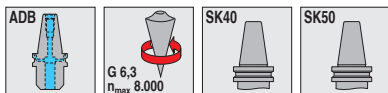
E01	8337011600	8395028400	8395011300	8336701600	8336811600
E02	8337012200	8395028500	8395012400	8336702200	8336812200
E03	8337012700	8395028600	8395012500	8336702700	8336812700
E04	8337013200	8395028700	8395012600	8336703200	8336813200
E05	8337014000	8395028800	8395011200	8336704000	8336814000
E06	8337015000	8395028900		8336705000	



DIN 69871

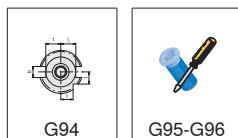
Shell mill adapters, centre bolt

G20



Type, description	d ₁ [mm]	d _A [mm]	D [mm]	l ₁ [mm]	l ₂ [mm]	l ₄ [mm]	
69871-ADB40-QA16-44	16	40	38	61	17	44	E01
69871-ADB40-QA16-100	16	40	38	117	17	100	E01
69871-ADB40-QA16-160	16	40	38	177	17	160	E01
69871-ADB40-QA22-44	22	40	48	63	19	44	E02
69871-ADB40-QA22-100	22	40	48	119	19	100	E02
69871-ADB40-QA22-160	22	40	48	179	19	160	E02
69871-ADB40-QA27-55	27	40	58	76	21	55	E03
69871-ADB40-QA27-100	27	40	58	121	21	100	E03
69871-ADB40-QA27-160	27	40	58	181	21	160	E03
69871-ADB40-QA32-50	32	40	78	74	24	50	E04
69871-ADB40-QA32-100	32	40	78	124	24	100	E04
69871-ADB40-QA32-160	32	40	78	184	24	160	E04
69871-ADB40-QA40-50	40	40	88	77	27	50	E05
69871-ADB40-QA40-100	40	40	88	127	27	100	E05
69871-ADB40-QA40-160	40	40	88	187	27	160	E05
69871-ADB50-QA16-44	16	50	38	61	17	44	E01
69871-ADB50-QA16-100	16	50	38	117	17	100	E01
69871-ADB50-QA16-160	16	50	38	177	17	160	E01
69871-ADB50-QA22-44	22	50	48	61	19	44	E02
69871-ADB50-QA22-100	22	50	48	119	19	100	E02
69871-ADB50-QA22-160	22	50	48	179	19	160	E02
69871-ADB50-QA27-44	27	50	58	65	21	44	E03
69871-ADB50-QA27-100	27	50	58	121	21	100	E03
69871-ADB50-QA27-160	27	50	58	181	21	160	E03
69871-ADB50-QA32-40	32	50	78	64	24	40	E04
69871-ADB50-QA32-100	32	50	78	124	24	100	E04
69871-ADB50-QA32-160	32	50	78	184	24	160	E04
69871-ADB50-QA40-50	40	50	88	77	27	50	E05
69871-ADB50-QA40-100	40	50	88	127	27	100	E05
69871-ADB50-QA40-160	40	50	88	187	27	160	E05

E01	8395012000	8395029600	8395011300	8336701600	8336811600
E02	8395012100	8395029700	8395012400	8336702200	8336812200
E03	8395012200	8395013600	8395012500	8336702700	8336812700
E04	8395012300	8395013700	8395012600	8336703200	8336813200
E05	8395029500	8395013800	8395011200	8336704000	8336814000

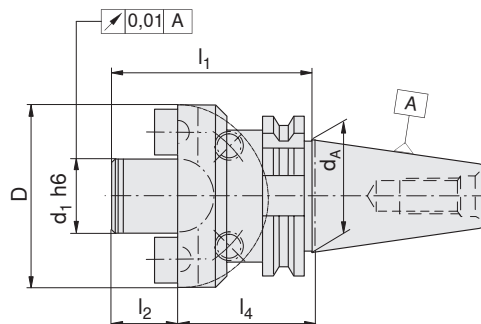
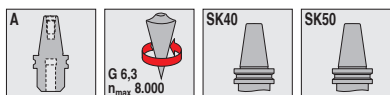


Spindle nose tools / Rotating

DIN 69871

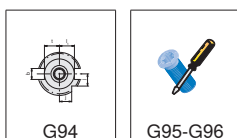
Shell mill adapters, 4 bolts

G21



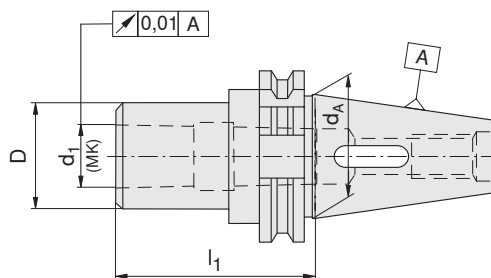
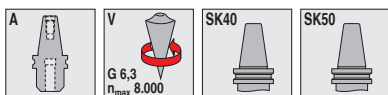
Type, description	d ₁ [mm]	d _A [mm]	D [mm]	l ₁ [mm]	l ₂ [mm]	l ₄ [mm]	
69871-A40-MA40-60	40	40	89	90	30	60	E01
69871-A50-MA40-70	40	50	89	100	30	70	E01
69871-A50-MA60-70	60	50	129	110	40	70	E02

E01	8395029500	8395013800	8395014000
E02	8395029800		333940 / 8395016000

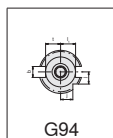


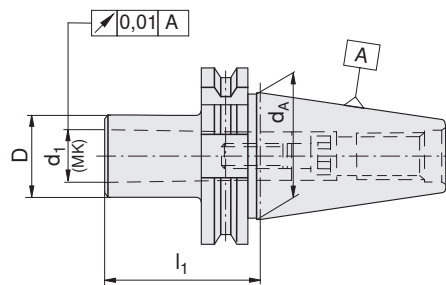
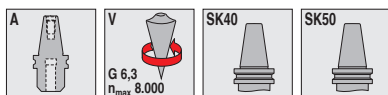
DIN 69871


Morse taper adapters MT








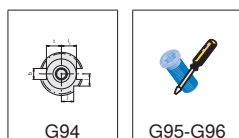
Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]
69871-A40-MK1D-50-V	1	50	40	25
69871-A40-MK2D-50-V	2	50	40	32
69871-A40-MK3D-70-V	3	70	40	40
69871-A40-MK4D-95-V	4	95	40	48
69871-A50-MK1D-50-V	1	50	50	25
69871-A50-MK2D-60-V	2	60	50	32
69871-A50-MK3D-65-V	3	65	50	40
69871-A50-MK4D-95-V	4	95	50	48
69871-A50-MK5D-105-V	5	105	50	63





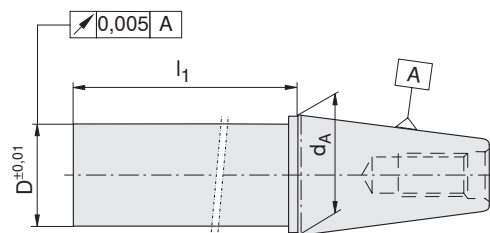
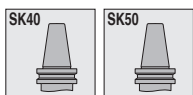
Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
69871-A40-MK1C-50-V	1	50	40	25	E01
69871-A40-MK2C-50-V	2	50	40	32	E02
69871-A40-MK3C-70-V	3	70	40	40	E03
69871-A40-MK4C-95-V	4	95	40	48	E04
69871-A50-MK1C-45-V	1	45	50	25	E05
69871-A50-MK2C-60-V	2	60	50	32	E06
69871-A50-MK3C-65-V	3	65	50	40	E07
69871-A50-MK4C-95-V	4	95	50	48	E04
69871-A50-MK5C-120-V	5	120	50	63	E08

				
E01	8335901300	8395003000	8395026000	8395026500
E02	8335901300	8395003100	8395026100	8395026700
E03	8335901700	8395003000	8395001800	8395026900
E04	8335902300	8395003100	8395001900	8395027000
E05	8335902000	8395003100	8395026000	8395026600
E06	8335902000	8395003100	8395001700	8395026800
E07	8335901700	8395003100	8395001700	8395026900
E08	8335903300	8395003100	8395026200	8395027100

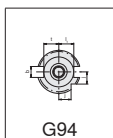


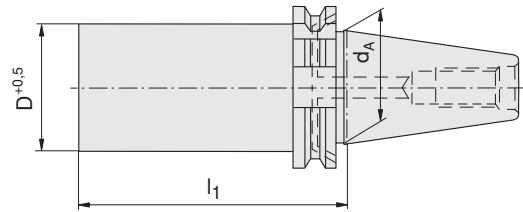
DIN 69871

Test bars

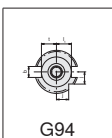


Type, description	d_A [mm]	D [mm]	l [mm]
DIN69871/MAS-BT-A40.KD.40.330	40	40	330
DIN69871/MAS-BT-A50.KD.50.330	50	50	330





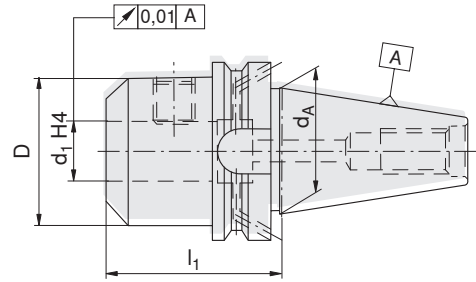
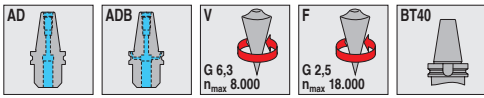
Type, description	d_A [mm]	D [mm]	l [mm]
69871-ADB40-HF63-250	40	63	250
69871-ADB50-HF63,5-300	50	63.5	300



MAS-BT

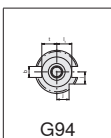
Weldon adapters

G26



Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
MAS-BT-ADB40-WE06-50-F	6	50	40	25	E01
MAS-BT-ADB40-WE06-50-V	6	50	40	25	E01
MAS-BT-ADB40-WE08-50-F	8	50	40	28	E02
MAS-BT-ADB40-WE08-50-V	8	50	40	28	E02
MAS-BT-ADB40-WE10-63-F	10	50	40	35	E03
MAS-BT-ADB40-WE10-63-V	10	50	40	35	E03
MAS-BT-ADB40-WE12-63-F	12	50	40	42	E04
MAS-BT-ADB40-WE12-63-V	12	50	40	42	E04
MAS-BT-ADB40-WE14-63-F	14	50	40	44	E04
MAS-BT-ADB40-WE14-63-V	14	50	40	44	E04
MAS-BT-AD40-WE16-35-F	16	35	40	48	E05
MAS-BT-AD40-WE16-35-V	16	35	40	48	E05
MAS-BT-ADB40-WE16-63-F	16	63	40	48	E06
MAS-BT-ADB40-WE16-63-V	16	63	40	48	E06
MAS-BT-ADB40-WE18-63-F	18	63	40	50	E06
MAS-BT-ADB40-WE18-63-V	18	63	40	50	E06
MAS-BT-AD40-WE20-35-F	20	35	40	50	E07
MAS-BT-AD40-WE20-35-V	20	35	40	50	E07
MAS-BT-ADB40-WE20-63-F	20	63	40	52	E08
MAS-BT-ADB40-WE20-63-V	20	63	40	52	E08
MAS-BT-AD40-WE25-40-F	25	40	40	50	E09
MAS-BT-AD40-WE25-40-V	25	40	40	50	E09
MAS-BT-ADB40-WE25-100-F	25	100	40	65	E10
MAS-BT-ADB40-WE25-100-V	25	100	40	65	E10
MAS-BT-ADB40-WE32-100-F	32	100	40	72	E11
MAS-BT-ADB40-WE32-100-V	32	100	40	72	E11
MAS-BT-ADB40-WE40-120-V	40	120	40	90	E12

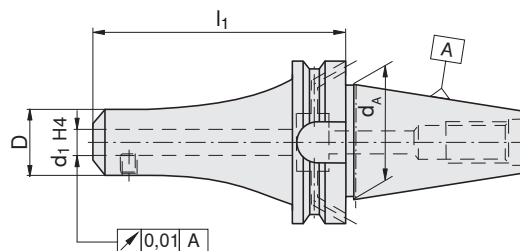
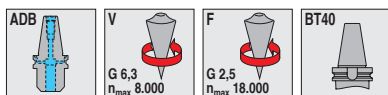
E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05		6295001600
E06	8395003700	6295001600
E07		6295002000
E08	8395027200	6295002000
E09		6295002500
E10	8395029000	6295002500
E11	8395029000	6295003200
E12		6295003200







MAS-BT

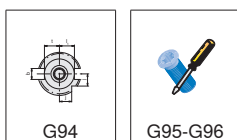
Weldon adapters, long

G27



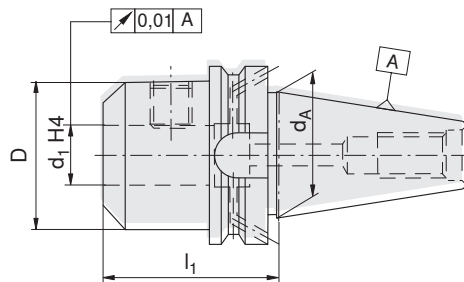
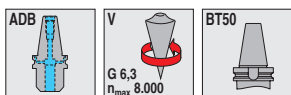
Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
MAS-BT-ADB40-WE06-100-F	6	100	40	25	E01
MAS-BT-ADB40-WE06-100-V	6	100	40	25	E01
MAS-BT-ADB40-WE06-160-F	6	160	40	25	E01
MAS-BT-ADB40-WE06-160-V	6	160	40	25	E01
MAS-BT-ADB40-WE08-100-F	8	100	40	28	E02
MAS-BT-ADB40-WE08-100-V	8	100	40	28	E02
MAS-BT-ADB40-WE08-160-F	8	160	40	28	E02
MAS-BT-ADB40-WE08-160-V	8	160	40	28	E02
MAS-BT-ADB40-WE10-100-F	10	100	40	35	E03
MAS-BT-ADB40-WE10-100-V	10	100	40	35	E03
MAS-BT-ADB40-WE10-160-F	10	160	40	35	E03
MAS-BT-ADB40-WE10-160-V	10	160	40	35	E03
MAS-BT-ADB40-WE12-100-F	12	100	40	42	E04
MAS-BT-ADB40-WE12-100-V	12	100	40	42	E04
MAS-BT-ADB40-WE12-160-F	12	160	40	42	E04
MAS-BT-ADB40-WE12-160-V	12	160	40	42	E04
MAS-BT-ADB40-WE14-160-F	14	160	40	44	E04
MAS-BT-ADB40-WE14-160-V	14	160	40	44	E04
MAS-BT-ADB40-WE16-100-F	16	100	40	48	E05
MAS-BT-ADB40-WE16-100-V	16	100	40	48	E05
MAS-BT-ADB40-WE16-160-F	16	160	40	48	E05
MAS-BT-ADB40-WE16-160-V	16	160	40	48	E05
MAS-BT-ADB40-WE18-160-F	18	160	40	50	E05
MAS-BT-ADB40-WE18-160-V	18	160	40	50	E05
MAS-BT-ADB40-WE20-100-F	20	100	40	52	E06
MAS-BT-ADB40-WE20-100-V	20	100	40	52	E06
MAS-BT-ADB40-WE20-160-F	20	160	40	52	E06
MAS-BT-ADB40-WE20-160-V	20	160	40	52	E06
MAS-BT-ADB40-WE25-160-F	25	160	40	65	E07
MAS-BT-ADB40-WE25-160-V	25	160	40	65	E07

		
E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500



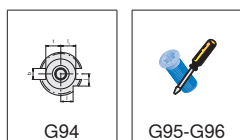
MAS-BT

Weldon adapters



Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
MAS-BT-ADB50-WE06-63-V	6	63	50	25	E01
MAS-BT-ADB50-WE08-63-V	8	63	50	28	E02
MAS-BT-ADB50-WE10-80-V	10	80	50	35	E03
MAS-BT-ADB50-WE12-80-V	12	80	50	42	E04
MAS-BT-ADB50-WE14-80-V	14	80	50	44	E04
MAS-BT-ADB50-WE16-80-V	16	80	50	48	E05
MAS-BT-ADB50-WE18-80-V	18	80	50	50	E05
MAS-BT-ADB50-WE20-80-V	20	80	50	52	E06
MAS-BT-ADB50-WE25-100-V	25	100	50	65	E07
MAS-BT-ADB50-WE32-105-V	32	105	50	72	E08
MAS-BT-ADB50-WE40-120-V	40	120	50	90	E09

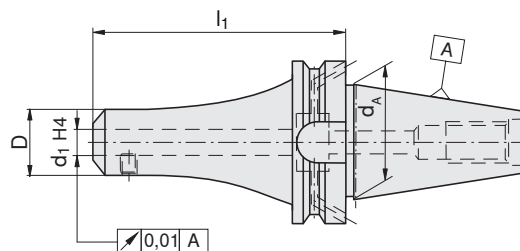
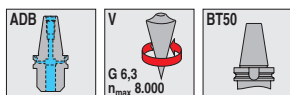
E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500
E08	8395029000	6295003200
E09		6295003200



MAS-BT

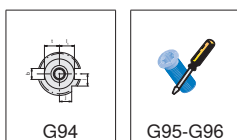
Weldon adapters, long

G29



Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
MAS-BT-ADB50-WE06-100-V	6	100	50	25	E01
MAS-BT-ADB50-WE06-160-V	6	160	50	25	E01
MAS-BT-ADB50-WE08-100-V	8	100	50	28	E02
MAS-BT-ADB50-WE08-160-V	8	160	50	28	E02
MAS-BT-ADB50-WE10-100-V	10	100	50	35	E03
MAS-BT-ADB50-WE10-160-V	10	160	50	35	E03
MAS-BT-ADB50-WE12-100-V	12	100	50	42	E04
MAS-BT-ADB50-WE12-160-V	12	160	50	42	E04
MAS-BT-ADB50-WE14-100-V	14	100	50	44	E04
MAS-BT-ADB50-WE14-160-V	14	160	50	44	E04
MAS-BT-ADB50-WE16-100-V	16	100	50	48	E05
MAS-BT-ADB50-WE16-160-V	16	160	50	48	E05
MAS-BT-ADB50-WE18-100-V	18	100	50	50	E05
MAS-BT-ADB50-WE18-160-V	18	160	50	50	E05
MAS-BT-ADB50-WE20-100-V	20	100	50	52	E06
MAS-BT-ADB50-WE20-160-V	20	160	50	52	E06
MAS-BT-ADB50-WE25-120-V	25	120	50	65	E07
MAS-BT-ADB50-WE25-160-V	25	160	50	65	E07
MAS-BT-ADB50-WE32-160-V	32	160	50	72	E08

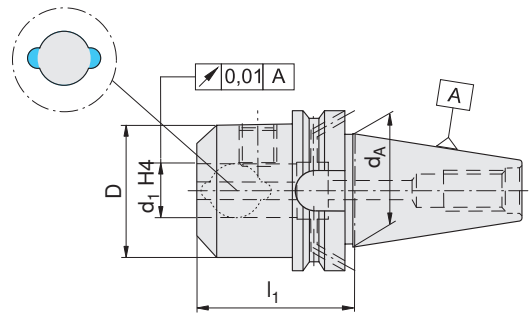
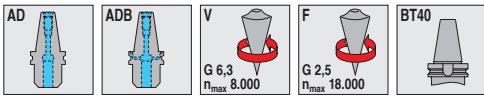
E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500
E08	8395029000	6295003200



MAS-BT

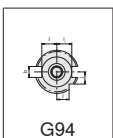
Weldon adapters with through-coolant (IK)

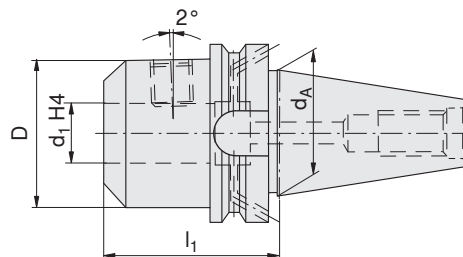
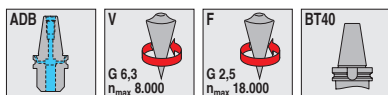
G30



Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
MAS-BT-ADB40-WE06IK-50-F	6	50	40	25	E01
MAS-BT-ADB40-WE06IK-50-V	6	50	40	25	E01
MAS-BT-ADB40-WE08IK-50-F	8	50	40	28	E02
MAS-BT-ADB40-WE08IK-50-V	8	50	40	28	E02
MAS-BT-ADB40-WE10IK-63-F	10	63	40	35	E03
MAS-BT-ADB40-WE10IK-63-V	10	63	40	35	E03
MAS-BT-ADB40-WE12IK-63-F	12	63	40	42	E04
MAS-BT-ADB40-WE12IK-63-V	12	63	40	42	E04
MAS-BT-ADB40-WE14IK-63-F	14	63	40	44	E04
MAS-BT-ADB40-WE14IK-63-V	14	63	40	44	E04
MAS-BT-AD40-WE16IK-35-V	16	35	40	48	E05
MAS-BT-ADB40-WE16IK-63-F	16	63	40	48	E05
MAS-BT-ADB40-WE16IK-63-V	16	63	40	48	E05
MAS-BT-ADB40-WE18IK-63-F	18	63	40	50	E05
MAS-BT-ADB40-WE18IK-63-V	18	63	40	50	E05
MAS-BT-AD40-WE20IK-35-V	20	35	40	50	E06
MAS-BT-ADB40-WE20IK-63-F	20	63	40	52	E06
MAS-BT-ADB40-WE20IK-63-V	20	63	40	52	E06
MAS-BT-AD40-WE25IK-40-V	25	40	40	50	E07
MAS-BT-ADB40-WE25IK-100-F	25	100	40	65	E07
MAS-BT-ADB40-WE25IK-100-V	25	100	40	65	E07
MAS-BT-ADB40-WE32IK-100-V	32	100	40	72	E08

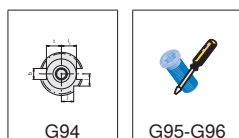
E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500
E08	8395029000	6295003200





Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
MAS-BT-ADB40-WN06-50-F	6	50	40	25	E01
MAS-BT-ADB40-WN06-50-V	6	50	40	25	E01
MAS-BT-ADB40-WN08-50-F	8	50	40	28	E02
MAS-BT-ADB40-WN08-50-V	8	50	40	28	E02
MAS-BT-ADB40-WN10-63-F	10	63	40	35	E03
MAS-BT-ADB40-WN10-63-V	10	63	40	35	E03
MAS-BT-ADB40-WN12-63-F	12	63	40	42	E04
MAS-BT-ADB40-WN12-63-V	12	63	40	42	E04
MAS-BT-ADB40-WN14-63-F	14	63	40	44	E04
MAS-BT-ADB40-WN14-63-V	14	63	40	44	E04
MAS-BT-ADB40-WN16-63-F	16	63	40	48	E05
MAS-BT-ADB40-WN16-63-V	16	63	40	48	E05
MAS-BT-ADB40-WN18-63-F	18	63	40	50	E05
MAS-BT-ADB40-WN18-63-V	18	63	40	50	E05
MAS-BT-ADB40-WN20-63-V	20	63	40	52	E06

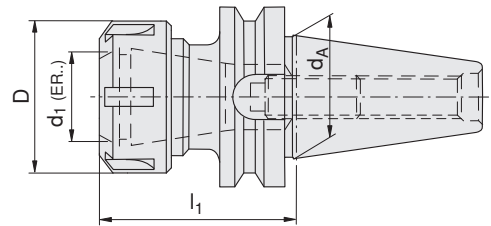
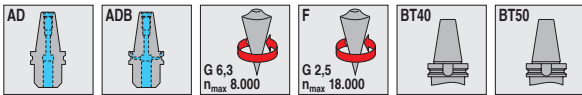
E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000






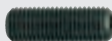

MAS-BT

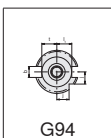
Collet chucks type ER

G32



Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
MAS-BT-ADB40-ER16-60	16	60	40	32	E01
MAS-BT-ADB40-ER16-60-F	16	60	40	32	E01
MAS-BT-ADB40-ER16-120	16	120	40	32	E01
MAS-BT-ADB40-ER16-120-F	16	120	40	32	E01
MAS-BT-ADB40-ER25-70	25	70	40	42	E02
MAS-BT-ADB40-ER25-70-F	25	70	40	42	E02
MAS-BT-ADB40-ER25-120	25	120	40	42	E02
MAS-BT-ADB40-ER25-120-F	25	120	40	42	E02
MAS-BT-ADB40-ER32-70	32	70	40	50	E03
MAS-BT-ADB40-ER32-70-F	32	70	40	50	E03
MAS-BT-ADB40-ER32-120	32	120	40	50	E03
MAS-BT-ADB40-ER32-120-F	32	120	40	50	E03
MAS-BT-ADB40-ER40-70	40	70	40	63	E04
MAS-BT-ADB40-ER40-70-F	40	70	40	63	E04
MAS-BT-AD50-ER25-100	25	100	50	42	E02
MAS-BT-AD50-ER25-160	25	160	50	42	E02
MAS-BT-AD50-ER.2-20.75	32	75	50	50	E03
MAS-BT-AD50-ER32-100	32	100	50	50	E03
MAS-BT-AD50-ER32-160	32	160	50	50	E03
MAS-BT-AD50-ER.4-26.75	40	75	50	63	E04
MAS-BT-AD50-ER40-100	40	100	50	63	E04

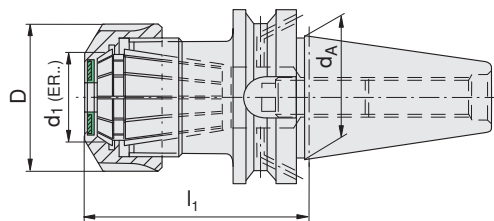
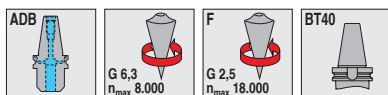
			
E01	6295005400		8335711600
E02	6295005500	8395001000	8335712500
E03	6295005600	8395001000	8335713200
E04	6295005700	8395001100	8335714000








MAS-BT

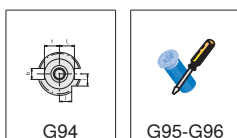
Collet chucks type ER-D

G33



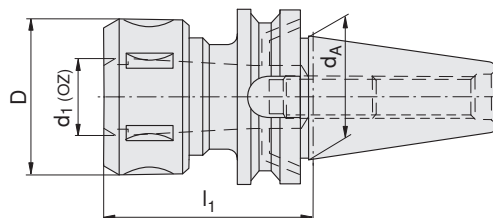
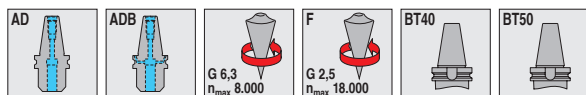
Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
MAS-BT-ADB40-ER25D-73	25	73	40	42	E01
MAS-BT-ADB40-ER25D-123	25	123	40	42	E01
MAS-BT-ADB40-ER25D-123-F	25	123	40	42	E01
MAS-BT-ADB40-ER32D-73	32	73	40	50	E02
MAS-BT-ADB40-ER32D-73-F	32	73	40	50	E02
MAS-BT-ADB40-ER32D-123	32	123	40	50	E02
MAS-BT-ADB40-ER32D-123-F	32	123	40	50	E02
MAS-BT-ADB40-ER40D-73	40	73	40	63	E03


			
E01	8395005500	8395001000	8335712500
E02	8395005600	8395001000	8335713200
E03	8395005700	8395001100	8335714000







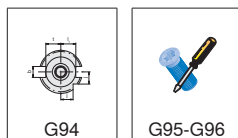
MAS-BT

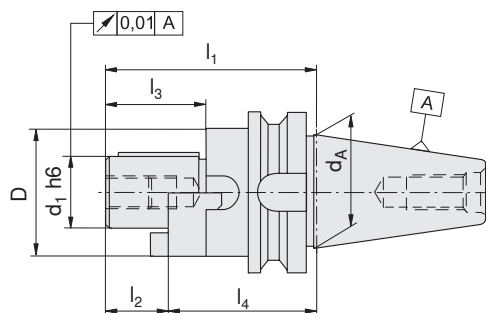
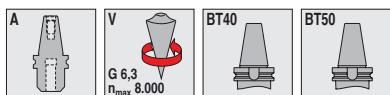
Collet chucks type OZ



Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
MAS-BT-ADB40-BC2-16-70	16	70	40	43	E01
MAS-BT-ADB40-BC2-16-120	16	120	40	43	E01
MAS-BT-ADB40-BC2-16-120-F	16	120	40	43	E01
MAS-BT-ADB40-BC2-25-70	25	70	40	60	E02
MAS-BT-ADB40-BC2-25-120	25	120	40	60	E02
MAS-BT-ADB40-BC2-25-120-F	25	120	40	60	E02
MAS-BT-AD50-BC2-25-90	25	90	50	60	E02
MAS-BT-AD50-BC2-25-120	25	120	50	60	E02
MAS-BT-AD50-BC4-32-100	32	100	50	72	E03
MAS-BT-AD50-BC4-32-120	32	120	50	72	E03

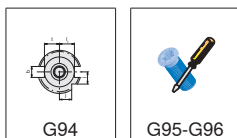
			
E01	6295005000	8395001000	8335411600
E02	6295005100	8395001000	8335412500
E03		8395001100	8335413200





Type, description	d ₁ [mm]	d _A [mm]	D [mm]	l ₁ [mm]	l ₂ [mm]	l ₃ [mm]	l ₄ [mm]	
MAS-BT-A40.KA16.55.V	16	40	32	72	17	27	55	E01
MAS-BT-A40.KA22.55.V	22	40	40	74	19	31	55	E02
MAS-BT-A40.KA27.55.V	27	40	48	76	21	33	55	E03
MAS-BT-A40.KA32.60.V	32	40	58	84	24	38	60	E04
MAS-BT-A40.KA40.60.V	40	40	70	87	27	41	60	E05
MAS-BT-A50.KA16.70.V	16	50	32	72	17	27	70	E01
MAS-BT-A50.KA22.70.V	22	50	40	74	19	31	70	E02
MAS-BT-A50.KA27.70.V	27	50	48	76	21	33	70	E03
MAS-BT-A50.KA32.70.V	32	50	58	84	24	38	70	E04
MAS-BT-A50.KA40.70.V	40	50	70	87	27	41	70	E05

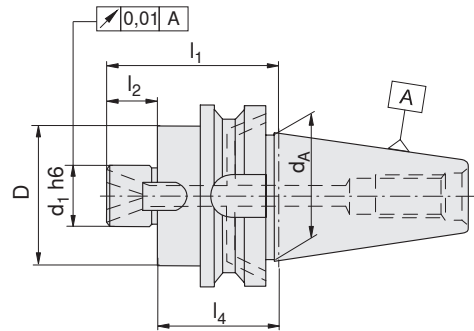
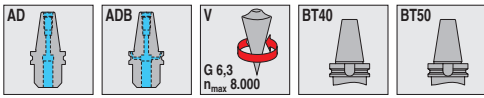
E01	8337011600	8395028400	8395011300	8336701600	8336811600
E02	8337012200	8395028500	8395012400	8336702200	8336812200
E03	8337012700	8395028600	8395012500	8336702700	8336812700
E04	8337013200	8395028700	8395012600	8336703200	8336813200
E05	8337014000	8395028800	8395011200	8336704000	8336814000



MAS-BT

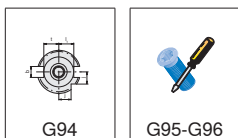
Shell mill adapters, centre bolt

G36



Type, description	d ₁ [mm]	d _A [mm]	D [mm]	l ₁ [mm]	l ₂ [mm]	l ₄ [mm]	
MAS-BT-ADB40.QA16.52.V	16	40	38	69	17	52	E01
MAS-BT-ADB40.QA16.100.V	16	40	38	117	17	100	E01
MAS-BT-ADB40.QA16.160.V	16	40	38	177	17	160	E01
MAS-BT-ADB40.QA22.52.V	22	40	48	71	19	52	E02
MAS-BT-ADB40.QA22.100.V	22	40	48	119	19	100	E02
MAS-BT-ADB40.QA22.160.V	22	40	48	179	19	160	E02
MAS-BT-ADB40.QA27.52.V	27	40	58	73	21	52	E03
MAS-BT-ADB40.QA27.100.V	27	40	58	121	21	100	E03
MAS-BT-ADB40.QA27.160.V	27	40	58	181	21	160	E03
MAS-BT-ADB40.QA32.50.V	32	40	78	74	24	50	E04
MAS-BT-ADB40.QA32.100.V	32	40	78	124	24	100	E04
MAS-BT-ADB40.QA32.160.V	32	40	78	184	24	160	E04
MAS-BT-ADB40.QA40.50.V	40	40	88	77	27	50	E05
MAS-BT-ADB40.QA40.100.V	40	40	88	127	27	100	E05
MAS-BT-ADB40.QA40.160.V	40	40	88	187	27	160	E05
MAS-BT-AD50.QA16.63.V	16	50	48	80	17	63	E01
MAS-BT-AD50.QA16.100.V	16	50	38	117	17	100	E01
MAS-BT-AD50.QA16.160.V	16	50	38	177	17	160	E01
MAS-BT-AD50.QA22.63.V	22	50	48	82	19	63	E02
MAS-BT-AD50.QA22.100.V	22	50	48	119	19	100	E02
MAS-BT-AD50.QA22.160.V	22	50	48	179	19	160	E02
MAS-BT-AD50.QA27.63	27	50	58	84	21	63	E03
MAS-BT-AD50.QA27.100.V	27	50	58	121	21	100	E03
MAS-BT-AD50.QA27.160.V	27	50	58	181	21	160	E03
MAS-BT-AD50.QA32.60.V	32	50	78	84	24	60	E04
MAS-BT-AD50.QA32.100.V	32	50	78	124	24	100	E04
MAS-BT-AD50.QA32.160.V	32	50	78	184	24	160	E04
MAS-BT-AD50.QA40.60.V	40	50	88	87	27	60	E05
MAS-BT-AD50.QA40.100.V	40	50	88	127	27	100	E05
MAS-BT-AD50.QA40.160.V	40	50	88	187	27	160	E05

E01	8395012000	8395029600	8395011300	8336701600	8336811600
E02	8395012100	8395029700	8395012400	8336702200	8336812200
E03	8395012200	8395013600	8395012500	8336702700	8336812700
E04	8395012300	8395013700	8395012600	8336703200	8336813200
E05	8395029500	8395013800	8395011200	8336704000	8336814000

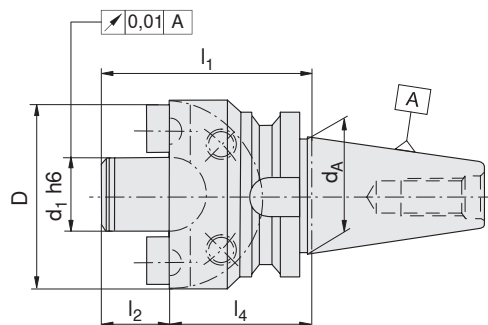
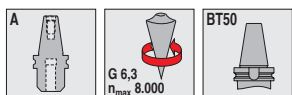



Spindle nose tools / Rotating



MAS-BT

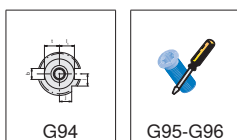
Shell mill adapters, 4 bolts

G37



Type, description	d ₁ [mm]	d _A [mm]	D [mm]	l ₁ [mm]	l ₂ [mm]	l ₄ [mm]	
MAS-BT-A50-MA40-70	40	50	89	100	30	70	E01
MAS-BT-A50-MA60-80	60	50	129	120	40	80	E02

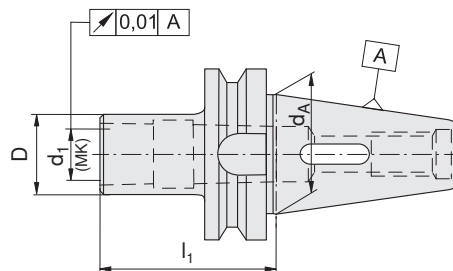
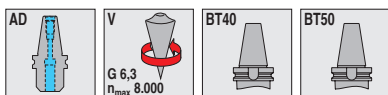
			
E01	8395029500	8395013800	8395014000
E02	8395029800		333940 / 8395016000



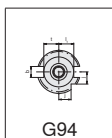
MAS-BT

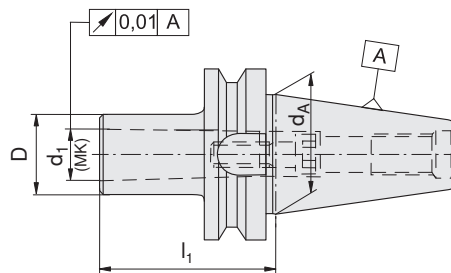
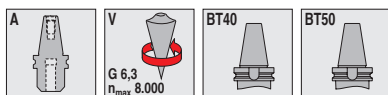
Morse taper adapters MT

G38



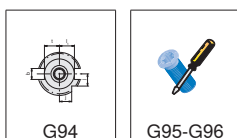
Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]
MAS-BT-AD40.KH.MK1.50.V	1	50	40	25
MAS-BT-AD40.KH.MK2.50.V	2	50	40	32
MAS-BT-AD40.KH.MK3.70.V	3	70	40	40
MAS-BT-AD40.KH.MK4.95.V	4	95	40	48
MAS-BT-AD50.KH.MK1.45.V	1	45	50	25
MAS-BT-AD50.KH.MK2.60.V	2	60	50	32
MAS-BT-AD50.KH.MK4.95.V	4	95	50	48
MAS-BT-AD50.KH.MK5.105.V	5	105	50	63





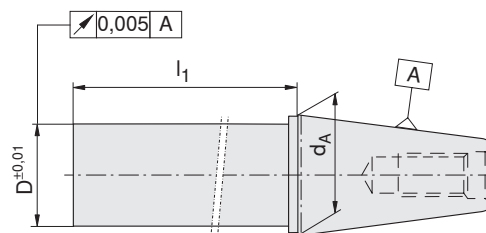
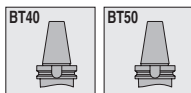
Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
MAS-BT-A40-MK3C-70-V	3	70	40	40	E01
MAS-BT-A40-MK4C-95-V	4	95	40	48	E02
MAS-BT-A50-MK1C-45-V	1	45	50	25	E03
MAS-BT-A50-MK2C-60-V	2	60	50	32	E04
MAS-BT-A50-MK3C-65-V	3	65	50	40	E01
MAS-BT-A50-MK4C-95-V	4	95	50	48	E02
MAS-BT-A50-MK5C-118-V	5	118	50	63	E05

E01	8335901700	8395003000	8395001800	8395026900
E02	8335902300	8395003100	8395001900	8395027000
E03	8335902000	8395003100	8395026000	8395026600
E04	8335902000	8395003100	8395001700	8395026800
E05	8335903300	8395003100	8395026200	8395027100

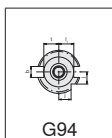


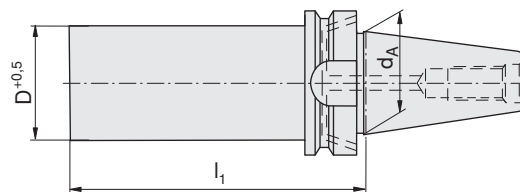
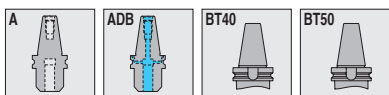
MAS-BT

Test bars

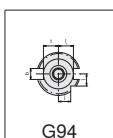


Type, description	d_A [mm]	D [mm]	l [mm]
DIN69871/MAS-BT-A40.KD.40.330	40	40	330
DIN69871/MAS-BT-A50.KD.50.330	50	50	330





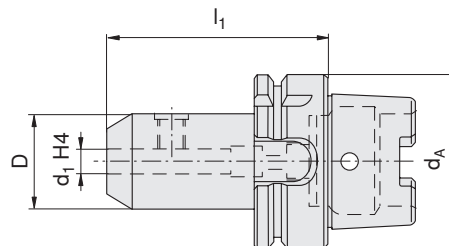
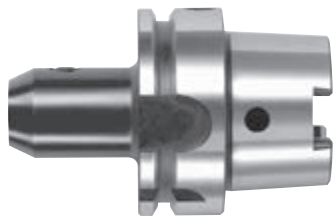
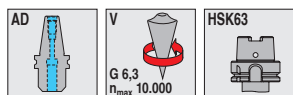
Type, description	d_A [mm]	D [mm]	l [mm]
MAS-BT-ADB40-HF63-250	40	63	250
MAS-BT-A50-HF63,5-300	50	63.5	300



G94

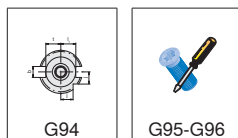
HSK-A

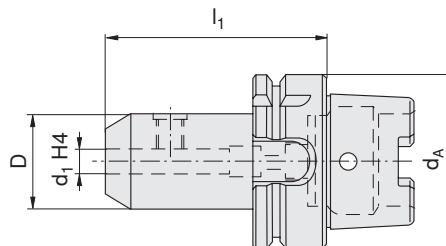
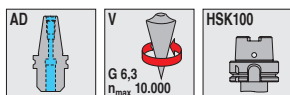
Weldon adapters







Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
HSK63A-WE06-65-V	6	65	63	25	E01
HSK63A-WE06-160-V	6	160	63	22	E01
HSK63A-WE08-65-V	8	65	63	28	E02
HSK63A-WE08-160-V	8	160	63	24	E02
HSK63A-WE10-65-V	10	65	63	35	E03
HSK63A-WE10-160-V	10	160	63	25	E03
HSK63A-WE12-80-V	12	80	63	42	E04
HSK63A-WE12-160-V	12	160	63	26	E04
HSK63A-WE14-80-V	14	80	63	44	E04
HSK63A-WE14-160-V	14	160	63	28	E04
HSK63A-WE16-80-V	16	80	63	48	E05
HSK63A-WE16-160-V	16	160	63	30	E05
HSK63A-WE18-80-V	18	80	63	50	E05
HSK63A-WE18-160-V	18	160	63	32	E05
HSK63A-WE20-80-V	20	80	63	52	E06
HSK63A-WE20-160-V	20	160	63	34	E06
HSK63A-WE25-110-V	25	110	63	65	E07
HSK63A-WE25-160-V	25	160	63	65	E07
HSK63A-WE32-110-V	32	110	63	72	E08
HSK63A-WE32-160-V	32	160	63	72	E08

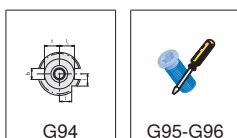
E01	8376006300	6295000600
E02	8376006300	6295000800
E03	8376006300	6295001000
E04	8376006300	6295001200
E05	8376006300	6295001600
E06	8376006300	6295002000
E07	8376006300	6295002500
E08	8376006300	6295003200





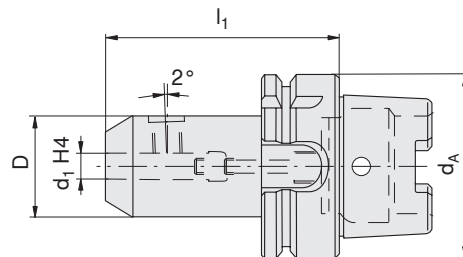
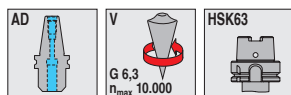
Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
HSK100A-WE06-80-V	6	80	100	25	E01
HSK100A-WE06-160-V	6	160	100	22	E01
HSK100A-WE08-80-V	8	80	100	28	E02
HSK100A-WE08-160-V	8	160	100	24	E02
HSK100A-WE10-80-V	10	80	100	35	E03
HSK100A-WE10-160-V	10	160	100	25	E03
HSK100A-WE12-80-V	12	80	100	42	E04
HSK100A-WE12-160-V	12	160	100	25	E04
HSK100A-WE14-80-V	14	80	100	44	E04
HSK100A-WE14-160-V	14	160	100	28	E04
HSK100A-WE16-100-V	16	100	100	48	E05
HSK100A-WE16-160-V	16	160	100	30	E05
HSK100A-WE18-100-V	18	100	100	50	E05
HSK100A-WE18-160-V	18	160	100	32	E05
HSK100A-WE20-100-V	20	100	100	52	E06
HSK100A-WE20-160-V	20	160	100	34	E06
HSK100A-WE25-100-V	25	100	100	65	E07
HSK100A-WE25-160-V	25	160	100	65	E07
HSK100A-WE32-100-V	32	100	100	75	E08
HSK100A-WE32-160-V	32	160	100	75	E08

		
E01	8376010000	6295000600
E02	8376010000	6295000800
E03	8376010000	6295001000
E04	8376010000	6295001200
E05	8376010000	6295001600
E06	8376010000	6295002000
E07	8376010000	6295002500
E08	8376010000	6295003200



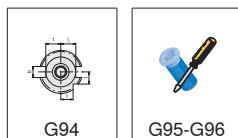
HSK-A

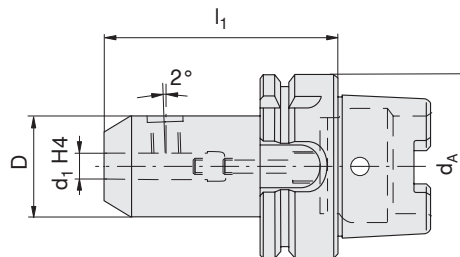
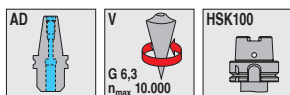
Whistle Notch adapters







Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
HSK63A-WN06-80-V	6	80	63	25	E01
HSK63A-WN06-160-V	6	160	63	22	E01
HSK63A-WN08-80-V	8	80	63	28	E02
HSK63A-WN08-160-V	8	160	63	24	E02
HSK63A-WN10-80-V	10	80	63	35	E03
HSK63A-WN10-160-V	10	160	63	25	E03
HSK63A-WN12-90-V	12	90	63	42	E04
HSK63A-WN12-160-V	12	160	63	26	E04
HSK63A-WN14-90-V	14	90	63	44	E04
HSK63A-WN14-160-V	14	160	63	28	E04
HSK63A-WN16-100-V	16	100	63	48	E05
HSK63A-WN16-160-V	16	160	63	30	E05
HSK63A-WN18-100-V	18	100	63	50	E05
HSK63A-WN18-160-V	18	160	63	32	E05
HSK63A-WN20-100-V	20	100	63	52	E06
HSK63A-WN20-160-V	20	160	63	34	E06
HSK63A-WN25-110-V	25	110	63	65	E07
HSK63A-WN25-160-V	25	160	63	65	E07
HSK63A-WN32-110-V	32	110	63	72	E08
HSK63A-WN32-160-V	32	160	63	72	E08

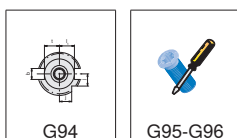
E01	8376006300	6295000600
E02	8376006300	6295000800
E03	8376006300	6295001000
E04	8376006300	6295001200
E05	8376006300	6295001600
E06	8376006300	6295002000
E07	8376006300	6295002500
E08	8376006300	6295003200





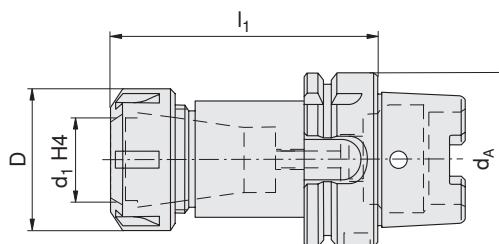
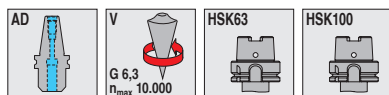
Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
HSK100A-WN06-90-V	6	90	100	25	E01
HSK100A-WN06-160-V	6	160	100	22	E01
HSK100A-WN08-90-V	8	90	100	28	E02
HSK100A-WN08-160-V	8	160	100	24	E02
HSK100A-WN10-90-V	10	90	100	35	E03
HSK100A-WN10-160-V	10	160	100	25	E03
HSK100A-WN12-100-V	12	100	100	42	E04
HSK100A-WN12-160-V	12	160	100	26	E04
HSK100A-WN14-100-V	14	100	100	44	E04
HSK100A-WN14-160-V	14	160	100	28	E04
HSK100A-WN16-100-V	16	100	100	48	E05
HSK100A-WN16-160-V	16	160	100	30	E05
HSK100A-WN18-100-V	18	100	100	50	E05
HSK100A-WN18-160-V	18	160	100	32	E05
HSK100A-WN20-110-V	20	110	100	52	E06
HSK100A-WN20-160-V	20	160	100	34	E06
HSK100A-WN25-120-V	25	120	100	65	E07
HSK100A-WN25-160-V	25	160	100	65	E07
HSK100A-WN32-120-V	32	120	100	72	E08
HSK100A-WN32-160-V	32	160	100	72	E08

		
E01	8376010000	6295000600
E02	8376010000	6295000800
E03	8376010000	6295001000
E04	8376010000	6295001200
E05	8376010000	6295001600
E06	8376010000	6295002000
E07	8376010000	6295002500
E08	8376010000	6295003200



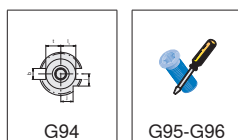
HSK-A

Collet chucks type ER



Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
HSK63A-ER16-100-V	16	100	63	28	E01
HSK63A-ER16-160-V	16	160	63	28	E01
HSK63A-ER20-103-V	20	103	63	35	E02
HSK63A-ER25-103-V	25	103	63	42	E03
HSK63A-ER25-160-V	25	160	63	42	E03
HSK63A-ER32-103-V	32	103	63	50	E04
HSK63A-ER40-120-V	40	120	63	63	E05
HSK100A-ER16-100-V	16	100	100	32	E06
HSK100A-ER16-160-V	16	160	100	32	E06
HSK100A-ER20-103-V	20	103	100	35	E07
HSK100A-ER25-103-V	25	103	100	42	E08
HSK100A-ER25-160-V	25	160	100	42	E08
HSK100A-ER32-103-V	32	103	100	50	E09
HSK100A-ER40-120-V	40	120	100	63	E10

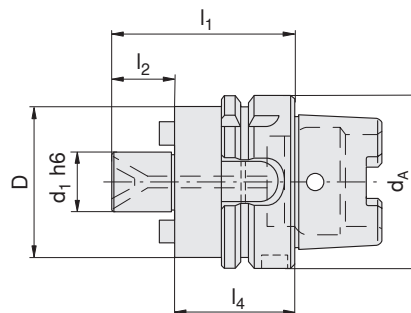
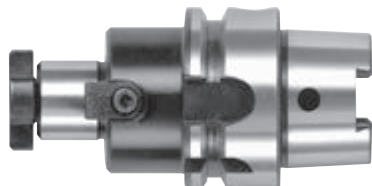
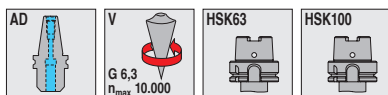
E01	6295005400	8376006300	11154410	8335711600
E02	6295004500	8376006300	11154413	
E03	6295005500	8376006300	11154414	8335712500
E04	6295005600	8376006300	11154418	8335713200
E05	6295005700	8376006300	11154419	8335714000
E06	6295005400	8376010000	11154410	8335711600
E07	6295004500	8376010000	11154413	
E08	6295005500	8376010000	11154414	8335712500
E09	6295005600	8376010000	11154418	8335713200
E10	6295005700	8376010000	11154419	8335714000



HSK-A

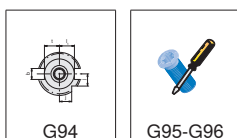
Shell mill adapters, centre bolt

G47



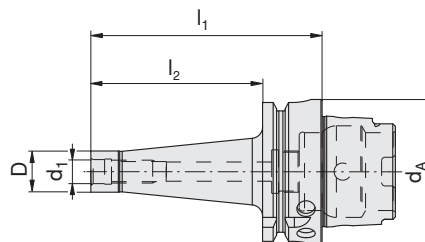
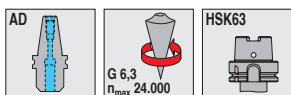
Type, description	d ₁ [mm]	d _A [mm]	D [mm]	l ₁ [mm]	l ₂ [mm]	l ₄ [mm]	
HSK63A-QA16-50-V	16	63	40	67	17	50	E01
HSK63A-QA22-50-V	22	63	50	69	19	50	E02
HSK63A-QA27-60-V	27	63	60	81	21	60	E03
HSK63A-QA32-60-V	32	63	78	84	24	60	E04
HSK63A-QA40-60-V	40	63	89	87	27	60	E05
HSK100A-QA16-50-V	16	100	40	67	17	50	E06
HSK100A-QA22-50-V	22	100	50	69	19	50	E07
HSK100A-QA27-50-V	27	100	60	71	21	50	E08
HSK100A-QA32-50-V	32	100	78	74	24	50	E09
HSK100A-QA40-60-V	40	100	89	87	27	60	E10
HSK100A-QA60-70-V	60	100	129	110	40	70	E11


E01	8395012000	8376006300	8395029600		8336701600
E02	8395012100	8376006300	8395029700		8336702200
E03	8395012200	8376006300	8395013600		8336702700
E04	8395012300	8376006300	8395013700		8336703200
E05	8395029500	8376006300	8395013800	8395014000	8336704000
E06	8395012000	8376010000	8395029600		8336701600
E07	8395012100	8376010000	8395029700		8336702200
E08	8395012200	8376010000	8395013600		8336702700
E09	8395012300	8376010000	8395013700		8336703200
E10	8395029500	8376010000	8395013800	8395014000	8336704000
E11	8395029800	8376010000		8395016000 / 8395012500	





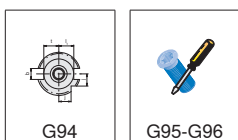
HSK-A

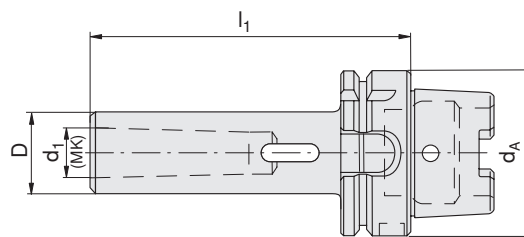
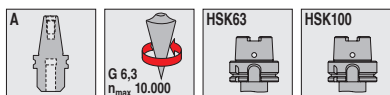
Adapters for threaded shank milling cutters






Type, description	d ₁ [mm]	l ₁ [mm]	l ₂ [mm]	d _A [mm]	D [mm]	
HSK-A63-M8-50	8	76	50	63	23	E01
HSK-A63-M8-75	8	101	75	63	25	E01
HSK-A63-M8-100	8	126	100	63	30	E01
HSK-A63-M10-50	10	76	50	63	25	E01
HSK-A63-M10-75	10	101	75	63	30	E01
HSK-A63-M10-100	10	126	100	63	35	E01
HSK-A63-M12-50	12	76	50	63	30	E01
HSK-A63-M12-75	12	101	75	63	35	E01
HSK-A63-M12-100	12	126	100	63	38	E01
HSK-A63-M16-50	16	76	50	63	34	E01
HSK-A63-M16-75	16	101	75	63	35	E01
HSK-A63-M16-100	16	126	100	63	40	E01

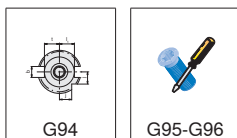
	
E01	8376006300





Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
HSK63A-MK1D-100	1	100	63	25	E01
HSK63A-MK2D-120	2	120	63	32	E01
HSK63A-MK3D-140	3	140	63	40	E01
HSK63A-MK4D-160	4	160	63	48	E01
HSK100A-MK1D-110	1	110	100	25	E02
HSK100A-MK2D-120	2	120	100	32	E02
HSK100A-MK3D-150	3	150	100	40	E02
HSK100A-MK4D-170	4	170	100	48	E02
HSK100A-MK5D-200	5	200	100	63	E02

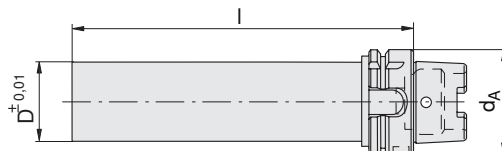
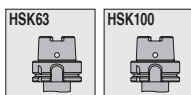
	
E01	8376006300
E02	8376010000



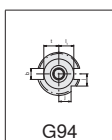
HSK-A

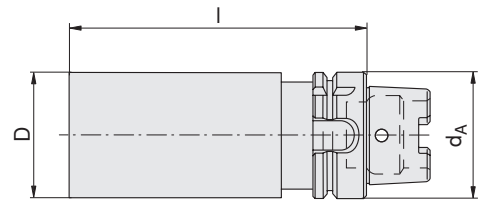
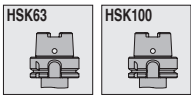
Test bars

G50

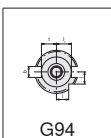


Type, description	d_A [mm]	D [mm]	l [mm]
HSK100A-KD40-349	100	40	349
HSK63A-KD40-346	63	63	346





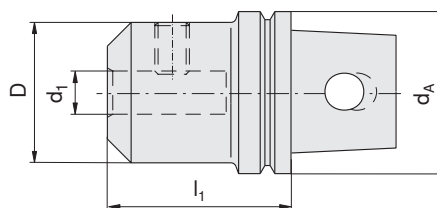
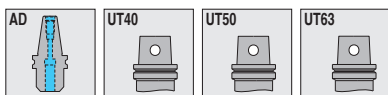
Type, description	d_A [mm]	D [mm]	l [mm]
HSK63A-HF63-200	63	63	200
HSK100A-HF100-250	100	100	250








UTS

Weldon adapters

G52

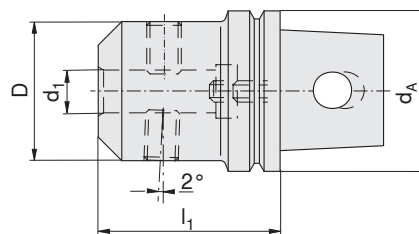
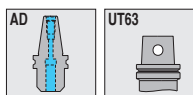



Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
UT40-AD-ZYL 08	8	45	40	28	E01
UT40-AD-ZYL 12	12	55	40	42	E02
UT40-AD-ZYL 16	16	60	40	48	E03
UT40-AD-ZYL 20	20	65	40	52	E04
UT40-AD-ZYL 25	25	75	40	65	E05
UT50-AD-ZYL 20	20	60	50	52	E06
UT63-WE06-80-MIY	6	80	63	25	E07
UT63-WE08-80-MIY	8	80	63	28	E08
UT63-WE10-80-MIY	10	80	63	35	E09
UT63-WE12-80-MIY	12	80	63	42	E10
UT63-WE14-80-MIY	14	80	63	44	E10
UT63-WE16-80-MIY	16	80	63	48	E11
UT63-WE18-80-MIY	18	80	63	50	E11
UT63-WE20-80-MIY	20	80	63	52	E12
UT63-WE25-80-MIY	25	80	63	65	E13
UT63-WE32-85-MIY	32	80	63	72	E14
UT63-AD-ZYL 32	32	85	63	70	E14
UT63-WE40-95-MIY	40	95	63	63	E15
UT63-AD-ZYL 40	40	100	63	90	E15





			
E01	8395003400	6295000800	194263
E02	8395003600	6295001200	194263
E03	8395003700	6295001600	194263
E04	8395027200	6295002000	194263
E05	8395029000	6295002500	194263
E06	8395027200	6295002000	225429
E07	8395003300	6295000600	225430
E08	8395003400	6295000800	225430
E09	8395003500	6295001000	225430
E10	8395003600	6295001200	225430
E11	8395003700	6295001600	225430
E12	8395027200	6295002000	225430
E13	8395029000	6295002500	225430
E14	8395029000	6295003200	225430
E15		6295003200	225430



Spindle nose tools / Rotating



Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
UT63-WEWN06-80-MIY	6	80	63	25	E01
UT63-WEWN08-80-MIY	8	80	63	28	E02
UT63-WEWN10-80-MIY	10	80	63	35	E03
UT63-WEWN12-80-MIY	12	80	63	42	E04
UT63-WEWN14-80-MIY	14	80	63	44	E04
UT63-WEWN16-80-MIY	16	80	63	48	E05
UT63-WEWN18-80-MIY	18	80	63	50	E05
UT63-WEWN20-80-MIY	20	80	63	52	E06
UT63-WEWN25-80-MIY	25	80	63	65	E07
UT63-WEWN32-80-MIY	32	80	63	72	E08
UT63-WEWN40-95-MIY	40	95	63	80	E09

			
E01	8395003300	6295000600	225430
E02	8395003400	6295000800	225430
E03	8395003500	6295001000	225430
E04	8395003600	6295001200	225430
E05	8395003700	6295001600	225430
E06	8395027200	6295002000	225430
E07	8395029000	6295002500	225430
E08	8395029000	6295003200	225430
E09		6295003200	225430

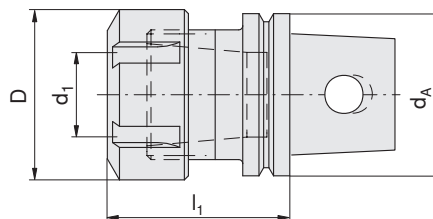
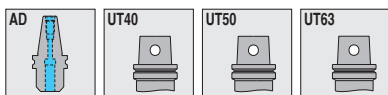



G95-G96







UTS

Collet chucks type ER

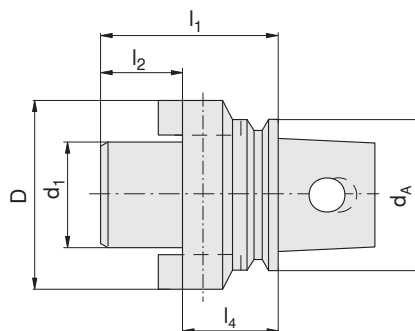
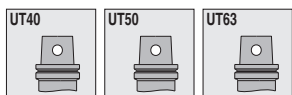
G54










Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	
UT40-ER16-38	16	38	40	32	E01
UT40-ER25-45	25	45	40	42	E02
UT40-ER32-51	32	51	40	50	E03
UT50-ER32-51	32	51	50	50	E04
UT63-ER16-90-MIY	16	90	63	32	E05
UT63-ER16-120-MIY	16	120	63	32	E05
UT63-ER25-90-MIY	25	90	63	42	E06
UT63-ER25-120-MIY	25	120	63	42	E06
UT63-ER32-90-MIY	32	90	63	50	E07
UT63-ER40-80-MIY	40	80	63	63	E08

					
E01	6295005400			194263	8335711600
E02	6295005500	8395001000		194263	8335712500
E03	6295005600	8395001000		194263	8335713200
E04	6295005600	8395001000		225429	8335713200
E05	6295005400			225430	8335711600
E06	6295005500	8395001000		225430	8335712500
E07		8395029000	6295003200	225430	
E08			6295003200	225430	





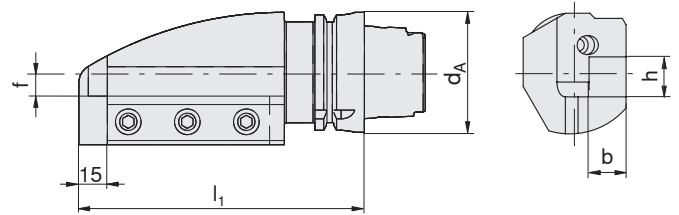
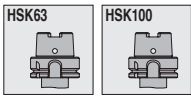
Type, description	d ₁ [mm]	d _A [mm]	D [mm]	l ₁ [mm]	l ₂ [mm]	l ₄ [mm]	
UT40-QA16-25IK	16	40	38	42	17	25	E01
UT40-QA22-25IK	22	40	46	44	19	25	E02
UT50-QA22-27IK	22	50	48	46	19	27	E03
UT50-QA32-35IK	32	50	78	59	24	35	E04
UT63-QA16-28-MIY	16	63	38	44	17	28	E05
UT63-QA16-110-MIY	16	63	38	127	17	110	E05
UT63-QA22-36-MIY	22	63	50	46	19	36	E06
UT63-QA22-110-MIY	22	63	50	129	19	110	E06
UT63-QA27-36-MIY	27	63	58	57	21	36	E07
UT63-QA27-36IK	27	63	58	57	21	36	E07
UT63-QA27-110-MIY	27	63	58	131	21	110	E07
UT63-QA32-33-MIY	32	63	78	57	24	33	E08
UT63-QA40-56IK	40	63	88	83	27	56	E09


					
E01	8395012000	8395029600	333935		194263
E02	8395012100	11210254	333937		194263
E03	8395012100	11210254	333937		225429
E04	8395012300	8395013700	333945		225429
E05	8395012000	8395029600	333935		225430
E06	8395012100	11210254	333937		225430
E07	8395012200	8395013600	333940		225430
E08	8395012300	8395013700	333945		225430
E09	8395029500	8395013800		8336704000	225430








HSK-T

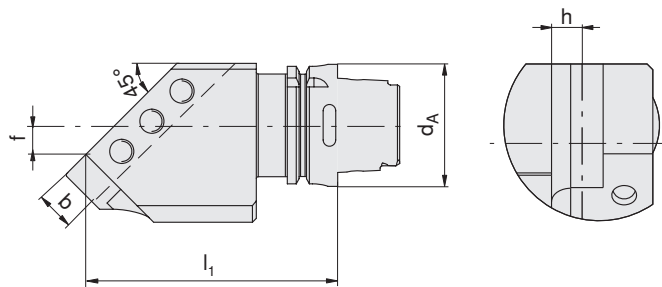
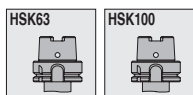
Tool holders 0°









Type, description	d _A [mm]	l ₁ [mm]	f [mm]	b [mm]	h [mm]	
HSK-T63-SHL00-2525	63	150	13	25	25	E01
HSK-T63-SHR00-2525	63	150	13	25	25	E01
HSK-T100-SHR00-3232	100	160	15	32	32	E01
HSK-T100-SHL00-3232	100	160	15	32	32	E01

				
E01	12001280	11960178	11848510	11106932





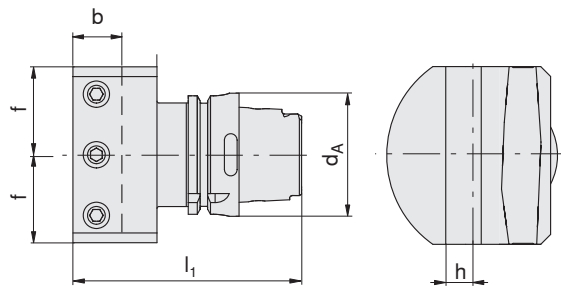
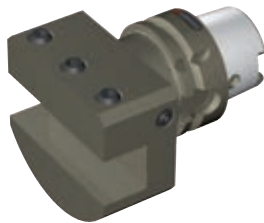
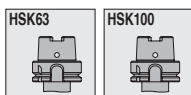
Type, description	d _A [mm]	l ₁ [mm]	f [mm]	b [mm]	h [mm]	
HSK-T63-SHL45-2525	63	130	15	25	25	E01
HSK-T63-SHR45-2525	63	130	15	25	25	E01
HSK-T100-SHL45-3232	100	160	20	32	32	E01
HSK-T100-SHR45-3232	100	160	20	32	32	E01


				
E01	12001280	11960178	11848510	11106932








HSK-T

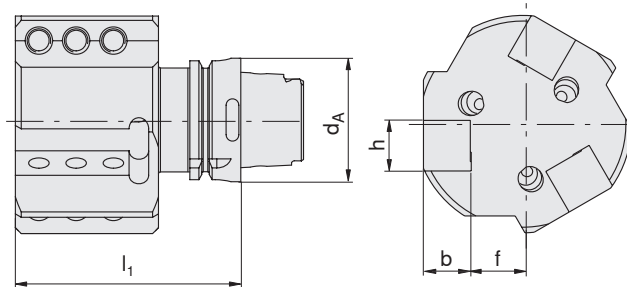
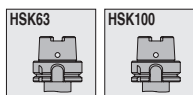
Tool holders 90° / neutral









Type, description	d _A [mm]	l ₁ [mm]	f [mm]	b [mm]	h [mm]	
HSK-T63-SHN90-2525	63	85	45	25	25	E01
HSK-T100-SHN90-3232	100	90	50	32	32	E01

				
E01	12001280	11960178	11848510	11106932





Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]	
HSK-T63-SH3L00-2525	63	115	28	25	25	E01
HSK-T100-SH3L00-2525	100	120	33	25	25	E01

				
E01	12001280	11960178	11848510	11106932

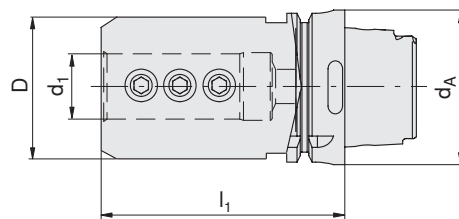
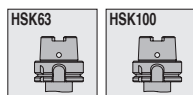


G95-G96

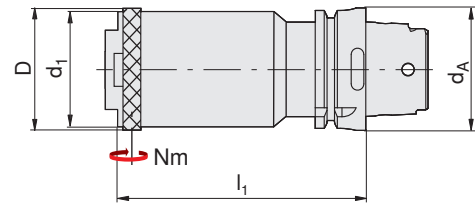
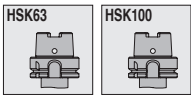
HSK-T

Boring bar holders

G60



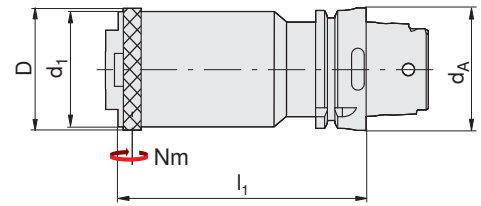
Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]
HSK-T63-BH08-80	8	80	63	32
HSK-T63-BH10-80	10	80	63	40
HSK-T63-BH12-80	12	80	63	40
HSK-T63-BH16-80	16	80	63	40
HSK-T63-BH20-80	20	80	63	50
HSK-T63-BH25-90	25	90	63	52.6
HSK-T63-BH32-95	32	95	63	68
HSK-T100-BH20-90	20	90	100	55
HSK-T100-BH25-95	25	95	100	55
HSK-T100-BH32-110	32	110	100	68
HSK-T100-BH40-120	40	120	100	83
HSK-T100-BH50-125	50	125	100	98



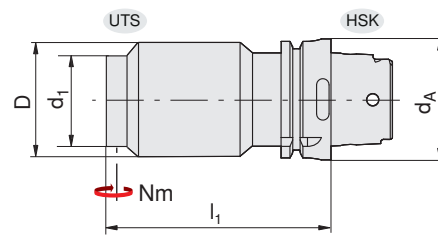
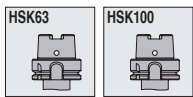
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	Torque moment [Nm]
HSK-T63-V80	63	80	63	68	20
HSK-T63-V120	63	120	63	68	20
HSK-T100-V120	100	120	100	105	50

HSK-T

Reducers



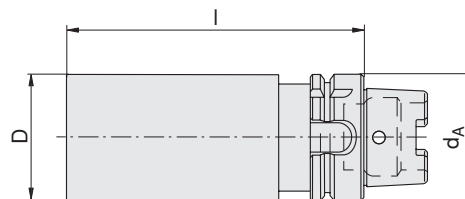
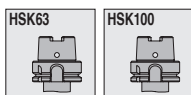
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	Torque moment [Nm]
HSK-T100-R63-100	63	100	100	68	50



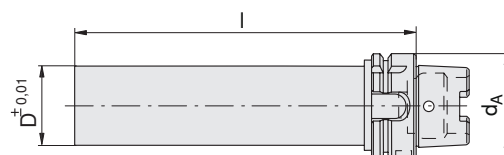
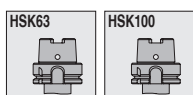
Type, description	d ₁ [mm]	l ₁ [mm]	d _A [mm]	D [mm]	Torque moment [Nm]
HSK-T63-UT40-80	40	80	63	48	16
HSK-T63-UT50-95	50	95	63	58	32
HSK-T63-UT63-105	63	105	63	72	50
HSK-T100-UT40-80	40	80	100	48	16
HSK-T100-UT50-100	50	100	100	58	32
HSK-T100-UT63-115	63	115	100	72	50

HSK-T

Blanks



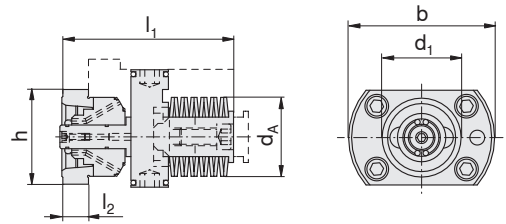
Type, description	d_A [mm]	D [mm]	l [mm]
HSK-T63-HF72-210	63	72	210
HSK-T63-HF90-90	63	90	90
HSK-T63-HF100-150	63	100	150
HSK-T100-HF100-250	100	100	250
HSK-T100-HF110-100	100	110	100
HSK-T100-HF120-160	100	120	160



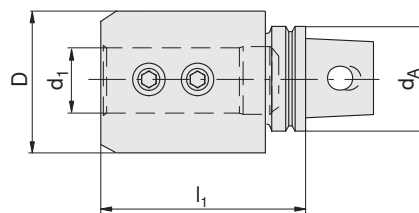
Type, description	d_A [mm]	D [mm]	l [mm]
HSK100A-KD40-349	100	40	349
HSK63A-KD40-346	63	63	346


UTS



Assembly sets



Type, description	d ₁ [mm]	d _A [mm]	l ₂ [mm]	l ₁ [mm]	h [mm]	b [mm]
UT40-ES1473-OSN	40	40	14	87.5	46	74
UT40-ES1473-SSN	40	40	14	87.5	46	74

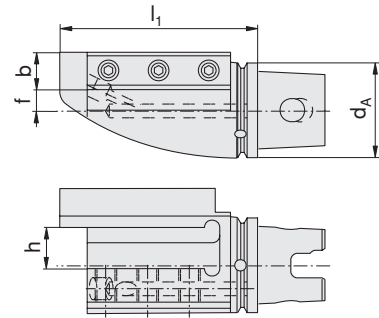



Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
UT63-BH40-75-MIY	40	75	63	75	E01





	
E01	225430

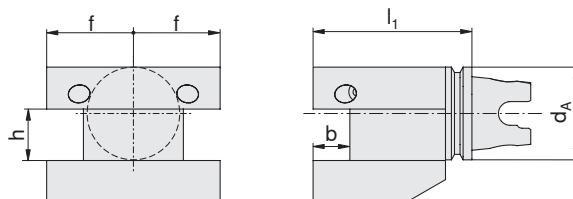
UTS


Single shank holders






Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]	
UT63-SHR2525-MIY	63	130	13	25	25	E01
UT63-SHL2525-MIY	63	130	13	25	25	E01

			
E01	231176	11106932	225430



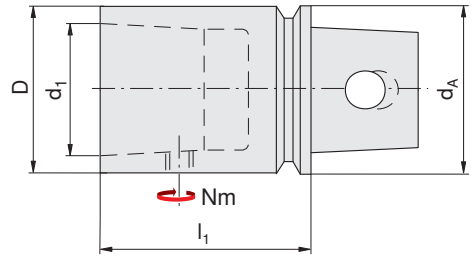
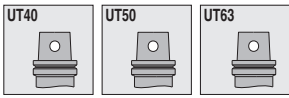
Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]	
UT63-SH4-2020-MIY	63	110	27.8	20	20	E01
UT63-3225-KN	63	108	34	25	32	E02


		
E01		225430
E02	231176	225430



UTS

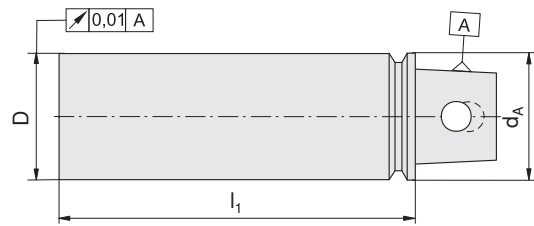
Adapter extensions

G70



Type, description	d_A [mm]	d_1 [mm]	D [mm]	l_1 [mm]	Torque moment [Nm]	
UT40-AD-VLG 60	40	40	40	60		E01
UT40-AD-VLG 80	40	40	40	80		E01
UT50-AD-VLG 140	50	50	50	140		E02
UT63-V63-80-MIY	63	63	63	80	50	E03
UT63-AD-VLG 100	63	63	63	100		E03
UT63-V63-120-MIY	63	63	63	120	50	E03
UT63-AD-VLG 140	63	63	63	140		E03

		
E01		194263
E02		225429
E03		225430

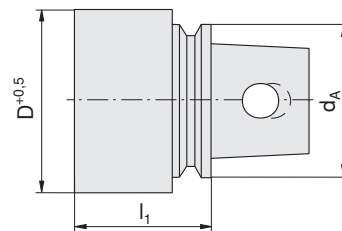
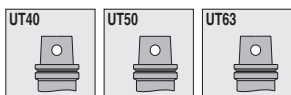


Type, description	d_A [mm]	D [mm]	l [mm]
UT63-AD-AD	63	63	120

UTS

Blanks

G72

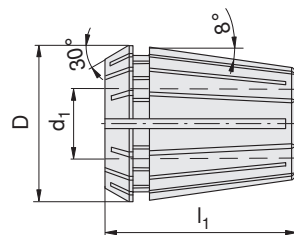


Type, description	d_A [mm]	D [mm]	l [mm]
UT40-HF49-60	40	49	60
UT40-HF49-112	40	49	112
UT40-HF49-120	40	49	120
UT40-HF72-49	40	72	49
UT40-HF72-130	40	72	130
UT40-HF88-80	40	88	80
UT40-HF88-150	40	88	150
UT50-HF55-200	50	55	200
UT50-HF105-100	50	105	100
UT63-HF63-112	63	63	112
UT63-HF74-250	63	74	250
UT63-HF88-75	63	88	75
UT63-HF88-141-MIY	63	88	141
UT63-HF115-150	63	115	150
UT63-HF125-120	63	125	120



Collets ER16/426E

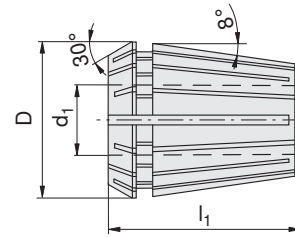
G74



Type, description	d_1 [mm]	$d_{1\ min}$ [mm]	$d_{1\ max}$ [mm]	D [mm]	l_1 [mm]
DIN6499-B-426E/ER16.SZ.Ø1,0	1.0	0.50	1.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø2,0	2.0	1.50	2.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø3,0	3.0	2.50	3.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø4,0	4.0	3.00	4.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø5,0	5.0	4.00	5.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø6,0	6.0	5.00	6.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø7,0	7.0	6.00	7.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø8,0	8.0	7.00	8.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø9,0	9.0	8.00	9.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø10,0	10.0	9.00	10.00	17.25	27.5
DIN6499-B-426E/ER16.SZ				17.25	27.5



Set in wooden box: DIN6499-B-426E/ER16.SZ



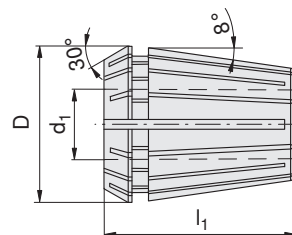
Type, description	d ₁ [mm]	d _{1 min} [mm]	d _{1 max} [mm]	D [mm]	l ₁ [mm]
428E-010	1.0	0.50	1.00	21.3	31.5
428E-020	2.0	1.50	2.00	21.3	31.5
428E-030	3.0	2.50	3.00	21.3	31.5
428E-040	4.0	3.00	4.00	21.3	31.5
428E-050	5.0	4.00	5.00	21.3	31.5
428E-060	6.0	5.00	6.00	21.3	31.5
428E-070	7.0	6.00	7.00	21.3	31.5
428E-080	8.0	7.00	8.00	21.3	31.5
428E-090	9.0	8.00	9.00	21.3	31.5
428E-100	10.0	9.00	10.00	21.3	31.5
428E-110	11.0	10.00	11.00	21.3	31.5
428E-120	12.0	11.00	12.00	21.3	31.5
428E-130	13.0	12.00	13.00	21.3	31.5
428E-SET				21.3	31.5



Set in wooden box: 428E-SET

Collets ER25/430E

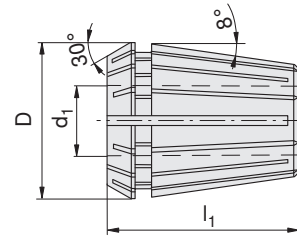
G76



Type, description	d ₁ [mm]	d _{1 min} [mm]	d _{1 max} [mm]	D [mm]	l ₁ [mm]
430E-020	2.0	1.50	2.00	26.3	34
430E-030	3.0	2.50	3.00	26.3	34
430E-040	4.0	3.00	4.00	26.3	34
430E-050	5.0	4.00	5.00	26.3	34
430E-060	6.0	5.00	6.00	26.3	34
430E-070	7.0	6.00	7.00	26.3	34
430E-080	8.0	7.00	8.00	26.3	34
430E-090	9.0	8.00	9.00	26.3	34
430E-100	10.0	9.00	10.00	26.3	34
430E-110	11.0	10.00	11.00	26.3	34
430E-120	12.0	11.00	12.00	26.3	34
430E-130	13.0	12.00	13.00	26.3	34
430E-140	14.0	13.00	14.00	26.3	34
430E-150	15.0	14.00	15.00	26.3	34
430E-160	16.0	15.00	16.00	26.3	34
430E-SET				26.3	34



Set in wooden box: 430E-SET



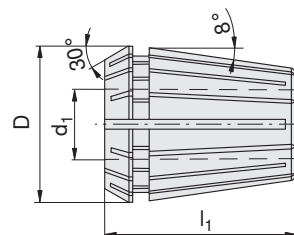
Type, description	d ₁ [mm]	d _{1 min} [mm]	d _{1 max} [mm]	D [mm]	l ₁ [mm]
470E-030	3.0	2.50	3.00	33.35	40
470E-040	4.0	3.00	4.00	33.35	40
470E-050	5.0	4.00	5.00	33.35	40
470E-060	6.0	5.00	6.00	33.35	40
470E-070	7.0	6.00	7.00	33.35	40
470E-080	8.0	7.00	8.00	33.35	40
470E-090	9.0	8.00	9.00	33.35	40
470E-100	10.0	9.00	10.00	33.35	40
470E-110	11.0	10.00	11.00	33.35	40
470E-120	12.0	11.00	12.00	33.35	40
470E-130	13.0	12.00	13.00	33.35	40
470E-140	14.0	13.00	14.00	33.35	40
470E-150	15.0	14.00	15.00	33.35	40
470E-160	16.0	15.00	16.00	33.35	40
470E-170	17.0	16.00	17.00	33.35	40
470E-180	18.0	17.00	18.00	33.35	40
470E-190	19.0	18.00	19.00	33.35	40
470E-200	20.0	19.00	20.00	33.35	40
470E-SET				33.35	40



Set in wooden box: 470E-SET

Collets ER40/472E

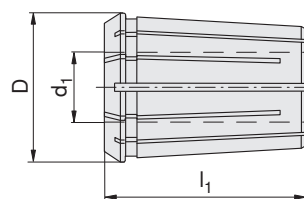
G78



Type, description	d ₁ [mm]	d _{1 min} [mm]	d _{1 max} [mm]	D [mm]	l ₁ [mm]
472E-030	3.0	2.50	3.00	41.4	46
472E-040	4.0	3.00	4.00	41.4	46
472E-050	5.0	4.00	5.00	41.4	46
472E-060	6.0	5.00	6.00	41.4	46
472E-070	7.0	6.00	7.00	41.4	46
472E-080	8.0	7.00	8.00	41.4	46
472E-090	9.0	8.00	9.00	41.4	46
472E-100	10.0	9.00	10.00	41.4	46
472E-110	11.0	10.00	11.00	41.4	46
472E-120	12.0	11.00	12.00	41.4	46
472E-130	13.0	12.00	13.00	41.4	46
472E-140	14.0	13.00	14.00	41.4	46
472E-150	15.0	14.00	15.00	41.4	46
472E-160	16.0	15.00	16.00	41.4	46
472E-170	17.0	16.00	17.00	41.4	46
472E-180	18.0	17.00	18.00	41.4	46
472E-190	19.0	18.00	19.00	41.4	46
472E-200	20.0	19.00	20.00	41.4	46
472E-210	21.0	20.00	21.00	41.4	46
472E-220	22.0	21.00	22.00	41.4	46
472E-230	23.0	22.00	23.00	41.4	46
472E-240	24.0	23.00	24.00	41.4	46
472E-250	25.0	24.00	25.00	41.4	46
472E-260	26.0	25.00	26.00	41.4	46
472E-SET				41.4	46



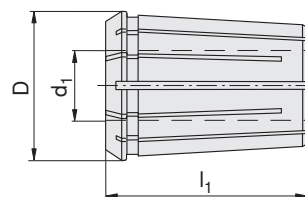
Set in wooden box: 472E-SET



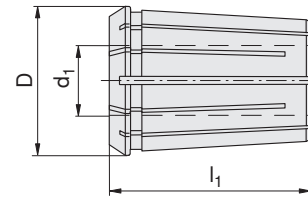
Type, description	d_1 [mm]	$d_{1 \min}$ [mm]	$d_{1 \max}$ [mm]	D [mm]	l_1 [mm]
415E-020	2.0	1.6	2.1	25.5	40
415E-025	2.5	2.1	2.6	25.5	40
415E-030	3.0	2.6	3.1	25.5	40
415E-035	3.5	3.1	3.6	25.5	40
415E-040	4.0	3.6	4.1	25.5	40
415E-045	4.5	4.1	4.6	25.5	40
415E-050	5.0	4.6	5.1	25.5	40
415E-055	5.5	5.1	5.6	25.5	40
415E-060	6.0	5.6	6.1	25.5	40
415E-065	6.5	6.1	6.6	25.5	40
415E-070	7.0	6.6	7.1	25.5	40
415E-075	7.5	7.1	7.6	25.5	40
415E-080	8.0	7.6	8.1	25.5	40
415E-085	8.5	8.1	8.6	25.5	40
415E-090	9.0	8.6	9.1	25.5	40
415E-095	9.5	9.1	9.6	25.5	40
415E-100	10.0	9.6	10.1	25.5	40
415E-105	10.5	10.1	10.6	25.5	40
415E-110	11.0	10.6	11.1	25.5	40
415E-115	11.5	11.1	11.6	25.5	40
415E-120	12.0	11.6	12.1	25.5	40
415E-125	12.5	12.1	12.6	25.5	40
415E-130	13.0	12.6	13.1	25.5	40
415E-135	13.5	13.1	13.6	25.5	40
415E-140	14.0	13.6	14.1	25.5	40
415E-145	14.5	14.1	14.6	25.5	40
415E-150	15.0	14.6	15.1	25.5	40
415E-155	15.5	15.1	15.6	25.5	40
415E-160	16.0	15.6	16.1	25.5	40

Collets 462E

G80



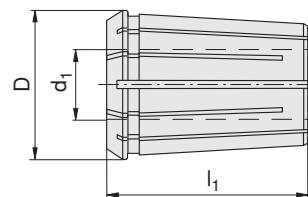
Type, description	d ₁ [mm]	d _{1 min} [mm]	d _{1 max} [mm]	D [mm]	l ₁ [mm]
462E-020	2.0	1.6	2.1	35.05	52
462E-025	2.5	2.1	2.6	35.05	52
462E-030	3.0	2.6	3.1	35.05	52
462E-035	3.5	3.1	3.6	35.05	52
462E-040	4.0	3.6	4.1	35.05	52
462E-045	4.5	4.1	4.6	35.05	52
462E-050	5.0	4.6	5.1	35.05	52
462E-055	5.5	5.1	5.6	35.05	52
462E-060	6.0	5.6	6.1	35.05	52
462E-065	6.5	6.1	6.6	35.05	52
462E-070	7.0	6.6	7.1	35.05	52
462E-075	7.5	7.1	7.6	35.05	52
462E-080	8.0	7.6	8.1	35.05	52
462E-085	8.5	8.1	8.6	35.05	52
462E-090	9.0	8.6	9.1	35.05	52
462E-095	9.5	9.1	9.6	35.05	52
462E-100	10.0	9.6	10.1	35.05	52
462E-105	10.5	10.1	10.6	35.05	52
462E-110	11.0	10.6	11.1	35.05	52
462E-115	11.5	11.1	11.6	35.05	52
462E-120	12.0	11.6	12.1	35.05	52
462E-125	12.5	12.1	12.6	35.05	52
462E-130	13.0	12.6	13.1	35.05	52
462E-135	13.5	13.1	13.6	35.05	52
462E-140	14.0	13.6	14.1	35.05	52
462E-145	14.5	14.1	14.6	35.05	52
462E-150	15.0	14.6	15.1	35.05	52
462E-155	15.5	15.1	15.6	35.05	52
462E-160	16.0	15.6	16.1	35.05	52
462E-165	16.5	16.1	16.6	35.05	52
462E-170	17.0	16.6	17.1	35.05	52
462E-175	17.5	17.1	17.6	35.05	52
462E-180	18.0	17.6	18.1	35.05	52
462E-185	18.5	18.1	18.6	35.05	52
462E-190	19.0	18.6	19.1	35.05	52
462E-195	19.5	19.1	19.6	35.05	52
462E-200	20.0	19.6	20.1	35.05	52
462E-205	20.5	20.1	20.6	35.05	52
462E-210	21.0	20.6	21.1	35.05	52
462E-215	21.5	21.1	21.6	35.05	52
462E-220	22.0	21.6	22.1	35.05	52
462E-225	22.5	22.1	22.6	35.05	52
462E-230	23.0	22.6	23.1	35.05	52
462E-235	23.5	23.1	23.6	35.05	52
462E-240	24.0	23.6	24.1	35.05	52
462E-245	24.5	24.1	24.6	35.05	52
462E-250	25.0	24.6	25.1	35.05	52



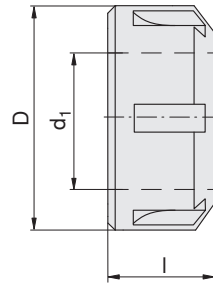
Type, description	d_1 [mm]	$d_{1 \text{ min}}$ [mm]	$d_{1 \text{ max}}$ [mm]	D [mm]	l_1 [mm]
467E-040	4.0	3.6	4.1	43.7	60
467E-045	4.5	4.1	4.6	43.7	60
467E-050	5.0	4.6	5.1	43.7	60
467E-055	5.5	5.1	5.6	43.7	60
467E-060	6.0	5.6	6.1	43.7	60
467E-065	6.5	6.1	6.6	43.7	60
467E-070	7.0	6.6	7.1	43.7	60
467E-075	7.5	7.1	7.6	43.7	60
467E-080	8.0	7.6	8.1	43.7	60
467E-085	8.5	8.1	8.6	43.7	60
467E-090	9.0	8.6	9.1	43.7	60
467E-095	9.5	9.1	9.6	43.7	60
467E-100	10.0	9.6	10.1	43.7	60
467E-105	10.5	10.1	10.6	43.7	60
467E-110	11.0	10.6	11.1	43.7	60
467E-115	11.5	11.1	11.6	43.7	60
467E-120	12.0	11.6	12.1	43.7	60
467E-125	12.5	12.1	12.6	43.7	60
467E-130	13.0	12.6	13.1	43.7	60
467E-135	13.5	13.1	13.6	43.7	60
467E-140	14.0	13.6	14.1	43.7	60
467E-145	14.5	14.1	14.6	43.7	60
467E-150	15.0	14.6	15.1	43.7	60
467E-155	15.5	15.1	15.6	43.7	60
467E-160	16.0	15.6	16.1	43.7	60
467E-165	16.5	16.1	16.6	43.7	60
467E-170	17.0	16.6	17.1	43.7	60
467E-175	17.5	17.1	17.6	43.7	60
467E-180	18.0	17.6	18.1	43.7	60
467E-185	18.5	18.1	18.6	43.7	60
467E-190	19.0	18.6	19.1	43.7	60
467E-195	19.5	19.1	19.6	43.7	60

Collets 467E

G82



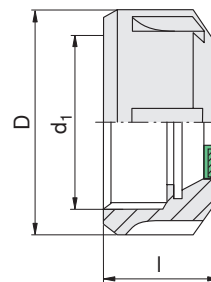
Type, description	d_1 [mm]	$d_{1\ min}$ [mm]	$d_{1\ max}$ [mm]	D [mm]	l_1 [mm]
467E-200	20.0	19.6	20.1	43.7	60
467E-205	20.5	20.1	20.6	43.7	60
467E-210	21.0	20.6	21.1	43.7	60
467E-215	21.5	21.1	21.6	43.7	60
467E-220	22.0	21.6	22.1	43.7	60
467E-225	22.5	22.1	22.6	43.7	60
467E-230	23.0	22.6	23.1	43.7	60
467E-235	23.5	23.1	23.6	43.7	60
467E-240	24.0	23.6	24.1	43.7	60
467E-245	24.5	24.1	24.6	43.7	60
467E-250	25.0	24.6	25.1	43.7	60
467E-255	25.5	25.1	25.6	43.7	60
467E-260	26.0	25.6	26.1	43.7	60
467E-265	26.5	26.1	26.6	43.7	60
467E-270	27.0	26.6	27.1	43.7	60
467E-275	27.5	27.1	27.6	43.7	60
467E-280	28.0	27.6	28.1	43.7	60
467E-285	28.5	28.1	28.6	43.7	60
467E-290	29.0	28.6	29.1	43.7	60
467E-295	29.5	29.1	29.6	43.7	60
467E-300	30.0	29.6	30.1	43.7	60
467E-305	30.5	30.1	30.6	43.7	60
467E-310	31.0	30.6	31.1	43.7	60
467E-315	31.5	31.1	31.6	43.7	60
467E-320	32.0	31.6	32.1	43.7	60



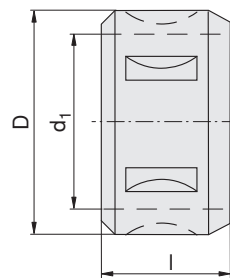
Type, description	l [mm]	D [mm]	d ₁
SM-ER16/M22x1,5	17.0	32	M22x1,5
SM-ER20/M25x1,5	19.5	34	M25x1,5
SM-ER25/M32X1,5	20.0	42	M32x1,5
SM-ER32/M40x1,5	22.3	50	M40x1,5
SM-ER40/M50x1,5	25.3	63	M50x1,5

Lock nuts ER-D

G84



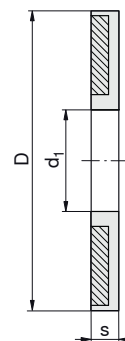
Type, description	l [mm]	D [mm]	d ₁
SM-ER16D	22.0	32	M22x1,5
SM-ER25D	24.7	42	M32x1,5
SM-ER32D	27.0	50	M40x1,5
SM-ER40D	30.7	63	M50x1,5



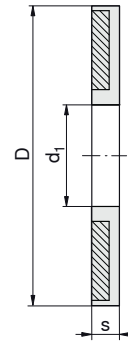
Type, description	l [mm]	D [mm]	d ₁
SM-BC2-16	24.0	43	M33x1,5
SM-BC2-25	30.0	60	M48x2,0

Sealing rings

G86



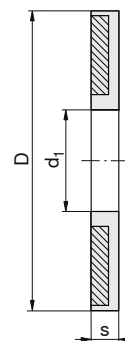
Type, description	d ₁ [mm]	D [mm]	s [mm]
DS-426E-020	2.0	12.6	2.0
DS-426E-025	2.5	12.6	2.0
DS-426E-030	3.0	12.6	2.0
DS-426E-035	3.5	12.6	2.0
DS-426E-040	4.0	12.6	2.0
DS-426E-045	4.5	12.6	2.0
DS-426E-050	5.0	12.6	2.0
DS-426E-055	5.5	12.6	2.0
DS-426E-060	6.0	12.6	2.0
DS-426E-065	6.5	12.6	2.0
DS-426E-070	7.0	12.6	2.0
DS-426E-075	7.5	12.6	2.0
DS-426E-080	8.0	12.6	2.0
DS-426E-085	8.5	12.6	2.0
DS-426E-090	9.0	12.6	2.0
DS-426E-095	9.5	12.6	2.0
DS-426E-100	10.0	12.6	2.0
DS-430E-020	2.0	20.2	2.0
DS-430E-025	2.5	20.2	2.0
DS-430E-030	3.0	20.2	2.0
DS-430E-035	3.5	20.2	2.0
DS-430E-040	4.0	20.2	2.0
DS-430E-045	4.5	20.2	2.0
DS-430E-050	5.0	20.2	2.0
DS-430E-055	5.5	20.2	2.0
DS-430E-060	6.0	20.2	2.0
DS-430E-065	6.5	20.2	2.0
DS-430E-070	7.0	20.2	2.0
DS-430E-075	7.5	20.2	2.0
DS-430E-080	8.0	20.2	2.0
DS-430E-085	8.5	20.2	2.0
DS-430E-090	9.0	20.2	2.0
DS-430E-095	9.5	20.2	2.0
DS-430E-100	10.0	20.2	2.0
DS-430E-105	10.5	20.2	2.0
DS-430E-110	11.0	20.2	2.0
DS-430E-115	11.5	20.2	2.0
DS-430E-120	12.0	20.2	2.0
DS-430E-125	12.5	20.2	2.0
DS-430E-130	13.0	20.2	2.0
DS-430E-135	13.5	20.2	2.0
DS-430E-140	14.0	20.2	2.0
DS-430E-145	14.5	20.2	2.0
DS-430E-150	15.0	20.2	2.0
DS-430E-155	15.5	20.2	2.0
DS-430E-160	16.0	20.2	2.0



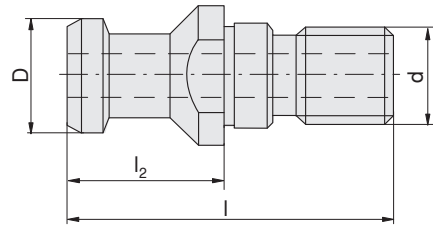
Type, description	d ₁ [mm]	D [mm]	s [mm]
DS-470E-020	2.0	26.2	2.0
DS-470E-025	2.5	26.2	2.0
DS-470E-030	3.0	26.2	2.0
DS-470E-035	3.5	26.2	2.0
DS-470E-040	4.0	26.2	2.0
DS-470E-045	4.5	26.2	2.0
DS-470E-050	5.0	26.2	2.0
DS-470E-055	5.5	26.2	2.0
DS-470E-060	6.0	26.2	2.0
DS-470E-065	6.5	26.2	2.0
DS-470E-070	7.0	26.2	2.0
DS-470E-075	7.5	26.2	2.0
DS-470E-080	8.0	26.2	2.0
DS-470E-085	8.5	26.2	2.0
DS-470E-090	9.0	26.2	2.0
DS-470E-095	9.5	26.2	2.0
DS-470E-100	10.0	26.2	2.0
DS-470E-105	10.5	26.2	2.0
DS-470E-110	11.0	26.2	2.0
DS-470E-115	11.5	26.2	2.0
DS-470E-120	12.0	26.2	2.0
DS-470E-125	12.5	26.2	2.0
DS-470E-130	13.0	26.2	2.0
DS-470E-135	13.5	26.2	2.0
DS-470E-140	14.0	26.2	2.0
DS-470E-145	14.5	26.2	2.0
DS-470E-150	15.0	26.2	2.0
DS-470E-155	15.5	26.2	2.0
DS-470E-160	16.0	26.2	2.0
DS-470E-165	16.5	26.2	2.0
DS-470E-170	17.0	26.2	2.0
DS-470E-175	17.5	26.2	2.0
DS-470E-180	18.0	26.2	2.0
DS-470E-185	18.5	26.2	2.0
DS-470E-190	19.0	26.2	2.0
DS-470E-195	19.5	26.2	2.0
DS-470E-200	20.0	26.2	2.0

Sealing rings

G88



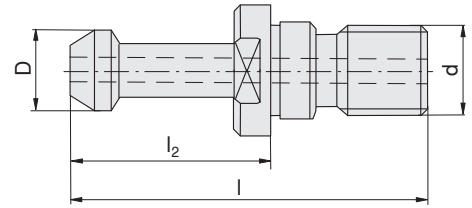
Type, description	d ₁ [mm]	D [mm]	s [mm]
DS-472E-030	3.0	34.2	2.0
DS-472E-035	3.5	34.2	2.0
DS-472E-040	4.0	34.2	2.0
DS-472E-045	4.5	34.2	2.0
DS-472E-050	5.0	34.2	2.0
DS-472E-055	5.5	34.2	2.0
DS-472E-060	6.0	34.2	2.0
DS-472E-065	6.5	34.2	2.0
DS-472E-070	7.0	34.2	2.0
DS-472E-075	7.5	34.2	2.0
DS-472E-080	8.0	34.2	2.0
DS-472E-085	8.5	34.2	2.0
DS-472E-090	9.0	34.2	2.0
DS-472E-095	9.5	34.2	2.0
DS-472E-100	10.0	34.2	2.0
DS-472E-105	10.5	34.2	2.0
DS-472E-110	11.0	34.2	2.0
DS-472E-115	11.5	34.2	2.0
DS-472E-120	12.0	34.2	2.0
DS-472E-125	12.5	34.2	2.0
DS-472E-130	13.0	34.2	2.0
DS-472E-135	13.5	34.2	2.0
DS-472E-140	14.0	34.2	2.0
DS-472E-145	14.5	34.2	2.0
DS-472E-150	15.0	34.2	2.0
DS-472E-155	15.5	34.2	2.0
DS-472E-160	16.0	34.2	2.0
DS-472E-165	16.5	34.2	2.0
DS-472E-170	17.0	34.2	2.0
DS-472E-175	17.5	34.2	2.0
DS-472E-180	18.0	34.2	2.0
DS-472E-185	18.5	34.2	2.0
DS-472E-190	19.0	34.2	2.0
DS-472E-195	19.5	34.2	2.0
DS-472E-200	20.0	34.2	2.0
DS-472E-205	20.5	34.2	2.0
DS-472E-210	21.0	34.2	2.0
DS-472E-215	21.5	34.2	2.0
DS-472E-220	22.0	34.2	2.0
DS-472E-225	22.5	34.2	2.0
DS-472E-230	23.0	34.2	2.0
DS-472E-235	23.5	34.2	2.0
DS-472E-240	24.0	34.2	2.0
DS-472E-245	24.5	34.2	2.0
DS-472E-250	25.0	34.2	2.0
DS-472E-255	25.5	34.2	2.0
DS-472E-260	26.0	34.2	2.0



Type, description	D [mm]	l ₂ [mm]	l [mm]	Thread size
69872-A19	23	26	54	M16
69872-A28	36	34	74	M24
69872-B19	23	26	54	M16
69872-B28	36	34	74	M24

Pull studs MAS-BT

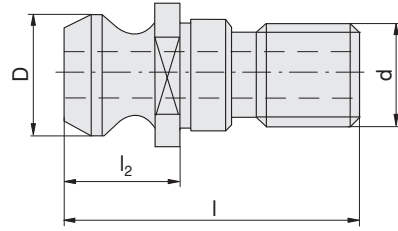
G90



Type, description	D [mm]	l ₂ [mm]	l [mm]	Thread size
MAS-BT-30-A15	23	35	60	M16
MAS-BT-30-A23	38	45	85	M24
MAS-BT-30-B15	23	35	60	M16
MAS-BT-30-B23	38	45	85	M24
MAS-BT-45-A15	23	35	60	M16
MAS-BT-45-A23	38	45	85	M24
MAS-BT-45-B15	23	35	60	M16
MAS-BT-45-B23	38	45	85	M24
MAS-BT-90-A15	23	35	60	M16
MAS-BT-90-A23	38	45	85	M24
MAS-BT-90-B15	23	35	60	M16
MAS-BT-90-B23	38	45	85	M24

Pull studs DIN 7388

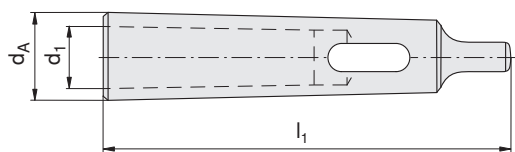
G91



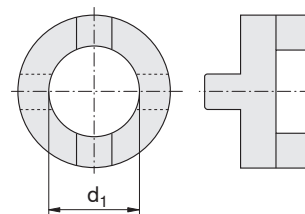
Type, description	D [mm]	l ₂ [mm]	l [mm]	Thread size
ISO/DIS7388-40.M16	22.5	16.40	41.26	M16
ISO/DIS7388-50.M24	37.0	25.55	65.50	M24

Reducers MK

G92



Type, description	d_A Morse taper [MK]	d_1 Morse taper [MK]	l_1 [mm]
DIN2185.MK1-MK0-80	MK1	MK0	80
DIN2185.MK2-MK1-92	MK2	MK1	92
DIN2185.MK3-MK1-99	MK3	MK1	99
DIN2185.MK3-MK2-112	MK3	MK2	112
DIN2185.MK4-MK1-124	MK4	MK1	124
DIN2185.MK4-MK2-124	MK4	MK2	124
DIN2185.MK4-MK3-140	MK4	MK3	140
DIN2185.MK5-MK3-156	MK5	MK3	156
DIN2185.MK5-MK2-156	MK5	MK2	156
DIN2185.MK5-MK4-171	MK5	MK4	171



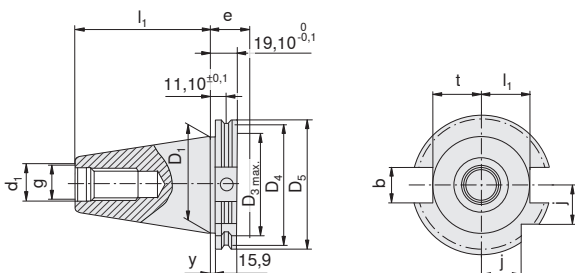
Type, description	d_1 [mm]
83 370 116	16
83 370 122	22
83 370 127	27
83 370 132	32
83 370 140	40
83 370 150	50

Technical data for HSK adapters

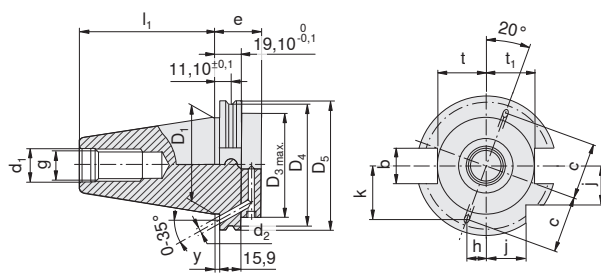
G94



DIN 69871 form A

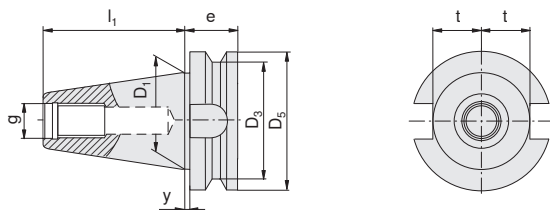


DIN 69871 form B



	D ₁	D _{3 max}	D ₄	D ₅	l ₁ ^{+0,2} ₀	g	d ₁ ^{H7}	e	y ^{+0,1}	t	t ₁	j	d ₂	h	k	c	b
	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
SK 40	44,45	50	56,25	63,55	68,4	M 16	17	35	3,2	22,8	25	18,5	4	9,2	25,4	27	16,1
SK 50	69,85	80	91,25	97,5	101,75	M 24	25	35	3,2	35,5	37,7	30	6	14,4	39,5	42	25,7

MAS-BT

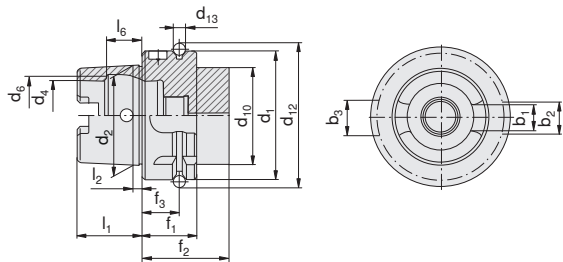


	D ₁	D ₃	D ₅	l ₁	g	e	t	y	b
	[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	[mm]	[mm]
BT 40	44,45	53	63	65,4	M 16	27	22,5	2	16,1
BT 50	69,85	85	100	101,8	M 24	38	35,3	3,2	25,7

HSK DIN 69893 A+C

Recommended parameters for HSK-A adapters

HSK-A 63 up to 25,000 1/min.
HSK-A 100 up to 16,000 1/min.



	b ₁	b ₂	b ₃	d ₁	d ₂	d ₄	d ₆	d ₁₀	d ₁₂	f ₁	f ₂	b ₁	f ₃	l ₁	l ₂	l ₆
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
HSK 63	12,54	16	18	63	48	34	37	53	72,3	7	26	42	18	32	6,3	18,13
HSK 100	20,02	20	22	100	75	53	58	88	109,75	7	29	45	20	50	10	28,56





	Material	Type, description
	8337011600	83 370 116
	8337012200	83 370 122
	8337012700	83 370 127
	8337013200	83 370 132
	8337014000	83 370 140
	8337015000	83 370 150
	8395012000	8X9X17,5
	8395012100	10X11X20,5
	8395012200	12X13X24,3
	8395012300	14X21X21,2
	8395029500	15,9X16,3X19,5
	8395029800	25,4X25X26,5
	8395028400	82998015.4X4X20
	8395028500	82998016.6X6X25
	8395028600	82998017.7X7X25
	8395028700	82998018.8X7X28
	8395028800	82998019.10X8X32
	8395028900	82998020.12X8X36
	6295005000	SM-BC2-16
	6295005100	SM-BC2-25
	8395005500	SM-ER25D
	8395005600	SM-ER32D
	8395005700	SM-ER40D
	6295004500	SM-ER20/M25x1,5
	6295005400	SM-ER16/M22x1,5
	6295005500	SM-ER25/M32X1,5
	6295005600	SM-ER32/M40x1,5
	6295005700	SM-ER40/M50x1,5
	8336811600	604016.Ø16
	8336812200	604022.Ø22
	8336812700	604027.Ø27
	8336813200	604032.Ø32
	8336814000	83 368 140
	12001280	10014334/S-D12-D1.3
	8335901300	SCHL.13X62
	8335901700	SCHL.17X117
	8335902000	SCHL.20X135
	8335902300	SCHL.23X145
	8335903300	SCHL.33X175
	8335411600	SS-BC2-16
	8335412500	601060.2-25
	8335413200	SS-BC4-32
	8335711600	SS-ER16
	8335712500	SS-ER25
	8335713200	SS-ER32
	8335714000	SS-ER40
	11960178	GS-HSK 10015789-0
	8395026500	83 950 265
	8395026600	83 950 266
	8395026700	83 950 267
	8395026800	83 950 268
	8395026900	83 950 269
	8395027000	83 950 270
	8395027100	83 950 271
	8376006300	KMS.HSK63
	8376010000	KMS.HSK100

	Material	Type, description
	194263	7896900/O-RING 40
	225429	7896940/O-RING 50
	225430	7896941/O-RING 63
	11848510	10014329/SD 12X7 100BAR
	231176	7896944/SD 12X8
	8336701600	604008.M8
	8336702200	604010.M10
	8336702700	604012.M12
	8336703200	604016.M16
	8336704000	83 367 040/M20x30-12,9
	8336705000	83 367 050
	11210254	10002666/M4X16 DIN912 - 12.9
	8395013600	82998006.M5X12
	8395013700	82998008.M5X20
	8395013800	82998009.M6X16
	8395029600	82998004.M3X8
8395029700	82998005.M4X12	

Spare parts

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	Material	Type, description	l [mm]	Thread size	Key size
	8395001000	VS-ER25	50	M10	SW5
	8395001100	VS-ER40	50	M12	SW6
	8395003300	83 950 033	35	M5	SW2,5
	8395003400	83 950 034	35	M6	SW3
	8395003500	83 950 035	35	M8	SW4
	8395003600	83 950 036	35	M10	SW5
	8395003700	83 950 037	40	M12	SW7
	8395027200	83 950 272	45	M16	SW8
	8395029000	M20x35.SW10	35	M20	SW10
	11106932	7896982/M12X1.75X25-DIN913	25	M12	SW6
	11154410	VS-ER16-K/M5X8	8	M5	SW2,5
	11154413	VS-ER20-K/M6X12	12	M6	SW3
	11154414	VS-ER25-K/M8X1X14	14	M8	SW4
	11154418	VS-ER32-K/M10X1X14	14	M10	SW5
	11154419	VS-ER40-K/M12X1X18	18	M12	SW6
	6295000600	62 950 006/M6X10	10	M6	SW3
	6295000800	62 950 008/M8x10	10	M8	SW4
	6295001000	62 950 010/M10x12	12	M10	SW5
	6295001200	62 950 012/M12x16	16	M12	SW6
	6295001600	62 950 016/M14x16	16	M14	SW6
	6295002000	62 950 020/M16X16	16	M16	SW8
	6295002500	62 950 025/M18X2X20	20	M18	SW10
	6295003200	62 950 032/M20x2x20	20	M20	SW10
	8395003000	83 950 030	6	M5	SW2,5
	8395003100	83 950 031	8	M5	SW2,5
	333935	7818123/M8X25/DIN912-12.9	25	M8	SW6
	333937	7818124/M10X25/DIN912-12.9	25	M10	SW8
	333940	7818125/M12X30/DIN912-12.9	30	M12	SW10
	333945	7818126/M16X35 DIN912 - 12.9	35	M16	SW14
	8395001700	83 950 017	30	M10	SW8
	8395001800	83 950 018	35	M12	SW10
	8395001900	83 950 019	40	M16	SW14
	8395011200	M20X40	40	M20	SW17
	8395011300	M8X25	25	M8	SW6
	8395012400	M10X25	25	M10	SW8
	8395012500	M12X30	30	M12	SW10
	8395012600	M16X35	35	M16	SW14
	8395014000	M12X50	50	M12	SW10
	8395016000	M16X45	45	M16	SW14
	8395026000	83 950 260	30	M6	SW5
	8395026100	83 950 261	30	M10	SW8
	8395026200	83 950 262	50	M20	SW17

6	
69871.. BC..	G18
69871.. ER..	G16, G17
69871.. HF..	G25
69871.. KA..	G19
69871.. KD..	G24
69871.. MA..	G21
69871.. MK..	G22
69871.. MK.. C..	G23
69871.. QA..	G20
69871.. WE..	G10, G11, G12, G13, G14
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DIN6499-B.. 426E..	G74
DIN6499-B.. 428E..	G75
DIN6499-B.. 430E..	G76
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DNMG	A10
DS-426E..	G86
DS-430E..	G86
DS-470E..	G87
DS-472E..	G88
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HSK A.. HF..	G51
HSK A.. KD..	G50, G65
HSK A.. M..	G48
HSK A.. MK..	G49
HSK A.. QA..	G47
HSK A.. WE..	G42, G43
HSK A.. WN..	G44, G45
HSK T.. BH..	G60
HSK T.. HF..	G64

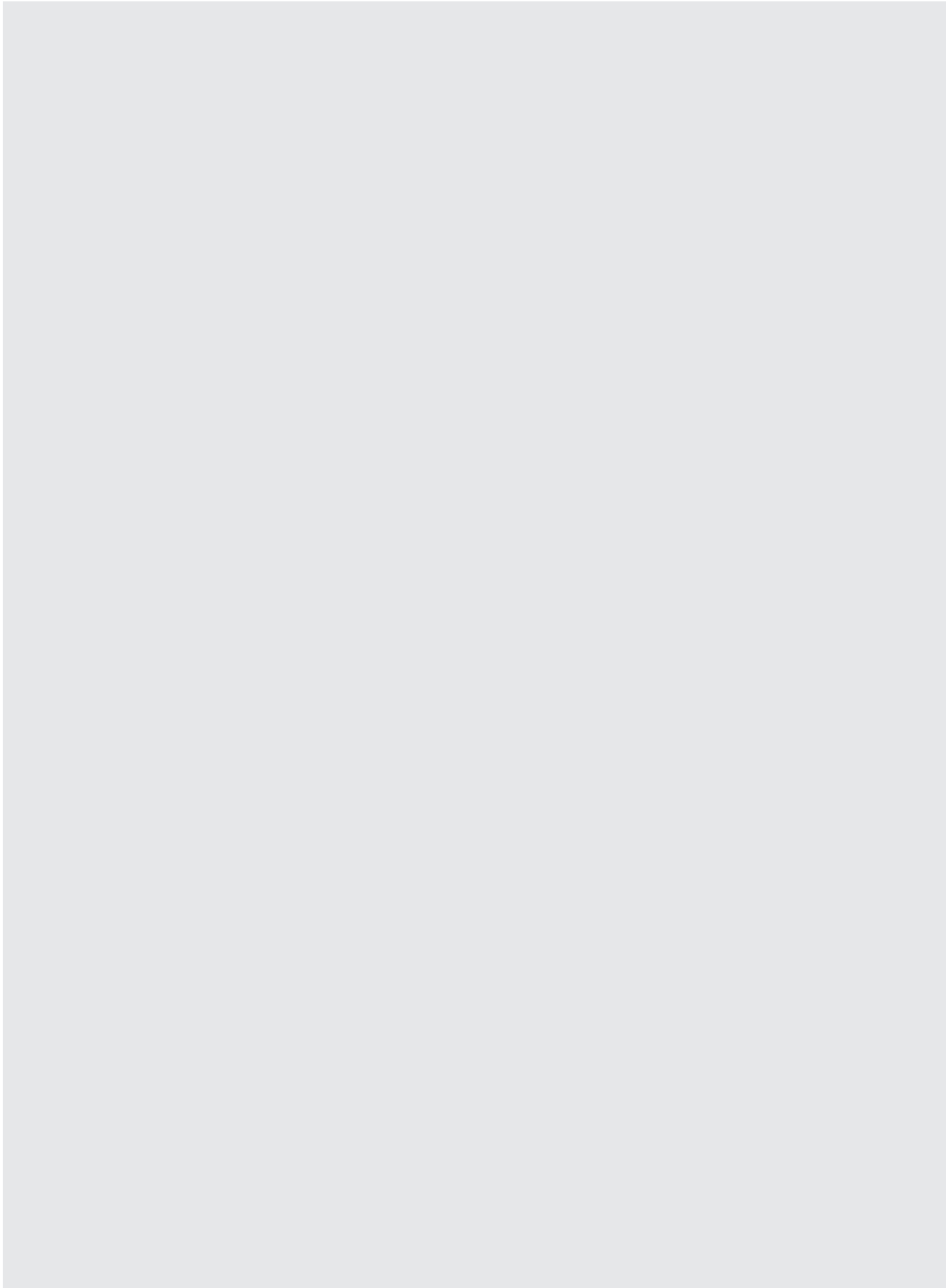
HSK T.. R..	G62
HSK T.. SH3..	G59
HSK T.. SHL00..	G56
HSK T.. SHL45..	G57
HSK T.. SHN90..	G58
HSK T.. SHR00..	G56
HSK T.. SHR45..	G57
HSK T.. UT..	G63
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MAS-BT.. ER..	G32, G33
MAS-BT.. HF..	G41
MAS-BT.. KA..	G35
MAS-BT.. KD..	G40
MAS-BT.. MA..	G37
MAS-BT.. MK..	G38
MAS-BT.. MK..C..	G39
MAS-BT.. QA..	G36
MAS-BT.. WE..	G26, G27, G28, G29, G30
MAS-BT.. WN..	G31
MAS-BT-30-A..	G90
MAS-BT-30-B..	G90
MAS-BT-45-A..	G90
MAS-BT-45-B..	G90
MAS-BT-90-A..	G90
MAS-BT-90-B..	G90
R	
RCMT	A13
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SCMT	A13
SM-BC..	G85
SM-ER..	G83
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SNHU	B18
SNMA	A11
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TCMT	A14
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Notes



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CERATIZIT worldwide

H4



- Logistics
- Headquarters
- Production sites
- Sales companies

- 1 Mamer Luxembourg
- 2 Reutte Austria
- 3 Gabrovo Bulgaria
- 4 Empfingen Germany
- 5 Hitzacker Germany
- 6 Alserio Italy
- 7 Kolkata India
- 8 Livange Luxembourg
- 9 Niederkorn Luxembourg
- 10 Biel Switzerland
- 11 Warren United States
- 12 Kempten Germany

- 13 Reutte Austria
- 14 São Paulo Brazil
- 15 Gabrovo Bulgaria
- 16 Velké Meziříčí Czech Republic + Slovakia
- 17 Empfingen Germany
- 18 Sheffield United Kingdom
- 19 Budapest Hungary
- 20 Bangalore India
- 21 Chennai India
- 22 Pune India
- 23 New Delhi India
- 24 Alserio Italy
- 25 Shizuoka Japan
- 26 Mamer Luxembourg + Belgium + France
- 27 Querétaro Mexico
- 28 Roosendaal Netherlands
- 29 Krakow Poland
- 30 Madrid Spain + Portugal
- 31 Biel Switzerland
- 32 Warren United States + Canada

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