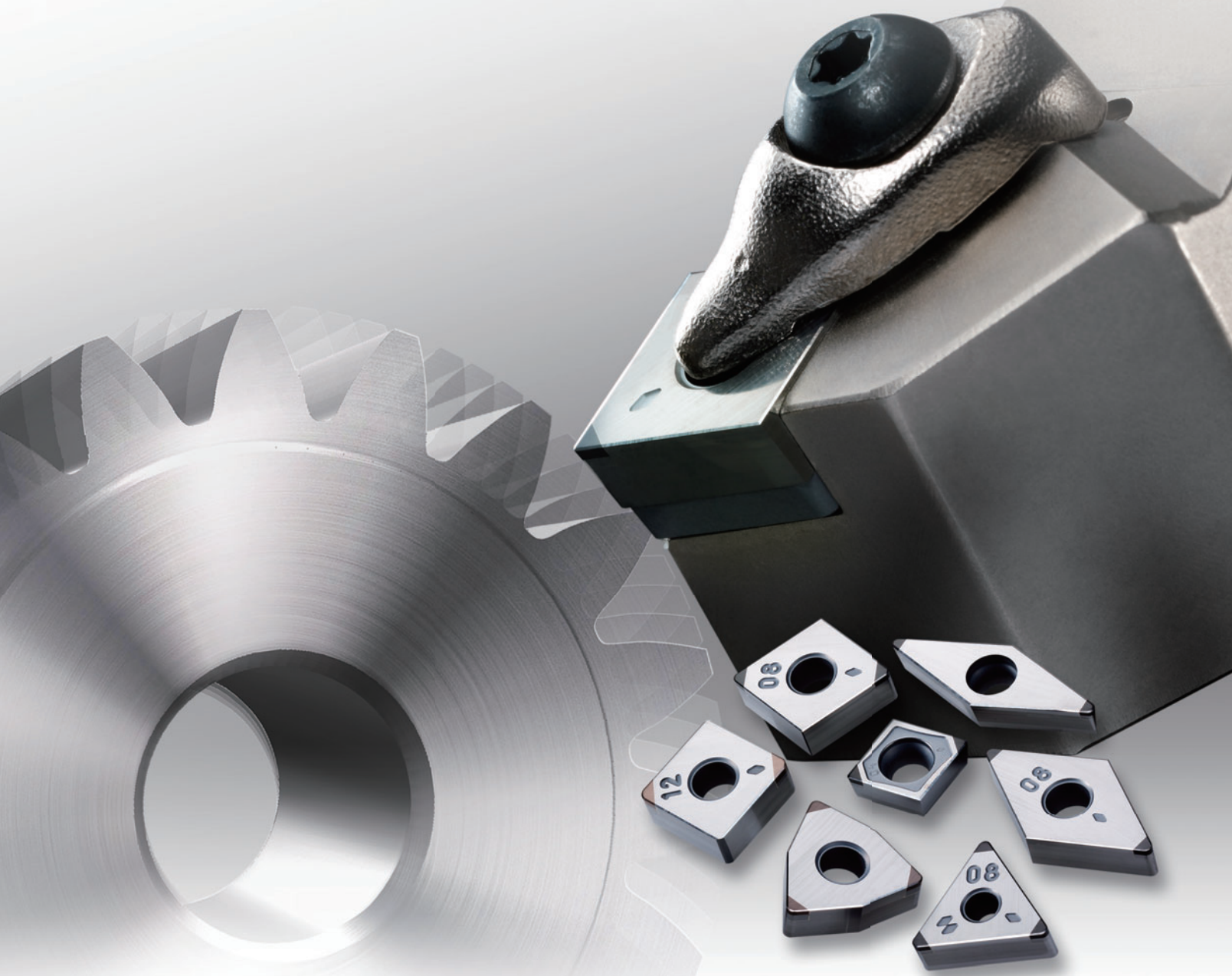


CBN Grade for Sintered Alloys and Cast Irons

# MB4120

New  
Product

## Excellent Fracture Resistance and Stable Cutting Improves Productivity



# CBN Grade for Sintered Alloys and Cast Irons

# ***MB4120***

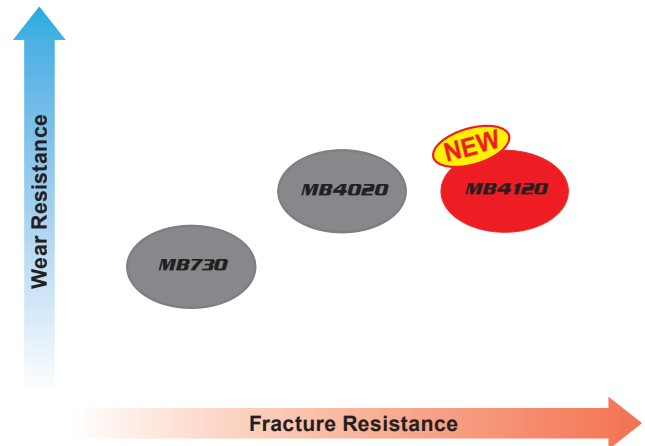
Increasing the CBN particle content and bonding strength makes it suitable for machining various sintered materials.

## High Fracture Resistance

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

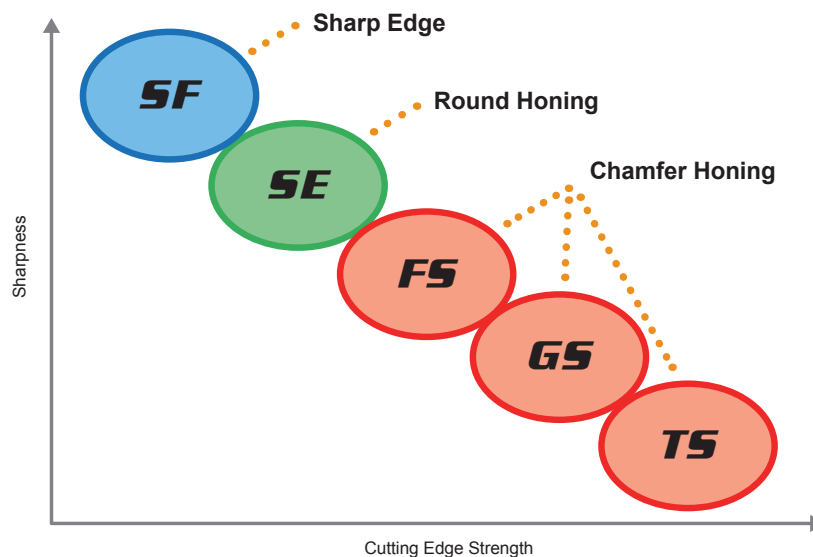
## High Adhesion Strength of Fine CBN Particles

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

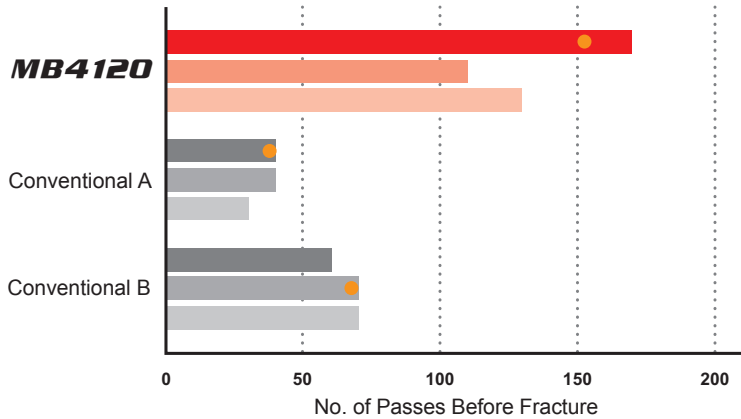
The SF type offers a sharper cutting edge, leading to the reduction in cutting resistance and burr development and an increase in surface finishes. The SF type is the first recommendation but, to increase cutting edge strength and chipping resistance there are also the SE, FS, GS and TS edge preparations.



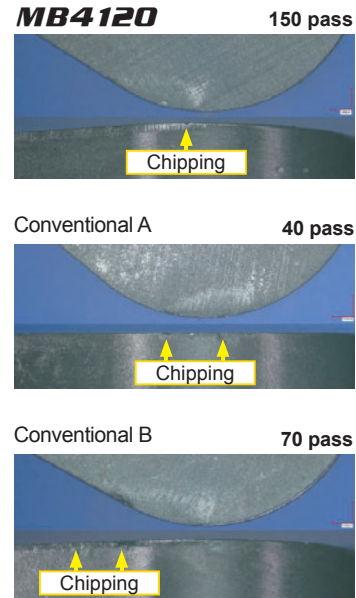
# Cutting Performance

## Fracture Resistance Comparison During Interrupted Facing of High Strength Sintered Alloy

Increased fracture resistance even during heavy interrupted machining.

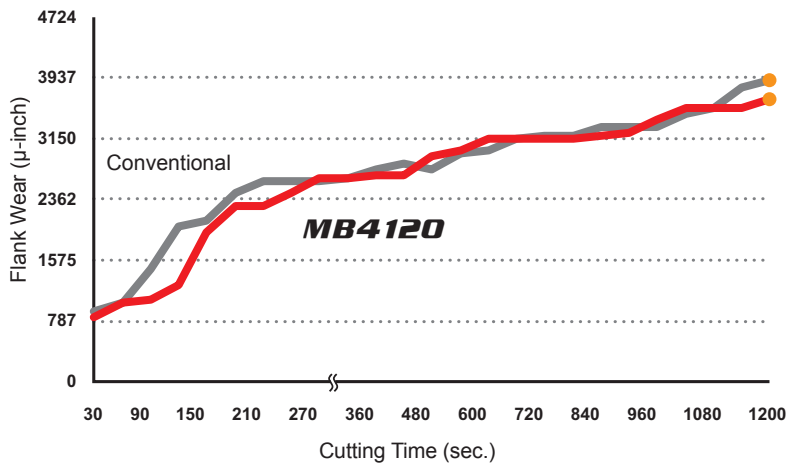


<Cutting Conditions>  
 Work Material : High Strength Sintered Alloy  
 Insert : NP-TNGA332-SE3  
 Cutting Speed :  $v_c=490$  SFM  
 Feed per Rev. :  $f=.006$  IPR  
 Depth of Cut :  $a_p=.004$  inch  
 Cutting Mode : Wet Cutting

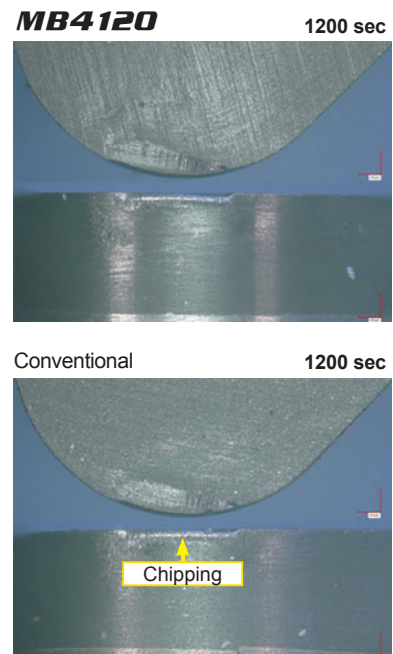


## Comparison in Continuous Machining of AISI No 35 B

Excellent fracture resistance compared to conventional products.



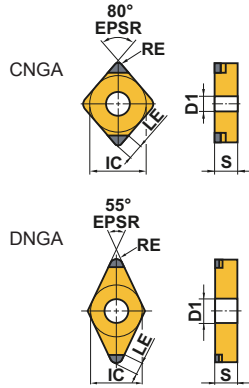
<Cutting Conditions>  
 Work Material : AISI No 35 B (Perlite)  
 Insert : NP-TNGA332-SF3  
 Cutting Speed :  $v_c=2625$  SFM  
 Feed per Rev. :  $f=.004$  IPR  
 Depth of Cut :  $a_p=.008$  inch  
 Cutting Mode : Dry Cutting



# CBN Grade for Sintered Alloys and Cast Irons

## Negative Inserts (With Hole)

G Class



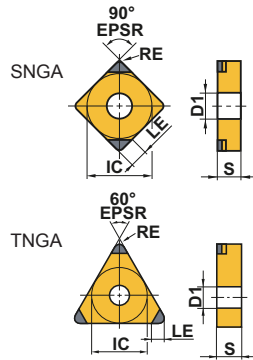
NEW PETIT CUT			
NP_002			
NEW PETIT CUT			
NP_002			

(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_002			
NEW PETIT CUT			
NP_003			

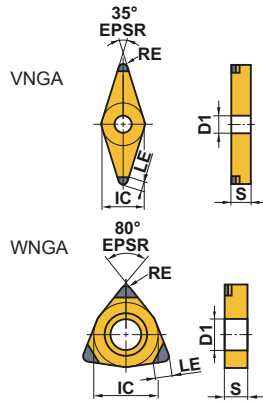
(inch)

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_002			
NEW PETIT CUT			
NP_003			

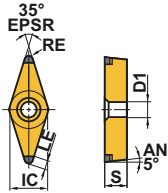
(inch)


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

VBGW



NEW PETIT CUT			
NP_002			
			

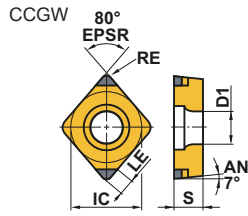
(inch)

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_002			

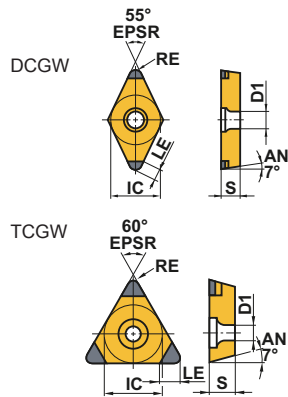
(inch)

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_002			
NEW PETIT CUT			
NP_003			

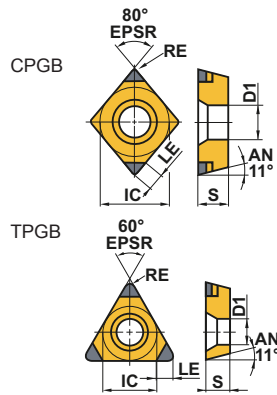
(inch)

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

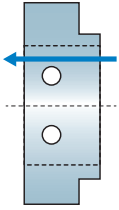
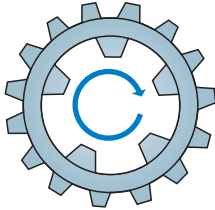
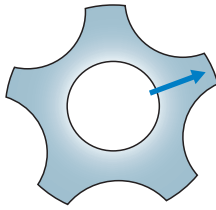
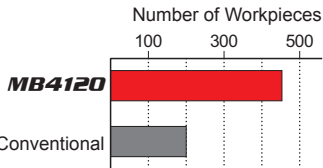
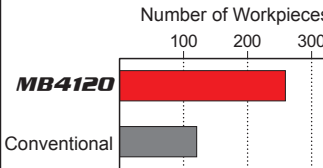
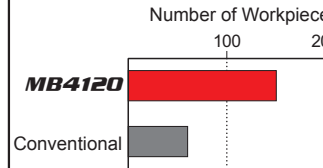


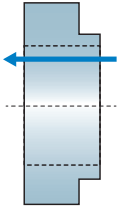
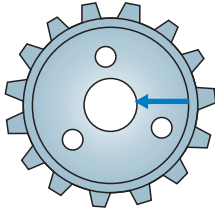
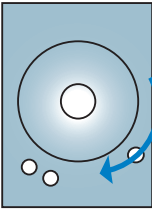
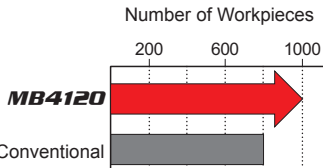
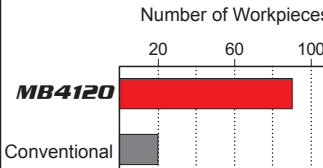
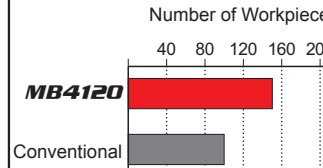
NEW PETIT CUT			
NP_002			
NEW PETIT CUT			
NP_003			

(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 ≤ 1.0 μm 
Component	Housing(Interrupted Boring)	Case(Interrupted Boring)	Pinion(Interrupted Facing)
Cutting Conditions	Cutting Speed $v_c$ (SFM)	655	655
	Feed per Rev. $f$ (IPR)	.003	.010
	Depth of Cut $a_p$ (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 $v_c$ (SFM)	820	1970
	Feed per Rev. $f$ (IPR)	.004	.005
	Depth of Cut $a_p$ (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.

## 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	<b>MB4120</b>	Turning						≤.008	≤.012	Dry, Wet
High Strength Sintered Alloys	<b>MB4120</b>	Turning						≤.008	≤.012	Dry, Wet
Hardened Sintered Alloys	<b>MB4120</b>	Turning						≤.008	≤.012	Dry, Wet

### Cast Irons

(inch)

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

#### For your safety

●Don't touch breakers and chips without gloves. ●Please machine within recommended application range, and exchange expired tools with new parts in advance. ●Please use safety cover and wear safety glasses. ●When using compounded cutting oils, please take fire prevention. ●When attaching inserts or spare parts, please use the attached wrench or driver. ●When using tools in revolution machining, please make a trial run to check run-out, vibration, abnormal sounds etc.

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EXP-18-E002  
Printed in U.S.A. 6/18