

MB4120

**CBN GRADE FOR SINTERED
ALLOYS AND CAST IRONS**



CBN Grade for Sintered Alloys and Cast Irons

MB4120

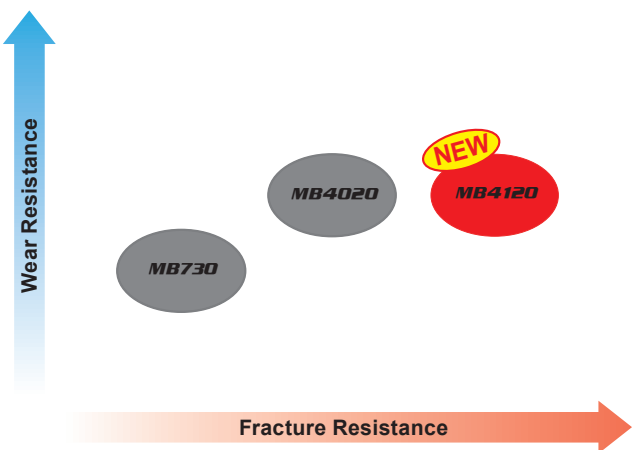
Increasing the CBN particle content and bonding strength makes it suitable for machining various sintered materials.

High Fracture Resistance

Fine CBN particles increase cutting edge toughness. The high fracture resistance allows stable performance even during interrupted machining.

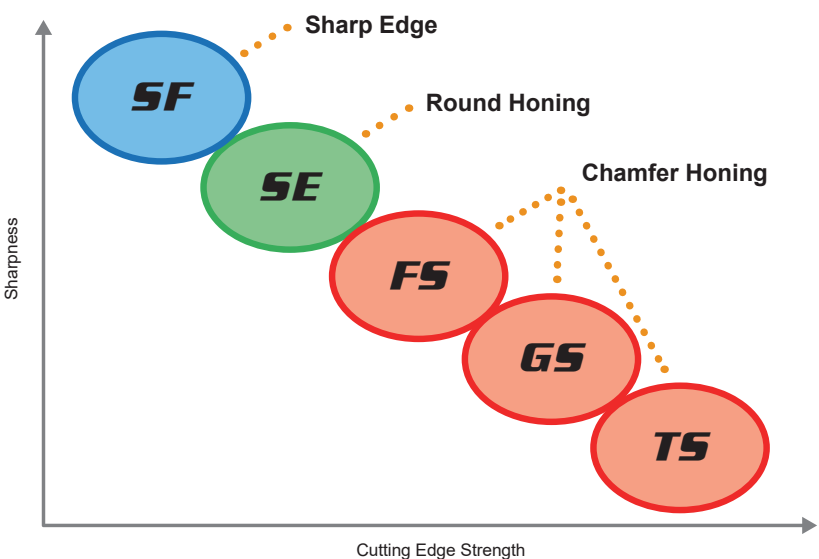
High Adhesion Strength of Fine CBN Particles

Optimization of the sintering conditions strengthens adhesion between fine CBN particles. This increases both fracture resistance and wear resistance.



A Wide Range of Edge Preparation (Honing) are Available

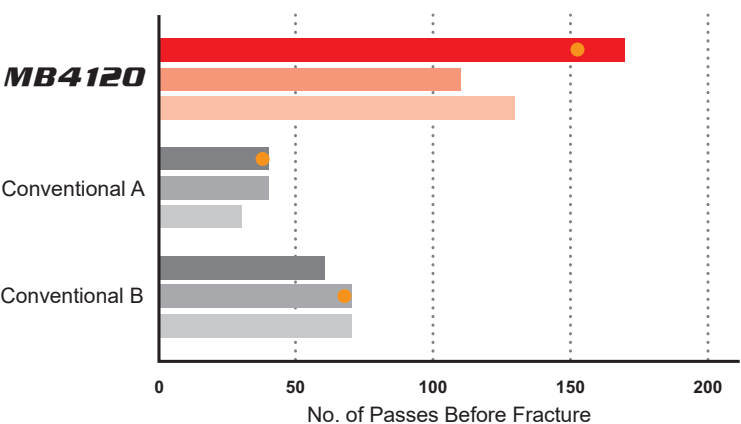
The SF type offers a sharper cutting edge, leading to the reduction in cutting resistance and burr development and an increase in surface finishes. The SF type is the first recommendation but, to increase cutting edge strength and chipping resistance there are also the SE, FS, GS and TS edge preparations.



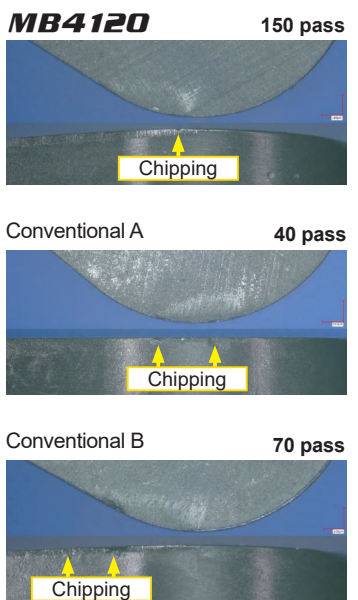
Cutting Performance

Fracture Resistance Comparison During Interrupted Facing of High Strength Sintered Alloy

Increased fracture resistance even during heavy interrupted machining.

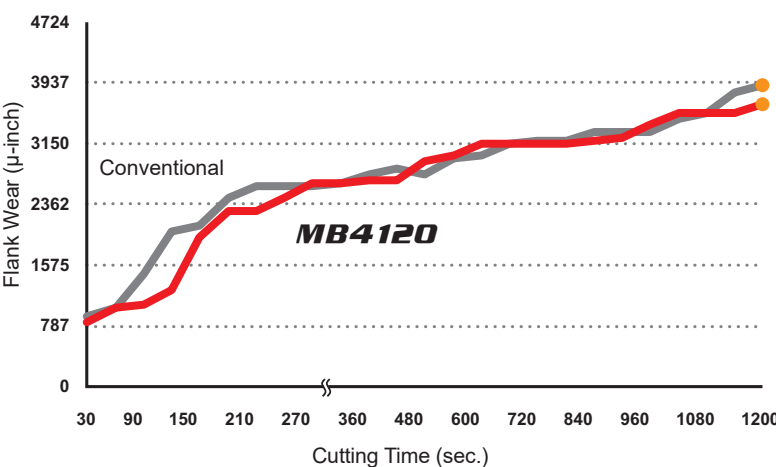


<Cutting Conditions>
Work Material : High Strength Sintered Alloy
Insert : NP-TNGA332-SE3
Cutting Speed : $v_c=490$ SFM
Feed per Rev. : $f=.006$ IPR
Depth of Cut : $a_p=.004$ inch
Cutting Mode : Wet Cutting

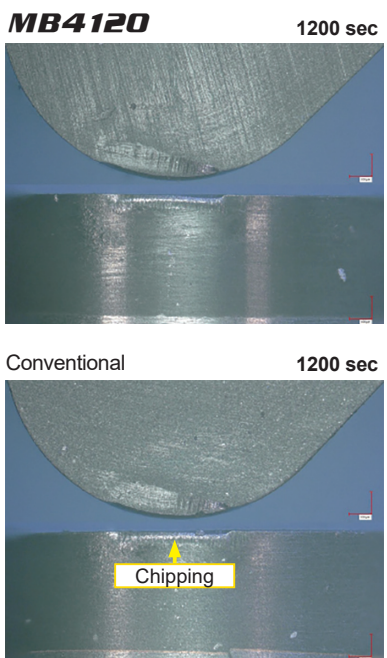


Comparison in Continuous Machining of AISI No 35 B

Excellent fracture resistance compared to conventional products.



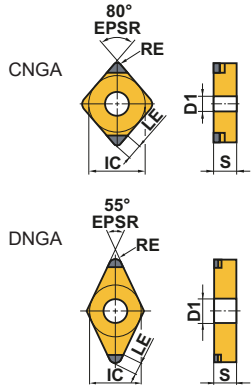
<Cutting Conditions>
Work Material : AISI No 35 B (Perlite)
Insert : NP-TNGA332-SF3
Cutting Speed : $v_c=2625$ SFM
Feed per Rev. : $f=.004$ IPR
Depth of Cut : $a_p=.008$ inch
Cutting Mode : Dry Cutting



CBN Grade for Sintered Alloys and Cast Irons

Negative Inserts (With Hole)

G Class



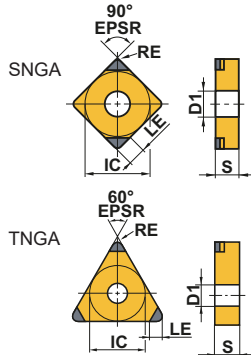
NEW PETIT CUT			
NP_2			
NEW PETIT CUT			
NP_2			

(inch)

Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-CNGA431-SF2	●	2	.500	.187	.016	.203	.075
NP-CNGA432-SF2	●	2	.500	.187	.031	.203	.083
NP-CNGA433-SF2	●	2	.500	.187	.047	.203	.091
NP-CNGA431-SE2	●	2	.500	.187	.016	.203	.075
NP-CNGA432-SE2	●	2	.500	.187	.031	.203	.083
NP-CNGA433-SE2	●	2	.500	.187	.047	.203	.091
NP-CNGA431-FS2	●	2	.500	.187	.016	.203	.075
NP-CNGA432-FS2	●	2	.500	.187	.031	.203	.083
NP-CNGA433-FS2	●	2	.500	.187	.047	.203	.091
NP-CNGA431-GS2	●	2	.500	.187	.016	.203	.075
NP-CNGA432-GS2	●	2	.500	.187	.031	.203	.083
NP-CNGA433-GS2	●	2	.500	.187	.047	.203	.091
NP-CNGA431-TS2	●	2	.500	.187	.016	.203	.075
NP-CNGA432-TS2	●	2	.500	.187	.031	.203	.083
NP-CNGA433-TS2	●	2	.500	.187	.047	.203	.091
NP-DNGA431-SF2	●	2	.500	.187	.016	.203	.083
NP-DNGA432-SF2	●	2	.500	.187	.031	.203	.079
NP-DNGA433-SF2	●	2	.500	.187	.047	.203	.075
NP-DNGA441-SF2	●	2	.500	.250	.016	.203	.083
NP-DNGA442-SF2	●	2	.500	.250	.031	.203	.079
NP-DNGA443-SF2	●	2	.500	.250	.047	.203	.075
NP-DNGA431-SE2	●	2	.500	.187	.016	.203	.083
NP-DNGA432-SE2	●	2	.500	.187	.031	.203	.079
NP-DNGA433-SE2	●	2	.500	.187	.047	.203	.075
NP-DNGA441-SE2	●	2	.500	.250	.016	.203	.083
NP-DNGA442-SE2	●	2	.500	.250	.031	.203	.079
NP-DNGA443-SE2	●	2	.500	.250	.047	.203	.075
NP-DNGA431-FS2	●	2	.500	.187	.016	.203	.083
NP-DNGA432-FS2	●	2	.500	.187	.031	.203	.079
NP-DNGA433-FS2	●	2	.500	.187	.047	.203	.075
NP-DNGA441-FS2	●	2	.500	.250	.016	.203	.083
NP-DNGA442-FS2	●	2	.500	.250	.031	.203	.079
NP-DNGA443-FS2	●	2	.500	.250	.047	.203	.075
NP-DNGA431-GS2	●	2	.500	.187	.016	.203	.083
NP-DNGA432-GS2	●	2	.500	.187	.031	.203	.079
NP-DNGA433-GS2	●	2	.500	.187	.047	.203	.075
NP-DNGA441-GS2	●	2	.500	.250	.016	.203	.083
NP-DNGA442-GS2	●	2	.500	.250	.031	.203	.079
NP-DNGA443-GS2	●	2	.500	.250	.047	.203	.075
NP-DNGA431-TS2	●	2	.500	.187	.016	.203	.083
NP-DNGA432-TS2	●	2	.500	.187	.031	.203	.079
NP-DNGA433-TS2	●	2	.500	.187	.047	.203	.075
NP-DNGA441-TS2	●	2	.500	.250	.016	.203	.083
NP-DNGA442-TS2	●	2	.500	.250	.031	.203	.079
NP-DNGA443-TS2	●	2	.500	.250	.047	.203	.075

Negative Inserts (With Hole)

G Class



NEW PETIT CUT			
NP_2			
NEW PETIT CUT			
NP_3			

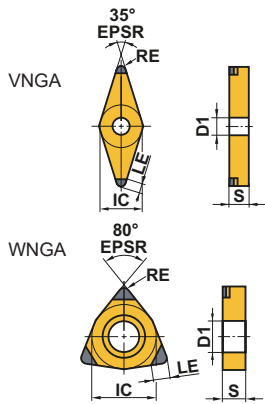
(inch)

Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-SNGA431-SF2	●	2	.500	.187	.016	.203	.083
NP-SNGA432-SF2	●	2	.500	.187	.031	.203	.091
NP-SNGA433-SF2	●	2	.500	.187	.047	.203	.098
NP-SNGA431-SE2	●	2	.500	.187	.016	.203	.083
NP-SNGA432-SE2	●	2	.500	.187	.031	.203	.091
NP-SNGA433-SE2	●	2	.500	.187	.047	.203	.098
NP-SNGA431-FS2	●	2	.500	.187	.016	.203	.083
NP-SNGA432-FS2	●	2	.500	.187	.031	.203	.091
NP-SNGA433-FS2	●	2	.500	.187	.047	.203	.098
NP-SNGA431-GS2	●	2	.500	.187	.016	.203	.083
NP-SNGA432-GS2	●	2	.500	.187	.031	.203	.091
NP-SNGA433-GS2	●	2	.500	.187	.047	.203	.098
NP-SNGA431-TS2	●	2	.500	.187	.016	.203	.083
NP-SNGA432-TS2	●	2	.500	.187	.031	.203	.091
NP-SNGA433-TS2	●	2	.500	.187	.047	.203	.098
NP-TNGA331-SF3	●	3	.375	.187	.016	.150	.063
NP-TNGA332-SF3	●	3	.375	.187	.031	.150	.071
NP-TNGA333-SF3	●	3	.375	.187	.047	.150	.075
NP-TNGA331-SE3	●	3	.375	.187	.016	.150	.063
NP-TNGA332-SE3	●	3	.375	.187	.031	.150	.071
NP-TNGA333-SE3	●	3	.375	.187	.047	.150	.075
NP-TNGA331-FS3	●	3	.375	.187	.016	.150	.063
NP-TNGA332-FS3	●	3	.375	.187	.031	.150	.071
NP-TNGA333-FS3	●	3	.375	.187	.047	.150	.075
NP-TNGA331-GS3	●	3	.375	.187	.016	.150	.063
NP-TNGA332-GS3	●	3	.375	.187	.031	.150	.071
NP-TNGA333-GS3	●	3	.375	.187	.047	.150	.075
NP-TNGA331-TS3	●	3	.375	.187	.016	.150	.063
NP-TNGA332-TS3	●	3	.375	.187	.031	.150	.071
NP-TNGA333-TS3	●	3	.375	.187	.047	.150	.075

CBN Grade for Sintered Alloys and Cast Irons

Positive Inserts (With Hole)

G Class



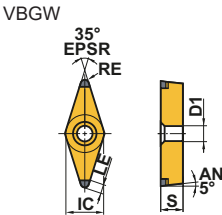
NEW PETIT CUT			
NP_2			
			
NEW PETIT CUT			
NP_3			
			

(inch)

Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-VNGA331-SF2	●	2	.375	.187	.016	.150	.098
NP-VNGA332-SF2	●	2	.375	.187	.031	.150	.079
NP-VNGA331-SE2	●	2	.375	.187	.016	.150	.098
NP-VNGA332-SE2	●	2	.375	.187	.031	.150	.079
NP-VNGA331-FS2	●	2	.375	.187	.016	.150	.098
NP-VNGA332-FS2	●	2	.375	.187	.031	.150	.079
NP-VNGA331-GS2	●	2	.375	.187	.016	.150	.098
NP-VNGA332-GS2	●	2	.375	.187	.031	.150	.079
NP-VNGA331-TS2	●	2	.375	.187	.016	.150	.098
NP-VNGA332-TS2	●	2	.375	.187	.031	.150	.079
NP-WNGA432-SF3	●	3	.500	.187	.031	.203	.083
NP-WNGA432-SE3	●	3	.500	.187	.031	.203	.083
NP-WNGA432-FS3	●	3	.500	.187	.031	.203	.083
NP-WNGA432-GS3	●	3	.500	.187	.031	.203	.083
NP-WNGA432-TS3	●	3	.500	.187	.031	.203	.083

Positive Inserts (With Hole)

G Class



NEW PETIT CUT			
NP_2			
			

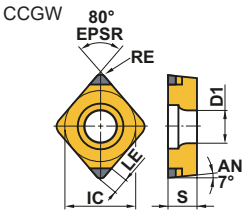
(inch)

Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-VBGW221-SF2	●	2	.250	.125	.016	.112	.098
NP-VBGW222-SF2	●	2	.250	.125	.031	.112	.079
NP-VBGW331-SF2	●	2	.375	.187	.016	.174	.098
NP-VBGW332-SF2	●	2	.375	.187	.031	.174	.079
NP-VBGW221-SE2	●	2	.250	.125	.016	.112	.098
NP-VBGW222-SE2	●	2	.250	.125	.031	.112	.079
NP-VBGW331-SE2	●	2	.375	.187	.016	.174	.098
NP-VBGW332-SE2	●	2	.375	.187	.031	.174	.079
NP-VBGW221-FS2	●	2	.250	.125	.016	.112	.098
NP-VBGW222-FS2	●	2	.250	.125	.031	.112	.079
NP-VBGW331-FS2	●	2	.375	.187	.016	.174	.098
NP-VBGW332-FS2	●	2	.375	.187	.031	.174	.079
NP-VBGW221-GS2	●	2	.250	.125	.016	.112	.098
NP-VBGW222-GS2	●	2	.250	.125	.031	.112	.079
NP-VBGW331-GS2	●	2	.375	.187	.016	.174	.098
NP-VBGW332-GS2	●	2	.375	.187	.031	.174	.079

CBN Grade for Sintered Alloys and Cast Irons

Positive Inserts (With Hole)

G Class



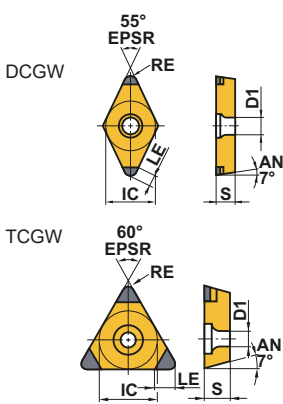
NEW PETIT CUT			
NP_2			

(inch)

Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-CCGW21.50.5-SF2	●	2	.250	.094	.008	.110	.071
NP-CCGW21.51-SF2	●	2	.250	.094	.016	.110	.075
NP-CCGW21.52-SF2	●	2	.250	.094	.031	.110	.083
NP-CCGW32.50.5-SF2	●	2	.375	.156	.008	.173	.071
NP-CCGW32.51-SF2	●	2	.375	.156	.016	.173	.075
NP-CCGW32.52-SF2	●	2	.375	.156	.031	.173	.083
NP-CCGW21.50.5-SE2	●	2	.250	.094	.008	.110	.071
NP-CCGW21.51-SE2	●	2	.250	.094	.016	.110	.075
NP-CCGW21.52-SE2	●	2	.250	.094	.031	.110	.083
NP-CCGW32.50.5-SE2	●	2	.375	.156	.008	.173	.071
NP-CCGW32.51-SE2	●	2	.375	.156	.016	.173	.075
NP-CCGW32.52-SE2	●	2	.375	.156	.031	.173	.083
NP-CCGW21.50.5-FS2	●	2	.250	.094	.008	.110	.071
NP-CCGW21.51-FS2	●	2	.250	.094	.016	.110	.075
NP-CCGW21.52-FS2	●	2	.250	.094	.031	.110	.083
NP-CCGW32.50.5-FS2	●	2	.375	.156	.008	.173	.071
NP-CCGW32.51-FS2	●	2	.375	.156	.016	.173	.075
NP-CCGW32.52-FS2	●	2	.375	.156	.031	.173	.083
NP-CCGW21.50.5-GS2	●	2	.250	.094	.008	.110	.071
NP-CCGW21.51-GS2	●	2	.250	.094	.016	.110	.075
NP-CCGW21.52-GS2	●	2	.250	.094	.031	.110	.083
NP-CCGW32.50.5-GS2	●	2	.375	.156	.008	.173	.071
NP-CCGW32.51-GS2	●	2	.375	.156	.016	.173	.075
NP-CCGW32.52-GS2	●	2	.375	.156	.031	.173	.083
NP-CCGW21.52-TS2	●	2	.250	.094	.031	.110	.083
NP-CCGW32.52-TS2	●	2	.375	.156	.031	.173	.083

Positive Inserts (With Hole)

G Class



NEW PETIT CUT			
NP_2			

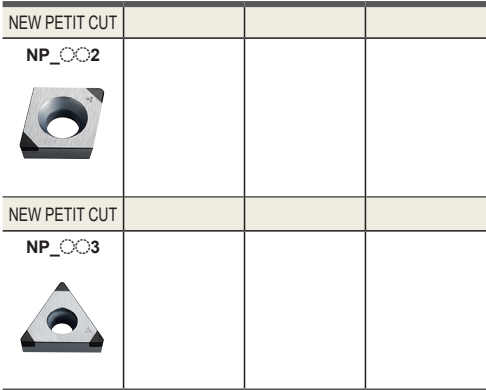
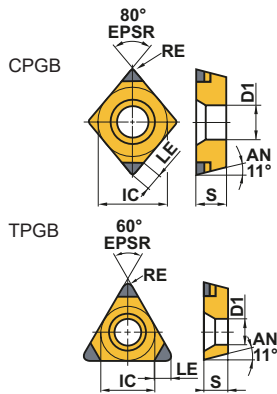
(inch)

Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-DCGW21.51-SF2	●	2	.250	.094	.016	.110	.083
NP-DCGW21.52-SF2	●	2	.250	.094	.031	.110	.079
NP-DCGW32.50.5-SF2	●	2	.375	.156	.008	.173	.059
NP-DCGW32.51-SF2	●	2	.375	.156	.016	.173	.083
NP-DCGW32.52-SF2	●	2	.375	.156	.031	.173	.079
NP-DCGW21.51-SE2	●	2	.250	.094	.016	.110	.083
NP-DCGW21.52-SE2	●	2	.250	.094	.031	.110	.079
NP-DCGW32.50.5-SE2	●	2	.375	.156	.008	.173	.059
NP-DCGW32.51-SE2	●	2	.375	.156	.016	.173	.083
NP-DCGW32.52-SE2	●	2	.375	.156	.031	.173	.079
NP-DCGW21.51-FS2	●	2	.250	.094	.016	.110	.083
NP-DCGW21.52-FS2	●	2	.250	.094	.031	.110	.079
NP-DCGW32.50.5-FS2	●	2	.375	.156	.008	.173	.059
NP-DCGW32.51-FS2	●	2	.375	.156	.016	.173	.083
NP-DCGW32.52-FS2	●	2	.375	.156	.031	.173	.079
NP-DCGW21.51-GS2	●	2	.250	.094	.016	.110	.083
NP-DCGW21.52-GS2	●	2	.250	.094	.031	.110	.079
NP-DCGW32.50.5-GS2	●	2	.375	.156	.008	.173	.059
NP-DCGW32.51-GS2	●	2	.375	.156	.016	.173	.083
NP-DCGW32.52-GS2	●	2	.375	.156	.031	.173	.079
NP-TCGW21.51-SF3	●	3	.250	.094	.016	.110	.063
NP-TCGW21.52-SF3	●	3	.250	.094	.031	.110	.071
NP-TCGW21.51-SE3	●	3	.250	.094	.016	.110	.063
NP-TCGW21.52-SE3	●	3	.250	.094	.031	.110	.071
NP-TCGW21.51-FS3	●	3	.250	.094	.016	.110	.063
NP-TCGW21.52-FS3	●	3	.250	.094	.031	.110	.071
NP-TCGW21.51-GS3	●	3	.250	.094	.016	.110	.063
NP-TCGW21.52-GS3	●	3	.250	.094	.031	.110	.071

CBN Grade for Sintered Alloys and Cast Irons

Positive Inserts (With Hole)

G Class



(inch)

Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-CPGB2.51.50.5-SE2	●	2	.313	.094	.008	.138	.071
NP-CPGB2.51.51-SE2	●	2	.313	.094	.016	.138	.075
NP-CPGB320.5-SE2	●	2	.375	.125	.008	.177	.071
NP-CPGB321-SE2	●	2	.375	.125	.016	.177	.075
NP-CPGB322-SE2	●	2	.375	.125	.031	.177	.083
NP-CPGB2.51.50.5-FS2	●	2	.313	.094	.008	.138	.071
NP-CPGB2.51.51-FS2	●	2	.313	.094	.016	.138	.075
NP-CPGB320.5-FS2	●	2	.375	.125	.008	.177	.071
NP-CPGB321-FS2	●	2	.375	.125	.016	.177	.075
NP-CPGB322-FS2	●	2	.375	.125	.031	.177	.083
NP-TPGB1.81.50.5-SF3	●	3	.219	.094	.008	.114	.059
NP-TPGB1.81.51-SF3	●	3	.219	.094	.016	.114	.063
NP-TPGB220.5-SF3	●	3	.250	.125	.008	.134	.059
NP-TPGB221-SF3	●	3	.250	.125	.016	.134	.063
NP-TPGB222-SF3	●	3	.250	.125	.031	.134	.071
NP-TPGB1.81.50.5-SE3	●	3	.219	.094	.008	.114	.059
NP-TPGB1.81.51-SE3	●	3	.219	.094	.016	.114	.063
NP-TPGB220.5-SE3	●	3	.250	.125	.008	.134	.059
NP-TPGB221-SE3	●	3	.250	.125	.016	.134	.063
NP-TPGB222-SE3	●	3	.250	.125	.031	.134	.071
NP-TPGB1.81.50.5-FS3	●	3	.219	.094	.008	.114	.059
NP-TPGB1.81.51-FS3	●	3	.219	.094	.016	.114	.063
NP-TPGB220.5-FS3	●	3	.250	.125	.008	.134	.059
NP-TPGB221-FS3	●	3	.250	.125	.016	.134	.063
NP-TPGB222-FS3	●	3	.250	.125	.031	.134	.071
NP-TPGB1.81.50.5-GS3	●	3	.219	.094	.008	.114	.059
NP-TPGB1.81.51-GS3	●	3	.219	.094	.016	.114	.063
NP-TPGB220.5-GS3	●	3	.250	.125	.008	.134	.059
NP-TPGB221-GS3	●	3	.250	.125	.016	.134	.063
NP-TPGB222-GS3	●	3	.250	.125	.031	.134	.071

Application Examples

Insert	NP-DCGW32.52-SF2	NP-DCGW32.52-SF2	NP-DCGW32.52-SF2
Workpiece	General Sintered Alloy 	General Sintered Alloy 	Iron-based Sintered Alloy (60HRB) Ra≤1.0μm
Component	Housing(Interrupted Boring)	Case(Interrupted Boring)	Pinion(Interrupted Facing)
Cutting Conditions	Cutting Speed vc (SFM)	655	590
	Feed per Rev. f (IPR)	.003	.010
	Depth of Cut ap (inch)	.008	.008 – .012
Cutting Mode	Wet Cutting	Wet Cutting	Wet Cutting
Results	 Double the tool life of the conventional product.	 Double the tool life of the conventional product.	 As compared with the conventional product, good surface finishes were maintained and 2.5 times longer tool life was achieved.

Insert	NP-TNGA332-SF3	NP-TNGA332-SE3	NP-CNGA432-SF2
Workpiece	High Strength Sintered Alloy 	General Sintered Alloy 	Cast Iron
Component	Sprocket(Continuous Boring)	Sprocket(Interrupted Facing)	Mechanical Parts(Interrupted Facing)
Cutting Conditions	Cutting Speed vc (SFM)	820	785
	Feed per Rev. f (IPR)	.004	.005
	Depth of Cut ap (inch)	.004	.002
Cutting Mode	Wet Cutting	Wet Cutting	Dry Cutting
Results	 When comparing with the conventional product after machining the same number of workpieces, flank wear was smaller and further tool life extension can be expected.	 As compared with the conventional cermet product, higher surface quality and more than 4 times longer tool life was achieved.	 There is no abnormal damage and more than 1.5 times longer tool life was achieved.

The above application examples are customer's applications, so it can be different from the recommended conditions.

CBN Grade for Sintered Alloys and Cast Irons

Recommended Cutting Conditions

Sintered Alloys

							(inch)			
Work Material	Grade	Machining	vc (SFM)					f (IPR)	ap	Cutting Mode
			330	490	655	820	985			
General Sintered Alloys	MB4120	Turning						≤.008	≤.012	Dry, Wet
High Strength Sintered Alloys	MB4120	Turning						≤.008	≤.012	Dry, Wet
Hardened Sintered Alloys	MB4120	Turning						≤.008	≤.012	Dry, Wet

Cast Irons

Cast Irons

(inch)

Work Material	Grade	Machining	vc (SFM)					f (IPR)	ap	Cutting Mode
			820	1640	2460	3280	4100			
Gray Cast Irons	MB4120	Turning						≤ .016	≤ .020	Dry, Wet

Memo



MACHINING TECHNOLOGY
AND EDUCATION CENTER

Welcome to our new world-class
Machining Technology and Education
Center (MTEC) in Mooresville, NC
providing year round support and
services to North America.



ABOUT MTEC

TOOLING PROPOSALS & EVALUATION

We will review your current processes or outline a new process. From this review, we will improve productivity, analyze programming methods and output a solution with programming, tooling and time savings.

MACHINING SIMULATION

Using the latest CAD/CAM software and our cutting tool experience, we will outline a new process using proper machining techniques to maximize tool life and productivity.

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TRAINING

We are excited to offer several levels of training with goals to reach our highest level--Craftsman Machining Technology. At MTEC NC, we will train using a combination of classroom and hands-on machine time to develop skills and real-world understanding of materials, tools and applications. In addition to multi-day courses, we will have Machining Technology skills seminars, as well as seminars from our partners to complement our apprentice level courses, our journeyman courses, and up to our craftsman level courses.

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- Advanced End Milling
- Advanced Turning
- Basic Threading
- Advanced Face Milling
- Basic Workpiece Materials
- Tool Grades
- Advanced Workpiece Materials

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Programs are designed for several levels of skill development – from basic understanding to advance manufacturing with digital solutions, complementing to your valued experience in CNC machining environment. Participate in machining demonstrations with Mitsubishi Materials' skilled engineers. Discover methods to reduce setup and cycle time, optimize programs and enhance your knowledge base.

Information on course schedule,
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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 driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

www.mmc-carbide.com/us

Tools specifications subject to change without notice.

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