

Hard Metal®

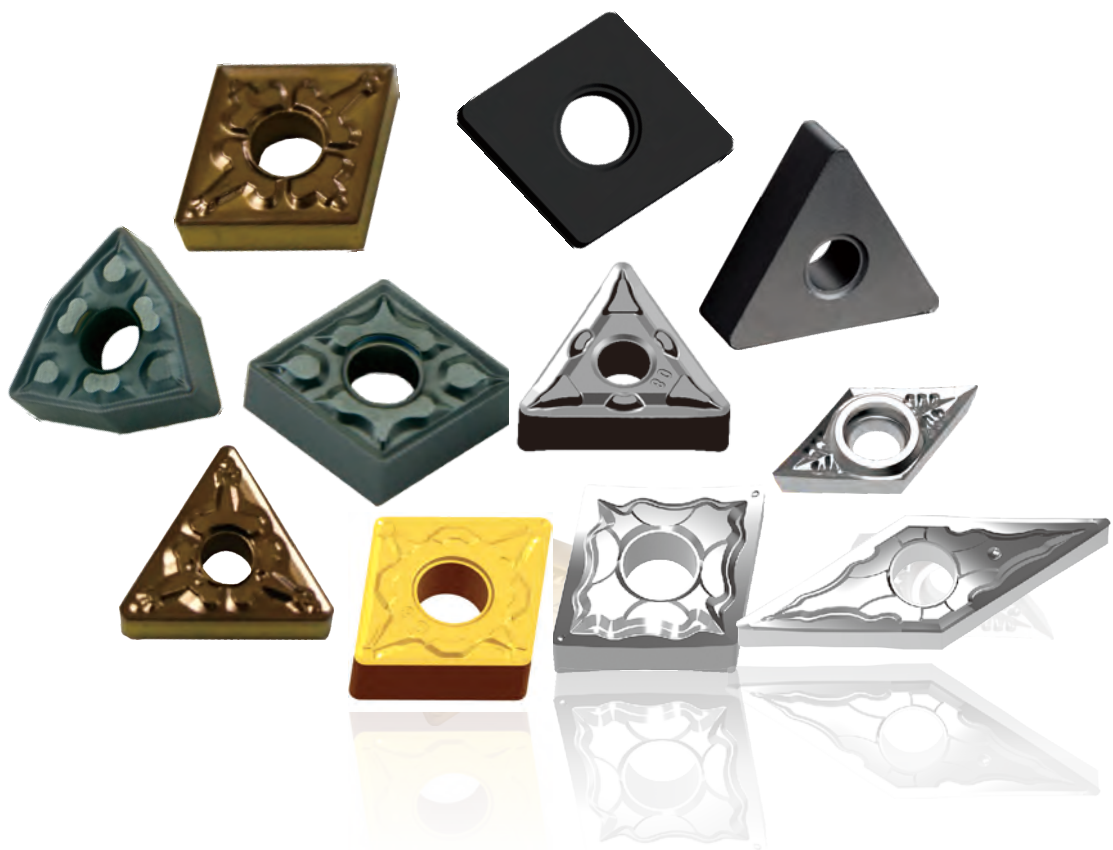
Cutting Tools Catalog 2020



Index	Page
Turning Inserts-----	P001-P032
External Turning Holders-----	P033-P074
Internal Turning Holders-----	P075-P104
Grooving & Parting Tools-----	P105-P122
Milling Tools-----	P123-P155
Threading Tools-----	P156-P178
End Mills-----	P179-P209
Drill & Taps-----	P210-P250
Drilling & Boring Tools-----	P251-P283
Tool Holders-----	P284-P344



Turning Inserts



Workpiece Material Table

	ISO Material Group	Workpiece Material	Carbon Content	Tensile Strength N/mm2	Brinell Hardness HB	Rockwell Hardness HRC
P Steel	P1	Low-carbon Steels, Long Chipping.	C<0.25%	<530	<125	
	P2	Low-carbon Steels, Short Chipping, Free-cutting Steels.	C<0.25%	<530	<125	
	P3	High-carbon Steels, Medium-carbon Steels.	C<0.25%	<530	<220	<25
	P4	Alloy Steels, Tool Steels.	C<0.25%	600-850	<330	<35
	P5	Alloy Steels, Tool Steels.	C<0.25%	850-1400	340-450	35-48
	P6	Ferritic Stainless Steels, Martensitic Stainless Steels, PH Stainless Steels.	C=(0-0.4)%	600-900	<330	<35
	P7	High-strength Ferritic Stainless Steels, Martensitic Stainless Steels, PH Stainless Steels.	C=(0.1-0.6)%	900-1350	330-450	35-48
M Stainless Steel	M1	Austenitic Stainless Steels.	C=(0.05-0.15)%	<600	130-200	
	M2	High-strength Austenitic Stainless Steels and Cast Stainless Steels.	C=(0.05-0.15)%	600-800	150-230	<25
	M3	Duplex Stainless Steels.	C=(0.05-0.20)%	<800	135-275	<30
K Cast Iron	K1	Grey Cast Iron.		125-500	120-290	<32
	K2	Moderately Difficult Alloy Cast iron, Nodular Cast Iron.		<600	130-260	<28
	K3	Difficult High-alloy Cast Iron, Nodular Cast Iron.		>600	180-350	<43
N Non-ferrous Metal	N1	Wrought Aluminium Alloys.		<520	60-90	
	N2	Cast Aluminium Alloys.	Si≤12%	<350	70-100	
	N3	Cast Aluminium Alloys.	Si>12%	200-320	60-120	
	N4	Copper, Copper Alloys.		200-650	60-200	
	N5	Graphite, CFK, CFRP Graphite, Composite Materials.		600-1500		
	N6	GFK, CFK Aluminium-based Composite Materials.		<700	<210	
S Heat-resistant Alloy, Ti Alloy	S1	Iron-based Heat-resistant Alloys.		500-1200	160-260	25-48
	S2	Cobalt-based Heat-resistant Alloys.		1000-1450	250-450	25-48
	S3	Nickel-based Heat-resistant Alloys.		600-1700	160-450	<48
	S4	Titanium and Titanium Alloys.		900-1600	300-400	33-48
H High Hardness Materials	H1	Hardened Steels.				45-55
	H2	Hardened Steels.				55-60
	H3	Hardened Steels.				60-65
	H4	Hardened Steels.				>65

Chip Breaker Introduction

Steel(P)

PF

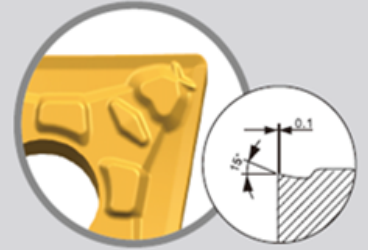
Finishing Cutting Steel(P)

Chipbreaker for steel finishing machining

Special Design for steel finishing

Unique design efficiently controls the form of chip and breaks the chip

Sharp cutting edge, smooth cutting



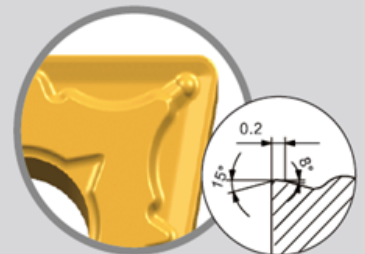
PM

Medium Cutting Steel(P)

Chipbreaker for steel semi-finishing machining

Negative chamfer design gives blade good strength

Double chipbreaker lands, makes bigger chip control range



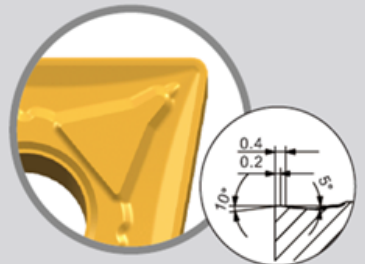
PR

Rough Cutting Steel(P)

Three- dimension design with double rake angle, wide margin and negative chamfer

Wonderfu blade intensity gives a longer tool life time

Suitab,e for steel rough machining



Cast Iron(K)

KM

MEDIUM-FINISHING

Chipbreaker for Medium-finish machining Cast Iron

Special Design for finish machining Alloys

Unique design efficiently controls the form of chip and breaks the chip

Sharp cutting edge, smooth cutting

None

Rough Machining

Without Chipbreaker, for rough machining Cast Iron

Flat Top

Srong Edge Design for interrupt cutting conditions

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

End Mill

Drill & Tap

Drilling & Boring

Tool Holder

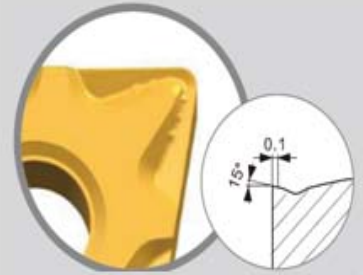
Chip Breaker Introduction

Stainless Steel(M)

MF

FNINSHING

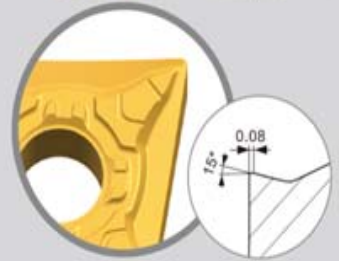
Special designed rake angle and cutting edge inclination;
Sharp cutting edge, small cutting force;
Good machining surface quality;
Suitable for stainless steel finishing.



MF1

FINISHING

Three-dimension designed with double rake angle;
Sharp cutting edge and lower cutting resistance;
Efficiently solved build up edge, work hardening and other machining problems.
Cutting edge inclination designation is good to control chip flow direction and obtains excellent Surface quality.



MM1

MEDIUM-FINISHING

Special chipbreaker design to keep both sharp cutting edge and increased blade intensity;
Efficiently solved break chip, high cutting temperature, sticking, work hardening and other machining problems.
It has very excellent efficiency
Suitable for stainless steel semi-finishing cutting.



MM

MEDIUM-FINISHING

Special chipbreaker design to keep cutting edge sharp and safe
Good anti impact resistance;
Excellent tool life time;
Suitable for stainless steel semi-finishing.



Chip Breaker Introduction

Aluminum Alloy(N)

NL

FINISHING TO ROUGHING

Unique three- dimensional chip breaker and sufficient chip pocket;
Large rake angle and clearance angle form sharp cutting edge, it' s optimized quick cutting and lower cutting loading;
Special design in cutting edge inclination efficiently control flow direction of chips.
Mirror effect in rake angle area;
Obtained good surface quality and insert life.

Alloy,TiAlloy(S)

SF

FINISHING

Chipbreaker for Alloy finishing machining
Special Design for finish machining Alloys
Unique design efficiently controls the form of chip and breaks the chip
Sharp cutting adge, smooth cutting

SM

MEDIUM-FINISHING

Chipbreaker for Alloy semi-finishing machining
Negative chamfer design gives blade good strength
Double chipbreaker lands, makes bigger chip control range

General Machining (PMKS)

GF/GM/GM1/GR

Chipbreaker for General machining
GF for General finish machining
GM/GM1 for general medium machining
GR for general rough machining

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

End Mill

Drill & Tap

Drilling & Boring

Tool Holder

ISO Turning Indexable Inserts Identification System

Symbol	Shape	Corner Angle	Figure
H	Hexagon	120°	
O	Octagon	135°	
P	Pentagon	108°	
S	Square	90°	
T	Triangle	60°	
C	Rhombic	80°	
D		55°	
E		75°	
F		50°	
M		86°	
V		35°	
W	Trigon	80°	
L	Rectangle	90°	
A	Parallelogram	85°	
B		82°	
K		55°	
R	Round	—	

① Shape Symbol

Symbol	Relief Angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Other

② Relief Angle Symbol

Symbol	Tolerance(mm)			Tolerance(inch)		
	Corner Height(m)	Thickness(S)	I.C.Size(φd)	Corner Height(m)	Thickness(S)	I.C.Size(φd)
A	± 0.005	± 0.025	± 0.025	± 0.0002	± 0.001	± 0.001
F	± 0.005	± 0.025	± 0.013	± 0.0002	± 0.001	± 0.0005
C	± 0.013	± 0.025	± 0.025	± 0.0005	± 0.001	± 0.001
H	± 0.013	± 0.025	± 0.013	± 0.0005	± 0.001	± 0.0005
E	± 0.025	± 0.025	± 0.025	± 0.001	± 0.001	± 0.001
G	± 0.025	± 0.013	± 0.025	± 0.001	± 0.005	± 0.001
J	± 0.005	± 0.025	± 0.05 ~ ± 0.13	± 0.0002	± 0.001	± 0.002 ~ ± 0.005
K	± 0.013	± 0.025	± 0.05 ~ ± 0.13	± 0.0005	± 0.001	± 0.002 ~ ± 0.005
L	± 0.025	± 0.025	± 0.05 ~ ± 0.13	± 0.001	± 0.001	± 0.002 ~ ± 0.005
M	± 0.08 ~ ± 0.18	± 0.013	± 0.05 ~ ± 0.13	± 0.003 ~ ± 0.007	± 0.005	± 0.002 ~ ± 0.005
N	± 0.08 ~ ± 0.18	± 0.025	± 0.05 ~ ± 0.13	± 0.003 ~ ± 0.007	± 0.001	± 0.002 ~ ± 0.005
U	± 0.13 ~ ± 0.38	± 0.013	± 0.08 ~ ± 0.25	± 0.005 ~ ± 0.015	± 0.005	± 0.003 ~ ± 0.01

③ Relief Angle Symbol

①

②

③

④

⑤

T

N

M

G

22

①

②

③

④

⑤

④ Chipbreaker/Hole Symbol

Symbol	Hole	Hole Shape	Chipbreaker	Shape
N	Without	—	Without	
R			Single-sided	
F			Double-sided	
A	With Hole	With Hole	Without	
M			Single-sided	
G			Double-sided	
W	With	With hole and one countersink 40° ~ 60°	Without	
T			Single-sided	
Q		With hole and two countersink 40° ~ 60°	Without	
U			Double-sided	
B		With hole and one countersink 70° ~ 90°	Without	
H			Single-sided	
C		With hole and two countersink 70° ~ 90°	Without	
J			Double-sided	
X	—	—	—	—

⑤ Cutting Edge Length Symbol(ISO)(mm)

Symbol	Length	Symbol	Length	Symbol	Length	Symbol	Length	Symbol	Length	Symbol	Length	Symbol	Length	I.C.Size (mm)
		03	3.97	03	4.0			06	6.9	4	4.8			3.97
		04	4.76	04	4.8			08	8.2	5	5.8			4.76
05	5	—	—	—	—	—	—	—	—	—	—	—	—	5
		05	5.56	05	5.6	03	3.8	09	9.6	6	6.8			5.56
06	6	—	—	—	—	—	—	—	—	—	—	—	—	6
		06	6.35	06	6.5	04	4.3	11	11	7	7.8	11	11.2	6.35
		07	7.94	08	8.1	05	5.4	13	13.8	9	9.7			7.94
08	8	—	—	—	—	—	—	—	—	—	—	—	—	8
09	9.525	09	9.525	09	9.7	06	6.5	16	16.5	11	11.6	16	16.6	9.525
10	10	—	—	—	—	—	—	—	—	—	—	—	—	10
12	12	—	—	—	—	—	—	—	—	—	—	—	—	12
12	12.7	12	12.7	12	12.9	08	8.7	22	22	15	15.5	22	22.1	12.7
15	15.875	15	15.875	16	16.1	10	10.9	27	27.5	19	19.4			15.875
16	16	—	—	—	—	—	—	—	—	—	—	—	—	16
19	19.05	19	19.05	19	19.3	13	13	33	33	23	23.3			19.05
20	20	—	—	—	—	—	—	—	—	—	—	—	—	20
		22	22.225	22	22.6			38	38.5	27	27.1			22.225
25	25	—	—	—	—	—	—	—	—	—	—	—	—	25
25	25.4	25	25.4	25	25.8			44	44	31	31			25.4
31	31.75	31	31.75	32	32.2			55	55	38	38.8			31.75
31	32	—	—	—	—	—	—	—	—	—	—	—	—	32

ISO Turning Indexable Inserts Identification System

Insert Shape: H.O.P.S.T.C.E.M.W.R									
I.C. Size (mm)	Tolerance of I.C. Size (∅d)(mm)		Tolerance of Corner Height (m)(mm)		I.C. Size (inch)	Tolerance of I.C. Size (∅d)(mm)		Tolerance of Corner Height (m)(mm)	
	Class J,K,L,M,N	Class U	Class M,N	Class U		Class J,K,L,M,N	Class U	Class J,K,L,M,N	Class U
6.35	± 0.05	± 0.08	± 0.08	± 0.13	0.250	± 0.002	± 0.003	± 0.003	± 0.005
9.525					0.375				
12.7	± 0.08	± 0.13	± 0.13	± 0.2	0.500	± 0.003	± 0.005	± 0.005	± 0.008
15.875					0.625				
19.05	± 0.1	± 0.18	± 0.15	± 0.27	0.750	± 0.004	± 0.007	± 0.006	± 0.011
25.4					1.000				
31.75	± 0.15	± 0.25	± 0.2	± 0.38	1.250	± 0.006	± 0.010	± 0.007	± 0.015
32					1.260				

Insert Shape: D					
Inscribed Circle Size		Tolerance of I.C. Size		Tolerance of Corner Height	
mm	in	mm	in	mm	in
6.35	0.250	± 0.05	± 0.002	± 0.11	± 0.004
9.525	0.375	± 0.05	± 0.002	± 0.11	± 0.004
12.7	0.500	± 0.08	± 0.003	± 0.15	± 0.006
15.875	0.625	± 0.10	± 0.004	± 0.18	± 0.007
19.05	0.750	± 0.10	± 0.004	± 0.18	± 0.007

Insert Shape: V					
Inscribed Circle Size		Tolerance of I.C. Size		Tolerance of Corner Height	
mm	in	mm	in	mm	in
6.35	0.250	± 0.05	± 0.002	± 0.15	± 0.006
9.525	0.375	± 0.05	± 0.002	± 0.15	± 0.006
12.7	0.500	± 0.08	± 0.003	± 0.20	± 0.008
15.875	0.625	± 0.10	± 0.004	± 0.27	± 0.011
19.05	0.750	± 0.10	± 0.004	± 0.27	± 0.011

Symbol	Thickness (mm)
01	1.59
02	2.38
T2	2.78
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35
07	7.94
09	9.52

Thickness Symbol



04 08 – NM2



Inscribed Circle Size
Thickness(s)
Corner Height(m)

Corner Symbol	
Symbol	Corner-Rc(mm)
00	0.03
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
28	2.8
32	3.2

Chipbreaker Symbol
Indicates the cutting properties and chipbreaker

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

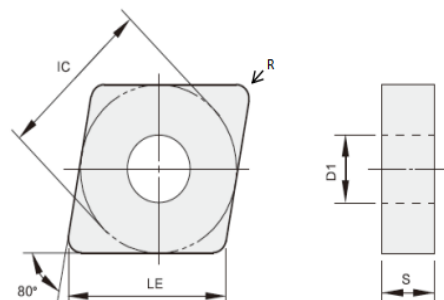
End Mill

Drill & Tap

Drilling & Boring

Tool Holder

CNMG/CNMA



Shape	Type	Dimension					P				M				K			S
		Le	I	S	D	R	2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105
	CNMG120404-PF	12.9	12.7	4.76	5.16	0.4			#	O								
	CNMG120408-PF	12.9	12.7	4.76	5.16	0.8			#	O								
	CNMG120404-MF	12.9	12.7	4.76	5.16	0.4					O	O	#	O				
	CNMG120408-MF	12.9	12.7	4.76	5.16	0.8					O	O	#	O				
	CNMG090304-MF1	9.7	9.525	3.18	3.81	0.4					O	O	#	O				
	CNMG120404-MF1	12.9	12.7	4.76	5.16	0.4					O	O	#	O				
	CNMG120404-PM	12.9	12.7	4.76	5.16	0.4			O	#						O		
	CNMG120408-PM	12.9	12.7	4.76	5.16	0.8			O	#						O		
	CNMG120412-PM	12.9	12.7	4.76	5.16	1.2			O	#						O		
	CNMG120416-PM	12.9	12.7	4.76	5.16	1.6			O	#						O		
	CNMG160608-PM	16.1	15.875	6.35	6.35	0.8			O	#						O		
	CNMG160612-PM	16.1	15.875	6.35	6.35	1.2			O	#						O		
	CNMG160616-PM	16.1	15.875	6.35	6.35	1.6			O	#						O		
	CNMG190608-PM	19.3	19.05	6.35	7.94	0.8			O	#						O		
	CNMG190612-PM	19.3	19.05	6.35	7.94	1.2			O	#						O		
	CNMG190616-PM	19.3	19.05	6.35	7.94	1.6			O	#						O		
	CNMG120404-MM	12.9	12.7	4.76	5.16	0.4				O	O	O	#	O				
	CNMG120408-MM	12.9	12.7	4.76	5.16	0.8				O	O	O	#	O				
	CNMG160608-MM	16.1	15.875	6.35	6.35	0.8				O	O	O	#	O				
	CNMG090308-MM1	9.7	9.525	3.18	3.81	0.8					O	O	#	O				
	CNMG120408-MM1	12.9	12.7	4.76	5.16	0.8					O	O	#	O				
	CNMG120412-MM1	12.9	12.7	4.76	5.16	1.2					O	O	#	O				
	CNMG160612-MM1	16.1	15.875	6.35	6.35	1.2					O	O	#	O				
	CNMG120404-SM	12.9	12.7	4.76	5.16	0.4												O
	CNMG120408-SM	12.9	12.7	4.76	5.16	0.8												O
	CNMG120412-SM	12.9	12.7	4.76	5.16	1.2												O

#Featured Grade

O: OptionalGrade

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

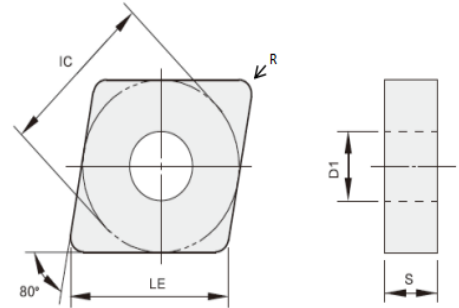
End Mill

Drill & Tap

Drilling & Boring

Tool Holder

CNMG/CNMA

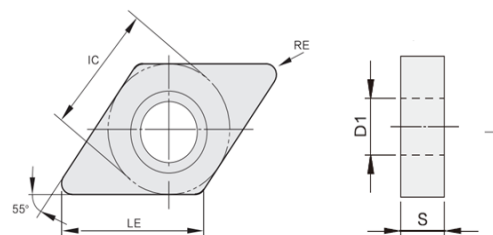


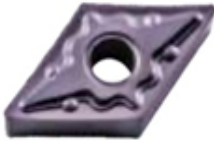
Shape	Type	Dimension					P				M				K			S
		Le	I	S	D	R	2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105
	Medium	CNMG120404-KM	12.9	12.7	4.76	5.16	0.4	○	○	○					○	#	○	
		CNMG120408-KM	12.9	12.7	4.76	5.16	0.8	○	○	○					○	#	○	
		CNMG120412-KM	12.9	12.7	4.76	5.16	1.2	○	○	○					○	#	○	
		CNMG160608-KM	16.1	15.875	6.35	6.35	0.8	○	○	○					○	#	○	
		CNMG160612-KM	16.1	15.875	6.35	6.35	1.2	○	○	○					○	#	○	
		CNMG160616-KM	16.1	15.875	6.35	6.35	1.6	○	○	○					○	#	○	
		CNMG190608-KM	19.3	19.05	6.35	7.94	0.8	○	○	○					○	#	○	
		CNMG190612-KM	19.3	19.05	6.35	7.94	1.2	○	○	○					○	#	○	
		CNMG190616-KM	19.3	19.05	6.35	7.94	1.6	○	○	○					○	#	○	
	Roughing	CNMG120408-PR	12.9	12.7	4.76	5.16	0.8	○	○	#							○	
		CNMG120416-PR	12.9	12.7	4.76	5.16	1.6	○	○	#							○	
		CNMG190608-PR	19.3	19.05	6.35	7.94	0.8	○	○	#							○	
		CNMG190612-PR	19.3	19.05	6.35	7.94	1.2	○	○	#							○	
		CNMG190616-PR	19.3	19.05	6.35	7.94	1.6	○	○	#							○	
		CNMG190608-PR	19.3	19.05	6.35	7.94	0.8	○	○	#							○	
		CNMG190612-PR	19.3	19.05	6.35	7.94	1.2	○	○	#							○	
		CNMG190616-PR	19.3	19.05	6.35	7.94	1.6	○	○	#							○	
	Heavy Duty	CNMG190616-PR1	19.3	19.05	6.35	7.94	1.6	○	○	#							○	
	Roughing	CNMA120404	12.9	12.7	4.76	5.16	0.4								○	#	○	
		CNMA120408	12.9	12.7	4.76	5.16	0.8								○	#	○	
		CNMA120412	12.9	12.7	4.76	5.16	1.2								○	#	○	
		CNMA120416	12.9	12.7	4.76	5.16	1.6								○	#	○	
		CNMA160608	16.1	15.875	6.35	6.35	0.8								○	#	○	
		CNMA160612	16.1	15.875	6.35	6.35	1.2								○	#	○	
		CNMA160616	16.1	15.875	6.35	6.35	1.6								○	#	○	
		CNMA160620	16.1	15.875	6.35	6.35	2.0								○	#	○	
		CNMA190612	19.3	19.05	6.35	7.94	1.2								○	#	○	
		CNMA190616	19.3	19.05	6.35	7.94	1.6								○	#	○	

#Featured Grade

○: Optional Grade

DNMG/DNMA

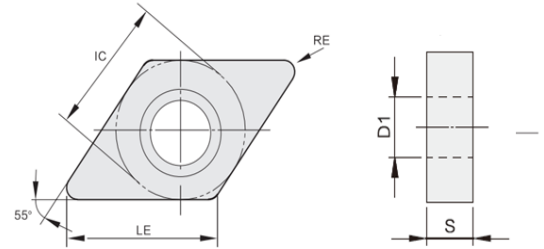


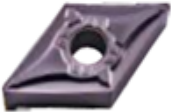
Shape	Type	Dimension					P				M				K			S
		LE	IC	S	D1	RE	2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105
	DNMG110404-PM	11.6	9.525	4.76	3.81	0.4		O	#							O		
	DNMG110408-PM	11.6	9.525	4.76	3.81	0.8		O	#							O		
	DNMG110412-PM	11.6	9.525	4.76	3.81	1.2		O	#							O		
	DNMG150404-PM	15.5	12.7	4.76	5.16	0.4		O	#							O		
	DNMG150408-PM	15.5	12.7	4.76	5.16	0.8		O	#							O		
	DNMG150412-PM	15.5	12.7	4.76	5.16	1.2		O	#							O		
	DNMG150604-PM	15.5	12.7	6.35	5.16	0.4		O	#							O		
	DNMG150608-PM	15.5	12.7	6.35	5.16	0.8		O	#							O		
	DNMG150612-PM	15.5	12.7	6.35	5.16	1.2		O	#							O		
	DNMG110404-MM	11.6	9.525	4.76	3.81	0.4			O	O	O	#	O					
	DNMG110408-MM	11.6	9.525	4.76	3.81	0.8			O	O	O	#	O					
	DNMG150404-MM	15.5	12.7	4.76	5.16	0.4			O	O	O	#	O					
	DNMG150408-MM	15.5	12.7	4.76	5.16	0.8			O	O	O	#	O					
	DNMG150604-MM	15.5	12.7	6.35	5.16	0.4			O	O	O	#	O					
	DNMG150608-MM	15.5	12.7	6.35	5.16	0.8			O	O	O	#	O					
	DNMG150612-MM	15.5	12.7	6.35	5.16	1.2			O	O	O	#	O					
	DNMG110408-MM1	11.6	9.525	4.76	3.81	0.8					O	#	O					
	DNMG150408-MM1	15.5	12.7	4.76	5.16	0.8					O	#	O					
	DNMG150608-MM1	15.5	12.7	6.35	5.16	0.8					O	#	O					
	DNMG110408-KM	11.6	9.525	4.76	3.81	0.8			O	O					O	#	O	
	DNMG150404-KM	15.5	12.7	4.76	5.16	0.4			O	O					O	#	O	
	DNMG150408-KM	15.5	12.7	4.76	5.16	0.8			O	O					O	#	O	
	DNMG150412-KM	15.5	12.7	4.76	5.16	1.2			O	O					O	#	O	
	DNMG150608-KM	15.5	12.7	6.35	5.16	0.8			O	O					O	#	O	
	DNMG150612-KM	15.5	12.7	6.35	5.16	1.2			O	O					O	#	O	
	DNMA150616-KM	15.5	12.7	6.35	5.16	1.6									O	#	O	

#Featured Grade

O: OptionalGrade

DNMG/DNMA

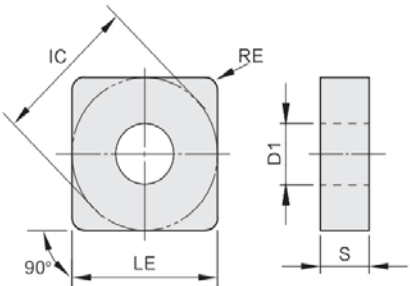


Shape		Type	Dimension					P				M				K			S		
			LE	IC	S	D1	RE	2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105		
	Finishing	DNMG110404-PF	11.6	9.525	4.76	3.81	0.4	#	O												
		DNMG110408-PF	11.6	9.525	4.76	3.81	0.8	#	O												
		DNMG150404-PF	15.5	12.7	4.76	5.16	0.4	#	O												
		DNMG150408-PF	15.5	12.7	4.76	5.16	0.8	#	O												
		DNMG150604-PF	15.5	12.7	6.35	5.16	0.4	#	O												
		DNMG150608-PF	15.5	12.7	6.35	5.16	0.8	#	O												
		DNMG110404-MF1	11.6	9.525	4.76	3.81	0.4				O	O	#	O							
		DNMG150404-MF1	15.5	12.7	4.76	5.16	0.4				O	O	#	O							
			DNMG150604-MF	15.5	12.7	6.35	5.16	0.4				O	O	#	O						
			DNMG150608-MF	15.5	12.7	6.35	5.16	0.8				O	O	#	O						
		Roughing	DNMG150408-PR	15.5	12.7	4.76	5.16	0.8		O	O	#						O			
	DNMG150412-PR		15.5	12.7	4.76	5.16	1.2		O	O	#						O				
	DNMG150608-PR		15.5	12.7	6.35	5.16	0.8		O	O	#						O				
	DNMG150612-PR		15.5	12.7	6.35	5.16	1.2		O	O	#						O				
	DNMG150612-PR		15.5	12.7	6.35	5.16	1.6		O	O	#						O				
	DNMA110416		11.6	9.525	4.76	3.81	0.8										O	#	O		
	DNMA150404		15.5	12.7	4.76	5.16	0.4										O	#	O		
	DNMA150408		15.5	12.7	4.76	5.16	0.8										O	#	O		
	DNMA150604		15.5	12.7	6.35	5.16	0.4										O	#	O		
	DNMA150608		15.5	12.7	6.35	5.16	0.8										O	#	O		
	DNMA150612		15.5	12.7	6.35	5.16	1.2										O	#	O		
	DNMA150616		15.5	12.7	6.35	5.16	1.6										O	#	O		

#Featured Grade

O: OptionalGrade

SNMG



Shape	Type	Dimension					P				M				K			S
		LE	IC	S	D1	RE	2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105
	Medium	SNMG120404-PM	12.7	12.7	4.76	5.16	0.4		O	#						O		
		SNMG120408-PM	12.7	12.7	4.76	5.16	0.8		O	#						O		
		SNMG120412-PM	12.7	12.7	4.76	5.16	1.2		O	#						O		
		SNMG150608-PM	15.875	15.875	6.35	6.35	0.8		O	#						O		
		SNMG150612-PM	15.875	15.875	6.35	6.35	1.2		O	#						O		
		SNMG190612-PM	19.05	19.05	6.35	7.94	1.2		O	#						O		
	Medium	SNMG120404-MM	12.7	12.7	4.76	5.16	0.4			O	O	O	#	O				
		SNMG120408-MM	12.7	12.7	4.76	5.16	0.8			O	O	O	#	O				
		SNMG120412-MM	12.7	12.7	4.76	5.16	1.2			O	O	O	#	O				
		SNMG150608-MM	15.875	15.875	6.35	6.35	0.8			O	O	O	#	O				
		SNMG120408-MM1	12.7	12.7	4.76	5.16	0.8				O	O	#	O				
	Medium	SNMG120408-SM	12.7	12.7	4.76	5.16	0.8											O
	Medium	SNMG090304-KM								O					O	#	O	
		SNMG090308-KM								O					O	#	O	
		SNMG120404-KM	12.7	12.7	4.76	5.16	0.4			O					O	#	O	
		SNMG120408-KM	12.7	12.7	4.76	5.16	0.8			O					O	#	O	
		SNMG120412-KM	12.7	12.7	4.76	5.16	1.2			O					O	#	O	
		SNMG120416-KM	12.7	12.7	4.76	5.16	1.6			O					O	#	O	
		SNMG150608-KM	15.875	15.875	6.35	6.35	0.8			O					O	#	O	
		SNMG150612-KM	15.875	15.875	6.35	6.35	1.2			O					O	#	O	
		SNMG190612-KM	19.05	19.05	6.35	7.94	1.2	O	O	#						O		
		SNMG190616-KM	19.05	19.05	6.35	7.94	1.6	O	O	#						O		
		SNMG250724-KM	25.4	25.4	7.94	9.12	2.4	O	O	#						O		
		SNMG250924-KM	25.4	25.4	9.525	9.12	2.4	O	O	#						O		

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

End Mill

Drill & Tap

Drilling & Boring

Tool Holder

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

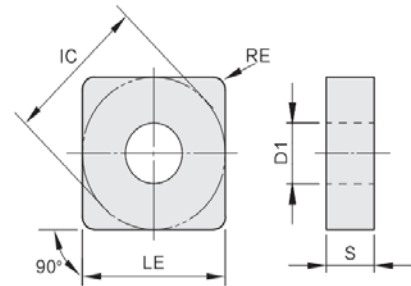
End Mill

Drill & Tap

Drilling & Boring

Tool Holder

SNMG/SNMA

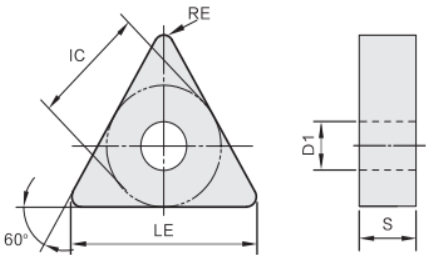


Shape	Type	Dimension					P				M				K			S
		LE	IC	S	D1	RE	2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105
	Finishing	SNMG120404-PF	12.7	12.7	4.76	5.16	0.4			#	O							
		SNMG120408-PF	12.7	12.7	4.76	5.16	0.8			#	O							
	Finishing	SNMG120408-MF	12.7	12.7	4.76	5.16	0.8					O	O	#	#			
	Roughing	SNMG120408-PR	12.7	12.7	4.76	5.16	0.8	O	O	#						O		
		SNMG120412-PR	12.7	12.7	4.76	5.16	1.2	O	O	#						O		
		SNMG150608-PR	15.875	15.875	6.35	6.35	0.8	O	O	#						O		
		SNMG150612-PR	15.875	15.875	6.35	6.35	1.2	O	O	#						O		
		SNMG190612-PR	19.05	19.05	6.35	7.94	1.2	O	O	#						O		
		SNMG190616-PR	19.05	19.05	6.35	7.94	1.6	O	O	#						O		
	Roughing	SNMG190624-PR1	19.05	19.05	6.35	7.94	2.4	O	O	#						O		
		SNMG250924-PR1	25.4	25.4	9.525	9.12	2.4	O	O	#						O		
		SNMA120408	12.7	12.7	4.76	5.16	0.8								O	#	O	
		SNMA120412	12.7	12.7	4.76	5.16	1.2								O	#	O	
		SNMA120416	12.7	12.7	4.76	5.16	1.6								O	#	O	
		SNMG150608	15.875	15.875	6.35	6.35	0.8								O	#	O	
		SNMG150612	15.875	15.875	6.35	6.35	1.2								O	#	O	
		SNMG190612	19.05	19.05	6.35	7.94	1.2									O	O	
		SNMG190616	19.05	19.05	6.35	7.94	1.6									O	O	

#Featured Grade

O: OptionalGrade

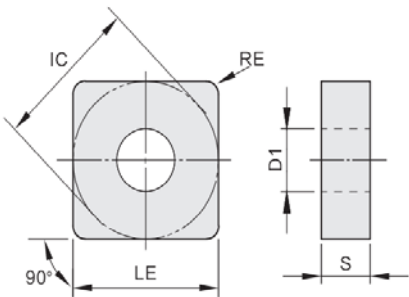
TNMG



Shape	Type	Dimension					P				M				K			S
		LE	IC	S	D1	RE	2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105
	TNMG160404-PM	16.5	9.525	4.76	3.81	0.4			o	#						o		
	TNMG160408-PM	16.5	9.525	4.76	3.81	0.8			o	#						o		
	TNMG160412-PM	16.5	9.525	4.76	3.81	1.2			o	#						o		
	TNMG220404-PM	22	12.7	4.76	5.16	0.4			o	#						o		
	TNMG220408-PM	22	12.7	4.76	5.16	0.8			o	#						o		
	TNMG220412-PM	22	12.7	4.76	5.16	1.2			o	#						o		
	TNMG160404-MM	16.5	9.525	4.76	3.81	0.4				o	o	o	#	o				
	TNMG160408-MM	16.5	9.525	4.76	3.81	0.8				o	o	o	#	o				
	TNMG160412-MM	16.5	9.525	4.76	3.81	1.2				o	o	o	#	o				
	TNMG220404-MM	22	12.7	4.76	5.16	0.4				o	o	o	#	o				
	TNMG220408-MM	22	12.7	4.76	5.16	0.8				o	o	o	#	o				
	TNMG220412-MM	22	12.7	4.76	5.16	1.2				o	o	o	#	o				
	TNMG160404-MM1	16.5	9.525	4.76	3.81	0.4					o	o	#	o				
	TNMG160408-MM1	16.5	9.525	4.76	3.81	0.8					o	o	#	o				
	TNMG160412-MM1	16.5	9.525	4.76	3.81	1.2					o	o	#	o				
	TNMG160408-KM	16.5	9.525	4.76	3.81	0.8		o	o	o					o	#	o	
	TNMG160412-KM	16.5	9.525	4.76	3.81	1.2		o	o	o					o	#	o	
	TNMG220404-KM	22	12.7	4.76	5.16	0.4		o	o	o					o	#	o	
	TNMG220408-KM	22	12.7	4.76	5.16	0.8		o	o	o					o	#	o	
	TNMG220412-KM	22	12.7	4.76	5.16	1.2		o	o	o					o	#	o	
	TNMG220416KM	22	12.7	4.76	5.16	1.6		o	o	o					o	#	o	
#Featured Grade		o : OptionalGrade																

Turning Insert
External Turning Holder
Internal Turning Holder
Grooving & Parting
Milling
Threading
End Mill
Drill & Tap
Drilling & Boring
Tool Holder

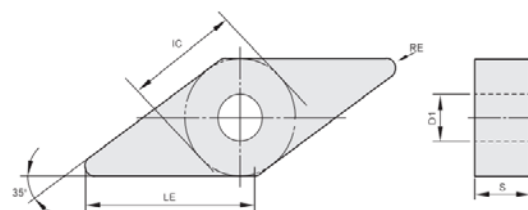
TNMG/TNMA

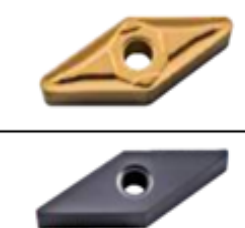


Shape		Type	Dimension					P				M				K			S
			LE	IC	S	D1	RE	2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105
	Finishing	TNMG160404-PF	16.5	9.525	4.76	3.81	0.4			#	○								
		TNMG160408-PF	16.5	9.525	4.76	3.81	0.8			#	○								
		TNMG160404-MF	16.5	9.525	4.76	3.81	0.4					○	○	#	○				
		TNMG160408-MF	16.5	9.525	4.76	3.81	0.8					○	○	#	○				
		TNMG160404-MF1	16.5	9.525	4.76	3.81	0.4					○	○	#	○				
	Roughing	TNMG160404-PR	16.5	9.525	4.76	3.81	0.4		○	○	#						○		
		TNMG160408-PR	16.5	9.525	4.76	3.81	0.8		○	○	#						○		
		TNMG160412-PR	16.5	9.525	4.76	3.81	1.2		○	○	#						○		
		TNMG160416-PR	16.5	9.525	4.76	3.81	1.6		○	○	#						○		
		TNMG220408-PR	22	12.7	4.76	5.16	0.8		○	○	#						○		
		TNMG220412-PR	22	12.7	4.76	5.16	1.2		○	○	#						○		
		TNMG220416-PR	22	12.7	4.76	5.16	1.6		○	○	#						○		
		TNMG270612-PR	27.5	15.875	6.35	6.35	1.2		○	○	#						○		
		TNMA160404	16.5	9.525	4.76	3.81	0.4									○	#	○	
		TNMA160408	16.5	9.525	4.76	3.81	0.8									○	#	○	
		TNMA160412	16.5	9.525	4.76	3.81	1.2									○	#	○	
		TNMA160416	16.5	9.525	4.76	3.81	1.6									○	#	○	
		TNMA220408	22	12.7	4.76	5.16	0.8									○	#	○	
		TNMA220412	22	12.7	4.76	5.16	1.2									○	#	○	
		TNMA220416	22	12.7	4.76	5.16	1.6									○	#	○	

#Featured Grade O: OptionalGrade

VNMG



Shape		Type	Dimension					P				M				K			S
			LE	IC	S	D1	RE	2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105
	Finishing	VNMG160404-PF	16.6	9.525	4.76	3.81	0.4			#	○								
		VNMG160408-PF	16.6	9.525	4.76	3.81	0.8			#	○								
		VNMG160404-MF	16.6	9.525	4.76	3.81	0.4					○	○	#	○				
	Medium	VNMG160404-PM	16.6	9.525	4.76	3.81	0.4			○	#						○		
		VNMG160408-PM	16.6	9.525	4.76	3.81	0.8			○	#						○		
		VNMG160412-PM	16.6	9.525	4.76	3.81	1.2			○	#						○		
		VNMG160404-MM	16.6	9.525	4.76	3.81	0.4				○	○	○	#	○				
		VNMG160408-MM	16.6	9.525	4.76	3.81	0.8				○	○	○	#	○				
		VNMG160408-MM1	16.6	9.525	4.76	3.81	0.8					○	○	#	○				
		VNMG160404-KM	16.6	9.525	4.76	3.81	0.4		○	○							○	#	○
		VNMG160408-KM	16.6	9.525	4.76	3.81	0.8		○	○							○	#	○
																	○	#	○
	Roughing	VNMG160408-PR	16.6	9.525	4.76	3.81	0.8		○	○	#								
		VNMG160412-PR	16.6	9.525	4.76	3.81	1.2		○	○	#								
		VNMA160404	16.6	9.525	4.76	3.81	0.4									○	#	○	
		VNMA160408	16.6	9.525	4.76	3.81	0.8									○	#	○	

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

End Mill

Drill & Tap

Drilling & Boring

Tool Holder

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

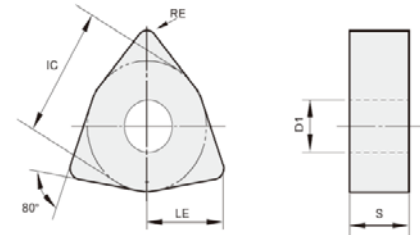
End Mill

Drill & Tap

Drilling & Boring

Tool Holder

WNMG

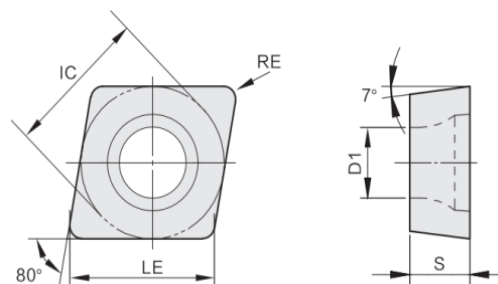


Shape	Type	Dimension					P				M				K				S
		LE	IC	S	D1	RE	2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105	
	WNMG060404-PF	6.5	9.525	4.76	3.81	0.4			#	o									
	WNMG060408-PF	6.5	9.525	4.76	3.81	0.8			#	o									
	WNMG080404-PF	8.7	12.7	4.76	5.16	0.4			#	o									
	WNMG080408-PF	8.7	12.7	4.76	5.16	0.8			#	o									
	WNMG060408-MF	6.5	9.525	4.76	3.81	0.8					o	o	#	o					
	WNMG080404-MF	8.7	12.7	4.76	5.16	0.4					o	o	#	o					
	WNMG080408-MF	8.7	12.7	4.76	5.16	0.8					o	o	#	o					
	WNMG060304-MF1	6.5	9.525	3.18	3.81	0.4					o	o	#	o					
	WNMG060404-MF1	6.5	9.525	4.76	3.81	0.4					o	o	#	o					
	WNMG080404-MF1	6.5	9.525	4.76	3.81	0.4					o	o	#	o					
	WNMG060408-PM	6.5	9.525	4.76	3.81	0.8			o	#						o			
	WNMG080404-PM	8.7	12.7	4.76	5.16	0.4			o	#						o			
	WNMG080408-PM	8.7	12.7	4.76	5.16	0.8			o	#						o			
	WNMG080412-PM	8.7	12.7	4.76	5.16	1.2			o	#						o			
	WNMG060408-MM	6.5	9.525	4.76	3.81	0.8				o	o	o	#	o					
	WNMG060412-MM	6.5	9.525	4.76	3.81	1.2				o	o	o	#	o					
	WNMG080404-MM	8.7	12.7	4.76	5.16	0.4				o	o	o	#	o					
	WNMG080408-MM	8.7	12.7	4.76	5.16	0.8				o	o	o	#	o					
	WNMG080412-MM	8.7	12.7	4.76	5.16	1.2				o	o	o	#	o					
	WNMG060408-MM1	6.5	9.525	4.76	3.81	0.8					o	o		o					
	WNMG080408-MM1	8.7	12.7	4.76	5.16	0.8					o	o		o					
	WNMG080412-MM1	8.7	12.7	4.76	5.16	1.2					o	o		o					
	WNMG080404-KM	8.7	12.7	4.76	5.16	0.4		o	o	o					o	#	o		
	WNMG080408-KM	8.7	12.7	4.76	5.16	0.8		o	o	o					o	#	o		
	WNMG080412-KM	8.7	12.7	4.76	5.16	1.2		o	o	o					o	#	o		
	WNMG080408-PR	8.7	12.7	4.76	5.16	0.8		o	o							o			
	WNMG080412-PR	8.7	12.7	4.76	5.16	1.2		o	o							o			
	WNMA060404	6.5	9.525	4.76	3.81	0.4									o	#	o		
	WNMA060412	6.5	9.525	4.76	3.81	0.4									o	#	o		
	WNMA080408	8.7	12.7	4.76	5.16	0.8									o	#	o		
	WNMA080412	8.7	12.7	4.76	5.16	1.2									o	#	o		
	WNMA080416	8.7	12.7	4.76	5.16	1.6									o	#	o		

#Featured Grade

o : OptionalGrade

CCMT

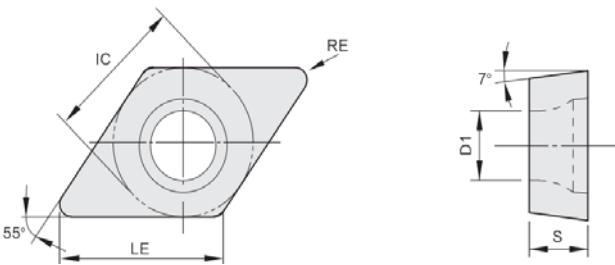


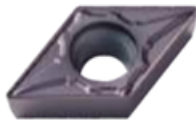
Shape	Type	Dimension						P				M				K			S
		LE	IC	S	D1	RE		2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105
	Finishing	CCMT060202-GF	6.4	6.35	2.38	2.8	0.2			#	O			#	O				
		CCMT060204-GF	6.4	6.35	2.38	2.8	0.4			#	O			#	O				
		CCMT060208-GF	6.4	6.35	2.38	2.8	0.8			#	O			#	O				
		CCMT09T304-GF	9.7	9.525	3.97	4.4	0.4			#	O			#	O				
		CCMT09T308-GF	9.7	9.525	3.97	4.4	0.8			#	O			#	O				
		CCMT120404-GF	12.9	12.7	4.76	5.5	0.4			#	O			#	O				
		CCMT120408-GF	12.9	12.7	4.76	5.5	0.8			#	O			#	O				
	Finishing	CCMT060202-MF	6.4	6.35	2.38	2.8	0.2						O	#	O				
		CCMT060204-MF	6.4	6.35	2.38	2.8	0.4						O	#	O				
		CCMT09T304-MF	9.7	9.525	3.97	4.4	0.4						O	#	O				
		CCMT09T308-MF	9.7	9.525	3.97	4.4	0.8						O	#	O				
		CCMT120404-MF	12.9	12.7	4.76	5.5	0.4						O	#	O				
	Medium	CCMT060204-GM	6.4	6.35	2.38	2.8	0.4			O	#			O	O		O		
		CCMT060208-GM	6.4	6.35	2.38	2.8	0.8			O	#			O	O		O		
		CCMT09T304-GM	9.7	9.525	3.97	4.4	0.4			O	#			O	O		O		
		CCMT09T308-GM	9.7	9.525	3.97	4.4	0.8			O	#			O	O		O		
		CCMT120404-GM	12.9	12.7	4.76	5.5	0.4			O	#			O	O		O		
		CCMT120408-GM	12.9	12.7	4.76	5.5	0.8			O	#			O	O		O		
	Medium	CCMT060204-GM1	6.4	6.35	2.38	2.8	0.4			O	#			#	O				
		CCMT060208-GM1	6.4	6.35	2.38	2.8	0.8			O	#			#	O				
		CCMT09T304-GM1	9.7	9.525	3.97	4.4	0.4			O	#			#	O				
		CCMT09T308-GM1	9.7	9.525	3.97	4.4	0.8			O	#			#	O				
		CCMT120404-GM1	12.9	12.7	4.76	5.5	0.4			O	#			#	O				
		CCMT120408-GM1	12.9	12.7	4.76	5.5	0.8			O	#			#	O				
	Rough	CCMT060208-GR	6.4	6.35	2.38	2.8	0.8			O	#						#	O	
		CCMT09T304-GR	9.7	9.525	3.97	4.4	0.4			O	#						#	O	
		CCMT09T308-GR	9.7	9.525	3.97	4.4	0.8			O	#						#	O	
		CCMT120408-GR	12.9	12.7	4.76	5.5	0.8			O	#						#	O	
		CCMT120412-GR	12.9	12.7	4.76	5.5	1.2			O	#						#	O	

#Featured Grade

O: OptionalGrade

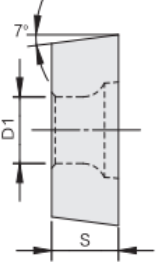
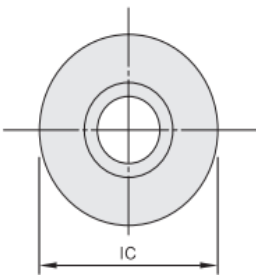
DCMT



Shape		Type	Dimension					P				M				K			S
			LE	IC	S	D1	RE	2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105
	Finishing	DCMT070204-GF	7.8	6.35	2.38	2.8	0.4			#	o			#	o				
		DCMT070208-GF	7.8	6.35	2.38	2.8	0.8			#	o			#	o				
		DCMT11T302-GF	11.6	9.525	3.97	4.4	0.2			#	o			#	o				
		DCMT11T304-GF	11.6	9.525	3.97	4.4	0.4			#	o			#	o				
		DCMT11T308-GF	11.6	9.525	3.97	4.4	0.8			#	o			#	o				
	Medium	DCMT070204-GM	7.8	6.35	2.38	2.8	0.4			o	#			o	o		o		
		DCMT070208-GM	7.8	6.35	2.38	2.8	0.8			o	#			o	o		o		
		DCMT11T304-GM	11.6	9.525	3.97	4.4	0.4			o	#			o	o		o		
		DCMT11T308-GM	11.6	9.525	3.97	4.4	0.8			o	#			o	o		o		
	Medium	DCMT070204-GM1	7.8	6.35	2.38	2.8	0.4			o	#			#	o				
		DCMT070208-GM1	7.8	6.35	2.38	2.8	0.8			o	#			#	o				
		DCMT11T304-GM1	11.6	9.525	3.97	4.4	0.4			o	#			#	o				
		DCMT11T308-GM1	11.6	9.525	3.97	4.4	0.8			o	#			#	o				
	Rough	DCMT11T304-GR	11.6	9.525	3.97	4.4	0.4			o	#						#	o	
		DCMT11T308-GR	11.6	9.525	3.97	4.4	0.8			o	#						#	o	
		DCMT11T312-GR	11.6	9.525	3.97	4.4	1.2			o	#						#	o	

#Featured Grade o: OptionalGrade

RCMT/RCMX



Shape		Type	Dimension					P				M			K			S	
			LE	IC	S	D1	RE	2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105
	Medium	RCMT0803MO	8	8	3.18	3.4			O		#	#							
		RCMT1606MO	16	16	6.35	5.5			O		#	#							
	Medium-Rough	RCMX0803MO	8	8	3.18	3.4			O		#	#					O		
		RCMX1003MO	10	10	3.18	3.6			O		#	#					O		
		RCMX1204MO	12	12	4.76	4.4			O		#	#					O		
		RCMX1606MO	16	16	6.35	5.5			O		#	#					O		
		RCMX2006MO	20	20	6.35	6.5			O		#	#					O		
		RCMX2507MO	25	25	7.94	7.2			O		#	#					O		
		RCMX3209MO	32	32	9.52	9.5			O		#	#					O		

#Featured Grade

O: OptionalGrade

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

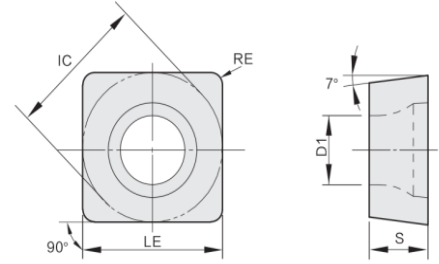
End Mill

Drill & Tap

Drilling & Boring

Tool Holder

SCMT

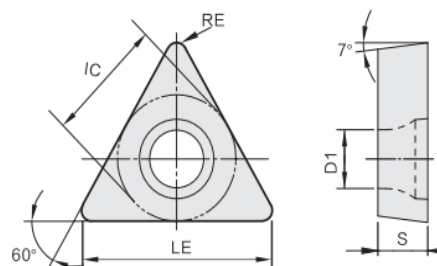


Shape		Type	Dimension						P				M				K				S
			LE	IC	S	D1	RE		2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105	
	Finishing	SCMT09T304-GF	9.525	9.525	3.97	4.4	0.4				#	o			#	o					
		SCMT09T308-GF	9.525	9.525	3.97	4.4	0.8				#	o			#	o					
		SCMT120404-GF	12.7	12.7	4.76	5.5	0.4				#	o			#	o					
	Medium	SCMT09T304-GM	9.525	9.525	3.97	4.4	0.4				o	#			o	o		o			
		SCMT09T308-GM	9.525	9.525	3.97	4.4	0.8				o	#			o	o		o			
		SCMT120404-GM	12.7	12.7	4.76	5.5	0.4				o	#			o	o		o			
		SCMT120408-GM	12.7	12.7	4.76	5.5	0.8				o	#			o	o		o			
		SCMT120412-GM	12.7	12.7	4.76	5.5	1.2				o	#			o	o		o			
	Medium	SCMT09T304-GM1	9.525	9.525	3.97	4.4	0.4				o	#			#	o					
		SCMT09T308-GM1	9.525	9.525	3.97	4.4	0.8				o	#			#	o					
	Rough	SCMT09T304-GR	9.525	9.525	3.97	4.4	0.4				o							#	o		
		SCMT09T308-GR	9.525	9.525	3.97	4.4	0.8				o							#	o		
		SCMT120404-GR	12.7	12.7	4.76	5.5	0.4				o							#	o		
		SCMT120408-GR	12.7	12.7	4.76	5.5	0.8				o							#	o		
		SCMT120412-GR	12.7	12.7	4.76	5.5	1.2				o							#	o		

#Featured Grade

o: OptionalGrade

TCMT



Shape	Type	Dimension					P				M				K				S
		LE	IC	S	D1	RE	2015	2025	2115	2125	4315	1205	1215	1315	3105	3215	3115	1105	
	Finishing	TCMT110202-GF	11	6.35	2.38	2.8	0.2		#	○			#	○					
		TCMT110204-GF	11	6.35	2.38	2.8	0.4		#	○			#	○					
		TCMT16T304-GF	16.5	9.525	3.97	4.4	0.4		#	○			#	○					
		TCMT16T308-GF	16.5	9.525	3.97	4.4	0.8		#	○			#	○					
	Medium	TCMT090204-GM	9.6	5.56	2.38	2.5	0.4		○	#			○	○		○			
		TCMT090208-GM	9.6	5.56	2.38	2.5	0.8		○	#			○	○		○			
		TCMT110204-GM	11	6.35	2.38	2.8	0.4		○	#			○	○		○			
		TCMT110208-GM	11	6.35	2.38	2.8	0.8		○	#			○	○		○			
		TCMT16T304-GM	16.5	9.525	3.97	4.4	0.4		○	#			○	○		○			
		TCMT16T308-GM	16.5	9.525	3.97	4.4	0.8		○	#			○	○		○			
		TCMT16T312-GM	16.5	9.525	3.97	4.4	1.2		○	#			○	○		○			
	Rough	TCMT110204-GM1	11	6.35	2.38	2.8	0.4		○	#			#	○					
		TCMT110208-GM1	11	6.35	2.38	2.8	0.8		○	#			#	○					
		TCMT16T304-GM1	16.5	9.525	3.97	4.4	0.4		○	#			#	○					
		TCMT16T308-GM1	16.5	9.525	3.97	4.4	0.8		○	#			#	○					
	Rough	TCMT16T304-GR	16.5	9.525	3.97	4.4	0.4		○	#						#	○		
		TCMT16T308-GR	16.5	9.525	3.97	4.4	0.8		○	#						#	○		
		TCMT16T312-GR	16.5	9.525	3.97	4.4	1.2		○	#						#	○		
		TCMT220408-GR	22	12.7	4.76	5.5	0.8		○	#						#	○		

#Featured Grade

○: OptionalGrade

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

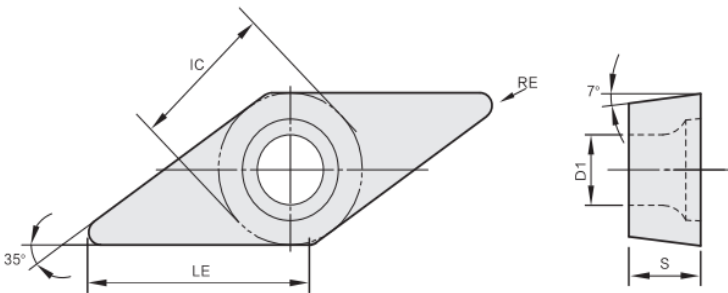
End Mill

Drill & Tap

Drilling & Boring

Tool Holder

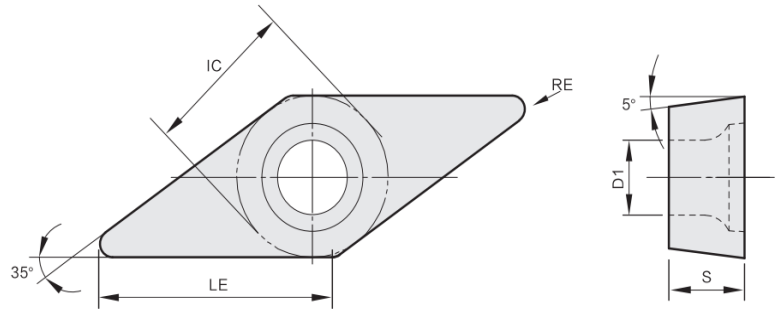
VCMT/VCGT



Shape		Type	Dimension					P					M				K			S
			LE	IC	S	D1	RE	2015	2025	2115	2125	6110	4315	1205	1215	1315	3105	3215	3115	1105
	Finishing	VCMT110302-GF	11	6.35	3.18	2.8	0.2			#	o				#	o				
		VCMT110304-GF	11	6.35	3.18	2.8	0.4			#	o				#	o				
		VCMT160404-GF	16.5	9.525	4.76	4.4	0.4			#	o				#	o				
		VCGT160408-SF	16.5	9.525	4.76	4.4	0.8													o
	Medium	VCMT160404-GM	16.5	9.525	4.76	4.4	0.4			o	#				o	o		o		
		VCMT160408-GM	16.5	9.525	4.76	4.4	0.8			o	#				o	o		o		
		VCMT160408-SM	16.5	9.525	4.76	4.4	0.8													o

#Featured Grade o: OptionalGrade

VBMT



Shape	Type	Dimension						P					M				K			S
		LE	IC	S	D1	RE		2015	2025	2115	2125	6110	4315	1205	1215	1315	3105	3215	3115	1105
	Finishing	VBMT160404-GF	16.5	9.525	4.76	4.4	0.4			#	o				#	o				
		VBMT160408-GF	16.5	9.525	4.76	4.4	0.8			#	o				#	o				
	Medium	VBMT110304-GM	11	6.35	3.18	2.8	0.4			o	#				o	o		o		
		VBMT110308-GM	11	6.35	3.18	2.8	0.8			o	#				o	o		o		
		VBMT160404-GM	16.5	9.525	4.76	4.4	0.4			o	#				o	o		o		
		VBMT160408-GM	16.5	9.525	4.76	4.4	0.8			o	#				o	o		o		
		VBMT160412-GM	16.5	9.525	4.76	4.4	1.2			o	#				o	o		o		
	Medium	VBMT160404-SM	16.5	9.525	4.76	4.4	0.4													o
		VBMT160408-SM	16.5	9.525	4.76	4.4	0.8													o
	Medium	VBMT160404-GM1	16.5	9.525	4.76	4.4	0.4			o	#				#	o				o
		VBMT160408-GM1	16.5	9.525	4.76	4.4	0.8			o	#				#	o				o
	Rough	VBMT160404-GR	16.5	9.525	4.76	4.4	0.4			o	#							#	o	
		VBMT160408-GR	16.5	9.525	4.76	4.4	0.8			o	#							#	o	
		VBMT160412-GR	16.5	9.525	4.76	4.4	1.2			o	#							#	o	

#Featured Grade

o: OptionalGrade

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

End Mill

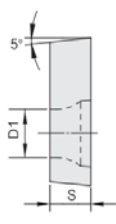
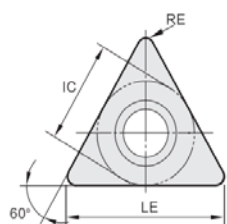
Drill & Tap

Drilling & Boring

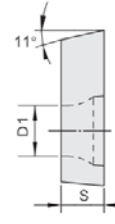
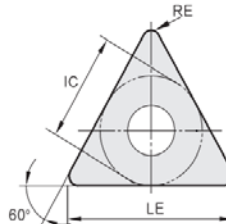
Tool Holder

Turning Insert
External Turning Holder
Internal Turning Holder
Grooving & Parting
Milling
Threading
End Mill
Drill & Tap
Drilling & Boring
Tool Holder

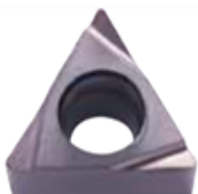
TBGH



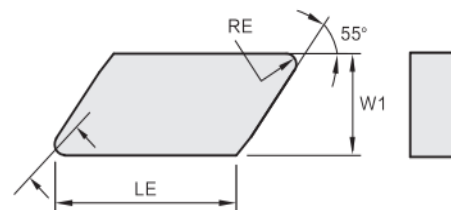
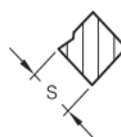
TB



TP

Shape		Type	Dimension					P					M				K			S
			LE	IC	S	D1	RE	2015	2025	2115	2125	6110	4315	1205	1215	1315	3105	3215	3115	1105
	Finishing	TBGH060202L	6.4	3.97	2.38	2.3	0.2						#		O					
		TBGH060202R	6.4	3.97	2.38	2.3	0.2						#		O					
		TBGH060204L	6.4	3.97	2.38	2.3	0.4						#		O					
		TBGH060204R	6.4	3.97	2.38	2.3	0.4						#		O					
		TPGH080202L	8.2	4.76	2.38	2.4	0.2						#		O					
		TPGH080204L	8.2	4.76	2.38	2.4	0.4						#		O					
		TPGH090202L	9.6	5.56	2.38	2.8	0.2						#		O					
		TPGH090204L	9.6	5.56	2.38	2.8	0.4						#		O					
		TPGH110302L	11	6.35	3.18	3.18	0.2						#		O					
		TPGH110304L	11	6.35	3.18	3.18	0.4						#		O					
		TPGH11T302L	11	6.35	3.18	3.18	0.2						#		O					
		TPGH11T302R	11	6.35	3.18	3.18	0.2						#		O					
		TPGH11T304L	11	6.35	3.18	3.18	0.4						#		O					
		TPGH11T304R	11	6.35	3.18	3.18	0.4						#		O					

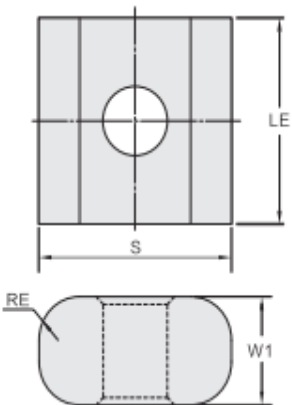
KNUX



Shape		Type	Dimension					P					M			K			S
			LE	IC	S	D1	RE	2015	2025	2115	2125	6110	4225	1205	1215		3105	3215	3115
	Rough	KNUX160405L11	16.2	9.525	4.76	2.2	0.5		O		#			O					
		KNUX160405R11	16.2	9.525	4.76	2.2	0.8		O		#			O					

Heavy Duty Machining

Specially for Wheel Nave Cutting



Shape	Type	Dimension						P				M				K			S
		LE	W1	S	D1	RE	2015	2025	2115	2125	6110	4315	1205	1215	1315	3105	3215	3115	1105
	Heavy Duty	175.32-191940-22	19.1	10	19.1	6.35	4	O	O		O								
		175.32-191940-24	19.1	10	19.1	6.35	4	O	O		O								
		175.32-191940-28	19.1	10	19.1	6.35	4	O	O		O								

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

End Mill

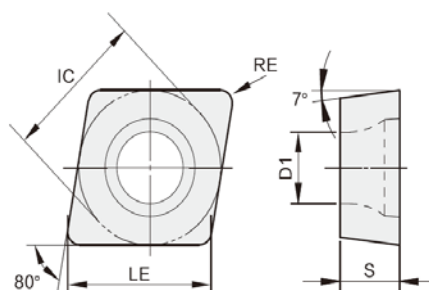
Drill & Tap

Drilling & Boring

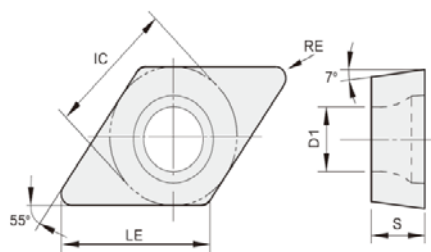
Tool Holder

Aluminum Cutting

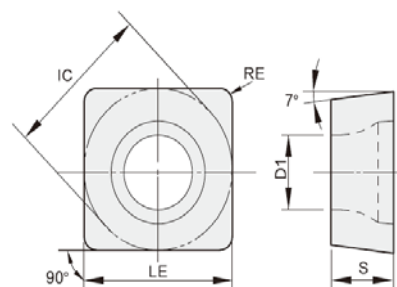
CCGX

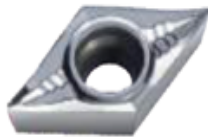


DCGX



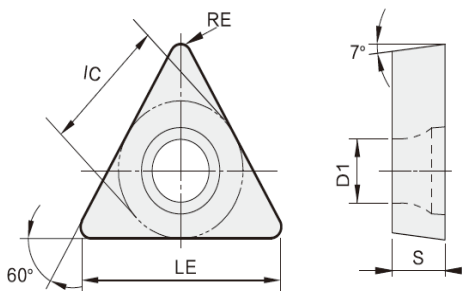
SCGX



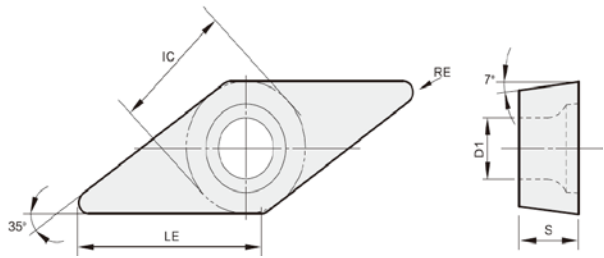
Shape	Type	Dimension					Coat Grade
		LE	IC	S	D1	RE	
	CCGX060202-NL	6.4	6.35	2.38	2.8	0.2	AL434
	CCGX060204-NL	6.4	6.35	2.38	2.8	0.4	
	CCGX09T302-NL	9.7	9.525	3.97	4.4	0.2	
	CCGX09T304-NL	9.7	9.525	3.97	4.4	0.4	
	CCGX09T308-NL	9.7	9.525	3.97	4.4	0.8	
	CCGX120404-NL	12.9	12.7	4.76	5.5	0.4	
	CCGX120408-NL	12.9	12.7	4.76	5.5	0.8	
	DCGX070202-NL	7.8	6.35	2.38	2.8	0.2	AL434
	DCGX070204-NL	7.8	6.35	2.38	2.8	0.4	
	DCGX11T302-NL	11.6	9.525	3.97	4.4	0.2	
	DCGX11T304-NL	11.6	9.525	3.97	4.4	0.4	
	DCGX11T308-NL	11.6	9.525	3.97	4.4	0.8	
	SCGX09T304-NL	9.525	9.525	3.97	4.4	0.4	AL434
	SCGX09T308-NL	9.525	9.525	3.97	4.4	0.8	
	SCGX120408-NL	12.9	12.7	4.76	5.5	0.8	

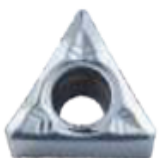
Aluminum Cutting

TCGX



VCGX



Shape	Type	Dimension					Coat Grade
		LE	IC	S	D1	RE	
	TCGX090204-NL	9.6	5.56	2.38	2.5	0.4	AL434
	TCGX110202-NL	11	6.35	2.38	2.8	0.2	
	TCGX110204-NL	11	6.35	2.38	2.8	0.4	
	TCGX16T304-NL	16.5	9.525	3.97	4.4	0.4	
	TCGX16T308-NL	16.5	9.525	3.97	4.4	0.8	
	VCGX110302-NL	11	6.35	3.18	2.8	0.2	AL434
	VCGX110402-NL	11	6.35	3.18	2.8	0.4	
	VCGX160402-NL	16.5	9.525	4.76	4.4	0.2	
	VCGX160404-NL	16.5	9.525	4.76	4.4	0.4	
	VCGX160408-NL	16.5	9.525	4.76	4.4	0.8	
	VCGX160412-NL	16.5	9.525	4.76	4.4	1.2	
	VCGX220530-NL	22	12.7	5.56	5.5	3	

Finishing

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

End Mill

Drill & Tap

Drilling & Boring

Tool Holder

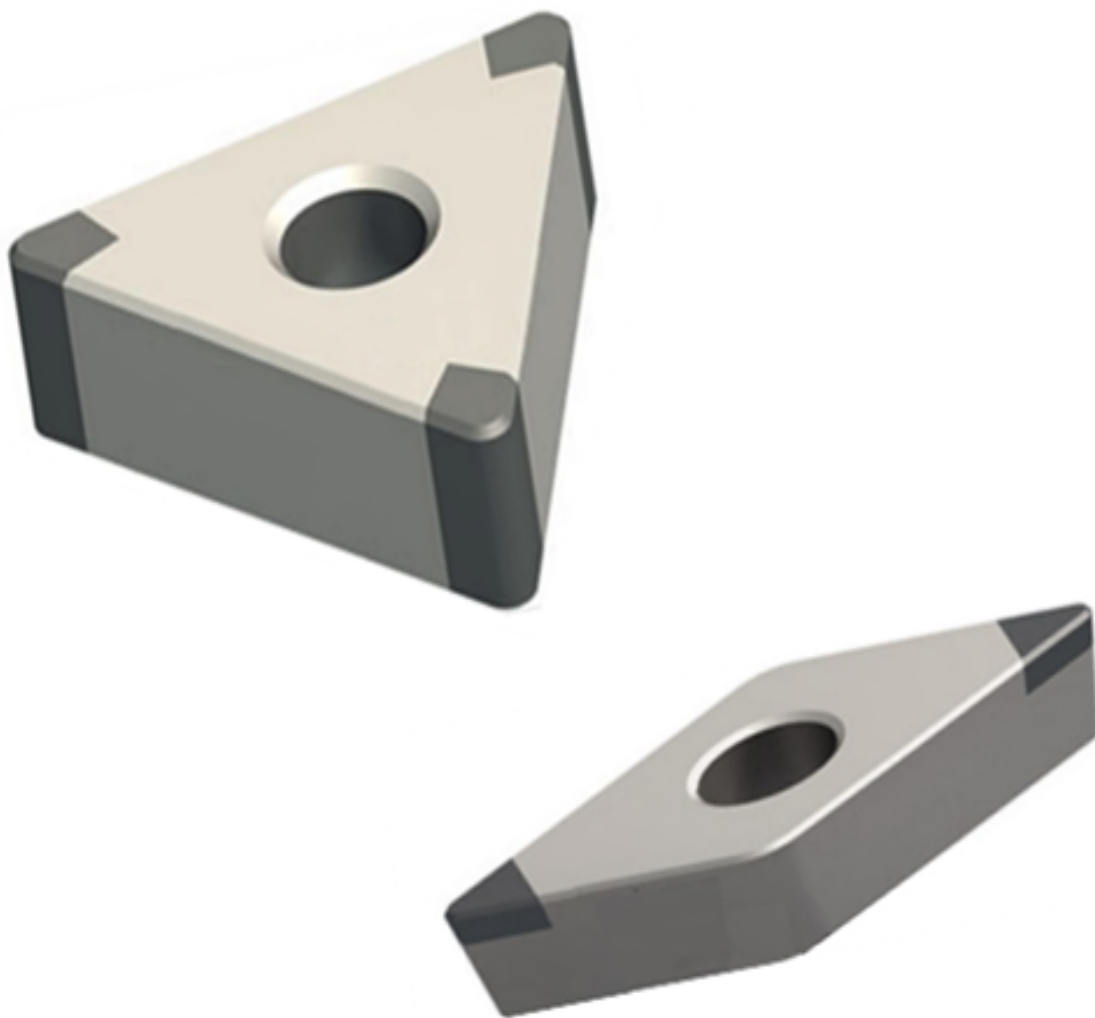
CBN - ISO Inserts

Indexable CBN Inserts, Solid CBN Inserts, Fullface CBN Inserts, Turning Inserts, Milling Inserts, super finishing for Hi Chrome Casting Workpiece, Hardened Steel, Bearing Steel and so on .

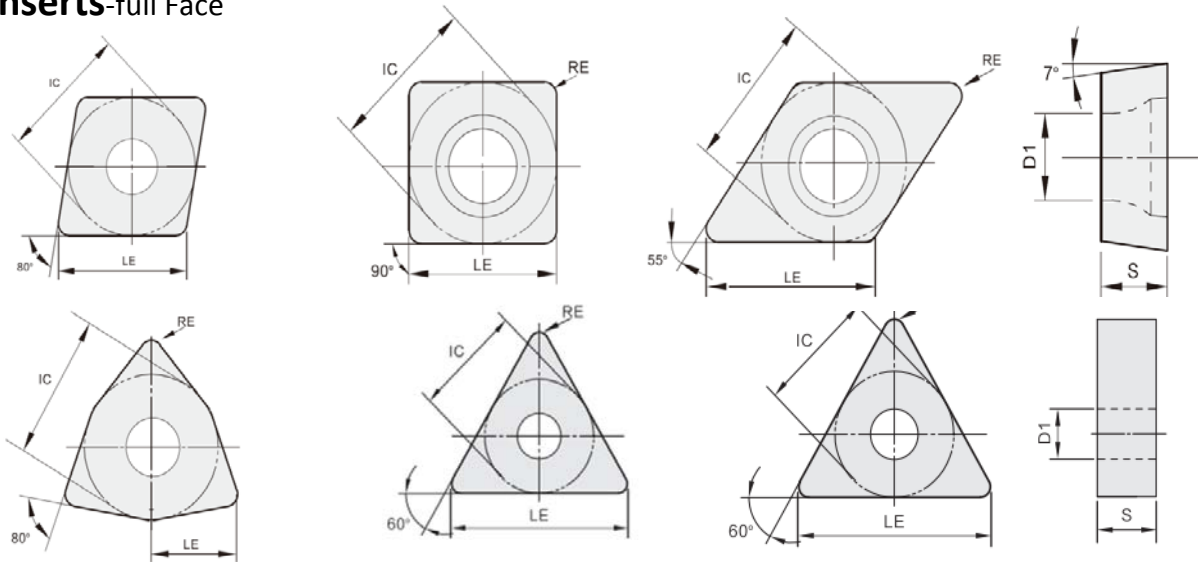
Advantages as below-

- Dramatically improve the tool life ,
- Dramatically improve the efficiency and surface finishing quality.
- Used for skipping grinding process as well.
- Especially applicable for interrupted working condition and Hardened Steel and casting iron.

We can also supply all kinds of Custom Made tools. You just provide us detailed CBN inserts cutting condition, like the CBN inserts ISO size or grade you are using, the workpiece name, workpiece material, rough or semifinish or finish turning, continuous or interrupted working.

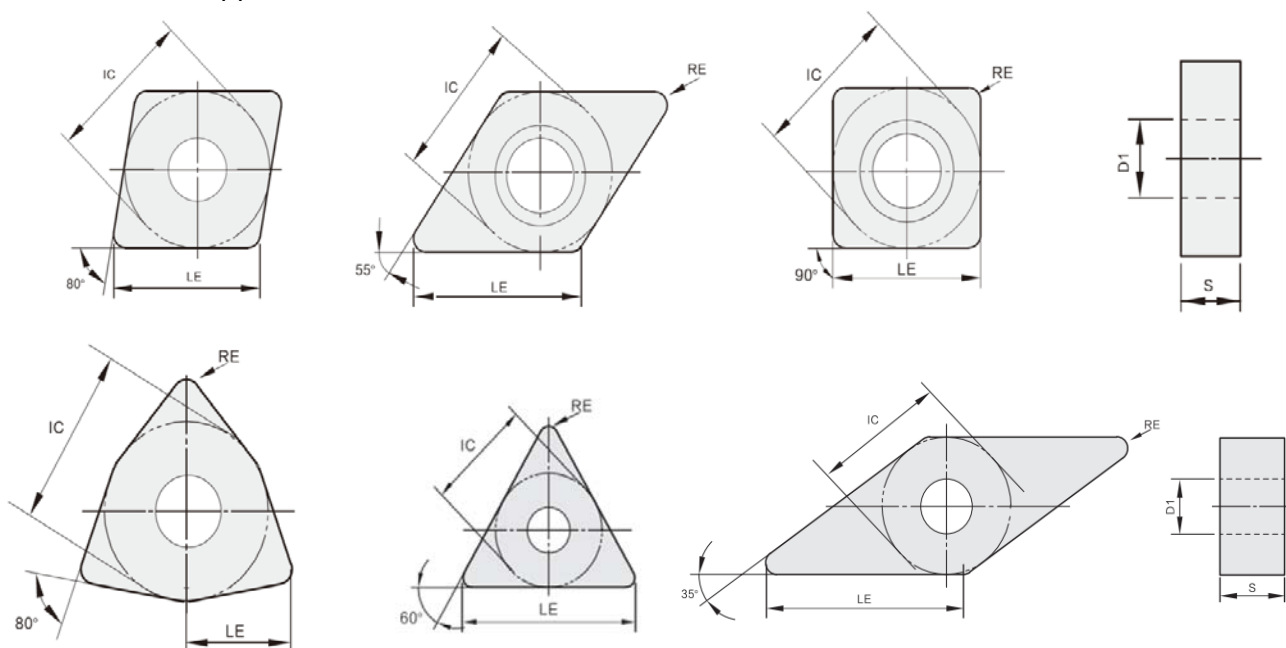


CBN Inserts-full Face



Shape	Model	Dimension			ISO Type
		Le	IC	S	
	SNGA1204□□-E	12.7	12.7	4.76	Negative
	CNGA1204□□-E	12.9	12.7	4.76	Negative
	TNGA1604□□-E	16.5	9.525	4.76	Negative
	WNGA 0804□□-E	8.7	12.7	4.76	Negative
	CCGW09T3□□-F	9.7	9.525	3.97	Positive
	TCGW0902□□-F	9.6	5.56	2.38	Positive
	TCGW1103□□-F	11	6.35	3.18	Positive
	SCGW09T3□□-F	9.525	9.525	3.97	Positive
	DCGW11T3□□-F	11.6	9.525	3.97	Positive

CBN Inserts-Tipped Conner



Shape	Model	Dimension			ISO Type
		Le	IC	S	
	CNGA1204 □ □ -ZH	12.9	12.7	4.76	Negative
	DNGA1504 □ □ -ZH	15.5	12.7	4.76	Negative
	DNGA1506 □ □ -ZH	15.5	12.7	6.35	Negative
	SNGA1204 □ □ -ZH	12.7	12.7	4.76	Negative
	TNGA1604 □ □ -ZH	16.5	9.525	4.76	Negative
	WNGA 0804 □ □ -ZH	8.7	12.7	4.76	Negative
	VNGA1604 □ □ -ZH	16.6	9.525	4.76	Negative

Turning Insert

External Turning Holder

Internal Turning Holder

Grooving & Parting

Milling

Threading

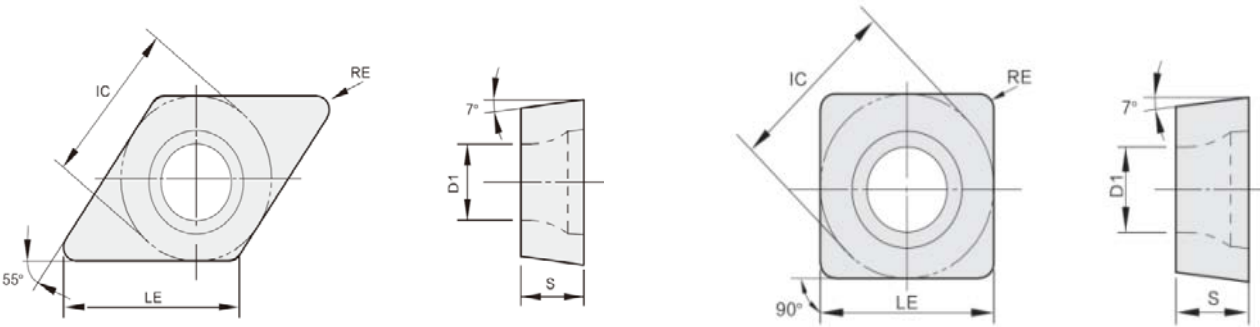
End Mill

Drill & Tap

Drilling & Boring

Tool Holder

CBN Inserts- Partial Conner Tipped



Shape	Model	Dimension			Type
		Le	IC	S	
	DNGA1504□□-H	15.5	12.7	4.76	Negative
	DNGA1506□□-H	15.5	12.7	6.35	Negative
	VNGA1604□□-H	16.6	9.525	4.76	Negative
	VCGA1604□□-H	16.6	9.525	4.76	Negative
	CNGA1204□□-H	12.9	12.7	4.76	Negative