

NEW

KBN010 / KBN020



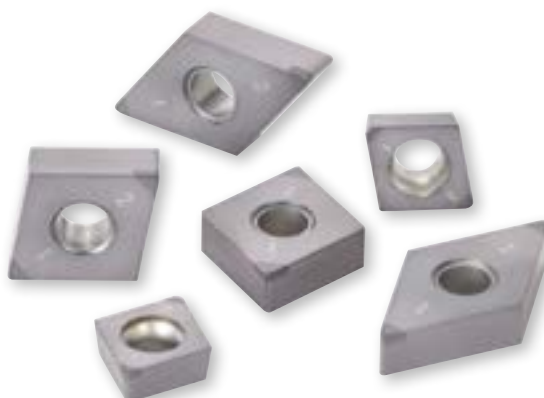
**"Wear resistance + fracture resistance" lowers costs
when machining hardened material**

Combination of new coating technology and high content CBN provides
Exceptional wear resistance and fracture resistance.

Supports a wide range of applications from continuous to heavily interrupted machining.
Newly developed "MEGACOAT TOUGH" coating technology.

NEW

New coating is now available



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 machining hardened materials.

1

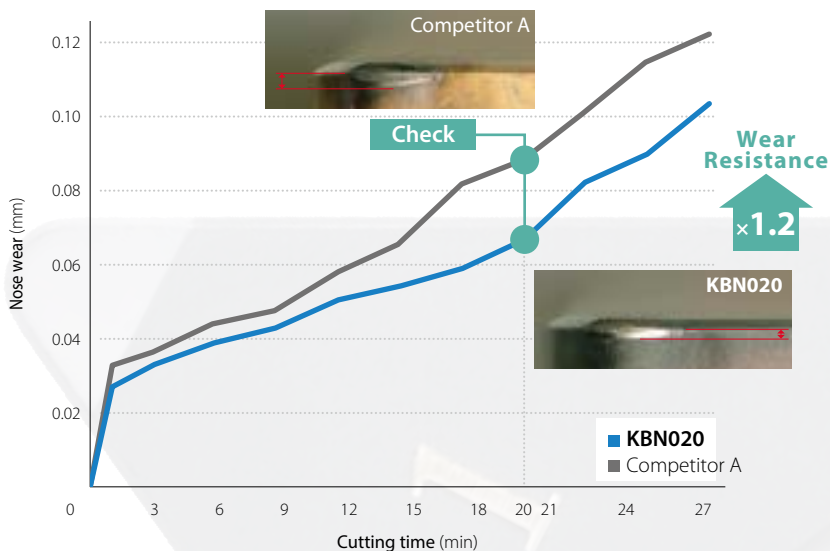
Combination of new coating technology and high content CBN provides exceptional wear resistance and fracture resistance

Wear resistance

New coating "MEGACOAT TOUGH" suppresses layer peeling.

Excellent wear resistance

Wear resistance comparison (in-house evaluation)



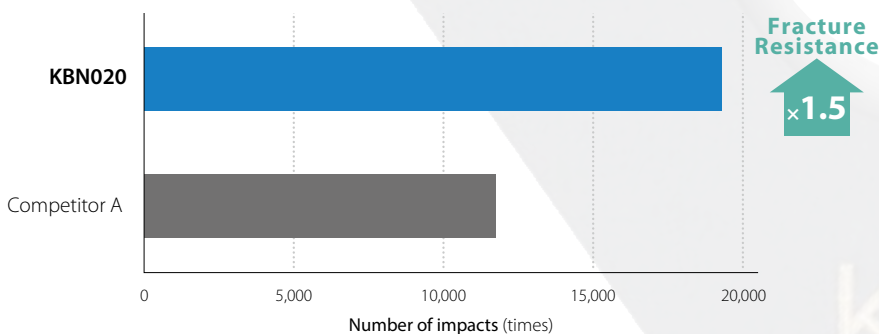
Cutting conditions : $V_c = 150$ m/min, $a_p = 0.2$ mm, $f = 0.1$ mm/rev, Wet
Workpiece : SCM415® 60 HRC

Fracture resistance

High content CBN and high purity TiN binder improves strength of CBN.

Excellent fracture resistance

Continuous to interrupted machining comparison (in-house evaluation)



Cutting conditions : $V_c = 150$ m/min, $a_p = 0.2$ mm, $f = 0.2$ mm/rev, Dry
Workpiece : SCM415® 60 HRC

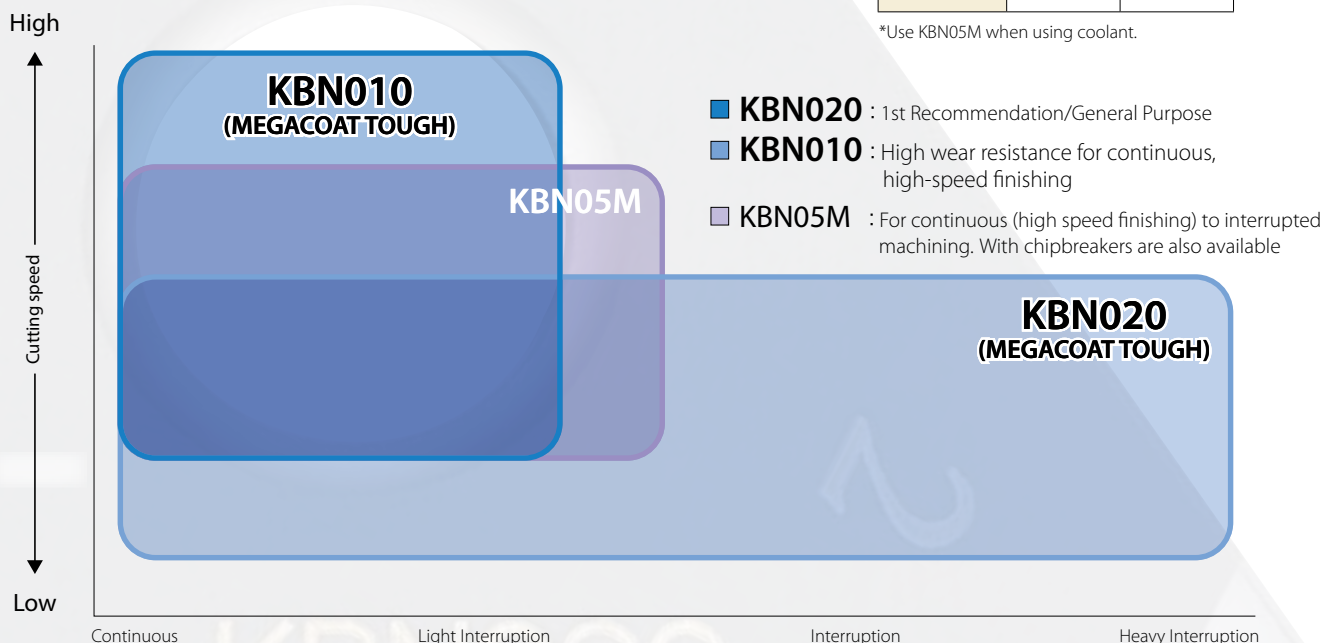
2

Supports a wide range of applications from continuous to heavily interrupted machining

KBN010 for high-speed finishing

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

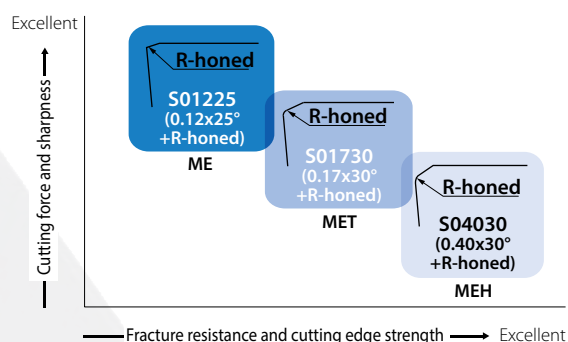
Application Map



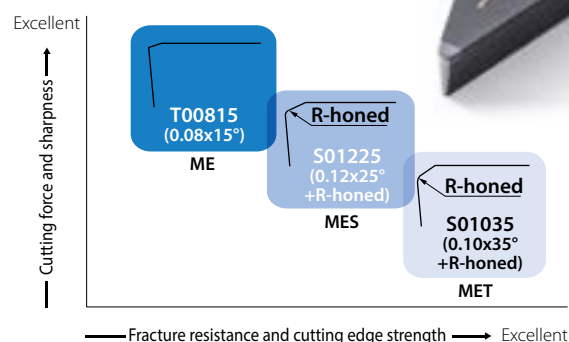
3

Extended lineup of cutting edge preparations for various applications and features

Negative insert



Positive insert



Negative insert standard cutting edge preparation (Hardened material machining)

Symbol	Cutting edge preparation		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 preparation (Hardened material machining)

Symbol	Cutting edge preparation		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



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

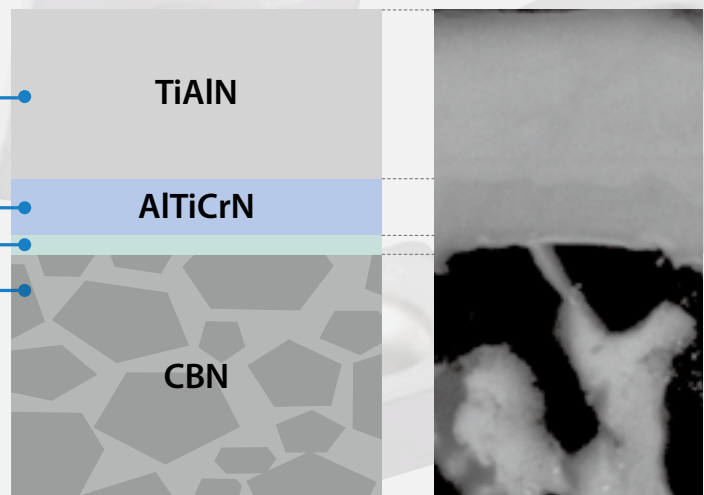
Improved adhesion between CBN and high wear resistant layer. Suppresses layer peeling

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

$V_c = 100 \text{ m/min}$

$a_p = 0.15 \text{ mm}$

$f = 0.1 \text{ mm/rev}$

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

$V_c = 100 \text{ m/min}$

$a_p = 0.05 \text{ mm}$

$f = 0.15 \text{ mm/rev}$

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

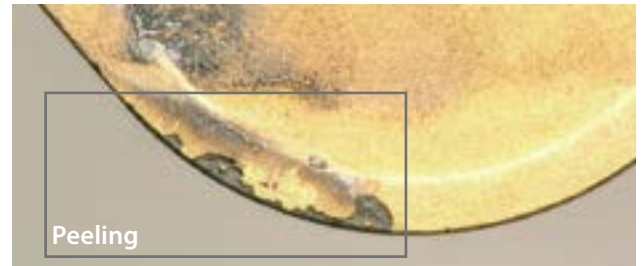
Improved adhesion between CBN and high wear resistance layer

KBN020



Cutting conditions : $V_c = 150$ m/min, $a_p = 0.2$ mm, $f = 0.2$ mm/rev, Dry
Workpiece : SCM 415® (In-house evaluation)

Competitor A

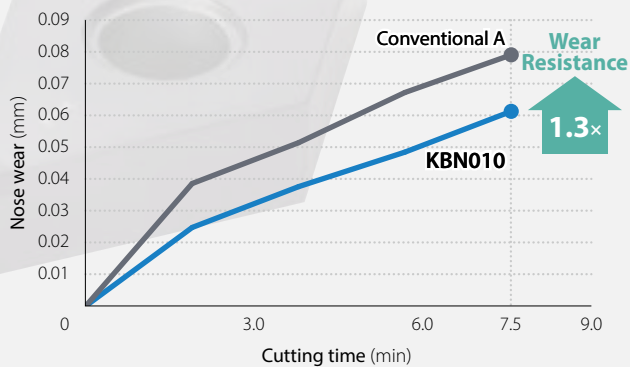


Check

High toughness CBN

KBN010

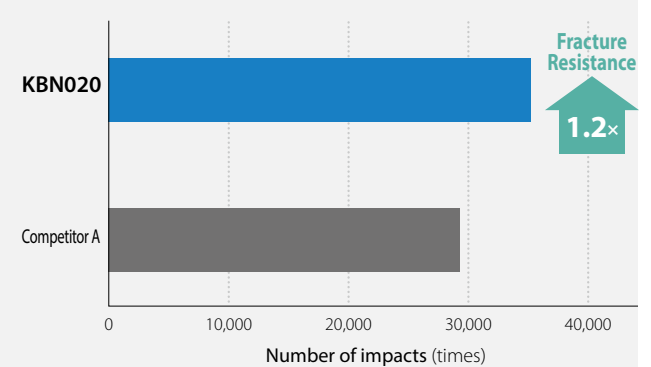
Improved wear resistance by 30% in high-speed machining (Compared to conventional A)



Cutting conditions : $V_c = 210$ m/min, $a_p = 0.2$ 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 : $V_c = 100$ m/min, $a_p = 0.2$ mm, $f = 0.3$ mm/rev, Dry
Workpiece : SCM415® 4 grooves in workpiece 61HRC (In-house evaluation)

Gear SNCM220® 58HRC

$V_c = 125$ m/min
 $a_p = 0.25$ mm
 $f = 0.1$ mm/rev
Dry
CNGA120408S04030MEH



Tool Life

KBN010 **600** pcs/edge **3.0x**

Competitor D **200** pcs/edge

KBN010 provides longer tool life than competitor D.

(User evaluation)

Roll SKD11 62HRC

$V_c = 145$ m/min
 $a_p = 0.25-0.50$ mm
 $f = 0.1$ mm/rev
Dry
DNGA150608S01225



Tool Life

KBN010 **18** pcs/edge **1.3x**

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

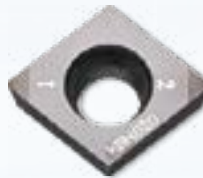
S45C (Carburizing and quenching)

Insert

CCMW09T308S01035MET

Applications

Boring finishing for spline part (Interruption)



(Image)



CVT shaft

Workpiece

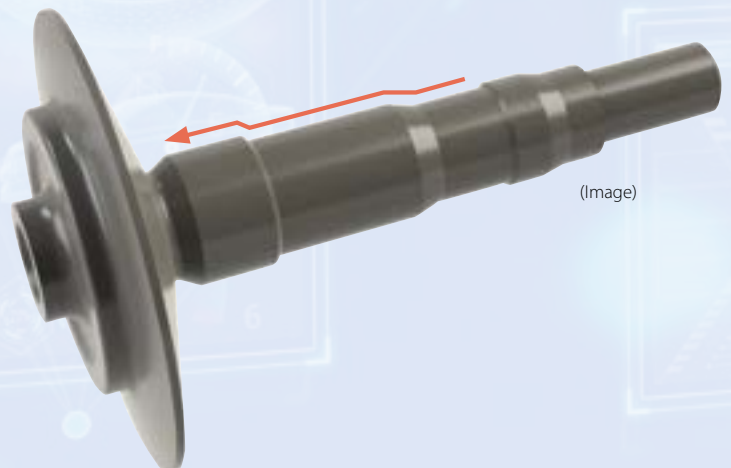
SCr420H

Insert

DNGA150404S01225ME

Applications

External finishing



(Image)

Diff ring

Workpiece

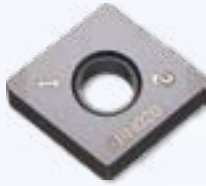
SCr420H

Insert

CNGA120408S01730MET

Applications

Facing (Interruption)



(Image)

Pinion gear

Workpiece

SCM420H

Insert

DNGA150404S01225ME

Applications

External finishing



(Image)

Side gear

Workpiece

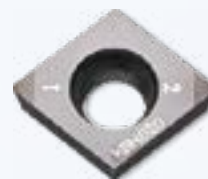
S45C (Carburizing and quenching)

Insert

CCMW09T308S01035MET

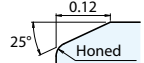
Applications

Boring finishing for spline part (Interruption)

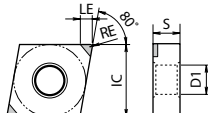
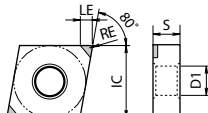
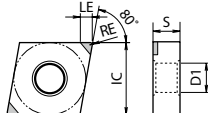
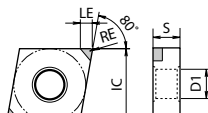
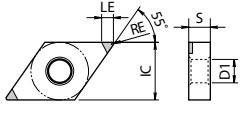
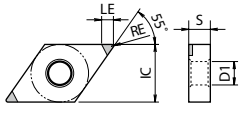
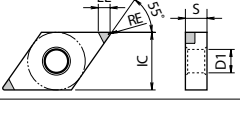


(Image)

Negative type inserts

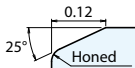
Cutting edge preparation			
Symbol	Cutting edge specification	Indication	Shape examples
S	Chamfered and honed	S01225 0.12 mm x 25° chamfered and honed	

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

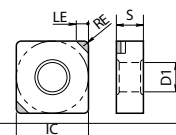
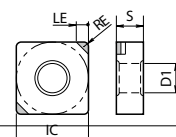
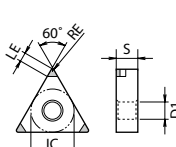
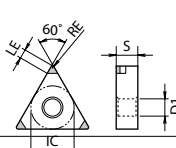
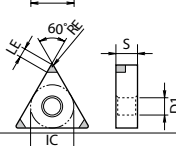
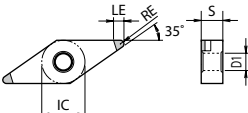
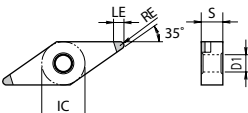
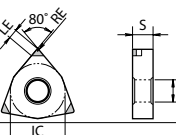
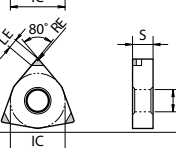
Shape		Description	Cutting edge preparation	Dimensions (mm)		No. of edges	MEGACOAT TOUGH	
				RE	LE		KBN010	KBN020
		CNGA 120404S01215MEW	S01215	0.4	2.6	2	●	●
		120408S01215MEW		0.8	2.5		●	●
		120412S01215MEW		1.2	2.5		●	●
		CNGA 120402S01225ME	S01225	0.2	2.6	2	●	●
		120404S01225ME		0.4	2.6		●	●
		120408S01225ME		0.8	2.6		●	●
		120412S01225ME		1.2	2.5		●	●
		120416S01225ME		1.6	3.4		●	●
		120420S01225ME		2.0	3.4		●	●
		CNGA 120404S01730MET	S01730	0.4	2.6	2	●	●
		120408S01730MET		0.8	2.6		●	●
		120412S01730MET		1.2	2.5		●	●
		120416S01730MET		1.6	3.4		●	●
		CNGA 120408S04030MEH	S04030	0.8	2.6	2	●	●
		120412S04030MEH		1.2	2.5		●	●
		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		●	●
		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		●	●
		DNGA 150404S04030MEH	S04030	0.4	2.6	2	●	●
		150408S04030MEH		0.8	2.2		●	●
		150412S04030MEH		1.2	1.9		●	●

● : Available

Negative type inserts

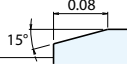
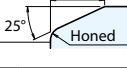
Cutting edge preparation			
Symbol	Cutting edge specification	Indication	Shape examples
S	Chamfered and honed	S01225 0.12 mm x 25° chamfered and honed	

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

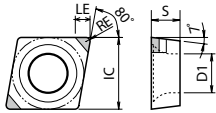
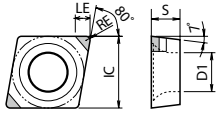
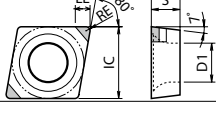
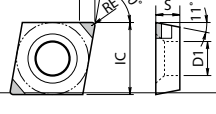
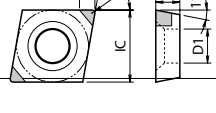
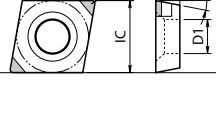
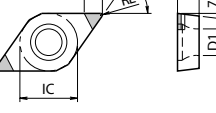
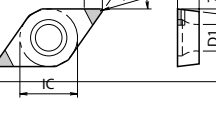
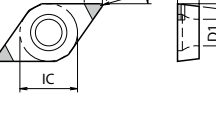
Shape		Description	Cutting edge preparation	Dimensions (mm)		No. of edges	MEGACOAT TOUGH	
				RE	LE		KBN010	KBN020
 Multi edge		SNGA 120404S01225ME	S01225	0.4	2.6	2	●	●
		120408S01225ME		0.8	2.6		●	●
 Multi edge/ Tough		SNGA 120404S01730MET	S01730	0.4	2.6	2	●	●
		120408S01730MET		0.8	2.6		●	●
		120412S01730MET		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		●	●

● : Available

Positive type inserts

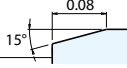
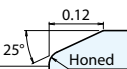
Cutting edge preparation				
Symbol	Cutting edge specification	Indication		Shape examples
T	Chamfered	T00815	0.08 mm x 15° chamfered	
S	Chamfered and honed	S01225	0.12 mm x 25° chamfered and honed	

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		●	●
		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		●	●

● : Available

Positive type inserts

Cutting edge preparation				
Symbol	Cutting edge specification	Indication		Shape examples
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)		No. of edges	MEGACOAT TOUGH	
			RE	LE		KBN010	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		●	●

● : Available

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~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