

Precision Tooling Blanks

by the world market leader

Photo: Lake Plansee, Reutte region



CERATIZIT is a high-technology engineering group specialised in cutting tools and hard material solutions.

Tooling a Sustainable Future

ceratizit.com

Dear customer,

CERATIZIT Group develops and produces innovative carbide solutions for tool manufacturers. Based on your requirements and the desired price point, when it comes to tool production you can choose from two different product lines:

Professional line

Our brand-new professional line has been engineered for material specific applications when standard 10% submicron will not suffice. This high-performance product line consists of our premium grades in various sizes and configurations, all manufactured in our state-of-the-art tool blank production facility in Reutte, Austria. You can choose from 11 standard grades, ranging from ultrafine to submicron and even fine grain compositions. With over 1,300 stock products in 26 different variants, CERATIZIT offers you the largest stock range worldwide for manufacturers of solid carbide tools.

Elite line

Our K200 grade of the Elite line is the first choice for 80% of the applications and has the most competitive price/performance ratio for end mill blanks in the industry. These products are manufactured in our Taiwan CB-CERATIZIT plant. CB-CERATIZIT has been our reliable joint venture partner for many years.

World market leader for rods & preforms

Driven by innovative excellence, the CERATIZIT Group offers the world's most comprehensive carbide solutions for tool manufacturers looking for a competitive edge. CERATIZIT can also supply you with individual near net shape preforms and semi-finished tool blanks based on your drawings, with timely deliveries. CERATIZIT offers you a unique product portfolio, with outstanding performance in all aspects - from the development of the product, along with inventory levels and customer service to exceed your expectations.

Highly developed logistics processes

You can rely on our high level of delivery security and flexible production capacity along with optimally stocked warehouses that ensures your order will always be handled efficiently. You can also order stock products 24/7 through our online E-Techstore, and you can take advantage of the technical expertise from our sales and office staff. With over 50 company sites in Europe, America and Asia, CERATIZIT is ready to serve you at any time throughout the world.

CERATIZIT – Tooling a Sustainable Future

If you want to keep up with trends and innovations, you need a partner you can rely on. We at CERATIZIT offer you comprehensive knowledge of the industry, decades of expertise and can thus support you with valuable advice.

In addition, sustainability is at the top of our agenda. We therefore make every effort to achieve even ambitious goals: we strive to be a pioneer in terms of sustainability. Innovative developments such as our sustainable CT-GS20Y carbide grade provide you, as our customer, with the benefit of a lower CO₂ footprint.

Premium carbide grades, the basis of high-performance cutting tools

Depending on their specific requirements, tool manufacturers can choose from three different product lines. The Premium Line offers the largest selection of grades and finishes for high-performance tools in every application area.

Our Premium Line line products are exclusively manufactured using carbide grades which are produced at our company site in Reutte, Austria. You can choose from 13 standard grades, ranging from ultra-fine to submicron and fine grain, as well as cermet grades. With over 1,400 stock products in 25 different variants, we offer you the largest stock range worldwide for manufacturers of solid carbide tools. Of course, we can also supply you with individual near net shape preforms and semi-finished tools based on your drawings, with timely deliveries guaranteed.

Our latest contribution to a CO₂-reduced future is our CT-GS20Y grade. This carbide grade consists of more than 99% recycled carbide offering maximum performance. Thanks to CT-GS20Y, we are able to guarantee better price stability and reduced supply risks.



CERATIZIT Group

For over **100 years**, CERATIZIT has been a pioneer developing exceptional hard material products for cutting tools and wear protection.

The privately owned company, based in Mamer, Luxembourg, develops and manufactures highly specialised carbide cutting tools, inserts and rods made of hard materials as well as wear parts.

The CERATIZIT Group is the **global market leader** in several application segments for wear parts and rods and successfully develops new carbide, cermet and ceramic grades, for example, in wood, metal and stone working.

Facts & figures

 **1 headquarters**
Mamer, Luxembourg

 **30** production sites


 **7 000** employees

 **80** countries in which we are active

 **1 00 000** different products

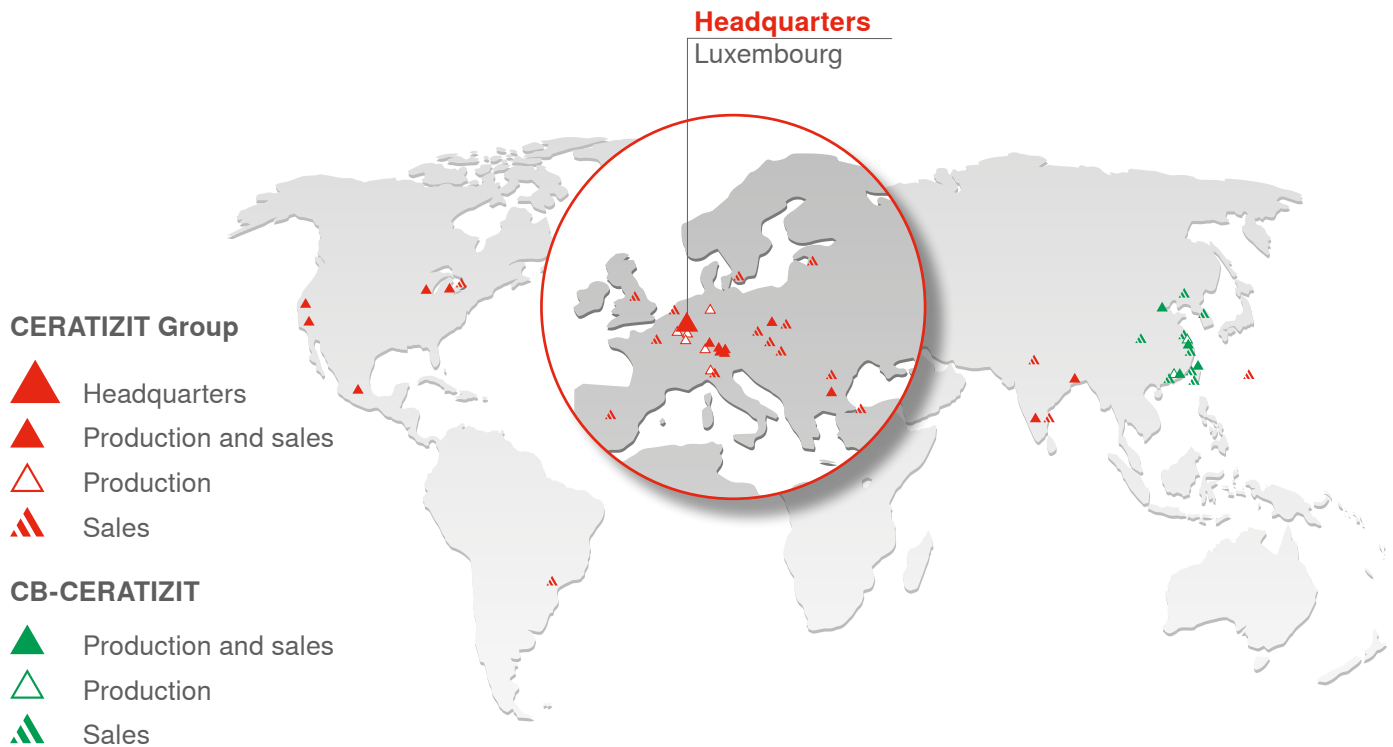
 **1 000** patents and utility models

 **2 00** employees in R&D

 **30** % of products developed in the last 5 years

 **25** innovation awards

Operating globally for you



Production site

The CERATIZIT centre of excellence for cutting tool products, rods and preforms is located at the Breitenwang/Reutte site in Austria. CERATIZIT Austria GmbH is certified to ISO 9001. The company currently has around 850 employees and is thus the second-largest site of the CERATIZIT Group.

From powder preparation to the production of rods and preforms to the recycling of carbide, all production processes are located in Reutte. The CERATIZIT Group has expanded the successful production site and its production space in the years 2013, 2017 and 2018 by a total of more than 10,500 square metres.

A new dimension has been reached with the extension of the production halls in Kreckelmoos. The entire additional production space amounts to around 18,000 square metres, 5,000 square metres of which are exclusively dedicated to rod finishing.





Sustainability is not an option, it's a mission

Together for Sustainability

Leading in sustainability by 2025

Our mission is just as clear as it is difficult to accomplish. By 2025, we aim to be the sustainability leader for the hard metals and cutting tool industry. To meet this ambitious objective and become truly sustainable, we are implementing an array of sustainability measures along the entire value chain. However, we're not just keeping our sustainability ethos in-house, it will help set new standards for cooperating with partners moving forward.



Climate neutral by 2025

We recognise our responsibility to be good stewards to the climate and are going to great lengths to keep our carbon footprint to a minimum. The United Nations' Sustainable Development Goals aim to achieve net-zero carbon emissions by 2050. We think we can do better and aim to be net-zero by 2040.

- ▲ **By 2025:** carbon neutral, emissions reduced by 35%
- ▲ **By 2030:** combined reduction of 60%
- ▲ **By 2040:** net zero, emissions reduced by 75%



Minimise the use of virgin raw materials

To reduce the mining of virgin raw materials, our goal is to increase the share of raw materials remaining in the carbide production chain to over 95% by 2030 (based on scrap recycling rates of sintered products).

Read more about our sustainability approach on our website.

ceratizit.com





Environmentally friendly, sustainable and cost-effective

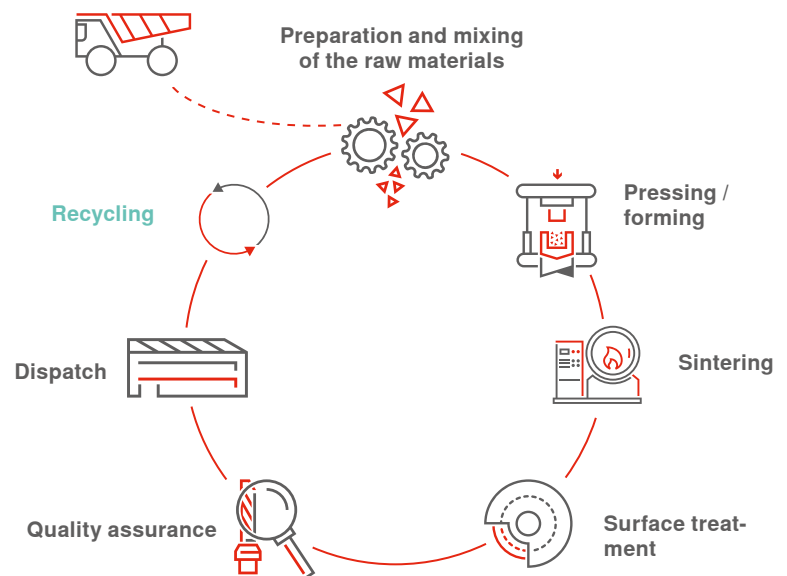
For us, recycling means the responsible handling of [resources](#). To reduce the depletion of scarce primary raw materials, we are continually increasing the proportion of recycled carbide in our products. Currently, we are at around 83%, but we want to exceed 95% by 2030. That also means that we are continuing to develop our recycling partnerships with you, our customers. CERATIZIT has a state of the art recycling center located in the US. If you are interested, please contact your local sales representative.

The CERATIZIT Group manages the entire production process from the powder to recycling

Becoming more flexible and resilient in recent years and making sustainability a focus of our strategy has already proven to be an effective decision.

As a company, we have emerged stronger from the international crises. We are better prepared than ever to support our customers in the best possible way, even under difficult conditions.

We are committed to the highest standards of ethical business conduct and expect the same from our suppliers. For this reason, we have established a code of conduct for all our suppliers and their subcontractors.



Responsible packaging



Packaging should also contribute to a low CO₂ footprint. We have therefore developed an innovative packaging system, which is ideal for heavy carbide rods in terms of product safety and handling.

Environmentally friendly cardboard is the optimum solution for product safety and can be recycled without any problems.

What about availability? Better every day.

Do you need standard products on demand? Then we have good news for you, as most of them are available from stock. Thanks to our new state-of-the-art logistics centre in Kempten, Germany and also Towanda in Pennsylvania, orders are processed very fast, all over the world.

Ordering is particularly easy thanks to the straightforward E-Techstore.

The online shop for your cemented carbide products around the clock

The benefits for you:

- ▲ Worldwide availability check in real time
- ▲ Track and trace your orders and shipments
- ▲ Immediate order confirmation
- ▲ Complete product information: product and technical details (including CAD data)
- ▲ Full document history: invoices, history of both online and offline orders etc.
- ▲ Order a standard item or configure your tailor-made solution



The new CERATIZIT logistics centre is the most technologically advanced and modern in the industry worldwide



Sustainability is also a relevant issue in logistics: our logistics centre is energy-efficient to the highest standards, and we cover almost all our energy needs with solar energy.

We are continuously working on [environmentally friendly solutions](#), for example, when it comes to packaging. Our partner transport companies are committed to optimising their processes and systems sustainably. Together we are striving to achieve an environmentally friendly inventory management and resource-efficient logistics processes.

Cemented carbide – a composite material with valuable properties

Cemented carbides are composite materials consisting of a hard component and a comparatively soft binder metal, such as cobalt. The application range of carbide is primarily determined by hardness, transverse rupture strength and fracture toughness. Important parameters for the optimisation of the characteristics are the cobalt content and the grain size of the hard material phase.

The tungsten carbide grains have an average size of less than 0.2 nanometres to several micrometres (μm). The cobalt fills the gaps between the carbide grains. On the one hand, when extremely high toughness is required, the cobalt content can amount up to 30%. On the other, for maximum wear resistance, the cobalt content is reduced, and the grain size decreased to the nano-crystalline range ($< 200 \text{ Nm}$).

CERATIZIT produces far more than 100 different carbide grades particularly for wear parts and cutting tools, thus offering a customised solution for every application.



How cemented carbide is produced

CERATIZIT has produced cemented carbide since 1929. Last but not least, thanks to long-standing experience CERATIZIT handles the entire process chain, from the raw material to the dispatching of the finished products to customers. The production process of powder-metallurgical products basically involves the four steps of powder preparation, forming, sintering and finishing.

Tungsten carbide production

The APT (ammonium para-tungstate) is calcined into tungsten oxide under high temperature. Subsequently the oxide is reduced to tungsten metal in a hydrogen atmosphere. The metal powder is then mixed with carbon and carburized under inert atmosphere at high temperatures. The production parameters are decisive for the WC grain size in the sintered carbide.

Powder preparation

The tungsten carbide is intensely mixed with the binder metal cobalt, nickel or iron, various grain growth inhibitors and special alloys as well as materials, which promote compaction, by wet grinding so that a homogeneous suspension is created. Afterwards, the suspension is dried in a spray tower to produce a granulate with good flow characteristics. This granulate represents the basis for all forming processes.



APT (ammonium para-tungstate)



Yellow tungsten oxide



Tungsten

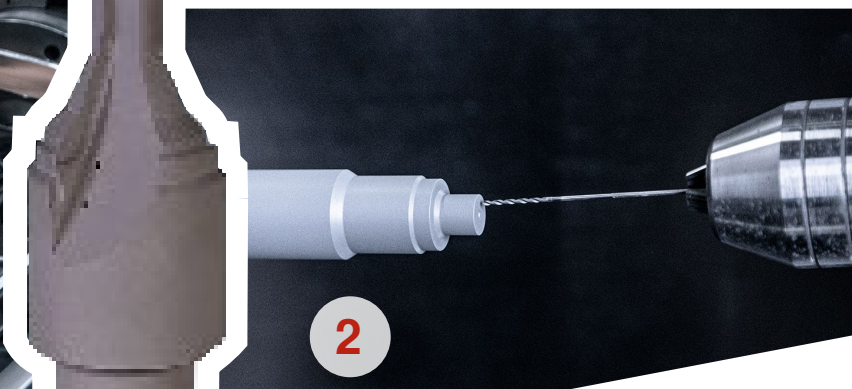
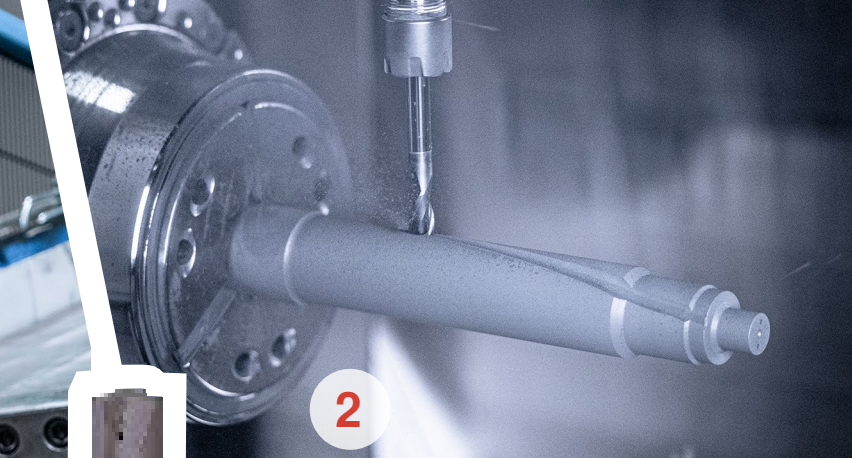
Forming cemented carbide

In the forming process the granulate is inserted into moulds to be pressed into a definite shape, using a wide range of different pressing methods. The resulting workpieces sometimes have to be finished mechanically.

- 1** Carbide rods are most commonly produced by extrusion pressing. For this process the carbide powder is plasticised by adding organic compounds (e.g. paraffin). This makes it possible for the mixture to be forced through appropriately designed cemented carbide nozzles. (After the forming process is complete, the added plasticiser is removed by thermal treatment.)
- 2** In order to produce preforms, pre-sintered compacts (green compacts) are machined mechanically before the sintering process (turning, milling, drilling). This machining process of the compacts, which are characterised by a strength similar to chalk, is exclusively carried out with diamond tools on conventional machines.
- 3** The sintering process converts the blank into a homogeneous and dense cemented carbide with a high level of hardness. The material is sintered at temperatures between 1,300 and 1,500°C (liquid phase sintering) and sometimes also at high pressure (up to 100 bar).
- 4** During the sintering process the blanks shrink, their dimensions being reduced between 20 and 25%, depending on the grain size and cobalt content.
- 5**
- 6** In order to achieve the final requirements of surface finish, tolerances, etc., carbide parts can undergo a series of finishing processes (e.g. grinding, polishing, spark erosion and coating). The most important grinding procedure for carbide rods is centreless grinding. When producing tool blanks, minimum diameter tolerances and excellent surface quality represent an optimal quality characteristic.
- 7**



Tungsten carbide



- 1 Extrusion pressing
- 2 Mechanical machining of presintered compacts
- 3 Sintering process





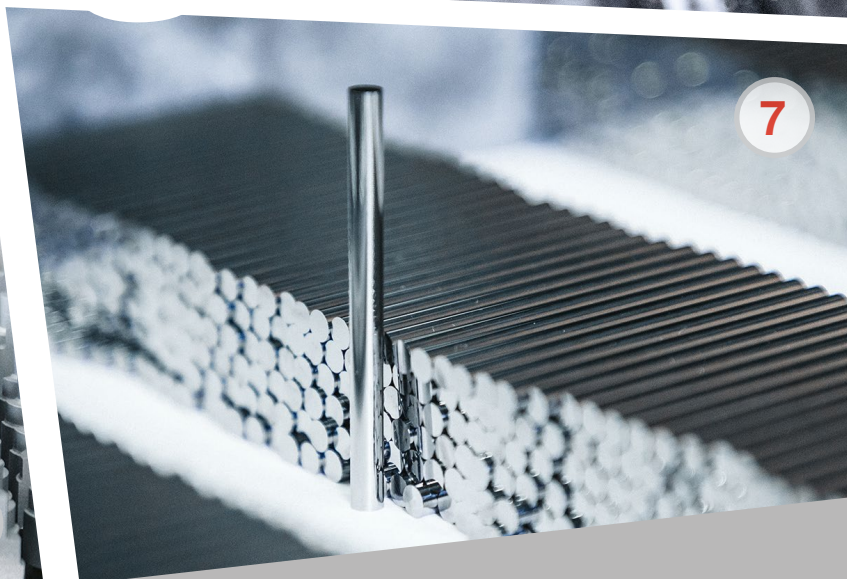
- 4 Sinter shrinkage – green compact compared to sintered part
- 5 Sintered rods and preforms
- 6 Centreless grinding
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4

6



5



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Professional line

2 END MILL BLANKS

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Grades: composition and properties

Professional line

Grade	ISO code*	U.S. code	Binder [m %]	Density [g/cm³]	Hardness [HV30] [HRA]		Transverse rupture strength [MPa]	K _{IC} ** (Shetty) [MPa·m ^{1/2}]	[GPa]	[-]
Ultrafine grades										
CTU08L	K10	C-2	4.2	15.05	2200	95.2	3700	8.4	646	0.202
TSF22	K10 – K20	C-2	8.2	14.55	1930	93.7	4400	9.2	596	0.210
TSF44	K10 – K20	C-2	12.0	14.10	1730	92.7	4600	9.8	547	0.218
Submicron grades										
CTS12D	K05 – K10	C-3	6.0	14.80	1820	93.1	3600	9.3	624	0.205
CTS15D	K10 – K30	C-3	7.5	14.70	1750	92.8	3700	9.5	605	0.208
CTS18D	K20 – K40	C-2	9.0	14.55	1590	91.9	3650	10.7	586	0.211
CTS20D	K20 – K40	C-2	10.0	14.38	1600	91.9	4000	10.4	570	0.214
CTS24Z	K20 – K40	C-2	12.0	14.10	1570	91.7	4000	11.3	549	0.217
CTS30D	K30 – K40	C-2	15.0	13.84	1400	90.4	4300	13.2	512	0.223
Fine grades										
CTF12E	K15	C-2	6.0	14.95	1620	92.1	3000	9.9	624	0.205
CTF25E	K30 – K40	C-2	12.5	14.15	1300	89.5	3500	15.0	543	0.218

Elite line

Grade	ISO code*	U.S. code	Binder [m %]	Density [g/cm³]	Hardness		Transverse rupture strength [MPa]	K _{ic} ** (Shetty) [MPa·m ^{1/2}]	[GPa]	[-]
					[HV30]	[HRA]				
Submicron grades										
K200	K20 – K40	C-3	10.0	14.40	1510	91.3	3920	10.5	547	0.218

Grain size classification		CERATIZIT code
Average grain size [µm]	Classification	
< 0.2	nano	N
0.2 – < 0.5	ultrafine	U
0.5 – < 0.8	submicron	S
0.8 – < 1.3	fine	F
1.3 – < 2.5	medium	M
2.5 – < 6.0	coarse	C
> 6.0	extra-coarse	E

Comment:

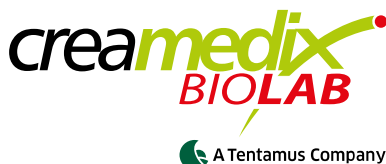
The data in this table are typical material parameters. We reserve the right to modify the data due to technical progress or further development within our company.

*) The classification of carbides according to grain size corresponds to the recommendations of the Powder Metallurgy Association. The standard ISO codes for carbides which were developed for fine to medium grain sizes no longer correspond to today's state of the art. Only the application data are relevant for the correct grade selection. K_{IC}^{**} : The measured critical tension intensity factors (K_{IC}) depend to a high degree on the sample geometry and sample preparation. A direct comparison with parameters which have been determined by means of a different method is therefore not admissible.

Carbide grades for biocompatible tools in accordance with ISO 10993-5 for the medical and dental industry

The biocompatibility requirement for medical products increases patient safety. For tools that come into short-term direct contact with body tissue, cell tolerance must be guaranteed. Testing for in-vitro cytotoxicity in accordance with DIN EN ISO 10993-5 was carried out by an accredited testing laboratory. The following carbide grades were successfully tested for their cell tolerance:

▲ TSF22 ▲ CTS15D ▲ CTS20D
▲ TSF44 ▲ CTS18D ▲ CTS24Z
▲ CTS12D



Certified biological testing of the in-vitro
cytotoxicity in accordance with

DIN EN ISO 10993-5
by
Creamedix GmbH

Accreditation number
D-PL-19876-01



Application recommendations

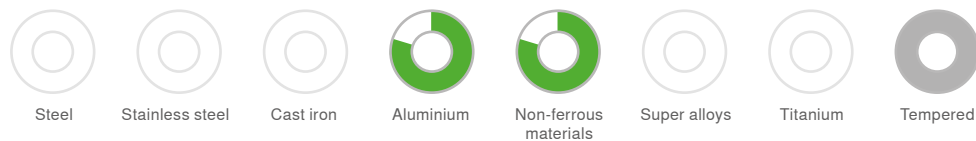
Ultrafine grades

100 µm
Micrograph (example)

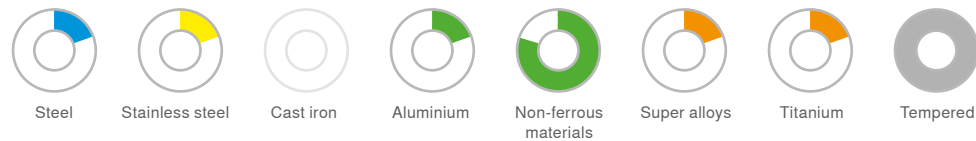
CTU08L: carbide grade with a typical grain size of 0.2 µm for the machining of materials with a hardness > 65 HRC. Thanks to the high wear resistance also excellent suitability for abrasive fiber composite materials.



TSF22: ultrafine carbide grade for HSC machining of tempered steels with a hardness of > 60 HRC and abrasive aluminum alloys.

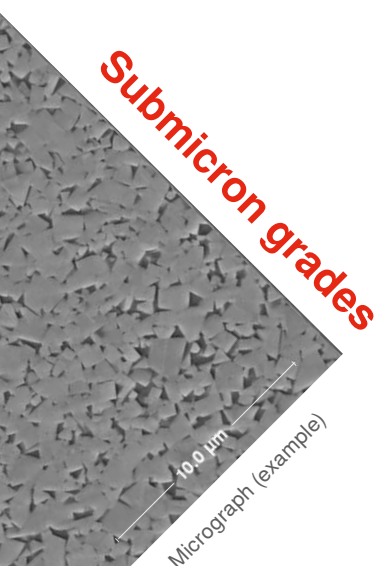


TSF44 ultrafine carbide grade for HSC machining of tempered steels up to 60 HRC, suitable for micro-tools and finishing tools and for a variety of materials.

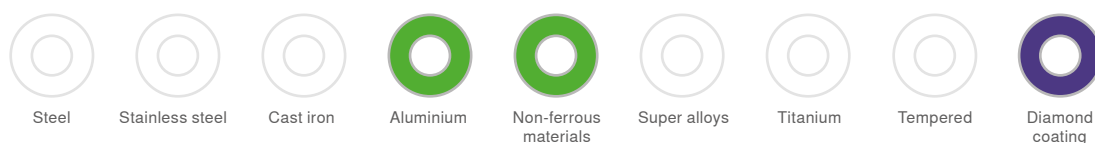


The illustration for the selection of the carbide grade is a general recommendation based on the material. In addition to the material, there are numerous other determining factors. Machining methods, cutting parameters, coating, macro and micro geometry are important as well. All these factors in turn influence one another, which makes it difficult to precisely predict the performance during a machining process. The colour scheme of the diagrams is based on the application groups ac-

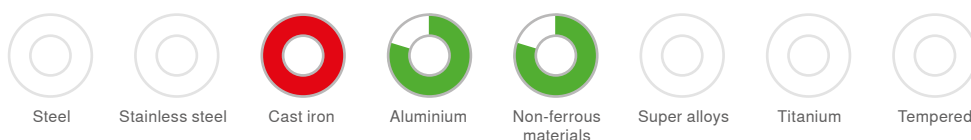
cording to ISO 513. The degree to which the circle is filled indicates the suitability for the respective material. Aluminium and titanium alloys are shown in separate diagrams due to their importance. In addition, the purple diagram indicates special characteristics of the respective carbide grades.



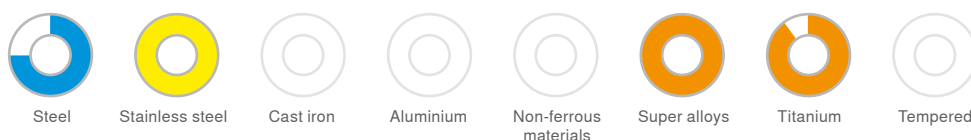
CTS12D for machining aluminium alloys, fibre-reinforced plastics (carbon-fibre and glass-fibre reinforced), composite materials, graphite; particularly suitable for diamond coating.



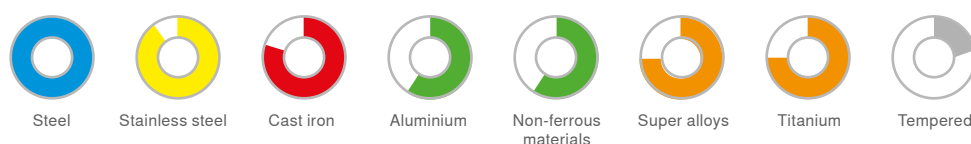
CTS15D for machining grey cast iron, tempered cast iron, non-alloyed steel, non-ferrous metals and plastics.



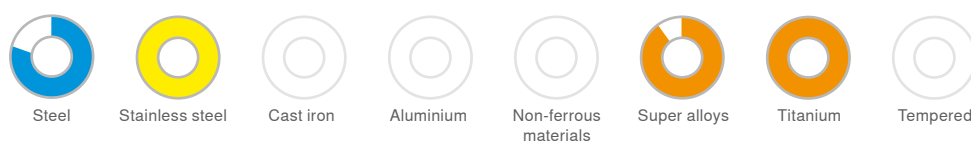
CTS18D for high-performance machining of steel, stainless steel and the machining of difficult materials.



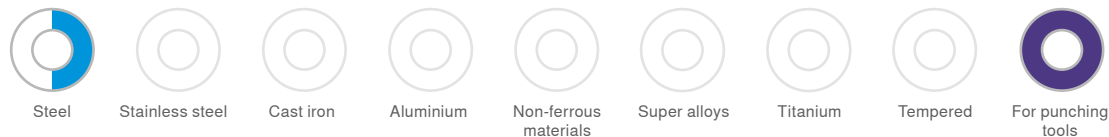
CTS20D for universal machining of alloyed and non-alloyed steels. In view of its balanced properties, it can be used for a variety of cutting operations on different materials. Improved toughness values ensure a low breakage risk on the cutting edges.



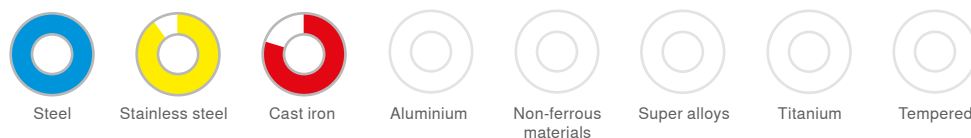
CTS24Z, the special high-performance grade for the roughing of titanium and heat-resistant alloys. Even higher fracture toughness than CTS18D and CTS20D with approximately the same hardness.



CTS30D with extremely high fracture toughness for particularly unstable and difficult applications. A good choice when switching from HSS to cemented carbide.



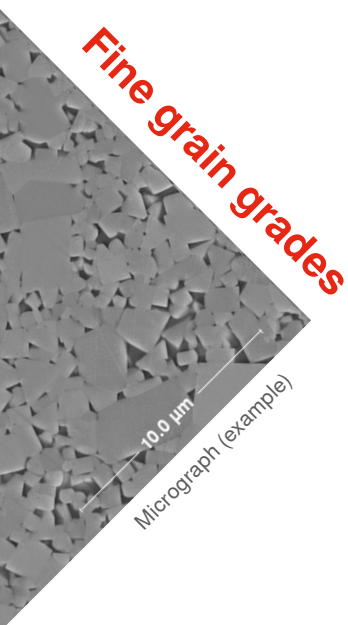
K200 Submicron grade with well-balanced wear resistance and toughness. Particularly suitable for drilling applications.



CTF12E: for gun drills with an adapted relation between hardness and toughness. Suitable also for diamond-coated solid carbide tools.



CTF25E: for the production of PCD tools and tool shanks. The increased cobalt content and the coarser grain improve brazability while increasing fracture toughness.



Stock range at a glance

The product map below provides you with a quick overview of the grades and rods which are available in stock.

Other products are available upon request.

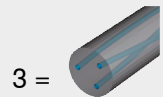
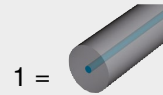
		Professional line										Elite line	starting page
		Ultra-fine			Submicron						Fine	Submicron	
		CTU08L	TSF22	TSF44	CTS12D	CTS15D	CTS18D	CTS20D	CTS24Z	CTS30D	CTF12E		
End mill blanks, inch	RMIC											<input type="checkbox"/>	27
	RGIC		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>				32
	End mill blanks, metric	RMMC										<input type="checkbox"/>	29
		RGMC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>				36
	End mill blanks with Weldon shank, metric	RGMCW						<input type="checkbox"/>					40
	End mill blanks with through coolant, metric	RGMCY						<input type="checkbox"/>					41
Solid carbide rods, as sintered	RR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		45
	Solid carbide rods, ground, metric	RGI						<input type="checkbox"/>					49
	Solid carbide rods, ground, inch	RGM		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		50
Drill blanks with through coolant	..MB2							<input type="checkbox"/>					55
	Drill blanks for micro-drills with through coolant	..G2 SO						<input type="checkbox"/>					57
Rods, as sintered, with two helical coolant holes	..R2				<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>				59
	Rods, as sintered, with three helical coolant holes	..R3						<input type="checkbox"/>					65
	Rods, as sintered, with four helical coolant holes	..R4						<input type="checkbox"/>					66
	Rods, ground, with two helical coolant holes	..G2						<input type="checkbox"/>					67
	Rods, ground, with three helical coolant holes	..G3						<input type="checkbox"/>					69
Rods, as sintered, with central coolant hole	00R1			<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>					71
	Rods, as sintered, with two straight coolant holes	00R2				<input type="checkbox"/>		<input type="checkbox"/>					73
	Rods, ground, with central coolant hole	00G1				<input type="checkbox"/>							76
	Rods, ground, with two straight coolant holes	00G2				<input type="checkbox"/>							77
Rods for gun drills with kidney-shaped coolant holes	GDRK							<input type="checkbox"/>			<input type="checkbox"/>		79
	Profiled rods for gun drills with kidney-shaped coolant holes	GDVK						<input type="checkbox"/>			<input type="checkbox"/>		80
	Profiled rods for gun drills with two coolant holes	GDV2									<input type="checkbox"/>		82
	Profiled tips for gun drills with two coolant holes	GDV2P									<input type="checkbox"/>		84
Flat and square strips	FR and SR							<input type="checkbox"/>					87
	Brazing tips to DIN 8011	DIN 8011			<input type="checkbox"/>								89

Designation system

RR Sintered rods	
RGM Ground rods, metric	
RMM Matte ground rods, metric	
	C with chamfer
	Y with radial coolant exit holes
	W with Weldon shank
RGI Ground rods, inch	
00 Helix angle 30 of 40 coolant hole rods	C with chamfer
	R coolant hole rods, as sintered
	G coolant hole rods, ground
	MB Drill blanks, ground mat
GD Blanks for gun drills	RK round rods with kidney-shaped coolant holes
	VK profiled rods with kidney-shaped coolant holes
	V2 profiled rods with two coolant holes
	V2P profiled tips with two coolant holes
FR Flat strips	
SR Square strips	



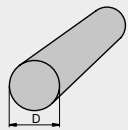
30 GB



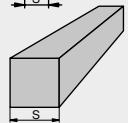
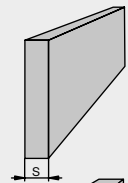
Number of coolant holes



2



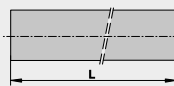
Outside diameter
[1/100 mm]



Thickness
[1/100 mm]



**Diameter of the
coolant holes**
[mm]



Rod length
[mm]



**Diameter
tolerance**

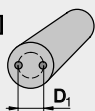


1000 / 4,8 / 1,3 / 54,4-104 CTS20D h5

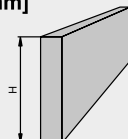


**Pitch circle of the
coolant holes**

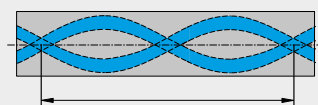
[mm]



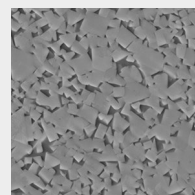
Height
[mm]



**Nominal pitch
of the
coolant holes**
[mm]



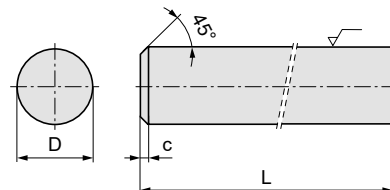
Grade



Elite line

Exceptional performance & widest
application range

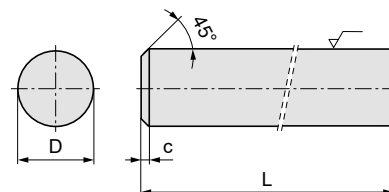
Inch Submicron grades



D [°]	L [inch]	Type, description	Dia. tol. [inch]	ISO 286	c [inch]	K200
1/8	1.500	CB-RMIC 1/8-1.50	+0/-0.0002	h6	0.016	●
1/8	2.000	CB-RMIC 1/8-2.00	+0/-0.0002	h6	0.016	●
1/8	3.000	CB-RMIC 1/8-3.00	+0/-0.0002	h6	0.016	●
3/16	2.000	CB-RMIC 3/16-2.00	+0/-0.0003	h6	0.016	●
3/16	2.500	CB-RMIC 3/16-2.50	+0/-0.0003	h6	0.016	●
3/16	3.000	CB-RMIC 3/16-3.00	+0/-0.0003	h6	0.016	●
3/16	4.000	CB-RMIC 3/16-4.00	+0/-0.0003	h6	0.016	●
1/4	2.000	CB-RMIC 1/4-2.00	+0/-0.0004	h6	0.016	●
1/4	2.500	CB-RMIC 1/4-2.50	+0/-0.0004	h6	0.016	●
1/4	3.000	CB-RMIC 1/4-3.00	+0/-0.0004	h6	0.016	●
1/4	4.000	CB-RMIC 1/4-4.00	+0/-0.0004	h6	0.016	●
1/4	6.000	CB-RMIC 1/4-6.00	+0/-0.0004	h6	0.016	●
5/16	2.000	CB-RMIC 5/16-2.00	+0/-0.0004	h6	0.024	●
5/16	2.500	CB-RMIC 5/16-2.50	+0/-0.0004	h6	0.024	●
5/16	3.000	CB-RMIC 5/16-3.00	+0/-0.0004	h6	0.024	●
5/16	4.000	CB-RMIC 5/16-4.00	+0/-0.0004	h6	0.024	●
5/16	6.000	CB-RMIC 5/16-6.00	+0/-0.0004	h6	0.024	●
3/8	2.000	CB-RMIC 3/8-2.00	+0/-0.0004	h6	0.024	●
3/8	2.500	CB-RMIC 3/8-2.50	+0/-0.0004	h6	0.024	●
3/8	3.000	CB-RMIC 3/8-3.00	+0/-0.0004	h6	0.024	●
3/8	3.500	CB-RMIC 3/8-3.50	+0/-0.0004	h6	0.024	●
3/8	4.000	CB-RMIC 3/8-4.00	+0/-0.0004	h6	0.024	●
3/8	5.000	CB-RMIC 3/8-5.00	+0/-0.0004	h6	0.024	●
3/8	6.000	CB-RMIC 3/8-6.00	+0/-0.0004	h6	0.024	●
7/16	2.500	CB-RMIC 7/16-2.50	+0/-0.0004	h6	0.024	●
7/16	2.570	CB-RMIC 7/16-2.75	+0/-0.0004	h6	0.024	●
7/16	4.000	CB-RMIC 7/16-4.00	+0/-0.0004	h6	0.024	●
7/16	6.000	CB-RMIC 7/16-6.00	+0/-0.0004	h6	0.024	●
1/2	2.500	CB-RMIC 1/2-2.50	+0/-0.0004	h6	0.031	●
1/2	3.000	CB-RMIC 1/2-3.00	+0/-0.0004	h6	0.031	●

1

Inch Submicron grades



D [°]	L [inch]	Type, description	Dia. tol. [inch]	ISO 286	c [inch]	K200
1/2	3.500	CB-RMIC 1/2-3.50	+0/-0.0004	h6	0.031	●
1/2	4.000	CB-RMIC 1/2-4.00	+0/-0.0004	h6	0.031	●
1/2	5.000	CB-RMIC 1/2-5.00	+0/-0.0004	h6	0.031	●
1/2	6.000	CB-RMIC 1/2-6.00	+0/-0.0004	h6	0.031	●
1/2	8.000	CB-RMIC 1/2-8.00	+0/-0.0004	h6	0.031	●
9/16	3.500	CB-RMIC 9/16-3.50	+0/-0.0004	h6	0.031	●
9/16	4.000	CB-RMIC 9/16-4.00	+0/-0.0004	h6	0.031	○
5/8	3.000	CB-RMIC 5/8-3.00	+0/-0.0004	h6	0.039	●
5/8	3.500	CB-RMIC 5/8-3.50	+0/-0.0004	h6	0.039	●
5/8	4.000	CB-RMIC 5/8-4.00	+0/-0.0004	h6	0.039	●
5/8	5.000	CB-RMIC 5/8-5.00	+0/-0.0004	h6	0.039	●
5/8	6.000	CB-RMIC 5/8-6.00	+0/-0.0004	h6	0.039	●
5/8	8.000	CB-RMIC 5/8-8.00	+0/-0.0004	h6	0.039	●
3/4	3.000	CB-RMIC 3/4-3.00	+0/-0.0005	h6	0.039	●
3/4	4.000	CB-RMIC 3/4-4.00	+0/-0.0005	h6	0.039	●
3/4	5.000	CB-RMIC 3/4-5.00	+0/-0.0005	h6	0.039	●
3/4	6.000	CB-RMIC 3/4-6.00	+0/-0.0005	h6	0.039	●
3/4	7.000	CB-RMIC 3/4-7.00	+0/-0.0005	h6	0.039	●
3/4	8.000	CB-RMIC 3/4-8.00	+0/-0.0005	h6	0.039	○
7/8	4.000	CB-RMIC 7/8-4.00	+0/-0.0005	h6	0.039	○
1	3.000	CB-RMIC 1-3.00	+0/-0.0005	h6	0.039	○
1	4.000	CB-RMIC 1-4.00	+0/-0.0005	h6	0.039	●
1	5.000	CB-RMIC 1-5.00	+0/-0.0005	h6	0.039	●
1	6.000	CB-RMIC 1-6.00	+0/-0.0005	h6	0.039	●
1	7.000	CB-RMIC 1-7.00	+0/-0.0005	h6	0.039	○
1	8.000	CB-RMIC 1-8.00	+0/-0.0005	h6	0.039	○
1 1/4	4.500	CB-RMIC 1 1/4-4.50	+0/-0.0005	h6	0.039	○
1 1/4	5.000	CB-RMIC 1 1/4-5.00	+0/-0.0005	h6	0.039	○
1 1/4	6.000	CB-RMIC 1 1/4-6.00	+0/-0.0005	h6	0.039	○
1 1/4	7.000	CB-RMIC 1 1/4-7.00	+0/-0.0005	h6	0.039	○
1 1/4	8.000	CB-RMIC 1 1/4-8.00	+0/-0.0005	h6	0.039	○

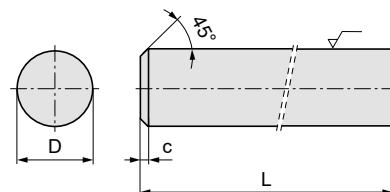
○ limited stock

● stock item

▲ new stock item

Other grades and dimensions upon request

Inch Submicron grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	c [mm]	DIN 6527	K200
3.00	38	CB-RMMC 0300-038	+0/-0.006	h6	0.30	x	●
4.00	51	CB-RMMC 0400-051	+0/-0.008	h6	0.40	x	●
5.00	51	CB-RMMC 0500-051	+0/-0.008	h6	0.50	x	○
6.00	51	CB-RMMC 0600-051	+0/-0.008	h6	0.60	x	●
6.00	55	CB-RMMC 0600-055	+0/-0.008	h6	0.60	x	○
6.00	58	CB-RMMC 0600-058	+0/-0.008	h6	0.60	x	○
6.00	100	CB-RMMC 0600-100	+0/-0.008	h6	0.60		●
8.00	59	CB-RMMC 0800-059	+0/-0.009	h6	0.80	x	○
8.00	64	CB-RMMC 0800-064	+0/-0.009	h6	0.80	x	●
8.00	100	CB-RMMC 0800-100	+0/-0.009	h6	0.80		●
10.00	67	CB-RMMC 1000-067	+0/-0.009	h6	1.00	x	○
10.00	73	CB-RMMC 1000-073	+0/-0.009	h6	1.00	x	○
10.00	100	CB-RMMC 1000-100	+0/-0.009	h6	1.00		●
12.00	74	CB-RMMC 1200-074	+0/-0.011	h6	1.00	x	○
12.00	84	CB-RMMC 1200-084	+0/-0.011	h6	1.00	x	●
12.00	100	CB-RMMC 1200-100	+0/-0.011	h6	1.00		○

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Professional line

Large selection of grades & designs for
material specific applications

End mill blanks

In addition to DIN dimensions, we can also supply our high-precision end mill blanks in extra-long sizes. End mill blanks in the most popular inch dimensions have now been added to the range. Whether in standard execution, with Weldon shanks, internal cooling or as a DualBlank, you can be sure of finding the product you need.

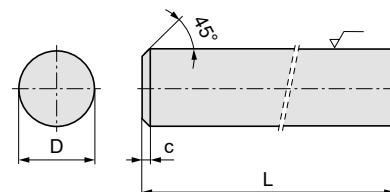
Our end mill blanks are now also available in the new high-performance grade CTS24Z for the machining of difficult materials like titanium or Inconel. Having virtually the same hardness, CTS24Z is even tougher than our proven CTS18D and CTS20D grades. This extreme toughness offers maximum protection against breakage and ensures consistent performance of your tools.

Of course we can also produce carbide rods in other dimensions and grades to order – just get in touch with your contact person at CERATIZIT.

Detailed technical data for our end mill blanks can be found in the 'Information' section.



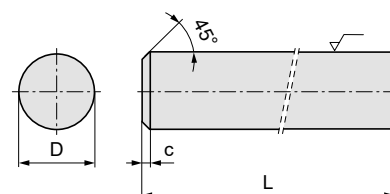
Inch Ultrafine grades



D [°]	L [inch]	Type, description	Dia. tol. [inch]	ISO 286	c [inch]	TSF22	TSF44
1/4	2.500	RGIC 1/4-2.50	+0/-0.0002	h5	0.016	●	●
1/4	3.000	RGIC 1/4-3.00	+0/-0.0002	h5	0.016	●	●
1/4	4.000	RGIC 1/4-4.00	+0/-0.0002	h5	0.016	●	●
5/16	2.500	RGIC 5/16-2.50	+0/-0.0002	h5	0.016	●	●
3/8	2.500	RGIC 3/8-2.50	+0/-0.0002	h5	0.016	●	●
3/8	3.000	RGIC 3/8-3.00	+0/-0.0002	h5	0.016	●	●
1/2	3.000	RGIC 1/2-3.00	+0/-0.0002	h5	0.031	●	●
1/2	4.000	RGIC 1/2-4.00	+0/-0.0002	h5	0.031	●	●
1/2	6.000	RGIC 1/2-6.00	+0/-0.0002	h5	0.031	●	●
5/8	3.000	RGIC 5/8-3.00	+0/-0.0002	h5	0.031	●	●
5/8	4.000	RGIC 5/8-4.00	+0/-0.0002	h5	0.031	●	●

2

Inch Submicron grades



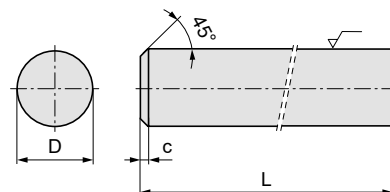
D [°]	L [inch]	Type, description	Dia. tol. [inch]	ISO 286	c [inch]	CTS12D	CTS20D	CTS24Z
1/8	1.500	RGIC 1/8-1.50	+0/-0.0001	h5	0.012	○		
1/8	1.500	RGIC 1/8-1.50	+0/-0.0003	h6	0.015		●	
1/8	2.000	RGIC 1/8-2.00	+0/-0.0003	h6	0.012		○	
1/8	3.000	RGIC 1/8-3.00	+0/-0.0001	h5	0.012	○		
1/8	3.000	RGIC 1/8-3.00	+0/-0.0003	h6	0.012		●	
3/16	2.000	RGIC 3/16-2.00	+0/-0.0003	h6	0.015		●	
3/16	2.000	RGIC 3/16-2.00	+0/-0.0002	h5	0.016	●		

→ For further information go to page 116.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request



Inch Submicron grades



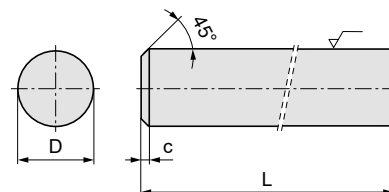
D [°]	L [inch]	Type, description	Dia. tol. [inch]	ISO 286	c [inch]	CTS12D	CTS20D	CTS24Z
3/16	2.500	RGIC 3/16-2.50	+0/-0.0003	h6	0.015		●	
3/16	3.000	RGIC 3/16-3.00	+0/-0.0002	h5	0.016	●		
3/16	3.000	RGIC 3/16-3.00	+0/-0.0003	h6	0.015		●	
3/16	4.000	RGIC 3/16-4.00	+0/-0.0003	h6	0.016		○	
1/4	2.000	RGIC 1/4-2.00	+0/-0.0002	h5	0.016			●
1/4	2.000	RGIC 1/4-2.00	+0/-0.0004	h6	0.015		●	
1/4	2.500	RGIC 1/4-2.50	+0/-0.0004	h6	0.015		●	
1/4	2.500	RGIC 1/4-2.50	+0/-0.0002	h5	0.016	●		●
1/4	3.000	RGIC 1/4-3.00	+0/-0.0004	h6	0.015		●	
1/4	4.000	RGIC 1/4-4.00	+0/-0.0002	h5	0.016	●		
1/4	4.000	RGIC 1/4-4.00	+0/-0.0004	h6	0.015		●	
1/4	6.000	RGIC 1/4-6.00	+0/-0.0002	h5	0.016	●		
5/16	2.000	RGIC 5/16-2.00	+0/-0.0004	h6	0.015		●	
5/16	2.500	RGIC 5/16-2.50	+0/-0.0004	h6	0.015		●	
5/16	2.500	RGIC 5/16-2.50	+0/-0.0002	h5	0.016			○
5/16	3.000	RGIC 5/16-3.00	+0/-0.0004	h6	0.015		●	
5/16	4.000	RGIC 5/16-4.00	+0/-0.0004	h6	0.015		●	
5/16	4.000	RGIC 5/16-4.00	+0/-0.0002	h5	0.016			○
5/16	6.000	RGIC 5/16-6.00	+0/-0.0004	h6	0.015		●	
3/8	2.000	RGIC 3/8-2.00	+0/-0.0002	h5	0.016			●
3/8	2.000	RGIC 3/8-2.00	+0/-0.0004	h6	0.015		●	
3/8	2.500	RGIC 3/8-2.50	+0/-0.0002	h5	0.016	●		●
3/8	2.500	RGIC 3/8-2.50	+0/-0.0004	h6	0.015		●	
3/8	3.000	RGIC 3/8-3.00	+0/-0.0004	h6	0.015		●	
3/8	3.000	RGIC 3/8-3.00	+0/-0.0002	h5	0.016	●		●
3/8	3.500	RGIC 3/8-3.50	+0/-0.0004	h6	0.015		●	
3/8	4.000	RGIC 3/8-4.00	+0/-0.0002	h5	0.016	●		●
3/8	4.000	RGIC 3/8-4.00	+0/-0.0004	h6	0.015		●	
3/8	4.000	RGIC 3/8-4.00	+0/-0.0002	h5	0.016			
3/8	5.000	RGIC 3/8-5.00	+0/-0.0004	h6	0.015		●	

→ For further information go to page 116.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Inch

Submicron grades



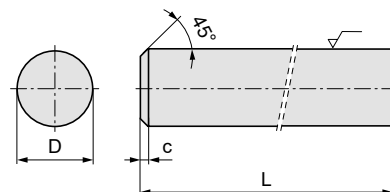
D [°]	L [inch]	Type, description	Dia. tol. [inch]	ISO 286	c [inch]	CTS12D	CTS20D	CTS24Z
3/8	6.000	RGIC 3/8-6.00	+0/-0.0002	h5	0.016			○
3/8	6.000	RGIC 3/8-6.00	+0/-0.0004	h6	0.015		●	
7/16	2.500	RGIC 7/16-2.50	+0/-0.0004	h6	0.031		●	
7/16	2.750	RGIC 7/16-2.75	+0/-0.0004	h6	0.031		●	
7/16	4.000	RGIC 7/16-4.00	+0/-0.0004	h6	0.031		●	
7/16	6.000	RGIC 7/16-6.00	+0/-0.0004	h6	0.031		●	
1/2	2.500	RGIC 1/2-2.50	+0/-0.0004	h6	0.031		●	
1/2	3.000	RGIC 1/2-3.00	+0/-0.0002	h5	0.031	●		●
1/2	3.000	RGIC 1/2-3.00	+0/-0.0004	h6	0.031		●	
1/2	3.000	RGIC 1/2-3.00	+0/-0.0002	h5	0.031			
1/2	3.500	RGIC 1/2-3.50	+0/-0.0004	h6	0.031		●	
1/2	4.000	RGIC 1/2-4.00	+0/-0.0004	h6	0.031		●	
1/2	4.000	RGIC 1/2-4.00	+0/-0.0002	h5	0.031	●		●
1/2	5.000	RGIC 1/2-5.00	+0/-0.0004	h6	0.031		●	
1/2	6.000	RGIC 1/2-6.00	+0/-0.0004	h6	0.031		●	
1/2	6.000	RGIC 1/2-6.00	+0/-0.0002	h5	0.031	●		●
1/2	8.000	RGIC 1/2-8.00	+0/-0.0004	h6	0.031		●	
9/16	3.500	RGIC 9/16-3.50	+0/-0.0004	h6	0.031		●	
9/16	4.000	RGIC 9/16-4.00	+0/-0.0004	h6	0.031		○	
5/8	3.000	RGIC 5/8-3.00	+0/-0.0002	h5	0.031	○		●
5/8	3.000	RGIC 5/8-3.00	+0/-0.0004	h6	0.031		●	
5/8	3.000	RGIC 5/8-3.00	+0/-0.0002	h5	0.031			
5/8	3.500	RGIC 5/8-3.50	+0/-0.0004	h6	0.031		●	
5/8	3.500	RGIC 5/8-3.50	+0/-0.0002	h5	0.031			●
5/8	4.000	RGIC 5/8-4.00	+0/-0.0002	h5	0.031	○		●
5/8	4.000	RGIC 5/8-4.00	+0/-0.0004	h6	0.031		●	
5/8	5.000	RGIC 5/8-5.00	+0/-0.0004	h6	0.031		●	
5/8	6.000	RGIC 5/8-6.00	+0/-0.0002	h5	0.031	○		
5/8	6.000	RGIC 5/8-6.00	+0/-0.0004	h6	0.031		●	
3/4	3.000	RGIC 3/4-3.00	+0/-0.0005	h6	0.031		●	

→ For further information go to page 116.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request



Inch Submicron grades



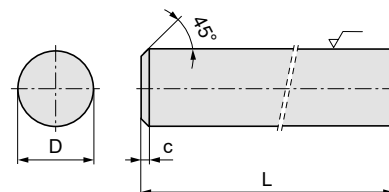
D [°]	L [inch]	Type, description	Dia. tol. [inch]	ISO 286	c [inch]	CTS12D	CTS20D	CTS24Z
3/4	4.000	RGIC 3/4-4.00	+0/-0.0005	h6	0.031		●	
3/4	4.000	RGIC 3/4-4.00	+0/-0.0004	h5	0.039			●
3/4	5.000	RGIC 3/4-5.00	+0/-0.0004	h5	0.039			●
3/4	5.000	RGIC 3/4-5.00	+0/-0.0005	h6	0.031		●	
3/4	6.000	RGIC 3/4-6.00	+0/-0.0005	h6	0.031		●	
3/4	6.000	RGIC 3/4-6.00	+0/-0.0004	h5	0.039			●
3/4	7.000	RGIC 3/4-7.00	+0/-0.0005	h6	0.031		●	
3/4	8.000	RGIC 3/4-8.00	+0/-0.0004	h5	0.039			○
7/8	4.000	RGIC 7/8-4.00	+0/-0.0005	h6	0.031		○	
1	3.000	RGIC 1-3.00	+0/-0.0005	h6	0.039		○	
1	4.000	RGIC 1-4.00	+0/-0.0005	h6	0.031		●	
1	4.000	RGIC 1-4.00	+0/-0.0004	h5	0.039			●
1	4.500	RGIC 1-4.50	+0/-0.0004	h5	0.039			●
1	5.000	RGIC 1-5.00	+0/-0.0005	h6	0.031		●	
1	5.000	RGIC 1-5.00	+0/-0.0004	h5	0.039			●
1	6.000	RGIC 1-6.00	+0/-0.0004	h5	0.039			●
1	6.000	RGIC 1-6.00	+0/-0.0005	h6	0.031		●	
1	7.000	RGIC 1-7.00	+0/-0.0005	h6	0.031		○	
1	8.000	RGIC 1-8.00	+0/-0.0005	h6	0.031		●	
1	8.000	RGIC 1-8.00	+0/-0.0004	h5	0.039			●
1	10.000	RGIC 1-10.00	+0/-0.0005	h6	0.039		○	
1 1/4	4.500	RGIC 1 1/4-4.50	+0/-0.0006	h6	0.031		○	
1 1/4	6.000	RGIC 1 1/4-6.00	+0/-0.0006	h6	0.039		○	
1 1/4	7.500	RGIC 1 1/4-7.50	+0/-0.0006	h6	0.039		○	

→ For further information go to page 116.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Metric

Ultrafine grades



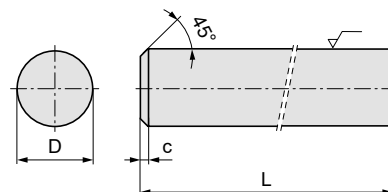
D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	c [mm]	DIN 6527	CTU08L	TSF22	TSF44
3.00	39	RGMC 0300-039	+0/-0.004	h5	0.30	x	○	●	●
3.00	40	RGMC 0300-040	+0/-0.004	h5	0.30			●	
3.00	50	RGMC 0300-050	+0/-0.004	h5	0.30			●	●
3.00	60	RGMC 0300-060	+0/-0.004	h5	0.30			●	
4.00	51	RGMC 0400-051	+0/-0.005	h5	0.40	x	●	●	●
4.00	60	RGMC 0400-060	+0/-0.005	h5	0.40			●	
4.00	75	RGMC 0400-075	+0/-0.005	h5	0.40			●	
5.00	51	RGMC 0500-051	+0/-0.005	h5	0.40	x			○
6.00	51	RGMC 0600-051	+0/-0.005	h5	0.40	x		●	●
6.00	58	RGMC 0600-058	+0/-0.005	h5	0.40	x	●	●	●
6.00	60	RGMC 0600-060	+0/-0.005	h5	0.40			●	
6.00	65	RGMC 0600-065	+0/-0.005	h5	0.40			●	
6.00	70	RGMC 0600-070	+0/-0.005	h5	0.40			●	
6.00	75	RGMC 0600-075	+0/-0.005	h5	0.40			●	
6.00	80	RGMC 0600-080	+0/-0.005	h5	0.40			●	
6.00	100	RGMC 0600-100	+0/-0.005	h5	0.40			●	●
8.00	64	RGMC 0800-064	+0/-0.006	h5	0.60	x	●	●	●
8.00	70	RGMC 0800-070	+0/-0.006	h5	0.60			●	
8.00	75	RGMC 0800-075	+0/-0.006	h5	0.60			●	
8.00	100	RGMC 0800-100	+0/-0.006	h5	0.60			●	●
8.00	120	RGMC 0800-120	+0/-0.006	h5	0.60			●	●
10.00	67	RGMC 1000-067	+0/-0.006	h5	0.80	x			●
10.00	73	RGMC 1000-073	+0/-0.006	h5	0.80	x	●	●	●
10.00	75	RGMC 1000-075	+0/-0.006	h5	0.80			●	
10.00	80	RGMC 1000-080	+0/-0.006	h5	0.80			●	
10.00	100	RGMC 1000-100	+0/-0.006	h5	0.80			●	●
10.00	120	RGMC 1000-120	+0/-0.006	h5	0.80			●	●
12.00	84	RGMC 1200-084	+0/-0.008	h6	0.80	x		●	●

→ For further information go to page 116.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request



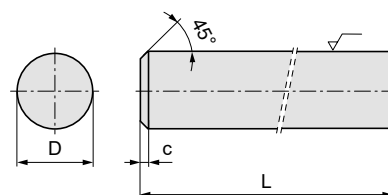
Metric Ultrafine grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	c [mm]	DIN 6527	CTU08L	TSF22	TSF44
12.00	100	RGMC 1200-100	+0/-0.008	h5	0.80			●	●
12.00	120	RGMC 1200-120	+0/-0.008	h5	0.80			●	●
16.00	93	RGMC 1600-093	+0/-0.008	h5	0.80	x		●	●
16.00	110	RGMC 1600-110	+0/-0.008	h5	0.80			●	
16.00	120	RGMC 1600-120	+0/-0.008	h5	0.80				○
16.00	130	RGMC 1600-130	+0/-0.008	h5	0.80				○
16.00	150	RGMC 1600-150	+0/-0.008	h5	0.80				●
20.00	105	RGMC 2000-105	+0/-0.009	h5	1.00	x			●
20.00	125	RGMC 2000-125	+0/-0.009	h5	1.00			●	○
20.00	150	RGMC 2000-150	+0/-0.009	h5	1.00				●

2

Metric Submicron grades



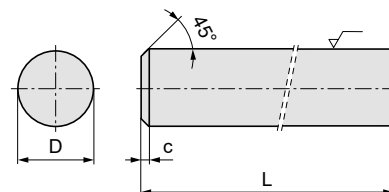
D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	c [mm]	DIN 6527	CTS18D	CTS20D	CTS24Z
3.00	39	RGMC 0300-039	+0/-0.006	h6	0.30	x		●	
3.00	40	RGMC 0300-040	+0/-0.004	h5	0.30			●	
3.00	50	RGMC 0300-050	+0/-0.004	h5	0.30			●	
3.00	60	RGMC 0300-060	+0/-0.004	h5	0.30			●	
4.00	51	RGMC 0400-051	+0/-0.008	h6	0.40	x		●	
4.00	60	RGMC 0400-060	+0/-0.005	h5	0.40			●	

→ For further information go to page 116.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Metric

Submicron grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	c [mm]	DIN 6527	CTS18D	CTS20D	CTS24Z
4.00	75	RGMC 0400-075	+0/-0.005	h5	0.40			●	
5.00	51	RGMC 0500-051	+0/-0.008	h6	0.40	x		●	
6.00	51	RGMC 0600-051	+0/-0.008	h6	0.40	x		●	
6.00	55	RGMC 0600-055	+0/-0.008	h6	0.40	x		●	
6.00	55	RGMC 0600-055	+0/-0.005	h5	0.40	x			●
6.00	58	RGMC 0600-058	+0/-0.008	h6	0.40	x	●	●	
6.00	58	RGMC 0600-058	+0/-0.005	h5	0.40	x			●
6.00	60	RGMC 0600-060	+0/-0.005	h5	0.40			●	
6.00	65	RGMC 0600-065	+0/-0.005	h5	0.40			●	
6.00	70	RGMC 0600-070	+0/-0.005	h5	0.40			●	
6.00	75	RGMC 0600-075	+0/-0.005	h5	0.40			●	
6.00	80	RGMC 0600-080	+0/-0.005	h5	0.40			●	
6.00	100	RGMC 0600-100	+0/-0.005	h5	0.40			●	
8.00	59	RGMC 0800-059	+0/-0.009	h6	0.60	x		●	
8.00	59	RGMC 0800-059	+0/-0.006	h5	0.60	x			●
8.00	64	RGMC 0800-064	+0/-0.009	h6	0.60	x	●	●	
8.00	64	RGMC 0800-064	+0/-0.006	h5	0.60	x			●
8.00	70	RGMC 0800-070	+0/-0.006	h5	0.60			●	
8.00	75	RGMC 0800-075	+0/-0.006	h5	0.60			●	
8.00	80	RGMC 0800-080	+0/-0.006	h5	0.60			●	
8.00	100	RGMC 0800-100	+0/-0.006	h5	0.60			●	●
8.00	120	RGMC 0800-120	+0/-0.006	h5	0.60			●	
10.00	67	RGMC 1000-067	+0/-0.009	h6	0.80	x		●	
10.00	67	RGMC 1000-067	+0/-0.006	h5	0.80	x			●
10.00	73	RGMC 1000-073	+0/-0.009	h6	0.80	x	●	●	
10.00	73	RGMC 1000-073	+0/-0.006	h5	0.80	x			●
10.00	75	RGMC 1000-075	+0/-0.006	h5	0.80			●	
10.00	80	RGMC 1000-080	+0/-0.006	h5	0.80			●	

→ For further information go to page 116.

○ limited stock

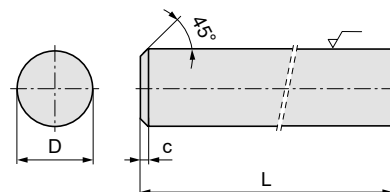
● stock item

▲ new stock item

Other grades and dimensions upon request



Metric Submicron grades



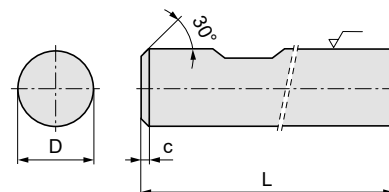
D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	c [mm]	DIN 6527	CTS18D	CTS20D	CTS24Z
10.00	90	RGMC 1000-090	+0/-0.006	h5	0.80			●	
10.00	100	RGMC 1000-100	+0/-0.006	h5	0.80			●	●
10.00	120	RGMC 1000-120	+0/-0.006	h5	0.80			●	
12.00	74	RGMC 1200-074	+0/-0.011	h6	0.80	x		●	
12.00	74	RGMC 1200-074	+0/-0.008	h5	0.80	x			●
12.00	84	RGMC 1200-084	+0/-0.011	h6	0.80	x	●	●	
12.00	84	RGMC 1200-084	+0/-0.008	h5	0.80	x			●
12.00	100	RGMC 1200-100	+0/-0.008	h5	0.80			●	●
12.00	120	RGMC 1200-120	+0/-0.008	h5	0.80			●	
14.00	76	RGMC 1400-076	+0/-0.011	h6	0.80	x		●	
14.00	84	RGMC 1400-084	+0/-0.011	h6	0.80	x		●	
14.00	84	RGMC 1400-084	+0/-0.008	h5	0.80	x			●
16.00	83	RGMC 1600-083	+0/-0.011	h6	0.80	x		●	
16.00	93	RGMC 1600-093	+0/-0.011	h6	0.80	x	●	●	
16.00	93	RGMC 1600-093	+0/-0.008	h5	0.80	x			●
16.00	110	RGMC 1600-110	+0/-0.008	h5	0.80			●	
16.00	120	RGMC 1600-120	+0/-0.008	h5	0.80			●	●
16.00	130	RGMC 1600-130	+0/-0.008	h5	0.80			●	
16.00	150	RGMC 1600-150	+0/-0.008	h5	0.80			●	
18.00	93	RGMC 1800-093	+0/-0.011	h6	1.00	x		●	
20.00	93	RGMC 2000-093	+0/-0.013	h6	1.00	x		●	
20.00	105	RGMC 2000-105	+0/-0.013	h6	1.00	x	●	●	
20.00	105	RGMC 2000-105	+0/-0.009	h5	1.00	x			●
20.00	125	RGMC 2000-125	+0/-0.009	h5	1.00			●	●
20.00	150	RGMC 2000-150	+0/-0.009	h5	1.00			●	
25.00	125	RGMC 2500-125	+0/-0.009	h5	1.00			●	
25.00	150	RGMC 2500-150	+0/-0.009	h5	1.00			●	

→ For further information go to page 116.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Metric with Weldon

Submicron grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	c [mm]	DIN 6527	CTS20D
6.00	51	RGMCW 0600-051	+0/-0.008	h6	0.40	x	●
6.00	55	RGMCW 0600-055	+0/-0.008	h6	0.40	x	○
6.00	58	RGMCW 0600-058	+0/-0.008	h6	0.40	x	●
8.00	64	RGMCW 0800-064	+0/-0.009	h6	0.60	x	●
10.00	67	RGMCW 1000-067	+0/-0.009	h6	0.80	x	●
10.00	73	RGMCW 1000-073	+0/-0.009	h6	0.80	x	●
12.00	74	RGMCW 1200-074	+0/-0.011	h6	0.80	x	●
12.00	84	RGMCW 1200-084	+0/-0.011	h6	0.80	x	●
16.00	93	RGMCW 1600-093	+0/-0.011	h6	0.80	x	●
20.00	93	RGMCW 2000-093	+0/-0.013	h6	1.00	x	○
20.00	105	RGMCW 2000-105	+0/-0.013	h6	1.00	x	●

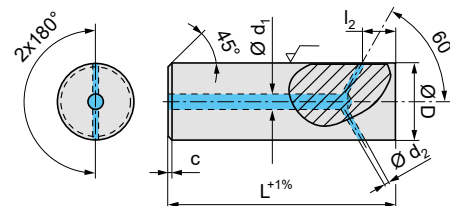
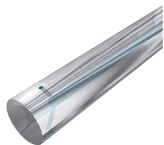
2

→ For further information go to page 116.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Metric with through coolant, 2x 180°

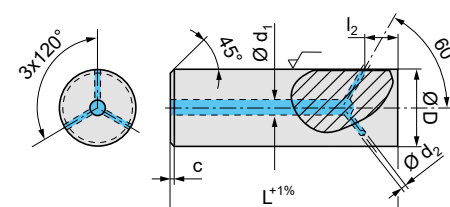
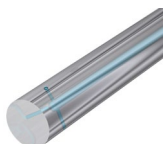
Submicron grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	d ₁ [mm]	d ₂ [mm]	l ₂ [mm]	c [mm]	CTS20D
6.00	58	RGMCY2 0600-058	+0/-0.008	h6	1.20	0.80	3.00	0.40	○
8.00	64	RGMCY2 0800-064	+0/-0.009	h6	1.60	1.10	4.00	0.60	○
10.00	73	RGMCY2 1000-073	+0/-0.009	h6	2.00	1.40	5.00	0.80	○
12.00	84	RGMCY2 1200-084	+0/-0.011	h6	2.20	1.60	6.00	0.80	○
14.00	84	RGMCY2 1400-084	+0/-0.011	h6	2.40	1.70	7.00	0.80	○
16.00	93	RGMCY2 1600-093	+0/-0.011	h6	2.60	1.90	8.00	0.80	○
18.00	93	RGMCY2 1800-093	+0/-0.011	h6	2.80	2.00	9.00	1.00	○
20.00	105	RGMCY2 2000-105	+0/-0.013	h6	3.00	2.10	10.00	1.00	○
25.00	125	RGMCY2 2500-125	+0/-0.013	h6	3.20	2.30	12.50	1.00	○

Metric with through coolant, 3x 120°

Submicron grades



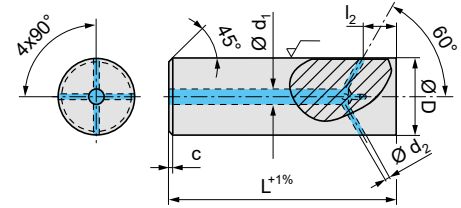
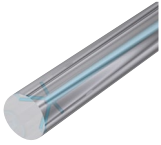
D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	d ₁ [mm]	d ₂ [mm]	l ₂ [mm]	c [mm]	CTS20D
6.00	58	RGMCY3 0600-058	+0/-0.008	h6	1.20	0.70	3.00	0.40	●
8.00	64	RGMCY3 0800-064	+0/-0.009	h6	1.60	0.90	4.00	0.60	●
10.00	73	RGMCY3 1000-073	+0/-0.009	h6	2.00	1.20	5.00	0.80	●
12.00	84	RGMCY3 1200-084	+0/-0.011	h6	2.20	1.30	6.00	0.80	●
14.00	84	RGMCY3 1400-084	+0/-0.011	h6	2.40	1.40	7.00	0.80	●
16.00	93	RGMCY3 1600-093	+0/-0.011	h6	2.60	1.50	8.00	0.80	●
18.00	93	RGMCY3 1800-093	+0/-0.011	h6	2.80	1.60	9.00	1.00	●
20.00	105	RGMCY3 2000-105	+0/-0.013	h6	3.00	1.70	10.00	1.00	●
25.00	125	RGMCY3 2500-125	+0/-0.013	h6	3.20	1.80	12.50	1.00	●

→ For further information go to page 113.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Metric with through coolant, 4x 90°

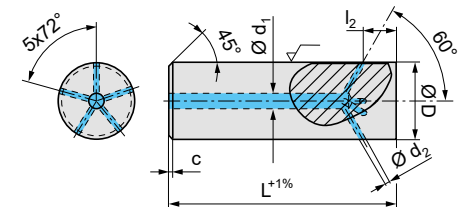
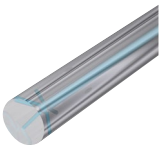
Submicron grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	d ₁ [mm]	d ₂ [mm]	l ₂ [mm]	c [mm]	CTS20D
6.00	58	RGMCY4 0600-058	+0/-0.008	h6	1.20	0.60	3.00	0.40	●
8.00	64	RGMCY4 0800-064	+0/-0.009	h6	1.60	0.80	4.00	0.60	●
10.00	73	RGMCY4 1000-073	+0/-0.009	h6	2.00	1.00	5.00	0.80	●
12.00	84	RGMCY4 1200-084	+0/-0.011	h6	2.20	1.10	6.00	0.80	●
14.00	84	RGMCY4 1400-084	+0/-0.011	h6	2.40	1.20	7.00	0.80	●
16.00	93	RGMCY4 1600-093	+0/-0.011	h6	2.60	1.30	8.00	0.80	●
18.00	93	RGMCY4 1800-093	+0/-0.011	h6	2.80	1.40	9.00	1.00	●
20.00	105	RGMCY4 2000-105	+0/-0.013	h6	3.00	1.50	10.00	1.00	●
25.00	125	RGMCY4 2500-125	+0/-0.013	h6	3.20	1.60	12.50	1.00	●

2 Metric with through coolant, 5x 72°

Submicron grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	d ₁ [mm]	d ₂ [mm]	l ₂ [mm]	c [mm]	CTS20D
6.00	58	RGMCY5 0600-058	+0/-0.008	h6	1.20	0.50	3.00	0.40	○
8.00	64	RGMCY5 0800-064	+0/-0.009	h6	1.60	0.70	4.00	0.60	○
10.00	73	RGMCY5 1000-073	+0/-0.009	h6	2.00	0.90	5.00	0.80	○
12.00	84	RGMCY5 1200-084	+0/-0.011	h6	2.20	1.00	6.00	0.80	○
14.00	84	RGMCY5 1400-084	+0/-0.011	h6	2.40	1.10	7.00	0.80	○
16.00	93	RGMCY5 1600-093	+0/-0.011	h6	2.60	1.20	8.00	0.80	○
18.00	93	RGMCY5 1800-093	+0/-0.011	h6	2.80	1.30	9.00	1.00	○
20.00	105	RGMCY5 2000-105	+0/-0.013	h6	3.00	1.40	10.00	1.00	○
25.00	125	RGMCY5 2500-125	+0/-0.013	h6	3.20	1.50	12.50	1.00	○

→ For further information go to page 113.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request



Solid carbide rods

A comprehensive standard range of sintered and ground solid carbide rods in various dimensions is available from stock. Furthermore, you can choose from carbide grades with the most varied characteristics for every application area: from ultrafine grades for the machining of hardened materials, by way of submicron grades for universal application to our cermet grade for the finish machining of ferrous materials.

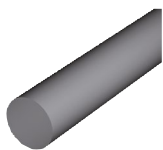
Of course, we can also produce carbide rods in other dimensions and grades to order – simply get in touch with your contact person at CERATIZIT.

Detailed technical data for our solid carbide rods can be found in the 'Specifications' section.



As sintered – METRIC

Ultrafine grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	CTU08L	TSF22	TSF44
3.25	330	RR 0325-330	-0/+0.20	●	●	●
4.20	330	RR 0420-330	-0/+0.20	●	●	●
5.20	330	RR 0520-330	-0/+0.25	●	●	●
6.20	330	RR 0620-330	-0/+0.25	●	●	●
8.20	330	RR 0820-330	-0/+0.30	●	●	●
10.20	330	RR 1020-330	-0/+0.30	●	●	●
12.20	330	RR 1220-330	-0/+0.30	●	●	●
14.20	330	RR 1420-330	-0/+0.30		●	●
16.20	330	RR 1620-330	-0/+0.45		●	●
18.20	330	RR 1820-330	-0/+0.45		●	○
20.20	330	RR 2020-330	-0/+0.45		●	●
25.20	330	RR 2520-330	-0/+0.65		●	●
32.20	330	RR 3220-330	-0/+0.65			●

○ limited stock

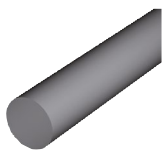
● stock item

▲ new stock item

Other grades and dimensions upon request

As sintered – METRIC

Submicron grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	CTS12D	CTS15D	CTS18D	CTS20D	CTS24Z	CTS30D
1.15	330	RR 0115-330	-0/+0.15				●		
1.65	330	RR 0165-330	-0/+0.15	●			●		
1.80	330	RR 0180-330	-0/+0.15				●		
2.20	330	RR 0220-330	-0/+0.20	●			●		
2.70	330	RR 0270-330	-0/+0.20				●		
3.25	330	RR 0325-330	-0/+0.20	●	●	●	●	●	
3.70	330	RR 0370-330	-0/+0.20				●		
4.20	330	RR 0420-330	-0/+0.20	●	●	●	●	●	
4.70	330	RR 0470-330	-0/+0.20				●		
5.20	330	RR 0520-330	-0/+0.25	●	●		●		
5.70	330	RR 0570-330	-0/+0.25				●		
6.20	330	RR 0620-330	-0/+0.25	●	●	●	●	●	●
6.55	330	RR 0655-330	-0/+0.25				●		
6.70	330	RR 0670-330	-0/+0.25		○		●		
7.20	330	RR 0720-330	-0/+0.30				●		
7.70	330	RR 0770-330	-0/+0.30				●		
8.20	330	RR 0820-330	-0/+0.30	●	●	●	●	●	●
8.70	330	RR 0870-330	-0/+0.30				●		
9.20	330	RR 0920-330	-0/+0.30				●		
9.70	330	RR 0970-330	-0/+0.30				●		
10.20	330	RR 1020-330	-0/+0.30	●	●	●	●	●	●
10.70	330	RR 1070-330	-0/+0.30				●		
11.20	330	RR 1120-330	-0/+0.30				●		
11.70	330	RR 1170-330	-0/+0.30				●		
12.20	330	RR 1220-330	-0/+0.30	●	●	●	●	●	●
12.70	330	RR 1270-330	-0/+0.30		●		●		
13.00	330	RR 1300-330	-0/+0.30				○		
13.20	330	RR 1320-330	-0/+0.30				●		
14.20	330	RR 1420-330	-0/+0.30	●	●	●	●	●	
14.70	330	RR 1470-330	-0/+0.30				●		

○ limited stock

● stock item

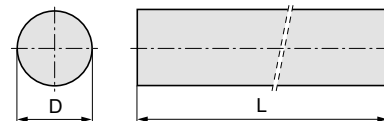
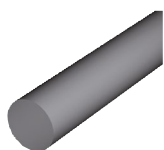
▲ new stock item

Other grades and dimensions upon request



As sintered – METRIC

Submicron grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	CTS12D	CTS15D	CTS18D	CTS20D	CTS24Z	CTS30D
15.20	330	RR 1520-330	-0/+0.30				●		
16.20	330	RR 1620-330	-0/+0.45	●	●	●	●	●	●
17.20	330	RR 1720-330	-0/+0.45				●		
18.20	330	RR 1820-330	-0/+0.45	●	●		●	●	
19.20	330	RR 1920-330	-0/+0.45				●		
20.20	330	RR 2020-330	-0/+0.45	●	●	●	●	●	●
21.20	330	RR 2120-330	-0/+0.55				●		
22.20	330	RR 2220-330	-0/+0.55				●		
23.20	330	RR 2320-330	-0/+0.55				●		
24.20	330	RR 2420-330	-0/+0.55				●		
25.20	330	RR 2520-330	-0/+0.65		●	●	●	●	○
25.80	330	RR 2580-330	-0/+0.65				○		
26.20	330	RR 2620-330	-0/+0.65				●		
28.20	330	RR 2820-330	-0/+0.65				●		
30.20	330	RR 3020-330	-0/+0.65				●		
32.20	330	RR 3220-330	-0/+0.65			○	●		
34.20	330	RR 3420-330	-0/+0.65				●		
36.20	330	RR 3620-330	-0/+0.65				●		
38.20	330	RR 3820-330	-0/+0.70				○		
40.20	330	RR 4020-330	-0/+0.70				●		
42.20	330	RR 4220-330	-0/+0.70				●		
46.20	330	RR 4620-330	-0/+0.70				●		

○ limited stock

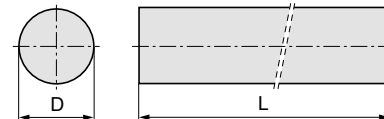
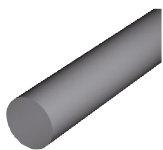
● stock item

▲ new stock item

Other grades and dimensions upon request

As sintered – METRIC

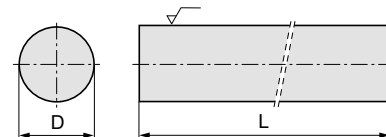
Fine grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	CTF12E
3.25	330	RR 0325-330	-0/+0.20	●
6.20	330	RR 0420-330	-0/+0.20	●
5.20	330	RR 0520-330	-0/+0.25	●
6.20	330	RR 0620-330	-0/+0.25	●
8.20	330	RR 0820-330	-0/+0.30	●
10.20	330	RR 1020-330	-0/+0.30	●
12.20	330	RR 1220-330	-0/+0.30	●
14.20	330	RR 1420-330	-0/+0.30	○
16.20	330	RR 1620-330	-0/+0.45	●
18.20	330	RR 1820-330	-0/+0.45	○

Solid carbide rods, ground – INCH

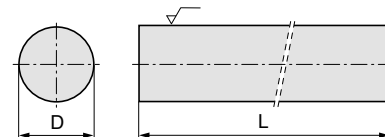
Submicron grades



D [°]	L [inch]	Type, description	Dia. tol. [inch]	ISO 286	CTS20D
1/8	13.000	RGI 1/8-13.00	+0/-0,0003	h6	●
3/16	13.000	RGI 3/16-13.00	+0/-0,0003	h6	●
1/4	13.000	RGI 1/4-13.00	+0/-0,0004	h6	●
5/16	13.000	RGI 5/16-13.00	+0/-0,0004	h6	●
3/8	13.000	RGI 3/8-13.00	+0/-0,0004	h6	●
7/16	13.000	RGI 7/16-13.00	+0/-0,0004	h6	●
1/2	13.000	RGI 1/2-13.00	+0/-0,0004	h6	●
5/8	13.000	RGI 5/8-13.00	+0/-0,0004	h6	●
3/4	13.000	RGI 3/4-13.00	+0/-0,0005	h6	●
1	13.000	RGI 1-13.00	+0/-0,0005	h6	●

Ground – METRIC

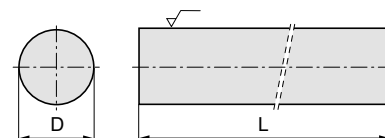
Ultrafine grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	TSF22	TSF44
2.00	330	RGM 0200-330	+0/-0.004	h5		●
3.00	330	RGM 0300-330	+0/-0.004	h5	●	●
4.00	330	RGM 0400-330	+0/-0.005	h5	●	●
5.00	330	RGM 0500-330	+0/-0.005	h5	●	●
6.00	330	RGM 0600-330	+0/-0.005	h5	●	●
8.00	330	RGM 0800-330	+0/-0.006	h5	●	●
10.00	330	RGM 1000-330	+0/-0.006	h5	●	●
12.00	330	RGM 1200-330	+0/-0.008	h5	●	●
14.00	330	RGM 1400-330	+0/-0.008	h5	○	●
16.00	330	RGM 1600-330	+0/-0.008	h5	●	●
20.00	330	RGM 2000-330	+0/-0.009	h5	●	●
25.00	330	RGM 2500-330	+0/-0.009	h5	●	●

Ground – METRIC

Submicron grades



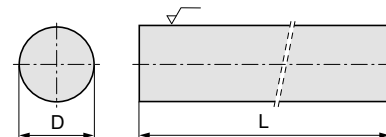
D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	CTS12D	CTS15D	CTS18D	CTS20D	CTS24Z	CTS30D
1.00	330	RGM 0100-330	+0/-0.006	h6				●		
1.50	330	RGM 0150-330	+0/-0.006	h6				●		
2.00	330	RGM 0200-330	+0/-0.006	h6				●		
2.50	330	RGM 0250-330	+0/-0.006	h6		●		●		
3.00	330	RGM 0300-330	+0/-0.006	h6	●			●		

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request



Ground – METRIC

Submicron grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	CTS12D	CTS15D	CTS18D	CTS20D	CTS24Z	CTS30D
3.50	330	RGM 0350-330	+0/-0.008	h6				●		
4.00	330	RGM 0400-330	+0/-0.008	h6	●			●		
4.50	330	RGM 0450-330	+0/-0.008	h6				●		
5.00	330	RGM 0500-330	+0/-0.008	h6				●		
5.50	330	RGM 0550-330	+0/-0.008	h6				●		
6.00	330	RGM 0600-330	+0/-0.008	h6	●	●	●	●		○
6.00	330	RGM 0600-330	+0/-0.005	h5					●	
6.50	330	RGM 0650-330	+0/-0.009	h6				●		
7.00	330	RGM 0700-330	+0/-0.009	h6				●		
7.50	330	RGM 0750-330	+0/-0.009	h6				●		
8.00	330	RGM 0800-330	+0/-0.009	h6	●	●	●	●		○
8.00	330	RGM 0800-330	+0/-0.006	h5					●	
8.50	330	RGM 0850-330	+0/-0.009	h6				●		
9.00	330	RGM 0900-330	+0/-0.009	h6				●		
9.50	330	RGM 0950-330	+0/-0.009	h6				●		
10.00	330	RGM 1000-330	+0/-0.009	h6	●	●	●	●		○
10.00	330	RGM 1000-330	+0/-0.006	h5					●	
11.00	330	RGM 1100-330	+0/-0.011	h6				●		
12.00	330	RGM 1200-330	+0/-0.011	h6	●	●	●	●		○
12.00	330	RGM 1200-330	+0/-0.008	h5					●	
13.00	330	RGM 1300-330	+0/-0.011	h6				●		
14.00	330	RGM 1400-330	+0/-0.011	h6	●			●		
15.00	330	RGM 1500-330	+0/-0.011	h6				●		
16.00	330	RGM 1600-330	+0/-0.011	h6	●	●	●	●		○
16.00	330	RGM 1600-330	+0/-0.008	h5					●	
18.00	330	RGM 1800-330	+0/-0.011	h6		●		●		
19.00	330	RGM 1900-330	+0/-0.013	h6				●		
20.00	330	RGM 2000-330	+0/-0.013	h6	●	●	●	●		○
20.00	330	RGM 2000-330	+0/-0.009	h5					●	
22.00	330	RGM 2200-330	+0/-0.013	h6				●		

○ limited stock

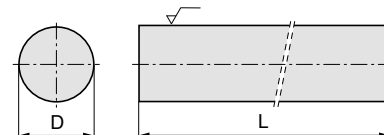
● stock item

▲ new stock item

Other grades and dimensions upon request

Ground – METRIC

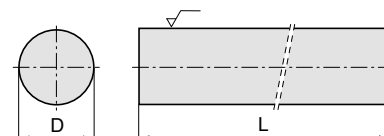
Submicron grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	CTS12D	CTS15D	CTS18D	CTS20D	CTS24Z	CTS30D
24.00	330	RGM 2400-330	+0/-0.013	h6				●		
25.00	330	RGM 2500-330	+0/-0.013	h6			●	●		○
25.00	330	RGM 2500-330	+0/-0.009	h5					●	
28.00	330	RGM 2800-330	+0/-0.013	h6				●		
30.00	330	RGM 3000-330	+0/-0.013	h6				●		
32.00	330	RGM 3200-330	+0/-0.016	h6			●	●		
38.00	330	RGM 3800-330	+0/-0.016	h6				—		
40.00	330	RGM 4000-330	+0/-0.016	h6				●		

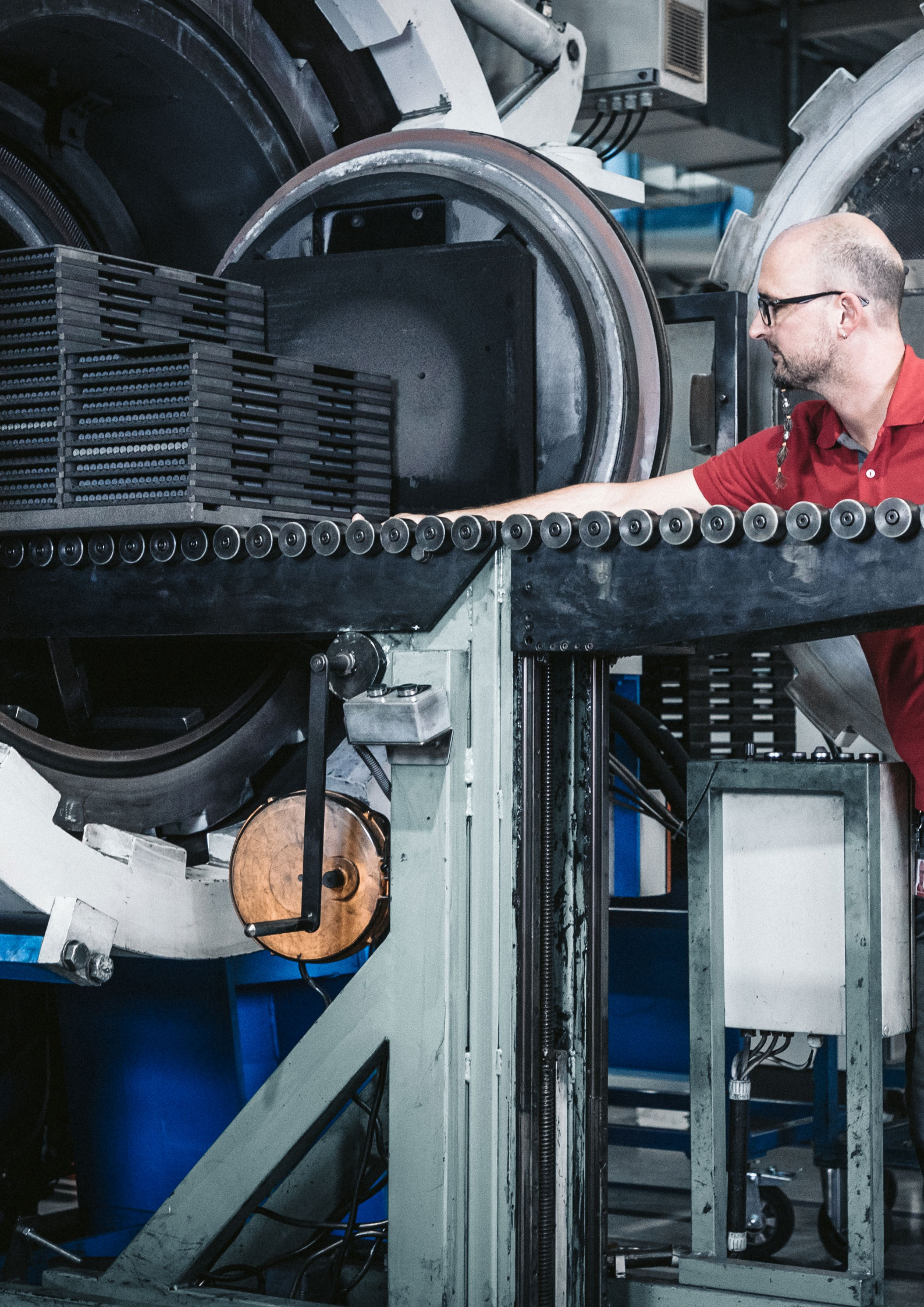
Ground – METRIC

Fine grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	CTF12E
3.00	330	RGM 0300-330	+0/-0.004	h6	○
4.00	330	RGM 0400-330	+0/-0.008	h6	●
6.00	330	RGM 0600-330	+0/-0.008	h6	●
8.00	330	RGM 0800-330	+0/-0.009	h6	●
10.00	330	RGM 1000-330	+0/-0.009	h6	●
12.00	330	RGM 1200-330	+0/-0.011	h6	●
14.00	330	RGM 1400-330	+0/-0.011	h6	○
16.00	330	RGM 1600-330	+0/-0.011	h6	○

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request



Drill blanks

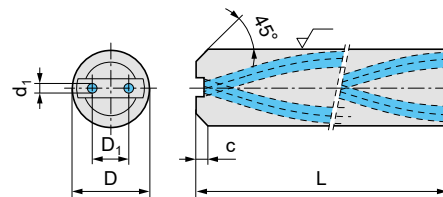
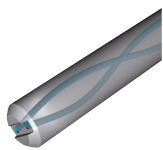
In addition to their geometrical precision thanks to a special grinding surface, our drill blanks are also notable for the improved pull-out resistance of the tool shank. The shank end corresponds to DIN 69090-3 and therefore complies with the standard for cutting tools which are suitable for MQL.

Of course we can also produce carbide rods in other dimensions and grades to order – just get in touch with your contact person at CERATIZIT.

Detailed technical data for our drill blanks can be found in the 'Information' section.



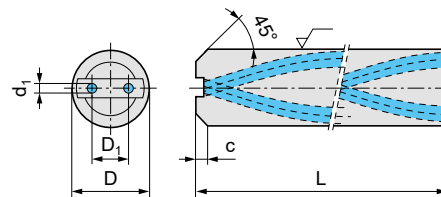
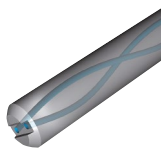
3xD, 5xD with through-coolant Drill blanks



xD factor	D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	Nominal pitch [mm]	[°]	c [mm]	D ₁ [mm]	d ₁ [mm]	CTS20D
3	6.00	63	40MB2 0600/1,9/0,7/22,5-063	+0/-0.005	h5	22.50	40.0	0.95	1.90	0.70	●
3	6.00	63	46MB2 0600/1,6/0,5/18,0-063	+0/-0.005	h5	18.00	46.3	0.95	1.60	0.50	●
3	6.00	67	30MB2 0600/2,7/0,8/32,7-067	+0/-0.005	h5	32.70	30.0	0.95	2.70	0.80	●
3	6.00	67	33MB2 0600/2,2/0,9/29,0-067	+0/-0.005	h5	29.00	33.0	0.95	2.20	0.90	●
3	8.00	80	30MB2 0800/3,4/1,0/43,5-080	+0/-0.006	h5	43.50	30.0	1.25	3.40	1.00	●
3	10.00	90	30MB2 1000/4,8/1,3/54,0-090	+0/-0.006	h5	54.40	30.0	1.35	4.80	1.30	●
3	12.00	103	30MB2 1200/6,3/1,7/65,3-103	+0/-0.008	h5	65.30	30.0	1.75	6.30	1.70	●
3	14.00	108	30MB2 1400/6,7/1,8/76,2-108	+0/-0.008	h5	76.20	30.0	1.95	6.70	1.80	●
3	16.00	116	30MB2 1600/8,0/2,0/87,1-116	+0/-0.008	h5	87.10	30.0	2.45	8.00	2.00	●
3	18.00	124	30MB2 1800/9,0/2,3/98,0-124	+0/-0.008	h5	98.00	30.0	2.75	9.00	2.30	●
3	20.00	132	30MB2 2000/10,0/2,5/108,8-132	+0/-0.009	h5	108.80	30.0	3.25	10.00	2.50	○
5	6.00	67	46MB2 0600/1,6/0,5/18,0-067	+0/-0.005	h5	18.00	46.3	0.95	1.60	0.50	●
5	6.00	67	40MB2 0600/1,9/0,7/22,5-067	+0/-0.005	h5	22.50	40.0	0.95	1.90	0.70	●
5	6.00	75	33MB2 0600/2,2/0,9/29,0-075	+0/-0.005	h5	29.00	33.0	0.95	2.20	0.90	●
5	6.00	75	40MB2 0600/1,9/0,7/22,5-075	+0/-0.005	h5	22.50	40.0	0.95	1.90	0.70	●
5	6.00	83	30MB2 0600/2,7/0,8/32,7-083	+0/-0.005	h5	32.70	30.0	0.95	2.70	0.80	●
5	8.00	92	30MB2 0800/3,4/1,0/43,5-092	+0/-0.006	h5	43.50	30.0	1.25	3.40	1.00	●
5	10.00	104	30MB2 1000/4,8/1,3/54,0-104	+0/-0.006	h5	54.40	30.0	1.35	4.80	1.30	●
5	12.00	119	30MB2 1200/6,3/1,7/65,3-119	+0/-0.008	h5	65.30	30.0	1.75	6.30	1.70	●
5	14.00	125	30MB2 1400/6,7/1,8/76,2-125	+0/-0.008	h5	76.20	30.0	1.95	6.70	1.80	●
5	16.00	134	30MB2 1600/8,0/2,0/87,1-134	+0/-0.008	h5	87.10	30.0	2.45	8.00	2.00	●
5	18.00	144	30MB2 1800/9,0/2,3/98,0-144	+0/-0.008	h5	98.00	30.0	2.75	9.00	2.30	●
5	20.00	154	30MB2 2000/10,0/2,5/108,8-154	+0/-0.009	h5	108.80	30.0	3.25	10.00	2.50	○

8xD, 12xD with through coolant

Drill blanks



xD factor	D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	Nominal pitch [mm]	[°]	c [mm]	D ₁ [mm]	d ₁ [mm]	CTS20D
8	6.00	73	46MB2 0600/1,6/0,5/18,0-073	+0/-0.005	h5	18.00	46.3	0.95	1.60	0.50	●
8	6.00	73	40MB2 0600/1,9/0,7/22,5-073	+0/-0.005	h5	22.50	40.0	0.95	1.90	0.70	●
8	6.00	82	33MB2 0600/2,2/0,9/29,0-082	+0/-0.005	h5	29.00	33.0	0.95	2.20	0.90	●
8	6.00	82	40MB2 0600/1,9/0,7/22,5-082	+0/-0.005	h5	22.50	40.0	0.95	1.90	0.70	●
8	6.00	96	30MB2 0600/2,7/0,8/32,7-096	+0/-0.005	h5	32.70	30.0	0.95	2.70	0.80	●
8	8.00	115	30MB2 0800/3,4/1,0/43,5-115	+0/-0.006	h5	43.50	30.0	1.25	3.40	1.00	●
8	10.00	143	30MB2 1000/4,8/1,3/54,0-143	+0/-0.006	h5	54.40	30.0	1.35	4.80	1.30	●
8	12.00	163	30MB2 1200/6,3/1,7/65,3-163	+0/-0.008	h5	65.30	30.0	1.75	6.30	1.70	●
8	14.00	179	30MB2 1400/6,7/1,8/76,2-179	+0/-0.008	h5	76.20	30.0	1.95	6.70	1.80	●
8	16.00	204	30MB2 1600/8,0/2,0/87,1-204	+0/-0.008	h5	87.10	30.0	2.45	8.00	2.00	●
8	18.00	223	30MB2 1800/9,0/2,3/98,0-223	+0/-0.008	h5	98.00	30.0	2.75	9.00	2.30	●
8	20.00	244	30MB2 2000/10,0/2,5/108,8-244	+0/-0.009	h5	108.80	30.0	3.25	10.00	2.50	○
12	6.00	93	40MB2 0600/1,9/0,7/22,5-093	+0/-0.005	h5	22.50	40.0	0.95	1.90	0.70	○
12	6.00	93	46MB2 0600/1,6/0,5/18,0-093	+0/-0.005	h5	18.00	46.3	0.95	1.60	0.50	○
12	6.00	103	40MB2 0600/1,9/0,7/22,5-103	+0/-0.005	h5	22.50	40.0	0.95	1.90	0.70	○
12	6.00	103	33MB2 0600/2,2/0,9/29,0-103	+0/-0.005	h5	29.00	33.0	0.95	2.20	0.90	○
12	6.00	117	30MB2 0600/2,7/0,8/32,7-117	+0/-0.005	h5	32.70	30.0	0.95	2.70	0.80	○
12	8.00	147	30MB2 0800/3,4/1,0/43,5-147	+0/-0.006	h5	43.50	30.0	1.25	3.40	1.00	○
12	10.00	163	30MB2 1000/4,8/1,3/54,0-163	+0/-0.006	h5	54.40	30.0	1.35	4.80	1.30	○
12	12.00	205	30MB2 1200/6,3/1,7/65,3-205	+0/-0.008	h5	65.30	30.0	1.75	6.30	1.70	○
12	14.00	231	30MB2 1400/6,7/1,8/76,2-231	+0/-0.008	h5	76.20	30.0	1.95	6.70	1.80	○
12	16.00	261	30MB2 1600/8,0/2,0/87,1-261	+0/-0.008	h5	87.10	30.0	2.45	8.00	2.00	○
12	18.00	286	30MB2 1800/9,0/2,3/98,0-286	+0/-0.008	h5	98.00	30.0	2.75	9.00	2.30	○
12	20.00	311	30MB2 2000/10,0/2,5/108,8-311	+0/-0.009	h5	108.80	30.0	3.25	10.00	2.50	○

○ limited stock

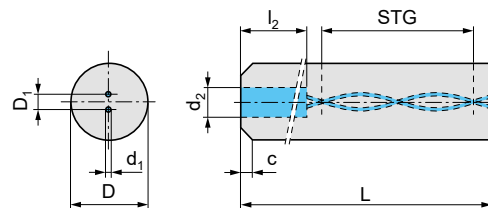
● stock item

▲ new stock item

Other grades and dimensions upon request

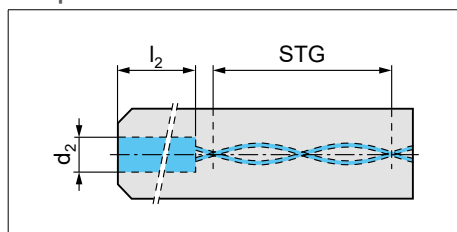
Micro-drill blanks with through coolant

Blanks for micro-drills

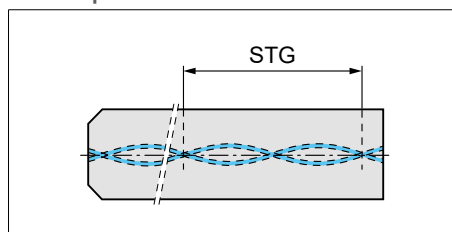


D	L	Type, description	Dia. tol.		Nominal pitch		c	D ₁	d ₁	d ₂	l ₂	CTS20D
[mm]	[mm]		[mm]	ISO 286	[mm]	[°]	[mm]	[mm]	[mm]	[mm]	[mm]	
3.00	55	71G2 0300/0,29/0,05/3,2-055	+0/-0.004	h5	3.20	71.2	0.20	0.29	0.05	0.70	25	○
3.00	60	67G2 0300/0,37/0,07/4,0-060	+0/-0.004	h5	4.00	67.0	0.20	0.37	0.07	0.90	25	●
3.00	65	62G2 0300/0,47/0,10/5,0-065	+0/-0.004	h5	5.00	62.1	0.20	0.47	0.10	1.20	25	●
3.00	75	58G2 0300/0,60/0,13/6,0-075	+0/-0.004	h5	6.00	57.5	0.20	0.60	0.13	1.50	25	●
3.00	85	53G2 0300/0,75/0,16/7,2-085	+0/-0.004	h5	7.20	52.6	0.20	0.75	0.16	1.70	25	●
3.00	95	46G2 0300/0,90/0,20/9,0-095	+0/-0.004	h5	9.00	46.3	0.20	0.90	0.20			●
3.00	105	42G2 0300/1,05/0,25/10,6-105	+0/-0.004	h5	10.60	41.6	0.20	1.05	0.25			●
3.00	120	37G2 0300/1,25/0,30/12,5-120	+0/-0.004	h5	12.50	37.0	0.20	1.25	0.30			●
3.00	140	33G2 0300/1,50/0,35/14,5-140	+0/-0.004	h5	14.50	33.0	0.20	1.50	0.35			●
4.00	55	76G2 0400/0,29/0,05/3,2-055	+0/-0.005	h5	3.20	75.7	0.30	0.29	0.05	0.70	25	○
4.00	60	72G2 0400/0,37/0,07/4,0-060	+0/-0.005	h5	4.00	72.3	0.30	0.37	0.07	0.90	25	○
4.00	65	68G2 0400/0,47/0,10/5,0-065	+0/-0.005	h5	5.00	68.3	0.30	0.47	0.10	1.20	25	●
4.00	75	64G2 0400/0,60/0,13/6,0-075	+0/-0.005	h5	6.00	64.5	0.30	0.60	0.13	1.50	25	●
4.00	85	60G2 0400/0,75/0,16/7,2-085	+0/-0.005	h5	7.20	60.2	0.30	0.75	0.16	2.00	25	●
4.00	95	54G2 0400/0,90/0,20/9,0-095	+0/-0.005	h5	9.00	54.4	0.30	0.90	0.20	2.50	25	●
4.00	105	50G2 0400/1,05/0,25/10,6-105	+0/-0.005	h5	10.60	49.9	0.30	1.05	0.25			●
4.00	120	46G2 0400/1,25/0,30/12,0-120	+0/-0.005	h5	12.00	46.3	0.30	1.25	0.30			●
4.00	140	38G2 0400/1,50/0,35/16,2-140	+0/-0.004	h5	16.20	37.8	0.30	1.50	0.35			●
4.00	160	35G2 0400/1,70/0,40/18,0-160	+0/-0.004	h5	18.00	34.9	0.30	1.70	0.40			●
4.00	180	30G2 0400/2,00/0,45/21,8-180	+0/-0.004	h5	21.80	30.0	0.30	2.00	0.45			○

with power chamber



without power chamber



○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Rods with helical coolant holes

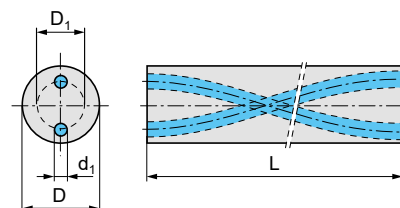
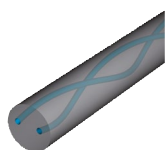
Our range of sintered and ground rods with helical coolant holes supports the production of drills in a diameter range from 3 mm to 35 mm. Our rods with helical coolant holes are available in the proven CTS20D grade for the universal machining of steel, stainless steel or heat-resistant alloys, and now also in CTS12D and the new high-performance grade CTS24Z for the machining of difficult materials like titanium or Inconel. Having virtually the same hardness, CTS24Z is even tougher than our proven CTS18D and CTS20D grades. This extreme toughness offers maximum protection against breakage and ensures consistent performance of your tools.

Of course we can also produce carbide rods in other dimensions and grades to order – just get in touch with your contact person at CERATIZIT.

Detailed technical data for our rods with helical coolant holes can be found in the 'Information' section.



As sintered

With two coolant holes, $\leq 22^\circ$ 

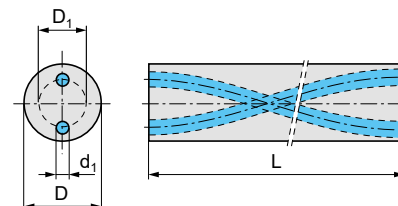
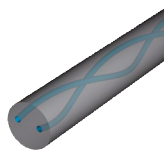
D	L	Type, description	Nominal pitch		D ₁	d ₁	CTS12D	CTS20D
[mm]	[mm]		[mm]	[°]	[mm]	[mm]		
6.30	415	22R2 0630/1,9/0,6/46,9-415	46.90	21.9	1.90	0.60		●
6.30	330	15R2 0630/2,6/0,7/70,35-330	70.35	15.0	2.60	0.70	○	●
6.30	415	15R2 0630/2,6/0,7/70,35-415	70.35	15.0	2.60	0.70		●
8.30	415	20R2 0830/3,3/1,0/70,34-415	70.34	19.7	3.30	1.00		●
8.30	330	15R2 0830/3,6/1,25/93,8-330	93.80	15.0	3.60	1.25	○	●
8.30	415	15R2 0830/3,6/1,25/93,8-415	93.80	15.0	3.60	1.25		●
10.30	415	19R2 1030/4,40/1,20/93,80-415	93.80	18.5	4.40	1.20		○
10.30	330	15R2 1030/4,80/1,40/117,25-330	117.25	15.0	4.80	1.40	○	●
10.30	415	15R2 1030/4,80/1,40/117,25-415	117.25	15.0	4.80	1.40		●
12.30	415	18R2 1230/5,40/1,50/117,25-415	117.25	17.8	5.40	1.50		●
12.30	330	15R2 1230/6,25/1,55/140,70-330	140.70	15.0	6.25	1.55	○	●
12.30	415	15R2 1230/6,25/1,55/140,70-415	140.70	15.0	6.25	1.55		●
14.30	330	15R2 1430/6,70/1,90/164,14-330	164.14	15.0	6.70	1.90	○	●
14.30	415	15R2 1430/6,70/1,90/164,14-415	164.14	15.0	6.70	1.90		●
16.30	330	15R2 1630/8,0/2,10/187,59-330	187.59	15.0	8.00	2.10	○	●
18.30	330	15R2 1830/9,0/2,3/211,0-330	211.00	15.0	9.00	2.30	○	●
20.30	330	15R2 2030/10,0/2,50/234,49-330	234.49	15.0	10.00	2.50	○	●
22.30	330	15R2 2230/12,0/2,5/257,94-330	257.94	15.0	12.00	2.50		○

→ For further information go to page 114.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

As sintered

With two coolant holes, 23° – 49°



D	L	Type, description	Nominal pitch		D ₁	d ₁	CTS12D	CTS20D	CTS24Z
[mm]	[mm]		[mm]	[°]	[mm]	[mm]			
3.30	330	49R2 0330/0,55/0,20/8,2-330	8.20	49.0	0.55	0.20		●	
3.30	330	40R2 0330/0,3/0,15/11,2-330	11.20	40.1	0.30	0.15		●	
3.30	330	39R2 0330/0,8/0,23/11,5-330	11.50	39.3	0.80	0.23		●	
3.30	330	34R2 0330/1,1/0,35/14,0-330	14.00	34.0	1.10	0.35		●	
3.30	330	30R2 0330/1,4/0,35/16,32-330	16.32	30.0	1.40	0.35		●	
4.30	330	46R2 0430/1,0/0,3/12,0-330	12.00	46.3	1.00	0.30		●	
4.30	330	38R2 0430/1,2/0,35/16,2-330	16.20	37.8	1.20	0.35		●	
4.30	330	35R2 0430/1,6/0,45/18,0-330	18.00	34.9	1.60	0.45		●	
4.30	330	30R2 0430/2,1/0,45/21,8-330	21.80	30.0	2.10	0.45		●	
5.30	330	33R2 0530/2,2/0,6/24,5-330	24.50	32.7	2.20	0.60		●	
6.30	330	46R2 0630/1,6/0,5/18,0-330	18.00	46.3	1.60	0.50	●	●	●
6.30	350	46R2 0630/1,6/0,5/18,0-350	18.00	46.3	1.60	0.50		●	
6.30	330	40R2 0630/1,9/0,7/22,5-330	22.50	40.0	1.90	0.70	●	●	●
6.30	350	40R2 0630/1,9/0,7/22,5-350	22.50	40.0	1.90	0.70		●	
6.30	330	35R2 0630/2,3/0,7/27,2-330	27.20	34.6	2.30	0.70		▲	
6.30	330	33R2 0630/2,4/0,7/29,0-330	29.00	32.7	2.40	0.70		▲	
6.30	330	30R2 0630/2,7/0,8/32,7-330	32.70	30.0	2.70	0.80	○	●	●
6.30	330	30R2 0630/3,0/0,9/32,7-330	32.70	30.0	3.00	0.90		●	
6.30	330	30R2 0630/2,2/0,7/32,7-330	32.70	30.0	2.20	0.70		●	
6.30	330	30R2 0630/2,0/0,9/32,7-330	32.70	30.0	2.00	0.90		●	
6.30	350	30R2 0630/2,2/0,7/32,7-350	32.70	30.0	2.20	0.70		●	
6.80	330	30R2 0680/2,7/0,8/35,4-330	35.40	28.0	2.70	0.80	○		
6.80	330	30R2 0680/3,3/0,9/35,4-330	35.40	28.0	3.30	0.90		○	
7.30	330	30R2 0730/3,5/1,0/38,1-330	38.10	30.0	3.50	1.00		●	
8.30	330	43R2 0830/2,3/0,7/27,2-330	27.20	42.7	2.30	0.70		●	
8.30	330	40R2 0830/2,9/0,7/30,0-330	30.00	40.0	2.90	0.70	●	●	●
8.30	330	36R2 0830/3,3/1,0/35,0-330	35.00	35.7	3.30	1.00		●	
8.30	350	36R2 0830/3,3/1,0/35,0-350	35.00	35.7	3.30	1.00		●	
8.30	330	30R2 0830/4,1/1,2/43,5-330	43.50	30.0	4.10	1.20		●	
8.30	330	30R2 0830/3,4/1,0/43,5-330	43.50	30.0	3.40	1.00	●	●	●

→ For further information go to page 114.

○ limited stock

● stock item

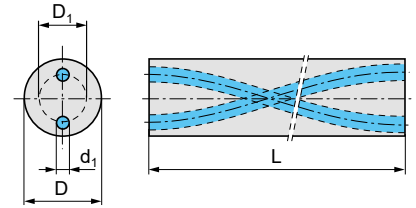
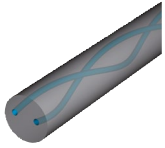
▲ new stock item

Other grades and dimensions upon request



As sintered

With two coolant holes, 23° – 49°



D	L	Type, description	Nominal pitch		D ₁	d ₁	CTS12D	CTS20D	CTS24Z
[mm]	[mm]		[mm]	[°]	[mm]	[mm]			
8.30	350	30R2 0830/3,4/1,0/43,5-350	43.50	30.0	3.40	1.00		●	
9.30	330	30R2 0930/4,35/1,0/49,0-330	49.00	30.0	4.35	1.00		●	
9.80	330	30R2 0980/4,8/1,3/51,7-330	51.70	28.7	4.80	1.30		○	
10.30	330	40R2 1030/2,7/0,8/37,0-330	37.00	40.3	2.70	0.80	●	●	●
10.30	330	34R2 1030/3,9/1,1/46,0-330	46.00	34.3	3.90	1.10		●	
10.30	330	34R2 1030/4,4/1,15/46,0-330	46.00	34.3	4.40	1.15		●	
10.30	330	33R2 1030/5,0/1,2/49,0-330	49.00	32.7	5.00	1.20		●	
10.30	330	30R2 1030/4,8/1,3/54,4-330	54.40	30.0	4.80	1.30	●	●	●
11.30	330	40R2 1130/3,2/0,8/41,2-330	41.20	40.0	3.20	0.80		●	
11.30	330	30R2 1130/5,5/1,5/59,9-330	59.90	30.0	5.50	1.50		●	
11.80	330	30R2 1180/5,5/1,5/62,6-330	62.60	28.9	5.50	1.50		○	
12.30	330	40R2 1230/4,0/0,9/44,9-330	44.90	40.0	4.00	0.90	●	●	●
12.30	330	39R2 1230/3,5/1,0/46,3-330	46.30	39.2	3.50	1.00		●	
12.30	250	33R2 1230/5,4/1,5/57,0-250	57.00	33.5	5.40	1.50		●	
12.30	330	33R2 1230/5,0/1,35/57,0-330	57.00	33.5	5.00	1.35		●	
12.30	330	33R2 1230/5,4/1,5/57,0-330	57.00	33.5	5.40	1.50		●	
12.30	330	32R2 1230/6,0/1,5/59,9-330	59.90	32.2	6.00	1.50		●	
12.30	250	30R2 1230/6,3/1,7/65,3-250	65.30	30.0	6.30	1.70		●	
12.30	330	30R2 1230/6,3/1,7/65,3-330	65.30	30.0	6.30	1.70	●	○	●
13.30	330	40R2 1330/4,4/1,0/48,7-330	48.70	40.0	4.40	1.00		○	
13.30	330	30R2 1330/6,5/1,6/70,7-330	70.70	30.0	6.50	1.60		●	
14.30	330	40R2 1430/4,6/1,3/52,4-330	52.40	40.0	4.60	1.30	●	●	●
14.30	330	34R2 1430/6,0/1,6/65,0-330	65.00	34.1	6.00	1.60		●	
14.30	330	30R2 1430/6,7/1,8/76,2-330	76.20	30.0	6.70	1.80	●	●	●
14.30	330	30R2 1430/7,6/2,0/76,2-330	76.20	30.0	7.60	2.00		●	
14.30	330	30R2 1430/7,0/2,0/76,2-330	76.20	30.0	7.00	2.00		●	
15.30	330	30R2 1530/7,6/2,0/81,6-330	81.60	30.0	7.60	2.00		●	
16.30	330	40R2 1630/5,5/1,2/59,9-330	59.90	40.0	5.50	1.20	●	●	○
16.30	330	35R2 1630/7,0/2,0/73,0-330	73.00	34.6	7.00	2.00		●	
16.30	330	32R2 1630/8,4/2,0/81,6-330	81.60	31.6	8.40	2.00		●	

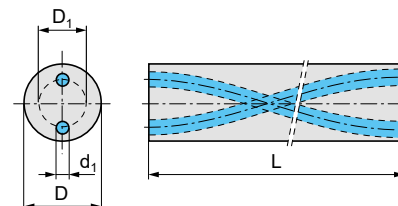
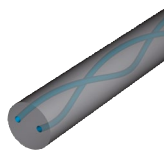
→ For further information go to page 114.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request



As sintered

With two coolant holes, 23° – 49°



D	L	Type, description	Nominal pitch		D ₁	d ₁	CTS12D	CTS20D	CTS24Z
[mm]	[mm]		[mm]	[°]	[mm]	[mm]			
16.30	280	30R2 1630/8,0/2,0/87,1-280	87.10	30.0	8.00	2.00		●	
16.30	330	30R2 1630/8,0/2,0/87,1-330	87.10	30.0	8.00	2.00	●	●	●
16.30	330	30R2 1630/8,6/2,5/87,1-330	87.10	30.0	8.60	2.50		●	
17.30	330	40R2 1730/5,75/1,3/63,6-330	63.60	40.0	5.75	1.30		○	
17.30	330	30R2 1730/8,9/2,5/92,5-330	92.50	30.0	8.90	2.50		○	
18.30	330	40R2 1830/5,6/1,6/68,0-330	68.00	39.7	5.60	1.60	●	●	○
18.30	330	40R2 1830/6,3/1,7/68,0-330	68.00	39.7	6.30	1.70		●	
18.30	330	35R2 1830/7,75/2,2/82,0-330	82.00	34.6	7.75	2.20		●	
18.30	330	30R2 1830/9,3/2,7/98,0-330	98.00	30.0	9.30	2.70	●	●	●
19.80	330	30R2 1980/9,6/2,4/106,1-330	106.10	29.4	9.60	2.40		○	
20.30	330	40R2 2030/7,1/1,5/74,9-330	74.90	40.0	7.10	1.50	○	●	○
20.30	330	37R2 2030/6,5/1,7/84,3-330	84.30	36.7	6.50	1.70		●	
20.30	330	30R2 2030/10,7/3,2/108,8-330	108.80	30.0	10.70	3.20		●	
20.30	330	30R2 2030/10,0/2,5/108,8-330	108.80	30.0	10.00	2.50	○	●	○
21.30	330	30R2 2130/10,65/2,0/114,2-330	114.20	30.0	10.65	2.00		●	
21.30	330	30R2 2130/11,5/3,2/114,2-330	114.20	30.0	11.50	3.20		●	
22.30	330	40R2 2230/7,7/1,7/82,4-330	82.40	40.0	7.70	1.70		●	
22.30	330	33R2 2230/10,0/2,50/108,0-330	108.00	32.6	10.00	2.50		●	
22.30	330	30R2 2230/11,5/3,4/119,7-330	119.70	30.0	11.50	3.40		●	
22.30	330	30R2 2230/11,3/2,0/119,7-330	119.70	30.0	11.30	2.00		●	
25.30	330	40R2 2530/7,7/1,75/93,6-330	93.60	40.0	7.70	1.75		●	○
25.30	330	33R2 2530/12,0/3,2/119,0-330	119.00	33.0	12.00	3.20		●	○
28.30	330	39R2 2830/9,0/2,0/107,7-330	107.70	39.2	9.00	2.00		●	
28.30	330	29R2 2830/14,8/2,5/159,0-330	159.00	29.0	14.80	2.50		●	
30.30	330	39R2 3030/10,0/2,0/116,0-330	116.00	39.1	10.00	2.00		●	
30.30	330	29R2 3030/16,0/2,5/172,0-330	172.00	28.7	16.00	2.50		●	
32.30	330	40R2 3230/11,0/2,0/119,8-330	119.80	40.0	11.00	2.00		●	
32.30	330	29R2 3230/17,0/3,0/177,8-330	177.80	29.5	17.00	3.00		●	
35.30	330	30R2 3530/18,0/3,0/189,5-330	189.50	30.0	18.00	3.00		●	

→ For further information go to page 114.

○ limited stock

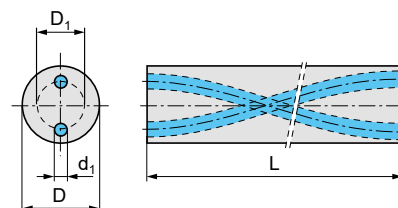
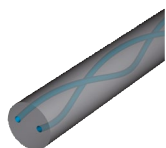
● stock item

▲ new stock item

Other grades and dimensions upon request

As sintered

With two coolant holes, extra-long, 23° – 49°

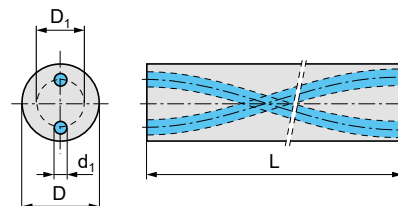
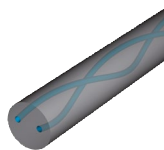


D	L	Type, description	Nominal pitch		D ₁	d ₁	CTS20D
[mm]	[mm]		[mm]	[°]	[mm]	[mm]	
6.30	430	46R2 0630/1,6/0,5/18,0-430	18.00	46.3	1.60	0.50	●
6.30	430	40R2 0630/1,9/0,7/22,5-430	22.50	40.0	1.90	0.70	●
6.30	430	30R2 0630/3,0/0,9/32,7-430	32.70	30.0	3.00	0.90	●
6.30	430	30R2 0630/2,2/0,7/32,7-430	32.70	30.0	2.20	0.70	●
8.30	430	30R2 0830/3,4/1,0/43,5-430	43.50	30.0	3.40	1.00	●
10.30	430	30R2 1030/4,8/1,3/54,4-430	54.40	30.0	4.80	1.30	●
10.30	530	30R2 1030/4,8/1,3/54,4-530	54.40	30.0	4.80	1.30	●
12.30	430	30R2 1230/6,3/1,7/65,3-430	65.30	30.0	6.30	1.70	●
12.30	530	30R2 1230/6,3/1,7/65,3-530	65.30	30.0	6.30	1.70	●
14.30	430	30R2 1430/6,7/1,8/76,2-430	76.20	30.0	6.70	1.80	●
14.30	530	30R2 1430/6,7/1,8/76,2-530	76.20	30.0	6.70	1.80	●
16.30	430	30R2 1630/8,0/2,0/87,1-430	87.10	30.0	8.00	2.00	●
16.30	530	30R2 1630/8,0/2,0/87,1-530	87.10	30.0	8.00	2.00	●
18.30	430	30R2 1830/9,3/2,7/98,0-430	98.00	30.0	9.30	2.70	●
18.30	530	30R2 1830/9,3/2,7/98,0-530	98.00	30.0	9.30	2.70	○
20.30	430	30R2 2030/10,0/2,5/108,8-430	108.80	30.0	10.00	2.50	●
20.30	530	30R2 2030/10,0/2,5/108,8-530	108.80	30.0	10.00	2.50	●
25.30	430	33R2 2530/12,0/3,2/119,0-430	119.00	33.4	12.00	3.20	●
25.30	530	33R2 2530/12,0/3,2/119,0-530	119.00	33.4	12.00	3.20	●

→ For further information go to page 114.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

As sintered

With two coolant holes, $\geq 50^\circ$ 

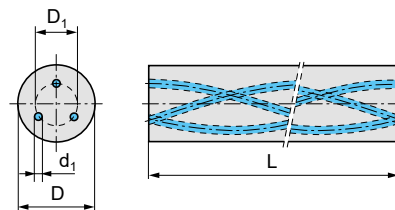
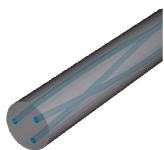
D [mm]	L [mm]	Type, description	Nominal pitch		D ₁ [mm]	d ₁ [mm]	CTS20D
			[mm]	[°]			
10.30	330	50R2 1030/2,3/0,7/26,0-330	26.00	50.4	2.30	0.70	●
12.30	330	51R2 1230/2,3/0,7/30,1-330	30.10	51.4	2.30	0.70	●
13.30	330	50R2 1330/2,6/0,7/34,0-330	34.00	50.2	2.60	0.70	●
16.30	330	50R2 1630/3,7/1,0/42,0-330	42.00	50.1	3.70	1.00	●
20.30	330	50R2 2030/4,4/1,2/52,7-330	52.70	50.0	4.40	1.20	●

→ For further information go to page 114.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

As sintered

With three coolant holes



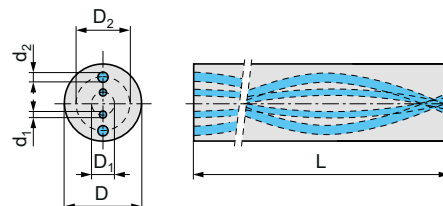
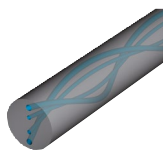
D [mm]	L [mm]	Type, description	Nominal pitch		D ₁ [mm]	d ₁ [mm]	CTS20D
6.30	330	30R3 0630/3,0/0,6/32,7-330	32.70	31.2	3.00	0.60	●
8.30	330	40R3 0830/2,9/0,7/30,0-330	30.00	40.0	2.90	0.70	●
8.30	330	30R3 0830/4,0/0,75/43,5-330	43.50	30.0	4.00	0.75	●
10.30	330	40R3 1030/3,5/0,75/37,0-330	37.00	40.3	3.50	0.75	●
10.30	330	30R3 1030/4,9/1,0/54,4-330	54.40	30.0	4.90	1.00	●
12.30	330	40R3 1230/4,0/0,9/44,9-330	44.90	40.0	4.00	0.90	●
12.30	330	30R3 1230/6,0/1,1/65,3-330	65.30	30.0	6.00	1.10	●
14.30	330	40R3 1430/4,65/1,2/52,4-330	52.40	40.0	4.65	1.20	●
14.30	330	30R3 1430/7,1/1,3/76,2-330	76.20	30.0	7.10	1.30	●
16.30	330	40R3 1630/5,5/1,2/59,9-330	59.90	40.0	5.50	1.20	●
16.30	330	30R3 1630/8,3/1,5/87,0-330	87.00	30.0	8.30	1.50	●
18.30	330	40R3 1830/6,25/1,5/67,4-330	67.40	40.0	6.25	1.50	●
18.30	330	30R3 1830/9,6/1,7/98,0-330	98.00	30.0	9.60	1.70	●
20.30	330	40R3 2030/7,1/1,5/74,9-330	74.90	40.0	7.10	1.50	●
20.30	330	30R3 2030/10,4/2,0/108,8-330	108.80	30.0	10.40	2.00	●
22.30	330	40R3 2230/7,7/1,7/82,4-330	82.40	40.0	7.70	1.70	●
22.30	330	30R3 2230/10,7/2,0/119,7-330	119.70	30.0	10.70	2.00	●
25.30	330	40R3 2530/8,1/1,7/93,6-330	93.60	40.0	8.10	1.70	●
25.30	330	33R3 2530/11,5/2,2/119,0-330	119.00	33.4	11.50	2.20	●

→ For further information go to page 114.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

As sintered

With four coolant holes



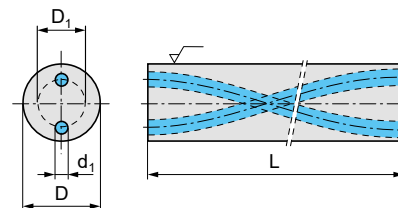
D	L	Type, description	Nominal pitch		D ₁	d ₁	D ₂	d ₂	CTS20D
[mm]	[mm]		[mm]	[°]	[mm]	[mm]	[mm]	[mm]	
8.30	330	33R4 0830/1,9/3,9/0,4/0,8/38-330	38.10	33.4	1.90	0.40	3.90	0.80	●
8.30	330	30R4 0830/2,2/4,5/0,45/0,9/44-330	43.50	29.7	2.20	0.45	4.50	0.90	○
10.30	330	33R4 1030/2,5/5,1/0,5/1,0/49-330	49.00	32.7	2.50	0.50	5.10	1.00	●
10.30	330	30R4 1030/2,8/5,7/0,6/1,1/54-330	54.40	30.0	2.80	0.60	5.70	1.10	●
12.30	330	32R4 1230/3,1/6,3/0,7/1,2/60-330	59.90	32.2	3.10	0.70	6.30	1.20	●
12.30	330	30R4 1230/3,4/6,9/0,7/1,4/65-330	65.30	30.0	3.40	0.70	6.90	1.40	●
14.30	330	32R4 1430/3,6/7,5/0,8/1,5/71-330	70.70	31.9	3.60	0.80	7.50	1.50	●
14.30	330	30R4 1430/3,9/8,1/0,8/1,6/76-330	76.20	30.0	3.90	0.80	8.10	1.60	●
16.30	330	30R4 1630/4,4/9,0/0,9/1,8/87-330	87.10	30.0	4.40	0.90	9.00	1.80	●
18.30	330	30R4 1830/5,0/10,2/1,0/2,0/98-330	98.00	30.0	5.00	1.00	10.20	2.00	●
20.30	330	30R4 203/5,6/11,4/1,2/2,3/109-330	108.80	30.0	5.60	1.20	11.40	2.30	●
22.30	330	30R4 223/6,1/12,6/1,2/2,5/120-330	119.70	30.0	6.10	1.20	12.60	2.50	○
25.30	330	29R4 253/6,9/14,1/1,4/2,8/139-330	139.30	29.4	6.90	1.40	14.10	2.80	●

→ For further information go to page 114.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Ground

With two coolant holes, $\leq 22^\circ$



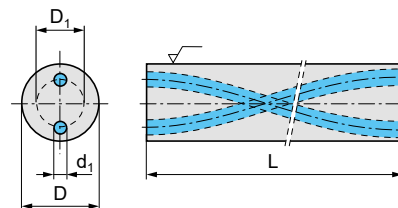
D	L	Type, description	Dia. tol.	ISO 286	Nominal pitch		D ₁	d ₁	CTS20D
[mm]	[mm]		[mm]		[mm]	[°]	[mm]	[mm]	
6.00	330	15G2 0600/2,6/0,7/70,35-330	+0/-0.008	h6	70.35	15.0	2.60	0.70	●
8.00	330	15G2 0800/3,6/1,25/93,8-330	+0/-0.009	h6	93.80	15.0	3.60	1.25	●
10.00	330	15G2 1000/4,80/1,40/117,25-330	+0/-0.009	h6	117.25	15.0	4.80	1.40	●
12.00	330	15G2 1200/6,25/1,55/140,70-330	+0/-0.011	h6	140.70	15.0	6.25	1.55	●
14.00	330	15G2 1400/6,70/1,90/164,14-330	+0/-0.011	h6	164.14	15.0	6.70	1.90	●
16.00	330	15G2 1600/8,0/2,10/187,59-330	+0/-0.011	h6	187.59	15.0	8.00	2.10	●
18.00	330	15G2 1800/9,0/2,3/211,0-330	+0/-0.011	h6	211.00	15.0	9.00	2.30	●
20.00	330	15G2 2000/10,0/2,50/234,49-330	+0/-0.013	h6	234.49	15.0	10.00	2.50	●

→ For further information go to page 114.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Ground

With two coolant holes, 23° – 49°



D	L	Type, description	Dia. tol.	ISO 286	Nominal pitch		D ₁	d ₁	CTS20D
[mm]	[mm]		[mm]		[mm]	[°]	[mm]	[mm]	
6.00	330	40G2 0600/1,9/0,7/22,5-330	+0/-0.008	h6	22.50	40.0	1.90	0.70	●
6.00	330	30G2 0600/3,0/0,9/32,7-330	+0/-0.008	h6	32.70	30.0	3.00	0.90	●
8.00	330	43G2 0800/2,3/0,7/27,2-330	+0/-0.009	h6	27.20	42.7	2.30	0.70	●
8.00	330	30G2 0800/3,4/1,0/43,5-330	+0/-0.009	h6	43.50	30.0	3.40	1.00	●
10.00	330	40G2 1000/2,7/0,8/37,0-330	+0/-0.009	h6	37.00	40.0	2.70	0.80	●
10.00	330	30G2 1000/4,8/1,3/54,4-330	+0/-0.009	h6	54.40	30.0	4.80	1.30	●
12.00	330	39G2 1200/3,5/1,0/46,3-330	+0/-0.011	h6	46.30	39.0	3.50	1.00	●
12.00	330	30G2 1200/6,3/1,7/65,3-330	+0/-0.011	h6	65.30	30.0	6.30	1.70	●
14.00	330	40G2 1400/4,6/1,3/52,4-330	+0/-0.011	h6	52.40	40.0	4.60	1.30	●
14.00	330	30G2 1400/6,7/1,8/76,2-330	+0/-0.011	h6	76.20	30.0	6.70	1.80	●
16.00	330	40G2 1600/5,5/1,2/59,9-330	+0/-0.011	h6	59.90	40.0	5.50	1.20	●
16.00	330	30G2 1600/8,0/2,0/87,1-330	+0/-0.011	h6	87.10	30.0	8.00	2.00	●
18.00	330	40G2 1800/6,3/1,7/68,0-330	+0/-0.011	h6	68.00	39.7	6.30	1.70	●
18.00	330	30G2 1800/9,3/2,7/98,0-330	+0/-0.011	h6	98.00	30.0	9.30	2.70	●
20.00	330	40G2 2000/7,1/1,5/74,9-330	+0/-0.013	h6	74.90	40.0	7.10	1.50	●
20.00	330	30G2 2000/10,0/2,5/108,8-330	+0/-0.013	h6	108.80	30.0	10.00	2.50	●
25.00	330	40G2 2500/7,7/1,75/93,6-330	+0/-0.013	h6	93.60	40.0	7.70	1.75	●
25.00	330	33G2 2500/12,0/3,2/119,0-330	+0/-0.013	h6	119.00	33.4	12.0	3.20	●
32.00	330	40G2 3200/11,0/2,0/119,8-330	+0/-0.016	h6	119.80	40.0	11.00	2.00	○
32.00	330	29G2 3200/17,0/3,0/177,8-330	+0/-0.016	h6	177.80	29.5	17.00	3.00	○

→ For further information go to page 114.

○ limited stock

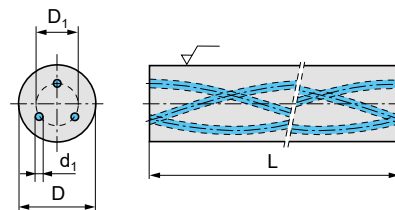
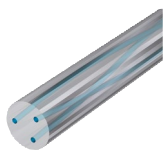
● stock item

▲ new stock item

Other grades and dimensions upon request

Ground

With three coolant holes



D	L	Type, description	Dia. tol.	ISO 286	Nominal pitch		D ₁	d ₁	CTS20D
[mm]	[mm]		[mm]		[mm]	[°]	[mm]	[mm]	
6.00	330	30G3 0600/3,0/0,6/32,7-330	+0/-0.008	h6	32.70	30.0	3.00	0.60	●
8.00	330	30G3 0800/4,0/0,75/43,5-330	+0/-0.009	h6	43.50	30.0	4.00	0.75	●
10.00	330	30G3 1000/4,9/1,0/54,4-330	+0/-0.009	h6	54.40	30.0	4.90	1.00	●
12.00	330	30G3 1200/6,0/1,1/65,3-330	+0/-0.011	h6	65.30	30.0	6.00	1.10	●
14.00	330	30G3 1400/7,1/1,3/76,2-330	+0/-0.011	h6	76.20	30.0	7.10	1.30	●
16.00	330	30G3 1600/8,3/1,5/87,0-330	+0/-0.011	h6	87.00	30.0	8.30	1.50	●
18.00	330	30G3 1800/9,6/1,7/98,0-330	+0/-0.011	h6	98.00	30.0	9.60	1.70	●
20.00	330	30G3 2000/10,4/2,0/108,8-330	+0/-0.013	h6	108.80	30.0	10.40	2.00	●
25.00	330	30G3 2500/11,5/2,2/119,0-330	+0/-0.013	h6	119.00	33.0	11.50	2.20	●

→ For further information go to page 114.

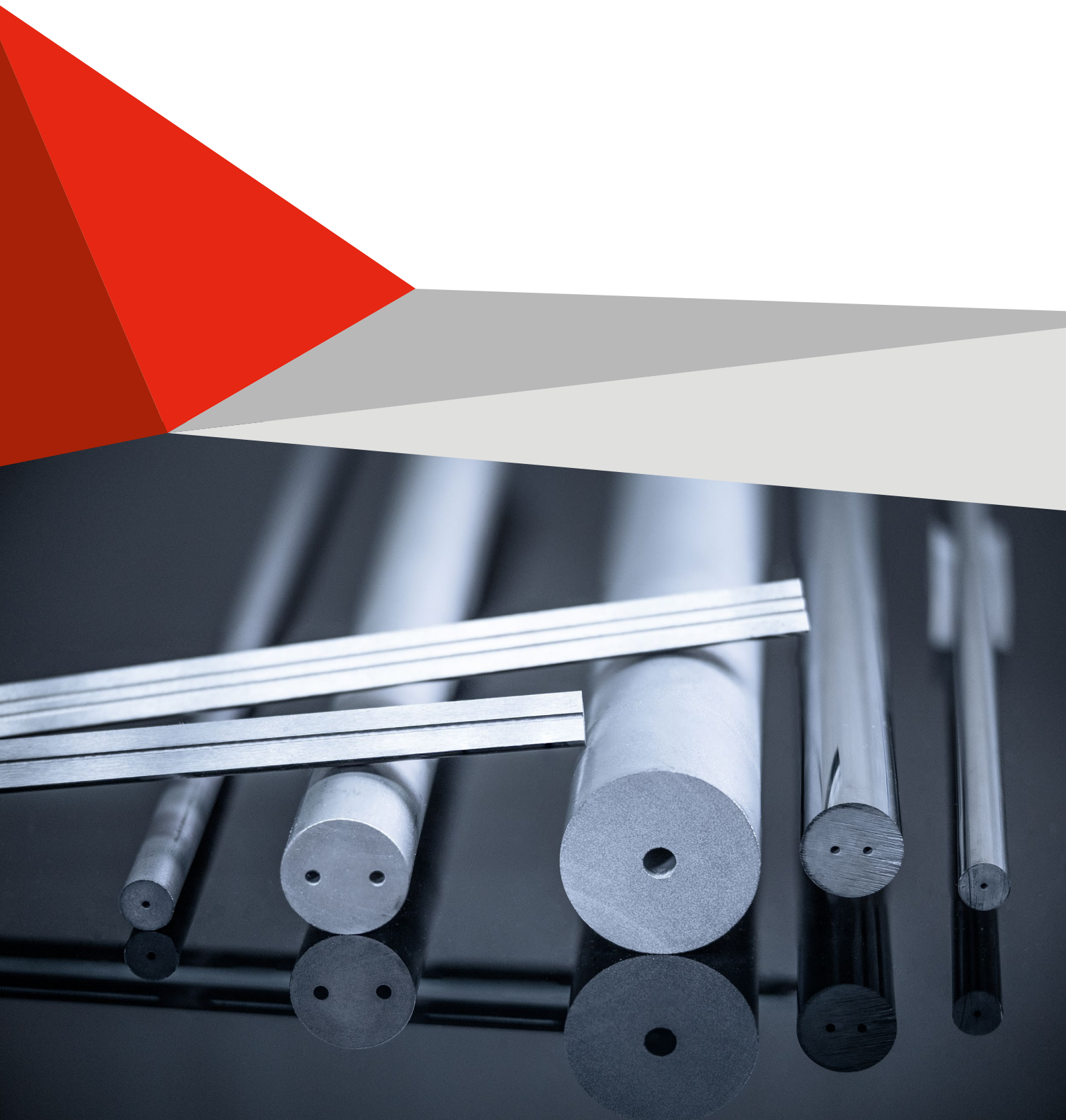
○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Rods with straight coolant holes

Our standard range includes sintered and ground rods with one central or two straight coolant holes.

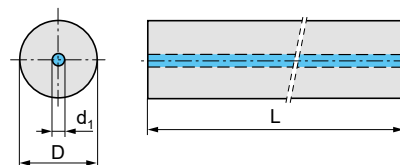
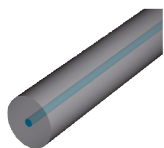
Of course we can also produce carbide rods in other dimensions and grades to order – just get in touch with your contact person at CERATIZIT.

Detailed technical data for our rods with straight coolant holes can be found in the 'Information' section.



As sintered

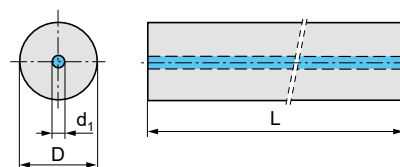
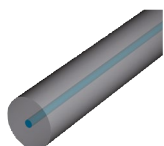
With central coolant hole, ultra-fine grades



D [mm]	L [mm]	Type, description	d ₁ [mm]	TSF44
6.45	330	00R1 0645/1,0-330	1.00	●
8.55	330	00R1 0855/1,3-330	1.30	●
10.55	330	00R1 1055/1,3-330	1.30	●
10.55	330	00R1 1055/2,0-330	2.00	●
12.55	330	00R1 1255/2,0-330	2.00	●
14.70	330	00R1 1470/2,0-330	2.00	●
16.70	330	00R1 1670/2,0-330	2.00	●
20.70	330	00R1 2070/3,0-330	3.00	●

As sintered

With central coolant hole, submicron grades



D [mm]	L [mm]	Type, description	d ₁ [mm]	CTS15D	CTS20D
4.95	330	00R1 0495/0,6-330	0.60	●	
6.30	330	00R1 0630/1,0-330	1.00		●
6.45	330	00R1 0645/1,0-330	1.00	●	
8.30	330	00R1 0830/1,3-330	1.30		●
8.55	330	00R1 0855/2,0-330	2.00	●	
8.55	330	00R1 0855/1,3-330	1.30	●	
10.30	330	00R1 1030/2,0-330	2.00		○
10.55	330	00R1 1055/1,3-330	1.30	●	
10.55	330	00R1 1055/2,0-330	2.00	●	
11.30	330	00R1 1130/2,0-330	2.00		○

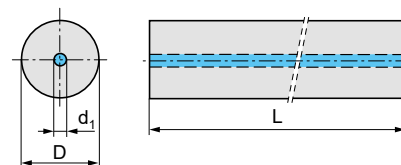
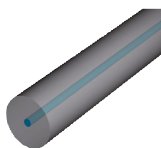
→ For further information go to page 116.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request



As sintered

With central coolant hole, submicron grades



D [mm]	L [mm]	Type, description	d ₁ [mm]	CTS15D	CTS20D
12.30	330	00R1 1230/2,0-330	2.00		●
12.55	330	00R1 1255/2,0-330	2.00	●	
13.30	330	00R1 1330/2,0-330	2.00		●
14.30	330	00R1 1430/2,0-330	2.00		●
14.70	330	00R1 1470/2,0-330	2.00	●	
16.30	330	00R1 1630/2,0-330	2.00		●
16.70	330	00R1 1670/2,0-330	2.00	●	
18.30	330	00R1 1830/3,0-330	3.00		●
18.70	330	00R1 1870/3,0-330	3.00	●	
20.30	330	00R1 2030/3,0-330	3.00		●
20.70	330	00R1 2070/3,0-330	3.00	●	
25.30	330	00R1 2530/3,0-330	3.00		●
28.30	330	00R1 2830/4,0-330	4.00		●
30.30	330	00R1 3030/5,0-330	5.00		●
32.30	330	00R1 3230/5,0-330	5.00		●

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→ For further information go to page 116.

○ limited stock

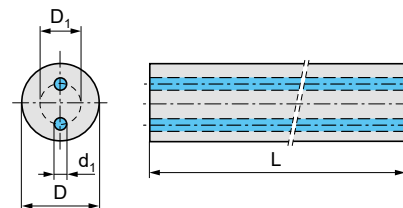
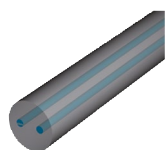
● stock item

▲ new stock item

Other grades and dimensions upon request

As sintered

With two straight coolant holes, submicron grades



D [mm]	L [mm]	Type, description	D ₁ [mm]	d ₁ [mm]	CTS15D	CTS20D
3.30	330	00R2 0330/1,1/0,425-330	1.10	0.43	●	
4.20	330	00R2 0420/1,1/0,45-330	1.10	0.45	●	
5.20	330	00R2 0520/2,0/0,9-330	2.00	0.90	○	○
6.20	330	00R2 0620/1,1/0,5-330	1.10	0.50	●	
6.20	330	00R2 0620/1,5/0,9-330	1.50	0.90	●	
6.20	330	00R2 0620/1,7/0,6-330	1.70	0.60	●	●
6.20	330	00R2 0620/2,0/0,9-330	2.00	0.90	●	●
6.20	330	00R2 0620/2,3/0,9-330	2.30	0.90	●	
6.20	330	00R2 0620/2,6/0,9-330	2.60	0.90		●
6.20	330	00R2 0620/3,0/1,2-330	3.00	1.20	●	
7.20	330	00R2 0720/2,0/0,9-330	2.00	0.90	○	○
7.20	330	00R2 0720/3,0/0,9-330	3.00	0.90		●
8.20	330	00R2 0820/2,0/0,9-330	2.00	0.90	●	●
8.20	330	00R2 0820/2,6/0,9-330	2.60	0.90	●	
8.20	330	00R2 0820/2,6/1,2-330	2.60	1.20		●
8.20	330	00R2 0820/3,4/1,0-330	3.40	1.00		●
8.20	330	00R2 0820/3,5/1,5-330	3.50	1.50	●	
8.20	330	00R2 0820/4,0/0,9-330	4.00	0.90	●	●
9.20	330	00R2 0920/2,6/1,2-330	2.60	1.20		○
9.20	330	00R2 0920/3,5/1,5-330	3.50	1.50	○	
9.20	330	00R2 0920/3,8/1,2-330	3.80	1.20		●
9.20	330	00R2 0920/4,0/1,3-330	4.00	1.30	○	
10.20	330	00R2 1020/2,0/1,0-330	2.00	1.00	●	
10.20	330	00R2 1020/2,6/1,2-330	2.60	1.20		●
10.20	330	00R2 1020/2,8/1,0-330	2.80	1.00	●	
10.20	330	00R2 1020/3,5/1,5-330	3.50	1.50	●	
10.20	330	00R2 1020/4,2/1,4-330	4.20	1.40	●	●
10.20	330	00R2 1020/5,0/1,2-330	5.00	1.20	●	
10.20	330	00R2 1020/5,2/1,4-330	5.20	1.40	●	
12.20	330	00R2 1220/2,6/1,2-330	2.60	1.20	●	

→ For further information go to page 116.

○ limited stock

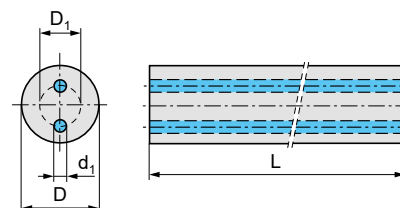
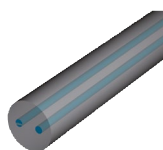
● stock item

▲ new stock item

Other grades and dimensions upon request

As sintered

With two straight coolant holes, submicron grades



D [mm]	L [mm]	Type, description	D ₁ [mm]	d ₁ [mm]	CTS15D	CTS20D
12.20	330	00R2 1220/3,5/1,5-330	3.50	1.50	●	●
12.20	330	00R2 1220/4,8/1,5-330	4.80	1.50	●	
12.20	330	00R2 1220/5,0/2,0-330	5.00	2.00	●	●
12.20	330	00R2 1220/6,0/1,5-330	6.00	1.50	●	
13.20	330	00R2 1320/5,4/2,0-330	5.40	2.00		●
14.20	330	00R2 1420/3,5/1,5-330	3.50	1.50		●
14.20	330	00R2 1420/5,0/1,7-330	5.00	1.70	●	
14.20	330	00R2 1420/5,0/2,0-330	5.00	2.00	●	●
14.20	330	00R2 1420/5,8/2,0-330	5.80	2.00		●
14.20	330	00R2 1420/7,0/2,0-330	7.00	2.00	●	
15.20	330	00R2 1520/5,0/2,0-330	5.00	2.00	○	
16.20	330	00R2 1620/3,5/1,5-330	3.50	1.50	●	
16.20	330	00R2 1620/5,0/1,5-330	5.00	1.50	●	
16.20	330	00R2 1620/5,0/2,0-330	5.00	2.00	●	●
16.20	400	00R2 1620/6,2/2,0-400	6.20	2.00	●	
16.20	330	00R2 1620/6,6/2,5-330	6.60	2.50		●
16.20	330	00R2 1620/8,0/2,0-330	8.00	2.00	●	
16.20	415	00R2 1620/8,0/2,0-415	8.00	2.00	●	
18.20	330	00R2 1820/5,0/2,0-330	5.00	2.00	●	
18.20	330	00R2 1820/6,0/2,0-330	6.00	2.00	●	●
18.20	330	00R2 1820/7,5/2,5-330	7.50	2.50		●
18.20	330	00R2 1820/9,0/2,0-330	9.00	2.00	●	●
20.20	330	00R2 2020/3,5/1,5-330	3.50	1.50	●	
20.20	330	00R2 2020/6,0/2,0-330	6.00	2.00		●
20.20	330	00R2 2020/6,2/2,0-330	6.20	2.00	●	
20.20	330	00R2 2020/8,2/2,5-330	8.20	2.50	●	
20.20	330	00R2 2020/10,0/2,5-330	10.00	2.50	●	
21.20	330	00R2 2120/7,0/2,3-330	7.00	2.30		●
22.20	330	00R2 2220/7,0/2,3-330	7.00	2.30		●
22.20	330	00R2 2220/10,5/3,0-330	10.50	3.00		●

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→ For further information go to page 116.

○ limited stock

● stock item

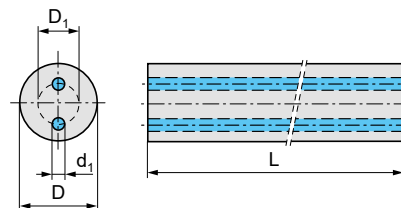
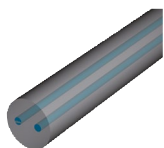
▲ new stock item

Other grades and dimensions upon request



As sintered

With two straight coolant holes, submicron grades



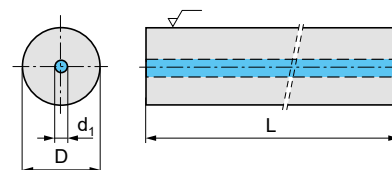
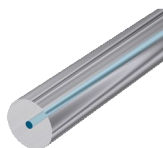
D [mm]	L [mm]	Type, description	D ₁ [mm]	d ₁ [mm]	CTS15D	CTS20D
25.30	330	00R2 2530/6,2/2,0-330	6.20	2.00	●	●
25.30	330	00R2 2530/8,0/2,0-330	8.00	2.00	●	
25.30	330	00R2 2530/10,0/2,5-330	10.00	2.50	●	
25.30	330	00R2 2530/12,0/3,0-330	12.00	3.00	●	●
26.30	330	00R2 2630/7,5/2,0-330	7.50	2.00		●
26.30	330	00R2 2630/12,0/3,0-330	12.00	3.00		●
28.30	330	00R2 2830/13,0/3,0-330	13.00	3.00		●
30.30	330	00R2 3030/13,0/3,0-330	13.00	3.00		●
32.30	330	00R2 3230/9,0/2,2-330	9.00	2.20		●
32.30	330	00R2 3230/13,8/3,0-330	13.80	3.00		●
34.30	330	00R2 3430/13,8/3,0-330	13.80	3.00		●

→ For further information go to page 116.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Ground

With central coolant hole, submicron grades



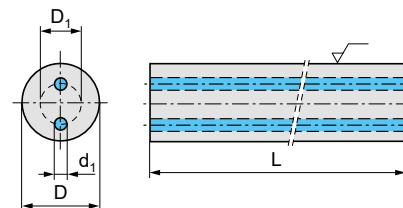
D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	d ₁ [mm]	CTS15D
6.00	330	00G1 0600/1,0-330	+0/-0.008	h6	1.00	●
8.00	330	00G1 0800/1,3-330	+0/-0.009	h6	1.30	●
10.00	330	00G1 1000/2,0-330	+0/-0.009	h6	2.00	●
12.00	330	00G1 1200/2,0-330	+0/-0.011	h6	2.00	●
14.00	330	00G1 1400/2,0-330	+0/-0.011	h6	2.00	●
16.00	330	00G1 1600/2,0-330	+0/-0.011	h6	2.00	●
16.00	330	00G1 1600/3,0-330	+0/-0.011	h6	3.00	●
20.00	330	00G1 2000/3,0-330	+0/-0.013	h6	3.00	●
25.00	330	00G1 2500/3,0-330	+0/-0.013	h6	3.00	●
32.00	330	00G1 3200/5,0-330	+0/-0.016	h6	5.00	●

→ For further information go to page 116.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Ground

With two coolant holes, submicron grades



D [mm]	L [mm]	Type, description	Dia. tol. [mm]	ISO 286	D ₁ [mm]	d ₁ [mm]	CTS15D
6.00	330	00G2 0600/1,5/0,9-330	+0/-0.008	h6	1.50	0.90	●
6.00	330	00G2 0600/3,0/1,2-330	+0/-0.008	h6	3.00	1.20	●
8.00	330	00G2 0800/2,0/0,9-330	+0/-0.009	h6	2.00	0.90	●
8.00	330	00G2 0800/4,0/0,9-330	+0/-0.009	h6	4.00	0.90	●
10.00	330	00G2 1000/2,8/1,0-330	+0/-0.009	h6	2.80	1.00	●
10.00	330	00G2 1000/5,2/1,4-330	+0/-0.009	h6	5.20	1.40	●
12.00	330	00G2 1200/3,5/1,5-330	+0/-0.011	h6	3.50	1.50	●
12.00	330	00G2 1200/6,0/1,5-330	+0/-0.011	h6	6.00	1.50	●
14.00	330	00G2 1400/5,0/1,7-330	+0/-0.011	h6	5.00	1.70	●
14.00	330	00G2 1400/7,0/2,0-330	+0/-0.011	h6	7.00	2.00	●
16.00	330	00G2 1600/5,0/1,5-330	+0/-0.011	h6	5.00	1.50	●
16.00	330	00G2 1600/8,0/2,0-330	+0/-0.011	h6	8.00	2.00	●
18.00	330	00G2 1800/6,0/2,0-330	+0/-0.011	h6	6.00	2.00	●
18.00	330	00G2 1800/9,0/2,0-330	+0/-0.011	h6	9.00	2.00	●
20.00	330	00G2 2000/6,2/2,0-330	+0/-0.013	h6	6.20	2.00	●
20.00	330	00G2 2000/10,0/2,5-330	+0/-0.013	h6	10.00	2.50	●
25.00	330	00G2 2500/6,2/2,0-330	+0/-0.013	h6	6.20	2.00	●
25.00	330	00G2 2500/8,0/2,0-330	+0/-0.013	h6	8.00	2.00	●
25.00	330	00G2 2500/12,0/3,0-330	+0/-0.013	h6	12.00	3.00	●

→ For further information go to page 116.

○ limited stock

● stock item

▲ new stock item

Other grades and dimensions upon request

Blanks for gun drills

We offer a complete stock range of rods and tips for the production of solid carbide or brazed gun drills. These include rods with a kidney-shaped coolant hole, profiled rods with one or two coolant holes and profiled tips with two coolant holes.

Our blanks for gun drills are available in the proven CTS20D grade for the universal machining of steel, stainless steel or heat-resistant alloys: some dimensions can also be ordered in grade CTF12E, a fine-grain grade specifically for gun drills with an optimised balance between hardness and toughness.

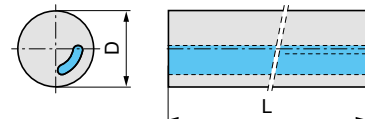
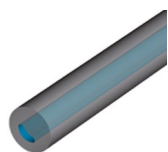
Of course we can also produce carbide rods in other dimensions and grades to order – just get in touch with your contact person at CERATIZIT.

Detailed technical data for our gun drill blanks can be found in the 'Information' section.



Rods

Rods with kidney-shaped coolant holes, submicron grades



Technical drawings upon request

D [mm]	L [mm]	Type, description	Dia. tol. [mm]	CTS20D	CTF12E
2.40	310	GDRK 0240-310	±0.15	○	○
2.60	310	GDRK 0260-310	±0.15	○	○
2.90	310	GDRK 0290-310	±0.15	○	○
3.15	310	GDRK 0315-310	±0.15	○	○
3.45	310	GDRK 0345-310	±0.15	○	○
3.50	310	GDRK 0350-310	±0.15	○	○
3.90	310	GDRK 0390-310	±0.15	○	○
4.40	310	GDRK 0440-310	±0.15	○	○
4.90	310	GDRK 0490-310	±0.15	○	○
5.50	310	GDRK 0550-310	±0.15	○	○
6.00	310	GDRK 0600-310	±0.15	○	○
6.50	310	GDRK 0650-310	±0.15	○	○
7.10	310	GDRK 0710-310	±0.15	○	○
7.60	310	GDRK 0760-310	±0.15	○	○
8.10	310	GDRK 0810-310	±0.15	○	○
8.30	310	GDRK 0830-310	±0.15	○	○
8.70	310	GDRK 0870-310	±0.15	○	○
9.20	310	GDRK 0920-310	±0.15	○	○
10.60	310	GDRK 1060-310	±0.15	○	○
11.30	310	GDRK 1130-310	±0.15	○	○

○ limited stock

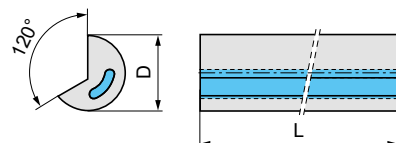
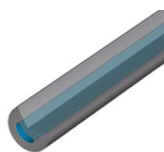
● stock item

▲ new stock item

Other grades and dimensions upon request

Rods

Profiled rods with kidney-shaped coolant hole, 120°, submicron grades



Technical drawings upon request

D [mm]	L [mm]	Type, description	Dia. tol. [mm]	CTS20D
2.90	310	GDVK 0290-310	±0.15	○
3.15	310	GDVK 0315-310	±0.15	○
3.45	310	GDVK 0345-310	±0.15	○
3.90	310	GDVK 0390-310	±0.15	○
4.40	310	GDVK 0440-310	±0.15	●
4.90	310	GDVK 0490-310	±0.15	●
5.50	310	GDVK 0550-310	±0.15	●
6.00	310	GDVK 0600-310	±0.15	●
6.50	310	GDVK 0650-310	±0.15	●
7.10	310	GDVK 0710-310	±0.15	●
7.60	310	GDVK 0760-310	±0.15	○
8.10	310	GDVK 0810-310	±0.15	○
8.70	310	GDVK 0870-310	±0.15	●
9.20	310	GDVK 0920-310	±0.15	○

6

○ limited stock

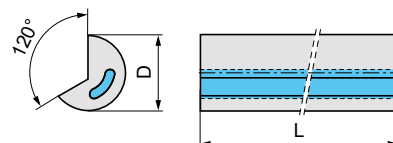
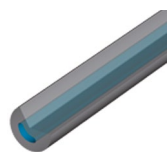
● stock item

▲ new stock item

Other grades and dimensions upon request

Rods

Profiled rods with kidney-shaped coolant hole, 120°, fine grain grades



Technical drawings upon request

D [mm]	L [mm]	Type, description	Dia. tol. [mm]	CTF12E
2.40	310	GDVK 0240-310	±0.15	●
2.90	310	GDVK 0290-310	±0.15	●
3.15	310	GDVK 0315-310	±0.15	●
3.45	310	GDVK 0345-310	±0.15	●
3.90	310	GDVK 0390-310	±0.15	●
4.40	310	GDVK 0440-310	±0.15	●
4.90	310	GDVK 0490-310	±0.15	●
6.00	310	GDVK 0600-310	±0.15	●
6.50	310	GDVK 0650-310	±0.15	●
7.10	310	GDVK 0710-310	±0.15	●
7.60	310	GDVK 0760-310	±0.15	●
8.10	310	GDVK 0810-310	±0.15	●
8.70	310	GDVK 0870-310	±0.15	●
9.20	310	GDVK 0920-310	±0.15	●

○ limited stock

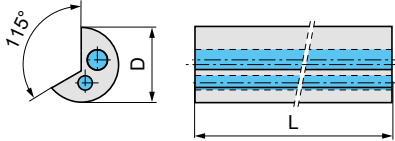
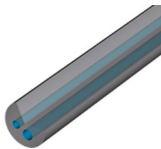
● stock item

▲ new stock item

Other grades and dimensions upon request

Rods

Profiled rods with two coolant hole, 115°, fine grain grades

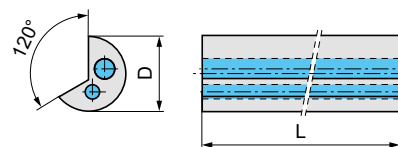
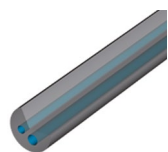


Technical drawings upon request

D [mm]	L [mm]	Type, description	Dia. tol. [mm]	CTF12E
13.50	310	GDV2 1350/115-310	±0.20	○
13.90	310	GDV2 1390/115-310	±0.20	○
14.50	310	GDV2 1450/115-310	±0.20	●
15.50	310	GDV2 1550/115-310	±0.20	●
16.50	310	GDV2 1650/115-310	±0.20	●
17.50	310	GDV2 1750/115-310	±0.20	○
18.60	310	GDV2 1860/115-310	±0.20	○
19.60	310	GDV2 1960/115-310	±0.25	●
20.60	310	GDV2 2060/115-310	±0.25	○
21.60	310	GDV2 2160/115-310	±0.25	●

Rods

Profiled rods with two coolant hole, 120°, fine grain grades



Technical drawings upon request

D [mm]	L [mm]	Type, description	Dia. tol. [mm]	CTF12E
5.50	310	GDV2 0550-310	±0.15	○
6.00	310	GDV2 0600-310	±0.15	○
6.50	310	GDV2 0650-310	±0.15	●
7.10	310	GDV2 0710-310	±0.15	●
7.60	310	GDV2 0760-310	±0.15	●
8.10	310	GDV2 0810-310	±0.15	●
8.70	310	GDV2 0870-310	±0.15	●
9.20	310	GDV2 0920-310	±0.15	●
9.70	310	GDV2 0970-310	±0.15	●
10.80	310	GDV2 1080-310	±0.15	●
11.30	310	GDV2 1130-310	±0.15	○
11.80	310	GDV2 1180-310	±0.15	●
12.30	310	GDV2 1230-310	±0.15	●
12.80	310	GDV2 1280-310	±0.15	●

○ limited stock

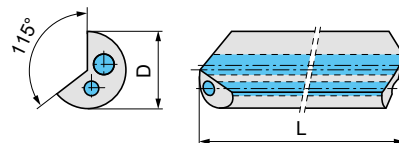
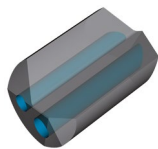
● stock item

▲ new stock item

Other grades and dimensions upon request

Tips

Profiled tips with two coolant holes, 115°, fine grain grades



Technical drawings upon request

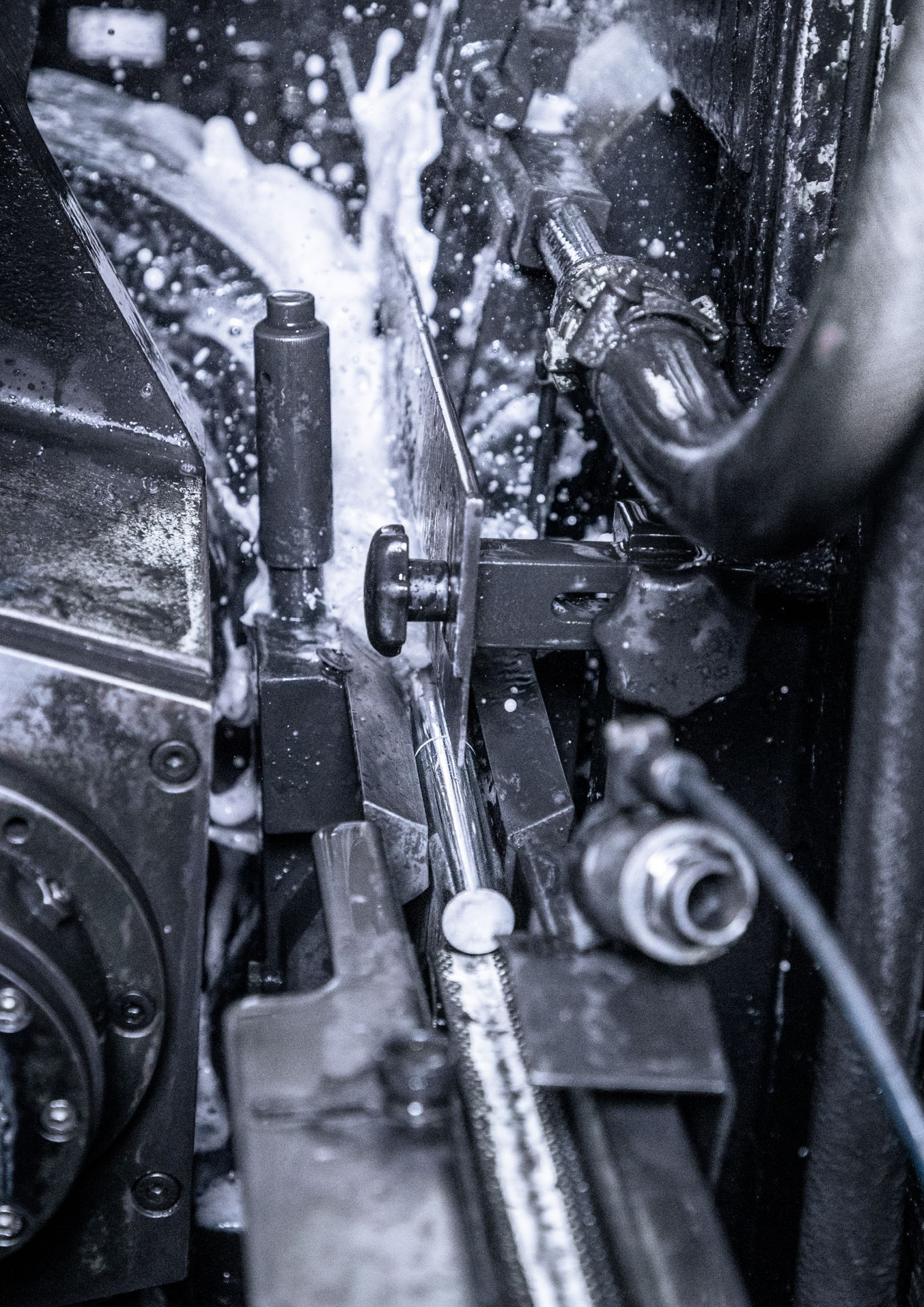
D [mm]	L [mm]	Type, description	Dia. tol. [mm]	CTF12E
13.50	40	GDV2P 1350-040	±0.20	●
14.50	40	GDV2P 1450-040	±0.20	●
15.50	40	GDV2P 1550-040	±0.20	●
16.50	40	GDV2P 1650-040	±0.20	●
17.50	40	GDV2P 1750-040	±0.20	●
18.60	40	GDV2P 1860-040	±0.25	●
19.60	45	GDV2P 1960-045	±0.25	●
20.60	45	GDV2P 2060-045	±0.25	●
21.60	45	GDV2P 2160-045	±0.25	●
22.60	50	GDV2P 2260-050	±0.25	●
23.60	50	GDV2P 2360-050	±0.25	●
24.60	55	GDV2P 2460-055	±0.25	●
25.60	55	GDV2P 2560-055	±0.25	●
26.60	55	GDV2P 2660-055	±0.25	●
27.20	55	GDV2P 2720-055	±0.25	○
28.70	65	GDV2P 2870-065	±0.25	●
30.80	65	GDV2P 3080-065	±0.25	●
33.10	65	GDV2P 3310-065	±0.25	●
36.10	75	GDV2P 3610-075	±0.25	●
39.10	75	GDV2P 3910-075	±0.25	○
40.00	80	GDV2P 4000-080	±0.30	○
42.00	80	GDV2P 4200-080	±0.30	○

○ limited stock

● stock item

▲ new stock item

Other grades and dimensions upon request



Flat and square strips, brazing tips

Our flat and square strips, in the proven CTS20D grade and in a wide variety of dimensions, are available directly from stock. Our brazing tips are characterised by very good brazability and can be supplied upon request in the most common DIN dimensions. Our stock range includes DIN 8011 brazing tips in grade CTS12D, as well as in the cermet grade CTF28T (especially suited to the finish machining of steel materials).

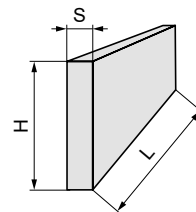
Of course we can also produce carbide rods in other dimensions and grades to order – just get in touch with your contact person at CERATIZIT.

Detailed technical data for our flat and square strips can be found in the 'Information' section.



Flat strips

Submicron grade



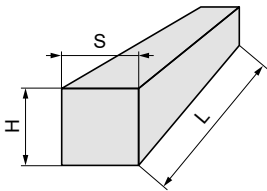
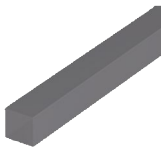
Type, description	h [mm]	S [mm]	L [mm]	CTS20D
FR 0230/0530-330	5.30	2.30	330	●
FR 0230/0630-330	6.30	2.30	330	●
FR 0230/0830-330	8.30	2.30	330	●
FR 0230/1030-330	10.30	2.30	330	●
FR 0230/1630-330	16.30	2.30	330	●
FR 0330/0430-330	4.30	3.30	330	●
FR 0330/0530-330	5.30	3.30	330	●
FR 0330/0630-330	6.30	3.30	330	●
FR 0330/0830-330	8.30	3.30	330	●
FR 0330/1030-330	10.30	3.30	330	●
FR 0330/1230-330	12.30	3.30	330	●
FR 0330/1630-330	16.30	3.30	330	●
FR 0330/2030-330	20.30	3.30	330	●
FR 0430/0630-330	6.30	4.30	330	●
FR 0430/0830-330	8.30	4.30	330	●
FR 0430/1030-330	10.30	4.30	330	●
FR 0430/1330-330	13.30	4.30	330	●
FR 0430/1630-330	16.30	4.30	330	●
FR 0430/2030-330	20.30	4.30	330	●
FR 0530/1030-330	10.30	5.30	330	●
FR 0530/1330-330	13.30	5.30	330	●
FR 0630/1030-330	10.30	6.30	330	●
FR 0630/1330-330	13.30	6.30	330	●
FR 0830/1230-330	12.30	8.30	330	●
FR 0830/1630-330	16.30	8.30	330	●
FR 1030/1630-330	16.30	10.30	330	●

→ For further information go to page 118.

○ limited stock ● stock item ▲ new stock item Other grades and dimensions upon request

Square strips

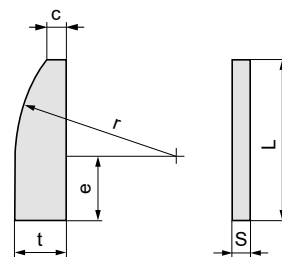
Submicron grade



Type, description	h [mm]	S [mm]	L [mm]	CTS20D
SR 0330-330	3.30	3.30	330	●
SR 0430-330	4.30	4.30	330	●
SR 0530-330	5.30	5.30	330	●
SR 0830-330	8.30	8.30	330	●
SR 1030-330	10.30	10.30	330	●

Brazing tips to DIN 8011

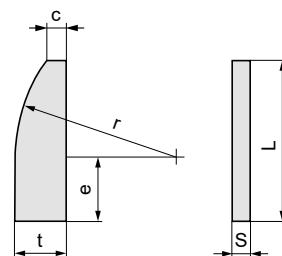
Form R



Type, description	L [mm]	e [mm]	S [mm]	r [mm]	c [mm]	t [mm]	CTS12D
DIN 8011 R 12	12	5.00	0.80	25.00	0.80	2.00	○
DIN 8011 R 16	16	7.10	1.20	25.00	1.00	2.50	●
DIN 8011 R 19	19	9.00	1.40	25.00	1.00	3.00	●
DIN 8011 R 22	22	11.20	1.80	25.00	1.40	3.50	●
DIN 8011 R 25	25	15.00	2.20	25.00	1.40	4.00	●
DIN 8011 R 30	30	18.00	2.80	25.00	1.40	5.00	●

Brazing tips to DIN 8011

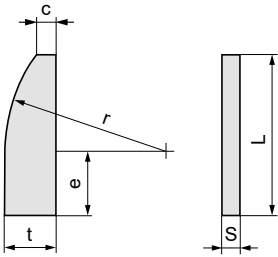
Form T



Type, description	L [mm]	e [mm]	S [mm]	r [mm]	c [mm]	t [mm]	CTS12D
DIN 8011 T 12	12	4.50	1.20	15.00	1.00	3.00	○
DIN 8011 T 16	16	7.50	1.60	15.00	1.00	3.50	○
DIN 8011 T 19	19	7.50	2.00	25.00	1.80	4.50	●
DIN 8011 T 22	22	9.50	2.50	25.00	2.50	5.60	●
DIN 8011 T 25	25	10.00	2.80	25.00	3.00	8.00	●

Brazing tips to DIN 8011

Form U



Type, description	L [mm]	e [mm]	S [mm]	r [mm]	c [mm]	t [mm]	CTS12D
DIN 8011 U 12	12	1.40	1.20	15.00	1.00	5.60	○
DIN 8011 U 16	16	4.00	1.60	15.00	1.00	6.70	○
DIN 8011 U 19	19	2.50	2.00	25.00	1.80	8.00	●
DIN 8011 U 22	22	2.80	2.50	25.00	2.50	11.20	●
DIN 8011 U 25	25	4.00	2.80	25.00	3.00	14.00	●



Exchangeable head system (EHS) – the innovative solution for your application

The unique exchangeable head system is characterised by maximum efficiency and economy in terms of the tool connection. Four different blank diameters in three finishes each are part of the standard range, offering you countless possibilities for the design of your individual exchangeable head system. The advantages of the innovative connection technology include:

Precision

High radial and axial run-out precision for long tool life

Stability and process reliability

Short and stable interface with face contact

Very attractive price-performance ratio

Highly economical due to the new technology of the connection. Resource-efficient thanks to smaller quantity of cemented carbide in the connection area

Resource-efficient

Smaller quantity of cemented carbide in the connection area

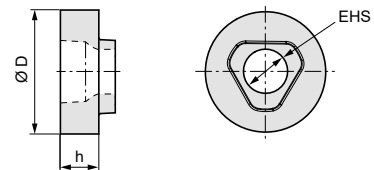
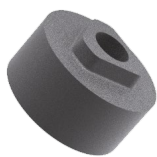
Can be used for any application

Thanks to the threaded-end adapters, it is possible to use the system with all threaded-end shanks commonly available on the market.



As sintered

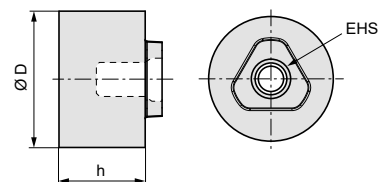
Blanks for application without cutting edge in the centre



D [mm]	D [inch]	h [mm]	h [inch]	Type, description	EHS Size	CTS20D
13.30	0.523	4.20	0.165	EHS12.E13,3-4,2	12	▲
13.30	0.523	6.20	0.244	EHS12.E13,3-6,2	12	▲
18.60	0.732	5.70	0.244	EHS16.E18,6-5,7	16	▲
18.60	0.732	8.20	0.322	EHS16.E18,6-8,2	16	▲
22.60	0.889	6.70	0.263	EHS20.E22,6-6,7	20	▲
22.60	0.889	9.20	0.362	EHS20.E22,6-9,2	20	▲
26.00	1.023	7.20	0.283	EHS25.E26-7,2	25	▲
26.00	1.023	10.20	0.401	EHS25.E26-10,2	25	▲

As sintered

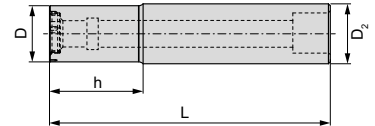
Blanks for application with cutting edge in the centre



D [mm]	D [inch]	h [mm]	h [inch]	Type, description	EHS Size	CTS20D
13.30	0.523	9.20	0.362	EHS12.B13,3-9,2	12	▲
18.60	0.732	13.70	0.539	EHS16.B18,6-13,7	16	▲
22.60	0.889	16.70	0.657	EHS20.B22,6-16,7	20	▲
26.00	1.023	19.20	0.755	EHS25.B26-19,2	25	▲

Adapters and spare parts

Shank for grinding, metric



D [mm]	D ₂ [mm]	h [mm]	L [mm]	Type, description	EHS Size
11.00	12	20.00	66.00	EHS12-A-A12-20-MFR	12
15.00	16	25.00	75.00	EHS16-A-A16-25-MFR	16
19.00	20	25.00	77.00	EHS20-A-A20-25-MFR	20
24.00	25	30.00	87.00	EHS25-A-A25-30-MFR	25

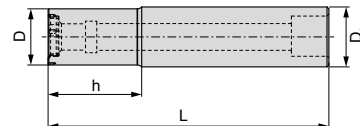
Spare parts



			EHS Size
14584515	14584516	14584517	12
14584518	14584520	14584523	16
14584518	14584520	14584523	20
14584524	14584525	14584527	25

Adapters and spare parts

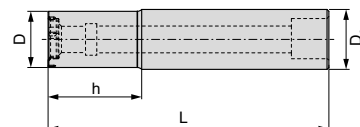
Standard shank, metric



D [mm]	D ₂ [mm]	h [mm]	L [mm]	Type, description	EHS Size
11.00	12	20.00	66.00	EHS12-A-A12-20	12
15.00	16	25.00	75.00	EHS16-A-A16-25	16
19.00	20	25.00	77.00	EHS20-A-A20-25	20
24.00	25	30.00	87.00	EHS25-A-A25-30	25

Adapters and spare parts

Standard shank, inch



D [inch]	D ₂ [inch]	h [inch]	L [inch]	Type, description	EHS Size
0.433	0.500	0.787	2.598	EHS12-A-A 1/2-0.787	12
0.590	0.625	1.000	2.952	EHS16-A-A 5/8-1.00	16
0.748	0.750	1.000	3.031	EHS20-A-A 3/4-1.00	20
0.944	1.000	1.181	3.425	EHS25-A-A 1-1.181	25
0.944	1.000	1.181	3.425	EHS25-A-A 1-1.181	25

Spare parts

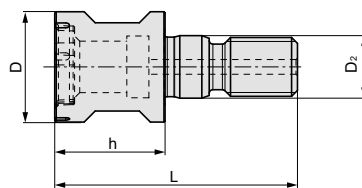


			EHS Size
14584515	14584516	14584517	12
14584518	14584520	14584523	16
14584518	14584520	14584523	20
14584524	14584525	14584527	25

→ For further information go to page 119.

Adapters and spare parts

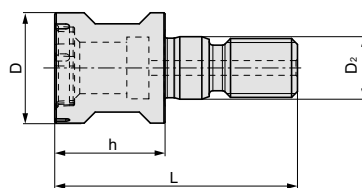
With threaded end – type A, metric



D [mm]	D ₂ [mm]	h [mm]	L [mm]	Type, description	EHS Size
11.00	6.50	13.00	28.00	EHS12-A-G12-A	12
15.00	8.50	14.00	33.00	EHS16-A-G16-A	16
19.00	10.50	18.00	37.00	EHS20-A-G20-A	20
24.00	12.50	20.00	42.00	EHS25-A-G25-A	25

Adapters and spare parts

With threaded end – type A, inch



D [inch]	D ₂ [inch]	h [inch]	L [inch]	Type, description	EHS Size
0.433	0.256	0.512	1.102	EHS12-A-G 1/2-A	12
0.590	0.335	0.590	1.299	EHS16-A-G 5/8-A	16
0.728	0.413	0.709	1.457	EHS20-A-G 3/4-A	20
0.944	0.492	0.787	1.654	EHS25-A-G 1-A	25

Spare parts

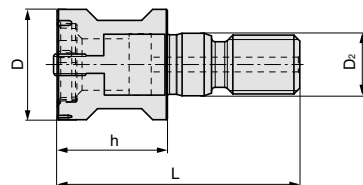
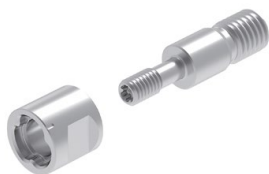


		EHS Size
14584515	14584517	12
14584518	14584523	16
14584518	14584523	20
14584524	14584527	25

→ For further information go to page 119.

Adapters and spare parts

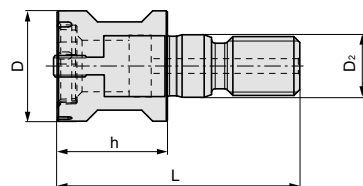
With threaded end – type B, metric



D [mm]	D ₂ [mm]	h [mm]	L [mm]	Type, description	EHS Size
11.00	6.50	13.00	28.00	EHS12-A-G12-B	12
15.00	8.50	14.00	33.00	EHS16-A-G16-B	16
19.00	10.50	18.00	37.00	EHS20-A-G20-B	20
25.00	12.50	20.00	42.00	EHS25-A-G25-B	25

Adapters and spare parts

With threaded end – type B, inch



D [inch]	D ₂ [inch]	h [inch]	L [inch]	Type, description	EHS Size
0.433	0.256	0.512	1.102	EHS12-A-G 1/2-B	12
0.590	0.335	0.590	1.299	EHS16-A-G 5/8-B	16
0.728	0.413	0.709	1.457	EHS20-A-G 3/4-B	20
0.944	0.492	0.787	1.654	EHS25-A-G 1-B	25

Spare parts



	[mm]	[inch]	EHS Size
14570428	14570445	14687311	12
14570434	14570450	14687313	16
14570437	14570453	14687314	20
14570440	14570455	14687316	25

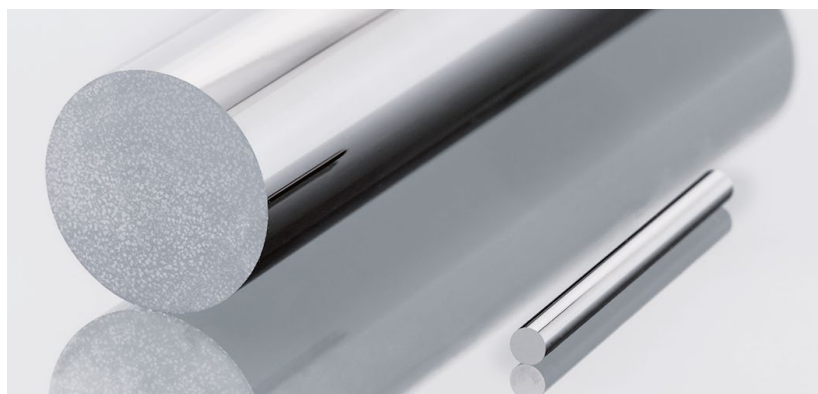
→ For further information go to page 119.

Special products

In addition to our standard range we also offer individual solutions for our rods. Thanks to our comprehensive manufacturing possibilities we can also implement your most demanding requirements. Whether special coolant hole profiles, large helix angles or other customised versions, see for yourself and benefit from our expertise. In our up-to-date grinding department we also produce semi-finished ground articles, in high volumes as well as in small batches.



Available types



- ▲ Broad selection of diameters and grades starting at 0.016 inch, e.g. for erosion electrodes up to 3.15 inch for special tools. For semi-finished tools bigger than that we offer customized preforms.



- ▲ Solid carbide or coolant hole rods up to a meter in length are no problem for us. Close tolerance production techniques of spiral through hole rod minimize the risk of grinding through into the coolant channels. Using leading-edge technologies we are also able to deliver coolant hole rod with pre-formed flutes if required.



- ▲ Increasingly, tool producers rely on prefabricated semi-finished products. In this context we offer ground cut-to-lengths in a variety of versions. For example steps, tapers, cones, male or female centers, ball noses, chamfers, recesses, ground holes and many others.



- ▲ Thanks to our modern extrusion processes we can offer you a variety of coolant hole profiles.

Preforms

In addition to our comprehensive range of rods we also offer various types of preforms for rotary cutting tools. The products include both blanks and semi-finished tools for solid carbide and PCD tools, exchangeable head systems and tool shanks. Years of experience in the field of blank machining combined with a state-of-the-art production plant make it possible for us to produce the most complex, near net shape geometries with short delivery times. In particular for tool shanks and PCD tool bodies we have developed the new grade CTF25E which is ideal even for the most sophisticated tool versions with narrow shapes and critical transitions.



Available types

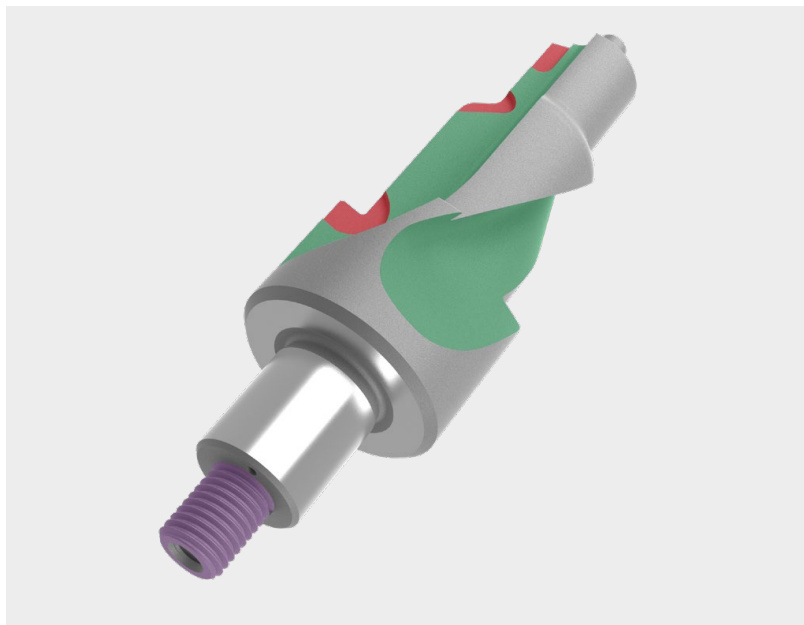
Based on your drawings of blanks or finished parts, we are able to produce outside diameters of up to approx. 11.81 inch and lengths of approx. 19.68 inch. Ideally, you should provide us with digital drawings or 3-D models (.stp, .prt,...).

■ Preformed seats for PCD inserts

■ Straight and helical chip flutes

■ External thread

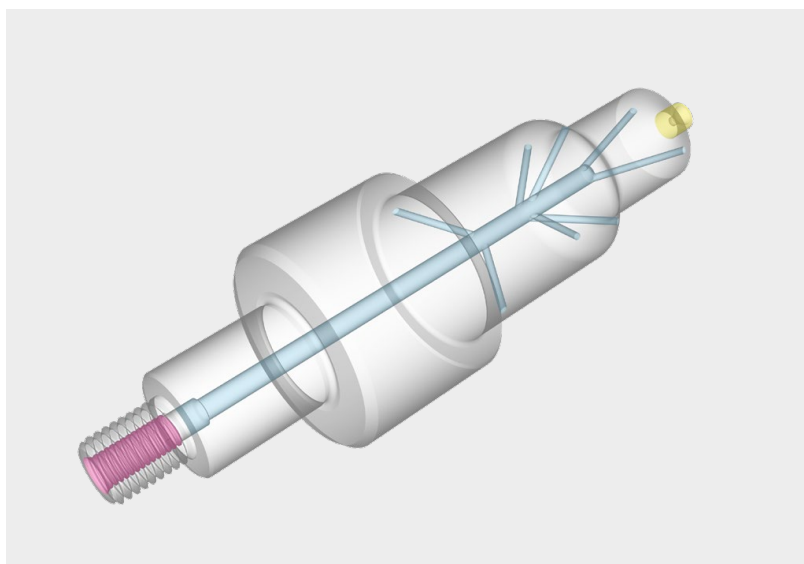
□ Shank, ground

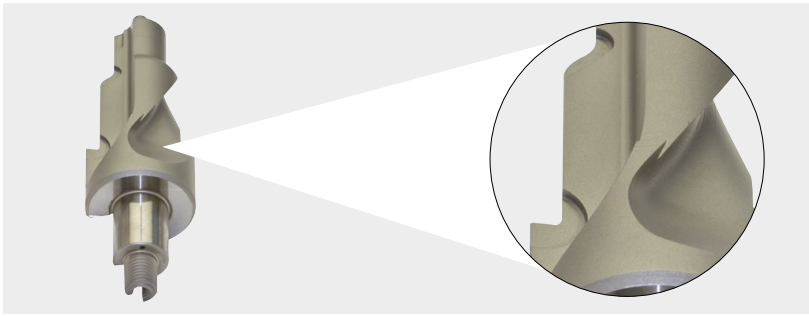


■ Coolant holes

■ As sintered male or female centers

■ External and internal thread





Our preformed chip flutes and insert seats with optimized machining allowance make it possible to save production costs thanks to reduced grinding times in tool production.

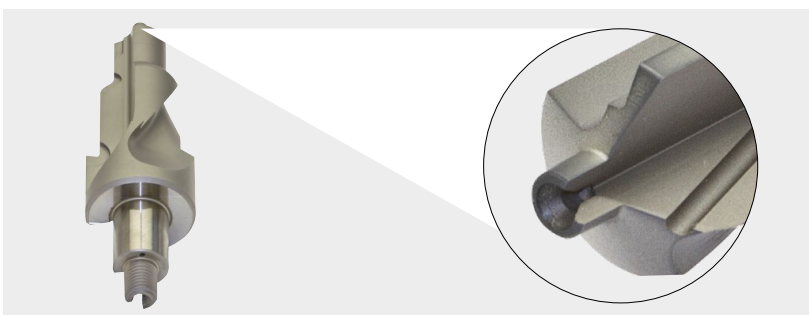


Individually designed coolant exit holes can be formed into the blank.

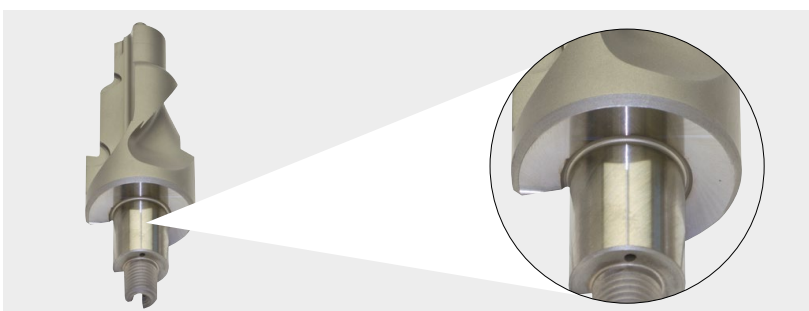
- ▲ Axial holes from Ø .025 inch
- ▲ Radial exit holes from Ø .019 inch and greater
- ▲ Smaller holes available depending on the depth and upon request



- ▲ Outside and inside threads
- ▲ Metric ISO threads, as sintered, tolerance class 8H
- ▲ UN threads, as sintered
- ▲ Special threads upon request
- ▲ Ground threads are possible upon request



- ▲ Female and male centers
- ▲ Female centers to DIN 332
- ▲ As sintered centers (form 'R' preferred)
- ▲ Upon request ground version also available



- ▲ Upon request ground version also available, for example ground shank to h6

Do not hesitate to contact us with questions about possible variations. We will be pleased to help you design blanks for cost-efficient production of precision tools.

Grades: composition and properties

An extensive stock of the most important grades makes shortest delivery times for customized blanks possible.

Submicron grade

Grade	ISO code*	Binder [m %]	Density [g/cm ³]	Hardness		Transverse rupture strength [MPa]	KIC** (Shetty) [MPa·m ^{1/2}]	Modulus of elasticity GPa	Poisson's ratio [-]
				[HV30]	[HRA]				
CTS12D	K05 – K10	6.0	14.80	1820	93.1	3600	9.3	624	0.205
CTS15D	K10 – K30	7.5	14.70	1750	92.8	3700	9.5	605	0.208
CTS20D	K20 – K40	10.0	14.38	1600	91.9	4000	10.4	570	0.214

Fine grain grade

Grade	ISO code*	Binder [m %]	Density [g/cm ³]	Hardness		Transverse rupture strength [MPa]	KIC** (Shetty) [MPa·m ^{1/2}]	Modulus of elasticity GPa	Poisson's ratio [-]
				[HV30]	[HRA]				
CTF25E	K30 – K40	12.5	14.15	1300	89.5	3500	15.0	543	0.218

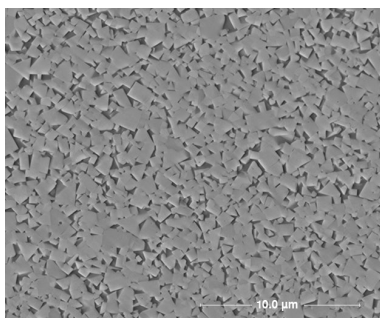
Our CTF25E fine-grain grade has been specially designed for PCD tools and tool shanks.

The coarser grain structure combined with higher cobalt content provides this grade with increased resistance to breakage and excellent brazability.

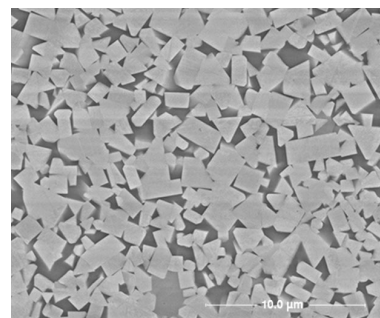
CTF25E vs. CTS20D

	CTS20D	CTF25E
▲ Grain size:	submicron	fine grain
▲ Cobalt content:	10.0%	12.5%
▲ Additives:	1.15%	1.2%
▲ Hardness:	1600 HV30 4000 MPa	1300 HV30 3500 MPa
▲ Transverse rupture strength:	10.4 MPa·m ^{0.5}	15 MPa·m ^{0.5}
▲ Fracture toughness KIC:		

CTS20D

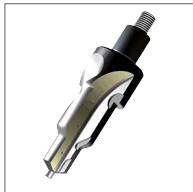


CTF25E

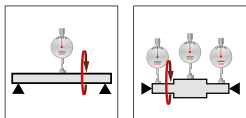


Of course we also offer preforms in all other 'Round Tool Materials' grades upon request.

Specifications



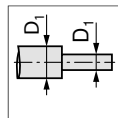
Straightness



max. deflection
[inch]

.012

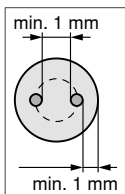
Diameter steps



Different diameters, dia. steps

$D_1 - D_2 \geq .039$ inch

Wall thicknesses



Min. wall thicknesses and hole distances

$\geq .039$ inch

Tolerance table for preforms

Diameters

Nominal Ø [inch]	Blank tolerance incl. grinding allow- ance [inch]	Sintering tolerance [±]
< .787	.022	±0.15
> .787 – 1.378	.024	±0.20
> 1.378 – 1.772	.026	±0.25
> 1.772 – 2.165	.028	±0.30
> 2.165 – 2.756	.033	±0.35
> 2.756 – 3.937	.035	±0.40
> 3.937 – 5.906	.039	±0.50

Example of a finished diameter .866 inch with grinding allowance:

Finished dimension Ø .866 inch
Grinding allowance +.024 inch
Blank dimensions Ø .890 ±.008 inch

Length

[inch]	Blank tolerance incl. grinding allow- ance [inch]	Sintering tolerance [±]
L	0.5% L + .016	±0.5% L

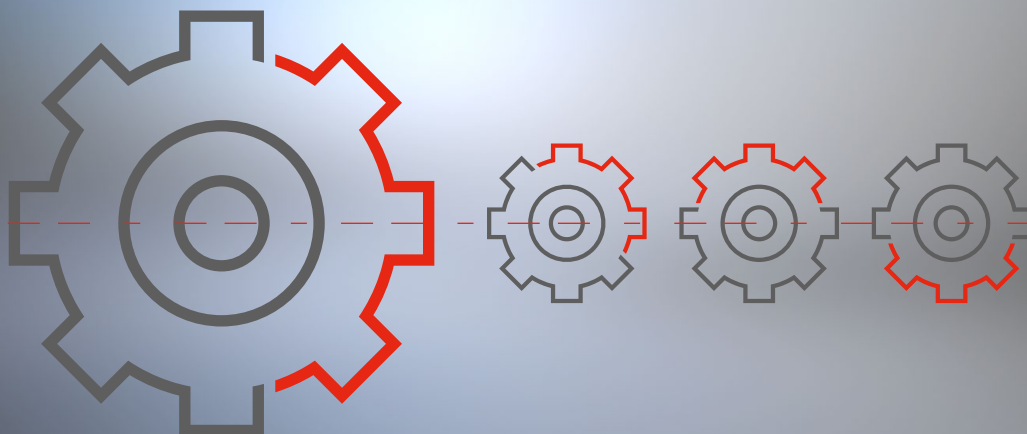
Example of a finished length 5.906 inch with grinding allowance:

Finished dimension 5.906 inch
Grinding allowance +.045 inch
Blank dimensions 5.951 ±.030 inch



Technical information

In this section you can find additional information on product labelling, technical product specifications and carbide properties. Specifications for preforms can be found at the end of the 'Preforms' section.

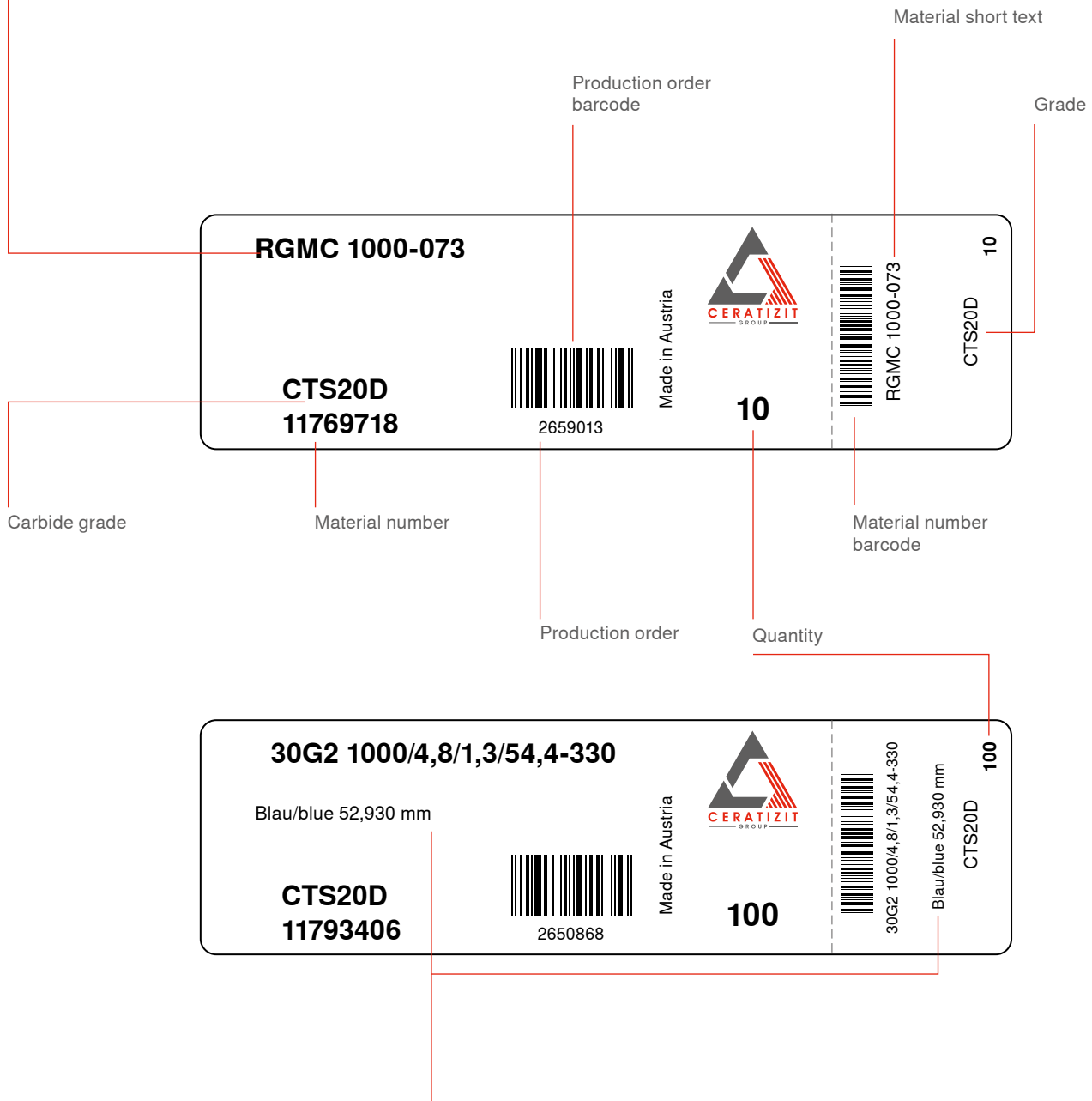


Product labelling

Material short text:

The material short text describes the article in terms of the most important geometrical specifications.

A guide to the designation system can be found in the catalogue on page 24.

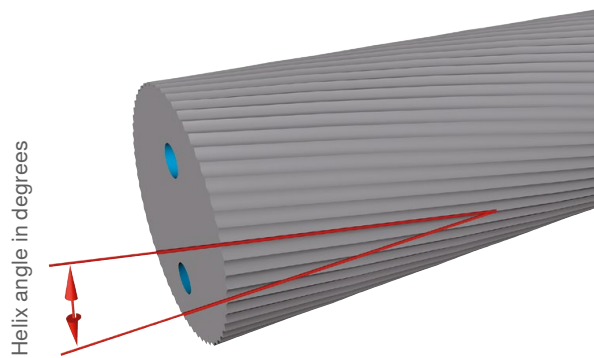


Pitch information:

(for rods with helical coolant holes)

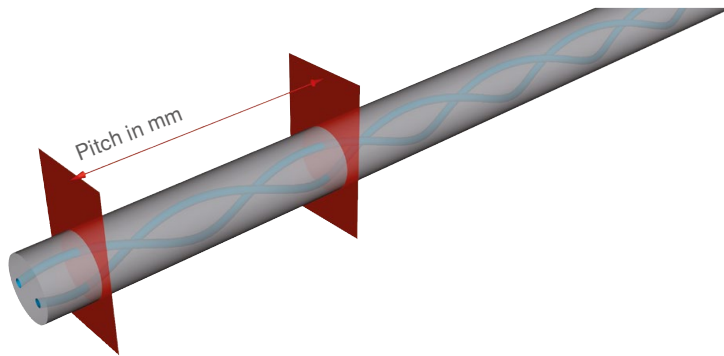
The pitch class and its average value are stated here. This value is used as the adjustment value for flute grinding.

More information on the pitch classification for rods with helical coolant holes can be found in the catalogue on page 108.



Definition of the helix angle

The helix angle indicates the torsion of the coolant holes in relation to the nominal diameter. In this context it has to be taken into account that the angle decreases depending on the diameter steps. For this reason, rods with 40° coolant holes are used for step drills in order to achieve an optimal spiral flute helix angle of 25 to 30°.



Definition of pitch

The pitch is the length of a complete 360° rotation of the coolant holes. This value is independent of the diameter or the diameter steps. The CERATIZIT designation system for coolant hole rods includes both the helix angle in degrees and the pitch of the helix in millimeters.

Conversion helix angle/pitch:

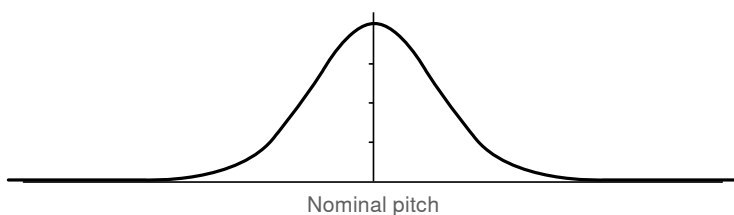
Conversion pitch to angle:

$$\alpha = \tan^{-1} \frac{d \times \pi}{\text{Stg}}$$

Stg. pitch
d nominal diameter
 α helix angle

Conversion angle to pitch:

$$\text{Stg} = \frac{d \times \pi}{\tan \alpha}$$



3 class system

0 class system					
-1°		0°		+1°	
yellow		white		blue	
-0.33°		+0.33°		-0.33°	
				+0.33°	

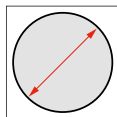
6 class system

-0,75°		0°		+0,75°	
white	blue	green	black	red	yellow
-0,125°	+0,125°	-0,125°	+0,125°	-0,125°	+0,125°

Pitch classification

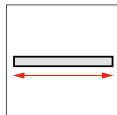
In order to guarantee the closest pitch tolerances, our carbide rods with helical coolant holes are divided into tolerance classes. For this purpose all rods are measured and assigned to the respective class, which is indicated on the product label. 114.

Outside diameter



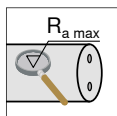
Measured outside diameter of the round rod.

Length



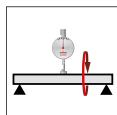
Measured length of the round rod.

Surface



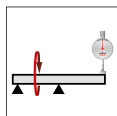
The surface quality describes the state of the surface. For ground rods the surface value is indicated as maximum average roughness value R_a (DIN EN ISO 4287:1998).

Straightness



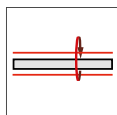
Maximum deflection of a rotating rod which lies on two contact points, measured in the middle of the rod. The distance between the two contact points is 300 mm. When the rod is longer or shorter than 330 mm the contact width corresponds to the rod length minus 10 mm.

Concentricity



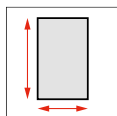
Maximum deflection of a rod. Contact point A is 5 mm before the chamfer. Contact point B is in the middle of the rod. The measurement is carried out 2 mm from the end.

Cylindricity



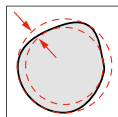
The cylindricity describes the tolerance field of an ideal cylinder inside which the skin surface of the rod should be.

Width, height



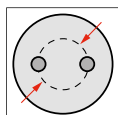
Lateral length of square and rectangular strips

Roundness



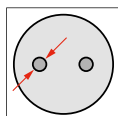
Roundness is the radial distance of two concentric circles which include the circumference line of the round rod's section. (DIN ISO 1101).

Pitch circle diameter



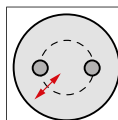
The pitch circle is defined as the circle which goes through two or three center points of coolant holes.

Hole diameter



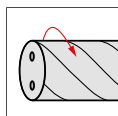
The hole diameter is the diameter of the coolant holes inside the rod.

Excentricity



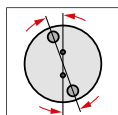
Excentricity means the deviation of the pitch circle center point or, in case of a coolant hole, the deviation of the coolant hole center point from the center point of the rod.

Helix angle



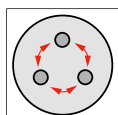
The helix angle is the angle between the longitudinal axis and the helix line.

Torsion



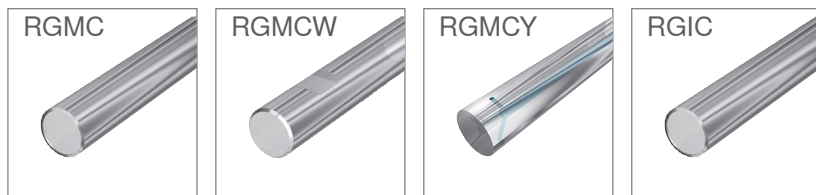
Maximum difference of the angle of the two imaginary lines which go through the center point of the coolant holes which are on the pitch circle.

Pitch error

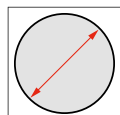


For rods with three helical coolant holes the section surface is divided into three circle sectors which go through the center point of the coolant holes. The pitch error is the difference of the angles between the circle sectors.

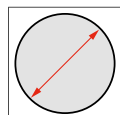
End mill blanks



Outside diameter metric



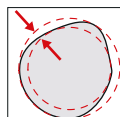
Outside diameter [mm]	Tolerance	
	h6 [mm]	h5 [mm]
1.0 – 3.0	+0/-0.006	+0/-0.004
3.1 – 6.0	+0/-0.008	+0/-0.005
6.1 – 10.0	+0/-0.009	+0/-0.006
10.1 – 18.0	+0/-0.011	+0/-0.008
18.1 – 30.0	+0/-0.013	+0/-0.009
30.1 – 40.0	+0/-0.016	+0/-0.011



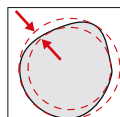
inch

Outside diameter [inch]	Tolerance	
	h6 [inch]	h5 [inch]
0 – 0.118	+0/-0.0002	+0/-0.0001
0.1181 – 0.236	+0/-0.0003	+0/-0.0002
0.2361 – 0.394	+0/-0.0004	+0/-0.0002
0.3941 – 0.709	+0/-0.0004	+0/-0.0003
0.7091 – 1.181	+0/-0.0005	+0/-0.0004

Roundness metric



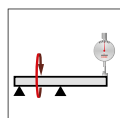
Outside diameter [mm]	Tolerance	
	h6 [mm]	h5 [mm]
1.0 – 3.0	+0/+0.003	+0/+0.002
3.1 – 6.0	+0/+0.003	+0/+0.002
6.1 – 10.0	+0/+0.003	+0/+0.002
10.1 – 25.0	+0/+0.004	+0/+0.002



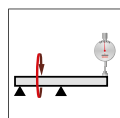
inch

Outside diameter [inch]	Tolerance	
	h6 [inch]	h5 [inch]
0 – 0.118	0.00011	0.00011
0.1181 – 0.236	0.00015	0.00011
0.2361 – 0.394	0.00019	0.00011
0.3941 – 0.709	0.00023	0.00015
0.7091 – 1.181	0.00031	0.00019

Run-out metric



Outside diameter [mm]	max. concentricity [μm] starting length [mm]									
	30	40	50	60	70	80	90	110	140	
3.0	5	5	6	7	-	-	-	-	-	
4.0 – 5.0	5	5	6	6	7	-	-	-	-	
6.0	4	5	5	6	6	7	8	-	-	
8.0 – 10.0	4	4	4	5	5	5	6	7	-	
12.0 – 14.0	3	4	4	4	4	5	5	6	-	
16.0 – 20.0	3	4	4	4	4	4	5	5	6	
25.0	3	4	4	4	4	4	5	5	6	

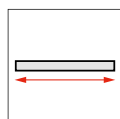


inch

Outside diameter [inch]	maximum concentricity [μm] starting length [inch]			
	1.500 – 2.500	2.501 – 3.500	3.501 – 8.000	6.000 – 8.000
0.1250 – 0.2499	0.0002	0.0003	n/a	n/a
0.2500 – 0.3750	0.0002	0.0003	0.0004	n/a
0.3751 – 1.0000	0.0002	0.0003	0.0004	0.0004
1.0001 – 1.2500	0.0002	0.0003	0.0004	0.0004

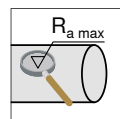
*0.0004 for Elite line products

Length



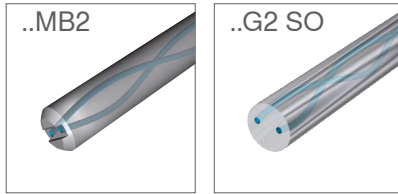
Type	Total length tolerance
	[mm]
RGMC	+1%
RGIC	+1%

Surface finish

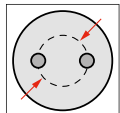


Ra _{max} [μm]
0.05

Drill blanks

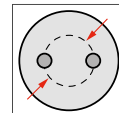


Pitch circle diameter of DIN drill blanks



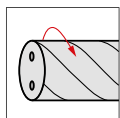
Pitch circle diameter [mm]	Tolerance [mm]
1.6 – 6.3	+/-0.20
6.7 – 8.0	+/-0.25
9.0 – 10.0	+/-0.30

Pitch circle diameter for micro-drill blanks



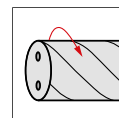
Pitch circle diameter [mm]	Tolerance [mm]
0.29	+/-0.03
0.30 – 1.05	+/-0.05
1.06 – 2.0	+/-0.08

Helix angle for DIN drill blanks



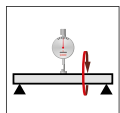
Total tolerance class [°]	Number of classes	Tolerance class [°]
+/-1	3	+/-0.33

Helix angle for micro-drill blanks




Total tolerance class [°]	Number of classes	Tolerance class [°]
+/-0.75	6	+/-0.125

Straightness of DIN drill blanks



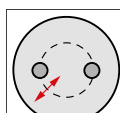
Outside diameter [mm]	Deflection [μm] with length [mm]					
	63–66	67–81	82–114	115–133	134–162	163–310
6.0	10	15	30	40	–	–
8.0	–	15	20	40	40	–
10.0	–	–	20	30	40	50
12.0	–	–	20	30	30	50
14.0	–	–	20	30	30	50
16.0	–	–	–	20	30	50
18.0	–	–	–	20	30	50
20.0	–	–	–	20	30	50

Run-out of micro-drill blanks



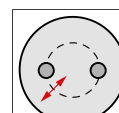
Outside diameter [mm]	Deflection [μm] with length [mm]			
	55–65	66–85	86–105	106–180
3.0	5	8	20	20
4.0	–	8	15	20

Excentricity of DIN drill blanks



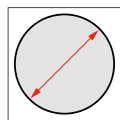
Pitch circle diameter [mm]	max. excentricity [mm]
1.6 – 3.4	0.10
4.8	0.15
6.3 – 6.7	0.18
8.0 – 10.0	0.20

Excentricity of micro-drill blanks



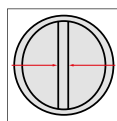
Pitch circle diameter [mm]	max. excentricity [mm]
0.29	0.025
0.30 – 0.59	0.035
0.6 – 1.5	0.040
1.51 – 2.00	0.050

Outside diameter



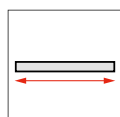
Outside diameter [mm]	Tolerance h5 [mm]
3.0	+0/-0.004
3.1 – 6.0	+0/-0.005
6.1 – 10.0	+0/-0.006
10.1 – 18.0	+0/-0.008
18.1 – 30.0	+0/-0.009

Cross groove profile for DIN drill blanks



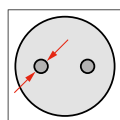
Outside diameter [mm]	Cross groove width [mm]	Cross groove depth [mm]
6	1.5 +/-0.1	0.30 +/-0.05
8	1.5 +/-0.1	0.40 +/-0.05
10	2.0 +/-0.1	0.50 +/-0.10
12	2.0 +/-0.1	0.60 +/-0.10
14	2.5 +/-0.1	0.80 +/-0.10
16	2.5 +/-0.1	1.10 +/-0.10
18	3.0 +/-0.1	1.30 +/-0.10
20	3.0 +/-0.1	1.60 +/-0.10

Length



Tolerance
+0%/+1%

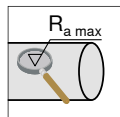
Hole diameter



Hole diameter [mm]	Tolerance [mm]
0.05	+/-0.010
0.06 – 0.20	+/-0.015
0.21 – 0.45	+/-0.030
0.5 – 1.3	+/-0.050
1.31 – 2.50	+/-0.075

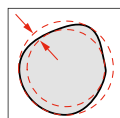
11

Surface finish



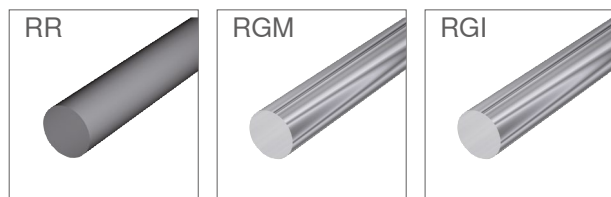
Product	Ra _{max} [μm]
DIN drill blanks	Ground mat, 0.05 - 0.1
Micro-drill blanks	0.05

Roundness

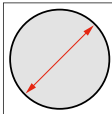


Outside diameter [mm]	Tolerance [mm]
3.0 – 6.0	0.002
8.0 – 10.0	0.003
12.0 – 18.0	0.004
20.0	0.005

Solid carbide rods

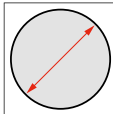


Outside diameter as sintered



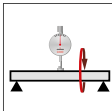
Outside diameter [mm]	Tolerance [mm]
0.8 – 2.1	+0/+0.15
2.2 – 4.7	+0/+0.20
4.8 – 6.7	+0/+0.25
6.8 – 15.2	+0/+0.30
15.3 – 20.2	+0/+0.45
20.3 – 24.2	+0/+0.55
24.3 – 36.2	+0/+0.65
36.3 – 46.2	+0/+0.70

ground



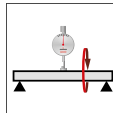
Outside diameter [mm]	Tolerance [mm]	
	h6 [mm]	h5 [mm]
1.0 – 3.0	+0/-0.006	+0/-0.004
3.1 – 6.0	+0/-0.008	+0/-0.005
6.1 – 10.0	+0/-0.009	+0/-0.006
10.1 – 18.0	+0/-0.011	+0/-0.008
18.1 – 30.0	+0/-0.013	+0/-0.009
30.1 – 40.0	+0/-0.016	+0/-0.011

Straightness as sintered



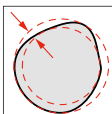
Outside diameter [mm]	max. deflection [mm]
0.8 – 3.2	1.2
3.25 – 46.2	0.5

ground



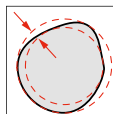
Outside diameter [mm]	max. deflection [mm]
1.0 – 2.9	1.20
3.0 – 5.9	0.15
6.0 – 7.9	0.12
8.0 – 9.9	0.10
10.0 – 11.9	0.08
12.0 – 19.9	0.05
20.0 – 40.0	< 0.05

Roundness as sintered



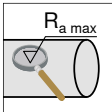
Outside diameter [mm]	Tolerance [mm]
0.8 – 5.7	0.05
5.8 – 7.7	0.08
7.8 – 12.7	0.10
12.8 – 30.2	0.13
30.3 – 46.2	0.16

ground



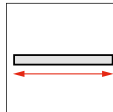
Outside diameter [mm]	Tolerance [mm]	
	h6 [mm]	h5 [mm]
1.0 – 3.0	+0/+0.003	+0/+0.003
3.1 – 6.0	+0/+0.004	+0/+0.003
6.1 – 10.0	+0/+0.005	+0/+0.003
10.1 – 30.0	+0/+0.006	+0/+0.004
30.1 – 40.0	+0/+0.007	+0/+0.005
30.1 – 40.0	+0/+0.008	+0/+0.006

Surface finish



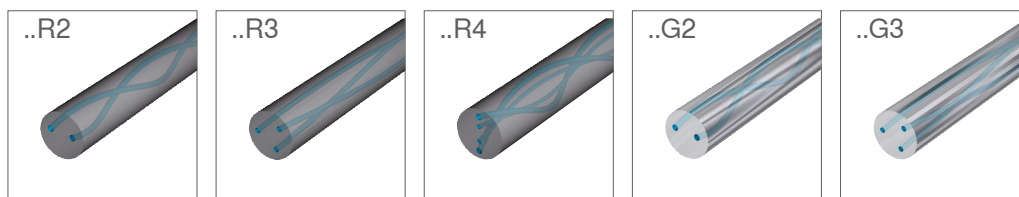
Executions	R _{a max} [μm]
as sintered	as sintered
ground	0.05

Length



Tolerance [mm]
+0/+10

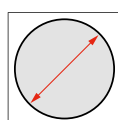
Rods with helical coolant holes



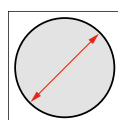
Outside diameter

as sintered

ground



Outside diameter [mm]	Tolerance core diameter [mm]	Tolerance outside diameter [mm]
3.3 – 4.3	+0.10/+0.20	+0.20/+0.60
4.4 – 8.3	+0.10/+0.30	+0.20/+0.70
8.4 – 10.3	+0.10/+0.35	+0.20/+0.75
10.4 – 12.3	+0.10/+0.40	+0.25/+0.80
12.4 – 14.3	+0.10/+0.40	+0.30/+0.80
14.4 – 16.3	+0.10/+0.45	+0.35/+0.95
16.4 – 18.3	+0.10/+0.50	+0.40/+1.00
18.4 – 20.3	+0.10/+0.55	+0.40/+1.05
20.4 – 22.3	+0.10/+0.60	+0.45/+1.10
22.4 – 35.3	+0.10/+0.60	+0.50/+1.10

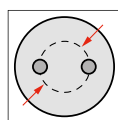


Outside diameter [mm]	Tolerance [mm]
6.0	+0/-0.008
6.1 – 10.0	+0/-0.009
10.1 – 18.0	+0/-0.011
18.1 – 30.0	+0/-0.013
30.1 – 32.0	+0/-0.016

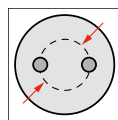
Pitch circle diameter

as sintered

ground



Outside diameter [mm]	Tolerance [mm]
3.3	+/-0.10
3.4 – 4.3	+/-0.15
4.4 – 12.3	+/-0.20
12.4 – 18.3	+/-0.25
18.4 – 35.3	+/-0.30

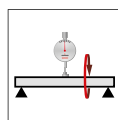


Outside diameter [mm]	Tolerance [mm]
6.0 – 12.0	+/-0.20
12.1 – 18.0	+/-0.25
18.1 – 32.0	+/-0.30

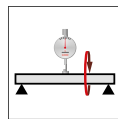
Straightness

as sintered

ground

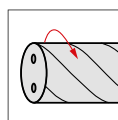


Length [mm]	max. deflection [mm]
250 – 280	0.40
> 280	0.50



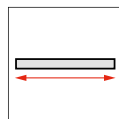
Outside diameter [mm]	max. deflection [mm]
6.0 – 7.9	0.12
8.0 – 9.9	0.10
10.0 – 11.9	0.08
12.0 – 19.9	0.05
20.0 – 32.0	< 0.05

Helix angle



Product group	Total tolerance class [°]	Number of classes	Tolerance class [°]
Standard	+/-1	3	+/-0.333
Ø 3.3 – 4.3	+/-0.75	6	+/-0.125
extra-long, 3 holes	+/-0.75	6	+/-0.125
As sintered, with two coolant holes ≥ 50°	+/-0.75	6	+/-0.125

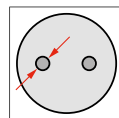
Length



Total length tolerance
[mm]

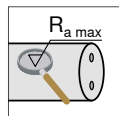
+0/+10

Hole diameter



Outside diameter [mm]	Hole diameter [mm]	Tolerance [mm]
3.3 – 4.3	≤ 1.00	+/-0.030
3.3 – 4.3	≥ 1.01	+/-0.050
4.4 – 35.3	0.40 – 1.30	+/-0.050
4.4 – 35.3	1.31 – 2.50	+/-0.075
4.4 – 35.3	2.51 – 5.00	+/-0.100

Surface finish



Executions

$R_{a \max}$ [μm]

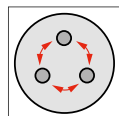
as sintered

as sintered

ground

0.05

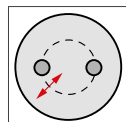
Pitch error



max. pitch error with ..R3
[°]

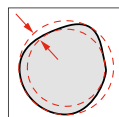
+/-3.0

Excentricity



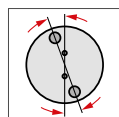
Outside diameter [mm]	Tolerance [mm]
3.3	0.04
3.4 – 4.3	0.05
4.4 – 8.3	0.10
8.4 – 10.3	0.15
10.4 – 14.3	0.18
14.4 – 35.3	0.20

Roundness ground



Outside diameter [mm]	Tolerance [mm]
6.0	0.004
6.1 – 10.0	0.005
10.1 – 30.0	0.006
30.1 – 32.0	0.008

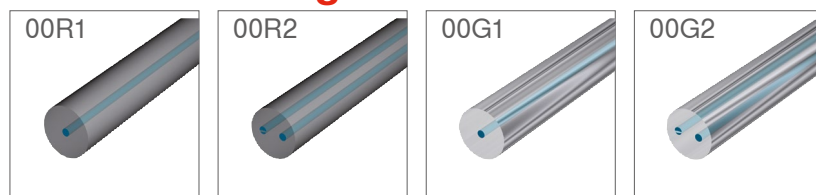
Torsion as sintered



max. torsion with ..R4
[°]

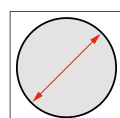
2.0

Rods with straight coolant holes



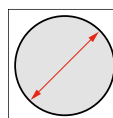
Outside diameter

as sintered



Outside diameter [mm]	Tolerance [mm]
3.3	+0/+0.20
3.4 – 5.0	+0/+0.30
5.1 – 6.5	+0/+0.35
6.6 – 15.2	+0/+0.40
15.3 – 20.7	+0/+0.55
20.8 – 22.2	+0/+0.65
22.3 – 34.3	+0/+0.75

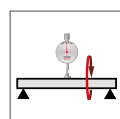
ground



Outside diameter [mm]	Tolerance [mm]
4.0 – 6.0	+0/-0.008
6.1 – 10.0	+0/-0.009
10.1 – 18.0	+0/-0.011
18.1 – 30.0	+0/-0.013
30.1 – 32.0	+0/-0.016

Straightness

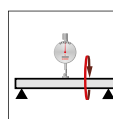
as sintered



max. deflection [mm]

0.50

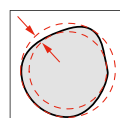
ground



Outside diameter [mm]	max. deflection [mm]
4.0 – 5.9	0.15
6.0 – 7.9	0.12
8.0 – 9.9	0.10
10.0 – 11.9	0.08
12.0 – 19.9	0.05
20.0 – 32.0	< 0.05

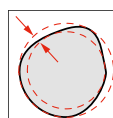
Roundness

as sintered



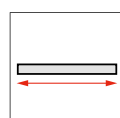
Outside diameter [mm]	Tolerance [mm]
3.3 – 5.7	0.05
6.2 – 7.7	0.08
8.2 – 12.7	0.10
13.2 – 30.2	0.13
30.3 – 34.3	0.16

ground



Outside diameter [mm]	Tolerance [mm]
4.0 – 6.0	0.004
6.1 – 10.0	0.005
10.1 – 30.0	0.006
30.1 – 32.0	0.008

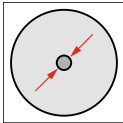
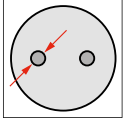
Length



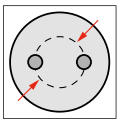
Total length tolerance [mm]

+0/+10

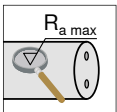
Hole diameter

	Product group	Hole diameter [mm]	Tolerance [mm]
	central coolant hole	0.10 – 0.50	+0.05
		0.51 – 1.30	+0.10
		1.31 – 2.50	+0.15
		2.51 – 5.00	+0.20
	two coolant holes	0.10 – 0.50	+/-0.025
		0.51 – 1.30	+/-0.050
		1.31 – 2.50	+/-0.075
		2.51 – 5.00	+/-0.100

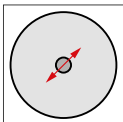
Pitch circle diameter

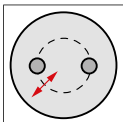
	Outside diameter [mm]	Tolerance [mm]
	3.3 – 3.9	+/-0.05
	4.0 – 5.9	+/-0.10
	6.0 – 14.9	+/-0.20
	15.0 – 20.9	+/-0.25
	21.0 – 34.3	+/-0.30

Surface finish

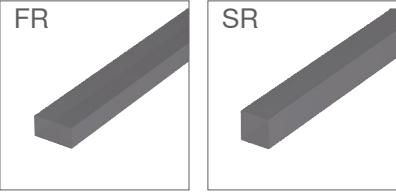
	Executions	R _{a max.} [μm]
	as sintered	as sintered
	ground	0.05

Excentricity

	Outside diameter [mm]	Tolerance [mm]
	3.3 – 3.9	0.025
	4.0 – 5.9	0.050
	6.0 – 7.9	0.100
	8.0 – 10.9	0.120
	11.0 – 24.9	0.150
	25.0 – 34.3	0.200

	Outside diameter [mm]	Tolerance [mm]
	3.3 – 3.9	0.025
	4.0 – 5.9	0.050
	6.0 – 7.9	0.100
	8.0 – 10.9	0.120
	11.0 – 24.9	0.150
	25.0 – 34.3	0.200

Flat and square strips



Width, height

	Width, height [mm]	Tolerance [mm]
	2.3 – 4.3	+0/+0.20
	4.4 – 6.3	+0/+0.25
	6.4 – 10.3	+0/+0.30
	10.4 – 14.3	+0/+0.35
	14.4 – 16.3	+0/+0.40
	16.4 – 20.3	+0/+0.50

Levelness

	Levelness [mm]
	max. 0.4

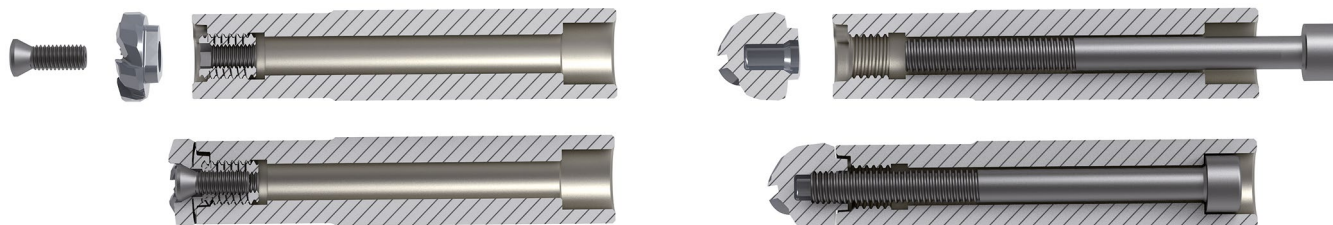
Length

	Total length tolerance [mm]
	+0/+10

Exchangeable head system (EHS)

Application instructions for mounting

Assembly instructions for cylinder shanks

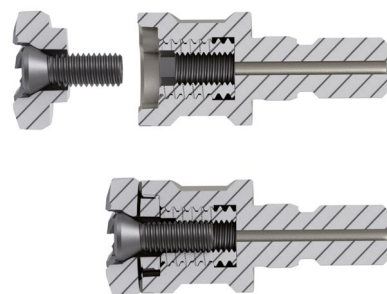


Cylinder shanks are suitable for any application. This means that blanks with a through-hole are fixed by means of a threaded bush and a clamping screw from the front.

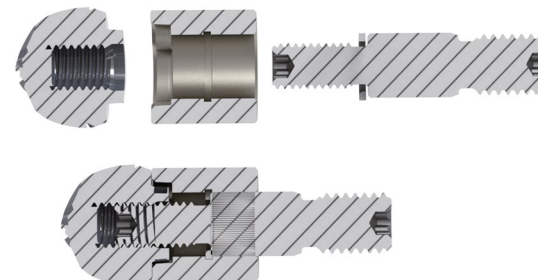
Blanks with an internal thread are fixed from behind using a cylinder screw. For this type of blanks, the threaded bush has to be eliminated.

Assembly instructions for screw in adapters

Type A



Type B



Threaded-end adapters can be used with all commonly available threaded-end shanks. As there are different types of blanks, two types of adapters are required.

The threaded-end adapter, type A, is used for blanks with a through-hole. These blanks are clamped from the front using a threaded bush and a clamping screw.

The threaded-end adapter, type B, is suitable for blanks with internal thread. This adapter consists of two parts. The blank is clamped in the seat by means of the screw. Subsequently, the assembled adapter including the blank is fixed with another screw.

Radial and axial run-out

Achievable radial and axial run-out tolerances for an assembled, finish-ground tool (shank and head):

Radial run-out: max. 0.020 mm

Axial run-out: max. 0.015 mm



All connections have to be cleaned and free of burrs before mounting.

Figure 1: test assembly for the determination of wear resistance according to ASTM B611-85

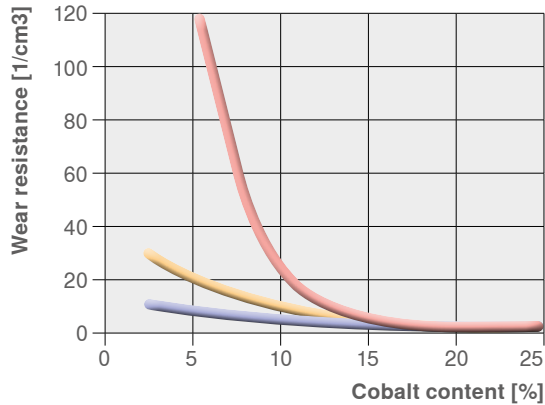
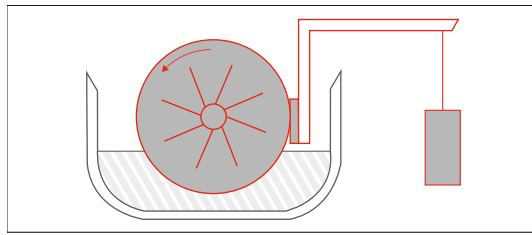


Figure 2: wear resistance in relation to the cobalt content and grain size

- Submicron grades
- Fine / medium grades
- Coarse grades

Wear resistance

The most important property of carbide is wear resistance. This property – or, to be precise, this combination of properties – refers to the surface of the component. When two surfaces rub against each other, material is removed from both of them. Under low stress the material removed consists of single grains or particles. This phenomenon is called 'scoring'. In cases of high stress, the material removed consists of grain clusters and is called 'abrasion'. The concept of wear is very complex and depends on many variables. Wear resistance is mainly tested using the ASTM B611-85 method. In this method a carbide piece is pressed onto a rotating steel disk using a lever. The rotating steel disk is the carrier for the abrasive material, which together with the material that is subject to analysis is transported from a tank below the container directly to the contact zone (see figure 1). The abrasive material consists of water and aluminum oxide (corundum).

Wear resistance is determined by measuring the volume of material removed from the carbide piece while the revolution number, test time and the force applied at 90° on the steel disk are held at consistent levels. A gravimetric evaluation is carried out, with the volume removal indicated in mm³. As shown in figure 2, wear resistance increases the finer the grain and the lower the cobalt content.

Hardness

Hardness is a material's mechanical resistance to another, harder, material which penetrates it. The hardness is normally determined based on the Vickers hardness test according to ISO 3878. In this test a 136° pyramidal diamond indenter is pressed onto a work piece with a determined test force. The size of the indent is determined optically by measuring the two diagonals of the square indent produced by the applied force (F). The impression surface is calculated with formula 1 (see fig. 3). When introducing this test method the obsolete unit 'kilopond' was used for the test force. Therefore in the formula the factor 0.102 is used for conversion. The standardized indication of the Vickers hardness, for example, is as follows:

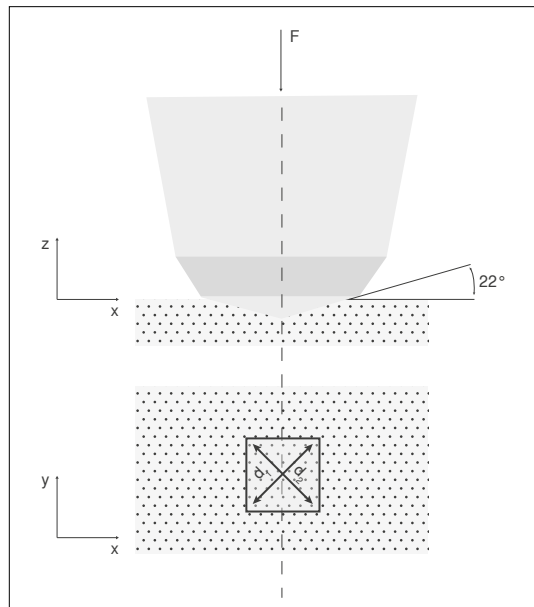
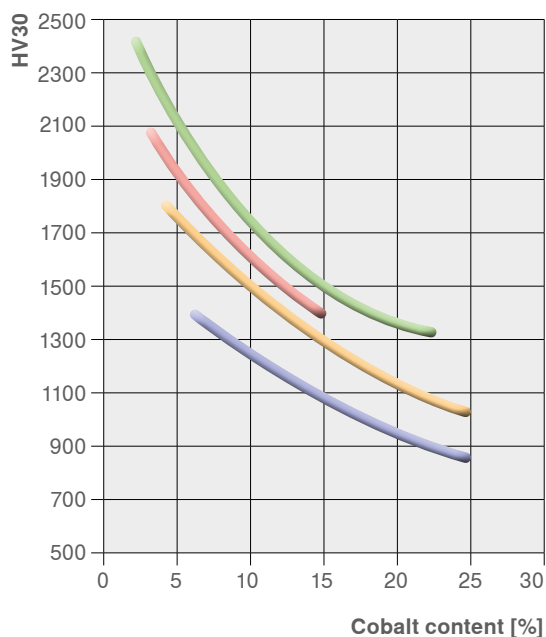


Figure 3: Vickers hardness test according to ISO 3878

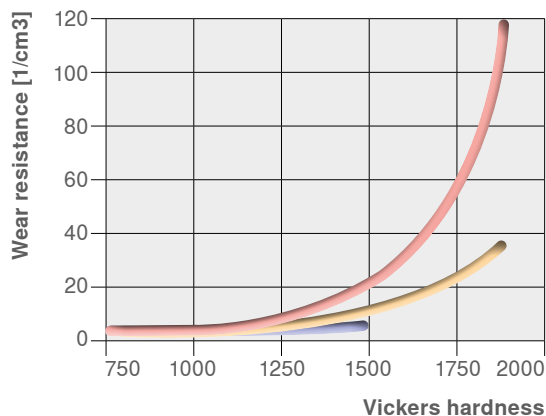
Formula 1: calculation of the Vickers hardness (ISO 3878)

$$HV = \frac{0.102 \times 2 \times F \times \sin \frac{136^\circ}{2}}{d^2} \approx 0.1891 \frac{F}{d^2}$$



- Ultrafine grades
- Submicron grades
- Fine / medium grades
- Coarse grades

Figure 4: hardness in relation to the cobalt content and grain size



- Submicron grades
- Fine / medium grades
- Coarse grades

Figure 5: wear resistance in function of hardness with different grain sizes

Hardness

Hardness is a material's mechanical resistance to another, harder, material which penetrates it. The hardness is normally determined based on the Vickers hardness test according to ISO 3878. In this test a 136° pyramidal diamond indenter is pressed onto a work piece with a determined test force. The size of the indent is determined optically by measuring the two diagonals of the square indent produced by the applied force (F). The impression surface is calculated with formula #1 (see fig. 3). When introducing this test method the obsolete unit 'kilopond' was used for the test force. Therefore in the formula the factor 0.102 is used for conversion. The standardised indication of the Vickers hardness, for example, is as follows:

620 HV 30

Parameters:

- 620 = hardness
- HV = test procedure
- 30 = test force in kilopond

Another method for determining hardness is the Rockwell procedure (ISO 3738). It is similar to the Vickers procedure but uses a diamond brale indenter. Here, the depth of penetration is used as the degree of hardness. There is no theoretical basis for a conversion between the two procedures. In order to create a comparison a determinate test must be carried out. Like wear resistance, hardness also increases with a smaller grain size and lower cobalt content (see figure 4). As wear resistance and hardness show similar behaviour with regard to cobalt content and grain size, hardness is often used as a reference for wear resistance. Furthermore, the Vickers procedure is easier and quicker than ASTM B611-85. Nevertheless the relation of hardness and wear resistance is exponential and also depends on the grain size (see figure 5).

Formula 2: calculation of the critical tension intensity factor K_{IC}

$$K_{IC} = 0.15 \sqrt{\frac{HV30}{\Sigma L}} \left[\frac{MN}{m^{\frac{3}{2}}} \right]$$

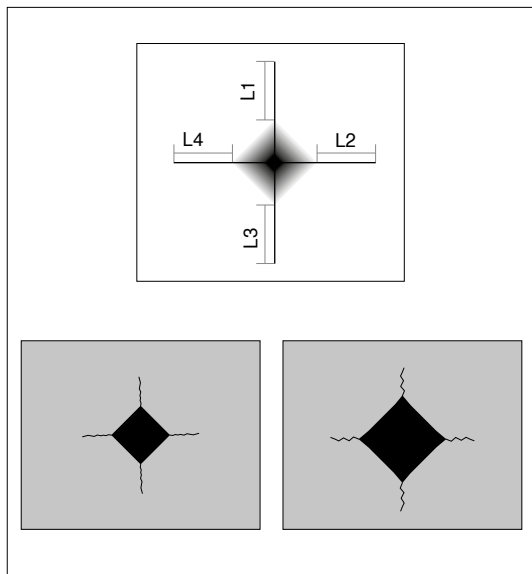


Figure 6: Palmqvist method for the determination of fracture toughness

Toughness

When a material is exposed to external static or dynamic stress, this leads to mechanical tensions. In many cases, particularly with impact loads, both the strength and ductility of the material have to be taken into account. These two properties represent the basis for the concept of toughness, which is defined as the capacity to resist fracture or crack propagation. Fracture in this context means the complete separation of the material into at least two parts. There are numerous possibilities to define or determine toughness, transverse rupture strength or fracture toughness. In the definition above, the integrated product of force and deformation until fracture occurs is used as the toughness value. In the case of carbide, the Palmqvist method is frequently applied to determine the toughness as a critical tension intensity factor K_{IC} . For this purpose, the crack length of a Vickers hardness indent is used to deduce the fracture toughness (see figure 6). This is then converted into the tension intensity factor using formula 2. As can be seen in figure 7, toughness increases with the metal binder content and growing grain size. Compared to other metal materials, carbide can be found in the lower part of the toughness range, about the same as hardened steel.

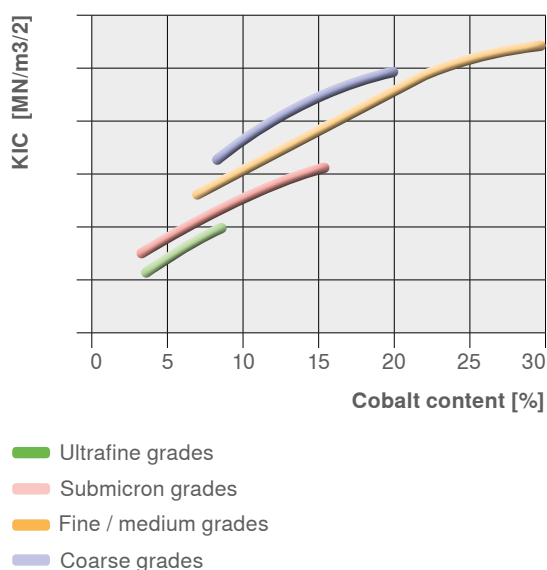


Figure 7: fracture toughness in relation to the grain size and the cobalt content

Figure 8: crack propagation in large grain sizes; larger crack propagation requires higher fracture energy - higher toughness

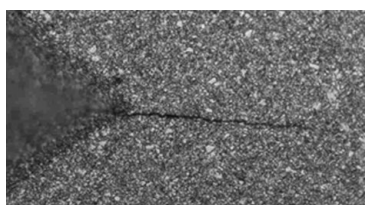
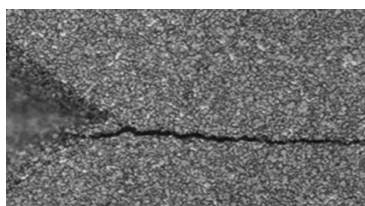
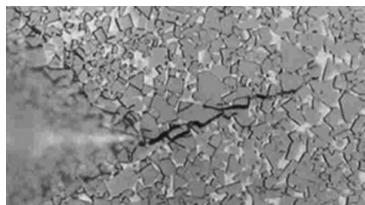
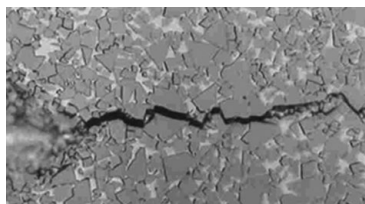


Figure 9: crack propagation in small grain sizes; direct, shorter crack propagation – requires lower fracture energy -- lower toughness

By definition, carbide is to be considered a brittle material as there is basically no plastic deformation prior to fracture. This is confirmed by examination of surfaces where breakage occurred. Various carbides, however, show very big differences in terms of toughness which can be best explained by taking a look at the microstructure. Cracks inside the carbide grains may occur just like intergranular fractures and shear fractures in the binder metal. Generally the number of grain cracks rises with increasing grain size and the number of shear fractures when raising the binder content. In terms of fracture energy, the main contribution to toughness comes from the length of the rupture in the metal binder (see figures 8 and 9).

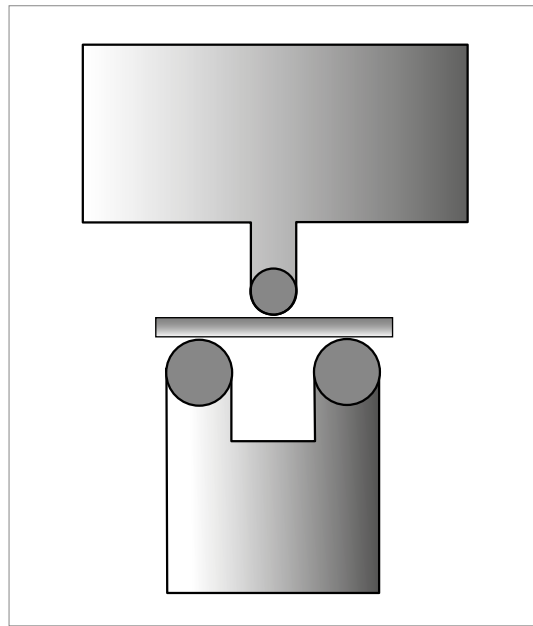


Figure 10: illustration of a transverse rupture strength test

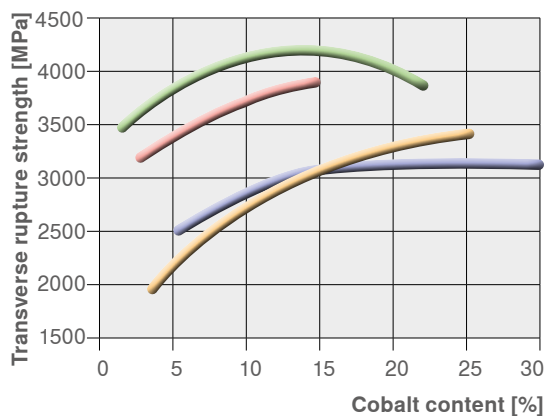


Figure 11: transverse rupture strength in relation to the grain size and the cobalt content

- Ultrafine grades
- Submicron grades
- Fine / medium grades
- Coarse grades

Mechanical strength

Every material has defects such as inclusions and micro-ruptures. For brittle materials such as hardened steels or carbide the mechanical strength is limited by the number and size of these defects. In this context the mechanical strength depends on the volume, as with a growing material volume the probability of a large defect rises. Depending on the type of stress, various types of strength are distinguished.

Transverse rupture strength

Testing the transverse rupture strength is the easiest and most common procedure of analysing the mechanical strength of carbide. According to the standardized ISO 3327 procedure a test material of a certain length is placed on a surface and put under stress in the middle until it breaks (see figure 10). The transverse rupture strength (T.R.S.) is then the average value of several tests. The maximum value is achieved with a cobalt content of around 14 weight-% and grain sizes of around $.2 - .5 \mu\text{m}$.

The very low plastic deformation is normally not taken into account as it occurs only in the toughest carbides. Transverse rupture strength decreases with increasing temperature.

Furthermore, the carbides show creep values when they are subjected to stress or to high temperatures for a long time. The transverse rupture strength is decisively influenced by the number and size of defects in the structure or on the surface. Fractures always occur at the weakest point of the structure, which is also where the largest defect is. A high number of defects therefore increases the probability that one of these defects causes a premature fracture on the point with the highest stress. As the quality demands in the field of carbide manufacturing are high, impurities or defects can be minimized and thus the risk of breakage reduced.

Tensile strength

When testing the tensile strength of brittle materials it is difficult to measure exact results. A precise result depends on both the perfect preparation of the test materials as well as on the additional stress present on the mounting fixtures. Applying the Weibull theory, however, the tensile strength can be deducted from the values of the transverse rupture strength.

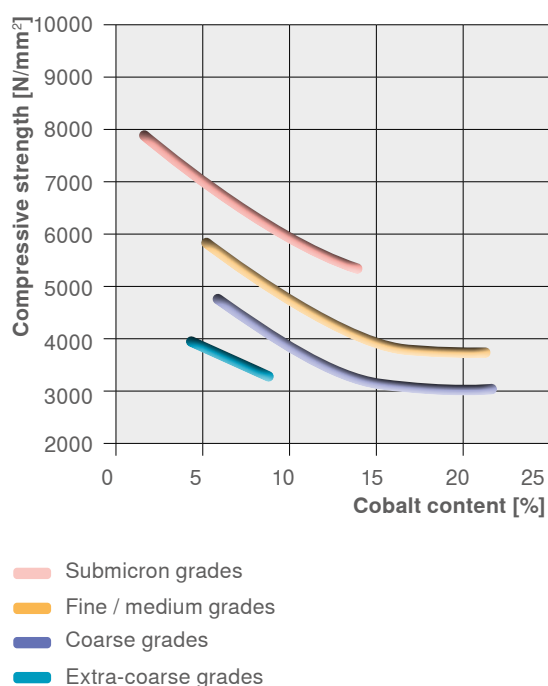


Figure 12: compressive strength in relation to the grain size and the cobalt content

Compressive strength

One of the most remarkable properties of carbide is the extremely high compressive strength under uniaxial stress. This valuable property is used in virtually all application fields (cutting edges with high compressive strength in all machining processes, pressing and drawing dies, rolls, anvils and dies for the production of synthetic diamonds, etc.). The tension of this kind of stress doesn't actually cause fracture due to pressure but due to tension: a shear fracture. A suitable procedure for determining compressive strength can be found in ISO 4506. To achieve precise values for carbide, the test piece's geometry must be changed so that the effects of the edges and contact, which occur in a simple cylindrical test piece, are eliminated. Elastic deformation is produced under initial load; however, before fracture a degree of plastic deformation results. Figure 12 shows the compressive strength of various grain sizes in relation to the cobalt content.

The compressive strength increases when the metal binder content decreases and the grain size is reduced. A small grain carbide grade with a low metal binder content typically has a compressive strength of almost 7,000 N/mm². The compressive strength decreases when the temperature increases. The degree of plastic deformation increases notably with the temperature, so that the results are variable when temperatures are high.

Shear strength

The implementation of pure shear tests is very difficult. However, numerous things speak for the fact that the shear strength is somewhat higher than the compressive strength.

Fatigue strength

The fatigue strength of carbide is above 2 million pulsating compressive loads at around 65 to 85% of the static compressive strength. The compressive fatigue strength increases with a decreasing cobalt content and with decreasing grain size.

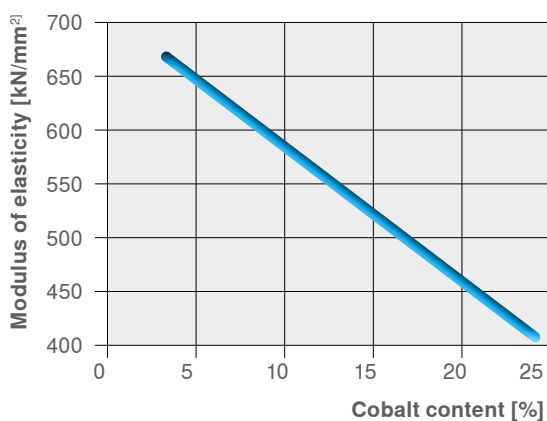


Figure 13: modulus of elasticity of WC-Co carbides

Property	from	to
Hardness [HV30]	1300	2200
Transverse rupture strength [MPa]	2000	4600
Fracture toughness [$\text{MPa} \cdot \text{m}^{1/2}$]	8.4	15

Figure 14: properties of CERATIZIT round rods and preforms

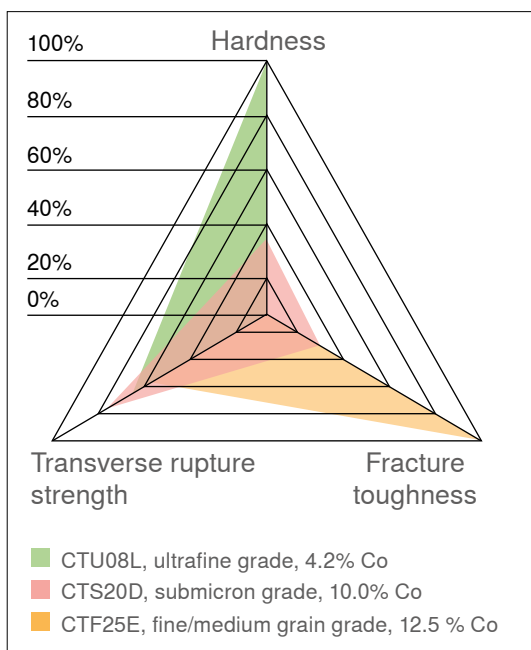


Figure 15: tension fields of three CERATIZIT grades, 0% - lowest value of all grades, 100% - highest value of all grades

Modulus of elasticity, shear modulus, Poisson's ratio

The modulus of elasticity indicates the resistance of a material against elastic deformation and is higher the more rigid a material is. In the case of carbide the modulus of elasticity is 2 to 3 times higher than in steel and increases linearly with decreasing metal binder content. See fig. 13: additives of γ -phase reduce the modulus of elasticity. An exact determination of the modulus of elasticity based on the tension-expansion diagram is difficult. Therefore, for reliable results resonance measurements of transverse and longitudinal waves are carried out according to ISO 3312. The shear module is determined in the same way with the help of torsional vibration. By determining the modulus of elasticity and the shear module the Poisson's ratio can be calculated.

Influence of the grain size and the cobalt content on the most important properties

The most important mechanical properties of the carbide, such as hardness, transverse rupture strength and fracture toughness, are determined by the grain size of the tungsten carbide and cobalt content. Figure 14 shows the properties of CERATIZIT round rods and preforms. Sporadically it can be sustained that through smaller grain sizes higher hardness and transverse rupture strength can be achieved. At the same time, however, fracture toughness decreases. By increasing the cobalt content hardness is reduced, while the transverse rupture strength and fracture toughness are raised. Based on this fact a compromise between hardness and fracture toughness can be made. Figure 15 shows three different CERATIZIT grades and their hardness, fracture toughness and transverse rupture strength. 0% is the lowest value and 100% the highest value of all CERATIZIT grades.

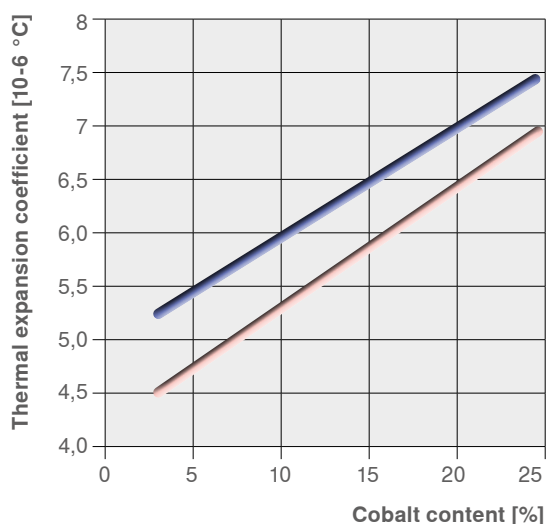


Figure 16: thermal expansion in function of the cobalt content for two temperature intervals

— 20°C – 40°C
— 20°C – 800°C

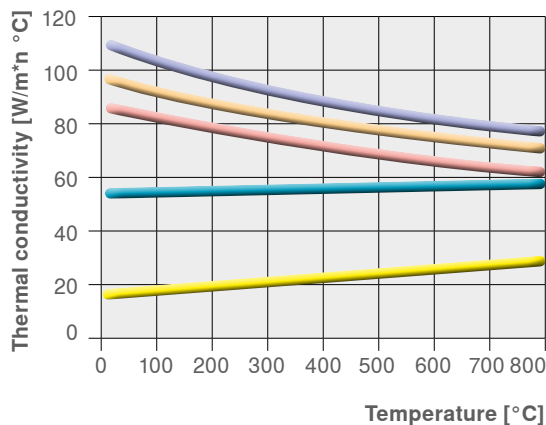


Figure 17: thermal conductivity in relation to the temperature of various micro-structures and grain sizes

— Submicron grades
— Fine / medium grades
— High γ-phase content
— Coarse grades
— Low γ-phase content

Physical properties of carbide

Density

The density of carbide is determined according to ISO 3369 and varies strongly depending on the composition of the carbide grade. Grades with a very high WC content have the highest density. Grades with a high titanium carbide content and a high binder content have the lowest density. Typically it can however be assumed that the density is around 50 to 100% higher than that of steel.

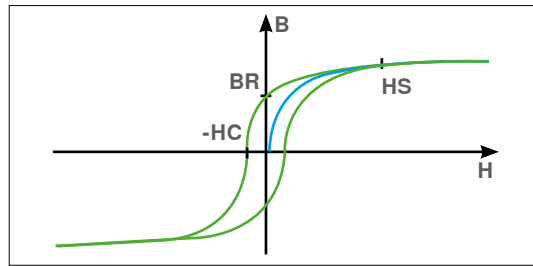
Thermal expansion

As tungsten carbide has a very low thermal expansion coefficient, the values for carbide compared to steel are very low. For carbide grades which contain titanium carbide the values are somewhat higher than for the pure WC-Co carbides. Figure 16 shows the thermal expansion in relation to the cobalt content.

Thermal conductivity

The thermal conductivity is of great significance for carbide applications, as it determines the temperature in the wear areas and has a large influence on the carbide's thermal fatigue resistance and resistance to thermal fluctuations. The thermal conductivity of WC-Co carbide is around twice that of unalloyed steels. It is only slightly influenced by the cobalt content and the grain size, while γ-phases like titanium carbide or tantalum carbide have an impact. Titanium carbide strongly reduces the thermal conductivity. Therefore, for milling grades tantalum carbide is mostly used as γ-phase (see figure 17).

Figure 18: hysteresis curve of a ferromagnetic material



Specific thermal capacity

The specific thermal capacity is the quantity of heat which is necessary to heat up 1 kg of a material by 1°C. In application technology it is equally important as thermal conductivity, because during the machining processes the heat has to be taken away from the cutting edge. Through a high thermal capacity the surrounding area is less hot as it can absorb more energy.

Magnetic saturation & coercive field strength

Carbides with cobalt as a metal binder are ferromagnetic. If a ferromagnetic material is exposed to a magnetic field strength H , the magnetic flux density B in this material increases (figure 18, blue line). The flux density decreases when the field strength rises, until maximum saturation is achieved. This maximum flux density is defined as magnetic saturation ($4\pi\sigma$). When the external field strength is removed, the flux density in the material is reduced along the upper green line to a certain residual magnetism (BR), the so called 'remanence'. The higher the remanence is, the better a material can be magnetized and the remanence can only be eliminated when the material is subjected to an inverse field. The inverse field strength HC which is necessary to reduce the magnetic flux density to zero, or to 'de-magnetize' the material, is defined as coercive field strength.

The finer the magnetic field lines of the metal binder phase in the carbide, the higher the coercive field strength. This means that the coercive field strength provides information about the state of the metal binder phase. The metal binder phase becomes finer with smaller tungsten carbide grains and lower binder content. As described under 1.1.2, the smaller the grains and the lower the metal binder content, the higher the hardness of the structure. In this way an accordant correlation between coercive field strength and hardness can be seen. In practical applications this represents a non-destructive measuring method for the hardness.

The magnetic saturation of carbide also depends on the content and the state of the cobalt binder. When one of these parameters is known, information can be given about the other parameters. In this context the carbon content of the carbide has a decisive influence on the magnetic state of the cobalt. The magnetic saturation provides information about the carburisation of the carbide. This measuring method represents an important tool for checking the production quality.

Figure 19: some chemical compounds and the corresponding resistance of carbide

Chemical compounds	Resistance
Acetone	high resistance
Ethanol	high resistance
Sodium hydroxide	high resistance
All acids	low resistance
Tap water	high resistance
Petroleum	high resistance

Permeability

Magnetic permeability means the penetrability of materials for magnetic fields. Although carbide is ferromagnetic, the magnetic permeability values are low. They increase equally along with the magnetic saturation and with the cobalt content and amount to around 5 H/m with 20 vol.%. Compared to this, vacuum has a magnetic permeability of 1 H/m and iron between 300 and 10,000 H/m.

Corrosion resistance

According to DIN EN ISO 8044 corrosion is a reaction of a metal material with its environment, which causes a measurable modification of the material and may lead to a reduced performance of the metal element or the entire system. In most cases the reaction is electrochemical in nature or in some cases chemical or metalphysical in nature. In carbides corrosion causes a reduction of the surface of the binder phase, thus on the surface there remains only a carbide 'skeleton'. The bond between carbide grains next to each other is very weak, so the rate of destruction increases correspondingly. When the metal binder content is low the carbide 'skeleton' is more pronounced. Consequently this type of carbide grade shows higher wear resistance and corrosion resistance than carbides with a higher metal binder content. In practical applications, however, this is not sufficient to significantly increase the service life. Due to their limited corrosion resistance pure WC-Co carbides are often not suitable for application fields with difficult corrosion conditions. Typically, it can be assumed that WC-Co carbides down to pH 7 are corrosion-resistant.



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