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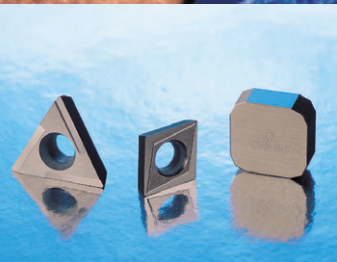
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KORLOY[®]

CUTTING TOOLS

The Cutting Tool Pioneer

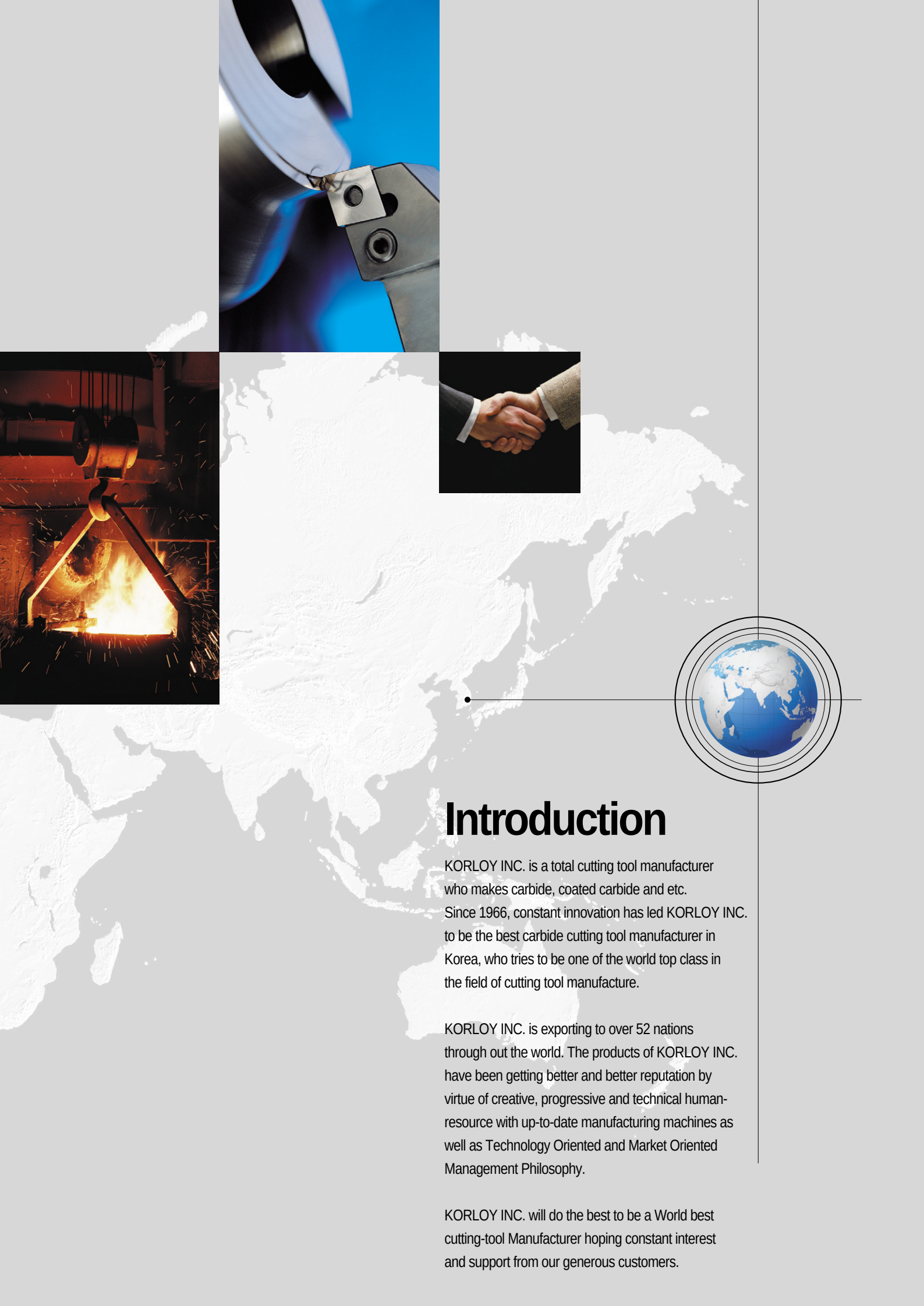
We Create, You Feel



40 years' Challenge has made New-Road. Another 40 years will Create New-Beginning.

As a cutting tool manufacturer pursuing Leading-company of world market,
Ceaseless challenge and creative mind will make the future of KORLOY Inc.





Introduction

KORLOY INC. is a total cutting tool manufacturer who makes carbide, coated carbide and etc. Since 1966, constant innovation has led KORLOY INC. to be the best carbide cutting tool manufacturer in Korea, who tries to be one of the world top class in the field of cutting tool manufacture.

KORLOY INC. is exporting to over 52 nations through out the world. The products of KORLOY INC. have been getting better and better reputation by virtue of creative, progressive and technical human-resource with up-to-date manufacturing machines as well as Technology Oriented and Market Oriented Management Philosophy.

KORLOY INC. will do the best to be a World best cutting-tool Manufacturer hoping constant interest and support from our generous customers.

Turning

Work piece	P						M				K					Hardened Material	
Cutting Condition	High Speed		Medium Speed	Low Speed	Intermittent & Heavy Duty		High Speed	Medium Speed	Low Speed	High Speed	Medium Speed	Low Speed		Low Speed			
ISO	P01	P10	P20	P30	P40	P50	M10	M20	M30	M40	K01	K10	K20	K30	K40		
Coated Carbide	NC310		NEW				NC9020		NEW		NC305K						
	NC3015		NEW				NC330		NEW		NC315K						
	NC3020						PC9030				PC205K						
			NC330														
			PC230														
Cermet	CN100		NEW								CN100		NEW				
	CT10																
	CN200																
C.B.N											KB350					KB320	
											KB360					KB330 KB420	
Carbide	ST05							U10			H02						
	ST10							U20			H01						
	ST15																
	ST20																
	MA2																
	ST30A		ST40					U40									
					ST46 ST45												

Milling

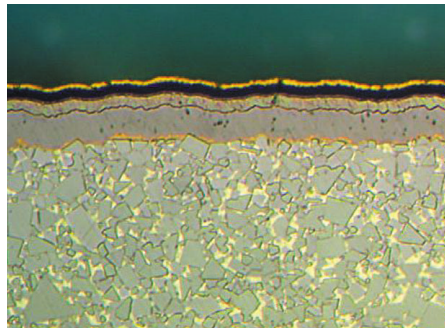
Coated Carbide	NCM325	NCM335	PC3530	PC230			NCM325	NCM335	PC230	PC9530	NCM310K	NCM320K	PC205K	PC215K		
Cermet	CN20	CN30														
C.B.N											KB360					KB350
Carbide	ST20	MA2	ST30A	ST30N	ST40		U10	U20	U40		H01	H05	H10	G10		

Drilling & Endmilling

Coated Carbide	PC210F	PC220F					PC210F	PC220F			PC210F	PC220F				PC210F
Un-Coated Ultra-fine Carbide	FS1	FCC	FA1				FS1	FA1			FS1	FA1				

Special Features

- 1) Having superior wear resistance and toughness at the same time due to special crystalline structure of film.
- 2) High bonding strength between film and substrate by adopting new-coating technology.



TiN Reduce Friction-force
Al₂O₃ Wear Resistance, Prevent Build-up-edge
TiC Wear Resistance
TiCN Enhancing Wear-resistance and Toughness by adopting New-Coating Tech.

Cross-sectional view of CVD coating film

Guide of Grade Selection

Turning

Work-piece	Cutting condition	1 st Recommend Grade	Cutting speed		ISO	Application Range
			(m/min)	(sfm)		
Steel	Continuous cutting	NC310	280(220 ~ 350)	920(730 ~ 1,150)	P01	
		NC3015	250(200 ~ 320)	820(660 ~ 1,050)	P10	
		NC3020	220(180 ~ 300)	730(600 ~ 990)	P20	
	Intermittent cutting	NC3020	180(150 ~ 200)	590(500 ~ 660)	P30	
		NC330	150(120 ~ 200)	500(400 ~ 660)	P40	
Cast Iron	Continuous cutting	NC305K	250(150 ~ 300)	820(500 ~ 990)	K01	
		NC315K	220(150 ~ 270)	730(500 ~ 890)	K10	
	Intermittent cutting	NC315K	200(150 ~ 250)	660(500 ~ 820)	K20	
					K30	
Stainless steel	Continuous cutting	NC9020	170(180 ~ 220)	560(600 ~ 730)	M01	
	Intermittent cutting	NC330	100(80 ~ 120)	330(270 ~ 400)	M10	
					M20	
					M30	

Milling

Work-piece	1 st Recommend Grade	Cutting speed		ISO	Application Range
		(m/min)	(sfm)		
Steel	NCM325	250(150 ~ 300)	820(500 ~ 990)	P20 M20	
	NCM335	200(150 ~ 250)	660(500 ~ 820)	P30 M30	
				P40 M40	
Cast Iron	NCM310K	250(200 ~ 300)	820(600 ~ 990)	K10	
	NCM320K	200(150 ~ 250)	600(500 ~ 820)	K20	
				K30	

Special Features

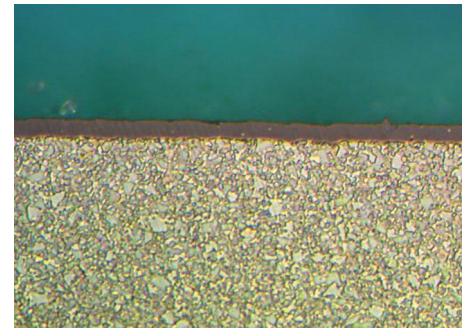
- 1) PVD coating technique has inherent advantage such as superior chipping resistance of coated film itself and maintain the toughness of carbide substrate. Thus it is possible to increase the tool life approximately 2~4times longer than carbide cutting tools.
- 2) PVD coating can make sharp cutting edge without blunting of sharp substrate.
- 3) Ti-base coating film can provide excellent surface finish and high accuracy machining due to the low affinity of Ti film and work piece.

KORLOY PVD Trio

PC3530 : Steel milling grade equipped with tough substrate and Nano-TiAlN coating film.

PC9030 : Exclusive grade for turning of stainless steel consisting tough substrate and TiAlN coating film.

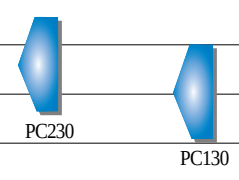
PC9530 : Exclusive grade for milling of stainless steel consisting ultra fine grain size substrate and TiAlN coating film.



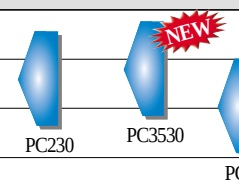
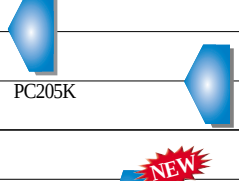
Cross-sectional view of PVD coating film

Guide of Grade Selection

■ Turning

Work-piece	Coating	1 st Recommend Grade	Cutting speed		ISO	Application Range
			(m/min)	(sfm)		
Steel	TiAlN	PC230	180(120 ~ 230)	590(400 ~ 760)	P10	
	TiCN	PC130	130(100 ~ 160)	430(330 ~ 530)	P20	
Cast Iron	TiAlN	PC205K	200(150 ~ 250)	660(500 ~ 820)	P30	
		PC215K	170(120 ~ 210)	560(400 ~ 690)	P40	
	TiCN	PC105	150(100 ~ 200)	500(330 ~ 660)	K01	
Stainless steel	TiAlN	PC9030	130(50 ~ 180)	430(170 ~ 590)	K10	
					K20	
					M20	
					M30	
					M40	

■ Milling

Work-piece	Coating	1 st Recommend Grade	Cutting speed		ISO	Application Range
			(m/min)	(sfm)		
Steel	TiAlN	PC3530	200(150 ~ 250)	660(500 ~ 820)	P10	
		PC230	120(100 ~ 150)	400(330 ~ 500)	P20	
Cast Iron	TiAlN	PC205K	200(150 ~ 250)	660(500 ~ 820)	P30	
		PC215K	170(120 ~ 210)	560(400 ~ 690)	P40	
	TiCN	PC105	150(100 ~ 200)	500(330 ~ 660)	K01	
Stainless steel	TiAlN	PC9530	130(50 ~ 200)	430(170 ~ 660)	K10	
					K20	
					M20	
					M30	
					M40	

Special Features

KORLOY cermet is a kind of carbonitride type cermet which has ultra fine micro structure by adding TiN, TiCN powders as additives. It has superior thermal shock resistance and optimal wear resistance and toughness as per cutting condition, as well.

Special Advantages

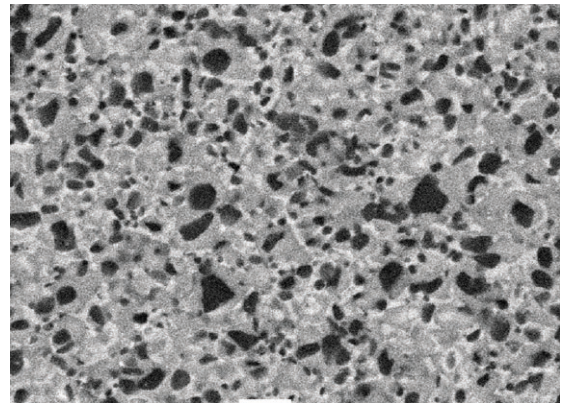
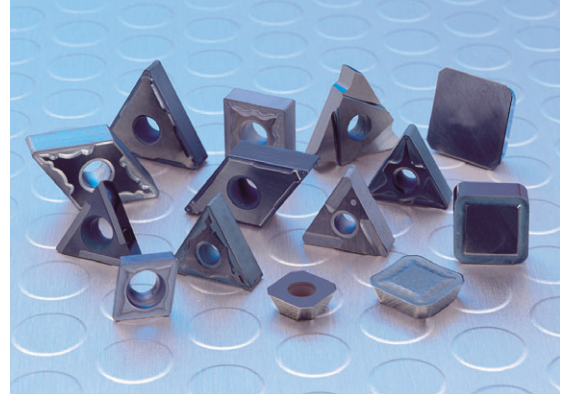
Cermet, using TiCN as main component, is harder than cemented carbide and has lower affinity with Ferrous work piece at high temperature, thus cermet have special advantage as below,

● Comparing with Un-Coated Carbide

1. Since cermet has superior wear resistance and cratering resistance, higher speed cutting is available.
2. Since cermet has low affinity with ferrous work piece, from low to high speed cutting is available.
3. Low affinity with work piece provides excellent surface finish.
4. Exceptional tool life and cutting performance can be acquired at high speed finishing.

● Comparing with Coated Carbide

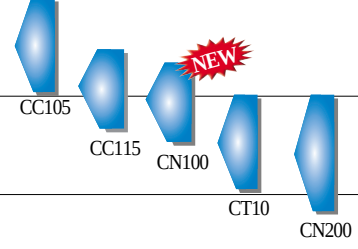
1. Suitable for light cutting(finishing).
2. Better wear resistance and surface finish can be acquired at the same cutting condition.



Microstructure of Cermet

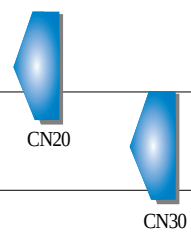
Guide of Grade Selection

■ Turning

Work-piece	Coating	1 st Recommend Grade	Recommended cutting speed		ISO	Application Range
			(m/min)	(sfm)		
Steel	Finishing	* CC105 * CC115	230(150 ~ 300)	760(500 ~ 990)	P01	
	Light to medium cutting	CN100 CT10	200(150 ~ 280) 200(130 ~ 250)	660(500 ~ 920) 660(430 ~ 820)	P10	
		CN200	180(130 ~ 250)	590(430 ~ 820)	P20	

* CC105, CC115 is Coated Cermet Grades.

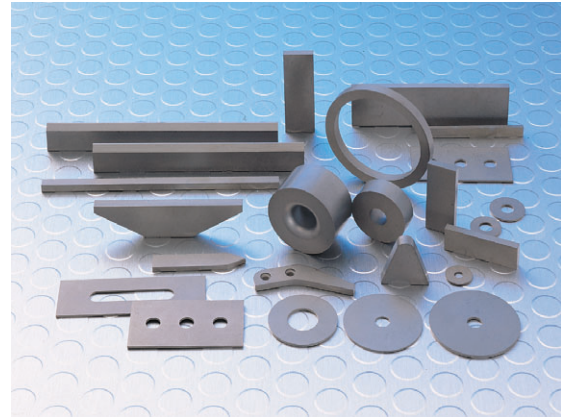
■ Milling

Work-piece	Coating	1 st Recommend Grade	Recommended cutting speed		ISO	Application Range
			(m/min)	(sfm)		
Steel	Finishing	CN20	230(150 ~ 300)	760(500 ~ 990)	P01	
	Light to medium cutting	CN30	200(150 ~ 250)	660(500 ~ 820)	P10	
					P20	

Special Features

Thanks to the revolutionary advanced sintering technology, KORLOY uncoated carbide grades have fine and even alloy structure which provides superior quality cutting performance.

KORLOY uncoated carbide grades have exceptional wear resistance and toughness at the same time through special alloy design with WC, Co, and additives like TaC, TiC etc.



Advantage

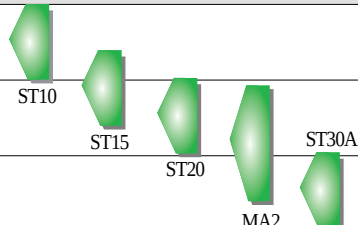
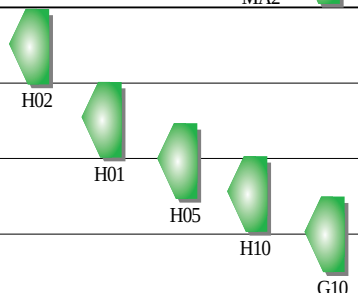
1. Variety of available grades as per ISO classification (P,M,K)
2. Excellent resistance to thermal crack allows cutting with coolant.
3. Specially designed alloys have fine micro structure and low affinity with work piece.
4. They have excellent toughness in general.

● Special Features

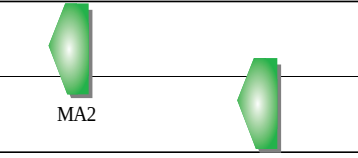
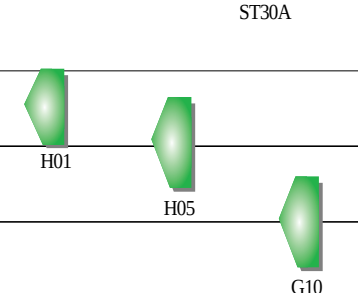
ISO	Composition	Characteristics	Work piece
P	WC-TiC-TaC-Co	Excellent thermal shock resistance and resistance against plastic deformation.	Carbon steel, Alloy steel
M	WC-TiC-TaC-Co	Comprehensive grades have excellent thermal shock resistance and superior strength.	Alloy steel, Stainless steel
K	WC-Co	Hard and strong grades.	Cast iron, Non ferrous metal Plastic, Acryl etc.

ISO	Grade	Hardness (HRA)	TRS(kg/mm ²)	Young's modulus (x10 ³ kg/mm ²)	Thermal conductivity (cal/cm · Sec · °C)	Thermal expansion coefficient (x10 ⁻⁶ /°C)
P	ST10	92.1	160	4.8	0.06	6.2
	ST15	92.0	170	5.1	0.08	5.6
	ST20	91.8	180	5.6	0.10	5.2
	MA2	91.5	200	5.3	-	5.2
	ST30A	91.3	210	5.3	-	5.2
M	U10	92.4	180	4.7	-	-
K	H02	93.0	170	6.1	0.25	4.4
	H01	92.8	190	6.6	0.26	4.7
	H05	92.1	200	6.15	0.27	4.5
	H010	92.0	200	-	0.16	4.5
	G10	91.0	220	6.3	0.25	4.7

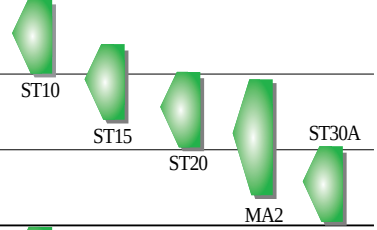
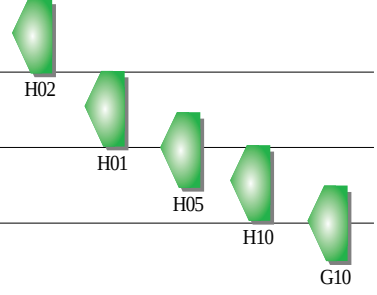
Special Features

Work piece	1 st Recommend Grade	Recommended cutting speed		ISO	Application Range
		(m/min)	(sfm)		
Steel	ST10	150(100 ~ 200)	500(330 ~ 660)	P10	
	ST15	140(90 ~ 190)	460(300 ~ 630)	P20	
	ST20	130(70 ~ 180)	430(230 ~ 590)	P30	
	MA2, ST30A	130(70 ~ 180)	430(230 ~ 590)		
Cast iron	H02	150(100 ~ 200)	500(330 ~ 660)	K01	
	H01, H05	140(100 ~ 200)	460(330 ~ 660)	K10	
	H10, G10	130(90 ~ 190)	430(300 ~ 630)	K20	
Aluminum alloy	H01	500(300 ~ 800)	1,640(990 ~ 2,630)	K30	
Copper, Bronze	H01	200(150 ~ 300)	660(500 ~ 990)		

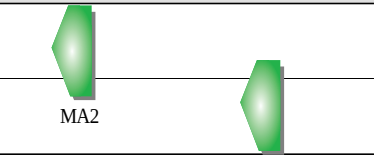
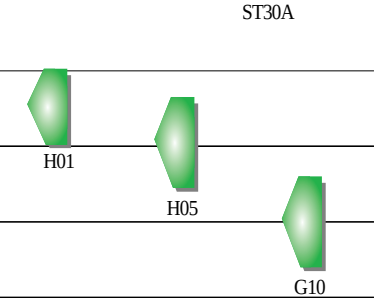
■ For Milling

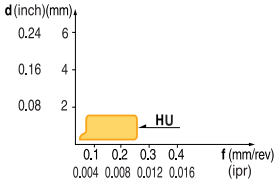
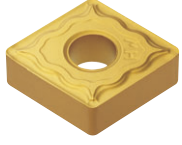
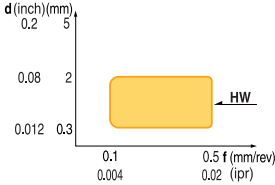
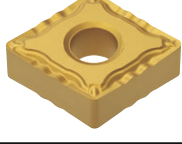
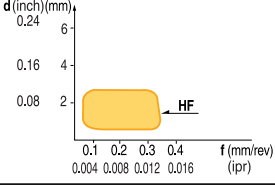
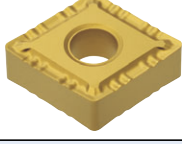
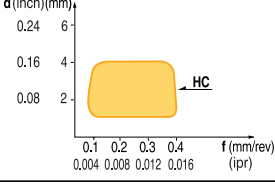
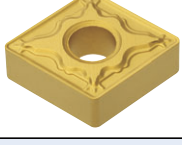
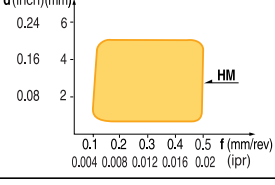
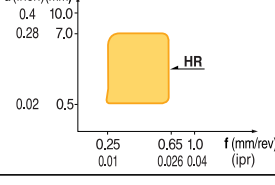
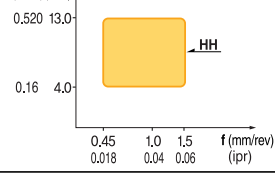
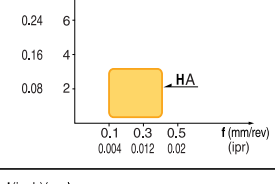
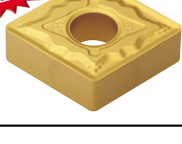
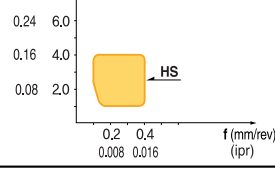
Work piece	1 st Recommend Grade	Recommended cutting speed		ISO	Application Range
		(m/min)	(sfm)		
Steel	MA2	140(70 ~ 180)	460(230 ~ 590)	P20	
	ST30A	130(70 ~ 180)	430(230 ~ 590)	P30	
Cast iron	H01, H05	150(100 ~ 200)	500(330 ~ 660)	K01	
	H10, G10	140(90 ~ 190)	460(300 ~ 630)	K10	
Aluminum alloy	H01	500(300 ~ 800)	1,640(900 ~ 2,630)	K20	
Copper, Bronze	H01	200(150 ~ 300)	660(500 ~ 990)	K30	

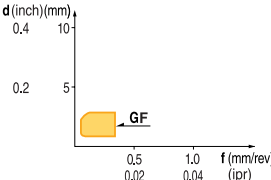
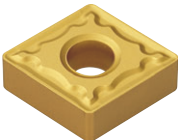
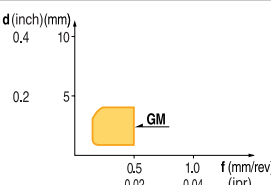
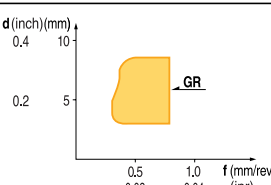
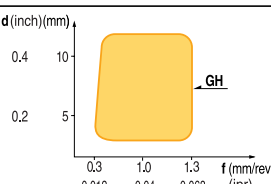
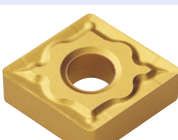
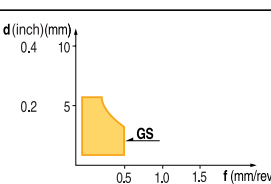
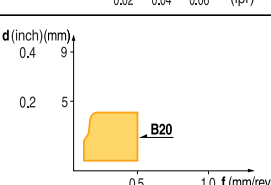
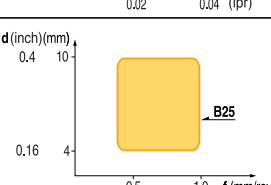
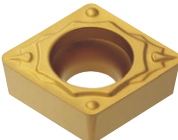
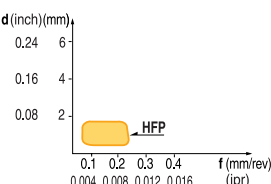
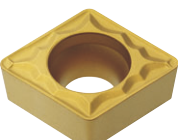
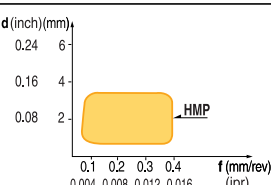
Special Features

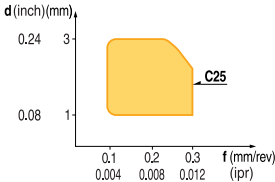
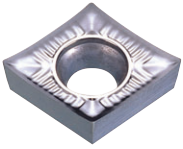
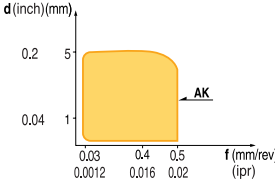
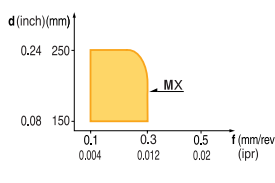
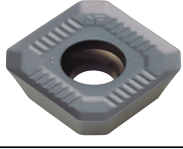
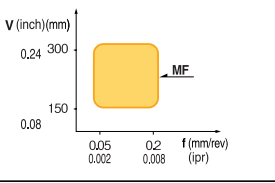
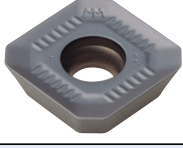
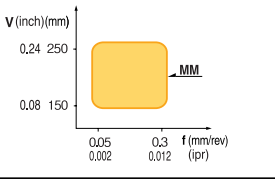
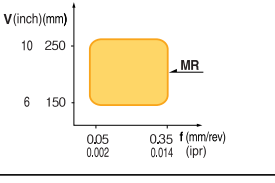
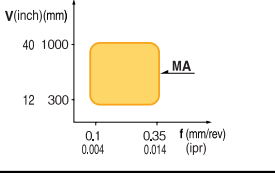
Work piece	1 st Recommend Grade	Recommended cutting speed		ISO	Application Range
		(m/min)	(sfm)		
Steel	ST10	150(100 ~ 200)	500(330 ~ 660)	P10	
	ST15	140(90 ~ 190)	460(300 ~ 630)	P20	
	ST20	130(70 ~ 180)	430(230 ~ 590)	P30	
	MA2, ST30A	130(70 ~ 180)	430(230 ~ 590)		
Cast iron	H02	150(100 ~ 200)	500(330 ~ 660)	K01	
	H01, H05	140(100 ~ 200)	460(330 ~ 660)	K10	
	H10, G10	130(90 ~ 190)	430(300 ~ 630)	K20	
Aluminum alloy	H01	500(300 ~ 800)	1,640(990 ~ 2,630)	K30	
Copper, Bronze	H01	200(150 ~ 300)	660(500 ~ 990)		

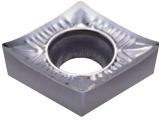
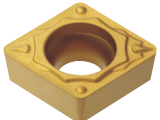
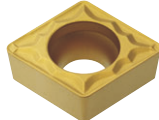
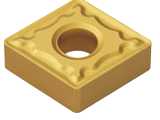
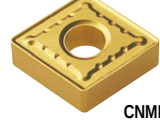
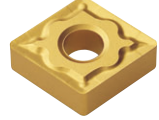
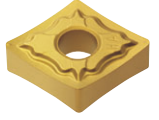
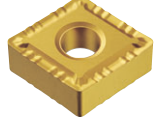
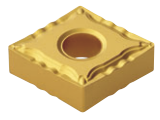
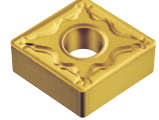
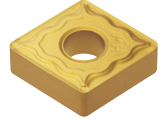
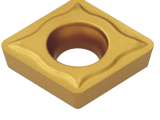
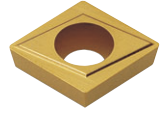
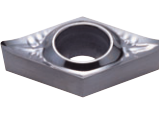
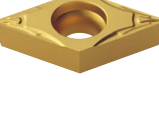
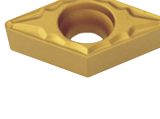
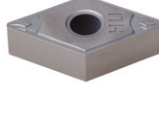
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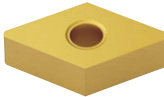
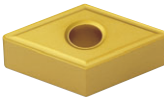
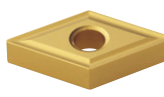
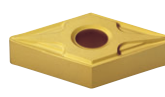
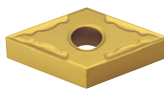
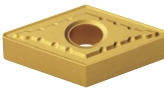
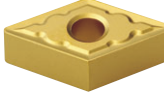
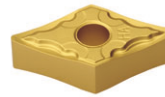
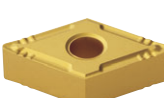
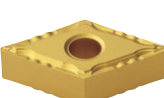
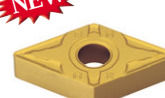
Work piece	1 st Recommend Grade	Recommended cutting speed		ISO	Application Range
		(m/min)	(sfm)		
Steel	MA2	140(70 ~ 180)	460(230 ~ 590)	P20	
	ST30A	130(70 ~ 180)	430(230 ~ 590)	P30	
Cast iron	H01, H05	150(100 ~ 200)	500(330 ~ 660)	K01	
	H10, G10	140(90 ~ 190)	460(300 ~ 630)	K10	
Aluminum alloy	H01	500(300 ~ 800)	1,640(900 ~ 2,630)	K20	
Copper, Bronze	H01	200(150 ~ 300)	660(500 ~ 990)	K30	

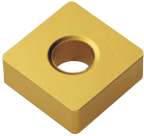
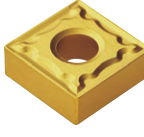
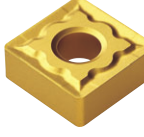
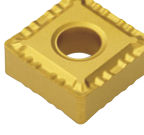
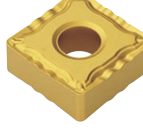
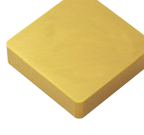
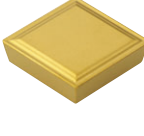
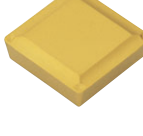
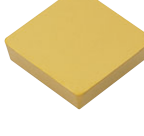
Shape		Application Range	Special Feature
"H" Series	HU 		- For Ultra-fine Finishing, Finishing - Suitable for a machining need fine surface finish and a machining generate low cutting force due to sharp cutting edge design. - Specially designed chip breaker ensure stable chip control at ultra fine-finishing condition. - Recommended Cutting Conditions $d = 0.1 \sim 1.5\text{mm}$ $f = 0.03 \sim 0.25\text{mm/rev}$ $0.004 \sim 0.006\text{inch}$ $0.0012 \sim 0.01\text{ipr}$
	HW 		- For Finishing - High speed, high feed cutting is available due to the special chip pocket design. - Specially designed cutting edge consist of recess cutting edge and wiper cutting edge guarantee superior surface finish. - Recommended Cutting Conditions $d = 0.3 \sim 2.0\text{mm}$ $f = 0.1 \sim 0.5\text{mm/rev}$ $0.012 \sim 0.08\text{inch}$ $0.004 \sim 0.024\text{ipr}$
	HF 		- For Finishing - Excellent chip control at varied depth of cut cutting. - Strong cutting edge toughness due to special design. - Recommended Cutting Conditions $d = 0.3 \sim 2.5\text{mm}$ $f = 0.05 \sim 0.35\text{mm/rev}$ $0.012 \sim 0.100\text{inch}$ $0.002 \sim 0.014\text{ipr}$
	HC 		- For Medium to Finish Cutting - Excellent for copying of special shape. - Smooth chip control at shallow cut as well as deep depth of cut. - Recommended Cutting Conditions $d = 0.8 \sim 4.0\text{mm}$ $f = 0.08 \sim 0.4\text{mm/rev}$ $0.03 \sim 0.16\text{inch}$ $0.003 \sim 0.016\text{ipr}$
	HM 		- For Medium Cutting - Wide available chip control range from medium-finishing to medium-roughing. - Suitable chip breaker for CNC machining - Recommended Cutting Conditions $d = 1.0 \sim 5.0\text{mm}$ $f = 0.1 \sim 0.5\text{mm/rev}$ $0.04 \sim 0.20\text{inch}$ $0.004 \sim 0.02\text{ipr}$
	HR 		- For Roughing - Excellent chip control at deep depth of cut and fast feed rate. - Strong cutting edge makes excellent cutting performance at intermittent cutting. - Recommended Cutting Conditions $d = 2.5 \sim 7.0\text{mm}$ $f = 0.25 \sim 0.65\text{mm/rev}$ $0.1 \sim 0.28\text{inch}$ $0.01 \sim 0.028\text{ipr}$
	HH 		- For Heavy duty cutting - Specially designed toughest cutting edge provides superior cutting performance at deep depth of cut and fast feed rate. - Unique design of dot on cutting edge makes smooth chip flow and reduce cutting force. - Recommended Cutting Conditions $d = 4.0 \sim 13.0\text{mm}$ $f = 0.45 \sim 1.5\text{mm/rev}$ $0.16 \sim 0.5\text{inch}$ $0.018 \sim 0.04\text{ipr}$
	HA 		- For Light-alloy, Stainless-steel machining. - Sharp cutting edge generate low cutting force. - Specially designed tough main cutting edge. - Suitable for cutting of low carbon steel, stainless steel, aluminum. - Recommended Cutting Conditions $d = 0.8 \sim 3.5\text{mm}$ $f = 0.1 \sim 0.4\text{mm/rev}$ $0.03 \sim 0.16\text{inch}$ $0.004 \sim 0.016\text{ipr}$
	HS 		- For Medium cutting of Stainless-steel - Exclusive design for stainless steel cutting provide longer tool life - Wear resistance have been reinforced through high rake angle of chip breaker land. - Recommended Cutting Conditions $d = 1.0 \sim 4.0\text{mm}$ $f = 0.1 \sim 0.4\text{mm/rev}$ $0.04 \sim 0.16\text{inch}$ $0.004 \sim 0.16\text{ipr}$

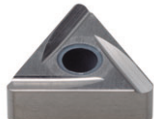
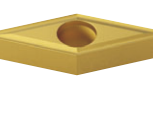
Shape		Application Range	Special Feature
“G” Series	GF 		- For Finishing - Fine surface finish with low cutting force. - Excellent chip control at shallow depth of cut and fast feed rate. - Recommended Cutting Conditions $d = 0.5 \sim 2.0\text{mm}$ $f = 0.05 \sim 0.3\text{mm/rev}$ $0.02 \sim 0.08\text{inch}$ $0.002 \sim 0.012\text{ipr}$
	GM 		- For Medium to Light cutting - Excellent chip control at general cutting conditions. - Strong cutting edge strength provide good performance at intermittent and fast feed cutting. - Recommended Cutting Conditions $d = 0.7 \sim 4.0\text{mm}$ $f = 0.1 \sim 0.5\text{mm/rev}$ $0.03 \sim 0.16\text{inch}$ $0.004 \sim 0.02\text{ipr}$
	GR 		- For Medium to Roughing - Suitable for deep depth of cut and fast feed cutting of steel and cast iron. - Suitable for intermittent cutting. - Recommended Cutting Conditions $d = 3.0 \sim 8.0\text{mm}$ $f = 0.3 \sim 0.8\text{mm/rev}$ $0.12 \sim 0.32\text{inch}$ $0.012 \sim 0.032\text{ipr}$
	GH 		- For Heavy duty cutting - Suitable for heavy duty cutting due to strong cutting edge. - Wide chip control range with low cutting force - Recommended Cutting Conditions $d = 3.0 \sim 11.0\text{mm}$ $f = 0.3 \sim 1.3\text{mm/rev}$ $0.12 \sim 0.44\text{inch}$ $0.012 \sim 0.047\text{ipr}$
	GS 		- For Medium to Roughing of Stainless-steel - Exclusive chip breaker for stainless steel. - Recommended Cutting Conditions $d = 1.5 \sim 5.5\text{mm}$ $f = 0.15 \sim 0.5\text{mm/rev}$ $0.06 \sim 0.22\text{inch}$ $0.006 \sim 0.020\text{ipr}$
	B20 		- For Light to Medium cutting - Exclusive chip breaker for cutting of cast iron. - Recommended Cutting Conditions $d = 1.5 \sim 4.0\text{mm}$ $f = 0.15 \sim 0.5\text{mm/rev}$ $0.06 \sim 0.16\text{inch}$ $0.006 \sim 0.020\text{ipr}$
	B25 		- For General cutting - Suitable for general cutting condition cutting. - Recommended Cutting Conditions $d = 4.0 \sim 10.0\text{mm}$ $f = 0.5 \sim 1.0\text{mm/rev}$ $0.16 \sim 0.40\text{inch}$ $0.02 \sim 0.04\text{ipr}$
“H-Posi” Series	HFP 		- For Finishing - Excellent chip control at shallow depth of cut and low feed rate. - Excellent surface finish of work piece due to reduced cutting force. - Suitable for fine boring. - Recommended Cutting Conditions $d = 0.1 \sim 1.5\text{mm}$ $f = 0.05 \sim 0.25\text{mm/rev}$ $0.004 \sim 0.06\text{inch}$ $0.002 \sim 0.01\text{ipr}$
	HMP 		- For Medium cutting - Excellent chip control at wide range of cutting conditions. - Suitable for stainless steel cutting. - Recommended Cutting Conditions $d = 0.5 \sim 3.5\text{mm}$ $f = 0.05 \sim 0.4\text{mm/rev}$ $0.02 \sim 0.14\text{inch}$ $0.002 \sim 0.016\text{ipr}$

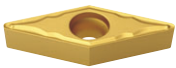
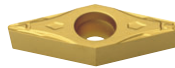
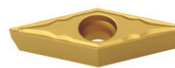
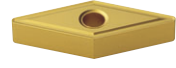
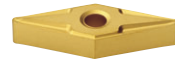
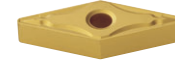
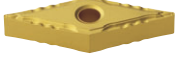
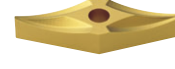
Shape		Application Range	Special Feature
"C" Series	C25	 	- For Medium cutting - Suitable for intermittent cutting and cast iron machining. - Good surface finish due to low cutting force. - Suitable for both boring and outer diameter turning. - Recommended Cutting Conditions $d = 1.0 \sim 3.0\text{mm}$ $f = 0.1 \sim 0.3\text{mm/rev}$ $0.04 \sim 0.12\text{inch}$ $0.004 \sim 0.012\text{ipr}$
	AK	 	- For Aluminum cutting - Exclusive chip breaker for aluminum and aluminum alloy. - Recommended Cutting Conditions $d = 0.1 \sim 5.0\text{mm}$ $f = 0.03 \sim 0.5\text{mm/rev}$ $0.004 \sim 0.20\text{inch}$ $0.0012 \sim 0.02\text{ipr}$
"MX" Series	MX	 	- For General Milling - Possible to increase productivity through increase feed and depth. - Excellent heat resistance due to the special chip breaker design of top face of insert. - Recommended Cutting Conditions $d = 1.0 \sim 5.0\text{mm}$ $f = 0.1 \sim 0.3\text{mm/rev}$ $0.04 \sim 0.2\text{inch}$ $0.004 \sim 0.012\text{ipt}$
"Future Mill" Series	MF	 	- For Finishing of Milling - Special design for light cutting of gummy materials like stainless steel and hard to machine material provide fine surface finish and longer tool life. - Recommended Cutting Conditions $d = 0.5 \sim 5.0\text{mm}$ $f = 0.05 \sim 0.2\text{mm/rev}$ $0.02 \sim 0.2\text{inch}$ $0.002 \sim 0.008\text{ipt}$
	MM	 	- For Medium cutting of Milling - Chip breaker design to cover general cutting condition provide wide available application range. - Ground type and as sintered type is available. - Recommended Cutting Conditions $d = 1.0 \sim 5.0\text{mm}$ $f = 0.05 \sim 0.3\text{mm/rev}$ $0.04 \sim 0.2\text{inch}$ $0.002 \sim 0.012\text{ipt}$
	MR	 	- For Roughing of Milling - Strongest cutting edge strength provide stable tool life even in case of severe cutting with heavy intermittent and heavy roughing. - Recommended Cutting Conditions $d = 1.5 \sim 5.0\text{mm}$ $f = 0.05 \sim 0.35\text{mm/rev}$ $0.06 \sim 0.2\text{inch}$ $0.002 \sim 0.014\text{ipt}$
	MA	 	- For Aluminum Milling - Suitable design for aluminum machining like sharp cutting edge, mirror face of insert top which prevent build up edge, provide excellent cutting performance. - Recommended Cutting Conditions $d = 0.5 \sim 5.0\text{mm}$ $f = 0.1 \sim 0.35\text{mm/rev}$ $0.02 \sim 0.2\text{inch}$ $0.004 \sim 0.014\text{ipt}$

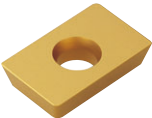
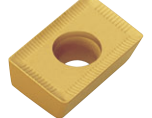
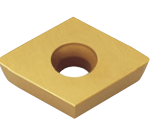
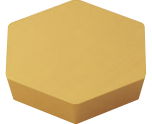
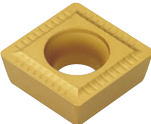
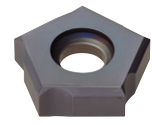
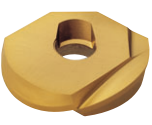
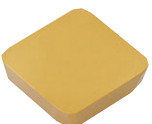
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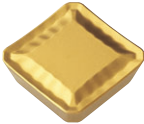
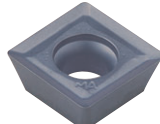
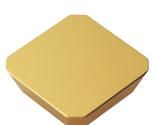
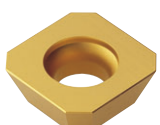
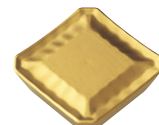
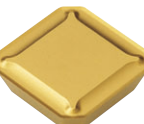
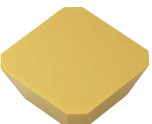
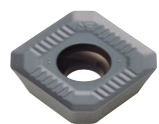
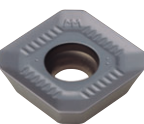
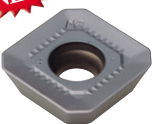
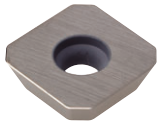
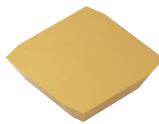
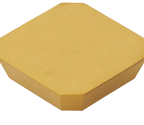
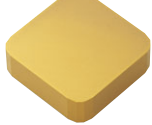
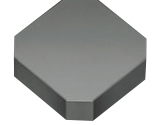
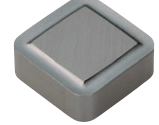
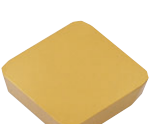
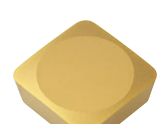
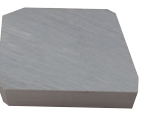
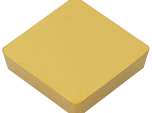
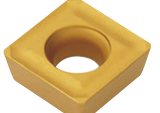
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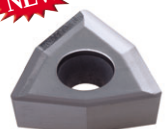
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WNMG-HF  060404 (331) 060408 (332) 060412 (333) 080404 (431) 080408 (432)	WNMG-HM  060404 (331) 060408 (332) 060412 (333) 080404 (431) 080408 (432) 080412 (433)	WNMG-HR  060408 (332) 060412 (333) 080408 (432) 080412 (433) 080416 (434)	WNMG-HS  060404 (331) 060408 (332) 060412 (333) 080404 (431) 080408 (432) 080412 (433)
WNMG-HW  060408 (332) 080408 (432)			

ADKA  150308R 150308TR 150308SR	ADLT  150308R 150308TR 150308SR	APFT-X28  1604PDR 1604PDSR 1604PDTR	APKT  1604PDSR
APKT-MA  1604PDFR	APKT-X22, APFT-X22  1604PDS(T)R 1604PDS(T)R	APKT-X23, X24  1604PD(T)R-X23 1604PD(F)R-X24	APXT, APKT  APXT 11T3PDSR-MF 11T3PDSR-MM 11T3PDSR-MR 11T312R-MM 11T316R-MM 11T324R-MM 11T3PDR-MA 11T318R-MA 11T318R-MM 1604PDSR-MF 1604PDSR-MM 160416R-MM 160432R-MM APKT 1604PDFR-MA2 160416FR-MA2 160432FR-MA2
CSN(CSNH)  43M 43MT 43M 43MT	CSP(H)  53R 53L 53R 53L	EDCW  1604ZDFR (53) 1604ZDTR (53)	HECN  090408FN (532) 090408SN (532) 090408TN (532) 110412FN (633) 110412TN (633)
HPEN  090408FN (532) 090408SN (532) 090408EN (532) 110412FN (633)	HPEN-WC  090408-WC (532) 110412-WC (633)	MCMT  080308EN 09T308EN	MPMT  090308 (322) 120408 (432)
OFCN  0704SN 0704FN 070408SN 070408FN	OFCW  05T3SN 05T3FN 05T308FN	OFKR-MF, MM, MA  0704SN-MF 070408SN-MF 0704SN-MM 070408SN-MM 0704FN-MA 0704EN-MA	OFKT-MF, MM, MA  05T3SN-MF 05T308SN-MF 05T3SN-MM 05T308SN-MM 05T3FN-MA 05T3EN-MA 0704SN-MM 0704EN-MA 0704FN-MA
PNEJ  1223N 1225N 1230N 1235N 1240N 1245N 1250N 1255N 1260N 1265N 1270N 1275N 1285N	PNEJ-C  1223N-C03 1230N-C03 1235N-C03 1240N-C05 1245N-C05 1250N-C05 1255N-C05 1260N-C05 1265N-C05 1270N-C05 1275N-C05	RC  RC16 RC20 RC25 RC30 RC32	REKR-MM  170400-MM
RPMM  120400	SDAN, SDCN, SDKN  SDAN 1203AEEN 1203AEFN 1203AESN SDCN 1203AESN SDKN 1504AEFN 1504AETN 1504AESN	SDC(H)  42R 42L 42TR 42TL 53R 53L 53TR 53TL	SDCN  42R 42L 42M 42MT 42MT-RH 42MT-S20 53R 53L 53M 53MT 53MT-RH 53MT-S20

SDKR-MX  1203AESN-MX 1203AETN-MX 1504AESN-MX 1504AETN-MX	SDMT  090308 (322)	SDXT-MA  09M405R-MA 130508R-MA	SDXT-MF  09M405R-MF 09M405L-MF 130508R-MF
SDXT-MM  09M405R-MM 09M405L-MM 130508R-MM 130538-MM	SEAN, SECN, SEKN  1203AFFN (42) 1203AFTN (42) 1203AFEN (42) 1203AFN (42) 1203AFSN (42) 1203AFTN-S20 (42) 1504AFFN (53) 1504AFTN (53) 1504AFEN (53) 1504AFSN (53)	SECA  1204AFSN (43) 1204AFTN (43) 1204AFFN (43) 1204AFEN (43) 1504AFSN (53) 1504AFTN (53) 1504AFFN (53)	SECR-MX, SEKR-MX(MF1)  1203AFSN- MX (42) 1203AFSN- MX (42) 1203AFSN- MF1 (42) 1204AFSN- MX (43) 1504AFSN- MX (53)
SEKR-X35  1203AFSN-X35 (42) 1203AFFN-X35 (42) 1204AFFN-X35 (43)	SEMN  1204AZ (43)	SEET-MA  0903AGFN-MA 14M4AGFN-MA	SEX(E)T-MF  0903AGSN-MF 0903AGSN-MF 14M4AGSN-MF 14M4AGSN-MF
SEX(E)T-MM  0903AGSN-MM 0903AGSN-MM 14M4AGSN-MM 14M4AGSN-MM	SEXT-MR  0903AGSN-MR 14M4AGSN-MR	SEEW  0903AGTN 14M4AGTN	SFAN, SFCN  1203EFR (42) 1203EFR (42) 1203ZFR (42)
SFKN  12T3AZTN (42.5) 12T3AZSN (42.5) 12T3AZFN (42.5) 12T3AZEN (42.5)	SNAN, SNCN, SNKN  1204ENN (43) 1504ENN (53) 1204ENN (43) 1504ENN (53)	SNC-MW  43MW	SNEF  435 535
SPAN, SPCN, SPKN  SPAN 1203ED(T)R (42) SPAN 1504ED(T)R (53) SPCN 1203ED(T)R (42) 1203ED(T)L (42) 1204ED(T)R (43) 1504ED(T)R (53) 150412T (53) 1504EDL (53) 1203ED(T)R-RH (42) 1504ED(T)R-RH (53) 1203EDR-S20 (42) 1504EDR-S20 (53) SPKN 1203ED(T)R (42) 1204ED(T)R (43) 1504ED(T)R (53) 1904ED(T) (63)	SPC(H)  42R 42TR 53R 53TR	SPCR-MX, SPKR-MX  SPCR 1203EDSR (42) SPKR 1203EDSL (42) 1504EDSR (53)	SPEN-WC  120416-WC (434) 150412-WC (533) 150416-WC (534) 150420-WC (535) 190424-WC (636)
SPEX  1203EDR-1 (42) 1203EDL-1 (42) 1504EDR-1 (53) 1504EDL-1 (53) 1904EDR-1 (63) 1904EDL-1 (63)	SPMN  120304 (421) 120308 (422) 120312 (423) 120408 (432) 120412 (433) 150408 (532) 150412 (533) 190408 (632) 190412 (633)	SPMT  060304 (221) 120408 (432)	TECN, TEKN, TEEN  TEEN 43R 43TR 43TR-S20 43R 43TR TEKN 43R (TECN) 43TR

TECN, TEKN, TEEN(-Z)  TECN 22R 22TR TEEN 32R 32TR 22TR 32R 32TR 43R-Z 43TR-Z TEKN 43L-Z (TECN)43TL-Z	TFAN, TFCN  TFAN 2203PFR (42) 2203PFL (42) TFCN 1603PFR (32) 1603PFL (32) TFCN 2203PFR (42) 2203PFL (42)	TPAN, TPCN  TPAN 1103PPN (22) TPCN 1103PPTN (22) 1603PPN (32) 1603PPTN (32)	1603PPR (32) 1603PPTR (32) 1603PDR (32) 1603PPSR (32) 1603PPR-RH (32) 1603PDR-S20 (32) 2204PPN (43) 2204PPTN (43) 2204PDR (43) 2204PDTR (43) 2204PDL (43) 2204PDSR (43) 2204PDR-RH (43) 2204PDR-S20 (43)	TPKN  1103PPN (22) 1103PPTN (22) 1603PPN (32) 1603PPTN (32) 1603PPR (32) 1603PPTR (32) 1603PDR (32) 1603PDSR (32) 2204PPN (43) 2204PPTN (43) 2204PDR (43) 2204PDTR (43) 2204PDSR (43)
TPKR-MX  1603PPR -MX (32) 1603PDSN -MX (32) 1603PDSR -MX (32) 2204PDSR -MX (43) 2204PPR -MX (43)	VCKT-MA  220530N-MA	WCMT-C20  030208-C20 (1.81.52) 040208-C20 (21.52) 050308-C20 (2.522) 06T308-C20 (32.52) 080408-C20 (432) 080412-C20 (433)	WCMT-C21  030204-C21 (1.81.51) 040204-C21 (21.51) 040208-C21 (432) 080408-C21	
WCKT-DA  030208-DA 040208-DA 050308-DA 06T308-DA 080408-DA	WCMT-DS(P)  030204-DSP 040204-DSP 050308-DS 06T308-DS 080408-DS 080412-DS	ZCMT-ER  080308-ER 09T308-ER	ZDMT-R  08T2-R10 1103-R12.5 13T3-R16	
ZPMT  1504PPSR	ZPMT-R  1604-R20 1604-R25 1604-R31.5			

for Turning

CCGT-AK



060202 (21.50.5)
060204 (21.51)
060208 (21.52)
09T302 (32.50.5)
09T304 (32.51)
09T308 (32.52)
120402 (430.5)
120404 (431)
120408 (432)

DCGT-AK



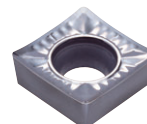
070202 (21.50.5)
070204 (21.51)
11T302 (32.50.5)
11T304 (32.51)
11T308 (32.52)
11T312 (32.53)

RCGT-AK



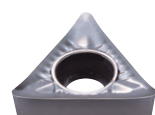
0602M0
0803M0
1003M0
1204M0

SCGT-AK



09T302 (32.50.5)
09T304 (32.51)
09T308 (32.52)
120404 (431)
120408 (432)
120412 (433)
120416 (434)

TCGT-AK



110202 (21.50.5)
110204 (21.52)
110208 (21.52)
16T302 (32.50.5)
16T304 (32.51)
16T308 (32.52)
16T312 (32.53)
16T316 (32.54)

VBGT-AK



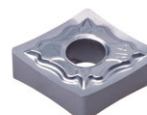
110302 (220.5)
110304 (221)
110308 (222)
130302 (2.52.0.5)
160402 (330.5)
160404 (331)
160412 (333)

VCGT-AK



110302 (220.5)
110304 (221)
110308 (222)
130304 (2.521)
160402 (330.5)
160404 (331)
160408 (332)
160412 (333)
220525
220530

CNMG-HA



120404
120408
120412

for Milling

APKT



1604PDR-MA
160416R-MA
160432R-MA

APKT



1604PDR-MA3

APXT



11T3PDR-MA

OFKT



05T3FN-MA
0704FN-MA

OFKR



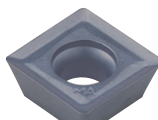
0704FN-MA

SDHT



1204AEFN-MA (43)

SDXT - MA



09M405R
130508R

SEHT



1204AFFN-M (43)

SEET- MA



0903AGFN
14M4AGFN

VCKT-MA



220530 (43.57.5)

for Grooving

MRGN



MRGN600-A
MRGN800-A

for Drilling

WCKT



06T308-DA (32.52)
080408-DA (432)

■ for Forming, Grooving, Threading and Parting

for M.G.T Tools

MGMN - G



• Width
2.0mm 0.078 inch
3.0mm 0.118 inch
4.0mm 0.157 inch
5.0mm 0.197 inch

MGMN - M



• Width
3.0mm 0.118 inch
4.0mm 0.157 inch
5.0mm 0.197 inch
6.0mm 0.236 inch

MRGN - A



Radius : 3R
4R

MRMN - M



Radius : 1.5R
2R
2.5R
3R
4R

Holder : MGEHR/L, MGEVR/L, MGEUR/L, MGIVR/L, MGIUR/L

for Micro Boring Tools

FTG, FTT, FTF



Holder : FTIH



※ for Internal Grooving, Threading and Copy machining

for Parting

SP



Holder : SPB-S or SPH-S
SPB or SPH

SP

200 400 600
200L 400L 600L
200R 400R 600R
300 500
300L 500L
300R 500R

SP- A Series for Aluminum

200 - A 200 R/L - A
300 - A 300 R/L - A
400 - A 400 R/L - A
500 - A 500 R/L - A

inch : 0.087, 0.122, 0.161, 0.201, 0.252

for Forming

BF



• Width
3.1mm 0.122 inch
5.1mm 0.201 inch
8.1mm 0.319 inch

Holder : GFT, GFIP

Grooving

DB



• Width
3.0 - 8.0mm
0.118-0.315 inch

Holder : DBH

DC



Holder : DBH

ESB



34

Holder : EH

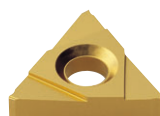
GO



• Width
2.5mm 0.098 inch
3.2mm 0.126 inch
4.1mm 0.161 inch

Holder : GH

GS



• Width
1.23 - 4.28mm
0.048-0.169 inch

Holder : GH

GW



Holder : GFT, GFIP

IG



• Width
1.25 - 2.8mm
0.049-0.110 inch

Holder : IGH

GR



• Width
2.0 - 8.0mm
0.079-0.315 inch

Holder : GFT, GFIK

POB



• Width
3.0mm 0.118 inch
4.0mm 0.157 inch
5.0mm 0.197 inch

Holder : PH

TB



Holder : TBH

FGD / FGM

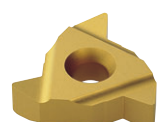


• Width
3.0mm 0.118 inch
4.0mm 0.157 inch
5.0mm 0.197 inch

Holder : FGHH, FGVH

for Threading

ECTR



ISO Metric
1.0 - 5.0(pitch-mm)
Whitworth 55
5 - 28(No.of pitch/Inch)
UN 60
5 - 28(No.of pitch/Inch)

Holder : ETH

ICTR



Holder : ITH

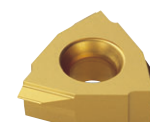
EMTR / IMTR



Holder : ETH/ITH

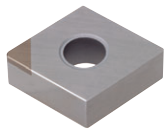
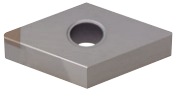
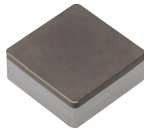
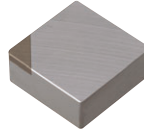
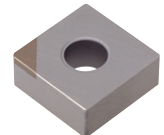
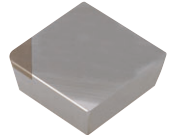
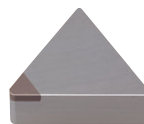
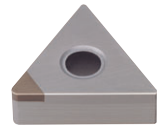
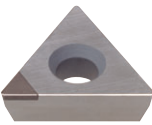
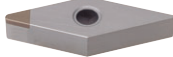
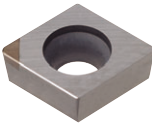
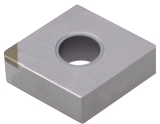
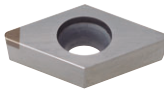
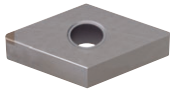
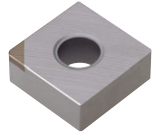
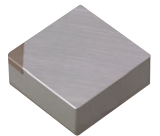
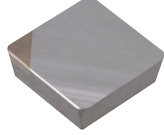
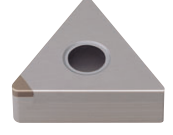
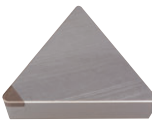
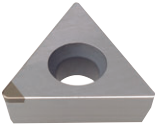
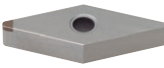
ISO Metric
0.5 - 3.0(pitch-mm)

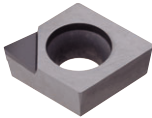
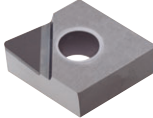
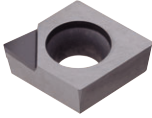
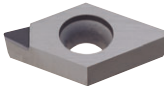
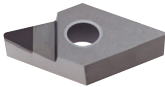
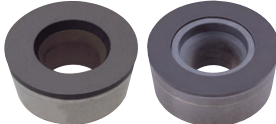
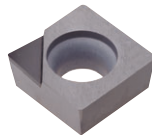
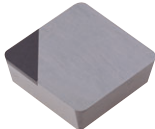
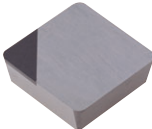
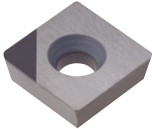
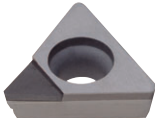
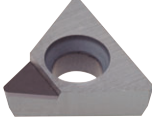
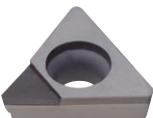
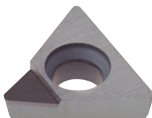
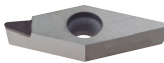
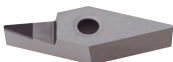
VETR



Holder : TH

ISO Metric
0.8 - 3.0(pitch-mm)

CNMA  120404 (431) 120408 (432) 120412 (433)	DNMA  150404 (431) 150408 (432) 150412 (433)	SNGN-B  120408-B (432) 120412-B (433) 120416-B (434)	SNGN  120408 (432) 120412 (433)
SNMA  120404 (431) 120408 (432) 120412 (433)	SPGN  090304 (321) 090308 (322) 090312 (323) 120308 (422) 120312 (423)	TBGN-B  060102-B (1.210.5) 060104-B (1.211) 060108-B (1.212)	TNGN  160404 (331) 160408 (332) 160412 (333)
TNMA  160402 (330.5) 160404 (331) 160408 (332) 160412 (333) 220408 (432) 220412 (433)	TPGN  090204 (1.81.51) 090208 (1.81.52) 110304 (221) 110308 (222) 160304 (321) 160308 (322) 160312 (323) 220408 (432)	TPGW  110304 (221) 110308 (222) 160404 (331) 160408 (332) 160412 (333)	VBMW  160404 (331) 160408 (332)
VCMW  160404 (331) 160408 (332)	VNMA  160404 (331) 160408 (332) 220408 (432)	NU-CC(P)GW  NU- 060202 (21.50.5) CCGW 060204 (21.51) 060208 (21.52) 09T302 (32.50.5) 09T304 (32.51) 09T308 (32.52) NU- 080202 (2.51.50.5) CPGW 080204 (2.51.51) 080208 (2.51.52) 090302 (320.5) 090304 (321) 090308 (322)	NU-CNMA  120404 (431) 120408 (432) 120412 (433)
NU-DCGW  070202 (21.50.5) 070204 (21.51) 070208 (21.52) 11T302 (32.50.5) 11T304 (32.51) 11T308 (32.52)	NU-DNMA  150404 (431) 150408 (432) 150412 (433)	NU-SNMA  120404 120408 120412	NU-SNMN  120408 (432) 120412 (433)
NU-SPGN  090304 (321) 090308 (322)	NU-TNMA  160404 (331) 160408 (332) 160412 (333)	NU-TPGN  110304 (221) 110308 (222) 160304 (321) 160308 (322)	NU-TPGW  080202 (1.51.50.5) 080204 (1.51.51) 080208 (1.51.52) 110202 (21.50.5) 110204 (21.51) 110208 (21.52) 110302 (220.5) 110304 (221) 110308 (222) 160404 (331) 160408 (332)
NU-VNMA  160404 (331) 160408 (332)			

CCMT  060201 (21.50) 060202 (21.50.5) 060204 (21.51) 09T301 (32.50) 09T302 (32.50.5) 09T304 (32.51)	CNMX  120404 (431) 120408 (432) 120412 (433)	CPMT  080202 (2.51.50.5) 080204 (2.51.51) 080208 (2.51.52) 090302 (320.5) 090304 (321) 090308 (322)	DCMT  070201 (21.50) 070202 (21.50.5) 070204 (21.51) 11T301 (32.50) 11T302 (32.50.5) 11T304 (32.51)
DNMX  150404 (431) 150408 (432) 150412 (433)	MRGN(-CB)  MRGN 600 800 MRGN 600-CB 800-CB	RPG(T)W(-WF)  RPGW 0803MO RPGT 0803MO-WF	SCMT  070201 (2.51.50) 070202 (2.51.50.5) 070204 (2.51.51) 09T301 (32.50) 09T302 (32.50.5) 09T304 (32.51)
SEGN  070202 (2.51.50.5) 070204 (2.51.51) 070208 (2.51.52) 090302 (320.5) 090304 (321) 090308 (322) 120302 (420.5) 120304 (421) 120308 (422)	SPGN  090302 (320.5) 090304 (321) 090308 (322) 120304 (421) 120308 (422) 120312 (423)	SPGW  090302 (320.5) 090304 (321) 090308 (322)	TBGN-B  060102-B (1.210.5) 060104-B (1.211) 060108-B (1.212)
TBGW  060102 (1.210.5) 060104 (1.211)	TCMT  090201 (1.81.50) 090202 (1.81.50.5) 090204 (1.81.51) 110201 (21.50) 110202 (21.50.5) 110204 (21.51)	TEGN  110202 (21.50.5) 110204 (21.51) 110208 (21.52) 110302 (220.5) 110304 (221) 110308 (222) 160302 (320.5) 160304 (321) 160308 (322) 220404 (431) 220408 (432)	TNMX  160404 (331) 160408 (332) 160412 (333)
TPGN  090202 (1.81.50.5) 090204 (1.81.51) 090208 (1.81.52) 110302 (220.5) 110304 (221) 110308 (222) 160302 (320.5) 160304 (321) 160308 (322) 160312 (323)	TPGW  080202 (1.51.50.5) 080204 (1.51.51) 080208 (1.51.52) 110202 (21.50.5) 110204 (21.51) 110208 (21.52) 110300 (210) 110302 (210.5) 110304 (211) 110308 (212) 160402 (330.5) 160404 (331) 160408 (332) 160412 (333)	TPMT  110302 (220.5) 110304 (221) 110308 (222)	VCMT  110301 (220) 110302 (220.5) 110304 (221) 110308 (222) 160408 (332) 160412 (333) 220520 (43.55) 220530
VNMX  160402 (330.5) 160404 (331) 160408 (332) 160412 (333)	DFE  2040S 2050S 2080S 2090S 2100S 4090S 4100S 4130GS	DPE  1040 2090 1045 2095 1050 2100 1055 2105 2060 2110 2065 2115 2070 2120 2075 2080 2085	

- Ultra fine grain grade (FCC, FA1, FS1)
- Accurate cutting surface and good finishing operations with excellent toughness

Z-Max Endmill

HSE0000



No of Flute : 4, 6, 8
Cutting diameter : $\phi 3 - \phi 20$ mm
For high feed

HSRE



No of Flute : 4
Cutting diameter : $\phi 3 - \phi 16$ mm

HSBE



No of Flute : 2
Cutting diameter : $\phi 1.0 - \phi 16.0$ mm

Ball Endmill

SSBE (2000/4000)

Solid Carbide



Cutting diameter : $\phi 1 - \phi 16$
Cutting length : 70mm - 120mm

SSBE2000 - Q / 4000 - Q

Q-Max Ball Endmill



Cutting diameter : $\phi 1 - \phi 16$
Cutting length : 70mm - 120mm

LSSBE - Q (Long Ball Endmill)

Q-Max Ball Endmill



Cutting diameter : $\phi 3 - \phi 16$
Cutting length : 100mm - 170mm

ZSBE(Brazed Spiral)



Cutting diameter : $\phi 14 - \phi 50$
Cutting length : 100mm - 170mm

Coated Carbide Endmill Q-MAX Endmill

SSE2000 - Q(TiAlN)



Cutting diameter : $\phi 1 - \phi 16$
Cutting length : 40mm - 90mm

SSE3000 - Q(TiAlN)



Cutting diameter : $\phi 3 - \phi 16$
Cutting length : 45mm - 90mm

SSE4000 - Q



Cutting diameter : $\phi 13 - \phi 16$
Cutting length : 45mm - 90mm

E-Max Endmill

ESE2000 - Q



Cutting diameter : $\phi 3 - \phi 16$
Cutting length : 40mm - 80mm

ESE4000 - Q



Cutting diameter : $\phi 3 - \phi 16$
Cutting length : 40mm - 80mm

Solid Spiral Endmill

SSE2000



Cutting diameter : $\phi 3 - \phi 16$
Cutting length : 40mm - 80mm

SSE4000



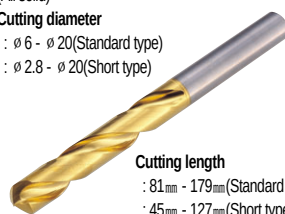
Cutting diameter : $\phi 3 - \phi 16$
Cutting length : 40mm - 80mm

Vulcan Drill

VSD- MP, MG, MK, SP, SG, SK

(All solid)

Cutting diameter
: $\phi 6 - \phi 20$ (Standard type)
: $\phi 2.8 - \phi 20$ (Short type)



Cutting length
: 81mm - 179mm(Standard type)
: 45mm - 127mm(Short type)

VZD- MA, MBA, LA, LBA

(Brazed type)

Cutting diameter
: $\phi 9.5 - \phi 40$



Cutting length
: 95mm - 245mm(Medium type)
: 115mm - 325mm(Long type)

Drill

SSD-S



Cutting diameter : $\phi 1 - \phi 14$
Cutting length : 32mm - 55mm
For non - ferrous metal

SSD



Cutting diameter : $\phi 1 - \phi 13$
Cutting length : 32mm - 125mm
For General purpose

Turning Toolholders

Lever lock system

PCBNR/L



2020-K12 (12-4B)
2525-M12 (16-4D)
2525-M16 (16-5D)
3232-P16 (20-5D)
3232-P19 (20-6D)
4040-S19 (24-6E)

PCLNR/L



2020-K12 (12-4B)
2525-M12 (16-4D)
2525-M16 (20-4D)
3232-P12 (16-5D)
3232-P16 (20-5D)
3232-P19 (20-6D)
4040-S19 (24-6E)

PDJNR/L



1616-H11 (10-3A)
2020-K11 (12-3B)
2525-M11 (16-3D)
2020-K15 (12-4B)
2525-M15 (16-4D)
3232-P15 (20-4D)
2020-K15-3 (12-4B-3)
2525-M15-3 (16-4D-3)
3232-P15- (20-4D-3)

PDDNR/L



2525-M15 (16-4D)
4025-M15 (86-4D)
2525-M15-3 (16-4D-3)
4025-M15-3 (86-4D-3)
3232-P15 (20-4D)

PRDCN



2020-M10 (12-10B)
2525-M12 (16-12D)

PRGCR/L



2020-K10 (12-10B)
2525-M10 (16-10D)
2020-K12 (12-12B)
2525-M12 (16-12D)

PSDNN



2020-K12 (12-4B)
2525-M12 (16-4D)
3232-P12 (20-4D)
3232-P15 (20-5D)
3232-P19 (20-6D)
4040-S19 (24-6E)

PSBNR/L



2020-K12 (12-4B)
2525-M12 (16-4D)
3232-P12 (85-4D)
3225-P12 (20-4D)
2525-M15 (16-5D)
3232-P15 (20-5D)
3232-P19 (20-6D)
4040-S19 (24-6E)

PSKNR/L



2020-K12 (12-4B)
2525-M12 (16-4D)
3232-P12 (20-4D)
2525-M15 (16-5D)
3232-P15 (20-5D)
3232-P19 (20-6D)
3232-S19 (20-6D)

PSSNR/L



2020-K12 (12-4B)
2525-M12 (16-4D)
3232-P12 (20-4D)
2525-M15 (16-5D)
3232-P15 (20-5D)
3232-P19 (20-6D)
4040-P19 (24-6E)

PTFNR/L



1616-H16 (10-3A)
2020-K16 (12-3B)
2525-M16 (16-3D)
2525-M22 (16-4D)
3232-P22 (20-4D)
3232-P27 (20-5D)
4040-S27 (24-5E)

PTGNR/L



1616-H16 (10-3A)
2020-K16 (12-3B)
2525-M16 (16-3D)
3232-P16 (20-3D)
2525-M22 (16-4D)
3232-P22 (20-4D)
3232-P27 (20-5D)
4040-S27 (24-5E)

Mult Lock System

PTTNR/L



1616-H16 (10-3A)
2020-K16 (12-3B)
2525-M22 (16-4D)

PWLNRL/L



2020-K06 (12-3)
2525-M06 (16-3)
2020-K08 (12-4)
2525-M08 (16-4)

MVJNR/L



2020K16
2525M16

Wedge clamp on system

WTJNR



2020-K16 (12-3B)
2525-M16 (16-3D)
3232-P16 (20-3D)
2525-M22 (16-4D)
3232-P22 (20-4D)

WTXNR/L



2020-K16 (12-3B)
2525-M16 (16-3D)
3232-P16 (20-3D)

WWLNR/L



2020-K08 (12-4B)
2525-M0 (16-4D)

Turning Toolholders

Clamp on system

CKJNR/L



2525-M16 (16-3D)
3232-P16 (20-3D)
4040-R16 (24-3E)
2525-M16 (16-3D)
3232-P16 (20-3D)
4040-R16 (24-3E)

CSDNN



2020-K12C (12-4B)
2525-M12C (16-4D)
3225-P12C (85-4D)

CCLNR/L



2020-K12C (12-4B)
2525-M12C (16-4D)
3225-P12C (85-4D)

CRDNN



2020-K12C (12-4B)
2525-M12C (16-4D)
3225-P12C (85-4D)

CRGNN/L



2020-K12C (12-4B)
2525-M12C (16-4D)
3225-P12C (85-4D)

CSKNN/L



2020-K12C (12-4B)
2525-M12C (16-4D)
3225-P12C (85-4D)

CTFNN/L



2020-K16C (12-4B)
2525-M16C (16-4D)
3225-P16C (85-4D)

CKNNR/L



2525-M16 (16-3D)
3232-P16 (20-3D)

CTGNN/L



2020-K16C (12-4B)
2525-M16C (16-4D)
3225-P16C (85-4D)

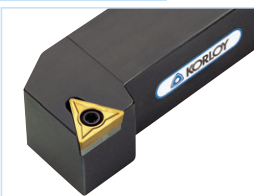
Screw on system

SDJCR/L



1010-E07 (06-2J)
1212-E07 (08-2K)
1616-H11 (10-3A)
2020-K11 (12-3B)
2525-M11 (16-3D)

STGCR/L



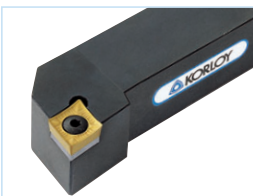
0808-D09 (05-1.8J)
1010-E09 (06-1.8J)
1212-F11 (08-2K)
1616-H11 (10-2A)
2020-K16 (12-3B)
2525-M16 (16-3D)

SVVBN



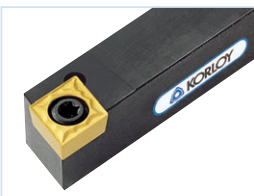
1212-F11 (08-2K)
1616-H11 (10-2A)
2020-K11 (12-2B)
1616-H16 (10-3A)
2020-K16 (12-3B)
2525-M16 (16-3D)

SCLCR/L



0808-D06 (05-2J)
1010-E06 (06-2J)
1212-F09 (08-3K)
1616-H09 (10-3A)
2020-K12 (12-4B)
2525-M12 (16-4D)

SCACR/L



1010-E06 (06-2J)
1212-F09 (08-3K)

SSKCR/L



1616-H09 (10-3A)

SDNCR

1010-E07 (06-2J)
1212-F07 (08-2K)
1212-H11 (08-3A)
1616-H11 (10-3A)
2020-K11 (12-3B)

SDACR/L

1010-E07 (06-2J)
1212-E07 (08-3K)
1616-H11 (10-3A)

SSDCN

1212-F09 (1212-F09)
1616-H09 (1616-H09)

SSBCR/L

1212-F09 (08-3K)
1616-H09 (10-3A)
2020-K12 (12-4B)

STACR/L

1010-E09 (06-1.8J)
1212-F11 (08-2K)

STTCR/L

1616-H11 (10-2A9)
1616-H16 (10-3A)
2020-K16 (12-3B)

STFCR/L

1010-E09 (06-1.8J)
1212-F11 (08-2K)
1616-H11 (10-2A)
1616-H16 (10-3A)
2020-K16 (12-3B)

SVABR/L

1616-M16 (10-3A)
2020-K16 (12-3B)

SWACR/L

1010-E04 (06-2J)
1212-F04 (08-2A)
1616-H06 (10-3A)
2020-K08 (12-4B)

SSSCR/L

1616-H09 (10-3A)
2020-K12 (12-4B)

Boring Bars

Screw on system

SCLCR/L



S08K-SCLCR/L06 (S05K-SCLCR/L2)
S10M-SCLCR/L06 (S06M-SCLCR/L2)
S12M-SCLCR/L06 (S08M-SCLCR/L2)
S12M-SCLCR/L09 (S08M-SCLCR/L3)
S16R-SCLCR/L09 (S10R-SCLCR/L3)
S20S-SCLCR/L09 (S12S-SCLCR/L3)
S25T-SCLCR/L09 (S16T-SCLCR/L3)
S25T-SCLCR/L12 (S16T-SCLCR/L4)
S32U-SCLCR/L12 (S20U-SCLCR/L4)
S40V-SCLCR/L12 (S24V-SCLCR/L4)
A08F-SCLCR/L06 (A05F-SCLCR/L2)
A10H-SCLCR/L06 (A06H-SCLCR/L2)
A12K-SCLCR/L06 (A08K-SCLCR/L2)
A12K-SCLCR/L09 (A08K-SCLCR/L3)
A16M-SCLCR/L09 (A10M-SCLCR/L3)
A20Q-SCLCR/L09 (A12Q-SCLCR/L3)
A25R-SCLCR/L09 (A16R-SCLCR/L3)
A25R-SCLCR/L12 (A16R-SCLCR/L4)
A32S-SCLCR/L12 (A20S-SCLCR/L4)

SCLPR/L



S10M-SCLPR/L08 (S06M-SCLPR/L2.5)
S12M-SCLPR/L08 (S08M-SCLPR/L2.5)
S16N-SCLPR/L09 (S10N-SCLPR/L3)
S16R-SCLPR/L09 (S10R-SCLPR/L3)
S20N-SCLPR/L09 (S12N-SCLPR/L3)
S20S-SCLPR/L09 (S12S-SCLPR/L3)
A10H-SCLPR/L08 (A06H-SCLPR/L2.5)
A12K-SCLPR/L08 (A08K-SCLPR/L2.5)
A16M-SCLPR/L09 (A10M-SCLPR/L3)
A20Q-SCLPR/L09 (A12Q-SCLPR/L3)
C10M-SCLPR/L08 (C06M-SCLPR/L2.5)
C12M-SCLPR/L08 (C08M-SCLPR/L2.5)
C16R-SCLPR/L09 (C10R-SCLPR/L3)
C20S-SCLPR/L09 (C12S-SCLPR/L3)
E10M-SCLPR/L08 (E06M-SCLPR/L2.5)
E12M-SCLPR/L08 (E08M-SCLPR/L2.5)
E16R-SCLPR/L09 (E10R-SCLPR/L3)
E20S-SCLPR/L09 (E12S-SCLPR/L3)

SDUCR/L,SDQCR/L



S10M-SDQCR/L07 (S06M-SDQCR/L2)
S12M-SDQCR/L07 (S08M-SDQCR/L2)
S16R-SDQCR/L07 (S10R-SDQCR/L2)
S20S-SDQCR/L11 (S12S-SDQCR/L3)
S25T-SDQCR/L11 (S16T-SDQCR/L3)
A10H-SDQCR/L07 (A06H-SDQCR/L2)
A12K-SDQCR/L07 (A08K-SDQCR/L2)
A16M-SDQCR/L11 (A10M-SDQCR/L3)
A20Q-SDQCR/L11 (A12Q-SDQCR/L3)
A25R-SDQCR/L11 (A16R-SDQCR/L3)

SDZCR/L



S25T-SDZCR/L11 (S16T-SDZCR/L3)
S32U-SDZCR/L11 (S20U-SDZCR/L3)
S40V-SDZCR/L11 (S24V-SDZCR/L3)
A25R-SDZCR/L11 (A16R-SDZCR/L3)
A32S-SDZCR/L11 (A20S-SDZCR/L3)

SSKCR/L



S12M-SSKCR09 (S08M-SSKCR3)
S16R-SSKCR09 (S10R-SSKCR3)
S20S-SSKCR09 (S12S-SSKCR3)
S25T-SSKCR12 (S16T-SSKCR4)
S32U-SSKCR12 (S20U-SSKCR4)
A12K-SSKCR09 (A08K-SSKCR3)
A16M-SSKCR09 (A10M-SSKCR3)
A20Q-SSKCR09 (A12Q-SSKCR3)
A25R-SSKCR12 (A16R-SSKCR4)
A32S-SSKCR12 (A20S-SSKCR4)

SSKPR/L



S12M-SSKPR/L09 (S08M-SSKPR/L3)
S16N-SSKPR/L09 (S10N-SSKPR/L3)
S16R-SSKPR/L09 (S10R-SSKPR/L3)
S20N-SSKPR/L09 (S12N-SSKPR/L3)
S20S-SSKPR/L09 (S12S-SSKPR/L3)
X12M-SSKPR/L09 (X08M-SSKPR/L3)
X16N-SSKPR/L09 (X10N-SSKPR/L3)
X16R-SSKPR/L09 (X10R-SSKPR/L3)
X20N-SSKPR/L09 (X12N-SSKPR/L3)
X20S-SSKPR/L09 (X12S-SSKPR/L3)
A12K-SSKPR/L09 (A08K-SSKPR/L3)
A16M-SSKPR/L09 (A10M-SSKPR/L3)
A20Q-SSKPR/L09 (A12Q-SSKPR/L3)

STFCR/L



S10M-STFCR/L09 (S06M-STFCR/L1.8)
S12M-STFCR/L09 (S08M-STFCR/L1.8)
S12M-STFCR/L11 (S08M-STFCR/L2)
S16R-STFCR/L11 (S10R-STFCR/L2)
S20S-STFCR/L11 (S12S-STFCR/L2)
S25T-STFCR/L16 (S16T-STFCR/L3)
S32U-STFCR/L16 (S20U-STFCR/L3)
S40V-STFCR/L16 (S24V-STFCR/L3)
A10H-STFCR/L09 (A06H-STFCR/L1.8)
A12K-STFCR/L09 (A08K-STFCR/L1.8)
A12K-STFCR/L11 (A08K-STFCR/L2)
A16M-STFCR/L11 (A10M-STFCR/L2)
A20Q-STFCR/L11 (A12Q-STFCR/L2)
A25R-STFCR/L16 (A16R-STFCR/L3)
A32S-STFCR/L16 (A20S-STFCR/L3)

STFPR/L



S10M-STFPR/L11 (S06M-STFPR/L2)
S12M-STFPR/L11 (S08M-STFPR/L2)
S16N-STFPR/L11 (S10N-STFPR/L2)
S16R-STFPR/L11 (S10R-STFPR/L2)
S20N-STFPR/L16 (S12N-STFPR/L3)
S20S-STFPR/L16 (S12S-STFPR/L3)
A10H-STFPR/L11 (A06H-STFPR/L2)
A12K-STFPR/L11 (A08K-STFPR/L2)
A16M-STFPR/L11 (A10M-STFPR/L2)
A20Q-STFPR/L16 (A12Q-STFPR/L3)
C10M-STFPR/L11 (C06M-STFPR/L2)
C12M-STFPR/L11 (C08M-STFPR/L2)
C16R-STFPR/L11 (C10R-STFPR/L2)
C20S-STFPR/L16 (C12S-STFPR/L3)
E10M-STFPR/L11 (E06M-STFPR/L2)
E12M-STFPR/L11 (E08M-STFPR/L2)
E16R-STFPR/L11 (E10R-STFPR/L2)
E20S-STFPR/L16 (E12S-STFPR/L3)

SVQBR/L



S32U-SVQBR/L16 (S20U-SVQBR/L3)
S40V-SVQBR/L16 (S24V-SVQBR/L3)
A32S-SVQBR/L16 (A20S-SVQBR/L3)

SVUBR/L



S32U-SVUBR/L16 (S20U-SVUBR/L3)
S40V-SVUBR/L16 (S24V-SVUBR/L3)
A32S-SVUBR/L16 (A20S-SVUBR/L3)

SWLCR/L



S25T-SWLCR/L08 (S16T-SWLCR/L4)
S32U-SWLCR/L08 (S20U-SWLCR/L4)
A25R-SWLCR/L08 (A16R-SWLCR/L4)
A32S-SWLCR/L08 (A20S-SWLCR/L4)

Micro boring bars

STUBR/L



S08K-STUBR/L06 (S05K-STUBR/L1.2)
A08F-STUBR/L06 (A05F-STUBR/L1.2)

STUPR/L



S08K-STUPR/L08 (S05K-STUPR/L1.5)
A08F-STUPR/L08 (A05F-STUPR/L1.5)

SWUBR/L



S05H-SWUBR/L02 (S03H-SWUBR/L1.2)
S08K-SWUBR/L02 (S05K-SWUBR/L1.2)
S08K-SWUBR/L03 (S05K-SWUBR/L1.5)
A08F-SWUBR/L02 (A05F-SWUBR/L1.2)
A08F-SWUBR/L03 (A05F-SWUBR/L1.5)
E05H-SWUBR/L02 (E03H-SWUBR/L1.2)
E08K-SWUBR/L02 (E05K-SWUBR/L1.2)

Boring Bars

Coolant hole boring bars

SDUCR/L



A10H-SDUCR/L07 (A06H-SDUCR/L2)
A12K-SDUCR/L07 (A08K-SDUCR/L2)
A16M-SDUCR/L07 (A10M-SDUCR/L2)
A20Q-SDUCR/L11 (A12Q-SDUCR/L3)
A25R-SDUCR/L11 (A16R-SDUCR/L3)

STFCR/L



A10H-STFCR/L09 (A06H-STFCR/L1.8)
A12K-STFCR/L09 (A08K-STFCR/L1.8)
A12K-STFCR/L11 (A08K-STFCR/L2)
A16M-STFCR/L11 (A10M-STFCR/L2)
A20Q-STFCR/L11 (A12Q-STFCR/L2)
A25R-STFCR/L16 (A16R-STFCR/L3)
A32S-STFCR/L16 (A20S-STFCR/L3)

SDQCR/L



A10H-SDQCR/L07 (A06H-SDUCR/L2)
A12K-SDQCR/L07 (A08K-SDUCR/L2)
A16M-SDQCR/L11 (A10M-SDUCR/L2)
A20Q-SDQCR/L11 (A12Q-SDUCR/L3)
A25R-SDQCR/L11 (A16R-SDUCR/L3)

SCLCR/L



A08F-SCLCR/L06 (A05F-SCLCR/L2)
A10H-SCLCR/L06 (A06H-SCLCR/L2)
A12K-SCLCR/L06 (A08K-SCLCR/L2)
A12K-SCLCR/L09 (A08K-SCLCR/L3)
A16M-SCLCR/L09 (A10M-SCLCR/L3)
A20Q-SCLCR/L09 (A12Q-SCLCR/L3)
A25R-SCLCR/L09 (A16R-SCLCR/L3)
A25R-SCLCR/L12 (A16R-SCLCR/L4)
A32S-SCLCR/L12 (A20S-SCLCR/L4)

SCLCR/L



E08K-SCLCR/L-06
E10M-SCFCR/L-06
E12M-SCFCR/L-06
E16R-SCFCR/L-09
E20S-SCFCR/L-09

PDUNR/L



S32U-PDUNR/L15 (S20U-PDUNR/L4)
S40V-PDUNR/L15 (S24V-PDUNR/L4)
S32U-PDUNR/L15-3 (S20U-PDUNR/L4-3)
S40V-PDUNR/L15-3 (S24V-PDUNR/L4-3)
A32S-PDUNR/L15 (A20S-PDUNR/L4)
A32S-PDUNR/L15-3 (A20S-PDUNR/L4-3)

PCLNR/L



A25R-PCLNR/L12 (A16R-PCLNR/L4)
A32S-PCLNR/L12 (A20S-PCLNR/L4)

SDUCR/L



A10H-SDUCR/L07 (A06H-SDUCR/L2)
A12K-SDUCR/L07 (A08K-SDUCR/L2)
A16M-SDUCR/L07 (A10M-SDUCR/L2)
A20Q-SDUCR/L11 (A12Q-SDUCR/L3)
A25R-SDUCR/L11 (A16R-SDUCR/L3)

Lever lock system

PCLNR/L



S25T-PCLNR/L12 (S16T-PCLNR/L4)
S32U-PCLNR/L12 (S20U-PCLNR/L4)
S40V-PCLNR/L12 (S24V-PCLNR/L4)
S50W-PCLNR/L12 (S32W-PCLNR/L4)
S50W-PCLNR/L19 (S32W-PCLNR/L6)
A25R-PCLNR/L12 (A16R-PCLNR/L4)
A32S-PCLNR/L12 (A20S-PCLNR/L4)

PSKNR/L



S25T-PSKNR/L12 (S16T-PSKNR/L4)
S32U-PSKNR/L12 (S20U-PSKNR/L4)
S40V-PSKNR/L12 (S24V-PSKNR/L4)
A25R-PSKNR/L12 (A16R-PSKNR/L4)
A32S-PSKNR/L12 (A20S-PSKNR/L4)

PTFNR/L



S25T-PTFNR/L16 (S16T-PTFNR/L3)
S32U-PTFNR/L16 (S20U-PTFNR/L3)
S40V-PTFNR/L16 (S24V-PTFNR/L3)
A25R-PTFNR/L16 (A16R-PTFNR/L3)
A32S-PTFNR/L16 (A20S-PTFNR/L3)

PDSNR/L



S32U-PDSNR/L15 (S20U-PDSNR/L4)
S40V-PDSNR/L15 (S24V-PDSNR/L4)
S32U-PDSNR/L15-3 (S20U-PDSNR/L4-3)
S40V-PDSNR/L15-3 (S24V-PDSNR/L4-3)
A32S-PDSNR/L15 (A20S-PDSNR/L4)
A32S-PDSNR/L15-3 (A20S-PDSNR/L4-3)

PDUNR/L



S32U-PDUNR/L15 (S20U-PDUNR/L4)
S40V-PDUNR/L15 (S24V-PDUNR/L4)
S32U-PDUNR/L15-3 (S20U-PDUNR/L4-3)
S40V-PDUNR/L15-3 (S24V-PDUNR/L4-3)
A32S-PDUNR/L15 (A20S-PDUNR/L4)
A32S-PDUNR/L15-3 (A20S-PDUNR/L4-3)

Forming, Grooving, Threading, Parting

SAW-MAN

SPB-S(SPBA-S)

(Stopper type)



Insert : SP

· Blade
226 432
232 526
326 532
332 632
426

SPH-S(SPHA-S)



Insert : SP

· Blade
320
325
420
425
525

SPB(SPBA) / SMBB(SMBBA)



Insert : SP

· Blade
226 432
232 526
326 532
332 632
426
· Block
20-26
20-32
25-26
25-32

Face Grooving Tools

FGHH (FGVH)



Insert : FGD
FGM

325R
425R
525R

M. G. T

MGEHR/L



Insert : MGMN-M
MRMN-M
MRGN-A

MGIVR/L



Insert : MGMN-M
MRMN-M
MRGN-A

MGEUR/L



Insert : MGMN-M
MRMN-M
MRGN-A

MGEVR/L



Insert : MGMN-M
MRMN-M

MGIUR/L



Insert : MGMN-M
MRMN-M
MRGN-A

Internal Cutting

FTIH



Insert : FTG, FTT, FTF

IGH



Insert : IG

214 (0910-2)
216 (1110-2)
220 (1310-2)

GFIK



Insert : GR

316 (1410-3)
325 (2116-3)
340 (3224-3)
525 (2116-5)
540 (3224-5)
840 (3224-8)

GFIP



Insert : BF, GW

316 (1310-3)
320 (1712-3)
325 (2116-3)
340 (3224-3)
525 (2116-5)
540 (3224-5)
(3224-8)

External Cutting

DBH



Insert : DB

320 (12-3)
325 (16-3)
520 (12-5)
525 (16-5)
720 (12-7)
725 (16-7)

GH



Insert : GS, GO

2020-3 (12-3)
2525-4 (16-3)
2525-3 (12-4)
2525-4 (16-4)

GFT



Insert : GW, BF

325 (16-3)
525 (16-5)
825 (16-8)

TBH



Insert : TB

320-23 (12-3-23)
320-33 (12-3-33)
320-43 (12-3-43)
325-23 (16-3-23)
325-33 (16-3-33)
325-43 (16-3-43)
420-23 (12-4-23)
420-33 (12-4-33)
420-45 (12-4-45)
425-23 (16-4-23)
425-33 (16-4-33)
425-45 (16-4-45)

EH



Insert : ESB

620
625

PH



Insert : POB

320 (12-3)
325 (16-3)
420 (12-4)
425 (16-4)
525 (16-5)

Threading

ETH



Insert : ECTR

320 (12-3)
325 (16-3)

ITH



Insert : ICTR

212R (0808R-2)
216R (1010R-2)
316R (1310R-3)
320R (1612R-3)
325R (1916R-3)
332R (2420R-3)
340R (2924R-3)
350R (3532R-4)
420R (1612R-4)
425R (1916R-4)
432R (2420R-4)
440R (2924R-4)
450R (3632R-4)
463R (4440R-4)

PH



Insert : VETR

2020 (12)
2525 (16)
3225 (85)

Double-Mill series

- Excellent anti-vibration effect.
- Less cutting resistance by double positive rake angle.
- Use TORX screws of durability and clamping power.
- Good rigidity and easy operation by simple structure.

AFO4000(AFOM,FAOA)



(ϕ 80 - ϕ 125mm)
(ϕ 3 - ϕ 4 inch)

- Insert
OFCW05T3N
OFKT05T3SN-MF
OFKT05T3SN-MM
REKT12T300-MM
OFKT05T3FN-MA

AFO5000(AFOM,AFOA)



(ϕ 80 - ϕ 200mm)
(ϕ 3 - ϕ 8 inch)

- Insert
OFCN0704N
OFKR0704SN-MF
OFKR0704SN-MM
REKR170400-MM
OFKR0704FN-MA

※ AFOM : They have the Metric Size System.

Mill-Max series

AD4000(ADM,ADA) / AD5000



(ϕ 80 - ϕ 315mm)
(ϕ 3 - ϕ 12 inch)

- Insert
SDAN1203(42)
SDKN1203(42)
• For milling of steel, alloy steel and precise cast iron products

AE4000(AEM,AEA)



(ϕ 80 - ϕ 315mm)
(ϕ 3 - ϕ 12 inch)

- Insert
SECN1203(42)
SEKN1203(42)
SEKR1203(42)
• For milling of steel, tool steel and stainless steel

EF4000(EFM,EFA)



(ϕ 80 - ϕ 315mm)
(ϕ 3 - ϕ 12 inch)

- Insert
SFAN1203(42)
SFCN1203
• For milling of aluminum and light alloy exclusively

※ ADM, AEM, EFM : They have the Metric Size System.

EN4000(ENM,ENA)



(ϕ 80 - ϕ 315mm)
(ϕ 3 - ϕ 12 inch)

- Insert
SNCN1204(42)
• For milling of cast iron exclusively

EP4000(EPM,EPA) / EP5000



(ϕ 80 - ϕ 315mm)
(ϕ 3 - ϕ 12 inch)

- Insert
SPAN1203(42), 1504(42)
SPCN1203(42)
SPKN1203(42), 1504(42)
SPKR1203(42)
• For milling of steel, alloy steel and cast iron

PP4000(PPM,PPA)



(ϕ 80 - ϕ 315mm)
(ϕ 3 - ϕ 12 inch)

- Insert
TPAN2204(43)
TPKN2204(43)
TPKR2204(43)
TPCN2204(43)
TPKN2204(43)
TPKR2204(43)
• For square shoulder cutting of steel, alloy steel and cast iron

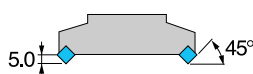
※ EPM, ENM, PPM : They have the Metric Size System.

High feed cutter

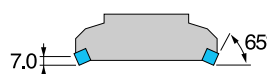


ANH4000, 5000
CDH4000, 5000
CDH4000, 5000
DEH5000
DPH5000
PNH4000, 5000

ANH type



CDH type



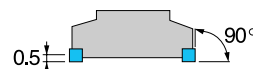
DEH type



DPH type



PNH type



Side cutter

FC0810R/L-31524R/L(FCA) HC10024R/L-31524R/L(HCA)



FC0810R/L-31524R/L(FCA)
(ϕ 80 - ϕ 315mm)
(ϕ 3 - ϕ 12 inch)

HC10024R/L-31524R/L(HCA)
(ϕ 100 - ϕ 315mm)
(ϕ 4 - ϕ 12 inch)
• Insert
TPCN1103PPN
1603PPN

SPB(SPBA) (Boss type)

NEW



(ϕ 80 - ϕ 200mm)
(ϕ 3 - ϕ 8 inch)

- Insert
PNEJ 1223N
PNEJ 1275N

SPP(SPPA) (Disk type)

NEW



(ϕ 80 - ϕ 200mm)
(ϕ 3 - ϕ 8 inch)

- Insert
PNEJ 1223N
PNEJ 1275N

Indexable - Drill Series

NPD(NPDA)



(ϕ 13 - ϕ 55mm)
(ϕ 0.625 - ϕ 2.250inch)

• Insert
NPM121304-DM,DS,DR,DA
141504
160804
192104
222408
252808
293208
334108
425508

TSDH(TSDHA)



(ϕ 16 - ϕ 32mm)
(ϕ 0.629 - ϕ 1.25inch)

• Insert
TSD1600-3150 - DM,DS,DA
TSDA06563-12500- DM,DS,DA

JD(JDA)

(ϕ 16 - ϕ 55mm)
(ϕ 0.5 - ϕ 2.25inch)



• Insert
WCMT030208-C20
040208-C20
050308-C20
06T308-C20
080408-C20
(for Aluminum Drilling)
WCKT06T308-DA
080408-DA

Pro-A Mill

PAC(PACA)



(ϕ 40 - ϕ 100mm)
(ϕ 1.5 - ϕ 4.0inch)

• Insert
VCKT220530 - MA

PAS(PASA)



(ϕ 32 - ϕ 40mm)
(ϕ 1.25 - ϕ 1.50inch)

• Insert
VCKT220530 - MA

Future -Mill Series

FMPC(FMPCA)



(ϕ 50 - ϕ 125)
(ϕ 2 - ϕ 5inch)

FMPS(FMPSA)



(ϕ 25 - ϕ 63mm)
(ϕ 1 - ϕ 2.25inch)

• Insert
SDXT09M405R-MF, MM, MA
SDXT130508R-MF, MM, MA

FMAC(FMACA)



(ϕ 50 - ϕ 200mm)
(ϕ 1.969 - ϕ 7.874inch)

• Insert
SEE(X)T0903AGT(F)N
- MF, MM, MR, MA
SEE(X)T14M4AGT(F)N
- MF, MM, MR, MA

Alpha-Mill Series

FMAS(FMASA)



(ϕ 25 - ϕ 63mm)
(ϕ 1.0 - ϕ 2.5inch)

AMC(AMCA)2000,3000S



(ϕ 50 - ϕ 100mm)
(ϕ 3 - ϕ 4inch)

• Insert
APXT11T3PDSR-MM
11T3PDSR-MF
11T312R-MM
11T3PDR-MA
APKT1604PDFR-MA
APXT1604PDSR-MM
1604PDSR-MF
160416R-MM
160432R-MM

AMC(AMCA) 2000,3000SE



(ϕ 80 - ϕ 100mm)
(ϕ 3 - ϕ 4inch)

• Insert
APXT11T3PDSR-MM
11T3PDSR-MF
11T312R-MM
1604PDSR-MM
1604PDSR-MF
160416R-MM
160432R-MM

AMS(AMSA) 2000S, 3000S

(ϕ 10 - ϕ 63mm)
(ϕ 0.5 - ϕ 2.5inch)



• Insert
APXT 11T3PDSR-MM
11T3PDSR-MF
11T312R-MM
1604PDSR-MM
1604PDSR-MF
160416R-MM
APKT 160432R-MM
1604PDFR-MA

AMS(AMSA) 2000, 3000SE

(ϕ 25 - ϕ 63mm)
(ϕ 0.5 - ϕ 2.5inch)



• Insert
APXT 11T3PDSR-MM
11T3PDSR-MF
11T312R-MM
1604PDSR-MM
1604PDSR-MF
160416R-MM
160432R-MM

AMS(AMSA) 2000M

(ϕ 20 - ϕ 40mm)
(ϕ 1 - ϕ 1.5inch)



• Insert
APXT 11T3PDSR-MM
11T3PDSR-MF
11T312R-MM
11T3PDR-MA

Alpha-Mill Series

AMC(AMCA) 2000M



($\varnothing$ 50 - $\varnothing$ 100mm)
($\varnothing$ 2 - $\varnothing$ 4inch)

• Insert
APXT11T3PDSR-MM
11T3PDSR-MF
11T312R-MM
11T3PDR-MA

Mach-Mill Series

BFE(BREA)

($\varnothing$ 16- $\varnothing$ 32mm)
($\varnothing$ 0.5- $\varnothing$ 1.25inch)



• Insert
RC16
RC20
RC25
RC30
RC32

BRE(BREA)

($\varnothing$ 20 - $\varnothing$ 63mm)
($\varnothing$ 1- $\varnothing$ 2.25inch)



• Insert
ZDMT08T2-R10.0 + SPMT060304
ZDMT1103-R12.5 + SPMT060304
ZDMT13T3-R16.0 + SDMT090308
ZPMT1604-R20.0 + SPMT120408
ZPMT1604-R25.0 + SPMT120408
ZPMT1604-R31.5 + SPMT120408

Cen-Mill Series

CE(CEA)

($\varnothing$ 7 - $\varnothing$ 35mm)
($\varnothing$ 0.25- $\varnothing$ 1.5inch)



• Insert
SPMN120308
120312

PM(PMA)

($\varnothing$ 40 - $\varnothing$ 50mm)
($\varnothing$ 1.5 - $\varnothing$ 2inch)



• Insert
EDCW1604ZDF(T)R

SE(SEA)

($\varnothing$ 25 - $\varnothing$ 40mm)
($\varnothing$ 1- $\varnothing$ 1.5inch)



• Insert
MPMT090308
120408

Eco-Max Series

TM(TMA)

($\varnothing$ 32 - $\varnothing$ 50mm)
($\varnothing$ 1.25 - $\varnothing$ 2inch)



• Insert
MIT 100, 150, 200, 300, 400
MET 100, 150, 200, 300, 400

EK(EKA)

($\varnothing$ 40 - $\varnothing$ 125)
($\varnothing$ 1.5 - $\varnothing$ 5inch)



• Insert
SECA1204AFTN

EKS(EKSA)

($\varnothing$ 32 - $\varnothing$ 63mm)
($\varnothing$ 1.25 - $\varnothing$ 2.5inch)



• Insert
SECA1204AFTN

Turbo-Mill Series

ADS(ADSA) 4000, 5000

($\varnothing$ 50 - $\varnothing$ 63mm)
($\varnothing$ 2- $\varnothing$ 2.25inch)



• Insert
SDCN42M/MT
SDCN42M/MT

PES(PESA)2000, 3000, 4000

($\varnothing$ 20 - $\varnothing$ 63mm)
($\varnothing$ 1 - $\varnothing$ 2.25inch)



• Insert
TECN22R/TR
TECN32R/TR
TECN42R/TR
TECN43R/TR

Tank-Mill Series

THE(THEA)

($\varnothing$ 25 - $\varnothing$ 50mm)
($\varnothing$ 1- $\varnothing$ 2inch)



• Insert
APLT070304R
ADLT150308R
ZPMT1504PPSR
SPMT060304
SPMT120308
SDMT090308

HE(HEA)

($\varnothing$ 25 - $\varnothing$ 63mm)
($\varnothing$ 1- $\varnothing$ 2.25inch)



• Insert
MCMT080308EN ZCMT 080308ER
09T308EN 09T308ER

The comparison of chip breaker for turning

APPLICATION			KORLOY		SUMITO -MO	SANDVIK	KENNA- METAL	KYOCERA	MITSUBI -SHI	ISCAR	TOSHIBA	SECO	WALTER	DIJET	
			Main	Sub											
NEGATIVE TYPE	STEELS	EXTREME FINISHING	HU	D02	FA	QF	FF	GP DP CF	FH	SF	TF	FF1 F1, F2		F1 FA	
		FINISHING	HF	GF	SU, SK SP LU	PF	FN FP FW	CQ HQ	SH	NF	TS, AS 11 17	MF2	NF NF3 NF5	FT UA	
		MEDIUM FINISHING	HC	HM	SX UU	SM		CQ HQ	SH	NF RF LF	MJ	MF1	NS4 NS8	GP UR PF	
		MEDIUM ROUGHING	HM	GM	GU UX UG	PM QM	MN MP MW	GS HS CS	MA MH	TF PP	TM	M3 MR3	NM, NM4 NM5, NM6 NM7	UB GG	
		ROUGHING	HR	GR	MU MX	PR	RN CT	GT HT ★	GH	NR	TH	MR4 M5 MR7	NR5 NR7	UD	
		HEAVY	GH HH	B40	HG MP HP	HR	RH SP HP	HX	HZ, HV HH HX	TNM	TU 57 65	RR9 R4		UC	
		WIPER	HW		LUW GUW	WF WM WR	MW FW	WQ	MW SW	WF WG	ASW	M3 M5	NF, PF NM, PM		
	GENERAL		B25	GR	UZ	23	MG	★	MT, MV	GN				GN	
	STAINLESS STEEL MILD STEEL		HA HS GS	HC HM GR X38	SU, EX MU, FL (GU)	MF MM, QM MR	FF, FW FP, MP MW, RN	GU, HU XP, XQ XS	FS, FJ SH, MJ MS, GJ GH	PP TF	TF SS SA TU, MS	MF1 MF3 M5	NS4 NM4 NR7	SF	
	CAST IRON		GR	B20 B25 HR	UZ UX ★	KF KM, QM KR, QR	FF, FW MP, MW RN	GC ★ ZS	★ ★	GN	★ 33, CM ★	MF3 M5	NS4, NS8 ★ NM4		
	ALUMINUM		HA				F GP MS	AH		PP					
	POSITIVE TYPE	CAST IRON	FINISHING	HFP	C05	FP FK	PF KF	MT-UF MT-LF GT-LF	GP DP HQ	FV SQ	★ SM	01 PF	F1	PF4 PF5	FT
			MEDIUM FINISHING	HMP		SJ, SU SK	(PM) (KM)	MF	XQ HQ	R/L R/L-F	14, SM 17, 19	PS 23 PM	F1 F2	PS4 PS5	
MEDIUM ROUGHING			C25	HMP	SF MU	(PR) (KR)	MT-MF GM	★ G	MV MQ ★	19	24 ★	F2	PM2, PM5 (PR5)		
ALUMINUM		AK		AG	AL	HP	A3		AS	PP	AI		ALU ACB		
STAINLESS STEEL MILD STEEL		HMP	AK	MU	MF, MM MR	LF	(XQ)	FV ★	14, SM 17, 19	SS		PS4 PM5			
INDEXABLE DRILL		C20 DS, DA DM	C21	S04 R06	51, 53 56, 58		★ SU, SP		SW, GF GG, DT		C1, P1 85, 86				
GROOVING			M,G			CM, CS				K3, J10	MC, LF				

★ No Name ★ Simple Type

The Comparison of Cutting Grade

ISO	KORLOY	SUMITOMO		KYOCERA		ISCAR		SANDVIK		KENNAMETAL		TOSHIBA		MITSUBISHI		HITACHI		VALENITE		WALTER		NTK		DIJET	
		TUNGSTEN CARBIDE	COATED	CERMET	TUNGSTEN CARBIDE	COATED	CERMET	TUNGSTEN CARBIDE	COATED	CERMET	TUNGSTEN CARBIDE	COATED	CERMET	TUNGSTEN CARBIDE	COATED	CERMET	TUNGSTEN CARBIDE	COATED	CERMET	TUNGSTEN CARBIDE	COATED	CERMET	TUNGSTEN CARBIDE		COATED
P	ST05	CU000	ST10P	AC700G	TL10A	CP70L5	TN30	IC70	IC307	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC110V	LN10
	ST10	NC310	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC215V	CV60	
	ST15	NC3015	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC215V	CV75	
	ST20	NC3020	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC215V	CV90	
M	MA2	NC3020	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M
	ST30A	NC3030	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
	ST30N	NC3030	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
	ST40	NC3030	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
N	U10	NC3020	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
	U20	NC3020	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
	U40	NC3030	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
	U40	NC3030	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
I	H02	NC305K	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
	H01	NC3010	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
	H05	NC315K	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
	H10	NC315K	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
G	G10	NC315K	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
	G10	NC315K	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
	G10	NC315K	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
	G10	NC315K	CC115★	ST70E	AC300G	T200Z★	P101★	IC3015	IC3015	IC3015	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	IC30M	
ISO	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	
	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	COATED	CERMET	
P	NOM825	CN100	AC230	TL12A	PR630★	TN60	IC520M	GCL1015★	T20M	KCT725M★	KT175	T325	F7000	V45N	CH500	CH500	CH500	CH500	CH500	CH500	CH500	CH500	CH500	CH500	
	PC230★	CN20	AC230★	TL200A	PR730★	TN100M	IC635	GCL1025★	T25M	KCT792M	HT2	AH330★	GP20M★	NX2525	CH150★	CH150★	CH150★	CH150★	CH150★	CH150★	CH150★	CH150★	CH150★	CH150★	
	PC350★	CN30	CC125★	T250A	PR730★	TC60M	IC950★	GCL1020★	CP200★	KC935M	HT5	AH740★	AP20M★	NX55	CH250★	CH250★	CH250★	CH250★	CH250★	CH250★	CH250★	CH250★	CH250★	CH250★	
	NOM835	CN30	AC230	T250A	PR830★	TC60M	IC1009★	GCL1040	T350M	KCT195M	KT195M	T325	AP20M★	NX4545	CH570	CH570	CH570	CH570	CH570	CH570	CH570	CH570	CH570	CH570	
M	PC130★	CN30	EH510Z★	T250A	PR660★	TN100M	IC908★	GCL1005★	CP200★	KC9240	KT175	T325	VP15TF★	NX4545	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	
	NOM835	CN30	EH520Z★	T250A	PR730★	TC60M	IC928★	GCL1005★	CP200★	KC705M★	KT195M	AH140★	VP20RT★	NX4545	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★		
	PC350★	CN300	AC2350	T250A	PR830★	TC60M	IC928★	GCL1005★	CP200★	KC705M★	KT195M	AH140★	VP20RT★	NX4545	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★		
	NOM835	CN300	AC2350	T250A	PR830★	TC60M	IC928★	GCL1005★	CP200★	KC705M★	KT195M	AH140★	VP20RT★	NX4545	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★		
K	NOM810K	CN300	AC211	T250A	PR660★	TN100M	IC908★	GCL1005★	CP200★	KC9240	KT175	T325	VP15TF★	NX4545	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	
	PC205K★	CN300	AC211	T250A	PR660★	TN100M	IC908★	GCL1005★	CP200★	KC9240	KT175	T325	VP15TF★	NX4545	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	
	NOM820K	CN300	AC211	T250A	PR660★	TN100M	IC908★	GCL1005★	CP200★	KC9240	KT175	T325	VP15TF★	NX4545	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	
	PC215K★	CN300	AC211	T250A	PR660★	TN100M	IC908★	GCL1005★	CP200★	KC9240	KT175	T325	VP15TF★	NX4545	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	CH3844★	

※ Coated★ : PVD
Cermet★ : cermet+PVD



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