



CBN GRADES

**EXCELLENT CUTTING PERFORMANCE
IN HARDENED STEEL AND CAST IRON**

Insert Styles:

Negative:

CNGA
DNGA
RNGN
SNGA
TNGA
VNGA
WNGA

Positive:

CCGW
DCGW
RCGX
SCGW
TCGW
TPGN
TPGW
VBGW

Grades and Applications:

TB610 - For hardened steel
TB670 - For hardened steel
and chilled cast iron
TB730 - For gray cast iron
and carbide rolls

Other:

- Most inserts offered with multiple tips to maximize economy.
- Tip lengths available in standard or mini sizes.

**PRODUCT
ANNOUNCEMENT
• UPDATE •
2019**

TB610
TB670
TB730



This update addresses a nomenclature change within our line of CBN inserts for turning hardened steels and cast iron. Negative ISO inserts will change from CNMA, DNMA, RNMN, SNMA, TNMA and WNMA to CNGA, DNGA, RNGN, SNGA, TNGA and WNGA.

These inserts have extremely high hardness and moderate fracture toughness. The chemical composition of these grades and a state-of-the-art brazing process provide exceptional surface finish and stable tool life. These grades represent an excellent complement to our existing, high performance CBN grades TB650 and KB90A.

Options within this arsenal of CBN inserts include standard tip lengths, mini-tip lengths, single tips, multiple tips, full-top round inserts and wiper geometry. All together, there are more than 150 inserts that allow great flexibility for any application.

■ CBN GRADES & APPLICATION AREA

TB610

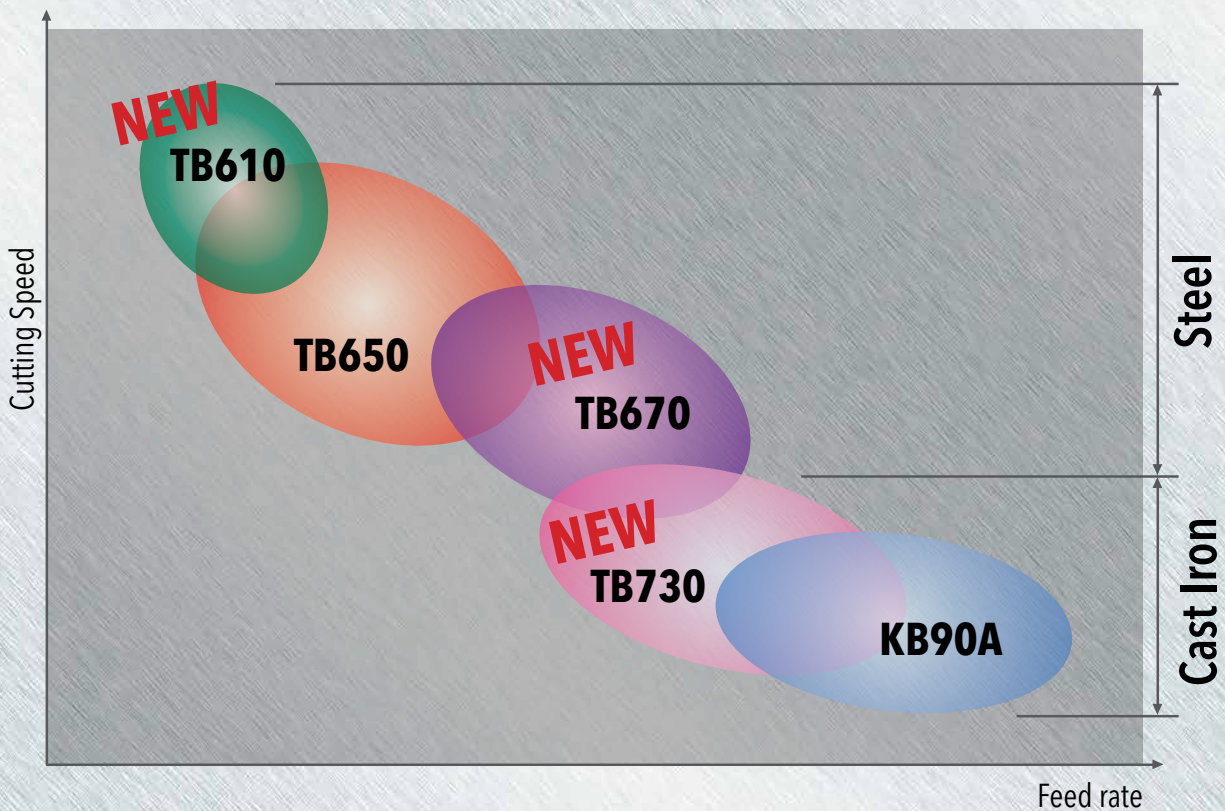
- Excellent oxidation resistance and chemical stability.
- For continuous to light interrupted turning.
- For machining hard steel, alloy steel, tool steel and case hardened steel.

TB670

- High hardness and impact resistance.
- For continuous to severe interrupted turning.
- For alloy steel, tool steel, case hardened steel and chilled cast iron.

TB730

- High hardness and high fracture toughness.
- General turning and milling.
- For gray cast iron, nodular cast iron and carbide rolls.



RECOMMENDED CUTTING CONDITIONS

Materials		TB610	TB670	TB730
Gray Cast Iron (HB 180-230)	V (sfm)			1640 - 3280
	f (ipr)			.004 - .012
Chilled Cast Iron (> HB 400)	V (sfm)		260 - 490	260 - 490
	f (ipr)		.004 - .008	.004 - .012
Hardened Steel (HRc 40-65)	V (sfm)	490 - 1150	330 - 980	
	f (ipr)	.002 - .008	.004 - .012	
Sintered Metal (Hv 200-600)	V (sfm)		330 - 980	330 - 820
	f (ipr)		.002 - .008	.004 - .010
DCI or HSS Roll	V (sfm)		650 - 1640	
	f (ipr)		.002 - .008	
Super Alloy (Ni-base)	V (sfm)			330 - 980
	f (ipr)			.002 - .008

CASE STORY 1

Component : Direct Annulus Gear (Carburized Steel, 60 HRc)
External Turning - Continuous Cut, Wet

Maker	Competitor K	Ingersoll
Insert	CNGA 432	CNGA 432 LN
Grade	CBN	TB670
Tool Life (pcs.)	80 pcs.	160 pcs.
Cutting Speed (sfm)		394
Feed (ipr)		.006
Depth of Cut (inches)		.008

CASE STORY 2

Component : Seal Ring (Chilled Cast Iron, 68-70 HRc)
External Turning - Continuous Cut, Wet

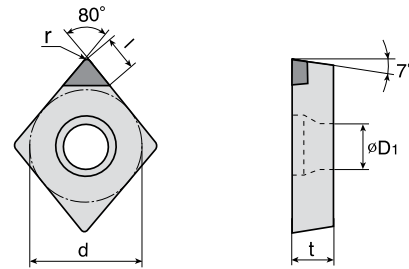
Maker	Competitor E	Ingersoll
Insert	CNGA 432	CNGA 432 LN
Grade	CBN	TB670
Tool Life (pcs.)	7 pcs.	25 pcs.
Cutting Speed (sfm)	407	
Feed (ipr)	.0035	
Depth of Cut (inches)	.004-.020	

CASE STORY 3

Component : Part of Car Seat (Hardened Steel, 60 HRc)
External Facing, Severe Interruption Cut, Dry

Maker	Competitor E	Ingersoll
Insert	CNGA 431	CNGA 431 LN
Grade	Coated CBN	TB670
Tool Life (pcs.)	150 pcs.	350 pcs.
Cutting Speed (sfm)	690	
Feed (ipr)	.001	
Depth of Cut (inches)	.006	

CCGW CBN

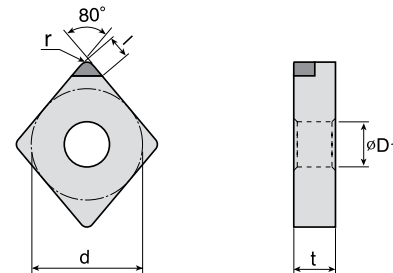


ANSI DESIGNATION	ISO DESIGNATION	Dimension (inches)					Grade	TB610	TB670	TB730
		l	d	t	r	D1				
CCGW 21.50.5LS2	CCGW 060202 LS2	.087	.250	.094	.008	.110				
CCGW 21.51LS2	CCGW 060204 LS2	.083	.250	.094	.016	.110				
CCGW 21.52LS2	CCGW 060208 LS2	.083	.250	.094	.031	.110				
CCGW 32.51LS2	CCGW 09T304 LS2	.094	.375	.157	.016	.173				
CCGW 32.51WZ-LS2	CCGW 09T304 WZ-LS2	.094	.375	.157	.016	.173				
CCGW 32.52LS2	CCGW 09T308 LS2	.091	.375	.157	.031	.173				
CCGW 32.52WZ-LS2	CCGW 09T308 WZ-LS2	.091	.375	.157	.031	.173				
CCGW 431LS2	CCGW 120404 LS2	.083	.500	.187	.016	.216				
CCGW 432LS2	CCGW 120408 LS2	.083	.500	.187	.031	.216				

LS2 - Insert with 2 tips WZ - Insert with wiper geometry

● = P ● = M ● = K ● = N ● = S ○ = H

CNGA-WZ CBN

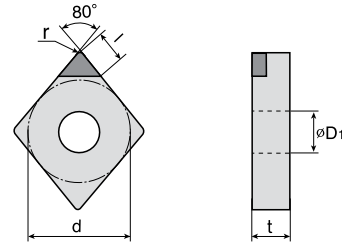


ANSI DESIGNATION	ISO DESIGNATION	Dimension (inches)					Grade	TB610	TB670	TB730
		l	d	t	r	D1				
CNGA 431WZ-LS2	CNGA 120404 WZ-LS2	.083	.500	.187	.016	.203				
CNGA 431WZ-LS4	CNGA 120404 WZ-LS4	.083	.500	.187	.016	.203				
CNGA 432WZ-LS2	CNGA 120408 WZ-LS2	.083	.500	.187	.031	.203				
CNGA 432WZ-LS4	CNGA 120408 WZ-LS4	.083	.500	.187	.031	.203				
CNGA 433WZ-LS2	CNGA 120412 WZ-LS2	.098	.500	.187	.047	.203				
CNGA 433WZ-LS4	CNGA 120412 WZ-LS4	.098	.500	.187	.047	.203				

LS2 - Insert with 2 tips LS4 - Insert with 4 tips WZ - Insert with wiper geometry

● = P ● = M ● = K ● = N ● = S ○ = H

CNGA CBN

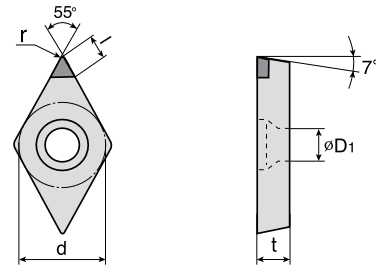
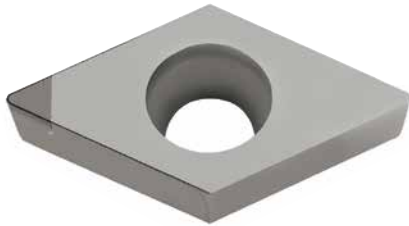


ANSI DESIGNATION	ISO DESIGNATION	Dimension (inches)					Grade	TB610	TB670	TB730
		l	d	t	r	D1				
CNGA 431LN	CNGA 120404 LN	.165	.500	.187	.016	.203	○	○	○	
CNGA 431LN2	CNGA 120404 LN2	.165	.500	.187	.016	.203				●
CNGA 431LS2	CNGA 120404 LS2	.087	.500	.187	.016	.203	○	○	○	●
CNGA431LS4	CNGA 120404 LS4	.087	.500	.187	.016	.203		○	○	
CNGA 432LN	CNGA 120408 LN	.157	.500	.187	.031	.203	○	○	○	●
CNGA 432LS2	CNGA 120408 LS2	.083	.500	.187	.031	.203	○	○	○	●
CNGA 432LS4	CNGA 120408 LS4	.083	.500	.187	.031	.203	○	○	○	●
CNGA433LN	CNGA 120412 LN	.154	.500	.187	.047	.203	○	○	○	
CNGA433LS2	CNGA 120412 LS2	.098	.500	.187	.047	.203		○	○	●
CNGA 433LS4	CNGA 120412 LS4	.098	.500	.187	.047	.203		○	○	●

LN - Insert with longer tip LS2 - Insert with 2 tips LS4 - Insert with 4 tips

● = P ● = M ● = K ● = N ● = S ○ = H

DCGW CBN

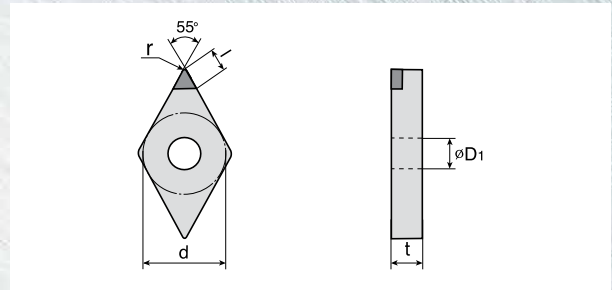


ANSI DESIGNATION	ISO DESIGNATION	Dimension (inches)					Grade	TB610	TB670	TB730
		l	d	t	r	D1				
DCGW21.50.5LS2	DCGW 070202 LS2	.102	.250	.094	.008	.110	○	○	○	●
DCGW21.51LS2	DCGW 070204LS2	.094	.250	.094	.016	.110	○	○	○	●
DCGW21.52LS2	DCGW 070208 LS2	.083	.250	.094	.031	.110	○	○	○	●
DCGW32.51LS2	DCGW 070304 LS2	.102	.375	.157	.016	.173				●
DCGW32.52LS2	DCGW 11T308 LS2	.087	.375	.157	.031	.173	○	○	○	●

LS2 - Insert with 2 tips

● = P ● = M ● = K ● = N ● = S ○ = H

DNGA CBN

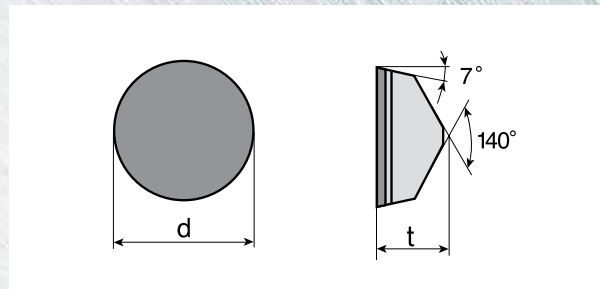


ANSI DESIGNATION	ISO DESIGNATION	Dimension (inches)					Grade	TB610	TB670	TB730
		l	d	t	r	D1				
DNGA 431LN	DNGA 150404 LN	.165	.500	.187	.016	.203	○	○	○	
DNGA 431LS2	DNGA 150404 LS2	.102	.500	.187	.016	.203	○	○	○	●
DNGA 431LS4	DNGA 150404 LS4	.102	.500	.187	.016	.203	○	○	○	●
DNGA 432LN	DNGA 150408 LN	.154	.500	.187	.031	.203	○	○	○	
DNGA 432LS2	DNGA 150408 LS2	.102	.500	.187	.031	.203	○	○	○	
DNGA 432LS4	DNGA 150408 LS4	.091	.500	.187	.031	.203		○	○	
DNGA 433LN	DNGA 150412 LN	.138	.500	.187	.047	.203	○	○	○	●
DNGA 433LS2	DNGA 150412 LS2	.087	.500	.187	.047	.203		○	○	
DNGA 433LS4	DNGA 150412 LS4	.087	.500	.187	.047	.203		○	○	
DNGA 441LN	DNGA 150604 LN	.165	.500	.250	.016	.203				
DNGA 441LS2	DNGA 150604 LS2	.102	.500	.250	.016	.203				
DNGA 442LN	DNGA 150608 LN	.154	.500	.250	.031	.203				
DNGA 442LS2	DNGA 150608 LS2	.091	.500	.250	.031	.203				
DNGA 442LS4	DNGA 150608 LS4	.091	.500	.250	.031	.203				
DNGA 443LS2	DNGA 150612 LS2	.087	.500	.250	.047	.203				

LN - Insert with longer tip LS2 - Insert with 2 tips LS4 - Insert with 4 tips

● = P ● = M ● = K ● = N ● = S ○ = H

RCGX CBN

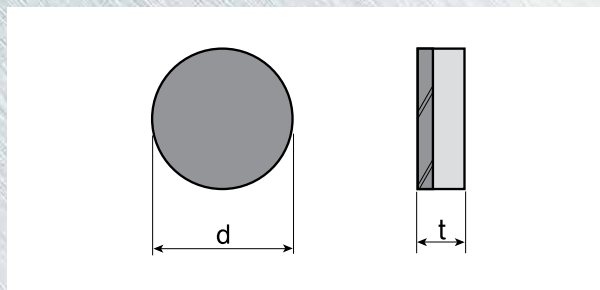


ANSI DESIGNATION	ISO DESIGNATION	Dimensions (inches)		Grade	TB610	TB670	TB730
		d	t				
RCGX 22FT	RCGX 060300 FT	.250	.125				●
RCGX 32FT	RCGX 090300 FT	.375	.125				●
RCGX 43FT	RCGX 120400 FT	.500	.187				●

FT - Full top CBN

● = P ● = M ● = K ● = N ● = S ○ = H

RNGN CBN

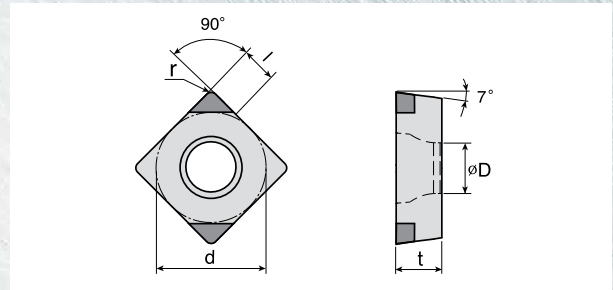
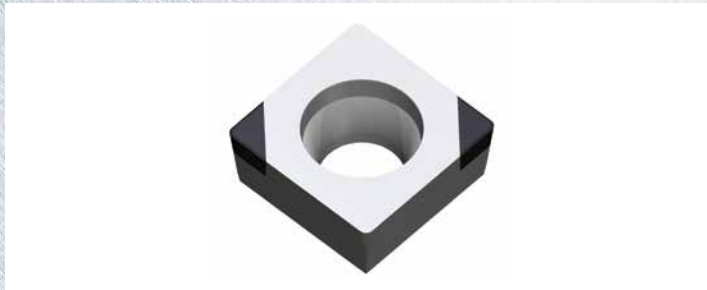


ANSI DESIGNATION	ISO DESIGNATION	Dimension (inches)		Grade	TB610	TB670	TB730
		d	t				
RNG32FT	RNGN 090300 FT	.375	.125				●
RNG42FT	RNGN 120400 FT	.500	.125				●

FT - Full top CBN

● = P ● = M ● = K ● = N ● = S ○ = H

SCGW CBN

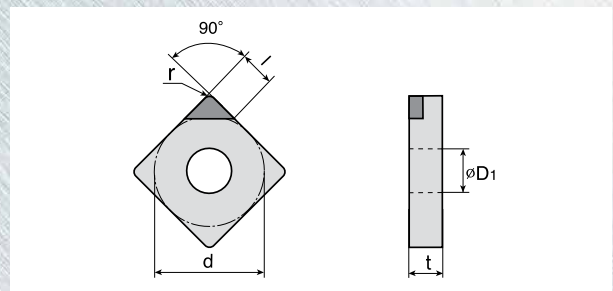


ANSI DESIGNATION	ISO DESIGNATION	Dimension (inches)					Grade	TB610	TB670	TB730
		l	d	t	r	D1				
SCGW 32.51LS2	SCGW 09T304 LS2	.106	.375	.157	.016	.173				●
SCGW 32.52LS2	SCGW 09T308 LS2	.106	.375	.157	.031	.173				●

LS2 - Insert with 2 tips

● = P ● = M ● = K ● = N ● = S ○ = H

SNGA CBN

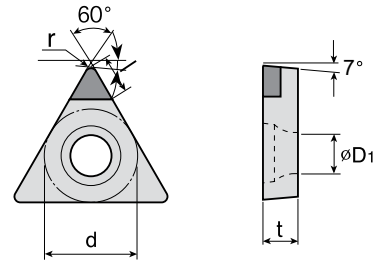


ANSI DESIGNATION	ISO DESIGNATION	Dimension (inches)					Grade	TB610	TB670	TB730
		l	d	t	r	D1				
SNGA 431LN	SNGA 120404 LN	.165	.500	.187	.016	.203			●	
SNGA 431LS2	SNGA 120404 LS2	.098	.500	.187	.016	.203			●	●
SNGA 431LS4	SNGA 120404 LS4	.098	.500	.187	.016	.203			●	
SNGA 432LN	SNGA 120408 LN	.165	.500	.187	.031	.203	○	●	●	●
SNGA 432LS2	SNGA 120408 LS2	.098	.500	.187	.031	.203	○	●	●	●
SNGA 432LS4	SNGA 120408 LS4	.098	.500	.187	.031	.203			●	
SNGA 432LS8	SNGA 120408 LS8	.098	.500	.187	.031	.203			●	

LN - Insert with longer tip LS2 - Insert with 2 tips LS4 - Insert with 4 tips LS8 - Insert with 8 tips

● = P ● = M ● = K ● = N ● = S ○ = H

TCGW CBN

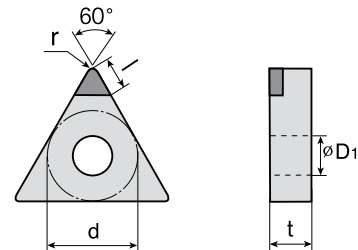


ANSI DESIGNATION	ISO DESIGNATION	Dimensions (inches)					Grade	TB610	TB670	TB730
		l	d	t	r	D1				
TCGW 731LS3	TCGW 090204 LS3	.090	.219	.094	.016	.098				
TCGW 732LS3	TCGW 090208 LS2	.082	.219	.094	.031	.098				
TCGW 21.51LS3	TCGW 110204 LS3	.090	.250	.094	.016	.110				
TCGW 21.52LS3	TCGW 110208 LS3	.090	.250	.094	.031	.110				
TCGW 32.51LS3	TCGW 16T304 LS3	.082	.375	.157	.016	.173				
TCGW 32.52LS3	TCGW 16T308 LS3	.082	.375	.157	.031	.173				

LS3 - Insert with 3 tips

● = P ● = M ● = K ● = N ● = S ○ = H

TNGA CBN

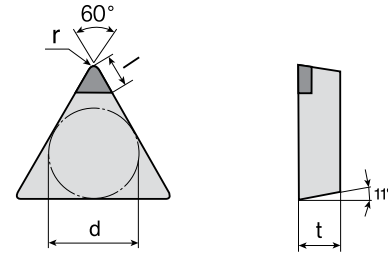


ANSI DESIGNATION	ISO DESIGNATION	Dimension (inches)					Grade	TB610	TB670	TB730
		l	d	t	r	D1				
TNGA 331LN	TNGA 160404 LN	.169	.375	.187	.016	.150				
TNGA 331LS3	TNGA 160404 LS3	.086	.375	.187	.016	.150				
TNGA 331LS6	TNGA 160404 LS6	.086	.375	.187	.016	.150				
TNGA 332LN	TNGA 160408 LN	.157	.375	.187	.031	.150				
TNGA 332LS3	TNGA 160408 LS3	.082	.375	.187	.031	.150				
TNGA 332LS6	TNGA 160408 LS6	.082	.375	.187	.031	.150				
TNGA 333LS3	TNGA 160412 LS3	.100	.375	.187	.047	.150				

LN - Insert with longer tip LS3 - Insert with 3 tips LS6 - Insert with 6 tips

● = P ● = M ● = K ● = N ● = S ○ = H

TPG CBN

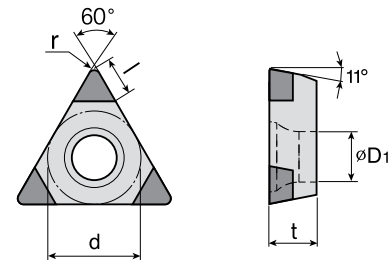
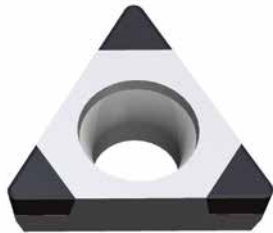


ANSI DESIGNATION	ISO DESIGNATION	l	Dimensions (inches)			Grade	TB610	TB670	TB730
			d	t	r				
TPG 731LS3	TPGN 090204 LS3	.090	0.219	0.094	0.016		○		
TPG 21.50.5LS3	TPGN 110302 LS3	.110	0.250	0.125	0.008				●
TPG 21.51LS3	TPGN 110304 LS3	.102	0.250	0.125	0.016		○	●	●
TPG 21.52LS3	TPGN 110308 LS3	.090	0.250	0.125	0.031		○	●	●
TPG 32.51LS3	TPGN 160304 LS3	.110	0.375	0.125	0.016		○	●	●
TPG 32.52LS3	TPGN 160308 LS3	.100	0.375	0.125	0.031		○	●	●

LS3 - Insert with 3 tips

● = P ● = M ● = K ● = N ● = S ○ = H

TPGW CBN

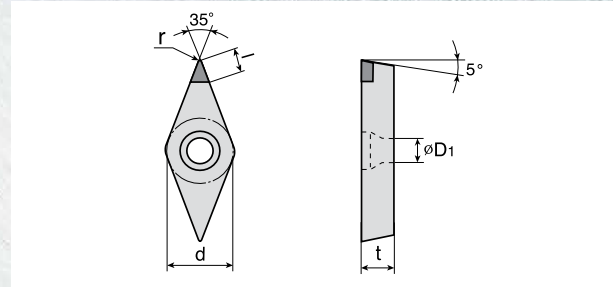
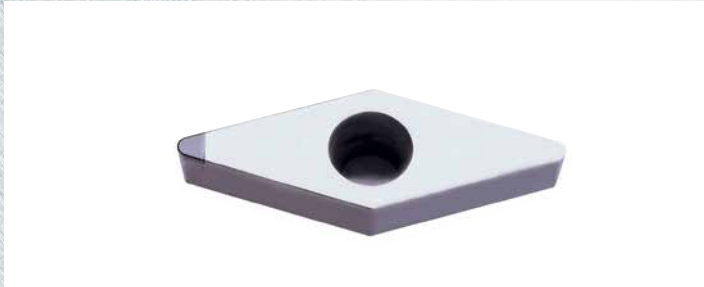


ANSI DESIGNATION	ISO DESIGNATION	l	Dimensions (inches)			D1	Grade	TB610	TB670	TB730
			d	t	r					
TPGW 631LS3	TPGW 080204 LS3	.082	.187	.094	.016	.098		●	●	
TPGW 731LS3	TPGW 090204 LS3	.090	.219	.094	.016	.098		●	●	●
TPGW 732LS3	TPGW 090208 LS3	.078	.219	.094	.031	.098		●	●	
TPGW 220.5LS3	TPGW 110302 LS3	.110	.250	.125	.008	.134	○			●
TPGW 221LS	TPGW 110304 LS	.102	.250	.125	.016	.134		●	●	
TPGW 221LS3	TPGW 110304 LS3	.102	.250	.125	.016	.134	○			●
TPGW 222LS3	TPGW 110308 LS3	.090	.250	.125	.031	.134	○	●	●	●
TPGW 331LS3	TPGW 160404 LS3	.110	.375	.187	.016	.173		●	●	
TPGW 332LS3	TPGW 160408 LS3	.100	.375	.187	.031	.173		●	●	

LS3 - Insert with 3 tips

● = P ● = M ● = K ● = N ● = S ○ = H

VBGW CBN

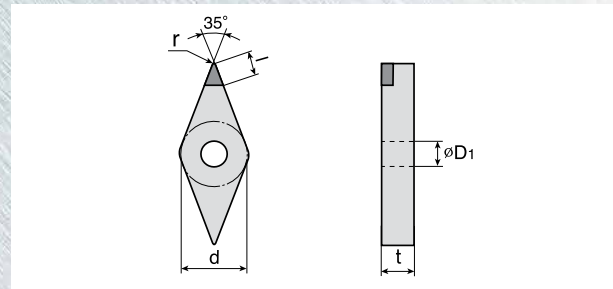


ANSI DESIGNATION	ISO DESIGNATION	Dimensions (inches)					Grade	TB610	TB670	TB730
		l	d	t	r	D1				
VBGW 222LS2	VBGW 110308 LS2	.094	.250	.125	.031	.110				
VBGW 332LS2	VBGW 160408 LS2	.090	.375	.187	.031	.173				

LS2 - Insert with 2 tips

● = P ● = M ● = K ● = N ● = S ○ = H

VNGA CBN

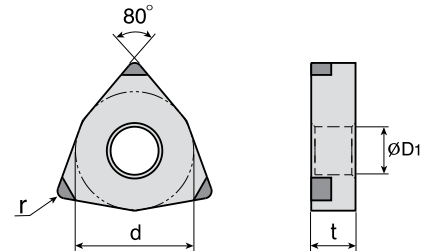
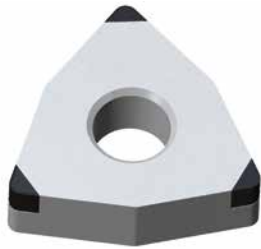


ANSI DESIGNATION	ISO DESIGNATION	Dimensions (inches)					Grade	TB610	TB670	TB730
		l	d	t	r	D1				
VNGA 331LN	VNGA 160404 LN	.197	.375	.187	.016	.150				
VNGA 331LS2	VNGA 160404 LS2	.126	.375	.187	.016	.150				
VNGA 332LN	VNGA 160408 LN	.161	.375	.187	.031	.150				
VNGA 332LS2	VNGA 160408 LS2	.094	.375	.187	.031	.150				
VNGA 332LS4	VNGA 160408 LS4	.094	.375	.187	.031	.150				

LN - Insert with longer tip LS2 - Insert with 2 tips LS4 - Insert with 4 tips

● = P ● = M ● = K ● = N ● = S ○ = H

WNGA-WZ CBN

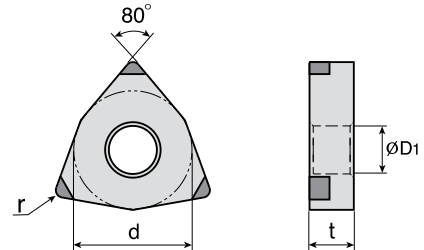
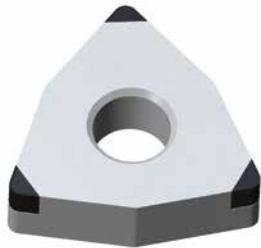


ANSI DESIGNATION	ISO DESIGNATION	Dimensions (inches)					Grade	TB610	TB670	TB730
		l	d	t	r	D1				
WNGA 332WZ-LS6	WNGA 060408 WZ-LS6	.083	.375	.187	.031	.150				
WNGA 432WZ-LS3	WNGA 080408 WZ-LS3	.083	.500	.187	.031	.203				
WNGA 432WZ-LS6	WNGA 080408 WZ-LS6	.083	.500	.187	.031	.203				
WNGA 433WZ-LS3	WNGA 080412 WZ-LS3	.083	.500	.187	.047	.203				

LS3 - Insert with 3 tips LS6 - Insert with 6 tips WZ - Insert with wiper geometry

● = P ● = M ● = K ● = N ● = S ○ = H

WNGA CBN



ANSI DESIGNATION	ISO DESIGNATION	Dimensions (inches)					Grade	TB610	TB670	TB730
		l	d	t	r	D1				
WNGA 432LS3	WNGA 080408 LS3	.083	.500	.187	.031	.203				
WNGA 432LS6	WNGA 080408 LS6	.083	.500	.187	.031	.203				

LS3 - Insert with 3 tips LS6 - Insert with 6 tips

● = P ● = M ● = K ● = N ● = S ○ = H

Availability

In stock

Price

Available in the GAL system