

CBN Grade for Sintered Alloy

MB4020

First recommendation for finishing sintered alloy

High efficiency, high precision machining of sintered alloy.

- New high CBN content tool grade, developed using a particle activated sintering process, is suitable for machining various sintered alloys.



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Features

MB4020 is a general purpose grade suitable for continuous turning through to light interrupted machining of sintered alloy. Increasing the CBN particle content and bonding strength makes it suitable for machining various sintered alloys with different structures and levels of hardness.

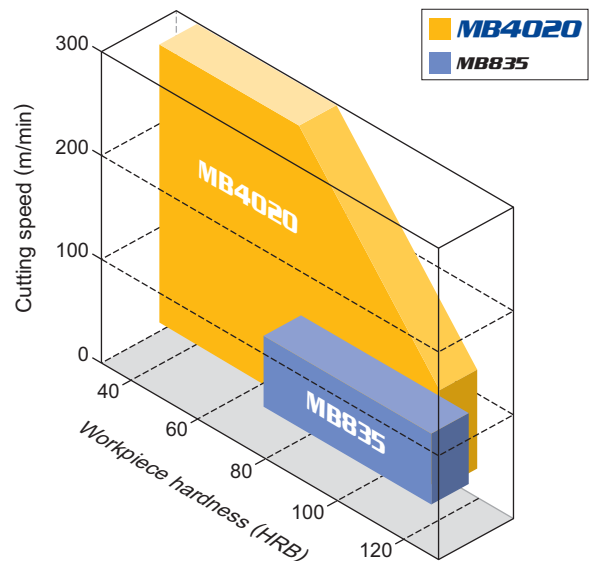
High cutting edge strength

A newly developed special binder and the particle-activated sintering method promotes binding of the CBN particles, leading to higher cutting edge strength. When machining sintered alloy, reduction of burrs and plastic flow is required even during interrupted machining. MB4020 that offers high cutting edge strength allows a sharper cutting edge to prevent burrs and achieve ideal

Excellent welding tolerances

A chemically stable, high CBN content reduces welding of the work material on the cutting edge and stabilizes dimensional accuracy of finished components.

Application Range



A Wide Variety of Edge Preparation Forms (Honing types)


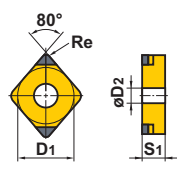

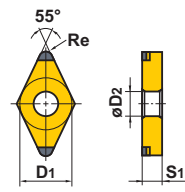

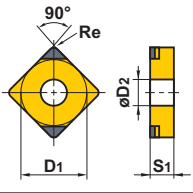

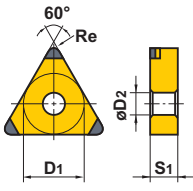

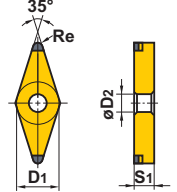

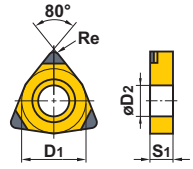
For MB4020, considering tool grade property, machinability of sintered alloy and workpiece properties, FS (for general use) and TS (for interrupted cutting) are offered as standard.




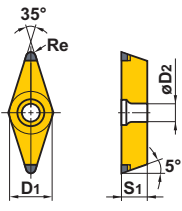

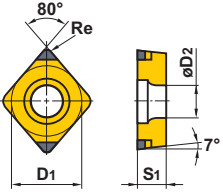
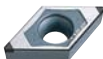
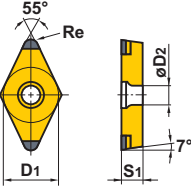

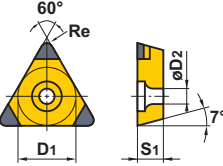

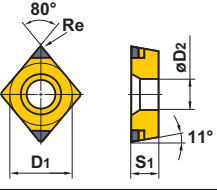

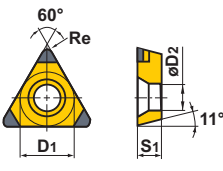
MB4020

Inserts

● Negative Inserts

Shape	Order Number	Stock	Dimensions (mm)				Geometry	Holders
			D1	S1	Re	D2		
	NP-CNGA120404FS2	●	12.7	4.76	0.4	5.16		LL holder
	120408FS2	●	12.7	4.76	0.8	5.16		Double clamp holder
	120412FS2	●	12.7	4.76	1.2	5.16		Double clamp dimple bar
	120404TS2	●	12.7	4.76	0.4	5.16		P type boring bar
	120408TS2	●	12.7	4.76	0.8	5.16		D type boring head
	120412TS2	●	12.7	4.76	1.2	5.16		LL cartridge
	NP-DNGA150404FS2	●	12.7	4.76	0.4	5.16		LL holder
	150408FS2	●	12.7	4.76	0.8	5.16		Double clamp holder
	150412FS2	●	12.7	4.76	1.2	5.16		Double clamp dimple bar
	150404TS2	●	12.7	4.76	0.4	5.16		P type boring bar
	150408TS2	●	12.7	4.76	0.8	5.16		D type boring head
	150412TS2	●	12.7	4.76	1.2	5.16		
	NP-SNGA120404FS2	●	12.7	4.76	0.4	5.16		LL holder
	120408FS2	●	12.7	4.76	0.8	5.16		Double clamp holder
	120412FS2	●	12.7	4.76	1.2	5.16		ML holder
	120404TS2	●	12.7	4.76	0.4	5.16		Double clamp dimple bar
	120408TS2	●	12.7	4.76	0.8	5.16		P type boring bar
	120412TS2	●	12.7	4.76	1.2	5.16		LL cartridge
	NP-TNGA160404FS3	●	9.525	4.76	0.4	3.81		LL holder
	160408FS3	●	9.525	4.76	0.8	3.81		Double clamp holder
	160412FS3	●	9.525	4.76	1.2	3.81		ML holder
	160404TS3	●	9.525	4.76	0.4	3.81		WP holder
	160408TS3	●	9.525	4.76	0.8	3.81		Double clamp dimple bar
	160412TS3	●	9.525	4.76	1.2	3.81		P type boring bar
	NP-VNGA160404FS2	●	9.525	4.76	0.4	3.81		Double clamp holder
	160408FS2	●	9.525	4.76	0.8	3.81		MP holder
	160404TS2	●	9.525	4.76	0.4	3.81		Double clamp dimple bar
	160408TS2	●	9.525	4.76	0.8	3.81		D type boring head
	NP-WNGA080408FS3	●	12.7	4.76	0.8	5.16		LL holder
	080408TS3	●	12.7	4.76	0.8	5.16		Double clamp holder
								MP holder
								Double clamp dimple bar
								D type boring head

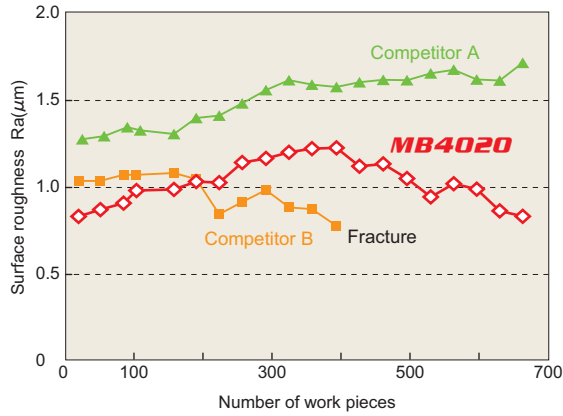
● Positive inserts

Shape	Order Number	Stock	Dimensions (mm)				Geometry	Holders
			D1	S1	Re	D2		
	NP-VBGW110304FS2	●	6.35	3.18	0.4	2.85		Dimple bar
	110308FS2	●	6.35	3.18	0.8	2.85		
	110304TS2	●	6.35	3.18	0.4	2.85		
	110308TS2	●	6.35	3.18	0.8	2.85		
	160404FS2	●	9.525	4.76	0.4	4.43		
	160408FS2	●	9.525	4.76	0.8	4.43		
	160404TS2	●	9.525	4.76	0.4	4.43		
	NP-CCGW060202FS2	●	6.35	2.38	0.2	2.8		Dimple bar
	060204FS2	●	6.35	2.38	0.4	2.8		
	060208FS2	●	6.35	2.38	0.8	2.8		
	060202TS2	●	6.35	2.38	0.2	2.8		
	060204TS2	●	6.35	2.38	0.4	2.8		
	060208TS2	●	6.35	2.38	0.8	2.8		
	09T302FS2	●	9.525	3.97	0.2	4.4		
	09T304FS2	●	9.525	3.97	0.4	4.4		
	09T308FS2	●	9.525	3.97	0.8	4.4		
	09T302TS2	●	9.525	3.97	0.2	4.4		
	09T304TS2	●	9.525	3.97	0.4	4.4		
09T308TS2	●	9.525	3.97	0.8	4.4			
	NP-DCGW070204FS2	●	6.35	2.38	0.4	2.8		SP holder Small tools Dimple bar S type boring bar
	070208FS2	●	6.35	2.38	0.8	2.8		
	070204TS2	●	6.35	2.38	0.4	2.8		
	070208TS2	●	6.35	2.38	0.8	2.8		
	11T302FS2	●	9.525	3.97	0.2	4.4		
	11T304FS2	●	9.525	3.97	0.4	4.4		
	11T308FS2	●	9.525	3.97	0.8	4.4		
	11T302TS2	●	9.525	3.97	0.2	4.4		
	11T304TS2	●	9.525	3.97	0.4	4.4		
11T308TS2	●	9.525	3.97	0.8	4.4			
	NP-TCGW110204FS3	●	6.35	2.38	0.4	2.8		SP holder S type boring bar
	110208FS3	●	6.35	2.38	0.8	2.8		
	110204TS3	●	6.35	2.38	0.4	2.8		
	110208TS3	●	6.35	2.38	0.8	2.8		
	NP-CPGB080202FS2	●	7.94	2.38	0.2	3.5		Dimple bar
	080204FS2	●	7.94	2.38	0.4	3.5		
	090302FS2	●	9.525	3.18	0.2	4.5		
	090304FS2	●	9.525	3.18	0.4	4.5		
	090308FS2	●	9.525	3.18	0.8	4.5		
	NP-TPGB090202FS3	●	5.56	2.38	0.2	2.9		Dimple bar
	090204FS3	●	5.56	2.38	0.4	2.9		
	110302FS3	●	6.35	3.18	0.2	3.4		
	110304FS3	●	6.35	3.18	0.4	3.4		
	110308FS3	●	6.35	3.18	0.8	3.4		

● : Inventory maintained

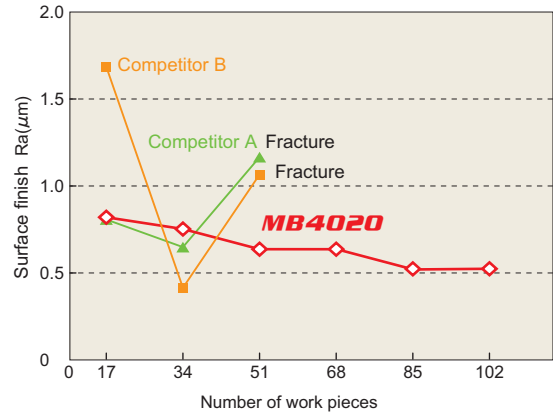
Cutting Performance

Continuous machining of high strength sintered alloy



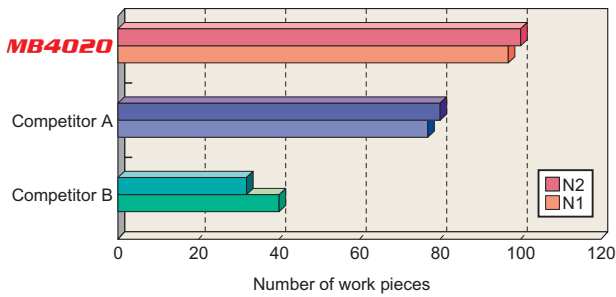
<Cutting conditions>
 Workpiece : High strength sintered alloy (75HRB)
 Insert : NP-CNGA120408FS2 Feed : 0.15mm/rev
 Cutting speed: 190m/min Depth of cut: 0.1mm
 Dry cutting

Continuous machining of hardened sintered alloy



<Cutting conditions>
 Workpiece : Hardened sintered alloy (40HRC)
 Insert : NP-CNGA120408FS2 Feed : 0.15mm/rev
 Cutting speed: 100m/min Depth of cut: 0.1mm
 Wet cutting

Interrupted machining of high strength sintered alloy



<Cutting conditions>
 Workpiece : High strength sintered alloy (75HRB)
 Insert : NP-CNGA120408FS2 Feed : 0.15mm/rev
 Cutting speed: 190m/min Depth of cut: 0.1mm
 Wet cutting

Interrupted machining of general sintered alloy



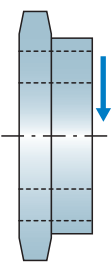
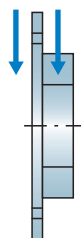
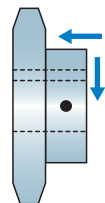
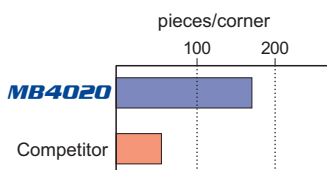
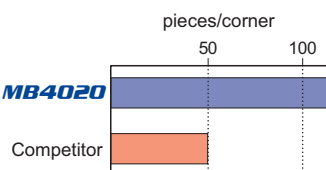
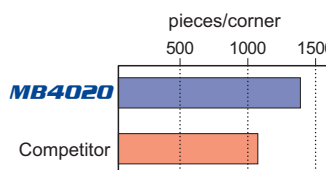
<Cutting conditions>
 Workpiece : General sintered alloy (45HRB)
 Insert : NP-CNGA120408FS2 Feed : 0.15mm/rev
 Cutting speed: 270m/min Depth of cut: 0.1mm
 Wet cutting

Recommended Cutting Conditions

Work Material	Cutting Mode	Cutting Speed (m/min)				Feed (mm/rev)	Depth of Cut (mm)	Coolant
		50	100	200	300			
General sintered alloy	Continuous to Interrupted cutting	[Bar chart showing speed range from ~100 to ~250 m/min]				-0.2	-0.3	Wet, Dry
Hardened sintered alloy	Continuous to Interrupted cutting	[Bar chart showing speed range from ~100 to ~200 m/min]				-0.2	-0.3	
Sintered alloy	Continuous to Interrupted cutting	[Bar chart showing speed range from ~100 to ~150 m/min]				-0.2	-0.3	

MB4020

Application Examples

Insert		NP-TNGA160404TS3	NP-TNGA160408TS3	NP-CNGA120404FS2
Workpiece		Carburized and quenched alloy Interrupted facing	Carburized and quenched alloy Interrupted machining of flange end faces	General sintered alloy (equivalent to SMF4040) External interrupted facing
				
Component		Variable valve parts	Variable valve parts	Sprocket parts
Cutting Conditions	Cutting Speed (m/min)	140	110	150
	Feed (mm/rev)	0.05	0.1	0.1-0.15
	Depth of Cut (mm)	0.15	0.05	0.2
Coolant		Wet cutting	Dry cutting	Dry cutting
Results		<p>pieces/corner</p> <p>100 200</p>  <p>A competitor's CBN reached the end of tool life after machining 50 parts due to burr formation. MB4020 enabled longer tool life by machining up to 170 parts.</p>	<p>pieces/corner</p> <p>50 100</p>  <p>A competitor's grade showed unstable tool life after machining 20 – 50 parts due to the defect. MB4020 enabled stable machining with longer tool life up over 120 parts.</p>	<p>pieces/corner</p> <p>500 1000 1500</p>  <p>MB4020 maintained a good surface finish after machining 1400 parts compared with only 1100 parts from a competitor's grade.</p>

For Your Safety

- Don't handle inserts and chips without gloves. ● Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage. ● Please use safety covers and wear safety glasses. ● When using compounded cutting oils, please take fire precautions. ● When attaching inserts or spare parts, please use only the correct wrench or spanner. ● When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

MITSUBISHI MATERIALS CORPORATION



The Scope of the Registration:
Design, Development and
Production of Cemented
Carbide Tools and Carbide
Blanks



The Scope of the Registration:
Design, Development and
Production of Cutting Tools,
Wear-resistant Tools, Drill
Drilling Tools, Cemented
Carbide Blanks and Coated
Products



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(Tools specifications subject to change without notice.)