

**CERABIT**

# CUTTING TOOLS

- CERAMIC
- CERMET
- PCBN/PCD
- TOOL HOLDER
- MILLING CUTTER



# SPEEDY SOLUTION!!



A22



A82



A106

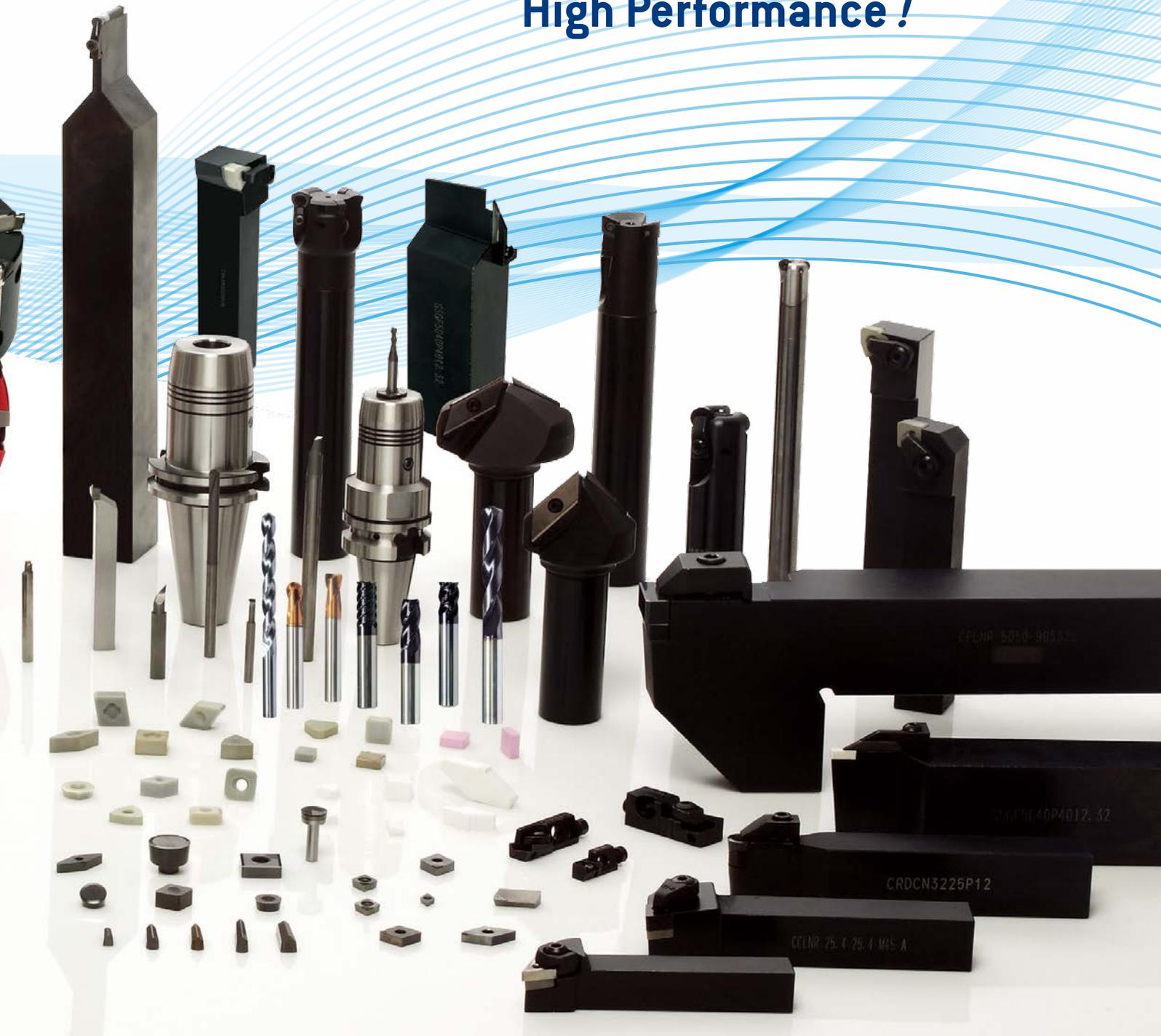


A130

**High Speed !**

**High Quality !**

**High Performance !**



**A178**



**B1**



**C1**



**D1**

## INTRODUCTION

Union Materials Corporation has accumulated technologies and experiences over 40 years through developing and manufacturing various high-tech materials. Including hard ferrite magnets which are awarded Best Supplier from Robert Bosch GmbH for seven times consecutively in last 18 years, Union Materials Corporation manufactures various ceramic-based parts, cutting tools and industrial ceramics for automotive, electrical & electronic engineering and machinery industry.

Union cutting tool products are advanced materials developed with high technologies through long-term experiences, continuous studies and applications to commercialization of new materials. We have attained many great achievements in the field of various cutting tools for automotive, steel mill, aerospace and machinery field.

As of March 14 2017, Union Corporation has been the largest shareholder of Union Materials Corporation. We started new era with new company name, Union Materials Corporation since September 28, 2017 in accordance with the change of major shareholder which was originally Ssangyong Cement to Union Corporation.

Union Materials Corporation firmly promises to engage in its current business activities and will endeavor to support our customers for satisfaction.



Seoul HQ Office



Daegu plant

# CONTENTS



## TURNING & MILLING

A1 - A283

## ENDMILL & DRILL

B1 - B143

## CHUCK

C1 - C59

## REAMER

D1 - D35

## TECHNICAL DATA

E1 - E7

## INDEX

F1 - F9

**UNION MATERIALS**

**CUTTING TOOLS**

**A**

**TURNING &**

## **INSERT**

---

Grade Information	A 4
Application Index	A 14
Identification System	A 18
Ceramic	A 24
- Turning / Roll Turning	
- Grooving	
- Milling / Wiper	
- Special	
Cermet	A 84
- Turning	
- Milling	
- Special	
PCBN / PCD	A 108
- PCBN	
- PCD	
- Special	

## **TOOL HOLDER**

---

Application Index	A 132
Identification System	A 134
External Toolholder	A 136
Special	A 173

## **MILLING CUTTER**

---

Application Index	A 180
Face Milling Cutter	A 182
Ball Endmill	A 218
Chamfer Cutter	A 220
Aluminum Cutter	A 223
Special	A 232

## **TECHNICAL DATA**

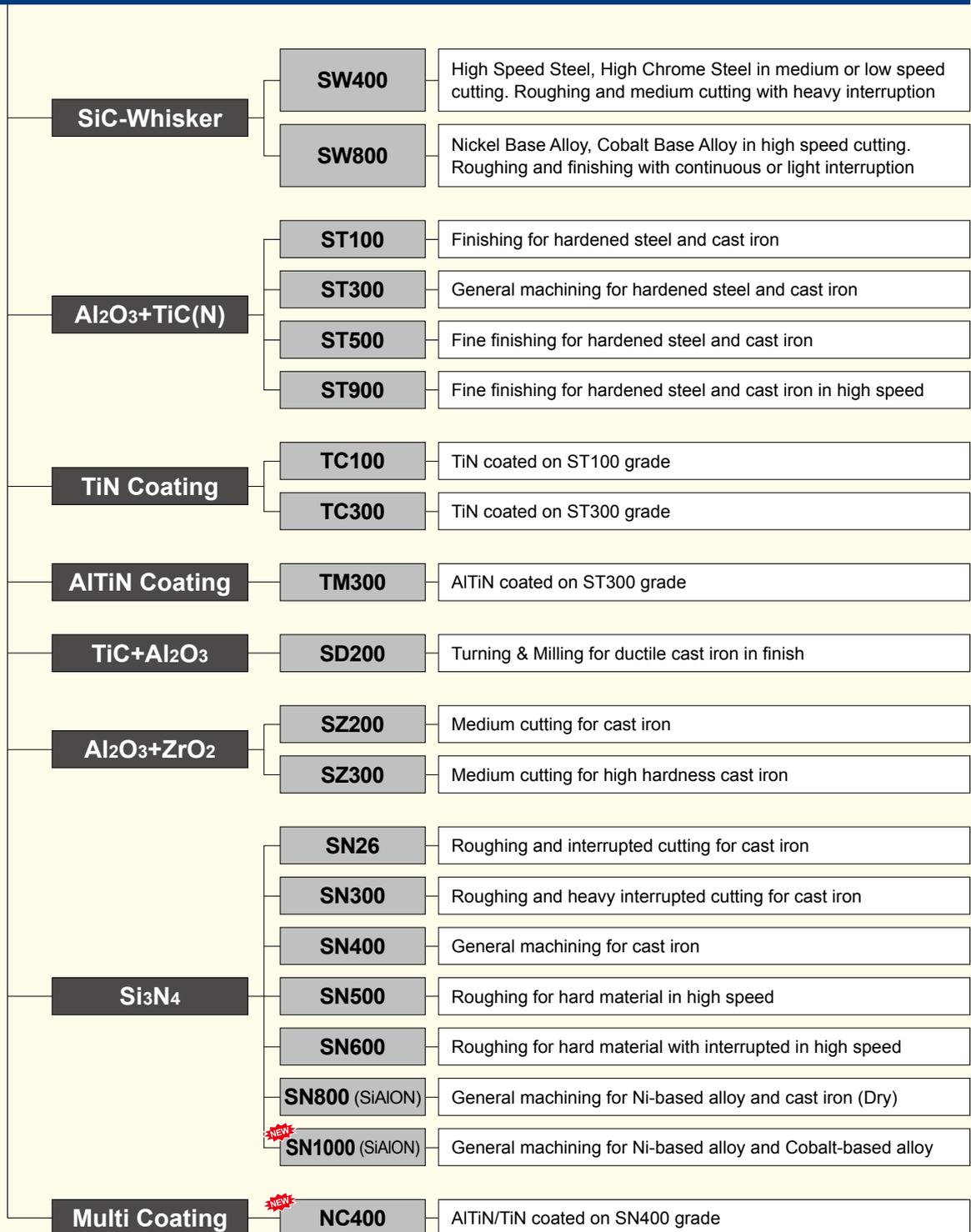
---

Test Results	A 268
Trouble Shooting	A 271
Hardness Conversion Table	A 272
Grade Comparison	A 274
Comparison of Work-piece	A 275

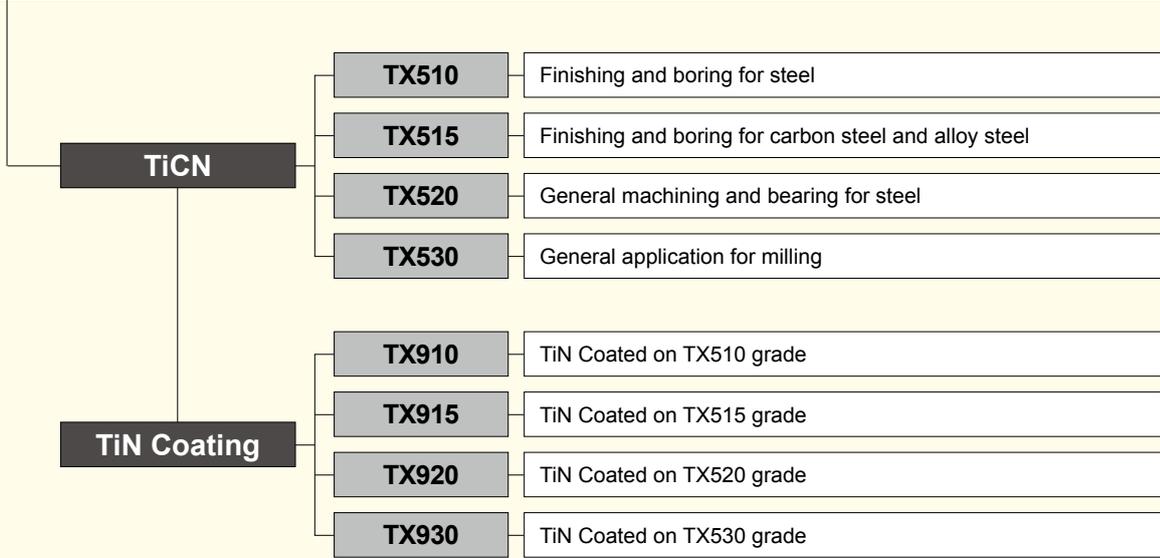
# MILLING

# GRADE INFORMATION

## CERAMIC



**CERMET**

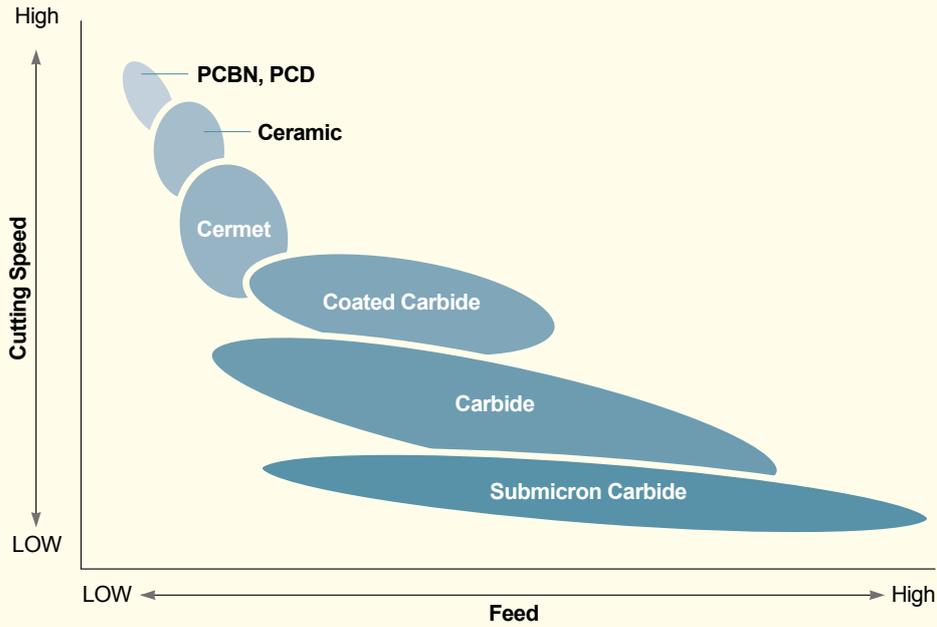


**PCBN/PCD**

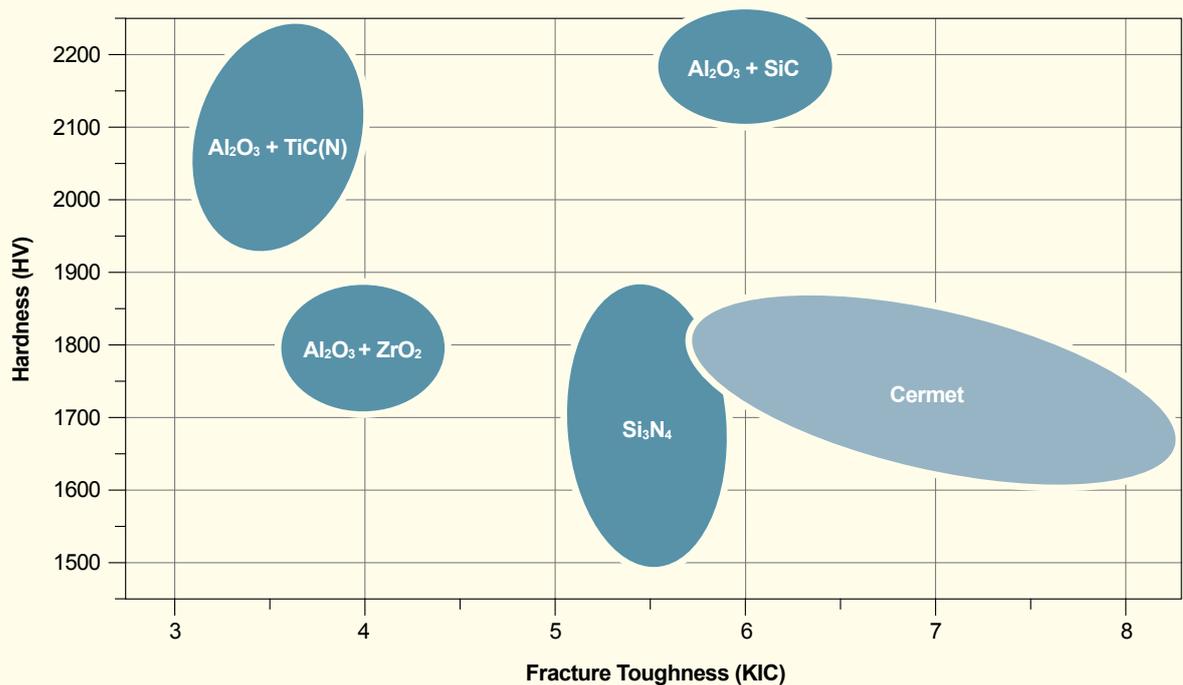


# GRADE INFORMATION

## Application Range



## Mechanical Properties



# CERAMIC

Union Ceramics take pride in its outstanding wear resistance and thermal shock resistance with high speed cutting. Pure raw materials give stability and fine microstructure to the products. Through HIP process, shaped bodies are completely condensed so that the finished goods are strong and resistant against fracture and wear.

- Improved work efficiency by increasing cutting speed on extremely higher than carbide inserts.
- Longer tool life through excellent wear resistance
- Precise cutting and superior surface roughness

	Whisker	SW400	Excellent flank & notch wear in high speed cutting Al <sub>2</sub> O <sub>3</sub> +SiC	High Speed Steel, High Chrome Steel in medium or low speed cutting Roughing and medium cutting with heavy interruption	Tougher 	
		SW800	Excellent flank & notch wear in high speed cutting Al <sub>2</sub> O <sub>3</sub> +SiC	Nickel Base Alloy, Cobalt Base Alloy in high speed cutting Roughing and finishing with continuous or light interruption	Harder 	
	Al <sub>2</sub> O <sub>3</sub> Series	ST100	Tougher alternative to ST300 High thermal shock resistance Al <sub>2</sub> O <sub>3</sub> +TiC	Universal grade for machining cast iron and hardened steel	Tougher 	
		ST300	Excellent wear resistance Al <sub>2</sub> O <sub>3</sub> +TiCN	A basic choice for machining hardened steel and alloy steel		
		ST500	Alternative to PCBN fine microstructure Al <sub>2</sub> O <sub>3</sub> +TiCN	Fine finishing for hardened steel and cast iron		
		ST900	Excellent wear and thermal shock resistance Al <sub>2</sub> O <sub>3</sub> +TiCN	Fine finishing for hardened steel and cast iron in high speed		
		TC100	Wear resistance improved TiN coated	Finishing for hardened steel and cast iron		
		TC300	Excellent wear resistance TiN coated	Finishing for hardened steel and cast iron		
		TM300	Excellent wear resistance & thermal shock resistance	Finishing for hardened steel and cast iron		Harder 
		SD200	High thermal shock resistance Usable with coolant TiC+Al <sub>2</sub> O <sub>3</sub>	Machining ductile cast iron Finishing for ductile cast iron and hard materials		Finishing for ductile cast iron
	ZrO <sub>2</sub> Series	SZ200	Toughened by zirconia High chemical stability Al <sub>2</sub> O <sub>3</sub> +ZrO <sub>2</sub>	Finishing, semi-finishing of cast iron and steel	Tougher 	
		SZ300	Harder alternative to SZ200 Al <sub>2</sub> O <sub>3</sub> +ZrO <sub>2</sub>	Finishing, semi-finishing of cast iron and steel	Harder 	
	Si <sub>3</sub> N <sub>4</sub> Series	SN26	Good toughness and thermal shock resistance Well balanced wear resistance and toughness Si <sub>3</sub> N <sub>4</sub>	First choice for roughing with interrupted cuts Roll turning and milling of cast iron and steel	Roughing in lower speed	
		SN300	Tougher alternative to SN400 Thermal shock resistance and good toughness Si <sub>3</sub> N <sub>4</sub>	Roughing and high speed cutting with interruption	Tougher 	
		SN400	Excellent wear resistance in high speed cutting Si <sub>3</sub> N <sub>4</sub>	First choice for roughing of cast iron High speed machining with interrupted cuts	Harder 	
		SN500	Harder alternative to SN400 Improved wear resistance at high cutting speed Si <sub>3</sub> N <sub>4</sub>	High speed roughing for cast iron		
		SN600	Excellent wear resistance in interrupted cutting Si <sub>3</sub> N <sub>4</sub>	Roughing for hard material with interruption and high speed	Harder 	
		SN800	Advanced grade with SiAlON contained superior edge strength SiAlON	Great performance against notch wear High speed roughing of high temperature alloy and inconel	Harder 	
		SN900	Excellent thermal shock resistance and thermal conductivity SiAlON	Tough machining in Heat Resistance Super Alloy (HRSA)	Tougher 	
		NEW SN1000	Excellent thermal shock resistance and thermal conductivity SiAlON	Ni-based Alloy, Cobalt-based Alloy in medium or low speed cutting Roughing and Medium cutting with heavy interruption		
NEW NC400	Excellent wear resistance & thermal shock resistance	Cast Iron in roughing and semi-finishing cutting				

# GRADE INFORMATION

## Physical Properties

Grade	Composition	Color	Density (g/cm <sup>3</sup> )	Hardness (HV)	Toughness (MPa·m <sup>1/2</sup> )	Thermal Conductivity (cal/cm. sec. °C)
SW400	Al <sub>2</sub> O <sub>3</sub> +SiC	Green	3.8	2,100	7.0	-
SW800	Al <sub>2</sub> O <sub>3</sub> +SiC	Green	3.7	2,100	7.0	-
ST100	Al <sub>2</sub> O <sub>3</sub> +TiC	Black	4.20	2,100	4.00	0.08
ST300	Al <sub>2</sub> O <sub>3</sub> +TiCN	Black	4.40	2,150	4.50	0.08
ST500	Al <sub>2</sub> O <sub>3</sub> +TiCN	Black	4.30	2,200	4.50	0.08
ST900	Al <sub>2</sub> O <sub>3</sub> +TiCN	Black	4.30	2,250	4.70	0.08
TC100	ST100+TiN PVD	Gold	4.20	2,150	4.00	-
TC300	ST300+TiN PVD	Gold	4.40	2,200	4.50	-
TM300	ST300+AlTiN PVD	Black	4.40	2,250	4.50	
SD200	TiC+Al <sub>2</sub> O <sub>3</sub>	Black	4.60	2,200	4.50	0.07
SZ200	Al <sub>2</sub> O <sub>3</sub> +ZrO <sub>2</sub>	White	4.00	1,800	4.50	0.07
SZ300	Al <sub>2</sub> O <sub>3</sub> +ZrO <sub>2</sub>	Pink	4.10	1,850	4.50	0.07
SN26	Si <sub>3</sub> N <sub>4</sub>	Black	3.30	1,600	5.00	0.06
SN300	Si <sub>3</sub> N <sub>4</sub>	Gray	3.20	1,600	6.00	0.05
SN400	Si <sub>3</sub> N <sub>4</sub>	Gray	3.20	1,650	6.00	0.05
SN500	Si <sub>3</sub> N <sub>4</sub>	Gray	3.20	1,700	6.00	0.05
SN600	Si <sub>3</sub> N <sub>4</sub>	Black	3.20	1,700	6.50	0.07
SN800	Si <sub>3</sub> N <sub>4</sub>	Black	3.20	1,900	6.00	0.04
SN1000 	Si <sub>3</sub> N <sub>4</sub> +Al <sub>2</sub> O <sub>3</sub>	Black	3.3	1,800	7.00	
NC400 	SN400+PVD (AlTiN/TiN)	Gold	3.2	1,650	6.00	

## Choice of Ceramic Grade for Workpiece

	ST100/ST300 ST500/ST900 TC100/TC300 TM300	SD200	SZ200 SZ300	SN26 SN300/SN400 SN500/SN600 NC400	SN800 SN1000	SW400	SW800
Cast Iron	Gray Cast Iron	⊙	○	⊙	○		
	Chilled Cast Iron	⊙		⊙	⊙		
	Ductile Cast Iron	○	⊙		○		○
Steel	Mild Steel		○				
	Carbon Steel		○				
	Alloy Steel	⊙		○		⊙	○
	Forged Steel	⊙					
	Heat Treated Steel	⊙					
	High Speed Steel	⊙					⊙
	High Manganese Steel	○			○	○	⊙
	Stainless Steel						
	Heat Resistant Steel	○			○	○	○
	Super Alloy Steel	○			○	⊙	⊙
Inconel					⊙	○	

⊙ : Excellent ○ : Good

## Choice of Ceramic Grade for Workpiece

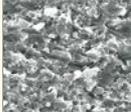
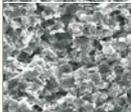
Application	Grade	Workpiece	Machining Type	Speed (V) (m/min)	Feed (f) (mm/rev)	Depth (DOC) (mm)	
Turning	ST100 ST300 ST500 ST900 TC100 TC300 TM300	Gray Cast Iron	Gray Cast Iron (FC)	Rough	150 ~ 800	0.2 ~ 0.5	3 ~ 6
			Malleable (FCMB)	Finish	200 ~ 1,200	0.3 ~ 0.5	0.1 ~ 0.5
			Chilled Cast Iron	Rough	30 ~ 100	0.1 ~ 0.2	0.5 ~ 1.5
				Finish	50 ~ 200	0.05 ~ 0.15	0.1 ~ 0.5
		Steel	Carbon Steel Alloy Steel Bearing Steel	Rough	150 ~ 400	0.2 ~ 0.5	2 ~ 5
				Finish	200 ~ 800	0.05 ~ 0.2	0.1 ~ 0.5
	Hard Steel (HRC 45≥)		Rough	20 ~ 100	0.1 ~ 0.2	0.5 ~ 1.5	
			Finish	40 ~ 200	0.05 ~ 0.5	0.1 ~ 0.5	
	SD200	Ductile Cast Iron Nodular Cast Iron	Rough Finish	100 ~ 400 200 ~ 800	0.1 ~ 0.2 0.05 ~ 0.25	1 ~ 2 0.1 ~ 0.5	
	SZ200 SZ300	Gray Cast Iron (FC) Steel (HRC 45≤)	Rough Finish	200 ~ 700 300 ~ 1,200	0.2 ~ 0.4 0.05 ~ 0.3	2 ~ 5 0.1 ~ 0.5	
	SN26 SN300 SN400 SN500 SN600 <b>NEW</b> NC400	Gray Cast Iron	Gray Cast Iron (FC)	Rough	150 ~ 1,100	0.3 ~ 0.8	< 5
	Malleable (FCMB)		Finish	250 ~ 1,200	0.15 ~ 0.4	< 1	
	Chilled Cast Iron		Rough	20 ~ 100	1.0 ~ 2.0	< 5	
		Finish	60 ~ 200	0.5 ~ 1.0	< 1		
	SN800 <b>NEW</b> SN1000	Ni-Based Alloy Non-Ferrous Metal Inconel	Rough Finish	150 ~ 250 150 ~ 450	0.2 ~ 0.4 0.1 ~ 0.2	< 5 < 1	
SW400 SW800	High temperature alloys Inconel Stellite	Rough Finish	180 ~ 360 180 ~ 450	0.1 ~ 0.25 0.1 ~ 0.30	1 ~ 3 0.5 ~ 2.0		
Milling	SN26 SN300 SN400	Gray Cast Iron (FC)	Rough	100 ~ 1,200	0.3 ~ 0.5	< 5	
			Finish	150 ~ 1,500	0.3 ~ 0.7	< 3	
	<b>NEW</b> SN500 SN600 NC400	Ductile Cast Iron Alloy Steel	Rough	90 ~ 500	0.1 ~ 0.3	< 5	
			Finish	100 ~ 700	0.1 ~ 0.4	< 3	
	<b>NEW</b> SN800 SN1000	High temperature alloys Inconel Stellite	Finish	700 ~ 1,000	0.05 ~ 0.15 / tooth	0.5 ~ 2.5	
	SW400 SW800	High temperature alloys Inconel	Rough	150 ~ 400	0.05 ~ 0.1 / tooth	1 ~ 3	

# GRADE INFORMATION

## CERMET

A matrix of TiCN with carbide as a metal binder, Union Cermets are tougher than ceramics and harder than tungsten carbides. It shows greater wear resistance than carbide and its cutting speed is also much higher than carbide. Cermet inserts give excellent surface finish and high-speed machining.

- Four different grades for different workpiece and cutting condition.
- Ideal for high-speed finishing and milling of mild steel, carbon steel and alloy steel.
- Excellent performance in turning, grooving, boring, bearing and milling.

	TX510	Excellent wear resistance Outstanding surface finish TiCN	Fine-finishing and boring for steel	Harder ↑ ↓ Tougher
	TX910	TiN coating		
	TX515	Wear resistance and high mechanical strength TiCN	Finishing and boring for carbon steel and alloy steel	
	TX915	TiN coating		
	TX520	Excellent thermal conductivity and wear resistance TiCN	The first choice for machining steel Turning, grooving, boring and bearing for steel	
	TX920	TiN coating		
	TX530	The toughest cermet grade TiCN		
	TX930	TiN coating		
			Wide range of milling for steel materials	

### Physical Properties

Grade	Composition	Color	Density (g/cm <sup>3</sup> )	Hardness (HRA)	Toughness (MPa·m <sup>1/2</sup> )	Thermal Conductivity (cal/cm. sec. °C)
TX510	TiCN	Silver	6.50	93.50	7.00	0.08
TX515	TiCN	Silver	6.48	93.00	7.50	0.08
TX520	TiCN	Silver	6.53	92.50	8.00	0.09
TX530	TiCN	Silver	6.35	91.00	8.40	0.09
TX910	TX510+TiN PVD	Gold	6.50	98.50	7.00	-
TX915	TX515+TiN PVD	Gold	6.48	98.00	7.50	-
TX920	TX520+TiN PVD	Gold	6.53	97.50	8.00	-
TX930	TX530+TiN PVD	Gold	6.35	96.00	8.40	-

### Choice of Ceramic Grade for Workpiece

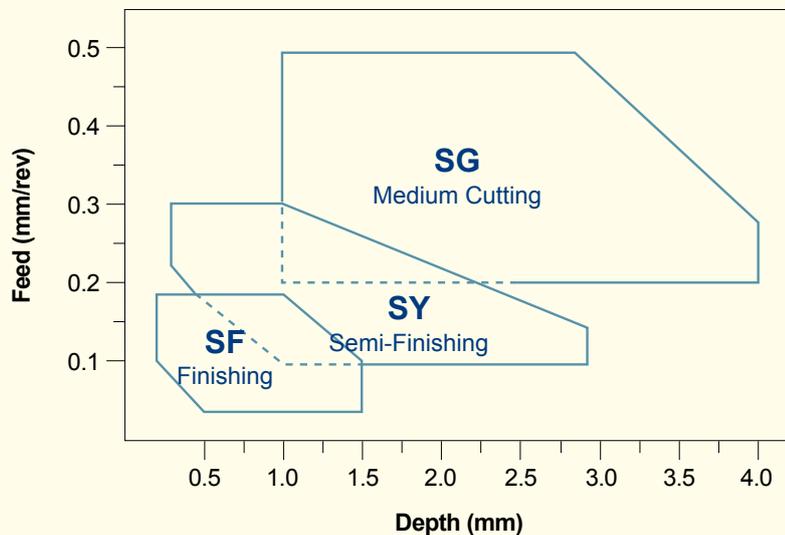
	TX510/TX910	TX515/TX915	TX520/TX920	TX530/TX930
MILD STEEL	◎	◎	◎	○
CARBON STEEL	◎	◎	◎	◎
ALLOY STEEL	○	○	○	○
FORGED STEEL	◎			
HEAT TREATED STEEL	◎			
HEAT RESISTANT STEEL		◎	◎	◎

◎ : Excellent ○ : Good

### Choice of Ceramic Grade for Workpiece

Application	Grade	Workpiece	Machining Type	Speed (V) (m/min)	Feed (f) (mm/rev)	Depth (DOC) (mm)
Turning	TX510/TX910	Mild Steel, Carbon Steel, Alloy Steel	Finishing	100 ~ 600	0.03 ~ 0.3	0.1 ~ 1.5
	TX515/TX915	Mild Steel, Carbon Steel, Alloy Steel	Finishing Medium	100 ~ 500	0.03 ~ 0.3	0.1 ~ 2.0
	TX520/TX920	Bearing Steel, General Steel	Finishing Medium	100 ~ 400	0.03 ~ 0.3	0.1 ~ 2.0
Milling	TX530/TX930	Mild Steel, Carbon Steel, Alloy Steel	Medium	100 ~ 400	0.1 ~ 0.3	< 5
			Roughing	100 ~ 500	0.1 ~ 0.5	< 3

### Choice of Chipbreaker



Chipbreaker Type	Shape	Machining Type	Characteristics
SF		Finishing	Sharp and narrow C/B Optimum for D=0.10~1.50, f=0.05~0.20 Specialized for shaft machining
SY		Semi-finishing	General performing C/B Optimum for D=0.30~2.50, f=0.10~0.30 Low carbon steel, pipe (STKM) machining
SG		Medium cutting	Wider C/B design Optimum for D=1.00~5.00, f=0.20~0.50 Low carbon steel



## Recommended Cutting Conditions

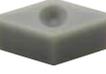
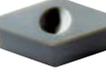
Application	Grade	Workpiece	Speed (V) (m/min)	Feed (f) (mm/rev)	Depth (DOC) (mm)	
Turning	PCBN	SBN1000	Cast iron	400 ~ 1,000	0.15 ~ 0.45	0.10 ~ 2.00
			High hardened cast iron	75 ~ 150	0.15 ~ 0.30	0.10 ~ 1.80
			Nodular cast iron roll	45 ~ 60	0.60 ~ 0.80	2.00 ~ 3.50
			Carbide roll	10 ~ 15	0.15 ~ 0.25	0.50 ~ 2.50
		SBN2000	High hardened steel (roughing)	60 ~ 140	0.15 ~ 0.40	0.70 ~ 2.30
	High hardened steel (finishing, >H <sub>R</sub> C 45)		100 ~ 140	0.10 ~ 0.20	0.10 ~ 0.75	
	Hardened alloy steel (>H <sub>R</sub> C 35)		100 ~ 240	0.05 ~ 0.30	0.10 ~ 2.50	
	SBN3000	Hardened steel	80 ~ 160	0.02 ~ 0.20	<0.5	
		Heat resistance sintered steel	50 ~ 100	0.05 ~ 0.20	<0.5	
	SBN4000	Hardened steel	120 ~ 250	0.025 ~ 0.50	0.05 ~ 0.30	
		Powder metal & Sintered irons	200 ~ 400	0.025 ~ 0.20	0.05 ~ 0.20	
		superalloys	200 ~ 400	0.10 ~ 0.30	0.20 ~ 2.00	
	SBN5000	Cast iron	500 ~ 2,000	0.10 ~ 0.50	<0.5	
		Ductile cast iron	200 ~ 600	0.10 ~ 0.40	<0.5	
Hard cast iron (H <sub>R</sub> C 59)		50 ~ 150	0.10 ~ 1.00	<0.5		
PCD	SPD1000	Plastic alloy	300 ~ 1,000	0.05 ~ 0.25	0.05 ~ 3.00	
		Wood	1,000 ~ 2,500	0.10 ~ 0.50	0.20 ~ 4.50	
	SPD2000	Aluminum / Zinc / Copper	600 ~ 1,000	0.05 ~ 0.25	0.05 ~ 0.30	
	SPD2000	Aluminum alloy (Si 4~8%)	800 ~ 2,500	0.10 ~ 0.30	0.05 ~ 3.00	
			500 ~ 1,290	0.10 ~ 0.30	0.05 ~ 3.00	
	SPD3000	Aluminum alloy (Si 9~14%)	300 ~ 600	0.10 ~ 0.30	0.05 ~ 3.00	
300 ~ 600			0.10 ~ 0.30	0.05 ~ 3.00		
SPD3000	Powdered Carbide Piece	50 ~ 250	0.10 ~ 0.40	0.10 ~ 4.00		
		Sintered Carbide	20 ~ 40	0.05 ~ 0.20	0.02 ~ 0.45	
Milling	PCBN	SBN1000	Cast iron (H <sub>B</sub> 180~230)	400 ~ 1,000	0.12 ~ 0.30	0.20 ~ 2.00
			Hardened cast iron (>H <sub>B</sub> 400)	120 ~ 240	0.12 ~ 0.30	0.20 ~ 2.00
		SBN2000	Hardened steel (>H <sub>R</sub> C 45)	120 ~ 240	0.10 ~ 0.25	0.12 ~ 1.00
			Hardened alloy steel (>H <sub>R</sub> C 35)	120 ~ 240	0.10 ~ 0.35	0.10 ~ 1.00
	SBN3000	Hardened steel (>H <sub>R</sub> C 45)	100 ~ 200	0.10 ~ 0.15	<0.5	
	SBN4000	Hardened steel	150 ~ 250	0.025 ~ 0.30	0.05 ~ 0.20	
	PCD	SPD3000	Aluminum alloy (<Si 14%)	300 ~ 3,000	0.10 ~ 0.25	0.12 ~ 1.00
(>Si 15%)			100 ~ 240	0.10 ~ 0.35	0.10 ~ 1.00	

## Physical Properties

Grade	Contents of pCBN (%)	Particle size (μm)	Hardness (HV)
SBN1000	95	3	3,900
SBN2000	50	1	2,700
SBN3000	60	2	2,700
SBN4000	65	5	2,900
SBN5000	93	10	3,900

Grade	Particle size (μm)	Hardness (HV)
SPD1000	4 ~ 5	6,000 ~ 8,000
SPD2000	8 ~ 9	7,000 ~ 9,000
SPD3000	15 ~ 22	8,000 ~ 10,000

# APPLICATION INDEX

<b>CNGA</b>  Page 24	<b>CNMA</b>  Page 25	<b>CNGN</b>  Page 26	<b>CNMN</b>  Page 27	<b>CNGX</b>  Page 28	<b>CNVX</b>  Page 28	<b>CNMX</b>  Page 29
<b>CNMX .. RD</b>  Page 29	<b>CCGX</b>  Page 29	<b>CCGW</b>  Page 30	<b>CPGN</b>  Page 31	<b>DNGA</b>  Page 32	<b>DNMA</b>  Page 32	<b>DNGN</b>  Page 33
<b>DNGX</b>  Page 34	<b>DNMX</b>  Page 34	<b>DCGX</b>  Page 34	<b>ENGN</b>  Page 35	<b>RNGA</b>  Page 36	<b>RNGN</b>  Page 36	<b>RPGA</b>  Page 37
<b>RPGN</b>  Page 37	<b>RPGX .. DP</b>  Page 38	<b>RNGX .. DP</b>  Page 38	<b>RBGN</b>  Page 39	<b>RCGN</b>  Page 39	<b>SNGA</b>  Page 40	<b>SNMA</b>  Page 40
<b>SNGN</b>  Page 41	<b>SNGX</b>  Page 42	<b>SNMX</b>  Page 42	<b>SNMX .. RD</b>  Page 42	<b>SCGN</b>  Page 43	<b>SCGX</b>  Page 43	<b>SCGW</b>  Page 43
<b>SPGN</b>  Page 44	<b>TNGA</b>  Page 45	<b>TNGN</b>  Page 46	<b>TCUN</b>  Page 47	<b>TPGN</b>  Page 48	<b>TPUN</b>  Page 48	<b>VNGA</b>  Page 49
<b>VNGN</b>  Page 49	<b>VNGX</b>  Page 50	<b>WNGA</b>  Page 51	<b>WNGX</b>  Page 51	<b>CDH</b>  Page 52	<b>F-Series</b>  Page 53	<b>F-Series</b>  Page 53
<b>F-Series</b>  Page 54	<b>F-Series</b>  Page 54	<b>LNJ</b>  Page 55	<b>SNGN3812R</b>  Page 55	<b>RBGX</b>  Page 56	<b>RCGX</b>  Page 56	<b>RPGX</b>  Page 57

TURNING

RXGX	SYBF	SYBR	SGF	SGR	SSF	SSR
						
Page 57	Page 58	Page 58	Page 59	Page 59	Page 60	Page 60

WFC	WRC	WFP	WRP
			
Page 61	Page 62	Page 63	Page 64

MILLING

HNEN	LNE	OEGB	OPEN	SNCN	SNCN .. ENTN	SNGN .. ING
						
Page 65	Page 65	Page 66	Page 66	Page 67	Page 67	Page 67

SDCN	SDCN .. T	SDCW	SEAN	SEAN .. NW	SEAN .. T	SPCN .. T
						
Page 68	Page 68	Page 68	Page 69	Page 69	Page 69	Page 70

SPCW	SPEN	SPHX	SPKN	SPKN .. SP	TNCN	TEKN
						
Page 70	Page 70	Page 71	Page 71	Page 71	Page 72	Page 72

TPKN	CNGN .. AZ	SNCN .. ZZT	SNCN .. GZ	SNCN .. KZ	SCGN .. WZ	SCGN .. XZ
						
Page 72	Page 73	Page 74	Page 74	Page 74	Page 75	Page 75

SCGN .. ZZ	SCGN .. MZ
	
Page 75	Page 76

SPECIAL

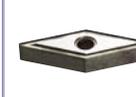
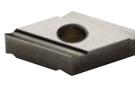
SVW	GvGN	SZT 5810	SNMX	SNGF	INGN	ENDMILL
						
Page 77	Page 77	Page 78	Page 78	Page 79	Page 79	Page 80

# APPLICATION INDEX

CERAMIC

TURNING  
&  
MILLING

T  
U  
R  
N  
I  
N  
G

<b>CNMG .. SF</b>  Page 84	<b>CNMG .. SY</b>  Page 84	<b>CNMG .. SG</b>  Page 84	<b>DNMG .. SF</b>  Page 85	<b>DNMG .. SY</b>  Page 85	<b>DNMG .. SG</b>  Page 85	<b>SNMG .. SF</b>  Page 86
<b>SNMG .. SY</b>  Page 86	<b>SNMG .. SG</b>  Page 86	<b>TNMG .. SY</b>  Page 87	<b>TNMG .. SG</b>  Page 87	<b>VNMG .. SG</b>  Page 87	<b>WNMG .. SY</b>  Page 88	<b>WNMG .. SG</b>  Page 88
<b>CCMT</b>  Page 89	<b>DCGW</b>  Page 89	<b>CPGT</b>  Page 89	<b>SPGT</b>  Page 90	<b>TPGT</b>  Page 90	<b>TPGT .. KC</b>  Page 90	<b>TPGR</b>  Page 91
<b>SPMW</b>  Page 91	<b>DNGG</b>  Page 92	<b>SNGG</b>  Page 92	<b>SNGL</b>  Page 92	<b>TNGG</b>  Page 93	<b>TNGG .. FS</b>  Page 93	<b>TNGG .. F</b>  Page 93
<b>TNMG .. 2G</b>  Page 94	<b>TNMG .. RM</b>  Page 94					

M  
I  
L  
L  
I  
N  
G

<b>SDCN</b>  Page 95	<b>SDKN</b>  Page 95	<b>SDEN</b>  Page 95	<b>SDEW</b>  Page 96	<b>SNK</b>  Page 96	<b>SEHW</b>  Page 96	<b>SEKN</b>  Page 97
<b>SEKN .. R</b>  Page 97	<b>SPKN</b>  Page 97	<b>TEKN</b>  Page 98	<b>TPKN</b>  Page 98	<b>YCE</b>  Page 99	<b>XCET</b>  Page 99	

S  
P  
E  
C  
I  
A  
L

<b>BSN</b>  Page 100	<b>BTN</b>  Page 100	<b>GBF</b>  Page 101	<b>INGN</b>  Page 101	<b>RBAR</b>  Page 102	<b>SBAR</b>  Page 104
---	---	---	--	---	--

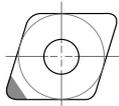
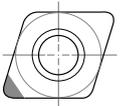
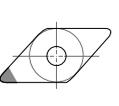
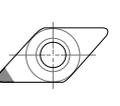
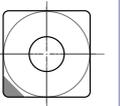
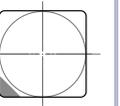
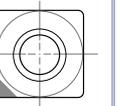
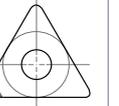
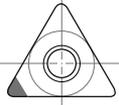
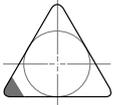
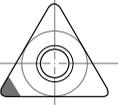
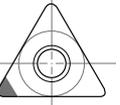
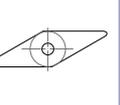
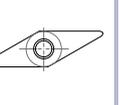
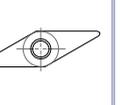
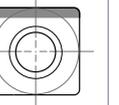
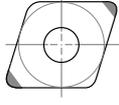
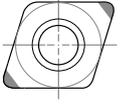
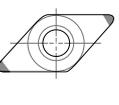
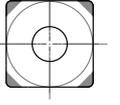
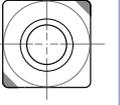
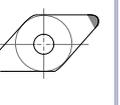
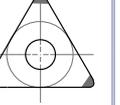
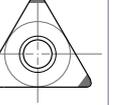
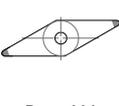
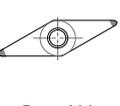
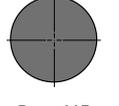
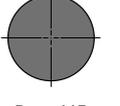
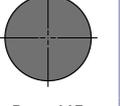
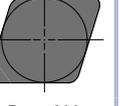
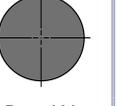
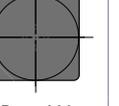
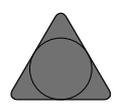
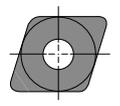
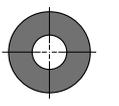
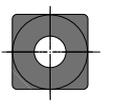
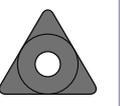
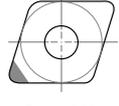
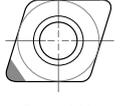
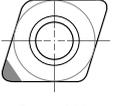
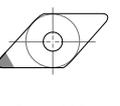
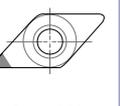
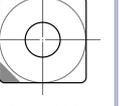
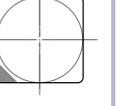
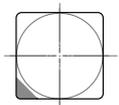
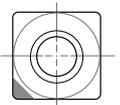
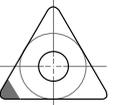
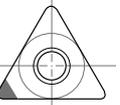
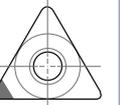
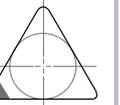
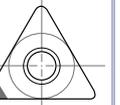
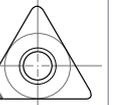
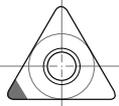
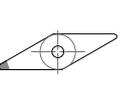
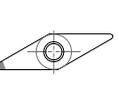
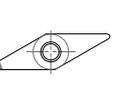
# APPLICATION INDEX

PCBN·PCD

PART.

A

TURNING  
&  
MILLING

PCBN	<b>CNGA</b>	<b>CCGW</b>	<b>DNGA</b>	<b>DCGW</b>	<b>SNGA</b>	<b>SNGN</b>	<b>SCGW</b>	<b>TNGA</b>	
									
	Page 108	Page 108	Page 108	Page 108	Page 109	Page 109	Page 109	Page 109	
	<b>TCGW</b>	<b>TPGN</b>	<b>TPGB</b>	<b>TPGW</b>	<b>VNGA</b>	<b>VBGW</b>	<b>VCGW</b>	<b>SCGW .. FS</b>	
									
	Page 110	Page 110	Page 110	Page 110	Page 111	Page 111	Page 111	Page 111	
	<b>CNGA</b>	<b>CCGW</b>	<b>DCGW</b>	<b>SNGA</b>	<b>SCGW</b>	<b>DNGA</b>	<b>TNGA</b>	<b>TPGW</b>	
									
	Page 112	Page 112	Page 112	Page 112	Page 113	Page 113	Page 113	Page 113	
	<b>VNGA</b>	<b>VBGW</b>	<b>RCGX</b>	<b>RNGN</b>	<b>RPGN</b>	<b>CNGN</b>	<b>RNGN</b>	<b>SNGN</b>	
									
	Page 114	Page 114	Page 115	Page 115	Page 115	Page 116	Page 116	Page 116	
	<b>TNGN</b>	<b>CNGA</b>	<b>RNGA</b>	<b>SNGA</b>	<b>TNGA</b>				
									
	Page 116	Page 117	Page 117	Page 117	Page 117				
	PCD	<b>CNGA</b>	<b>CCGW</b>	<b>CPGW</b>	<b>DNGA</b>	<b>DCGW</b>	<b>SNGA</b>	<b>SNGN</b>	<b>SCGW</b>
									
Page 118		Page 118	Page 118	Page 118	Page 119	Page 119	Page 119	Page 119	
<b>SPGN</b>		<b>SPGW</b>	<b>TNGA</b>	<b>TBGW</b>	<b>TCGW</b>	<b>TPGN</b>	<b>TPGB</b>	<b>TPGW</b>	
									
Page 120		Page 120	Page 120	Page 120	Page 121	Page 121	Page 121	Page 122	
<b>TPGT</b>		<b>VNGA</b>	<b>VBGW</b>	<b>VCGW</b>					
									
Page 122		Page 122	Page 122	Page 123					
SPECIAL		<b>NOTCH BITE</b>	<b>SFE .. 1C</b>	<b>SFE .. 2C</b>	<b>SBE .. 1C</b>	<b>SBE .. 2C</b>			
									
	Page 124	Page 125	Page 125	Page 126	Page 126				

# IDENTIFICATION SYSTEM

ISO  
ASA

**TURNING**

S	N	G	N
S	N	G	N
S	P	K	N
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>

**MILLING**

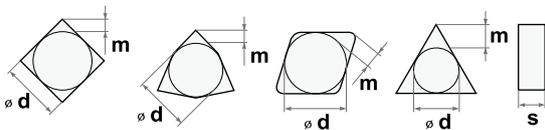
**1 Shape**

C D E H L  
R S T V W

**2 Clearance Angle**

B C D E  
N P O

**3 Tolerance**



\*See tables below

Symbol	d(mm)	m(mm)	s(mm)
A	±0.025	±0.005	±0.025
C	±0.025	±0.013	±0.025
E	±0.025	±0.025	±0.025
F	±0.013	±0.005	±0.025
G	±0.025	±0.025	±0.130
H	±0.013	±0.013	±0.025
J	*	±0.005	±0.025
K	*	±0.013	±0.025
L	*	±0.025	±0.025
M	*	*	±0.127
U	*	*	±0.127
N	*	*	±0.025

IC (mm)	D		C, E, H, O, S, T, R, W			
	d(mm)	m(mm)	d(mm)		m(mm)	
	M, N	M, N	J, K, L, M, N	U	M, N	U
5.56	±0.05	±0.11	±0.05	±0.08	±0.08	±0.13
6.35	±0.05	±0.11	±0.05	±0.08	±0.08	±0.13
7.94	±0.05	±0.11	±0.05	±0.08	±0.08	±0.13
9.52	±0.05	±0.11	±0.05	±0.08	±0.08	±0.13
12.70	±0.08	±0.15	±0.08	±0.13	±0.13	±0.20
15.87	±0.10	±0.18	±0.10	±0.18	±0.15	±0.27
19.05	±0.10	±0.18	±0.10	±0.18	±0.15	±0.27
25.40	-	-	±0.13	±0.25	±0.18	±0.38

**4 Type**

A B C F G H J M  
N Q R T U W X

Special design

12 04 08 E040

4 3 2

4 3 E D T R  
5 6 7 8 9 10 11 12

Diameter of inscribed circle	5 Cutting Edge Length								
	ASA		ISO						
	over 6.35 (IC)	over 5.56 (IC)	R	W	V	D	C	S	T
3.969	-	5	03	02	-	04	03	03	06
4.762	-	6	04	03	-	05	04	04	08
5.556	-	7	05	03	09	06	05	05	09
6.350	2	(8)	06	04	11	07	06	06	11
7.938	-	0	07	05	13	09	08	07	13
9.525	3	-	09	06	16	11	09	09	16
12.700	4	-	12	08	22	15	12	12	22
15.875	5	-	15	10	27	19	16	15	27
19.050	6	-	19	13	33	23	19	19	33
22.225	7	-	22	-	38	27	22	22	38
25.400	8	-	25	-	44	31	25	25	44
31.750	0	-	31	-	54	38	32	31	55

6 Thickness			
Thickness(mm)	ISO	ASA	
		Over 6.35(IC)	Over 5.56(IC)
1.59	01	-	2
2.38	02	-	3
3.18	03	2	4
3.97	T3	-	5
4.76	04	3	6
5.56	05	-	-
6.35	06	4	-
7.94	07	5	-
9.52	09	6	-
12.70	12	8	-

7 Nose-Radius		
(mm)	ISO	ASA
Sharp	00	O
0.2	02	Y
0.4	04	1
0.8	08	2
1.2	12	3
1.6	16	4
2.0	20	5
2.4	24	6
2.8	28	7
3.2	32	8

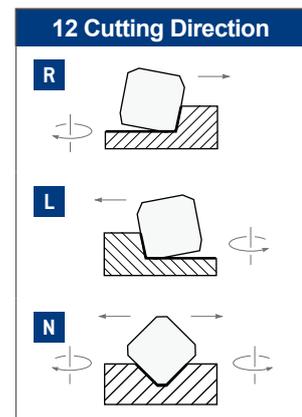
8 Shape and Corner

Detailed edge preparations refer to the next page.

9 Land Angle	
A	45°
D	60°
E	75°
F	85°
P	90°

10 Relief Angle for Land	
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°

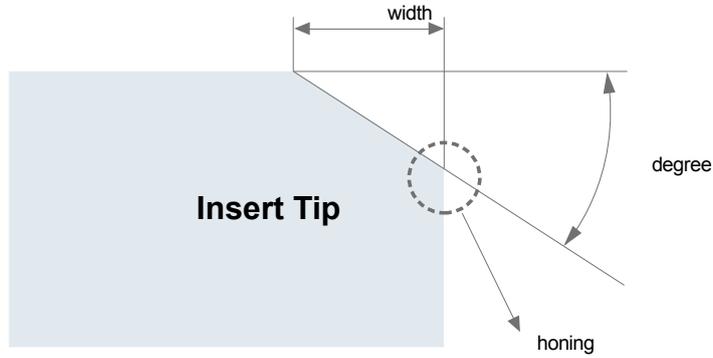
11 Edge	
F	Sharp
E	Honed
T	Chamfered
S	Chamfered + Honed



# IDENTIFICATION SYSTEM

## 8 Chamfer Specification

### 1 Mono chamfer

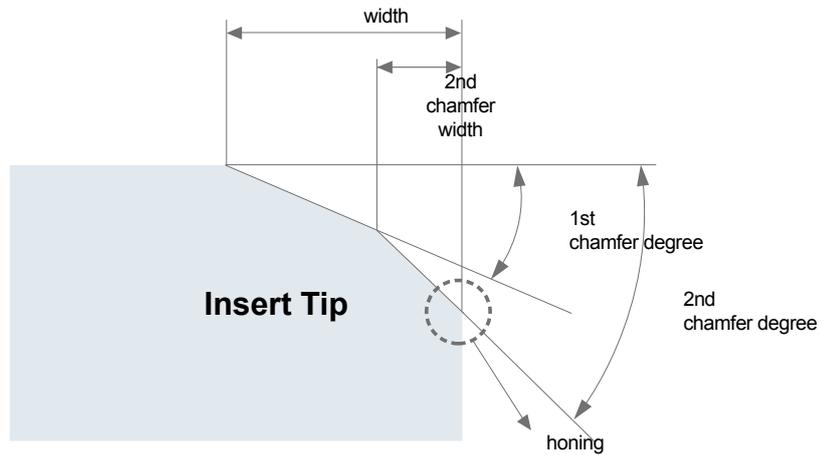


ISO

S N G N 1 2 0 4 0 8 E 0 4 0

Chamfer Degree (°)	Chamfer Width (mm)		Honing (µm)
E : 20	01 : 0.05	10 : 0.50	0 : No Honing
F : 25	02 : 0.10	20 : 1.00	1 : 10
G : 30	03 : 0.15	40 : 2.00	2 : 20
	04 : 0.20		3 : 30

### 2 Double chamfer



ISO

S N G N 1 9 0 7 1 6 X 5 4 2

1st Chamfer Degree (°)	1st Chamfer Width (mm)		2nd Chamfer Width(mm)×Degree		Honing (µm)
W : 10 X : 15	3 : 1.00 4 : 1.20 5 : 1.50 6 : 2.00	A : 0.75 B : 1.25 D : 2.30	3 : 0.20×25 4 : 0.10×30 5 : 0.20×30	A : 0.15×30 B : 0.45×25	0 : No Honing 1 : 10 2 : 20 3 : 30 5 : 50

## CERAMIC INSERT

Union Ceramic Cutting Tool is an inorganic material, die-pressed and sintered using very fine and pure raw materials with fine microstructure.

Since the Union ceramic inserts are prepared by HIP process to condense completely, it has high thermal shock resistance, excellent fracture toughness and distinguished wear resistance through HIP.

## CERMET INSERT

Union Cermet Cutting Tool is a composite between titanium carbide or titanium nitride with carbide-metal binder. Since the toughness of the cermet is higher than that of ceramic and the hardness of the cermet is harder than that of the tungsten carbide, cermet cutting tool shows high wear resistance and excellent surface finish under high speed cutting.

## PCBN/PCD INSERT

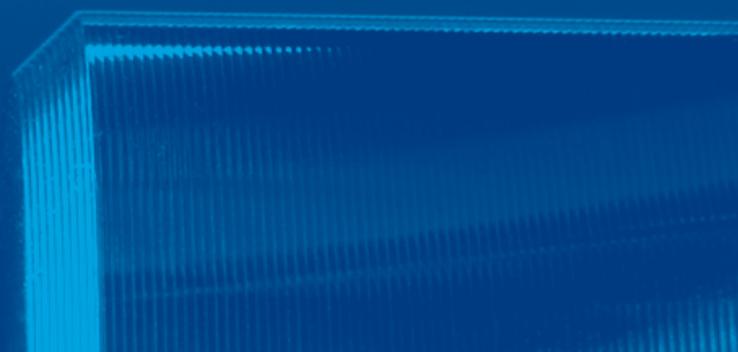
Union PCBN is an ultra hard cutting tool material consisting of polycrystalline cubicboron nitride with metallic or ceramic binder.

It is available both tip brazed and solid PCBN. Primarily used to machine hardened ferrous materials.

Union PCD is an ultra hard cutting tool material consisting of polycrystalline diamond which is tip brazed to a carbide insert according to the various applications.

It is used for non-ferrous material, wood, aluminum and copper alloys at extremely high speed.

# C E R M E T



Turning A 84

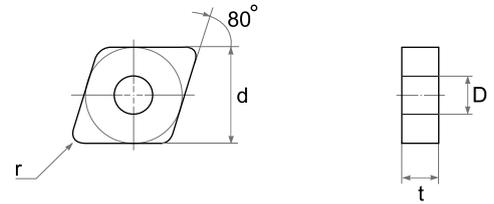
Milling A 95

Special A 100

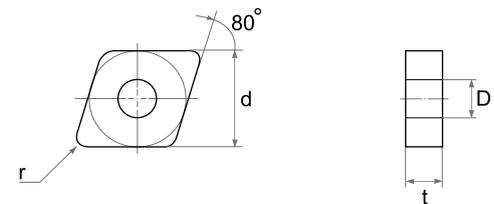


# TURNING INSERT

## CNMG



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>CNMG 120404SF</b>	<b>CNMG 431SF</b>	12.70	4.76	0.4	5.16	•	•	•					
<b>CNMG 120408SF</b>	<b>CNMG 432SF</b>	12.70	4.76	0.8	5.16	•	•	•				•	
<b>CNMG 120412SF</b>	<b>CNMG 433SF</b>	12.70	4.76	1.2	5.16								



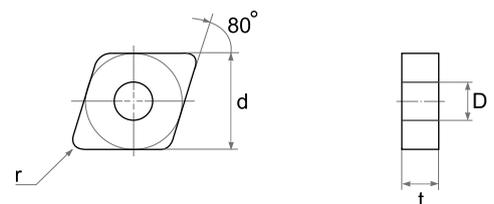
Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>CNMG 120404SY</b>	<b>CNMG 431SY</b>	12.70	4.76	0.4	5.16	•	•	•	•			•	
<b>CNMG 120408SY</b>	<b>CNMG 432SY</b>	12.70	4.76	0.8	5.16		•	•	•			•	
<b>CNMG 120412SY</b>	<b>CNMG 433SY</b>	12.70	4.76	1.2	5.16		•	•				•	

CERAMIC

CERMET

PCBN  
/  
PCD

TOOL  
HOLDER



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>CNMG 120404SG</b>	<b>CNMG 431SG</b>	12.70	4.76	0.4	5.16	•	•	•					
<b>CNMG 120408SG</b>	<b>CNMG 432SG</b>	12.70	4.76	0.8	5.16	•	•	•					
<b>CNMG 120412SG</b>	<b>CNMG 433SG</b>	12.70	4.76	1.2	5.16			•			•		

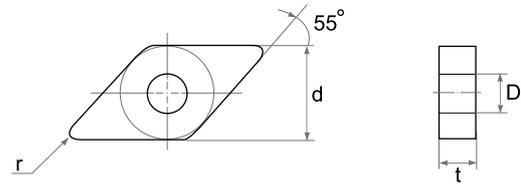
MILLING  
CUTTER

# TURNING INSERT

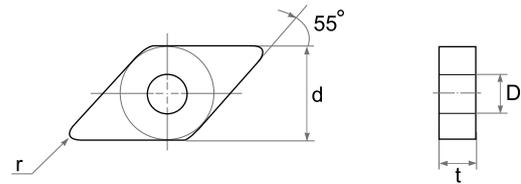
PART.  
**A**

TURNING  
&  
MILLING

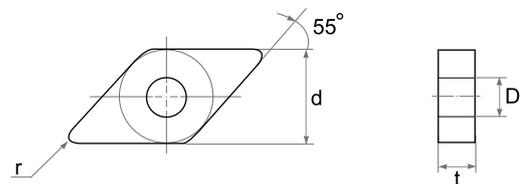
## DNMG



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>DNMG 150404SF</b>	<b>DNMG 431SF</b>	12.70	4.76	0.4	5.16		•	•				•	
<b>DNMG 150408SF</b>	<b>DNMG 432SF</b>	12.70	4.76	0.8	5.16	•	•	•				•	
<b>DNMG 150412SF</b>	<b>DNMG 433SF</b>	12.70	4.76	1.2	5.16		•	•					•
<b>DNMG 150604SF</b>	<b>DNMG 441SF</b>	12.70	6.35	0.4	5.16		•	•					
<b>DNMG 150608SF</b>	<b>DNMG 442SF</b>	12.70	6.35	0.8	5.16		•	•					
<b>DNMG 150612SF</b>	<b>DNMG 443SF</b>	12.70	6.35	1.2	5.16		•						



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>DNMG 150404SY</b>	<b>DNMG 431SY</b>	12.70	4.76	0.4	5.16		•	•				•	
<b>DNMG 150408SY</b>	<b>DNMG 432SY</b>	12.70	4.76	0.8	5.16		•	•				•	
<b>DNMG 150412SY</b>	<b>DNMG 433SY</b>	12.70	4.76	1.2	5.16		•	•					•
<b>DNMG 150604SY</b>	<b>DNMG 441SY</b>	12.70	6.35	0.4	5.16		•	•					
<b>DNMG 150608SY</b>	<b>DNMG 442SY</b>	12.70	6.35	0.8	5.16		•	•					
<b>DNMG 150612SY</b>	<b>DNMG 443SY</b>	12.70	6.35	1.2	5.16		•	•					



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>DNMG 150404SG</b>	<b>DNMG 431SG</b>	12.70	4.76	0.4	5.16		•	•					
<b>DNMG 150408SG</b>	<b>DNMG 432SG</b>	12.70	4.76	0.8	5.16		•	•					
<b>DNMG 150412SG</b>	<b>DNMG 433SG</b>	12.70	4.76	1.2	5.16		•	•					•
<b>DNMG 150604SG</b>	<b>DNMG 441SG</b>	12.70	6.35	0.4	5.16		•	•					
<b>DNMG 150608SG</b>	<b>DNMG 442SG</b>	12.70	6.35	0.8	5.16		•	•					
<b>DNMG 150612SG</b>	<b>DNMG 443SG</b>	12.70	6.35	1.2	5.16		•						

CERAMIC

CERMET

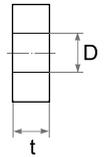
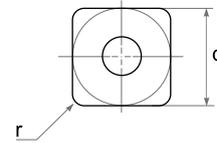
PCBN  
/  
PCD

TOOL  
HOLDER

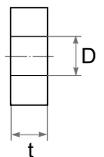
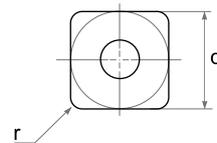
MILLING  
CUTTER

# TURNING INSERT

## SNMG



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>SNMG 120404SF</b>	<b>SNMG 431SF</b>	12.70	4.76	0.4	5.16		•	•					
<b>SNMG 120408SF</b>	<b>SNMG 432SF</b>	12.70	4.76	0.8	5.16		•	•			•		
<b>SNMG 120412SF</b>	<b>SNMG 433SF</b>	12.70	4.76	1.2	5.16		•	•					



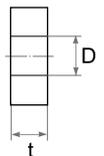
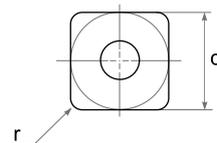
Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>SNMG 120404SY</b>	<b>SNMG 431SY</b>	12.70	4.76	0.4	5.16		•	•	•			•	
<b>SNMG 120408SY</b>	<b>SNMG 432SY</b>	12.70	4.76	0.8	5.16		•	•				•	
<b>SNMG 120412SY</b>	<b>SNMG 433SY</b>	12.70	4.76	1.2	5.16		•	•					

CERAMIC

CERMET

PCBN  
/  
PCD

TOOL  
HOLDER



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>SNMG 120404SG</b>	<b>SNMG 431SG</b>	12.70	4.76	0.4	5.16		•	•					
<b>SNMG 120408SG</b>	<b>SNMG 432SG</b>	12.70	4.76	0.8	5.16		•	•					
<b>SNMG 120412SG</b>	<b>SNMG 433SG</b>	12.70	4.76	1.2	5.16		•	•					

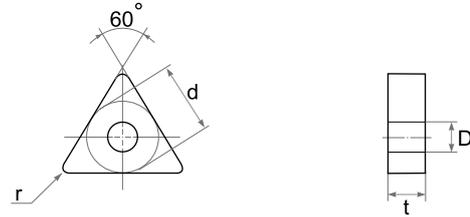
MILLING  
CUTTER

# TURNING INSERT

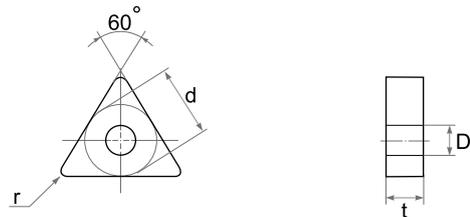
PART.  
**A**

TURNING  
&  
MILLING

## TNMG



Type		Dimensions [mm]				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>TNMG 160404SY</b>	<b>TNMG 331SY</b>	9.52	4.76	0.4	3.81		•	•					
<b>TNMG 160408SY</b>	<b>TNMG 332SY</b>	9.52	4.76	0.8	3.81								
<b>TNMG 160412SY</b>	<b>TNMG 333SY</b>	9.52	4.76	1.2	3.81		•	•					

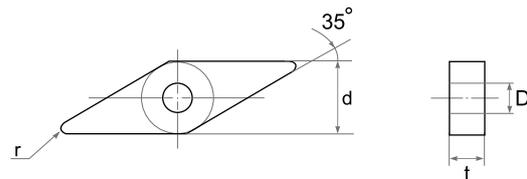


Type		Dimensions [mm]				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>TNMG 160404SG</b>	<b>TNMG 331SG</b>	9.52	4.76	0.4	3.81		•	•					
<b>TNMG 160408SG</b>	<b>TNMG 332SG</b>	9.52	4.76	0.8	3.81		•	•					
<b>TNMG 160412SG</b>	<b>TNMG 333SG</b>	9.52	4.76	1.2	3.81		•	•					

CERAMIC

CERMET

## VNMG



Type		Dimensions [mm]				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>VNMG 160404SG</b>	<b>VNMG 331SG</b>	9.52	4.76	0.4	3.81		•	•			•	•	
<b>VNMG 160408SG</b>	<b>VNMG 332SG</b>	9.52	4.76	0.8	3.81		•	•				•	

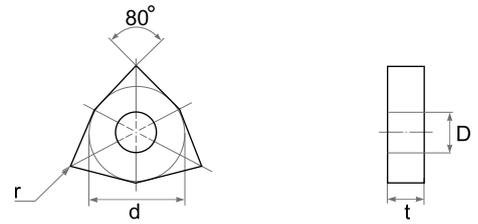
PCBN  
/  
PCD

TOOL  
HOLDER

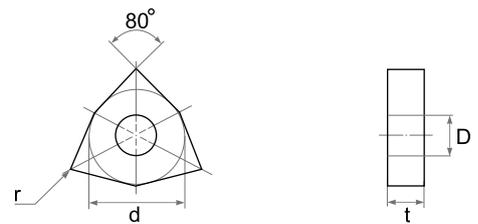
MILLING  
CUTTER

# TURNING INSERT

## WNMG



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>WNMG 080404SY</b>	<b>WNMG 431SY</b>	12.70	4.76	0.4	5.16		•	•			•	•	
<b>WNMG 080408SY</b>	<b>WNMG 432SY</b>	12.70	4.76	0.8	5.16		•	•			•	•	



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>WNMG 080404SG</b>	<b>WNMG 431SG</b>	12.70	4.76	0.4	5.16		•	•			•		
<b>WNMG 080408SG</b>	<b>WNMG 432SG</b>	12.70	4.76	0.8	5.16		•	•					
<b>WNMG 080412SG</b>	<b>WNMG 433SG</b>	12.70	4.76	1.2	5.16		•	•					

CERAMIC

CERMET

PCBN  
/  
PCD

TOOL  
HOLDER

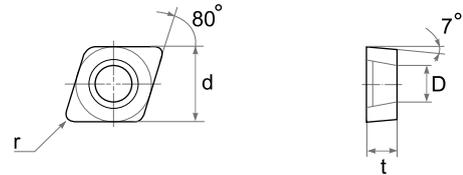
MILLING  
CUTTER

# TURNING INSERT

PART.  
**A**

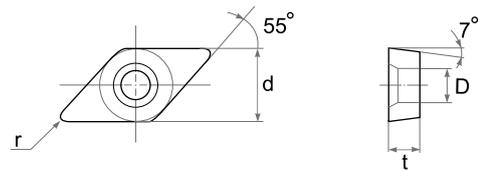
TURNING  
&  
MILLING

## CCMT



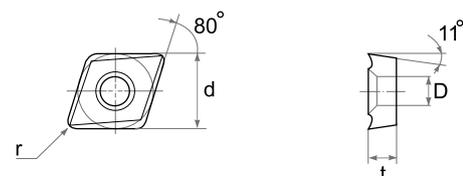
Type	Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)				
	ISO	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>CCMT 09T304</b>	9.52	3.97	0.4	4.40	•	•	•				•		
<b>CCMT 09T308</b>	9.52	3.97	0.8	4.40	•	•	•						

## DCGW



Type	Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)				
	ISO	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>DCGW 090304</b>	8.50	3.18	0.4	3.60			•						
<b>DCGW 11T304</b>	9.52	3.97	0.4	4.40			•						

## CPGT



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>CPGT 090304</b>	<b>CPGT 321</b>	9.52	3.18	0.4	4.50	•	•	•					
<b>CPGT 090308</b>	<b>CPGT 322</b>	9.52	3.18	0.8	4.50	•	•	•					

CERAMIC

CERMET

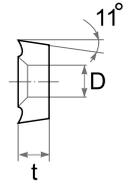
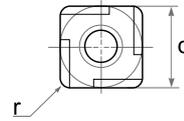
PCBN  
/  
PCD

TOOL  
HOLDER

MILLING  
CUTTER

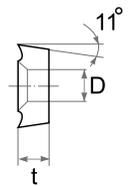
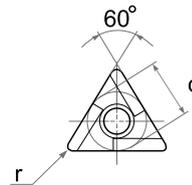
# TURNING INSERT

## SPGT



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
SPGT 090304R/L	SPGT 321R/L	9.52	3.18	0.4	3.40	•	•						
SPGT 090308R/L	SPGT 322R/L	9.52	3.18	0.8	3.40	•	•						

## TPGT



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
TPGT 110302R/L	TPGT 2205R/L	6.35	3.18	0.2	3.56	•	•	•					
TPGT 110304R/L	TPGT 221R/L	6.35	3.18	0.4	3.56	•	•	•					
TPGT 110308R/L	TPGT 222R/L	6.35	3.18	0.8	3.56	•	•						
TPGT 160304R/L	TPGT 321R/L	9.52	3.18	0.4	4.46	•	•	•					
TPGT 160308R/L	TPGT 322R/L	9.52	3.18	0.8	4.46	•	•	•					
TPGT 160404R/L	TPGT 331R/L	9.52	4.76	0.4	4.40	•	•	•					
TPGT 160408R/L	TPGT 332R/L	9.52	4.76	0.8	4.40	•	•	•					

CERAMIC

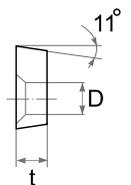
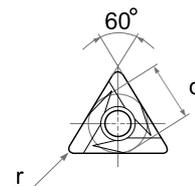
CERMET

PCBN  
/  
PCD

TOOL  
HOLDER

MILLING  
CUTTER

## TPGT .. KC

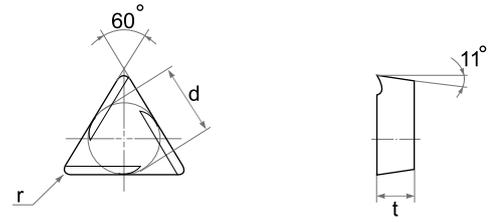


Type	Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
TPGT 110304KC	6.35	3.18	0.4	3.56			•					

# TURNING INSERT

PART.  
**A**

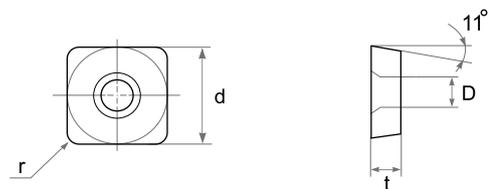
## TPGR



TURNING  
&  
MILLING

Type	Dimensions (mm)			Cermet (TiCN)				Cermet (PVD)				
	ISO	d	t	r	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
TPGR 110302R/L	6.35	3.18	0.2		•							
TPGR 110304R/L	6.35	3.18	0.4		•							
TPGR 110308R/L	6.35	3.18	0.8									
TPGR 160302R/L	9.52	3.18	0.2		•							
TPGR 160304R/L	9.52	3.18	0.4		•		•					
TPGR 160308R/L	9.52	3.18	0.8		•							
TPGR 220404K-R/L	12.70	4.76	0.4		•		•					
TPGR 220408K-R/L	12.70	4.76	0.8		•							
TPGR 220412K-R/L	12.70	4.76	1.2		•							

## SPMW



Type	Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)				
	ISO	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
SPMW 090304HS	9.52	3.18	0.4	3.4		•	•						
SPMW 090308HS	9.52	3.18	0.8	3.4		•	•						
SPMW 090304HL	9.52	3.18	0.4	4.6		•	•						
SPMW 090308HL	9.52	3.18	0.8	4.6		•	•						

CERAMIC

CERMET

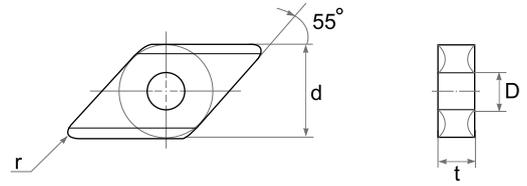
PCBN  
/  
PCD

TOOL  
HOLDER

MILLING  
CUTTER

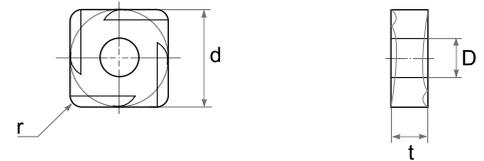
# TURNING INSERT

## DNGG



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>DNGG 150404R/L</b>	<b>DNGG 431R/L</b>	12.70	4.76	0.4	5.16		•	•				•	
<b>DNGG 150408R/L</b>	<b>DNGG 432R/L</b>	12.70	4.76	0.8	5.16		•	•					
<b>DNGG 150604R/L</b>	<b>DNGG 441R/L</b>	12.70	6.35	0.4	5.16		•	•					
<b>DNGG 150608R/L</b>	<b>DNGG 442R/L</b>	12.70	6.35	0.8	5.16		•	•					

## SNGG



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>SNGG 120404R/L</b>	<b>SNGG 431R/L</b>	12.70	4.76	0.4	5.16		•	•					
<b>SNGG 120408R/L</b>	<b>SNGG 432R/L</b>	12.70	4.76	0.8	5.16		•	•					
<b>SNGG 120412R/L</b>	<b>SNGG 433R/L</b>	12.70	4.76	1.2	5.16								

CERAMIC

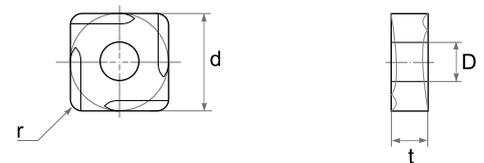
CERMET

PCBN  
/  
PCD

TOOL  
HOLDER

MILLING  
CUTTER

## SNGL



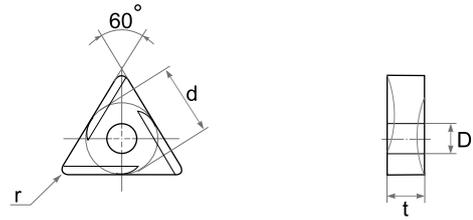
Type		Dimensions (mm)			Cermet (TiCN)				Cermet (PVD)			
ISO		d	t	r	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>SNGL 070204R/L</b>		7.14	2.38	0.4	•							

# TURNING INSERT

PART.  
**A**

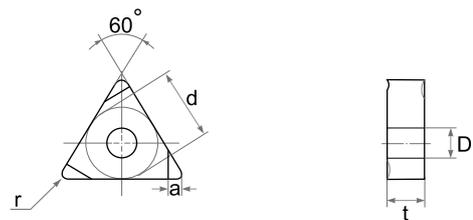
TURNING  
&  
MILLING

## TNGG



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
TNGG 160402R/L	TNGG 3302R/L	9.52	4.76	0.2	3.81		●	●	●				
TNGG 160404R/L	TNGG 331R/L	9.52	4.76	0.4	3.81	●	●	●	●				
TNGG 160408R/L	TNGG 332R/L	9.52	4.76	0.8	3.81	●	●	●					
TNGG 220404R/L	TNGG 431R/L	12.70	4.76	0.4	5.16		●	●					
TNGG 220408R/L	TNGG 432R/L	12.70	4.76	0.8	5.16		●	●					

## TNGG .. FS

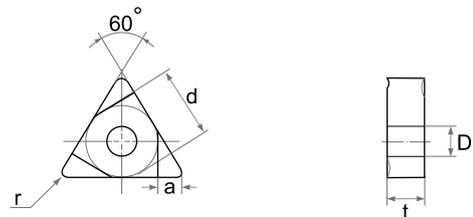


Type	Dimensions (mm)					Cermet (TiCN)				Cermet (PVD)			
ISO	d	t	r	D	a	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
TNGG 160402R/L-FS	9.52	4.76	0.2	3.81	1.28		●	●					
TNGG 160404R/L-FS	9.52	4.76	0.4	3.81	1.28		●	●				●	
TNGG 160408R/L-FS	9.52	4.76	0.8	3.81	1.28		●	●					

CERAMIC

CERMET

## TNGG .. F



Type	Dimensions (mm)					Cermet (TiCN)				Cermet (PVD)			
ISO	d	t	r	D	a	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
TNGG 160402R/L-F	9.52	4.76	0.2	3.81	2.50		●	●					
TNGG 160404R/L-F	9.52	4.76	0.4	3.81	2.50		●	●				●	
TNGG 160408R/L-F	9.52	4.76	0.8	3.81	2.50		●	●					

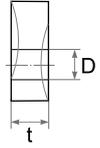
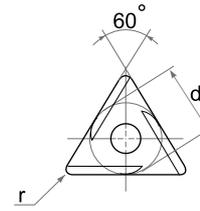
PCBN  
/  
PCD

TOOL  
HOLDER

MILLING  
CUTTER

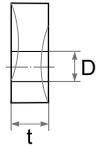
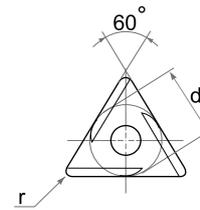
## TURNING INSERT

### TNMG .. 2G



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>TNMG 160404R/L 2G</b>	<b>TNMG 331R/L 2G</b>	9.52	4.76	0.4	3.81	•	•	•	•			•	
<b>TNMG 160408R/L 2G</b>	<b>TNMG 332R/L 2G</b>	9.52	4.76	0.8	3.81		•	•				•	

### TNMG .. RM



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>TNMG 160404 RM</b>	<b>TNMG 331 RM</b>	9.52	4.76	0.4	3.81		•	•					

CERAMIC

CERMET

PCBN  
/  
PCD

TOOL  
HOLDER

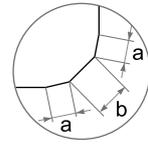
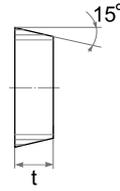
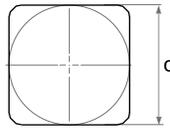
MILLING  
CUTTER

# MILLING INSERT

PART.  
**A**

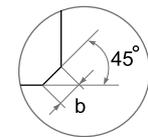
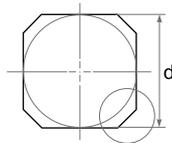
TURNING  
&  
MILLING

## SDCN



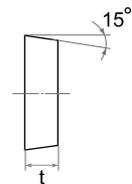
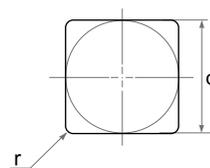
Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	a	b	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>SDCN 1203MT</b>	<b>SDCN 42MT</b>	12.70	3.18	0.50	1.40			•	•				
<b>SDCN 1504MT</b>	<b>SDCN 53MT</b>	15.87	4.76	0.50	1.40				•				

## SDKN



Type		Dimensions (mm)			Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	r	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>SDKN 1203AETN</b>	<b>SDKN 42AETN</b>	12.70	3.18	2.00			•	•				
<b>SDKN 1504AETN</b>	<b>SDKN 53AETN</b>	15.87	4.76	2.00			•	•				

## SDEN



Type	Dimensions (mm)			Cermet (TiCN)				Cermet (PVD)			
ISO	d	t	r	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>SDEN 150404FN</b>	15.87	4.76	0.4			•	•				

CERAMIC

CERMET

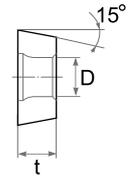
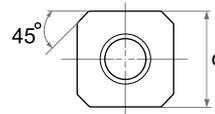
PCBN  
/  
PCD

TOOL  
HOLDER

MILLING  
CUTTER

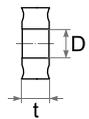
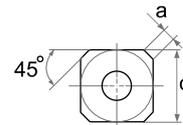
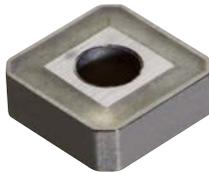
# MILLING INSERT

## SDEW



Type		Dimensions (mm)			Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>SDEW 1204AZT</b>	<b>SDEW 43AZT</b>	12.70	4.76	5.20			○	●				

## SNK

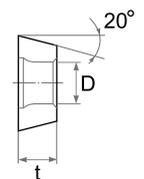
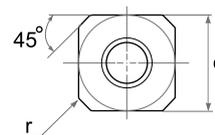


Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	D	a	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>SNK 0903AEN</b>	<b>SNK 32AEN</b>	9.52	3.18	3.81	1.40		●						

CERAMIC

CERMET

## SEHW



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	D	r	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>SEHW 120408AE</b>	<b>SEHW 432AE</b>	12.70	4.76	5.50	0.8				●				●

PCBN  
/  
PCD

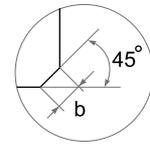
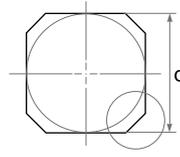
TOOL  
HOLDER

MILLING  
CUTTER

# MILLING INSERT

PART.  
**A**

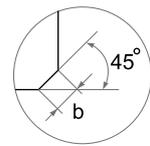
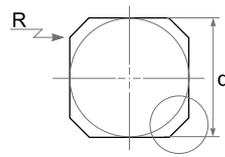
## SEKN



TURNING  
&  
MILLING

Type		Dimensions (mm)			Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	b	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
SEKN 1203 AFTN	SEKN 42 AFTN	12.70	3.18	2.00		•	•	•				•
SEKN 1504 AFTN	SEKN 53 AFTN	15.87	4.76	2.00			•	•				•

## SEKN .. R

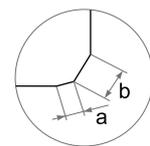
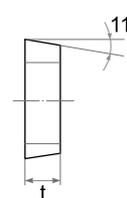
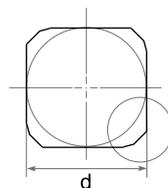


Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	b	R	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
SEKN 120308 AFTN	SEKN 432 AFTN	12.70	3.18	2.00	0.8			•	•				
SEKN 150408 AFTN	SEKN 532 AFTN	15.87	4.76	2.00	0.8								

CERAMIC

CERMET

## SPKN



PCBN  
/  
PCD

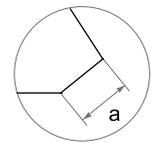
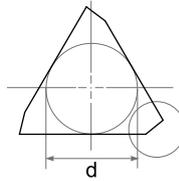
TOOL  
HOLDER

Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	a	b	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
SPKN 1203EDTR/L	SPKN 42EDTR/L	12.70	3.18	1.00	1.40			•	•				
SPKN 1504EDTR/L	SPKN 53EDTR/L	15.87	4.76	1.00	1.40			•	•				

MILLING  
CUTTER

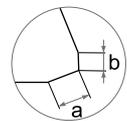
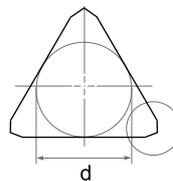
# MILLING INSERT

## TEKN



Type		Dimensions (mm)			Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	a	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
TEKN 1603PETR/L	TEKN 32PETR/L	9.52	3.18	1.40			○	●				
TEKN 2204PETR/L	TEKN 43PETR/L	12.70	4.76	2.00			○	●				
TEKN 1603PEER/L	TEKN 32PEER/L	9.52	3.18	1.40			○	●				
TEKN 2204PEER/L	TEKN 43PEER/L	12.70	4.76	2.00			○	●				

## TPKN



Type		Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	ASA	d	t	a	b	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
TPKN 1603PDTR/L	TPKN 32PDTR/L	9.52	3.18	1.20	1.00			●	●				
TPKN 2204PDTR/L	TPKN 43PDTR/L	12.70	4.76	1.40	0.70			●	●				

CERAMIC

CERMET

PCBN  
/  
PCD

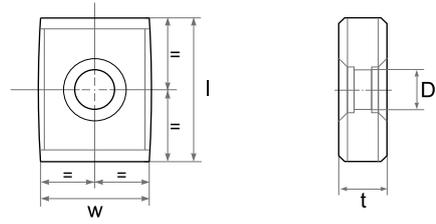
TOOL  
HOLDER

MILLING  
CUTTER

# MILLING INSERT

PART.  
**A**

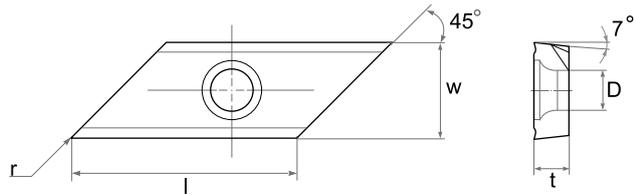
## YCE



Type	Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)				
	ISO	l	w	t	D	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>YCE 434-01</b>	19.05	14.29	6.35	5.25		•	•						

TURNING  
&  
MILLING

## XCET



Type	Dimensions (mm)					Cermet (TiCN)				Cermet (PVD)			
	ISO	l	w	t	D	r	TX510	TX515	TX520	TX530	TX910	TX915	TX920
<b>XCET 310404 ER</b>	22.00	12.70	4.50	5.60	0.4			•				•	
<b>XCET 310408 ER</b>	22.00	12.70	4.50	5.60	0.8			•					

CERAMIC

CERMET

PCBN  
/  
PCD

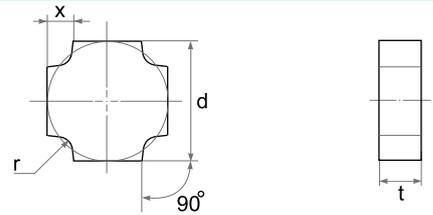
TOOL  
HOLDER

MILLING  
CUTTER

# SPECIAL INSERT

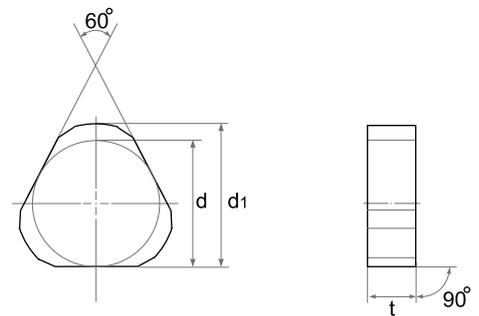
TURNING  
&  
MILLING

## BSN



Type	Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)			
ISO	d	x	t	r	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>BSN 090306</b>	9.52	2.00	3.18	0.6			•					
<b>BSN 090310</b>	9.52	2.57	3.18	1.0			•					
<b>BSN 120406</b>	12.70	2.14	4.76	0.6			•					
<b>BSN 120410</b>	12.70	2.40	4.76	1.0			•					
<b>BSN 120415</b>	12.70	3.00	4.76	1.5	•		•					
<b>BSN 120420</b>	12.70	3.45	4.76	2.0			•					
<b>BSN 150525</b>	15.87	4.00	5.56	2.5			•					
<b>BSN 150530</b>	15.87	4.70	5.56	3.0			•					

## BTN



Type	Dimensions (mm)			Cermet (TiCN)				Cermet (PVD)			
ISO	d	d <sub>1</sub>	t	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>BTN 1464</b>	12.70	14.60	4.76			•					
<b>BTN 1714</b>	15.87	17.10	4.76	•	•	•					
<b>BTN 2116</b>	19.05	21.10	6.00			•					
<b>BTN 2416</b>	22.22	24.10	6.00			•					
<b>BTN 2718</b>	25.40	27.10	8.80			•					

CERAMIC

CERMET

PCBN  
/  
PCD

TOOL  
HOLDER

MILLING  
CUTTER

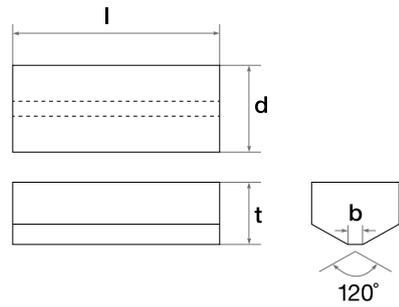
# SPECIAL INSERT

PART.

A

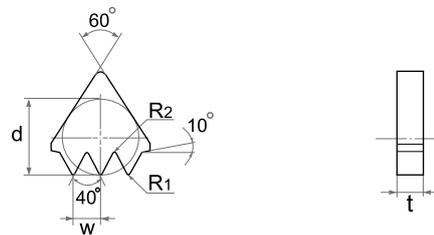
TURNING  
&  
MILLING

## GBF



Type	Dimensions (mm)				Cermet (TiCN)				Cermet (PVD)				
	ISO	d	l	t	b	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>GBF 127250 B</b>	12.70	25.00	8.00	2.3			•						
<b>GBF 150250 B</b>	15.00	25.00	9.50	2.3			•						
<b>GBF 200300 B</b>	20.00	30.00	9.50	2.5			•						

## INGN



Type	Dimensions (mm)					Cermet (TiCN)				Cermet (PVD)				
	ISO	d	t	w	R <sub>1</sub>	R <sub>2</sub>	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
<b>INGN 160435 F303</b>	9.52	4.76	3.56	0.5	0.3			•						
<b>INGN 160435 F304</b>	9.52	4.76	3.56	0.5	0.4			•				•		
<b>INGN 220435 F403</b>	12.70	4.76	3.56	0.5	0.3									
<b>INGN 220435 F404</b>	12.70	4.76	3.56	0.5	0.4									

CERAMIC

CERMET

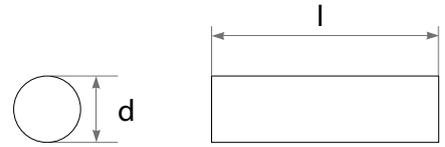
PCBN  
/  
PCD

TOOL  
HOLDER

MILLING  
CUTTER

# BLANK

## RBAR



Type	Dimensions (mm)		Cermet (TiCN)				Cermet (PVD)				
	ISO	d	l	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
RBAR 2230 B		30.8	22.8				•				
RBAR 2507 B		7.8	25.8				•				
RBAR 2508 B		8.8	25.8				•				
RBAR 2509 B		9.8	25.8				•				
RBAR 2510 B		10.8	25.8				•				
RBAR 2511 B		11.8	25.8				•				
RBAR 2512 B		12.8	25.8				•				
RBAR 2513 B		13.8	25.8				•				
RBAR 2514 B		14.8	25.8				•				
RBAR 2515 B		15.8	25.8				•				
RBAR 2516 B		16.8	25.8				•				
RBAR 2517 B		17.8	25.8				•				
RBAR 2518 B		18.8	25.8				•				
RBAR 2519 B		19.8	25.8				•				
RBAR 2520 B		20.8	25.8				•				
RBAR 2521 B		21.8	25.8				•				
RBAR 2525 B		25.8	25.8				•				
RBAR 2530 B		30.8	25.8				•				
RBAR 2535 B		35.8	25.8				•				
RBAR 2640 B		40.8	26.8				•				
RBAR 2950 B		50.8	29.8				•				
RBAR 3007 B		7.8	30.8				•				
RBAR 3008 B		8.8	30.8				•				
RBAR 3009 B		9.8	30.8				•				
RBAR 3010 B		10.8	30.8				•				
RBAR 3011 B		11.8	30.8				•				
RBAR 3012 B		12.8	30.8				•				
RBAR 3013 B		13.8	30.8				•				
RBAR 3014 B		14.8	30.8				•				
RBAR 3016 B		16.8	30.8				•				
RBAR 3017 B		17.8	30.8				•				
RBAR 3018 B		18.8	30.8				•				
RBAR 3019 B		19.8	30.8				•				
RBAR 3025 B		25.8	30.8				•				
RBAR 3040 B		40.8	30.8				•				
RBAR 3045 B		45.8	30.8				•				
RBAR 3050 B		50.8	30.8				•				
RBAR 3507 B		7.8	35.8				•				

CERAMIC

CERMET

PCBN  
/  
PCD

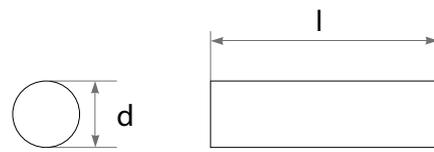
TOOL  
HOLDER

MILLING  
CUTTER

# BLANK

PART.  
**A**

## RBAR



TURNING  
&  
MILLING

Type	Dimensions [mm]		Cermet (TiCN)				Cermet (PVD)				
	ISO	d	l	TX510	TX515	TX520	TX530	TX910	TX915	TX920	TX930
RBAR 3508 B		8.8	35.8				•				
RBAR 3509 B		9.8	35.8				•				
RBAR 3510 B		10.8	35.8				•				
RBAR 3511 B		11.8	35.8				•				
RBAR 3512 B		12.8	35.8				•				
RBAR 3513 B		13.8	35.8				•				
RBAR 3514 B		14.8	35.8				•				
RBAR 3515 B		15.8	35.8				•				
RBAR 3516 B		16.8	35.8				•				
RBAR 3517 B		17.8	35.8				•				
RBAR 3518 B		18.8	35.8				•				
RBAR 3519 B		19.8	35.8				•				
RBAR 3520 B		20.8	35.8				•				
RBAR 3521 B		21.8	35.8				•				
RBAR 3523 B		23.8	35.8				•				
RBAR 3525 B		25.8	35.8				•				
RBAR 3526 B		26.8	35.8				•				
RBAR 3530 B		30.8	35.8				•				
RBAR 3535 B		35.8	35.8				•				
RBAR 3540 B		40.8	35.8				•				
RBAR 3550 B		50.8	35.8				•				
RBAR 3555 B		55.8	35.8				•				
RBAR 3560 B		60.8	35.8				•				
RBAR 3565 B		65.8	35.8				•				
RBAR 3570 B		70.8	35.8				•				
RBAR 4030 B		30.8	40.8				•				
RBAR 4042 B		42.8	40.8				•				
RBAR 4045 B		45.8	40.8				•				
RBAR 4050 B		50.8	40.8				•				
RBAR 4060 B		60.8	40.8				•				
RBAR 4070 B		70.8	40.8				•				
RBAR 4080 B		80.8	40.8				•				
RBAR 4090 B		90.8	40.8				•				
RBAR 5055 B		55.8	50.8				•				
RBAR 5060 B		60.8	50.8				•				

CERAMIC

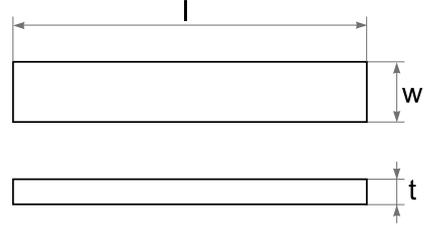
CERMET

PCBN  
/  
PCD

TOOL  
HOLDER

MILLING  
CUTTER

**SBAR**



Type	Dimensions (mm)			Cermet (TiCN)				Cermet (PVD)				
	ISO	l	w	t	TX510	TX510	TX510	TX510	TX910	TX915	TX920	TX930
SBAR 040825	26.11	8.89	5.30			•						
SBAR 041608	16.67	4.75	8.10			•						
SBAR 050518	18.01	5.15	5.00			•						
SBAR 050620	22.35	4.95	6.30			•						
SBAR 056440	47.31	6.78	5.50			•						
SBAR 060331	34.75	5.94	6.35			•						
SBAR 121985	19.10	12.67	8.50			•						
SBAR 122025	25.50	1.40	2.20			•						
SBAR 122525	25.50	1.40	2.70			•						
SBAR 1295632	12.90	5.60	3.20			•						
SBAR 151985	19.10	15.30	8.50			•						
SBAR 163025	29.82	3.47	1.60			•						
SBAR 163315	15.62	3.41	1.60			•						
SBAR 163815	16.67	4.75	1.60			•						
SBAR 173815	15.06	3.69	1.70			•						
SBAR 203530	29.59	3.44	2.00			•						
SBAR 204035	34.53	3.94	2.00			•						
SBAR 704035	34.78	3.97	7.00			•						
SBAR 224816	16.67	4.72	2.20			•						
SBAR 255022	22.18	4.92	2.50			•						
SBAR 256035	34.49	5.89	2.50			•						
SBAR 306035	34.75	6.00	3.00			•						
SBAR 324850	3.60	5.10	50.00			•						
SBAR 326650	3.60	7.00	50.00			•						
SBAR 345022	22.35	4.95	3.40			•						
SBAR 327025	24.44	7.09	3.35			•						
SBAR 325075	71.94	14.39	3.20			•						
SBAR 327050	50.00	7.00	3.20			•						
SBAR 368950	50.40	8.92	3.60			•						
SBAR 328550	50.03	8.85	3.20			•						
SBAR 607050	50.40	8.92	6.50			•						
SBAR 638232	32.72	8.99	6.30			•						
SBAR 202525	25.40	2.70	2.20			•						
SBAR 224035	34.53	3.94	2.20			•						
SBAR 368232	32.72	8.99	3.60			•						

CERAMIC

CERMET

PCBN  
/  
PCD

TOOL  
HOLDER

MILLING  
CUTTER