KYOCERA

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

KBN020 supports a wide range of hardened applications from continuous to heavily interrupted machining

Newly developed "MEGACOAT TOUGH" coating technology

NEW **New Coating Technology!**

MEGACOAT TOUGH | CBN |

KBN020

New Coated CBN for Machining Hardened Material

View Online

Product Video

Long tool life and stable machining results with wear resistance and fracture resistance

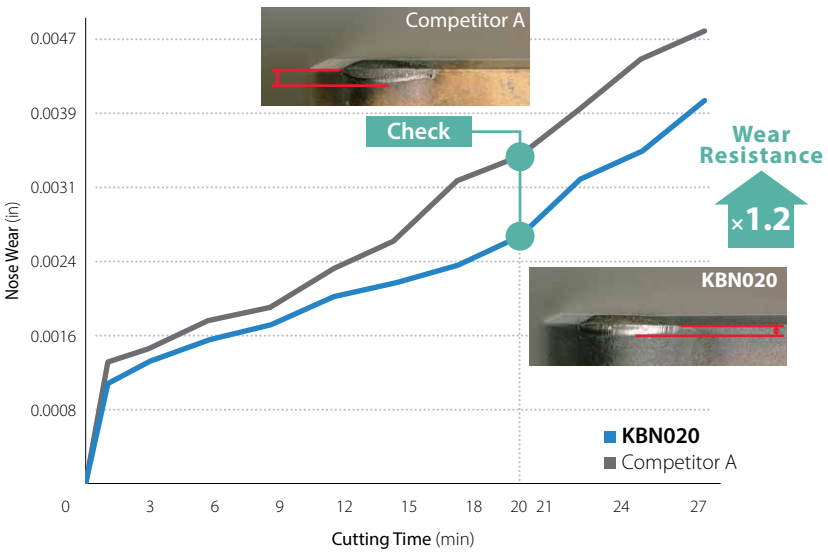
Supports a wide range of applications and reduces the cost of machining hardened materials

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)

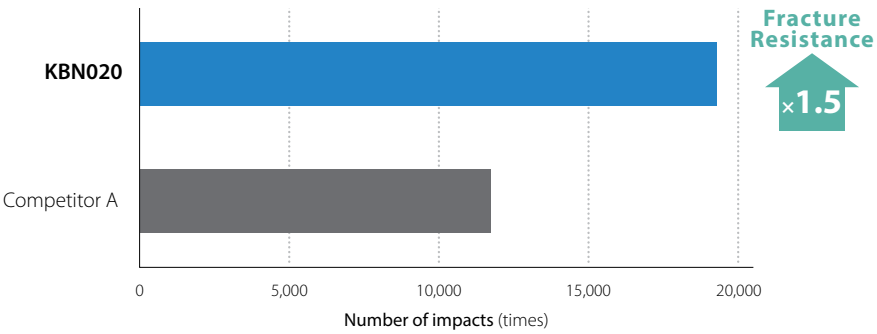


Cutting Conditions : Vc = 490 sfm, D.O.C. = 0.008", f = 0.004 ipr, Wet
Workpiece : 4118Ⓗ 60 HRC

Fracture Resistance

High content CBN and high purity TiN binder improves strength of CBN for excellent fracture resistance

Continuous to Interrupted Machining Comparison (Internal Evaluation)



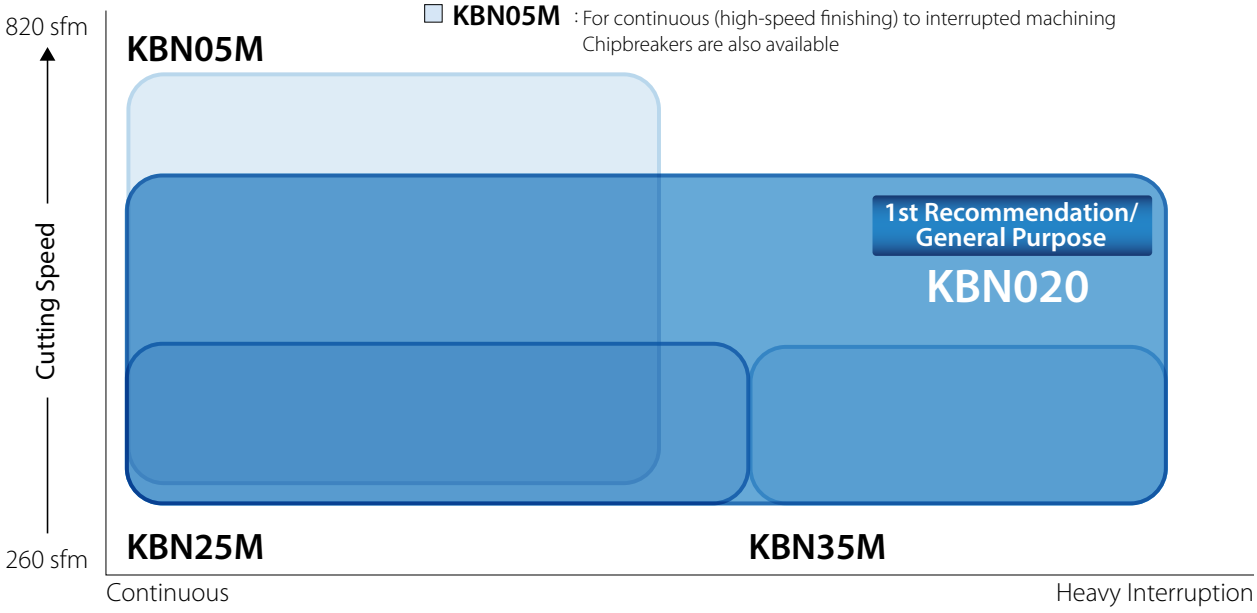
Cutting Conditions : Vc = 490 sfm, D.O.C. = 0.008", f = 0.008 ipr, Dry
Workpiece : 4118Ⓗ 60 HRC

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

KBN020 covers a wide range of applications from continuous to interrupted machining of hardened material

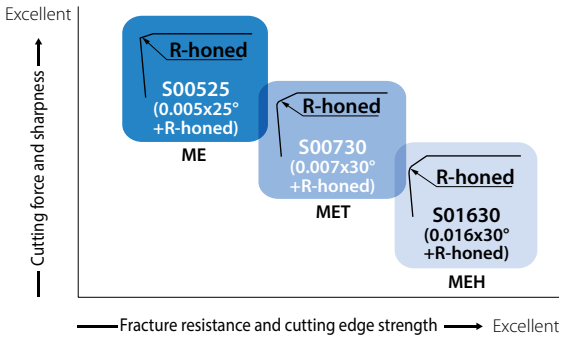
Application Map

- **KBN020** : 1st Recommendation / General Purpose
- **KBN25M** : High-efficiency stable machining for light interrupted to interrupted machining
- **KBN35M** : High fracture resistance, and for heavy interrupted machining
- **KBN05M** : For continuous (high-speed finishing) to interrupted machining
  Chipbreakers are also available

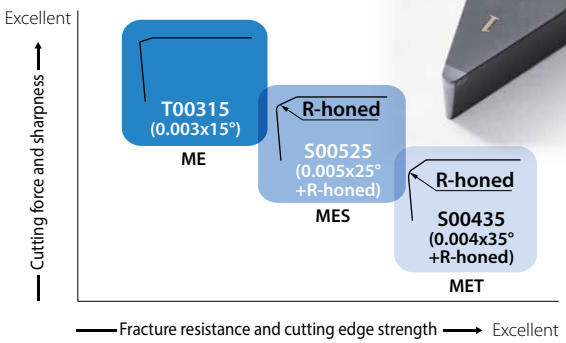


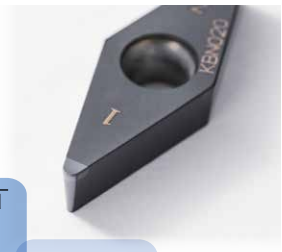
3 Extended lineup of cutting edge preparations for various applications and benefits

Negative Insert



Positive 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 - 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

4 Newly Developed Coating "MEGACOAT TOUGH"

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

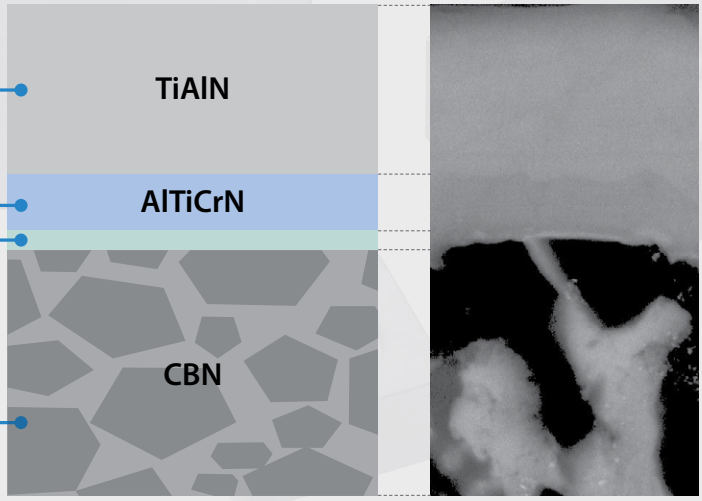
New Layering Technology

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

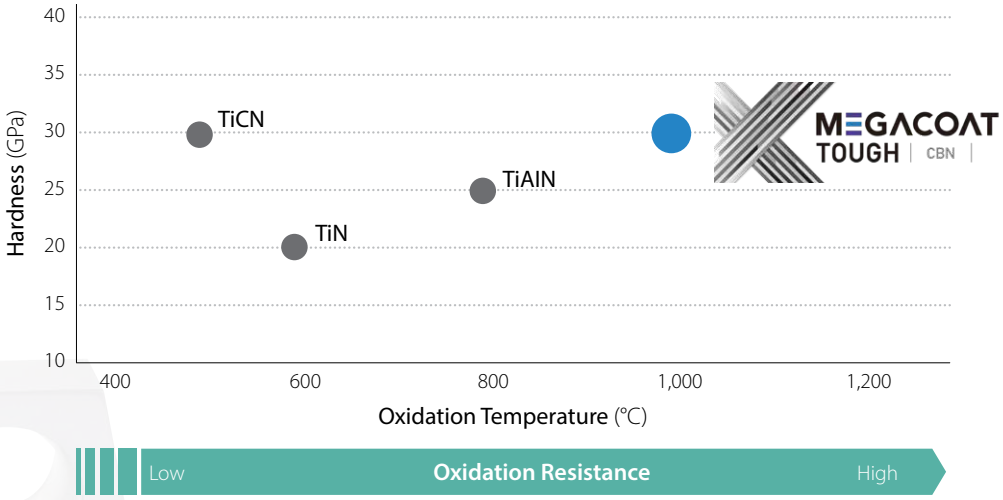
Vc = 330 sfm
D.O.C. = 0.002"
f = 0.006 ipr
Wet
CNGA432S00525MEW

Tool Life

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

KBN020 improves dimensional variation with longer tool life.
(User Evaluation)

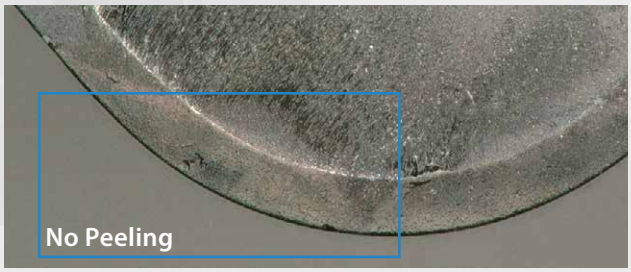
Coating Properties (Internal Evaluation)



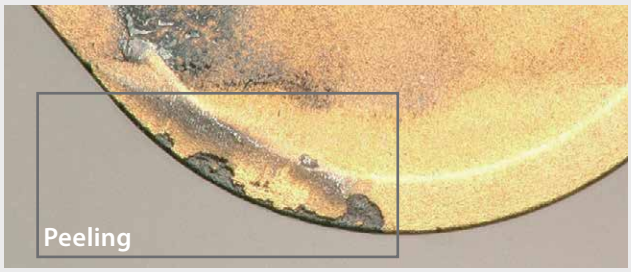
Suppress Layer Peeling

New Adhesion Technology 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)

Machining Demo

1. Shaft - External Turning

DDJNL16-4D
DNGA432S00525ME
4118Ⓗ 62HRC

Vc = 390 sfm, D.O.C. = 0.008", f = 0.007 ipr (Interruption f = 0.006 ipr)

Excellent stable machining in continuous to interrupted machining.

2. Gear - Facing

DCLNL16-4D
CNGA433S00525ME
1045Ⓗ 58HRC

Vc = 390 sfm, D.O.C. = 0.016" , f = 0.006 ipr

Excellent stability in heavily interrupted machining

Solution for Automotive Parts

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.

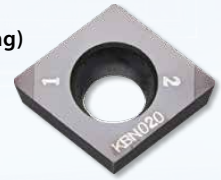
Long tool life and stable machining
High toughness suppresses sudden fractures from occurring

Stable machining increases productivity.

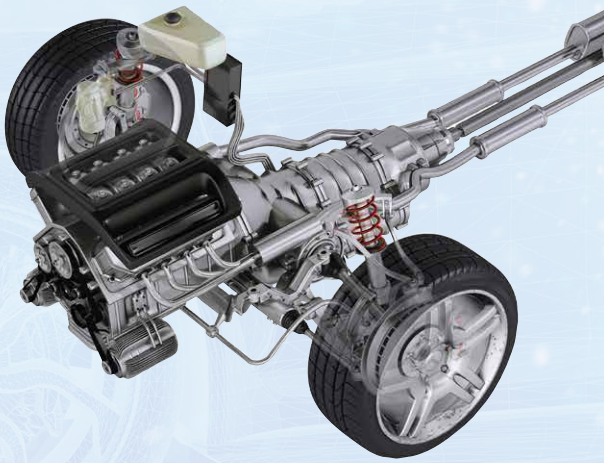
Sun Gear

Workpiece
1045 (Carburizing and quenching)

Insert
CCMW3252S00435MET



Applications
Bore finishing for spline part (Interruption)

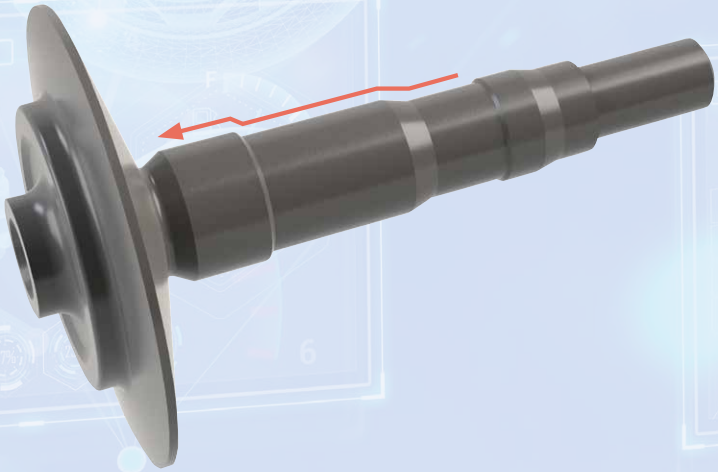


CVT Shaft

Workpiece
5120H

Insert
DNGA431S00525ME

Applications
External finishing

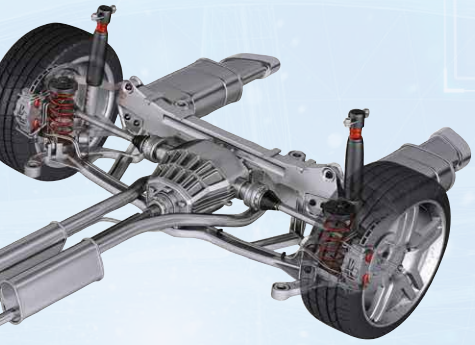


Diff Ring

Workpiece
5120H

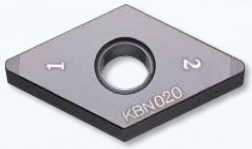
Insert
CNGA432S00730MET

Applications
Facing (Interruption)



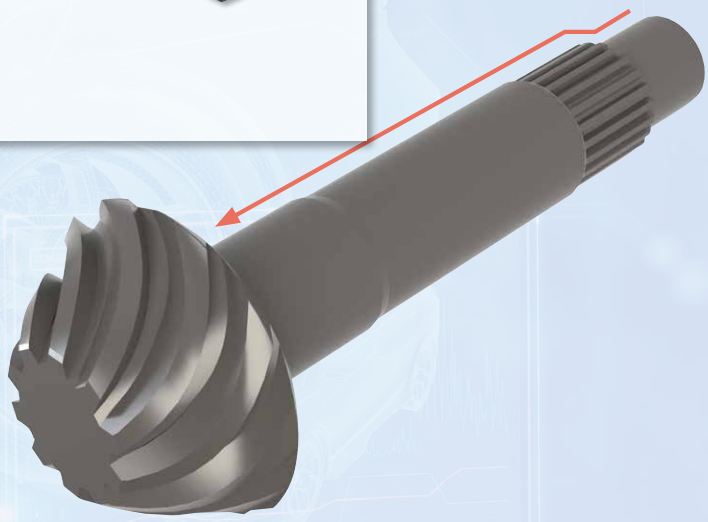
Pinion Gear

Workpiece
4118H



Insert
DNGA431S00525ME

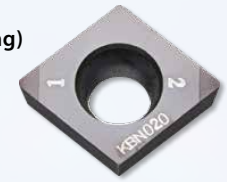
Applications
External finishing



Side Gear

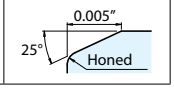
Workpiece
1045 (Carburizing and quenching)

Insert
CCMW3252S00435MET

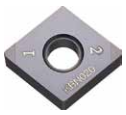
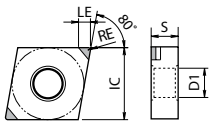
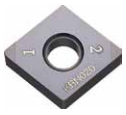
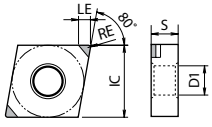
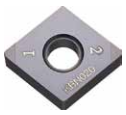
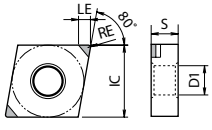
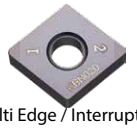
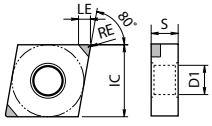
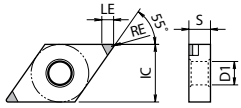
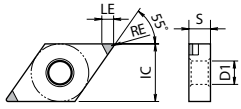
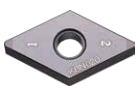
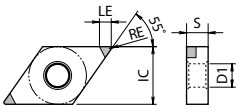


Applications
Boring finishing for spline part (Interruption)

Negative Inserts

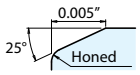
Cutting Edge Preparation				
Symbol	Cutting Edge Specification	Indication		Shape examples
S	Chamfered and Honed	S00525	0.005" x 25°chamfered and honed	

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	

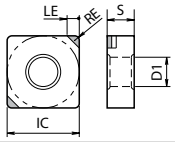
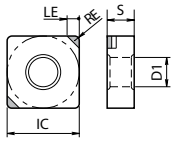
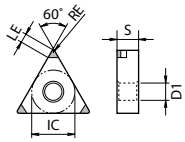
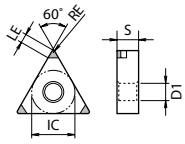
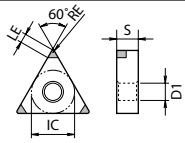
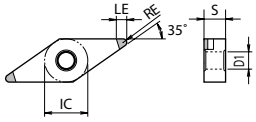
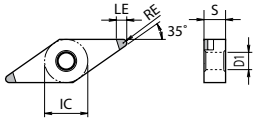
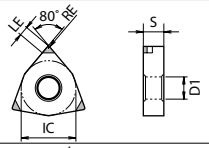
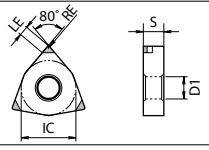
Shape		Part Number	Cutting Edge Preparation	Dimensions (in)		No. of Edges	MEGACOAT TOUGH
				RE	LE		KBN020
 Multi Edge / with Wiper Edge		CNGA 431S00515MEW	S00515	1/64	0.102	2	●
		432S00515MEW		1/32	0.098		●
		433S00515MEW		3/64	0.098		●
 Multi Edge		CNGA 4305S00525ME	S00525	0.008	0.102	2	●
		431S00525ME		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		●
 Multi Edge / Tough		DNGA 431S00730MET	S00730	1/64	0.102	2	●
		432S00730MET		1/32	0.087		●
		433S00730MET		3/64	0.075		●
		434S00730MET		1/16	0.150		●
		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

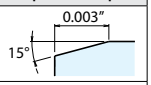
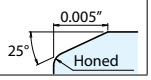
Cutting Edge Preparation				
Symbol	Cutting Edge Specification	Indication		Shape examples
S	Chamfered and Honed	S00525	0.005" x 25°chamfered and honed	

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

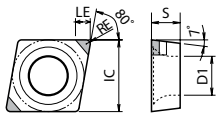
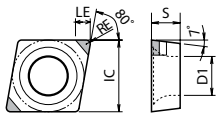
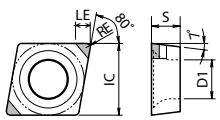
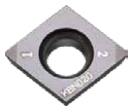
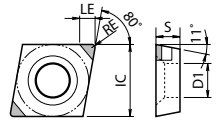
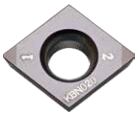
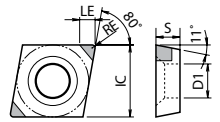
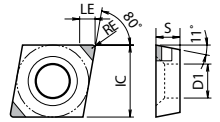
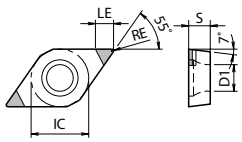
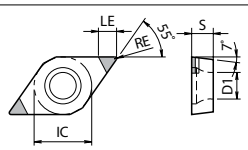
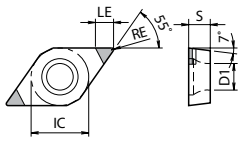
Shape		Part Number	Cutting Edge Preparation	Dimensions (in)		No. of Edges	MEGACOAT TOUGH
				RE	LE		KBN020
 Multi Edge		SNGA 431S00525ME	S00525	1/64	0.102	2	●
		432S00525ME		1/32	0.102		●
 Multi Edge / Tough		SNGA 431S00730MET	S00730	1/64	0.102	2	●
		432S00730MET		1/32	0.102		●
		433S00730MET		3/64	0.102		●
 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

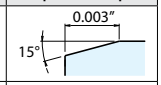
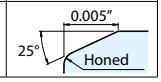
Cutting Edge Preparation				
Symbol	Cutting Edge Specification	Indication		Shape Examples
T	Chamfered	T00315	0.003" x 15°chamfered	
S	Chamfered and Honed	S00525	0.005" x 25°chamfered and honed	

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

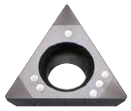
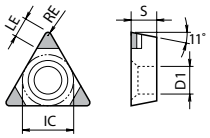
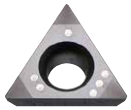
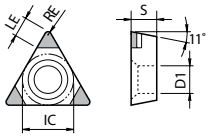
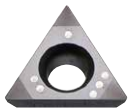
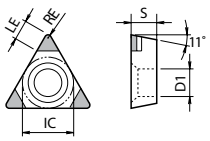
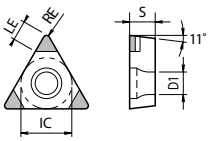
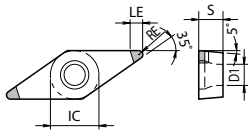
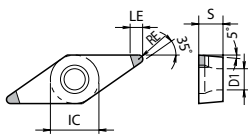
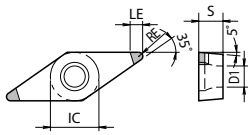
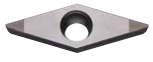
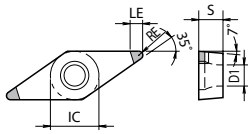
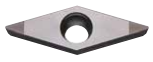
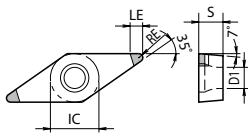
Shape		Part Number	Cutting Edge Preparation	Dimensions (in)		No. of Edges	MEGACOAT TOUGH
				RE	LE		KBN020
 Multi Edge		CCMW 21505T00315ME	T00315	0.008	0.079	2	●
		2151T00315ME		1/64	0.075		●
		2152T00315ME		1/32	0.071		●
		CCMW 32505T00315ME	T00315	0.008	0.079	2	●
		3251T00315ME		1/64	0.075		●
		3252T00315ME		1/32	0.071		●
 Multi Edge / General Purpose		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		●
 Multi Edge / Tough		CCMW 3251S00435MET	S00435	1/64	0.075	2	●
		3252S00435MET		1/32	0.071		●
 Multi Edge		CPGB 25151T00315ME	T00315	1/64	0.075	2	●
		CPGB 3205T00315ME	T00315	0.008	0.102	2	●
		321T00315ME		1/64	0.102		●
 Multi Edge / General Purpose		CPGB 321S00525MES	S00525	1/64	0.098	2	●
		322S00525MES		1/32	0.098		●
 Multi Edge / Tough		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		●
 Multi Edge		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		●
		3253T00315ME		3/64	0.075		●
 Multi Edge / General Purpose		DCMW 32505S00525MES	S00525	0.008	0.094	2	●
		3251S00525MES		1/64	0.087		●
		3252S00525MES		1/32	0.075		●
 Multi Edge / Tough		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		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	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 (Small D.O.C.)	Interruption ~ Heavy Interruption	KBN020	260 - **430** - 590	0.002 - **0.008** - 0.020	0.002 - **0.008** - 0.016

KYOCERA

KYOCERA Precision Tools
102 Industrial Park Road
Hendersonville, NC 28792
Customer Service | 800.823.7284 - Option 1
Technical Support | 800.823.7284 - Option 2

Official Website | www.kyoceraprecisiontools.com
Distributor Website | portal.kyoceraprecisiontools.com
Email | cuttingtools@kyocerapti.com

12/22