DIA EDGE

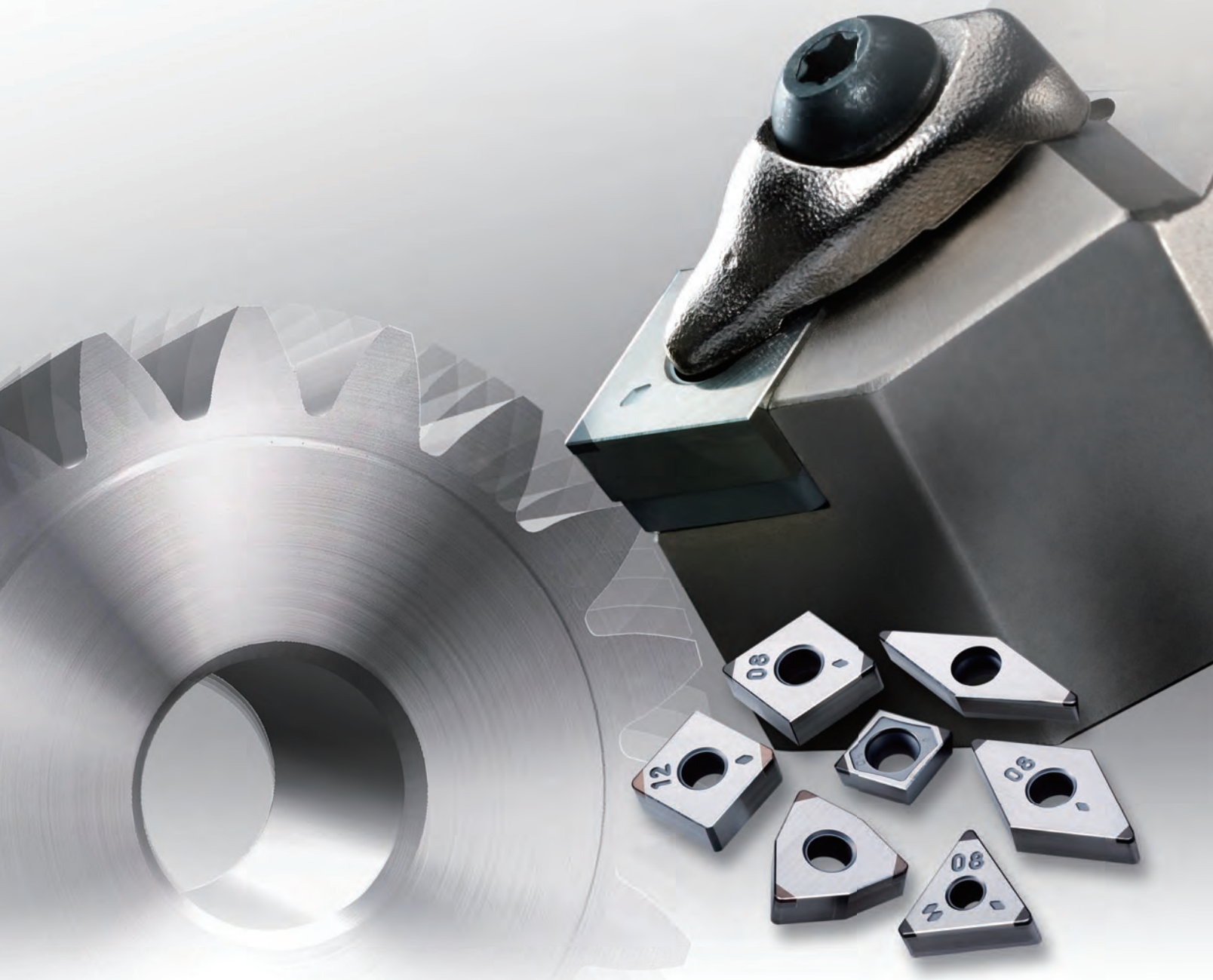
TOOL NEWS B246A

CBN Grade for Sintered Alloys and Cast Irons

MB4120

New Product

Excellent Fracture Resistance and Stable Cutting Improves Productivity



MITSUBISHI MATERIALS CORPORATION

CBN Grade for Sintered Alloys and Cast Irons

MB4120

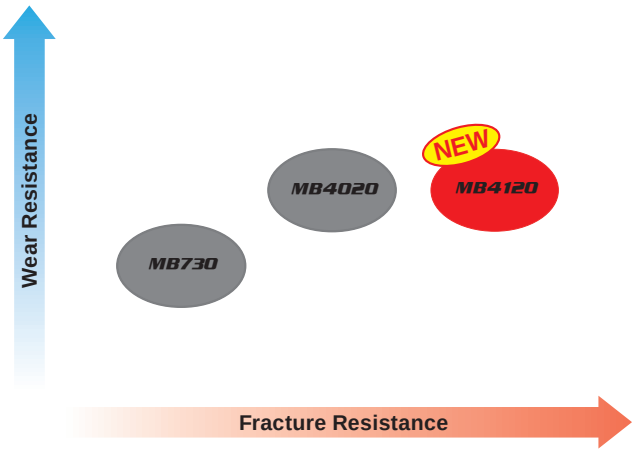
Increasing the CBN particle content and bonding strength makes it suitable for machining various sintered materials.

High Fracture Resistance

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

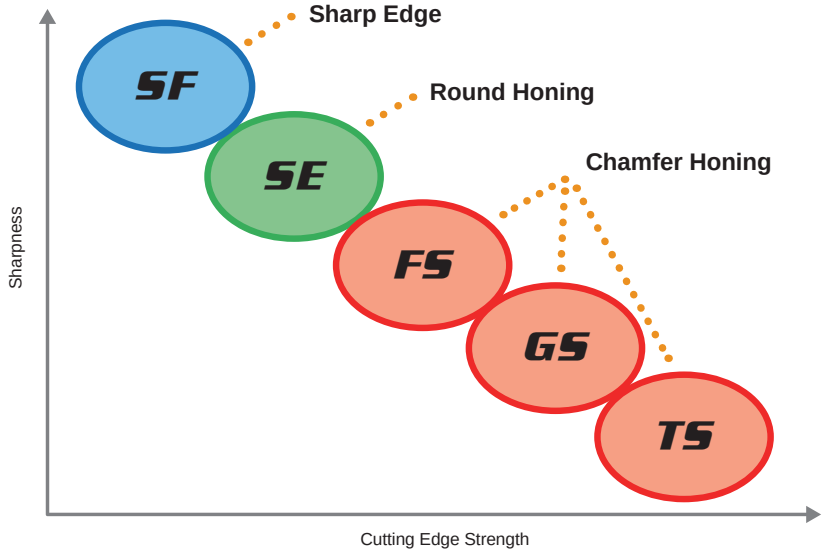
High Adhesion Strength of Fine CBN Particles

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

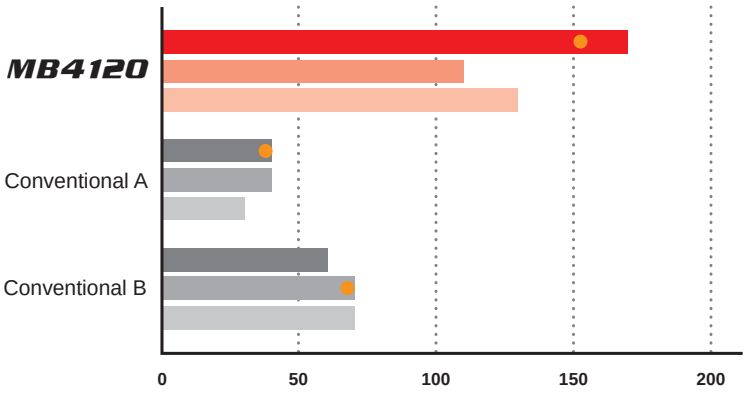
The SF type offers a sharper cutting edge, leading to the reduction in cutting resistance and burr development and an increase in surface finishes. The SF type is the first recommendation but, to increase cutting edge strength and chipping resistance there are also the SE, FS, GS and TS edge preparations.



Cutting Performance

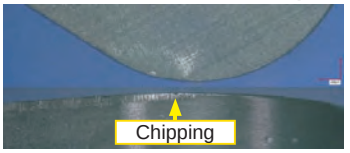
Fracture Resistance Comparison During Interrupted Facing of High Strength Sintered Alloy

Increased fracture resistance even during heavy interrupted machining.

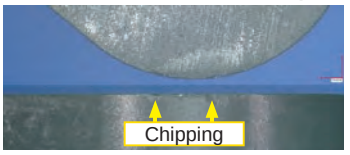


<Cutting Conditions>
Work Material : High Strength Sintered Alloy
Insert : NP-TNGA332-SE3
Cutting Speed : vc=490 SFM
Feed per Rev. : f=.006 IPR
Depth of Cut : ap=.004 inch
Cutting Mode : Wet Cutting

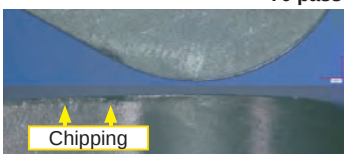
MB4120 **150 pass**



Conventional A **40 pass**

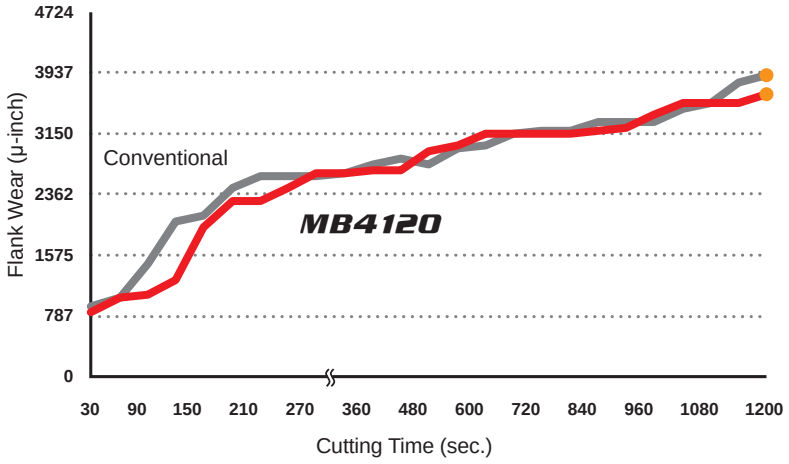


Conventional B **70 pass**



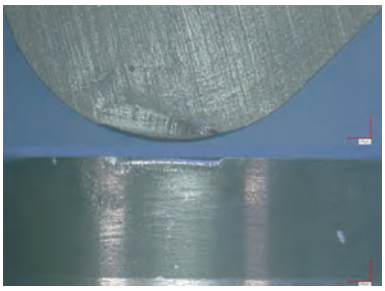
Comparison in Continuous Machining of AISI No 35 B

Excellent fracture resistance compared to conventional products.

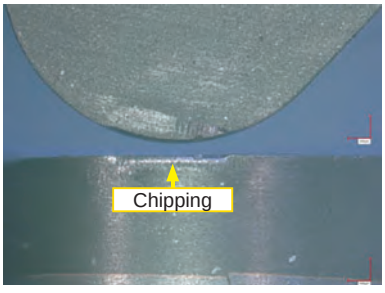


<Cutting Conditions>
Work Material : AISI No 35 B (Perlite)
Insert : NP-TNGA332-SF3
Cutting Speed : vc=2625 SFM
Feed per Rev. : f=.004 IPR
Depth of Cut : ap=.008 inch
Cutting Mode : Dry Cutting

MB4120 **1200 sec**



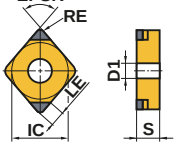
Conventional **1200 sec**



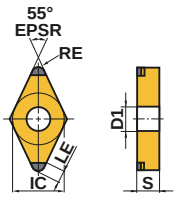
Negative Inserts (With Hole)

G Class

CNGA



DNGA



NEW PETIT CUT			
NP_○○2			
NEW PETIT CUT			
NP_○○2			

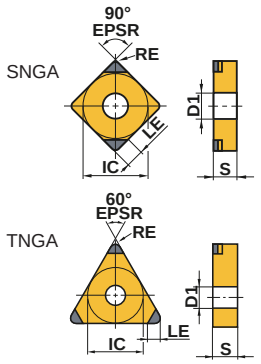
(inch)

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

● : Inventory maintained. (1 insert in one case.)

Negative Inserts (With Hole)

G Class



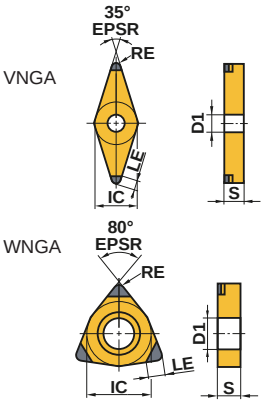
NEW PETIT CUT			
NP_○○2			
NEW PETIT CUT			
NP_○○3			

(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

Positive Inserts (With Hole)

G Class



NEW PETIT CUT			
NP_○○2 			
NEW PETIT CUT			
NP_○○3 			

(inch)

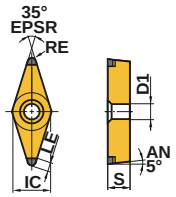
Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-VNGA331-SF2	●	2	.375	.187	.016	.150	.098
NP-VNGA332-SF2	●	2	.375	.187	.031	.150	.079
NP-VNGA331-SE2	●	2	.375	.187	.016	.150	.098
NP-VNGA332-SE2	●	2	.375	.187	.031	.150	.079
NP-VNGA331-FS2	●	2	.375	.187	.016	.150	.098
NP-VNGA332-FS2	●	2	.375	.187	.031	.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

● : Inventory maintained. (1 insert in one case.)

Positive Inserts (With Hole)

G Class

VBGW



NEW PETIT CUT			
NP_○○2			
			

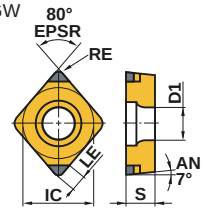
(inch)

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

Positive Inserts (With Hole)

G Class

CCGW



NEW PETIT CUT			
NP_○○2 			

(inch)

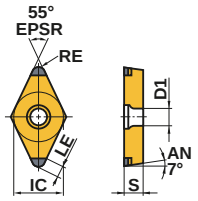
Order Number	MB4120	Cutting Edges	IC	S	RE	D1	LE
NP-CCGW21.50.5-SF2	●	2	.250	.094	.008	.110	.071
NP-CCGW21.51-SF2	●	2	.250	.094	.016	.110	.075
NP-CCGW21.52-SF2	●	2	.250	.094	.031	.110	.083
NP-CCGW32.50.5-SF2	●	2	.375	.156	.008	.173	.071
NP-CCGW32.51-SF2	●	2	.375	.156	.016	.173	.075
NP-CCGW32.52-SF2	●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

● : Inventory maintained. (1 insert in one case.)

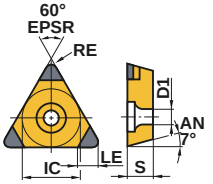
Positive Inserts (With Hole)

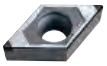
G Class

DCGW



TCGW



NEW PETIT CUT			
NP_○○2 			
NEW PETIT CUT			
NP_○○3 			

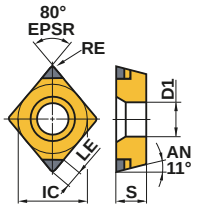
(inch)

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

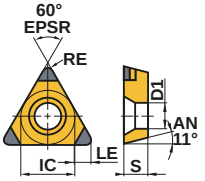
Positive Inserts (With Hole)

G Class

CPGB



TPGB



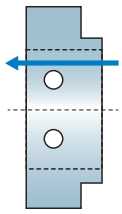
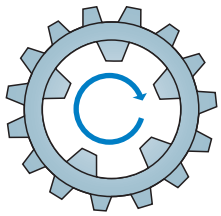
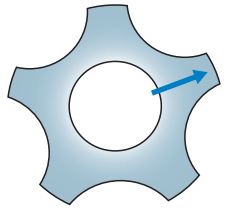
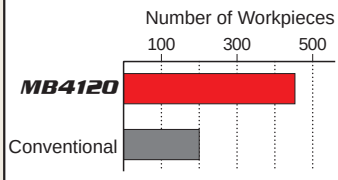
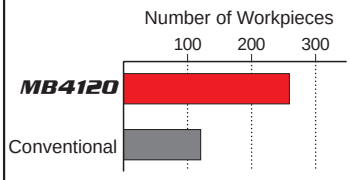
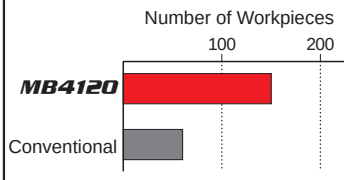
NEW PETIT CUT			
NP_○○2			
NEW PETIT CUT			
NP_○○3			

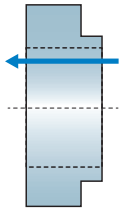
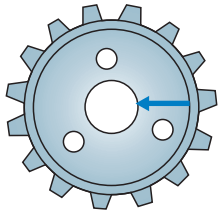
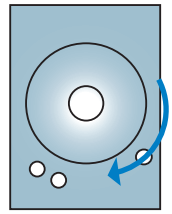
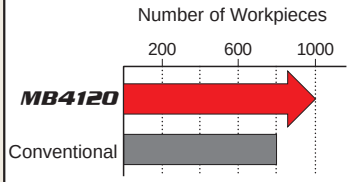
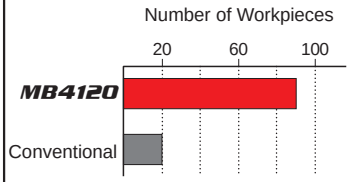
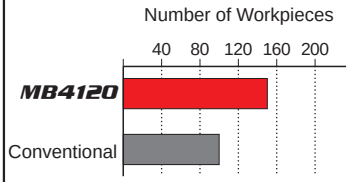
(inch)

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

● : Inventory maintained. (1 insert in one case.)

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	655
Cutting Conditions: Feed per Rev. **f** (IPR)	.003	.010	.0016 – .0020
Cutting Conditions: Depth of Cut **ap** (inch)	.008	.008 – .012	.016
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	1970
Cutting Conditions: Feed per Rev. **f** (IPR)	.004	.005	.007 – .010
Cutting Conditions: Depth of Cut **ap** (inch)	.004	.002	.006 – .008
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) 330 490 655 820 985	**f** (IPR)	**ap**	Cutting Mode
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

(inch)

Work Material	Grade	Machining	**vc** (SFM) 820 1640 2460 3280 4100	**f** (IPR)	**ap**	Cutting Mode
Gray Cast Irons	**MB4120**	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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