



2017 Master Catalog

WIDIA  TM



Ceramic, PcBN, and PCD Inserts

Advanced Material Inserts



Hard part turning, along with the machining of cast irons, high-temp alloys, and non-ferrous materials, can be accomplished through the use of inserts made from advanced materials. These advanced materials include ceramics, PcBN (polycrystalline cubic boron nitride), and PCD (polycrystalline diamond). WIDIA™ offers:

- Improved performance.
- Greater wear resistance.
- Focused grades portfolio to make choosing the right grade easy.

Ceramic Inserts

- Silicon-nitride based ceramic for cast iron machining.
- Mixed ceramic for hard machining and finishing of cast iron.
- Whisker ceramic for high-temp alloy and hard machining.

**CW2015 —
Mixed Ceramic**



**CW5025 —
Silicon-Nitride
Ceramic**

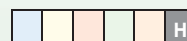


PcBN

Solid Inserts

- Inserts are made only from PcBN.
- No material joint.
- Best heat-absorption capacity.
- Can work at highest temperatures.

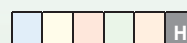
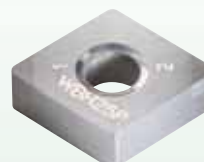
WBH25P



Tipped Inserts

- Require a carrier and a PcBN tip.
- The tips are brazed to a carrier.
- The substrate has to have a pocket that will accommodate and support the tip.

WBH25P



PCD

- Targeted machining of non-ferrous materials.
- Significant advantage in hardness over carbide tools.
- Increased productivity through higher speeds and longer tool life.
- Best used in processing materials that are un-machinable with conventional tooling.

WDN25U



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.

WIDIA Cubic Boron Nitride and Polycrystalline Diamond Inserts ISO/ANSI Inserts

CCGW21505EC

ISO catalog number	ANSI catalog number	D	L10	S	Ra	D1
		mm	in	mm	in	mm
CCGW21505EC	CCGW21505EC	6.35	1/4	6.45	254	2.38
CCGW21505EC	CCGW21505EC	6.35	1/4	6.45	254	2.38

C

Insert Shape

H Hexagon 120°

O Octagon 135°

P Pentagon 108°

R Round —

S Square 90°

T Triangular 60°

C Rhomboid 80°

D 55°

E 75°

M 86°

V 35°

W Trigon 80° with enlarged corner angles

L Rectangular 90°

A Parallelogram 85°

B 82°

N/K 55°

C

Insert Clearance Angle

A 3°

B 5°

C 7°

D 15°

E 20°

F 25°

G 30°

N 0°

P 11°

O For other clearance angles requiring descriptions.

G

Tolerance Class

Tolerances apply prior to edge prep and coating

D = Theoretical diameter of the insert inscribed circle

S = Thickness

B = See figures below

W

Insert Features

N

R

F

A

M

G

W

T

Q

U

B

H

C

J

X Special Design

V

2

Size

Code for inch cutting edge length "L10"

"D"		C	D	R	S	T	V	W
inch	inch							
1.2 (5)	5/32	S4	04	03	03	06	—	—
1.5 (6)	3/16	04	05	04	04	08	08	S3
1.8 (7)	7/32	05	06	05	05	09	09	03
—	.236	—	—	06	—	—	—	—
2	1/4	06	07	06	06	11	11	04
2.5	5/16	08	09	07	07	13	13	05
—	.315	—	—	08	—	—	—	—
3	3/8	09	11	09	09	16	16	06
—	.394	—	—	10	—	—	—	—
3.5	7/16	11	13	11	11	19	19	07
—	.472	—	—	12	—	—	—	—
4	1/2	12	15	12	12	22	22	08
4.5	9/16	14	17	14	14	24	24	09
5	5/8	16	19	15	15	27	27	10
—	.630	—	—	16	—	—	—	—
5.5	11/16	17	21	17	17	30	30	11
6	3/4	19	23	19	19	33	33	13
—	.787	—	—	20	—	—	—	—
7	7/8	22	27	22	22	38	38	15
—	.984	—	—	25	—	—	—	—
8	1	25	31	25	25	44	44	17
10	1-1/4	32	38	31	31	54	54	21
—	1.260	—	—	32	—	—	—	—

tolerance class*	tolerance on "D"	tolerance on "B"	tolerance on "S"
C	±.0010"	±.0005"	±.001"
H	±.0005"	±.0005"	±.001"
E	±.0010"	±.0010"	±.001"
G	±.0010"	±.0010"	±.005"
M	See tables on next page		±.005"
U	See tables on next page		±.005"

*Tolerances apply prior to edge prep and coating.

By referencing this easy-to-use guide, you can identify the correct product to meet your needs.

WIDIA Cubic Boron Nitride and Polycrystalline Diamond Inserts ISO/ANSI Inserts									
ISO catalog number	ANSI catalog number	D mm	D in	L mm	L in	S mm	S in	R mm	R in
CCGW21505EC	CCGW21505EC	6.35	.25	6.45	.254	2.38	.094	0.2	.008
CCGW21505EC	CCGW21505EC	6.35	.25	6.45	.254	2.38	.094	0.2	.008

CCGW21505EC

15

Thickness
"S"

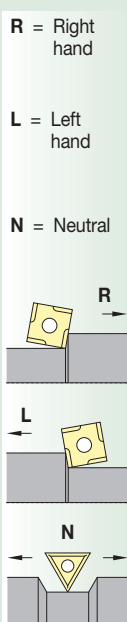
symbol	thick- ness
inch	inch
.5 (1)	1/32
.6	.040
1 (2)	1/16
1.2	5/64
1.5 (3)	3/32
2	1/8
2.5	5/32
3	3/16
3.5	7/32
4	1/4
5	5/16
6	3/8
7	7/16
8	1/2

05

Corner
Radius "R_c"

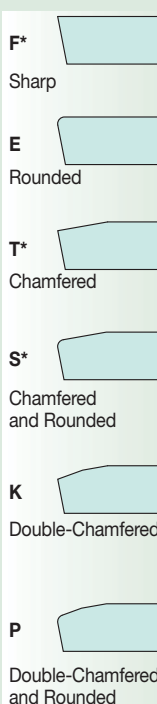
symbol	corner radius
inch	inch
X0	.0015
0	.004
.5	.008
1	1/64
2	1/32
3	3/64
4	1/16
5	5/64
6	3/32
7	7/64
8	1/8
—	round insert

Hand of Insert
(optional)



E

Cutting Edge
(optional)



*Also available
in wiper style.

T-Land Width
(optional)

symbol	inch
ANSI	size
04	.004
08	.008

T-Land Angle
(optional)

symbol	size
10	10°
15	15°
20	20°
25	25°
30	30°

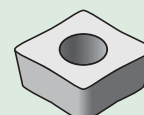
C

Tip
Style
(optional)

Chipbreaker
(optional)

FW = Finishing Wiper
MW = Medium Wiper

symbol	usage
C	full top
M	mini tip
MT	multi-tip
ST	single tip



“D” inch	± Tolerance on “D”				“D” inch	± Tolerance on “B”			
	Class M Tolerance			Class U Tolerance		Class M Tolerance			Class U Tolerance
	Shapes S, T, C, R, & W	Shape D	Shape V			Shapes S, T, & C	Shapes S, T, C, R, & W	Shape D	
	inch	inch	inch	inch		inch	inch	inch	inch
5/32	.002	—	—	—	5/32	.003	—	—	—
3/16	.002	—	—	.003	3/16	.003	—	—	.005
7/32	.002	.002	.002	.003	7/32	.003	.004	—	.005
1/4	.002	.002	.002	.003	1/4	.003	.004	—	.005
5/16	.002	.002	.002	.003	5/16	.003	.004	—	.005
3/8	.002	.002	.002	.003	3/8	.003	.004	.007	.005
7/16	.003	.003	.003	.005	7/16	.005	.006	—	—
1/2	.003	.003	.003	.005	1/2	.005	.006	.010	.008
9/16	.003	.003	.003	.005	9/16	.005	.006	—	—
5/8	.004	.004	.004	.007	5/8	.006	.007	—	.011
11/16	.004	.004	.004	.007	11/16	.006	.007	—	.011
3/4	.004	.004	.004	.007	3/4	.006	.007	—	.011
7/8	.005	—	—	.010	7/8	.006	—	—	.015
1	.005	—	—	.010	1	.007	—	—	.015
1 1/4	.006	—	—	.010	1 1/4	.008	—	—	.015

WBH25P for Enhanced Performance — Five Unique Features

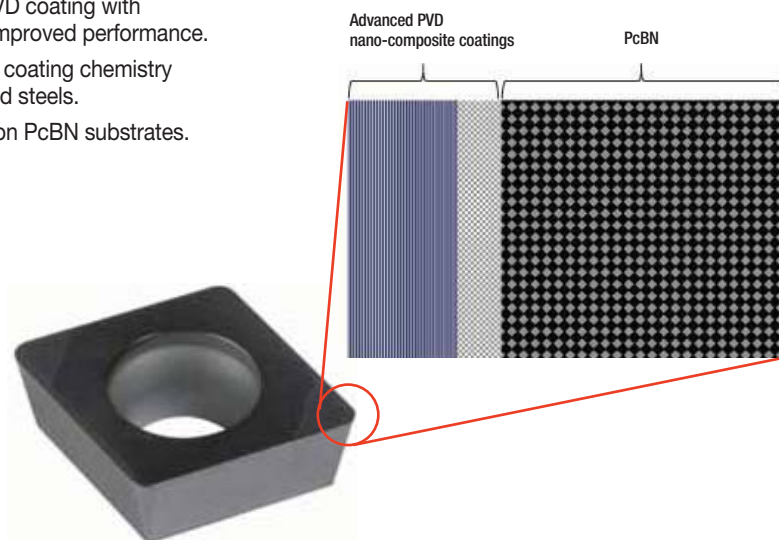
1 Newly developed substrate enables application in a wide variety of demanding situations.

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.

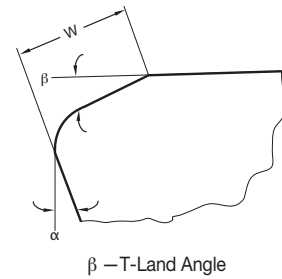
A critical performance factor is the edge preparation itself. The grind direction, surface roughness, hone sizes, and tolerances have great impact on performance and process reliability. WIDIA™ has performed significant research work and optimized edge preparation to improve your overall machining effectiveness.

4 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. WIDIA™ has developed three standard edge configurations, including wiper inserts.

- | | |
|--------------------------------------|--|
| • Light machining edge prep E. | E: Honed cutting edge |
| • Medium machining edge prep S01015. | S01015: $W \times \beta = .004" \times 15^\circ$
(0,10mm x 15°) |
| • Heavy machining edge prep S01025. | S01025: $W \times \beta = .004" \times 25^\circ$
(0,10mm x 25°) |

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



5 CB1 chipbreaker in positive and negative geometries, solving chipbreaking 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 as a custom solution product.



Insert without Chipbreaker



- Long chips.
- Bird-nest formation.

Insert with Chipbreaker



- Chips are broken.

Grade Numbering System — Ceramics

CW	2	0	15
Brand	Cutting Material Group		Application Range
CW = WIDIA™	2 = CM Mixed (black) ceramic 3 = CR Whisker reinforced ceramic 5 = CN Silicon nitride ceramic	0 = Stationary cutting edges (turning, parting, threading) 1 = First successor 2 = Semi-standard rotating cutting edges 3 = Semi-standard general applications 5 = Rotating cutting edges (milling, drilling, reaming)	05 = fine finishing 10 = finishing 15 = } medium to roughing 20 = } 25 = } 30 = } roughing 35 = } 40 = } 45 = } heaviest roughing 50 = }



Grade Numbering System — PcBN and PCD

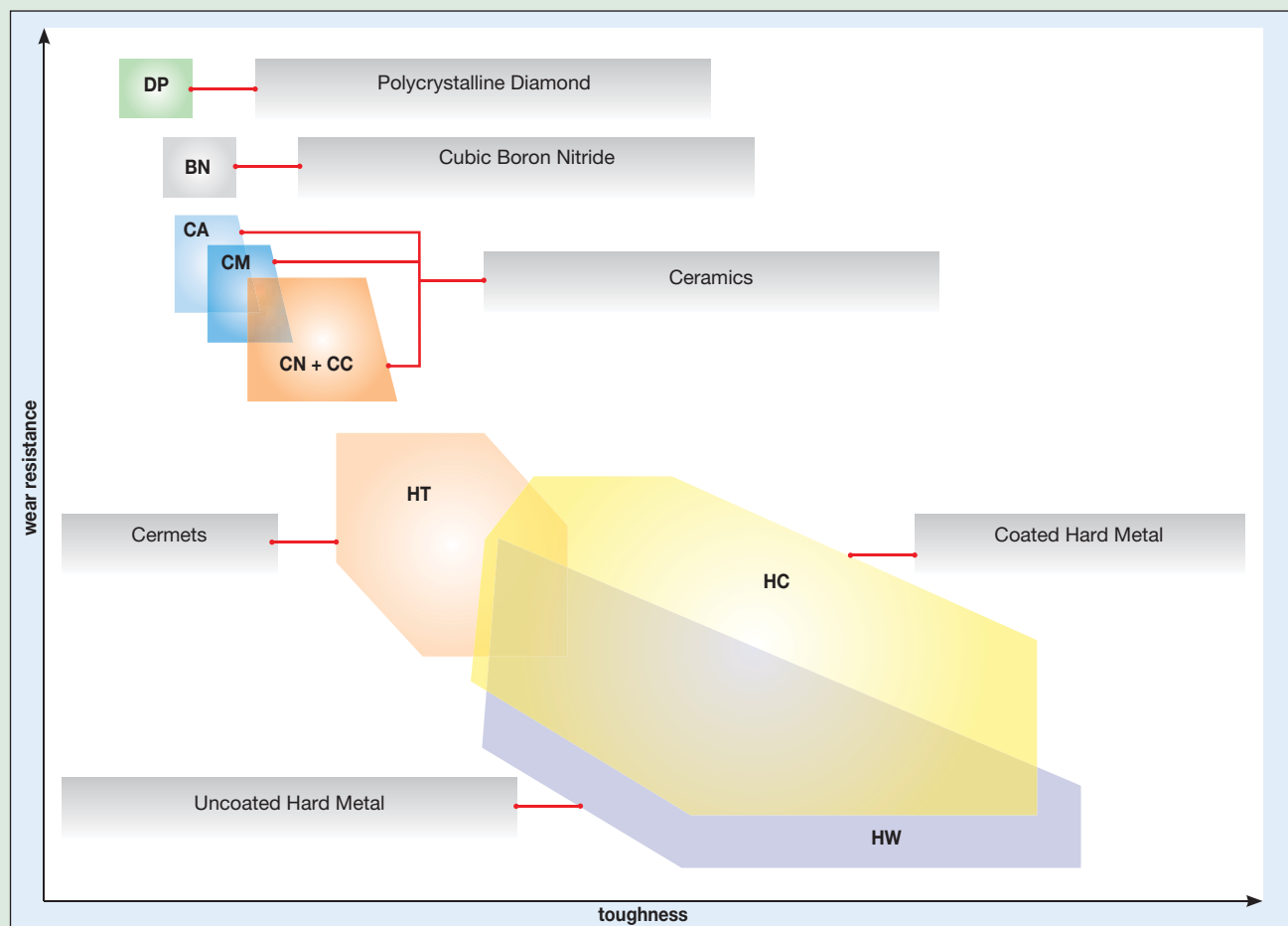
W	B	H	30	P
Brand	Cutting Material Group	Material Range	Application Range	Coating
WIDIA™	B = CBN D = PCD		05 = fine finishing 10 = finishing 15 = } medium to roughing 20 = } 25 = } 30 = } roughing 35 = } 40 = } 45 = } heaviest roughing 50 = }	U = Uncoated C = CVD Coated P = PVD Coated

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials
U	Universal Machining



The cutting tool materials are classified by the combination of their hardness and wear resistance characteristics.

The extended standard DIN ISO 513 also includes ceramic cutting materials and the superhard polycrystalline materials, boron nitride and diamond, resulting in additional identification symbols for these cutting material groups.



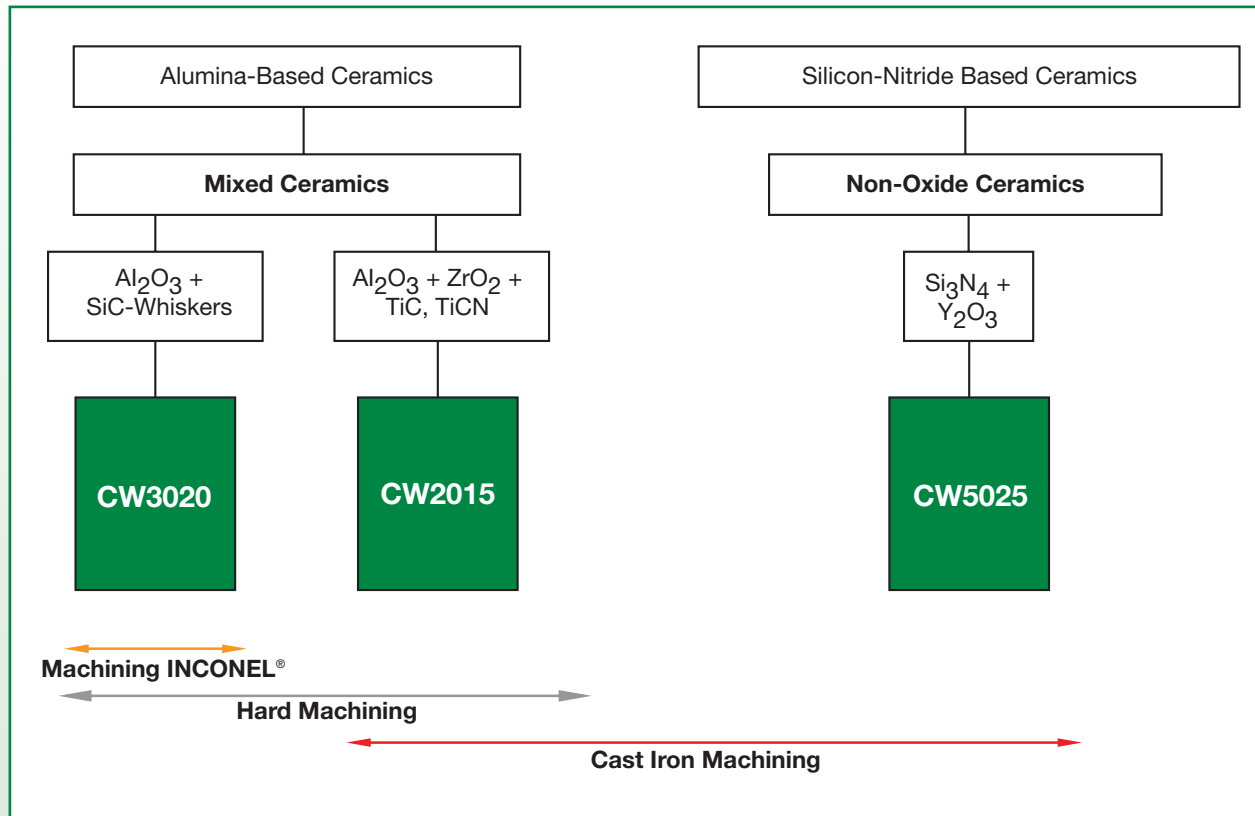
main group	sub-group (symbol)	feature
hard metal	HW	Uncoated WC-base hard metal
	HT	Uncoated TiC/TiN-base hard metal (cermets)
	HC	Coated hard metal
ceramics	CA	Al ₂ O ₃ -base oxide ceramics
	CM	Composite ceramics Al ₂ O ₃ + metal carbide
	CN	Si ₃ N ₄ -base nitride ceramics
	CC	Coated ceramics
cubic boron nitride	BL	Cubic boron nitride (CBN) with low CBN content
	BH	Cubic boron nitride (CBN) with high CBN content
diamond	DP	Polycrystalline diamond (PCD)

Ceramic Inserts for Hard Turning, Turning in Cast Iron Materials, and Turning in High-Temp Alloys



- Ceramics offer greater wear resistance and toughness.
- Ceramics can be used in high-speed, continuous, and lightly interrupted turning applications in cast iron materials.
- Ceramics can be used for high-speed applications in high-temp alloys.

Ceramic Turning Grades



CW2015™

- Alumina and titanium carbo-nitride.
- High hardness and wear resistance.
- TiCN increases strength and hardness.
- Black in color.

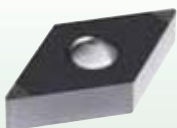
CW3020™

- Alumina + SiC whisker.
- High hardness and wear resistance.
- Whisker ceramic with elongated crystals and very high strength.
- Gray-green color.

CW5025™

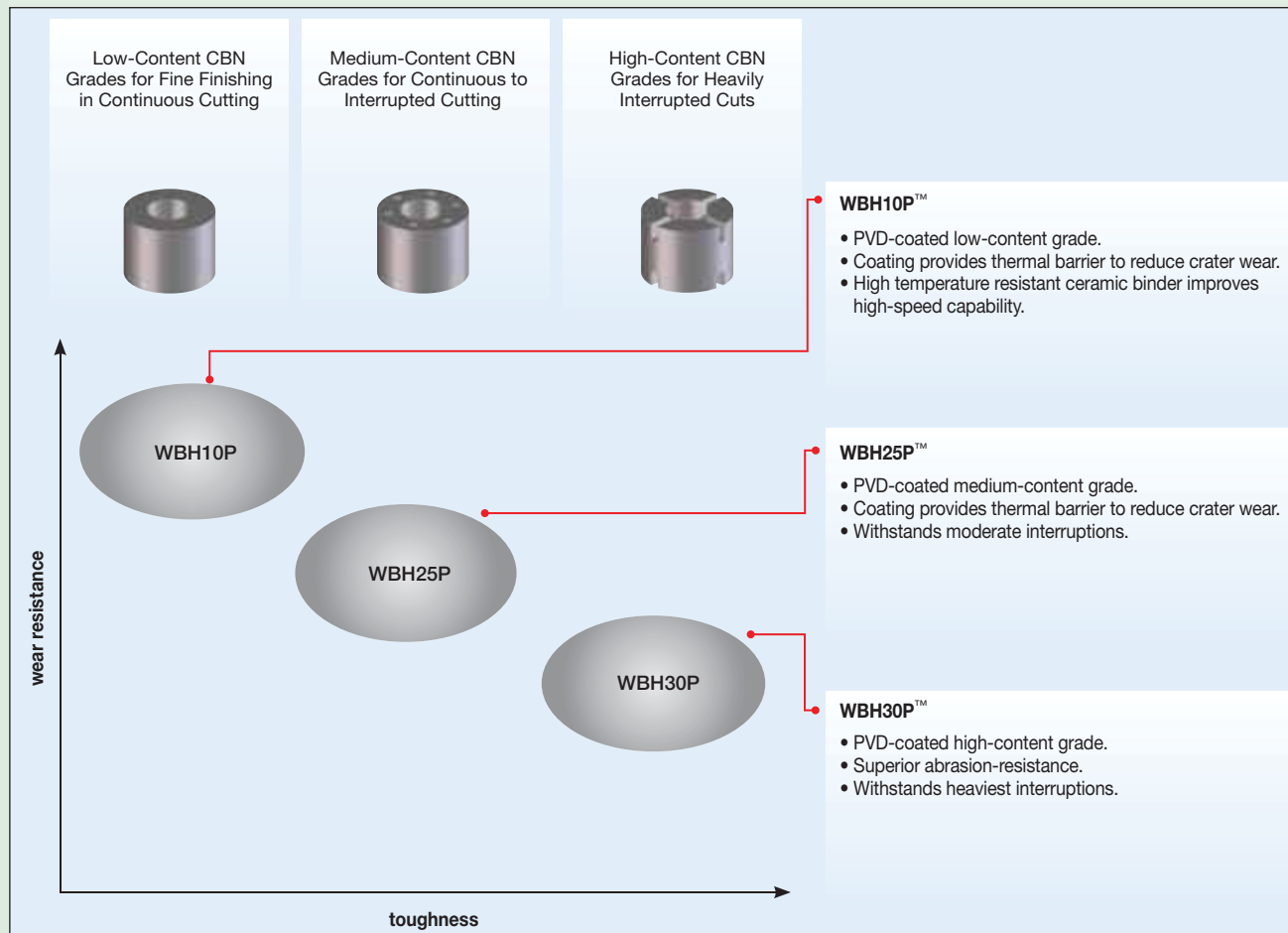
- Pure silicon-nitride composition.
- Used in high-speed turning applications.
- Designed for use in gray cast iron and lower tensile ductile irons.

PcBN Grades for Hard Turning, Powder Metal, and Gray Cast Iron Machining

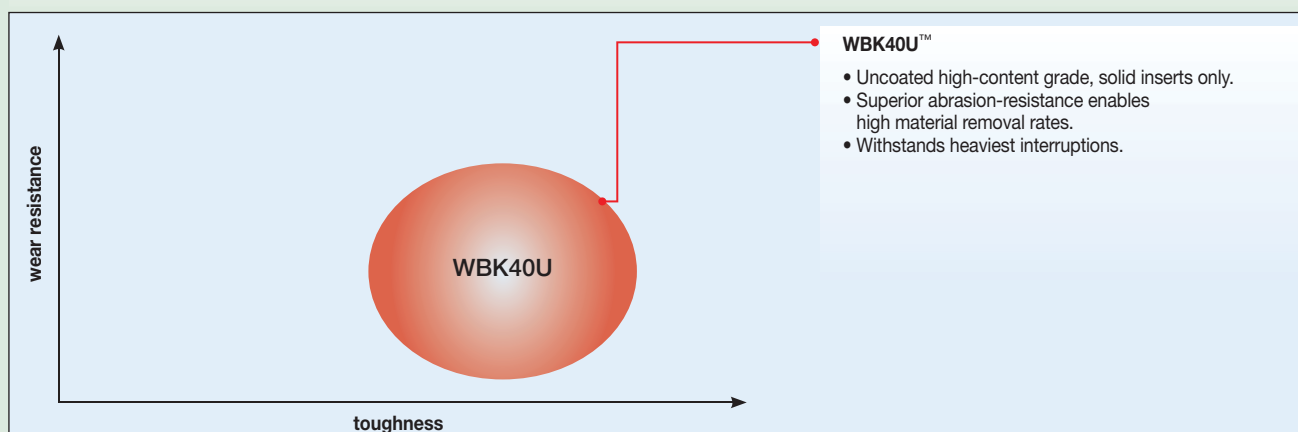


- PVD-coated grades available.
- Complete range of CBN grades for continuous to heavily interrupted turning.
- Industry-leading grades for gray cast iron machining.
- Full line of grades for hard turning.
- For best performance: solid, full-top, and tipped inserts are available.

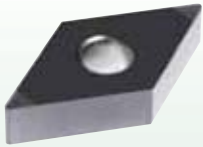
Hard Turning Grades



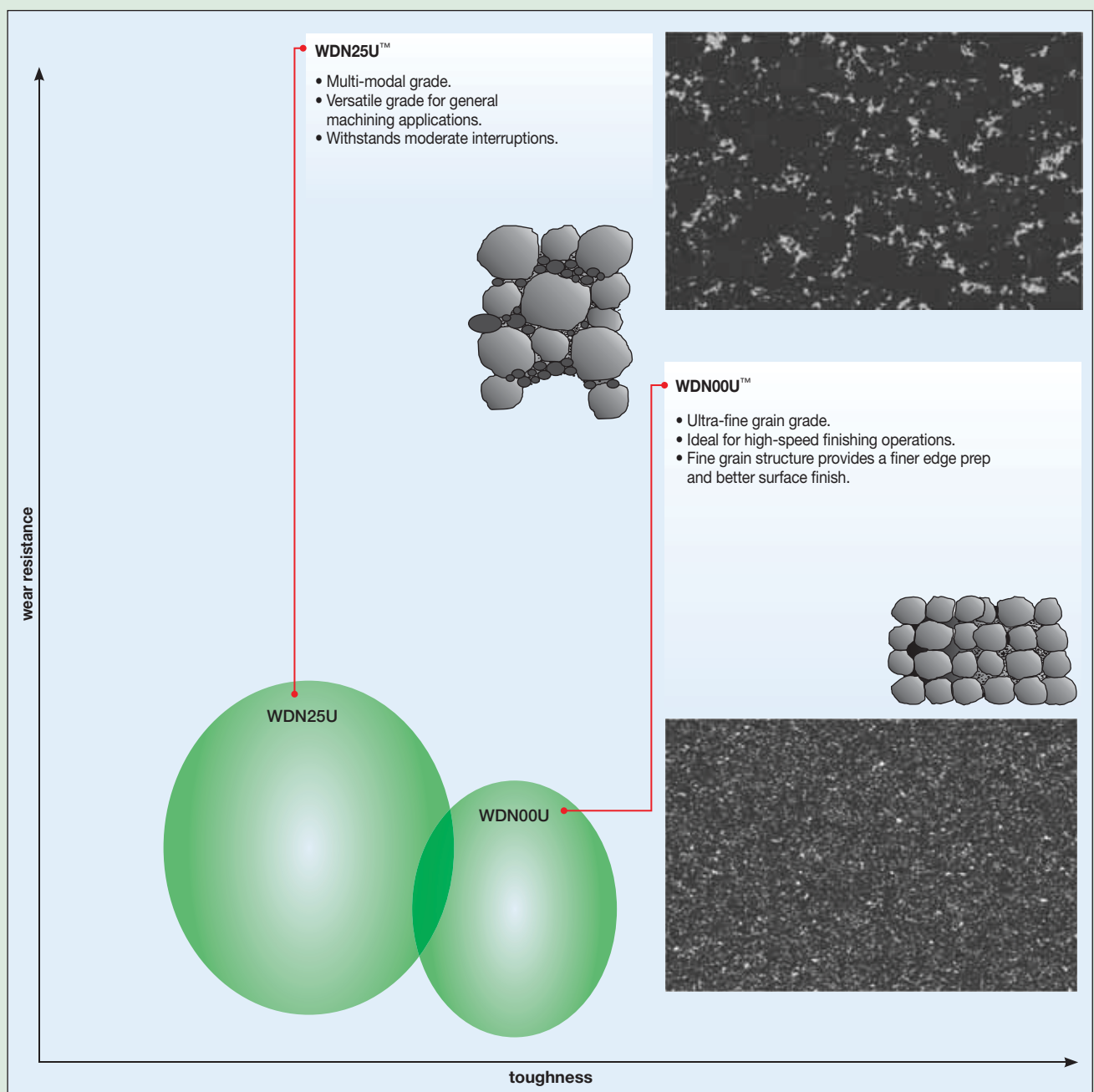
Gray Cast Iron Grade



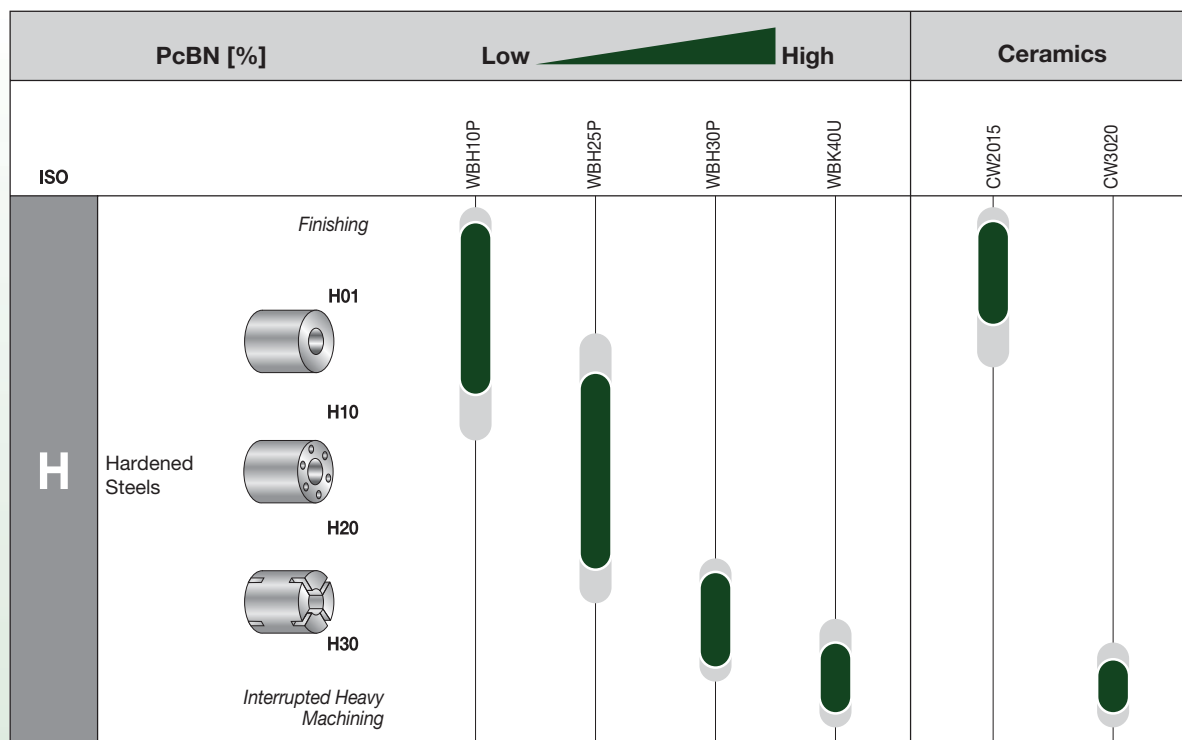
PCD Grades for Turning Non-Ferrous Materials



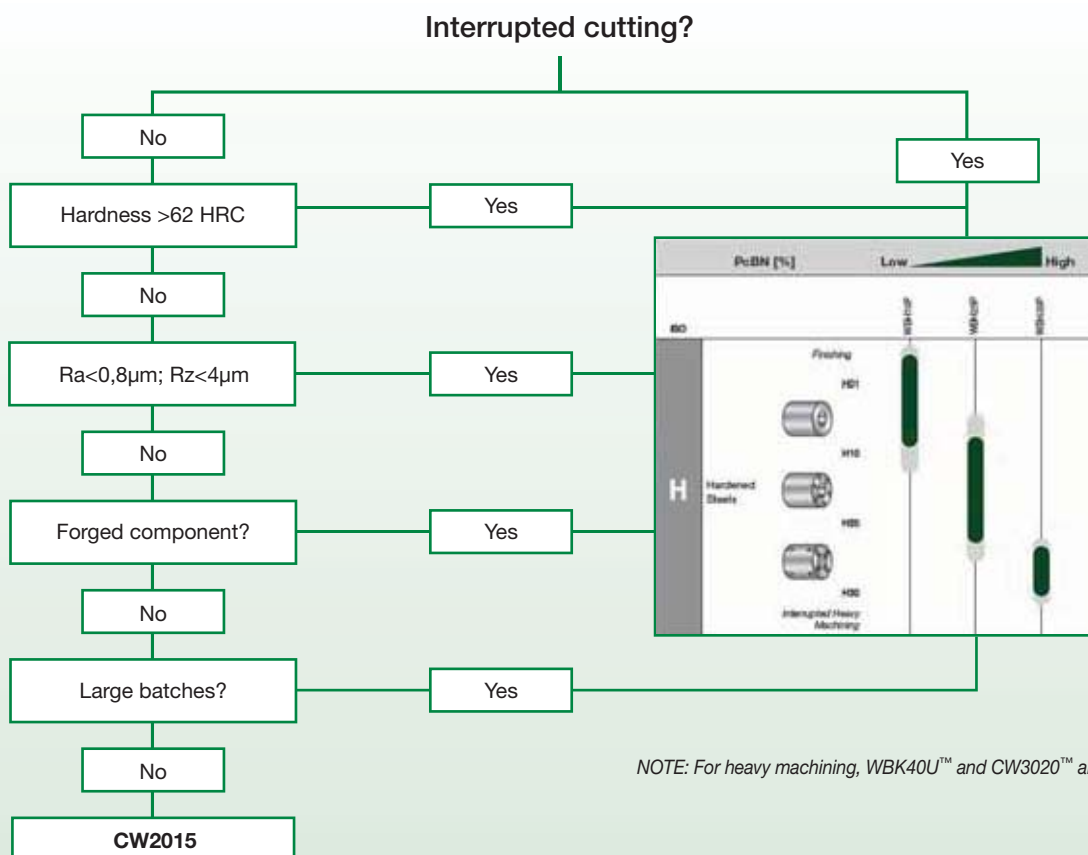
- Two PCD grades — WDN25U and WDN00U — cover a wide range of applications.
- New grades provide outstanding performance to increase productivity and cut manufacturing costs.
- High abrasion and chipping resistance.
- Used in machining aluminum alloys with low- and high-silicon content, copper alloys, ceramics, and plastics.
- Suitable for machining highly abrasive materials such as titanium and Metal Matrix Composites (MMC).



Advanced Materials for Hard Turning

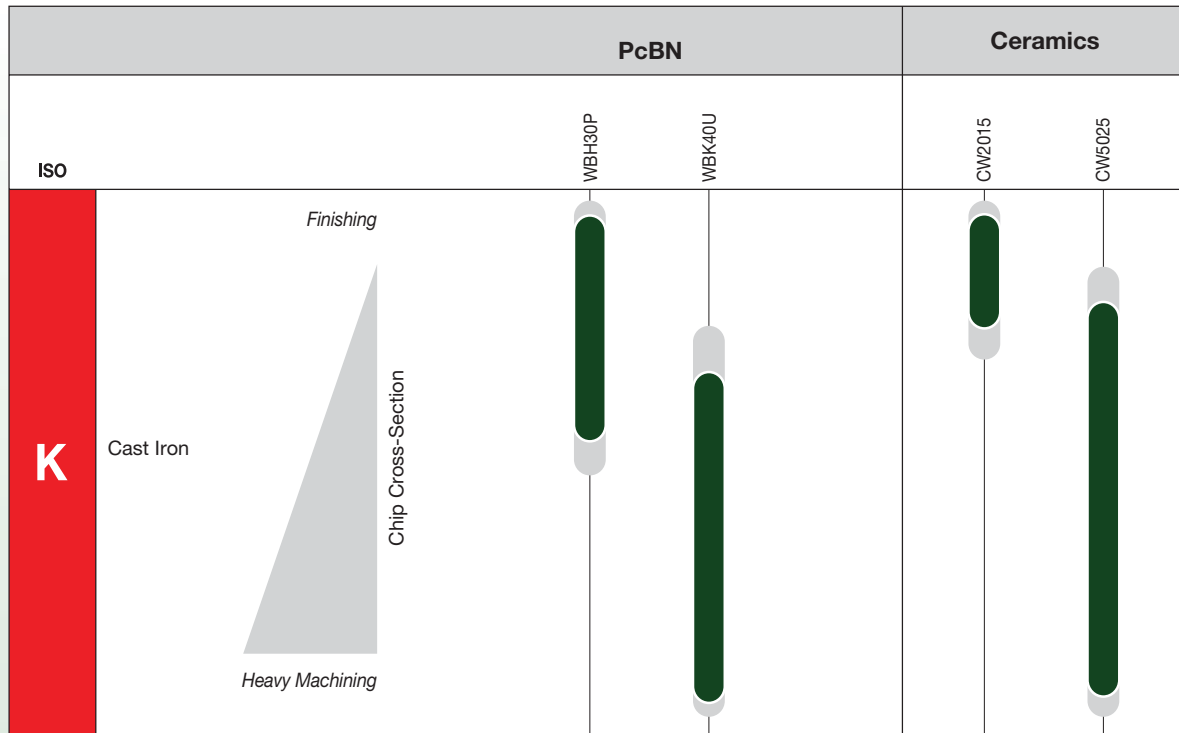


Hard Turning Grade Selection

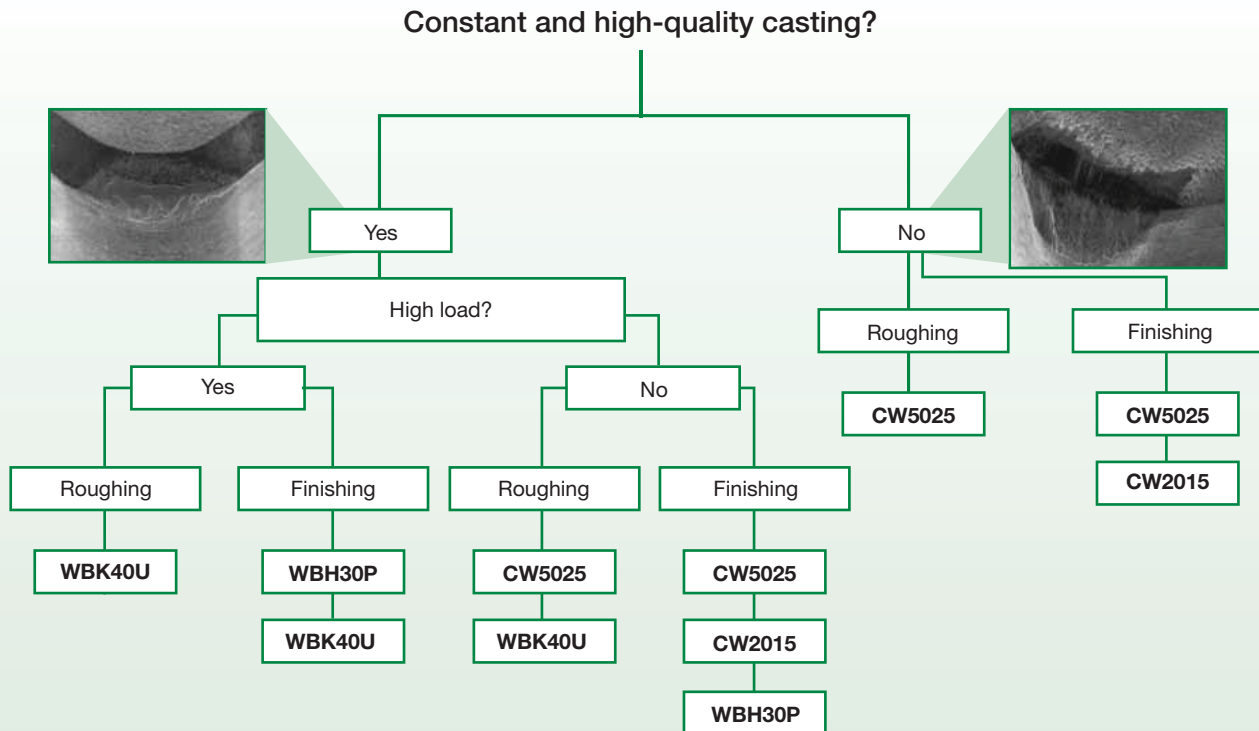


NOTE: For heavy machining, WBK40U™ and CW3020™ are the ideal choices.

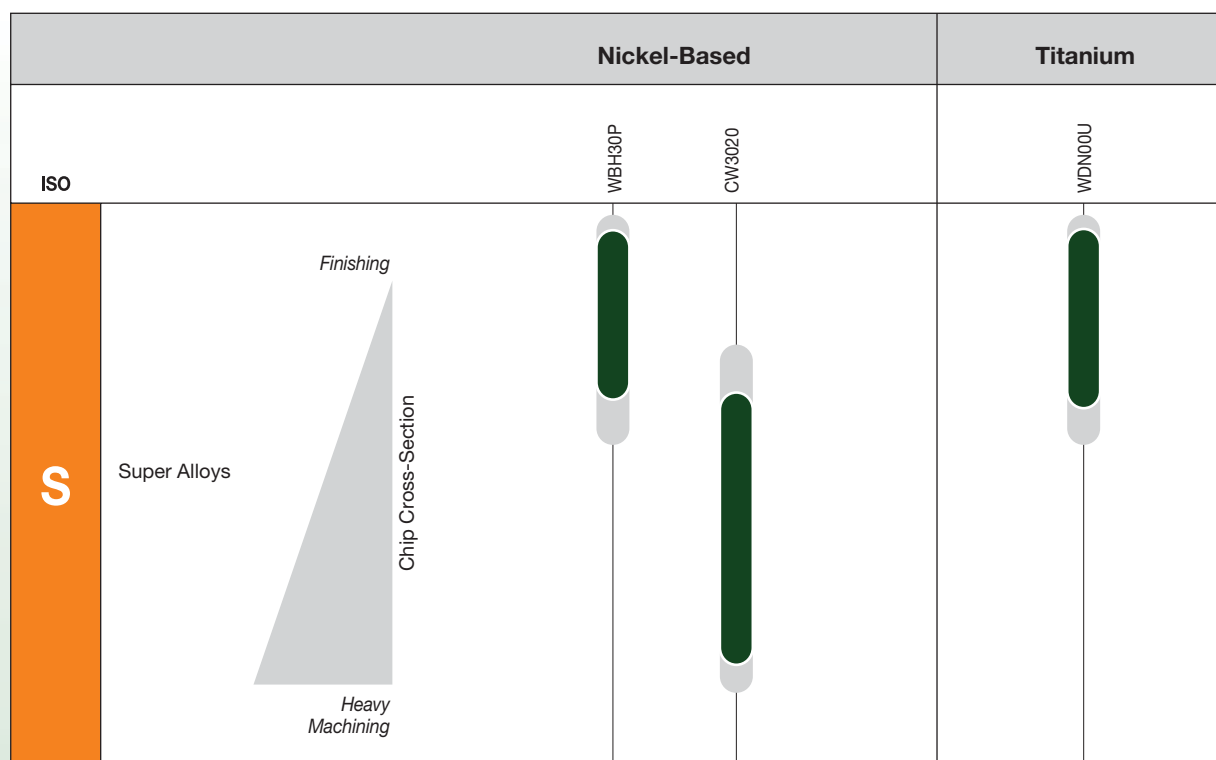
Advanced Materials for Cast Iron Machining



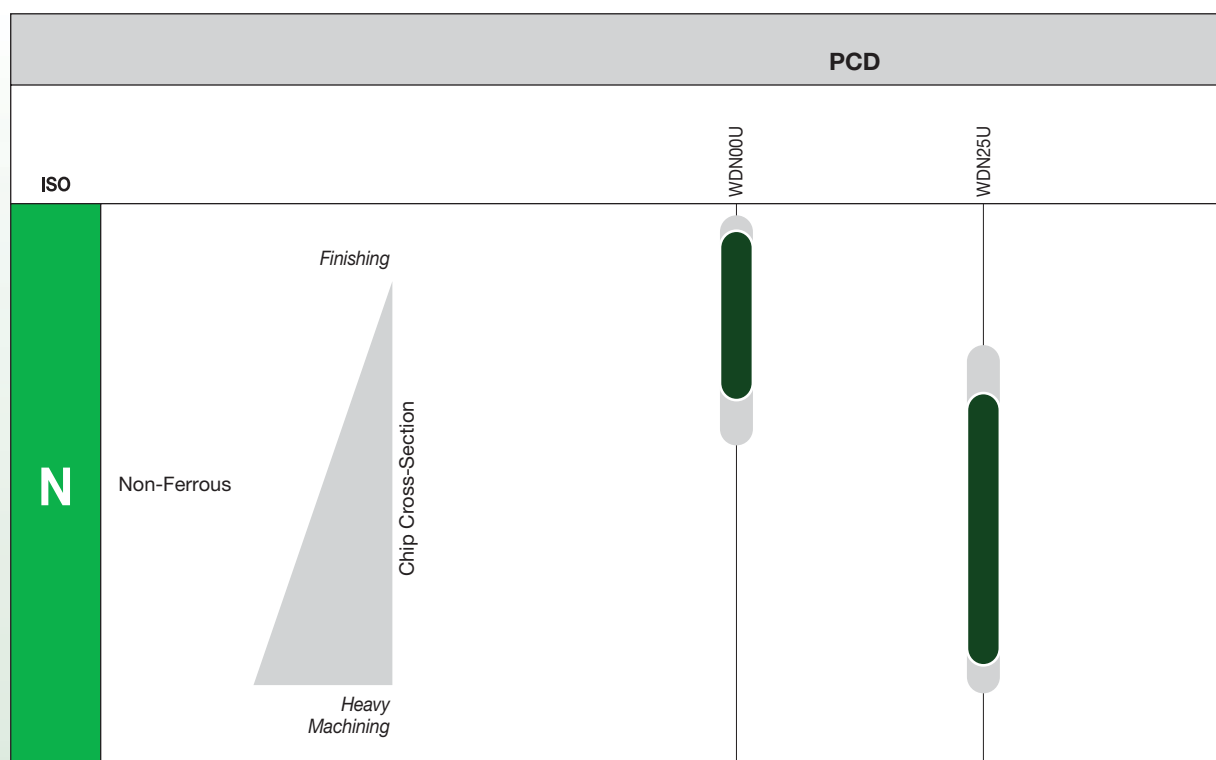
Cast Iron Machining Grade Selection

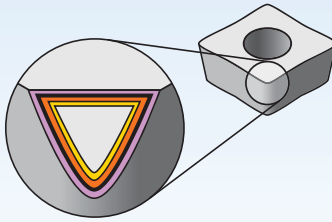


Advanced Materials for High-Temperature Machining



Advanced Materials for Non-Ferrous Machining

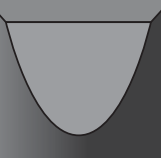
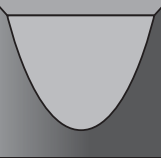
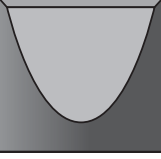
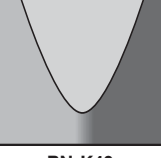
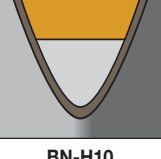


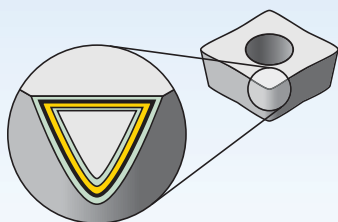


Reduce cycle times. High speed and feed capability. Long tool life. New multi-layer coating provides better wear resistance.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade	Coating	Grade Description		05	10	15	20	25	30	35	40	45
CW2015		Mixed (black) ceramic. Matrix Al_2O_3 and TiCN. Good toughness properties combined with good wear resistance. Semi-finishing and finishing. For hardened iron base materials and gray cast iron (finishing).										
			K									
	CM-H10		H									
CW5025		Silicon-nitride ceramic. Extraordinary toughness properties. Roughing, also in heavily interrupted cuts. Capable of high-performance turning. To be used with or without coolant. For gray cast iron.										
			K									
	CN-K15											
CW3020		Whisker ceramic with a matrix of Al_2O_3 + SiCw. The SiC whiskers embedded in the micro-structure give this ceramic excellent toughness for cutting high-temp alloys and cast materials with high Brinell hardness.										
			S									
			H									
	C4											
WBK40U		A high CBN content, solid CBN insert with multiple cutting edges. Applied in roughing to finishing of fully pearlitic gray cast iron, chilled irons, high-chrome alloyed steels, sintered powdered metals, and heavy cuts in hardened steels (>45 HRC). Use for finishing chilled and fully pearlitic cast iron. Solid inserts offer better security and shock-resistance than tipped inserts, while also enabling deeper depth-of-cut capability.										
			K									
	BN-K40		H									
WBH10P		A low content CBN grade with a PVD-TiAlN coating for added wear resistance. Designed for precision machining of hardened steels (>45 HRC); the harder the steel the better. PVD coating offers improved wear resistance and excellent surface finish capability. Effectively applied on bearing steels, hot and cold work tool steels, high-speed steels, die steels, case-hardened steels, carburized and nitrided irons, and some hard coatings.										
	BN-H10		H									

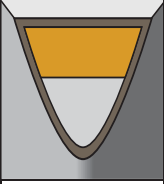
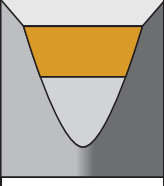
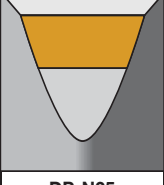


Reduce cycle times. High speed and feed capability. Long tool life. New multi-layer coating provides better wear resistance.

P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous
S	High-Temp Alloys
H	Hardened Materials

wear resistance ← → toughness

Grade

Coating	Grade Description		05	10	15	20	25	30	35	40	45
 WBH25P	A PVD-TiAlN coating over a low content, CBN tip brazed onto a carbide insert. Designed for roughing to finishing of hardened steels (>45 HRC). Use on bearing steel, hot and cold work tool steels, high-speed steels, die steels, case-hardened steels, carburized and nitrided irons, and some hard coatings.										
BN-H25		H									
 WBH30P	A PVD-TiAlN coating over a low content, CBN tip brazed onto a carbide insert. Designed for roughing to finishing in interrupted cuts on hardened steels (>45 HRC). Applied on gray cast iron, chilled irons, high-chrome alloyed steels, high-temp alloys, and sintered powdered metals.										
BN-H30		K									
		S									
		H									
 WDN00U*	An ultra-fine grained polycrystalline diamond (PCD) tip brazed onto a carbide substrate. Designed for general purpose turning of primarily non-ferrous materials. Applied over a wide range of continuous to interrupted cuts where superior surface finish is needed. Use on low to medium silicon content aluminum alloys, non-metallics, copper, brass, and zinc-based alloys. The ultra-fine grained diamond particle size enables superior surface finishes while ensuring the best mechanical shock resistance of any PCD cutting tool.										
DP-N10		N									
		S									
 WDN25U	A multi-modal PCD grade with a range of grain sizes brazed onto a carbide substrate. Engineered for extreme abrasion resistance and good edge strength for demanding applications. An ideal choice for high-silicon aluminum alloys, bi-metallic (AL/GC) materials, MMC, carbon-fiber reinforced plastics, and other abrasive non-metallic materials.										
DP-N25		N									

*Grade available as Custom Solution only.

Cutting Speed — vc m/min										
Material Group		CW2015			CW3020			CW5025		
		min	Start	max	min	Start	max	min	Start	max
ap [mm]		0,5		4,0	0,5		4,0	1,0		8,0
f [mm/rev]		0,2		0,4	0,1		5,0	0,2		0,6
P	0	–	–	–	–	–	–	–	–	–
	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–
	5	–	–	–	–	–	–	–	–	–
	6	–	–	–	–	–	–	–	–	–
M	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
K	1	250	475	725	–	–	–	250	760	1000
	2	300	550	800	–	–	–	275	365	490
	3	250	400	600	–	–	–	275	335	440
N	1	–	–	–	–	–	–	–	–	–
	2	–	–	–	–	–	–	–	–	–
	3	–	–	–	–	–	–	–	–	–
	4	–	–	–	–	–	–	–	–	–
	5	–	–	–	–	–	–	–	–	–
	6	–	–	–	–	–	–	–	–	–
	7	–	–	–	–	–	–	–	–	–
	8	–	–	–	–	–	–	–	–	–
S	1	–	–	–	170	200	375	–	–	–
	2	–	–	–	170	200	375	–	–	–
	3	–	–	–	190	250	375	–	–	–
	4	–	–	–	–	–	–	–	–	–
H	1	60	100	140	45	85	125	–	–	–
	2	60	100	140	45	85	125	–	–	–
	3	60	100	140	45	85	125	–	–	–
	4	60	100	140	45	85	125	–	–	–

Inserts

Speed and Feed Chart

Ceramics • Inch



Inserts

		Cutting Speed — vc SFM								
Material Group		CW2015			CW3020			CW5025		
		min	Start	max	min	Start	max	min	Start	max
ap [inch]		0.0197		0.1575	0.0197		0.0394	0.0394		0.315
f [inch]		0.0079		0.0157	0.0039		0.1969	0.0047		0.0236
P	0	—	—	—	—	—	—	—	—	—
	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—
M	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
K	1	815	1555	2375	—	—	—	800	2500	3300
	2	980	1800	2600	—	—	—	900	1200	1600
	3	820	1310	1965	—	—	—	900	1100	1450
N	1	—	—	—	—	—	—	—	—	—
	2	—	—	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—	—	—
	6	—	—	—	—	—	—	—	—	—
	7	—	—	—	—	—	—	—	—	—
	8	—	—	—	—	—	—	—	—	—
S	1	—	—	—	550	650	1200	—	—	—
	2	—	—	—	550	720	1200	—	—	—
	3	—	—	—	600	820	1200	—	—	—
	4	—	—	—	—	—	—	—	—	—
H	1	200	325	450	150	275	400	—	—	—
	2	200	325	450	150	275	400	—	—	—
	3	200	325	450	150	275	400	—	—	—
	4	200	325	450	150	275	400	—	—	—

		Cutting Speed — vc m/min																	
Material Group		WBH10P			WBH25P			WBH30P			WBK40U			WDN00U			WDN25U		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
ap [mm]		0,10		0,50	0,10		0,50	0,08		0,40	0,10		1,50	0,20		2,00	0,20		2,00
f [mm/rev]		0,06		0,25	0,05		0,20	0,05		0,20	0,08		0,20	0,10		0,30	0,10		0,25
P	0/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K	1	-	-	-	-	-	-	400	600	800	650	800	1200	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N	1	-	-	-	-	-	-	-	-	-	-	-	-	500	765	2500	500	765	2500
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	350	580	1000
	3	-	-	-	-	-	-	-	-	-	-	-	-	250	520	1000	250	520	1000
	4	-	-	-	-	-	-	-	-	-	-	-	-	250	400	750	250	400	750
	5	-	-	-	-	-	-	-	-	-	-	-	-	550	760	1000	550	760	1000
	6	-	-	-	-	-	-	-	-	-	-	-	-	400	460	850	400	365	750
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	120	160	200	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	120	160	200	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	120	160	200	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	100	180	320	-	-	-
H	1	80	170	260	80	160	230	60	120	220	60	120	220	-	-	-	-	-	-
	2	80	170	260	80	160	230	60	120	220	60	120	220	-	-	-	-	-	-
	3	80	170	260	80	160	230	60	120	220	60	120	220	-	-	-	-	-	-
	4	80	170	260	80	160	230	60	120	220	60	120	220	-	-	-	-	-	-

Inserts

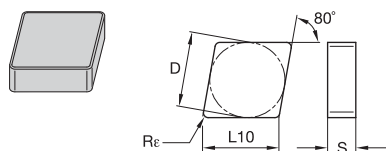
Speed and Feed Chart

PcBN and PCD • Inch



Inserts

Material Group		Cutting Speed — vc m/min																	
		WBH10P			WBH25P			WBH30P			WBK40U			WDN00U			WDN25U		
		min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max	min	Start	max
ap [inch]		0.004		0.020	0.004		0.020	0.003		0.016	0.008		0.080	0.008		0.079	0.008		0.079
f [inch]		0.002		0.010	0.002		0.008	0.002		0.008	0.003		0.010	0.004		0.010	0.004		0.010
P	0/1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
K	1	-	-	-	-	-	-	1310	1975	2625	2125	2625	3950	-	-	-	-	-	-
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N	1	-	-	-	-	-	-	-	-	-	-	-	-	1600	2500	8000	1600	2500	8000
	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	2000	3200
	3	-	-	-	-	-	-	-	-	-	-	-	-	800	1700	3200	800	1700	3200
	4	-	-	-	-	-	-	-	-	-	-	-	-	800	1300	2400	800	1300	2400
	5	-	-	-	-	-	-	-	-	-	-	-	-	1700	2500	3200	1700	2500	3200
	6	-	-	-	-	-	-	-	-	-	-	-	-	1000	1200	2400	1000	1500	2800
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	1	-	-	-	-	-	-	400	525	650	-	-	-	-	-	-	-	-	-
	2	-	-	-	-	-	-	400	525	650	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	400	525	650	-	-	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-	-	-	-	-	-	325	600	1050	-	-	-
H	1	275	550	850	275	525	755	200	400	725	200	400	725	-	-	-	-	-	-
	2	275	550	850	275	525	755	200	400	725	200	400	725	-	-	-	-	-	-
	3	275	550	850	275	525	755	200	400	725	200	400	725	-	-	-	-	-	-
	4	275	550	850	275	525	755	200	400	725	200	400	725	-	-	-	-	-	-



- first choice
- alternate choice

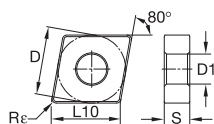
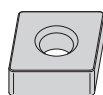
P				
M				
K	●		●	
N				
S			●	
H	●			

Inserts

CNGN/CNG

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
CNGN120404T02020	CNG431T0820	12,70	1/2	12,90	.508	4,76	3/16	0,4	.016	—	—	2952551	—	—
CNGN120408T01020	CNG432T0420	12,70	1/2	12,90	.508	4,76	3/16	0,8	.031	—	—	3869578	—	—
CNGN120408T02020	CNG432T0820	12,70	1/2	12,90	.508	4,76	3/16	0,8	.031	—	—	2952552	—	2952082
CNGN120412T01020	CNG433T0420	12,70	1/2	12,90	.508	4,76	3/16	1,2	.047	—	—	3869579	—	—
CNGN120412T02020	CNG433T0820	12,70	1/2	12,90	.508	4,76	3/16	1,2	.047	—	—	2952603	—	2952113
CNGN120416T01020	CNG434T0420	12,70	1/2	12,90	.508	4,76	3/16	1,6	.063	—	—	3869580	—	—
CNGN120416T02020	CNG434T0820	12,70	1/2	12,90	.508	4,76	3/16	1,6	.063	—	—	2952604	—	2952114
CNGN120712T01020	CNG453T0420	12,70	1/2	12,90	.508	7,94	5/16	1,2	.047	—	—	3869581	—	—
CNGN120712T02020	CNG453T0820	12,70	1/2	12,90	.508	7,94	5/16	1,2	.047	—	—	2952605	—	2952115
CNGN120716T01020	CNG454T0420	12,70	1/2	12,90	.508	7,94	5/16	1,6	.063	—	—	3869582	—	—



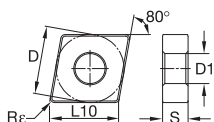
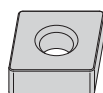


- first choice
○ alternate choice

P				
M				
K	●			●
N				
S			●	
H	●			

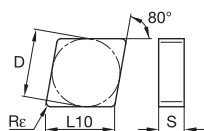
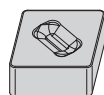
■ CNGA

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
CNGA120404T02020	CNGA431T0820	12,70	1/2	12,90	.508	4,76	3/16	0,4	.016	5,16	.203	2952526	2952527	2952159
CNGA120408T02020	CNGA432T0820	12,70	1/2	12,90	.508	4,76	3/16	0,8	.031	5,16	.203	2952527	2952528	2952161
CNGA120412T02020	CNGA433T0820	12,70	1/2	12,90	.508	4,76	3/16	1,2	.047	5,16	.203	2952528	2952173	2952161
CNGA120416T02020	CNGA434T0820	12,70	1/2	12,90	.508	4,76	3/16	1,6	.063	5,16	.203	2952173	2952174	2952161
CNGA160612T02020	CNGA543T0820	15,88	5/8	16,12	.635	6,35	1/4	1,2	.047	6,35	.250	2952529	2952175	2952176
CNGA160616T02020	CNGA544T0820	15,88	5/8	16,12	.635	6,35	1/4	1,6	.063	6,35	.250	2952175	2952176	2952176
CNGA190612T02020	CNGA643T0820	19,05	3/4	19,34	.762	6,35	1/4	1,2	.047	7,93	.313	2952530	2952176	2952176
CNGA190616T02020	CNGA644T0820	19,05	3/4	19,34	.762	6,35	1/4	1,6	.063	7,93	.313	2952531	2952176	2952176



■ CNGA-FW

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
CNGA120408T01020FW	CNGA432T0420FW	12,70	1/2	12,90	.508	4,76	3/16	0,8	.031	5,16	.203	2952158	2952160	2952162
CNGA120412T01020FW	CNGA433T0420FW	12,70	1/2	12,90	.508	4,76	3/16	1,2	.047	5,16	.203	2952160	2952162	2952162
CNGA120416T01020FW	CNGA434T0420FW	12,70	1/2	12,90	.508	4,76	3/16	1,6	.063	5,16	.203	2952162	2952162	2952162



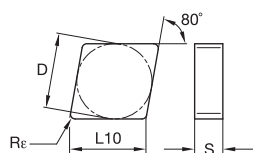
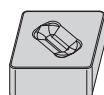
- first choice
- alternate choice

P			
M			
K	●		●
N			
S		●	
H	●		

Inserts

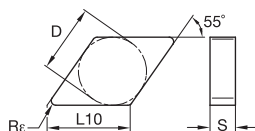
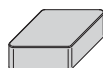
■ CNGX

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
CNGX120708T02020	CNGX452T0820	12,70	1/2	12,90	.508	7,94	5/16	0,8	.031	—	—	■	■	2952117
CNGX120712T02020	CNGX453T0820	12,70	1/2	12,90	.508	7,94	5/16	1,2	.047	—	—	■	■	2952119
CNGX160716T02020	CNGX554T0820	15,88	5/8	16,12	.635	7,94	5/16	1,6	.063	—	—	■	■	2952121


■ CNGX-FW

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
CNGX120712T01020FW	CNGX453T0420FW	12,70	1/2	12,90	.508	7,94	5/16	1,2	.047	—	—	■	■	2952118



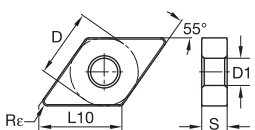
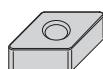


- first choice
○ alternate choice

P				
M				
K	●		●	
N				
S		●		
H	●			

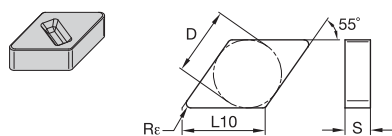
■ DNGN/DNG

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
DNGN150704T02020	DNG451T0820	12,70	1/2	15,50	.610	7,94	5/16	0,4	.016	—	—	2952607	3869743	—
DNGN150708T01020	DNG452T0420	12,70	1/2	15,50	.610	7,94	5/16	0,8	.031	—	—	—	—	—
DNGN150708T02020	DNG452T0820	12,70	1/2	15,50	.610	7,94	5/16	0,8	.031	—	—	2952608	—	—
DNGN150712T02020	DNG453T0820	12,70	1/2	15,50	.610	7,94	5/16	1,2	.047	—	—	2952609	—	—
DNGN150716T01020	DNG454T0420	12,70	1/2	15,50	.610	7,94	5/16	1,6	.063	—	—	—	3869745	—



■ DNGA

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
DNGA150404T02020	DNGA431T0820	12,70	1/2	15,50	.610	4,76	3/16	0,4	.016	5,16	.203	2952532	—	—
DNGA150408T02020	DNGA432T0820	12,70	1/2	15,50	.610	4,76	3/16	0,8	.031	5,16	.203	2952533	—	—
DNGA150412T02020	DNGA433T0820	12,70	1/2	15,50	.610	4,76	3/16	1,2	.047	5,16	.203	2952534	—	2952184
DNGA150604T02020	DNGA441T0820	12,70	1/2	15,50	.610	6,35	1/4	0,4	.016	5,16	.203	2952535	—	—
DNGA150608T02020	DNGA442T0820	12,70	1/2	15,50	.610	6,35	1/4	0,8	.031	5,16	.203	2952536	—	—
DNGA150612T02020	DNGA443T0820	12,70	1/2	15,50	.610	6,35	1/4	1,2	.047	5,16	.203	2952537	—	2952185



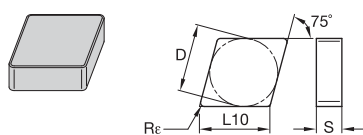
- first choice
- alternate choice

P				
M				
K	●			●
N				
S			●	
H	●			

Inserts

■ DNGX

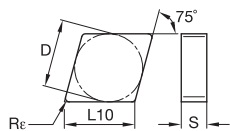
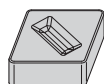
ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
DNGX120712T02020	DNGX120712T02020	10,00	.3937	12,21	.481	7,94	5/16	1,2	.047	—	—	●	●	2952124
DNGX120716T02020	DNGX120716T02020	10,00	.3937	12,21	.481	7,94	5/16	1,6	.063	—	—	●	●	2952125
DNGX150708T02020	DNGX452T0820	12,70	1/2	15,50	.610	7,94	5/16	0,8	.031	—	—	●	●	2952126
DNGX150712T02020	DNGX453T0820	12,70	1/2	15,50	.610	7,94	5/16	1,2	.047	—	—	●	●	2952127
DNGX150716T02020	DNGX454T0820	12,70	1/2	15,50	.610	7,94	5/16	1,6	.063	—	—	●	●	2952128



■ ENGN/ENG

ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
ENGN130704T02020	ENG451T0820	12,70	1/2	13,15	.518	7,94	5/16	0,4	.016	—	—	●	●	2952611
ENGN130708T02020	ENG452T0820	12,70	1/2	13,15	.518	7,94	5/16	0,8	.031	—	—	●	●	2952612
ENGN130712T02020	ENG453T0820	12,70	1/2	13,15	.518	7,94	5/16	1,2	.047	—	—	●	●	2952613
ENGN130716T02020	ENG454T0820	12,70	1/2	13,15	.518	7,94	5/16	1,6	.063	—	—	●	●	2952614





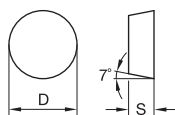
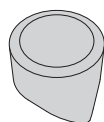
● first choice

○ alternate choice

P				
M				
K	●			●
N				
S		●		
H	●			

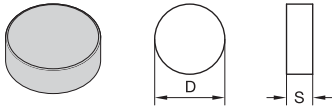
■ ENGX

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
ENGX130716T02020	ENGX454T0820	12,70	1/2	13,15	.518	7,94	5/16	1,6	.063	—	—	I	I	2952130



■ RCGX/RCGV

ISO catalog number	ANSI catalog number	D		S		CW2015	CW3020	CW5025
		mm	in	mm	in			
RCGX060400T01020	RCGV23T0420	6,35	1/4	4,76	3/16	I	3869746	I
RCGX090700T02020	RCGV35T0820	9,53	3/8	7,92	5/16	2952694	I	I
RCGX090700T07015	RCGV35T2815	9,53	3/8	7,92	5/16	2952695	I	I
RCGX090700T01020	RCGV35T0420	9,53	3/8	7,94	5/16	2952693	3869747	I
RCGX120700T01020	RCGV45T0420	12,70	1/2	7,92	5/16	I	3869748	I
RCGX120700T02020	RCGV45T0820	12,70	1/2	7,92	5/16	2952697	I	I
RCGX120700T20015	RCGV45T8015	12,70	1/2	7,92	5/16	2952698	I	I



● first choice
○ alternate choice

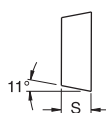
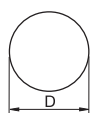
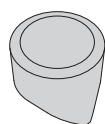
P				
M				
K	●		●	
N				
S		●		
H	●			

Inserts

■ RNGN/RNG

ISO catalog number	ANSI catalog number	D		S		CW2015	CW3020	CW5025
		mm	in	mm	in			
RNGN090300T01020	RNG32T0420	9,53	3/8	3,18	1/8	■	3869749	■
RNGN090400T02020	RNG33T0820	9,53	3/8	4,76	3/16	2952615	■	■
RNGN120400T01020	RNG43T0420	12,70	1/2	4,76	3/16	■	3869750	■
RNGN120400T02020	RNG43T0820	12,70	1/2	4,76	3/16	2952616	■	2952131
RNGN120700T01020	RNG45T0420	12,70	1/2	7,94	5/16	■	3869751	■
RNGN120700T02020	RNG45T0820	12,70	1/2	7,94	5/16	2952617	■	■
RNGN120700T10015	RNG45T4015	12,70	1/2	7,94	5/16	2952618	■	■
RNGN120700T20015	RNG45T8015	12,70	1/2	7,94	5/16	2952619	■	■
RNGN150700T02020	RNG55T0820	15,88	5/8	7,94	5/16	2952620	■	2952133





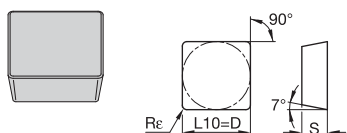
Inserts

- first choice
- alternate choice

P				
M				
K	●			●
N				
S			●	
H	●			

■ **RPGV**

ISO catalog number	ANSI catalog number	D		S		CW2015	CW3020	CW5025
		mm	in	mm	in			
RPGX060400T01020	RPGV23T0420	6,35	1/4	4,78	3/16	I	3869753	I
RPGX090700T01020	RPGV35T0420	9,53	3/8	7,92	5/16	I	3869754	I
RPGX120700T01020	RPGV45T0420	12,70	1/2	7,94	5/16	I	3869755	I



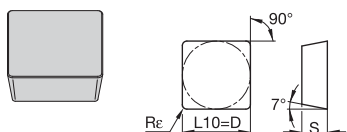
- first choice
- alternate choice

P			
M			
K	●		●
N			
S		●	
H	●		

Inserts

■ SCGN/SCG

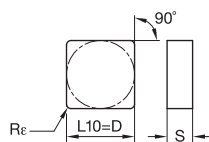
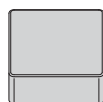
ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
SCGN090412T00520	SCG333T0220	9,53	3/8	9,53	.375	4,76	3/16	1,2	.047	—	—	I	I	2952147



■ SCUN/SCU

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
SCUN120412T00520	SCU433T0220	12,70	1/2	12,70	.500	4,76	3/16	1,2	.047	—	—	2952699	I	I





- first choice
○ alternate choice

P				
M				
K	●		●	
N				
S			●	
H	●			

■ SNGN/SNG

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
SNGN090308T02020	SNG322T0820	9,53	3/8	9,53	.375	3,18	1/8	0,8	.031	—	—	2952748	2952748	—
SNGN090412T00515	SNG333T0215	9,53	3/8	9,53	.375	4,76	3/16	1,2	.047	—	—	2952749	2952749	—
SNGN120408T00520	SNG432T0220	12,70	1/2	12,70	.500	4,76	3/16	0,8	.031	—	—	2952750	2952750	—
SNGN120408T02020	SNG432T0820	12,70	1/2	12,70	.500	4,76	3/16	0,8	.031	—	—	2952751	2952751	2952135
SNGN120412T01020	SNG433T0420	12,70	1/2	12,70	.500	4,76	3/16	1,2	.047	—	—	2952752	3869756	—
SNGN120412T02020	SNG433T0820	12,70	1/2	12,70	.500	4,76	3/16	1,2	.047	—	—	2952752	2952136	—
SNGN120416T01020	SNG434T0420	12,70	1/2	12,70	.500	4,76	3/16	1,6	.063	—	—	2952757	3869757	—
SNGN120416T02020	SNG434T0820	12,70	1/2	12,70	.500	4,76	3/16	1,6	.063	—	—	2952757	2952137	—
SNGN120704T02020	SNG451T0820	12,70	1/2	12,70	.500	7,94	5/16	0,4	.016	—	—	2952824	2952824	—
SNGN120708T02020	SNG452T0820	12,70	1/2	12,70	.500	7,94	5/16	0,8	.031	—	—	2952825	2952825	—
SNGN120712T00520	SNG453T0220	12,70	1/2	12,70	.500	7,94	5/16	1,2	.047	—	—	2953339	2953339	—
SNGN120712T01020	SNG453T0420	12,70	1/2	12,70	.500	7,94	5/16	1,2	.047	—	—	3869758	3869758	—

(continued)

(SNGN/SNG — continued)

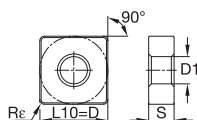
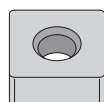
- first choice
- alternate choice

P				
M				
K	●		●	
N				
S			●	
H	●			

Inserts

ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
SNGN120712T02020	SNG453T0820	12,70	1/2	12,70	.500	7,94	5/16	1,2	.047	—	—	2952826	2952138	
SNGN120716T00520	SNG454T0220	12,70	1/2	12,70	.500	7,94	5/16	1,6	.063	—	—	2953340		
SNGN120716T01020	SNG454T0420	12,70	1/2	12,70	.500	7,94	5/16	1,6	.063	—	—		3869759	
SNGN120716T02020	SNG454T0820	12,70	1/2	12,70	.500	7,94	5/16	1,6	.063	—	—			2952139
SNGN120720T02020	SNG455T0820	12,70	1/2	12,70	.500	7,94	5/16	2,0	.078	—	—	2952828		
SNGN120720T10015	SNG455T4015	12,70	1/2	12,70	.500	7,94	5/16	2,0	.078	—	—	2952829		
SNGN150712T02020	SNG553T0820	15,88	5/8	15,88	.625	7,94	5/16	1,2	.047	—	—	2952830		
SNGN150716T02020	SNG554T0820	15,88	5/8	15,88	.625	7,94	5/16	1,6	.063	—	—	2952831		
SNGN190720K20015	SNG655K8015	19,05	3/4	19,05	.750	7,94	5/16	2,0	.079	—	—	2952832		
SNGN190720T20015	SNG655T8015	19,05	3/4	19,05	.750	7,94	5/16	2,0	.079	—	—	2952833		



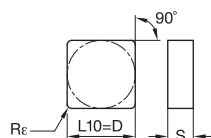
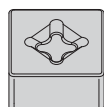


- first choice
○ alternate choice

P				
M				
K	●		●	
N				
S			●	
H	●			

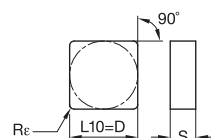
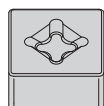
■ SNGA

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
SNGA120408T02020	SNGA432T0820	12,70	1/2	12,70	.500	4,76	3/16	0,8	.031	5,16	.203	2952538	2952187	
SNGA120412T02020	SNGA433T0820	12,70	1/2	12,70	.500	4,76	3/16	1,2	.047	5,16	.203	2952539	2952188	
SNGA120416T02020	SNGA434T0820	12,70	1/2	12,70	.500	4,76	3/16	1,6	.063	5,16	.203	2952540	2952189	
SNGA150612T02020	SNGA543T0820	15,88	5/8	15,88	.625	6,35	1/4	1,2	.047	6,35	.250		2952190	
SNGA150616T02020	SNGA544T0820	15,88	5/8	15,88	.625	6,35	1/4	1,6	.063	6,35	.250		2952191	



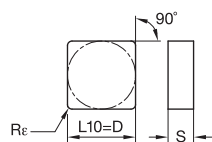
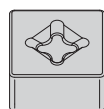
■ SNGX

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
SNGX120708T02020	SNGX452T0820	12,70	1/2	12,70	.500	7,94	5/16	0,8	.031	—	—			
SNGX150716T02020	SNGX554T0820	15,88	5/8	15,88	.625	7,94	5/16	1,6	.063	—	—			



■ SNGX-FW

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
SNGX120712T01020FW	SNGX453T0420FW	12,70	1/2	12,70	.500	7,94	5/16	1,2	.047	—	—			



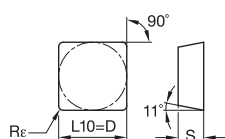
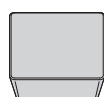
- first choice
- alternate choice

P				
M				
K	●		●	
N				
S			●	
H	●			

Inserts

■ SNMX

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
SNMX120712T02020	SNMX453T0820	12,70	1/2	12,70	.500	7,94	5/16	1,2	.047	—	—	■	■	2952069
SNMX120716T02020	SNMX454T0820	12,70	1/2	12,70	.500	7,94	5/16	1,6	.063	—	—	■	■	2952070
SNMX150716T02020	SNMX554T0820	15,88	5/8	15,88	.625	7,94	5/16	1,6	.063	—	—	■	■	2952071

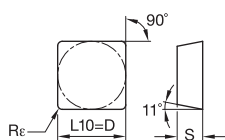


■ SPGN-T/SPG-T

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
SPGN090308T01020	SPG322T0420	9,53	3/8	9,53	.375	3,18	1/8	0,8	.031	—	—	■	■	2952700
SPGN120304T01020	SPG421T0420	12,70	1/2	12,70	.500	3,18	1/8	0,4	.016	—	—	■	■	2952701
SPGN120308T01020	SPG422T0420	12,70	1/2	12,70	.500	3,18	1/8	0,8	.031	—	—	■	■	2952702



Inserts

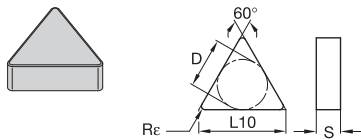


- first choice
○ alternate choice

P				
M				
K	●		●	
N				
S		●		
H	●			

■ SPUN-T/SPU-T

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
SPUN120304T00520	SPU421T0220	12,70	1/2	12,70	.500	3,18	1/8	0,4	.016	—	—	2952703	I	I
SPUN120308T00520	SPU422T0220	12,70	1/2	12,70	.500	3,18	1/8	0,8	.031	—	—	2952704	I	I
SPUN120312T00520	SPU423T0220	12,70	1/2	12,70	.500	3,18	1/8	1,2	.047	—	—	2952705	I	I



- first choice
- alternate choice

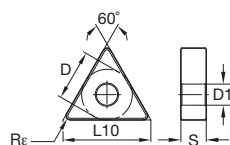
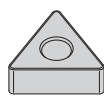
P				
M				
K	●		●	
N				
S			●	
H	●			

Inserts

TNGN/TNG

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
TNGN160404T02020	TNG331T0820	9,53	3/8	16,50	.650	4,76	3/16	0,4	.016	—	—	2952835	—	—
TNGN160408T01020	TNG332T0420	9,53	3/8	16,50	.650	4,76	3/16	0,8	.031	—	—	3869761	—	—
TNGN160408T02020	TNG332T0820	9,53	3/8	16,50	.650	4,76	3/16	0,8	.031	—	—	2952836	—	2952072
TNGN160412T02020	TNG333T0820	9,53	3/8	16,50	.650	4,76	3/16	1,2	.047	—	—	2952837	—	2952153
TNGN160416T02020	TNG334T0820	9,53	3/8	16,50	.650	4,76	3/16	1,6	.063	—	—	2952838	—	—
TNGN160708T02020	TNG352T0820	9,53	3/8	16,50	.650	7,94	5/16	0,8	.031	—	—	2952839	—	—
TNGN160712T02020	TNG353T0820	9,53	3/8	16,50	.650	7,94	5/16	1,2	.047	—	—	2952840	—	—
TNGN220408T02020	TNG432T0820	12,70	1/2	22,00	.866	4,76	3/16	0,8	.031	—	—	2952841	—	—
TNGN220416T02020	TNG434T0820	12,70	1/2	22,00	.866	4,76	3/16	1,6	.063	—	—	—	—	2952154





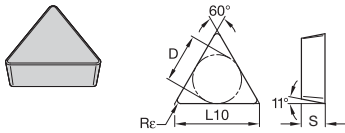
Inserts

- first choice
- alternate choice

P				
M				
K	●		●	
N				
S			●	
H	●			

■ **TNGA**

ISO catalog number	ANSI catalog number	D		L10		S		Re		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
TNGA160408T02020	TNGA332T0820	9,53	3/8	16,50	.650	4,76	3/16	0,8	.031	3,81	.150	2952541	2952195	
TNGA160412T02020	TNGA333T0820	9,53	3/8	16,50	.650	4,76	3/16	1,2	.047	3,81	.150	2952542	2952196	
TNGA160416T02020	TNGA334T0820	9,53	3/8	16,50	.650	4,76	3/16	1,6	.063	3,81	.150	2952543	2952197	
TNGA220408T02020	TNGA432T0820	12,70	1/2	22,00	.866	4,76	3/16	0,8	.031	5,16	.203	2952544		



- first choice
- alternate choice

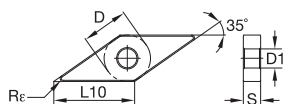
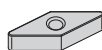
P				
M				
K	●		●	
N				
S		●		
H	●			

Inserts

TPG

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
TPGN110304T01020	TPG221T0420	6,35	1/4	11,00	.433	3,18	1/8	0,4	.016	—	—	2952706	2952706	2952706
TPGN110308T01020	TPG222T0420	6,35	1/4	11,00	.433	3,18	1/8	0,8	.031	—	—	2952707	2952707	2952707
TPGN110312T01020	TPG223T0420	6,35	1/4	11,00	.433	3,18	1/8	1,2	.047	—	—	2952708	2952708	2952708
TPGN160304T00520	TPG321T0220	9,53	3/8	16,50	.650	3,18	1/8	0,4	.016	—	—	2952709	2952709	2952709
TPGN160304T01020	TPG321T0420	9,53	3/8	16,50	.650	3,18	1/8	0,4	.016	—	—	2952710	2952710	2952710
TPGN160308T00520	TPG322T0220	9,53	3/8	16,50	.650	3,18	1/8	0,8	.031	—	—	2952711	2952711	2952711
TPGN160308T01020	TPG322T0420	9,53	3/8	16,50	.650	3,18	1/8	0,8	.031	—	—	2952712	2952712	2952712
TPGN160308T02020	TPG322T0820	9,53	3/8	16,50	.650	3,18	1/8	0,8	.031	—	—	2952155	2952155	2952155
TPGN160312T01020	TPG323T0420	9,53	3/8	16,50	.650	3,18	1/8	1,2	.047	—	—	2952713	2952713	2952713
TPGN160312T02020	TPG323T0820	9,53	3/8	16,50	.650	3,18	1/8	1,2	.047	—	—	2952156	2952156	2952156



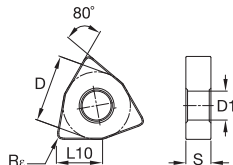
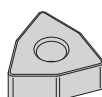


- first choice
- alternate choice

P				
M				
K	●			●
N				
S			●	
H	●			

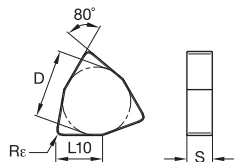
■ VNGA

ISO catalog number	ANSI catalog number	D		L10		S		R _ε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
VNGA160404T02020	VNGA331T0820	9,53	3/8	16,61	.654	4,76	3/16	0,4	.016	3,81	.150	2952545	2952545	2952545
VNGA160408T02020	VNGA332T0820	9,53	3/8	16,61	.654	4,76	3/16	0,8	.031	3,81	.150	2952546	2952546	2952198
VNGA160412T02020	VNGA333T0820	9,53	3/8	16,61	.654	4,76	3/16	1,2	.047	3,81	.150	2952547	2952547	2952547
VNGA220408T02020	VNGA432T0820	12,70	1/2	22,14	.872	4,76	3/16	0,8	.031	5,16	.203	2952548	2952548	2952548



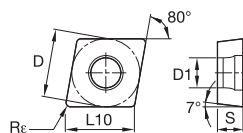
■ WNGA

ISO catalog number	ANSI catalog number	D		L10		S		R _ε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
WNGA080408T02020	WNGA432T0820	12,70	1/2	8,69	.342	4,76	3/16	0,8	.031	5,16	.203	2952199	2952199	2952199
WNGA080412T02020	WNGA433T0820	12,70	1/2	8,69	.342	4,76	3/16	1,2	.047	5,16	.203	2952200	2952200	2952200
WNGA080416T02020	WNGA434T0820	12,70	1/2	8,69	.342	4,76	3/16	1,6	.063	5,16	.203	2952201	2952201	2952201



■ WNGX

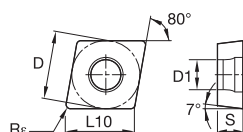
ISO catalog number	ANSI catalog number	D		L10		S		R _ε		D1		CW2015	CW3020	CW5025
		mm	in	mm	in	mm	in	mm	in	mm	in			
WNGX080712T02020	WNGX453T0820	12,70	1/2	8,69	.342	7,94	5/16	1,2	.047	—	—	2952157	2952157	2952157



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

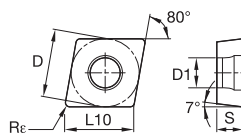
Inserts

ISO catalog number	ANSI catalog number											WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U						
		D		L10		S		R _e		D1													
		mm	in	mm	in	mm	in	mm	in	mm	in												
CCGW060202EC	CCGW21505EC	6,35	1/4	6,45	.254	2,38	3/32	0,2	.008	2,80	.110	3883505	3883561										
CCGW060202S01015C	CCGW21505S0415C	6,35	1/4	6,45	.254	2,38	3/32	0,2	.008	2,80	.110												
CCGW060204S01015C	CCGW2151S0415C	6,35	1/4	6,45	.254	2,38	3/32	0,4	.016	2,80	.110	3883506	3883573										
CCGW09T304S01015C	CCGW3251S0415C	9,53	3/8	9,67	.381	3,97	5/32	0,4	.016	4,40	.173		3883575										
CCGW09T308S01015C	CCGW3252S0415C	9,53	3/8	9,67	.381	3,97	5/32	0,8	.031	4,40	.173		3883577										



ISO catalog number	ANSI catalog number											WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U						
		D		L10		S		R _e		D1													
		mm	in	mm	in	mm	in	mm	in	mm	in												
CCGW060204FST	CCGW2151FST	6,35	1/4	6,45	.254	2,38	3/32	0,4	.016	2,80	.110	■	■	■	■	5885722	3808746						
CCGW09T304FST	CCGW3251FST	9,53	3/8	9,67	.381	3,97	5/32	0,4	.016	4,40	.173	■	■	■	■	5885723	3808749						
CCGW09T308FST	CCGW3252FST	9,53	3/8	9,67	.381	3,97	5/32	0,8	.031	4,40	.173	■	■	■	■	5885724	3808750						





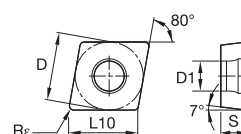
- first choice

- alternate choice

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

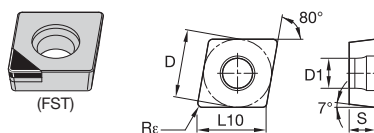
■ CCGW-FWC

ISO catalog number	ANSI catalog number											WBH10P	WBH25P	WBH30P	WBK40U	WDN00U
		D		L10		S		Rε		D1						
		mm	in	mm	in	mm	in	mm	in	mm	in					
CCGW060202EFWC	CCGW21505EFWC	6,35	1/4	6,45	.254	2,38	3/32	0,2	.008	2,80	.110	■	3883560	■	■	■
CCGW060204EFWC	CCGW2151EFWC	6,35	1/4	6,45	.254	2,38	3/32	0,4	.016	2,80	.110	■	3883562	■	■	■
CCGW09T304EFWC	CCGW3251EFWC	9,53	3/8	9,67	.381	3,97	5/32	0,4	.016	4,40	.173	■	3883574	■	■	■
CCGW09T308EFWC	CCGW3252EFWC	9,53	3/8	9,67	.381	3,97	5/32	0,8	.031	4,40	.173	■	3883576	■	■	■



CCGW-MT

ISO catalog number	ANSI catalog number											WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN02U
		D		L10		S		R _e		D1							
		mm	in	mm	in	mm	in	mm	in	mm	in						
CCGW09T304S01015MT	CCGW3251S0415MT	9,52	3/8	9,67	.381	3,99	.157	0,4	.016	4,40	.173	3883507	1	1	1	1	
CCGW09T308S01015MT	CCGW3252S0415MT	9,52	3/8	9,67	.381	3,99	.157	0,8	.031	4,40	.173	3883508	1	6018004		1	



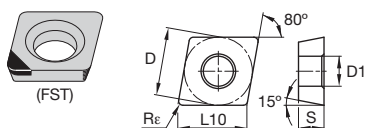
● first choice
○ alternate choice

P						
M						
K						
N						
S						
H						

Inserts

CCMW-FST

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CCMW060204FST	CCMW2151FST	6,35	1/4	6,45	.254	2,38	3/32	0,4	.016	2,80	.110	•	•	•	•	•	•
CCMW060208FST	CCMW2152FST	6,35	1/4	6,45	.254	2,38	3/32	0,8	.032	2,80	.110	•	•	•	•	•	•
CCMW09T304FST	CCMW3251FST	9,53	3/8	9,67	.381	3,97	5/32	0,4	.016	4,40	.173	•	•	•	•	•	•
CCMW09T308FST	CCMW3252FST	9,53	3/8	9,67	.381	3,97	5/32	0,8	.031	4,40	.173	•	•	•	•	•	•



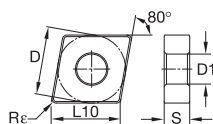
CDHB-FST

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CDHBS4T002FST	CDHB120601FST	3,97	5/32	4,03	.159	1,02	.040	0,1	.002	2,13	.084	•	•	•	•	•	•
CDHBS4T004FST	CDHB120605FST	3,97	.1562	4,03	.159	1,02	.040	0,2	.007	2,13	.084	•	•	•	•	•	•





(EMT)



- first choice

- alternate choice

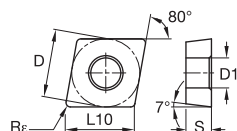
P	Blue							
M	Yellow							
K	Red			•	•			
N	Green						•	•
S	Orange			•		•		
H	Grey	•	•	•	•			

■ CNGA-EMT

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN00U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CNGA120408EMT	CNGA432EMT	12,70	1/2	12,90	.508	4,76	3/16	0,8	.031	5,16	.203	1	3883363	1	1	1	
CNGA120412EMT	CNGA433EMT	12,70	1/2	12,90	.508	4,76	3/16	1,2	.047	5,16	.203	1	3883364	1	1	1	

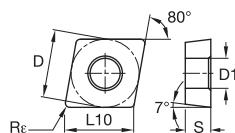


(FST)



■ CNGA-FST

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	
		mm	in	mm	in	mm	in	mm	in	mm	in						
CNGA120404FST	CNGA431FST	12,70	1/2	12,90	.508	4,76	3/16	0,4	.016	5,16	.203					5885725	
CNGA120408FST	CNGA432FST	12,70	1/2	12,90	.508	4,76	3/16	0,8	.031	5,16	.203					5885726	



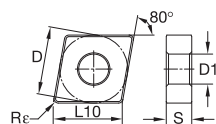
- first choice
- alternate choice

P						
M						
K						
N						
S						
H						

Inserts

■ CNGA-FW/MW MT

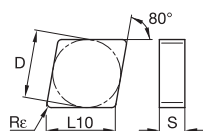
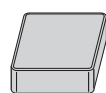
ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CNGA120404EFWMT	CNGA431EFWMT	12,70	1/2	12,90	.508	4,76	3/16	0,4	.016	5,15	.203	●	●	●	●	●	●
CNGA120408EFWMT	CNGA432EFWMT	12,70	1/2	12,90	.508	4,76	3/16	0,8	.031	5,16	.203	●	●	●	●	●	●
CNGA120408S01025FWMT	CNGA432S0425FWMT	12,70	1/2	12,90	.508	4,78	.1883	0,8	.031	5,16	.203	●	●	●	●	●	●



■ CNGA-MT

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CNGA120404S01025MT	CNGA431S0425MT	12,70	1/2	12,90	.508	4,78	.1883	0,4	.016	5,16	.203	●	●	●	●	●	●
CNGA120408S01025MT	CNGA432S0425MT	12,70	1/2	12,90	.508	4,78	.1883	0,8	.031	5,16	.203	●	●	●	●	●	●
CNGA120412S01020MT	CNGA433S0420MT	12,70	1/2	12,90	.508	4,78	.1883	1,2	.047	5,16	.203	●	●	●	●	●	●
CNGA120412S01025MT	CNGA433S0425MT	12,70	1/2	12,90	.508	4,78	.1883	1,2	.047	5,16	.203	●	●	●	●	●	●



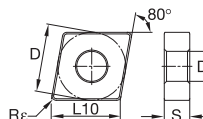
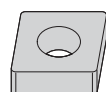


- first choice
○ alternate choice

P						
M						
K						
N						
S						
H						

■ CNMN/CNM

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CNMN090312S02020	CNM323S0820	9,53	3/8	9,67	.381	3,18	1/8	1,2	.047	—	—	■	■	■	3883278	■	■
CNMN120408S02020	CNM432S0820	12,70	1/2	12,90	.508	4,76	3/16	0,8	.031	—	—	■	■	■	3883279	■	■
CNMN120412S02020	CNM433S0820	12,70	1/2	12,90	.508	4,76	3/16	1,2	.047	—	—	■	■	■	3883280	■	■

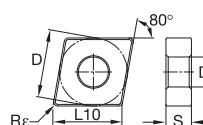


■ CNMA

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CNMA120408S02020	CNMA432S0820	12,70	1/2	12,90	.508	4,76	3/16	0,8	.031	5,16	.203	■	■	■	3883281	■	■
CNMA120412S02020	CNMA433S0820	12,70	1/2	12,90	.508	4,76	3/16	1,2	.047	5,16	.203	■	■	■	3883282	■	■

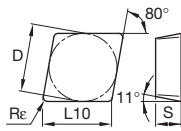
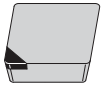


(FST)



■ CNMS-FST

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CNMS120408FST	CNMS432FST	12,70	1/2	12,90	.508	4,76	3/16	0,8	.031	5,16	.203	■	■	■	■	■	3883279



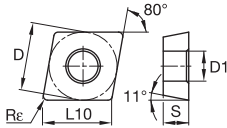
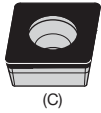
- first choice
- alternate choice

P											
M											
K											
N											
S											
H											

Inserts

■ CPGN/CPG

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CPGN120304F	CPG421F	12,70	1/2	12,90	.508	3,18	1/8	0,4	.016	—	—	●	●	●	●	●	●
CPGN120308F	CPG422F	12,70	1/2	12,90	.508	3,18	1/8	0,8	.031	—	—	●	●	●	●	●	●



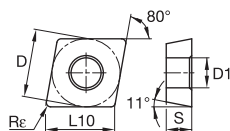
■ CPGW-C

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CPGW060202EC	CPGW21505EC	6,35	1/4	6,45	.254	2,38	3/32	0,2	.008	2,80	.110	●	●	●	●	●	●
CPGW060202S01015C	CPGW21505S0415C	6,35	1/4	6,45	.254	2,38	3/32	0,2	.008	2,80	.110	●	●	●	●	●	●
CPGW060204S01015C	CPGW2151S0415C	6,35	1/4	6,45	.254	2,38	3/32	0,4	.016	2,80	.110	●	●	●	●	●	●
CPGW060208S01015C	CPGW2152S0415C	6,35	1/4	6,45	.254	2,38	3/32	0,8	.031	2,80	.110	●	●	●	●	●	●
CPGW09T304S01015C	CPGW3251S0415C	9,53	3/8	9,67	.381	3,97	5/32	0,4	.016	4,40	.173	●	●	●	●	●	●
CPGW09T308S01015C	CPGW3252S0415C	9,53	3/8	9,67	.381	3,97	5/32	0,8	.031	4,40	.173	●	●	●	●	●	●





(FST)



● first choice

○ alternate choice

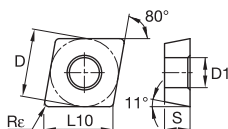
P						
M						
K						
N						
S						
H						

■ CPGW-FST

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CPGW060202FST	CPGW21505FST	6,35	1/4	6,45	.254	2,38	3/32	0,2	.008	2,80	.110	■	■	■	■	■	3898751
CPGW060204FST	CPGW2151FST	6,35	1/4	6,45	.254	2,38	3/32	0,4	.016	2,80	.110	■	■	■	■	■	3898752
CPGW060208FST	CPGW2152FST	6,35	1/4	6,45	.254	2,38	3/32	0,8	.031	2,80	.110	■	■	■	■	■	3898753
CPGW09T304FST	CPGW3251FST	9,53	3/8	9,67	.381	3,97	5/32	0,4	.016	4,40	.173	■	■	■	■	■	3898754
CPGW09T308FST	CPGW3252FST	9,53	3/8	9,67	.381	3,97	5/32	0,8	.031	4,40	.173	■	■	■	■	■	3898755
CPGW120404FST	CPGW431FST	12,70	1/2	12,90	.508	4,76	3/16	0,4	.016	5,50	.217	■	■	■	■	■	3898756
CPGW120408FST	CPGW432FST	12,70	1/2	12,90	.508	4,76	3/16	0,8	.031	5,50	.217	■	■	■	■	■	3898757

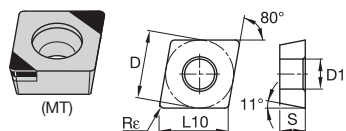


(FWST)



■ CPGW-FWST

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CPGW060204FWST	CPGW2151FWST	6,35	1/4	6,45	.254	2,38	3/32	0,4	.016	2,80	.110	■	■	■	■	■	5885758
CPGW09T308FWST	CPGW3252FWST	9,53	3/8	9,67	.381	3,97	5/32	0,8	.031	4,40	.173	■	■	■	■	■	5885759
CPGW120408FWST	CPGW432FWST	12,70	1/2	12,90	.508	4,76	3/16	0,8	.031	5,50	.217	■	■	■	■	■	5885760

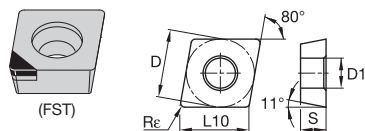


- first choice
- alternate choice

P	M	K	N	S	H
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●
●	●	●	●	●	●

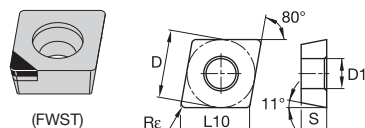
CPGW-MT

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CPGW09T304S01015MT	CPGW3251S0415MT	9,53	3/8	9,67	.381	3,99	.157	0,4	.016	4,40	.173	3883526	3883527	6018084	6018085		
CPGW09T308S01015MT	CPGW3252S0415MT	9,53	3/8	9,67	.381	3,99	.157	0,8	.031	4,40	.173						



CPMW-FST

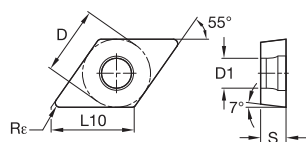
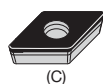
ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CPMW050204FST	CPMW7151FST	5,56	7/32	5,65	.222	2,38	3/32	0,4	.016	2,50	.098						
CPMW060204FST	CPMW2151FST	6,35	1/4	6,45	.254	2,38	3/32	0,4	.016	2,80	.110						



CPMW-FWST

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
CPMW09T304FWST	CPMW3251FWST	9,53	3/8	9,67	.381	3,97	5/32	0,4	.016	4,40	.173						



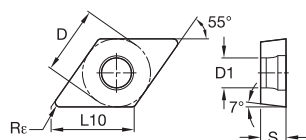
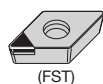


- first choice
- alternate choice

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

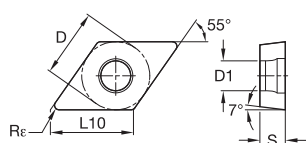
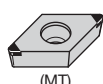
■ DCGW-C

ISO catalog number	ANSI catalog number											WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN02U
		D		L10		S		Rε		D1							
		mm	in	mm	in	mm	in	mm	in	mm	in						
DCGW070202EC	DCGW21505EC	6,35	1/4	7,75	.305	2,38	3/32	0,2	.008	2,80	.110	3883528	3883585	3883586	3883587	3883588	3883589
DCGW070202S01015C	DCGW21505S0415C	6,35	1/4	7,75	.305	2,38	3/32	0,2	.008	2,80	.110	3883529	3883590	3883591	3883592	3883593	3883594
DCGW070204S01015C	DCGW2151S0415C	6,35	1/4	7,75	.305	2,38	3/32	0,4	.016	2,80	.110	3883530	3883595	3883596	3883597	3883598	3883599



■ DCGW-FST

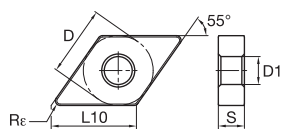
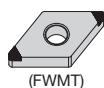
ISO catalog number	ANSI catalog number											WBH10P	WBH25P	WBH30P	WBK40U	WDN00U
		D		L10		S		R _ε		D1						
		mm	in	mm	in	mm	in	mm	in	mm	in					
DCGW070204FST	DCGW2151FST	6,35	1/4	7,75	.305	2,38	3/32	0,4	.016	2,80	.110	■	■	■	■	■
DCGW11T304FST	DCGW3251FST	9,53	3/8	11,63	.458	3,97	5/32	0,4	.016	4,40	.173	■	■	■	■	■



■ DCGW-MT

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WBH10P 3883530	WBH25P 3883531	WBH30P 3883532	WBK40U 3883533	WDN00U 3883534	WDN25U 3883535
		mm	in	mm	in	mm	in	mm	in	mm	in						
DCGW11T304S01015MT	DCGW3251S0415MT	9,52	3/8	11,63	.458	3,99	.157	0,4	.016	4,40	.173						
DCGW11T308S01015MT	DCGW3252S0415MT	9,52	3/8	11,63	.458	3,99	.157	0,8	.031	4,40	.173						



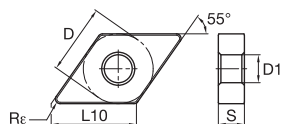
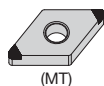


- first choice
- alternate choice

P						
M						
K						
N						
S						
H						

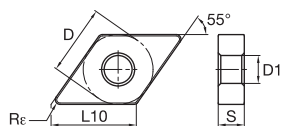
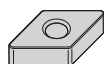
■ DNGA-FWMT

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
DNGA150404EFWMT	DNGA431EFWMT	12,70	1/2	15,50	.610	4,76	3/16	0,4	.007	5,16	.203	●	●	●	●	●	●
DNGA150408EFWMT	DNGA432EFWMT	12,70	1/2	15,50	.610	4,76	3/16	0,8	.016	5,16	.203	●	●	●	●	●	●
DNGA150412EFWMT	DNGA433EFWMT	12,70	1/2	15,50	.610	4,76	3/16	1,2	.047	5,16	.203	●	●	●	●	●	●



■ DNGA-MT

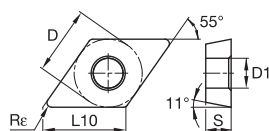
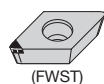
ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
DNGA150404S01025MT	DNGA431S0425MT	12,70	1/2	15,50	.610	4,78	.1883	0,4	.016	5,16	.203	●	●	●	●	●	●
DNGA150408S01025MT	DNGA432S0425MT	12,70	1/2	15,50	.610	4,78	.1883	0,8	.031	5,16	.203	●	●	●	●	●	●



■ DNMA

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
DNMA110408S02020	DNMA332S0820	9,53	3/8	11,63	.458	4,76	3/16	0,8	.031	3,81	.150	●	●	●	●	●	●



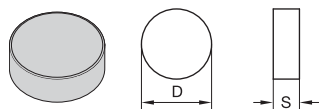


- first choice
- alternate choice

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

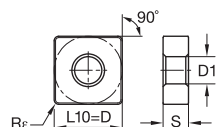
■ DPGW-FWST

ISO catalog number	ANSI catalog number	D		L10		S		R _e		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN01U	WDN02U	WDN03U	WDN04U	WDN05U	WDN06U	WDN07U	WDN08U	WDN09U	WDN10U	WDN11U	WDN12U	WDN13U	WDN14U	WDN15U	WDN16U	WDN17U	WDN18U	WDN19U	WDN20U	WDN21U	WDN22U	WDN23U	WDN24U	WDN25U	WDN26U	WDN27U	WDN28U	WDN29U	WDN30U	WDN31U	WDN32U	WDN33U	WDN34U	WDN35U	WDN36U	WDN37U	WDN38U	WDN39U	WDN40U	WDN41U	WDN42U	WDN43U	WDN44U	WDN45U	WDN46U	WDN47U	WDN48U	WDN49U	WDN50U	WDN51U	WDN52U	WDN53U	WDN54U	WDN55U	WDN56U	WDN57U	WDN58U	WDN59U	WDN60U	WDN61U	WDN62U	WDN63U	WDN64U	WDN65U	WDN66U	WDN67U	WDN68U	WDN69U	WDN70U	WDN71U	WDN72U	WDN73U	WDN74U	WDN75U	WDN76U	WDN77U	WDN78U	WDN79U	WDN80U	WDN81U	WDN82U	WDN83U	WDN84U	WDN85U	WDN86U	WDN87U	WDN88U	WDN89U	WDN90U	WDN91U	WDN92U	WDN93U	WDN94U	WDN95U	WDN96U	WDN97U	WDN98U	WDN99U	WDN100U	WDN101U	WDN102U	WDN103U	WDN104U	WDN105U	WDN106U	WDN107U	WDN108U	WDN109U	WDN110U	WDN111U	WDN112U	WDN113U	WDN114U	WDN115U	WDN116U	WDN117U	WDN118U	WDN119U	WDN120U	WDN121U	WDN122U	WDN123U	WDN124U	WDN125U	WDN126U	WDN127U	WDN128U	WDN129U	WDN130U	WDN131U	WDN132U	WDN133U	WDN134U	WDN135U	WDN136U	WDN137U	WDN138U	WDN139U	WDN140U	WDN141U	WDN142U	WDN143U	WDN144U	WDN145U	WDN146U	WDN147U	WDN148U	WDN149U	WDN150U	WDN151U	WDN152U	WDN153U	WDN154U	WDN155U	WDN156U	WDN157U	WDN158U	WDN159U	WDN160U	WDN161U	WDN162U	WDN163U	WDN164U	WDN165U	WDN166U	WDN167U	WDN168U	WDN169U	WDN170U	WDN171U	WDN172U	WDN173U	WDN174U	WDN175U	WDN176U	WDN177U	WDN178U	WDN179U	WDN180U	WDN181U	WDN182U	WDN183U	WDN184U	WDN185U	WDN186U	WDN187U	WDN188U	WDN189U	WDN190U	WDN191U	WDN192U	WDN193U	WDN194U	WDN195U	WDN196U	WDN197U	WDN198U	WDN199U	WDN200U	WDN201U	WDN202U	WDN203U	WDN204U	WDN205U	WDN206U	WDN207U	WDN208U	WDN209U	WDN210U	WDN211U	WDN212U	WDN213U	WDN214U	WDN215U	WDN216U	WDN217U	WDN218U	WDN219U	WDN220U	WDN221U	WDN222U	WDN223U	WDN224U	WDN225U	WDN226U	WDN227U	WDN228U	WDN229U	WDN230U	WDN231U	WDN232U	WDN233U	WDN234U	WDN235U	WDN236U	WDN237U	WDN238U	WDN239U	WDN240U	WDN241U	WDN242U	WDN243U	WDN244U	WDN245U	WDN246U	WDN247U	WDN248U	WDN249U	WDN250U	WDN251U	WDN252U	WDN253U	WDN254U	WDN255U	WDN256U	WDN257U	WDN258U	WDN259U	WDN260U	WDN261U	WDN262U	WDN263U	WDN264U	WDN265U	WDN266U	WDN267U	WDN268U	WDN269U	WDN270U	WDN271U	WDN272U	WDN273U	WDN274U	WDN275U	WDN276U	WDN277U	WDN278U	WDN279U	WDN280U	WDN281U	WDN282U	WDN283U	WDN284U	WDN285U	WDN286U	WDN287U	WDN288U	WDN289U	WDN290U	WDN291U	WDN292U	WDN293U	WDN294U	WDN295U	WDN296U	WDN297U	WDN298U	WDN299U	WDN300U	WDN301U	WDN302U	WDN303U	WDN304U	WDN305U	WDN306U	WDN307U	WDN308U	WDN309U	WDN310U	WDN311U	WDN312U	WDN313U	WDN314U	WDN315U	WDN316U	WDN317U	WDN318U	WDN319U	WDN320U	WDN321U	WDN322U	WDN323U	WDN324U	WDN325U	WDN326U	WDN327U	WDN328U	WDN329U	WDN330U	WDN331U	WDN332U	WDN333U	WDN334U	WDN335U	WDN336U	WDN337U	WDN338U	WDN339U	WDN340U	WDN341U	WDN342U	WDN343U	WDN344U	WDN345U	WDN346U	WDN347U	WDN348U	WDN349U	WDN350U	WDN351U	WDN352U	WDN353U	WDN354U	WDN355U	WDN356U	WDN357U	WDN358U	WDN359U	WDN360U	WDN361U	WDN362U	WDN363U	WDN364U	WDN365U	WDN366U	WDN367U	WDN368U	WDN369U	WDN370U	WDN371U	WDN372U	WDN373U	WDN374U	WDN375U	WDN376U	WDN377U	WDN378U	WDN379U	WDN380U	WDN381U	WDN382U	WDN383U	WDN384U	WDN385U	WDN386U	WDN387U	WDN388U	WDN389U	WDN390U	WDN391U	WDN392U	WDN393U	WDN394U	WDN395U	WDN396U	WDN397U	WDN398U	WDN399U	WDN400U	WDN401U	WDN402U	WDN403U	WDN404U	WDN405U	WDN406U	WDN407U	WDN408U	WDN409U	WDN410U	WDN411U	WDN412U	WDN413U	WDN414U	WDN415U	WDN416U	WDN417U	WDN418U	WDN419U	WDN420U	WDN421U	WDN422U	WDN423U	WDN424U	WDN425U	WDN426U	WDN427U	WDN428U	WDN429U	WDN430U	WDN431U	WDN432U	WDN433U	WDN434U	WDN435U	WDN436U	WDN437U	WDN438U	WDN439U	WDN440U	WDN441U	WDN442U	WDN443U	WDN444U	WDN445U	WDN446U	WDN447U	WDN448U	WDN449U	WDN450U	WDN451U	WDN452U	WDN453U	WDN454U	WDN455U	WDN456U	WDN457U	WDN458U	WDN459U	WDN460U	WDN461U	WDN462U	WDN463U	WDN464U	WDN465U	WDN466U	WDN467U	WDN468U	WDN469U	WDN470U	WDN471U	WDN472U	WDN473U	WDN474U	WDN475U	WDN476U	WDN477U	WDN478U	WDN479U	WDN480U	WDN481U	WDN482U	WDN483U	WDN484U	WDN485U	WDN486U	WDN487U	WDN488U	WDN489U	WDN490U	WDN491U	WDN492U	WDN493U	WDN494U	WDN495U	WDN496U	WDN497U	WDN498U	WDN499U	WDN500U	WDN501U	WDN502U	WDN503U	WDN504U	WDN505U	WDN506U	WDN507U	WDN508U	WDN509U	WDN510U	WDN511U	WDN512U	WDN513U	WDN514U	WDN515U	WDN516U	WDN517U	WDN518U	WDN519U	WDN520U	WDN521U	WDN522U	WDN523U	WDN524U	WDN525U	WDN526U	WDN527U	WDN528U	WDN529U	WDN530U	WDN531U	WDN532U	WDN533U	WDN534U	WDN535U	WDN536U	WDN537U	WDN538U	WDN539U	WDN540U	WDN541U	WDN542U	WDN543U	WDN544U	WDN545U	WDN546U	WDN547U	WDN548U	WDN549U	WDN550U	WDN551U	WDN552U	WDN553U	WDN554U	WDN555U	WDN556U	WDN557U	WDN558U	WDN559U	WDN560U	WDN561U	WDN562U	WDN563U	WDN564U	WDN565U	WDN566U	WDN567U	WDN568U	WDN569U	WDN570U	WDN571U	WDN572U	WDN573U	WDN574U	WDN575U	WDN576U	WDN577U	WDN578U	WDN579U	WDN580U	WDN581U	WDN582U	WDN583U	WDN584U	WDN585U	WDN586U	WDN587U	WDN588U	WDN589U	WDN590U	WDN591U	WDN592U	WDN593U	WDN594U	WDN595U	WDN596U	WDN597U	WDN598U	WDN599U	WDN600U	WDN601U	WDN602U	WDN603U	WDN604U	WDN605U	WDN606U	WDN607U	WDN608U	WDN609U	WDN610U	WDN611U	WDN612U	WDN613U	WDN614U	WDN615U	WDN616U	WDN617U	WDN618U	WDN619U	WDN620U	WDN621U	WDN622U	WDN623U	WDN624U	WDN625U	WDN626U	WDN627U	WDN628U	WDN629U	WDN630U	WDN631U	WDN632U	WDN633U	WDN634U	WDN635U	WDN636U	WDN637U	WDN638U	WDN639U	WDN640U	WDN641U	WDN642U	WDN643U	WDN644U	WDN645U	WDN646U	WDN647U	WDN648U	WDN649U	WDN650U	WDN651U	WDN652U	WDN653U	WDN654U	WDN655U	WDN656U	WDN657U	WDN658U	WDN659U	WDN660U	WDN661U	WDN662U	WDN663U	WDN664U	WDN665U	WDN666U	WDN667U	WDN668U	WDN669U	WDN670U	WDN671U	WDN672U	WDN673U	WDN674U	WDN675U	WDN676U	WDN677U	WDN678U	WDN679U	WDN680U	WDN681U	WDN682U	WDN683U	WDN684U	WDN685U	WDN686U	WDN687U	WDN688U	WDN689U	WDN690U	WDN691U	WDN692U	WDN693U	WDN694U	WDN695U	WDN696U	WDN697U	WDN698U	WDN699U	WDN700U	WDN701U	WDN702U	WDN703U	WDN704U	WDN705U	WDN706U	WDN707U	WDN708U	WDN709U	WDN710U	WDN711U	WDN712U	WDN713U	WDN714U	WDN715U	WDN716U	WDN717U	WDN718U	WDN719U	WDN720U	WDN721U	WDN722U	WDN723U	WDN724U	WDN725U	WDN726U	WDN727U	WDN728U	WDN729U	WDN730U	WDN731U	WDN732U	WDN733U	WDN734U	WDN735U	WDN736U	WDN737U	WDN738U	WDN739U	WDN740U	WDN741U	WDN742U	WDN743U	WDN744U	WDN745U	WDN746U	WDN747U	WDN748U	WDN749U	WDN750U	WDN751U	WDN752U	WDN753U	WDN754U	WDN755U	WDN756U	WDN757U	WDN758U	WDN759U	WDN760U	WDN761U	WDN762U	WDN763U	WDN764U	WDN765U	WDN766U	WDN767U	WDN768U	WDN769U	WDN770U	WDN771U	WDN772U	WDN773U	WDN774U	WDN775U	WDN776U	WDN777U	WDN778U	WDN779U	WDN780U	WDN781U	WDN782U	WDN783U	WDN784U	WDN785U	WDN786U	WDN787U	WDN788U	WDN789U	WDN790U	WDN791U	WDN792U	WDN793U	WDN794U	WDN795U	WDN796U	WDN797U	WDN798U	WDN799U	WDN800U	WDN801U	WDN802U	WDN803U	WDN804U	WDN805U	WDN806U	WDN807U	WDN808U	WDN809U	WDN810U	WDN811U	WDN812U	WDN813U	WDN814U	WDN815U	WDN816U	WDN817U	WDN818U	WDN819U	WDN820U	WDN821U	WDN822U	WDN823U	WDN824U	WDN825U	WDN826U	WDN827U	WDN828U	WDN829U	WDN830U	WDN831U	WDN832U	WDN833U	WDN834U	WDN835U	WDN836U	WDN837U	WDN838U	WDN839U	WDN840U	WDN841U	WDN842U	WDN843U	WDN844U	WDN845U	WDN846U	WDN847U	WDN848U	WDN849U	WDN850U	WDN851U	WDN852U	WDN853U	WDN854U	WDN855U	WDN856U	WDN857U	WDN858U	WDN859U	WDN860U	WDN861U	WDN862U	WDN863U	WDN864U	WDN865U	WDN866U	WDN867U	WDN868U	WDN869U	WDN870U	WDN871U	WDN872U	WDN873U	WDN874U	WDN875U	WDN876U	WDN877U	WDN878U	WDN879U	WDN880U	WDN881U
-----------------------	------------------------	---	--	-----	--	---	--	----------------	--	----	--	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------	---------



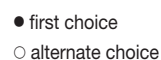
RNM

ISO catalog number	ANSI catalog number	D		S		WBH10P	WBH25P	WBH30P	WBH40U	WDN00U	WDN25U
		mm	in	mm	in						
RNMN090300S02020	RNM32S0820	9,53	3/8	3,18	1/8	■	■	■	3883315	■	
RNMN120300S02020	RNM42S0820	12,70	1/2	3,18	1/8	■	■	■	3883316	■	
RNMN120400S02020	RNM43S0820	12,70	1/2	4,76	3/16	■	■	■	3883317	■	



■ SNGA-MT

ISO catalog number	ANSI catalog number											WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		D		L10		S		Rε		D1							
		mm	in	mm	in	mm	in	mm	in	mm	in						
SNGA120404S01025MT	SNGA431S0425MT	12,70	1/2	12,70	.500	4,78	.1883	0,4	.016	5,16	.203	1	3883915	1	1	1	
SNGA120408S01025MT	SNGA432S0425MT	12,70	1/2	12,70	.500	4,78	.1883	0,8	.031	5,16	.203	1	3883328	1	1	1	
SNGA120412S01025MT	SNGA433S0425MT	12,70	1/2	12,70	.500	4,78	.1883	1,2	.047	5,16	.203	1	3883891	1	1	1	

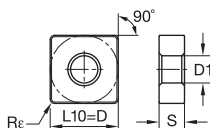


P						
M						
K						
N						
S						
H						

Inserts

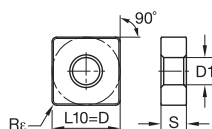
■ SNM

ISO catalog number	ANSI catalog number											WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		D		L10		S		R _e		D1							
		mm	in	mm	in	mm	in	mm	in	mm	in						
SNMN090316S02020	SNM324S0820	9,53	3/8	9,53	.375	3,18	1/8	1,6	.063	—	—	■	■	■	3883320	■	■
SNMN120416T02020	SNM434S0820	12,70	1/2	12,70	.500	4,76	3/16	1,6	.063	—	—	■	■	■	3883324	■	■



ISO catalog number	ANSI catalog number											WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		D		L10		S		Re		D1							
		mm	in	mm	in	mm	in	mm	in	mm	in						
SNMA120408S02020	SNMA432S0820	12,70	1/2	12,70	.500	4,76	3/16	0,8	.031	5,16	.203	■	■	■	3883325	■	■
SNMA120412S02020	SNMA433S0820	12,70	1/2	12,70	.500	4,76	3/16	1,2	.047	5,16	.203	■	■	■	3883326	■	■





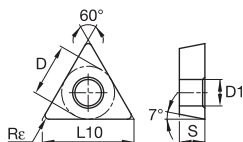
● first choice

○ alternate choice

P						
M						
K						
N						
S						
H						

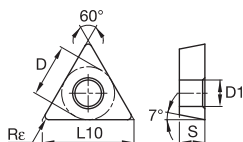
■ SNMS-FST

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
SNMS120408FST	SNMS432FST	12,70	1/2	12,70	.500	4,76	3/16	0,8	.031	5,16	.203	●	●	●	●	●	3898742
SNMS120412FST	SNMS433FST	12,70	1/2	12,70	.500	4,76	3/16	1,2	.047	5,16	.203	●	●	●	●	●	3898743



■ TCGW-C

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
TCGW110202EC	TCGW21505EC	6,35	1/4	11,00	.433	2,38	3/32	0,2	.008	2,80	.110	●	3883588	●	●	●	●
TCGW110204S01015C	TCGW2151S0415C	6,35	1/4	11,00	.433	2,38	3/32	0,4	.016	2,80	.110	●	3883589	●	●	●	●



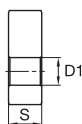
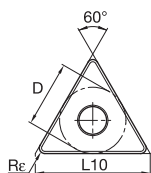
■ TCGW-FST

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
TCGW110204FST	TCGW2151FST	6,35	1/4	11,00	.433	2,38	3/32	0,4	.016	2,80	.110	●	●	●	●	●	3898768
TCGW16T304FST	TCGW3251FST	9,53	3/8	16,50	.650	3,97	5/32	0,4	.016	4,40	.173	●	●	●	●	●	3898769





(FST)

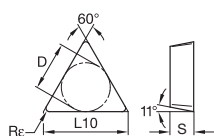
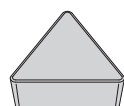


- first choice
- alternate choice

P						
M						
K						
N						
S						
H						

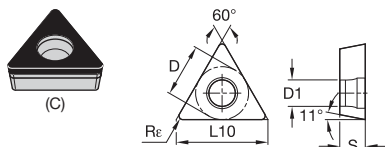
■ TNMS-FST

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
TNMS160404FST	TNMS331FST	9,53	3/8	16,50	.650	4,76	3/16	0,4	.016	3,81	.150	●	●	●	●	●	●
TNMS160408FST	TNMS332FST	9,53	3/8	16,50	.650	4,76	3/16	0,8	.031	3,81	.150	●	●	●	●	●	●



■ TPGN/TPG

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
TPGN110304F	TPG221F	6,35	1/4	11,00	.433	3,18	1/8	0,4	.016	—	—	●	●	●	●	●	●
TPGN110308F	TPG222F	6,35	1/4	11,00	.433	3,18	1/8	0,8	.031	—	—	●	●	●	●	●	●
TPGN160304F	TPG321F	9,53	3/8	16,50	.650	3,18	1/8	0,4	.016	—	—	●	●	●	●	●	●
TPGN160308F	TPG322F	9,53	3/8	16,50	.650	3,18	1/8	0,8	.031	—	—	●	●	●	●	●	●
TPGN220408F	TPG432F	12,70	1/2	22,00	.866	4,76	3/16	0,8	.031	—	—	●	●	●	●	●	●



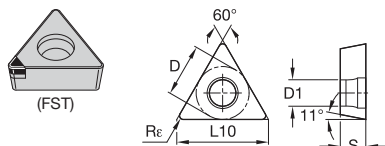
- first choice
- alternate choice

P						
M						
K						
N						
S						
H						

Inserts

TPGW-C

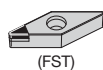
ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
TPGW110202EC	TPGW21505EC	6,35	1/4	11,00	.433	2,38	3/32	0,2	.008	2,80	.110	●	●	●	●	●	●
TPGW110204S01015C	TPGW2151S0415C	6,35	1/4	11,00	.433	2,38	3/32	0,4	.016	2,80	.110	3883534	3883591	6018092	●	●	●
TPGW110208S01015C	TPGW2152S0415C	6,35	1/4	11,00	.433	2,38	3/32	0,8	.031	2,80	.110	3883535	3883592	6018093	●	●	●



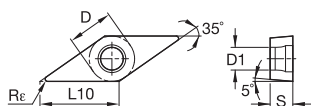
TPGW-FST

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
TPGW110204FST	TPGW2151FST	6,35	1/4	11,00	.433	2,38	3/32	0,4	.016	2,80	.110	●	●	●	●	●	3898770
TPGW110208FST	TPGW2152FST	6,35	1/4	11,00	.433	2,38	3/32	0,8	.031	2,80	.110	●	●	●	●	●	3898771
TPGW16T304FST	TPGW3251FST	9,53	3/8	16,50	.650	3,97	5/32	0,4	.016	4,40	.173	●	●	●	●	●	3898772
TPGW16T308FST	TPGW3252FST	9,53	3/8	16,50	.650	3,97	5/32	0,8	.031	4,40	.173	●	●	●	●	●	3898773





(FST)



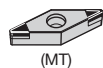
● first choice

○ alternate choice

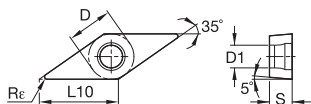
P						
M						
K						
N						
S						
H						

■ VBGW-FST

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
VBGW110304FST	VBGW221FST	6,35	1/4	11,07	.436	3,18	1/8	0,4	.016	2,80	.110	■	■	■	■	■	■
VBGW160404FST	VBGW331FST	9,53	3/8	16,61	.654	4,76	3/16	0,4	.016	4,40	.173	■	■	■	■	■	■

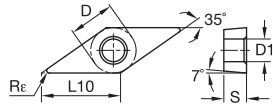
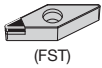


(MT)



■ VBGW-MT

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
VBGW160408S01015MT	VBGW332S0415MT	9,52	3/8	16,61	.654	4,78	.1883	0,8	.031	4,40	.173	3883537	■	6018095	■	■	■
VBGW160404S01015MT	VBGW331S0415MT	9,53	3/8	16,61	.654	4,78	.1883	0,4	.016	4,40	.173	3883536	■	6018094	■	■	■



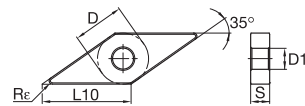
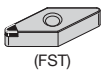
- first choice
- alternate choice

P						
M						
K						
N						
S						
H						

Inserts

■ VCMW-FST

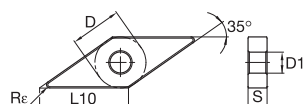
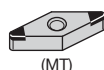
ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
VCMW110304FST	VCMW221FST	6,35	1/4	11,07	.436	3,18	1/8	0,4	.016	2,80	.110	●	●	●	●	●	3883147



■ VNGA-FST

ISO catalog number	ANSI catalog number	D		L10		S		Rε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
VNGA160404FST	VNGA331FST	9,53	3/8	16,61	.654	4,76	3/16	0,4	.016	3,81	.150	●	●	●	●	●	3898736
VNGA160408FST	VNGA332FST	9,53	3/8	16,61	.654	4,76	3/16	0,8	.031	3,81	.150	●	●	●	●	●	3898737



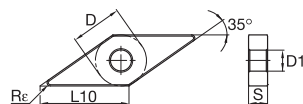


- first choice
○ alternate choice

P						
M						
K						
N						
S						
H						

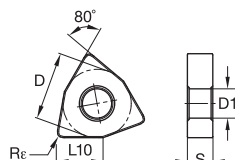
■ VNGA-MT

ISO catalog number	ANSI catalog number	D		L10		S		R _ε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
VNGA160404S01025MT	VNGA331S0425MT	9,53	3/8	16,61	.654	4,78	.1883	0,4	.016	3,81	.150	3883538	3883894	6018096	■	■	■
VNGA160408S01025MT	VNGA332S0425MT	9,53	3/8	16,61	.654	4,78	.1883	0,8	.031	3,81	.150	3883539	3883896	6018097	■	■	■



■ VNMS-FST

ISO catalog number	ANSI catalog number	D		L10		S		R _ε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
VNMS160404FST	VNMS331FST	9,53	3/8	16,61	.654	4,76	3/16	0,4	.016	3,81	.150	■	■	■	■	■	3898738
VNMS160408FST	VNMS332FST	9,53	3/8	16,61	.654	4,76	3/16	0,8	.031	3,81	.150	■	■	■	■	■	3898739



■ WNGA-FST

ISO catalog number	ANSI catalog number	D		L10		S		R _ε		D1		WBH10P	WBH25P	WBH30P	WBK40U	WDN00U	WDN25U
		mm	in	mm	in	mm	in	mm	in	mm	in						
WNGA080404FST	WNGA431FST	12,70	1/2	8,69	.342	4,76	3/16	0,4	.016	5,16	.203	■	■	■	■	■	3898740
WNGA080408FST	WNGA432FST	12,70	1/2	8,69	.342	4,76	3/16	0,8	.031	5,16	.203	■	■	■	■	■	3898741