



KBN010/KBN020

New Coated CBN for Machining Hardened Material



Lower Machining Costs in Hardened Material with Wear and Fracture Resistance

Combining new coating technology with 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 Technology!



KBN010 / KBN020

New Coated CBN for Machining Hardened Material

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



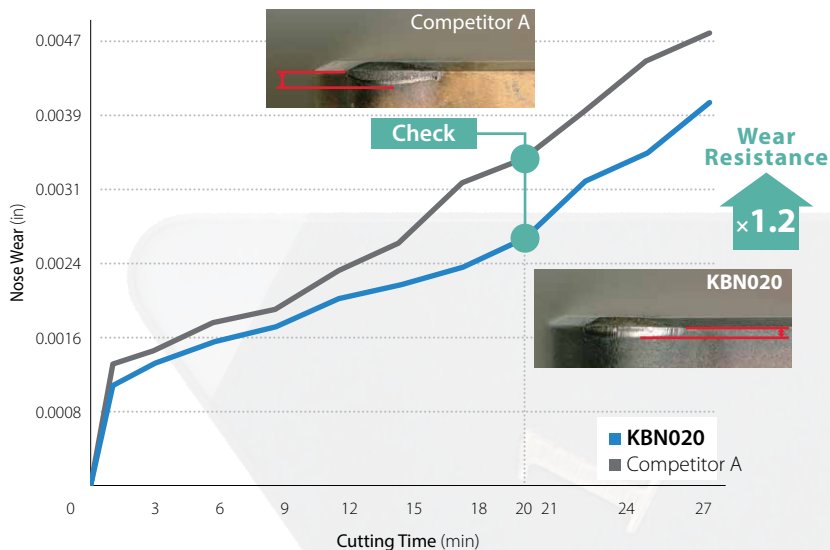
1

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

Wear Resistance

New coating "MEGACOAT TOUGH" suppresses layer peeling for excellent wear resistance

Wear Resistance Comparison (Internal Evaluation)



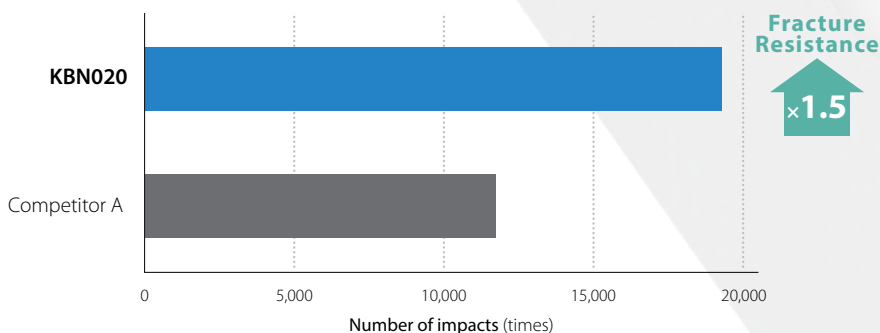
Cutting Conditions : $V_c = 490$ sfm, D.O.C. = 0.008", $f = 0.004$ ipr, Wet
Workpiece : 4118H 60 HRC

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 (Internal Evaluation)



Cutting Conditions : $V_c = 490$ sfm, D.O.C. = 0.008", $f = 0.008$ ipr, Dry
Workpiece : 4118H 60 HRC

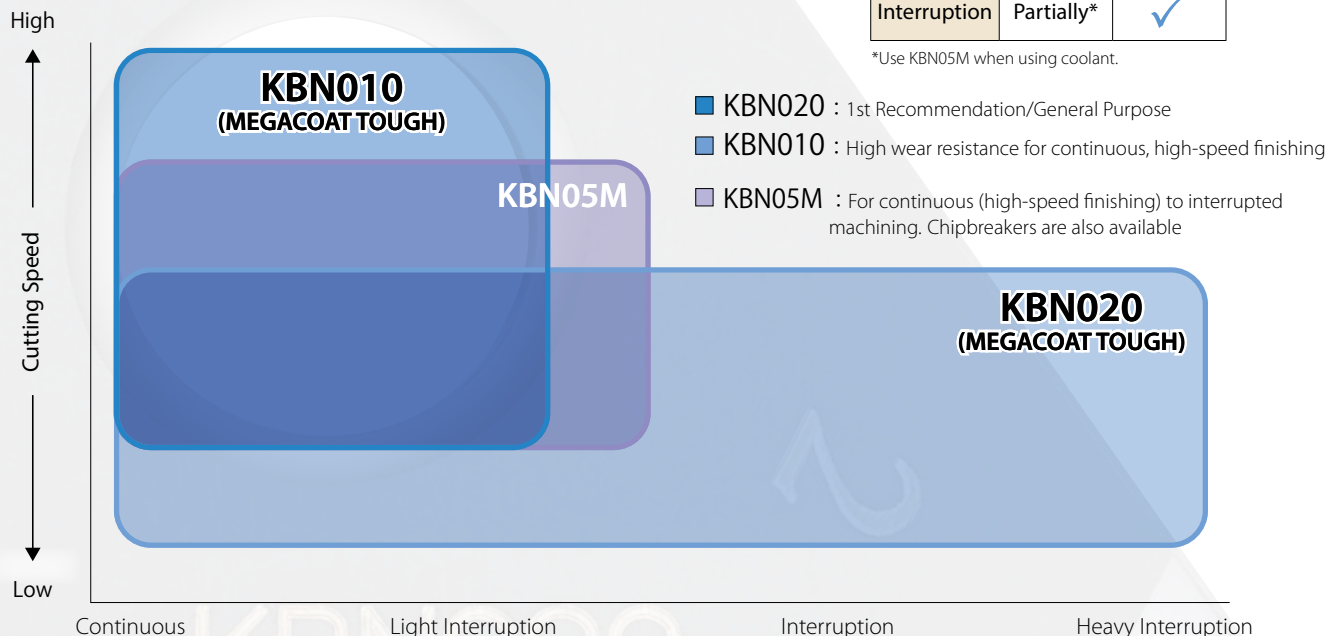
2

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



Coolant

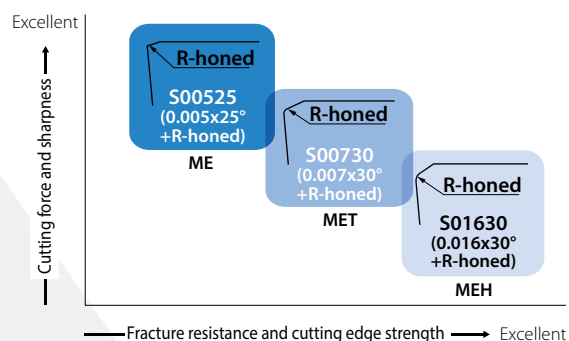
✓ Recommended ✗ Not Recommended

Application	Wet	Dry
Continuous	✓	✗
Interruption	Partially*	✓

3

Extended lineup of cutting edge preparations for various applications and benefits

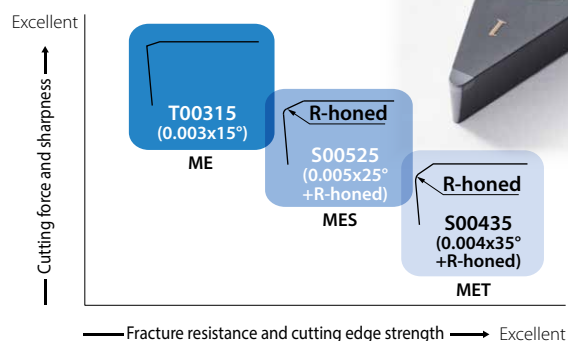
Negative Insert



Negative Insert - Standard Cutting Edge Prep. (Hardened Material Machining)

Symbol	Cutting Edge Prep.		Applications and Features
ME	S00525	0.005" x 25° + R-honed	General purpose
MET	S00730	0.007" x 30° + R-honed	Superior fracture resistance
MEH	S01630	0.016" x 30° + R-honed	For interrupted high-feed machining Prevents flaking

Positive Insert



Positive Insert - Standard Cutting Edge Prep. (Hardened Material Machining)

Symbol	Cutting Edge Prep.		Applications and Features
ME	T00315	0.003" x 15°	Chamfered Sharp Edge, Minimize Burrs
MES	S00525	0.005" x 25° + R-honed	General Purpose
MET	S00435	0.004" x 35° + R-honed	For interruption Stable machining



MEGACOAT
TOUGH | CBN |

Features

An adhesion layer is laminated between the high wear resistance layer and the CBN.

This reduces layer peeling to achieve long tool life and stable machining.

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

New Layering Technology

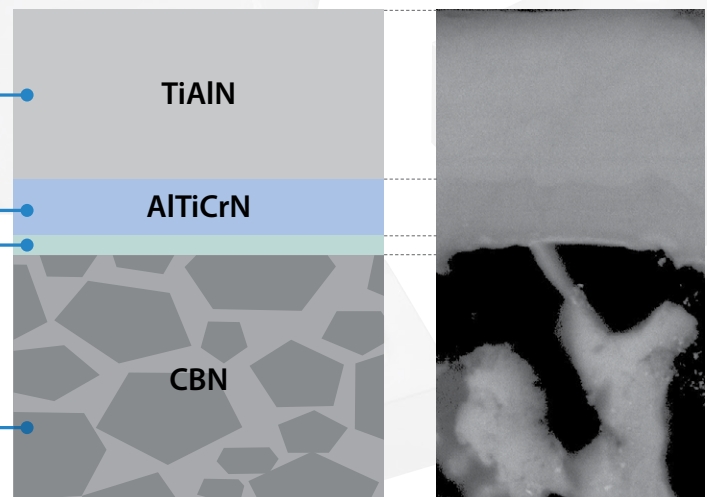
Interlayer for stress relief

High adhesion layer

Two layers dedicated to CBN

Improved adhesion between CBN and high wear resistant layer with suppressed layer peeling

High content CBN with high purity TiN binder for improved CBN strength



Case Studies

Clutch 5120H

Vc = 330 sfm
D.O.C. = 0.006"
f = 0.004 ipr
Wet
WNGA432S00525



Tool Life

KBN020 650 pcs/edge

1.6×

Competitor B 400 pcs/edge

KBN020 provides stable machining with longer tool life.

(User Evaluation)

Gear 4118

Vc = 330 sfm
D.O.C. = 0.002"
f = 0.006 ipr
Wet
CNGA432S00525MEW



Tool Life

KBN020 300 pcs/edge

1.5×

Competitor C 200 pcs/edge

KBN020 improves dimensional variation with longer tool life.

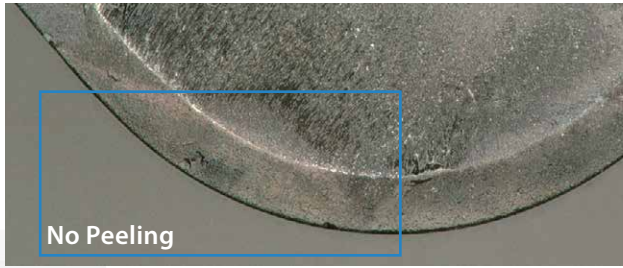
(User Evaluation)

New Adhesion Technology

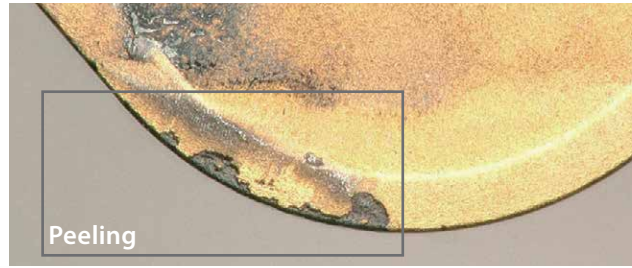
Newly developed adhesion layer

Improved adhesion between CBN and high wear resistance layer

KBN020



Competitor A

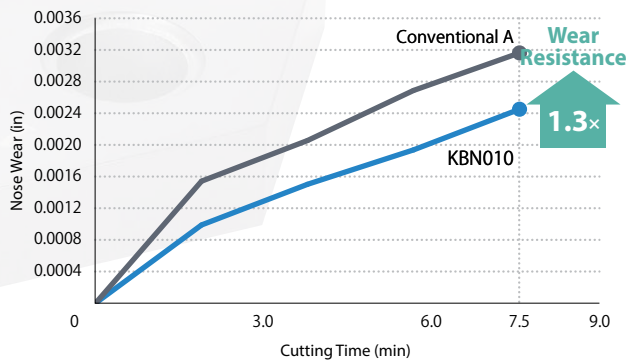


Cutting Conditions : Vc = 490 sfm, D.O.C. = 0.008", f = 0.008 ipr, Dry Work Material : 4118® (Internal Evaluation)

High Toughness CBN

KBN010

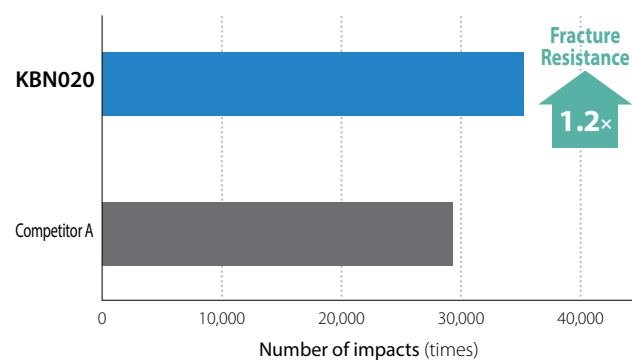
Improved wear resistance by 30% in high-speed machining (Compared to conventional A)



Cutting conditions : Vc = 690 sfm, D.O.C. = 0.008", f = 0.004 ipr, Wet Workpiece : 4118® 60HRC (In-house evaluation)

KBN020

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

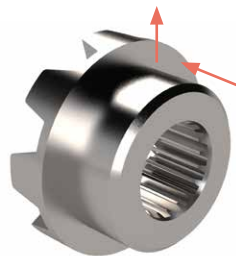


Cutting conditions : Vc = 330 sfm, D.O.C. = 0.008", f = 0.012 ipr, Dry Workpiece : 4118® 4 grooves in workpiece 61HRC (In-house evaluation)

Case Studies

Gear 8620® 58HRC

Vc = 410 sfm
D.O.C. = 0.010"
f = 0.004 ipr
Dry
CNGA432S01630MEH



Tool Life

KBN010 600 pcs/edge 3.0x

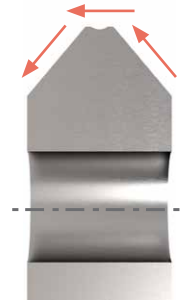
Competitor D 200 pcs/edge

KBN010 provides longer tool life than competitor D.

(User evaluation)

Roll D2 62HRC

Vc = 480 sfm
D.O.C. = 0.010"-0.020"
f = 0.004 ipr
Dry
DNGA432S00525



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

Available for continuous to heavily interrupted cuts

Powerful performance in a variety of parts including shafts and gears

Excellent machining performance of auto suspension parts that use hardened materials.

Long tool life and stable machining

High toughness suppresses sudden fractures from occurring

Stable machining increases productivity.

Sun Gear

Workpiece

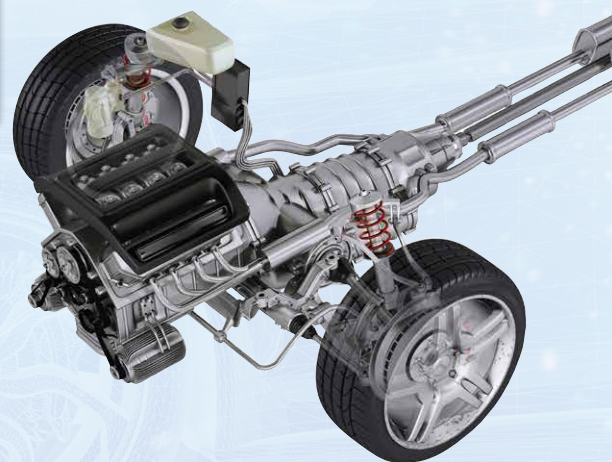
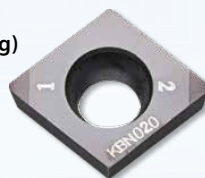
1045 (Carburizing and quenching)

Insert

CCMW3252S00435MET

Applications

Bore finishing for spline part (Interruption)



CVT Shaft

Workpiece

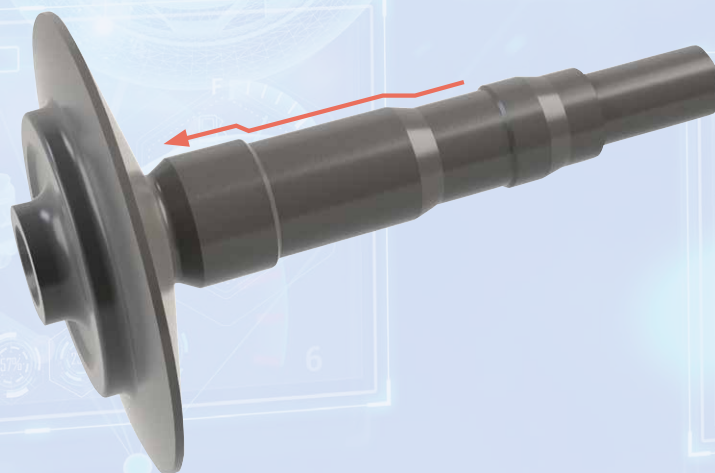
5120H

Insert

DNGA431S00525ME

Applications

External finishing



Diff Ring

Workpiece

5120H

Insert

CNGA432S00730MET

Applications

Facing (Interruption)



Pinion Gear

Workpiece

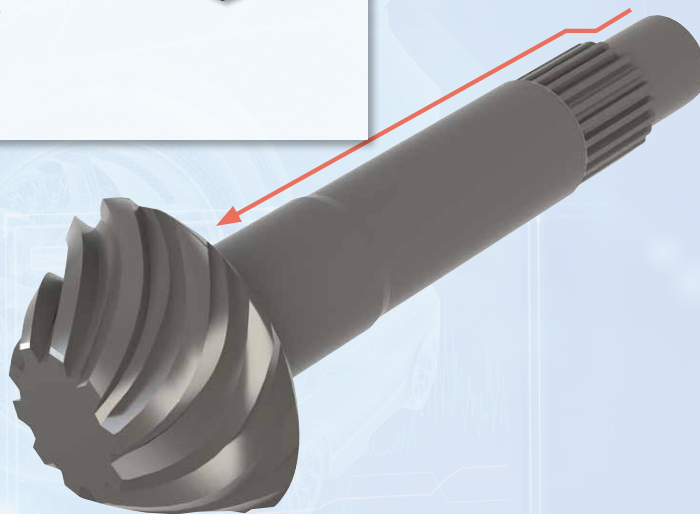
4118H

Insert

DNGA431S00525ME

Applications

External finishing



Side Gear

Workpiece

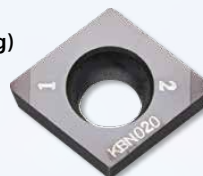
1045 (Carburizing and quenching)

Insert

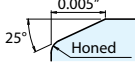
CCMW3252S00435MET

Applications

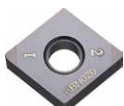
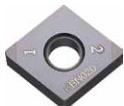
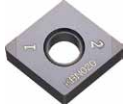
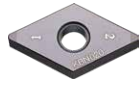
Boring finishing for spline part (Interruption)



Negative Inserts

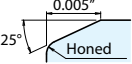
Cutting Edge Preparation			
Symbol	Cutting Edge Specification	Indication	Shape examples
S	Chamfered and Honed	S00525 0.005" x 25° chamfered and honed	

Part Number	IC	S	D1
CNGA 43_	1/2	3/16	0.203
DNGA 43_	1/2	3/16	0.203
DNGA 44_		1/4	

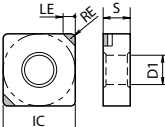
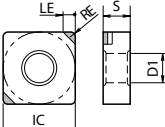
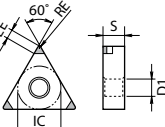
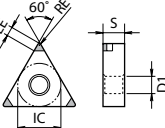
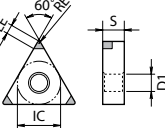
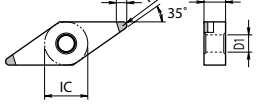
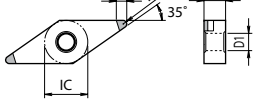
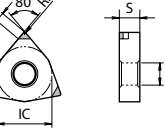
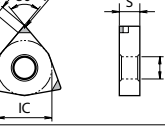
Shape	Part Number	Cutting Edge Preparation	Dimensions (in)		No. of Edges	MEGACOAT TOUGH	
			RE	LE		KBN010	KBN020
 Multi Edge / with Wiper Edge	CNGA 431S00515MEW	S00515	1/64	0.102	2	●	●
	432S00515MEW		1/32	0.098		●	●
	433S00515MEW		3/64	0.098		●	●
 Multi Edge	CNGA 430S00525ME	S00525	0.008	0.102	2	●	●
	431S00525ME		1/64	0.102		●	●
	432S00525ME		1/32	0.102		●	●
	433S00525ME		3/64	0.098		●	●
	434S00525ME		1/16	0.134		●	●
	435S00525ME		5/64	0.134		●	●
 Multi Edge / Tough	CNGA 431S00730MET	S00730	1/64	0.102	2	●	●
	432S00730MET		1/32	0.102		●	●
	433S00730MET		3/64	0.098		●	●
	434S00730MET		1/16	0.134		●	●
 Multi Edge / Interruption	CNGA 432S01630MEH	S01630	1/32	0.102	2	●	●
	433S01630MEH		3/64	0.098		●	●
 Multi Edge	DNGA 4302S00525ME	S00525	0.004	0.110	2	●	●
	4305S00525ME		0.008	0.106		●	●
	431S00525ME		1/64	0.102		●	●
	432S00525ME		1/32	0.087		●	●
	433S00525ME		3/64	0.075		●	●
	434S00525ME		1/16	0.150		●	●
	DNGA 441S00525ME	S00525	1/64	0.102	2	●	●
	442S00525ME		1/32	0.087		●	●
	DNGA 431S00730MET	S00730	1/64	0.102	2	●	●
	432S00730MET		1/32	0.087		●	●
	433S00730MET		3/64	0.075		●	●
	434S00730MET		1/16	0.150		●	●
 Multi Edge / Tough	DNGA 441S00730MET	S00730	1/64	0.102	2	●	●
	442S00730MET		1/32	0.087		●	●
 Multi Edge / Interruption	DNGA 431S01630MEH	S01630	1/64	0.102	2	●	●
	432S01630MEH		1/32	0.087		●	●
	433S01630MEH		3/64	0.075		●	●

● : Standard Item

Negative Inserts

Cutting Edge Preparation			
Symbol	Cutting Edge Specification	Indication	Shape examples
S	Chamfered and Honed	S00525 0.005" x 25° chamfered and honed	

Part Number	IC	S	D1
SNGA 43_	1/2	3/16	0.203
TNGA 33_	3/8	3/16	0.150
VNGA 33_	3/8	3/16	0.150
WNGA 43_	1/2	3/16	0.203

Shape		Part Number	Cutting Edge Preparation	Dimensions (in)		No. of Edges	MEGACOAT TOUGH	
				RE	LE		KBN010	KBN020
 Multi Edge		SNGA 431S00525ME	S00525	1/64	0.102	2	●	●
		432S00525ME		1/32	0.102		●	●
 Multi Edge / Tough		SNGA 431S00730MET	S00730	1/64	0.102	2	●	●
		432S00730MET		1/32	0.102		●	●
		433S00730MET		3/64	0.102		●	●
 Multi Edge		TNGA 3302S00525ME	S00525	0.004	0.114	3	●	●
		3305S00525ME		0.008	0.110		●	●
		331S00525ME		1/64	0.106		●	●
		332S00525ME		1/32	0.094		●	●
		333S00525ME		3/64	0.083		●	●
 Multi Edge / Tough		TNGA 331S00730MET	S00730	1/64	0.106	3	●	●
		332S00730MET		1/32	0.094		●	●
		333S00730MET		3/64	0.083		●	●
 Multi Edge / Interruption		TNGA 331S01630MEH	S01630	1/64	0.106	3	●	●
		332S01630MEH		1/32	0.094		●	●
 Multi Edge		VNGA 3302S00525ME	S00525	0.004	0.102	2	●	●
		3305S00525ME		0.008	0.091		●	●
		331S00525ME		1/64	0.079		●	●
		332S00525ME		1/32	0.106		●	●
 Multi Edge / Tough		VNGA 331S00730MET	S00730	1/64	0.079	2	●	●
		332S00730MET		1/32	0.106		●	●
 Multi Edge		WNGA 431S00525ME	S00525	1/64	0.102	3	●	●
		432S00525ME		1/32	0.102		●	●
 Multi Edge / Tough		WNGA 431S00730MET	S00730	1/64	0.079	3	●	●
		432S00730MET		1/32	0.102		●	●

● : Standard Item

Positive Inserts

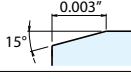
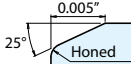
Cutting Edge Preparation				
Symbol	Cutting Edge Specification	Indication		Shape Examples
T	Chamfered	T00315	0.003" x 15° chamfered	
S	Chamfered and Honed	S00525	0.005" x 25° chamfered and honed	

Part Number	IC	S	D1
CCMW 215_	1/4	3/32	0.110
CCMW 325_	3/8	5/32	0.173
CPGB 2515_	5/16	3/32	0.138
CPGB 32_	3/8	1/8	0.177
DCMW 215_	1/4	3/32	0.110
DCMW 325_	3/8	5/32	0.173

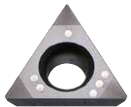
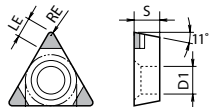
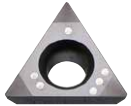
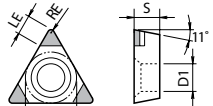
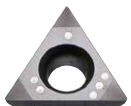
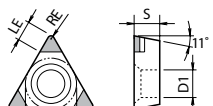
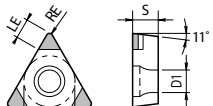
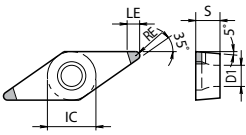
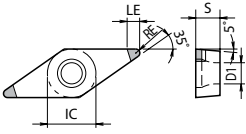
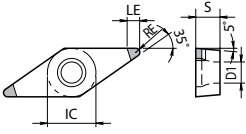
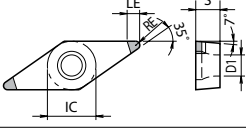
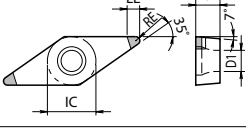
Shape		Part Number	Cutting Edge Preparation	Dimensions (in)		No. of Edges	MEGACOAT TOUGH	
				RE	LE		KBN010	KBN020
		CCMW 21505T00315ME	T00315	0.008	0.079	2	●	●
		2151T00315ME		1/64	0.075		●	●
		2152T00315ME		1/32	0.071		●	●
		CCMW 32505T00315ME	T00315	0.008	0.079	2	●	●
		3251T00315ME		1/64	0.075		●	●
		3252T00315ME		1/32	0.071		●	●
		CCMW 2151S00525MES	S00525	1/64	0.075	2	●	●
		2152S00525MES		1/32	0.071		●	●
		CCMW 3251S00525MES	S00525	1/64	0.075	2	●	●
		3252S00525MES		1/32	0.071		●	●
		CCMW 3251S00435MET	S00435	1/64	0.075	2	●	●
		3252S00435MET		1/32	0.071		●	●
		CPGB 25151T00315ME	T00315	1/64	0.075	2	●	●
		CPGB 3205T00315ME	T00315	0.008	0.102	2	●	●
		321T00315ME		1/64	0.102		●	●
		CPGB 321S00525MES	S00525	1/64	0.098	2	●	●
		322S00525MES		1/32	0.098		●	●
		CPGB 25151S00435MET	S00435	1/64	0.075	2	●	●
		25152S00435MET		1/32	0.087		●	●
		CPGB 321S00435MET	S00435	1/64	0.098	2	●	●
		322S00435MET		1/32	0.098		●	●
		DCMW 21505T00315ME	T00315	0.008	0.094	2	●	●
		2151T00315ME		1/64	0.087		●	●
		2152T00315ME		1/32	0.075		●	●
		DCMW 32505T00315ME	T00315	0.008	0.094	2	●	●
		3251T00315ME		1/64	0.087		●	●
		3252T00315ME		1/32	0.075		●	●
		DCMW 3253T00315ME		3/64	0.075		●	●
		DCMW 32505S00525MES	S00525	0.008	0.094	2	●	●
		3251S00525MES		1/64	0.087		●	●
		3252S00525MES		1/32	0.075		●	●
		DCMW 21505S00435MET	S00435	0.008	0.075	2	●	●
		2151S00435MET		1/64	0.067		●	●
		2152S00435MET		1/32	0.075		●	●
		DCMW 32505S00435MET	S00435	0.008	0.094	2	●	●
		3251S00435MET		1/64	0.087		●	●
		3252S00435MET		1/32	0.075		●	●
		3253S00435MET		3/64	0.075		●	●

● Standard Item

Positive Inserts

Cutting Edge Preparation				
Symbol	Cutting Edge Specification	Indication		Shape Examples
T	Chamfered	T00315	0.003" x 15° chamfered	
S	Chamfered and Honed	S00525	0.005" x 25° chamfered and honed	

Part Number	IC	S	D1
TPGB 22_	1/4	1/8	0.138
TPGB 32_	3/8		0.177
TPGW 33_	3/8	3/16	0.173
VBGW 22_	1/4	1/8	0.110
VBGW 33_	3/8	3/16	0.173
VCGW 1515_	3/16	3/32	0.091

Shape		Part Number	Cutting Edge Preparation	Dimensions (in)		No. of Edges	MEGACOAT TOUGH	
				RE	LE		KBN010	KBN020
 Multi Edge		TPGB 2205T00315ME	T00315	0.008	0.091	3	●	●
		221T00315ME		1/64	0.083		●	●
		222T00315ME		1/32	0.071		●	●
 Multi Edge / General Purpose		TPGB 221S00525MES	S00525	1/64	0.083	3	●	●
		222S00525MES		1/32	0.071		●	●
 Multi Edge / Tough		TPGB 2205S00435MET	S00435	0.008	0.091	3	●	●
		221S00435MET		1/64	0.083		●	●
		222S00435MET		1/32	0.071		●	●
		TPGB 321S00435MET	S00435	1/64	0.071	3	●	●
		322S00435MET		1/32	0.059		●	●
 Multi Edge / Tough		TPGW 331S00435MET	S00435	1/64	0.071	3	●	●
		332S00435MET		1/32	0.059		●	●
 Multi Edge		VBGW 2205T00315ME	T00315	0.008	0.094	2	●	●
		221T00315ME		1/64	0.079		●	●
		222T00315ME		1/32	0.067		●	●
		VBGW 3305T00315ME	T00315	0.008	0.094	2	●	●
		331T00315ME		1/64	0.079		●	●
		332T00315ME		1/32	0.067		●	●
 Multi Edge / General Purpose		VBGW 221S00525MES	S00525	1/64	0.079	2	●	●
		VBGW 331S00525MES	S00525	1/64	0.079	2	●	●
 Multi Edge / Tough		VBGW 2205S00435MET	S00435	0.008	0.094	2	●	●
		221S00435MET		1/64	0.079		●	●
		222S00435MET		1/32	0.067		●	●
		VBGW 3305S00435MET	S00435	0.008	0.094	2	●	●
		331S00435MET		1/64	0.079		●	●
		332S00435MET		1/32	0.067		●	●
 Multi Edge		VCGW 151505T00315ME	T00315	0.008	0.094	2	●	●
		15151T00315ME		1/64	0.079		●	●
 Multi Edge / Tough		VCGW 151505S00435MET	S00435	0.008	0.094	2	●	●
		15151S00435MET		1/64	0.079		●	●
		15152S00435MET		1/32	0.067		●	●

● : Standard Item

Recommended Cutting Conditions

Workpiece Material	Hardness	Application		Recommended Insert Grade	Cutting Conditions		
					Vc (sfm)	D.O.C (in)	f (ipr)
Hardened Materials	55HRC or more	High-Speed Finishing	Continuous	KBN010	260 - 590 - 750	0.002 - 0.008 - 0.014	0.002 - 0.006 - 0.012
		General Finishing	Continuous ~ Interruption	KBN020	260 - 490 - 660	0.002 - 0.008 - 0.020	0.002 - 0.008 - 0.018
		High-efficiency Stable Machining	Light Interruption ~ Interruption	KBN020	260 - 490 - 660	0.002 - 0.008 - 0.020	0.002 - 0.008 - 0.018
		Interruption	Interruption ~ Heavy Interruption	KBN020	260 - 430 - 590	0.002 - 0.008 - 0.020	0.002 - 0.008 - 0.016



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