

CARBIDE RODS



MMC RYOTEC Corporation
A Group Company of  **MITSUBISHI MATERIALS**

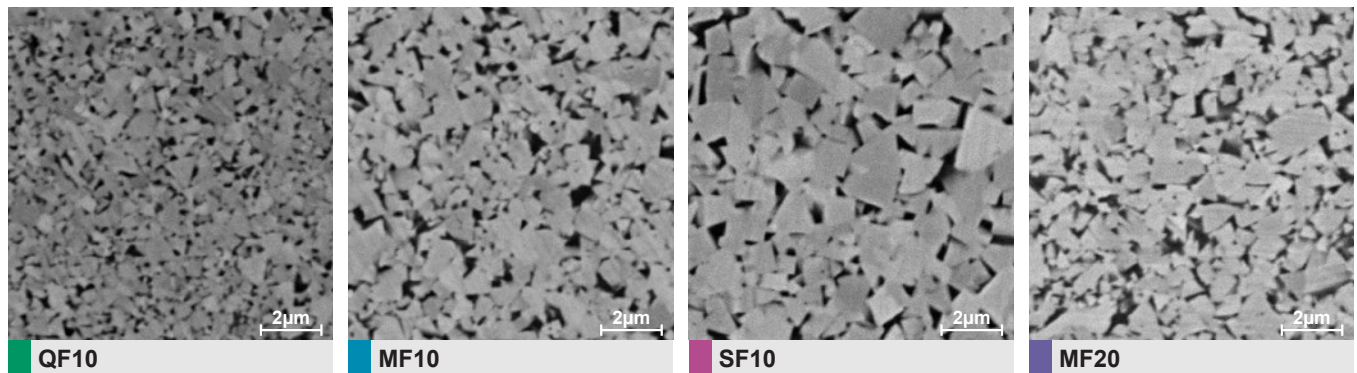
Carbide Rods

Tungsten Carbide Grade Properties

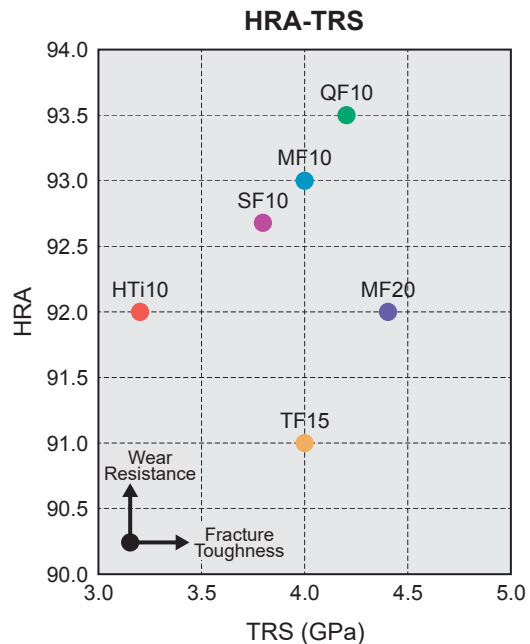
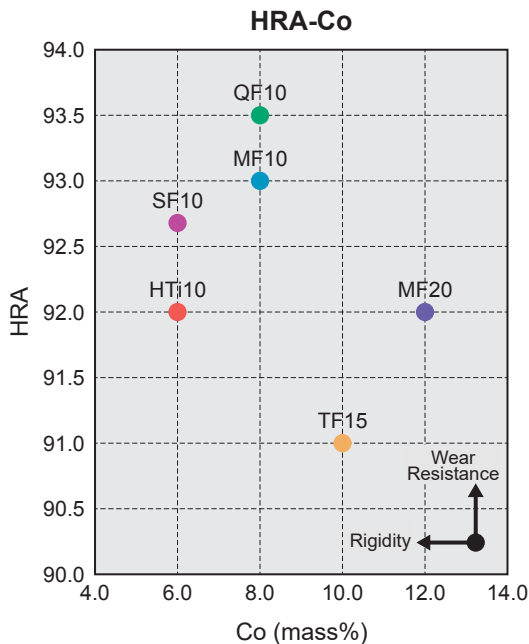
Grade	ISO Code	Grain Size (μm)	Co (mass%)	TRS (GPa) *1	Hardness		Fracture Toughness (MPa·m ^{1/2})	Applications			
					HRA *2	HV *3		End Mills	Drills	PCB Drills	Routers
QF10	K01	<0.4	8.0	4.2	93.5	2000	5.5	●			
MF10	K01	<0.6	8.0	4.0	93.0	1900	5.8	●			●
SF10	K01	<0.8	6.0	3.8	92.7	1830	6.6			●	●
MF20	K10	<0.6	12.0	4.4	92.0	1700	6.3	●	●		●
TF15	K20	<0.9	10.0	4.0	91.0	1550	8.7	●	●		
HTi10	K10	<1.0	6.0	3.2	92.0	1700	6.8	●	●		

Note) All numbers are after HIP *1 ISO03327 *2 HRA= Typical Value ISO03738 *3 ISO03878

《SEM Pictures》

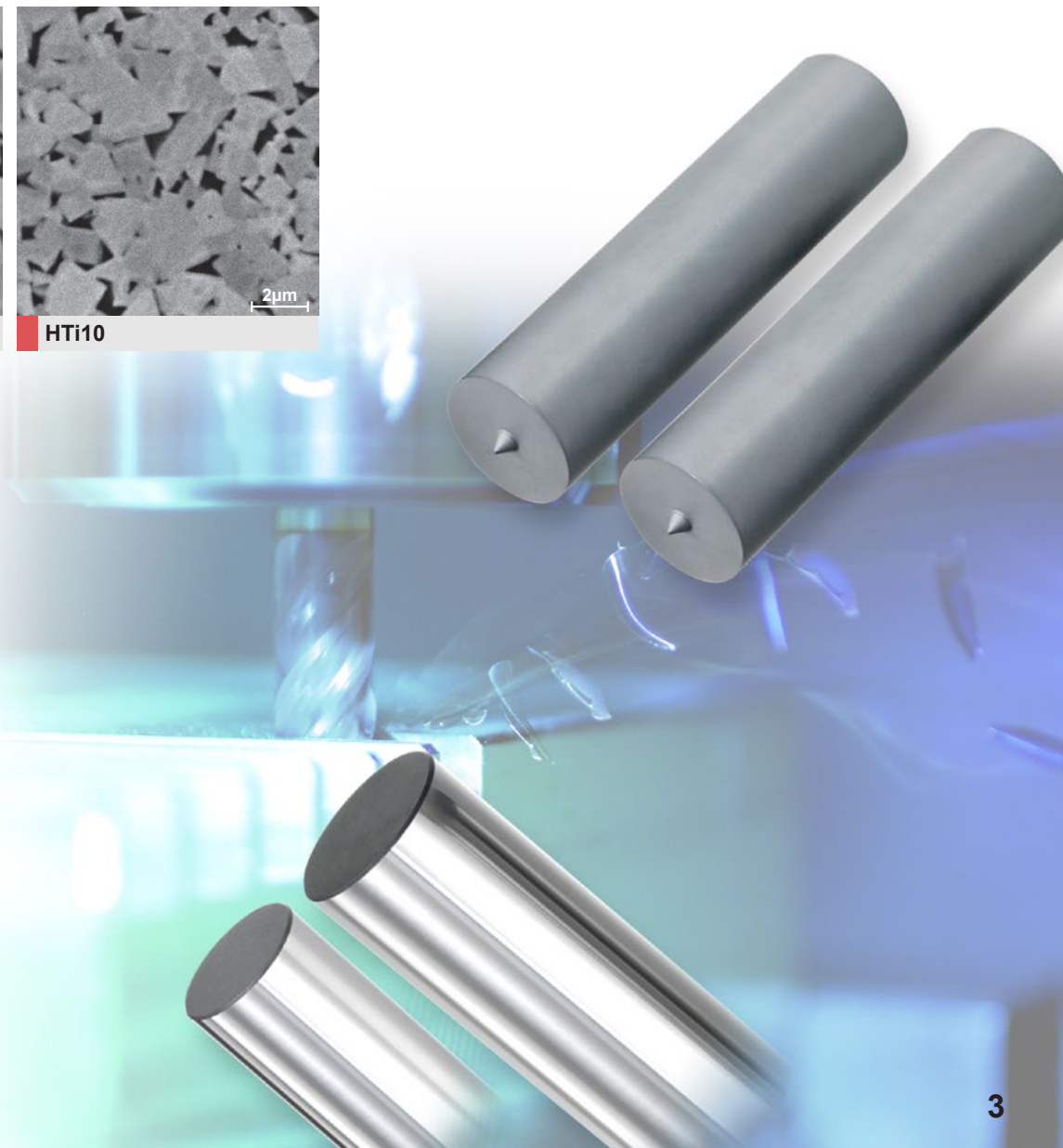
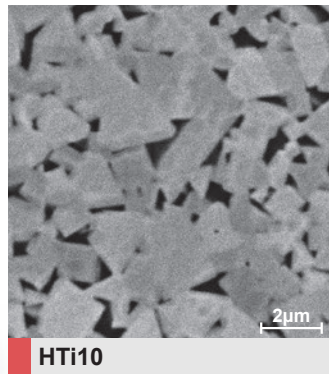
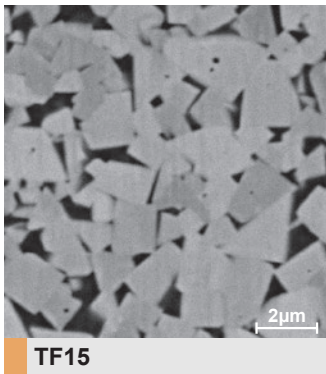


《Properties of Grade》

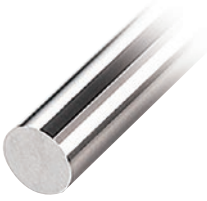


Application

Grade	Work Material							
	General Steel	Stainless Steel	Cast Iron	Hardened Steel	Aluminum Alloy	FRP	Titanium Alloy	Heat Resistant Alloy
QF10				○				
MF10	◎			◎	○	○	◎	◎
SF10	○		○		○	○		
MF20	○	○						
TF15	◎	◎					◎	◎
HTi10			◎		◎	◎	○	○



h6 Ground Blanks



Examples

Diameter (mm)	Tolerance (mm)	Length (mm)	Tolerance (mm)
D3	0, -0.006	40	+1.0, +0.4
		50	
		60	
		70	
D4	0, -0.008	40	+1.0, +0.4
		50	
		60	
		70	+1.4, +0.4
D6	0, -0.008	40	+1.4, +0.4
		50	
		60	
		70	
		80	

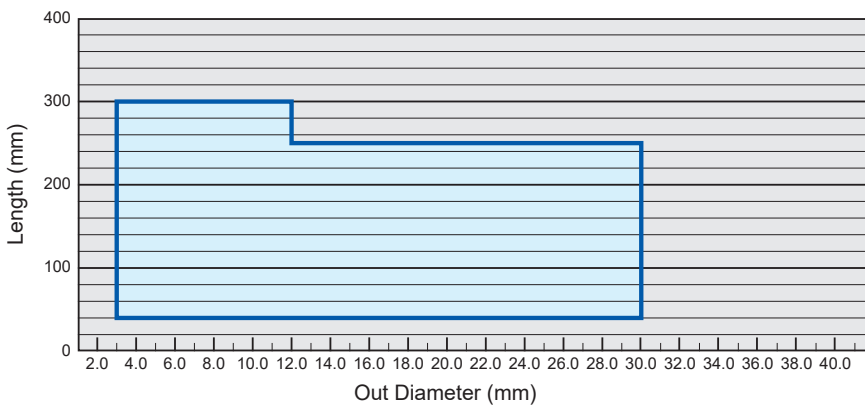
* For more detail, please contact.

Sintered Rods



D	Tolerance (mm)
3.0 ≤ D ≤ 10.0	+0.6 +0.3
10.0 < D ≤ 30.0	+0.7 +0.3

《Manufacturing Range》

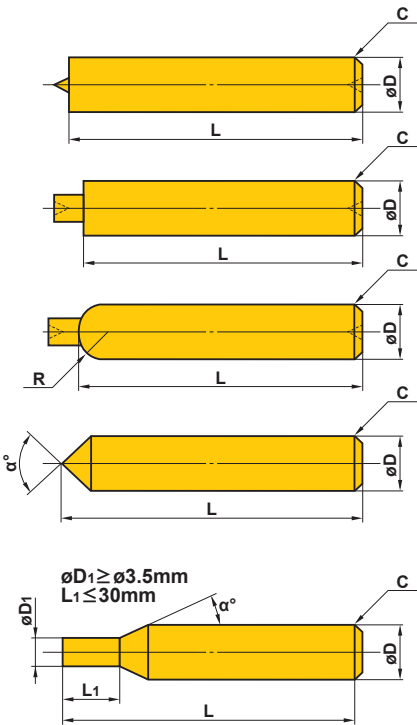


L	Tolerance (mm)	Curvature (mm)
40 ≤ L ≤ 60	+1.4 0	0.15
60 < L ≤ 100	+2.0 0	0.15
100 < L ≤ 150	+3.0 0	0.15
150 < L ≤ 200	+4.0 0	0.2
200 < L ≤ 300	* +Lx2% 0	0.2

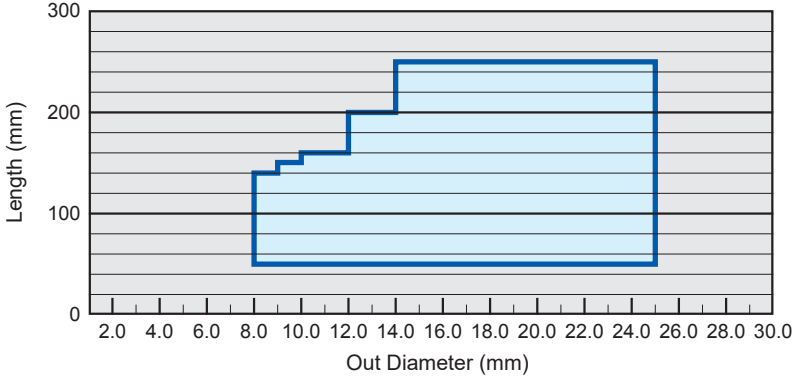
*Exp.) 250x2%=5mm

■ Special Sintered Rods

《Representative Geometry》



《Manufacturing Range》



Note) Please contact us for other products.

D	Tolerance (mm)
8.0 ≤ D ≤ 10.0	+0.6 +0.3
10.0 < D ≤ 25.0	+0.7 +0.3

L	Tolerance (mm)	Curvature (mm)
50 ≤ L ≤ 60	+1.4 0	0.15
60 < L ≤ 100	+2.0 0	0.15
100 < L ≤ 150	+3.0 0	0.15
150 < L ≤ 200	+4.0 0	0.2
200 < L ≤ 250	* +Lx2% 0	0.2

*Exp.) 250x2%=5mm



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SALES DEPT.

7F, KFC bldg., 1-6-1, YOKOAMI, SUMIDA-KU, TOKYO 130-0015, JAPAN

TEL +81-3-5819-5315 FAX +81-3-5819-5310

<http://www.ryotec.co.jp/en/>

