NEW

New Coated CBN for Machining Hardened Material

KBN010/KBN020

"Wear Resistance + Fracture Resistance" Lowers Costs when Machining Hardened Material

New Coating + High Toughness CBN Provide Wear Resistance and Fracture Resistance.

Supports a Wide Range of Application from Continuous to Interrupted/Heavy Interrupted Machining.

Newly Developed "MEGACOAT TOUGH" Coating Technology.

NEW **New Coating is Now Available**

MEGACOAT TOUGH | CBN

New Coated CBN for Machining Hardened Material

KBN010/KBN020

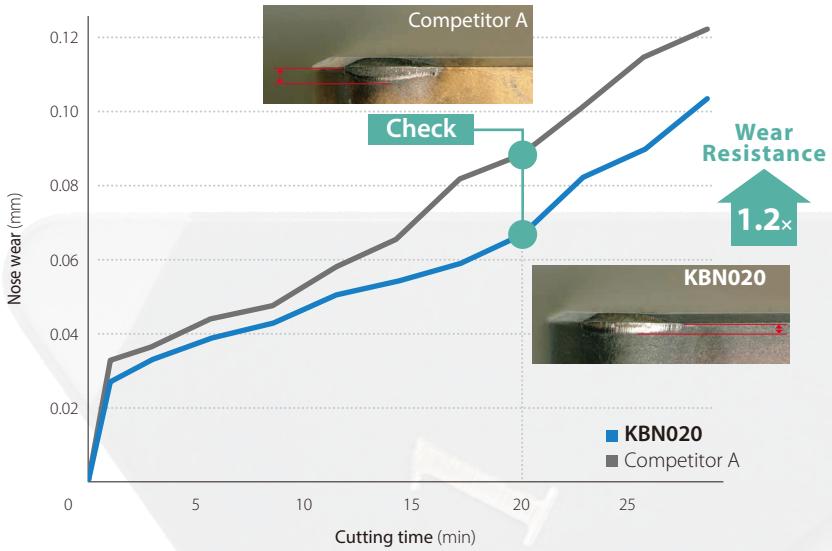
Long tool life and stable machining results with wear resistance and fracture resistance
Supports a wide range of applications and reduces the cost of hardened materials machining

1 New Coating + High Toughness CBN Provide Wear Resistance and Fracture Resistance

Wear Resistance

New coating "MEGACOAT TOUGH" suppresses layer peeling.
Excellent wear resistance

Wear Resistance Comparison (In-house evaluation)



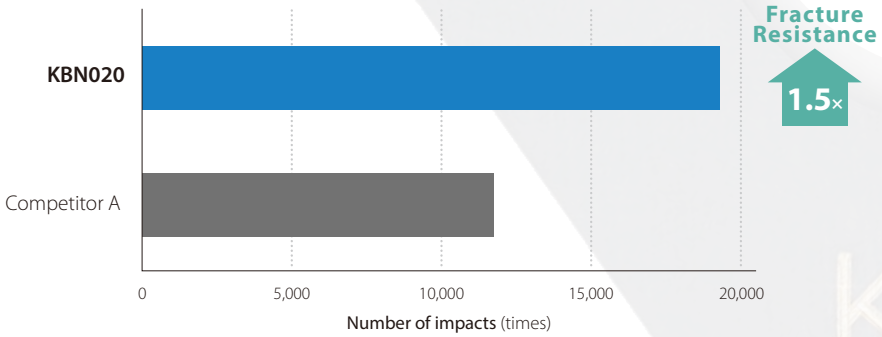
Cutting conditions : Vc = 150 m/min, ap = 0.2 mm, f = 0.1 mm/rev, Wet
Workpiece : SCM415Ⓗ 60 HRC

Fracture Resistance

KBN010 : Mixed structure of micro grain CBN and coarse grain CBN

KBN020 : High content CBN and high purity TiN binder provides excellent fracture resistance

Continuous to Interrupted Machining Comparison (In-house evaluation)



Cutting conditions : Vc = 150 m/min, ap = 0.2 mm, f = 0.2 mm/rev, Dry
Workpiece : SCM415Ⓗ 60 HRC

2 Supports a Wide Range of Application from Continuous to Interrupted/ Heavy Interrupted Machining

KBN010 for high-speed finishing

KBN020 [1st recommendation] covers a wide range of applications

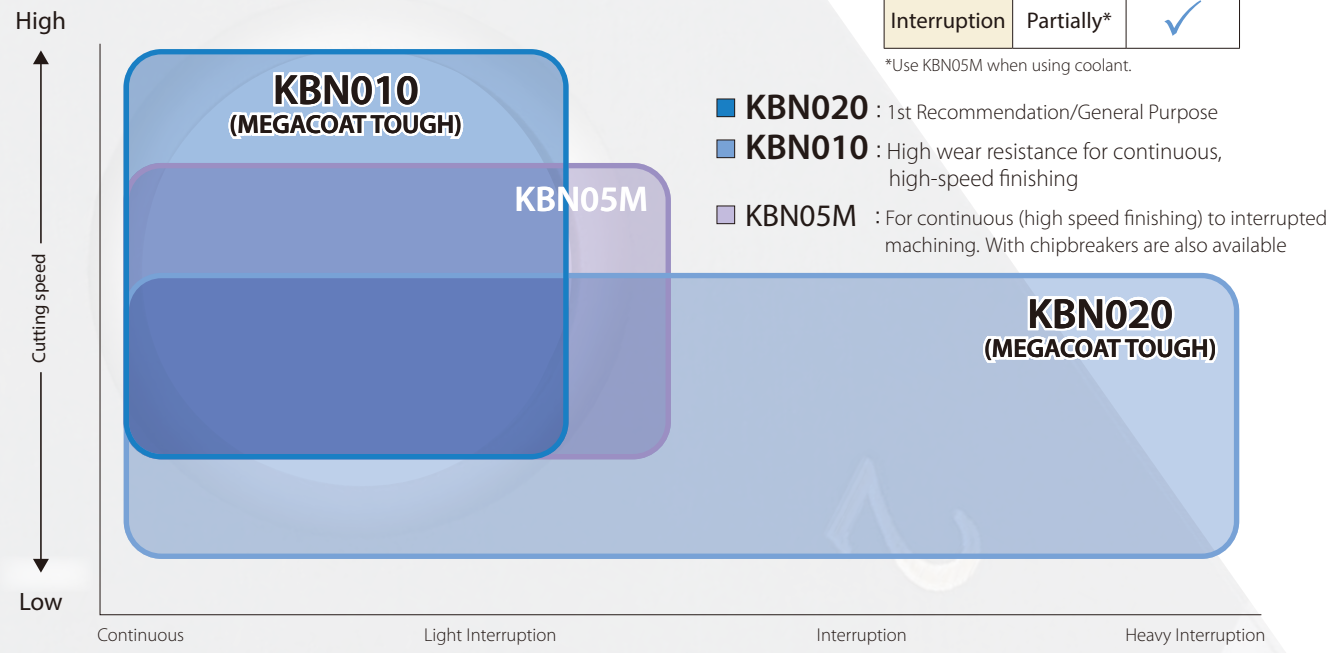
Coolant

✓ Recommended ⊘ Not Recommended

Application	Wet	Dry
Continuous	✓	⊘
Interruption	Partially*	✓

*Use KBN05M when using coolant.

Application Map



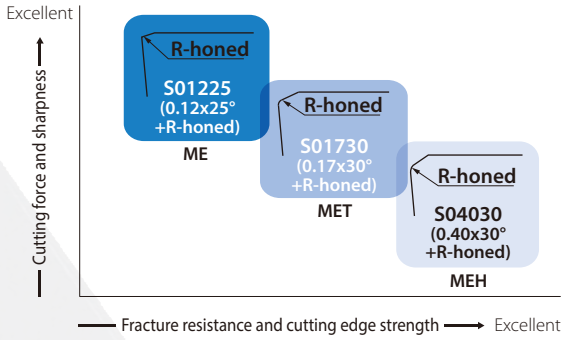
■ **KBN020** : 1st Recommendation/General Purpose

■ **KBN010** : High wear resistance for continuous, high-speed finishing

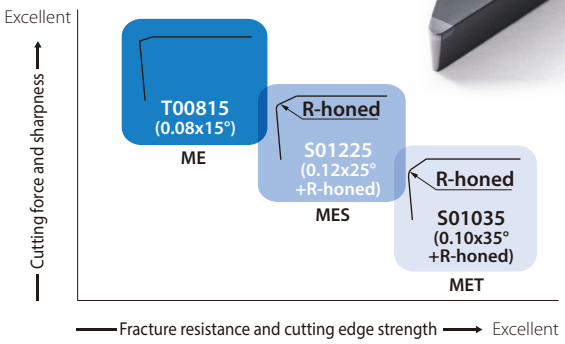
□ **KBN05M** : For continuous (high speed finishing) to interrupted machining. With chipbreakers are also available

3 Extended lineup of cutting edge preparations

Negative Insert



Positive Insert



Negative Insert Standard Cutting Edge Prep. (Hardened material machining)

Symbol	Cutting Edge Prep.		Applications and Features
ME	S01225	0.12mm x 25˚+R-honed	General purpose
MET	S01730	0.17mm x 30˚+R-honed	Superior fracture resistance
MEH	S04030	0.40mm x 30˚+R-honed	For interrupted · high-feed machining Prevents flaking

Positive Insert Standard Cutting Edge Prep. (Hardened material machining)

Symbol	Cutting Edge Prep.		Applications and Features
ME	T00815	0.08mm x 15˚	Chamfered Sharp edge, Minimize burrs
MES	S01225	0.12mm x 25˚+R-honed	General purpose
MET	S01035	0.10mm x 35˚+R-honed	For interruption Stable machining

4 Newly Developed Coating "MEGACOAT TOUGH"

MEGACOAT TOUGH | CBN

Features

An adhesion layer is laminated between the high wear resistance layer and the CBN. Reduces layer peeling to achieve long tool life and stable machining

High wear resistance layer with TiAlN + Oxidation resistance components
Suppresses oxidation/diffusional wear

Check Newly developed adhesion layer

Interlayer for stress relief

High adhesion layer

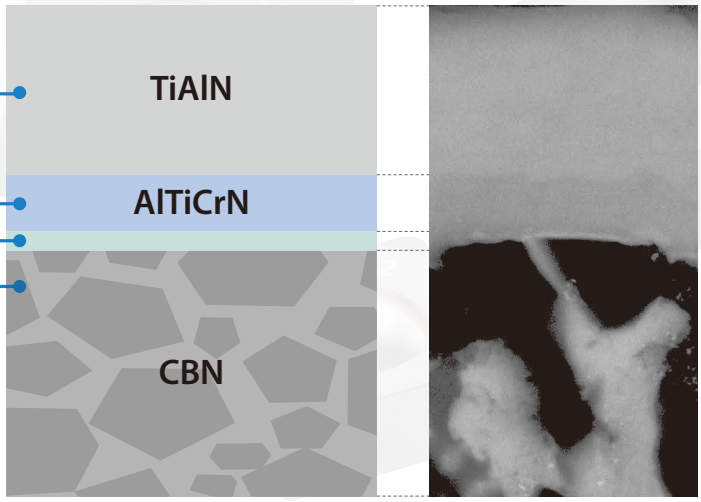
Two layers dedicated to CBN

Improved adhesion between CBN and high wear resistant layer. Suppresses layer peeling

Check High toughness CBN

KBN010 : Mixed structure of micro grain CBN and coarse grain CBN
Improved wear resistance in high speed machining

KBN020 : High content CBN with high purity TiN binder
Improved heat resistance and toughness



Layer image

Case studies

Clutch SCr420H

Vc = 100 m/min
ap = 0.15 mm
f = 0.1 mm/rev
Wet
WNGA080408S01225

Tool Life

KBN020	650 pcs/edge	1.6×
Competitor B	400 pcs/edge	

KBN020 provides stable machining with longer tool life.

(User evaluation)

Gear SCM415

Vc = 100 m/min
ap = 0.05 mm
f = 0.15 mm/rev
Wet
CNGA120408S01325MEW

Tool Life

KBN020	300 pcs/edge	1.5×
Competitor C	200 pcs/edge	

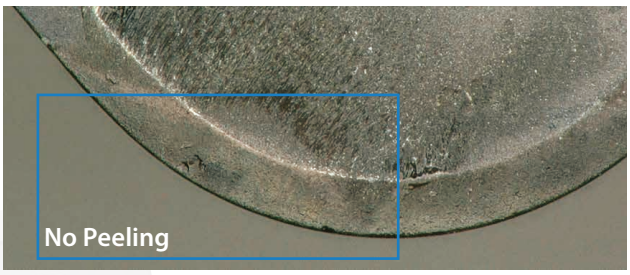
KBN020 improves dimensional variation with longer tool life.

(User evaluation)

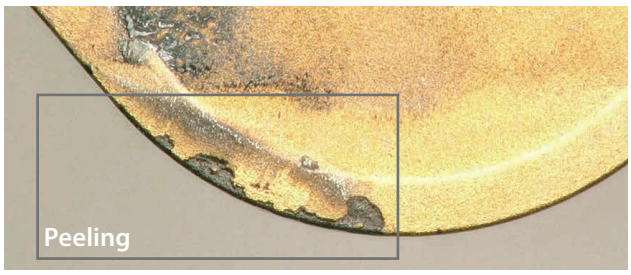
Check Newly developed adhesion layer

Improved adhesion between CBN and high wear resistance layer

KBN020



Competitor A

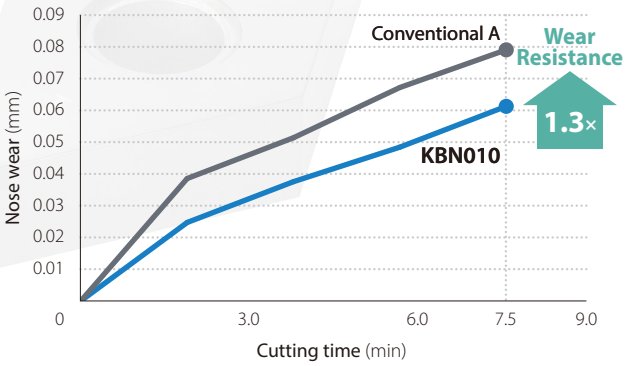


Cutting conditions : Vc = 150 m/min, ap = 0.2 mm, f = 0.2 mm/rev, Dry
Workpiece : SCM 415Ⓗ (In-house evaluation)

Check High toughness CBN

KBN010

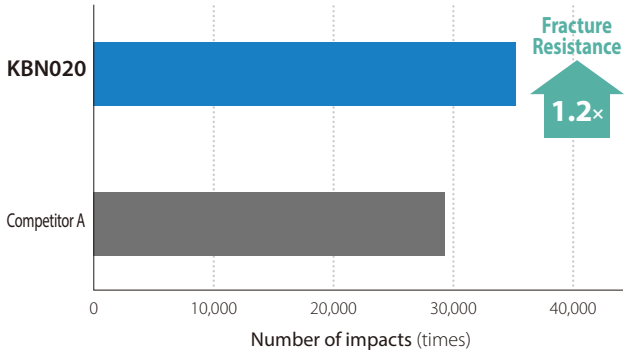
Improved wear resistance by 30% in high-speed machining (Compared to conventional A)



Cutting conditions : Vc = 210 m/min, ap = 0.2 mm, f = 0.1 mm/rev, Wet
Workpiece : SCM415Ⓗ 60HRC (In-house evaluation)

KBN020

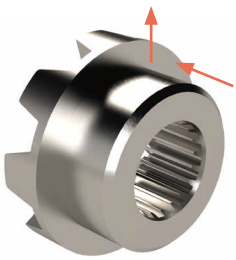
Improved fracture resistance by 20% in heavy interrupted machining (Compared to competitor A)



Cutting conditions : Vc = 100 m/min, ap=0.2 mm, f=0.3 mm/rev, Dry
Workpiece : SCM415Ⓗ 4 grooves in workpiece 61HRC (In-house evaluation)

Gear SNCM220Ⓗ 58HRC

Vc = 125 m/min
ap = 0.25 mm
f = 0.1 mm/rev
Dry
CNGA120408S04030MEH



Tool Life

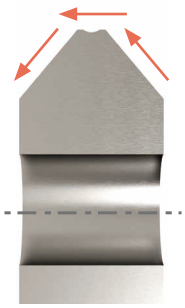
KBN010	**600** pcs/edge	3.0×
Competitor D	200 pcs/edge	

KBN010 provides longer tool life than competitor D.

(User evaluation)

Roll SKD11 62HRC

Vc = 145 m/min
ap = 0.25-0.50 mm
f = 0.1 mm/rev
Dry
DNGA150608S01225



Tool Life

KBN010	**18** pcs/edge	1.3×
Competitor E	13 pcs/edge	

Achieved longer tool life with excellent wear resistance in continuous machining of hardened material.

(User evaluation)

Solution for Automotive Parts

Videos

Shaft - External Turning
Continuous to interrupted machining

Gear - Facing
Heavy interrupted machining

Solution 1

Available for continuous to interrupted/heavy interrupted machining
Can be used on a variety of part shapes such as machining shafts and gears.

Point: Excellent machining performance of auto suspension parts that use a lot of hardened materials

Solution 2

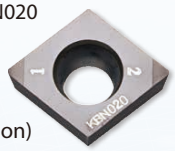
Long tool life and stable machining. High toughness suppresses sudden fractures during continuous to interrupted machining applications.

Point: Stable machining increases productivity.

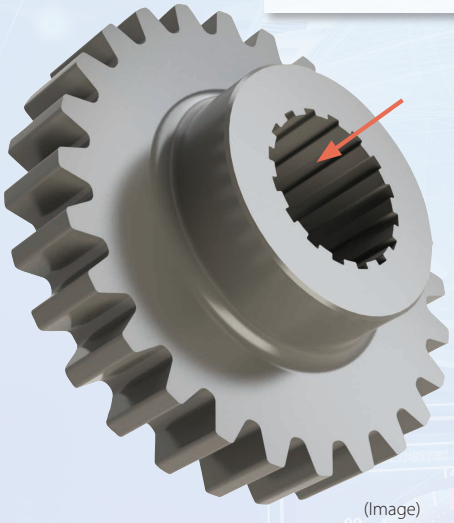
Sun Gear

Workpiece
S45C (Carburizing and quenching)

Insert 1st Recommendation : KBN020
CCMW09T308S01035MET



Applications
Boring finishing for spline part (Interruption)



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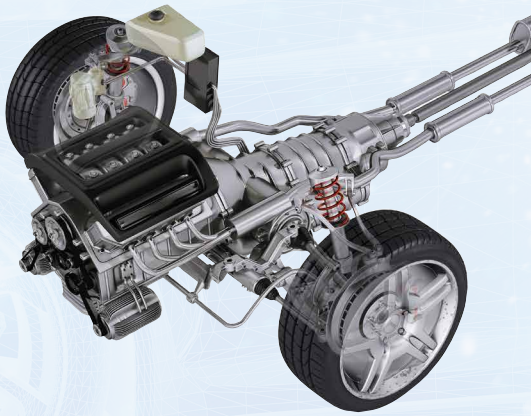
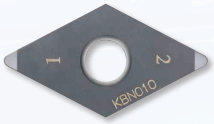


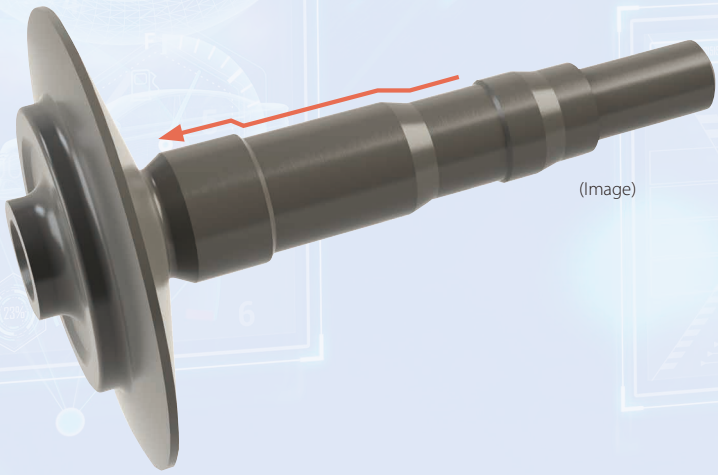
CVT Shaft

Workpiece
SCr420H

Insert 1st Recommendation : KBN010
2nd Recommendation : KBN020
DNGA150404S01225ME



Applications
External finishing



(Image)

Diff Ring

Workpiece

SCr420H

Insert 1st Recommendation : KBN020

CNGA120408S01730MET

Applications

Facing (Interruption)

(Image)

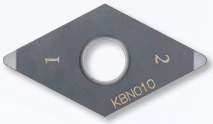
Pinion Gear

Workpiece

SCM420H

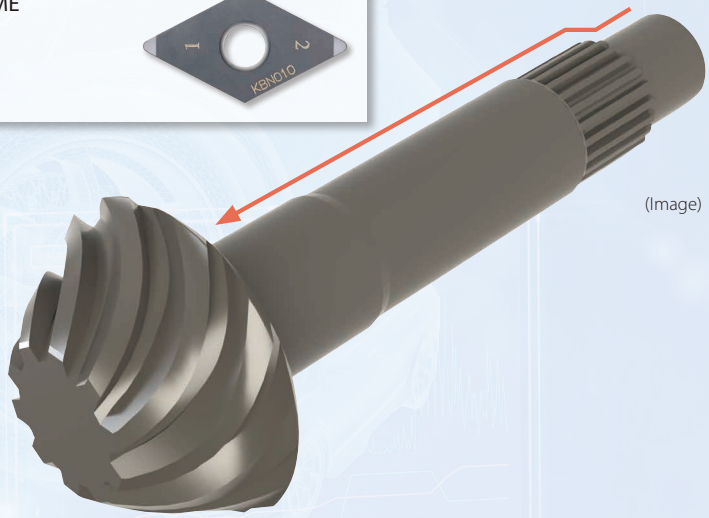
Insert 1st Recommendation : KBN010
2nd Recommendation : KBN020

DNGA150404S01225ME



Applications

External finishing



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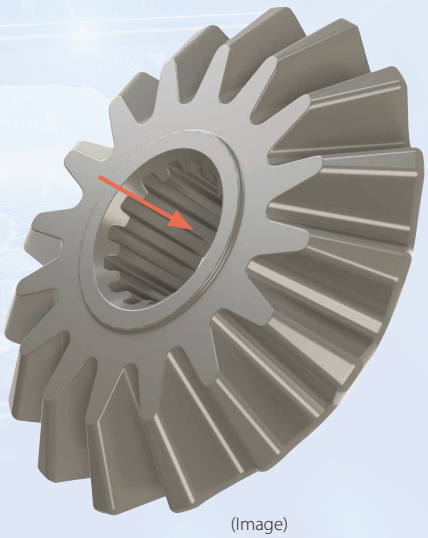


(Image)

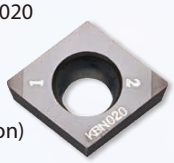
Side Gear

Workpiece

S45C (Carburizing and quenching)

Insert 1st Recommendation : KBN020

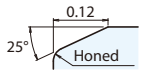
CCMW09T308S01035MET



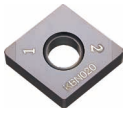
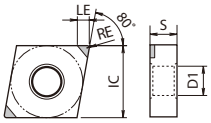
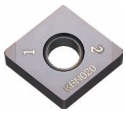
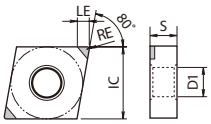
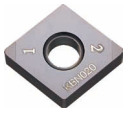
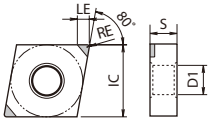
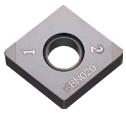
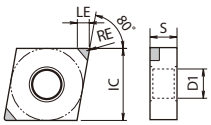
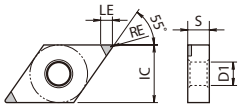
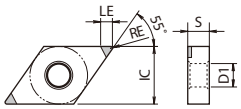
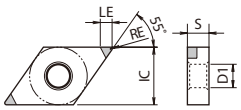
Applications

Boring finishing for spline part (Interruption)

Standard Stock (Negative)

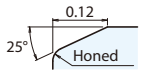
Cutting Edge Preparation				
Symbol	Cutting Edge Specification	Indication Example		Shape
S	Chamfered and Honed	S01225	0.12 mm x 25°chamfered and honed	

Description	IC	S	D1
CNGA 1204_	12.70	4.76	5.16
DNGA 1504_	12.70	4.76	5.16
DNGA 1506_		6.35	

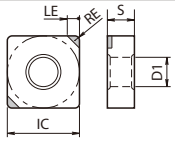
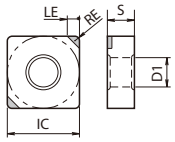
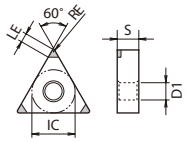
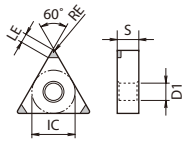
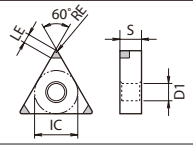
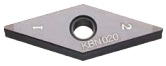
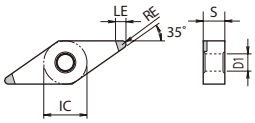
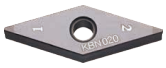
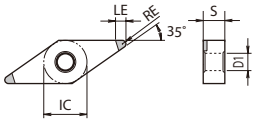
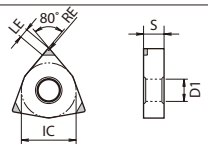
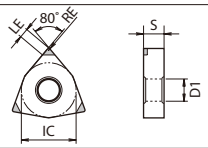
Shape		Description		Cutting Edge Preparation	Dimensions (mm) RE	Dimensions (mm) LE	No. of Edges	MEGACOAT TOUGH KBN010	MEGACOAT TOUGH KBN020
 Multi Edge/With Wiper Edge		CNGA	120404S01215MEW	S01215	0.4	2.6	2	●	●
			120408S01215MEW		0.8	2.5		●	●
			120412S01215MEW		1.2	2.5		●	●
 Multi Edge		CNGA	120402S01225ME	S01225	0.2	2.6	2	●	●
			120404S01225ME		0.4	2.6		●	●
			120408S01225ME		0.8	2.6		●	●
			120412S01225ME		1.2	2.5		●	●
			120416S01225ME		1.6	3.4		●	●
			120420S01225ME		2.0	3.4		●	●
 Multi Edge/Tough		CNGA	120404S01730MET	S01730	0.4	2.6	2	●	●
			120408S01730MET		0.8	2.6		●	●
			120412S01730MET		1.2	2.5		●	●
			120416S01730MET		1.6	3.4		●	●
 Multi Edge/Interruption		CNGA	120408S04030MEH	S04030	0.8	2.6	2	●	●
			120412S04030MEH		1.2	2.5		●	●
Multi Edge		DNGA	150401S01225ME	S01225	0.1	2.8	2	●	●
			150402S01225ME		0.2	2.7		●	●
			150404S01225ME		0.4	2.6		●	●
			150408S01225ME		0.8	2.2		●	●
			150412S01225ME		1.2	1.9		●	●
			150416S01225ME		1.6	3.8		●	●
		DNGA	150604S01225ME	S01225	0.4	2.6	2	●	●
			150608S01225ME		0.8	2.2		●	●
Multi Edge/Tough		DNGA	150404S01730MET	S01730	0.4	2.6	2	●	●
			150408S01730MET		0.8	2.2		●	●
			150412S01730MET		1.2	1.9		●	●
			150416S01730MET		1.6	3.8		●	●
		DNGA	150604S01730MET	S01730	0.4	2.6	2	●	●
			150608S01730MET		0.8	2.2		●	●
Multi Edge/Interruption		DNGA	150404S04030MEH	S04030	0.4	2.6	2	●	●
			150408S04030MEH		0.8	2.2		●	●
			150412S04030MEH		1.2	1.9		●	●

● : Standard Stock

Standard Stock (Negative)

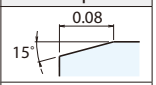
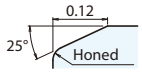
Cutting Edge Preparation				
Symbol	Cutting Edge Specification	Indication Example		Shape
S	Chamfered and Honed	S01225	0.12 mm x 25°chamfered and honed	

Description	IC	S	D1
SNGA 1204_	12.70	4.76	5.16
TNGA 1604_	9.525	4.76	3.81
VNGA 1604_	9.525	4.76	3.81
WNGA 0804_	12.70	4.76	5.16

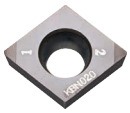
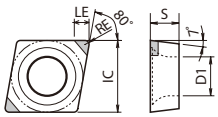
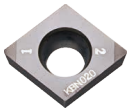
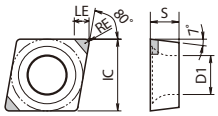
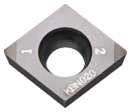
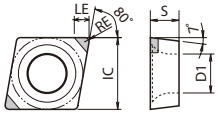
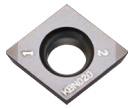
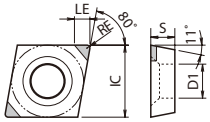
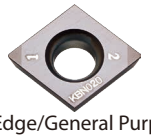
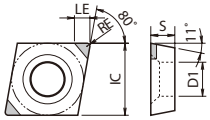
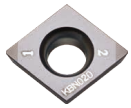
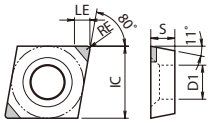
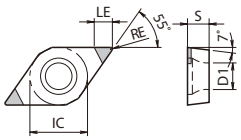
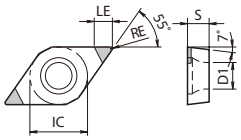
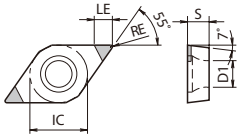
Shape		Description		Cutting Edge Preparation	Dimensions (mm)		No. of Edges	MEGACOAT TOUGH	
					RE	LE		KBN010	KBN020
Multi Edge		SNGA	120404S01225ME	S01225	0.4	2.6	2	●	●
			120408S01225ME		0.8	2.6		●	●
Multi Edge/Tough		SNGA	120404S01730MET	S01730	0.4	2.6	2	●	●
			120408S01730MET		0.8	2.6		●	●
			120412S01730MET		1.2	2.6		●	●
Multi Edge		TNGA	160401S01225ME	S01225	0.1	2.9	3	●	●
			160402S01225ME		0.2	2.8		●	●
			160404S01225ME		0.4	2.7		●	●
			160408S01225ME		0.8	2.4		●	●
			160412S01225ME		1.2	2.1		●	●
Multi Edge/Tough		TNGA	160404S01730MET	S01730	0.4	2.7	3	●	●
			160408S01730MET		0.8	2.4		●	●
			160412S01730MET		1.2	2.1		●	●
Multi Edge/Interruption		TNGA	160404S04030MEH	S04030	0.4	2.7	3	●	●
			160408S04030MEH		0.8	2.4		●	●
 Multi Edge		VNGA	160401S01225ME	S01225	0.1	2.6	2	●	●
			160402S01225ME		0.2	2.3		●	●
			160404S01225ME		0.4	2.0		●	●
			160408S01225ME		0.8	2.7		●	●
 Multi Edge/Tough		VNGA	160404S01730MET	S01730	0.4	2.0	2	●	●
			160408S01730MET		0.8	2.7		●	●
Multi Edge		WNGA	080404S01225ME	S01225	0.4	2.6	3	●	●
			080408S01225ME		0.8	2.6		●	●
Multi Edge/Tough		WNGA	080404S01730MET	S01730	0.4	2.0	3	●	●
			080408S01730MET		0.8	2.6		●	●

● : Standard Stock

Standard Stock (Positive)

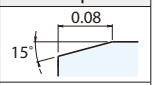
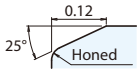
Cutting Edge Preparation				
Symbol	Cutting Edge Specification	Indication Example		Shape
T	Chamfered	T00815	0.08 mm x 15°chamfered	
S	Chamfered and Honed	S01225	0.12 mm x 25°chamfered and honed	

Description	IC	S	D1
CCMW 0602_	6.35	2.38	2.8
CCMW 09T3_	9.525	3.97	4.4
CPGB 0802_	7.94	2.38	3.5
CPGB 0903_	9.525	3.18	4.5
DCMW 0702_	6.35	2.38	2.8
DCMW 11T3_	9.525	3.97	4.4

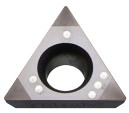
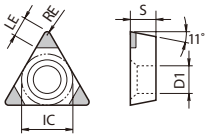
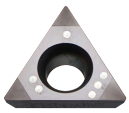
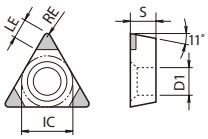
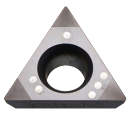
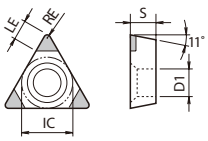
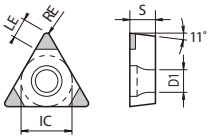
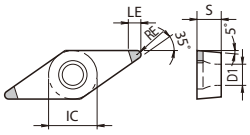
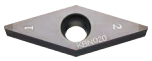
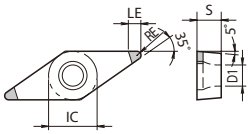
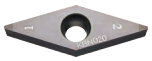
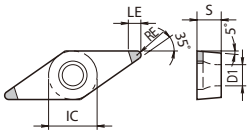
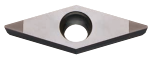
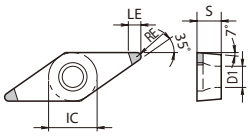
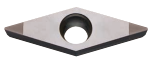
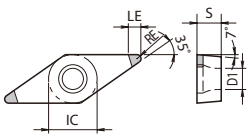
Shape		Description		Cutting Edge Preparation	Dimensions (mm)		No. of Edges	MEGACOAT TOUGH	
					RE	LE		KBN010	KBN020
 Multi Edge		CCMW	060202T00815ME	T00815	0.2	2.0	2	●	●
			060204T00815ME		0.4	1.9		●	●
			060208T00815ME		0.8	1.8		●	●
		CCMW	09T302T00815ME	T00815	0.2	2.0	2	●	●
			09T304T00815ME		0.4	1.9		●	●
			09T308T00815ME		0.8	1.8		●	●
 Multi Edge/General Purpose		CCMW	060204S01225MES	S01225	0.4	1.9	2	●	●
			060208S01225MES		0.8	1.8		●	●
		CCMW	09T304S01225MES	S01225	0.4	1.9	2	●	●
			09T308S01225MES		0.8	1.8		●	●
 Multi Edge/Tough		CCMW	09T304S01035MET	S01035	0.4	1.9	2	●	●
			09T308S01035MET		0.8	1.8		●	●
 Multi Edge		CPGB	080204T00815ME	T00815	0.4	1.9	2	●	●
		CPGB	090302T00815ME	T00815	0.2	2.6	2	●	●
			090304T00815ME		0.4	2.6		●	●
 Multi Edge/General Purpose		CPGB	090304S01225MES	S01225	0.4	2.5	2	●	●
			090308S01225MES		0.8	2.5		●	●
 Multi Edge/Tough		CPGB	080204S01035MET	S01035	0.4	1.9	2	●	●
			080208S01035MET		0.8	2.2		●	●
		CPGB	090304S01035MET	S01035	0.4	2.5	2	●	●
			090308S01035MET		0.8	2.5		●	●
Multi Edge		DCMW	070202T00815ME	T00815	0.2	2.4	2	●	●
			070204T00815ME		0.4	2.2		●	●
			070208T00815ME		0.8	1.9		●	●
		DCMW	11T302T00815ME	T00815	0.2	2.4	2	●	●
			11T304T00815ME		0.4	2.2		●	●
			11T308T00815ME		0.8	1.9		●	●
			11T312T00815ME		1.2	1.9		●	●
Multi Edge/General Purpose		DCMW	11T302S01225MES	S01225	0.2	2.4	2	●	●
			11T304S01225MES		0.4	2.2		●	●
			11T308S01225MES		0.8	1.9		●	●
Multi Edge/Tough		DCMW	070202S01035MET	S01035	0.2	1.9	2	●	●
			070204S01035MET		0.4	1.7		●	●
			070208S01035MET		0.8	1.9		●	●
		DCMW	11T302S01035MET	S01035	0.2	2.4	2	●	●
			11T304S01035MET		0.4	2.2		●	●
			11T308S01035MET		0.8	1.9		●	●
			11T312S01035MET		1.2	1.9		●	●

● : Standard Stock

Standard Stock (Positive)

Cutting Edge Preparation				
Symbol	Cutting Edge Specification	Indication Example		Shape
T	Chamfered	T00815	0.08 mm x 15°chamfered	
S	Chamfered and Honed	S01225	0.12 mm x 25°chamfered and honed	

Description	IC	S	D1
TPGB 1103_	6.35	3.18	3.5
TPGB 1603_	9.525		4.5
TPGW 1604_	9.525	4.76	4.4
VBGW 1103_	6.35	3.18	2.8
VBGW 1604_	9.525	4.76	4.4
VCGW 0802_	4.76	2.38	2.3

Shape		Description		Cutting Edge Preparation	Dimensions (mm) RE	Dimensions (mm) LE	No. of Edges	MEGACOAT TOUGH KBN010	MEGACOAT TOUGH KBN020
 Multi Edge		TPGB	110302T00815ME	T00815	0.2	2.3	3	●	●
			110304T00815ME		0.4	2.1		●	●
			110308T00815ME		0.8	1.8		●	●
 Multi Edge/General Purpose		TPGB	110304S01225MES	S01225	0.4	2.1	3	●	●
			110308S01225MES		0.8	1.8		●	●
 Multi Edge/Tough		TPGB	110302S01035MET	S01035	0.2	2.3	3	●	●
			110304S01035MET		0.4	2.1		●	●
			110308S01035MET		0.8	1.8		●	●
		TPGB	160304S01035MET	S01035	0.4	1.8	3	●	●
			160308S01035MET		0.8	1.5		●	●
Multi Edge/Tough		TPGW	160404S01035MET	S01035	0.4	1.8	3	●	●
			160408S01035MET		0.8	1.5		●	●
Multi Edge		VBGW	110302T00815ME	T00815	0.2	2.4	2	●	●
			110304T00815ME		0.4	2.0		●	●
			110308T00815ME		0.8	1.7		●	●
		VBGW	160402T00815ME	T00815	0.2	2.4	2	●	●
			160404T00815ME		0.4	2.0		●	●
			160408T00815ME		0.8	1.7		●	●
 Multi Edge/General Purpose		VBGW	110304S01225MES	S01225	0.4	2.0	2	●	●
		VBGW	160404S01225MES	S01225	0.4	2.0	2	●	●
 Multi Edge/Tough		VBGW	110302S01035MET	S01035	0.2	2.4	2	●	●
			110304S01035MET		0.4	2.0		●	●
			110308S01035MET		0.8	1.7		●	●
		VBGW	160402S01035MET	S01035	0.2	2.4	2	●	●
			160404S01035MET		0.4	2.0		●	●
			160408S01035MET		0.8	1.7		●	●
 Multi Edge		VCGW	080202T00815ME	T00815	0.2	2.4	2	●	●
			080204T00815ME		0.4	2.0		●	●
 Multi Edge/Tough		VCGW	080202S01035MET	S01035	0.2	2.4	2	●	●
			080204S01035MET		0.4	2.0		●	●
			080208S01035MET		0.8	1.7		●	●

● : Standard Stock

Recommended Cutting Conditions

Workpiece Material	Hardness	Application		Recommended Insert Grade	Cutting Conditions		
					Vc (m/min)	ap (mm)	f (mm/rev)
Hard Materials	55HRC or more	High-speed Finishing	Continuous	KBN010	80 - **180** - 230	0.05 - **0.2** - 0.35	0.05 - **0.15** - 0.3
		General Finishing	Continuous to Interruption	KBN020	80 - **150** - 200	0.05 - **0.2** - 0.5	0.05 - **0.2** - 0.45
		High-efficiency Stable Machining	Light Interruption to Interruption	KBN020	80 - **150** - 200	0.05 - **0.2** - 0.5	0.05 - **0.2** - 0.45
		Interruption	Interruption to Heavy Interruption	KBN020	80 - **130** - 180	0.05 - **0.2** - 0.5	0.05 - **0.2** - 0.4

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