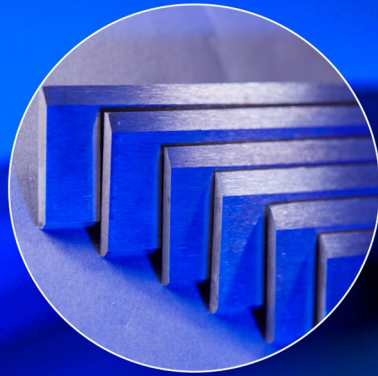
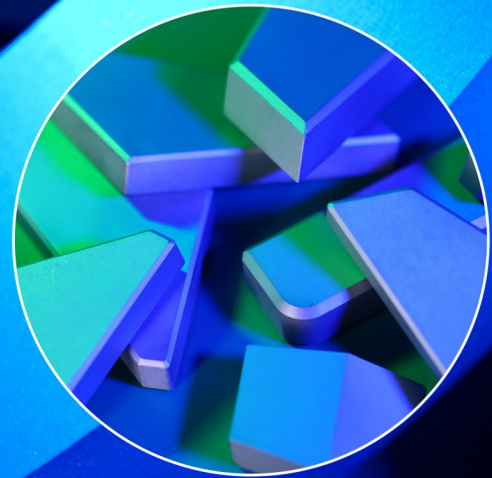


# MAIN BUSINESS

The main business is the R & D, producing and sales of high-performance cemented carbide products. The main products are high-performance ultra-fine / nano cemented carbide rods, high-performance cemented carbide mold materials, high-performance extra coarse grain size cemented carbide in engineering and mining, refined and deep processed cemented carbide products (parts / components), etc. Our products are widely used in aerospace, automobile, metallurgy, engineering & mining, microelectronics and other industrial fields, and have been well known by our customers.



Special Tools



Shield Cutter

# MAIN GRADE INTRODUCTION OF RODS

## Main Grade Introduction of Rods

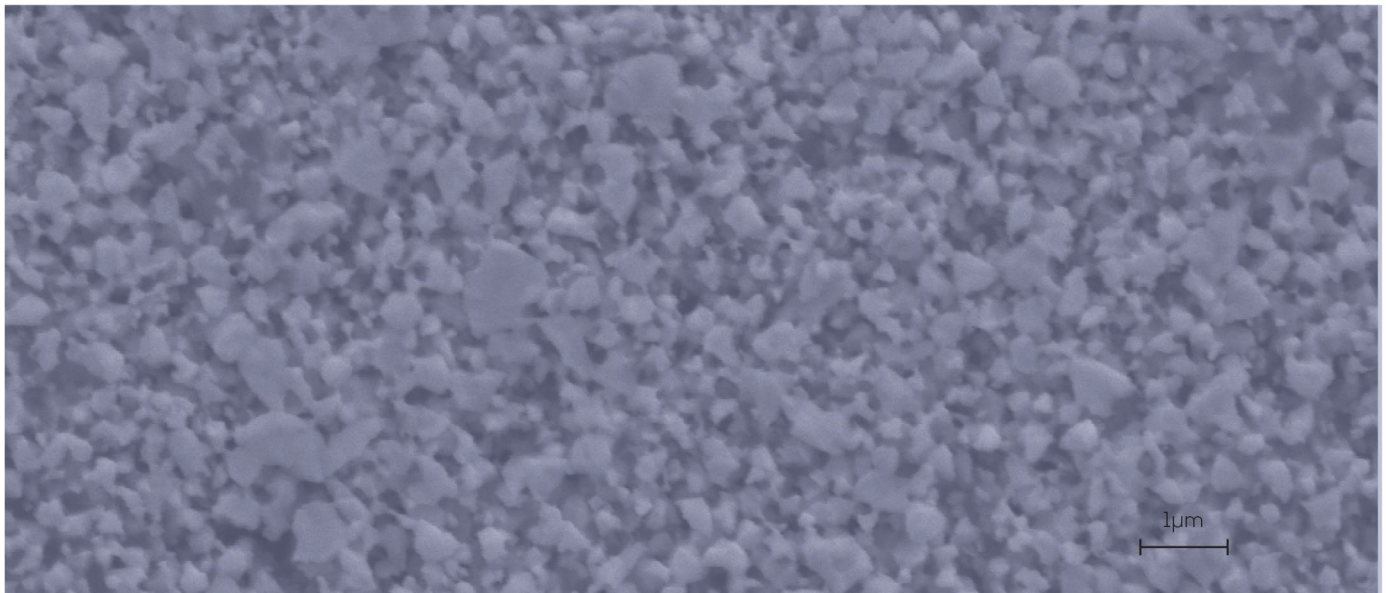
### Grade Introduction of Rods

Grade	Co	Grain Size of WC	Hardness		Density	Flexural Strength	Fracture Toughness	Elastic Modulus	Coefficient of Thermal Expansion
	Co%		HRA	HV <sub>30</sub>	g/cm <sup>3</sup>	MPa	MNm <sup>-3/2</sup>	GPa	10 <sup>-6</sup> /°C
ST10F	6	Sub-Micron	92.9	1840	14.8	3500	10	530	4.9
ST10UF	6	Ultra-fine	93.8	2040	14.7	2900	9	530	4.9
ST10NF	6	Nano	94.5	2180	14.6	4000	9	530	4.9
ST10C	7	Fine	90.7	1480	14.7	3200	12	520	5.0
ST11F	8	Sub-Micron	92.3	1720	14.6	3800	10	510	5.1
ST11UF	8	Ultra-fine	93.5	1960	14.5	3000	9	510	5.1
ST12F	9	Ultra-fine	93.5	1960	14.4	4500	10	500	5.3
ST12NF	9	Nano	94.2	2100	14.3	4800	9	500	5.3
ST15D	9	Sub-Micron	91.2	1520	14.4	3500	13	500	5.3
ST15F	10	Sub-Micron	92.0	1670	14.3	3600	11	490	5.4
ST20F	10	Sub-Micron	91.7	1620	14.4	4300	11	490	5.4
ST20D	10	Sub-Micron	92.0	1670	14.3	4100	11	490	5.4
ST25F	12	Ultra-fine	92.4	1740	14.1	5100	10	470	5.7
ST25EF	12	Ultra-fine	92.2	1700	14.1	4800	10	470	5.7
ST25D	12	Ultra-fine	91.5	1570	14.2	3900	13	470	5.7
ST37NF	15	Nano	92.0	1670	13.8	4800	10	430	6.3

Date reported in the table are averaged

Values which maybe under change without notice.

## Grade ST12F SEM Of Nano Size Carbide



 Cemented Carbide Selection Guide

Cemented Carbide Selection Guide		
Material	Processing method	Grade
Steel, Alloy Steel, Cast Steel	Rough Milling	ST20F/ST11F
Steel, Alloy Steel, Cast Steel	Finish milling	ST20F/ST25EF
Steel, Alloy Steel, Cast Steel	Drilling	ST15F/ST15D
Steel, Alloy Steel, Cast Steel	Reaming	ST11F/ST12F/ST25F
Cast Iron	Rough Milling	ST11F/ST20F
Cast Iron	Finish milling	ST10F
Cast Iron	Drilling	ST20F/ST15F
Cast Iron	Reaming	ST11F
High Hardness Steel	Rough Milling	ST12F/ST25F
High Hardness Steel	Finish milling	ST12F/ST12NF
High Hardness Steel	Drilling	ST12F
Stainless Steel	Rough Milling	ST15D/ST25EF/ST25D
Stainless Steel	Finish milling	ST25F/ST12F/ST15D/ST25D
Stainless Steel	Drilling	ST15F
Stainless Steel	Reaming	ST15F/ST11F
Titanium alloy High temperature alloy	Rough Milling	ST25EF/ST25F
Titanium alloy High temperature alloy	Finish milling	ST25F/ST12F
Titanium alloy High temperature alloy	Drilling	ST15F
Titanium alloy High temperature alloy	Reaming	ST15F/ST25F/ST11F
Aluminum Alloy, Copper Alloy	Rough Milling	ST11F/ST10F
Aluminum Alloy, Copper Alloy	Finish milling	ST10UF
Aluminum Alloy, Copper Alloy	Drilling	ST11F/ST15F
Aluminum Alloy, Copper Alloy	Reaming	ST11F
Plastic Composite	Rough Milling	ST10UF/ST10NF
Plastic Composite	Finish milling	ST10UF/ST10NF/ST12NF
Plastic Composite	Drilling	ST11F/ST15F/ST12NF
Diamond coating		ST10C

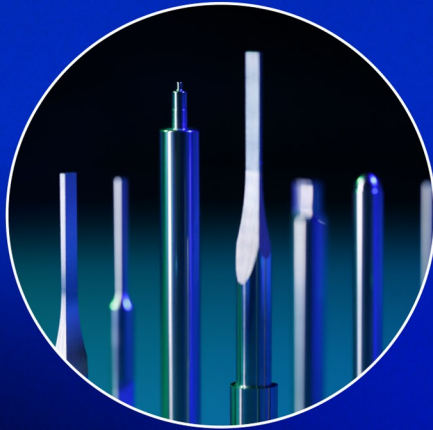
## Note:

The above is our recommended reference grade for different materials,

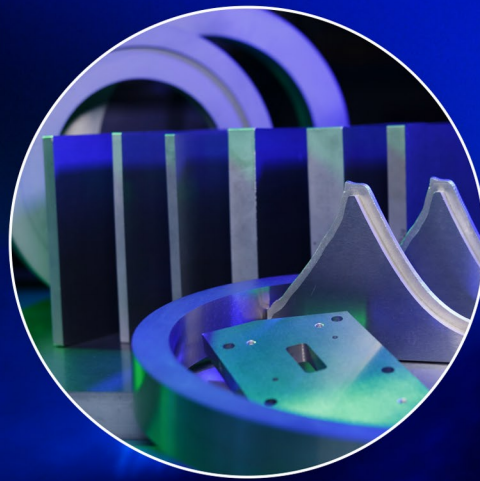
Grade application recommendation data is for reference only.



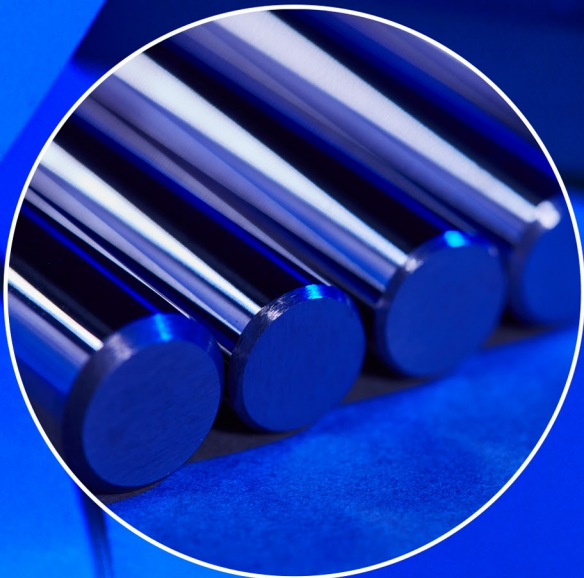
Coating



Finished Products



Molds



Rods