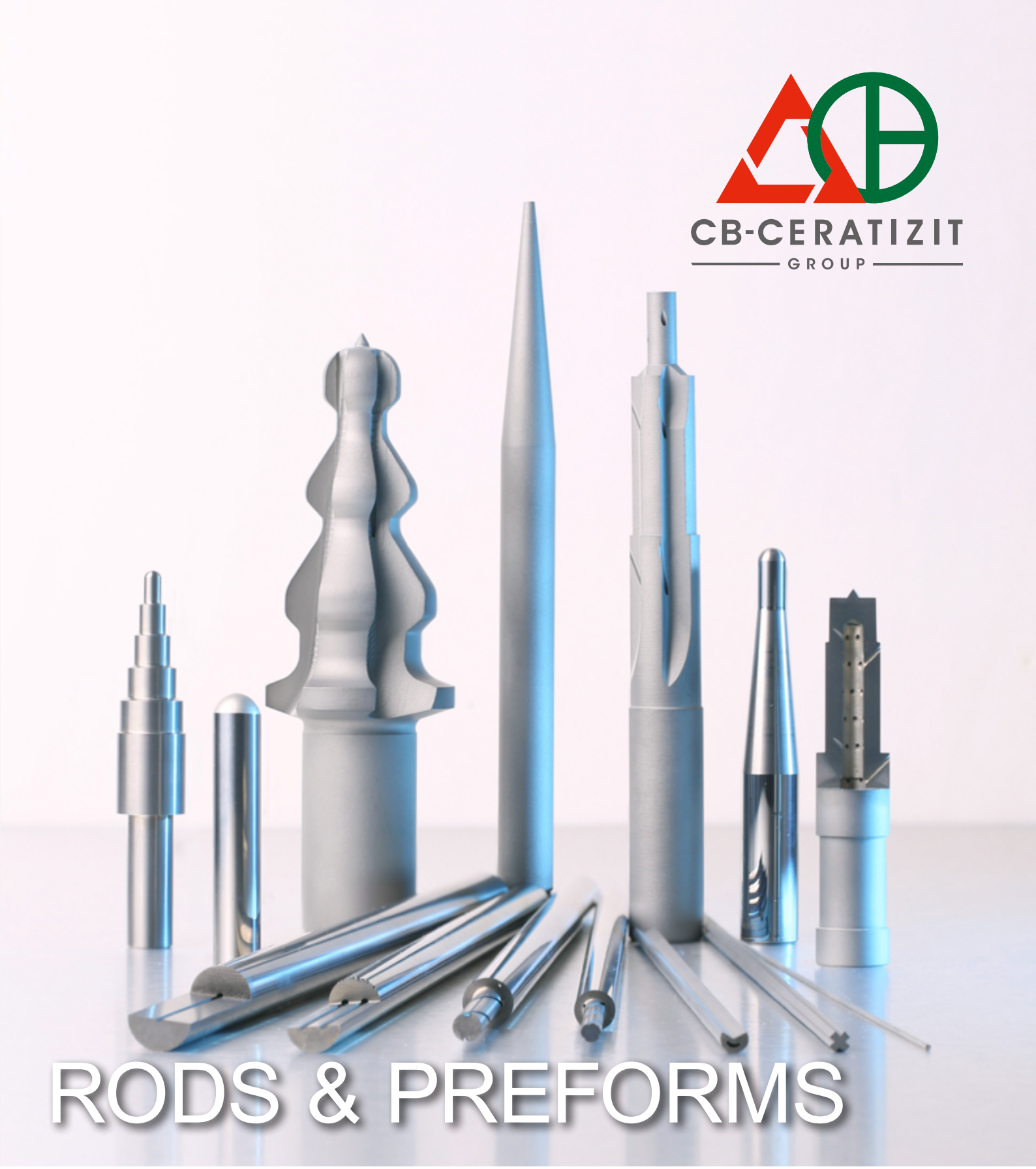
CB-CERATIZIT GROUP



RODS & PREFORMS

Tungsten Carbide Rods
For Precision Tool

TOOLING THE FUTURE

EN

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CB-CERATIZIT

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About CB-CERATIZIT

CB-CERATIZIT is the Asian market leader in carbide rod blanks, industrial wear parts, wood & stone applications, and specific cutting tool segments through quality products, fast delivery, and responsive customer service.

CB-CERATIZIT offers global production and technological supports as well as localised services.

CB-CERATIZIT combined has more than 140 years of tungsten carbide industry experience. We are confident CB-CERATIZIT is the best partner for our growth oriented customers by providing carbide solutions.

CB-CERATIZIT Industry Chain

Tungsten Ore

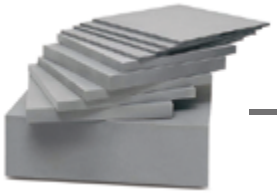
Ammonium Paratungstate (APT)

Tungsten Powder

Industrial Wear Parts

Rods

Ready to Press Powder



Tungsten Carbide

Wood and Stone

Cutting Tools

CB-CERATIZIT

We value customer feedback
We help to shape the industry trend
We improve continuously
We are CB-CERATIZIT

1 Customer Service

Grade Selection

Guide our customer to apply best solution for success.

2 Breakthrough

Achieve Outperformance

Enable our customer to achieve outperformance is our key objective.

3 Competitiveness

Enhance Competitiveness

Strengthen the competitiveness of our customer is our long term goal.

4 Training

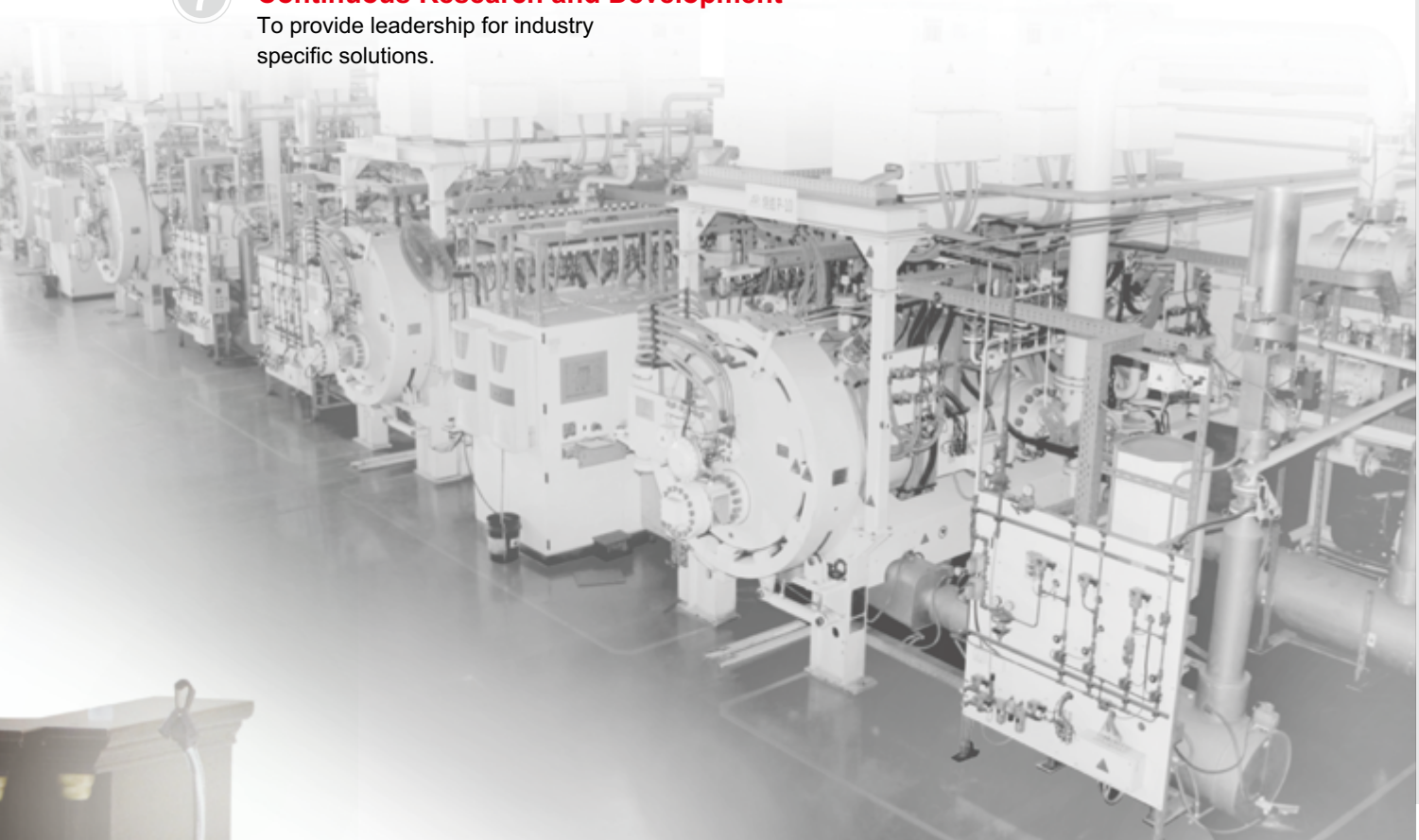
Continuous Learning

Nurturing talents for sustainable long term growth.

Core Competency

Professional, Dedication, Tailor-made service
Our Promises:

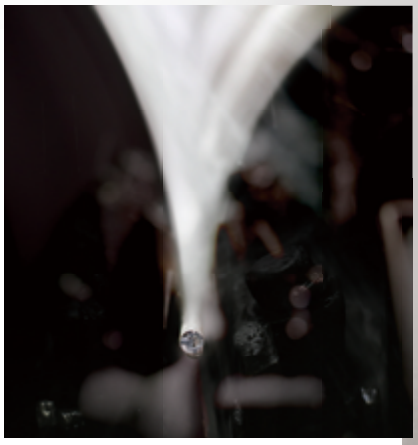
1. **Customer Focus**
   To relentlessly work to provide better solutions for our customers.
2. **Stable Quality**
   To keep stable quality contributes to our customer's brand reputation.
3. **On-time Delivery**
   To provide lean production for our customers.
4. **Stock Availability**
   To find solution for each and every customer'sgrade requirements.
5. **Comprehensive Specification**
   To work with customers for tailor-made products.
6. **Sustainable Capacity**
   To grow together with our customers.
7. **Continuous Research and Development**
   To provide leadership for industry specific solutions.



Rods Production Centre

Established in 2003, CB-CERATIZIT Xiamen Rods Production Centre has grown to become the leading production plant in Asia.

Our Rods Centre of Excellence production is technologically and capably equipped to support new Rods grade innovation and dynamic customer demands. We stand by our production and inspection procedures that upkeep strictly to ISO international standard.



Customized Rods Production Centre

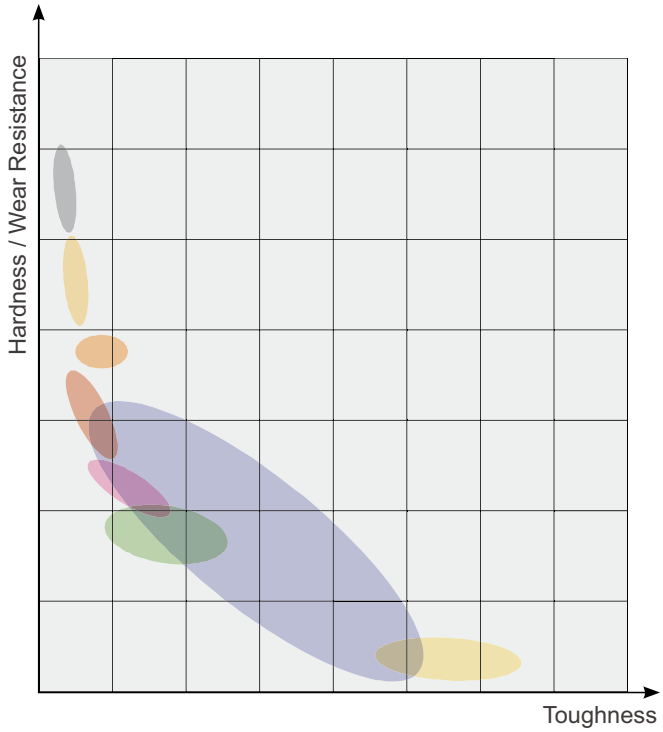
Established in 1999, CB-CERATIZIT Xiamen Industrial Wear Parts Production Centre is capable to produce wide range Customised Rods: Preform Rods, PCD Boring Bar, Anti-Vibration Boring Bar, Gun Drill, and T Cutter blanks. Step-down Rods, Internal Duct, Center Hole, Thread, and Chip Flutes are available upon customer requests.

CB-CERATIZIT is able to utilise our wide production capabilities to improve competitiveness for our customers

Professional R&D Team - Xiamen Tool Material R&D Application Center

To accelerate grade development and provide comprehensive tool applications, CB-CERATIZIT group set up its own high-end tool material R&D center at Xiamen, China. Aiming to provide vertical integrated solution by consolidating tungsten carbide material, tool design, coating solution, and machining strategy.

CB-CERATIZIT is able to offer our valuable customers an all-in-one solution including cutting-edge industrial applications and knowledge by utilizing the professional technology coming from R&D center.



- Natural diamond
- Poly-crystal Diamond / Diamond Coating
- Cubic Boron Nitride
- Ceramic(O)
- Ceramic(N)
- Cermet
- High Speed Steel
- **Carbide**

The mechanical property of carbide can be altered by changing grain size and constitute to cope with wide range of tool performance demand. Consequently, features of CB-CERATIZIT grade can also be modified in accordance with different machining methodology. CB-CERATIZIT can offer best-fit solutions for special work piece metals such as harden material with high wear resistance, Nicochrome which can withstand high temperature, and Composite material with complicated mechanical properties.

Criteria relevant for application

- Wear resistance, Hardness
- Compressive strength
- Impact strength
- Transverse rupture strength
- Tribological properties
- Specific weight
- Magnetic properties
- Modulus of elasticity, Rigidity
- Thermal properties
- Corrosion resistance, Resistance to oxidation
- Toughness

	Grade	ISO Code	Co (±0.5%)	Density (g/cm^3)	Hardness		TRS (MPa)
					HRA	HV30	
Ultrafine							
	K180	K05 - K10	9.0	14.34	93.8	1,970	3,600
	UF25	K10 - K20	12.0	14.10	92.4	1,680	4,000
	WF25	K10 - K20	11.5	14.15	92.2	1,650	3,800
Submicron							
	KS09	K20 - K40	9.0	14.48	91.8	1,580	3,600
	WF15	K20 - K40	10.0	14.35	91.8	1,580	3,800
	K200	K20 - K40	10.0	14.40	91.3	1,510	4,000
Fine							
	K100L	K10 - K20	6.0	14.83	92.2	1,650	3,000
	KR10	K10 - K20	5.8	14.80	92.2	1,650	3,000

*Please contact our representative if additional grade requirement is needed.

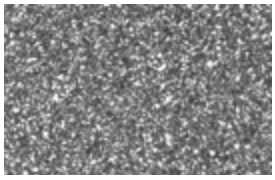
Grade Recommendation

	Work Material	K180	UF25	WF25	KS09	WF15	K200	K100L	KR10
P	Non Alloy Steel		○	○	●	●	●		
	Low / Medium Alloy Steel	●	○	○	●	●	●		●
	High Alloy Steel		●	●	○	●	○		
	Ferritic Stainless Steel		●	●	●	○	●		
	Martensitic Stainless Steel		●	●	●	○	●		
M	Austenitic Stainless Steel		●	●	●	○	●		
	Duplex Stainless Steel		●	○	●	○	●		
K	Grey Cast Iron	●		○	○	●	●	○	●
	Nodular Cast Iron	●		○	○	●	●	○	●
	Ductile Cast Iron	●		○	○	●	●	○	●
N	Plastic	●	○	○		○	○	●	●
	Composite Material	●						●	
	Aluminium Alloy (Si<12%)	●	○	○		○	○	●	
	Copper Based Alloy	●				○	○	○	○
S	Super Alloy		●	●	●	○	○		
	Titanium Alloy		●	○	●	○	●		
H	Harden Steel	●	●	●	●	○	○		

*Grade recommendation sheet is for reference only. Actual performance of cutting tool will be affected by different geometry and coating, please select appropriate grade according to individual property

● **Best** ○ **Fit**

Ultrafine grain

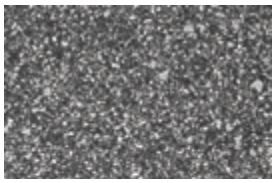


K180 : Ultrafine grade for HSC machining of tempered steel (HRC>60), abrasive aluminium, or CFRP.

UF25 : Ultrafine grade for HSC machining of tempered steel (HRC≤60)and stainless steel. Even more concentrated grain distributionenhances tool life and work performance.

WF25 : Appropriate for machining tempered steel (HRC<45) and stainless steel. It is a well-balanced high performance grade.

Submicron grain

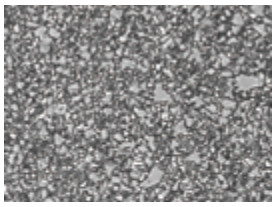


KS09 : Appropriate for machining stainless steels, heat-resistant alloys, & difficult-to-machine materials (Ti-based, Ni-based Alloy). Excellent performance especially under unfavorable conditions.

WF15 : Well balanced physical properties, very good at universal machining of alloyed / non-alloyed steel.

K200 : For stainless steel & heat-resistant alloys machining under work-condition of low cutting speed & high feed rate. Selective submicron carbide grade for optimum tool toughness.

Fine grain



K100L : Certified fine carbide grade for diamond coating tool. For machining graphite, composite material, and high-silicon aluminium alloy.

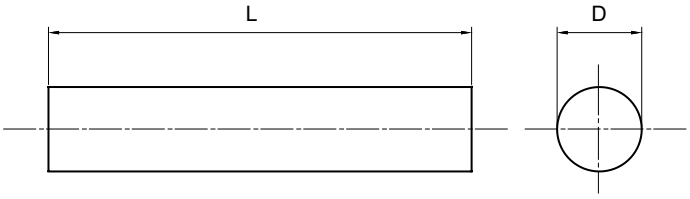
KR10 : Fine grain grade specially design for machining Non-ferrous metal, Cast Iron, and Plastic.

Tungsten carbide grain size (μm)	Classification
0.2 - 0.5	Ultrafine
0.5 - 0.8	Submicron
0.8 - 1.3	Fine
1.3 - 2.5	Medium
2.5 - 6.0	Coarse

* The classification of carbides according to grain size corresponds to the recommendations of the Powder Metallurgy Association.

Solid Rods

Sintered Solid Rods (Metric)

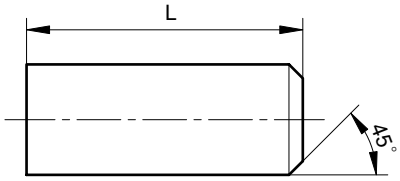


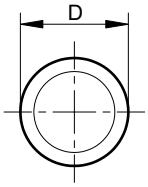
Sintered Solid Rods (Metric)									
Code	D	L	Grade						
	mm	mm	K180	UF25	WF25	KS09	WF15	K200	K100L
RR 0220−330	2.0	330			●		●	●	
RR 0320−330	3.0	330	●	●	●		●	●	●
RR 0370−330	3.5	330			●		●	●	
RR 0420−330	4.0	330	●	●	●	●	●	●	●
RR 0470−330	4.5	330			●		●	●	
RR 0520−330	5.0	330		●	●		●	●	
RR 0570−330	5.5	330			●		●	●	
RR 0620−330	6.0	330	●	●	●	●	●	●	●
RR 0670−330	6.5	330			●		●	●	
RR 0720−330	7.0	330			●		●	●	
RR 0770−330	7.5	330			●		●	●	
RR 0820−330	8.0	330	●	●	●	●	●	●	●
RR 0870−330	8.5	330			●		●	●	
RR 0920−330	9.0	330			●		●	●	
RR 0970−330	9.5	330			●		●	●	
RR 1020−330	10.0	330	●	●	●	●	●	●	●
RR 1070−330	10.5	330			●		●	●	
RR 1120−330	11.0	330			●		●	●	
RR 1170−330	11.5	330			●		●	●	
RR 1220−330	12.0	330	●	●	●	●	●	●	●
RR 1270−330	12.5	330			●		●	●	
RR 1320−330	13.0	330			●		●	●	
RR 1420−330	14.0	330		●	●		●	●	
RR 1520−330	15.0	330			●		●	●	
RR 1620−330	16.0	330	●	●	●	●	●	●	●
RR 1720−330	17.0	330			●		●	●	
RR 1820−330	18.0	330		●	●	●	●	●	●
RR 1920−330	19.0	330			●		●	●	
RR 2020−330	20.0	330	●	●	●	●	●	●	●
RR 2420−330	24.0	330					●	●	
RR 2520−330	25.0	330					●	●	
RR 3220−330	32.0	330					●	●	

1. Standard Diameter: Ø2 ~ Ø32, other dimensions are upon request.
2. Standard Length: 310 / 330 mm.

●=Standard Stock

We offer below post-processing services:



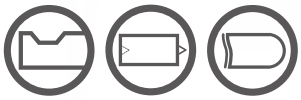


Ground Solid Rods - Cut to Length (Metric)										
Code	D	h5 D Tol.	L	Chamfer	Grade					
	mm	mm	mm	mm	K180	UF25	WF25	KS09	WF15	K200
RGMC 0300-050	3.0	-0/-0.004	50	0.3		●	●		●	●
RGMC 0400-050	4.0	-0/-0.005	50	0.4	●	●	●	●	●	●
RGMC 0400-075	4.0	-0/-0.005	75	0.4		●	●			
RGMC 0400-100	4.0	-0/-0.005	100	0.4			●			
RGMC 0600-050	6.0	-0/-0.005	50	0.6	●	●	●	●	●	●
RGMC 0600-075	6.0	-0/-0.005	75	0.6			●			
RGMC 0600-100	6.0	-0/-0.005	100	0.6		●	●			
RGMC 0800-060	8.0	-0/-0.006	60	0.8	●	●	●	●	●	●
RGMC 0800-075	8.0	-0/-0.006	75	0.8			●			
RGMC 0800-100	8.0	-0/-0.006	100	0.8		●	●			
RGMC 1000-075	10.0	-0/-0.006	75	1.0	●	●	●	●	●	●
RGMC 1000-100	10.0	-0/-0.006	100	1.0		●	●			
RGMC 1000-150	10.0	-0/-0.006	150	1.0			●			
RGMC 1200-075	12.0	-0/-0.008	75	1.0	●	●	●	●	●	●
RGMC 1200-100	12.0	-0/-0.008	100	1.0		●	●			
RGMC 1200-150	12.0	-0/-0.008	150	1.0			●			
RGMC 1600-100	16.0	-0/-0.008	100	1.0	●	●	●	●	●	●
RGMC 1600-150	16.0	-0/-0.008	150	1.0			●		●	●
RGMC 2000-100	20.0	-0/-0.009	100	1.5	●	●	●			
RGMC 2000-150	20.0	-0/-0.009	150	1.5	●	●	●			

1. Standard Diameter: Ø3 ~ Ø20, other dimensions are upon request.
2. Standard Length: Metric standard, other dimensions are upon requst.

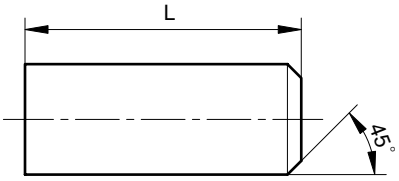
●=Standard Stock

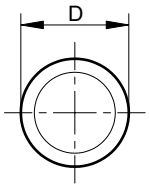
We offer below post-processing services:



Solid Rods

Ground Solid Rods - Cut to Length (DIN)



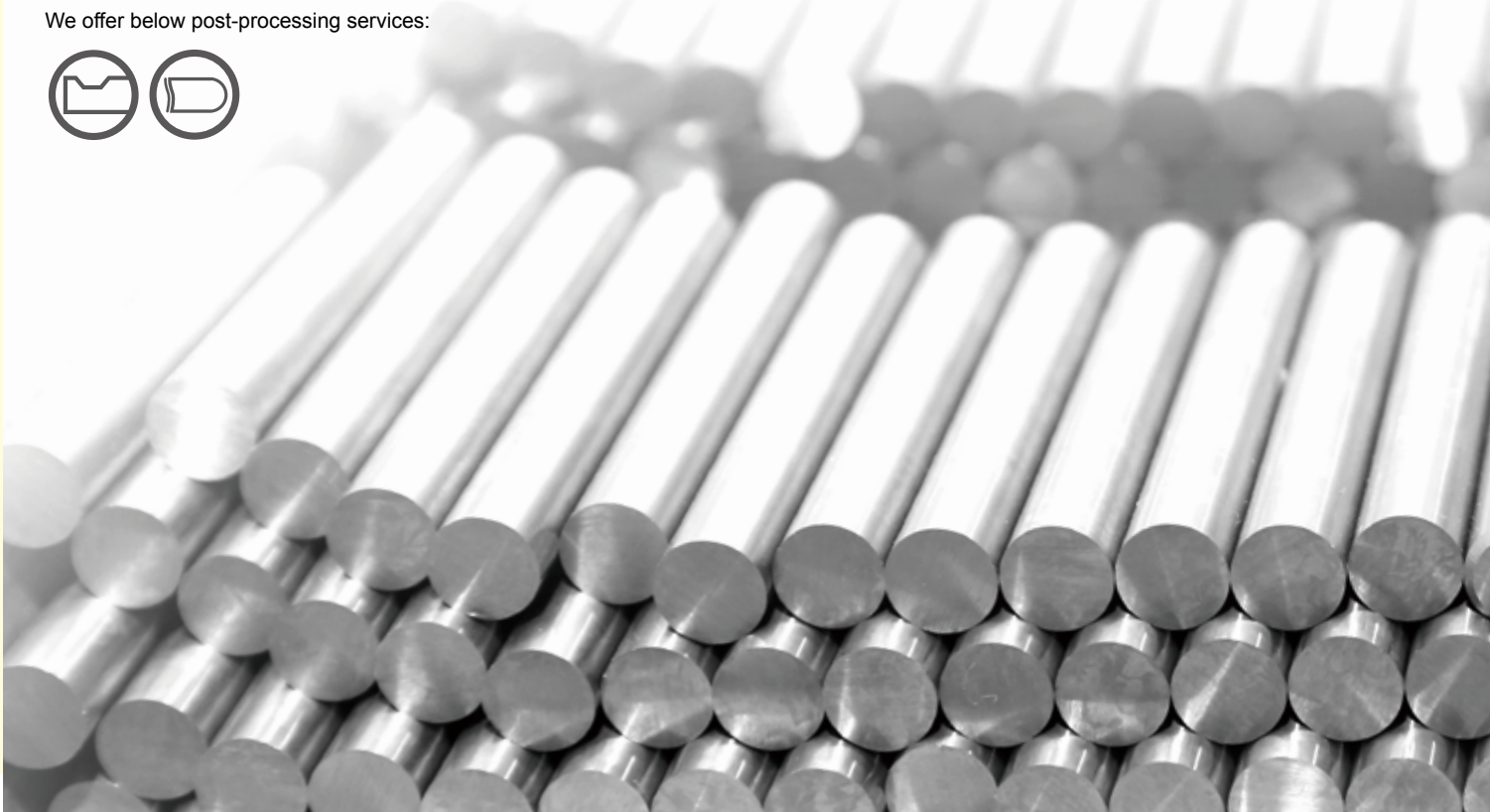


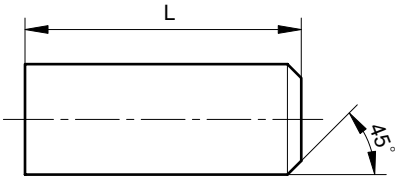
Ground Solid Rods - Cut to Length (DIN)					
Code	D	h5 D Tol.	L	Chamfer	Grade
	mm	mm	mm	mm	WF15
RGMC 0300−039	3.0	-0/-0.004	39	0.3	○
RGMC 0400−051	4.0	-0/-0.005	51	0.4	○
RGMC 0500−051	5.0	-0/-0.005	51	0.5	○
RGMC 0600−051	6.0	-0/-0.005	51	0.6	○
RGMC 0600−055	6.0	-0/-0.005	55	0.6	○
RGMC 0600−058	6.0	-0/-0.005	58	0.6	○
RGMC 0800−059	8.0	-0/-0.006	59	0.8	○
RGMC 0800−064	8.0	-0/-0.006	64	0.8	○
RGMC 1000−067	10.0	-0/-0.006	67	1.0	○
RGMC 1000−073	10.0	-0/-0.006	73	1.0	○
RGMC 1200−074	12.0	-0/-0.008	74	1.0	○
RGMC 1200−084	12.0	-0/-0.008	84	1.0	○
RGMC 1400−076	14.0	-0/-0.008	76	1.0	○
RGMC 1400−084	14.0	-0/-0.008	84	1.0	○
RGMC 1600−083	16.0	-0/-0.008	83	1.0	○
RGMC 1600−093	16.0	-0/-0.008	93	1.0	○
RGMC 1800−093	18.0	-0/-0.008	93	1.5	○
RGMC 2000−093	20.0	-0/-0.009	93	1.5	○
RGMC 2000−105	20.0	-0/-0.009	105	1.5	○

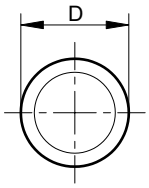
1. Standard Diameter: Ø3 ~ Ø20, other dimensions are upon request.
2. Standard Length: DIN standard, other dimensions are upon requst.

○=Make-to-Order

We offer below post-processing services:







Ground Solid Rods - Cut to Length (Inch)							
Code	D		h6 D Tol.	L		Chamfer	Grade
	inch	mm	mm	inch	mm	mm	K200
RGIC 1/8−1 1/2	1/8	3.175	-0/-0.008	1 1/2	38.10	0.4	○
RGIC 1/8−2	1/8	3.175	-0/-0.008	2	50.80	0.4	○
RGIC 1/8−2 1/2	1/8	3.175	-0/-0.008	2 1/2	63.50	0.4	○
RGIC 3/16−2	3/16	4.763	-0/-0.008	2	50.80	0.4	○
RGIC 3/16−2 1/2	3/16	4.763	-0/-0.008	2 1/2	63.50	0.4	○
RGIC 3/16−3	3/16	4.763	-0/-0.008	3	76.20	0.4	○
RGIC 1/4−2	1/4	6.350	-0/-0.009	2	50.80	0.4	○
RGIC 1/4−2 1/2	1/4	6.350	-0/-0.009	2 1/2	63.50	0.4	○
RGIC 1/4−3	1/4	6.350	-0/-0.009	3	76.20	0.4	○
RGIC 5/16−2 1/2	5/16	7.938	-0/-0.009	2 1/2	63.50	0.6	○
RGIC 5/16−3	5/16	7.938	-0/-0.009	3	76.20	0.6	○
RGIC 5/16−3 1/2	5/16	7.938	-0/-0.009	3 1/2	88.90	0.6	○
RGIC 5/16−4	5/16	7.938	-0/-0.009	4	101.60	0.6	○
RGIC 3/8−2 1/2	3/8	9.525	-0/-0.009	2 1/2	63.50	0.6	○
RGIC 3/8−3	3/8	9.525	-0/-0.009	3	76.20	0.6	○
RGIC 3/8−3 1/2	3/8	9.525	-0/-0.009	3 1/2	88.90	0.6	○
RGIC 3/8−4	3/8	9.525	-0/-0.009	4	101.60	0.6	○
RGIC 7/16−2 3/4	7/16	11.113	-0/-0.011	2 3/4	69.85	0.6	○
RGIC 1/2−3	1/2	12.700	-0/-0.011	3	76.20	0.8	○
RGIC 1/2−3 1/2	1/2	12.700	-0/-0.011	3 1/2	88.90	0.8	○
RGIC 1/2−4	1/2	12.700	-0/-0.011	4	101.60	0.8	○
RGIC 1/2−5	1/2	12.700	-0/-0.011	5	127.00	0.8	○
RGIC 5/8−3 1/2	5/8	15.875	-0/-0.011	3 1/2	88.90	1.0	○
RGIC 5/8−4	5/8	15.875	-0/-0.011	4	101.60	1.0	○
RGIC 5/8−5	5/8	15.875	-0/-0.011	5	127.00	1.0	○
RGIC 5/8−6	5/8	15.875	-0/-0.011	6	152.40	1.0	○
RGIC 3/4−4	3/4	19.050	-0/-0.013	4	101.60	1.0	○
RGIC 3/4−5	3/4	19.050	-0/-0.013	5	127.00	1.0	○
RGIC 3/4−6	3/4	19.050	-0/-0.013	6	152.40	1.0	○
RGIC 3/4−7	3/4	19.050	-0/-0.013	7	177.80	1.0	○
RGIC 1 −4	1	25.400	-0/-0.013	4	101.60	1.0	○
RGIC 1 −5	1	25.400	-0/-0.013	5	127.00	1.0	○
RGIC 1 −6	1	25.400	-0/-0.013	6	152.40	1.0	○
RGIC 1 −7	1	25.400	-0/-0.013	7	177.80	1.0	○
RGIC 1 −8	1	25.400	-0/-0.013	8	203.20	1.0	○

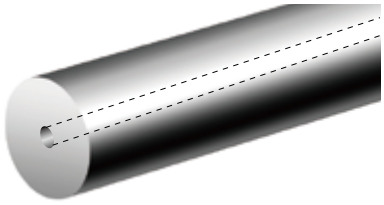
1. Standard Diameter: Ø1/8" ~ Ø 1", other dimensions are upon request.
2. Standard Length: Imperial standard, other dimensions are upon requst.

●=Standard Stock
○=Make-to-Order

We offer below post-processing services:

Coolant Hole Rods

Sintered Central Coolant Hole Rods

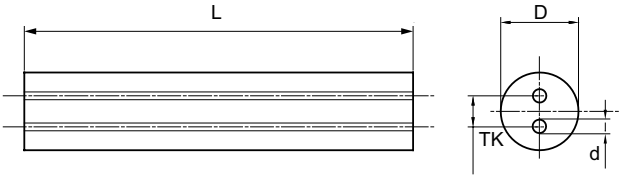


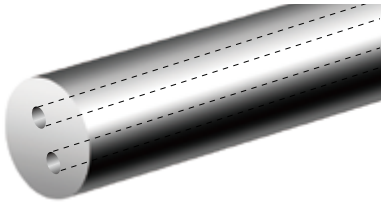
Sintered Central Coolant Hole Rods				
Code	D	d	L	Grade
	mm	mm	mm	WF15
00R1 0320/0.7-330	3.0	0.7	330	○
00R1 0420/0.6-330	4.0	0.6	330	○
00R1 0420/0.8-330	4.0	0.8	330	○
00R1 0520/1.0-330	5.0	1.0	330	○
00R1 0620/1.0-330	6.0	1.0	330	○
00R1 0620/1.5-330	6.0	1.5	330	○
00R1 0720/0.8-330	7.0	0.8	330	○
00R1 0820/1.2-330	8.0	1.2	330	○
00R1 0820/1.5-330	8.0	1.5	330	○
00R1 0920/1.0-330	9.0	1.0	330	○
00R1 1020/1.5-330	10.0	1.5	330	○
00R1 1020/2.0-330	10.0	2.0	330	○
00R1 1120/1.0-330	11.0	1.0	330	○
00R1 1220/2.0-330	12.0	2.0	330	○
00R1 1320/1.0-330	13.0	1.0	330	○
00R1 1420/2.0-330	14.0	2.0	330	○
00R1 1520/2.0-330	15.0	2.0	330	○
00R1 1620/2.0-330	16.0	2.0	330	○
00R1 1720/3.0-330	17.0	3.0	330	○
00R1 1820/3.0-330	18.0	3.0	330	○
00R1 2020/3.0-330	20.0	3.0	330	○
00R1 2020/4.0-330	20.0	4.0	330	○
00R1 2220/3.0-330	22.0	3.0	330	○
00R1 2420/4.0-330	24.0	4.0	330	○
00R1 2520/3.0-330	25.0	3.0	330	○
00R1 2520/4.0-330	25.0	4.0	330	○
00R1 2620/4.0-330	26.0	4.0	330	○
00R1 2820/4.0-330	28.0	4.0	330	○
00R1 3220/5.0-330	32.0	5.0	330	○

1. Standard Diameter: Ø3 ~ Ø32, other dimensions are upon request.
2. Standard Length: 330mm, other dimensions are upon requst.

○=Make-to-Order

We offer below post-processing services:





Sintered Parallel Coolant Hole Rods					
Code	D	TK	d	L	Grade
	mm	mm	mm	mm	WF15
00R2 0420/1.6/0.5-330	4.0	1.6	0.5	330	○
00R2 0520/2.1/0.6-330	5.0	2.1	0.6	330	○
00R2 0620/2.4/1.0-330	6.0	2.4	1.0	330	○
00R2 0620/2.6/0.9-330	6.0	2.6	0.9	330	○
00R2 0620/3.0/0.9-330	6.0	3.0	0.9	330	○
00R2 0720/3.0/0.9-330	7.0	3.0	0.9	330	○
00R2 0820/2.6/0.8-330	8.0	2.6	0.8	330	○
00R2 0820/2.6/1.0-330	8.0	2.6	1.0	330	○
00R2 0920/2.0/0.9-330	9.0	2.0	0.9	330	○
00R2 1020/2.5/1.0-330	10.0	2.5	1.0	330	○
00R2 1120/3.5/1.2-330	11.0	3.5	1.2	330	○
00R2 1220/3.5/1.2-330	12.0	3.5	1.2	330	○
00R2 1220/5.0/1.8-330	12.0	5.0	1.8	330	○
00R2 1220/5.8/1.8-330	12.0	5.8	1.8	330	○
00R2 1320/5.0/1.5-330	13.0	5.0	1.5	330	○
00R2 1420/5.0/1.5-330	14.0	5.0	1.5	330	○
00R2 1420/5.5/1.8-330	14.0	5.5	1.8	330	○
00R2 1520/5.0/1.5-330	15.0	5.0	1.5	330	○
00R2 1620/5.0/1.0-330	16.0	5.0	1.0	330	○
00R2 1620/5.5/1.8-330	16.0	5.5	1.8	330	○
00R2 1820/6.0/2.0-330	18.0	6.0	2.0	330	○
00R2 2020/6.0/2.0-330	20.0	6.0	2.0	330	○
00R2 2520/7.5/2.0-330	25.0	7.5	2.0	330	○

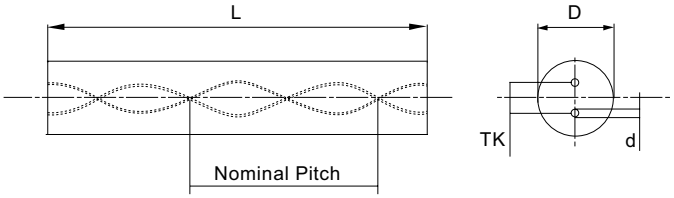
1. Standard Diameter: Ø4 ~ Ø25, other dimensions are upon request.
2. Standard Length: 330mm, other dimensions are upon requst.

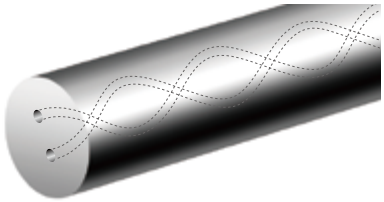
○=Make-to-Order

We offer below post-processing services:

Coolant Hole Rods

Sintered Two Helical Coolant Hole Rods (30°)



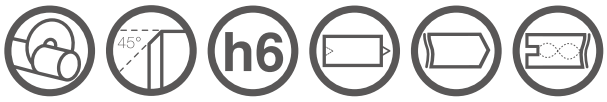


30° Two Helical Coolant Hole Rods									
Code	D	TK	d	L	Grade	Range of Drill Diameter	Nominal Pitch Reference		
	mm	mm	mm	mm	K200		Blue	White	Yellow
30R2 0330/1.2/0.4/16.3-330	3.0	1.20	0.40	330	●	2.5	15.89	16.32	16.77
30R2 0330/1.6/0.4/16.3-330	3.0	1.60	0.40	330	○	2.9	15.89	16.32	16.77
30R2 0430/1.6/0.4/21.8-330	4.0	1.60	0.40	330	●	3.1	21.19	21.77	22.36
30R2 0430/1.8/0.5/21.8-330	4.0	1.80	0.50	330	●	3.5	21.19	21.77	22.36
30R2 0430/2.1/0.6/21.8-330	4.0	2.10	0.60	330	●	3.8	21.19	21.77	22.36
30R2 0530/2.4/0.7/27.2-330	5.0	2.40	0.70	330	●	4.5	26.49	27.21	27.95
30R2 0630/1.8/0.5/32.7-330	6.0	1.80	0.50	330	●	3.9	31.79	32.65	33.54
30R2 0630/2.4/0.7/32.7-330	6.0	2.40	0.70	330	●	4.7	31.79	32.65	33.54
30R2 0730/3.5/1.0/38.1-330	7.0	3.50	1.00	330	●	6.3	37.09	38.09	39.13
30R2 0830/2.8/0.6/43.5-330	8.0	2.80	0.60	330	○	5.4	42.38	43.53	44.73
30R2 0830/3.5/1.0/43.5-330	8.0	3.50	1.00	330	●	6.5	42.38	43.53	44.73
30R2 0830/3.8/1.0/43.5-330	8.0	3.80	1.00	330	●	6.8	42.38	43.53	44.73
30R2 0930/4.5/1.4/49.0-330	9.0	4.50	1.40	330	●	8.2	47.68	48.97	50.32
30R2 1030/3.5/1.0/54.4-330	10.0	3.50	1.00	330	○	7.0	52.98	54.41	55.91
30R2 1030/4.5/1.4/54.4-330	10.0	4.50	1.40	330	●	8.4	52.98	54.41	55.91
30R2 1030/4.8/1.4/54.4-330	10.0	4.80	1.40	330	○	8.8	52.98	54.41	55.91
30R2 1130/4.9/1.4/59.9-330	11.0	4.90	1.40	330	●	9.1	58.28	59.86	61.50
30R2 1230/4.9/1.4/65.3-330	12.0	4.90	1.40	330	○	9.3	63.58	65.30	67.09
30R2 1230/5.85/1.4/65.3-330	12.0	5.85	1.40	330	●	10.2	63.58	65.30	67.09
30R2 1330/6.1/1.75/70.7-330	13.0	6.10	1.75	330	●	11.1	68.87	70.74	72.68
30R2 1430/6.7/1.75/76.2-330	14.0	6.70	1.75	330	●	11.9	74.17	76.18	78.27
30R2 1530/7.1/1.75/81.6-330	15.0	7.10	1.75	330	●	12.5	79.47	81.62	83.86
30R2 1630/7.9/1.75/87.1-330	16.0	7.90	1.75	330	●	13.5	84.77	87.06	89.45
30R2 1630/7.9/2.0/87.1-330	16.0	7.90	2.00	330	○	13.7	84.77	87.06	89.45
30R2 1730/7.9/1.75/92.5-330	17.0	7.90	1.75	330	●	13.7	90.07	92.50	95.04
30R2 1830/9.0/1.7/98.0-330	18.0	9.00	1.70	330	○	15.0	95.37	97.95	100.63
30R2 1830/9.15/2.0/98.0-330	18.0	9.15	2.00	330	●	15.4	95.37	97.95	100.63
30R2 1930/9.7/2.0/103.4-330	19.0	9.70	2.00	330	○	16.2	100.66	103.39	106.22
30R2 2030/9.9/2.0/108.8-330	20.0	9.90	2.00	330	●	16.7	105.96	108.83	111.81
30R2 2030/9.9/2.5/108.8-330	20.0	9.90	2.50	330	○	17.2	105.96	108.83	111.81
30R2 2130/10.5/2.0/114.3-330	21.0	10.50	2.00	330	○	17.5	111.26	114.27	117.40
30R2 2230/11.1/2.0/119.7-330	22.0	11.10	2.00	330	○	18.3	116.56	119.71	122.99
30R2 2230/11.1/2.5/119.7-330	22.0	11.10	2.50	330	●	18.8	116.56	119.71	122.99

1. Nominal Pitch: Categorise in 3 regions. The nominal pitch number is the reference for drill up to 12XD
2. Above 12XD Drill: Nominal pitch marked at the end of rods is the reference for drill over 12XD

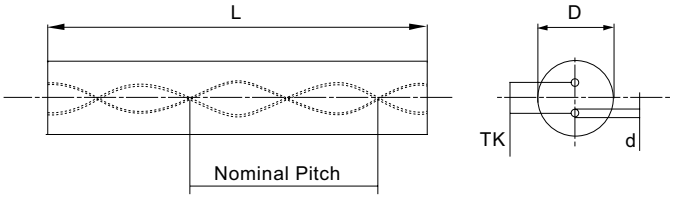
●=Standard Stock
○=Make-to-Order

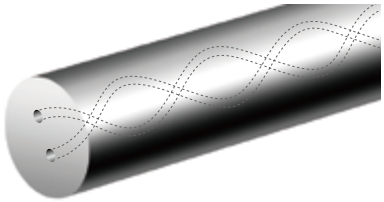
We offer below post-processing services:



Coolant Hole Rods

Sintered Two Helical Coolant Hole Rods (30° & 40°)





30° Two Helical Coolant Hole Rods									
Code	D	TK	d	L	Grade	Range of Drill Diameter	Nominal Pitch Reference		
	mm	mm	mm	mm	K200		Blue	White	Yellow
30R2 2330/11.7/2.5/125.2-330	23.0	11.7	2.5	330	○	19.6	121.86	125.15	128.58
30R2 2430/12.3/2.0/130.6-330	24.0	12.3	2.0	330	○	19.9	127.15	130.59	134.18
30R2 2530/12.3/2.5/136.0-330	25.0	12.3	2.5	330	○	20.6	132.45	136.03	139.77
30R2 2530/12.8/2.0/136.0-330	25.0	12.8	2.0	330	●	20.6	132.45	136.03	139.77
30R2 2730/13.7/2.0/146.9-330	27.0	13.7	2.0	330	○	21.9	143.05	146.92	150.95
30R2 2830/14.1/2.0/152.4-330	28.0	14.1	2.0	330	○	22.5	148.35	152.36	156.54
30R2 3230/17.0/3.0/174.1-330	32.0	17.0	3.0	330	○	27.2	169.54	174.12	178.90

40° Two Helical Coolant Hole Rods									
Code	D	TK	d	L	Grade	Range of Drill Diameter	Nominal Pitch Reference		
	mm	mm	mm	mm	K200		Blue	White	Yellow
40R2 0630/1.6/0.4/22.5-330	6.0	1.6	0.4	330	○	3.5	21.68	22.46	23.28
40R2 0630/1.9/0.7/22.5-330	6.0	1.9	0.7	330	●	4.1	21.68	22.46	23.28
40R2 0830/2.4/0.65/30.0-330	8.0	2.4	0.65	330	●	5.0	28.91	29.95	31.04
40R2 0930/3.0/0.7/33.7-330	9.0	3.0	0.7	330	○	6.0	32.53	33.70	34.92
40R2 1030/3.2/1.0/37.4-330	10.0	3.2	1.0	330	●	6.7	36.14	37.44	38.80
40R2 1230/3.8/1.2/44.9-330	12.0	3.8	1.2	330	●	8.0	43.37	44.93	46.55
40R2 1430/4.3/1.2/52.4-330	14.0	4.3	1.2	330	●	8.9	50.60	52.42	54.31
40R2 1630/5.1/1.3/59.9-330	16.0	5.1	1.3	330	●	10.2	57.82	59.90	62.07
40R2 1830/5.9/1.4/67.4-330	18.0	5.9	1.4	330	●	11.6	65.05	67.39	69.83
40R2 2030/6.6/1.5/74.9-330	20.0	6.6	1.5	330	○	12.9	72.28	74.88	77.59
40R2 2530/7.6/1.75/93.6-330	25.0	7.6	1.75	330	●	15.1	90.35	93.60	96.99

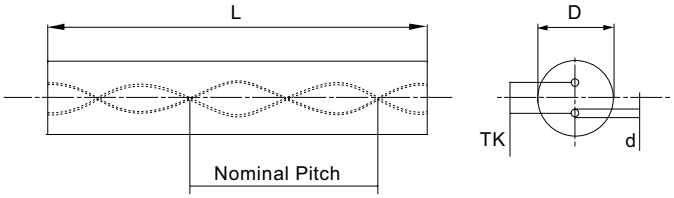
1. Nominal Pitch: Categorise in 3 regions. The nominal pitch number is the reference for drill up to 12XD
2. Above 12XD Drill: Nominal pitch marked at the end of rods is the reference for drill over 12XD

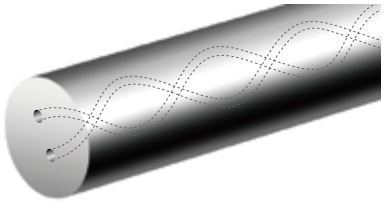
●=Standard Stock
○=Make-to-Order

We offer below post-processing services:

Coolant Hole Rods

Sintered Two Helical Coolant Hole Rods (15° & Special)





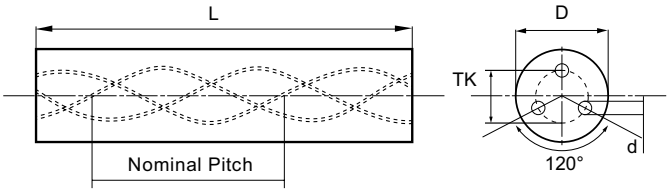
15° Two Helical Coolant Hole Rods									
Code	D	TK	d	L	Grade	Range of Drill Diameter	Nominal Pitch Reference		
	mm	mm	mm	mm	K200		Blue	White	Yellow
15R2 0630/2.6/0.7/70.4-330	6.0	2.6	0.7	330	○	4.9	68.75	70.35	72.02
15R2 0830/3.8/1.25/93.8-330	8.0	3.8	1.25	330	○	7.2	91.66	93.80	96.03
15R2 1030/3.3/1.0/117.3-330	10.0	3.3	1.0	330	○	6.8	114.58	117.25	120.03
15R2 1230/6.25/1.55/140.7-330	12.0	6.25	1.55	330	○	10.8	137.49	140.70	144.04
15R2 1430/6.7/1.9/164.1-330	14.0	6.7	1.9	330	○	12.0	160.41	164.14	168.05
15R2 1630/8.0/2.1/187.6-330	16.0	8.0	2.1	330	○	13.9	183.32	187.59	192.06
15R2 1830/9.0/2.3/211.0-330	18.0	9.0	2.3	330	○	15.6	206.24	211.04	216.06
15R2 2030/10.0/2.5/234.5-330	20.0	10.0	2.5	330	○	17.2	229.15	234.49	240.07

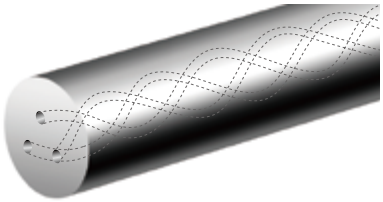
Special Two Helical Coolant Hole Rods										
Code	Angle	D	TK	d	L	Grade	Range of Drill Diameter	Nominal Pitch Reference		
	°	mm	mm	mm	mm	K200		Blue	White	Yellow
46R2 0630/1.6/0.4/18.5-330	45.50	6.0	1.6	0.4	330	○	3.6	17.89	18.52	19.18
43R2 0630/1.7/0.55/20.4-330	42.70	6.0	1.7	0.55	330	○	3.8	19.72	20.43	21.16
39R2 0630/1.7/0.55/23.0-330	39.30	6.0	1.7	0.55	330	○	3.8	22.23	23.03	23.87
38R2 0630/2.2/0.5/24.0-330	38.20	6.0	2.2	0.5	330	○	4.3	23.15	24.00	24.88
36R2 0630/2.4/0.7/25.9-330	36.10	6.0	2.4	0.7	330	○	4.7	25.07	25.85	26.66
36R2 0630/2.1/0.7/25.5-330	36.47	6.0	2.1	0.7	330	○	4.4	24.74	25.50	26.29
33R2 0630/2.4/0.7/29.0-330	33.00	6.0	2.4	0.7	330	○	4.7	28.30	29.03	29.78
35R2 0830/3.3/1.0/35.9-330	35.00	8.0	3.3	1.0	330	○	6.3	34.80	35.89	37.03
38R2 0830/2.85/0.7/32.7-330	37.60	8.0	2.85	0.7	330	○	5.5	31.48	32.65	33.84
36R2 1030/3.8/1.0/43.6-330	35.80	10.0	3.8	1.0	330	○	7.4	41.99	43.56	45.20
32R2 1430/5.6/1.2/69.3-330	32.40	14.0	5.6	1.2	330	○	10.2	67.55	69.31	71.12

1. Nominal Pitch: Categorise in 3 regions. The nominal pitch number is the reference for drill up to 12XD
2. Above 12XD Drill: Nominal pitch marked at the end of rods is the reference for drill over 12XD

●=Standard Stock
○=Make-to-Order

We offer below post-processing services:



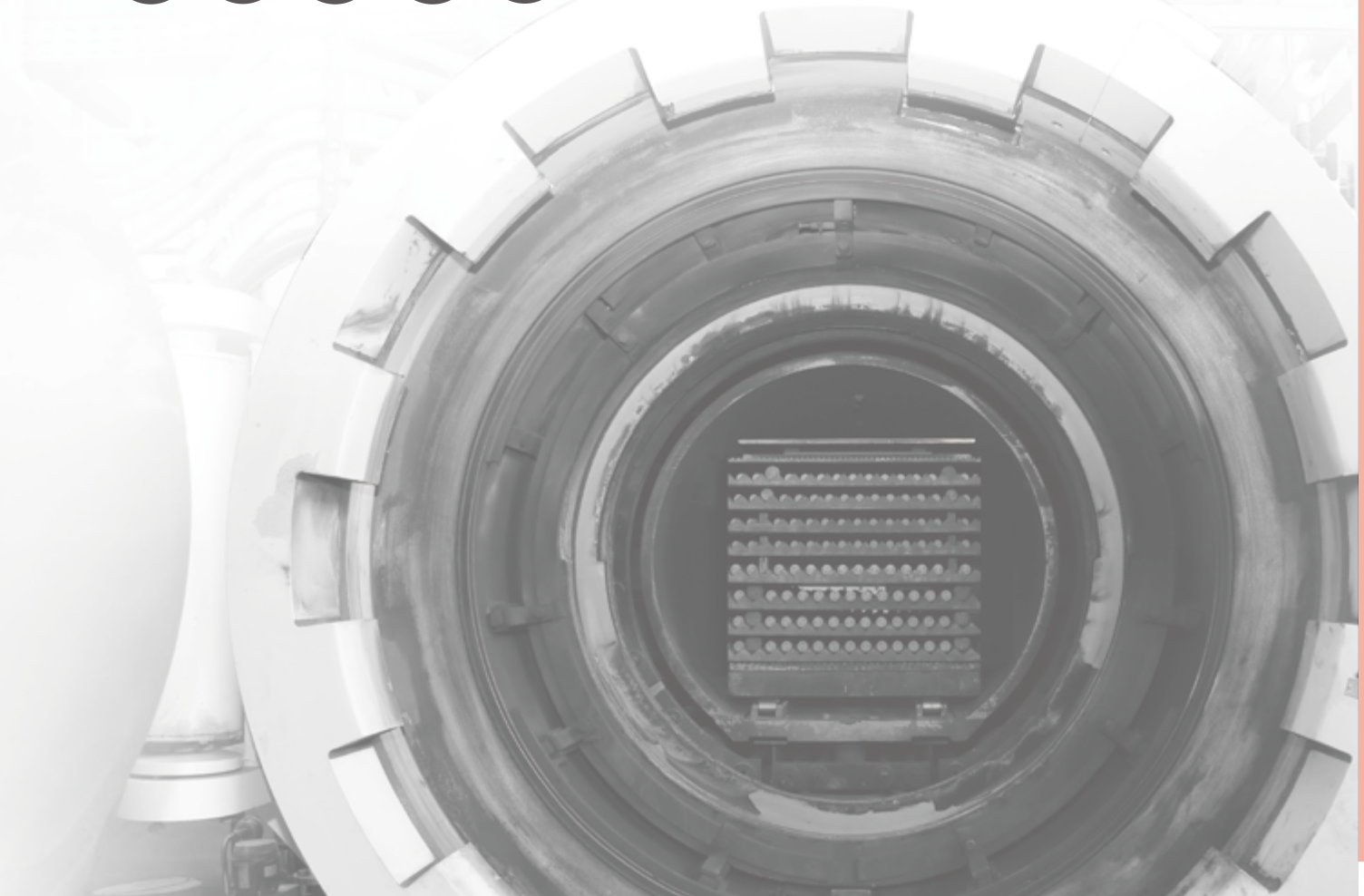


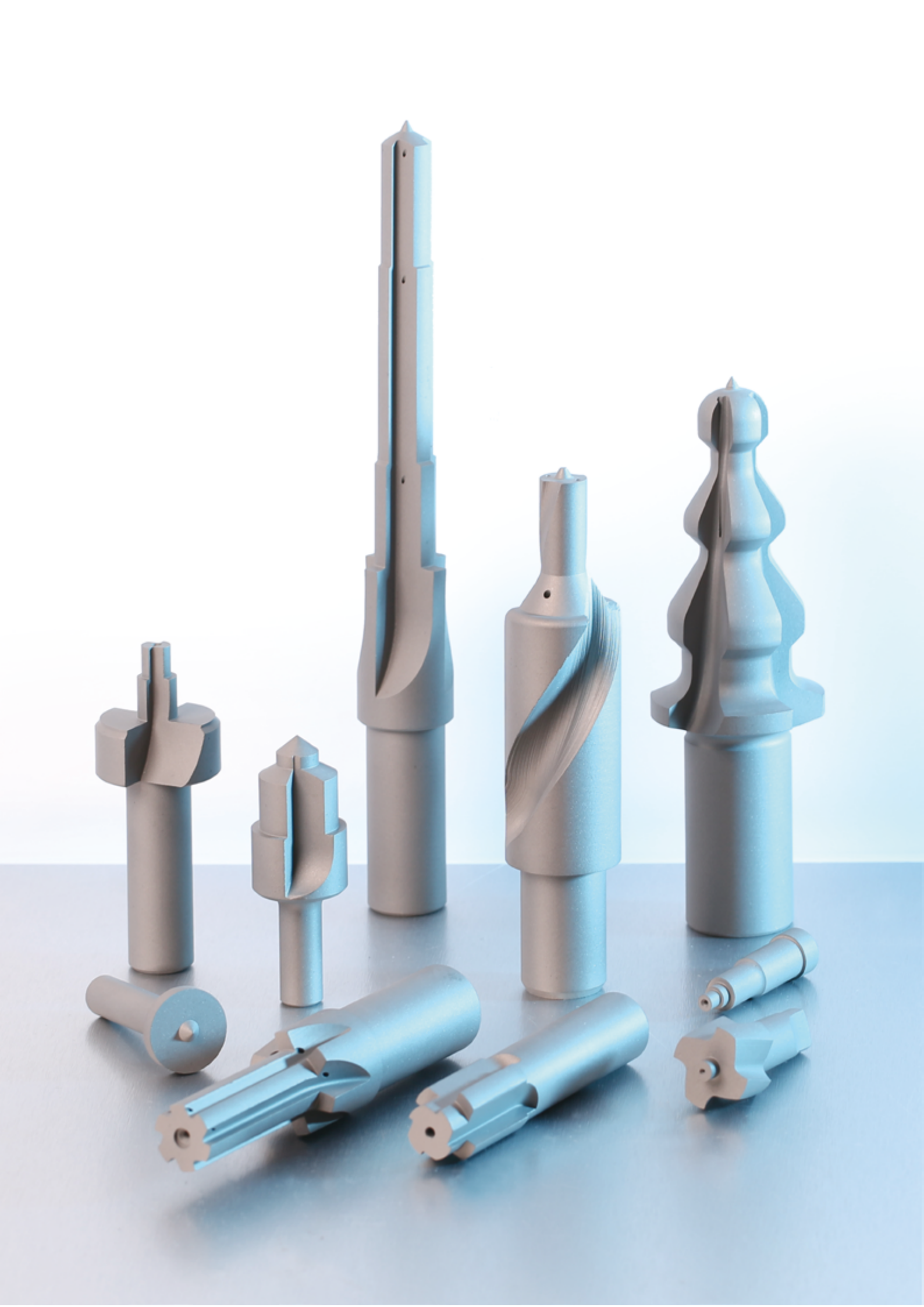
30° Three Helical Coolant Hole Rods									
Code	D	TK	d	L	Grade	Range of Drill Diameter	Nominal Pitch Reference		
	mm	mm	mm	mm	K200		Blue	White	Yellow
30R3 0630/3.0/0.6/32.7-330	6.0	3.0	0.6	330	●	5.2	31.79	32.65	33.54
30R3 0830/4.0/0.75/43.5-330	8.0	4.0	0.75	330	○	6.7	42.38	43.53	44.73
30R3 1030/4.9/1.0/54.4-330	10.0	4.9	1.0	330	○	8.4	52.98	54.41	55.91
30R3 1230/6.0/1.1/65.3-330	12.0	6.0	1.1	330	●	10.1	63.58	65.30	67.09
30R3 1430/7.1/1.3/76.2-330	14.0	7.1	1.3	330	○	11.8	74.17	76.18	78.27
30R3 1630/8.3/1.5/87.1-330	16.0	8.3	1.5	330	○	13.7	84.77	87.06	89.45
30R3 1830/9.7/1.7/98.0-330	18.0	9.7	1.7	330	○	15.7	95.37	97.95	100.63
30R3 2030/10.4/2.0/108.8-330	20.0	10.4	2.0	330	●	17.2	105.96	108.83	111.81
30R3 2530/12.5/2.0/136.0-330	25.0	12.5	2.0	330	○	20.3	132.45	136.03	139.77
30R3 2830/13.7/2.5/152.4-330	28.0	13.7	2.5	330	○	22.6	148.35	152.36	156.54
30R3 3330/14.5/2.5/179.6-330	33.0	14.5	2.5	330	○	24.4	174.84	179.57	184.49

1. Nominal Pitch: Categorise in 3 regions. The nominal pitch number is the reference for drill up to 12XD
2. Above 12XD Drill: Nominal pitch marked at the end of rods is the reference for drill over 12XD

●=Standard Stock
○=Make-to-Order

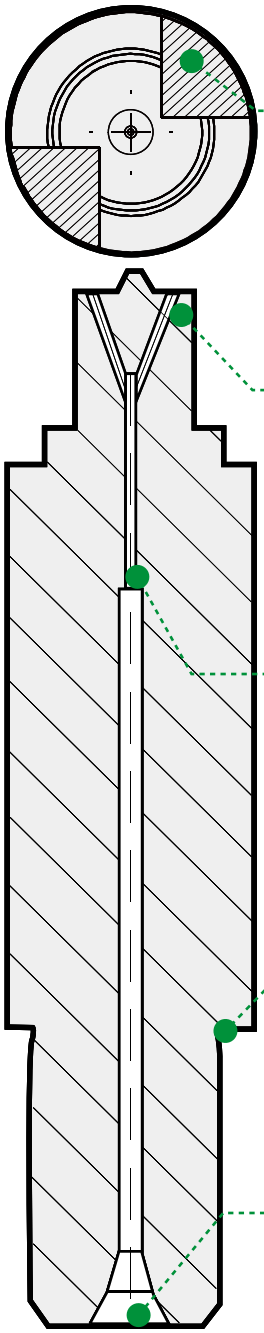
We offer below post-processing services:





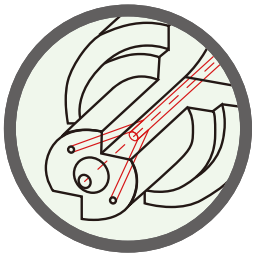
Preforms

In addition to standard rods, preform rods had become a trend in the market to cope with fast-changing & complicated industrial applications. From semi-finished cutting tool, boring bar, to PCD tool shank, CB CERATIZIT produces near-net-shape matrix in a single process to satisfy customers' multiple demands, thanks to state-of-the-art production technology.



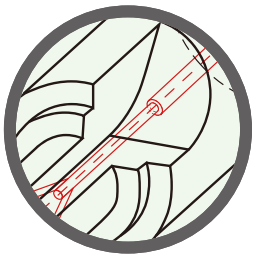
Chip Flute

With the pre-machined external flutes on the matrix, customers will be benefited from reduced production lead time and grinding cost. High precision technology leaves minimized grinding stock for users to make it a finished tool.



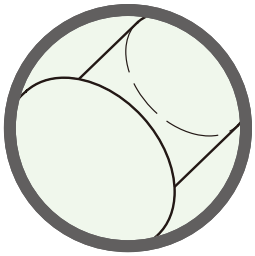
Y-Exit Coolant Hole

Y-Exit holes with various angle, hole diamter, & length are manufacturered under automatic processing, which will remarkably speed up production cycle.



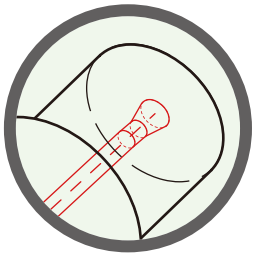
Blind / Through Coolant Hole

In line with drawings, no matter blind or through coolant hole could be formed integrated within standard tolerance of CB CERATIZIT.



Diameter Step

To improve the diversification of product services, it is able to produce diameter step including prependicular, taper, R angle, and other special form.



Center Hole

As part of preforms business, center holes based on international standard are on service list, no matter A, B, C, or R Type.

Special products

Customized products

Apart from standard program products, individual rods product solution is upon request

With CB-CERATIZIT comprehensive production capability, the most demanding requirement from customers, such as special coolant hole profiles, external grooves, and other non-standard designs could be achieved in a relatively short time. Our expertize is the guarantee of your quality.

Extra-Long Rods

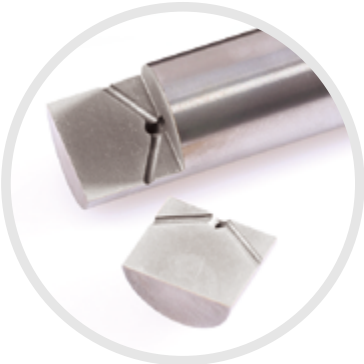
- Rods Length from 35 mm to 3,000 mm
- Advanced technology to fulfil special demands

Tailored Diameter

- Rods diameter from 1 mm up to 80 mm
- Cutting-edge technology ensures compactness and performance of every single rod

Stepped Rods

- Unground stepped rods / Ground stepped rods
- Different shape of pre-process to satisfy demand of fast operation



Y-Exit Coolant Hole Rods

- Pre-shaped coolant hole
- Special design for angles and hole positions

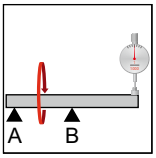
Ball-Nose Rods

- Pre-shaped ball nose
- Remarkably reduce operation time

Drills with Cones & Grooves

- Cones with different angle on demand
- Grooves to enhance fluid efficiency transmission

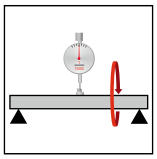
Ground Rods



Circular Run-out (Ground solid rods)

Maximum run-out (µm)

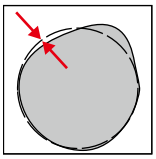
OD(Φ) \ L (mm)	30	50	60	70	80	90	100	110	120	130	140	150
OD 3	5	5	6	8	10	/	/	/	/	/	/	/
OD 4	5	5	6	8	10	/	/	/	/	/	/	/
OD 5	5	5	5	6	6	10	/	/	/	/	/	/
OD 6-7	4	4	5	5	6	7	8	8	10	/	/	/
OD 8-11	4	4	4	4	5	5	8	8	8	8	10	20
OD 12-15	3	3	3	4	4	4	5	6	6	7	10	10
OD 16-34	3	3	3	3	3	4	4	6	6	7	8	10



Straightness (Ground solid rods)

Straightness (mm)

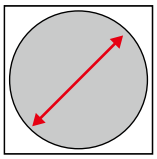
OD(Φ) \ L (mm)	310 / 330
2.0	1.20
3.0 - 5.0	0.15
6.0 - 7.0	0.12
8.0 - 9.0	0.10
10.0 - 11.0	0.08
12.0 - 19.0	0.05
20.0 - 32.0	<0.05



Roundness (Ground Rods)

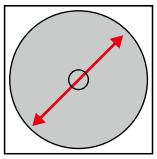
OD (Φ)	Tol. (µm)
3.0 - 9.5	3
10.0 - 14.0	4
15.0 - 22.0	5
25.0 - 28.0	6

Sintered Rods



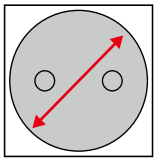
OD Tolearnce (Solid rods)

OD (mm)	Tol. (mm)
2.0 - 7.0	+0.2 / +0.4
7.5 - 11.5	+0.2 / +0.5
12.0 - 16.0	+0.3 / +0.6
16.5 - 22.0	+0.3 / +0.7
23.0 - 29.0	+0.4 / +0.8
> 30.0	+0.7 / +1.3



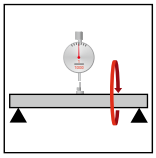
OD Tolerance (Straight hole rods)

OD (mm)	Tol. (mm)
3.0 - 5.0	+0.3 / +0.5
6.0 - 10.0	+0.3 / +0.6
11.0 - 19.0	+0.4 / +0.7
20.0 - 29.0	+0.4 / +0.9
> 30.0	+0.7 / +1.3



OD Tolerance (Helix rods)

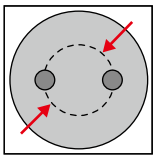
OD (mm)	Tol. (mm)
3.0 - 5.0	+0.5 / +0.9
6.0 - 11.0	+0.7 / +1.3
12.0 - 15.0	+0.7 / +1.5
16.0 - 28.0	+0.7 / +1.7



Straightness (Sintered solid rods)

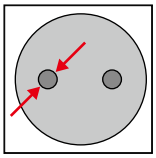
Straightness (mm)

OD(Φ) \ L (mm)	310 / 330
2.0-3.0	1.2
3.2-32.0	0.5



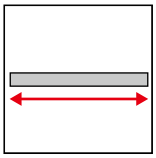
Pitch Circle Diameter

TK (mm)	Tol. (mm)
1.0 - 3.0	+0.3 / - 0.3
3.1 - 5.0	+0.4 / - 0.4
> 5.1	+0.5 / - 0.5



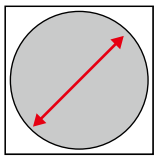
Hole Diameter

d (mm)	Tol. (mm)
< 1.0	+0.15 / -0.15
1.0 - 2.0	+0.20 / -0.20
2.1 - 3.0	+0.25 / -0.25



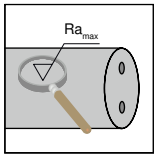
Length Tolerance

Length(mm)	Tol. (mm)
310 / 330 mm	+0.0 / +2.0
Cut to length	+0.5 / +1.5



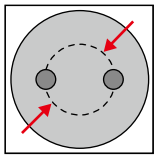
Outside Diameter

Measure the upper and lower limit of outside diameter of the round rods.



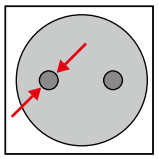
Surface Roughness

The surface quality of ground rods is indicated as maximum average roughness value Ra. (DIN EN ISO 4287: 1998)



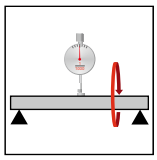
Pitch Circle Diameter

The pitch circle is defined as the circle which goes through two or three centre points of coolant holes.
The diameter of this suppositional circle is "Pitch Circle Diameter" or "TK".



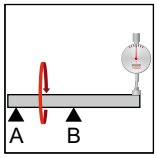
Hole Diameter

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



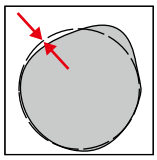
Straightness (Ground Rods)

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



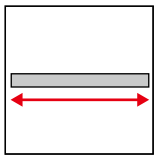
Circular Run-Out (Ground Rods)

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



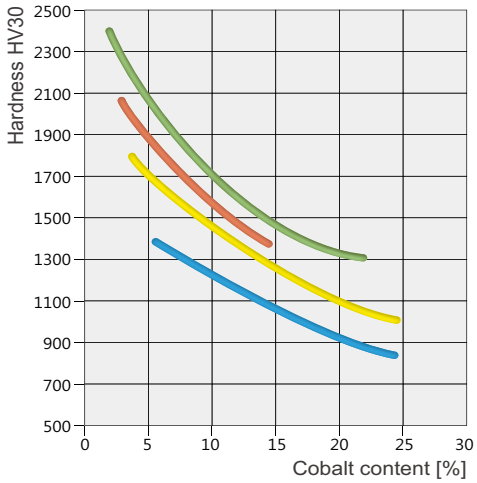
Roundness (Ground Rods)

Roundness is the radial distance of two concentric circles which include the circumference line of the round rod's section.



Length

Measure the upper and lower limit of length of the round rods.

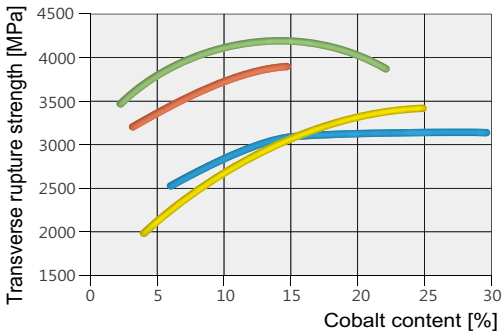


Hardness

Hardness is a material's mechanical resistance to another, harder, material which penetrates it. This value is usually measured by "Vickers Harndess Procedure" (ISO 3878) or "Rockwell Hardness Procedure" (ISO 3738). Like wear resistance, hardness also increases with a smaller grain size and lower cobalt content. Therefore, hardness is often used as a reference for wear resistance.

- Ultrafine grades
- Fine / Medium grades
- Submicron grades
- Coarse grades

Figure 1: Hardness in relation to the cobalt content and grain size

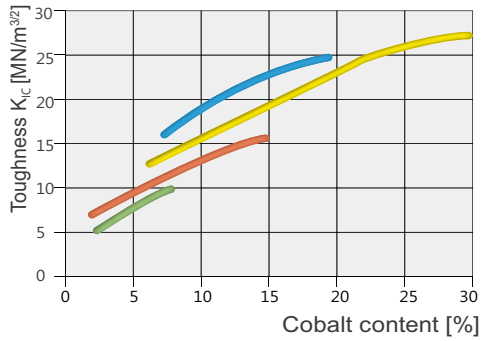


Transverse Rupture Strength

Testing "Transverse Rupture Strength" is a common procedure to analyse the mechanical property of carbide. Based on ISO 3327 standard, a material with fixed length is placed on two contact points and certain stress is given in the milddle until the material breaks. The average value of several tests is then determined as T.R.S. (Transverse Rupture Strength)

- Ultrafine grades
- Fine / Medium grades
- Submicron grades
- Coarse grades

Figure 2: Transverse rupture strength in relation to the grain size and thecobalt content

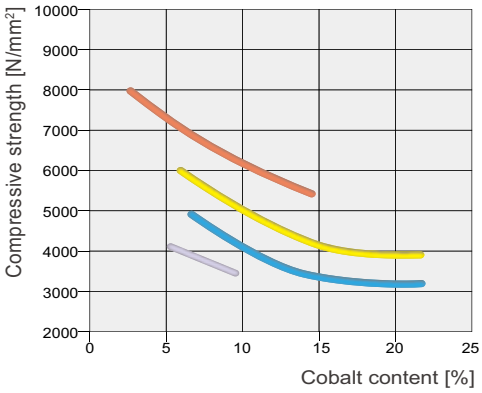


Fracture Toughness

When a material is exposed to external stress, this leads to mechanical tensions. Under this circumstances, both the strengh and ductility of the material indicate the basis for the concept of toughness. In other words, toughness is defined as the capacity to resist fracture or rupture growth. "Palmqvist Method" is frequently applied to determine the toughness value, K_{IC}.

- Ultrafine grades
- Fine / Medium grades
- Submicron grades
- Coarse grain grades

Figure 3: Fracture toughness in relation to the grain size and the cobalt content

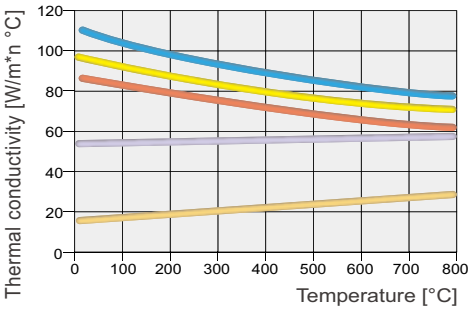


Compressive Strength

One of the most remarkable properties of carbide is the extremely high compressive strengh under uniaxial stress. This precious property is applied to almost all applications. When metal binder content decreases and the grain size decreases, the compressive strength increases. A small grain carbide 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 increase notably with the temperature, so that the results are variable when temperatures are high.

- Submicron grades
- Fine / Medium grades
- Coarse grades
- Extra-coarse grades

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

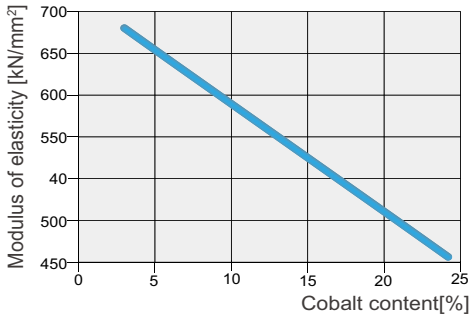


Thermal Conductivity

The thermal conductivity plays an important role in carbide applications, it determines the temperature in the wear areas and has a large influence on the carbide's thermal fatigure resistance and resistance to thermal fluctuations. The thermal conductivity of carbide is around twice as high as that of non-alloyed steel.

- Submicron grades
- Fine / Medium grades
- High y-phase content
- Coarse grades
- Low y-phase content

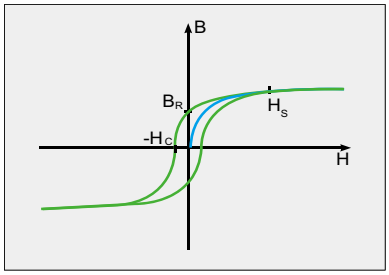
Figure 5: Thermal conductivity in relation to the temperature of various micro-structures and grain sizes



Modulus of Elasticity

The modulus of elasticity indicates the resistance of a material against elastic deformation. The modulus of elasticity for carbide is 2 to 3 times higher than in steel. It will increase linearly with decreaseing metal binder content.

Figure 6: Modulus of elasticity of WC-Co carbides



Magnetic Saturation

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 (blue line). The flux density decreases when the field strength rises, until maximum saturation is achieved.

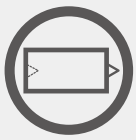
Coercive Force

Coercive Force is one of the property of magnetic material. The inverse field strength HC which is necessary to reduce the magnetic flux density to zero, or to 'de-magnetise' the material, is defined as coercive force. Coercive Force is usually measured in oersted (Oe) or ampere/meter (A/m) units and is denoted HC. It can be measured using a B-H analyzer or magnetometer.

Figure 7: Hysteresis curve of a ferromagnetic material

Value-added services

Not only focus on producing tungsten carbide rods, CB CERATIZIT has developed a series of value-added services to deal with demands of fast product cycle in cutting tool market.

Symbol	Service	Description
	Cutting	The most precise length tolerance could be guaranteed under our process.
	Grinding	Standard rods program could apply either h5 or h6 OD tolerance. Other demands upon request.
	Chamfering	Automatic chamfering service provides ready-to-use rods product.
	**Center Hole**	Any standard center hole (Male or Female hole), or center hole based on drawings is applicable in our grinding shop (DIN 332).
	Diameter Step	Provide different type of diameter step services to drive down machining time during tool-making process.
	Weldon Shank	Provide different type of weldon shanks, such as DIN 6535 HB or DIN 1835E.
	Ball Nose	Ball nose services could be offered based on customer demand.
	Point	Standard drill points, such as 120˚ or 140˚, are now on our service list.
	Groove	Pre-machined grooves allows customers to carry out easily afterward.

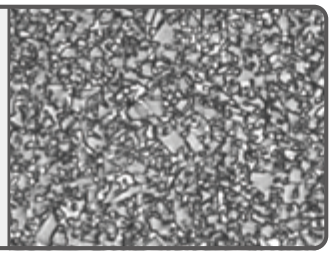
The Pillars of Success

The development of machining process require optimal control in
Carbide / Cutting Tool / Coating / Conditions
and they need to work together in order to achieve successful process.

Successful Machining Process

Carbide

- Optimum grade for the particular application and type of tool
- Optimum blank execution

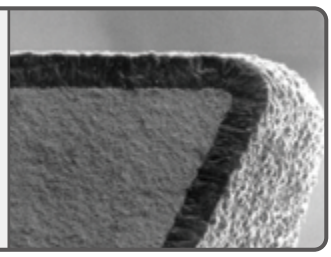


Cutting Tool

- Macro geometry
- Micro geometry
- Surface finish
- Precision

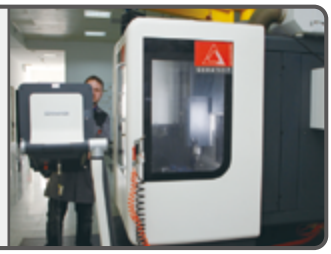
Coating

- Application oriented type of coating



Conditions

- Speeds & Feeds
- Machining strategy
- Rigidity of machine
- Cooling
- Clamping



* All parameters need to work together.

4C

CB-CERATIZIT GROUP

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CB-CERATIZIT
GROUP

TOOLING THE FUTURE

2021.03

We reserve the right to make technical changes for improvement of the product.