

CARBIDE RODS



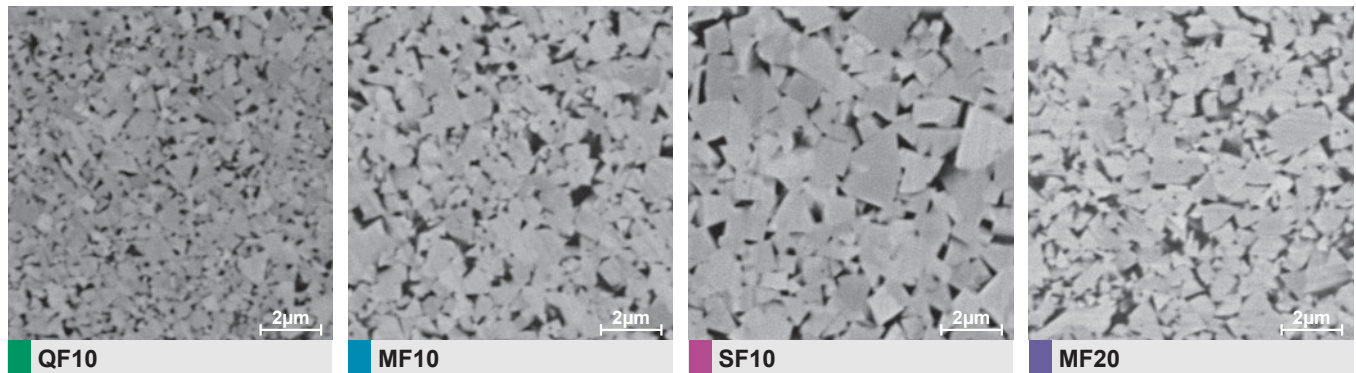
Carbide Rods

Tungsten Carbide Grade Properties

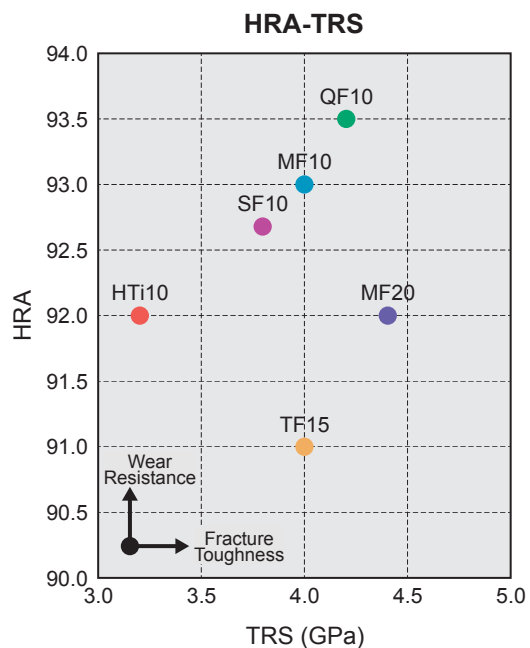
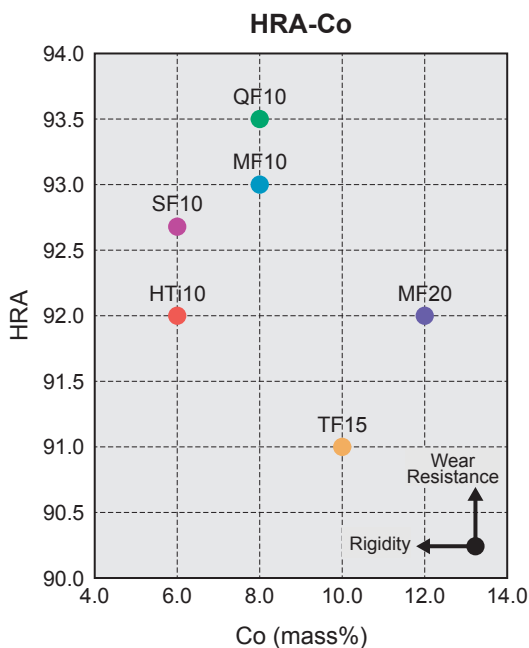
Grade	ISO Code	Grain Size (μm)	Co (mass%)	TRS (GPa) *1	Hardness		Fracture Toughness (MPa·m ^{1/2})	Applications			
					HRA *2	HV *3		End Mills	Drills	PCB Drills	Routers
QF10	K01	<0.4	8.0	4.2	93.5	2000	5.5	●			
MF10	K01	<0.6	8.0	4.0	93.0	1900	5.8	●			●
SF10	K01	<0.8	6.0	3.8	92.7	1830	6.6			●	●
MF20	K10	<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》

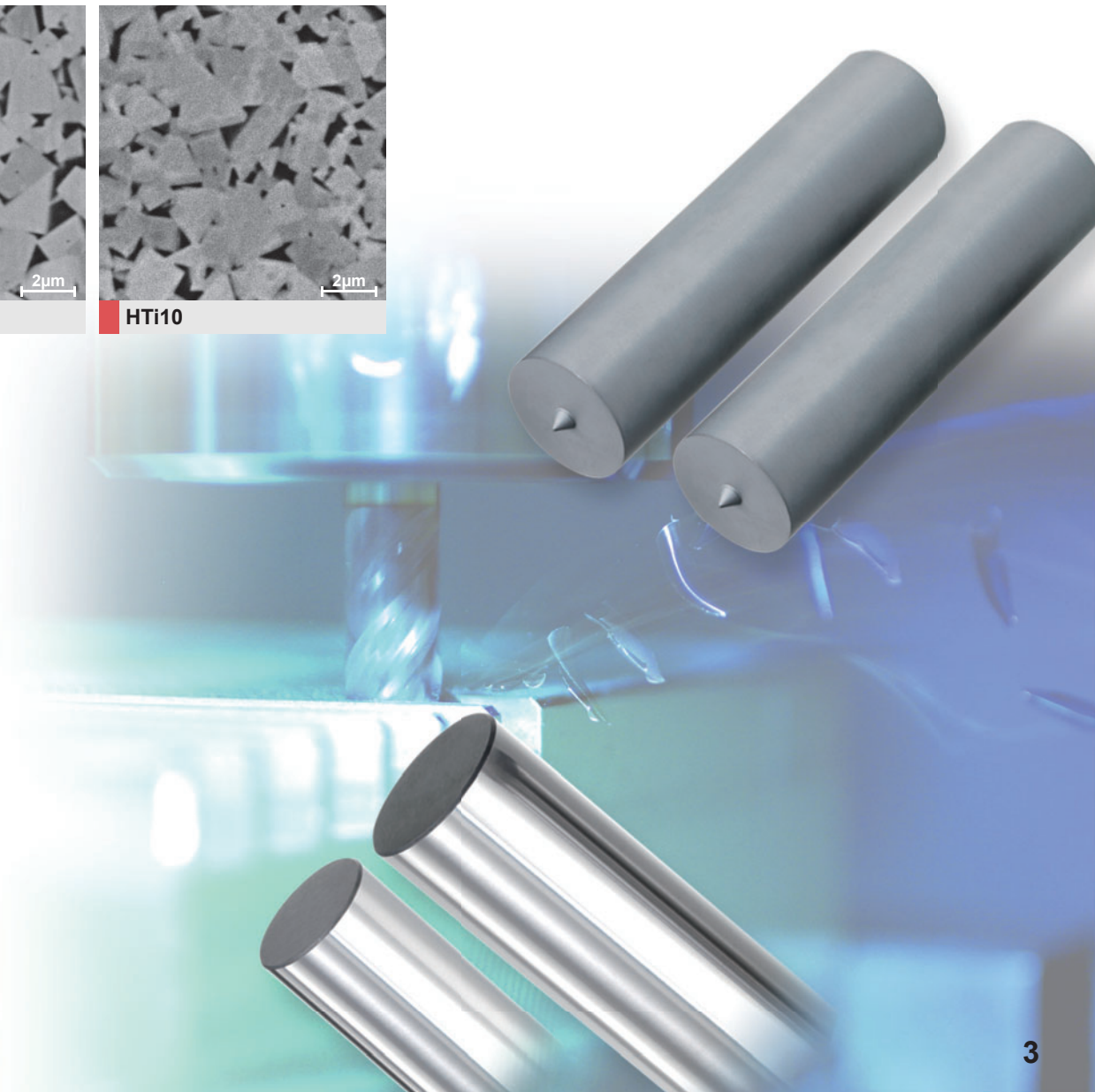
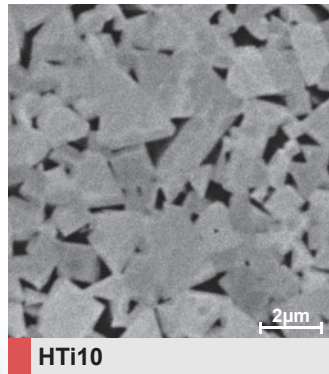
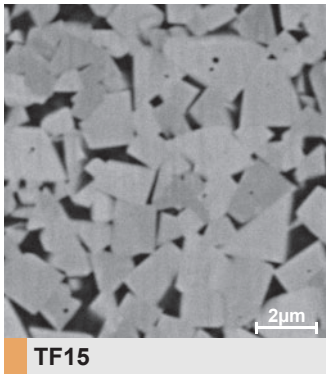


《Properties of Grade》

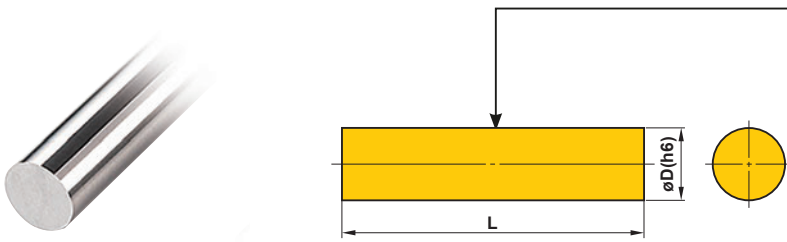


Application

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			◎		◎	◎	○	○

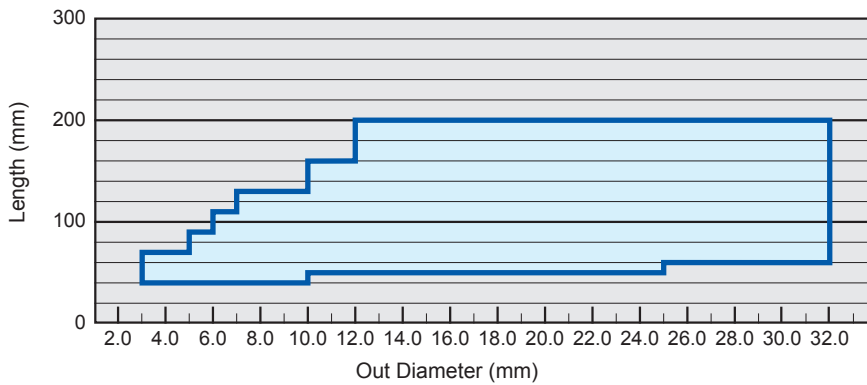


h6 Ground Blanks



Circularity	0.005 mm
Cylindricity	0.005 mm
Run Out	0.010 mm

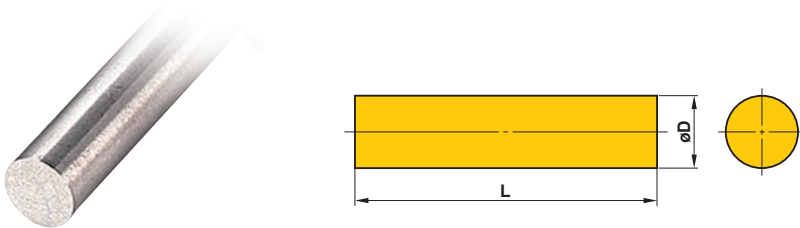
《Manufacturing Range》



D	h6 Tolerance (mm)
D=3	$\begin{matrix} 0 \\ -0.006 \end{matrix}$
3.0<D≤6.0	$\begin{matrix} 0 \\ -0.008 \end{matrix}$
6.0<D≤10.0	$\begin{matrix} 0 \\ -0.009 \end{matrix}$
10.0<D≤18.0	$\begin{matrix} 0 \\ -0.011 \end{matrix}$
18.0<D≤30.0	$\begin{matrix} 0 \\ -0.013 \end{matrix}$
30.0<D≤32.0	$\begin{matrix} 0 \\ -0.016 \end{matrix}$

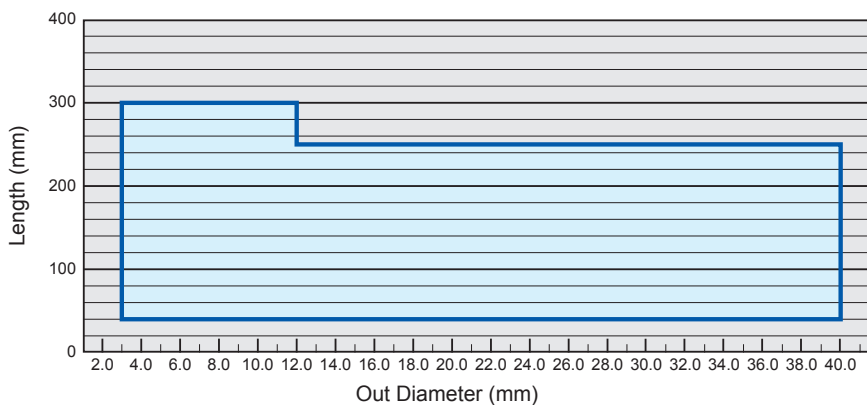
Note) Please contact us for product with length tolerance and chamfer.

Sintered Rods



D	Tolerance (mm)
3.0≤D≤10.0	$\begin{matrix} +0.6 \\ +0.3 \end{matrix}$
10.0<D≤30.0	$\begin{matrix} +0.7 \\ +0.3 \end{matrix}$
30.0<D≤40.0	$\begin{matrix} +0.9 \\ +0.3 \end{matrix}$

《Manufacturing Range》

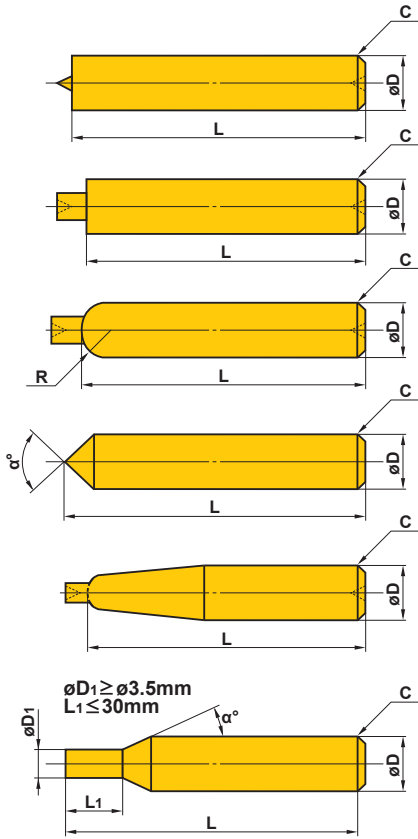


L	Tolerance (mm)	Curvature (mm)
40≤L≤60	$\begin{matrix} +1.4 \\ 0 \end{matrix}$	0.15
60<L≤100	$\begin{matrix} +2.0 \\ 0 \end{matrix}$	0.15
100<L≤150	$\begin{matrix} +3.0 \\ 0 \end{matrix}$	0.15
150<L≤200	$\begin{matrix} +4.0 \\ 0 \end{matrix}$	0.2
200<L≤300	$\begin{matrix} *+Lx2\% \\ 0 \end{matrix}$	0.2

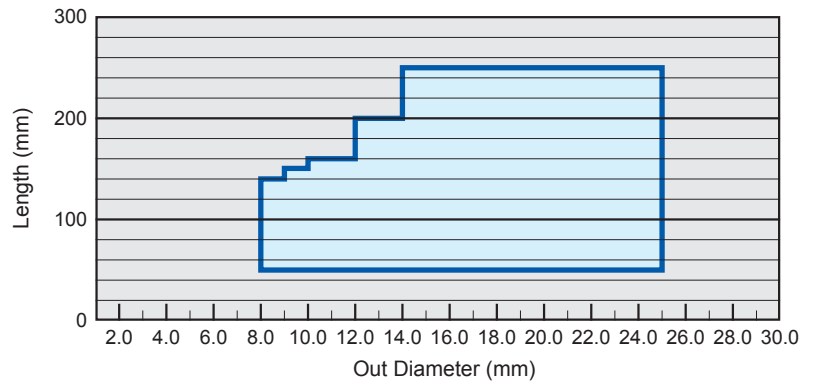
*Exp.) 250x2%=5mm

■ Special Sintered Rods

《Representative Geometry》



《Manufacturing Range》



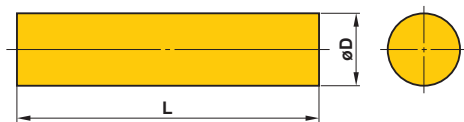
Note) Please contact us for other products.

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

■ Standard Sintered Rods LRB Series



Stocked Product

Order Number	Grade			Dimensions (mm)	
	HT10	TF15	MF10	D	L
LRB030	●	●	●	3	330
040	●	●	●	4	330
050	●	●	●	5	330
060	●	●	●	6	330
070	●	●	●	7	330
080	●	●	●	8	330
100	●	●	●	10	330
120	●	●	●	12	330

D	Dimensions (mm)	Tolerance (mm)
	3 - 8	+0.5 +0.3
10 - 12	+0.6 +0.3	

L	Dimensions (mm)	Tolerance (mm)	Curvature (mm)
	330	+10 0	0.3

● : Inventory Maintained in Japan. (LRB030 - LRB080:10pcs/box LRB100&LRB120:5pcs/box)



CARBIDE MATERIALS

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