

CEMENTED CARBIDE RODS

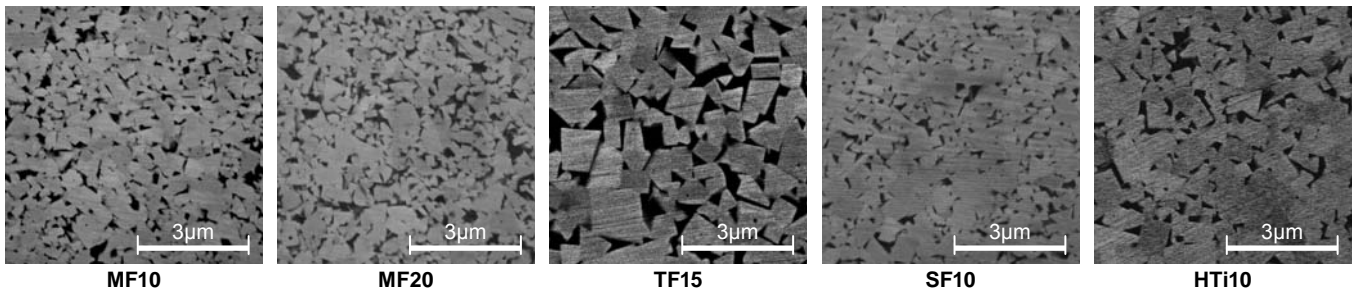
**Excellent wear resistance
and fracture resistance.**



Grade Classification

Grade	Grain size (μm)	Cobalt content (mass%)	Hardness		TRS (GPa)	Features	Products
			(HV)	(HRA)			
MF10	<0.6	8	1900	93.0	4.0	MF10 grade has exceptional advantages of high hardness with optimizing high wear resistance.	Small size drills Routers Endmills
MF20	<0.6	12	1700	92.0	4.4	MF20 grade has exceptional advantages of high strength and toughness with optimizing high breakage resistance.	Small size drills Routers Endmills
TF15	<0.9	10	1550	91.0	4.0	TF15 grade has exceptional advantages of high strength and toughness with optimizing high breakage resistance and strong edge sharpness.	Drills for general purpose Endmills
SF10	<0.8	6	1830	92.7	3.8	SF10 grade has exceptional advantages of high hardness with optimizing high wear resistance.	Small size drills Routers Endmills
HTi10	<1.0	6	1700	92.0	3.2	HTi10 grade has exceptional advantages of high strength and hardness with optimizing high wear resistance.	Drills for general purpose Endmills

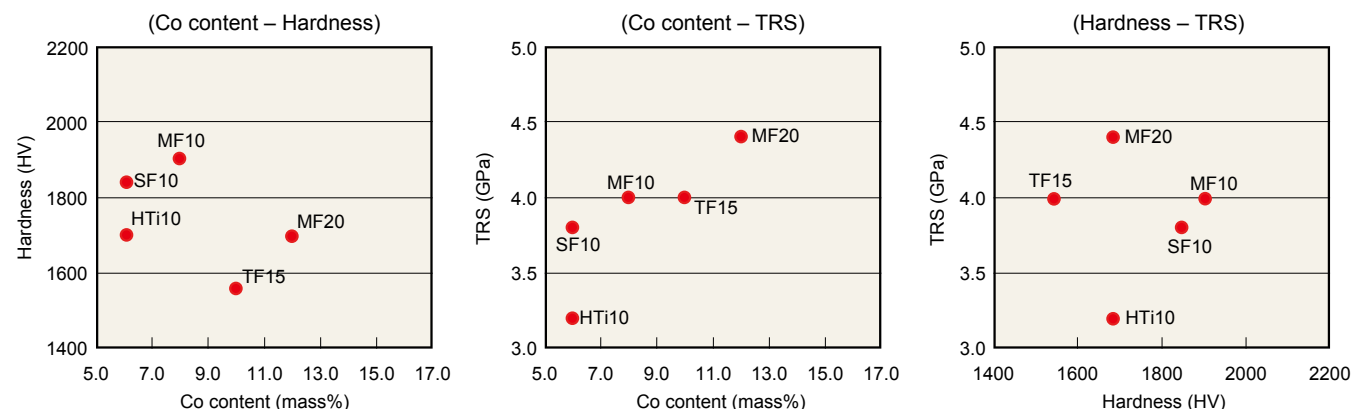
Comparison of Structure



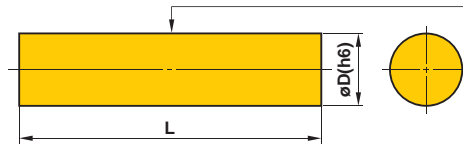
Recommended Grades

Work material	Soft ← Hardness → Hard
General steel	MF20, TF15, MF10
Stainless steel	TF15
Cast iron	TF15, MF10
Hardened steel	TF15, MF10
Aluminium alloy	TF15, HTi10
FRP	HTi10
Titanium alloy	TF15
Heat-resistant alloy	TF15

Properties of Grade

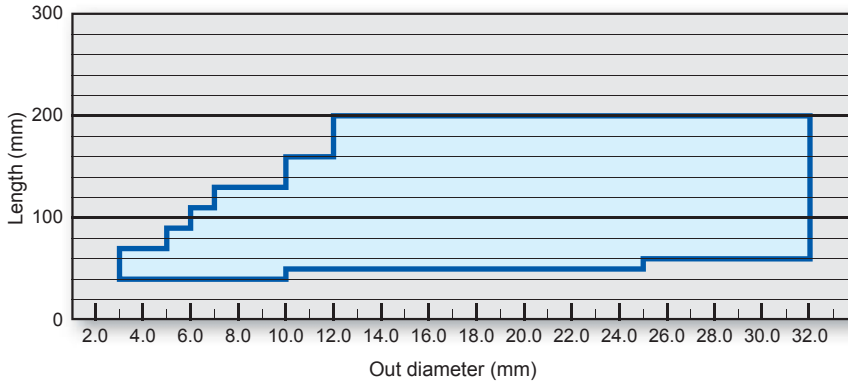


Ground rods



Circularity	0.005 mm
Cylindricity	0.005 mm
Run out	0.010 mm

(Manufacturing range)



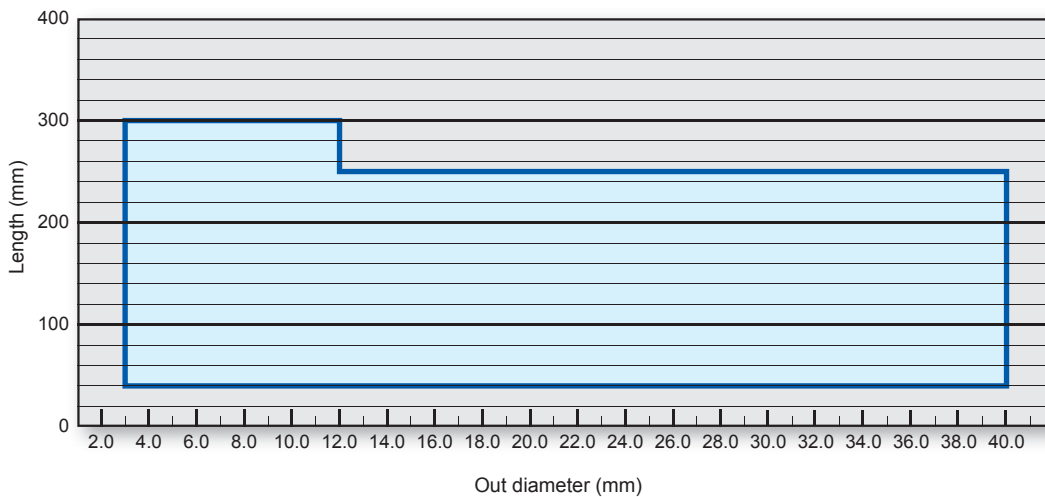
D	Tolerance (mm)
D=3	0 -0.006
3.0<D≤6.0	0 -0.008
6.0<D≤10.0	0 -0.009
10.0<D≤18.0	0 -0.011
18.0<D≤30.0	0 -0.013
30.0<D≤32.0	0 -0.016

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

Sintered rods



(Manufacturing range)



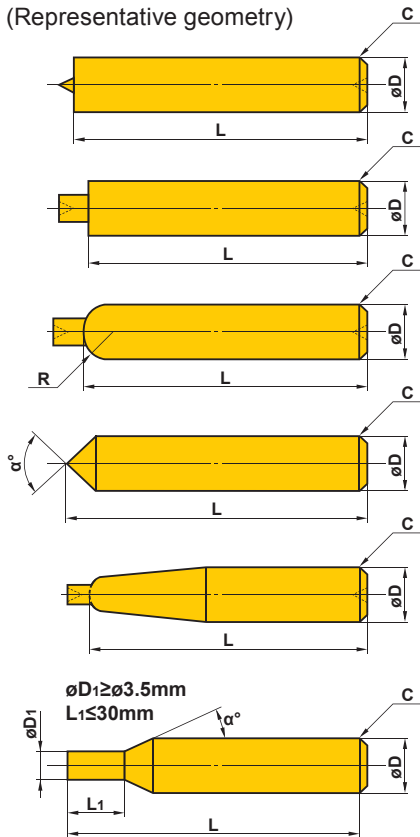
D	Tolerance (mm)
3.0≤D≤10.0	+0.6 +0.3
10.0<D≤30.0	+0.7 +0.3
30.0<D≤40.0	+0.9 +0.3

L	Tolerance (mm)	Bend (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

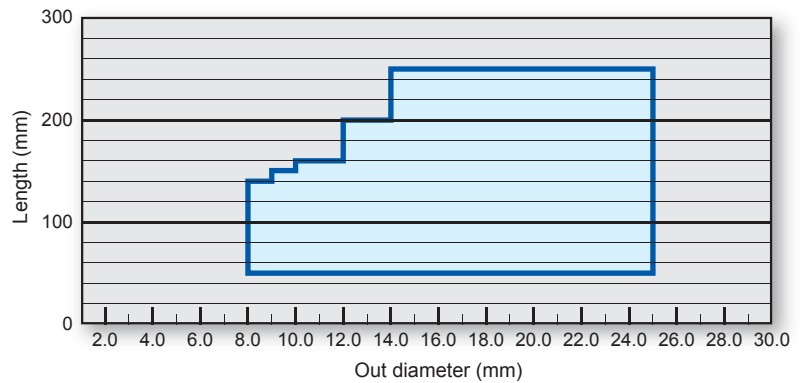
* Exp.) 250x2%=5mm

Special sintered rods

(Representative geometry)



(Manufacturing range)

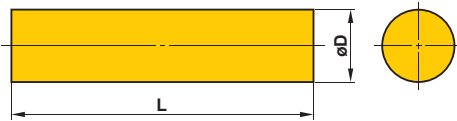


Note) Please contact us for other products.

D	Tolerance (mm)	L	Tolerance (mm)	Bend (mm)
8.0≤D≤10.0	+0.6 +0.3	50≤L≤60	+1.4 0	0.15
10.0<D≤25.0	+0.7 +0.3	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



Order number	Grade			Dimensions (mm)	
	HTi10	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

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

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

Symbol	Dimensions (mm)	Tolerance (mm)	Bend (mm)
L	330	+10 0	0.3

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