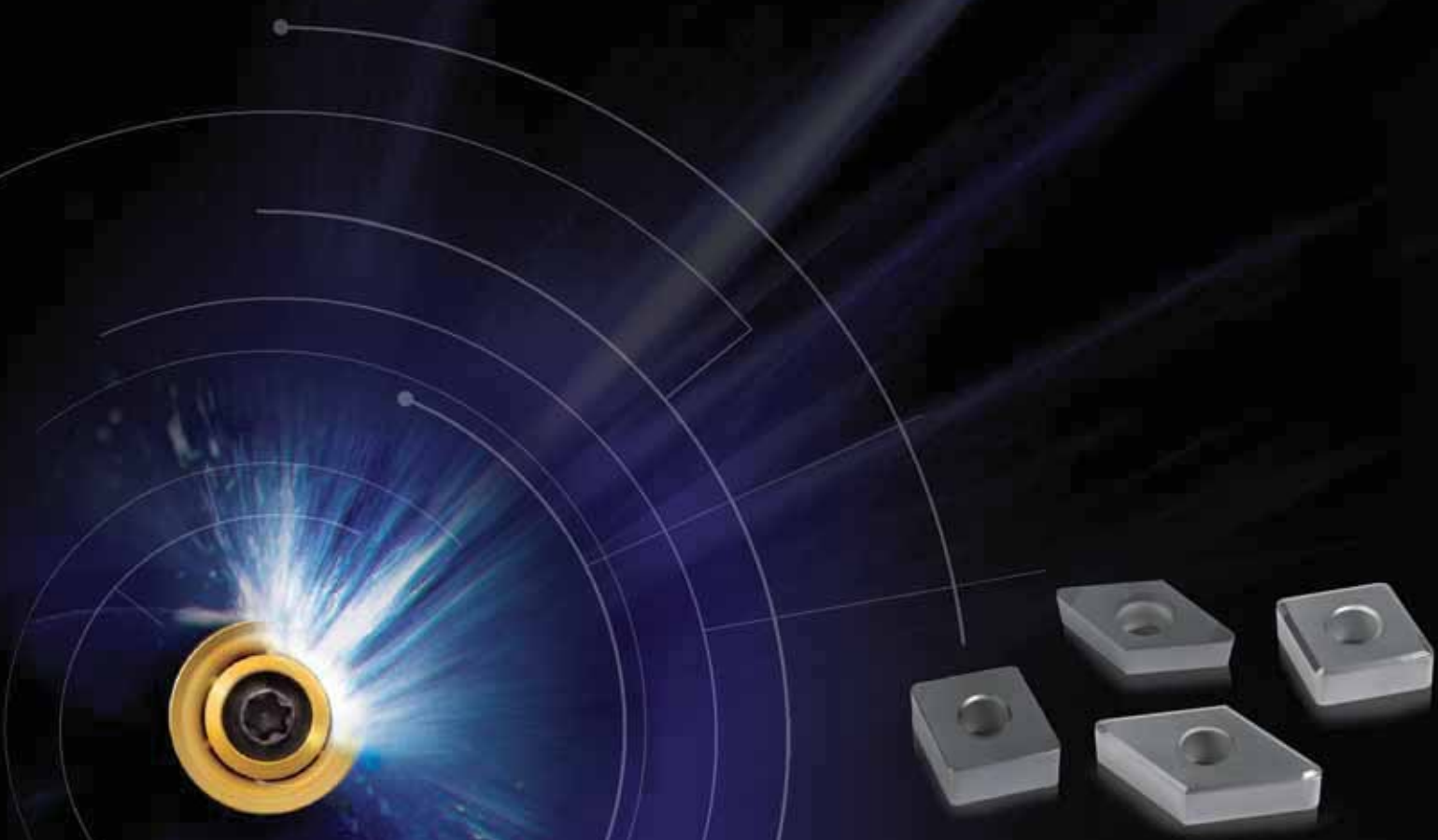


INNOVATIONS  
**MASTER CATALOG**

**KBH20™**  
2014





## KBH20™ • Developed for Your Hard Turning Application Requirements

### Primary Application

KBH20 is the ideal PCBN hard turning grade in continuous to lightly interrupted applications. The structure, as well as the different edge preparations, enable tight and repeatable workpiece tolerances, excellent surface finishes, and surface integrity — even at elevated speeds. Typical applications are case-hardened components, such as gears, shafts, and other drive train components.

### Features and Benefits

- Newly developed substrate that allows application in a wide variety of demanding applications.
- Nano-composite coating that enhances speed capabilities and tool life.
- Improved edge preparation technology for longer tool life, reliable performance, better surface finish, and tighter workpiece tolerances.
- Large standard portfolio.
- CB1 chipbreaker in positive and negative geometry, solving chip breaking and chip control issues.



## KBH20 for Enhanced Performance — 5 Unique Features

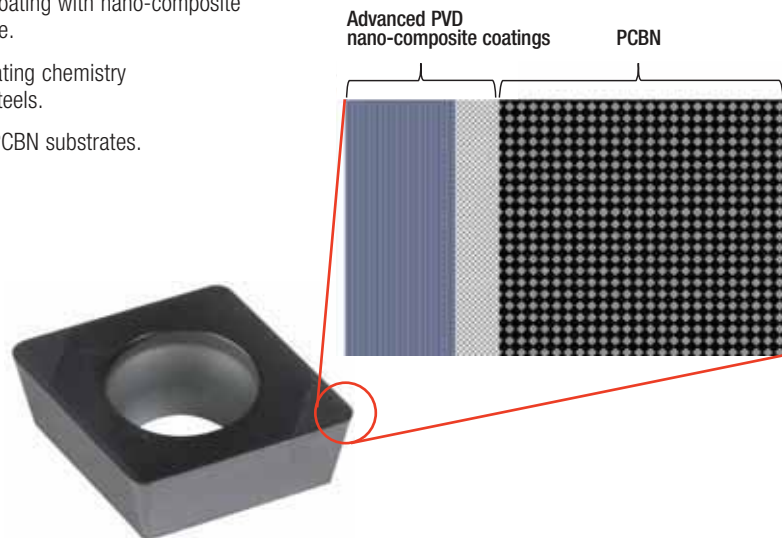
### 1 Newly developed substrate enables application in a wide variety of demanding situations.

The substrate contains superhard grains with a uniquely formulated size distribution and nano-structured binder phase. This unique combination provides an unparalleled balance of wear resistance and toughness. The net result is a robust hard turning tooling solution for a wide range of applications, including continuous to interrupted cutting.



### 2 Nano-composite coating that enhances speed capabilities and tool life.

- Specially developed, advanced PVD coating with nano-composite architecture for improved performance.
- Improved wear resistance by PVD coating chemistry technology for machining hardened steels.
- Enhanced PVD coating adhesion on PCBN substrates.



### 3 Improved edge preparation technology for longer tool life, reliable performance, better surface finish, and tighter workpiece tolerances.

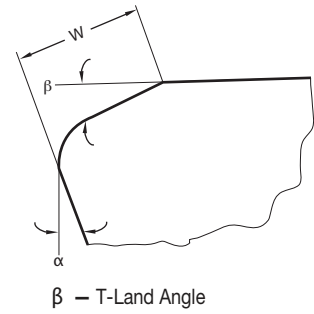
A critical performance factor is the edge preparation itself. The grind direction, surface roughness, hone sizes, and tolerances have great impact on performance and process reliability. Kennametal has performed significant research work and optimized edge preparation to improve your overall machining effectiveness.

**Large standard portfolio.**

Standard edge preparation — the optimum combination of T-land angle, T-land width, and hone size — is paramount in achieving maximum performance.

Kennametal has developed 3 standard edge configurations, including wiper inserts.

- Light machining edge prep S0415                      **S0415:**  $W \times \beta = .004 \text{ inch} \times 15^\circ$
- Medium machining edge prep S0525                      **S0525:**  $W \times \beta = .005 \text{ inch} \times 25^\circ$
- Heavy machining edge prep S0735                      **S0735:**  $W \times \beta = .007 \text{ inch} \times 35^\circ$



4

These edge preps are available in common styles, sizes, and nose radii in both positive and negative geometries.

**CB1 chipbreaker in positive and negative geometries, solving chip breaking and chip control issues.**

Chipbreaker — when machining case-hardened steel with a hard outer skin and a tough and softer core, a chipbreaker provides a great advantage. The CB1 chipbreaker is a proven solution to effectively breaking chips. Long chips can form bird nests, causing machine malfunctions, increasing scrap-rates, and reducing the overall equipment effectiveness



Available in Kenloc™ (negative) and Screw-On (positive) insert styles.

5

**Insert without Chipbreaker**



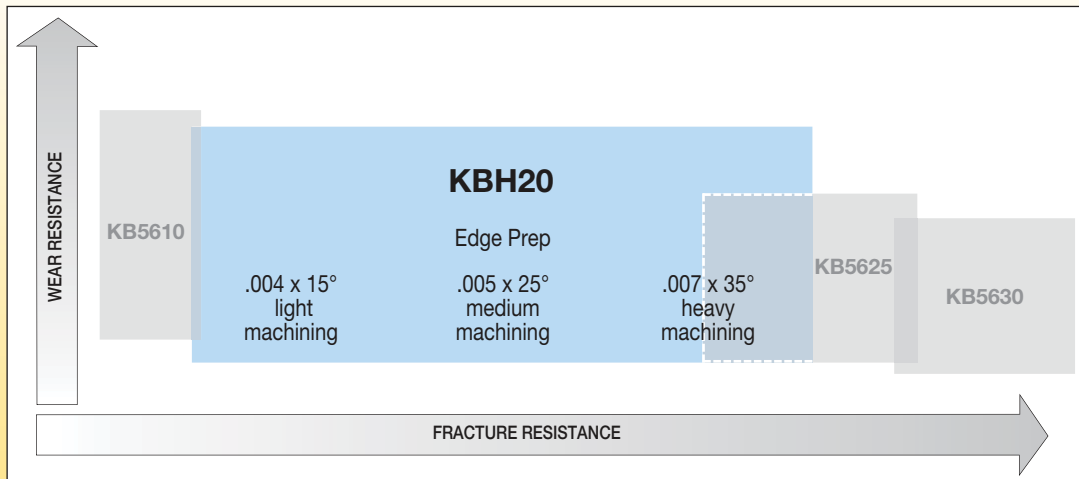
- Long chips.
- Bird-nest formation.

**Insert with Chipbreaker**

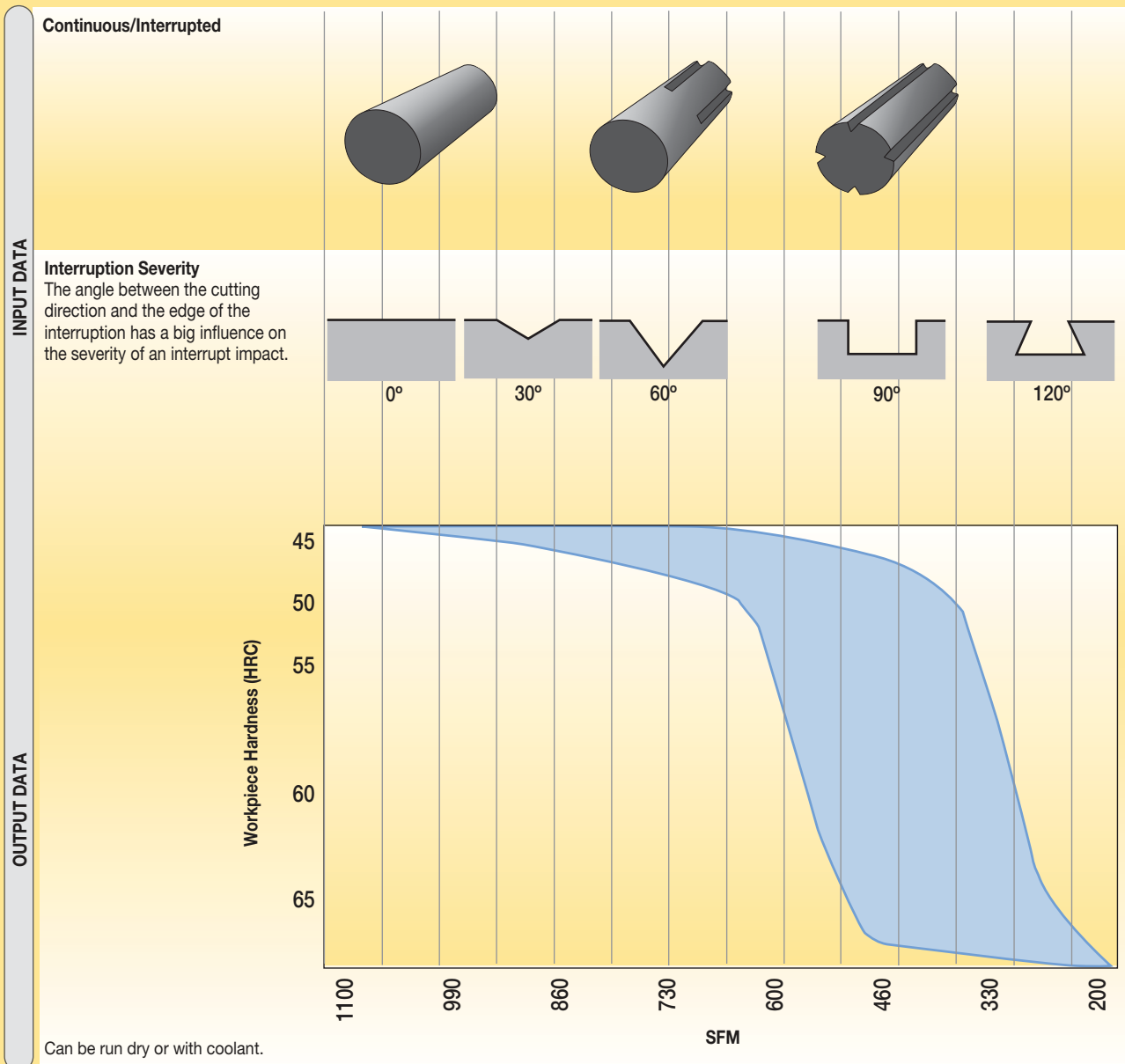


- Chips are broken.

■ Wear and Fracture Resistance



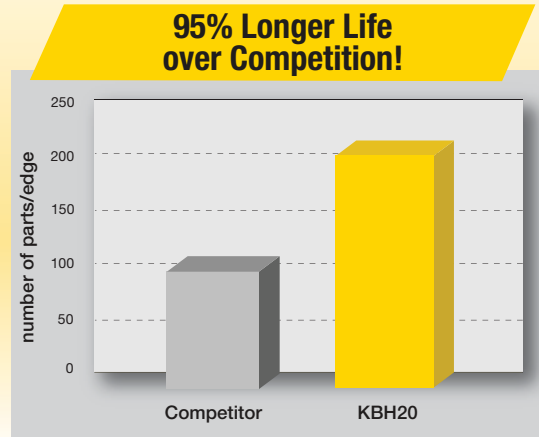
Speed Range Selection for Hard Turning



### ■ Case Study: Differential Shaft Machining

**Component:** Differential shaft  
**Application:** O.D. turning  
**Material:** Case-hardened steel, pre-machined  
**Results:** 95% more parts machined

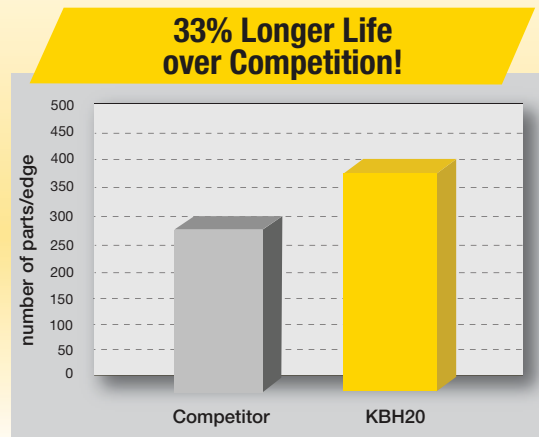
	COMPETITOR	KBH20
<b>insert:</b>	CNGA432	CNGA432S0525MT
<b>material:</b>	Case-hardened steel, pre-machined	Case-hardened steel, pre-machined
<b>depth of cut:</b>	0,15mm (.0059")	0,15mm (.0059")
<b>cutting speed:</b>	180 m/min (590 SFM)	180 m/min (590 SFM)
<b>feed rate:</b>	0,12mm (.0047 IPR)	0,12mm (.0047 IPR)
<b>coolant:</b>	External emulsion	External emulsion
<b>parts machined:</b>	110	215



### ■ Case Study: Drive Train Component

**Component:** Drive Train Component  
**Application:** I.D. turning and facing  
**Material:** Hardened steel — light interruptions  
**Results:** 33% more parts machined

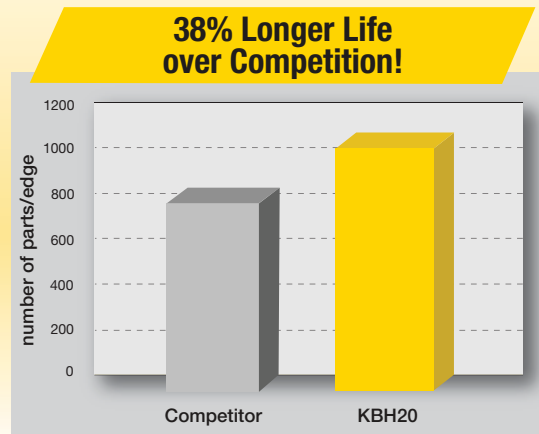
	COMPETITOR	KBH20
<b>insert:</b>	CNGA432	CNGA432S0735MT
<b>material:</b>	Hardened steel — light interruptions	Hardened steel — light interruptions
<b>depth of cut:</b>	0,2mm (.008")	0,2mm (.008")
<b>cutting speed:</b>	140 m/min (460 SFM)	140 m/min (460 SFM)
<b>feed rate:</b>	0,15mm (.006 IPR)	0,15mm (.006 IPR)
<b>coolant:</b>	Dry	Dry
<b>parts machined:</b>	300	400



### ■ Case Study: Gear Machining

**Component:** Gear  
**Application:** O.D. turning  
**Material:** Case-hardened steel, pre-machined 58–62 HRC  
**Results:** 38% more parts machined

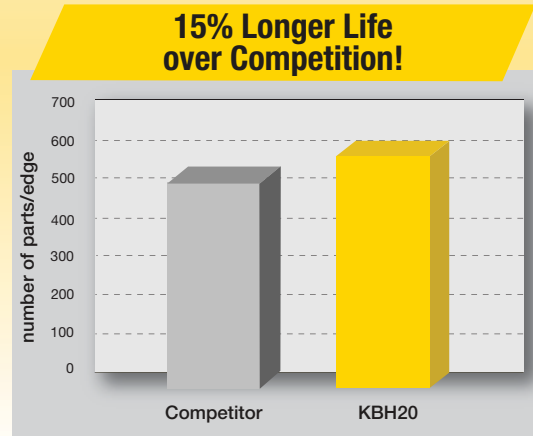
	COMPETITOR	KBH20
<b>insert:</b>	DNGA431GAWS2JL	DNGA431EFWMT
<b>material:</b>	Case-hardened steel, pre-machined 58–62 HRC	Case-hardened steel, pre-machined 58–62 HRC
<b>depth of cut:</b>	0,18mm (.007")	0,18mm (.007")
<b>cutting speed:</b>	128 m/min (423 SFM)	128 m/min (423 SFM)
<b>feed rate:</b>	0,076mm (.003 IPR)	0,076mm (.003 IPR)
<b>coolant:</b>	External emulsion	External emulsion
<b>parts machined:</b>	800	1104



■ Case Study: Gear Machining

**Component:** Gear  
**Application:** I.D. turning  
**Material:** Case-hardened steel, pre-machined  
**Results:** 15% more parts machined

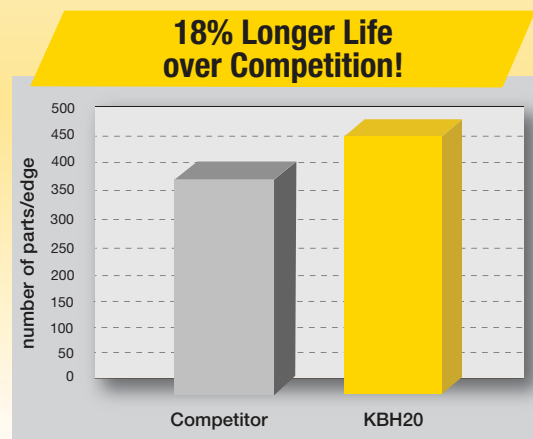
	COMPETITOR	KBH20
<b>insert:</b>	CNGA432	CNGA432S0525MT
<b>material:</b>	Case-hardened steel, pre-machined	Case-hardened steel, pre-machined
<b>depth of cut:</b>	0,15mm (.006")	0,15mm (.006")
<b>cutting speed:</b>	160 m/min (520 SFM)	160 m/min (520 SFM)
<b>feed rate:</b>	0,10mm (.004 IPR)	0,10mm (.004 IPR)
<b>coolant:</b>	Dry	Dry
<b>parts machined:</b>	521	600



■ Case Study: Drive Train Component Machining

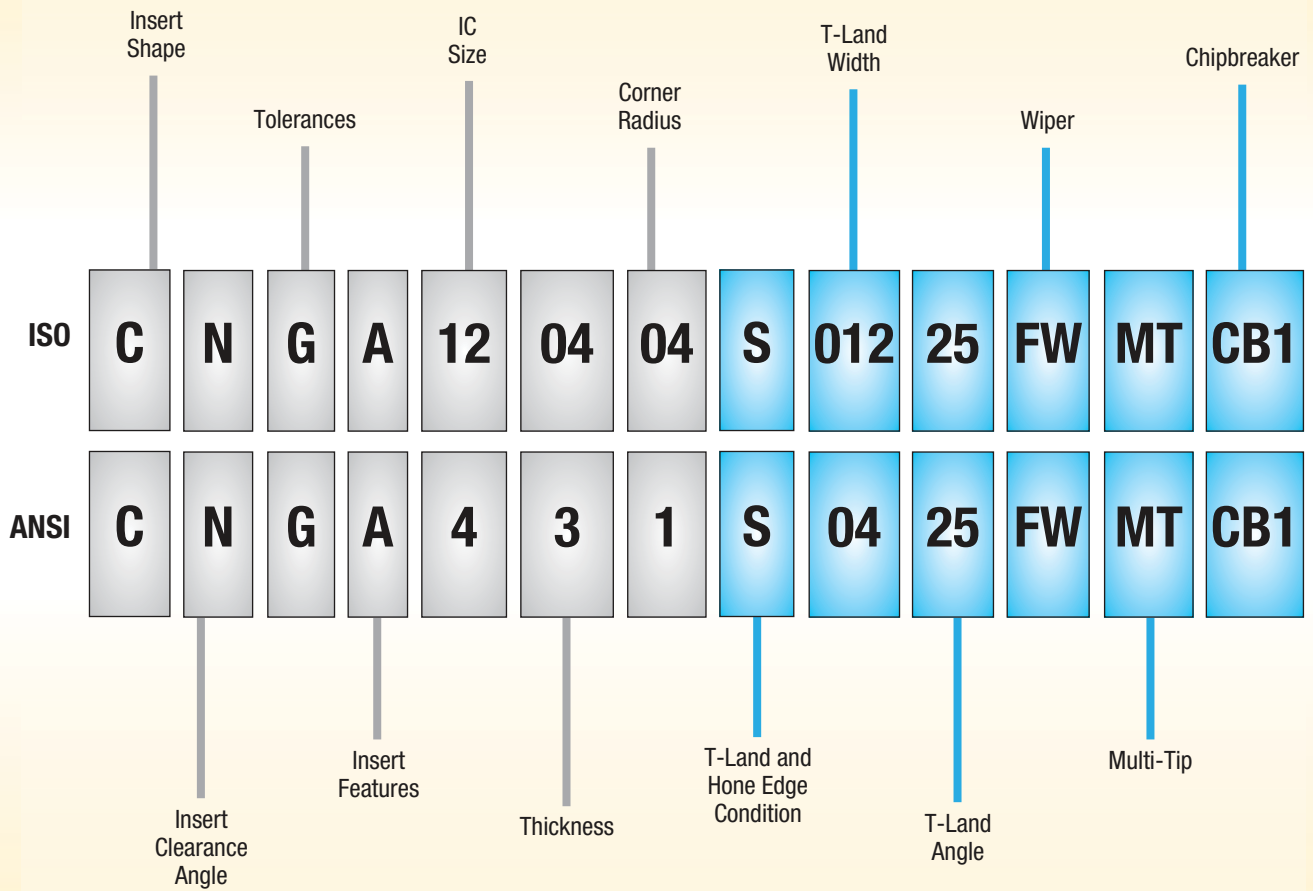
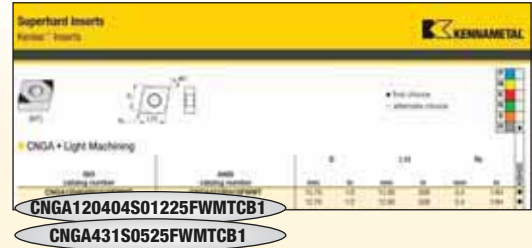
**Component:** Drive train component  
**Application:** O.D. turning  
**Material:** Case-hardened steel — forged skin  
**Results:** 18% more parts machined

	COMPETITOR	KBH20
<b>insert:</b>	DCGW3251	DCGW3251S0415MT
<b>material:</b>	Case-hardened steel — forged skin	Case-hardened steel — forged skin
<b>depth of cut:</b>	0,2mm (.008")	0,2mm (.008")
<b>cutting speed:</b>	140 m/min (462 SFM)	140 m/min (462 SFM)
<b>feed rate:</b>	0,11mm (.0043 IPR)	0,11mm (.0043 IPR)
<b>coolant:</b>	Dry	Dry
<b>parts machined:</b>	400	473



### How Do Catalog Numbers Work?

Each character in our catalog number signifies a specific trait of that product. Use the following key columns and corresponding images to easily identify which attributes apply.



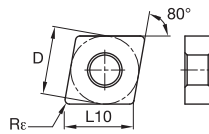


P	■
M	■
K	■
N	■
S	■
H	■

● first choice  
○ alternate choice



(MT)

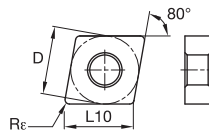


■ CNGA • Light Machining

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
CNGA120404S01015FWMT	CNGA431S0415FWMT	12,70	1/2	12,90	.508	0,4	1/64	●
CNGA120404S01015MT	CNGA431S0415MT	12,70	1/2	12,90	.508	0,4	1/64	●
CNGA120408S01015MT	CNGA432S0415MT	12,70	1/2	12,90	.508	0,8	1/32	●
CNGA120408S01015FWMT	CNGA432S0415FWMT	12,70	1/2	12,90	.508	0,8	1/32	●
CNGA120412S01015FWMT	CNGA433S0415FWMT	12,70	1/2	12,90	.508	1,2	3/64	●
CNGA120412S01015MT	CNGA433S0415MT	12,70	1/2	12,90	.508	1,2	3/64	●



(MT)

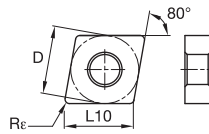


■ CNGA • Medium Machining

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
CNGA120404S01225MT	CNGA431S0525MT	12,70	1/2	12,90	.508	0,4	1/64	●
CNGA120408S01225MT	CNGA432S0525MT	12,70	1/2	12,90	.508	0,8	1/32	●
CNGA120412S01225MT	CNGA433S0525MT	12,70	1/2	12,90	.508	1,2	3/64	●



(MT)

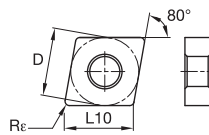


■ CNGM • Medium Machining

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
CNGM120404S01325MTCB1	CNGM431S0525MTCB1	12,70	1/2	12,90	.508	0,4	1/64	●
CNGM120408S01325MTCB1	CNGM432S0525MTCB1	12,70	1/2	12,90	.508	0,8	1/32	●
CNGM120412S01325MTCB1	CNGM433S0525MTCB1	12,70	1/2	12,90	.508	1,2	3/64	●



(MT)

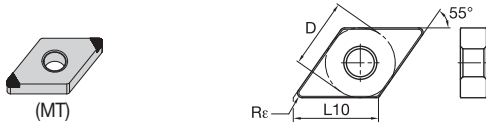


■ CNGA • Heavy Machining

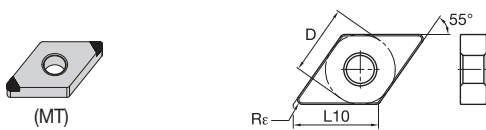
ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
CNGA120404S01735MT	CNGA431S0735MT	12,70	1/2	12,90	.508	0,4	1/64	●
CNGA120408S01735MT	CNGA432S0735MT	12,70	1/2	12,90	.508	0,8	1/32	●
CNGA120412S01735MT	CNGA433S0735MT	12,70	1/2	12,90	.508	1,2	3/64	●

P	Blue
M	Yellow
K	Red
N	Green
S	Orange
H	Grey

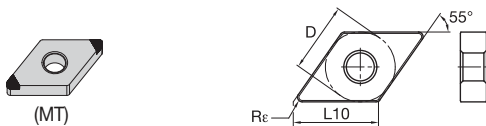
- first choice
- alternate choice


**DNGA • Light Machining**

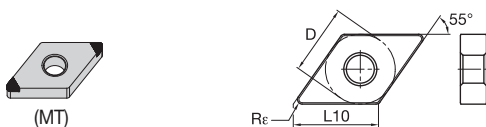
ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
DNGA150404S01015MT	DNGA431S0415MT	12,70	1/2	15,50	.610	0,4	1/64	●
DNGA150408S01015FWMT	DNGA432S0415FWMT	12,70	1/2	15,50	.610	0,4	—	●
DNGA150408S01015MT	DNGA432S0415MT	12,70	1/2	15,50	.610	0,8	1/32	●
DNGA150412S01015FWMT	DNGA433S0415FWMT	12,70	1/2	15,50	.610	0,8	—	●
DNGA150412S01015MT	DNGA433S0415MT	12,70	1/2	15,50	.610	1,2	3/64	●
DNGA150604S01015MT	DNGA441S0415MT	12,70	1/2	15,50	.610	0,4	1/64	●
DNGA150608S01015MT	DNGA442S0415MT	12,70	1/2	15,50	.610	0,8	1/32	●
DNGA150612S01015MT	DNGA443S0415MT	12,70	1/2	15,50	.610	1,2	3/64	●


**DNGA • Medium Machining**

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
DNGA150404S01225MT	DNGA431S0525MT	12,70	1/2	15,50	.610	0,4	1/64	●
DNGA150412S01225MT	DNGA433S0525MT	12,70	1/2	15,50	.610	1,2	3/64	●
DNGA150604S01225MT	DNGA441S0525MT	12,70	1/2	15,50	.610	0,4	1/64	●
DNGA150608S01225MT	DNGA442S0525MT	12,70	1/2	15,50	.610	0,8	1/32	●
DNGA150612S01225MT	DNGA443S0525MT	12,70	1/2	15,50	.610	1,2	3/64	●


**DNGM • Medium Machining**

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
DNGM150408S01325MTCB1	DNGM432S0525MTCB1	12,70	1/2	15,50	.610	0,8	1/32	●
DNGM150412S01325MTCB1	DNGM433S0525MTCB1	12,70	1/2	15,50	.610	1,2	3/64	●
DNGM150608S01325MTCB1	DNGM442S0525MTCB1	12,70	1/2	15,50	.610	0,8	1/32	●
DNGM150612S01325MTCB1	DNGM443S0525MTCB1	12,70	1/2	15,50	.610	1,2	3/64	●

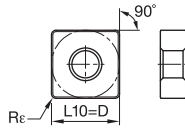

**DNGA • Heavy Machining**

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
DNGA150404S01735MT	DNGA431S0735MT	12,70	1/2	15,50	.610	0,4	1/64	●
DNGA150408S01735MT	DNGA432S0735MT	12,70	1/2	15,50	.610	0,8	1/32	●
DNGA150412S01735MT	DNGA433S0735MT	12,70	1/2	15,50	.610	1,2	3/64	●
DNGA150604S01735MT	DNGA441S0735MT	12,70	1/2	15,50	.610	0,4	1/64	●
DNGA150608S01735MT	DNGA442S0735MT	12,70	1/2	15,50	.610	0,8	1/32	●
DNGA150612S01735MT	DNGA443S0735MT	12,70	1/2	15,50	.610	1,2	3/64	●

P	Blue
M	Yellow
K	Red
N	Green
S	Orange
H	Grey



(MT)



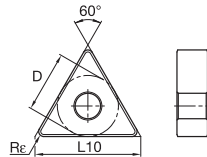
- first choice
- alternate choice

■ SNGA • Medium Machining

ISO catalog number	ANSI catalog number	D		L10		Re		KBH20
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SNGA120408S01225MT	SNGA432S0525MT	12,70	1/2	12,70	.500	0,8	1/32	●
SNGA120412S01225MT	SNGA433S0525MT	12,70	1/2	12,70	.500	1,2	3/64	●



(MT)

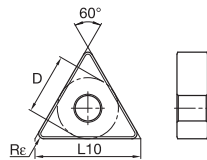


■ TNGA • Light Machining

ISO catalog number	ANSI catalog number	D		L10		Re		KBH20
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TNGA160404S01015MT	TNGA331S0415MT	9,52	3/8	16,50	.650	0,4	1/64	●
TNGA160408S01015MT	TNGA332S0415MT	9,52	3/8	16,50	.650	0,8	1/32	●
TNGA160412S01015MT	TNGA333S0415MT	9,52	3/8	16,50	.650	1,2	3/64	●



(MT)

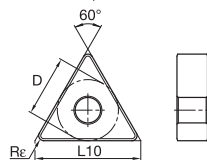


■ TNGA • Medium Machining

ISO catalog number	ANSI catalog number	D		L10		Re		KBH20
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TNGA160404S01225MT	TNGA331S0525MT	9,52	3/8	16,50	.650	0,4	1/64	●
TNGA160408S01225MT	TNGA332S0525MT	9,52	3/8	16,50	.650	0,8	1/32	●
TNGA160412S01225MT	TNGA333S0525MT	9,52	3/8	16,50	.650	1,2	3/64	●



(MT)

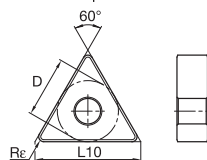


■ TNGM • Medium Machining

ISO catalog number	ANSI catalog number	D		L10		Re		KBH20
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TNGM160404S01325MTCB1	TNGM331S0525MTCB1	9,52	3/8	16,50	.650	0,4	1/64	●
TNGM160408S01325MTCB1	TNGM332S0525MTCB1	9,52	3/8	16,50	.650	0,8	1/32	●
TNGA160412S01325MTCB1	TNGM333S0525MTCB1	9,52	3/8	16,50	.650	1,2	3/64	●



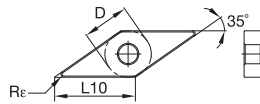
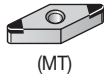
(MT)



■ TNGA • Heavy Machining

ISO catalog number	ANSI catalog number	D		L10		Re		KBH20
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TNGA160404S01735MT	TNGA331S0735MT	9,52	3/8	16,50	.650	0,4	1/64	●
TNGA160408S01735MT	TNGA332S0735MT	9,52	3/8	16,50	.650	0,8	1/32	●
TNGA160412S01735MT	TNGA333S0735MT	9,52	3/8	16,50	.650	1,2	3/64	●

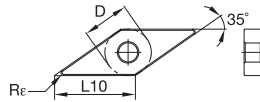
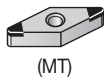
P	■
M	■
K	■
N	■
S	■
H	●



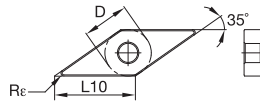
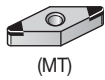
- first choice
- alternate choice

**VNGA • Light Machining**

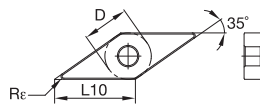
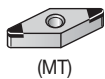
ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
VNGA160404S01015MT	VNGA331S0415MT	9,52	3/8	16,61	.654	0,4	1/64	●
VNGA160408S01015MT	VNGA332S0415MT	9,52	3/8	16,61	.654	0,8	1/32	●


**VNGA • Medium Machining**

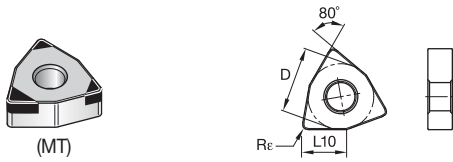
ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
VNGA160404S01225MT	VNGA331S0525MT	9,52	3/8	16,61	.654	0,4	1/64	●
VNGA160408S01225MT	VNGA332S0525MT	9,52	3/8	16,61	.654	0,8	1/32	●
VNGA160412S01225MT	VNGA333S0525MT	9,52	3/8	16,61	.654	1,2	3/64	●


**VNGM • Medium Machining**

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
VNGM160408S01325MTCB1	VNGM332S0525MTCB1	9,52	3/8	16,61	.654	0,8	1/32	●
VNGM160412S01325MTCB1	VNGM333S0525MTCB1	—	—	—	—	—	—	●


**VNGA • Heavy Machining**

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
VNGA160404S01735MT	VNGA331S0735MT	9,52	3/8	16,61	.654	0,4	1/64	●
VNGA160408S01735MT	VNGA332S0735MT	9,52	3/8	16,61	.654	0,8	1/32	●

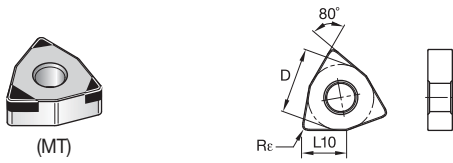


● first choice  
○ alternate choice

P	■
M	■
K	■
N	■
S	■
H	■
	●

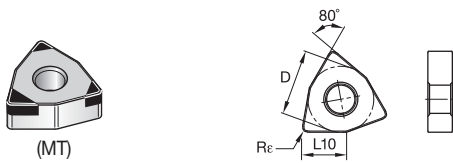
■ WNGA • Light Machining

ISO catalog number	ANSI catalog number	D		L10		Re		KBH20
		mm	in	mm	in	mm	in	
WNGA080404S01015MT	WNGA431S0415MT	12,70	1/2	8,69	.342	0,4	1/64	●
WNGA080408S01015FWMT	WNGA432S0415FWMT	12,70	1/2	8,69	.342	0,8	1/32	●
WNGA080408S01015MT	WNGA432S0415MT	12,70	1/2	8,69	.342	0,8	1/32	●



■ WNGA • Medium Machining

ISO catalog number	ANSI catalog number	D		L10		Re		KBH20
		mm	in	mm	in	mm	in	
WNGA080408S01225MT	WNGA432S0525MT	12,70	1/2	8,69	.342	0,8	1/32	●



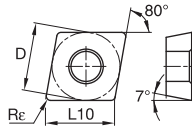
■ WNGA • Heavy Machining

ISO catalog number	ANSI catalog number	D		L10		Re		KBH20
		mm	in	mm	in	mm	in	
WNGA080408S01735MT	WNGA432S0735MT	12,70	1/2	8,69	.342	0,8	1/32	●

P	■
M	■
K	■
N	■
S	■
H	■
	●



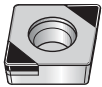
(MT)



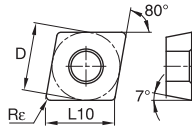
- first choice
- alternate choice

■ CCGW • Light Machining

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
CCGW09T304S01015FWMT	CCGW3251S0415FWMT	9,52	3/8	9,67	.381	0,4	1/64	●
CCGW09T304S01015MT	CCGW3251S0415MT	9,52	3/8	9,67	.381	0,4	1/64	●
CCGW09T308S01015FWMT	CCGW3252S0415FWMT	9,52	3/8	9,67	.381	0,8	1/32	●
CCGW09T308S01015MT	CCGW3252S0415MT	9,52	3/8	9,67	.381	0,8	1/32	●
CCGW120408S01015MT	CCGW432S0415MT	12,70	1/2	12,90	.508	0,8	1/32	●



(MT)

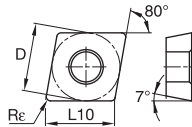


■ CCGW • Medium Machining

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
CCGW060202S01225MT	CCGW21505S0525MT	6,35	1/4	6,45	.254	0,2	.008	●
CCGW060204S01225MT	CCGW2151S0525MT	6,35	1/4	6,45	.254	0,4	1/64	●
CCGW09T302S01225MT	CCGW32505S0525MT	9,52	3/8	9,67	.381	0,2	.008	●
CCGW09T304S01225MT	CCGW3251S0525MT	9,52	3/8	9,67	.381	0,4	1/64	●
CCGW09T308S01225MT	CCGW3252S0525MT	9,52	3/8	9,67	.381	0,8	1/32	●



(MT)

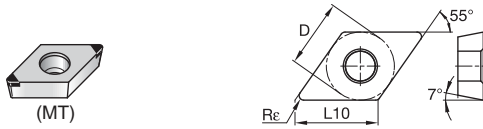


■ CCGM • Medium Machining

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
CCGM09T304S01325MTCB1	CCGM3251S0525MTCB1	9,52	3/8	9,67	.381	0,4	1/64	●
CCGM09T308S01325MTCB1	CCGM3252S0525MTCB1	9,52	3/8	9,67	.381	0,8	1/32	●

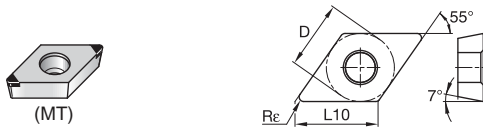
P	■
M	■
K	■
N	■
S	■
H	■

● first choice  
○ alternate choice



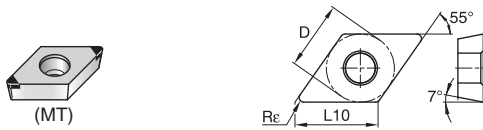
■ DCGW • Light Machining

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
DCGW070204S01015MT	DCGW2151S0415MT	6,35	1/4	7,75	.305	0,4	1/64	●
DCGW11T304S01015MT	DCGW3251S0415MT	9,52	3/8	11,63	.458	0,4	1/64	●
DCGW11T308S01015FWMT	DCGW3252S0415FWMT	9,52	3/8	11,63	.458	0,4	.16	●
DCGW11T308S01015MT	DCGW3252S0415MT	9,52	3/8	11,63	.458	0,8	1/32	●



■ DCGW • Medium Machining

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
DCGW070202S01225MT	DCGW2150S0525MT	6,35	1/4	7,75	.305	0,2	.008	●
DCGW070204S01225MT	DCGW2151S0525MT	6,35	1/4	7,75	.305	0,4	1/64	●
DCGW11T302S01225MT	DCGW3250S0525MT	9,52	3/8	11,63	.458	0,2	.008	●
DCGW11T304S01225MT	DCGW3251S0525MT	9,52	3/8	11,63	.458	0,4	1/64	●
DCGW11T308S01225MT	DCGW3252S0525MT	9,52	3/8	11,63	.458	0,8	1/32	●

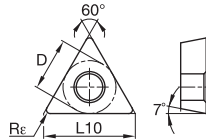


■ DCGM • Medium Machining

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
DCGM11T304S01325MTCB1	DCGM3251S0525MTCB1	9,52	3/8	11,63	.458	0,4	1/64	●

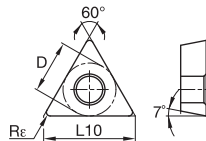
P	■
M	■
K	■
N	■
S	■
H	■
	●

- first choice
- alternate choice



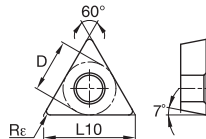
■ TCGW • Light Machining

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
TCGW090202S01015MT	TCGW181505S0415MT	5,56	7/32	9,62	.379	0,2	.008	●
TCGW090204S01015 MT	TCGW18151S0415MT	5,56	7/32	9,62	.379	0,4	1/64	●
TCGW110202S01015MT	TCGW21505S0415MT	6,35	1/4	11,00	.433	0,2	.008	●
TCGW110204S01015MT	TCGW2151S0415MT	6,35	1/4	11,00	.433	0,4	1/64	●
TCGW110208S01015MT	TCGW2152S0415MT	6,35	1/4	11,00	.433	0,8	1/32	●



■ TPGW • Light Machining

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
TPGW110202S01015MT	TPGW21505S0415MT	6,35	1/4	11,00	.433	0,2	.008	●
TPGW110204S01015MT	TPGW2151S0415MT	6,35	1/4	11,00	.433	0,4	1/64	●
TPGW110208S01015MT	TPGW2152S0415MT	6,35	1/4	11,00	.433	0,8	1/32	●
TPGW16T304S01015MT	TPGW3251S0415MT	9,52	3/8	16,50	.650	0,4	1/64	●
TPGW16T308S01015MT	TPGW3252S0415MT	9,52	3/8	16,50	.650	0,8	1/32	●



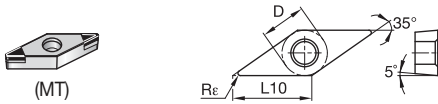
■ TPGW • Medium Machining

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
TPGW16T304S01225MT	TPGW3251S0525MT	9,52	3/8	16,50	.650	0,4	1/64	●
TPGW16T308S01225MT	TPGW3252S0525MT	9,52	3/8	16,50	.650	0,8	1/32	●



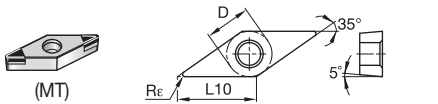
P	■
M	■
K	■
N	■
S	■
H	●

● first choice  
○ alternate choice



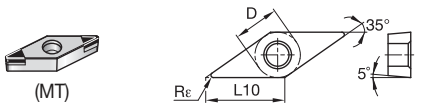
■ **VBGW • Light Machining**

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
VBGW110304S01015MT	VBGW221S0415MT	6,35	1/4	11,07	.436	0,4	1/64	●
VBGW160408S01015MT	VBGW332S0415MT	9,52	3/8	16,61	.654	0,8	1/32	●
VBGW160412S01015MT	VBGW333S0415MT	9,52	3/8	16,61	.654	1,2	3/64	●



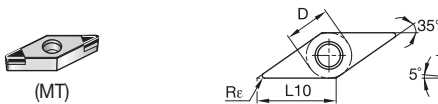
■ **VBGW • Medium Machining**

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
VBGW110304S01225MT	VBGW221S0525MT	6,35	1/4	11,07	.436	0,4	1/64	●
VBGW110308S01225MT	VBGW222S0525MT	6,35	1/4	11,07	.436	0,8	1/32	●



■ **VCGW • Light Machining**

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
VCGW160404S01015MT	VCGW331S0415MT	9,52	3/8	16,61	.654	0,4	1/64	●
VCGW160408S01015MT	VCGW332S0415MT	9,52	3/8	16,61	.654	0,8	1/32	●



■ **VCGW • Medium Machining**

ISO catalog number	ANSI catalog number	D		L10		Rε		KBH20
		mm	in	mm	in	mm	in	
VCGW160404S01225MT	VCGW331S0525MT	9,52	3/8	16,61	.654	0,4	1/64	●
VCGW160408S01225MT	VCGW332S0525MT	9,52	3/8	16,61	.654	0,8	1/32	●

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