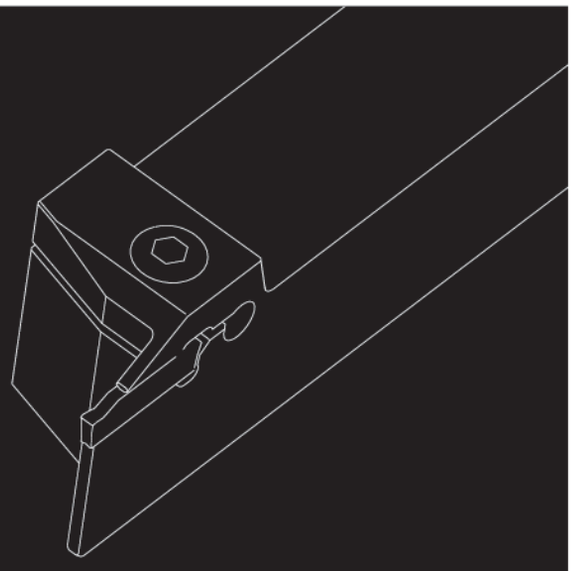

2021

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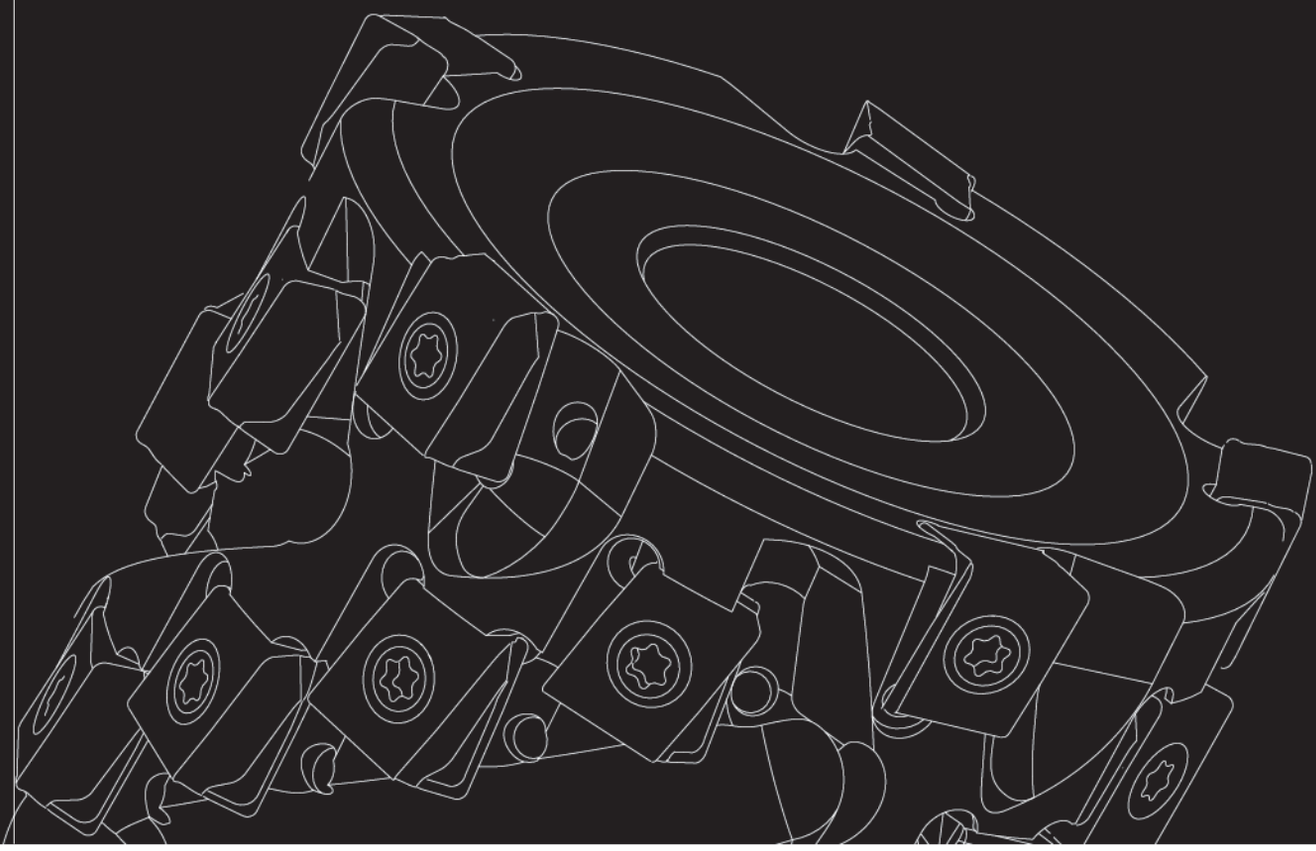
CUTTING TOOL CATALOGUE (INCH)

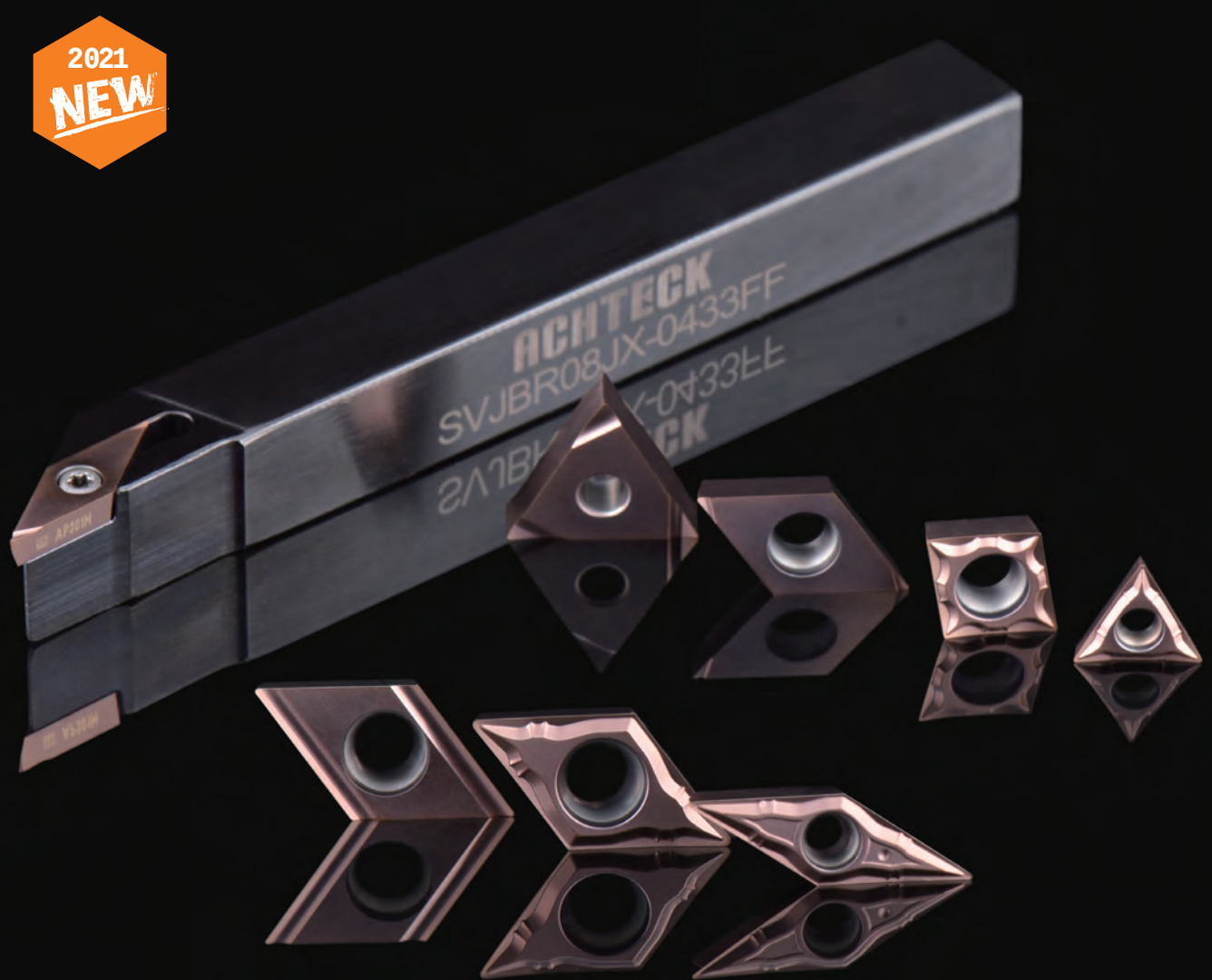


Company Profile

Ganzhou Achteck Tool Technology Co., Ltd. is a wholly-owned subsidiary of Chongyi Zhangyuan Tungsten Co., Ltd. (Listed Company with stock code 002378). The registered capital of Achteck is 260 million USD with 600 employees. The main products include: Coated Carbide Inserts, Carbide Rods and etc. Achteck has the outstanding R&D competence, the production and testing equipments, and the coated carbide insert production technology. The inserts covering Turning, Grooving, Milling and Drilling are widely applied in automotive, energy, die & mold, general machinery, aerospace and other industries.

Achteck Tool is technology oriented, owns a strong research team and keeps on innovation. Having “Benefit from Resources, Reliance on Technologies, Devotion to Humanity and Top with Trust” as the operation philosophy and “Safety, Harmony, Efficiency and Innovation” as the target, Achteck aims to become a well-known brand in the world and a first-class cemented carbide manufacturer in China.

Swiss Tool Inserts



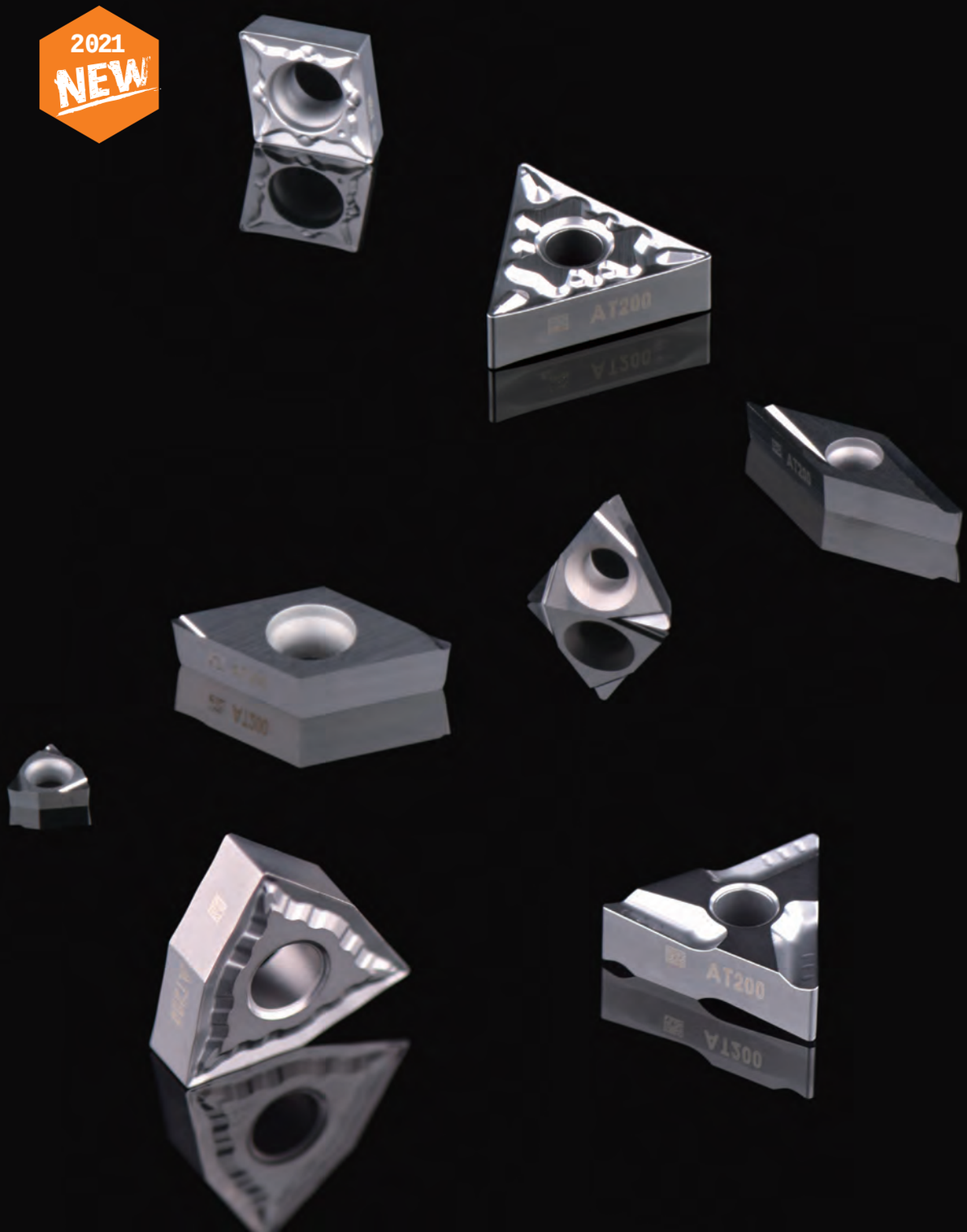
AP301M Features

PVD grade for stainless steel turning
Good machining performance, reduced built up edge, better surface finish, and longer tool life
Submicron cemented carbide substrate combined with nanostructured multi layer PVD coating
Good wear resistance and chipping resistance
Obtain more reliable machining performance
For continuous and interrupt cutting

Cermet

AT200

2021 NEW



Product Features and Applications

- Suitable for steel and cast iron finish and semi-finish turning, high oxidation resistance, can be used in high-speed dry machining
- High chemical stability, effectively reduced built up edge to obtain better surface finish

Grooving Tool

Product Features and Applications

- Holders can cover external, internal and face grooving.
- Insert width range： 2-8mm
- Three parting and grooving geometries: CS, CM, CH
- Two turning geometries: TM, TS.
- Two Profiling geometries： RM, RA
- High precision ground insert series, covering 1-8mm insert width, can be used in parting, grooving and profiling machining.
- Unique rake geometry design combined with double relief angle on the flank, obtained more clearance in smaller diameter face grooving and internal grooving

Profile Milling

APM00-RO

Product Features and Applications

- Main applications in blade and aircraft component profile milling
- Inserts are with anti-rotation design
- New AP403S and AP403M grade can cover stainless steel and super alloy machining
- Cutter diameter range: Φ25mm - Φ160mm
- MM3 geometry, precision ground flank and optimized cutting edge treatment, offer longer insert tool life
- Multiple coupling types: screw clamping, cylindrical shank and arbor cutter

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Product Features and Applications

- AFF40-LN12/LN15 series cutters are mainly used in cast iron engine cylinder block, cylinder head and other kinds of valve housing type milling
- The cutter used 40°approaching angel, close pitch design guaranteed high productivity
- Stable wedge clamping for main cutting inserts, easy to handle
- Wiper inserts are easy to be adjusted and reliable, can achieve good surface finish
- 16 cutting edges of each insert, offer constant performance and high cost efficiency.
- Cutter surface is blackened, with high precision insert pockets, and good wear resistance

2021 NEW

AFF40-LN12/LN15

Cast Iron Finishing Milling Cutter

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Product Features and Applications

LN09 insert series can be used not only in square shoulder milling cutter, but also in porcupine cutter

- Accurate 90° square shoulder milling cutter provides excellent verticality
- Tangential mounted insert design offers strong insert toughness with better cutter rigidity.
- Positive axial angle design makes the cutting smoothly. H-class insert tolerance offers high repeatability of insert positioning
- Double-sided 4-edge insert, more cost efficient choice, while each insert is with wiper edge which can obtain good surface finish
- Full tooth type of porcupine milling cutter, with high metal removal rate, large cutting depth, high efficiency, known as the “powerful tool for rough machining"

LN09

Shoulder Milling

Product Features and Applications

- True 90° square shoulder milling cutter, cutter dia.:φ1.500-φ6.300 in;
- High precision axial and radial runout;
- Tangential mounted inserts, with higher body strength and machining efficiency;
- 2 kinds of pitch design, coarse pitch and close pitch ;
- Coupling type: arbor, cylindrical, Weldon and modular style;
- Nickel-plated cutters have good corrosion and wear resistance;
- Negative inserts with 4 cutting edges, strong edges with positive rake angle for higher machining efficiency
- MR2 geometry with a short wiper edge design, to get better surface finish;
- Many choices of nose radius, R.031/.047/.063/.078/.094/.122;
- Inserts with 6 grades, offer wider applications.

2021 NEW

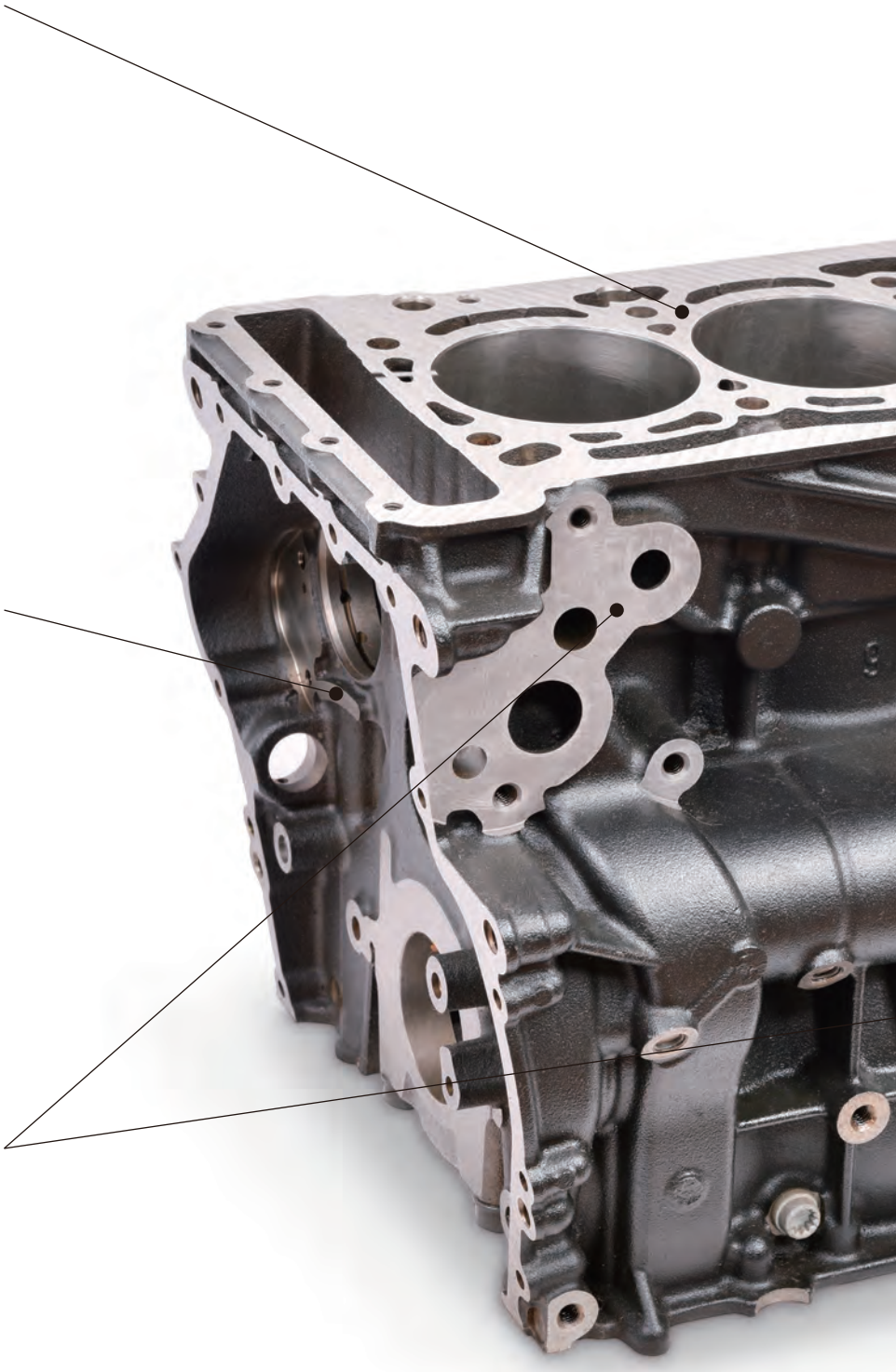
LN13

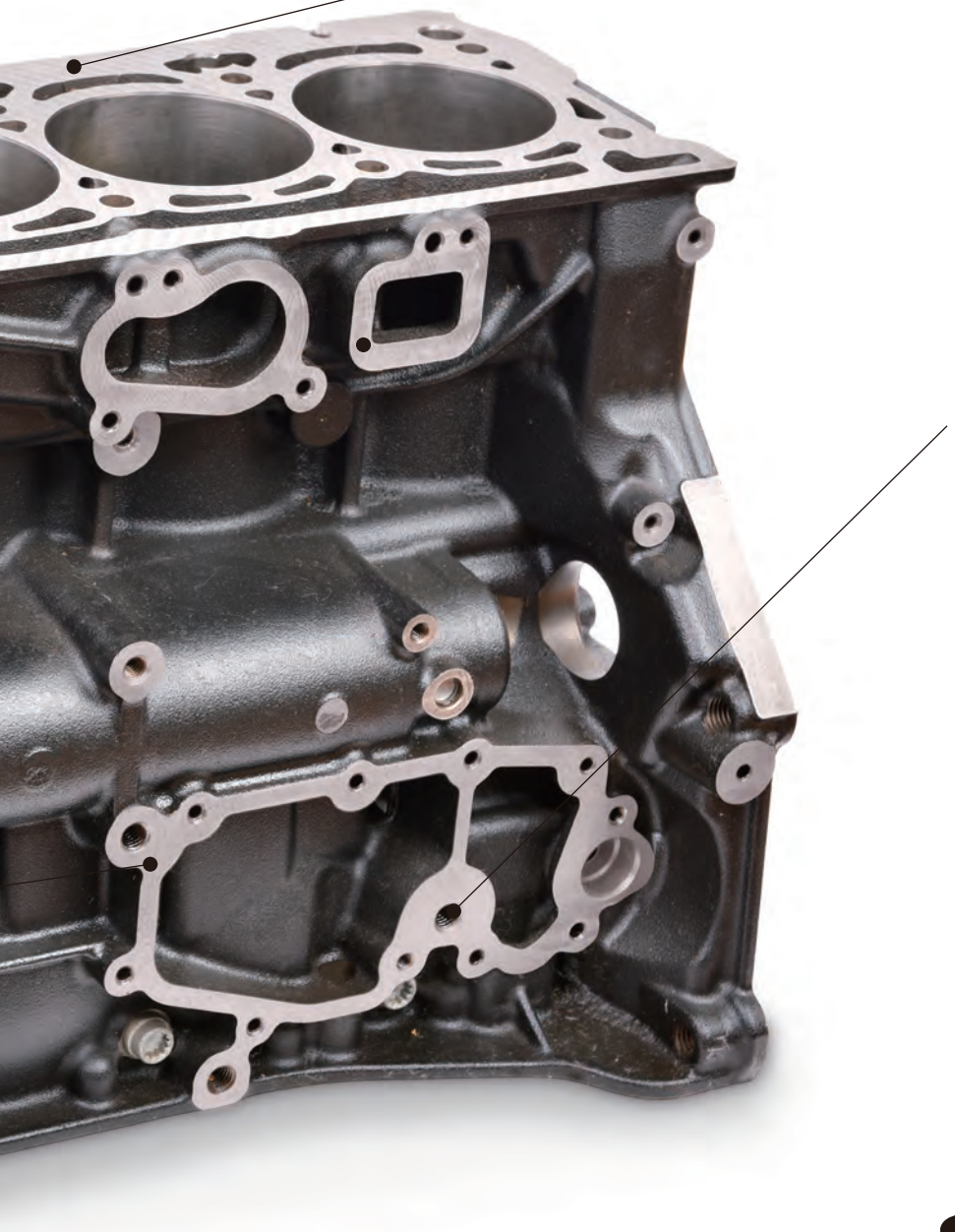
Square Shoulder Milling Cutter

AFM45-XN09-W milling cutter with heptagon inserts, extra close pitch with wedge clamping, combined with heat resistant CVD coated inserts. The ideal choice of cast iron rough milling.

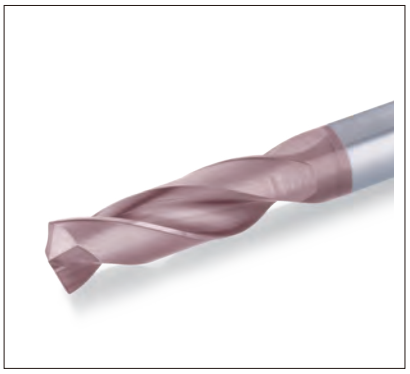
APE90-LN09/LN13 porcupine milling cutter uses tangential insert with helical edge profile. The high strength insert have 4 cutting edges, offering high productivity, machining reliability and cost efficiency.

ASM90-LN09/LN13 square shoulder milling cutter with 4 cutting edge tangential inserts with helical edge profile. The reliable cutting edge can adopt increased fz by 30%, and also bring on higher metal removal rate and productivity.





AFF40-LN15 cast iron finish milling cutter, combined with octagon main cutting inserts and wiper inserts. It's cost efficient and easy to handle. The good wear resistant grade and high precision cutting edge guaranteed excellent surface finishing and longer tool life.



D106 drill series, the substrate has both hardness and toughness, combined with high wear resistant PVD coating. It can reach higher tool life in cast iron machining. The unique drill tip geometry can reduce the edge chipping.

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Machining Solutions for Engine Block

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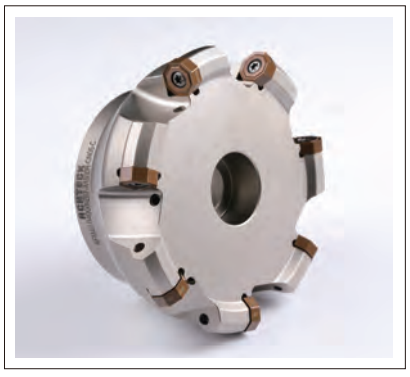
Turbocharger Housing Application Case

Special side face milling cutter used in machining the back face of flange.

ASM90-LN13 square shoulder milling cutter with tangential mounted inserts. The insert has 4 cutting edges, can be used to machine the boss surface on the turbocharger.



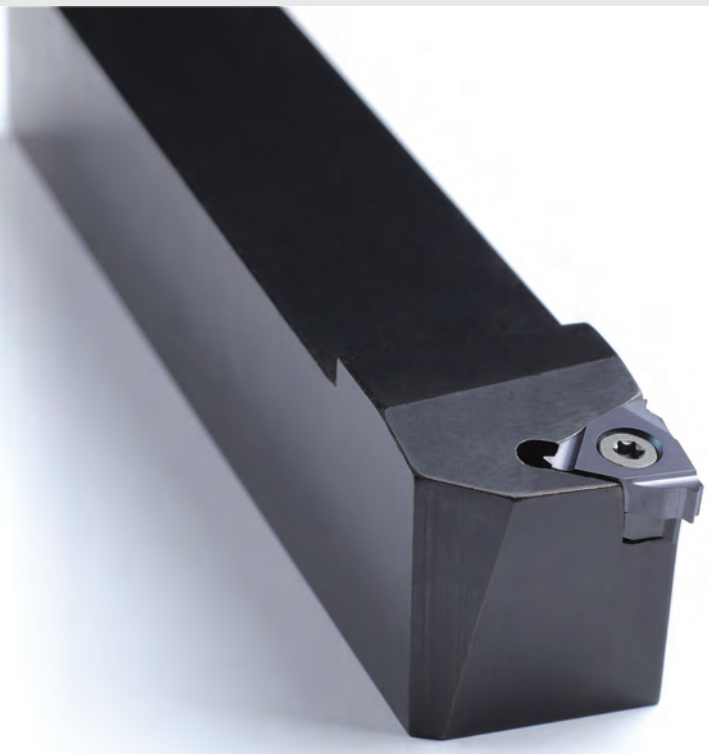
AFM40-ON05-C-45, with 45 degree approach angle, using 16 cutting edge insert with wiper edge. Used in finish milling the flange face of turbocharger casing

AFM45-XN07 face milling cutter with heptagon inserts, 14 cutting edges, with nanostructured PVD coating. Used in rough milling the flange face, with a high performance/cost ratio.

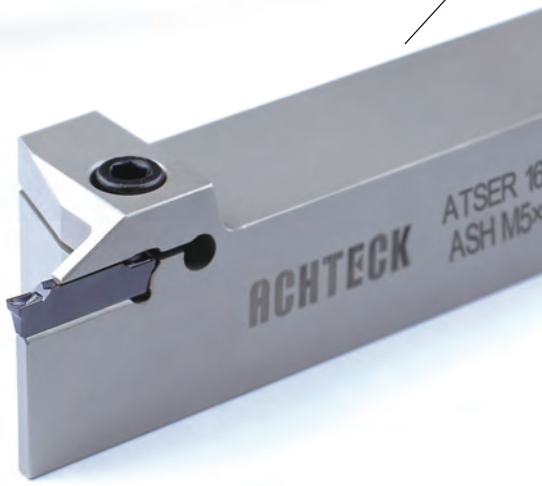
AP100S/AP301M PVD grades, used in rough external turning and face turning of turbocharger housing

ATD grooving insert series can be used in external, face and V-shaped grooving.

Special boring tool, used in the turbocharger housing boring.



16ER 100ISO AP220U threading insert, used in threading operation of turbine shaft.



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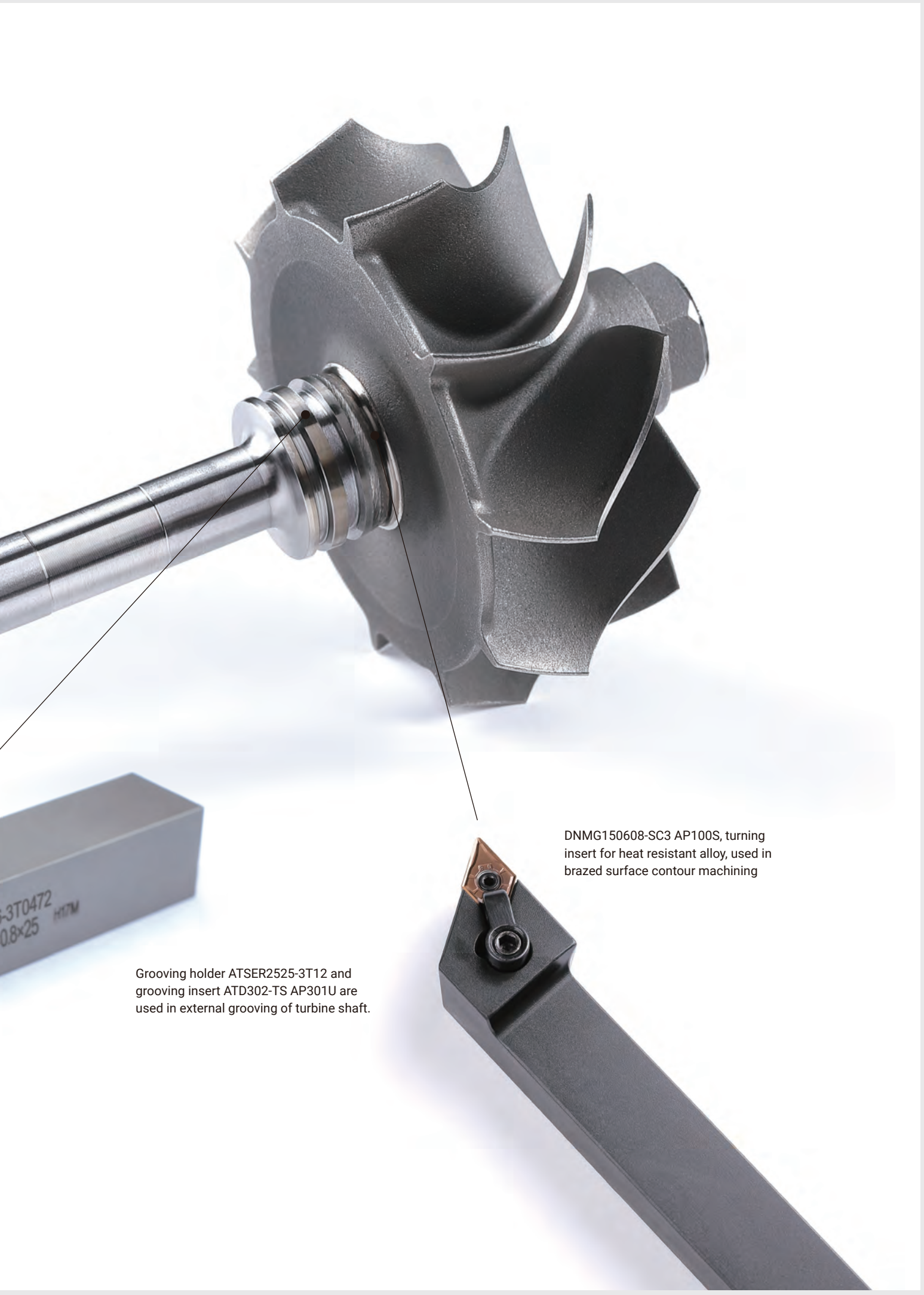
Turbine Shaft Machining Cases



DNMG150608-SC3 AP100S, turning insert for heat resistant alloy, used in brazed surface contour machining

Grooving holder ATSER2525-3T12 and grooving insert ATD302-TS AP301U are used in external grooving of turbine shaft.

ASM90-WN08 square shoulder milling cutter with negative insert, 6 cutting edges, accurate 90 degree design, used in rough or finish milling blade root and shroud.

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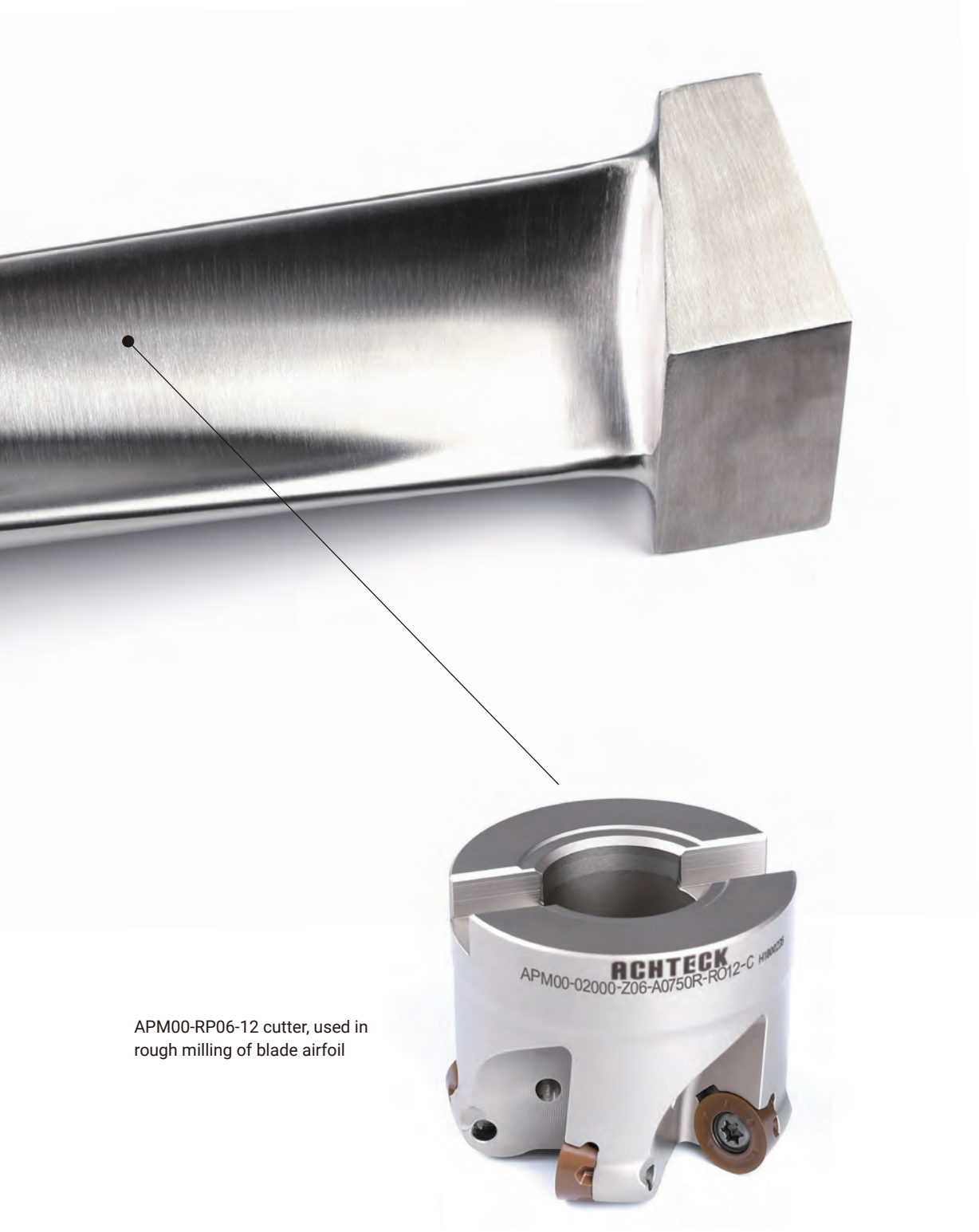
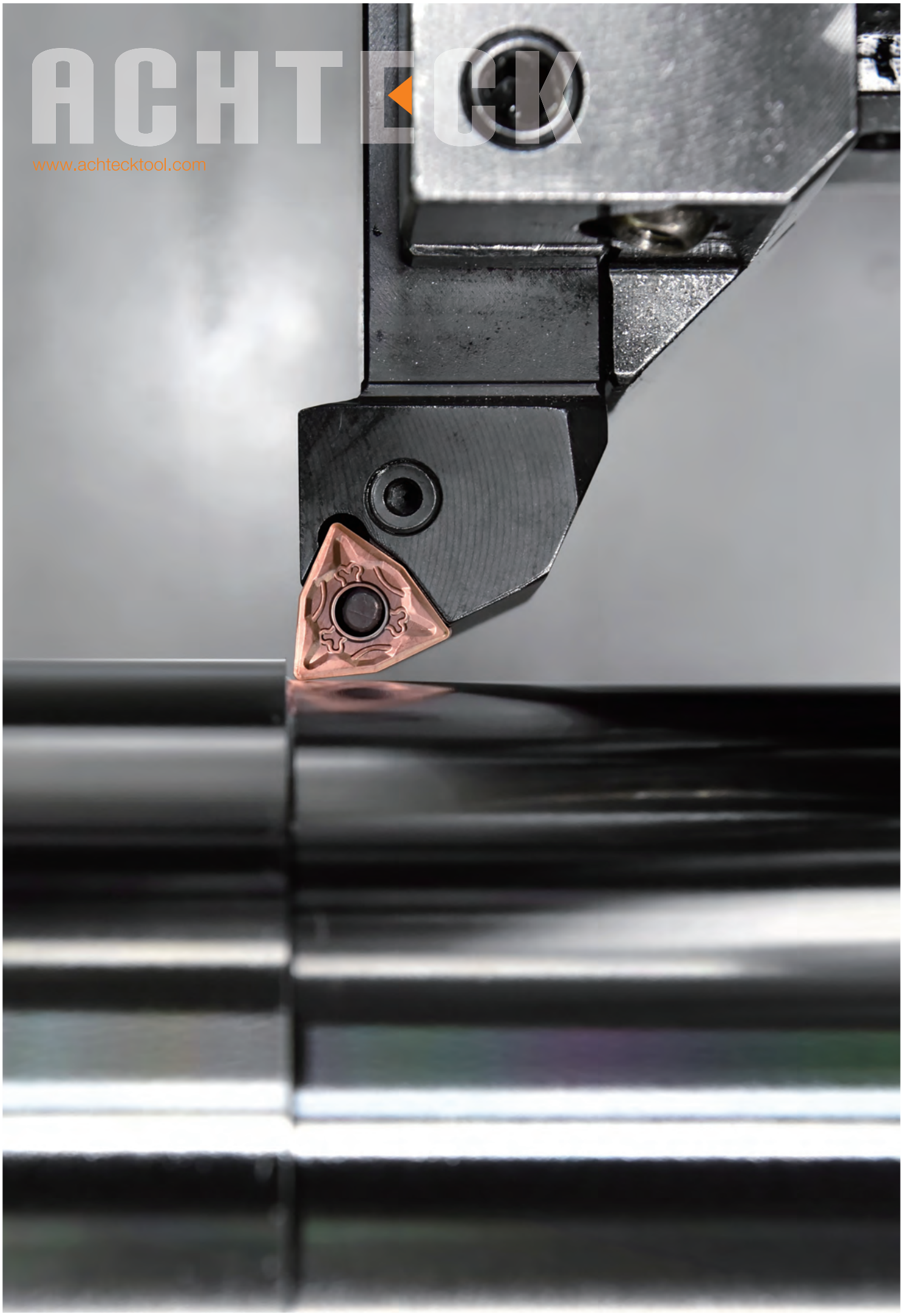
Steam Turbine and Aerospace Blade Solutions



APM00-RP06-12 cutter, used in rough milling of blade airfoil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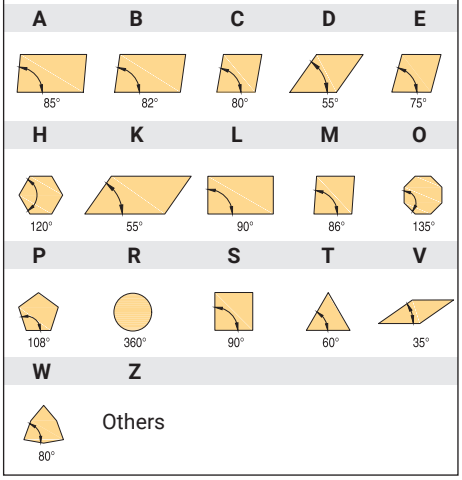
CUTTING TOOL CATALOGUE

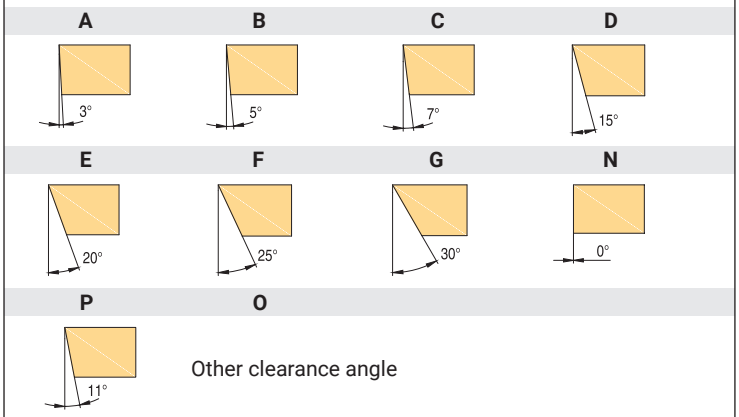
ISO Turning Insert Denomination System

C	N	M	G
1	2	3	4

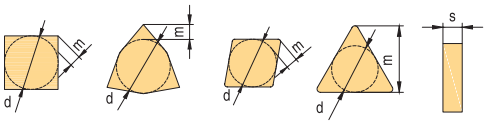
1- Shape/code



2- Clearance angle



3- Tolerance



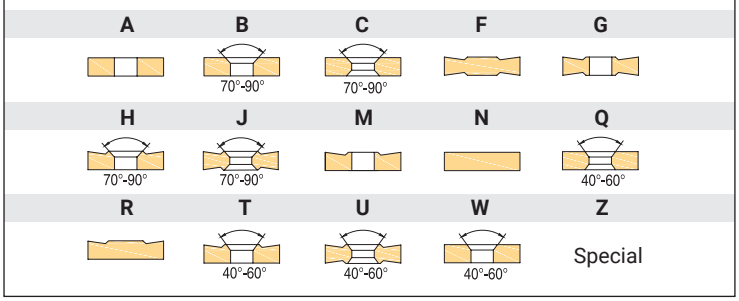
Class	Unit	In.Circle dimension d	Nose height m	Thickness s
A	in	± 0.0010	± 0.0002	± 0.0010
C	in	± 0.0010	± 0.0005	± 0.0010
E	in	± 0.0010	± 0.0010	± 0.0010
F	in	± 0.0005	± 0.0002	± 0.0010
G	in	± 0.0010	± 0.0010	± 0.0005
H	in	± 0.0005	± 0.0005	± 0.0010
J	in	*	± 0.0002	± 0.0010
K	in	*	± 0.0005	± 0.0010
L	in	*	± 0.0010	± 0.0010
M	in	*	*	± 0.0005
U	in	*	*	± 0.0005
N	in	*	*	± 0.0010

* For details refer to right and below tables

Shape: C, E, H, M, O, P, S, T, R, W				
IC	d		m	
	J,K,L,M,N	U	M, N	U
3/16	±0.002	±0.003	±0.003	±0.005
7/32	±0.002	±0.003	±0.003	±0.005
0.236	±0.002	±0.003	±0.003	±0.005
1/4	±0.002	±0.003	±0.003	±0.005
5/16	±0.002	±0.003	±0.003	±0.005
0.315	±0.002	±0.003	±0.003	±0.005
3/8	±0.002	±0.003	±0.003	±0.005
0.394	±0.002	±0.003	±0.003	±0.005
0.472	±0.003	±0.005	±0.005	±0.007
1/2	±0.003	±0.005	±0.005	±0.008
5/8	±0.004	±0.007	±0.005	±0.011
0.630	±0.003	± 0.007	±0.006	±0.011
3/4	±0.004	±0.007	±0.005	±0.011
0.787	±0.004	±0.007	±0.006	±0.011
0.984	±0.005	±0.010	±0.007	±0.015
1	±0.005	±0.010	±0.007	±0.015
1¼	±0.006	±0.010	±0.008	±0.015
1.260	±0.006	±0.010	±0.200	±0.015

M&N shape	D shape		V shape	
IC	d	m	d	m
7/32	±0.002	±0.004		
1/4	±0.002	±0.004	±0.002	±0.006
5/16	±0.002	±0.004	±0.002	±0.006
3/8	±0.002	±0.004	±0.002	±0.006
1/2	±0.003	±0.006	±0.003	±0.008
5/8	±0.004	±0.007	±0.004	±0.011
3/4	±0.004	±0.007	±0.004	±0.011

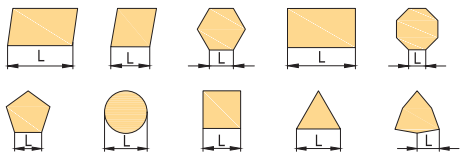
4 - Type of insert



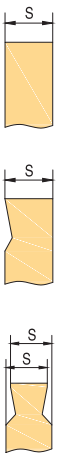
4			3						
5			6						

5- Cutting edge length

in	In.Circle Dimension (in)	insert shape C	D	R	S	T	V	W
1.2 (5)	5/32					06		02
1.5 (6)	5			05				
1.8 (7)	7/32			09				
	0.236		06					
2	1/4	06	07			11	11	04
	0.315			08				
3	3/8	09	11	09	09	16	16	06
	0.394			10				
	0.472			12				
4	1/2	12	15	12	12	22	22	08
5	5/8	16		15	15	27		
	0.630			16				
6	3/4	19		19	19	33		
	0.787			20				
	0.984			25				
8	1	25		25	25			
10	1¼			31				
	1.260			32				



6- Thickness



A, B, C, N, O, W,

H, M, R, T,

F, G, J, U,

Example:

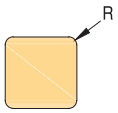
0.5(1) = 1/32
0.6 = 0.040
1(2) = 0.625
1.2 = 0.075
1.5(3) = 3/32
2 = 1/8
2.5 = 5/32
3 = 3/16
3.5 = 7/32
4 = 1/4
5 = 5/16
6 = 3/8
7 = 7/16
8 = 1/2

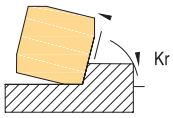
2	F	R	-
7	8	9	-

7- Nose radius

Corner radius

Example:
MO = round insert (metric)
OO = Sharp
0 = 0.004
0.5 = 0.008
1 = 1/64
2 = 1/32
3 = 3/64
4 = 1/16
5 = 5/64
6 = 3/32
7 = 7/64
8 = 1/8
X = Others





Wiper

Approaching angle (Kr)
A = 45°
D = 60°
E = 75°
F = 85°
G = 87°
P = 90°
Z = Others

Wiper clearance angle (an)
A = 3°
B = 5°
C = 7°
D = 15°
E = 20°
F = 25°
G = 30°
N = 0°
P = 11°
Z = Others

8- Edge preparation

F	Sharp cutting edge
NO	Edge processing

9-Direction of the blade

L	Left
R	Right

10- Chip Breaker Illustration

Refer to page : 22-31

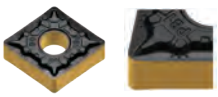
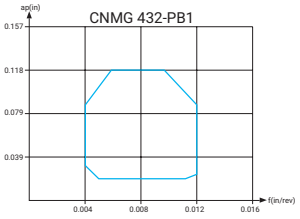
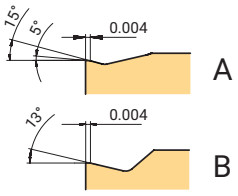
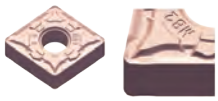
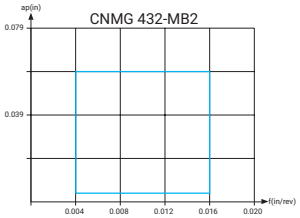
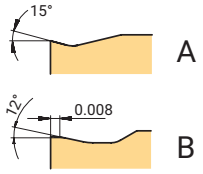
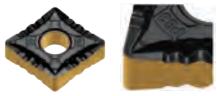
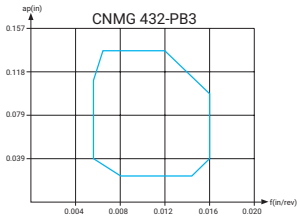
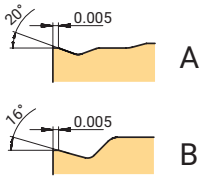
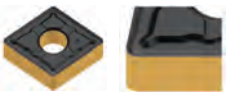
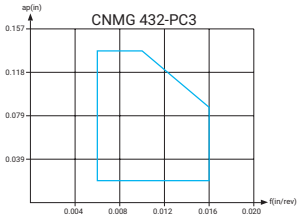
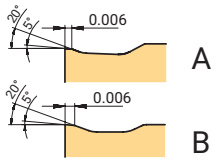
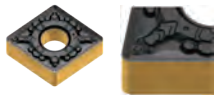
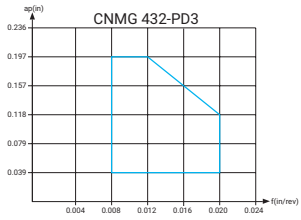
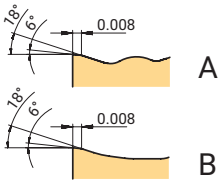
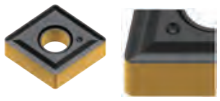
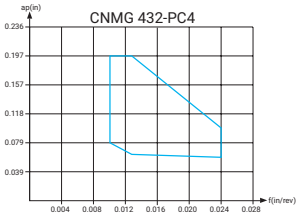
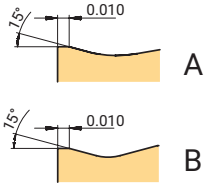
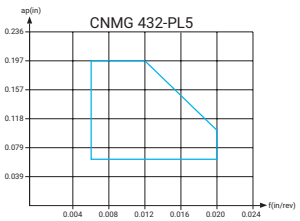
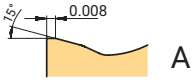
Ground positive insert sample

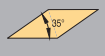
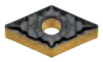
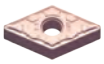
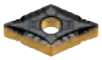
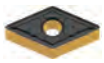
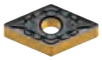
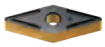
CCET 3 2.5 03 F P R – – F

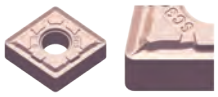
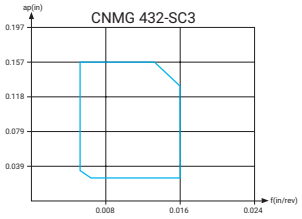
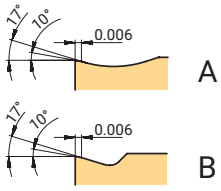
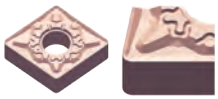
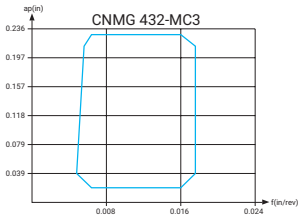
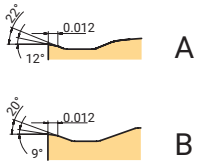
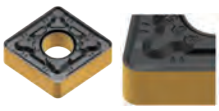
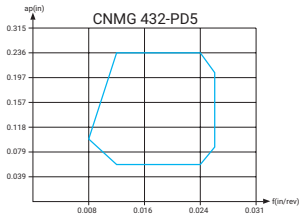
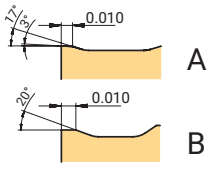
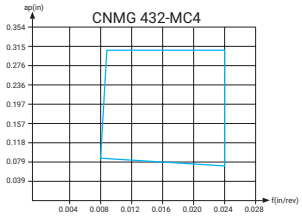
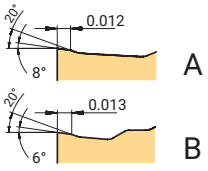
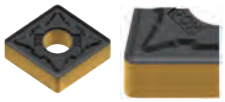
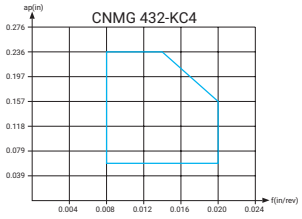
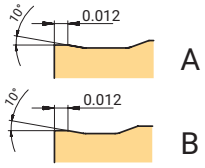
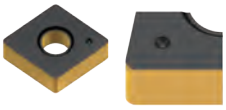
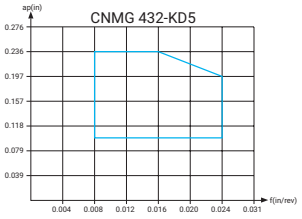
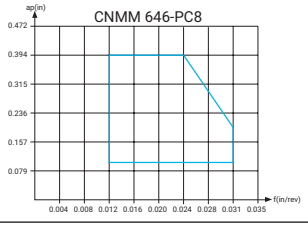
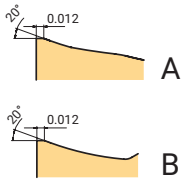
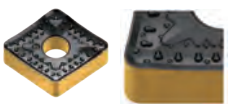
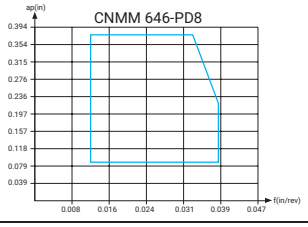
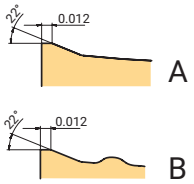
F: Sharp cutting edge NO: Edge processing	P: Insert polishing	L: Left R: Right	Chip breaker

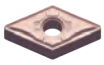
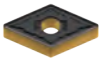
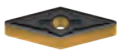
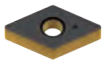
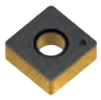
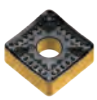
Overview of Turning Insert Geometries

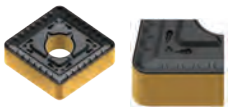
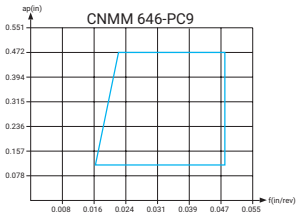
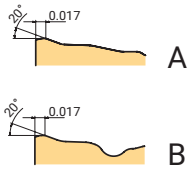
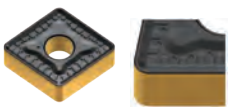
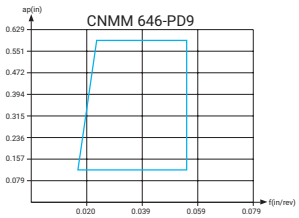
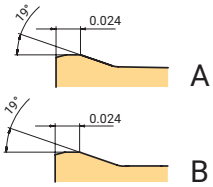
Negative inserts

Application	Chip breaker	Features	Chip breaker range	Cross section geometry
Finishing	PB1 	**First choice for steel finish turning** Light cutting chip breaker, low cutting force, suitable for machining slender shaft, thin wall and unstable clamping parts, good cutting performance		
	MB2 	**First choice for stainless steel finish turning** High positive rake angle reduced cutting force and built-up edge, can obtain much better surface quality. Very good chip breaking at low feed and cutting depth.		
Semifinishing	PB3 	**First choice for steel semi finish turning** The positive rake angle combined with small land guaranteed edge strength and sharpness, reduced the cutting force. The wavy side edge design has a good chip breaking result in out-copying turning on the shoulder, and in profile turning at different cutting depths		
	PC3 	**Alternative chipbreaker for steel semi-finish turning** Unique geometry design offers wider chip breaking range. Double rake angle makes the cutting smoothly. Enhanced insert tip reduced crater wear.		
Medium	PD3 	**First choice for steel medium turning** It has a strong chip control ability at low feed and cutting depth, and reduces crater wear. The chip breaking is also very good at high feed and cutting depth due to the geometry design. Double rake angle design makes sharp cutting edge and reduces cutting force.		
	PC4 	**First choice for cast iron medium turning** **Alternative chipbreaker for carbon steel and alloy steel medium turning** Flat T-land guarantee the strength of cutting edge. This multi-purpose geometry can be used in universal applications.		
	PL5 	**First choice for steel slender shaft turning** Open chip breaker leads to smooth cutting with low cutting force, which is suitable for slender shaft turning.		

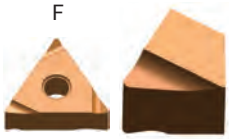
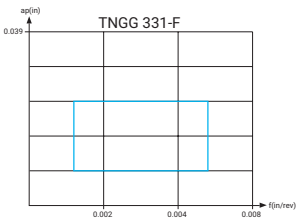
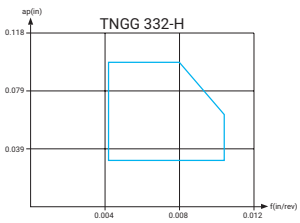
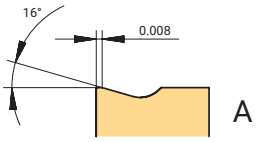
						
CNMG-PB1  P38	DNMG-PB1  P42	SNMG-PB1  P45	TNMG-PB1  P48	VNMG-PB1  P51	WNMG-PB1  P52	
CNMG-MB2  P38	DNMG-MB2  P42	SNMG-MB2  P45	TNMG-MB2  P48	VNMG-MB2  P51	WNMG-MB2  P52	
CNMG-PB3  P38	DNMG-PB3  P42		TNMG-PB3  P48	VNMG-PB3  P51	WNMG-PB3  P52	
CNMG-PC3  P38	DNMG-PC3  P42	SNMG-PC3  P45	TNMG-PC3  P48	VNMG-PC3  P51	WNMG-PC3  P52	
CNMG-PD3  P38	DNMG-PD3  P42	SNMG-PD3  P45	TNMG-PD3  P48	VNMG-PD3  P51	WNMG-PD3  P52	
CNMG-PC4  P39	DNMG-PC4  P43	SNMG-PC4  P46	TNMG-PC4  P49	VNMG-PC4  P51	WNMG-PC4  P53	
			TNMG-PL5  P48			

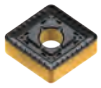
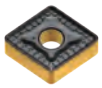
Application	Chip breaker	Features	Chip breaker range	Cross section geometry
Medium	SC3 	**First choice for high temperature alloy medium turning** Used in medium turning high temperature alloy and titanium alloy. Large rake angle + small land width design, easy cutting, also suitable in soft steel turning.		
	MC3 	**First choice for stainless steel medium turning** Sharp cutting edge, low cutting force, wide chip breaking range and chip removal ability		
Roughing	PD5 	**Alternative chipbreaker for steel rough turning** A strong cutting edge. Double rake angle design effectively reduces the cutting force, can still have good chip breaking at small cutting depth.		
	MC4 	**Alternative chipbreaker for stainless steel and superalloy rough turning** Large chip breaker design, smooth chip evacuation, good chip breaking, with high metal removal rate.		
	KC4 	**First choice for cast iron rough turning** It has strong cutting edge, reliable and stable performance.		
	KD5 	**First choice for cast iron rough turning** High cutting edge strength, suitable for interrupt cutting and unstable cutting		
Heavy roughing	PC8 	**Light cutting geometry for heavy turning** Positive rake angle and curved cutting edge design, low cutting force		
	PD8 	**Heavy turning geometry for soft steel and stainless steel** The geometry design ensures low cutting force. Suitable for low power machine tools. Applied in steel, stainless steel and cast iron heavy turning.		

80°	55°	90°	60°	35°	80°	360°
CNMG-SC3  P39	DNMG-SC3  P43	SNMG-SC3  P45	TNMG-SC3  P48	VNMG-SC3  P51	WNMG-SC3  P52	
CNMG-MC3  P39	DNMG-MC3  P43	SNMG-MC3  P45	TNMG-MC3  P49	VNMG-MC3  P51	WNMG-MC3  P52	
CNMG-PD5  P40	DNMG-PD5  P44	SNMG-PD5  P46	TNMG-PD5  P50		WNMG-PD5  P53	
CNMG-MC4  P39	DNMG-MC4  P43	SNMG-MC4  P46	TNMG-MC4  P49		WNMG-MC4  P53	
CNMG-KC4  P40	DNMG-KC4  P44	SNMG-KC4  P46	TNMG-KC4  P49	VNMG-KC4  P51	WNMG-KC4  P53	
CNMA-KD5  P40	DNMA-KD5  P44	SNMA-KD5  P47	TNMA-KD5  P50		WNMA-KD5  P53	
CNMM-PC8  P41						
CNMM-PD8  P41		SNMM-PD8  P47	TNMM-PD8  P50			

Application	Chip breaker	Features	Chip breaker range	Cross section geometry
Heavy roughing	PC9 	**First choice for steel heavy turning** Wavy geometry is good for chip breaking. The geometry has a big space for chips, which is suitable for high metal removal rate.		
	PD9 	**Alternative chipbreaker for steel heavy turning** High edge strength is suitable for big cutting depth and high feed turning. High machining reliability.		

Negative ground insert

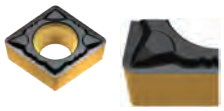
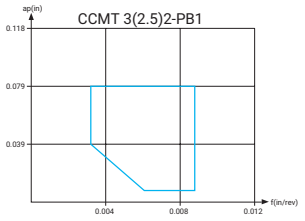
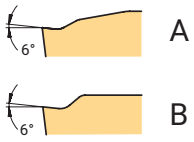
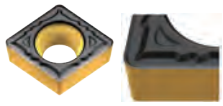
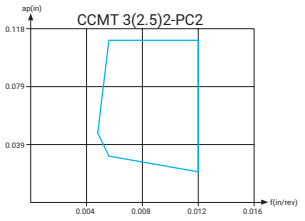
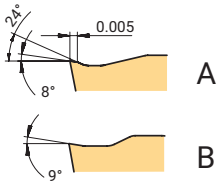
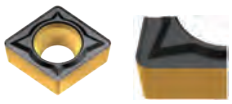
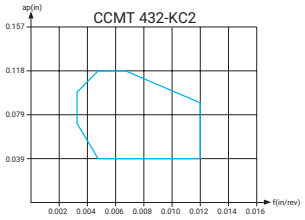
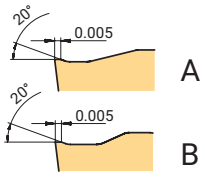
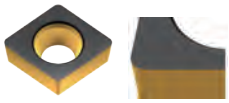
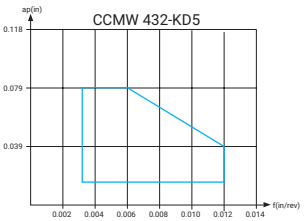
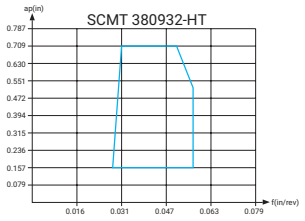
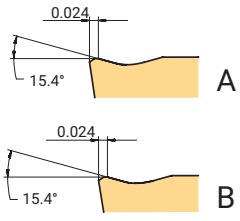
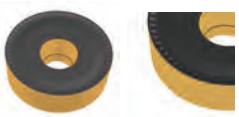
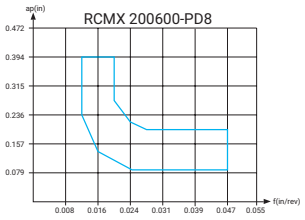
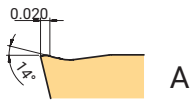
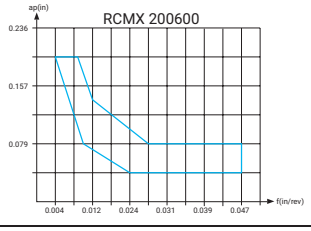
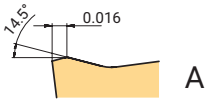
Application	Chip breaker	Features	Chip breaker range	Cross section geometry
Finishing	F 	**Finishing turning** Low cutting force, good chip control. The sharp edge produces a good surface finish.		
Semifinishing-roughing	H 	**Light turning** Excellent chip control at low to medium feed rates. Strong edge strength.		

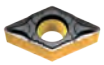
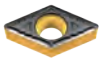
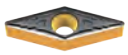
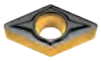
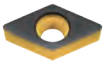
80°	55°	90°	60°	35°	80°	360°
CNMM-PC9  P41		SNMM-PC9  P47				
CNMM-PD9  P41		SNMM-PD9  P47				

80°	55°	90°	60°	35°	80°	360°
			TNGG-F  P50			
			TNGG-H  P50			

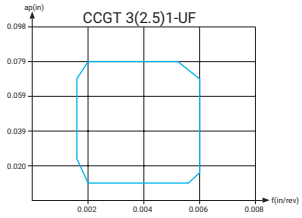
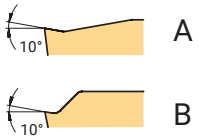
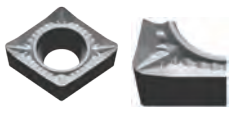
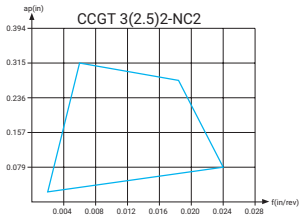
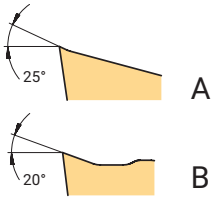
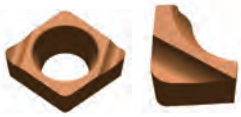
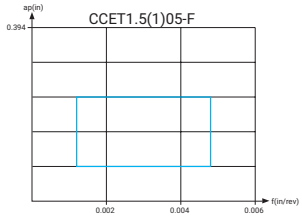
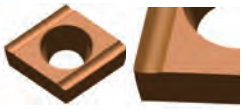
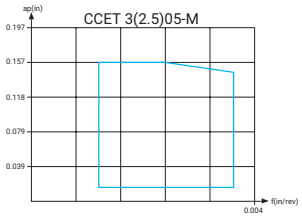
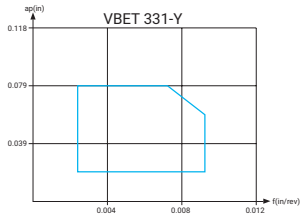
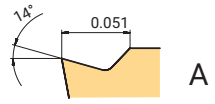
Overview of Turning Insert Geometries

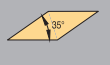
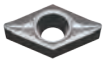
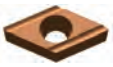
Positive inserts

Application	Chip breaker	Features	Chip breaker range	Cross section geometry
Finishing	PB1 	**First choice for steel finish turning** Positive rake angle reduces cutting force and built-up edge, and obtains better surface finish and longer tool life. Also can be used in stainless steel turning.		
Semifinishing	PC2 	**First choice for steel and stainless steel semi-finish turning** Sharp geometry design ensures low cutting force, less built-up edge and excellent chip control.		
Medium	KC2 	**General purpose geometry for steel, stainless steel and cast iron turning** Suitable for medium and rough turning. Simple and durable chip breaker design, very good versatility and wide application range.		
Roughing	KD5 	**Geometry for cast iron rough turning** Suitable for unstable machining due to its strong cutting edge. Reduced chipping.		
	HT 	**Geometry for steel turning with large cutting depth** Open chip breaker is suitable for large cutting depth with smooth chip evacuation. Good cost efficiency.		
Medium	PD8 	**Geometry for carbon steel and alloy steel heavy turning** A wide chipbreaker avoid chip jam at big cutting depth. Chip control can be also good at small cutting depth.		
	No code 	**Alternative chipbreaker for cast iron and alloy steel medium turning** Negative land and big rake angle design ensure cutting edge strength and sharpness		

						
CCMT-PB1  P55	DCMT-PB1  P58	SCMT-PB1  P61	TNMG-PB1  P62	VNMG-PB1  P65		
CCMT-PC2  P55	DCMT-PC2  P58	SCMT-PC2  P61	TCMT-PC2  P62	VBMT-PC2 VCMT-PC2  P65		
CCMT-KC2  P56	DCMT-KC2  P59	SCMT-KC2  P61	TCMT-KC2  P63	VBMT-KC2  P66		
CCMW-KD5  P56	DCMW-KD5  P59	SCMW-KD5  P61	TCMW-KD5  P63			
		SCMT-HT  P61				
						RCMX-PD8  P69
						RCMX  P69

Positive ground inserts

Application	Chip breaker	Features	Chip breaker range	Cross section geometry
Finishing	UF 	**First choice for high temperature alloy turning** Peripheral ground finish turning inserts. High repeatibility on insert positioning. Sharp cutting edge can achieve good machining tolerance.		
Semifinishing	NC2 	**Choice for aluminium alloy turning** Very positive rake angle is designed for non-ferrous metal finish and semi-finish turning. It reduces the cutting force and make smooth chip evacuation. The polished rake surface, with reduced friction and built-up edge.		
Finishing	F 	**Choice for finish turning** Excellent chip control at low feed rates. Very low cutting force.		
Low feed	M 	**Geometry for low feed turning in automatic lathe** Excellent chip control at low to medium feed rates. Reliable machining. Big rake angle avoid work hardening.		
	Y 	**Choice for Semi finish-rough turning in automatic lathe** The strong edge can be used in rough turning. Good chip control for low to medium feed rate		

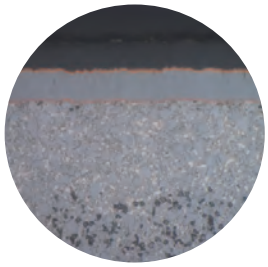
						
CCGT-UF  P55	DCGT-UF  P58		TCGT-UF  P62	VBGT-UF VCGT-UF  P65		
CCGT-NC2  P55	DCGT-NC2  P58	SCGT-NC2  P61	TCGT-NC2  P62	VCGT-NC2  P66		RCGT-NC2  P69
CCET-F  P56	DCET-F  P59		TBET-F TPEH-F  P64	VBET-F VCET-F VPET-F  P66、67	WBET-F  P68	
CCET-M  P57	DCET-M  P60		TCET-M  P64	VBET-M VPET-M  P66、67		
				VBET-Y  P67		

Grade Application Guide

Turning grade application for ISO material group													
Material Group	Materials	ISO	CVD coated						PVD coated		Uncoated	ISO
			AC150P	AC200P	AC250P	AC350P	ACK15A	AC150K	AP301M	AP100S	AW100K	
P	Unalloyed steels / Alloyed steels	P01										P01
		P05	AC150P									P05
		P10		AC200P								P10
		P15										P15
		P20			AC250P							P20
		P25										P25
		P30				AC350P						P30
		P35										P35
		P40										P40
		P45										P45
		P50										P50
M	Stainless steels	M01										M01
		M05								AP100S		M05
		M10										M10
		M15							AP301M			M15
		M20										M20
		M25										M25
		M30										M30
		M35										M35
		M40										M40
		M45										M45
K	Cast iron	K01										K01
		K05										K05
		K10					ACK15A	AC150K				K10
		K15										K15
		K20										K20
		K25										K25
		K30										K30
		K35										K35
		K40										K40
		K45										K45
		K50										K50
S	Heat resistant alloy	S01										S01
		S05								AP100S		S05
		S10										S10
		S15							AP301M			S15
		S20										S20
		S25										S25
		S30										S30
		S35										S35
		S40										S40
N	Aluminum/ Aluminum alloys	N01										N01
		N05									AW100K	N05
		N10										N10
		N15										N15
		N20										N20
		N25										N25
		N30										N30
H	Hardened steels/ Chilled cast iron	H01										H01
		H05										H05
		H10										H10
		H15										H15
		H20										H20
		H25										H25
		H30										H30

Turning Grade Description

AC150P



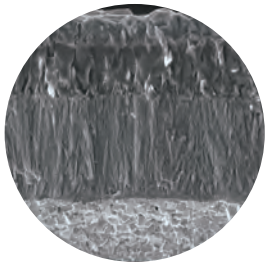
Coating: CVD coating

The ultra-fine crystal substrate combined with MTCVD TiCN coating, and plus a thick layer of α-Al_2O_3 coating offers excellent wear resistance to extend tool life under high speed continuous or slight interrupted cutting.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P		AC150P									
M											
K											
S											
N											
H											

Remark: ☐ Best choice

AC200P



Coating: CVD coating

The thickened ultra-fine crystal MTCVD TiCN coating and columnar α - Al_2O_3 coating has higher wear resistance and toughness, and can obtain longer tool life and better stability.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P			AC200P								
M											
K											
S											
N											
H											

Remark: ☐ Best choice

AC250P

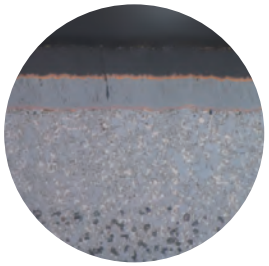
Coating: CVD coating

Cobalt enriched tough substrate with MTCVD TiCN and Al_2O_3 coating provides excellent wear resistance and chipping resistance. Very good versatility.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P					AC250P						
M											
K											
S											
N											
H											

Remark: ☐ Best choice

AC350P



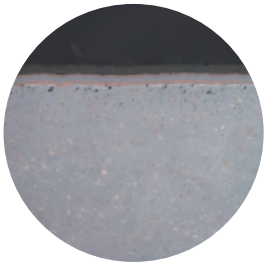
Coating: CVD coating

For rough turning steel. Very tough cobalt enriched substrate with specific coating. Excellent performance in interrupted cutting.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P							AC350P				
M											
K											
S											
N											
H											

Remark: ☐ Best choice

ACK15A



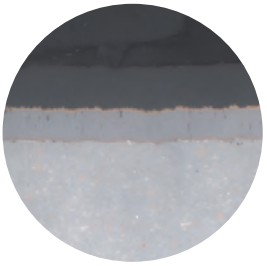
Coating: CVD coating

Very good performance in cast iron medium and rough turning. Good for continuous and interrupted cutting.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P											
M											
K			ACK15A								
S											
N											
H											

Remark: ☐ Best choice

AC150K



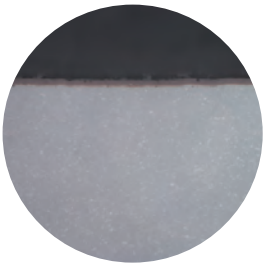
Coating: CVD coating

Suitable for cast iron semi finish and medium turning. New thicker CVD coating on ultra-fine crystal substrate, with optimized coating structure and adhesive strength, and polished smooth coating surface, result in good wear resistance and chipping resistance.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P											
M											
K			AC150K								
S											
N											
H											

Remark: ☐ Best choice

AP301M



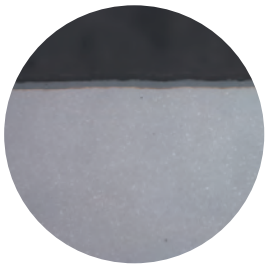
Coating: PVD coating

For stainless steel semi finish and medium turning. Tough and good wear resistance substrate with nanostructured PVD coating, provides better machining stability and longer tool life.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P											
M				AP301M							
K											
S				AP301M							
N											
H											

Remark: Best choice
2nd choice

AP100S



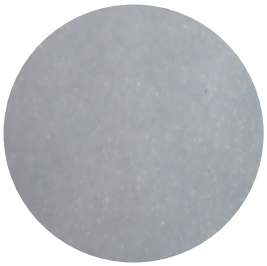
Coating: PVD coating

For heat resistant alloy turning. Ultra-fine grain substrate and nanostructured PVD coating provide strong adhesive strength and anti oxidation, and result in longer tool life.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P											
M		AP100S									
K											
S		AP100S									
N											
H											

Remark: Best choice
2nd choice

AW100K



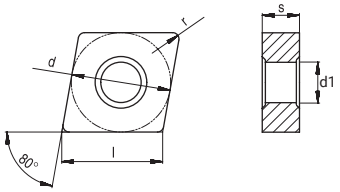
Coating: Uncoated

For nonferrous alloy turning. Fine grain size substrate, uncoated, with special edge preparation.

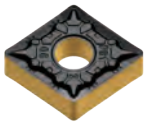
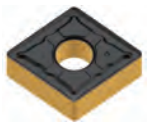
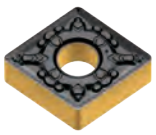
Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P											
M											
K											
S											
N		AW100K									
H											

Remark: ☐ Best choice

Negative 80° (C) Rhombic Inserts



Dimensions (in)				
Type	d	l	s	d1
CN_43_	1/2	0.508	3/16	0.203
CN_54_	5/8	0.635	1/4	0.250
CN_64_	3/4	0.762	1/4	0.313

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		CNMG 431-PB1	1/64	0.002-0.006	0.010-0.126	●	○	●						
		CNMG 432-PB1	1/32	0.004-0.012	0.020-0.126	●	○	●						
		CNMG 433-PB1	3/64	0.006-0.018	0.031-0.126	●	○	○						
		CNMG 432-MB2	1/64	0.002-0.006	0.010-0.126					●				●
		CNMG 433-MB2	1/32	0.004-0.012	0.020-0.126					●				●
Semifinishing		CNMG 431-PB3	1/64	0.002-0.007	0.012-0.138	●	○	●						
		CNMG 432-PB3	1/32	0.005-0.014	0.024-0.138	●	○	●						
		CNMG 433-PB3	3/64	0.007-0.021	0.035-0.138	●	○	○						
		CNMG 431-PC3	1/64	0.003-0.008	0.013-0.154	○	○	●						
		CNMG 432-PC3	1/32	0.006-0.016	0.027-0.154	●	●	●						
		CNMG 433-PC3	3/64	0.008-0.024	0.040-0.154	○	○	●						
		CNMG 642-PC3	1/32	0.006-0.016	0.027-0.228	○	○	○						
		CNMG 643-PC3	3/64	0.008-0.024	0.040-0.228	○	○	○						
Medium		CNMG 431-PD3	1/64	0.003-0.009	0.016-0.169	●	●	●	○					
		CNMG 432-PD3	1/32	0.006-0.017	0.031-0.169	●	●	●	●					
		CNMG 433-PD3	3/64	0.009-0.026	0.047-0.169	●	●	●	●					
		CNMG 542-PD3	1/32	0.006-0.017	0.031-0.209	●	○	●	○					
		CNMG 543-PD3	3/64	0.009-0.026	0.047-0.209	●	●	●	○					
		CNMG 642-PD3	1/32	0.006-0.017	0.031-0.252	○	○	●	○					

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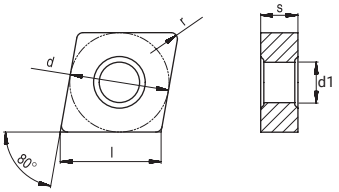
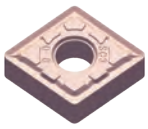
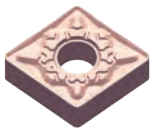
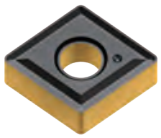
Marked: ● Stock available ○ Non-stocked standard

Negative 80° (C) Rhombic Inserts



Dimensions (in)				
Type	d	l	s	d1
CN_43_	1/2	0.508	3/16	0.203
CN_54_	5/8	0.635	1/4	0.250
CN_64_	3/4	0.762	1/4	0.313

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Medium		CNMG 431-SC3	1/64	0.003-0.009	0.016-0.169									●
		CNMG 432-SC3	1/32	0.006-0.017	0.031-0.169					○				●
		CNMG 433-SC3	3/64	0.009-0.026	0.047-0.169					○				●
		CNMG 543-SC3	3/64	0.009-0.026	0.047-0.209					○				●
		CNMG 544-SC3	1/16	0.012-0.035	0.063-0.209									○
		CNMG 643-SC3	3/64	0.009-0.026	0.047-0.252									●
		CNMG 644-SC3	1/16	0.012-0.035	0.063-0.252									○
		CNMG 431-MC3	1/64	0.003-0.009	0.013-0.169					●				○
		CNMG 432-MC3	1/32	0.006-0.017	0.025-0.169					●				●
		CNMG 433-MC3	3/64	0.009-0.026	0.038-0.169					●				○
		CNMG 434-MC3	1/16	0.012-0.035	0.050-0.169					○				
		CNMG 542-MC3	1/32	0.006-0.017	0.025-0.209					○				
		CNMG 543-MC3	3/64	0.009-0.026	0.038-0.209					○				
		CNMG 642-MC3	1/32	0.006-0.017	0.025-0.252					○				
		CNMG 643-MC3	3/64	0.009-0.026	0.038-0.252					○				
		CNMG 431-PC4	1/64	0.003-0.009	0.016-0.169	○		●	○		○	●		
		CNMG 432-PC4	1/32	0.006-0.017	0.031-0.169	●		●	○		●	●		
		CNMG 433-PC4	3/64	0.009-0.026	0.047-0.169	●		●	○		○	●		
		CNMG 543-PC4	3/64	0.009-0.026	0.047-0.209	○		●	○		○	○		
		CNMG 544-PC4	1/16	0.012-0.035	0.063-0.209	○		○	○		○	●		
		CNMG 643-PC4	3/64	0.009-0.026	0.047-0.252	○		●			○	○		
Roughing		CNMG 432-MC4	1/32	0.008-0.024	0.047-0.252					●				●
		CNMG 433-MC4	3/64	0.012-0.035	0.071-0.252					●				●
		CNMG 543-MC4	3/64	0.012-0.035	0.071-0.319					●				○
		CNMG 544-MC4	1/16	0.016-0.047	0.094-0.319					○				○
		CNMG 643-MC4	3/64	0.012-0.035	0.071-0.382					●				
		CNMG 644-MC4	1/16	0.016-0.047	0.094-0.382					●				

Marked: ● Stock available ○ Non-stocked standard

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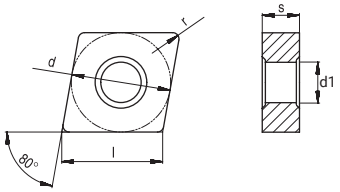
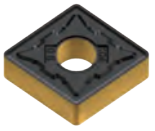
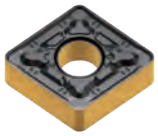
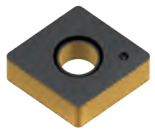
Negative 80° (C) Rhombic Inserts



Dimensions (in)				
Type	d	l	s	d1
CN_32_	3/8	0.381	1/8	0.150
CN_43_	1/2	0.508	3/16	0.203
CN_54_	5/8	0.635	1/4	0.250
CN_64_	3/4	0.762	1/4	0.313

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Roughing		CNMG 322-KC4	1/32	0.007-0.019	0.038-0.154						○	○		
		CNMG 431-KC4	1/64	0.004-0.009	0.019-0.205						○	●		
		CNMG 432-KC4	1/32	0.007-0.019	0.038-0.205						●	●		
		CNMG 433-KC4	3/64	0.010-0.028	0.057-0.205						●	●		
		CNMG 434-KC4	1/16	0.014-0.038	0.076-0.205						●	○		
		CNMG 542-KC4	1/32	0.007-0.019	0.038-0.252						○	○		
		CNMG 543-KC4	3/64	0.010-0.028	0.057-0.252						●	●		
		CNMG 544-KC4	1/16	0.014-0.038	0.076-0.252						○	●		
		CNMG 642-KC4	1/32	0.007-0.019	0.038-0.303						○	○		
		CNMG 643-KC4	3/64	0.010-0.028	0.057-0.303						○	●		
		CNMG 644-KC4	1/16	0.014-0.038	0.076-0.303						○	●		
		CNMG 646-KC4	3/32	0.021-0.057	0.113-0.303						○	○		
		CNMG 432-PD5	1/32	0.008-0.024	0.047-0.252	●		●	●					
		CNMG 433-PD5	3/64	0.012-0.035	0.071-0.252	●		●	○					
		CNMG 543-PD5	3/64	0.012-0.035	0.071-0.319	●	●	●	●					
		CNMG 544-PD5	1/16	0.016-0.047	0.094-0.319	●		●	○					
		CNMG 546-PD5	3/32	0.024-0.071	0.142-0.319			○	○					
		CNMG 643-PD5	3/64	0.012-0.035	0.071-0.382	●		●	○					
		CNMG 644-PD5	1/16	0.016-0.047	0.094-0.382	○	●	●	●					
		CNMA 431-KD5	1/64	0.004-0.012	0.024-0.252						○	○		
		CNMA 432-KD5	1/32	0.008-0.024	0.047-0.252						●	●		
		CNMA433-KD5	3/64	0.012-0.035	0.071-0.252						●	●		
		CNMA 434-KD5	1/16	0.016-0.047	0.094-0.252						○	○		
		CNMA 542-KD5	1/32	0.008-0.024	0.047-0.319						○	○		
		CNMA 543-KD5	3/64	0.012-0.035	0.071-0.319						○	○		
		CNMA 544-KD5	1/16	0.016-0.047	0.094-0.319						●	○		
		CNMA 545-KD5	0.079	0.020-0.059	0.118-0.319						●	○		
		CNMA 642-KD5	1/32	0.008-0.024	0.047-0.382						○	○		
		CNMA 643-KD5	3/64	0.012-0.035	0.071-0.382						○	○		
		CNMA 644-KD5	1/16	0.016-0.047	0.094-0.382						○	●		

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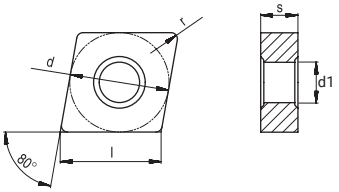
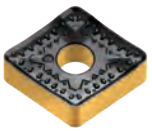
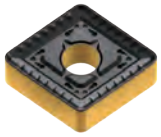
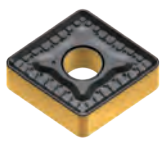
Marked: ● Stock available ○ Non-stocked standard

Negative 80° (C) Rhombic Inserts



Dimensions (in)				
Type	d	l	s	d1
CN_43_	1/2	0.508	3/16	0.203
CN_54_	5/8	0.635	1/4	0.250
CN_64_	3/4	0.762	1/4	0.313
CN_85_	1	0.762	0.313	0.359
CN_86_	1	0.762	3/8	0.359

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Heavy roughing		**CNMM 644-PC8**	1/16	0.013-0.025	0.113-0.303	○	○	○						
		CNMM 646-PC8	3/32	0.019-0.038	0.170-0.303	○	○	○						
		**CNMM 432-PD8**	1/32	0.006-0.013	0.057-0.205	●		○	○					
		CNMM 433-PD8	3/64	0.009-0.019	0.085-0.205	○		○	○					
		CNMM 543-PD8	3/64	0.009-0.019	0.085-0.252	○		●	○					
		CNMM 544-PD8	1/16	0.013-0.025	0.113-0.252	○		●	○					
		CNMM 546-PD8	3/32	0.019-0.038	0.170-0.252	○		○	○					
		CNMM 643-PD8	3/64	0.009-0.019	0.085-0.303	○		○	○					
		CNMM 644-PD8	1/16	0.013-0.025	0.113-0.303	○		○	●					
		CNMM 646-PD8	3/32	0.019-0.038	0.170-0.303	○		○	○					
		CNMM 856-PD8	3/32	0.019-0.038	0.170-0.406	○		○	○					
		CNMM 866-PD8	3/32	0.019-0.038	0.170-0.406	○		○	○					
		**CNMM 643-PC9**	3/64	0.010-0.024	0.094-0.382	○		○	○					
		CNMM 644-PC9	1/16	0.014-0.031	0.126-0.382	○		○	○					
		CNMM 646-PC9	3/32	0.021-0.047	0.189-0.382	○		○	○					
		CNMM 856-PC9	3/32	0.021-0.047	0.189-0.508	○		○	○					
		CNMM 866-PC9	3/32	0.021-0.047	0.189-0.508	○		●	○					
		**CNMM 643-PD9**	3/64	0.012-0.028	0.104-0.457	○		○	○					
		CNMM 644-PD9	1/16	0.016-0.038	0.139-0.457	●	○	●	○					
		CNMM 646-PD9	3/32	0.024-0.057	0.208-0.457	○		●	○					
		CNMM 856-PD9	3/32	0.024-0.057	0.208-0.610	○		○	○					
		CNMM 866-PD9	3/32	0.024-0.057	0.208-0.610	○	○	●	●					

Marked: ● Stock available ○ Non-stocked standard

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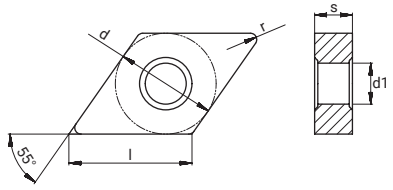
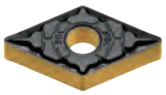
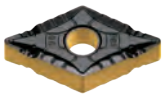
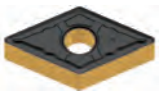
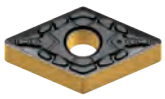
Negative 55°（D） Rhombic Inserts



Dimensions (in)				
Type	d	l	s	d1
DN_33_	3/8	0.458	3/16	0.150
DN_43_	1/2	0.610	3/16	0.203
DN_44_	1/2	0.610	1/4	0.203

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		DNMG 331-PB1	1/64	0.002-0.006	0.010-0.091	○		●						
		DNMG 431-PB1	1/64	0.002-0.006	0.010-0.122	●	○	●						
		DNMG 432-PB1	1/32	0.004-0.012	0.020-0.122	●	○	●						
		DNMG 441-PB1	1/64	0.002-0.006	0.010-0.122	●	○	○						
		DNMG 442-PB1	1/32	0.004-0.012	0.020-0.122	●	○	●						
		DNMG 431-MB2	1/64	0.002-0.006	0.010-0.114					○				●
		DNMG 432-MB2	1/32	0.004-0.012	0.020-0.114					○				○
		DNMG 441-MB2	1/64	0.002-0.006	0.010-0.114					●				●
		DNMG 442-MB2	1/32	0.004-0.012	0.020-0.114					○				●
Semifinishing		DNMG 431-PB3	1/64	0.002-0.007	0.012-0.122	○	○	○						
		DNMG 432-PB3	1/32	0.005-0.014	0.024-0.122	●	○	○						
		DNMG 433-PB3	3/64	0.007-0.021	0.035-0.122	○	○	○						
		DNMG 441-PB3	1/64	0.002-0.007	0.012-0.122	●	○	●						
		DNMG 442-PB3	1/32	0.005-0.014	0.024-0.122	●	○	●						
		DNMG 443-PB3	3/64	0.007-0.021	0.035-0.122	○	○	○						
		DNMG 332-PC3	1/32	0.006-0.016	0.027-0.102	●	○	○						
		DNMG 333-PC3	3/64	0.008-0.024	0.040-0.102	○	○	○						
		DNMG 431-PC3	1/64	0.003-0.008	0.013-0.138	○	○	○						
		DNMG 432-PC3	1/32	0.006-0.016	0.027-0.138	●	○	●						
		DNMG 433-PC3	3/64	0.008-0.024	0.040-0.138	○	○	○						
		DNMG 441-PC3	1/64	0.003-0.008	0.013-0.138	○	○	●						
		DNMG 442-PC3	1/32	0.006-0.016	0.027-0.138	●	●	●						
		DNMG 443-PC3	3/64	0.008-0.024	0.040-0.138	○	○	○						
Medium		DNMG 331-PD3	1/64	0.003-0.009	0.016-0.114	○	○	○						
		DNMG 332-PD3	1/32	0.006-0.017	0.031-0.114	●	○	●						
		DNMG 431-PD3	1/64	0.003-0.009	0.016-0.154	○	●	●						
		DNMG 432-PD3	1/32	0.006-0.017	0.031-0.154	●	●	●	○					
		DNMG 433-PD3	3/64	0.009-0.026	0.047-0.154	●	○	●	○					
		DNMG 441-PD3	1/64	0.003-0.009	0.016-0.154	●	○	●						
		DNMG 442-PD3	1/32	0.006-0.017	0.031-0.154	●	●	●	●					
		DNMG 443-PD3	3/64	0.009-0.026	0.047-0.154	○	●	●	○					

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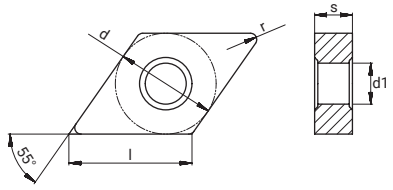
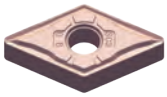
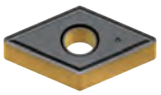
Marked: ● Stock available ○ Non-stocked standard

Negative 55°（D） Rhombic Inserts



Dimensions (in)				
Type	d	l	s	d1
DN_33_	3/8	0.458	3/16	0.150
DN_43_	1/2	0.610	3/16	0.203
DN_44_	1/2	0.610	1/4	0.203

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Medium		**DNMG 431-SC3**	1/64	0.003-0.009	0.016-0.154									●
		DNMG 432-SC3	1/32	0.006-0.017	0.031-0.154									●
		DNMG 433-SC3	3/64	0.009-0.026	0.047-0.154									○
		DNMG 441-SC3	1/64	0.003-0.009	0.016-0.154									●
		DNMG 442-SC3	1/32	0.006-0.017	0.031-0.154									●
		DNMG 443-SC3	3/64	0.009-0.026	0.047-0.154									○
		**DNMG 331-MC3**	1/64	0.003-0.009	0.013-0.114					●				
		DNMG 332-MC3	1/32	0.006-0.017	0.025-0.114					○				
		DNMG 431-MC3	1/64	0.003-0.009	0.013-0.154					●				
		DNMG 432-MC3	1/32	0.006-0.017	0.025-0.154					●				
		DNMG 433-MC3	3/64	0.009-0.026	0.038-0.154					○				
		DNMG 441-MC3	1/64	0.003-0.009	0.013-0.154					●				
		DNMG 442-MC3	1/32	0.006-0.017	0.025-0.154					●				
		DNMG 443-MC3	3/64	0.009-0.026	0.038-0.154					○				
		**DNMG 431-PC4**	1/64	0.003-0.009	0.016-0.154	○		○			○	○		
		DNMG 432-PC4	1/32	0.006-0.017	0.031-0.154	○		●			○	●		
		DNMG 433-PC4	3/64	0.009-0.026	0.047-0.154	○		○			○	●		
		DNMG 441-PC4	1/64	0.003-0.009	0.016-0.154	○		○			○	○		
		DNMG 442-PC4	1/32	0.006-0.017	0.031-0.154	●		○			●	●		
		DNMG 443-PC4	3/64	0.009-0.026	0.047-0.154	●		○			○	○		
Roughing		**DNMG 432-MC4**	1/32	0.008-0.024	0.047-0.213					○				○
		DNMG 433-MC4	3/64	0.012-0.035	0.071-0.213					○				○
		DNMG 442-MC4	1/32	0.008-0.024	0.047-0.213					○				○
		DNMG 443-MC4	3/64	0.012-0.035	0.071-0.213					○				○

Marked: ● Stock available ○ Non-stocked standard

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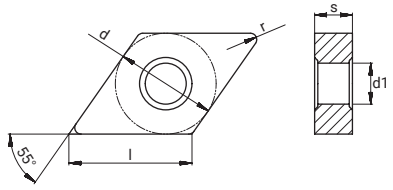
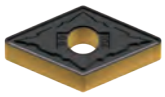
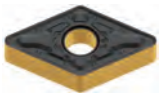
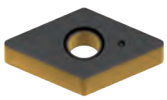
Negative 55°（D） Rhombic Inserts



Dimensions (in)				
Type	d	l	s	d1
DN_33_	3/8	0.458	3/16	0.150
DN_43_	1/2	0.610	3/16	0.203
DN_44_	1/2	0.610	1/4	0.203

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Roughing		**DNMG 331-KC4**	1/64	0.004-0.009	0.019-0.138						○	○		
		DNMG 332-KC4	1/32	0.007-0.019	0.038-0.138						○	●		
		DNMG 431-KC4	1/64	0.004-0.009	0.019-0.181						○	○		
		DNMG 432-KC4	1/32	0.007-0.019	0.038-0.181						○	●		
		DNMG 433-KC4	3/64	0.010-0.028	0.057-0.181						○	○		
		DNMG 441-KC4	1/64	0.004-0.009	0.019-0.181						○	●		
		DNMG 442-KC4	1/32	0.007-0.019	0.038-0.181						●	●		
		DNMG 443-KC4	3/64	0.010-0.028	0.057-0.181						●	○		
		**DNMG 432-PD5**	1/32	0.008-0.024	0.047-0.213	○	○	●	○					
		DNMG 433-PD5	3/64	0.012-0.035	0.071-0.213	○	○	●	○					
		DNMG 434-PD5	1/16	0.016-0.047	0.094-0.213	○	○	●	○					
		DNMG 442-PD5	1/32	0.008-0.024	0.047-0.213	○	○	○	●					
		DNMG 443-PD5	3/64	0.012-0.035	0.071-0.213	●	○	●	○					
		DNMG 444-PD5	1/16	0.016-0.047	0.094-0.213	○	○	●	○					
		**DNMA 431-KD5**	1/64	0.004-0.012	0.024-0.213						○	○		
		DNMA 432-KD5	1/32	0.008-0.024	0.047-0.213						○	○		
		DNMA 433-KD5	3/64	0.012-0.035	0.071-0.213						○	○		
		DNMA 441-KD5	1/64	0.004-0.012	0.024-0.213						○	○		
		DNMA 442-KD5	1/32	0.008-0.024	0.047-0.213						○	●		
		DNMA 443-KD5	3/64	0.012-0.035	0.071-0.213						●	●		

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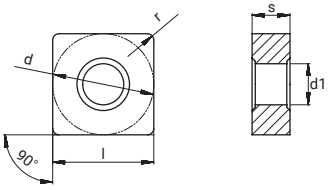
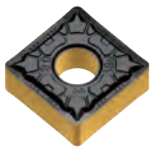
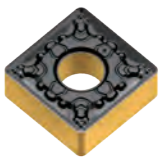
Marked: ● Stock available ○ Non-stocked standard

Negative 90°（S） Square Inserts



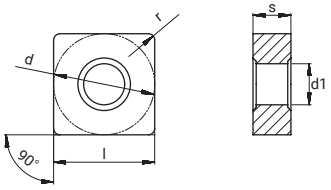
Dimensions (in)				
Type	d	l	s	d1
SN_43_	1/2	0.500	3/16	0.203
SN_54_	5/8	0.625	1/4	0.250
SN_64_	3/4	0.750	1/4	0.313

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		SNMG 431-PB1	1/64	0.002-0.006	0.010-0.126	○	○	○						
		SNMG 432-PB1	1/32	0.004-0.012	0.020-0.126	○	○	●						
		SNMG 433-PB1	3/64	0.006-0.018	0.031-0.126	●	○	○						
		SNMG 431-MB2	1/64	0.002-0.006	0.010-0.126					○				●
		SNMG 432-MB2	1/32	0.004-0.012	0.020-0.126					○				○
Semifinishing		SNMG 431-PC3	1/64	0.003-0.008	0.013-0.150	○		○						
		SNMG 432-PC3	1/32	0.006-0.016	0.027-0.150	○		●						
		SNMG 433-PC3	3/64	0.008-0.024	0.040-0.150	○		○						
Medium		SNMG 431-PD3	1/64	0.003-0.009	0.016-0.165	○	○	○	○					
		SNMG 432-PD3	1/32	0.006-0.017	0.031-0.165	●	○	●	●					
		SNMG 433-PD3	3/64	0.009-0.026	0.047-0.165	○	○	○	○					
		SNMG 642-PD3	1/32	0.006-0.017	0.031-0.248	○	○	○	○					
		SNMG 432-SC3	1/32	0.006-0.017	0.031-0.165									●
		SNMG 433-SC3	3/64	0.009-0.026	0.047-0.165									●
		SNMG 543-SC3	3/64	0.009-0.026	0.047-0.205									○
		SNMG 544-SC3	1/16	0.012-0.035	0.063-0.205									○
		SNMG 643-SC3	3/64	0.009-0.026	0.047-0.248									●
		SNMG 431-MC3	1/64	0.003-0.009	0.013-0.165					○				
		SNMG 432-MC3	1/32	0.006-0.017	0.025-0.165					●				
		SNMG 433-MC3	3/64	0.009-0.026	0.038-0.165					○				
		SNMG 543-MC3	3/64	0.009-0.026	0.038-0.205					○				
		SNMG 544-MC3	1/16	0.012-0.035	0.050-0.205					○				
		SNMG 643-MC3	3/64	0.009-0.026	0.038-0.248					○				
		SNMG 644-MC3	1/16	0.012-0.035	0.050-0.248					○				

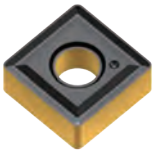
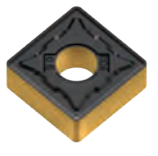
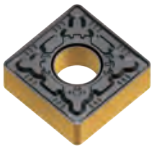
Marked: ● Stock available ○ Non-stocked standard

P72

Negative 90°（S） Square Inserts



Dimensions (in)				
Type	d	l	s	d1
SN_32_	3/8	0.375	1/8	0.150
SN_43_	1/2	0.500	3/16	0.203
SN_54_	5/8	0.625	1/4	0.250
SN_64_	3/4	0.750	1/4	0.313

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Medium		SNMG 431-PC4	1/64	0.003-0.009	0.016-0.165	○	○	○			○	○		
		SNMG 432-PC4	1/32	0.006-0.017	0.031-0.165	●	○	●			○	●		
		SNMG 433-PC4	3/64	0.009-0.026	0.047-0.165	●	○	●			○	●		
Roughing		SNMG 432-MC4	1/32	0.008-0.024	0.047-0.252					○				●
		SNMG 433-MC4	3/64	0.012-0.035	0.071-0.252					○				○
		SNMG 543-MC4	3/64	0.012-0.035	0.071-0.311					○				○
		SNMG 544-MC4	1/16	0.016-0.047	0.094-0.311					○				○
		SNMG 643-MC4	3/64	0.012-0.035	0.071-0.374					○				○
		SNMG 644-MC4	1/16	0.016-0.047	0.094-0.374					○				○
		SNMG 321-KC4	1/64	0.004-0.009	0.019-0.150						○	○		
		SNMG 322-KC4	1/32	0.007-0.019	0.038-0.150						○	○		
		SNMG 431-KC4	1/64	0.004-0.009	0.019-0.201						○	●		
		SNMG 432-KC4	1/32	0.007-0.019	0.038-0.201						●	●		
		SNMG 433-KC4	3/64	0.010-0.028	0.057-0.201						●	●		
		SNMG 542-KC4	1/32	0.007-0.019	0.038-0.252						○	○		
		SNMG 543-KC4	3/64	0.010-0.028	0.057-0.252						○	●		
		SNMG 544-KC4	1/16	0.014-0.038	0.076-0.252						○	○		
		SNMG 642-KC4	1/32	0.007-0.019	0.038-0.299						○	○		
		SNMG 643-KC4	3/64	0.010-0.028	0.057-0.299						○	●		
		SNMG 644-KC4	1/16	0.014-0.038	0.076-0.299						○	●		
		SNMG 646-KC4	3/32	0.021-0.057	0.113-0.299						○	○		
		SNMG 542-PD5	1/32	0.008-0.024	0.047-0.311	○	○	○	○					
		SNMG 543-PD5	3/64	0.012-0.035	0.071-0.311	○	○	●	○					
		SNMG 544-PD5	1/16	0.016-0.047	0.094-0.311	○	○	○	○					
		SNMG 643-PD5	3/64	0.012-0.035	0.071-0.374	●	○	●	○					
		SNMG 644-PD5	1/16	0.016-0.047	0.094-0.374	○	○	●	○					

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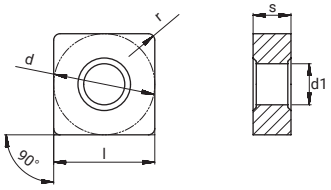
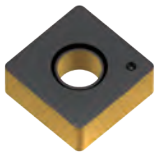
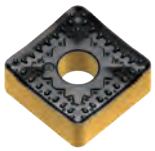
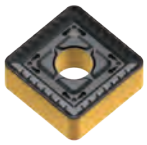
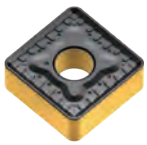
Marked: ● Stock available ○ Non-stocked standard

Negative 90°（S） Square Inserts



Dimensions (in)				
Type	d	l	s	d1
SN_43_	1/2	0.500	3/16	0.203
SN_54_	5/8	0.625	1/4	0.250
SN_64_	3/4	0.750	1/4	0.313
SN_85_	1	1	5/16	0.359
SN_86_	1	1	3/8	0.359
SN_10(6)_	1¼	1¼	3/8	0.372

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Roughing		**SNMA 432-KD5**	1/32	0.008-0.024	0.047-0.252						○	○		
		SNMA 433-KD5	3/64	0.012-0.035	0.071-0.252						●	●		
		SNMA 434-KD5	1/16	0.016-0.047	0.094-0.252						●	○		
		SNMA 543-KD5	3/64	0.012-0.035	0.071-0.311						○	●		
		SNMA 544-KD5	1/16	0.016-0.047	0.094-0.311						○	○		
		SNMA 643-KD5	3/64	0.012-0.035	0.071-0.374						○	●		
		SNMA 644-KD5	1/16	0.016-0.047	0.094-0.374						●	●		
Heavy roughing		**SNMM 432-PD8**	1/32	0.006-0.013	0.057-0.201	○		○	○					
		SNMM 433-PD8	3/64	0.009-0.019	0.085-0.201	○		○	○					
		SNMM 543-PD8	3/64	0.009-0.019	0.085-0.252	○		○	○					
		SNMM 544-PD8	1/16	0.013-0.025	0.113-0.252	○		○	○					
		SNMM 643-PD8	3/64	0.009-0.019	0.085-0.299	○		○	○					
		SNMM 644-PD8	1/16	0.013-0.025	0.113-0.299	○		○	●					
		SNMM 646-PD8	3/32	0.019-0.038	0.170-0.299	○		○	○					
		SNMM 856-PD8	3/32	0.019-0.038	0.170-0.402	○		○	○					
		SNMM 866-PD8	3/32	0.019-0.038	0.170-0.402	○		○	○					
		**SNMM 643-PC9**	3/64	0.010-0.024	0.094-0.374	●	○	○	○					
		SNMM 644-PC9	1/16	0.014-0.031	0.126-0.374	○	○	○	○					
		SNMM 646-PC9	3/32	0.021-0.047	0.189-0.374	○	○	○	○					
		SNMM 856-PC9	3/32	0.021-0.047	0.189-0.500	○	○	○	○					
		SNMM 866-PC9	3/32	0.021-0.047	0.189-0.500	●	○	●	○					
		SNMH 10(6)6-PC9	3/32	0.021-0.047	0.189-0.626			○	●					
		**SNMM 643-PD9**	3/64	0.012-0.028	0.104-0.449	○	○	○	○					
		SNMM 644-PD9	1/16	0.016-0.038	0.139-0.449	○	○	○	○					
		SNMM 646-PD9	3/32	0.024-0.057	0.208-0.449	○	○	●	○					
		SNMM 856-PD9	3/32	0.024-0.057	0.208-0.598	○	○	○	○					
		SNMM 866-PD9	3/32	0.024-0.057	0.208-0.598	●	○	●	●					
		SNMH 10(6)6-PD9	3/32	0.024-0.057	0.208-0.752			○	●					

Marked: ● Stock available ○ Non-stocked standard

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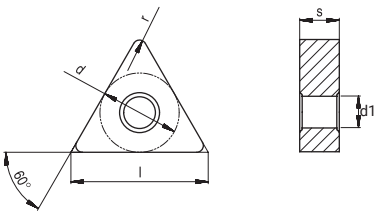
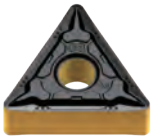
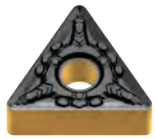
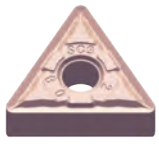
Negative 60°（T） Triangle Inserts



Dimensions (in)				
Type	d	l	s	d1
TN_33_	3/8	0.650	3/16	0.150

	Inserts Right-hand shown where it's applicable	ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		TNMG 331-PB1	1/64	0.002-0.006	0.010-0.122	●	○	●						
		TNMG 332-PB1	1/32	0.004-0.012	0.020-0.122	●	●	●						
		TNMG 333-PB1	3/64	0.006-0.018	0.031-0.122	●	○	○						
		TNMG 331-MB2	1/64	0.002-0.006	0.010-0.122					●				●
		TNMG 332-MB2	1/32	0.004-0.012	0.020-0.122					○				●
Semifinishing		TNMG 331-PB3	1/64	0.002-0.007	0.012-0.130	●	○	●						
		TNMG 332-PB3	1/32	0.005-0.014	0.024-0.130	●	●	●						
		TNMG 333-PB3	3/64	0.007-0.021	0.035-0.130	●	○	●						
		TNMG 331-PC3	1/64	0.003-0.008	0.013-0.146	●	○	●						
		TNMG 332-PC3	1/32	0.006-0.016	0.027-0.146	●	○	●						
		TNMG 333-PC3	3/64	0.008-0.024	0.040-0.146	○	○	○						
Medium		TNMG 331-PD3	1/64	0.003-0.009	0.016-0.161	●	○	●	○					
		TNMG 332-PD3	1/32	0.006-0.017	0.031-0.161	●	●	●	○					
		TNMG 333-PD3	3/64	0.009-0.026	0.047-0.161	●	●	●	○					
		TNMG 331R-PL5	1/64	0.003-0.009	0.016-0.161	●	○	●						
		TNMG 332R-PL5	1/32	0.006-0.017	0.031-0.161	●	○	●						
		TNMG 331L-PL5	1/64	0.003-0.009	0.016-0.161	●	○	●						
		TNMG 332L-PL5	1/32	0.006-0.017	0.031-0.161	●	○	●						
		TNMG 331-SC3	1/64	0.003-0.009	0.016-0.161									●
		TNMG 332-SC3	1/32	0.006-0.017	0.031-0.161									●
		TNMG 333-SC3	3/64	0.009-0.026	0.047-0.161									○

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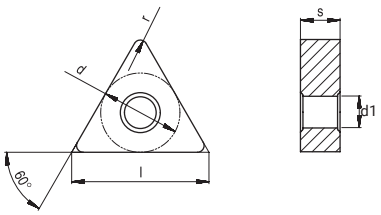
Marked: ● Stock available ○ Non-stocked standard

Negative 60°（T） Triangle Inserts



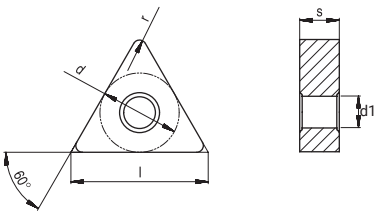
Dimensions (in)				
Type	d	l	s	d1
TN_22_	1/4	0.433	1/8	0.089
TN_33_	3/8	0.650	3/16	0.150
TN_43_	1/2	0.866	3/16	0.203

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Medium		TNMG 331-MC3	1/64	0.003-0.009	0.013-0.161					●				○
		TNMG 332-MC3	1/32	0.006-0.017	0.025-0.161					●				○
		TNMG 333-MC3	3/64	0.009-0.026	0.038-0.161					●				○
		TNMG 432-MC3	1/32	0.006-0.017	0.025-0.193					●				●
		TNMG 433-MC3	3/64	0.009-0.026	0.038-0.193					○				○
		TNMG 331-PC4	1/64	0.003-0.009	0.016-0.161	●	○	○			○	○		
		TNMG 332-PC4	1/32	0.006-0.017	0.031-0.161	●	○	●			●	●		
		TNMG 333-PC4	3/64	0.009-0.026	0.047-0.161	○	○	○			●	○		
		TNMG 433-PC4	3/64	0.009-0.026	0.047-0.193	○	○	○			○	○		
Roughing		TNMG 332-MC4	1/32	0.008-0.024	0.047-0.228					●				●
		TNMG 333-MC4	3/64	0.012-0.035	0.071-0.228					○				○
		TNMG 432-MC4	1/32	0.008-0.024	0.047-0.260					○				○
		TNMG 433-MC4	3/64	0.012-0.035	0.071-0.260					○				○
		TNMG 221-KC4	1/64	0.004-0.009	0.019-0.130						○	○		
		TNMG 331-KC4	1/64	0.004-0.009	0.019-0.193						○	●		
		TNMG 332-KC4	1/32	0.007-0.019	0.038-0.193						●	●		
		TNMG 333-KC4	3/64	0.010-0.028	0.057-0.193						○	○		
		TNMG 334-KC4	1/16	0.014-0.038	0.076-0.193						○	○		
		TNMG 433-KC4	3/64	0.010-0.028	0.057-0.236						○	●		
		TNMG 434-KC4	1/16	0.014-0.038	0.076-0.236						○	○		

Marked: ● Stock available ○ Non-stocked standard

P72

Negative 60°（T） Triangle Inserts



Dimensions (in)				
Type	d	l	s	d1
TN_33_	3/8	0.650	3/16	0.150
TN_43_	1/2	0.866	3/16	0.203

Inserts Right-hand shown where it's applicable		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Roughing		**TNMG 332-PD5**	1/32	0.008-0.024	0.047-0.228	○	○	○	●					
		TNMG 333-PD5	3/64	0.012-0.035	0.071-0.228	○	○	○	●					
		TNMG 432-PD5	1/32	0.008-0.024	0.047-0.303	○	○	●	○					
		TNMG 433-PD5	3/64	0.012-0.035	0.071-0.303	○	○	○	○					
		TNMG 434-PD5	1/16	0.016-0.047	0.094-0.303	○	○	○	○					
		**TNMA 331-KD5**	1/64	0.004-0.012	0.024-0.228						●	○		
		TNMA 332-KD5	1/32	0.008-0.024	0.047-0.228						●	●		
		TNMA 333-KD5	3/64	0.012-0.035	0.071-0.228						●	●		
		TNMA 334-KD5	1/16	0.016-0.047	0.094-0.228						○	○		
		TNMA 432-KD5	1/32	0.008-0.024	0.047-0.303						○	○		
		TNMA 433-KD5	3/64	0.012-0.035	0.071-0.303						○	○		
		TNMA 434-KD5	1/16	0.016-0.047	0.094-0.303						●	●		
Heavy roughing		**TNMM 332-PD8**	1/32	0.006-0.013	0.057-0.193	○		○	○					
		TNMM 333-PD8	3/64	0.009-0.019	0.085-0.193	○		○	○					
		TNMM 432-PD8	1/32	0.006-0.013	0.057-0.236	○		○	○					
		TNMM 433-PD8	3/64	0.009-0.019	0.085-0.236	○		○	○					
		TNMM 434-PD8	1/16	0.013-0.025	0.113-0.236	○		○	○					
Finishing		**TNGG 3(3)05FR-F**	0.008	0.003-0.008	0.020-0.091					●				
		TNGG 3(3)05FL-F	0.008	0.003-0.008	0.020-0.091					●				
		TNGG 331FR-F	1/64	0.003-0.008	0.020-0.091					●				
		TNGG 331FL-F	1/64	0.003-0.008	0.020-0.091					●				
Semifinishing-roughing		**TNGG 331R-H**	1/64	0.009-0.015	0.047-0.150					●				
		TNGG 331L-H	1/64	0.009-0.015	0.047-0.150					●				
		TNGG 332R-H	1/32	0.009-0.015	0.047-0.150					●				
		TNGG 332L-H	1/32	0.009-0.015	0.047-0.150					●				

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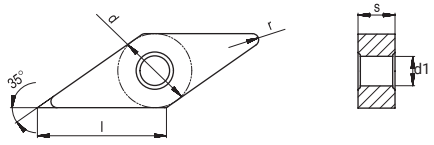
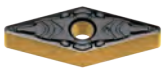
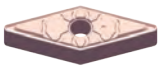
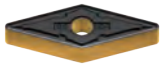
Marked: ● Stock available ○ Non-stocked standard

Negative 35°（V）Rhombic Inserts



Dimensions (in)				
Type	d	l	s	d1
VN_33_	3/8	0.654	3/16	0.150

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		VNMG 331-PB1	1/64	0.002-0.006	0.010-0.083	●	○	●						
		VNMG 332-PB1	1/32	0.004-0.012	0.020-0.083	●	●	●						
		VNMG 331-MB2	1/64	0.002-0.006	0.010-0.083					●				●
		VNMG 332-MB2	1/32	0.004-0.012	0.020-0.083					●				●
Semifinishing		VNMG 331-PB3	1/64	0.002-0.007	0.012-0.122	●	○	●						
		VNMG 332-PB3	1/32	0.005-0.014	0.024-0.122	●	●	●						
		VNMG 333-PB3	3/64	0.007-0.021	0.035-0.122	●	○	●						
		VNMG 331-PC3	1/64	0.003-0.008	0.013-0.130	●	○	●						
		VNMG 332-PC3	1/32	0.006-0.016	0.027-0.130	○	○	●						
		VNMG 333-PC3	3/64	0.008-0.024	0.040-0.130	○	○	○						
Medium		VNMG 331-PD3	1/64	0.003-0.009	0.016-0.130	●	○	●	○					
		VNMG 332-PD3	1/32	0.006-0.017	0.031-0.130	●	●	●	○					
		VNMG 333-PD3	3/64	0.009-0.026	0.047-0.130	●	○	●	○					
		VNMG 331-SC3	1/64	0.003-0.009	0.003-0.009									●
		VNMG 332-SC3	1/32	0.006-0.017	0.006-0.017									●
		VNMG 333-SC3	3/64	0.009-0.026	0.009-0.026									●
		VNMG 331-MC3	1/64	0.003-0.009	0.013-0.130					●				
		VNMG 332-MC3	1/32	0.006-0.017	0.025-0.130					●				
		VNMG 331-PC4	1/64	0.003-0.009	0.016-0.130	○		●			○	●		
		VNMG 332-PC4	1/32	0.006-0.017	0.031-0.130	●		○			●	●		
		VNMG 333-PC4	3/64	0.009-0.026	0.047-0.130	○		○			●	○		
Roughing		VNMG 331-KC4	1/64	0.004-0.009	0.019-0.130						○	●		
		VNMG 332-KC4	1/32	0.007-0.019	0.038-0.130						●	●		
		VNMG 333-KC4	3/64	0.010-0.028	0.057-0.130						○	○		

Marked: ● Stock available ○ Non-stocked standard

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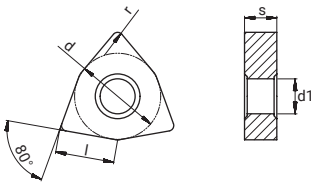
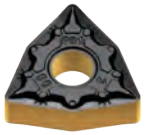
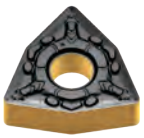
Negative 80°（W） Trigon Inserts



Dimensions (in)				
Type	d	l	s	d1
WN_33_	3/8	0.257	3/16	0.150
WN_43_	1/2	0.342	3/16	0.203

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		WNMG 431-PB1	1/64	0.002-0.006	0.010-0.087	●	○	●						
		WNMG 432-PB1	1/32	0.004-0.012	0.020-0.087	●	○	●						
		WNMG 433-PB1	3/64	0.006-0.018	0.031-0.087	○	○	○						
		WNMG 431-MB2	1/64	0.002-0.006	0.010-0.087					●				●
		WNMG 432-MB2	1/32	0.004-0.012	0.020-0.087					●				●
Semifinishing		WNMG 431-PB3	1/64	0.002-0.007	0.012-0.091	●	○	●						
		WNMG 432-PB3	1/32	0.005-0.014	0.024-0.091	●	○	●						
		WNMG 433-PB3	3/64	0.007-0.021	0.035-0.091	●	○	●						
		WNMG 431-PC3	1/64	0.003-0.008	0.013-0.102	●	○	●						
		WNMG 432-PC3	1/32	0.006-0.016	0.027-0.102	●	○	●						
		WNMG 433-PC3	3/64	0.008-0.024	0.040-0.102	●	○	●						
Medium		WNMG 332-PD3	1/32	0.006-0.017	0.031-0.083	●	○	●	○					
		WNMG 431-PD3	1/64	0.003-0.009	0.016-0.114	●	○	●	○					
		WNMG 432-PD3	1/32	0.006-0.017	0.031-0.114	●	●	●	●					
		WNMG 433-PD3	3/64	0.009-0.026	0.047-0.114	●	●	●	●					
		WNMG 431-SC3	1/64	0.003-0.009	0.016-0.114									●
		WNMG 432-SC3	1/32	0.006-0.017	0.031-0.114					○				●
		WNMG 433-SC3	3/64	0.009-0.026	0.047-0.114									●
		WNMG 332-MC3	1/32	0.006-0.017	0.025-0.083					●				○
		WNMG 333-MC3	3/64	0.009-0.026	0.038-0.083					●				○
		WNMG 431-MC3	1/64	0.003-0.009	0.013-0.114					●				○
		WNMG 432-MC3	1/32	0.006-0.017	0.025-0.114					●				●
		WNMG 433-MC3	3/64	0.009-0.026	0.038-0.114					○				○

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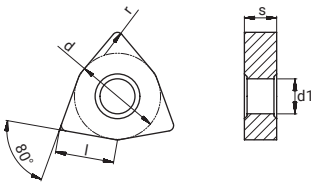
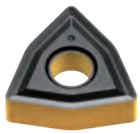
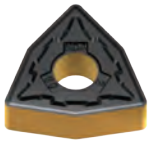
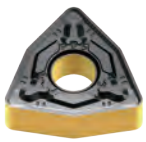
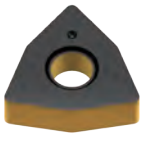
Marked: ● Stock available ○ Non-stocked standard

Negative 80°（W） Trigon Inserts



Dimensions (in)				
Type	d	l	s	d1
WN_33_	3/8	0.257	3/16	0.150
WN_43_	1/2	0.342	3/16	0.203

	Inserts	ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Medium		**WNMG 431-PC4**	1/64	0.003-0.009	0.016-0.114	○		●			●	●		
		WNMG 432-PC4	1/32	0.006-0.017	0.031-0.114	●		●			●	●		
		WNMG 433-PC4	3/64	0.009-0.026	0.047-0.114	●		●			●	●		
Roughing		**WNMG 332-MC4**	1/32	0.008-0.024	0.047-0.130					○				○
		WNMG 333-MC4	3/64	0.012-0.035	0.071-0.130					○				○
		WNMG 432-MC4	1/32	0.008-0.024	0.047-0.169					○				●
		WNMG 433-MC4	3/64	0.012-0.035	0.071-0.169					○				●
		**WNMG 331-KC4**	1/64	0.004-0.009	0.019-0.102						○	●		
		WNMG 332-KC4	1/32	0.007-0.019	0.038-0.102						○	●		
		WNMG 431-KC4	1/64	0.004-0.009	0.019-0.138						○	●		
		WNMG 432-KC4	1/32	0.007-0.019	0.038-0.138						●	●		
		WNMG 433-KC4	3/64	0.010-0.028	0.057-0.138						●	●		
		WNMG 434-KC4	1/16	0.014-0.038	0.076-0.138						○	○		
		**WNMG 432-PD5**	1/32	0.008-0.024	0.047-0.169	○	●	●	●					
		WNMG 433-PD5	3/64	0.012-0.035	0.071-0.169	○	○	●	●					
		**WNMA 431-KD5**	1/64	0.004-0.012	0.024-0.169						○	○		
		WNMA 432-KD5	1/32	0.008-0.024	0.047-0.169						○	●		
		WNMA 433-KD5	3/64	0.012-0.035	0.071-0.169						●	●		
		WNMA 434-KD5	1/16	0.016-0.047	0.094-0.169						○	●		

Marked: ● Stock available ○ Non-stocked standard

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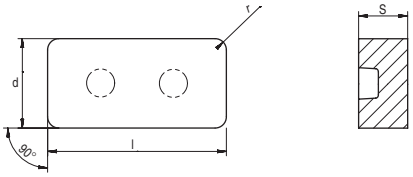
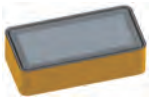
Negative 90°（L） Rectangle Inserts



Dimensions (in)			
Type	l	d	s
LN_5014_	2	1	0.559

Inserts		Type(ISO)	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Heavy roughing		**LNMX 501432S-HE**	0.126	0.028-0.063	0.236-1.575			○	●					

Marked: ● Stock available ○ Non-stocked standard

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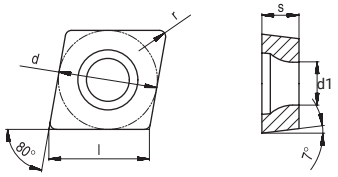
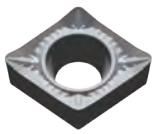
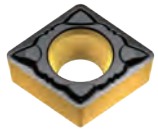
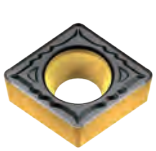
Positive 80°（C）Rhombic Inserts



Dimensions (in)				
Type	d	l	s	d1
CC_2(1.5)_	1/4	0.254	3/32	0.110
CC_3(2.5)_	3/8	0.381	5/32	0.173
CC_43_	1/2	0.508	3/16	O.217

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		CCGT 2(1.5)03-UF	0.004	0.001-0.006	0.004-0.055					○				○
		CCGT 2(1.5)05-UF	0.008	0.001-0.006	0.004-0.055					●				●
		CCGT 2(1.5)1-UF	1/64	0.001-0.008	0.004-0.055					●				●
		CCGT 3(2.5)03-UF	0.004	0.001-0.006	0.004-0.094					●				●
		CCGT 3(2.5)05-UF	0.008	0.001-0.006	0.004-0.094					●				●
		CCGT 3(2.5)1-UF	1/64	0.001-0.008	0.004-0.094					○				○
		CCGT 3(2.5)2-UF	1/32	0.001-0.010	0.004-0.094					●				○
		CCGT 2(1.5)03F-UF	0.004	0.001-0.006	0.004-0.055					●				
		CCGT 2(1.5)05F-UF	0.008	0.001-0.006	0.004-0.055					●				
		CCGT 2(1.5)1F-UF	1/64	0.001-0.008	0.004-0.055					●				
		CCGT 3(2.5)03F-UF	0.004	0.001-0.006	0.004-0.094					●				
		CCGT 3(2.5)05F-UF	0.008	0.001-0.006	0.004-0.094					●				
		CCGT 3(2.5)1F-UF	1/64	0.001-0.008	0.004-0.094					●				
		CCGT 3(2.5)2F-UF	1/32	0.001-0.010	0.004-0.094					●				
Semifinishing		CCGT 2(1.5)1F-NC2	1/64	0.002-0.008	0.013-0.114								●	
		CCGT 3(2.5)05F-NC2	0.008	0.001-0.004	0.006-0.173								○	
		CCGT 3(2.5)1F-NC2	1/64	0.002-0.008	0.013-0.173								●	
		CCGT 3(2.5)2F-NC2	1/32	0.004-0.016	0.025-0.173								●	
		CCGT 431F-NC2	1/64	0.002-0.008	0.013-0.228								●	
		CCGT 432F-NC2	1/32	0.004-0.016	0.025-0.228								○	
Finishing		CCMT 2(1.5)05-PB1	0.008	0.001-0.003	0.006-0.063	○	○	○		●				
		CCMT 2(1.5)1-PB1	1/64	0.002-0.006	0.012-0.063	●	○	●		●				
		CCMT 2(1.5)2-PB1	1/32	0.004-0.011	0.024-0.063	○	○	○		●				
		CCMT 3(2.5)05-PB1	0.008	0.001-0.003	0.006-0.094	○	○	○		●				
		CCMT 3(2.5)1-PB1	1/64	0.002-0.006	0.012-0.094	●	○	●		●				○
		CCMT 3(2.5)2-PB1	1/32	0.004-0.011	0.024-0.094	●	●	●		●				
Semifinishing		CCMT 2(1.5)1-PC2	1/64	0.002-0.006	0.014-0.075	●	○	●		●				●
		CCMT 2(1.5)2-PC2	1/32	0.004-0.013	0.028-0.075	●	○	●		●				●
		CCMT 3(2.5)1-PC2	1/64	0.002-0.006	0.014-0.114	●	●	●		●				●
		CCMT 3(2.5)2-PC2	1/32	0.004-0.013	0.028-0.114	●	●	●		●				●
		CCMT 3(2.5)3-PC2	3/64	0.006-0.019	0.041-0.114	○	○	○		●				○
		CCMT 431-PC2	1/64	0.002-0.006	0.014-0.154	●	○	●		●				●
		CCMT 432-PC2	1/32	0.004-0.013	0.028-0.154	●	○	●		●				●
		CCMT 433-PC2	3/64	0.006-0.019	0.041-0.154	○	○	○		○				○

Marked: ● Stock available ○ Non-stocked standard

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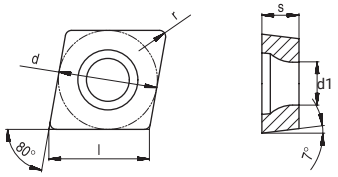
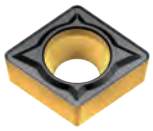
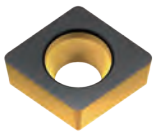
Positive 80°（C）Rhombic Inserts



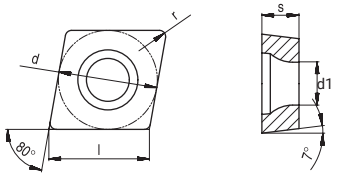
Dimensions (in)				
Type	d	l	s	d1
CC_1.2(1)_	0.138	0.140	0.055	0.079
CC_1.5(1)_	0.169	0.172	0.071	0.091
CC_2(1.5)_	1/4	0.254	3/32	0.110
CC_3(2.5)_	3/8	0.381	5/32	0.173
CC_43_	1/2	0.508	3/16	0.217

Inserts Left-hand shown where it's applicable		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Semifinishing		CCMT 2(1.5)1-KC2	1/64	0.002-0.007	0.016-0.083	○	○	●	○	●	○	●		●
		CCMT 2(1.5)2-KC2	1/32	0.005-0.014	0.031-0.083	○	○	○	○	○	○	●		
		CCMT 3(2.5)1-KC2	1/64	0.002-0.007	0.016-0.126	●	○	●	○	●	●	●		
		CCMT 3(2.5)2-KC2	1/32	0.005-0.014	0.031-0.126	●	●	●	○	●	●	●		
		CCMT 431-KC2	1/64	0.002-0.007	0.016-0.169	○	○	○	○	○	○	●		
		CCMT 432-KC2	1/32	0.005-0.014	0.031-0.169	●	○	●	●	●	●	●		
		CCMT 433-KC2	3/64	0.007-0.021	0.047-0.169	○	○	●	○	○	○	●		
Roughing		CCMW 2(1.5)1-KD5	1/64	0.004-0.009	0.016-0.126						○	○		
		CCMW 3(2.5)1-KD5	1/64	0.004-0.009	0.016-0.189						○	○		
		CCMW 3(2.5)2-KD5	1/32	0.008-0.017	0.031-0.189						○	●		
		CCMW 431-KD5	1/64	0.004-0.009	0.016-0.252						○	○		
		CCMW 432-KD5	1/32	0.008-0.017	0.031-0.252						○	●		
		CCMW 433-KD5	3/64	0.012-0.026	0.047-0.252						○	○		
Finishing		CCET 1.2(1)01FR-F	<0.001	0.0004-0.002	0.004-0.012					○				
		CCET 1.2(1)01FL-F	<0.001	0.0004-0.002	0.004-0.012					○				
		CCET 1.2(1)03FR-F	<0.004	0.0004-0.002	0.004-0.012					○				
		CCET 1.2(1)03FL-F	<0.004	0.0004-0.002	0.004-0.012					○				
		CCET 1.2(1)05FR-F	<0.008	0.0004-0.002	0.004-0.012					○				
		CCET 1.2(1)05FL-F	<0.008	0.0004-0.002	0.004-0.012					○				
		CCET 1.2(1)1FR-F	<1/64	0.0004-0.002	0.004-0.012					○				
		CCET 1.2(1)1FL-F	<1/64	0.0004-0.002	0.004-0.012					○				
		CCET 1.5(1)01FR-F	<0.001	0.0004-0.002	0.004-0.016					○				
		CCET 1.5(1)01FL-F	<0.001	0.0004-0.002	0.004-0.016					○				
		CCET 1.5(1)03FR-F	<0.004	0.0004-0.002	0.004-0.016					○				
		CCET 1.5(1)03FL-F	<0.004	0.0004-0.002	0.004-0.016					○				
		CCET 1.5(1)05FR-F	<0.008	0.0004-0.002	0.004-0.016					○				
		CCET 1.5(1)05FL-F	<0.008	0.0004-0.002	0.004-0.016					○				
		CCET 1.5(1)1FR-F	<1/64	0.0004-0.002	0.004-0.016					○				
		CCET 1.5(1)1FL-F	<1/64	0.0004-0.002	0.004-0.016					○				

P73

Marked: ● Stock available ○ Non-stocked standard

Positive 80°（C）Rhombic Inserts



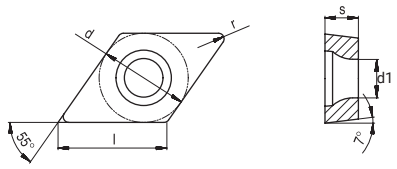
Dimensions (in)				
Type	d	l	s	d1
CC_2(1.5)_	1/4	0.254	3/32	0.110
CC_3(2.5)_	3/8	0.381	5/32	0.173

Inserts Left-hand shown where it's applicable		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Low feed		CCET 2(1)01FR-M	<0.001	0.001-0.004	0.020-0.098					○				
		CCET 2(1)01FL-M	<0.001	0.001-0.004	0.020-0.098					○				
		CCET 2(1)03FR-M	<0.004	0.001-0.004	0.020-0.098					○				
		CCET 2(1)03FL-M	<0.004	0.001-0.004	0.020-0.098					○				
		CCET 2(1)05FR-M	<0.008	0.001-0.004	0.020-0.098					○				
		CCET 2(1)05FL-M	<0.008	0.001-0.004	0.020-0.098					○				
		CCET 211FR-M	<1/64	0.0004-0.004	0.020-0.098					○				
		CCET 211FL-M	<1/64	0.0004-0.004	0.020-0.098					○				
		CCET 3(2.5)01FR-M	<0.001	0.001-0.004	0.020-0.157					●				
		CCET 3(2.5)01FL-M	<0.001	0.001-0.004	0.020-0.157					●				
		CCET 3(2.5)03FR-M	<0.004	0.001-0.004	0.020-0.157					●				
		CCET 3(2.5)03FL-M	<0.004	0.001-0.004	0.020-0.157					●				
		CCET 3(2.5)05FR-M	<0.008	0.001-0.004	0.020-0.157					●				
		CCET 3(2.5)05FL-M	<0.008	0.001-0.004	0.020-0.157					●				
		CCET 3(2.5)1FR-M	<1/64	0.001-0.004	0.020-0.157					●				
		CCET 3(2.5)1FL-M	<1/64	0.001-0.004	0.020-0.157					●				

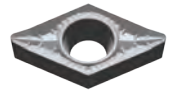
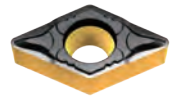
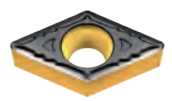
Marked: ● Stock available ○ Non-stocked standard

P73

Positive 55°（D）Rhombic Inserts



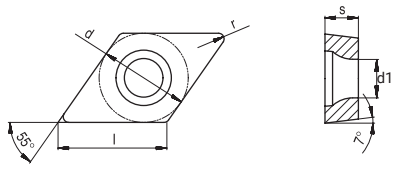
Dimensions (in)				
Type	d	l	s	d1
DC_2(1.5)_	1/4	0.305	3/32	0.110
DC_3(2.5)_	3/8	0.458	5/32	0.173

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		DCGT 2(1.5)03-UF	0.004	0.001-0.006	0.004-0.055					●				○
		DCGT 2(1.5)05-UF	0.008	0.001-0.006	0.004-0.055					●				○
		DCGT 2(1.5)1-UF	1/64	0.001-0.008	0.004-0.055					●				○
		DCGT 3(2.5)03-UF	0.004	0.001-0.006	0.004-0.094					●				●
		DCGT 3(2.5)05-UF	0.008	0.001-0.006	0.004-0.094					●				●
		DCGT 3(2.5)1-UF	1/64	0.001-0.008	0.004-0.094					●				●
		DCGT 2(1.5)03F-UF	0.004	0.001-0.006	0.004-0.055					●				
		DCGT 2(1.5)05F-UF	0.008	0.001-0.006	0.004-0.055					●				
		DCGT 2(1.5)1F-UF	1/64	0.001-0.008	0.004-0.055					●				
		DCGT 3(2.5)03F-UF	0.004	0.001-0.006	0.004-0.094					●				
		DCGT 3(2.5)05F-UF	0.008	0.001-0.006	0.004-0.094					●				
		DCGT 3(2.5)1F-UF	1/64	0.001-0.008	0.004-0.094					●				
Semifinishing		DCGT 2(1.5)05F-NC2	0.008	0.001-0.004	0.006-0.138								○	
		DCGT 2(1.5)1F-NC2	1/64	0.002-0.008	0.013-0.138								○	
		DCGT 3(2.5)05F-NC2	0.008	0.001-0.004	0.006-0.205								●	
		DCGT 3(2.5)1F-NC2	1/64	0.002-0.008	0.013-0.205								●	
		DCGT 3(2.5)2F-NC2	1/32	0.004-0.016	0.025-0.205								○	
Finishing		DCMT 2(1.5)05-PB1	0.008	0.001-0.003	0.006-0.059	○	○	○		○				
		DCMT 2(1.5)1-PB1	1/64	0.002-0.006	0.012-0.059	●	○	●		●				
		DCMT 3(2.5)05-PB1	0.008	0.001-0.003	0.006-0.091	●	○	●		●				
		DCMT 3(2.5)1-PB1	1/64	0.002-0.006	0.012-0.091	●	○	●		●				
		DCMT 3(2.5)2-PB1	1/32	0.004-0.011	0.024-0.091	●	○	●		○				
Semifinishing		DCMT 2(1.5)05-PC2	1/64	0.002-0.006	0.014-0.083	○	○	●		●				●
		DCMT 2(1.5)1-PC2	1/32	0.004-0.013	0.028-0.083	●	○	●		●				○
		DCMT 3(2.5)05-PC2	1/64	0.002-0.006	0.014-0.122	●	○	●		●				●
		DCMT 3(2.5)1-PC2	1/32	0.004-0.013	0.028-0.122	●	●	●		●				●
		DCMT 3(2.5)2-PC2	3/64	0.006-0.019	0.041-0.122	○	○	○		○				●

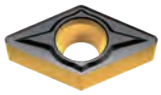
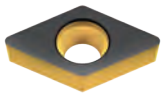
P73

Marked: ● Stock available ○ Non-stocked standard

Positive 55°（D）Rhombic Inserts



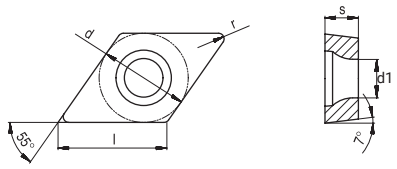
Dimensions (in)				
Type	d	l	s	d1
DC_2(1.5)_	1/4	0.305	3/32	0.110
DC_3(2.5)_	3/8	0.458	5/32	0.173

Inserts Left-hand shown where it's applicable		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Semifinishing		DCMT 2(1.5)05-KC2	1/64	0.002-0.007	0.016-0.091	○	○	○			○	●		
		DCMT 2(1.5)1-KC2	1/32	0.005-0.014	0.031-0.091	○	○	○	○		○	●		
		DCMT 3(2.5)05-KC2	1/64	0.002-0.007	0.016-0.138	●	○	●			●	●		
		DCMT 3(2.5)1-KC2	1/32	0.005-0.014	0.031-0.138	●	○	●	○		●	●		
		DCMT 3(2.5)2-KC2	3/64	0.007-0.021	0.047-0.138	○	○	○			○	○		
Roughing		DCMW 2(1.5)05-KD5	1/64	0.002-0.007	0.016-0.154						○	○		
		DCMW 2(1.5)1-KD5	1/32	0.005-0.014	0.031-0.154						○	○		
		DCMW 3(2.5)05-KD5	1/64	0.002-0.007	0.016-0.228						○	○		
		DCMW 3(2.5)1-KD5	1/32	0.005-0.014	0.031-0.228						○	○		
Finishing		DCET 2(1.5)01FR-F	<0.001	0.001-0.007	0.004-0.016					○				
		DCET 2(1.5)01FL-F	<0.001	0.001-0.007	0.004-0.016					○				
		DCET 2(1.5)03FR-F	<0.004	0.001-0.007	0.004-0.016					○				
		DCET 2(1.5)03FL-F	<0.004	0.001-0.007	0.004-0.016					○				
		DCET 2(1.5)05FR-F	<0.008	0.001-0.007	0.004-0.016					○				
		DCET 2(1.5)05FL-F	<0.008	0.001-0.007	0.004-0.016					○				
		DCET 2(1.5)1FR-F	<1/64	0.001-0.007	0.004-0.016					○				
		DCET 2(1.5)1FL-F	<1/64	0.001-0.007	0.004-0.016					○				
		DCET 3(2.5)01FR-F	<0.001	0.001-0.008	0.004-0.016					●				
		DCET 3(2.5)01FL-F	<0.001	0.001-0.008	0.004-0.016					●				
		DCET 3(2.5))03FR-F	<0.004	0.001-0.008	0.004-0.016					●				
		DCET 3(2.5)03FL-F	<0.004	0.001-0.008	0.004-0.016					●				
		DCET 3(2.5)05FR-F	<0.008	0.001-0.008	0.004-0.016					●				
		DCET 3(2.5)05FL-F	<0.008	0.001-0.008	0.004-0.016					●				
		DCET 3(2.5)1FR-F	<1/64	0.001-0.008	0.004-0.016					●				
		DCET 3(2.5)1FL-F	<1/64	0.001-0.008	0.004-0.016					●				

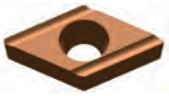
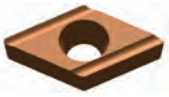
Marked: ● Stock available ○ Non-stocked standard

P73

Positive 55°（D）Rhombic Inserts



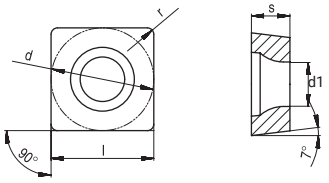
Dimensions (in)				
Type	d	l	s	d1
DC_2(1.5)_	1/4	0.305	3/32	0.110
DC_3(2.5)_	3/8	0.458	5/32	0.173

Inserts Left-hand shown where it's applicable		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Low feed		DCET 2(1.5)01FR-M	<0.001	0.0004-0.003	0.020-0.110					○				
		DCET 2(1.5)01FL-M	<0.001	0.0004-0.003	0.020-0.110					○				
		DCET 2(1.5)03FR-M	<0.004	0.0004-0.003	0.020-0.110					○				
		DCET 2(1.5)03FL-M	<0.004	0.0004-0.003	0.020-0.110					○				
		DCET 2(1.5)05FR-M	<0.008	0.0004-0.003	0.020-0.110					○				
		DCET 2(1.5)05FL-M	<0.008	0.0004-0.003	0.020-0.110					○				
		DCET 2(1.5)1FR-M	<1/64	0.0004-0.003	0.020-0.110					○				
		DCET 2(1.5)1FL-M	<1/64	0.0004-0.003	0.020-0.110					○				
		DCET 3(2.5)01FR-M	<0.001	0.0004-0.004	0.020-0.157					●				
		DCET 3(2.5)01FL-M	<0.001	0.0004-0.004	0.020-0.157					●				
		DCET 3(2.5))03FR-M	<0.004	0.0004-0.004	0.020-0.157					●				
		DCET 3(2.5)03FL-M	<0.004	0.0004-0.004	0.020-0.157					●				
		DCET 3(2.5)05FR-M	<0.008	0.0004-0.004	0.020-0.157					●				
		DCET 3(2.5)05FL-M	<0.008	0.0004-0.004	0.020-0.157					●				
		DCET 3(2.5)1FR-M	<1/64	0.0004-0.004	0.020-0.157					●				
		DCET 3(2.5)1FL-M	<1/64	0.0004-0.004	0.020-0.157					●				

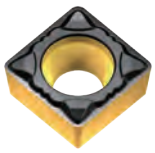
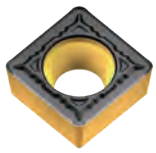
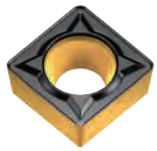
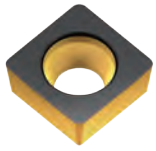
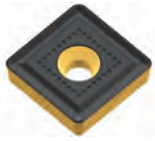
P73

Marked: ● Stock available ○ Non-stocked standard

Positive 90° (S) Square Inserts



Dimensions (in)				
Type	d	l	s	d1
SC_3(2.5)_	3/8	0.375	5/32	0.173
SC_43_	1/2	0.5	3/16	0.217
SC_3809_	1½	1½	3/8	0.386

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		**SCMT 3(2.5)1-PB1**	1/64	0.002-0.006	0.012-0.094	●	○	○		○				
		SCMT 3(2.5)2-PB1	1/32	0.004-0.011	0.024-0.094	○	○	○		●				
		SCMT 431-PB1	1/64	0.002-0.006	0.012-0.126	○	○	○		○				
Semifinishing		**SCMT 3(2.5)1-PC2**	1/64	0.002-0.006	0.014-0.114	●	○	●		●				●
		SCMT 3(2.5)2-PC2	1/32	0.004-0.013	0.028-0.114	○	○	●		○				○
		SCMT 431-PC2	1/64	0.002-0.006	0.014-0.15	○	○	●		●				○
		SCMT 432-PC2	1/32	0.004-0.013	0.028-0.15	●	○	○		●				○
		SCMT 433-PC2	3/64	0.006-0.019	0.041-0.15	○	○	○		○				○
		**SCGT 3(2.5)2F-NC2**	1/32	0.004-0.016	0.025-0.169								○	
		**SCMT 3(2.5)1-KC2**	1/64	0.002-0.007	0.016-0.122	○	○	○	○		○	●		
		SCMT 3(2.5)2-KC2	1/32	0.005-0.014	0.031-0.122	●	○	●	○		○	●		
		SCMT 431-KC2	1/64	0.002-0.007	0.016-0.165	○	○	○	○		○	○		
		SCMT 432-KC2	1/32	0.005-0.014	0.031-0.165	○	●	●	○		○	●		
		SCMT 433-KC2	3/64	0.007-0.021	0.047-0.165	○	○	○	○		○	●		
Roughing		**SCMW 3(2.5)1-KD5**	1/64	0.004-0.009	0.016-0.189						○	○		
		SCMW 3(2.5)2-KD5	1/32	0.008-0.017	0.031-0.189						○	○		
		SCMW 431-KD5	1/64	0.004-0.009	0.016-0.252						○	○		
		SCMW 432-KD5	1/32	0.008-0.017	0.031-0.252						○	○		
		**SCMT 380932S-HT(IS0)**	1/8	0.028-0.055	0.157-0.709				○					

Marked: ● Stock available ○ Non-stocked standard

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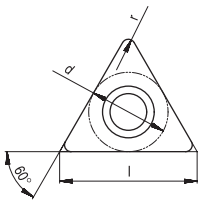
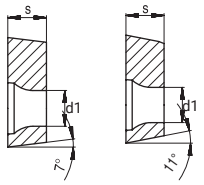
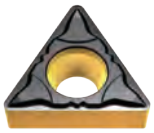
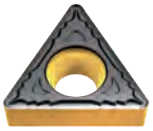
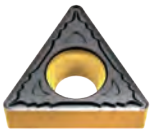
Positive 60°（T) Triangle Inserts





Dimensions (in)				
Type	d	l	s	d1
TCMT_1.8(1.5)_	0.219	0.379	0.094	0.098
TC_2(1.5)_	1/4	0.433	3/32	0.110
TC_3(2.5)_	3/8	0.650	5/32	0.173
TPMT_1.8(1.5)_	0.219	0.379	0.094	0.098
TPMT_22_	1/4	0.433	1/8	0.134

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		TCGT 2(1.5)03-UF	0.004	0.001-0.006	0.004-0.094					○				○
		TCGT 2(1.5)05-UF	0.008	0.001-0.006	0.008-0.094					○				○
		TCGT 2(1.5)1-UF	1/64	0.001-0.008	0.008-0.094					●				○
		TCGT 3(2.5)1-UF	1/64	0.001-0.008	0.008-0.094					○				○
		TCGT 2(1.5)03F-UF	0.004	0.001-0.006	0.001-0.006					●				
		TCGT 2(1.5)05F-UF	0.008	0.001-0.006	0.001-0.006					●				
		TCGT 2(1.5)1F-UF	1/64	0.001-0.008	0.001-0.008					●				
		TCGT 3(2.5)1F-UF	1/64	0.001-0.008	0.001-0.008					●				
		TCMT 1.8(1.5)1-PB1	1/64	0.002-0.006	0.012-0.075	○	○	○		○				
		TCMT 2(1.5)05-PB1	0.008	0.001-0.003	0.006-0.087	●	○	○		○				
		TCMT 2(1.5)1-PB1	1/64	0.002-0.006	0.012-0.087	○	○	○		○				
		TCMT 2(1.5)2-PB1	1/32	0.004-0.011	0.024-0.087	○	○	○		○				
		TCMT 3(2.5)1-PB1	1/64	0.002-0.006	0.012-0.13	●	○	○		○				
		TCMT 3(2.5)2-PB1	1/32	0.004-0.011	0.024-0.13	○	○	○		○				
Semifinishing		TCMT 1.8(1.5)1-PC2	1/64	0.002-0.006	0.014-0.102	○	○	●		●				○
		TCMT 1.8(1.5)2-PC2	1/32	0.004-0.013	0.028-0.102	○	○	○		○				○
		TCMT 2(1.5)1-PC2	1/64	0.002-0.006	0.014-0.118	○	○	●		●				●
		TCMT 2(1.5)2-PC2	1/32	0.004-0.013	0.028-0.118	○	○	●		●				●
		TCMT 3(2.5)1-PC2	1/64	0.002-0.006	0.014-0.177	●	○	●		○				○
		TCMT 3(2.5)2-PC2	1/32	0.004-0.013	0.028-0.177	●	○	●		●				○
		TCMT 3(2.5)3-PC2	3/64	0.006-0.019	0.041-0.177	○	○	○		○				○
		TPMT 1.8(1.5)1-PC2	1/64	0.002-0.006	0.014-0.102	○	○	○		●				○
		TPMT 1.8(1.5)2-PC2	1/32	0.004-0.013	0.028-0.102	○	○	○		●				○
		TPMT 221-PC2	1/64	0.002-0.006	0.014-0.118	●	○	●		●				○
		TPMT 222-PC2	1/32	0.004-0.013	0.028-0.118	○	○	○		●				○
		TCGT 2(1.5)1-NC2	1/64	0.002-0.008	0.013-0.193								○	
		TCGT 3(2.5)1-NC2	1/64	0.002-0.008	0.013-0.291								○	
		TCGT 3(2.5)2-NC2	1/32	0.004-0.016	0.025-0.291								○	

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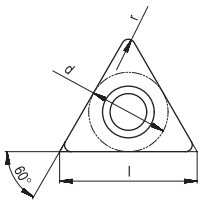
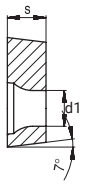
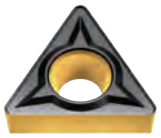
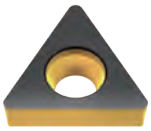
Marked: ● Stock available ○ Non-stocked standard

Positive 60°（T) Triangle Inserts





Dimensions (in)				
Type	d	l	s	d1
TCMT_1.8(1.5)_	0.219	0.379	0.094	0.098
TC_2(1.5)_	1/4	0.433	3/32	0.110
TC_3(2.5)_	3/8	0.650	5/32	0.173

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Semifinishing		TCMT 1.8(1.5)1-KC2	1/64	0.002-0.007	0.016-0.114	○	○	○			○	●		
		TCMT 1.8(1.5)2-KC2	1/32	0.005-0.014	0.031-0.114	○	○	○			○	●		
		TCMT 2(1.5)1-KC2	1/64	0.002-0.007	0.016-0.130	○	○	●			○	●		
		TCMT 2(1.5)2-KC2	1/32	0.005-0.014	0.031-0.130	○	○	○			○	●		
		TCMT 3(2.5)1-KC2	1/64	0.002-0.007	0.016-0.193	○	○	●			○	●		
		TCMT 3(2.5)2-KC2	1/32	0.005-0.014	0.031-0.193	○	○	○			●	●		
		TCMT 3(2.5)3-KC2	3/64	0.007-0.021	0.047-0.193	○	○	○			○	●		
Roughing		TCMW 2(1.5)1-KD5	1/64	0.002-0.007	0.016-0.217						○	○		
		TCMW 2(1.5)2-KD5	1/32	0.005-0.014	0.031-0.217						○	○		
		TCMW 3(2.5)1-KD5	1/64	0.002-0.007	0.016-0.323						○	○		
		TCMW 3(2.5)2-KD5	1/32	0.005-0.014	0.031-0.323						○	○		

Marked: ● Stock available ○ Non-stocked standard

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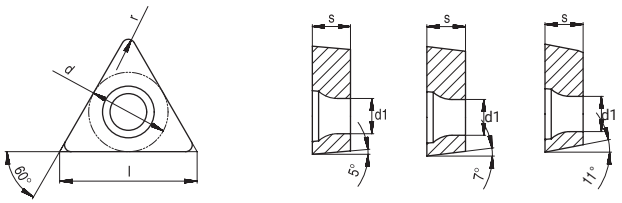
Positive 60°（T) Triangle Inserts



Dimensions (in)				
Type	d	l	s	d1
TBET_1.2(1)_	0.156	0.271	0.063	0.091
TPEH_1.5(1.5)_	0.187	0.324	0.094	0.091
TCET_1.5(1.5)_	0.187	0.324	0.094	0.091
TPEH_1.8(1.5)_	0.219	0.379	0.094	0.118
TPEH_22_	1/4	0.433	1/8	0.13
TCET_22_	1/4	0.433	0.125	0.11

Inserts Left-hand shown where it's applicable		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		TBET 1.2(1)01FR-F	<0.001	0.001-0.003	0.004-0.020					○				
		TBET 1.2(1)01FL-F	<0.001	0.001-0.003	0.004-0.020					○				
		TBET 1.2(1)03FR-F	<0.004	0.001-0.003	0.004-0.020					○				
		TBET 1.2(1)03FL-F	<0.004	0.001-0.003	0.004-0.020					○				
		TBET 1.2(1)05FR-F	<0.008	0.001-0.003	0.004-0.020					○				
		TBET 1.2(1)05FL-F	<0.008	0.001-0.003	0.004-0.020					○				
		TBET 1.2(1)1FR-F	<1/64	0.001-0.003	0.004-0.020					○				
		TBET 1.2(1)1FL-F	<1/64	0.001-0.003	0.004-0.020					○				
		TPEH 1.5(1.5)03FR-F	<0.004	0.0004-0.004	0.004-0.031					○				
		TPEH 1.5(1.5)03FL-F	<0.004	0.0004-0.004	0.004-0.031					○				
		TPEH 1.5(1.5)05FR-F	<0.008	0.0004-0.004	0.004-0.031					○				
		TPEH 1.5(1.5)05FL-F	<0.008	0.0004-0.004	0.004-0.031					○				
		TPEH 1.5(1.5)1FR-F	<1/64	0.0004-0.004	0.004-0.031					○				
		TPEH 1.5(1.5)1FL-F	<1/64	0.0004-0.004	0.004-0.031					○				
		TPEH 1.8(1.5)03FR-F	<0.004	0.0004-0.004	0.004-0.031					○				
		TPEH 1.8(1.5)03FL-F	<0.004	0.0004-0.004	0.004-0.031					○				
		TPEH 1.8(1.5)05FR-F	<0.008	0.0004-0.004	0.004-0.031					○				
		TPEH 1.8(1.5)05FL-F	<0.008	0.0004-0.004	0.004-0.031					○				
		TPEH 1.8(1.5)1FR-F	<1/64	0.0004-0.004	0.004-0.031					○				
		TPEH 1.8(1.5)1FL-F	<1/64	0.0004-0.004	0.004-0.031					○				
		TPEH 1.8(1.5)05FR-F	<0.008	0.0004-0.005	0.008-0.031					●				
		TPEH 2(2)05FL-F	<0.008	0.0004-0.005	0.008-0.031					●				
		TPEH 221FR-F	<1/64	0.0004-0.005	0.008-0.031					●				
		TPEH 221FL-F	<1/64	0.0004-0.005	0.008-0.031					●				
		TPEH 222FR-F	<1/32	0.0004-0.005	0.008-0.031					●				
		TPEH 222FL-F	<1/32	0.0004-0.005	0.008-0.031					●				
Low feed		TCET 1.5(1.5)01FR-M	<0.001	0.0004-0.003	0.020-0.098					○				
		TCET 1.5(1.5)01FL-M	<0.001	0.0004-0.003	0.020-0.098					○				
		TCET 1.5(1.5)03FR-M	<0.004	0.0004-0.003	0.020-0.098					○				
		TCET 1.5(1.5)03FL-M	<0.004	0.0004-0.003	0.020-0.098					○				
		TCET 1.5(1.5)05FR-M	<0.008	0.0004-0.003	0.020-0.098					○				
		TCET 1.5(1.5)05FL-M	<0.008	0.0004-0.003	0.020-0.098					○				
		TCET 2(2)01FR-M	<0.001	0.001-0.004	0.020-0.157					●				
		TCET 2(2)01FL-M	<0.001	0.001-0.004	0.020-0.157					●				
		TCET 2(2)03FR-M	<0.004	0.001-0.004	0.020-0.157					●				
		TCET 2(2)03FL-M	<0.004	0.001-0.004	0.020-0.157					●				
		TCET 2(2)05FR-M	<0.008	0.001-0.004	0.020-0.157					●				
		TCET 2(2)05FL-M	<0.008	0.001-0.004	0.020-0.157					●				
		TCET 221FR-M	<1/64	0.001-0.004	0.020-0.157					●				
		TCET 221FL-M	<1/64	0.001-0.004	0.020-0.157					●				

Marked: ● Stock available ○ Non-stocked standard

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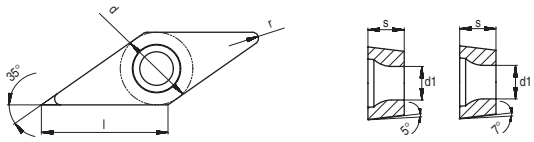
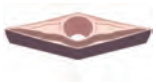
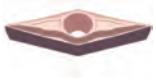
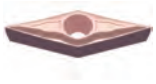
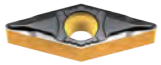
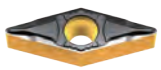
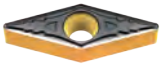
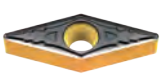
Positive 35°（V）Rhombic Inserts



Dimensions (in)				
Type	d	l	s	d1
VB_22_	1/4	0.436	1/8	0.110
VB_33_	3/8	0.654	3/16	0.173
VC_22_	1/4	0.436	1/8	0.110
VC_33_	3/8	0.654	3/16	0.173

Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		VBGT 2(2)03-UF	0.004	0.001-0.006	0.004-0.055					○				○
		VBGT 2(2)05-UF	0.008	0.001-0.006	0.008-0.055					●				○
		VBGT 221-UF	1/64	0.001-0.008	0.008-0.055					○				●
		VBGT 3(3)03-UF	0.004	0.001-0.006	0.004-0.055					○				●
		VBGT 3(3)05-UF	0.008	0.001-0.006	0.008-0.055					●				○
		VBGT 2(2)03F-UF	0.004	0.001-0.006	0.004-0.055					●				
		VBGT 2(2)05F-UF	0.008	0.001-0.006	0.008-0.055					●				
		VBGT 221F-UF	1/64	0.001-0.008	0.008-0.055					●				
		VBGT 3(3)03F-UF	0.004	0.001-0.006	0.004-0.055					●				
		VBGT 3(3)05F-UF	0.008	0.001-0.006	0.008-0.055					●				
		VCGT 2(2)03-UF	0.004	0.001-0.006	0.004-0.055					●				○
		VCGT 2(2)05-UF	0.008	0.001-0.006	0.008-0.055					●				●
		VCGT 221-UF	1/64	0.001-0.008	0.008-0.055					○				○
		VCGT 2(2)03F-UF	0.004	0.001-0.006	0.004-0.055					●				
		VCGT 2(2)05F-UF	0.008	0.001-0.006	0.008-0.055					●				
		VCGT 221F-UF	1/64	0.001-0.008	0.008-0.055					●				
		VBMT 221-PB1	1/64	0.002-0.006	0.012-0.055	○	○	○		●				
		VBMT 222-PB1	1/32	0.004-0.011	0.024-0.055	○	○	○		●				
		VBMT 3(3)05-PB1	0.008	0.001-0.003	0.006-0.083	○	○	○		●				
		VBMT 331-PB1	1/64	0.002-0.006	0.012-0.083	●	●	○		●				
		VBMT 332-PB1	1/32	0.004-0.011	0.024-0.083	●	●	○		○				
		VCMT 331-PB1	1/64	0.002-0.006	0.012-0.083	○		○		○				
		VCMT 332-PB1	1/32	0.004-0.011	0.024-0.083	○		○		○				
Semifinishing		VBMT 221-PC2	1/64	0.002-0.006	0.014-0.083	●	○	○		●				●
		VBMT 222-PC2	1/32	0.004-0.013	0.028-0.083	○	○	○		○				○
		VBMT 331-PC2	1/64	0.002-0.006	0.014-0.122	●	○	●		●				●
		VBMT 332-PC2	1/32	0.004-0.013	0.028-0.122	●	●	●		●				●
		VBMT 333-PC2	3/64	0.006-0.019	0.041-0.122	●	○	○		○				●
		VCMT 221-PC2	1/64	0.002-0.006	0.014-0.083	●	○	●		○				
		VCMT 222-PC2	1/32	0.004-0.013	0.028-0.083	○		○		○				
		VCMT 331-PC2	1/64	0.002-0.006	0.014-0.122	○		○		●				
		VCMT 332-PC2	1/32	0.004-0.013	0.028-0.122	●		○		○				

Marked: ● Stock available ○ Non-stocked standard

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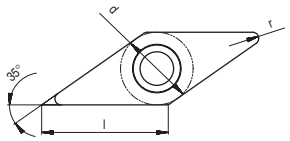
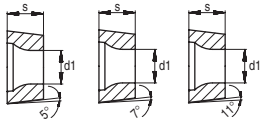
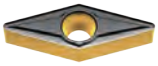
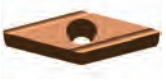
Positive 35°（V）Rhombic Inserts





Dimensions (in)				
Type	d	l	s	d1
VB_22_	1/4	0.436	1/8	0.110
VB_33_	3/8	0.654	3/16	0.173
VC_22_	1/4	0.436	1/8	0.110
VC_33_	3/8	0.654	3/16	0.173
VC_4(3.5)_	1/2	0.872	0.219	0.217
VP_4(3.5)_	1/2	0.872	0.219	0.217

Inserts Left-hand shown where it's applicable		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Semifinishing		VCGT 2(2)05F-NC2	0.008	0.001-0.004	0.006-0.11								○	
		VCGT 221F-NC2	1/64	0.002-0.008	0.013-0.11								●	
		VCGT 331F-NC2	1/64	0.002-0.008	0.013-0.165								●	
		VCGT 332F-NC2	1/32	0.004-0.016	0.025-0.165								●	
		VCGT 333F-NC2	3/64	0.006-0.024	0.038-0.165								●	
		VCGT 220530F-NC2(ISO)	0.118	0.014-0.059	0.094-0.217								○	
		VPGT 4(3.5)5-NC2	5/64	0.009-0.039	0.063-0.217								●	
		VPGT 4(3.5)5F-NC2	5/64	0.009-0.039	0.063-0.217								○	
		VBMT 331-KC2	1/64	0.002-0.007	0.016-0.130	●	○	●			●	○		
		VBMT 332-KC2	1/32	0.005-0.014	0.031-0.130	●	○	○			○	●		
		VBMT 333-KC2	3/64	0.007-0.021	0.047-0.130	●	○	●			○	○		
Finishing		VBET 2(2)01FR-F	<0.001	0.0004-0.007	0.004-0.012					●				
		VBET 2(2)01FL-F	<0.001	0.0004-0.007	0.004-0.012					●				
		VBET 2(2)03FR-F	<0.004	0.0004-0.007	0.004-0.012					●				
		VBET 2(2)03FL-F	<0.004	0.0004-0.007	0.004-0.012					●				
		VBET 2(2)05FR-F	<0.008	0.0004-0.007	0.004-0.012					●				
		VBET 2(2)05FL-F	<0.008	0.0004-0.007	0.004-0.012					●				
Low feed		VBET 2(2)03FR-M	<0.004	0.0004-0.002	0.008-0.079					●				
		VBET 2(2)03FL-M	<0.004	0.0004-0.002	0.008-0.079					●				
		VBET 2(2)05FR-M	<0.008	0.0004-0.002	0.008-0.079					●				
		VBET 2(2)05FL-M	<0.008	0.0004-0.002	0.008-0.079					●				
		VBET 221FR-M	<1/64	0.0004-0.002	0.008-0.079					●				
		VBET 221FL-M	<1/64	0.0004-0.002	0.008-0.079									

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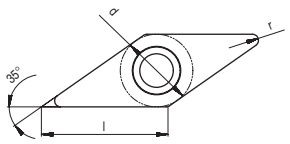
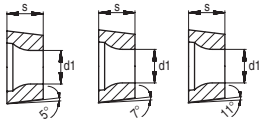
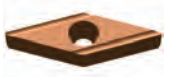
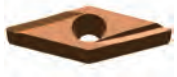
Marked: ● Stock available ○ Non-stocked standard

Positive 35°（V）Rhombic Inserts





Dimensions (in)				
Type	d	l	s	d1
VB_22_	1/4	0.436	1/8	0.110
VB_33_	3/8	0.654	3/16	0.173
VC_22_	1/4	0.436	1/8	0.110
VP_1.5(1.5)_	0.187	0.327	0.094	0.091
VP_22_	1/4	0.436	1/8	0.110

Inserts Left-hand shown where it's applicable		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		VCET 2(2)03FR-F	<0.004	0.0004-0.007	0.004-0.012					●				
		VCET 2(2)03FL-F	<0.004	0.0004-0.007	0.004-0.012					●				
		VCET 2(2)05FR-F	<0.008	0.0004-0.007	0.004-0.012					●				
		VCET 2(2)05FL-F	<0.008	0.0004-0.007	0.004-0.012					●				
		VCET 221FR-F	<1/64	0.0004-0.007	0.004-0.012					●				
		VCET 221FL-F	<1/64	0.0004-0.007	0.004-0.012					●				
		VPET 1.5(1.5)03FR-F	<0.004	0.001-0.006	0.002-0.008					○				
		VPET 1.5(1.5)03FL-F	<0.004	0.001-0.006	0.002-0.008					○				
		VPET 1.5(1.5)05FR-F	<0.008	0.001-0.006	0.002-0.008					○				
		VPET 1.5(1.5)05FL-F	<0.008	0.001-0.006	0.002-0.008					○				
Low feed		VPET 1.5(1.5)03FR-M	<0.004	0.0004-0.002	0.008-0.059					○				
		VPET 1.5(1.5)03FL-M	<0.004	0.0004-0.002	0.008-0.059					○				
		VPET 1.5(1.5)05FR-M	<0.008	0.0004-0.002	0.008-0.059					○				
		VPET 1.5(1.5)05FL-M	<0.008	0.0004-0.002	0.008-0.059					○				
		VPET 2(2)03FR-M	<0.004	0.0004-0.002	0.008-0.079					○				
		VPET 2(2)03FL-M	<0.004	0.0004-0.002	0.008-0.079					○				
		VPET 2(2)05FR-M	<0.008	0.0004-0.002	0.008-0.079					○				
		VPET 2(2)05FL-M	<0.008	0.0004-0.002	0.008-0.079					○				
		VPET 221FR-M	<1/64	0.0004-0.002	0.008-0.079					○				
		VPET 221FL-M	<1/64	0.0004-0.002	0.008-0.079					○				
		VBET 2(2)01FR-Y	<0.001	0.003-0.009	0.020-0.071					○				
		VBET 2(2)01FL-Y	<0.001	0.003-0.009	0.020-0.071					○				
		VBET 2(2)03FR-Y	<0.004	0.003-0.009	0.020-0.071					○				
		VBET 2(2)03FL-Y	<0.004	0.003-0.009	0.020-0.071					○				
		VBET 2(2)05FR-Y	<0.008	0.003-0.009	0.020-0.071					○				
		VBET 2(2)05FL-Y	<0.008	0.003-0.009	0.020-0.071					○				
		VBET 221FR-Y	<1/64	0.003-0.009	0.020-0.071					○				
		VBET 221FL-Y	<1/64	0.003-0.009	0.020-0.071					○				
		VBET 3(3)05FR-Y	<0.008	0.004-0.010	0.031-0.079					○				
		VBET 3(3)05FL-Y	<0.008	0.004-0.010	0.031-0.079					○				
		VBET 331FR-Y	<1/64	0.004-0.010	0.031-0.079					○				
		VBET 331FL-Y	<1/64	0.004-0.010	0.031-0.079					○				
		VBET 332FR-Y	1/32	0.004-0.010	0.031-0.079					○				
		VBET 332FL-Y	1/32	0.004-0.010	0.031-0.079					○				

Marked: ● Stock available ○ Non-stocked standard

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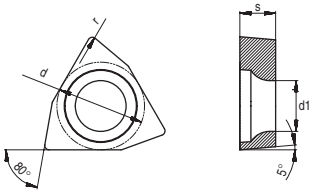
Positive 80°（W）Trigon Inserts



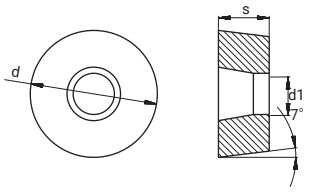
Dimensions (in)				
Type	d	l	s	d1
WB_31_	0.156	0.139	0.063	0.091
WB_4(1.5)_	0.187	0.188	0.094	0.091

Inserts Left-hand shown where it's applicable		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Finishing		**WBET 3(1)01FR-F**	<0.001	0.002-0.003	0.004-0.031					○				
		WBET 3(1)01FL-F	<0.001	0.002-0.003	0.004-0.031					○				
		WBET 3(1)03FR-F	<0.004	0.002-0.003	0.004-0.031					○				
		WBET 3(1)03FL-F	<0.004	0.002-0.003	0.004-0.031					○				
		WBET 3(1)05FR-F	<0.008	0.002-0.003	0.004-0.031					○				
		WBET 3(1)05FL-F	<0.008	0.002-0.003	0.004-0.031					○				
		WBET 311FR-F	<1/64	0.002-0.003	0.004-0.031					○				
		WBET 311FL-F	<1/64	0.002-0.003	0.004-0.031					○				
		**WBET 4(1.5)01FR-F**	<0.001	0.002-0.003	0.004-0.031					○				
		WBET 4(1.5)01FL-F	<0.001	0.002-0.003	0.004-0.031					○				
		WBET 4(1.5)03FR-F	<0.004	0.002-0.003	0.004-0.031					○				
		WBET 4(1.5)03FL-F	<0.004	0.002-0.003	0.004-0.031					○				
		WBET 4(1.5)05FR-F	<0.008	0.002-0.003	0.004-0.031					○				
		WBET 4(1.5)05FL-F	<0.008	0.002-0.003	0.004-0.031					○				
		WBET 4(1.5)FR-F	<1/64	0.002-0.003	0.004-0.031					○				
		WBET 4(1.5)1FL-F	<1/64	0.002-0.003	0.004-0.031					○				

P73

Marked: ● Stock available ○ Non-stocked standard

Positive Round Turning Inserts



Dimensions (in)			
Type	s	d	d1
RCGT_0803_	1/8	0.315	0.134
RCGT_1003_	1/8	0.394	0.173
RCGT_10T3_	5/32	0.394	0.173
RCMX_1003_	1/8	0.394	0.142
RCMX_1204_	3/16	0.472	0.165

Dimensions (in)			
Type	s	d	d1
RCMX_1606_	1/4	0.630	0.205
RCMX_2006_	1/4	0.787	0.256
RCMX_2507_	5/16	0.984	0.283
RCMX_3209_	3/8	1.260	0.378

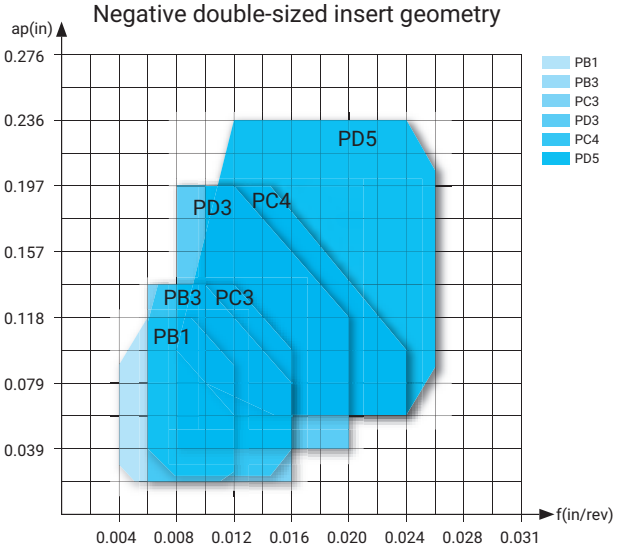
Inserts		ANSI	r (in)	Recommended parameters		Grades								
				f (in/rev)	ap (in)	AC150P	AC200P	AC250P	AC350P	AP301M	AC150K	ACK15A	AW100K	AP100S
Semifinishing		**RCGT 0803MOF-NC2**	0.157	0.004-0.039	0.028-0.130								○	
		RCGT 1003MOF-NC2	0.196	0.008-0.051	0.035-0.157								○	
		RCGT 10T3MOF-NC2	0.196	0.008-0.051	0.035-0.157								○	
Finishing		**RCMX 2006MOS-PD8**	0.394	0.019-0.035	0.138-0.354	○	○	○						
		RCMX 2507MOS-PD8	0.492	0.022-0.047	0.157-0.472	○	●	○						
		RCMX 3209MOS-PD8	0.630	0.026-0.059	0.197-0.591	○	○	○						
Medium		**RCMX 100300S**	0.196	0.010-0.020	0.059-0.157	○		●	○					
		RCMX 120400S	0.236	0.012-0.024	0.098-0.197	●		●	○					
		RCMX 160600S	0.315	0.016-0.030	0.118-0.276	●		○	○					
		RCMX 200600S	0.394	0.019-0.035	0.138-0.354	●		○	●					
		RCMX 250700S	0.492	0.022-0.047	0.157-0.472	○		○	○					
		RCMX 320900S	0.630	0.026-0.059	0.197-0.591	●		○	○					

Marked: ● Stock available ○ Non-stocked standard

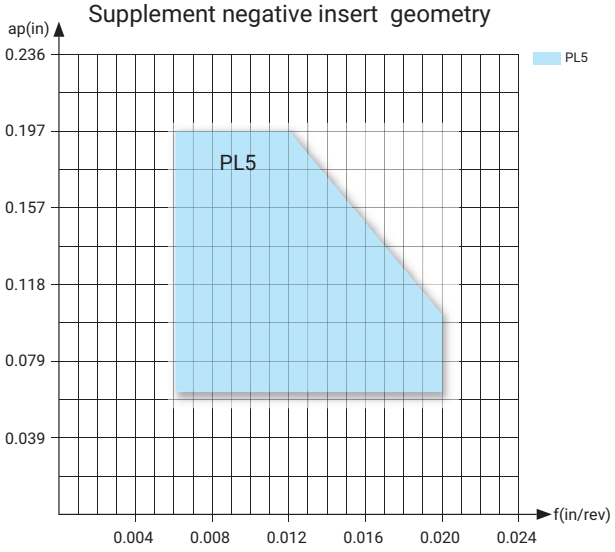
P73

Negative Insert Geometry
Ap, F Application Range

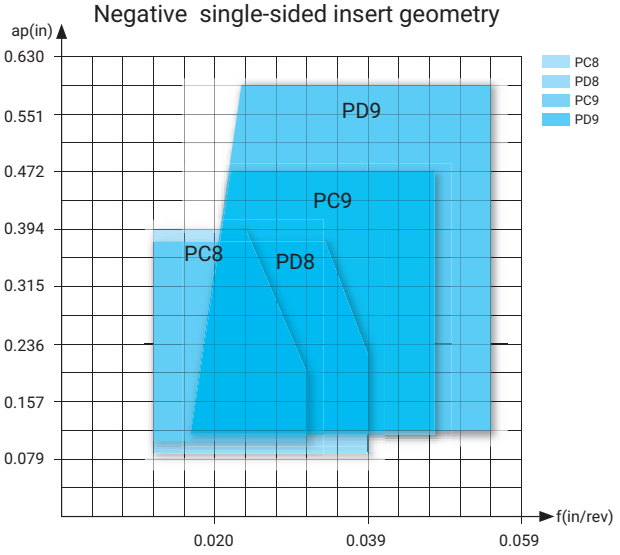
ISO P
Negative double-sized insert geometry



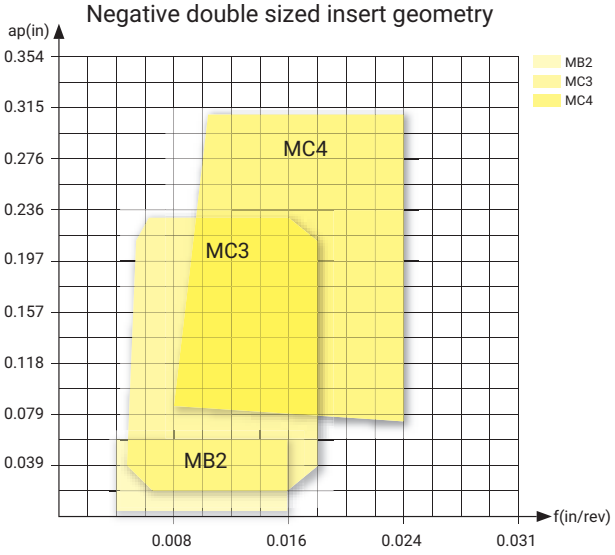
ISO P
Supplement negative insert geometry



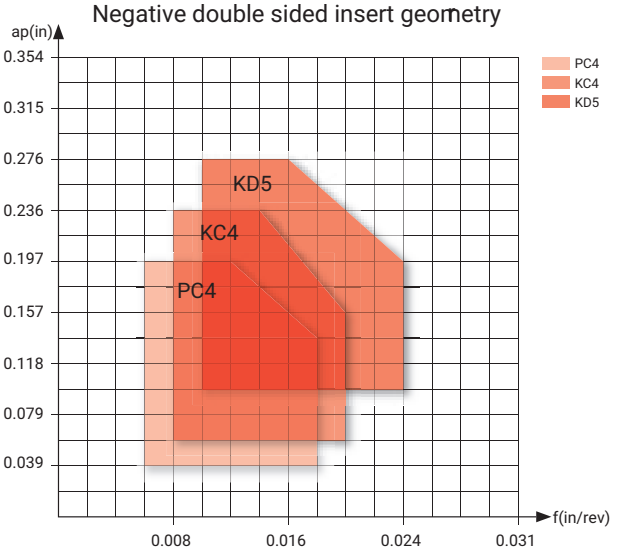
ISO P
Negative single-sided insert geometry



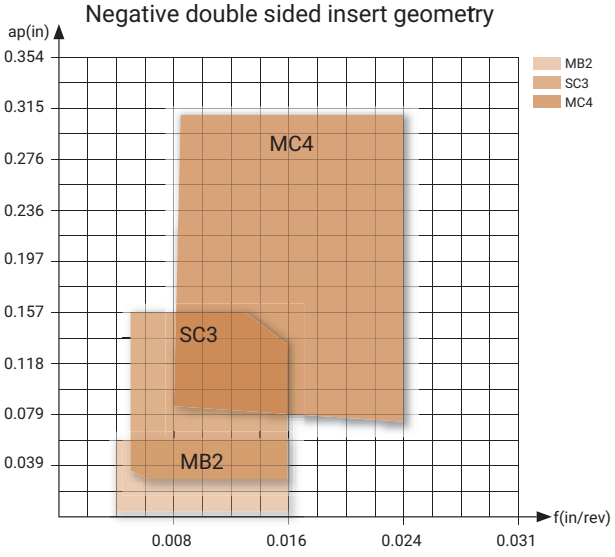
ISO M
Negative double sized insert geometry



ISO K
Negative double sided insert geometry

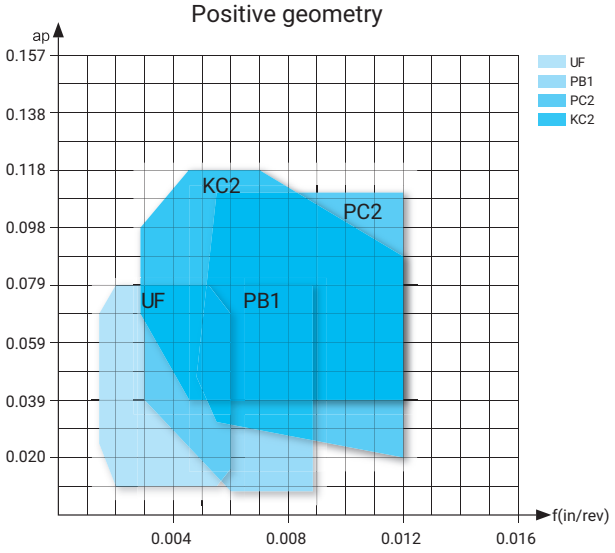


ISO S
Negative double sided insert geometry

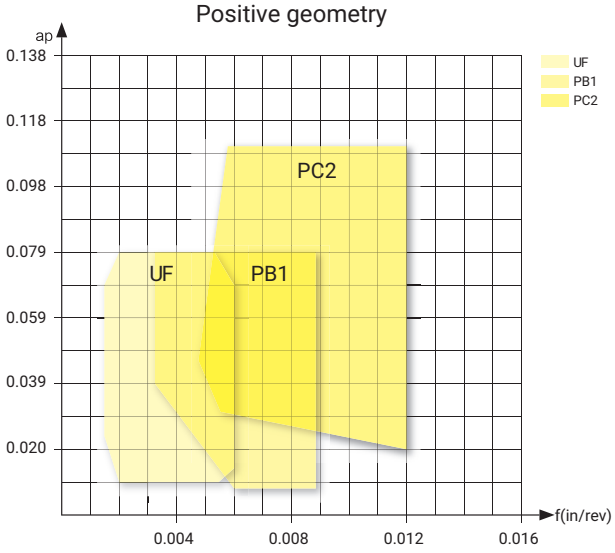


Positive Insert Geometry
Ap, F Application Range

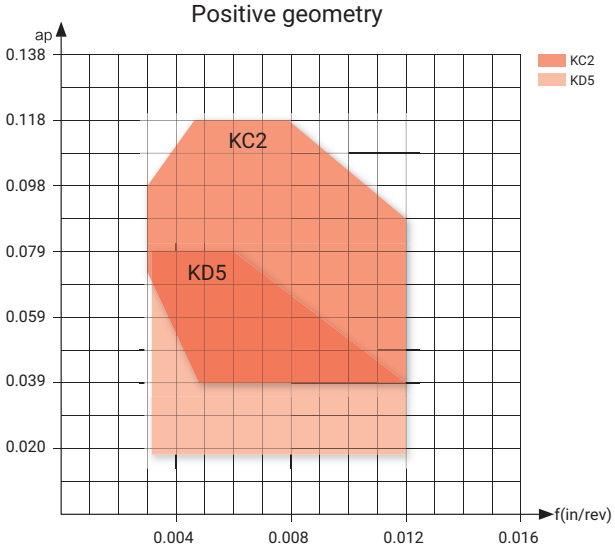
ISO P
Positive geometry



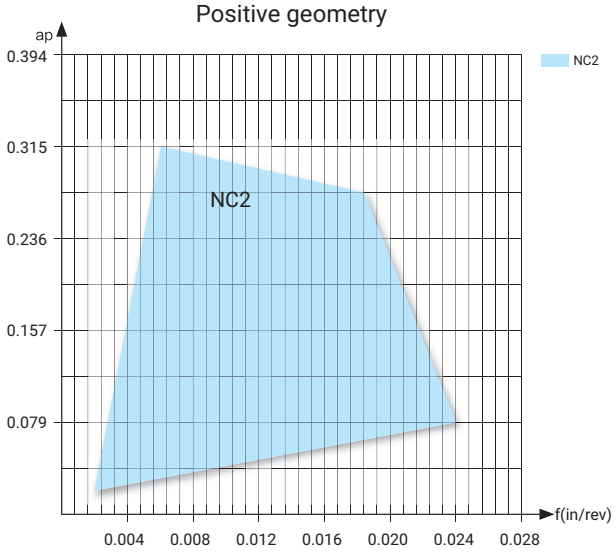
ISO M
Positive geometry



ISO K
Positive geometry

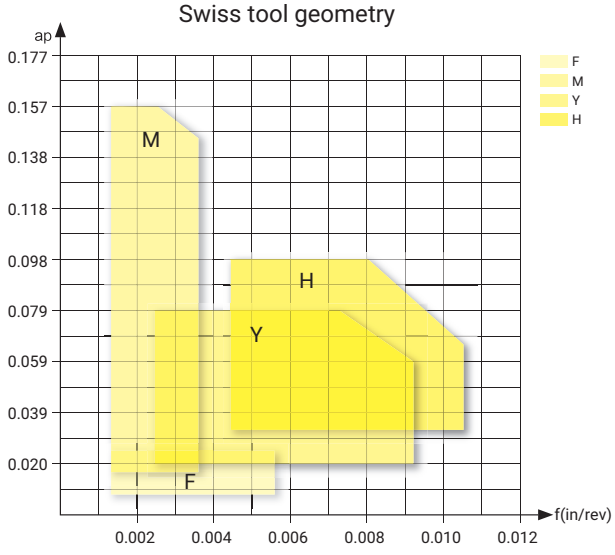


ISO N
Positive geometry



Swiss Tool Geometry Ap, F Application Range

ISO P/M
Swiss tool geometry



Cutting Parameter Recommendation Table -Negative inserts

Materials						Turning grade application range																														
						Initial value of cutting speed Vc(ft/min)																																
ISO	Workpiece material			Brinell hardness (HB)	Tensile strength Rm(lbs/in²)	AC150P			AC200P			AC250P			AC350P			AP301M			AC150K			ACK15A			AW100K			AP100S							
						f(in/rev)																																
						0.004	0.016	0.024	0.004	0.016	0.024	0.004	0.016	0.024	0.004	0.016	0.024	0.004	0.012	0.02	0.004	0.016	0.024	0.004	0.016	0.024	0.004	0.008	0.016	0.004	0.012	0.02				
P	Unalloyed steel	C ⩽ 0.25%	Annealed	125	62,076	1591	1181	886	1312	1017	755	1247	853	689	820	558	459																				
		0.25<C ⩽ 0.55%	Annealed	190	92,679	1214	886	689	1050	787	623	919	656	492	656	443	361																				
		0.25<C ⩽ 0.55%	Heat-treated	210	102,687	853	722	558	820	656	525	656	525	443	492	410	295																				
		C>0.55%	Annealed	190	92,679	886	722	525	886	656	492	787	525	410	558	361	295																				
		C>0.55%	Heat-treated	300	146,923	689	591	492	689	525	492	525	394	361	410	246	213																				
		Free cutting steel (short-chip)	Annealed	220	108,053	1444	1017	820	1181	886	689	1115	722	574	722	476	377																				
	Low-alloyed steel	Annealed		175	85,717	1148	853	722	951	689	591	787	574	443	656	541	492																				
		Heat-treated		300	146,923	722	558	492	623	525	459	459	328	279	443	295	230																				
		Heat-treated		380	185,938	525	394	328	591	492	394	328	230	180	295	213	148																				
		Heat-treated		430	214,221	295	230		394	328																											
	High-alloyed steel and high-alloyed tool steel	Annealed		200	97,900	1083	755	492	853	656	591	689	476	279	591	492	279																				
		Hardened and tempered		300	146,923	755	459	361	656	591	525	427	279	213	361	279	213																				
		Hardened and tempered		400	197,396	262	230		427	394																											
	Stainless steel	Ferritic/martensitic, annealed		200	97,900				722	558	525	591	492	394	492	394	312																				
		Martensitic, heat-treated		330	161,572				525	427	328	459	328	230	361	262	197																				
M	Stainless steel	Austenitic, quench hardened		200	97,900													656	525	427										787	623	492				
		Austenitic, precipitation hardened (PH)		300	146,923													525	427	230										492	279					
		Austenitic/ferritic, duplex		230	112,839													591	459	361										558	476	328				
K	Malleable cast iron	Ferritic		200	58,015																984	656	492	787	525	427										
		Pearlitic		260	101,526																886	541	377	656	394	312										
	Grey cast iron	Low tensile strength		180	29,008																1476	886	623	1312	689	492										
		High tensile strength/austenitic		245	50,763																804	558	410	656	492	328										
	Nodular cast iron	Ferritic		155	58,015																853	623	476	755	558	394										
		Pearlitic		265	101,526																623	476	410	558	394	328										
	GGV(CGI)			230	58,015																															
N	Wrought aluminium alloys	Non-aging alloy		30	-																															
		Aged alloy		100	49,313																															
	Cast aluminium alloys	≤ 12% Si, non-aging alloy		75	37,710																															
		≤ 12% Si, aged alloy		90	44,962																															
		> 12% Si, non-aging		130	65,267																															
	Magnesium alloys			70	36,259																															
	Copper and copper alloys (bronze/brass)	Unalloyed, electrolytic copper		100	49,313																															
		Brass, bronze, red brass		90	44,962																															
		Cu alloys, short-chip		110	55,114																															
		High tensile, Ampco alloy		300	146,488																															
S	Heat-resistant alloys	Fe-based	Annealed	200	98,626													295	197											328	213					
			Aged	280	136,335													230	164											262	180					
		Ni or Co based	Annealed	250	121,832													230	164											262	180					
			Aged	350	171,145													197	131											230	148					
			Cast	320	156,641													164	98											197	98					
	Titanium alloys	Pure titanium		200	98,626																									656	591	459				
		α and β alloys, aged		375	182,748													230	148	131										295	180	148				
		β alloys		410	203,053													131	115	98										180	115	98				
	Tungsten alloys	1177		300	146,488																															
	Molybdenum alloys	1262		300	146,488														525																	
H	Hardened steel	Hardened and tempered		50HRC																																
		Hardened and tempered		55HRC																																
		Hardened and tempered		60HRC																																
	Hardened cast steel	Hardened and tempered		50HRC																																

*The recommended cutting data always refer to general cutting conditions. The actual selection should be adjusted according to the factors such as machine rigidity, tool body, workpiece conditions and coolant.

Cutting Parameter Recommendation Table -Negative inserts

Materials						Turning grade application range																										
						Initial value of cutting speed Vc(ft/min)																										
ISO	Workpiece material			Brinell hardness (HB)	Tensile strength Rm(lbs/in²)	AC150P			AC200P			AC250P			AC350P			AP301M			AC150K			ACK15A			AW100K			AP100S		
						f(in/rev)																										
						0.004	0.008	0.016	0.004	0.008	0.016	0.004	0.008	0.016	0.004	0.008	0.016	0.004	0.008	0.016	0.004	0.008	0.016	0.004	0.008	0.016	0.004	0.008	0.016	0.004	0.008	0.016
P	Unalloyed steel	C ⩽ 0.25%	Annealed	125	62,076	1526	1312	1083	1312	1017	755	1181	1017	853	755	492	394																	
		0.25<C ⩽ 0.55%	Annealed	190	92,679	1181	1083	853	1083	820	656	951	820	623	591	377	328																	
		0.25<C ⩽ 0.55%	Heat-treated	210	102,687	886	787	722	820	656	525	656	591	525	427	377	279																	
		C>0.55%	Annealed	190	92,679	1083	984	951	853	689	558	820	722	689	492	328	279																	
		C>0.55%	Heat-treated	300	146,923	689	591	558	722	591	492	525	427	394	377	213	180																	
		Free cutting steel (short-chip)	Annealed	220	108,053	1444	1312	1247	1181	919	689	1050	951	902	689	443	344																	
	Low-alloyed steel	Annealed		175	85,717	1148	1017	984	951	656	591	853	787	722	623	509	427																	
		Heat-treated		300	146,923	656	558	525	787	558	525	443	394	328	410	262	213																	
		Heat-treated		380	185,938	394	328	295	656	492	459	328	279	213	295	213	148																	
		Heat-treated		430	214,221	262	230		459	427		213	180																					
	High-alloyed steel and high-alloyed tool steel	Annealed		200	97,900	1050	951	919	853	656	591	886	787	722	558	459	246																	
		Hardened and tempered		300	146,923	656	558	492	656	591	525	558	459	394	328	262	197																	
		Hardened and tempered		400	197,396	262	230		427	394		213	180																					
	Stainless steel	Ferritic/martensitic, annealed		200	97,900				820	722	689	623	558	492	394	328	295																	
		Martensitic, heat-treated		330	161,572				427	361	328	295	262	197	230	197	164																	
M	Stainless steel	Austenitic, quench hardened		200	97,900													656	591	361										722	656	427
		Austenitic, precipitation hardened (PH)		300	146,923													459	394											525	459	
		Austenitic/ferritic, duplex		230	112,839													492	427	262										558	492	361
K	Malleable cast iron	Ferritic		200	58,015																919	591	427	755	492	394						
		Pearlitic		260	101,526																820	509	377	623	394	312						
	Grey cast iron	Low tensile strength		180	29,008																1411	853	591	1280	656	459						
		High tensile strength/austenitic		245	50,763																771	525	377	623	459	328						
	Nodular cast iron	Ferritic		155	58,015																787	591	443	722	525	394						
		Pearlitic		265	101,526																591	443	394	525	394	328						
	GGV(CGI)			230	58,015																											
N	Wrought aluminium alloys	Non-aging alloy		30	-																											
		Aged alloy		100	49,313																						2461	1968	984			
	Cast aluminium alloys	≤ 12% Si, non-aging alloy		75	37,710																						2625	1476	984			
		≤ 12% Si, aged alloy		90	44,962																						1640	984	656			
		> 12% Si, non-aging		130	65,267																											
	Magnesium alloys			70	36,259																											
	Copper and copper alloys (bronze/brass)	Unalloyed, electrolytic copper		100	49,313																						1968	1312	886			
		Brass, bronze, red brass		90	44,962																						1312	984	820			
		Cu alloys, short-chip		110	55,114																						919	656	427			
		High tensile, Ampco alloy		300	146,488																											
S	Heat-resistant alloys	Fe-based	Annealed	200	98,626													295	230											328	230	
			Aged	280	136,335													230	197											262	197	
		Ni or Co based	Annealed	250	121,832													230	197											262	197	
			Aged	350	171,145													197	164											230	164	
			Cast	320	156,641													164	131											197	131	
	Titanium alloys	Pure titanium		200	98,626																											
		α and β alloys, aged		375	182,748													230	164	131												
		β alloys		410	203,053													131	115	98												
	Tungsten alloys	1177		300	146,488																											
	Molybdenum alloys	1262		300	146,488																											
H	Hardened steel	Hardened and tempered		50HRC																												
		Hardened and tempered		55HRC																												
		Hardened and tempered		60HRC																												
	Hardened cast steel	Hardened and tempered		50HRC																												

*The recommended cutting data always refer to general cutting conditions. The actual selection should be adjusted according to the factors such as machine rigidity, tool body, workpiece conditions and coolant.

PCBN Insert Denomination System

CNGA 432	-	S	010	20	-	SL	-	1	-	CB	PB30
1		2	3	4		5		6		7	8

1-Standard ANSI denomination system

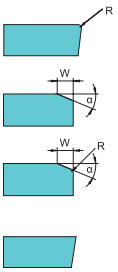
2-Cutting edge shape

E--Honed

T--Land without honing

S----Land with honed

F----Sharp



3-T-land width

005----0.001in
010----0.003in
015----0.005in
020----0.007in

4-T-land angle

10----10°
15----15°
20----20°
25----25°

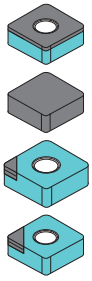
5-CBN insert structure

FT-- Full face CBN

SD-- Solid CBN

SL-- Small size tipped CBN

NL-- Standard-tipped CBN (Regrindable)



6-Number of cutting edge

1----One cutting edge
2----Two cutting edges
3----Three cutting edges

7-Cutting edge preparation

CB----With chip breaker
WG---With wiper edge
"-" ----Without chip breaker

8-Grade

PB30--- Low content CBN
PB60---Medium content CBN
PB90---High content CBN

PCBN Insert Grade Introduction

Grade	Feature	Application
PB30	Well balanced wear resistance and shock-resistance	Good versatilely. Suitable for continuous and light interrupted cutting of hardened steel
PB60	Excellent toughness	Mainly applied in medium interrupted cutting of hardened steel,interrupted and continuous cutting of powder metal and cast iron cutting.
PB90	Good wear resistance, toughness, and shock-resistance	K-mainly applied in cast iron cutting H-heavy interrupted cutting of hardened steel and powder metal machining

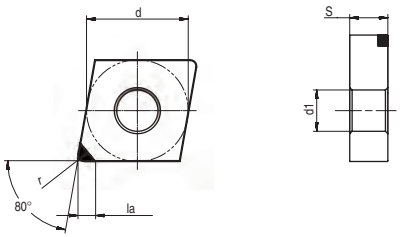
PCBN Recommended Cutting Parameter

Grade	Material	Hardness	Cutting speed Vc(ft/min)	Feed f(in/rev)	Cutting depth ap(in)	Recommended application
PB30	Hardened steel	HRC58-62	492-820	0.001-0.008	0.002-0.012	Continuous
PB60	Hardened steel	HRC55-60	164-492	0.001-0.008	0.002-0.020	Interrupted
	Cast iron	HB180-220	492-1476	0.001-0.012	0.012-0.020	Continuous / Interrupted
	Powder metal	-	656-1640	0.001-0.012	0.004-0.012	Continuous / Interrupted
PB90	Hardened steel	HRC55-60	98-394	0.001-0.008	0.002-0.020	Heavy interrupted
	Cast iron	HB180-220	492-1476	0.001-0.012	0.012-0.020	Continuous / Interrupted
	Powder metal	-	984-2625	0.001-0.012	0.004-0.012	Continuous / Interrupted

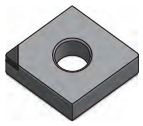
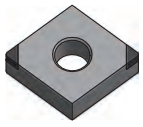
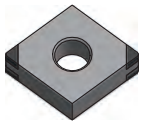
Grade Application Guide

PCBN grade applications						
Material Group	Materials	ISO	Uncoated			ISO
			PB30	PB60	PB90	
P	unalloy steels / Alloyed steels	P01				P01
		P05				P05
		P10				P10
		P15				P15
		P20				P20
		P25				P25
		P30				P30
		P35				P35
		P40				P40
		P45				P45
		P50				P50
M	Stainless steels	M01				M01
		M05				M05
		M10				M10
		M15				M15
		M20				M20
		M25				M25
		M30				M30
		M35				M35
		M40				M40
		M45				M45
K	Cast iron	K01				K01
		K05				K05
		K10		PB60		K10
		K15				K15
		K20				K20
		K25			PB90	K25
		K30				K30
		K35				K35
		K40				K40
		K45				K45
		K50				K50
N	Aluminum/ Aluminum alloys	N01				N01
		N05				N05
		N10				N10
		N15				N15
		N20				N20
		N25				N25
		N30				N30
S	Heat resistant alloys	S01				S01
		S05				S05
		S10				S10
		S15				S15
		S20				S20
		S25				S25
		S30				S30
		S35				S35
		S40				S40
H	Hardened steels/ Chilled cast iron	H01				H01
		H05	PB30			H05
		H10		PB60		H10
		H15				H15
		H20			PB90	H20
		H25				H25
		H30				H30

Negative 80°（C）



Dimensions (in)				
Type	d	s	la	d1
CN_43_	1/2	3/16	0.087	0.203

Inserts	ANSI	r (in)	Recommended parameters		Grade		
			f (in/rev)	ap (in)	PB30	PB60	PB90
	**CNGA 4(3)05-S01020-SL-1**	0.008	0.001-0.012	0.002-0.020	●	●	●
	CNGA 431-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	CNGA 432-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	CNGA 433-S01020-SL-1	3/64	0.001-0.012	0.002-0.020	●	●	●
	**CNGA 4(3)05-S01020-SL-2**	0.008	0.001-0.012	0.002-0.020	●	●	●
	CNGA 431-S01020-SL-2	1/64	0.001-0.012	0.002-0.020	●	●	●
	CNGA 432-S01020-SL-2	1/32	0.001-0.012	0.002-0.020	●	●	●
	CNGA 433-S01020-SL-2	3/64	0.001-0.012	0.002-0.020	●	●	●
	**CNGA 4(3)05-S01020-SL-4**	0.008	0.001-0.012	0.002-0.020	●	●	●
	CNGA 431-S01020-SL-4	1/64	0.001-0.012	0.002-0.020	●	●	●
	CNGA 432-S01020-SL-4	1/32	0.001-0.012	0.002-0.020	●	●	●
	CNGA 433-S01020-SL-4	3/64	0.001-0.012	0.002-0.020	●	●	●

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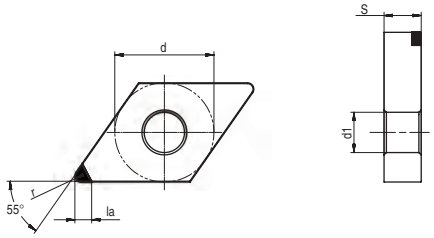
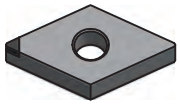
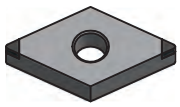
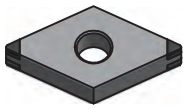
Marked: ● Stock available ○ Non-stocked standard

Negative 55°（D）



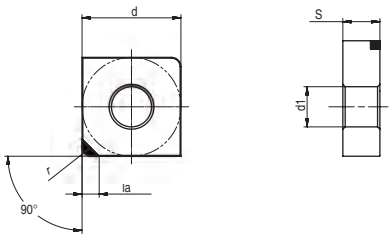
Dimensions (in)				
Type	d	s	la	d1
DN_43_	1/2	3/16	0.087	0.203
DN_44_	1/2	1/4	0.087	0.203

Inserts	ANSI	r (in)	Recommended parameters		Grade		
			f (in/rev)	ap (in)	PB30	PB60	PB90
	**DNGA 4(3)05-S01020-SL-1**	0.008	0.001-0.012	0.002-0.020	●	●	●
	DNGA 431-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	DNGA 432-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	DNGA 433-S01020-SL-1	3/64	0.001-0.012	0.002-0.020	●	●	●
	DNGA 4(4)05-S01020-SL-1	0.008	0.001-0.012	0.002-0.020	●	●	●
	DNGA 441-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	DNGA 442-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	DNGA 443-S01020-SL-1	3/64	0.001-0.012	0.002-0.020	●	●	●
	**DNGA 4(3)05-S01020-SL-2**	0.008	0.001-0.012	0.002-0.020	●	●	●
	DNGA 431-S01020-SL-2	1/64	0.001-0.012	0.002-0.020	●	●	●
	DNGA 432-S01020-SL-2	1/32	0.001-0.012	0.002-0.020	●	●	●
	DNGA 433-S01020-SL-2	3/64	0.001-0.012	0.002-0.020	●	●	●
	DNGA 4(4)05-S01020-SL-2	0.008	0.001-0.012	0.002-0.020	●	●	●
	DNGA 441-S01020-SL-2	1/64	0.001-0.012	0.002-0.020	●	●	●
	DNGA 442-S01020-SL-2	1/32	0.001-0.012	0.002-0.020	●	●	●
	DNGA 443-S01020-SL-2	3/64	0.001-0.012	0.002-0.020	●	●	●
	**DNGA 4(3)05-S01020-SL-4**	0.008	0.001-0.012	0.002-0.020	●	●	●
	DNGA 431-S01020-SL-4	1/64	0.001-0.012	0.002-0.020	●	●	●
	DNGA 432-S01020-SL-4	1/32	0.001-0.012	0.002-0.020	●	●	●
	DNGA 433-S01020-SL-4	3/64	0.001-0.012	0.002-0.020	●	●	●
	DNGA 4(4)05-S01020-SL-4	0.008	0.001-0.012	0.002-0.020	●	●	●
	DNGA 441-S01020-SL-4	1/64	0.001-0.012	0.002-0.020	●	●	●
	DNGA 442-S01020-SL-4	1/32	0.001-0.012	0.002-0.020	●	●	●
	DNGA 443-S01020-SL-4	3/64	0.001-0.012	0.002-0.020	●	●	●

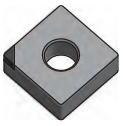
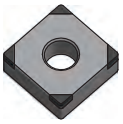
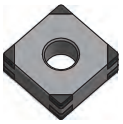
Marked: ● Stock available ○ Non-stocked standard

P74

Negative 90°（S）



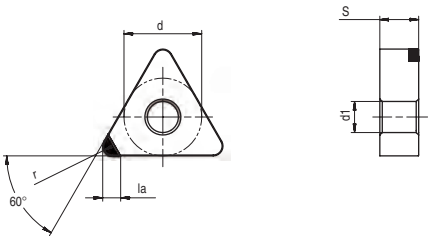
Dimensions (in)				
Type	d	s	la	d1
SN_43_	1/2	3/16	0.087	0.203

Inserts	ANSI	r (in)	Recommended parameters		Grade		
			f (in/rev)	ap (in)	PB30	PB60	PB90
	SNGA 4(3)05-S01020-SL-1	0.008	0.001-0.012	0.002-0.020	●	●	●
	SNGA 431-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	SNGA 432-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	SNGA 433-S01020-SL-1	3/64	0.001-0.012	0.002-0.020	●	●	●
	SNGA 4(3)05-S01020-SL-4	0.008	0.001-0.012	0.002-0.020	●	●	●
	SNGA 431-S01020-SL-4	1/64	0.001-0.012	0.002-0.020	●	●	●
	SNGA 432-S01020-SL-4	1/32	0.001-0.012	0.002-0.020	●	●	●
	SNGA 433-S01020-SL-4	3/64	0.001-0.012	0.002-0.020	●	●	●
	SNGA 4(3)05-S01020-SL-8	0.008	0.001-0.012	0.002-0.020	●	●	●
	SNGA 431-S01020-SL-8	1/64	0.001-0.012	0.002-0.020	●	●	●
	SNGA 432-S01020-SL-8	1/32	0.001-0.012	0.002-0.020	●	●	●
	SNGA 433-S01020-SL-8	3/64	0.001-0.012	0.002-0.020	●	●	●

P74

Marked: ● Stock available ○ Non-stocked standard

Negative 60°（T）



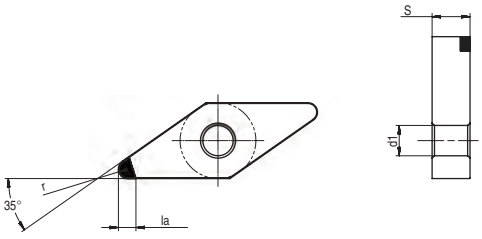
Dimensions (in)				
Type	d	s	la	d1
TN_33_	3/8	3/16	0.087	0.150

Inserts	ANSI	r (in)	Recommended parameters		Grade		
			f (in/rev)	ap (in)	PB30	PB60	PB90
	**TNGA 3(3)05-S01020-SL-1**	0.008	0.001-0.012	0.002-0.020	●	●	●
	TNGA 331-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	TNGA 332-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	TNGA 333-S01020-SL-1	3/64	0.001-0.012	0.002-0.020	●	●	●
	**TNGA 3(3)05-S01020-SL-3**	0.008	0.001-0.012	0.002-0.020	●	●	●
	TNGA 331-S01020-SL-3	1/64	0.001-0.012	0.002-0.020	●	●	●
	TNGA 332-S01020-SL-3	1/32	0.001-0.012	0.002-0.020	●	●	●
	TNGA 333-S01020-SL-3	3/64	0.001-0.012	0.002-0.020	●	●	●
	**TNGA 3(3)05-S01020-SL-6**	0.008	0.001-0.012	0.002-0.020	●	●	●
	TNGA 331-S01020-SL-6	1/64	0.001-0.012	0.002-0.020	●	●	●
	TNGA 332-S01020-SL-6	1/32	0.001-0.012	0.002-0.020	●	●	●
	TNGA 333-S01020-SL-6	3/64	0.001-0.012	0.002-0.020	●	●	●

Marked: ● Stock available ○ Non-stocked standard

P74

Negative 35°（V）



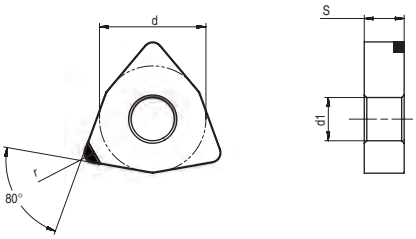
Dimensions (in)				
Type	d	s	la	d1
VN_33_	3/8	3/16	0.087	0.150

Inserts	ANSI	r (in)	Recommended parameters		Grade		
			f (in/rev)	ap (in)	PB30	PB60	PB90
	**VNGA 3(3)05-S01020-SL-1**	0.008	0.001-0.012	0.002-0.020	●	●	●
	VNGA 331-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	VNGA 332-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	VNGA 333-S01020-SL-1	3/64	0.001-0.012	0.002-0.020	●	●	●
	**VNGA 3(3)05-S01020-SL-2**	0.008	0.001-0.012	0.002-0.020	●	●	●
	VNGA 331-S01020-SL-2	1/64	0.001-0.012	0.002-0.020	●	●	●
	VNGA 332-S01020-SL-2	1/32	0.001-0.012	0.002-0.020	●	●	●
	VNGA 333-S01020-SL-2	3/64	0.001-0.012	0.002-0.020	●	●	●
	**VNGA 3(3)05-S01020-SL-4**	0.008	0.001-0.012	0.002-0.020	●	●	●
	VNGA 331-S01020-SL-4	1/64	0.001-0.012	0.002-0.020	●	●	●
	VNGA 332-S01020-SL-4	1/32	0.001-0.012	0.002-0.020	●	●	●
	VNGA 333-S01020-SL-4	3/64	0.001-0.012	0.002-0.020	●	●	●

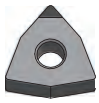
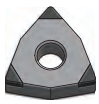
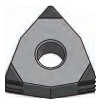
P74

Marked: ● Stock available ○ Non-stocked standard

Negative 80°（W）



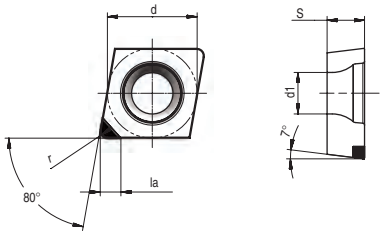
Dimensions (in)				
Type	d	s	la	d1
WN_43_	1/2	3/16	0.087	0.203

Inserts	ANSI	r (in)	Recommended parameters		Grade		
			f (in/rev)	ap (in)	PB30	PB60	PB90
	**WNGA 4(3)05-S01020-SL-1**	0.008	0.001-0.012	0.002-0.020	●	●	●
	WNGA 431-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	WNGA 432-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	WNGA 433-S01020-SL-1	3/64	0.001-0.012	0.002-0.020	●	●	●
	**WNGA 4(3)05-S01020-SL-3**	0.008	0.001-0.012	0.002-0.020	●	●	●
	WNGA 431-S01020-SL-3	1/64	0.001-0.012	0.002-0.020	●	●	●
	WNGA 432-S01020-SL-3	1/32	0.001-0.012	0.002-0.020	●	●	●
	WNGA 433-S01020-SL-3	3/64	0.001-0.012	0.002-0.020	●	●	●
	**WNGA 4(3)05-S01020-SL-6**	0.008	0.001-0.012	0.002-0.020	●	●	●
	WNGA 431-S01020-SL-6	1/64	0.001-0.012	0.002-0.020	●	●	●
	WNGA 432-S01020-SL-6	1/32	0.001-0.012	0.002-0.020	●	●	●
	WNGA 433-S01020-SL-6	3/64	0.001-0.012	0.002-0.020	●	●	●

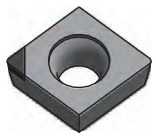
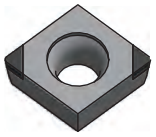
Marked: ● Stock available ○ Non-stocked standard

P74

Positive 80°（C）



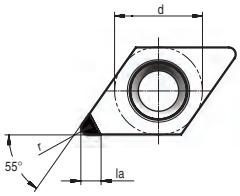
Dimensions (in)				
Type	d	s	la	d1
CC_2(1.5)_	1/4	3/32	0.087	0.110
CC_3(2.5)_	3/8	5/32	0.087	0.173
CC_43_	1/2	3/16	0.087	0.217

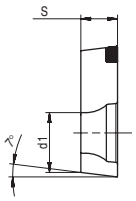
Inserts	ANSI	r (in)	Recommended parameters		Grade		
			f (in/rev)	ap (in)	PB30	PB60	PB90
	**CCGW 2(1.5)05-S01020-SL-1**	0.008	0.001-0.012	0.002-0.020	●	●	●
	CCGW 2(1.5)1-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	CCGW 2(1.5)2-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	CCGW 3(2.5)05-S01020-SL-1	0.008	0.001-0.012	0.002-0.020	●	●	●
	CCGW 3(2.5)1-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	CCGW 3(2.5)2-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	CCGW 4(3)05-S01020-SL-1	0.008	0.001-0.012	0.002-0.020	●	●	●
	CCGW 431-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	CCGW 432-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	CCGW 433-S01020-SL-1	3/64	0.001-0.012	0.002-0.020	●	●	●
	**CCGW 2(1.5)05-S01020-SL-2**	0.008	0.001-0.012	0.002-0.020	●	●	●
	CCGW 2(1.5)1-S01020-SL-2	1/64	0.001-0.012	0.002-0.020	●	●	●
	CCGW 2(1.5)2-S01020-SL-2	1/32	0.001-0.012	0.002-0.020	●	●	●
	CCGW 3(2.5)05-S01020-SL-2	0.008	0.001-0.012	0.002-0.020	●	●	●
	CCGW 3(2.5)1-S01020-SL-2	1/64	0.001-0.012	0.002-0.020	●	●	●
	CCGW 3(2.5)2-S01020-SL-2	1/32	0.001-0.012	0.002-0.020	●	●	●
	CCGW 4(3)05-S01020-SL-2	0.008	0.001-0.012	0.002-0.020	●	●	●
	CCGW 431-S01020-SL-2	1/64	0.001-0.012	0.002-0.020	●	●	●
	CCGW 432-S01020-SL-2	1/32	0.001-0.012	0.002-0.020	●	●	●
	CCGW 433-S01020-SL-2	3/64	0.001-0.012	0.002-0.020	●	●	●

P74

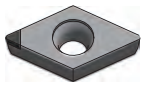
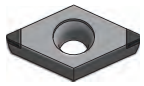
Marked: ● Stock available ○ Non-stocked standard

Positive 55°（D）





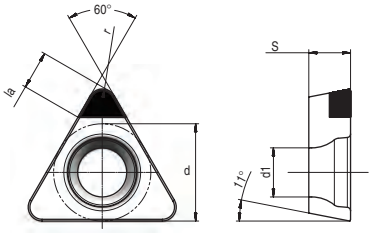
Dimensions (in)				
Type	d	s	la	d1
DC_0702_	1/4	3/32	0.087	0.110
DC_11T3_	3/8	5/32	0.087	0.173

Inserts	ANSI	r (in)	Recommended parameters		Grade		
			f (in/rev)	ap (in)	PB30	PB60	PB90
	**DCGW 2(1.5)05-S01020-SL-1**	0.008	0.001-0.012	0.002-0.020	●	●	●
	DCGW 2(1.5)1-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	DCGW 2(1.5)2-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	DCGW 3(2.5)05-S01020-SL-1	0.008	0.001-0.012	0.002-0.020	●	●	●
	DCGW 3(2.5)1-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	DCGW 3(2.5)2-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	DCGW 3(2.5)3-S01020-SL-1	3/64	0.001-0.012	0.002-0.020	●	●	●
	**DCGW 2(1.5)05-S01020-SL-2**	0.008	0.001-0.012	0.002-0.020	●	●	●
	DCGW 2(1.5)1-S01020-SL-2	1/64	0.001-0.012	0.002-0.020	●	●	●
	DCGW 2(1.5)2-S01020-SL-2	1/32	0.001-0.012	0.002-0.020	●	●	●
	DCGW 3(2.5)05-S01020-SL-2	0.008	0.001-0.012	0.002-0.020	●	●	●
	DCGW 3(2.5)1-S01020-SL-2	1/64	0.001-0.012	0.002-0.020	●	●	●
	DCGW 3(2.5)2-S01020-SL-2	1/32	0.001-0.012	0.002-0.020	●	●	●
	DCGW 3(2.5)3-S01020-SL-2	3/64	0.001-0.012	0.002-0.020	●	●	●

Marked: ● Stock available ○ Non-stocked standard

P74

Positive 60°（T）



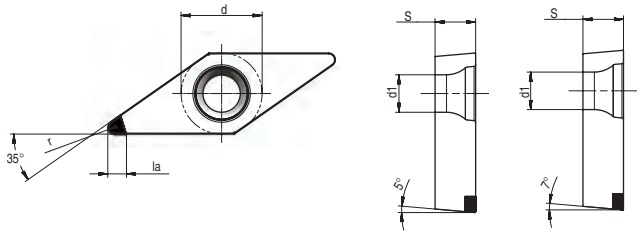
Dimensions (in)				
Type	d	s	la	d1
TP_1.5(1.5)_	3/16	3/32	0.087	0.094
TP_1.8(1.5)_	7/32	3/32	0.087	0.110
TP_22_	1/4	1/8	0.087	0.130
TP_33_	3/8	3/16	0.087	0.173

Inserts	ANSI	r (in)	Recommended parameters		Grade		
			f (in/rev)	ap (in)	PB30	PB60	PB90
	**TPGW 1.5(1.5)05-S01020-SL-1**	0.008	0.001-0.012	0.002-0.020	●	●	●
	TPGW 1.5(1.5)1-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	TPGW 1.8(1.5)05-S01020-SL-1	0.008	0.001-0.012	0.002-0.020	●	●	●
	TPGW 1.8(1.5)1-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	TPGW 1.8(1.5)2-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	TPGW 2(2)05-S01020-SL-1	0.008	0.001-0.012	0.002-0.020	●	●	●
	TPGW 221-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	TPGW 3(3)05-S01020-SL-1	0.008	0.001-0.012	0.002-0.020	●	●	●
	TPGW 331-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	TPGW 332-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	**TPGW 1.5(1.5)05-S01020-SL-3**	0.008	0.001-0.012	0.002-0.020	●	●	●
	TPGW 1.5(1.5)1-S01020-SL-3	1/64	0.001-0.012	0.002-0.020	●	●	●
	TPGW 1.8(1.5)05-S01020-SL-3	0.008	0.001-0.012	0.002-0.020	●	●	●
	TPGW 1.8(1.5)1-S01020-SL-3	1/64	0.001-0.012	0.002-0.020	●	●	●
	TPGW 1.8(1.5)2-S01020-SL-3	1/32	0.001-0.012	0.002-0.020	●	●	●
	TPGW 2(2)05-S01020-SL-3	0.008	0.001-0.012	0.002-0.020	●	●	●
	TPGW 221-S01020-SL-3	1/64	0.001-0.012	0.002-0.020	●	●	●
	TPGW 3(3)05-S01020-SL-3	0.008	0.001-0.012	0.002-0.020	●	●	●
	TPGW 331-S01020-SL-3	1/64	0.001-0.012	0.002-0.020	●	●	●
	TPGW 332-S01020-SL-3	1/32	0.001-0.012	0.002-0.020	●	●	●

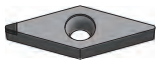
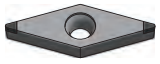
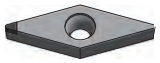
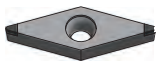
P74

Marked: ● Stock available ○ Non-stocked standard

Positive 35°（V）



Dimensions (in)				
Type	d	s	la	d1
VB_22_	1/4	1/8	0.087	0.110
VC_22_	1/4	1/8	0.087	0.110
VB_33_	3/8	3/16	0.087	0.173
VC_33_	3/8	3/16	0.087	0.173

Inserts	ANSI	r (in)	Recommended parameters		Grade		
			f (in/rev)	ap (in)	PB30	PB60	PB90
	**VBGW 2(2)05-S01020-SL-1**	0.008	0.001-0.012	0.002-0.020	●	●	●
	VBGW 2(2)1-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	VBGW 2(2)2-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	VBGW 3(3)05-S01020-SL-1	0.008	0.001-0.012	0.002-0.020	●	●	●
	VBGW 331-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	VBGW 332-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	**VBGW 2(2)05-S01020-SL-2**	0.008	0.001-0.012	0.002-0.020	●	●	●
	VBGW 2(2)1-S01020-SL-2	1/64	0.001-0.012	0.002-0.020	●	●	●
	VBGW 2(2)2-S01020-SL-2	1/32	0.001-0.012	0.002-0.020	●	●	●
	VBGW 3(3)05-S01020-SL-2	0.008	0.001-0.012	0.002-0.020	●	●	●
	VBGW 331-S01020-SL-2	1/64	0.001-0.012	0.002-0.020	●	●	●
	VBGW 332-S01020-SL-2	1/32	0.001-0.012	0.002-0.020	●	●	●
	**VCGW 2(2)05-S01020-SL-1**	0.008	0.001-0.012	0.002-0.020	●	●	●
	VCGW 2(2)1-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	VCGW 2(2)2-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	VCGW 3(3)05-S01020-SL-1	0.008	0.001-0.012	0.002-0.020	●	●	●
	VCGW 331-S01020-SL-1	1/64	0.001-0.012	0.002-0.020	●	●	●
	VCGW 332-S01020-SL-1	1/32	0.001-0.012	0.002-0.020	●	●	●
	**VCGW 2(2)05-S01020-SL-2**	0.008	0.001-0.012	0.002-0.020	●	●	●
	VCGW 2(2)1-S01020-SL-2	1/64	0.001-0.012	0.002-0.020	●	●	●
	VCGW 2(2)2-S01020-SL-2	1/32	0.001-0.012	0.002-0.020	●	●	●
	VCGW 3(3)05-S01020-SL-2	0.008	0.001-0.012	0.002-0.020	●	●	●
	VCGW 331-S01020-SL-2	1/64	0.001-0.012	0.002-0.020	●	●	●
	VCGW 332-S01020-SL-2	1/32	0.001-0.012	0.002-0.020	●	●	●

Marked: ● Stock available ○ Non-stocked standard

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PCD Insert Denomination System

CCGW 3(2.5)2	-	2	-	NL	-	5	-	CB	PD20
1		2		3		4		5	6

1-Standard ANSI denomination system

2-Number of cutting edge

1-One cutting edge
2-Two cutting edges
3-Three cutting edges

3-PCD insert structure

NL--Standard structure with tipped PCD

LL-- Full edge tipped PCD

4-Rake angle

00----0°
05----5°
10----10°

5-Cutting edge preparation

CB-- With chip breaker
WG--With wiper edge
"-" Without chip breaker

6-Grade

PD20--Coarse grain PCD

PCD Insert Grade Introduction

Grade	Feature	Application
PD20	Universal grade, balanced wear resistance and toughness	1st choice for general machining of aluminum alloys

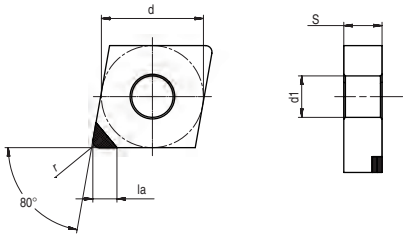
PCD Recommended Cutting Parameter

Grade	Material	Cutting speed Vc(ft/min)	Feed f(in/rev)	Cutting depth ap(in)	Recommended application
PD20	Low-Si Aluminium Alloy (Si < 6%)	984-13123	0.001-0.008	0.002-0.020	Continuous/interrupt

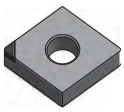
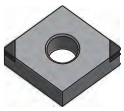
Grade Application Guide

PCD insert applications				
Material Group	Materials	ISO	Uncoated PD20	ISO
P	unalloy steels / Alloyed steels	P01		P01
		P05		P05
		P10		P10
		P15		P15
		P20		P20
		P25		P25
		P30		P30
		P35		P35
		P40		P40
		P45		P45
		P50		P50
M	Stainless steels	M01		M01
		M05		M05
		M10		M10
		M15		M15
		M20		M20
		M25		M25
		M30		M30
		M35		M35
		M40		M40
		M45		M45
K	Cast iron	K01		K01
		K05		K05
		K10		K10
		K15		K15
		K20		K20
		K25		K25
		K30		K30
		K35		K35
		K40		K40
		K45		K45
		K50		K50
N	Aluminum/ Aluminum alloys	N01		N01
		N05		N05
		N10	PD20	N10
		N15		N15
		N20		N20
		N25		N25
		N30		N30
S	Heat resistant alloys	S01		S01
		S05		S05
		S10		S10
		S15		S15
		S20		S20
		S25		S25
		S30		S30
		S35		S35
		S40		S40
H	Hardened steels/ Chilled cast iron	H01		H01
		H05		H05
		H10		H10
		H15		H15
		H20		H20
		H25		H25
		H30		H30

Negative 80°（C）



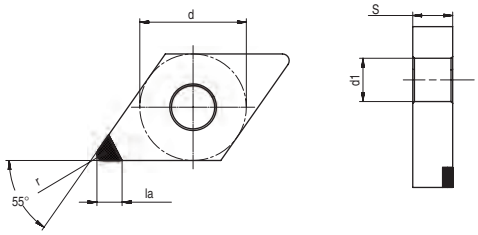
Dimensions (in)				
Type	d	s	la	d1
CN_43_	1/2	3/16	0.118	0.203

Inserts	ANSI	r (in)	Recommended parameters		Grade
			f (in/rev)	ap (in)	PD20
	**CNGA 4(3)05-1-NL-00**	0.008	0.001-0.008	0.002-0.020	●
	CNGA 431-1-NL-00	1/64	0.001-0.008	0.002-0.020	●
	CNGA 432-1-NL-00	1/32	0.001-0.008	0.002-0.020	●
	**CNGA 4(3)05-2-NL-00**	0.008	0.001-0.008	0.002-0.020	●
	CNGA 431-2-NL-00	1/64	0.001-0.008	0.002-0.020	●
	CNGA 432-2-NL-00	1/32	0.001-0.008	0.002-0.020	●

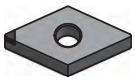
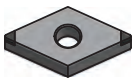
P86

Marked: ● Stock available ○ Non-stocked standard

Negative 55°（D）



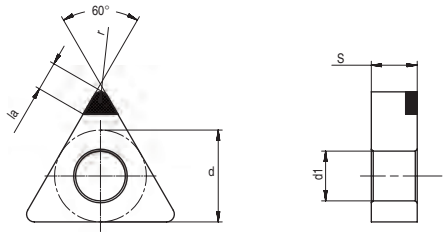
Dimensions (in)				
Type	d	s	la	d1
DN_43_	1/2	3/16	0.118	0.203

Inserts	ANSI	r (in)	Recommended parameters		Grade
			f (in/rev)	ap (in)	PD20
	**DNGA 4(3)05-1-NL-00**	0.008	0.001-0.008	0.002-0.020	●
	DNGA 431-1-NL-00	1/64	0.001-0.008	0.002-0.020	●
	DNGA 432-1-NL-00	1/32	0.001-0.008	0.002-0.020	●
	**DNGA 4(3)05-2-NL-00**	0.008	0.001-0.008	0.002-0.020	●
	DNGA 431-2-NL-00	1/64	0.001-0.008	0.002-0.020	●
	DNGA 432-2-NL-00	1/32	0.001-0.008	0.002-0.020	●

Marked: ● Stock available ○ Non-stocked standard

P86

Negative 60°（T）



Dimensions (in)				
Type	d	s	la	d1
TN_33_	3/8	3/16	0.118	0.150

Inserts	ANSI	r (in)	Recommended parameters		Grade
			f (in/rev)	ap (in)	PD20
	**TNGA 3(3)05-1-NL-00**	0.008	0.001-0.008	0.002-0.020	●
	TNGA 331-1-NL-00	1/64	0.001-0.008	0.002-0.020	●
	TNGA 332-1-NL-00	1/32	0.001-0.008	0.002-0.020	●
	**TNGA 3(3)05-3-NL-00**	0.008	0.001-0.008	0.002-0.020	●
	TNGA 331-3-NL-00	1/64	0.001-0.008	0.002-0.020	●
	TNGA 332-3-NL-00	1/32	0.001-0.008	0.002-0.020	●

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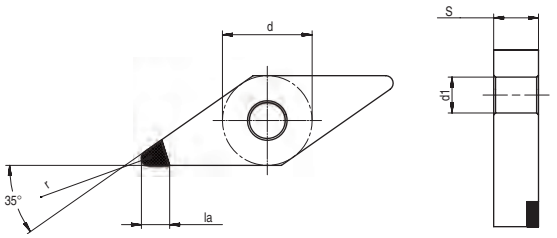
Marked: ● Stock available ○ Non-stocked standard

Negative 35°（V）



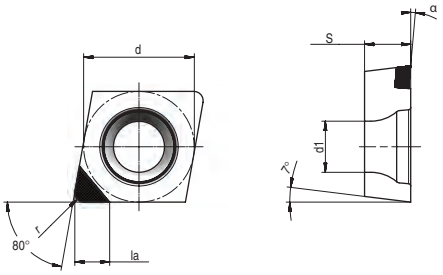
Dimensions (in)				
Type	d	s	la	d1
VN_33_	3/8	3/16	0.118	0.150

Inserts	ANSI	r (in)	Recommended parameters		Grade
			f (in/rev)	ap (in)	PD20
	**VNGA 3(3)05-1-NL-00**	0.008	0.001-0.008	0.002-0.020	●
	VNGA 3(3)1-1-NL-00	1/64	0.001-0.008	0.002-0.020	●
	VNGA 3(3)2-1-NL-00	1/32	0.001-0.008	0.002-0.020	●
	**VNGA 3(3)05-1-NL-00**	0.008	0.001-0.008	0.002-0.020	●
	VNGA 3(3)1-1-NL-00	1/64	0.001-0.008	0.002-0.020	●
	VNGA 3(3)2-1-NL-00	1/32	0.001-0.008	0.002-0.020	●

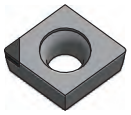
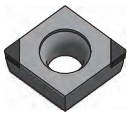
Marked: ● Stock available ○ Non-stocked standard

P86

Positive 80°（C）



Dimensions (in)				
Type	d	s	la	d1
CC_2(1.5)_	1/4	3/32	0.118	0.110
CC_3(2.5)_	3/8	5/32	0.118	0.173
CC_43_	1/2	3/16	0.118	0.217

Inserts	ANSI	r (in)	α (°)	Recommended parameters		Grade
				f (in/rev)	ap (in)	PD20
	**CCGW 2(1.5)05-1-NL-05**	0.008	5°	0.001-0.008	0.002-0.020	●
	CCGW 2(1.5)1-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	CCGW 2(1.5)2-1-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	CCGW 3(2.5)05-1-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	CCGW 3(2.5)1-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	CCGW 3(2.5)2-1-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	CCGW 4(3)05-1-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	CCGW 431-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	CCGW 432-1-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	**CCGW 2(1.5)05-2-NL-05**	0.008	5°	0.001-0.008	0.002-0.020	●
	CCGW 2(1.5)1-2-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	CCGW 2(1.5)2-2-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	CCGW 3(2.5)05-2-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	CCGW 3(2.5)1-2-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	CCGW 3(2.5)2-2-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	CCGW 4(3)05-2-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	CCGW 431-2-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	CCGW 432-2-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●

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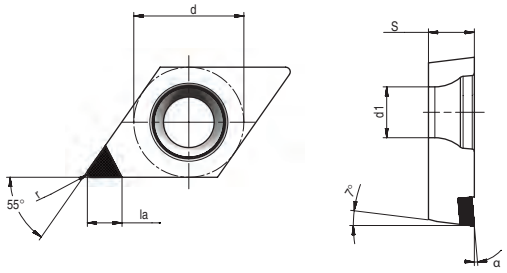
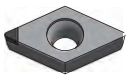
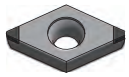
Marked: ● Stock available ○ Non-stocked standard

Positive 55°（D）



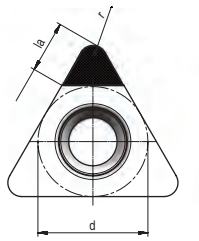
Dimensions (in)				
Type	d	s	la	d1
DC_2(1.5)_	1/4	3/32	0.118	0.110
DC_3(2.5)_	3/8	5/32	0.118	0.173

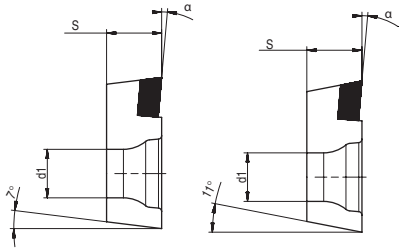
Inserts	ANSI	r (in)	α (°)	Recommended parameters		Grade
				f (in/rev)	ap (in)	PD20
	**DCGW 2(1.5)05-1-NL-05**	0.008	5°	0.001-0.008	0.002-0.020	●
	DCGW 2(1.5)1-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	DCGW 2(1.5)2-1-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	DCGW 3(2.5)05-1-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	DCGW 3(2.5)1-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	DCGW 3(2.5)2-1-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	**DCGW 2(1.5)05-2-NL-05**	0.008	5°	0.001-0.008	0.002-0.020	●
	DCGW 2(1.5)1-2-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	DCGW 2(1.5)2-2-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	DCGW 3(2.5)05-2-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	DCGW 3(2.5)1-2-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	DCGW 3(2.5)2-2-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●

Marked: ● Stock available ○ Non-stocked standard

P86

Positive 60°（T）





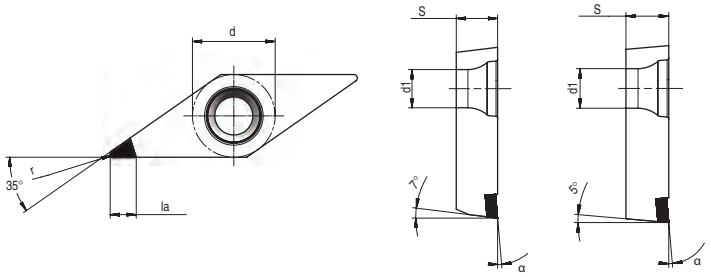
Dimensions (in)				
Type	d	s	la	d1
TC_1.5(1.5)_	3/16	3/32	0.118	0.094
TC_22_	1/4	1/8	0.118	0.110
TC_33_	3/8	3/16	0.118	0.173
TP_1.5(1.5)_	3/16	3/32	0.118	0.094
TP_33_	3/8	3/16	0.118	0.173

Inserts	ANSI	r (in)	α (°)	Recommended parameters		Grade
				f (in/rev)	ap (in)	PD20
	TCGW 1.5(1.5)05-1-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	TCGW 1.5(1.5)1-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	TCGW 1.5(1.5)2-1-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	TCGW 2(2)05-1-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	TCGW 221-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	TCGW 222-1-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	TCGW 3(3)05-1-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	TCGW 331-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	TCGW 332-1-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	TCGW 1.5(1.5)05-3-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	TCGW 1.5(1.5)1-3-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	TCGW 1.5(1.5)2-3-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	TCGW 2(2)05-3-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	TCGW 221-3-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	TCGW 222-3-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	TCGW 3(3)05-3-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	TCGW 331-3-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	TCGW 332-3-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	TPGW 1.5(1.5)05-1-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	TPGW 1.5(1.5)1-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	TPGW 1.5(1.5)2-1-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	TPGW 3(3)05-1-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	TPGW 331-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	TPGW 332-1-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	TPGW 160404-1-NL-05	0.4	5°	0.030-0.200	0.050-0.500	●
	TPGW 160404-1-NL-05	0.8	5°	0.030-0.200	0.050-0.500	●
	TPGW 1.5(1.5)05-3-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	TPGW 1.5(1.5)1-3-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	TPGW 1.5(1.5)2-3-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●
	TPGW 3(3)05-3-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	TPGW 331-3-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	TPGW 332-3-NL-05	1/32	5°	0.001-0.008	0.002-0.020	●

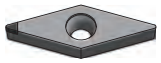
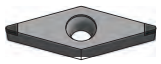
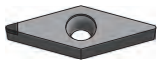
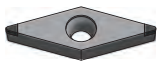
P86

Marked: ● Stock available ○ Non-stocked standard

Positive 35°（V）



Dimensions (in)				
Type	d	s	la	d1
VB_22_	1/4	1/8	0.118	0.110
VB_33_	3/8	3/16	0.118	0.173
VC_22_	1/4	1/8	0.118	0.110
VC_33_	3/8	3/16	0.118	0.173

Inserts	ANSI	r (in)	α (°)	Recommended parameters		Grade
				f (in/rev)	ap (in)	PD20
	**VBGW 2(2)05-1-NL-05**	0.008	5°	0.001-0.008	0.002-0.020	●
	VBGW 2(2)1-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	VBGW 3(3)05-1-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	VBGW 3(3)1-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	**VBGW 2(2)05-2-NL-05**	0.008	5°	0.001-0.008	0.002-0.020	●
	VBGW 2(2)1-2-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	VBGW 3(3)05-2-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	VBGW 3(3)1-2-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	**VCGW 2(2)05-1-NL-05**	0.008	5°	0.001-0.008	0.002-0.020	●
	VCGW 2(2)1-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	VCGW 3(3)05-1-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	VCGW 3(3)1-1-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	**VCGW 2(2)05-2-NL-05**	0.008	5°	0.001-0.008	0.002-0.020	●
	VCGW 2(2)1-2-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●
	VCGW 3(3)05-2-NL-05	0.008	5°	0.001-0.008	0.002-0.020	●
	VCGW 3(3)1-2-NL-05	1/64	5°	0.001-0.008	0.002-0.020	●

Marked: ● Stock available ○ Non-stocked standard

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ACHTECK

www.achtecktool.com

CUTTING TOOL CATALOGUE

ACHTECK

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Grooving Tool Holder

Grooving Holder Denomination System

A	G	U	E	R	0750	16	-	4	T0315	-	40	-	80	-	SW
1	2	3	4	5	6	7	-	8	9	-	10	-	11	-	12

1-Company name

ACHTECK

2-Application

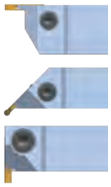
G	Grooving
T	Turning

3- Shape of holder head

S:Straight-180°

U:Under cut-45°

P:Perpendicular-90°

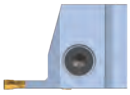


4-Machining type

E: External
I: Internal
F: Facing

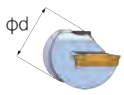
5-Hand of tool

L:Left hand



R:Right hand

6-Holder diameter



0375=0.375
0750=0.750
1000=1.000

7-Holder Height/width

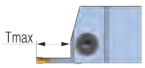
08=0.375
12=0.750
16=1.000

8-Insert width

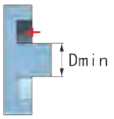
2=0.079
3=0.118
4=0.157

9-Ap

T0315=Max 0.315

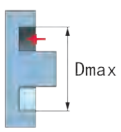


10-Minimum cutting diameter



40=1.575

11-Maximum cutting diameter

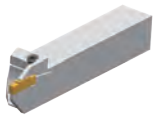
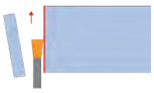
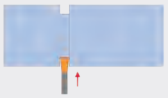
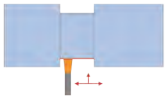
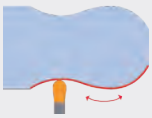
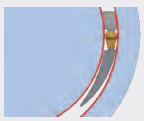
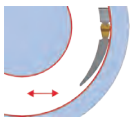
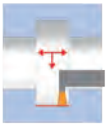


80=3.150

12-Special code

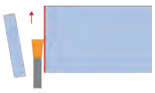
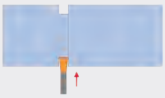
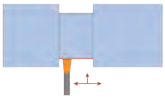
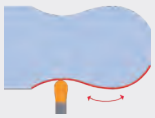
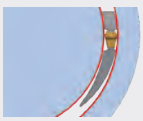
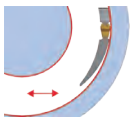
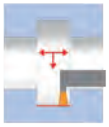
SW:For swiss machine
OB:Outside bulge holders
C:With internal coolant
D:Reinforced holders

Overview of Grooving Holders

Application \ Holder			External grooving			
			ATSER/L	ATSER/L-D	ATSER/L-SW	AGUER/L
						
Page			P103	P105	P106	P107
External grooving	Parting off		●	●	●	
	Grooving		●	●	●	
	Turning		●	●	●	
	Profiling		●	●	●	
	Under cut					●
Face grooving	Grooving					
	Turning					
Internal machining	Grooving					
	Turning					

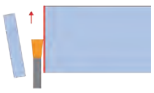
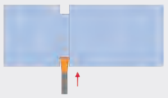
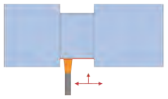
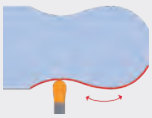
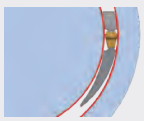
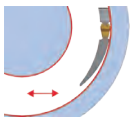
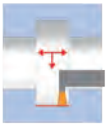
Marked: ● Best choice

Overview of Grooving Holders

Application \ Holder			Face grooving				
			ATSFR/L	ATSFR/L-OB	AGSFR/L	AGPFR/L	ATPFR/L
							
Page			P108	P109	P110	P111	P112
External grooving	Parting off						
	Grooving					●	●
	Turning					○	○
	Profiling						
	Under cut						
Face grooving	Grooving		●	●	●	●	●
	Turning		●	●	●	●	●
Internal machining	Grooving						
	Turning						

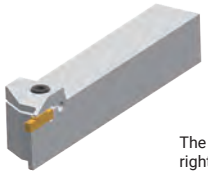
Marked: ● Best choice

Overview of Grooving Holders

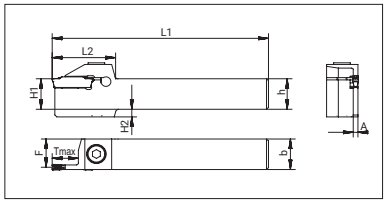
Holder / Application			Internal machining			
			ATPIR/L	ATSIR/L	AGSIR/L	AGUIR/L
						
Page			P113	P114	P115	P116
External grooving	Parting off					
	Grooving					
	Turning					
	Profiling					
	Under cut					●
Face grooving	Grooving			●	●	
	Turning			●	●	
Internal machining	Grooving		●			
	Turning		●			

Marked: ● Best choice

ATSER/L External Turning and Grooving Holder



The diagram shows the right hand holder



Product code		Dimension(in)										Inserts*
		h	b	H1	H2	A	L1	L2	F	Tmax	Marked	
ATSER/L	10-2T0315	0.625	0.625	0.625	0.157	0.071	4.500	1.260	0.594	0.315	○	ACD/ACS/ATD
	10-2T0472	0.625	0.625	0.625	0.157	0.071	4.500	1.260	0.594	0.472	●	
	10-2T0669	0.625	0.625	0.625	0.157	0.071	4.500	1.496	0.594	0.669	●	
	12-2T0315	0.750	0.750	0.750	0.000	0.071	5.000	1.260	0.752	0.315	○	
	12-2T0472	0.750	0.750	0.750	0.000	0.071	5.000	1.260	0.752	0.472	●	
	12-2T0669	0.750	0.750	0.750	0.000	0.071	5.000	1.496	0.752	0.669	●	
	16-2T0315	1.000	1.000	1.000	0.000	0.071	6.000	1.260	0.949	0.315	●	
	16-2T0472	1.000	1.000	1.000	0.000	0.071	6.000	1.260	0.949	0.472	●	
	16-2T0669	1.000	1.000	1.000	0.000	0.071	6.000	1.496	0.949	0.669	●	
ATSER/L	10-3T0354	0.625	0.625	0.625	0.157	0.094	4.500	1.260	0.583	0.354	○	
	10-3T0472	0.625	0.625	0.625	0.157	0.094	4.500	1.260	0.583	0.472	○	
	10-3T0787	0.625	0.625	0.625	0.157	0.094	4.500	1.496	0.583	0.787	○	
	12-3T0354	0.750	0.750	0.750	0.000	0.094	5.000	1.260	0.740	0.354	○	
	12-3T0472	0.750	0.750	0.750	0.000	0.094	5.000	1.260	0.740	0.472	●	
	12-3T0787	0.750	0.750	0.750	0.000	0.094	5.000	1.496	0.740	0.787	●	
	16-3T0354	1.000	1.000	1.000	0.000	0.094	6.000	1.260	0.937	0.354	●	
	16-3T0472	1.000	1.000	1.000	0.000	0.094	6.000	1.260	0.937	0.472	●	
	16-3T0787	1.000	1.000	1.000	0.000	0.094	6.000	1.496	0.937	0.787	●	
	16-3T0984	1.000	1.000	1.000	0.000	0.094	6.000	1.772	0.937	0.984	●	
ATSER/L	10-4T0394	0.625	0.625	0.625	0.157	0.118	4.500	1.260	0.571	0.394	○	
	10-4T0591	0.625	0.625	0.625	0.157	0.118	4.500	1.260	0.571	0.591	○	
	10-4T0984	0.625	0.625	0.625	0.157	0.118	4.500	1.772	0.571	0.984	○	
	12-4T0984	0.750	0.750	0.750	0.000	0.118	5.000	1.260	0.728	0.394	○	
	12-4T0591	0.750	0.750	0.750	0.000	0.118	5.000	1.260	0.728	0.591	●	
	12-4T0984	0.750	0.750	0.750	0.000	0.118	5.000	1.772	0.728	0.984	○	
	16-4T0394	1.000	1.000	1.000	0.000	0.118	6.000	1.260	0.925	0.394	●	
	16-4T0591	1.000	1.000	1.000	0.000	0.118	6.000	1.260	0.925	0.591	●	
	16-4T0787	1.000	1.000	1.000	0.000	0.118	6.000	1.260	0.925	0.787	○	
	16-4T0984	1.000	1.000	1.000	0.000	0.118	6.000	1.772	0.925	0.984	●	
ATSER/L	12-5T0472	0.750	0.750	0.750	0.000	0.157	5.000	1.496	0.713	0.472	○	
	12-5T0787	0.750	0.750	0.750	0.000	0.157	5.000	1.496	0.713	0.787	○	
	16-5T0472	1.000	1.000	1.000	0.000	0.157	6.000	1.496	0.909	0.472	○	
	16-5T0787	1.000	1.000	1.000	0.000	0.157	6.000	1.496	0.909	0.787	○	
	16-5T1260	1.000	1.000	1.000	0.000	0.157	6.000	2.165	0.906	1.260	○	
	20-5T0472	1.250	1.250	1.250	0.000	0.154	7.000	1.409	1.184	0.472	○	
	20-5T0787	1.250	1.250	1.250	0.000	0.154	7.000	1.488	1.184	0.787	○	
	20-5T0984	1.250	1.250	1.250	0.000	0.154	7.000	1.764	1.184	0.984	○	
	20-5T1260	1.250	1.250	1.250	0.000	0.154	7.000	2.165	1.184	1.260	○	
ATSER/L	12-6T0472	0.750	0.750	0.750	0.000	0.197	5.000	1.496	0.693	0.472	○	
	12-6T0787	0.750	0.750	0.750	0.000	0.197	5.000	1.575	0.693	0.787	○	
	16-6T0472	1.000	1.000	1.000	0.276	0.197	6.000	1.496	0.890	0.472	○	
	16-6T0787	1.000	1.000	1.000	0.276	0.197	6.000	1.575	0.890	0.787	○	
	16-6T1260	1.000	1.000	1.000	0.276	0.197	6.000	2.165	0.886	1.260	○	
	20-6T0472	1.250	1.250	1.250	0.000	0.193	7.000	1.409	1.184	0.472	○	
	20-6T0787	1.250	1.250	1.250	0.000	0.193	7.000	1.567	1.184	0.787	○	
	20-6T0984	1.250	1.250	1.250	0.000	0.193	7.000	1.764	1.184	0.984	○	
	20-6T1260	1.250	1.250	1.250	0.000	0.193	7.000	2.165	1.184	1.260	○	
ATSER/L	16-8T0630	1.000	1.000	1.000	0.276	0.232	6.000	1.772	0.870	0.630	○	
	16-8T0984	1.000	1.000	1.000	0.276	0.232	6.000	1.772	0.870	0.984	○	
	16-8T1417	1.000	1.000	1.000	0.276	0.232	6.000	2.362	0.870	1.417	○	
	20-8T0984	1.250	1.250	1.250	0.000	0.232	7.000	1.772	1.146	0.984	○	
	20-8T1417	1.250	1.250	1.250	0.000	0.232	7.000	2.362	1.146	1.417	○	

Inserts*: ACD/ACS series are only applicable to grooving and parting off machining

Marked: ● Stock available ○ Non-stocked standard

Product code	Screw	Wrench
		
ATSER/L 10-2/3	SH050160	LT-H4
ATSER/L 12-2/3	SH050200	LT-H4
ATSER/L 16-2/3	SH050250	LT-H4
ATSER/L 10-4/5	SH060160	LT-H5
ATSER/L 12-4/5	SH060200	LT-H5
ATSER/L 16-4/5	SH060250	LT-H5
ATSER/L 12-6	SH080200	LT-H6
ATSER/L 16-6/8	SH080250	LT-H6
ATSER/L 20-5	SH060250	LT-H5
ATSER/L 20-6	SH080250	LT-H6
ATSER/L 20-8	SH080250	LT-H6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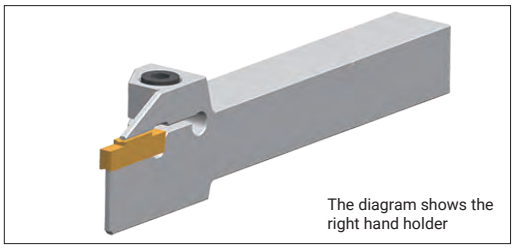
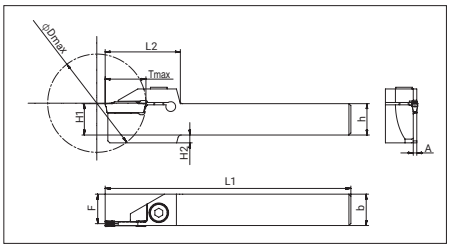
ATSER/L-D Reinforced External Turning and Grooving Holder





Product code		Dimension (in)										Marked	Inserts*
		h	b	H1	H2	A	L1	L2	F	Tmax	Dmax		
ATSER/L	06-2T0591-D40	0.375	0.375	0.375	0.236	0.071	5.000	1.260	0.358	0.591	1.575	○	ACD/ACS/ATD
	08-2T0591-D40	0.500	0.500	0.500	0.157	0.071	5.000	1.260	0.437	0.591	1.575	○	
	10-2T0787-D45	0.625	0.625	0.625	0.157	0.071	5.000	1.496	0.594	0.787	1.772	○	
	12-2T0787-D45	0.750	0.750	0.750	0.000	0.071	5.000	1.496	0.752	0.787	1.772	○	
	16-2T0787-D45	1.000	1.000	1.000	0.000	0.071	6.000	1.496	0.949	0.787	1.772	○	
	08-3T0591-D40	0.500	0.500	0.500	0.157	0.094	5.000	1.260	0.425	0.591	1.575	○	
	10-3T0787-D45	0.625	0.625	0.625	0.157	0.094	5.000	1.260	0.583	0.787	1.772	○	
	12-3T0787-D45	0.750	0.750	0.750	0.000	0.094	5.000	1.260	0.740	0.787	1.772	○	
	16-3T0787-D45	1.000	1.000	1.000	0.000	0.094	6.000	1.260	0.937	0.787	1.772	○	
	16-3T0984-D60	1.000	1.000	1.000	0.276	0.094	6.000	1.772	0.937	0.984	2.362	○	

Inserts*: ACD/ACS series are only applicable to grooving and parting off machining

Marked: ● Stock available ○ Non-stocked standard

Product code	Screw	Wrench
		
ATSER/L 06-2	SH050160	LT-H4
ATSER/L 08-2/3	SH050160	LT-H4
ATSER/L 10-2	SH050160	LT-H4
ATSER/L 10-3	SH050200	LT-H4
ATSER/L 10-2/3	SH050200	LT-H4
ATSER/L 16-2/3	SH050250	LT-H4

The max. cutting depth vs workpiece diameter.

Product code		Workpiece diameter	Tmax (in)																
			≤0.31496	0.354	0.394	0.433	0.472	0.512	0.551	0.591	0.669	0.709	0.748	0.787	0.827	0.866	0.906	0.945	0.984
ATSER/L	06-2T0591-D40	Dmax	∞	∞	∞	10.591	4.724	3.110	2.323	1.575	-	-	-	-	-	-	-	-	-
	08-2T0591-D40		∞	∞	∞	10.591	4.724	3.110	2.323	1.575	-	-	-	-	-	-	-	-	-
	10-2T0787-D45		∞	∞	∞	∞	∞	17.008	7.598	4.921	2.992	2.520	2.244	1.772	-	-	-	-	-
	12-2T0787-D45		∞	∞	∞	∞	∞	17.008	7.598	4.921	2.992	2.520	2.244	1.772	-	-	-	-	-
	16-2T0787-D45		∞	57.795	13.346	7.598	5.354	4.173	3.425	2.953	2.362	2.205	2.047	1.772	-	-	-	-	-
	08-3T0591-D40		∞	∞	∞	10.591	4.724	3.110	2.323	1.575	-	-	-	-	-	-	-	-	-
	10-3T0787-D45		∞	∞	∞	∞	∞	17.008	7.598	4.921	2.992	2.520	2.244	1.772	-	-	-	-	-
	12-3T0787-D45		∞	∞	∞	∞	∞	17.008	7.598	4.921	2.992	2.520	2.244	1.772	-	-	-	-	-
	16-3T0787-D45		∞	57.795	13.346	7.598	5.354	4.173	3.425	2.953	2.362	2.205	2.047	1.772	-	-	-	-	-
	16-3T0984-D60		∞	∞	∞	∞	∞	∞	∞	∞	16.457	9.331	6.575	5.118	4.213	3.583	3.189	2.874	2.362

The diameter is infinite

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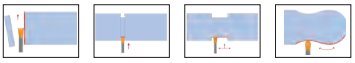
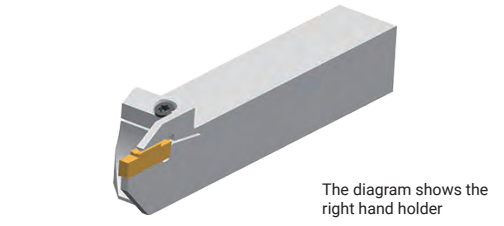
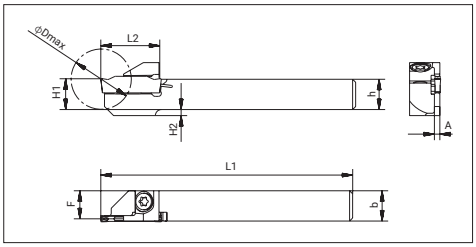
ATSER/L-SW External Turning and Grooving Holder for Swiss Lathe







Product code		Dimension (in)									Inserts*
		h	b	H1	H2	A	L1	L2	F	Dmax	Marked	
ATSER/L	06-2D20-SW	0.375	0.375	0.375	0.079	0.071	5.000	0.787	0.358	0.787	○	ACD/ACS/ATD
	08-2D24-SW	0.375	0.375	0.375	0.079	0.071	5.000	0.787	0.437	0.945	●	
	10-2D32-SW	0.625	0.625	0.625	0.000	0.071	5.000	0.984	0.594	1.260	●	
	08-3D24-SW	0.500	0.500	0.500	0.079	0.094	5.000	0.787	0.425	0.945	●	
	10-3D32-SW	0.625	0.625	0.625	0.000	0.094	5.000	0.984	0.583	1.260	●	
	10-3D38-SW	0.625	0.625	0.625	0.000	0.094	5.000	1.063	0.583	1.496	○	
	12-3D45-SW	0.750	0.750	0.750	0.000	0.094	5.000	0.945	0.740	1.772	○	

Inserts*: ACD/ACS series are only applicable to grooving and parting off machining

Marked: ● Stock available ○ Non-stocked standard

Product code	Screw	Wrench
		
ATSER/L-SW	SP040125	LT-TP15

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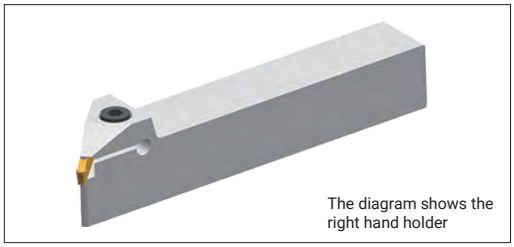
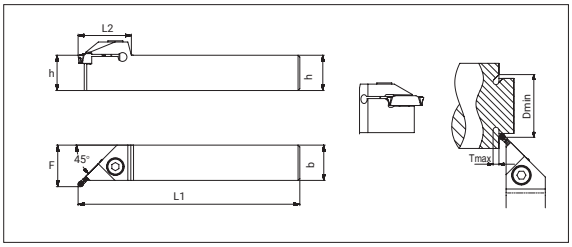
AGUER/L External Under Cut Holder





Product code		Insert Dimension (in)	Dimension (in)								Inserts*
			h	b	H1	L1	L2	F	Tmax	Dmin	Marked	
AGUER/L	10-3	0.079,0.118	0.625	0.625	0.625	4.500	1.161	0.740	0.118	2.362	○	ATD
	10-4	0.158	0.625	0.625	0.625	4.500	1.161	0.740	0.118	2.165	○	
	12-3	0.079,0.118	0.750	0.750	0.750	5.000	1.161	0.898	0.118	2.362	○	
	12-4	0.158	0.750	0.750	0.750	5.000	1.161	0.898	0.118	2.165	○	
	16-3	0.079,0.118	1.000	1.000	1.000	6.000	1.161	1.094	0.118	2.362	○	
	16-4	0.158	1.000	1.000	1.000	6.000	1.161	1.094	0.118	2.165	○	
	16-6	0.236	1.000	1.000	1.000	6.000	1.280	1.102	0.138	2.165	○	

Marked: ● Stock available ○ Non-stocked standard

Product code	Screw	Wrench
		
AGUER/L 10-3	SH050160	LT-H4
AGUER/L 12-3	SH050200	LT-H4
AGUER/L 16-3	SH050250	LT-H4
AGUER/L 10-4	SH060160	LT-H5
AGUER/L 12-4	SH060200	LT-H5
AGUER/L 16-4	SH060250	LT-H5
AGUER/L 16-6	SH060250	LT-H5

Grooving holders
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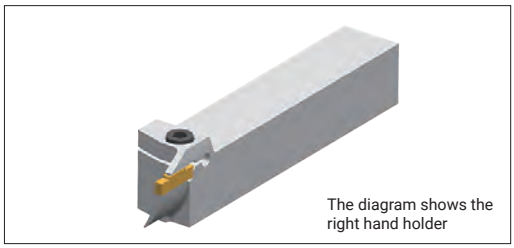
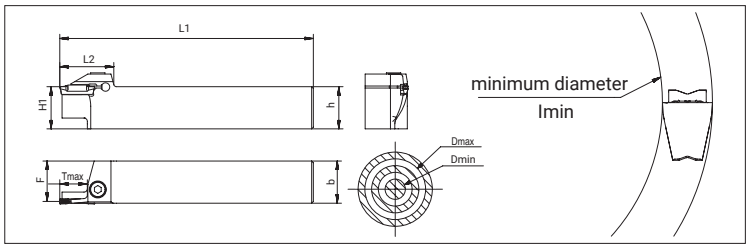
ATSFR/L Face Grooving and Turning Holder





Product code		Dimension (in)									Insert size (in)	Minimum machining diameter of face grooving inserts lmin (in)								Inserts*
		h	b	H1	L1	L2	F	Tmax	Dmin	Dmax		TS	TM	Ground	RM	CS	CM	CH	Marked	
ATSFR/L	16-3T0394-35-45	1.000	1.000	1.000	6.000	1.260	0.943	0.394	1.378	1.772	0.118	0.945	0.945	-	-	-	-	-	○	ACD/ ACS/ ATD
	16-3T0394-40-55	1.000	1.000	1.000	6.000	1.260	0.943	0.394	1.575	2.165	0.118	0.945	0.945	-	-	-	-	-	○	
	16-3T0591-45-65	1.000	1.000	1.000	6.000	1.260	0.943	0.591	1.772	2.559	0.118	0.945	0.945	2.323	2.323	-	-	-	○	
	16-3T0591-55-85	1.000	1.000	1.000	6.000	1.260	0.943	0.591	2.165	3.346	0.118	0.945	0.945	2.323	2.323	3.110	3.110	3.110	○	
	16-4T0591-35-50	1.000	1.000	1.000	6.000	1.260	0.927	0.591	1.378	1.969	0.157	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	16-4T0591-45-65	1.000	1.000	1.000	6.000	1.260	0.927	0.591	1.772	2.559	0.157	0.866	0.866	1.654	1.654	-	1.654	1.654	●	
	16-4T0591-55-85	1.000	1.000	1.000	6.000	1.260	0.927	0.591	2.165	3.346	0.157	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	16-5T0787-50-80	1.000	1.000	1.000	6.000	1.575	0.907	0.787	1.969	3.150	0.197	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-5T0787-70-110	1.000	1.000	1.000	6.000	1.575	0.907	0.787	2.756	4.331	0.197	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-5T0787-100-150	1.000	1.000	1.000	6.000	1.575	0.907	0.787	3.937	5.906	0.197	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-5T0787-140-200	1.000	1.000	1.000	6.000	1.575	0.907	0.787	5.512	7.874	0.197	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-6T0787-50-85	1.000	1.000	1.000	6.000	1.575	0.888	0.787	1.969	3.346	0.236	0.709	0.709	1.496	1.496	-	1.890	1.890	●	
	16-6T0787-75-150	1.000	1.000	1.000	6.000	1.575	0.888	0.787	2.953	5.906	0.236	0.709	0.709	1.496	1.496	-	1.890	1.890	○	
	16-6T0787-140-250	1.000	1.000	1.000	6.000	1.575	0.888	0.787	5.512	9.843	0.236	0.709	0.709	1.496	1.496	-	1.890	1.890	○	
	16-6T0787-200-000	1.000	1.000	1.000	6.000	1.575	0.888	0.787	7.874	∞	0.236	0.709	0.709	1.496	1.496	-	1.890	1.890	○	

Marked: ● Stock available ○ Non-stocked standard

1.Inserts*: ACD/ACS series are only applicable to grooving machining
2."-"Indicates that the insert is not a choice
3.Having selected the range of tool holder, please check the minimum face grooving machining diameter of the selected insert

Product code	Screw	Wrench
		
ATSFR/L 16-3	SH050250	LT-H4
ATSFR/L 16-4	SH060250	LT-H5
ATSFR/L 16-5	SH080250	LT-H6
ATSFR/L 16-6	SH080250	LT-H6

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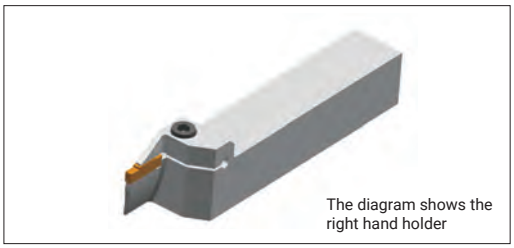
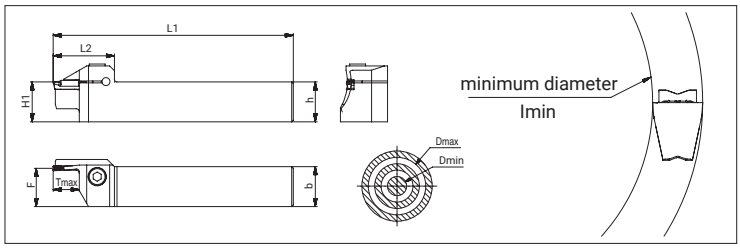
ATSFR/L-OB Face Grooving and Turning Holder (Outside Bluge Type)





Product code		Dimension (in)									Minimum machining diameter of face grooving inserts Imin (in)							Inserts*
		h	b	H1	L1	L2	F	Tmax	Dmin	Dmax	TS	TM	Ground	RM	CS	CM	CH	Marked	
ATSFR/L	12-3T0394-30-40-OB	0.750	0.750	0.750	6.000	1.220	0.746	0.394	1.181	1.575	0.945	0.945	-	-	-	-	-	○	ACD/ ACS/ ATD
	12-3T0394-35-50-OB	0.750	0.750	0.750	6.000	1.220	0.746	0.394	1.378	1.969	0.945	0.945	-	-	-	-	-	○	
	12-3T0591-45-70-OB	0.750	0.750	0.750	6.000	1.378	0.746	0.591	1.772	2.756	0.945	0.945	2.323	2.323	-	-	-	○	
	12-3T0591-65-100-OB	0.750	0.750	0.750	6.000	1.378	0.746	0.591	2.559	3.937	0.945	0.945	2.323	2.323	3.110	3.110	3.110	○	
	12-4T0394-20-30-OB	0.750	0.750	0.750	6.000	1.220	0.730	0.394	0.787	1.181	0.866	0.866	-	-	-	-	-	○	
	12-4T0394-25-35-OB	0.750	0.750	0.750	6.000	1.220	0.730	0.394	0.984	1.378	0.866	0.866	-	-	-	-	-	○	
	12-4T0630-30-45-OB	0.750	0.750	0.750	6.000	1.417	0.730	0.630	1.181	1.772	0.866	0.866	-	-	-	-	-	○	
	12-4T0630-35-50-OB	0.750	0.750	0.750	6.000	1.417	0.730	0.630	1.378	1.969	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	12-4T0630-45-70-OB	0.750	0.750	0.750	6.000	1.417	0.730	0.630	1.772	2.756	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	12-4T0630-65-120-OB	0.750	0.750	0.750	6.000	1.417	0.730	0.630	2.559	4.724	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	12-4T0630-115-200-OB	0.750	0.750	0.750	6.000	1.417	0.730	0.630	4.528	7.874	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	16-3T0394-35-50-OB	1.000	1.000	1.000	6.000	1.496	0.943	0.394	1.378	1.969	0.945	0.945	-	-	-	-	-	○	
	16-3T0591-45-70-OB	1.000	1.000	1.000	6.000	1.496	0.943	0.591	1.772	2.756	0.945	0.945	2.323	2.323	-	-	-	○	
	16-3T0591-65-100-OB	1.000	1.000	1.000	6.000	1.496	0.943	0.591	2.559	3.937	0.945	0.945	2.323	2.323	3.110	3.110	3.110	●	
	16-4T0394-25-35-OB	1.000	1.000	1.000	6.000	1.535	0.927	0.394	0.984	1.378	0.866	0.866	-	-	-	-	-	○	
	16-4T0787-30-45-OB	1.000	1.000	1.000	6.000	1.535	0.927	0.787	1.181	1.772	0.866	0.866	-	-	-	-	-	○	
	16-4T0787-35-50-OB	1.000	1.000	1.000	6.000	1.535	0.927	0.787	1.378	1.969	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	16-4T0787-45-70-OB	1.000	1.000	1.000	6.000	1.535	0.927	0.787	1.772	2.756	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	16-4T0787-65-125-OB	1.000	1.000	1.000	6.000	1.535	0.927	0.787	2.559	4.921	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	16-4T0787-115-200-OB	1.000	1.000	1.000	6.000	1.535	0.927	0.787	4.528	7.874	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	16-4T0787-190-000-OB	1.000	1.000	1.000	6.000	1.535	0.927	0.787	7.480	∞	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	16-5T0984-50-80-OB	1.000	1.000	1.000	6.000	1.929	0.907	0.984	1.969	3.150	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-5T0591-50-80-OB	1.000	1.000	1.000	6.000	1.614	0.907	0.591	1.969	3.150	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-5T0984-70-110-OB	1.000	1.000	1.000	6.000	1.929	0.907	0.984	2.756	4.331	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-5T0591-70-110-OB	1.000	1.000	1.000	6.000	1.929	0.907	0.591	2.756	4.331	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-5T0984-100-150-OB	1.000	1.000	1.000	6.000	1.929	0.907	0.984	3.937	5.906	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-5T0984-140-200-OB	1.000	1.000	1.000	6.000	1.929	0.907	0.984	5.512	7.874	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-5T0984-190-000-OB	1.000	1.000	1.000	6.000	1.929	0.907	0.984	7.480	∞	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-6T0984-50-70-OB	1.000	1.000	1.000	6.000	1.929	0.888	0.984	1.969	2.756	0.709	0.709	1.496	1.496	-	1.890	1.890	○	
	16-6T0984-60-100-OB	1.000	1.000	1.000	6.000	1.929	0.888	0.984	2.362	3.937	0.709	0.709	1.496	1.496	-	1.890	1.890	○	
	16-6T0984-90-180-OB	1.000	1.000	1.000	6.000	1.929	0.888	0.984	3.543	7.087	0.709	0.709	1.496	1.496	-	1.890	1.890	○	
	16-6T0984-170-400-OB	1.000	1.000	1.000	6.000	1.929	0.888	0.984	6.693	15.748	0.709	0.709	1.496	1.496	-	1.890	1.890	○	
	16-6T0984-390-000-OB	1.000	1.000	1.000	6.000	1.929	0.888	0.984	15.354	∞	0.709	0.709	1.496	1.496	-	1.890	1.890	○	

Marked: ● Stock available ○ Non-stocked standard

1.Inserts*: ACD/ACS series are only applicable to grooving machining
2."-"Indicates that the insert is not a choice
3.Having selected the range of tool holder, please check the minimum face grooving machining diameter of the selected insert

Product code	Screw	Wrench
		
ATSFR/L-OB 12-3/4	SH060200	LT-H5
ATSFR/L-OB 16-3	SH060250	LT-H5
ATSFR/L-OB 16-4	SH060250	LT-H5
ATSFR/L-OB 16-5	SH080250	LT-H6
ATSFR/L-OB 16-6	SH080250	LT-H6

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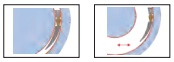
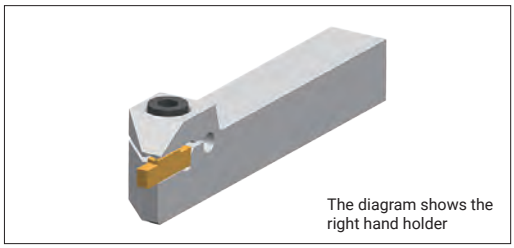
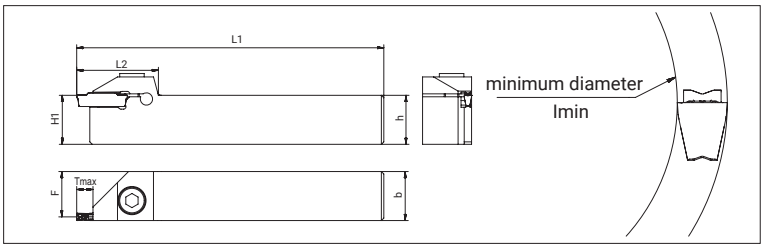
AGSFR/L External & Face Grooving and Turning Holder







Product code		Insert size (in)	Dimension (in)						Minimum machining diameter of face grooving inserts Imin (in)								Inserts*
			h	b	H1	L1	L2	F	TS	TM	Ground	RM	CS	CM	CH	Marked	
AGSFR/L	10-4	0.079	0.625	0.625	0.625	4.500	1.260	0.573	7.717	-	3.937	7.717	7.717	7.717	7.717	○	ACD/ACS/ATD
		0.118	0.625	0.625	0.625	4.500	1.260	0.573	0.945	0.945	2.323	2.323	3.110	3.110	3.110	○	
		0.157	0.625	0.625	0.625	4.500	1.260	0.573	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	10-4	0.079	0.750	0.750	0.750	5.000	1.260	0.730	7.717	-	3.937	7.717	7.717	7.717	7.717	○	
		0.118	0.750	0.750	0.750	5.000	1.260	0.730	0.945	0.945	2.323	2.323	3.110	3.110	3.110	○	
		0.157	0.750	0.750	0.750	5.000	1.260	0.730	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	12-6	0.197	0.750	0.750	0.750	5.000	1.496	0.692	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
		0.236	0.750	0.750	0.750	5.000	1.496	0.692	0.709	0.709	1.496	1.496	-	1.890	1.890	○	
	16-4	0.079	1.000	1.000	1.000	6.000	1.496	0.927	7.717	-	3.937	7.717	7.717	7.717	7.717	○	
		0.118	1.000	1.000	1.000	6.000	1.496	0.927	0.945	0.945	2.323	2.323	3.110	3.110	3.110	○	
		0.157	1.000	1.000	1.000	6.000	1.496	0.927	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	16-6	0.197	1.000	1.000	1.000	6.000	1.496	0.889	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
		0.236	1.000	1.000	1.000	6.000	1.496	0.889	0.709	0.709	1.49606	1.496	-	1.890	1.890	○	

Marked: ● Stock available ○ Non-stocked standard

1.Inserts*: ACD/ACS series are only applicable to grooving machining
2."-"Indicates that the insert is not a choice
3.Having selected the range of tool holder, please check the minimum face grooving machining diameter of the selected insert

Product code	Screw	Wrench
		
AGSFR/L 10	SH060160	LT-H5
AGSFR/L 12	SH060200	LT-H5
AGSFR/L 16	SH060250	LT-H5

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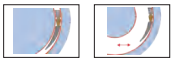
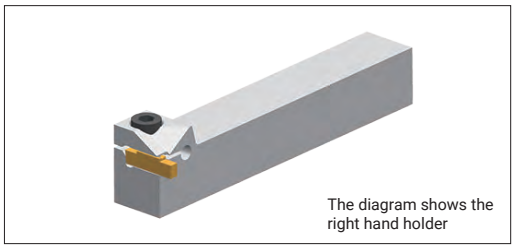
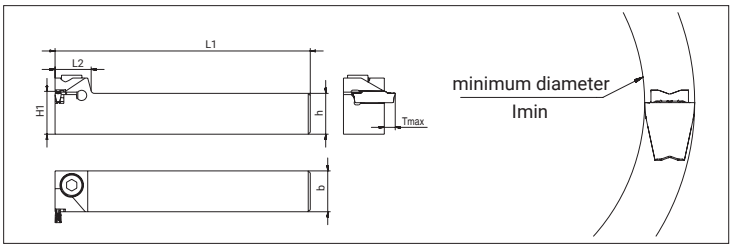
AGPFR/L Face Grooving and Turning Holder







Product code		Insert size (in)	Dimension (in)						Minimum machining diameter of face grooving inserts Imin (in)							Inserts*
			h	b	H1	L1	L2	Tmax	TS	TM	Ground	RM	CS	CM	Marked	
AGPFR/L	12-4	0.079	0.750	0.750	0.750	5.000	0.787	0.181	7.717	-	3.937	7.717	7.717	7.717	○	ACD/ACS/ATD
		0.118	0.750	0.750	0.750	5.000	0.787	0.181	0.945	0.945	2.323	2.323	3.110	3.110	○	
		0.157	0.750	0.750	0.750	5.000	0.787	0.181	0.866	0.866	1.654	1.654	-	1.654	○	
	16-4	0.079	1.000	1.000	1.000	6.000	0.787	0.181	7.717	-	3.937	7.717	7.717	7.717	○	
		0.118	1.000	1.000	1.000	6.000	0.787	0.181	0.945	0.945	2.323	2.323	3.110	3.110	○	
		0.157	1.000	1.000	1.000	6.000	0.787	0.181	0.866	0.866	1.654	1.654	-	1.654	○	
	16-6	0.197	1.000	1.000	1.000	6.000	0.984	0.181	0.787	0.787	1.575	1.575	-	1.969	○	
		0.236	1.000	1.000	1.000	6.000	0.984	0.181	0.709	0.709	1.496	1.496	-	1.890	○	

Marked: ● Stock available ○ Non-stocked standard

1.Inserts*: ACD/ACS series are only applicable to grooving machining
2."-"Indicates that the insert is not a choice
3.Having selected the range of tool holder, please check the minimum face grooving machining diameter of the selected insert

Product code	Screw	Wrench
		
AGPFR/L 12	SH060200	LT-H5
AGPFR/L 16	SH060250	LT-H5

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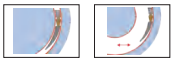
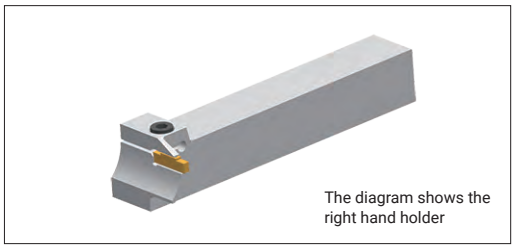
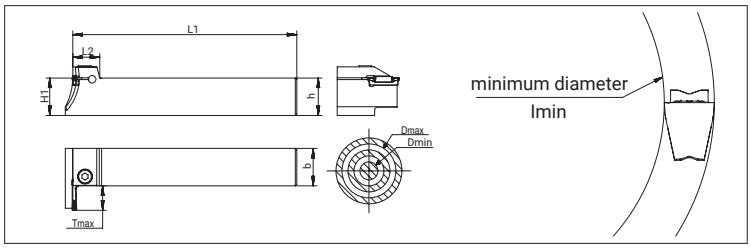
ATPFR/L Face Grooving and Turning Holder







Product code		Insert block size (in)	Dimension (in)							Minimum machining diameter of face grooving inserts Imin (in)								Inserts*
			h	b	L1	L2	Tmax	Dmin	Dmax	TS	TM	Ground	RM	CS	CM	CH	Marked	
ATPFR/L	16-3T0394-30-40	0.118	1.000	1.000	6.000	0.709	0.394	1.181	1.575	0.945	0.945	-	-	-	-	-	○	ACD/ ACS/ ATD
	16-3T0394-35-50	0.118	1.000	1.000	6.000	0.709	0.394	1.378	1.969	0.945	0.945	-	-	-	-	-	○	
	16-3T0591-45-60	0.118	1.000	1.000	6.000	0.709	0.591	1.772	2.362	0.945	0.945	-	-	-	-	-	○	
	16-3T0591-55-85	0.118	1.000	1.000	6.000	0.709	0.591	2.165	3.346	0.945	0.945	2.323	2.323	3.110	3.110	3.110	○	
	16-4T0472-25-40	0.157	1.000	1.000	6.000	0.728	0.472	0.984	1.575	0.866	0.866	-	-	-	-	-	○	
	16-4T0591-35-50	0.157	1.000	1.000	6.000	0.728	0.591	1.378	1.969	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	16-4T0591-45-60	0.157	1.000	1.000	6.000	0.728	0.591	1.772	2.362	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	16-4T0591-55-85	0.157	1.000	1.000	6.000	0.728	0.591	2.165	3.346	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	16-5T0787-50-80	0.197	1.000	1.000	6.000	0.866	0.787	1.969	3.150	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-5T0787-70-110	0.197	1.000	1.000	6.000	0.866	0.787	2.756	4.331	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-5T0787-100-150	0.197	1.000	1.000	6.000	0.866	0.787	3.937	5.906	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-5T0787-140-200	0.197	1.000	1.000	6.000	0.866	0.787	5.512	7.874	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-5T0787-190-000	0.197	1.000	1.000	6.000	0.866	0.787	7.480	∞	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
	16-6T0787-50-85	0.236	1.000	1.000	6.000	0.866	0.787	1.969	3.346	0.709	0.709	1.496	1.496	-	1.890	1.890	○	
	16-6T0787-75-150	0.236	1.000	1.000	6.000	0.866	0.787	2.953	5.906	0.709	0.709	1.496	1.496	-	1.890	1.890	○	
	16-6T0787-140-250	0.236	1.000	1.000	6.000	0.866	0.787	5.512	9.843	0.709	0.709	1.496	1.496	-	1.890	1.890	○	
	16-6T0787-240-000	0.236	1.000	1.000	6.000	0.866	0.787	9.449	∞	-	1.890	1.890	0.709	0.709	1.496	1.496	○	

Marked: ● Stock available ○ Non-stocked standard

1.Inserts*: ACD/ACS series are only applicable to grooving machining
2."-"Indicates that the insert is not a choice
3.Having selected the range of tool holder, please check the minimum face grooving machining diameter of the selected insert

Product code	Screw	Wrench
		
ATPFR/L 16-3	SH050250	LT-H4
ATPFR/L 16-4	SH060250	LT-H5
ATPFR/L 16-5	SH080250	LT-H6
ATPFR/L 16-6	SH080250	LT-H6

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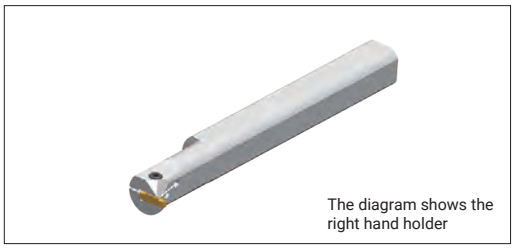
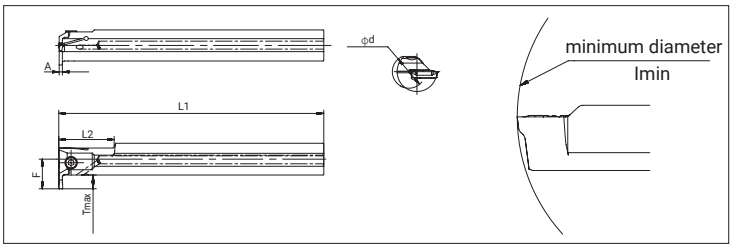
ATPIR/L Internal Grooving, Turning and Profiling Holder





Product code		Dimension (in)							Minimum machining diameter of internal grooving inserts Imin (in)									Inserts*
		d	L1	L1	F	A	Tmax	Dmin	TS	TM	Ground	RM	RA	CS	CM	CH	Marked	
ATPIR/L	0750-2T0236-25-C	0.750	6.000	1.575	0.622	0.063	0.236	0.984	0.984	-	0.984	0.984	-	-	-	-	●	ACD/ ACS/ATD
	1000-2T0197-25-C	1.000	8.000	1.575	0.689	0.063	0.197	0.984	0.984	-	0.984	0.984	-	-	-	-	●	
	1250-2T0197-30-C	1.250	10.000	1.575	0.780	0.063	0.197	1.181	0.984	-	0.984	0.984	-	-	-	-	○	
	0750-3T0236-25-C	0.750	6.000	1.575	0.622	0.083	0.236	0.984	0.984	0.984	0.984	0.984	0.984	-	-	-	○	
	1000-3T0197-25-C	1.000	8.000	1.575	0.689	0.083	0.197	0.984	0.984	0.984	0.984	0.984	0.984	-	-	-	○	
	1000-3T0315-32-C	1.000	8.000	1.575	0.846	0.094	0.315	1.260	0.984	0.984	0.984	0.984	0.984	-	-	-	○	
	1250-3T0197-30-C	1.250	10.000	2.362	0.780	0.083	0.197	1.181	0.984	0.984	0.984	0.984	0.984	-	-	-	○	
	1250-3T0394-40-C	1.250	8.000	2.362	1.063	0.094	0.394	1.575	0.984	0.984	0.984	0.984	0.984	-	-	-	●	
	1500-3T0472-50-C	1.500	12.000	2.559	1.299	0.094	0.472	1.969	0.984	0.984	0.984	0.984	0.984	1.772	1.772	1.772	●	
	0750-4T0236-25-C	0.750	6.000	1.575	0.622	0.118	0.236	0.984	0.984	0.984	0.984	0.984	0.984	-	-	-	○	
	1000-4T0197-25-C	1.000	8.000	1.575	0.689	0.114	0.197	0.984	0.984	0.984	0.984	0.984	0.984	-	-	-	○	
	1000-4T0315-32-C	1.000	8.000	1.575	0.846	0.118	0.315	1.260	0.984	0.984	0.984	0.984	0.984	-	-	-	○	
	1250-4T0197-30-C	1.250	10.000	2.362	0.819	0.114	0.197	1.181	0.984	0.984	0.984	0.984	0.984	-	-	-	○	
	1250-4T0394-40-C	1.250	10.000	2.362	1.063	0.118	0.394	1.575	0.984	0.984	0.984	0.984	0.984	-	-	-	○	
	1500-4T0472-50-C	1.500	12.000	2.559	1.299	0.118	0.472	1.969	0.984	0.984	0.984	0.984	0.984	-	1.772	1.772	●	
	2000-4T0551-60-C	2.000	14.000	2.756	1.575	0.118	0.551	2.362	0.984	0.984	0.984	0.984	0.984	-	1.772	1.772	●	
	1000-5T0197-31-C	1.000	8.000	1.575	0.681	0.154	0.197	1.220	1.181	1.181	1.181	1.181	1.181	-	-	-	○	
	1250-5T0197-31-C	1.250	10.000	2.362	0.819	0.154	0.197	1.220	1.181	1.181	1.181	1.181	1.181	-	-	-	○	
	1250-5T0394-40-C	1.250	10.000	2.362	1.063	0.152	0.394	1.575	1.181	1.181	1.181	1.181	1.181	-	-	-	○	
	1500-5T0472-50-C	1.500	12.000	2.559	1.299	0.152	0.472	1.969	1.181	1.181	1.181	1.181	1.181	-	1.772	1.772	○	
	2000-5T0551-60-C	2.000	14.000	2.756	1.575	0.152	0.551	2.362	1.181	1.181	1.181	1.181	1.181	-	1.772	1.772	○	
	1250-6T0197-31-C	1.250	10.000	2.362	0.819	0.193	0.197	1.220	1.181	1.181	1.181	1.181	1.181	-	-	-	○	
	1250-6T0394-40-C	1.250	10.000	2.362	1.063	0.191	0.394	1.575	1.181	1.181	1.181	1.181	1.181	-	-	-	○	
	1500-6T0472-50-C	1.500	12.000	2.559	1.299	0.191	0.472	1.969	1.181	1.181	1.181	1.181	1.181	-	1.772	1.772	○	
	2000-6T0551-60-C	2.000	14.000	2.756	1.575	0.191	0.551	2.362	1.181	1.181	1.181	1.181	1.181	-	1.772	1.772	○	
	1250-8T0236-38-C	1.250	10.000	2.362	0.839	0.230	0.236	1.496	1.260	1.260	1.260	1.260	1.260	-	-	-	○	
	1500-8T0236-42-C	1.500	12.000	2.362	1.016	0.230	0.236	1.654	1.260	1.260	1.260	1.260	1.260	-	-	-	○	

Marked: ● Stock available ○ Non-stocked standard

1.Inserts*: ACD/ACS series are only applicable to grooving machining
2."-"Indicates that the insert is not a choice
3.Having selected the range of tool holder, please check the minimum face grooving machining diameter of the selected insert

Product code	Screw	Wrench
		
ATPIR/L 0750-2/3/4	SH050120	LT-H4
ATPIR/L 1000-2/3/4	SH050160	LT-H4
ATPIR/L 2000-3/4	SH050160	LT-H4
ATPIR/L 1500-3/4	SH050160	LT-H4
ATPIR/L 2000-4	SH050200	LT-H4
ATPIR/L 1000-5	SH060160	LT-H5
ATPIR/L 1250-5/6/8	SH060200	LT-H5
ATPIR/L 1500/2000-5/6/8	SH060250	LT-H5

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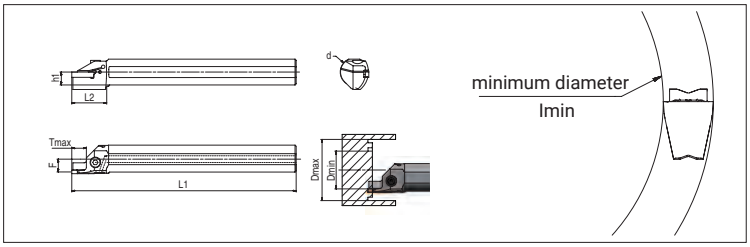
ATSIR/L Internal Facing Grooving and Turning Holder



Product code		Dimension (in)								Minimum machining diameter of face grooving inserts Imin (in)								Inserts*
		d	L1	L2	F	h1	Tmax	Dmin	Dmax	TS	TM	Ground	RM	CS	CM	CH	Marked	
ATSIR/L	1000-3T0472-35-45-C	1.000	8.000	1.220	0.453	0.453	0.472	1.378	1.772	0.945	0.945	-	-	-	-	-	○	ACD/ ACS/ ATD
	1000-3T0472-40-60-C	1.000	8.000	1.220	0.453	0.453	0.472	1.575	2.362	0.945	0.945	-	-	-	-	-	○	
	1000-3T0472-55-90-C	1.000	8.000	1.220	0.453	0.453	0.472	2.165	3.543	0.945	0.945	2.323	2.323	-	-	-	○	
	1000-3T0472-80-150-C	1.000	8.000	1.220	0.453	0.453	0.472	3.150	5.906	0.945	0.945	2.323	2.323	3.110	3.110	3.110	○	
	1000-4T0472-20-35-C	1.000	8.000	1.220	0.433	0.453	0.472	0.787	1.378	0.866	0.866	-	-	-	-	-	○	
	1000-4T0472-28-45-C	1.000	8.000	1.220	0.433	0.453	0.472	1.102	1.772	0.866	0.866	-	-	-	-	-	○	
	1000-4T0472-35-55-C	1.000	8.000	1.220	0.433	0.453	0.472	1.378	2.165	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	1250-4T0472-45-70-C	1.250	10.000	1.220	0.571	0.591	0.472	1.772	2.756	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	1250-4T0472-60-100-C	1.250	10.000	1.220	0.571	0.591	0.472	2.362	3.937	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	1250-4T0472-90-180-C	1.250	10.000	1.220	0.571	0.591	0.472	3.543	7.087	0.866	0.866	1.654	1.654	-	1.654	1.654	○	

Marked: ● Stock available ○ Non-stocked standard

1.Inserts*: ACD/ACS series are only applicable to grooving machining
2."-"Indicates that the insert is not a choice
3.Having selected the range of tool holder, please check the minimum face grooving machining diameter of the selected insert

Product code	Screw	Wrench
		
ATSIR/L 1000-3/4	SH050160	LT-H4
ATPIR/L 1250-4	SH050160	LT-H4

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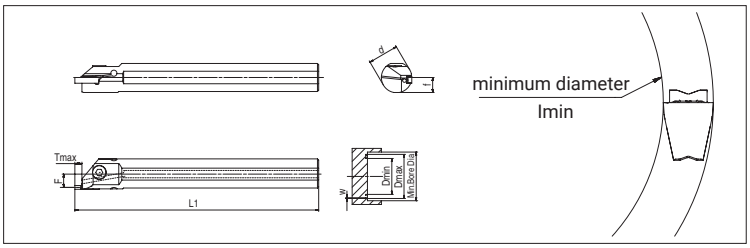
AGSIR/L Internal Facing Grooving and Turning Holder



Product code		Insert size (in)	Dimension (in)					Minimum machining diameter of face grooving inserts Imin (in)								Inserts*
			d	L1	H1	F	Tmax	TS	TM	Ground	RM	CS	CM	CH	Marked	
AGSIR/L	1000-4T0228-C	0.079	1.000	8.000	0.484	0.429	0.228	7.717	-	3.937	7.717	7.717	7.717	7.717	○	ACD/ACS/ ATD
		0.118	1.000	8.000	0.484	0.429	0.228	0.945	0.945	2.323	2.323	3.110	3.110	3.110	○	
		0.157	1.000	8.000	0.484	0.429	0.228	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	1000-6T0228-C	0.197	1.000	8.000	0.484	0.406	0.228	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
		0.236	1.000	8.000	0.484	0.406	0.228	0.709	0.709	1.496	1.496	-	1.890	1.890	○	
	1250-4T0228-C	0.079	1.250	10.000	0.622	0.571	0.228	7.717	-	3.937	7.717	7.717	7.717	7.717	○	
		0.118	1.250	10.000	0.622	0.571	0.228	0.945	0.945	2.323	2.323	3.110	3.110	3.110	○	
		0.157	1.250	10.000	0.622	0.571	0.228	0.866	0.866	1.654	1.654	-	1.654	1.654	○	
	1250-6T0228-C	0.197	1.250	10.000	0.622	0.543	0.228	0.787	0.787	1.575	1.575	-	1.969	1.969	○	
		0.236	1.250	10.000	0.622	0.543	0.228	0.709	0.709	1.496	1.496	-	1.890	1.890	○	

Marked: ● Stock available ○ Non-stocked standard

1.Inserts*: ACD/ACS series are only applicable to grooving machining
2."-"Indicates that the insert is not a choice
3.Having selected the range of tool holder, please check the minimum face grooving machining diameter of the selected insert

Product code	Screw	Wrench
		
AGSIR/L 1000	SH060160	LT-H4
AGSIR/L 1250	SH060160	LT-H4

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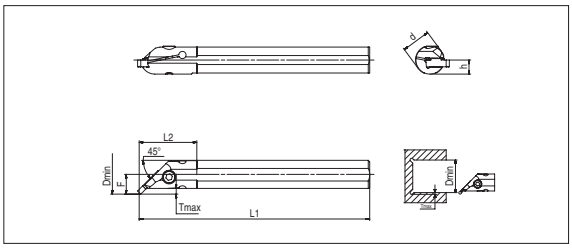
AGUIR/L Internal Under Cut Machining Holder



Product code		Dimension (in)							Inserts*
		d	L1	L2	F	Tmax	Dmin	Marked	
AGUIR/L	0750-3T0118-45	0.750	6.000	1.575	0.484	0.118	1.772	○	ATD
	0750-4T0118-45	0.750	6.000	1.575	0.484	0.118	1.772	○	
	0750-3T0118-45	1.000	8.000	1.575	0.567	0.118	1.772	○	
	1000-4T0118-45	1.000	8.000	1.575	0.567	0.118	1.772	○	
	1000-6T0118-45	1.000	8.000	1.575	0.567	0.118	1.772	○	

Product code	Screw	Wrench
		
AGUIR/L 0750-3	SH050120	LT-H4
AGUIR/L 0750-4	SH050120	LT-H4
AGUIR/L 1000-3	SH050160	LT-H4
AGUIR/L 1000-4	SH050160	LT-H4
AGUIR/L 1000-6	SH060160	LT-H5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Insert Denomination System

A	C	D	4	0	3	-	CM	-	6	R
1	2	3	4	5		-	6	-	7	8

1-Company name

ACHTECK

2-Application

C	Grooving/Parting off
T	Turning/Grooving

3-Insert shape

S	Single-edged
D	Double-edged

4-Insert width

2=0.079
3=0.118
4=0.157

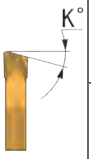
5-Corner radius

02=0.0079
03=0.0118
04=0.0157

6-Geometry

CS
CM
CH
TS

7-Cutting edge angle



6
15

8-Hand of tool

L: Left

R: Right

Insert Denomination System (Ground)

A	T	D	215	E	010	G	-	R/L
1	2	3	4	5	6	7	-	8

1-Company name

ACHTECK

2-Application

T	Turning/Grooving

3-Insert shape

S	Single-edged
D	Double-edged

4-Insert width

2=0.079
3=0.118
4=0.157

5-Application

E: External
F: Facing
I: Internal

6-Corner radius

010=0.004
020=0.008
200=0.079

7-Application limited

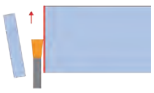
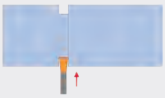
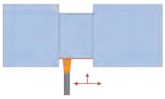
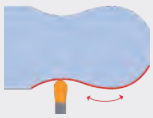
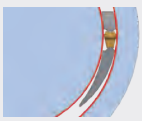
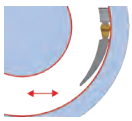
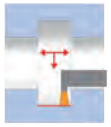
G	only applicable to parting off

8-insert direction

L: left hand

R: right hand

Overview of Grooving Inserts

Application \ Inserts*			ACD			ATD				
			CS	CM	CH	TS	TM	RM	RA	G
										
Page			P124	P125	P126	P127	P128	P129	P130	P131-133
External grooving	Parting off		●	●	●	◐	◐			
	Grooving		●	●	●	●	●	●		●
	Turning					●	●	●	◐	◐
	Profiling							●	●	◐
	Under cut							●	●	◐
Face grooving	Grooving		◐	◐	◐	●	●			●
	Turning					●	●			◐
Internal machining	Grooving		◐	◐	◐	●	●			●
	Turning					●	●	◐		◐

Marked: ● Best choice
◐ 2nd choice

ACHTECK

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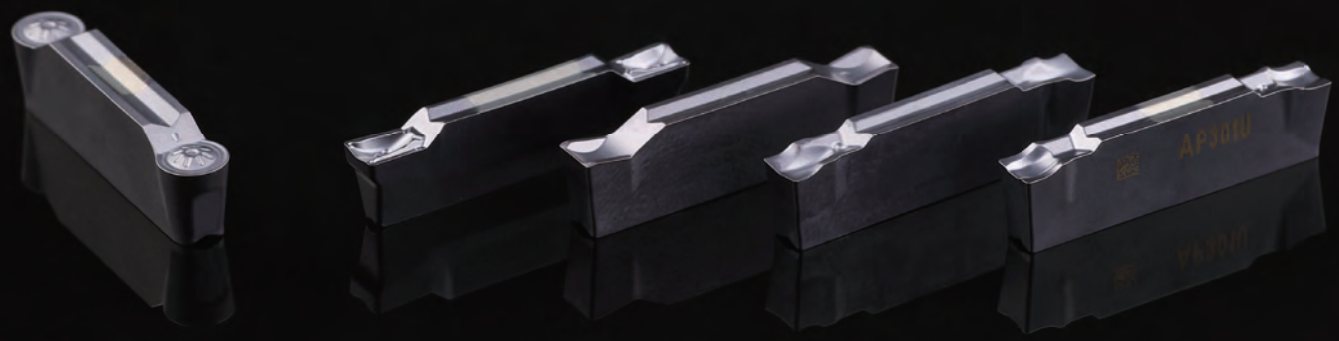
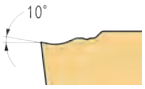
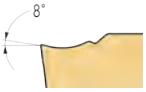
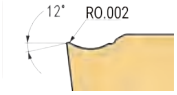
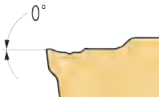
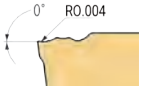


Grooving inserts

Insert Geometry Introduction

Inserts	Geometry	Shape of cutting edge	Description
	CS		1. Used in parting off & grooving stainless steel, heat resistant alloy and low carbon steel 2. For low feed rate application
	CM		1. Used in parting off & grooving low carbon steel and stainless steel 2. For sticky material, pipe fitting, thin-walled part parting off, low cutting force 3. For low to medium feed rate
	CH		1. Used in parting off and grooving steel with high hardness and toughness, alloy steel and stainless steel 2. Strong cutting edge 3. For parting office and grooving at medium to high feed rate
	TS		1. Multifunctional insert for external, internal turning and grooving, parting off, face grooving and face turning 2. Excellent chip control 3. For low and medium feed rate. 4. There is a wider machining diameter range in the internal grooving and face grooving.
	TM		1. Multifunctional insert for external, internal turning and grooving, parting off, face grooving and face turning 2. Stronger cutting edge design 3. For medium feed rate
	RM		1. External grooving, turning, profiling 2. Medium feed rate
	RA		1. For turning and profiling aluminum alloy 2. High positive rake angle and sharp cutting edge 3. Ground inserts with high precision

Grade Application Guide

Grooving grade ISO group					
Material	Materials	ISO	PVD coated AP301U	Uncoated AW100K	ISO
P	Unalloy steels / Alloyed steels	P01			P01
		P05			P05
		P10			P10
		P15	AP301U		P15
		P20			P20
		P25			P25
		P30			P30
		P35			P35
		P40			P40
		P45			P45
		P50			P50
M	Stainless steels	M01			M01
		M05			M05
		M10			M10
		M15	AP301U		M15
		M20			M20
		M25			M25
		M30			M30
		M35			M35
		M40			M40
		M45			M45
K	Cast iron	K01			K01
		K05			K05
		K10			K10
		K15	AP301U		K15
		K20			K20
		K25			K25
		K30			K30
		K35			K35
		K40			K40
		K45			K45
		K50			K50
S	Heat resistant alloys	S01			S01
		S05			S05
		S10			S10
		S15			S15
		S20			S20
		S25			S25
		S30			S30
		S35			S35
		S40			S40
N	Aluminum/ Aluminum alloys	N01			N01
		N05		AW100K	N05
		N10			N10
		N15			N15
		N20			N20
		N25			N25
		N30			N30
H	Hardened steels/ Chilled cast iron	H01			H01
		H05			H05
		H10			H10
		H15			H15
		H20			H20
		H25			H25
		H30			H30

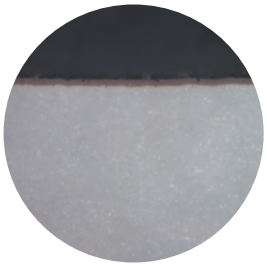
Grade Application Guide

Materials				Turning grade application	
				PVD coated	Uncoated
ISO	Material classification	Tensile strength (lbs/in^2)	Hardness (HB)	AP301U	AW100K
P	Unalloyed steel	<87,022	<180	●	-
		<137,785	<280	●	-
	Alloyed steel	101,526-137,785	200-280	●	-
		137,785-174,044	280-355	●	-
		174,044-203,052	355-415	●	-
M	Duplex stainless steel	112,839	230	●	-
	Austenitic stainless steel	97,900	200	●	-
	Precipitation-hardening stainless steel	146,922	300	●	-
K	Grey cast iron	101,526	220	◐	-
	Nodular cast iron	127,633	260	◐	-
	Malleable cast iron	116,030	250	◐	-
S	Fe-based alloy	136,770	280	-	-
	Co-based alloy	156,060	320	-	-
	Ni-based alloy	170,709	350	-	-
	Ti-alloy	183,037	370	-	-
N	Aluminum	37,710	75	-	●
	Aluminum alloy	64,832	130	-	●
H	Hardened steel	-	50-60HRC	-	-
	Chilled cast iron	-	55HRC	-	-

● Best choice
◐ 2nd choice
- Inapplicable

Grooving Grade Description

AP301U



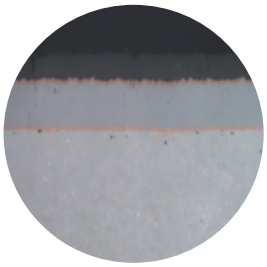
Coating: PVD coating

Suitable for steel, stainless steel and heat resistant alloy grooving. High strength and wear resistance submicron carbide substrate with multi layer nanostructured PVD coating. Good coating adhesion. High wear resistance.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P				AP301U							
M				AP301U							
K				AP301U							
S											
N											
H											

Remark: Best choice
2nd choice

AW100K



Coating: uncoated

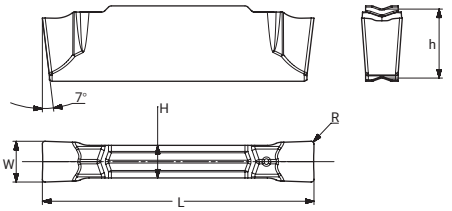
Uncoated ultra-fine grain substrate, specially treated cutting edge, suitable for aluminum alloy grooving

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P											
M											
K											
S											
N		AW100K									
H											

Remark: Best choice

Parting Off-Grooving Series

CS: Double-edged inserts applicable to parting off and grooving



Inserts	Product code	Cutting parameter		Dimension(in)					Grade	
		Tmax	Feed (in/rev)	W	R	L	H	h	AP301U	AW100K
	ACD 202-CS	0.776	0.002-0.005	0.079	0.008	0.787	0.067	0.201	●	
	ACD 302-CS	0.776	0.002-0.006	0.118	0.008	0.787	0.094	0.201	●	

Marked: ● Stock available ○ Non-stocked standard

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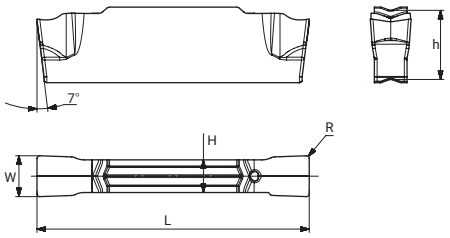
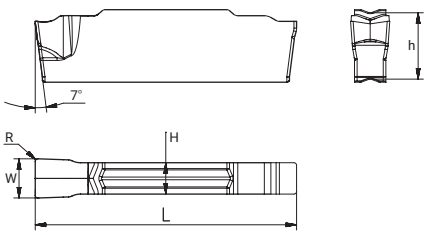
Parting Off-Grooving Series

CM: Double-edged, single-edged inserts applicable to parting off and grooving

ACD



ACS



Inserts	Product code	Cutting parameter		Dimension(in)					Grade	
		Tmax	Feed (in/rev)	W	R	L	H	h	AP301U	AW100K
	ACD 202-CM	0.776	0.002-0.006	0.079	0.008	0.787	0.067	0.201	●	
	ACD 202-CM-6R	0.776	0.001-0.004	0.079	0.008	0.815	0.067	0.201	●	
	ACD 202-CM-6L	0.776	0.001-0.004	0.079	0.008	0.815	0.067	0.201	●	
	ACD 202-CM-15R	0.776	0.001-0.004	0.079	0.008	0.827	0.067	0.201	●	
	ACD 202-CM-15L	0.776	0.001-0.004	0.079	0.008	0.827	0.067	0.201	●	
	ACD 302-CM	0.776	0.002-0.006	0.118	0.008	0.787	0.094	0.201	●	
	ACD 302-CM-6R	0.776	0.002-0.006	0.118	0.008	0.815	0.094	0.201	●	
	ACD 302-CM-6L	0.776	0.002-0.006	0.118	0.008	0.815	0.094	0.201	●	
	ACD 302-CM-15R	0.776	0.002-0.006	0.118	0.008	0.827	0.094	0.201	●	
	ACD 302-CM-15L	0.776	0.002-0.006	0.118	0.008	0.827	0.094	0.201	●	
	ACD 403-CM	0.776	0.002-0.007	0.157	0.012	0.787	0.118	0.201	●	
	ACD 403-CM-4R	0.776	0.002-0.006	0.157	0.012	0.815	0.118	0.201	●	
	ACD 403-CM-4L	0.776	0.002-0.006	0.157	0.012	0.815	0.118	0.201	●	
	ACD 503-CM	0.972	0.002-0.008	0.197	0.012	0.984	0.157	0.197	●	
	ACD 503-CM-4R	0.972	0.002-0.007	0.197	0.012	1.012	0.157	0.197	○	
	ACD 503-CM-4L	0.972	0.002-0.007	0.197	0.012	1.012	0.157	0.197	○	
	ACD 603-CM	1.169	0.002-0.009	0.236	0.012	0.984	0.197	0.197	●	
	ACS 202-CM	0.776	0.002-0.006	0.079	0.008	0.787	0.067	0.201	●	
	ACS 302-CM	0.776	0.002-0.006	0.118	0.008	0.787	0.094	0.201	●	
	ACS 403-CM	0.776	0.002-0.007	0.157	0.012	0.787	0.118	0.201	○	
	ACS 503-CM	0.972	0.002-0.008	0.197	0.012	0.984	0.157	0.197	○	
	ACS 603-CM	1.169	0.002-0.009	0.236	0.012	0.984	0.197	0.197	○	

Remark: 1. if R/L style inserts are selected, the feed need to be reduced by 20-40%
2. ACS single edged insert's Tmas is determined according to the tool holder.

Marked: ● Stock available ○ Non-stocked standard

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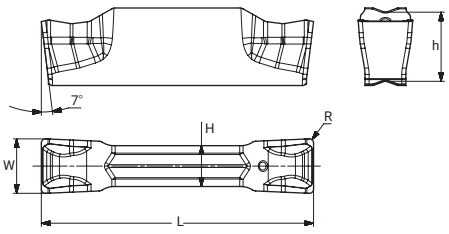
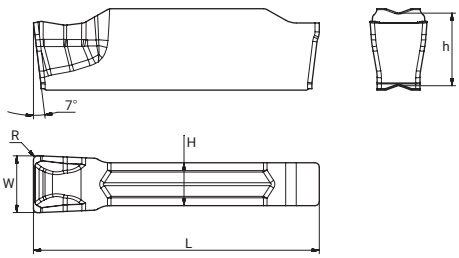
Parting Off-Grooving Series

CH: Double-edged, single-edged inserts applicable to parting off and grooving

ACD



ACS



inserts*	Product code	Cutting parameter		Dimension(in)					Grade	
		Tmax	Feed (in/rev)	W	R	L	H	h	AP301U	AW100K
	ACD 202-CH	0.776	0.002-0.008	0.079	0.008	0.787	0.067	0.201	●	
	ACD 202-CH-6R	0.776	0.002-0.006	0.079	0.008	0.815	0.067	0.201	●	
	ACD 202-CH-6L	0.776	0.002-0.006	0.079	0.008	0.815	0.067	0.201	●	
	ACD 202-CH-15R	0.776	0.002-0.006	0.079	0.008	0.827	0.067	0.201	●	
	ACD 202-CH-15L	0.776	0.002-0.006	0.079	0.008	0.827	0.067	0.201	●	
	ACD 302-CH	0.776	0.003-0.010	0.118	0.008	0.787	0.094	0.201	●	
	ACD 302-CH-6R	0.815	0.002-0.008	0.118	0.008	0.815	0.094	0.201	●	
	ACD 302-CH-6L	0.854	0.002-0.008	0.118	0.008	0.815	0.094	0.201	●	
	ACD 302-CH-15R	0.787	0.002-0.007	0.118	0.008	0.827	0.094	0.201	●	
	ACD 302-CH-15L	0.787	0.002-0.007	0.118	0.008	0.827	0.094	0.201	●	
	ACD 403-CH	0.748	0.003-0.012	0.157	0.012	0.787	0.118	0.201	●	
	ACD 403-CH-4R	0.776	0.002-0.010	0.157	0.012	0.815	0.118	0.201	●	
	ACD 403-CH-4L	0.776	0.002-0.010	0.157	0.012	0.815	0.118	0.201	●	
	ACD 503-CH	0.945	0.004-0.014	0.197	0.012	0.984	0.157	0.197	●	
	ACD 503-CH-4R	0.972	0.003-0.012	0.197	0.012	1.012	0.157	0.197	●	
	ACD 503-CH-4L	1.012	0.003-0.012	0.197	0.012	1.012	0.157	0.197	●	
	ACD 603-CH	0.945	0.005-0.016	0.236	0.012	0.984	0.197	0.197	●	
	ACD 804-CH	1.142	0.006-0.018	0.315	0.016	1.181	0.236	0.240	●	
	ACS 202-CH	0.776	0.002-0.008	0.079	0.008	0.787	0.067	0.201	●	
	ACS 302-CH	0.776	0.003-0.010	0.118	0.008	0.787	0.094	0.201	●	
	ACS 403-CH	0.776	0.003-0.012	0.157	0.012	0.787	0.118	0.201	●	
	ACS 503-CH	0.776	0.004-0.014	0.197	0.012	0.787	0.157	0.197	●	
	ACS 603-CH	0.972	0.005-0.016	0.236	0.012	0.984	0.197	0.197	○	

Remark: 1. if R/L style inserts are selected, the feed need to be reduced by 20-40%
2. ACS single edged insert's Tmas is determined according to the tool holder.

Marked: ● Stock available ○ Non-stocked standard

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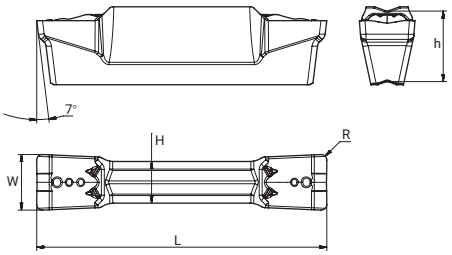
Grooving-Turning Series

TS: Double-edged inserts applicable to external, internal and face turning, grooving and parting off



inserts*	Product code	Cutting parameter				Dimension(in)					Grade	
		Grooving	Tmax	Turning		W	R	L	H	h	AP301U	AW100K
		Feed (in/rev)		Feed (in/rev)	Ap (in)							
	ATD 203-TS	0.002-0.008	0.776	0.005-0.007	0.016-0.059	0.079	0.012	0.815	0.067	0.201	●	
	ATD 303-TS	0.002-0.010	0.776	0.006-0.009	0.018-0.079	0.118	0.012	0.815	0.087	0.201	●	
	ATD 404-TS	0.002-0.011	0.776	0.007-0.010	0.020-0.098	0.157	0.016	0.815	0.118	0.201	●	
	ATD 408-TS	0.002-0.011	0.776	0.007-0.010	0.039-0.098	0.157	0.031	0.815	0.118	0.201	●	
	ATD 504-TS	0.003-0.012	0.972	0.008-0.012	0.022-0.138	0.197	0.016	1.012	0.157	0.197	●	
	ATD 508-TS	0.003-0.012	0.972	0.008-0.012	0.039-0.138	0.197	0.031	1.012	0.157	0.197	●	
	ATD 604-TS	0.004-0.016	0.972	0.009-0.018	0.026-0.150	0.236	0.016	1.012	0.197	0.197	●	
	ATD 608-TS	0.004-0.016	0.972	0.009-0.018	0.039-0.150	0.236	0.031	1.012	0.197	0.197	●	
	ATD 808-TS	0.005-0.018	1.201	0.011-0.020	0.039-0.177	0.315	0.031	1.240	0.236	0.240	○	

Marked: ● Stock available ○ Non-stocked standard

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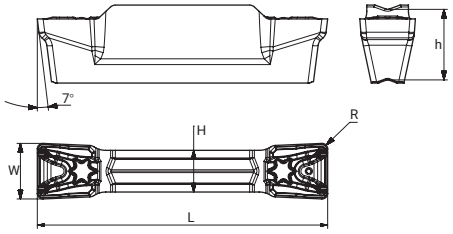
Grooving-Turning Series

TM: Double-edged inserts applicable to external, internal and face turning, grooving and parting off



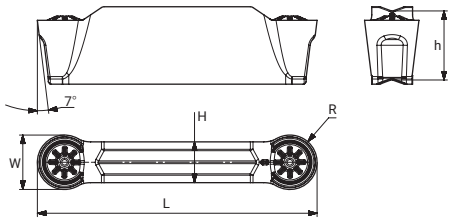
inserts*	Product code	Cutting parameter				Dimension(in)					Grade	
		Grooving	Tmax	Turning		W	R	L	H	h	AP301U	AW100K
		Feed (in/rev)		Feed (in/rev)	Ap (in)							
	ATD 304-TM	0.004-0.010	0.776	0.006-0.009	0.020-0.079	0.118	0.016	0.815	0.087	0.201	●	
	ATD 404-TM	0.006-0.012	0.776	0.007-0.011	0.020-0.098	0.157	0.016	0.815	0.118	0.201	●	
	ATD 408-TM	0.006-0.012	0.776	0.007-0.011	0.039-0.098	0.157	0.031	0.815	0.118	0.201	●	
	ATD 504-TM	0.007-0.014	0.972	0.008-0.014	0.022-0.138	0.197	0.016	1.012	0.157	0.197	●	
	ATD 508-TM	0.007-0.014	0.972	0.008-0.014	0.039-0.138	0.197	0.031	1.012	0.157	0.197	●	
	ATD 604-TM	0.008-0.018	0.972	0.009-0.018	0.026-0.157	0.236	0.016	1.012	0.197	0.197	●	
	ATD 608-TM	0.008-0.018	0.972	0.009-0.018	0.039-0.157	0.236	0.031	1.012	0.197	0.197	●	
	ATD 808-TM	0.009-0.020	1.201	0.011-0.020	0.039-0.197	0.315	0.031	1.240	0.236	0.240	○	
	ATD 812-TM	0.009-0.020	1.201	0.011-0.020	0.059-0.197	0.315	0.047	1.240	0.236	0.240	●	

Marked: ● Stock available ○ Non-stocked standard

P103 P134

Grooving-Turning Series

RM: Double-edged inserts applicable to external turning, grooving and profiling



inserts*	Product code	Cutting parameter			Dimension(in)					Grade	
		Grooving	Turning		W	R	L	H	h	AP301U	AW100K
		Feed (in/rev)	Feed (in/rev)	Ap (in)							
	ATD 210-RM	0.002-0.006	0.005-0.010	0.016-0.039	0.079	0.039	0.815	0.067	0.201	●	
	ATD 315-RM	0.003-0.007	0.006-0.012	0.020-0.059	0.118	0.059	0.815	0.087	0.201	●	
	ATD 420-RM	0.004-0.008	0.007-0.014	0.024-0.079	0.157	0.079	0.815	0.118	0.201	●	
	ATD 525-RM	0.005-0.010	0.008-0.016	0.028-0.098	0.197	0.098	1.012	0.157	0.197	●	
	ATD 630-RM	0.006-0.012	0.010-0.020	0.035-0.118	0.236	0.118	1.012	0.197	0.197	●	
	ATD 840-RM	0.007-0.014	0.012-0.024	0.039-0.157	0.315	0.157	1.240	0.236	0.240	●	

Marked: ● Stock available ○ Non-stocked standard

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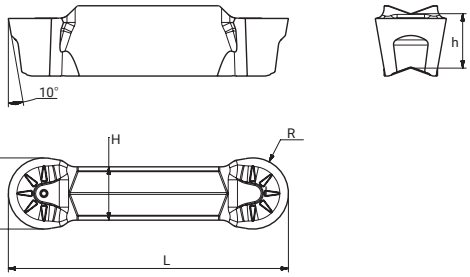
Grooving-Turning Series

RA: Double-edged ground inserts applicable to aluminium wheel turning and profiling



inserts*	Product code	Cutting parameter			Dimension(in)					Grade	
		Grooving	Turning		W	R	L	H	h	AP301U	AW100K
		Feed (in/rev)	Feed (in/rev)	Ap (in)							
	ATD 315-RA	0.003-0.007	0.006-0.012	0.020-0.059	0.118	0.059	0.815	0.087	0.201		○
	ATD 420-RA	0.004-0.010	0.008-0.018	0.024-0.008	0.157	0.079	0.815	0.118	0.201		○
	ATD 525-RA	0.004-0.011	0.008-0.020	0.028-0.098	0.197	0.098	1.012	0.157	0.197		○
	ATD 630-RA	0.005-0.012	0.009-0.024	0.035-0.118	0.236	0.118	1.012	0.197	0.197		○
	ATD 840-RA	0.006-0.016	0.010-0.026	0.039-0.157	0.315	0.157	1.240	0.236	0.240		○

Marked: ● Stock available ○ Non-stocked standard

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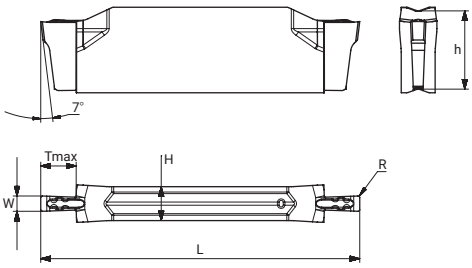
Grooving Series

Ground inserts applicable to grooving



inserts*	Product code	Suitable tool holder (in)	Cutting parameter	Dimension(in)						Grade	
			Grooving								
			Feed (in/rev)	W	R	Tmax	H	h	L	AP301U	AW100K
	ATD 100E000G	0.079	0.001-0.002	0.039	0.000	0.079	0.087	0.201	0.815	●	
	ATD 104E000G	0.079	0.001-0.002	0.041	0.000	0.079	0.087	0.201	0.815	●	
	*ATD 115E000G	0.079	0.001-0.002	0.045	0.000	0.079	0.087	0.201	0.815	●	
	ATD 120E000G	0.079	0.001-0.002	0.047	0.000	0.079	0.087	0.201	0.815	●	
	ATD 125E010G	0.079	0.001-0.002	0.049	0.004	0.079	0.087	0.201	0.815	●	
	*ATD 130E000G	0.079	0.001-0.002	0.051	0.000	0.079	0.087	0.201	0.815	●	
	ATD 135E000G	0.079	0.001-0.002	0.053	0.000	0.079	0.087	0.201	0.815	●	
	ATD 140E000G	0.079	0.001-0.002	0.055	0.000	0.079	0.087	0.201	0.815	●	
	ATD 145E010G	0.079	0.001-0.002	0.057	0.004	0.079	0.087	0.201	0.815	●	
	ATD 147E000G	0.079	0.001-0.002	0.058	0.000	0.098	0.087	0.201	0.815	●	
	ATD 150E010G	0.079	0.001-0.002	0.059	0.004	0.098	0.087	0.201	0.815	●	
	ATD 157E015G	0.079	0.001-0.003	0.062	0.006	0.106	0.087	0.201	0.815	●	
	*ATD 165E010G	0.079	0.001-0.003	0.065	0.004	0.106	0.087	0.201	0.815	●	
	ATD 170E010G	0.079	0.001-0.003	0.067	0.004	0.118	0.087	0.201	0.815	●	
	ATD 178E018G	0.079	0.001-0.003	0.070	0.007	0.118	0.087	0.201	0.815	●	
	*ATD 190E010G	0.079	0.002-0.004	0.075	0.004	0.118	0.087	0.201	0.815	●	
	ATD 196E015G	0.079	0.002-0.004	0.077	0.006	0.118	0.087	0.201	0.815	●	
	ATD 200E020G	0.079	0.002-0.004	0.079	0.008	0.118	0.087	0.201	0.815	●	
	*ATD 215E010G	0.079	0.002-0.004	0.085	0.004	0.118	0.087	0.201	0.815	●	
	ATD 222E015G	0.079	0.002-0.004	0.087	0.006	0.138	0.087	0.201	0.815	●	
	ATD 230E020G	0.079	0.002-0.004	0.091	0.008	0.138	0.087	0.201	0.815	●	
	ATD 100E050G	0.079	0.001-0.002	0.039	0.020	0.079	0.087	0.201	0.815	●	
	ATD 140E070G	0.079	0.002-0.003	0.055	0.028	0.079	0.087	0.201	0.815	●	
	ATD 157E079G	0.079	0.002-0.003	0.062	0.031	0.106	0.087	0.201	0.815	●	
	ATD 200E100G	0.079	0.002-0.004	0.079	0.039	0.118	0.087	0.201	0.815	●	
	ATD 239E120G	0.079	0.002-0.005	0.094	0.047	-	0.087	0.201	0.815	●	

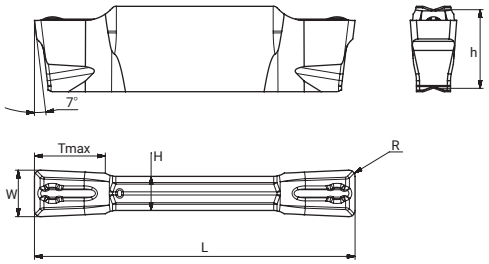
1. * For circlap grooves
2.When the width of the insert is less than 0.070in, please pay attention to size A of the holder

Marked: ● Stock available ○ Non-stocked standard

P103 P134

Grooving Series

Ground inserts applicable to profiling, turning and grooving



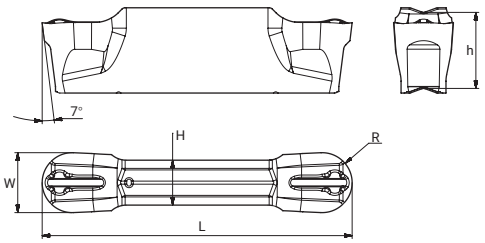
inserts*	Product code	Suitable tool holder (in)	Cutting parameter			Dimension(in)						Grade	
			Grooving	Turning		W	R	Tmax	H	h	L	AP301U	AW100K
			Feed (in/rev)	Feed (in/rev)	Ap (in)								
	ATD 265E015	0.118	0.002-0.005	0.004-0.007	0.008-0.071	0.104	0.006	-	0.087	0.201	0.815	●	
	ATD 300E020	0.118	0.002-0.006	0.004-0.008	0.012-0.079	0.118	0.008	-	0.087	0.201	0.815	●	
	ATD 300E040	0.118	0.002-0.006	0.006-0.009	0.020-0.087	0.118	0.016	-	0.087	0.201	0.815	●	
	ATD 400E040	0.157	0.003-0.007	0.006-0.012	0.020-0.098	0.157	0.016	-	0.118	0.201	0.815	●	
	ATD 400E080	0.157	0.003-0.007	0.006-0.012	0.039-0.098	0.157	0.031	-	0.118	0.201	0.815	●	
	ATD 415E015	0.157	0.003-0.007	0.006-0.012	0.008-0.098	0.163	0.006	-	0.118	0.201	0.815	●	
	ATD 478E055	0.197	0.004-0.008	0.008-0.014	0.024-0.102	0.188	0.022	-	0.157	0.197	1.012	●	
	ATD 500E040	0.197	0.004-0.008	0.008-0.014	0.020-0.102	0.197	0.016	-	0.157	0.197	1.012	●	
	ATD 500E080	0.197	0.004-0.008	0.009-0.014	0.039-0.118	0.197	0.031	-	0.157	0.197	1.012	●	
	ATD 515E015	0.197	0.004-0.009	0.009-0.014	0.008-0.118	0.203	0.006	-	0.157	0.197	1.012	●	
	ATD 555E055	0.236	0.005-0.011	0.009-0.016	0.024-0.118	0.219	0.022	-	0.197	0.197	1.012	●	
	ATD 600E080	0.236	0.005-0.012	0.010-0.018	0.039-0.138	0.236	0.031	-	0.197	0.197	1.012	●	
	ATD 600E120	0.236	0.005-0.012	0.010-0.018	0.051-0.138	0.236	0.047	-	0.197	0.197	1.012	●	
	ATD 635E080	0.236	0.005-0.012	0.010-0.018	0.039-0.138	0.250	0.031	-	0.197	0.197	1.012	●	
	ATD 800E080	0.315	0.006-0.016	0.012-0.022	0.039-0.189	0.315	0.031	-	0.236	0.240	1.240	●	
	ATD 800E120	0.315	0.006-0.016	0.012-0.022	0.047-0.189	0.315	0.047	-	0.236	0.240	1.240	●	

Marked: ● Stock available ○ Non-stocked standard

P103 P134

Grooving Series

Ground inserts applicable to turning and grooving



inserts*	Product code	Suitable tool holder (in)	Cutting parameter			Dimension(in)						Grade	
			Grooving	Turning		W	R	Tmax	H	h	L	AP301U	AW100K
			Feed (in/rev)	Feed (in/rev)	Ap (in)								
	ATD 300E150	0.118	0.003-0.007	0.006-0.012	0-0.059	0.118	0.059	-	0.087	0.201	0.815	●	
	ATD 400E200	0.157	0.004-0.008	0.007-0.014	0-0.079	0.157	0.079	-	0.118	0.201	0.815	●	
	ATD 478E239	0.197	0.005-0.009	0.009-0.018	0-0.094	0.188	0.094	-	0.157	0.197	1.012	●	
	ATD 500E250	0.197	0.005-0.009	0.009-0.018	0-0.098	0.197	0.098	-	0.157	0.197	1.012	●	
	ATD 600E300	0.236	0.006-0.012	0.010-0.020	0-0.118	0.236	0.118	-	0.197	0.197	1.012	●	
	ATD 800E400	0.315	0.007-0.014	0.012-0.026	0-0.157	0.315	0.157	-	0.236	0.240	1.240	●	

Marked: ● Stock available ○ Non-stocked standard

P103 P134

Cutting Parameter Recommendation of Parting Off and Grooving Application

Materials						Cutting parameter recommended table of parting off and grooving application					
ISO	Workpiece material			Brinell hardness (HB)	Tensile strength Rm(lbs/in²)	AP301U			AW100K		
						feed (in/rev)					
						0.004	0.019	0.020	0.004	0.008	0.016
P	Unalloyed steel	C≤0.25%	Annealed	125	62,075.84	591	476	427	-	-	-
		0.25 < C≤0.55%	Annealed	190	63,671.24	476	427	377	-	-	-
		0.25 < C≤0.55%	Heat-treated	210	102,686.20	427	377	328	-	-	-
		C > 0.55%	Annealed	190	92,678.64	476	427	377	-	-	-
		C > 0.55%	Heat-treated	300	146,922.48	377	328	262	-	-	-
		Free cutting steel (short-chip)	Annealed	220	108,052.57	427	479	430	-	-	-
	Low-alloyed steel	Annealed		175	85,716.87	591	427	377	-	-	-
		Heat-treated		300	146,922.48	377	377	328	-	-	-
		Heat-treated		380	185,937.43	558	427	377	-	-	-
		Heat-treated		430	214,219.65	-	-	-	-	-	-
	High-alloyed steel and high-alloyed tool steel	Annealed		200	97,899.98	-	-	-	-	-	-
		Hardened and tempered		300	146,922.48	-	-	-	-	-	-
		Hardened and tempered		400	197,395.36	-	-	-	-	-	-
	Stainless steel	Ferritic/martensitic, annealed		200	97,899.98	541	443	344	-	-	-
		Martensitic, heat-treated		330	161,571.22	492	377	230	-	-	-
M	Stainless steel	Austenitic, quench hardened		200	97,899.98	541	443	344	-	-	-
		Austenitic, precipitation hardened (PH)		300	146,922.48	509	394	262	-	-	-
		Austenitic/ferritic, duplex		230	112,838.79	443	361	279	-	-	-
K	Malleable cast iron	Ferritic		200	58,014.80	377	295	213	-	-	-
		Pearlitic		260	101,525.90	377	295	213	-	-	-
	Grey cast iron	Low tensile strength		180	29,007.40	607	459	312	-	-	-
		High tensile strength/austenitic		245	50,762.95	607	459	312	-	-	-
	Nodular cast iron	Ferritic		155	58,014.80	476	361	262	-	-	-
		Pearlitic		265	101,525.90	476	361	262	-	-	-
	GGV(CGI)			-	-	-	-	-	-	-	-
N	Wrought aluminium alloys	non-aging		30	-	-	-	-	-	-	-
		aged		100	49,312.58	-	-	-	-	-	-
	Cast aluminium alloys	≤ 12% Si, non-aging		75	37,709.62	-	-	-	2789	1640	656
		≤ 12% Si, aged		90	44,961.47	-	-	-	-	-	-
		> 12% Si, non-aging		130	65,266.65	-	-	-	1476	820	131
	Magnesium alloys			70	36,259.25	-	-	-	-	-	-
	Copper and copper alloys (bronze/brass)	Unalloyed, electrolytic copper		100	49,312.58	-	-	-	-	-	-
		Brass, bronze, red brass		90	44,961.47	-	-	-	-	-	-
		Cu alloys, short-chip		110	55,114.06	-	-	-	-	-	-
		High tensile, Ampco alloy		300	146,487.37	-	-	-	-	-	-
S	Heat-resistant alloys	Fe-based	Annealed	200	98,625.16	-	-	-	-	-	-
			Hardened	280	136,334.78	-	-	-	-	-	-
		Ni or Co based	Annealed	250	121,831.08	-	-	-	-	-	-
			Hardened	350	171,143.66	-	-	-	-	-	-
			Cast	320	156,639.96	-	-	-	-	-	-
	Titanium alloys	Pure titanium		200	98,625.16	-	-	-	-	-	-
		α and β alloys, hardened		375	182,746.62	-	-	-	-	-	-
		β alloys		410	203,051.80	-	-	-	-	-	-
	Tungsten alloys	1177		300	146,487.37	-	-	-	-	-	-
	Molybdenum alloys	1262		300	146,487.37	-	-	-	-	-	-
H	Hardened steel	Hardened and tempered		50HRC	-	-	-	-	-	-	-
		Hardened and tempered		55HRC	-	-	-	-	-	-	-
		Hardened and tempered		60HRC	-	-	-	-	-	-	-
	Hardened cast steel	Hardened and tempered		50HRC	-	-	-	-	-	-	-

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolant

Note

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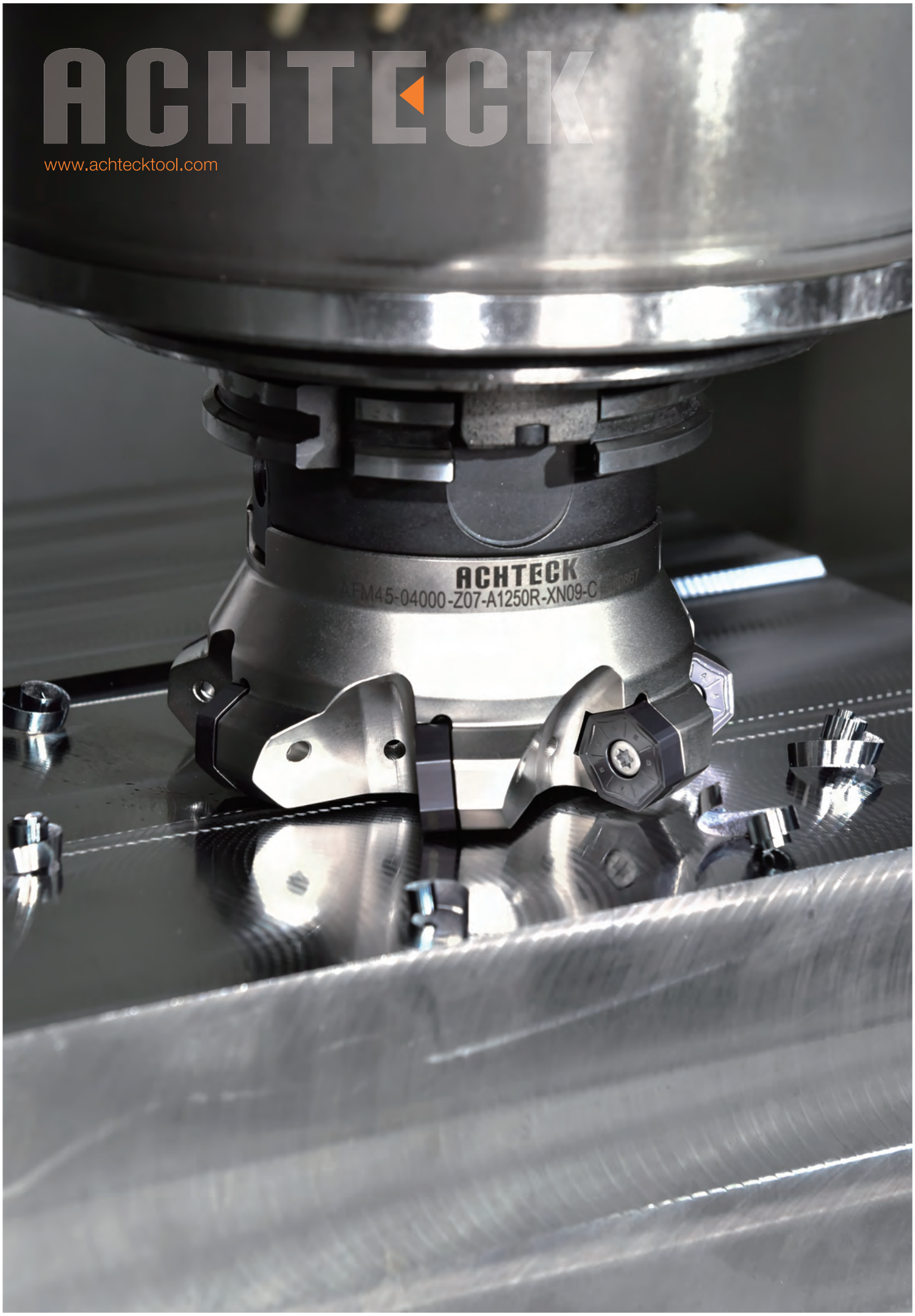


CUTTING TOOL CATALOGUE

Milling Cutter Denomination System

A	FM	90	-	03000	-	Z07	-	A	0750	R	-	SN12	-	C
1	2	3		4		5		6	7	8		9		10

1. A--ACHTECK

2. Machining method

Face milling	FM
Shoulder milling	SM
Profile milling	PM
High feed milling	HM
Side & face milling	DM
Thread milling	TM
Chamfer milling	CM

3. Approach angle (Kr)

Figure	Angle
90	90°
88	88°
75	75°
60	60°
45	45°
42	42°
•	•
•	•
•	•
15	15
00	Round insert

4. Cutter dia.

01000	1.000in
03000	3.000in
•	•
•	•
10000	10.000in

5. Number of teeth

Z02	2 teeth
•	•
Z05	5 teeth
•	•
Z30	30 teeth

6. Connection

A	Arbor
W	Weldon shank
C	Cylinder shank
N	Whistle notch shank
M	Screw clamped with modular head

7. Coupling Size

0750——Connection diameter 0.750in

8. Direction of tool

R	Right
L	Left
N	Neutral

9. Insert info

SN12——SN12 series insert

10. Others

C	Internal coolant
No mark	No coolant

Porcupine Cutter Denomination

A	PE	90	-	02500	-	Z04	-	A	1000	R	-	LN13	-	L2205	-	F	-	C
1	2	3		4		5		6	7	8		9		10		11		12

1. A--ACHTECK

2. Cutting method	
Porcupine cutter	PE
Shoulder milling cutter	SM
Profile milling cutter	PM
High feed milling cutter	HM
Side and face Milling cutter	DM
Thread milling cutter	TM
Chamfer milling cutter	CM
Face milling cutter	FM

3. Approach angle (Kr)	
Figure	Angle
90	90°
88	88°
75	75°
60	60°
45	45°
42	42°
•	•
•	•
•	•

4. Cutter dia.	
01000	1.000in
02500	2.500in
03000	3.000in
•	•
10000	10.000in

5. Number of teeth	
Z02	2 teeth
Z04	4 teeth
Z05	5 teeth
•	•
Z30	30 teeth

6. Coupling	
A	Arbor
W	Weldon shank
C	Cylinder shank
N	Whistle notch shank
M	Screw clamped with modular head

7. Coupling size
1000——Connection diameter 1.000in

8. Direction of tool	
R	Right
L	Left
N	Neutral

9. Insert information
LN13——LN13 series insert

10. Max. cutting depth	
L1181	1.181in
L1772	1.772in
L2205	2.205in

11. Tool type	
F	Full teeth
H	Half teeth

10. Others	
C	With internal coolant
No indication	Without internal coolant

Overview of Milling Products

Product family			AFM42-OD06 	AFM40-ON05 	AFM45-SN12 	AFM45-SN19 
Page			P148	P150	P152	P152
Approach angle			42°	40°	45°	45°
Max.ap（in）			0.177	0.138	0.256	0.433
Diameter range（in）			ϕ2.000-ϕ6.000	ϕ2.000-ϕ6.000	ϕ2.000-ϕ10.000	ϕ6.000-ϕ10.000
Insert type			OD..0605..	ON..0504..	SN..1206..	SN..1909..
Application	Face milling		●	●	●	●
	Shoulder milling					
	Slot milling					
	Ramping		●			
	Helical interpolate milling		●			
	Plunging					
	Profile milling					
	Chamfer milling		●			
	Pocket milling		●			

Remark: ● Recommended application

Overview of Milling Products

Product family			AFM75-SN12 	AFM88-SN12 	AFM45-XN07 	AFM45-XN09(C) 
Page			P154	P156	P158	P160
Approach angle			75°	88°	45°	45°
Max.ap（in）			0.315	0.394	0.173	0.236
Diameter range（in）			ϕ2.000-ϕ10.000	ϕ2.000-ϕ8.000	ϕ1.500-ϕ6.000	ϕ2.500-ϕ8.000
Insert type			SN..1206..	SN..1206..	XN..0705..	XN..0906..
Application	Face milling		●	●	●	●
	Shoulder milling					
	Slot milling					
	Ramping					
	Helical interpolate milling					
	Plunging					
	Profile milling					
	Chamfer milling					
	Pocket milling					

Remark: ● Recommended application

Overview of Milling Products

Product family			AFM45-XN09(W) 	AFF40-LN12 	AFF40-LN15 	ASM90-LN09 
Page			P160	P162	P162	P164
Approach angle			45°	40°	40°	90°
Max.ap（in）			0.236	0.019	0.019	0.314
Diameter range（in）			ϕ3.000-ϕ8.000	ϕ3.000-ϕ4.000	ϕ5.000-ϕ10.000	ϕ0.750-ϕ3.000
Insert type			XN..0906..	0N..0504.. LN..1204..	0N..0504.. LN..1504..	LNHU 0904..
Application	Face milling		●	●	●	●
	Shoulder milling					●
	Slot milling					●
	Ramping					
	Helical interpolate milling					
	Plunging					
	Profile milling					
	Chamfer milling					
	Pocket milling					

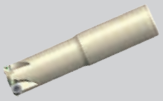
Remark: ● Recommended application

Overview of Milling Products

Product family			ASM90-LN13 	ASM90-LN16 	ASM90-WN08 	ASM90-AP10 
Page			P166	P168	P170	P172
Approach angle			90°	90°	90°	90°
Max.ap（in）			0.472	0.590	0.275	0.314
Diameter range（in）			ϕ1.500-ϕ6.000	ϕ2.500-ϕ6.000	ϕ1.500-ϕ6.000	ϕ0.625-ϕ2.500
Insert type			LNHU 1306..	LNHU 1607..	WN..0806..	APKT 1003..
Application	Face milling		●	●	●	●
	Shoulder milling		●	●	●	●
	Slot milling		●	●	●	●
	Ramping					●
	Helical interpolate milling					●
	Plunging					●
	Profile milling					
	Chamfer milling					
	Pocket milling					●

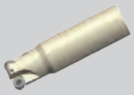
Remark: ● Recommended application

Overview of Milling Products

Product family			ASM90-AP17 	APE90-LN09 	APE90-LN13 	APM00-RO08 
Page			P174	P176	P178	P180
Approach angle			90°	90°	90°	-
Max.ap（in）			0.629	1.889	2.204	0.157
Diameter range（in）			ϕ1.000-ϕ2.500	ϕ1.000-ϕ2.000	ϕ1.500-ϕ3.000	ϕ0.625-ϕ1.000
Insert type			APKT 1705..	LNHU 0904..	LNHU 1306..	RO.. 0803..
Application	Face milling		●	●	●	●
	Shoulder milling		●	●	●	
	Slot milling		●			
	Ramping		●			●
	Helical interpolate milling		●			●
	Plunging		●			
	Profile milling					●
	Chamfer milling					
	Pocket milling		●			●

Remark: ● Recommended application

Overview of Milling Products

Product family			APM00-RO10 	APM00-RO12 	APM00-RO16 	APM00-RO20 
Page			P182	P184	P186	P188
Approach angle			-	-	-	-
Max.ap（in）			0.196	0.236	0.314	0.393
Diameter range（in）			ϕ1.000-ϕ2.000	ϕ1.250-ϕ3.000	ϕ2.500-ϕ4.000	ϕ4.000-ϕ6.000
Insert type			RO..10T3..	RO..1204..	RO..1605..	RO..2006..
Application	Face milling		●	●	●	●
	Shoulder milling					
	Slot milling					
	Ramping		●	●	●	●
	Helical interpolate milling		●	●	●	●
	Plunging					
	Profile milling		●	●	●	●
	Chamfer milling					
	Pocket milling		●	●	●	●

Remark: ● Recommended application

Overview of Milling Products

Product family			AHM20-LN06 			
Page			P190-191			
Approach angle			20°			
Max.ap（in）			0.393			
Diameter range（in）			ϕ0.625-ϕ2.500			
Insert type			LN..0604..			
Application	Face milling		●			
	Shoulder milling					
	Slot milling		●			
	Ramping		●			
	Helical interpolate milling		●			
	Plunging		●			
	Profile milling					
	Chamfer milling					
	Pocket milling		●			

Remark: ● Recommended application

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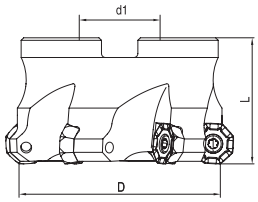
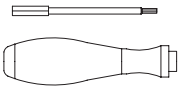
Milling cutters

AFM42-OD06

42 ° Approaching angle face milling cutter



Product code	D	d1	L	apmax	Internal coolant	Z	Marked	Inserts
AFM42-02000-Z04-A0750R-OD06-C	2.000	0.750	1.575	0.177		4	○	OD..0605
AFM42-02500-Z05-A0750R-OD06-C	2.500	0.750	1.575	0.177		5	○	
AFM42-03000-Z05-A1000R-OD06-C	3.000	1.000	1.969	0.177		5	○	
AFM42-03000-Z06-A1000R-OD06-C	3.000	1.000	1.969	0.177		6	○	
AFM42-04000-Z06-A1500R-OD06-C	4.000	1.500	2.480	0.177		6	○	
AFM42-04000-Z07-A1500R-OD06-C	4.000	1.500	2.480	0.177		7	○	
AFM42-05000-Z07-A1500R-OD06-C	5.000	1.500	2.480	0.177		7	○	
AFM42-05000-Z08-A1500R-OD06-C	5.000	1.500	2.480	0.177		8	○	
AFM42-06000-Z10-A1500R-OD06	6.000	1.500	2.480	0.177		10	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ2.000-6.000			44 in lb
	SP04512043	DT-TP20	

Note: With internal coolant
Without internal coolant

P204 P224

Product code	Dimension(in)		Grades						
	Insert corner radius	Wiper length	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
ODET 0605APFN-FM2	-	0.063							●
ODMT 060508EN-MM3	0.031	-	●	●	●	●	●	●	
ODMT 060512EN-MM3	0.047	-	●						
ODHT 0605APEN-MM3	-	0.063	●	●		●	●	●	
ODEW 0605APSR-HR2	-	0.063					●	●	
ODEW 0605APSN-HR2	-	0.063					●		
ODMW 060512EN-HR2	0.047	-					●	●	

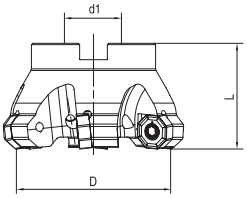
Marked: ● Stock available ○ Non-stocked standard

Materials				Cutting depth and feed							
ISO	Material classification	Tensile strength (1bs/in^2)	Hardness (HB)	OD..0605							
				ap		Geometry					
						HR2		MM3		FM2	
						fz					
				(in)							
				min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.008	0.177	0.0060	0.0157	0.0050	0.0137	-	-
		<137,785	<280								
	Alloyed steel	101,526-137,785	200-280			0.0050	0.0137	0.0039	0.0118	-	-
		137,785-174,044	280-355								
		174,044-203,052	355-415								
M	Duplex stainless steel	112,839	230			-	-	0.0032	0.0110	-	-
	Austenitic stainless steel	97,900	200								
	Precipitation-hardening stainless steel	146,923	300								
K	Grey cast iron	101,526	220			0.0060	0.0157	0.0050	0.0137	-	-
	Nodular cast iron	127,633	260								
	Malleable cast iron	116,030	250								
S	Fe-based alloy	136,770	280			-	-	-	-	-	-
	Co-based alloy	156,060	320								
	Ni-based alloy	170,709	350								
	Ti-alloy	183,037	370								
N	Aluminum	37,709	75			-	-	-	-	0.0040	0.0137
	Aluminum alloy	64,831	130								
H	Hardened steel	-	50-60HRC			0.0040	0.0098	-	-	-	-
	Chilled cast iron	-	55HRC								

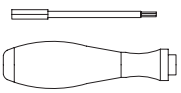
*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

P224

AFM40-ON05
40° Approaching angle face milling cutter



Product code	D	d1	L	apmax	Internal coolant	Z	Marked	Inserts
AFM40-02000-Z04-A0750R-ON05-N-C	2.000	0.750	1.575	0.137	●	4	○	ON..0504
AFM40-02000-Z06-A0750R-ON05-N-C	2.000	0.750	1.575	0.137	●	6	○	
AFM40-02500-Z05-A0750R-ON05-N-C	2.500	0.750	1.575	0.137	●	5	○	
AFM40-02500-Z06-A0750R-ON05-N-C	2.500	0.750	1.575	0.137	●	6	○	
AFM40-02500-Z08-A0750R-ON05-N-C	2.500	0.750	1.575	0.137	●	8	○	
AFM40-03000-Z06-A1000R-ON05-N-C	3.000	1.000	1.969	0.137	●	6	○	
AFM40-03000-Z08-A1000R-ON05-N-C	3.000	1.000	1.969	0.137	●	8	○	
AFM40-03000-Z09-A1000R-ON05-N-C	3.000	1.000	1.969	0.137	●	9	○	
AFM40-04000-Z07-A1500R-ON05-N-C	4.000	1.500	2.480	0.137	●	7	○	
AFM40-04000-Z09-A1500R-ON05-N-C	4.000	1.500	2.480	0.137	●	9	○	
AFM40-04000-Z11-A1500R-ON05-N-C	4.000	1.500	2.480	0.137	●	11	○	
AFM40-05000-Z07-A1500R-ON05-N-C	5.000	1.500	2.480	0.137	●	7	○	
AFM40-05000-Z09-A1500R-ON05-N-C	5.000	1.500	2.480	0.137	●	9	○	
AFM40-05000-Z14-A1500R-ON05-N-C	5.000	1.500	2.480	0.137	●	14	○	
AFM40-06000-Z10-A1500R-ON05-N	6.000	1.500	2.480	0.137	○	10	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ2.000-6.000			35 in lb
	SP040090	DT-TP15	

Note: ● With internal coolant
○ Without internal coolant

P204 P224

Product code	Dimension(in)		Grades						
	Insert corner radius	Wiper length	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
ONHU 050408-MM3	0.031	-	●						
ONMU 050408-MM4	0.031	-	●	●		●	●	●	
ONHU 050408AEN-MM3	0.031	0.028	●	●				●	
ONHU 050408AEN-MM4	0.031	0.028		●			●	●	
ONHU 0504ZNR-MM3	0.031	0.055	●						

Marked: ● Stock available ○ Non-stocked standard

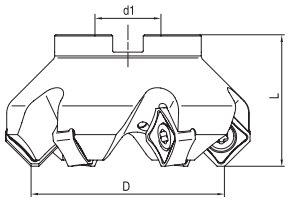
Materials				Cutting depth and feed					
ISO	Material classification	Tensile strength (1bs/in^2)	Hardness (HB)	ON..0504					
				ap		Geometry			
						MM3		MM4	
						fz			
				(in)					
				min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.008	0.137	0.0040	0.0098	0.0060	0.0138
		<137,785	<280						
	Alloyed steel	101,526-137,785	200-280						
		137,785-174,044	280-355						
		174,044-203,052	355-415						
M	Duplex stainless steel	112,839	230			0.0032	0.0078	0.0040	0.0098
	Austenitic stainless steel	97,900	200						
	Precipitation-hardening stainless steel	146,923	300						
K	Grey cast iron	101,526	220			0.0040	0.0098	0.0060	0.0138
	Nodular cast iron	127,633	260						
	Malleable cast iron	116,030	250						
S	Fe-based alloy	136,770	280			-	-	-	-
	Co-based alloy	156,060	320						
	Ni-based alloy	170,709	350						
	Ti-alloy	183,037	370						
N	Aluminum	37,709	75			-	-	-	-
	Aluminum alloy	64,831	130						
H	Hardened steel	-	50-60HRC			-	-	-	-
	Chilled cast iron	-	55HRC						

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

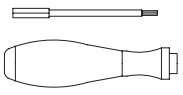
P224

AFM45-SN12/SN19

45°Approach angle face milling cutter



Product code	D	d1	L	apmax	Internal coolant	Z	Marked	Inserts
AFM45-02000-Z04-A0750R-SN12-N-C	2.000	0.750	1.575	0.255	●	4	●	SN..X 1206ANN SN..X 1206..
AFM45-02000-Z06-A0750R-SN12-N-C	2.000	0.750	1.575	0.255	●	6	●	
AFM45-02500-Z04-A0750R-SN12-N-C	2.500	0.750	1.575	0.255	●	4	○	
AFM45-02500-Z06-A1000R-SN12-N-C	2.500	1.000	1.575	0.255	●	6	●	
AFM45-03000-Z04-A1000R-SN12-N-C	3.000	1.000	1.969	0.255	●	4	○	
AFM45-03000-Z05-A1000R-SN12-N-C	3.000	1.000	1.969	0.255	●	5	●	
AFM45-03000-Z07-A1000R-SN12-N-C	3.000	1.000	1.969	0.255	●	7	●	
AFM45-04000-Z06-A1500R-SN12-N-C	4.000	1.500	2.480	0.255	●	6	●	
AFM45-04000-Z08-A1500R-SN12-N-C	4.000	1.500	2.480	0.255	●	8	●	
AFM45-05000-Z07-A1500R-SN12-N-C	5.000	1.500	2.480	0.255	●	7	○	
AFM45-05000-Z08-A1500R-SN12-N-C	5.000	1.500	2.480	0.255	●	8	●	
AFM45-05000-Z10-A1500R-SN12-N-C	5.000	1.500	2.480	0.255	●	10	●	
AFM45-06000-Z10-A1500R-SN12-N	6.000	1.500	2.480	0.255	○	10	●	
AFM45-06000-Z12-A1500R-SN12-N-C	6.000	1.500	2.480	0.255	●	12	●	
AFM45-08000-Z14-A2500R-SN12-N	8.000	2.500	2.480	0.255	○	14	○	
AFM45-10000-Z16-A2500R-SN12-N	10.000	2.500	2.480	0.255	○	16	○	
AFM45-06000-Z08-A1500R-SN19	6.000	1.500	2.480	0.433	○	8	○	SN..X 1909ANN
AFM45-08000-Z10-A2500R-SN19	8.000	2.500	2.480	0.433	○	10	○	
AFM45-10000-Z12-A2500R-SN19	10.000	2.500	2.480	0.433	○	12	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ2.000-10.000(SN..1206ANN)			
	SP050120	DT-TP20	31 in lb
ϕ6.000-10.000(SN..1909ANN)	SP06018070	DT-TP25	44 in lb

Note: With internal coolant
Without internal coolant

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Product code	Dimension(in)		Grades						
	Insert corner radius	Wiper length	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
SNGX 1206ANN-MM3	-	0.071	●	●	●		●	●	
SNGX 1206ANN-MM4	-	0.071	●	●	●		●	●	
SNGX 1206ANN-MR6	-	0.071	●	●	●		●	●	
SNGX 1206ANN-RR2	-	0.071	●	●	●		●	●	
SNGX 1909ANN-MM3	-	0.114		●					
SNGX 1909ANN-MR6	-	0.114		●					
SNGX 120608-MM4	0.031	-	●	●	●		●	●	
SNGX 120612-MM4	1.200	-	●						
SNMX 1206ANN-MM3	-	0.071	●	●	●		●	●	
SNMX 1206ANN-MM4	-	0.071	●	●	●		●	●	
SNMX 1206ANN-MR6	-	0.071	●	●	●		●	●	
SNMX 120608-MM4	0.031	-	●	●	●		●	●	
SNMX 120612-MM3	0.047	-	●	●	●		●	●	
SNMX 120612-MM4	0.047	-	●	●	●		●	●	
SNMX 120612-MR6	0.047	-	●	●	●		●	●	
SNMX 120612-RR2	0.047	-	●	●	●		●	●	
SNMX 120620-MM4	0.079	-	●	●	●		●	●	
SNMX 120620-RR2	0.079	-	●	●	●		●	●	
SNHX 1206ANN-FM2	-	0.071							●
SNHX 1206ANN-W	-	0.264	●				●		

Marked: ● Stock available ○ Non-stocked standard

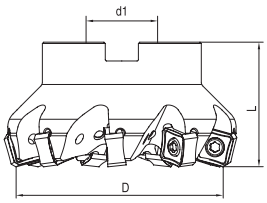
Materials				Cutting depth and feed											
				SN..1206..											
				ap		Geometry									
						MM3		MM4		MR6		RR2		FM2	
						fz									
						(in)									
ISO	Material classification	Tensile strength (1bs/in²)	Hardness (HB)	min	max	min	max	min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.008	0.255	0.0060	0.0137	0.0071	0.0149	0.0071	0.0157	0.0071	0.0177	-	-
		<137,785	<280												
	Alloyed steel	101,526-137,785	200-280			0.0050	0.0125	0.0060	0.0137	0.0060	0.0149	0.0060	0.0149	-	-
		137,785-174,044	280-355												
		174,044-203,052	355-415												
M	Duplex stainless steel	112,839	230			0.0050	0.0118	0.0050	0.0125	-	-	-	-	-	-
	Austenitic stainless steel	97,900	200												
	Precipitation-hardening stainless steel	146,923	300												
K	Grey cast iron	101,526	220			0.0060	0.0137	0.0071	0.0149	0.0071	0.0157	0.0071	0.0177	-	-
	Nodular cast iron	127,633	260												
	Malleable cast iron	116,030	250												
S	Fe-based alloy	136,770	280			0.0040	0.0098	0.0050	0.0110	-	-	-	-	-	-
	Co-based alloy	156,060	320												
	Ni-based alloy	170,709	350												
	Ti-alloy	183,037	370												
N	Aluminum	37,709	75			-	-	-	-	-	-	-	-	0.0060	0.0137
	Aluminum alloy	64,831	130												
H	Hardened steel	-	50-60HRC			-	-	-	-	-	-	-	-	-	-
	Chilled cast iron	-	55HRC												

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

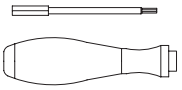
Milling cutters

P224

AFM75-SN12
75° Approach angle face milling cutter



Product code	D	d1	L	apmax	Internal coolant	Z	Marked	Inserts
AFM75-02000-Z04-A0750R-SN12-N-C	2.000	0.750	1.575	0.314	✓	4	○	SNGX1206ENN SN..X1206..
AFM75-02500-Z06-A0750R-SN12-N-C	2.500	0.750	1.575	0.314	✓	6	○	
AFM75-03000-Z07-A1000R-SN12-N-C	3.000	1.000	1.969	0.314	✓	7	○	
AFM75-04000-Z08-A1500R-SN12-N-C	4.000	1.500	2.480	0.314	✓	8	○	
AFM75-05000-Z08-A1500R-SN12-N-C	5.000	1.500	2.480	0.314	✓	8	○	
AFM75-05000-Z10-A1500R-SN12-N-C	5.000	1.500	2.480	0.314	✓	10	○	
AFM75-06000-Z10-A1500R-SN12-N	6.000	1.500	2.480	0.314	✗	10	○	
AFM75-08000-Z14-A2500R-SN12-N	8.000	2.500	2.480	0.314	✗	14	○	
AFM75-10000-Z16-A2500R-SN12-N	10.000	2.500	2.480	0.314	✗	16	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ2.000-10.000			31 in lb
	SP050120	DT-TP20	

Note: ✓ With internal coolant
✗ Without internal coolant

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Product code	Dimension(in)		Grades						
	Insert corner radius	Wiper length	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
SNGX 1206ENN-MM3	-	0.047	●	●	●		●	●	
SNGX 1206ENN-MM4	-	0.047	●	●	●		●	●	
SNGX 1206ENN-MR6	-	0.047	●	●	●		●	●	
SNGX 120608-MM4	0.031	-	●	●	●		●	●	
SNGX 120612-MM4	0.047	-	●						
SNMX 1206ENN-MM4	-	0.047			●				
SNMX 120608-MM4	0.031	-	●	●	●		●	●	
SNMX 120612-MM3	0.047	-	●	●	●		●	●	
SNMX 120612-MM4	0.047	-	●	●	●		●	●	
SNMX 120612-MR6	0.047	-	●	●	●		●	●	
SNMX 120612-RR2	0.047	-	●	●	●		●	●	
SNMX 120620-MM4	0.079	-	●	●	●		●	●	
SNMX 120620-RR2	0.079	-	●	●	●		●	●	

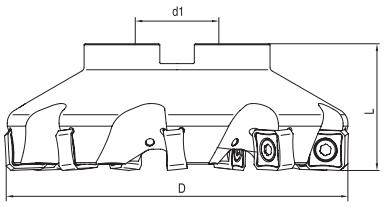
Marked: ● Stock available ○ Non-stocked standard

Materials				Cutting depth and feed									
				SN..1206..									
				ap		Geometry							
						MM3		MM4		MR6		RR2	
						fz							
						(in)							
ISO	Material classification	Tensile strength (1bs/in^2)	Hardness (HB)	min	max	min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.008	0.314	0.0050	0.0125	0.0075	0.0137	0.0060	0.0149	0.0070	0.0157
		<137,785	<280										
	Alloyed steel	101,526-137,785	200-280			0.0040	0.0118	0.0050	0.0125	0.0040	0.0137	0.0060	0.0137
		137,785-174,044	280-355										
		174,044-203,052	355-415										
M	Duplex stainless steel	112,839	230			0.0040	0.0110	0.0040	0.0118	-	-	-	-
	Austenitic stainless steel	97,900	200										
	Precipitation-hardening stainless steel	146,923	300										
K	Grey cast iron	101,526	220			0.0050	0.0125	0.0060	0.0137	0.0050	0.0137	0.0070	0.0157
	Nodular cast iron	127,633	260										
	Malleable cast iron	116,030	250										
S	Fe-based alloy	136,770	280			0.0040	0.0086	0.0040	0.0098	-	-	-	-
	Co-based alloy	156,060	320										
	Ni-based alloy	170,709	350										
	Ti-alloy	183,037	370										
N	Aluminum	37,709	75			-	-	-	-	-	-	-	-
	Aluminum alloy	64,831	130										
H	Hardened steel	-	50-60HRC			-	-	-	-	-	-	-	-
	Chilled cast iron	-	55HRC										

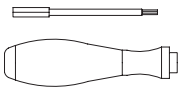
*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

P224

AFM88-SN12
88° Approach angle face milling cutter



Product code	D	d1	L	apmax	Internal coolant	Z	Marked	Inserts
AFM88-02000-Z04-A0750R-SN12-N-C	2.000	0.750	1.575	0.393	●	4	●	SNGX1206ZNN SN..X1206..
AFM88-02500-Z04-A0750R-SN12-N-C	2.500	0.750	1.575	0.393	●	4	○	
AFM88-02500-Z06-A1000R-SN12-N-C	2.500	1.000	1.575	0.393	●	6	●	
AFM88-03000-Z04-A1000R-SN12-N-C	3.000	1.000	1.969	0.393	●	4	○	
AFM88-03000-Z07-A1000R-SN12-N-C	3.000	1.000	1.969	0.393	●	7	●	
AFM88-04000-Z08-A1500R-SN12-N-C	4.000	1.500	2.480	0.393	●	8	●	
AFM88-04000-Z11-A1500R-SN12-N-C	4.000	1.500	2.480	0.393	●	11	●	
AFM88-05000-Z10-A1500R-SN12-N-C	5.000	1.500	2.480	0.393	●	10	●	
AFM88-05000-Z13-A1500R-SN12-N-C	5.000	1.500	2.480	0.393	●	13	●	
AFM88-06000-Z12-A1500R-SN12-N	6.000	1.500	2.480	0.393	○	12	●	
AFM88-08000-Z14-A2500R-SN12-N	8.000	2.500	2.480	0.393	○	14	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ2.000-8.000			31 in lb
	SP050120	DT-TP20	

Note: With internal coolant
Without internal coolant

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Product code	Dimension(in)		Grades						
	Insert corner radius	Wiper length	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
SNGX 1206ZNN-MM3	-	0.047	●	●	●		●	●	
SNGX 1206ZNN-MM4	-	0.047	●	●	●		●	●	
SNGX 1206ZNN-MR6	-	0.047	●	●	●		●	●	
SNGX 120608-MM4	0.031	-	●	●	●		●	●	
SNGX 120612-MM4	0.047	-	●						
SNMX 120608-MM4	0.031	-	●	●	●		●	●	
SNMX 120612-MM3	0.047	-	●	●	●		●	●	
SNMX 120612-MM4	0.047	-	●	●	●		●	●	
SNMX 120612-MR6	0.047	-	●	●	●		●	●	
SNMX 120612-RR2	0.047	-	●	●	●		●	●	
SNMX 120620-MM4	0.079	-	●	●	●		●	●	
SNMX 120620-RR2	0.079	-	●	●	●		●	●	
SNHX 1206ZNN-FM2	-	0.047							●
SNHX 1206ZNN-W	0.039	0.173	●				●		

Marked: ● Stock available ○ Non-stocked standard

Materials				Cutting depth and feed											
				SN..1206..											
				ap		Geometry									
						MM3		MM4		MR6		RR2		FM2	
						fz									
						(in)									
ISO	Material classification	Tensile strength (1bs/in^2)	Hardness (HB)	min	max	min	max	min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.008	0.393	0.0050	0.0125	0.0075	0.0138	0.0060	0.0149	0.0071	0.0157	-	-
		<137,785	<280												
	Alloyed steel	101,526-137,785	200-280			0.0040	0.0118	0.0050	0.0125	0.0040	0.0137	0.0060	0.0137	-	-
		137,785-174,044	280-355												
		174,044-203,052	355-415												
M	Duplex stainless steel	112,839	230			0.0040	0.0110	0.0040	0.0118	-	-	-	-	-	-
	Austenitic stainless steel	97,900	200												
	Precipitation-hardening stainless steel	146,923	300												
K	Grey cast iron	101,526	220			0.0050	0.0125	0.0060	0.0137	0.0050	0.0137	0.0071	0.0157	-	-
	Nodular cast iron	127,633	260												
	Malleable cast iron	116,030	250												
S	Fe-based alloy	136,770	280			0.0040	0.0086	0.0040	0.0098	-	-	-	-	-	-
	Co-based alloy	156,060	320												
	Ni-based alloy	170,709	350												
	Ti-alloy	183,037	370												
N	Aluminum	37,709	75			-	-	-	-	-	-	-	-	0.0050	0.0125
	Aluminum alloy	64,831	130												
H	Hardened steel	-	50-60HRC			-	-	-	-	-	-	-	-	-	-
	Chilled cast iron	-	55HRC												

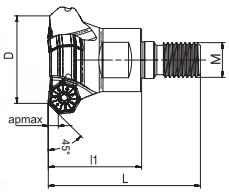
*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

Milling cutters

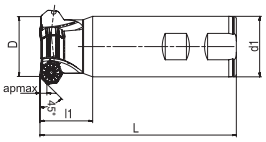
P224

AFM45-XN07

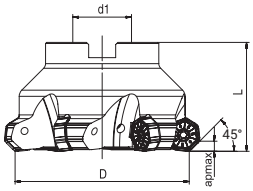
45° Approach angle face milling cutter



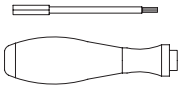
Product code	D	M	L	l1	apmax	Internal coolant	Z	Marked	Inserts
AFM45-01500-Z03-M16R-XN07-C	1.500	16	2.756	1.693	0.173	✓	3	○	XN..U 0705



Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
AFM45-01500-Z03-W1500R-XN07-C	1.500	1.500	5.118	1.378	0.173	✓	3	○	XN..U 0705



Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
AFM45-01500-Z03-A0750R-XN07-C	1.500	0.750	1.575	-	0.173	✓	3	○	XN..U 0705
AFM45-02000-Z04-A0750R-XN07-C	2.000	0.750	1.575	-	0.173	✓	4	●	
AFM45-02000-Z05-A0750R-XN07-C	2.000	0.750	1.575	-	0.173	✓	5	●	
AFM45-02500-Z05-A0750R-XN07-C	2.500	0.750	1.575	-	0.173	✓	5	○	
AFM45-02500-Z06-A0750R-XN07-C	2.500	0.750	1.575	-	0.173	✓	6	○	
AFM45-03000-Z06-A1000R-XN07-C	3.000	1.000	1.969	-	0.173	✓	6	●	
AFM45-03000-Z07-A1000R-XN07-C	3.000	1.000	1.969	-	0.173	✓	7	●	
AFM45-04000-Z07-A1500R-XN07-C	4.000	1.500	2.480	-	0.173	✓	7	●	
AFM45-04000-Z08-A1500R-XN07-C	4.000	1.500	2.480	-	0.173	✓	8	●	
AFM45-05000-Z08-A1500R-XN07-C	5.000	1.500	2.480	-	0.173	✓	8	○	
AFM45-05000-Z10-A1500R-XN07-C	5.000	1.500	2.480	-	0.173	✓	10	○	
AFM45-06000-Z09-A1500R-XN07	6.000	1.500	2.480	-	0.173	✗	9	○	
AFM45-06000-Z12-A1500R-XN07	6.000	1.500	2.480	-	0.173	✗	12	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ1.500-6.000			31 in lb
	SP035120H	DT-TP15	

Note: ✓ With internal coolant
✗ Without internal coolant

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Product code	Dimension(in)		Grades						
	Insert corner radius	Wiper length	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
XNGU 0705ANN-MM3	0.031	0.043	●	●			●		
XNGU 0705ANN-MM4	0.031	0.043	●				●		
XNMU 0705ANN-MM4	0.031	0.043	●	●	●	●	●	●	
XNMU 0705ANN-MR6	0.031	0.043	●	●			●	●	
XNMU 070508-MM4	0.031	-		●		●	●	●	
XNGX 0705ANN-W	0.039	0.236	●				●		

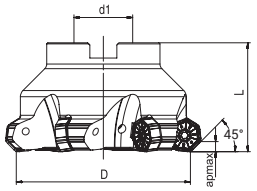
Marked: ● Stock available ○ Non-stocked standard

Materials				Cutting depth and feed							
ISO	Material classification	Tensile strength (1bs/in^2)	Hardness (HB)	XN.. 0705..							
				ap		Geometry					
						MM3		MM4		MR6	
						fz					
				(in)							
				min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.008	0.173	0.0060	0.0137	0.0071	0.0149	0.0071	0.0157
		<137,785	<280								
	Alloyed steel	101,526-137,785	200-280			0.0050	0.0125	0.0060	0.0137	0.0060	0.0149
		137,785-174,044	280-355								
		174,044-203,052	355-415								
M	Duplex stainless steel	112,839	230			0.0050	0.0118	0.0050	0.0125	-	-
	Austenitic stainless steel	97,900	200								
	Precipitation-hardening stainless steel	146,923	300								
K	Grey cast iron	101,526	220			0.0060	0.0137	0.0071	0.0149	0.0071	0.0157
	Nodular cast iron	127,633	260								
	Malleable cast iron	116,030	250								
S	Fe-based alloy	136,770	280			0.0040	0.0098	0.0050	0.0110	-	-
	Co-based alloy	156,060	320								
	Ni-based alloy	170,709	350								
	Ti-alloy	183,037	370								
N	Aluminum	37,709	75			-	-	-	-	-	-
	Aluminum alloy	64,831	130								
H	Hardened steel	-	50-60HRC			-	-	-	-	-	-
	Chilled cast iron	-	55HRC								

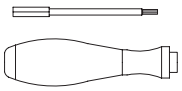
*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

P224

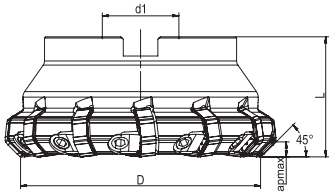
AFM45-XN09
45° Approach angle face milling cutter



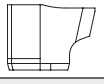
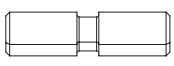
Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
AFM45-02500-Z05-A1000R-XN09-C	2.500	1.000	1.575	-	0.236	✓	5	○	XN..U 0906
AFM45-03000-Z06-A1000R-XN09-C	3.000	1.000	1.969	-	0.236	✓	6	○	
AFM45-04000-Z07-A1500R-XN09-C	4.000	1.500	2.480	-	0.236	✓	7	○	
AFM45-04000-Z08-A1500R-XN09-C	4.000	1.500	2.480	-	0.236	✓	8	○	
AFM45-05000-Z08-A1500R-XN09-C	5.000	1.500	2.480	-	0.236	✓	8	○	
AFM45-05000-Z10-A1500R-XN09-C	5.000	1.500	2.480	-	0.236	✓	10	○	
AFM45-06000-Z09-A1500R-XN09	6.000	1.500	2.480	-	0.236	✗	9	○	
AFM45-06000-Z11-A1500R-XN09	6.000	1.500	2.480	-	0.236	✗	11	○	
AFM45-08000-Z12-A2500R-XN09	8.000	2.500	2.480	-	0.236	✗	12	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ2.500-8.000			44 in lb
	SP050130	DT-TP20	

AFM45-XN09-W
45° Approach angle face milling cutter with wedge clamping



Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
AFM45-03000-Z09-A1000R-XN09-W	3.000	1.000	1.969	-	0.236	✗	9	○	XN..U 0906
AFM45-04000-Z12-A1500R-XN09-W	4.000	1.500	2.480	-	0.236	✗	12	○	
AFM45-05000-Z16-A1500R-XN09-W	5.000	1.500	2.480	-	0.236	✗	16	○	
AFM45-05000-Z16-A1500L-XN09-W	5.000	1.500	2.480	-	0.236	✗	16	○	
AFM45-06000-Z20-A1500R-XN09-W	6.000	1.500	2.480	-	0.236	✗	20	○	
AFM45-06000-Z20-A1500L-XN09-W	6.000	1.500	2.480	-	0.236	✗	20	○	
AFM45-08000-Z26-A2500R-XN09-W	8.000	2.500	2.480	-	0.236	✗	26	○	
AFM45-08000-Z26-A2500L-XN09-W	8.000	2.500	2.480	-	0.236	✗	26	○	

Dimension(in)	Spare parts			
Cutter diameter	Screw		Wrench	Torque
ϕ3.000-8.000				62 in lb
	AWG-8H	AWS830F	AWH4	

Note: ✓ With internal coolant
✗ Without internal coolant

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Product code	Dimension(in)		Grades						
	Insert corner radius	Wiper length	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
XNGU 0906ANN-MM3	0.031	0.055	●	●	●		●		
XNGU 0906ANN-MM4	0.031	0.055	●	●	●		●		
XNMU 0906ANN-MR6	0.031	0.055	●				●	●	
XNMU 090612-MM4	0.047	-	●	●		●	●	●	
XNGX 0906ANN-W	0.039	0.295	●				●		

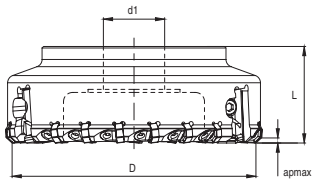
Marked: ● Stock available ○ Non-stocked standard

Materials				Cutting depth and feed							
				XN..0906..							
ISO	Material classification	Tensile strength (1bs/in^2)	Hardness (HB)	ap		Geometry					
						MM3		MM4		MR6	
						fz					
				(in)							
				min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.008	0.236	0.0060	0.0137	0.0071	0.0149	0.0071	0.0157
		<137,785	<280								
	Alloyed steel	101,526-137,785	200-280			0.0050	0.0125	0.0060	0.0137	0.0060	0.0149
		137,785-174,044	280-355								
		174,044-203,052	355-415								
M	Duplex stainless steel	112,839	230			0.0050	0.0118	0.0050	0.0125	-	-
	Austenitic stainless steel	97,900	200								
	Precipitation-hardening stainless steel	146,923	300								
K	Grey cast iron	101,526	220			0.0060	0.0137	0.0071	0.0149	0.0071	0.0157
	Nodular cast iron	127,633	260								
	Malleable cast iron	116,030	250								
S	Fe-based alloy	136,770	280			0.0040	0.0098	0.0050	0.0110	-	-
	Co-based alloy	156,060	320								
	Ni-based alloy	170,709	350								
	Ti-alloy	183,037	370								
N	Aluminum	37,709	75			-	-	-	-	-	-
	Aluminum alloy	64,831	130								
H	Hardened steel	-	50-60HRC			-	-	-	-	-	-
	Chilled cast iron	-	55HRC								

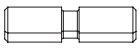
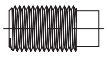
*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

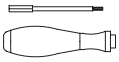
P224

AFF40-LN12/LN15
Cast iron finishing milling cutter



Product code	D	d1	L	apmax	Internal coolant	*Z	Cutting edge for finishing machining	Marked	Inserts
AFF40-03000-Z08-A1000R-LN12	3.000	1.000	1.969	0.019		8+2	2	○	ONHF 050408-MM3 LNHQ 120408FN-W
AFF40-04000-Z10-A1500R-LN12	4.000	1.500	2.480	0.019		10+2	2	○	
AFF40-05000-Z15-A1500R-LN15	5.000	1.500	2.480	0.019		15+3	3	○	ONHF 050408-MM3 LNHQ 150416FN-W
AFF40-06000-Z18-A1500R-LN15	6.000	1.500	2.480	0.019		18+3	3	○	
AFF40-08000-Z24-A2500R-LN15	8.000	2.500	2.480	0.019		24+3	3	○	
AFF40-10000-Z30-A2500R-LN15	10.000	2.500	2.480	0.019		30+3	3	○	

Dimension	Spare parts				
Cutter diameter	wedge type	wedge locking screw	wiper insert locking screw	wiper insert adjusting screw	wiper cartridge locking screw
ϕ3.000-10.000					
	AWG-6H-13B	WD060200	SP040085H	AH050100F	SH060250

Dimension	Spare parts					
Cutter diameter	wedge screw wrench	wiper insert screw wrench	wiper insert adjusting screw wrench	wiper insert cartridge locking screw wrench	wiper cartridge	
ϕ3.000-10.000						
	LT-H3	DT-TP10	LT-H2.5	LT-H5	ϕ3.000-4.000	ϕ5.000-10.000
					C-LN1235-2545	C-LN1535-2545

Note: With internal coolant
Without internal coolant

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Product code	Dimension(in)		Grades
	Insert corner radius	Wiper length	AP151H
ONHF 050408-MM3	0.031	-	●
LNHQ 120408FN-W	0.031	-	●
LNHQ 150416FN-W	0.063	-	●

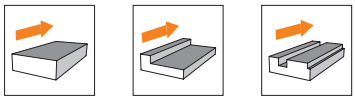
Marked: ● Stock available ○ Non-stocked standard

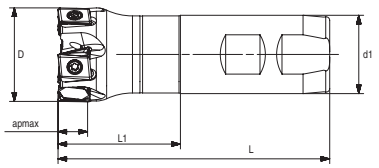
Materials				Cutting depth and feed			
ISO	Material classification	Tensile strength ($1bs/in^2$)	Hardness (HB)	ONHF..05 + LNHQ 12/15			
				ap		Geometry	
						MM3 + W	
						fz	
				(in)			
				min	max	min	max
K	Grey cast iron	101,526	220	0.0080	0.0190	0.0032	0.0098
	Nodular cast iron	127,633	260				
	Malleable cast iron	116,030	250				

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

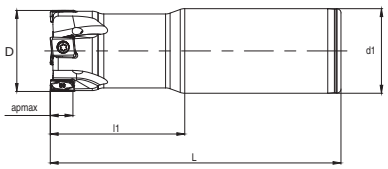
Milling cutters
P224

ASM90-LN09-C
90°Shoulder milling cutter

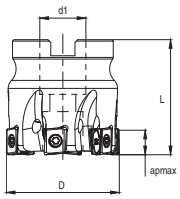




Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
ASM90-01000-Z03-W1000R-LN09-C	1.000	1.000	4.000	1.771	0.314	✓	3	○	LNHU 0904
ASM90-01000-Z04-W1000R-LN09-C	1.000	1.000	4.000	1.771	0.314	✓	4	○	
ASM90-01250-Z04-W1250R-LN09-C	1.250	1.250	4.500	1.968	0.314	✓	4	○	
ASM90-01250-Z05-W1250R-LN09-C	1.250	1.250	4.500	1.968	0.314	✓	5	○	
ASM90-01500-Z04-W1500R-LN09-C	1.500	1.500	4.500	0.984	0.314	✓	4	○	
ASM90-01500-Z06-W1500R-LN09-C	1.500	1.500	4.500	0.984	0.314	✓	6	○	



Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
ASM90-00750-Z02-C0750R-LN09-L4500	0.750	0.750	4.500	1.220	0.314	✗	2	○	LNHU 0904
ASM90-00750-Z03-C0750R-LN09-L4500	0.750	0.750	4.500	1.220	0.314	✗	3	○	
ASM90-01000-Z03-C1000R-LN09-L8000-C	1.000	1.000	8.000	1.574	0.314	✓	3	○	
ASM90-01000-Z04-C1000R-LN09-L8000-C	1.000	1.000	8.000	1.574	0.314	✓	4	○	
ASM90-01250-Z04-C1250R-LN09-L10000-C	1.250	1.250	10.000	1.968	0.314	✓	4	○	
ASM90-01250-Z05-C1250R-LN09-L10000-C	1.250	1.250	10.000	1.968	0.314	✓	5	○	



Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
ASM90-01500-Z04-A0750R-LN09-C	1.500	0.750	1.575	-	0.314	✓	4	○	LNHU 0904
ASM90-01500-Z06-A0750R-LN09-C	1.500	0.750	1.575	-	0.314	✓	6	○	
ASM90-02000-Z05-A0750R-LN09-C	2.000	0.750	1.575	-	0.314	✓	5	○	
ASM90-02000-Z07-A0750R-LN09-C	2.000	0.750	1.575	-	0.314	✓	7	○	
ASM90-02500-Z07-A0750R-LN09-C	2.500	0.750	1.575	-	0.314	✓	7	○	
ASM90-02500-Z10-A0750R-LN09-C	2.500	0.750	1.575	-	0.314	✓	10	○	
ASM90-03000-Z09-A1000R-LN09-C	3.000	1.000	1.968	-	0.314	✓	9	○	
ASM90-03000-Z13-A1000R-LN09-C	3.000	1.000	1.968	-	0.314	✓	13	○	

Note: ✓ With internal coolant
✗ Without internal coolant

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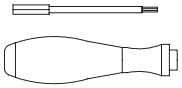
Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ0.750-3.000			16 in lbs
	SP030083	DT-TP09	

Product code	Dimension(in)		Grade						
	Insert corner radius	Wiper length	AP301U	AC301P	AP351U	AP403M	AC301K	AP351K	AW100K
LNHU 090404ER-FM2	0.016	0.073							●
LNHU 090404ER-MM3	0.016	0.073			●	●			
LNHU 090404ER-MR2	0.016	0.073	●		●	●	●	●	
LNHU 090408ER-MR2	0.031	0.051	●		●	●	●	●	
LNHU 090412ER-MR2	0.047	0.039	●			●	●		
LNHU 090416ER-MR2	0.063	0.026	●			●	●		
LNHU 090420ER-MR2	0.079	0.026	●			●	●		
LNHU 0904PDER-W	0.016	0.142	●				●		

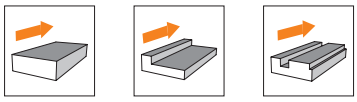
Marked: ● Stock available ○ Non-stocked standard

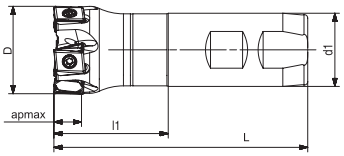
Materials				Cutting depth and feed							
				LNHU 0904..							
				ap		Geometry					
						MR2		MM3		FM2	
						fz					
						(in)					
ISO	Material classification	Tensile strength (1bs/in²)	Hardness (HB)	min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.007	0.314	0.0030	0.0110	0.0030	0.0098	-	-
		<137,785	<280								
	Alloyed steel	101,526-137,785	200-280			0.0020	0.0087	0.0020	0.0079	-	-
		137,785-174,044	280-355								
		174,044-203,052	355-415								
M	Duplex stainless steel	112,839	230			0.0020	0.0087	0.0020	0.0079	-	-
	Austenitic stainless steel	97,900	200								
	Precipitation-hardening stainless steel	146,923	300								
K	Grey cast iron	101,526	220			0.0030	0.0118	0.0030	0.0110	-	-
	Nodular cast iron	127,633	260								
	Malleable cast iron	116,030	250								
S	Fe-based alloy	136,770	280			-	-	0.0800	0.0059	-	-
	Co-based alloy	156,060	320								
	Ni-based alloy	170,709	350								
	Ti-alloy	183,037	370								
N	Aluminum	37,709	75			-	-	-	-	0.0020	0.0100
	Aluminum alloy	64,831	130								
H	Hardened steel	-	50-60HRC			-	-	-	-	-	-
	Chilled cast iron	-	55HRC								

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

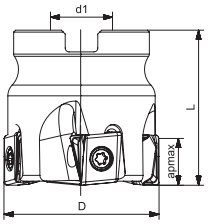
P224

ASM90-LN13-C
90°Shoulder milling cutter

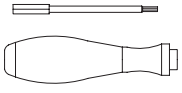




Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
ASM90-01500-Z05-W1250R-LN13-C	1.500	1.250	5.000	1.969	0.472	●	5	○	LNHU 1306



Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
ASM90-01500-Z04-A0750R-LN13-C	1.500	0.750	1.575	-	0.472	●	4	○	LNHU 1306
ASM90-01500-Z05-A0750R-LN13-C	1.500	0.750	1.575	-	0.472	●	5	○	
ASM90-02000-Z05-A0750R-LN13-C	2.000	0.750	1.575	-	0.472	●	5	●	
ASM90-02000-Z06-A0750R-LN13-C	2.000	0.750	1.575	-	0.472	●	6	●	
ASM90-02500-Z04-A0750R-LN13-C	2.500	0.750	1.575	-	0.472	●	4	○	
ASM90-02500-Z06-A0750R-LN13-C	2.500	0.750	1.575	-	0.472	●	6	○	
ASM90-02500-Z08-A0750R-LN13-C	2.500	0.750	1.575	-	0.472	●	8	○	
ASM90-03000-Z05-A1000R-LN13-C	3.000	1.000	1.969	-	0.472	●	5	○	
ASM90-03000-Z07-A1000R-LN13-C	3.000	1.000	1.969	-	0.472	●	7	●	
ASM90-03000-Z10-A1000R-LN13-C	3.000	1.000	1.969	-	0.472	●	10	●	
ASM90-04000-Z07-A1500R-LN13-C	4.000	1.500	1.969	-	0.472	●	7	○	
ASM90-04000-Z09-A1500R-LN13-C	4.000	1.500	1.969	-	0.472	●	9	●	
ASM90-04000-Z13-A1500R-LN13-C	4.000	1.500	1.969	-	0.472	●	13	●	
ASM90-05000-Z09-A1500R-LN13-C	4.000	1.500	2.480	-	0.472	●	9	○	
ASM90-05000-Z11-A1500R-LN13-C	5.000	1.500	2.480	-	0.472	●	11	○	
ASM90-05000-Z16-A1500R-LN13-C	5.000	1.500	2.480	-	0.472	●	16	○	
ASM90-06000-Z09-A1500R-LN13	6.000	1.500	2.480	-	0.472	✕	9	○	
ASM90-06000-Z13-A1500R-LN13	6.000	1.500	2.480	-	0.472	✕	13	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ1.500-6.000			31 in lbs
	SP040115	DT-TP15	

Note: ● With internal coolant
✕ Without internal coolant

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Product code	Dimension(in)		Grade						
	Insert corner radius	Wiper length	AP301U	AC301P	AP351U	AP401U	AC301K	AP351K	AW100K
LNHU 130608ER-FM2	0.031	0.106							●
LNHU 130608ER-MM3	0.031	0.106				●			
LNHU 130608ER-MR2	0.031	0.106	●	●	●	●	●	●	
LNHU 130612ER-MR2	0.047	0.091			●	●	●		
LNHU 130616ER-MR2	0.640	0.075			●	●	●		
LNHU 130620ER-MR2	0.079	0.059			●	●			
LNHU 130624ER-MR2	0.094	0.039			●	●			
LNHU 130631ER-MR2	0.119	0.015			●	●	●		
LNHU 1306PDER-W	0.031	0.220	●				●		

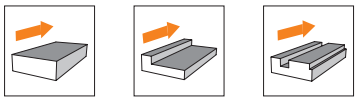
Marked: ● Stock available ○ Non-stocked standard

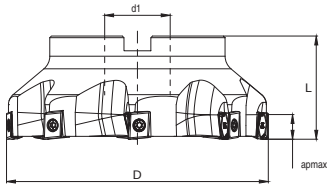
Materials				Cutting depth and feed					
				LNHU..1306..					
ISO	Material classification	Tensile strength (1bs/in^2)	Hardness (HB)	ap		Geometry			
						MM3		MR2	
						fz			
				(in)					
				min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.012	0.472	0.0039	0.0118	0.0047	0.0138
		<137,785	<280						
	Alloyed steel	101,526-137,785	200-280			0.0031	0.0098	0.0039	0.00118
		137,785-174,044	280-355						
		174,044-203,052	355-415						
M	Duplex stainless steel	112,839	230			0.0024	0.0079	0.0031	0.0098
	Austenitic stainless steel	97,900	200						
	Precipitation-hardening stainless steel	146,923	300						
K	Grey cast iron	101,526	220			-	-	0.0047	0.0138
	Nodular cast iron	127,633	260						
	Malleable cast iron	116,030	250						
S	Fe-based alloy	136,770	280			0.0024	0.0071	0.0031	0.0087
	Co-based alloy	156,060	320						
	Ni-based alloy	170,709	350						
	Ti-alloy	183,037	370						
N	Aluminum	37,709	75			-	-	-	-
	Aluminum alloy	64,831	130						
H	Hardened steel	-	50-60HRC			-	-	0.0031	0.0079
	Chilled cast iron	-	55HRC						

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

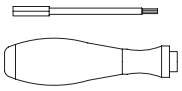
P224

ASM90-LN16-C
90° Shoulder milling cutter





Product code	D	d1	L	ISO	apmax	Internal coolant	Z	Marked	Inserts
ASM90-02500-Z04-A0750R-LN16-C	2.500	0.750	1.575	A	0.590	✓	4	○	LNHU 1607
ASM90-03000-Z05-A1000R-LN16-C	3.000	1.000	1.969	A	0.590	✓	5	○	
ASM90-05000-Z07-A1500R-LN16-C	5.000	1.500	2.480	A	0.590	✓	7	○	
ASM90-06000-Z08-A1500R-LN16	6.000	1.500	2.480	A	0.590	✗	8	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ2.500-6.000			44 in lbs
	SP05013063	DT-TP20	

Note: ✓ With internal coolant
✗ Without internal coolant

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Product code	Dimension(in)		Grade						
	Insert corner radius	Wiper length	AP301U	AC301P	AP351U	AP401U	AC301K	AP351K	AW100K
LNHU 160708ER-MR2	0.031	0.077	●		●		●	●	
LNHU 160716ER-MR2	0.629	0.059	●				●		

Marked: ● Stock available ○ Non-stocked standard

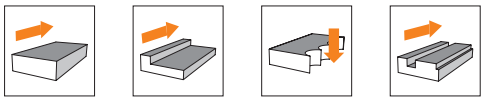
Materials				Cutting depth and feed			
				LNHU 1607..			
				ap		Geometry	
						MR2	
						fz	
				(in)			
ISO	Material classification	Tensile strength (1bs/in^2)	Hardness (HB)	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.012	0.590	0.0039	0.0118
		<137,785	<280				
	Alloyed steel	101,526-137,785	200-280			0.0031	0.0110
		137,785-174,044	280-355				
		174,044-203,052	355-415				
M	Duplex stainless steel	112,839	230			0.0031	0.0098
	Austenitic stainless steel	97,900	200				
	Precipitation-hardening stainless steel	146,923	300				
K	Grey cast iron	101,526	220			0.0039	0.0118
	Nodular cast iron	127,633	260				
	Malleable cast iron	116,030	250				
S	Fe-based alloy	136,770	280			-	-
	Co-based alloy	156,060	320				
	Ni-based alloy	170,709	350				
	Ti-alloy	183,037	370				
N	Aluminum	37,709	75			-	-
	Aluminum alloy	64,831	130				
H	Hardened steel	-	50-60HRC			-	-
	Chilled cast iron	-	55HRC				

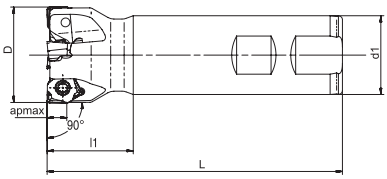
*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

Milling cutters

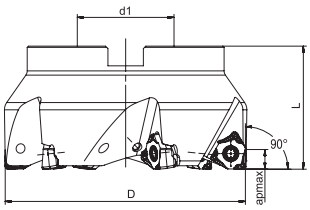
P224

ASM90-WN08-C
90° Shoulder milling cutter

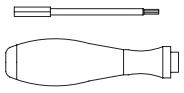




Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
ASM90-01500-Z03-W1250R-WN08-C	1.500	1.250	4.724	1.378	0.275	✓	3	○	WN.U 0806
ASM90-01500-Z04-W1250R-WN08-C	1.500	1.250	4.724	1.378	0.275	✓	4	○	



Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
ASM90-02000-Z04-A0750R-WN08-C	2.000	0.750	1.575	-	0.275	✓	4	○	WN.U 0806
ASM90-02000-Z05-A0750R-WN08-C	2.000	0.750	1.575	-	0.275	✓	5	○	
ASM90-02500-Z04-A0750R-WN08-C	2.500	0.750	1.575	-	0.275	✓	4	○	
ASM90-02500-Z06-A0750R-WN08-C	2.500	0.750	1.575	-	0.275	✓	6	○	
ASM90-02500-Z07-A0750R-WN08-C	2.500	0.750	1.575	-	0.275	✓	7	○	
ASM90-03000-Z05-A1000R-WN08-C	3.000	1.000	1.969	-	0.275	✓	5	○	
ASM90-03000-Z07-A1000R-WN08-C	3.000	1.000	1.969	-	0.275	✓	7	○	
ASM90-03000-Z09-A1000R-WN08-C	3.000	1.000	1.969	-	0.275	✓	9	○	
ASM90-04000-Z06-A1250R-WN08-C	4.000	1.250	1.969	-	0.275	✓	6	○	
ASM90-04000-Z08-A1250R-WN08-C	4.000	1.250	1.969	-	0.275	✓	8	○	
ASM90-04000-Z11-A1250R-WN08-C	4.000	1.250	1.959	-	0.275	✓	11	○	
ASM90-05000-Z07-A1500R-WN08-C	5.000	1.500	2.480	-	0.275	✓	7	○	
ASM90-05000-Z11-A1500R-WN08-C	5.000	1.500	2.480	-	0.275	✓	11	○	
ASM90-05000-Z13-A1500R-WN08-C	5.000	1.500	2.480	-	0.275	✓	13	○	
ASM90-06000-Z08-A1500R-WN08	6.000	1.500	2.480	-	0.275	✗	8	○	
ASM90-06000-Z12-A1500R-WN08	6.000	1.500	2.480	-	0.275	✗	12	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ1.500-6.000			31 in lbs
	SP040090	DT-TP15	

Note: ✓ With internal coolant
✗ Without internal coolant

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Product code	Dimension(in)		Grade							
	Insert corner radius	Wiper length	AP301U	AC301P	AP351U	AP401U	AC301K	AP351K	AW100K	AP151H
WNHU 080608R-FM2	0.031	0.079							●	
WNGU 080604R-MM3	0.016	0.087			●	●				
WNGU 080608R-MM3	0.031	0.079	●		●	●				
WNGU 080604R-MM4	0.016	0.087	●		●	●		●		
WNGU 080608R-MM4	0.031	0.079	●	●	●	●	●	●		●
WNGU 080612R-MM4	0.047	0.063	●		●	●				
WNGU 080616R-MM4	0.063	0.047	●		●	●				
WNGU 080608R-MR2	0.031	0.079	●					●		
WNGU 080612R-MR2	0.047	0.063	●					●		
WNGU 080616R-MR2	0.063	0.047	●					●		
WNHX 0806ZZR-W	0.039	0.189	●				●			

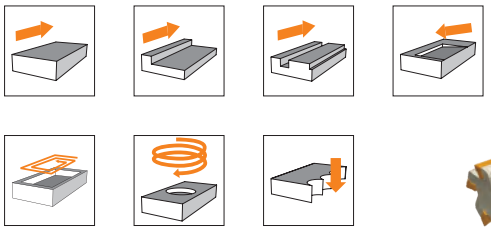
Marked: ● Stock available ○ Non-stocked standard

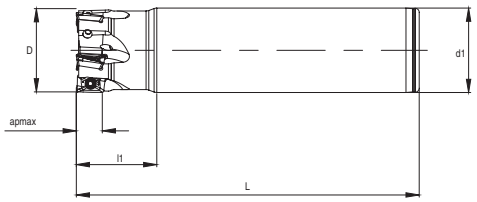
Materials				Cutting depth and feed									
				WNGU..0806..									
				ap		Geometry							
						FM2		MM3		MM4		MR2	
						fz							
						(in)							
ISO	Material classification	Tensile strength (1bs/in²)	Hardness (HB)	min	max	min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.007	0.275	-	-	0.0047	0.0098	0.0047	0.0110	0.0047	0.0118
		<137,785	<280										
	Alloyed steel	101,526-137,785	200-280					0.0039	0.0079	0.0039	0.0098	0.0039	0.0110
		137,785-174,044	280-355										
		174,044-203,052	355-415										
M	Duplex stainless steel	112,839	230					0.0031	0.0071	0.0031	0.0071	-	-
	Austenitic stainless steel	97,900	200										
	Precipitation-hardening stainless steel	146,923	300										
K	Grey cast iron	101,526	220					0.0047	0.0079	0.0039	0.0110	0.0059	0.0118
	Nodular cast iron	127,633	260										
	Malleable cast iron	116,030	250										
S	Fe-based alloy	136,770	280					0.0047	0.0051	0.0039	0.0059	-	-
	Co-based alloy	156,060	320										
	Ni-based alloy	170,709	350										
	Ti-alloy	183,037	370										
N	Aluminum	37,709	75			0.0040	0.0100	-	-	-	-	-	-
	Aluminum alloy	64,831	130										
H	Hardened steel	-	50-60HRC			-	-	-	-	-	-	-	-
	Chilled cast iron	-	55HRC										

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

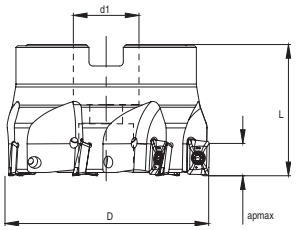
P224

ASM90-AP10-C
90° Shoulder milling cutter

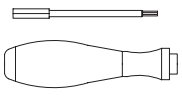




Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
ASM90-00625-Z02-C0625R-AP10-L4000-C	0.625	0.625	4.000	1.024	0.314		2	○	APKT 1003
ASM90-00750-Z03-C0750R-AP10-L4500-C	0.750	0.750	4.500	1.102	0.314		3	○	
ASM90-01000-Z04-C1000R-AP10-L5000-C	1.000	1.000	5.000	1.181	0.314		4	○	
ASM90-01250-Z05-C1250R-AP10-L5000-C	1.250	1.250	5.000	1.024	0.314		5	○	



Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
ASM90-02500-Z07-A0750R-AP10-C	2.500	0.750	1.575	-	0.314		7	○	APKT 1003

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ0.625-2.500			9 in lbs
	SP02506450H	DT-TP08	

Note: With internal coolant
Without internal coolant

P204 P224

Product code	Dimension(in)		Grade						
	Insert corner radius	Wiper length	AP301U	AC301P	AP351U	AP401U	AC301K	AP351K	AP403S
APKT 1003PDER-IT	0.031	0.043	●		●	●			●

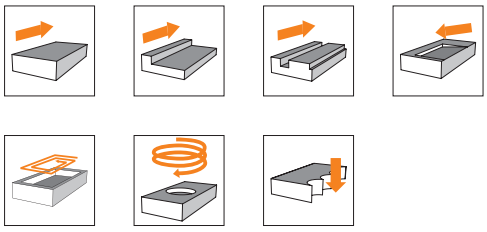
Marked: ● Stock available ○ Non-stocked standard

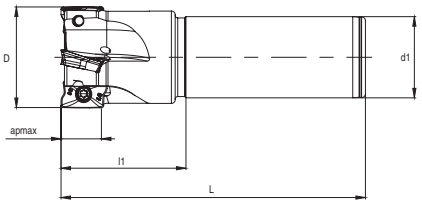
Materials				Cutting depth and feed			
				APKT..1003..			
				ap		Geometry	
						IT	
						fz	
				(in)			
ISO	Material classification	Tensile strength (1bs/in^2)	Hardness (HB)	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.004	0.314	0.0020	0.0080
		<137,785	<280				
	Alloyed steel	101,526-137,785	200-280			0.0020	0.0071
		137,785-174,044	280-355				
		174,044-203,052	355-415				
M	Duplex stainless steel	112,839	230			0.0020	0.0050
	Austenitic stainless steel	97,900	200				
	Precipitation-hardening stainless steel	146,923	300				
K	Grey cast iron	101,526	220			-	-
	Nodular cast iron	127,633	260				
	Malleable cast iron	116,030	250				
S	Fe-based alloy	136,770	280			0.0020	0.0050
	Co-based alloy	156,060	320				
	Ni-based alloy	170,709	350				
	Ti-alloy	183,037	370				
N	Aluminum	37,709	75			0.0020	0.0090
	Aluminum alloy	64,831	130				
H	Hardened steel	-	50-60HRC			-	-
	Chilled cast iron	-	55HRC				

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

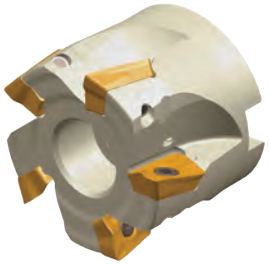
P224

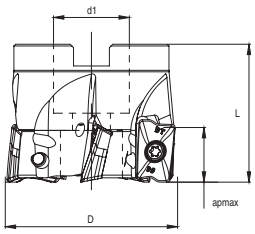
ASM90-AP17-C
90° Shoulder milling cutter



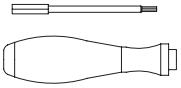


Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
ASM90-01000-Z02-C1000R-AP17-L4000-C	1.000	1.000	4.000	1.535	0.629		2	○	APKT 1705
ASM90-01250-Z03-C1250R-AP17-L4500-C	1.250	1.250	4.500	1.575	0.629		3	○	
ASM90-01500-Z04-C1500R-AP17-L5000-C	1.500	1.500	5.000	1.771	0.629		4	○	





Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
ASM90-02000-Z05-A0750R-AP17-C	2.000	0.750	1.575	-	0.629		5	○	APKT 1705
ASM90-02500-Z06-A0750R-AP17-C	2.500	0.750	1.575	-	0.629		6	○	

Dimension(in)	Spare parts			
Cutter diameter	Screw		Wrench	Torque
ϕ1.000		SP040084		35 in lbs
ϕ1.250-1.500		SP040100H		
ϕ2.000-2.500			DT-TP15	

Note: With internal coolant
Without internal coolant

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Product code	Dimension(in)		Grade						
	Insert corner radius	Wiper length	AP301U	AC301P	AP351U	AP401U	AC301K	AP351K	AW100K
APKT 1705PER-DT	0.031	0.085	●	●	●	●		●	●
APKT 170516R-DT	0.063	0.067	●			●		●	

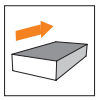
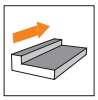
Marked: ● Stock available ○ Non-stocked standard

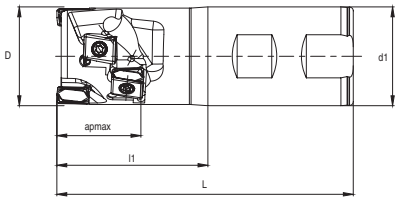
Materials				Cutting depth and feed			
ISO	Material classification	Tensile strength ($1bs/in^2$)	Hardness (HB)	APKT..1705..			
				ap		Geometry	
						DT	
						fz	
				(in)			
				min	max	min	max
P	Unalloyed steel	<87,022	<180	0.008	0.629	0.0031	0.0090
		<137,785	<280				
	Alloyed steel	101,526-137,785	200-280			0.0024	0.0080
		137,785-174,044	280-355				
		174,044-203,052	355-415				
M	Duplex stainless steel	112,839	230			0.0024	0.0070
	Austenitic stainless steel	97,900	200				
	Precipitation-hardening stainless steel	146,923	300				
K	Grey cast iron	101,526	220			0.0031	0.0090
	Nodular cast iron	127,633	260				
	Malleable cast iron	116,030	250				
S	Fe-based alloy	136,770	280			0.0024	0.0071
	Co-based alloy	156,060	320				
	Ni-based alloy	170,709	350				
	Ti-alloy	183,037	370				
N	Aluminum	37,709	75			0.0024	0.0110
	Aluminum alloy	64,831	130				
H	Hardened steel	-	50-60HRC			-	-
	Chilled cast iron	-	55HRC				

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

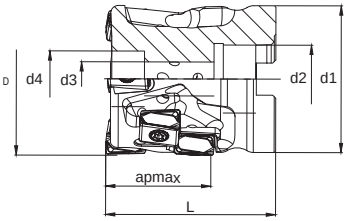
P224

APE90-LN09
90° Procupine milling cutter

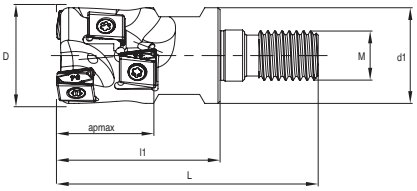


Product code	D	d1	L	L1	d2	d3	d4	apmax	Internal coolant	clamping screw	Z	row	Insert number	Marked	Inserts
APE90-01000-Z02-W1000R-LN09-L1259-F-C	1.000	1.000	4.000	1.693	-	-	-	1.259		-	2	4	8	○	LNHU 0904
APE90-01250-Z02-W1250R-LN09-L1259-F-C	1.250	1.250	4.000	1.732	-	-	-	1.259		-	2	4	8	○	
APE90-01250-Z02-W1250R-LN09-L1574-F-C	1.250	1.250	4.500	1.969	-	-	-	1.574		-	2	5	10	○	
APE90-01500-Z03-W1500R-LN09-L1574-F-C	1.500	1.500	5.000	2.165	-	-	-	1.574		-	3	5	15	○	
APE90-01500-Z03-W1500R-LN09-L1889-F-C	1.500	1.500	5.000	2.323	-	-	-	1.889		-	3	6	18	○	



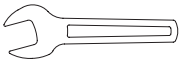
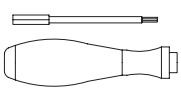
Product code	D	d1	L	L1	d2	d3	d4	apmax	Internal coolant	clamping screw	Z	row	Insert number	Marked	Inserts
APE90-01500-Z03-A0750R-LN09-L1259-F-C	1.500	1.496	2.165	-	0.750	0.354	0.591	1.259		SH080400	3	4	12	○	LNHU 0904
APE90-01500-Z03-A0750R-LN09-L1574-F-C	1.500	1.496	2.559	-	0.750	0.354	0.591	1.574		SH080500	3	5	15	○	
APE90-02000-Z04-A0750R-LN09-L1889-F-C	2.000	1.870	2.953	-	0.750	0.433	0.709	1.889		SH100550	4	6	24	○	

clamping screw	Designation	screw type	clamping torque
	SH080400	M8*40	362 in lbs
	SH080500	M8*50	362 in lbs
	SH100550	M10*55	717 in lbs



Product code	D	d1	L	L1	M	d3	d4	apmax	Internal coolant	clamping screw	Z	row	Insert number	Marked	Inserts
APE90-01000-Z02-M12R-LN09-L0944-F-C	1.000	0.921	2.520	1.575	12	-	-	0.944		-	2	3	6	○	LNHU 0904
APE90-01250-Z02-M16R-LN09-L0944-F-C	1.250	1.181	2.638	1.575	16	-	-	0.944		-	2	3	6	○	
APE90-01250-Z02-M16R-LN09-L1259-F-C	1.250	1.181	3.031	1.969	16	-	-	1.259		-	2	4	8	○	

Notice of inserts mounting:
For APE90-LN09 series: end insert must use corner radius R≤0.8, all side inserts must use corner radius R=0.4 to have right cutting edge overlapping.

Dimension(in)	Spare parts			
Cutter diameter	wrench	Screw	wrench	Torque
ϕ1.000-2.000				16 in lbs
	AFW-15/24	SP030083	DT-TP09	

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Note: With internal coolant
Without internal coolant

Product code	Dimension(in)		Grade						
	Insert corner radius	Wiper length	AP301U	AC301P	AP351U	AP403M	AC301K	AP351K	AW100K
LNHU 090404ER-FM2	0.016	0.073							●
LNHU 090404ER-MM3	0.016	0.073			●	●			
LNHU 090404ER-MR2	0.016	0.073	●		●	●	●	●	
LNHU 090408ER-MR2	0.031	0.051	●		●	●	●	●	
LNHU 090412ER-MR2	0.047	0.039	●			●	●		
LNHU 090416ER-MR2	0.063	0.026	●			●	●		
LNHU 090420ER-MR2	0.079	0.026	●			●	●		
LNHU 0904PDER-W	0.016	0.142	●				●		

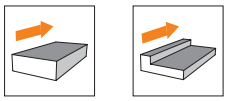
Marked: ● Stock available ○ Non-stocked standard

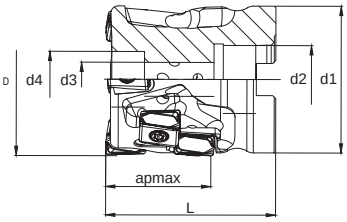
Materials				Cutting depth and feed							
				LNHU..0904..							
ISO	Material classification	Tensile strength (1bs/in^2)	Hardness (HB)	ap		Geometry					
						MM3		MR2		FM2	
						fz					
				(in)							
				min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.008	1.889	0.0020	0.0086	0.0030	0.0090	-	-
		<137,785	<280								
	Alloyed steel	101,526-137,785	200-280			0.0020	0.0070	0.0020	0.0075	-	-
		137,785-174,044	280-355								
		174,044-203,052	355-415								
M	Duplex stainless steel	112,839	230			0.0020	0.0070	0.0020	0.0070	-	-
	Austenitic stainless steel	97,900	200								
	Precipitation-hardening stainless steel	146,923	300								
K	Grey cast iron	101,526	220			0.0020	0.0086	0.0030	0.0098	-	-
	Nodular cast iron	127,633	260								
	Malleable cast iron	116,030	250								
S	Fe-based alloy	136,770	280			0.0020	0.0059	-	-	-	-
	Co-based alloy	156,060	320								
	Ni-based alloy	170,709	350								
	Ti-alloy	183,037	370								
N	Aluminum	37,709	75			-	-	-	-	0.0020	0.0098
	Aluminum alloy	64,831	130								
H	Hardened steel	-	50-60HRC			-	-	0.0020	0.0047	-	-
	Chilled cast iron	-	55HRC								

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

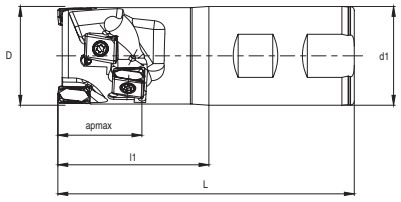
Milling cutters
P224

APE90-LN13
90° Porcupine milling cutter



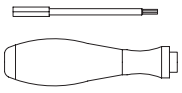


Product code	D	d1	L	L1	d2	d3	d4	apmax	Internal coolant	Mounting bolts	Z	Row	Insert number	Marked	Inserts
APE90-01500-Z02-A0750R-LN13-L1338-F-C	1.500	1.440	2.165	-	0.750	0.354	0.591	1.338		SH100400	2	3	6	○	LNHU 1306
APE90-01500-Z02-A0750R-LN13-L1771-F-C	1.500	1.440	2.559	-	0.750	0.354	0.591	1.771		SH100450	2	4	8	○	
APE90-02000-Z03-A0750R-LN13-L1338-F-C	2.000	1.890	2.165	-	0.750	0.433	0.709	1.338		SH100400	3	3	9	○	
APE90-02000-Z03-A0750R-LN13-L1771-F-C	2.000	1.890	2.559	-	0.750	0.433	0.709	1.771		SH100450	3	4	12	○	
APE90-02500-Z04-A01000R-LN13-L2204-F-C	2.500	2.343	3.150	-	1.000	0.551	0.787	2.204		SH120600	4	5	20	○	
APE90-02500-Z04-A01000R-LN13-L1771-F-C	2.500	2.343	2.756	-	1.000	0.551	0.787	1.771		SH120500	4	4	16	○	
APE90-03000-Z05-A01500R-LN13-L2204-F-C	3.000	2.835	3.346	-	1.500	0.709	1.024	2.204		SH160650	5	5	25	○	



Product code	D	d1	L	L1	d2	d3	d4	apmax	Internal coolant	Z	Row	Insert number	Marked	Inserts
APE90-01500-Z02-W1500R-LN13-L1339-F-C	1.500	1.500	4.500	2.126	-	-	-	1.338		2	3	6	○	LNHU 1306
APE90-01500-Z02-W1500R-LN13-L1772-F-C	1.500	1.500	5.000	2.520	-	-	-	1.771		2	4	8	○	

Notice of inserts mounting:
APE90-LN13 series: end insert must use corner radius R≤2.4, all side inserts must use corner radius R=0.8 to have right cutting edge overlapping

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ1.500--3.000			31 in lbs
	SP040115	DT-TP15	

Mounting bolts	Model	Bolt specification	Torque
	SH080400	M8*40	363 in lbs
	SH080500	M8*50	363 in lbs
	SH100550	M10*55	716 in lbs
	SH100400	M10*40	716 in lbs
	SH100450	M10*45	716 in lbs
	SH120500	M12*50	1257 in lbs
	SH120600	M12*60	1257 in lbs
	SH160650	M16*65	3098 in lbs

Note: With internal coolant
Without internal coolant

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Product code	Dimension(in)		Grade						
	Insert corner radius	Wiper length	AP301U	AC301P	AP351U	AP401U	AC301K	AP351K	AW100K
LNHU 130608ER-FM2	0.031	0.106							●
LNHU 130608ER-MM3	0.031	0.106				●			
LNHU 130608ER-MR2	0.031	0.106	●	●	●	●	●	●	
LNHU 130612ER-MR2	0.047	0.091			●	●	●		
LNHU 130616ER-MR2	0.063	0.075			●	●	●		
LNHU 130620ER-MR2	0.079	0.059			●	●			
LNHU 130624ER-MR2	0.094	0.039			●	●			
LNHU 130631ER-MR2	0.122	0.016			●	●	●		
LNHU 1306PDER-W	0.031	0.220	●				●		

Marked: ● Stock available ○ Non-stocked standard

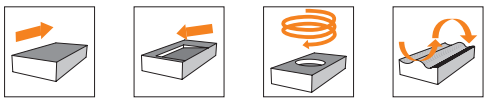
Materials				Cutting depth and feed							
				LNHU..1306..							
ISO	Material classification	Tensile strength (1bs/in^2)	Hardness (HB)	ap		Geometry					
						MM3		MR2		FM2	
						fz					
				(in)							
				min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.0078	2.204	0.0040	0.0110	0.0040	0.0118	-	-
		<137,785	<280								
	Alloyed steel	101,526-137,785	200-280			0.0031	0.0098	0.0031	0.0110	-	-
		137,785-174,044	280-355								
		174,044-203,052	355-415								
M	Duplex stainless steel	112,839	230			0.0031	0.0086	0.0031	0.0098	-	-
	Austenitic stainless steel	97,900	200								
	Precipitation-hardening stainless steel	146,923	300								
K	Grey cast iron	101,526	220			-	-	0.0040	0.0125	-	-
	Nodular cast iron	127,633	260								
	Malleable cast iron	116,030	250								
S	Fe-based alloy	136,770	280			0.0031	0.0078	-	-	-	-
	Co-based alloy	156,060	320								
	Ni-based alloy	170,709	350								
	Ti-alloy	183,037	370								
N	Aluminum	37,709	75			-	-	-	-	0.0040	0.0118
	Aluminum alloy	64,831	130								
H	Hardened steel	-	50-60HRC			-	-	0.0023	0.0059	-	-
	Chilled cast iron	-	55HRC								

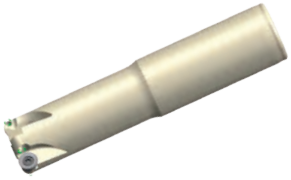
*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

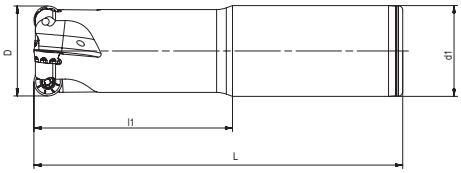
Milling cutters

P224

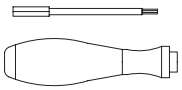
APM00-RO08
Profile milling cutter







Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
APM00-00625-Z02-W0625R-RO08-L4000	0.625	0.625	4.000	2.992	0.157		2	○	RO 0803
APM00-01000-Z04-C1000R-RO08-L4500-C	1.000	1.000	4.500	2.362	0.157		4	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ0.625-1.000			18 in lbs
	SP030072H	DT-TP09	

Note: With internal coolant
Without internal coolant

P204 P224

Product code	Dimension(in)		Grade						
	d	s	AP301U	AC301P	AP351U	AP401U	AP403M	AP351K	AP403S
ROHT 0803M0E-MM3	0.314	0.125					●		●

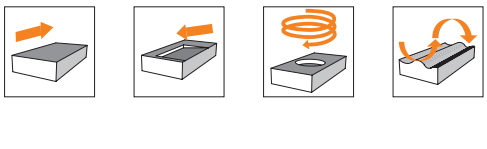
Marked: ● Stock available ○ Non-stocked standard

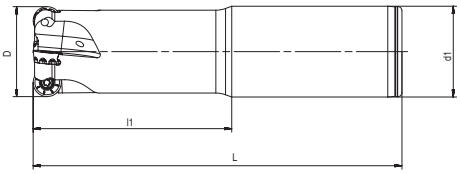
Materials				Cutting depth and feed					
				ROHT..0803..					
				ap		Geometry			
						MM3			
						fz			
						0.004<ap≤0.039		0.039<ap≤0.157	
						(in)			
ISO	Material classification	Tensile strength (1bs/in²)	Hardness (HB)	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.020	0.157	0.0059	0.0196	0.0031	0.0118
		<137,785	<280						
	Alloyed steel	101,526-137,785	200-280			0.0047	0.0177	0.0023	0.0110
		137,785-174,044	280-355						
		174,044-203,052	355-415						
M	Duplex stainless steel	112,839	230			0.0039	0.0157	0.0023	0.0098
	Austenitic stainless steel	97,900	200						
	Precipitation-hardening stainless steel	146,923	300						
K	Grey cast iron	101,526	220			-	-	-	-
	Nodular cast iron	127,633	260						
	Malleable cast iron	116,030	250						
S	Fe-based alloy	136,770	280			0.0039	0.0137	0.0023	0.0098
	Co-based alloy	156,060	320						
	Ni-based alloy	170,709	350						
	Ti-alloy	183,037	370						
N	Aluminum	37,709	75			-	-	-	-
	Aluminum alloy	64,831	130						
H	Hardened steel	-	50-60HRC			-	-	-	-
	Chilled cast iron	-	55HRC						

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

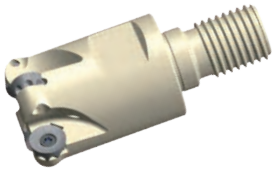
P224

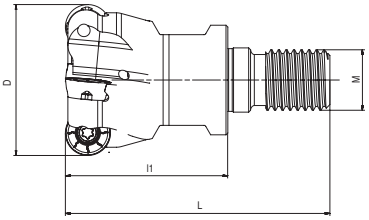
APM00-RO10
Profile milling cutter



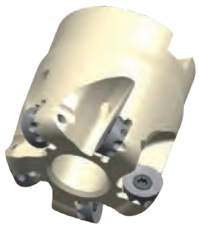


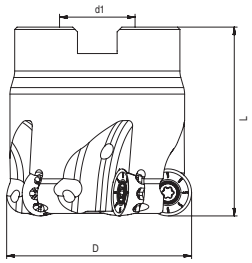
Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
APM00-01000-Z03-C1000R-RO10-L9000-C	1.000	1.000	9.000	3.362	0.196		3	○	RO 10T3
APM00-01250-Z04-C1250R-RO10-L5200-C	1.250	1.250	5.200	2.756	0.196		4	○	



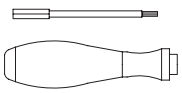


Product code	D	M	L	l1	apmax	Internal coolant	Z	Marked	Inserts
APM00-01000-Z03-M12R-RO10-C	1.000	M12	2.323	1.378	0.196		3	○	RO 10T3
APM00-01250-Z04-M16R-RO10-C	1.250	M16	2.756	1.693	0.196		4	○	





Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
APM00-01500-Z05-A0750R-RO10-C	1.500	0.750	1.575	-	0.196		5	○	RO 10T3
APM00-02000-Z06-A0750R-RO10-C	2.000	0.750	1.575	-	0.196		6	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ1.000-2.000			18 in lbs
	SP030072H	DT-TP09	

Note: With internal coolant
Without internal coolant

P204 P224

Product code	Dimension(in)		Grade						
	d	s	AP301U	AC301P	AP351U	AP401U	AP403M	AP351K	AP403S
ROHT 10T3M8E-MM3	0.393	0.156					●		●
ROMT 10T3M4E-MR6	0.393	0.156					●		●

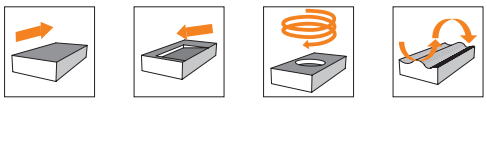
Marked: ● Stock available ○ Non-stocked standard

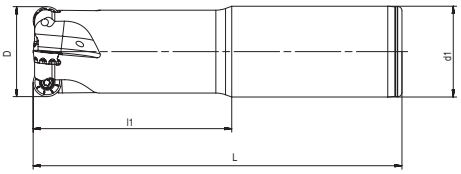
Materials				Cutting depth and feed									
				RO..10T3..									
				ap		Geometry							
						MM3				MR6			
						fz							
						0.004<ap≤0.047		0.047<ap≤0.196		0.004<ap≤0.047		0.047<ap≤0.196	
				(in)									
ISO	Material classification	Tensile strength (1bs/in²)	Hardness (HB)	min	max	min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.008	0.196	0.0059	0.0216	0.0039	0.0118	0.059	0.0236	0.0039	0.0125
		<137,785	<280										
	Alloyed steel	101,526-137,785	200-280			0.0047	0.0196	0.0031	0.0110	0.0047	0.0216	0.0031	0.0118
		137,785-174,044	280-355										
		174,044-203,052	355-415										
M	Duplex stainless steel	112,839	230			0.0039	0.0177	0.0031	0.0098	0.0039	0.0196	0.0031	0.0110
	Austenitic stainless steel	97,900	200										
	Precipitation-hardening stainless steel	146,923	300										
K	Grey cast iron	101,526	220			-	-	-	-	-	-	-	-
	Nodular cast iron	127,633	260										
	Malleable cast iron	116,030	250										
S	Fe-based alloy	136,770	280			0.0039	0.0157	0.0031	0.0098	-	-	-	-
	Co-based alloy	156,060	320										
	Ni-based alloy	170,709	350										
	Ti-alloy	183,037	370										
N	Aluminum	37,709	75			-	-	-	-	-	-	-	-
	Aluminum alloy	64,831	130										
H	Hardened steel	-	50-60HRC			-	-	-	-	-	-	-	-
	Chilled cast iron	-	55HRC										

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

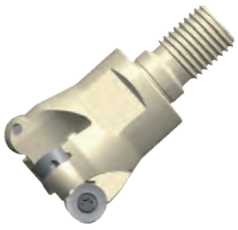
Milling cutters
P224

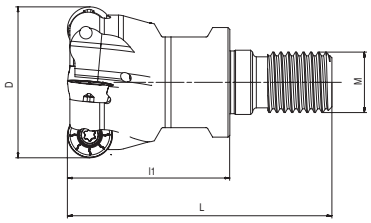
APM00-RO12
Profile milling cutter



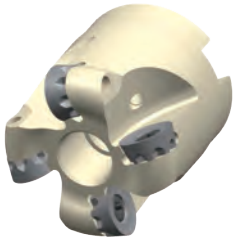


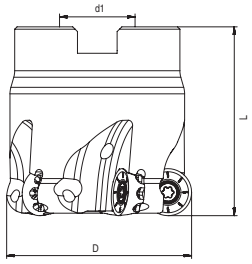
Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
APM00-01250-Z03-C1250R-RO12-L6000-C	1.250	1.250	6.000	3.031	0.236		3	●	RO 1204



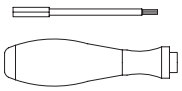


Product code	D	M	L	l1	apmax	Internal coolant	Z	Marked	Inserts
APM00-01500-Z04-M16R-RO12-C	1.5	M16	2.756	1.693	0.236		4	●	RO 1204





Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
APM00-02000-Z05-A0750R-RO12-C	2.000	0.750	1.575	-	0.236		5	●	RO 1204
APM00-02500-Z06-A1000R-RO12-C	2.500	1.000	1.575	-	0.236		6	●	
APM00-03000-Z07-A1000R-RO12-C	3.000	1.000	1.969	-	0.236		7	●	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ1.250-3.000			35 in lbs
	SP040085H	DT-TP10	

Note: With internal coolant
Without internal coolant

P204 P224

Product code	Dimension(in)		Grade						
	d	s	AP301U	AC301P	AP351U	AP401U	AP403M	AP351K	AP403S
ROHT 1204M4E-MM3	0.472	0.187					●		●
ROHT 1204M6E-MM3	0.472	0.187					●		●
ROMT 1204M6E-MR6	0.472	0.187					●		●

Marked: ● Stock available ○ Non-stocked standard

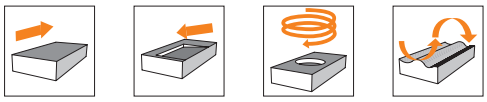
Materials				Cutting depth and feed									
				RO..1204..									
				ap		Geometry							
						MM3				MR6			
						fz							
						0.004<ap≤0.059		0.059<ap≤0.236		0.004<ap≤0.059		0.059<ap≤0.236	
				(in)									
ISO	Material classification	Tensile strength (1bs/in²)	Hardness (HB)	min	max	min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.008	0.236	0.0070	0.0236	0.0047	0.0125	0.0070	0.0255	0.0047	0.0137
		<137,785	<280										
	Alloyed steel	101,526-137,785	200-280			0.0059	0.0216	0.0039	0.0118	0.0059	0.0236	0.0039	0.0125
		137,785-174,044	280-355										
		174,044-203,052	355-415										
M	Duplex stainless steel	112,839	230			0.0047	0.0196	0.0039	0.0110	0.0047	0.0216	0.0039	0.0118
	Austenitic stainless steel	97,900	200										
	Precipitation-hardening stainless steel	146,923	300										
K	Grey cast iron	101,526	220			-	-	-	-	-	-	-	-
	Nodular cast iron	127,633	260										
	Malleable cast iron	116,030	250										
S	Fe-based alloy	136,770	280			0.0047	0.0177	0.0039	0.0110	-	-	-	-
	Co-based alloy	156,060	320										
	Ni-based alloy	170,709	350										
	Ti-alloy	183,037	370										
N	Aluminum	37,709	75			-	-	-	-	-	-	-	-
	Aluminum alloy	64,831	130										
H	Hardened steel	-	50-60HRC			-	-	-	-	-	-	-	-
	Chilled cast iron	-	55HRC										

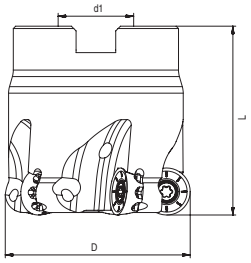
*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

Milling cutters

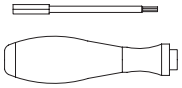
P224

APM00-RO16
Profile milling cutter





Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
APM00-02500-Z05-A1000R-RO16-C	2.500	1.000	1.575	-	0.314		5	○	RO 1605
APM00-03000-Z06-A1000R-RO16-C	3.000	1.000	1.969	-	0.314		6	○	
APM00-04000-Z07-A1500R-RO16-C	4.000	1.500	1.969	-	0.314		7	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ2.500-4.000			44 in lbs
	SP050120	DT-TP20	

Note: With internal coolant
Without internal coolant

P204 P224

Product code	Dimension(in)		Grade						
	d	s	AP301U	AC301P	AP351U	AP401U	AP403M	AP351K	AP403S
ROHT 1605M8E-MM3	0.629	0.218					●		●
ROMT 1605M6E-MR6	0.629	0.218					●		●

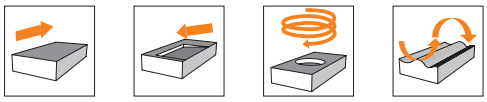
Marked: ● Stock available ○ Non-stocked standard

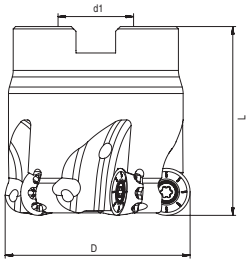
Materials				Cutting depth and feed									
				RO..1605..									
				ap		Geometry							
						MM3				MR6			
						fz							
						0.004<ap≤0.059		0.059<ap≤0.315		0.004<ap≤0.059		0.059<ap≤0.315	
						(in)							
ISO	Material classification	Tensile strength (1bs/in²)	Hardness (HB)	min	max	min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.008	0.315	0.0080	0.0255	0.0047	0.0137	0.0080	0.0267	0.0047	0.0149
		<137,785	<280										
	Alloyed steel	101,526-137,785	200-280			0.0070	0.0236	0.0039	0.0125	0.0070	0.0255	0.0039	0.0137
		137,785-174,044	280-355										
		174,044-203,052	355-415										
M	Duplex stainless steel	112,839	230			0.0059	0.0216	0.0039	0.0118	0.0059	0.0228	0.0039	0.0125
	Austenitic stainless steel	97,900	200										
	Precipitation-hardening stainless steel	146,923	300										
K	Grey cast iron	101,526	220			-	-	-	-	-	-	-	-
	Nodular cast iron	127,633	260										
	Malleable cast iron	116,030	250										
S	Fe-based alloy	136,770	280			0.0059	0.0196	0.0039	0.0118	-	-	-	-
	Co-based alloy	156,060	320										
	Ni-based alloy	170,709	350										
	Ti-alloy	183,037	370										
N	Aluminum	37,709	75			-	-	-	-	-	-	-	-
	Aluminum alloy	64,831	130										
H	Hardened steel	-	50-60HRC			-	-	-	-	-	-	-	-
	Chilled cast iron	-	55HRC										

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

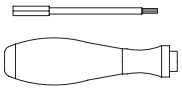
P224

APM00-RO20
Profile milling cutter





Product code	D	d1	L	l1	apmax	Internal coolant	Z	Marked	Inserts
APM00-04000-Z06-A1500R-RO20-C	4.000	1.500	1.969	-	0.393		6	○	RO 2006
APM00-05000-Z07-A1500R-RO20-C	5.000	1.500	2.480	-	0.393		7	○	
APM00-06000-Z08-A1500R-RO20	6.000	1.500	2.480	-	0.393		8	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ4.000-6.000			62 in lbs
	SP060121	DT-TP25	

Note: With internal coolant
Without internal coolant

P204 P224

Product code	Dimension(in)		Grade						
	d	s	AP301U	AC301P	AP351U	AP401U	AP403M	AP351K	AP403S
ROHT 2006M8E-MM3	0.787	0.250					●		●
ROMT 2006M8E-MR6	0.787	0.250					●		●

Marked: ● Stock available ○ Non-stocked standard

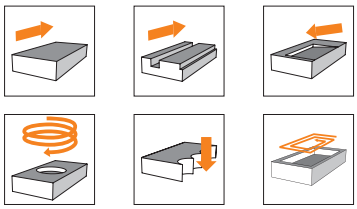
Materials				Cutting depth and feed									
				RO..2006..									
				ap		Geometry							
						MM3				MR6			
						fz							
						0.004<ap≤0.098		0.098<ap≤0.393		0.004<ap≤0.098		0.098<ap≤0.393	
				(in)									
ISO	Material classification	Tensile strength (1bs/in²)	Hardness (HB)	min	max	min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.008	0.393	0.0078	0.0275	0.0059	0.0149	0.0078	0.0314	0.0059	0.0157
		<137,785	<280										
	Alloyed steel	101,526-137,785	200-280			0.0070	0.0255	0.0047	0.0137	0.0070	0.0275	0.0047	0.0149
		137,785-174,044	280-355										
		174,044-203,052	355-415										
M	Duplex stainless steel	112,839	230			0.0059	0.0236	0.0047	0.0125	0.0059	0.0255	0.0047	0.0137
	Austenitic stainless steel	97,900	200										
	Precipitation-hardening stainless steel	146,923	300										
K	Grey cast iron	101,526	220			-	-	-	-	-	-	-	-
	Nodular cast iron	127,633	260										
	Malleable cast iron	116,030	250										
S	Fe-based alloy	136,770	280			0.0059	0.0216	0.0047	0.0125	-	-	-	-
	Co-based alloy	156,060	320										
	Ni-based alloy	170,709	350										
	Ti-alloy	183,037	370										
N	Aluminum	37,709	75			-	-	-	-	-	-	-	-
	Aluminum alloy	64,831	130										
H	Hardened steel	-	50-60HRC			-	-	-	-	-	-	-	-
	Chilled cast iron	-	55HRC										

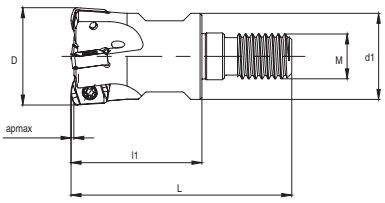
*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

Milling cutters

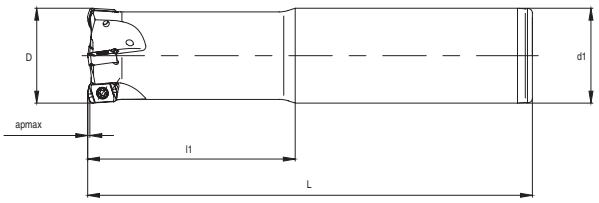
P224

AHM20-LN06
20° Approach angle high feed milling cutter





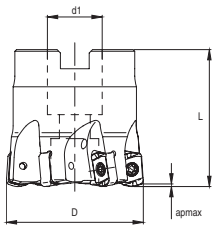
Product code	D	d1	L	L1	M	apmax	Internal coolant	Z	Marked	Inserts
AHM20-00625-Z02-M08R-LN06-C	0.625	0.570	1.654	0.984	M8	0.031		2	●	LN..0604
AHM20-017-Z02-M08R-LN06-C	0.669	0.570	1.654	0.984	M8	0.031		2	○	
AHM20-00750-Z03-M10R-LN06-C	0.750	0.709	2.008	1.181	M10	0.031		3	●	
AHM20-021-Z03-M10R-LN06-C	0.827	0.709	2.008	1.181	M10	0.031		3	○	
AHM20-01000-Z04-M12R-LN06-C	1.000	0.906	2.323	1.378	M12	0.031		4	●	
AHM20-026-Z03-M12R-LN06-C	1.024	0.906	2.323	1.378	M12	0.031		3	○	
AHM20-01024-Z04-M12R-LN06-C	1.024	0.906	2.323	1.378	M12	0.031		4	○	
AHM20-01250-Z04-M16R-LN06-C	1.250	1.142	2.756	1.693	M16	0.031		4	○	
AHM20-01250-Z05-M16R-LN06-C	1.250	1.142	2.756	1.693	M16	0.031		5	●	
AHM20-033-Z05-M16R-LN06-C	1.299	1.142	2.756	1.693	M16	0.031		5	○	
AHM20-01378-Z05-M16R-LN06-C	1.378	1.142	2.756	1.693	M16	0.031		5	○	
AHM20-01500-Z06-M16R-LN06-C	1.500	1.142	2.756	1.693	M16	0.031		6	○	



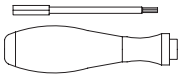
Product code	D	d1	L	L1	d2	apmax	Internal coolant	Z	Marked	Inserts
AHM20-00625-Z02-C0625R-LN06-L4000-C	0.625	0.625	4.000	1.181	-	0.031		2	●	LN..0604
AHM20-00669-Z02-C0625R-LN06-L6000-C	0.669	0.625	6.000	0.984	-	0.031		2	○	
AHM20-00750-Z03-C0750R-LN06-L5200-C	0.750	0.750	5.200	1.969	-	0.031		3	●	
AHM20-00827-Z03-C0750R-LN06-L6300-C	0.827	0.750	6.300	1.181	-	0.031		3	○	
AHM20-01000-Z03-C1000R-LN06-L5600-C	1.000	1.000	5.600	2.362	-	0.031		3	●	
AHM20-01024-Z03-C1000R-LN06-L7000-C	1.024	1.000	7.000	1.378	-	0.031		3	○	
AHM20-01250-Z04-C1250R-LN06-L6000-C	1.250	1.250	6.000	2.756	-	0.031		4	●	
AHM20-01250-Z05-C1250R-LN06-L6000-C	1.250	1.250	6.000	2.756	-	0.031		5	●	
AHM20-01299-Z04-C1250R-LN06-L8000-C	1.299	1.250	8.000	1.378	-	0.031		4	○	
AHM20-035-Z05-C1250R-LN06-L8000-C	1.378	1.250	8.000	1.378	-	0.031		5	○	

Note: With internal coolant
Without internal coolant

P204 P224



Product code	D	d1	L	L1	d2	apmax	Internal coolant	Z	Marked	Inserts
AHM20-01500-Z06-A0750R-LN06-C	1.500	0.750	1.575	-	-	0.031		6	○	LN..0604
AHM20-02000-Z07-A0750R-LN06-C	2.000	0.750	1.575	-	-	0.031		7	●	
AHM20-052-Z07-A1000R-LN06-C	2.047	1.000	1.575	-	-	0.031		7	○	
AHM20-02500-Z08-A1000R-LN06-C	2.500	1.000	1.575	-	-	0.031		8	○	

Dimension(in)	Spare parts		
Cutter diameter	Screw	Wrench	Torque
ϕ0.625-2.500			9 in lbs
	SP02506450H	DT-TP08	

Product code	Dimension(in)		Grades									
	Insert corner radius	Wiper length	AC301P	AP301U	AP351U	AP401U	AP403M	AC301K	AP351K	AW100K	AP403S	AP151H
LNMX 060410R-MM3	0.039	-		●	●		●				●	
LNMX 060410R-MM4	0.039	-		●	●		●				●	●

Marked: ● Stock available ○ Non-stocked standard

Materials				Cutting depth and feed							
				LNMX..0604..							
				High feed Milling				Plunging Milling			
				ap		fz		ae		fz	
				(in)							
ISO	Material classification	Tensile strength (1bs/in²)	Hardness (HB)	min	max	min	max	min	max	min	max
P	Unalloyed steel	<87,022	<180	0.012	0.031	0.0118	0.0393	0.020	0.157	0.0031	0.0059
		<137,785	<280								
	Alloyed steel	101,526-137,785	200-280			0.0118	0.0393			0.0023	0.0047
		137,785-174,044	280-355								
		174,044-203,052	355-415								
M	Duplex stainless steel	112,839	230			0.0098	0.0314			0.0023	0.0047
	Austenitic stainless steel	97,900	200								
	Precipitation-hardening stainless steel	146,923	300			0.0098	0.0236				
K	Grey cast iron	101,526	220			0.0118	0.0393			0.0031	0.0059
	Nodular cast iron	127,633	260								
	Malleable cast iron	116,030	250								
S	Fe-based alloy	136,770	280			0.0098	0.0236			0.0023	0.0039
	Co-based alloy	156,060	320								
	Ni-based alloy	170,709	350								
	Ti-alloy	183,037	370								
N	Aluminum	37,709	75			-	-			-	-
	Aluminum alloy	64,831	130								
H	Hardened steel	-	50-60HRC			0.0098	0.0236			0.0023	0.0039
	Chilled cast iron	-	55HRC								

Note: Please refer to P330 for programming information of high feed milling cutter

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants. $f_z = \frac{h_m}{\sqrt{\frac{a_e}{D_c}}}$, (calculate for $\frac{a_e}{D_c}$ <30%)

P224

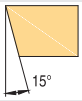
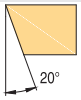
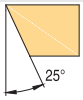
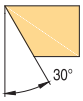
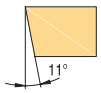
Milling Insert Denomination System

A	P	F	W
1	2	3	4

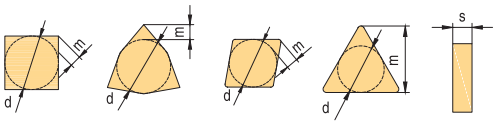
1- Shape/code

A	H	M	O	R
				
85°	120°	86°	135°	360°
S	**T**	**Z**	**X**	
			Special	
90°	60°	86°		

2- Clearance angle

C	D	E	F
			
7°	15°	20°	25°
G	**N**	**P**	**O**
			Other clearance angle
30°	0°	11°	

3- Tolerance



Class	Unit	In.Circle dimension d	Nose height m	Thickness s
A	in	± 0,0010	± 0,0002	± 0,0010
C	in	± 0,0010	± 0,0005	± 0,0010
E	in	± 0,0010	± 0,0010	± 0,0010
F	in	± 0,0005	± 0,0002	± 0,0010
G	in	± 0,0010	± 0,0010	± 0,0050
H	in	± 0,0005	± 0,0005	± 0,0250
J	in	*	± 0,0002	± 0,0010
K	in	*	± 0,0005	± 0,0010
L	in	*	± 0,0010	± 0,0010
M	in	*	*	± 0,0050
U	in	*	*	± 0,0050
N	in	*	*	± 0,0010

* For details refer to right and below tables

Shape : C, E, H, M, O, P, S, T, R, W				
IC	d		m	
	J,K,L,M,N	U	M, N	U
3/16	± 0,0020	± 0,0030	± 0,0030	± 0,0050
7/32	± 0,0020	± 0,0030	± 0,0030	± 0,0050
0.236	± 0,0020	± 0,0030	± 0,0030	± 0,0050
1/4	± 0,0020	± 0,0030	± 0,0030	± 0,0050
5/16	± 0,0020	± 0,0030	± 0,0030	± 0,0050
0.315	± 0,0020	± 0,0030	± 0,0030	± 0,0050
3/8	± 0,0020	± 0,0030	± 0,0030	± 0,0050
0.394	± 0,0020	± 0,0030	± 0,0030	± 0,0050
0.472	± 0,0030	± 0,0050	± 0,0050	± 0,0080
1/2	± 0,0030	± 0,0050	± 0,0050	± 0,0080
5/8	± 0,0040	± 0,0070	± 0,0060	± 0,0110
0.630	± 0,0040	± 0,0070	± 0,0060	± 0,0110
3/4	± 0,0040	± 0,0070	± 0,0060	± 0,0110
0.787	± 0,0040	± 0,0070	± 0,0060	± 0,0110
0.984	± 0,0050	± 0,0100	± 0,0070	± 0,0150
1	± 0,0050	± 0,0100	± 0,0070	± 0,0150
1 1/4	± 0,0060	± 0,0100	± 0,0080	± 0,0150
1.260	± 0,0060	± 0,0100	± 0,0080	± 0,0150

M&N shape	D shape		V shape	
IC	d	m	d	m
7/32	± 0,0020	± 0,0043		
1/4	± 0,0020	± 0,0043	± 0,0020	± 0,0060
5/16	± 0,0020	± 0,0043	± 0,0020	± 0,0060
3/8	± 0,0020	± 0,0043	± 0,0020	± 0,0060
1/2	± 0,0030	± 0,0060	± 0,0030	± 0,0080
5/8	± 0,0040	± 0,0070	± 0,0040	± 0,0110
3/4	± 0,0040	± 0,0070	± 0,0040	± 0,0110

4- Clamping type

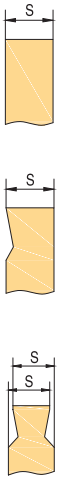
A	B	C	F	G
				
	70°-90°	70°-90°		
H	**J**	**M**	**N**	**Q**
				
70°-90°	70°-90°			40°-60°
R	**T**	**U**	**W**	**X**
				Special
	40°-60°	40°-60°	40°-60°	

16	04	PD	S	R	-	FM2
5	6	7	8	9	-	10

5- Cutting edge length

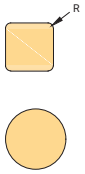
In.Circle dimension (mm)	H	M	O	R	S	T	Z
0.125						05	
0.157						06	
0.196				05			
7/32						09	
0.236				06			
1/4						11	
5/16						13	
0.315				08			
3/8				09	09	16	
0.394				10			
0.472				12			
1/2			04	12	12	22	
5/8				15	15	27	
0.630			06	16			
3/4				19	19	33	
0.787				20			
0.984				25	25		
1				25			
1 1/4				31			
1.260				32			

6- Insert thickness



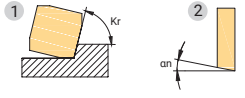
01=1/16in
T1=5/64in
02=3/32in
T2=0.109in
03=1/8in
T3=5/32in
04=3/16in
05=7/32in
06=1/4in
07=5/16in
09=3/8in

7-Corner radius and wiper edge



00 = sharp	24 = 0.093
01 = 0.004	28 = 0.109
02 = 0.008	32 = 0.125
04 = 0.015	40 = 0.157
08 = 0.031	48 = 0.188
12 = 0.047	56 = 0.220
16 = 0.062	64 = 0.251
20 = 0.078	X = others

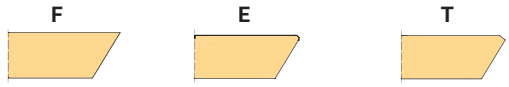
Round insert:MO refers to metric dia. size



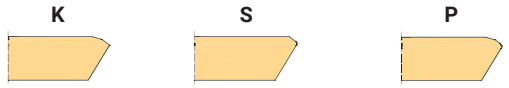
1 Approach angle(Entering angle)
(kr)
A = 45°
D = 60°
E = 75°
F = 85°
P = 90°
Z = Others

2 Clearance angle of wiper edge
(n)
A = 3°
B = 5°
C = 7°
D = 15°
E = 20°
F = 25°
G = 30°
N = 0°
P = 11°
Z = Others

8- Edge preparation

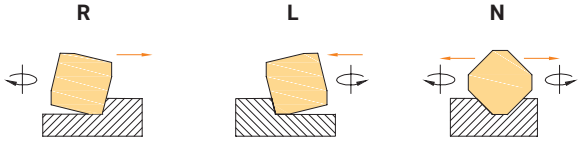


Sharp cutting edge | Honed cutting edge | Negative land



Double negative land | Negative land +honed | Double negative land +honed

9-Hand of tool



Right hand | Left hand | Neutral

10-Chip breakers refers to page P258

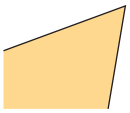
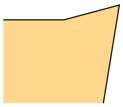
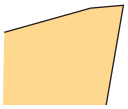
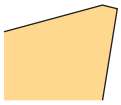
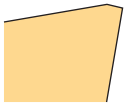
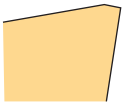
Marked: if it has corner radius, the information needs to put between thickness and wipers.
Example: APET 160408PDFR-FM2

Geometry Application Guide

Materials				Milling geometry application table						
				FM2	MM3	MM4	MR2	MR6	RR2	HR2
ISO	Material classification	Tensile strength (1bs/in²)	Hardness (HB)	Suitable for machining aluminium alloy	Light cutting machining	General purpose	Medium machining	Roughing machining	Heavy roughing machining	Roughing machining
P	Unalloyed steel	<87,022	<180	-	◐	●	●	●	-	-
		<137,785	<280	-	◐	●	●	●	-	-
	Alloyed steel	101,526-137,785	200-280	-	◐	●	●	●	-	-
		137,785-174,044	280-355	-	◐	●	●	●	-	-
		174,044-203,052	355-415	-	◐	●	●	●	-	-
M	Duplex stainless steel	112,839	230	-	◐	●	◐	-	-	-
	Austenitic stainless steel	97,900	200	-	◐	●	◐	-	-	-
	Precipitation-hardening stainless steel	146,923	300	-	◐	●	◐	-	-	-
K	Grey cast iron	101,526	220	-	-	◐	●	●	●	●
	Nodular cast iron	127,633	260	-	-	◐	●	●	●	●
	Malleable cast iron	116,030	250	-	-	◐	●	●	●	●
S	Fe-based alloy	136,770	280	-	●	◐	◐	-	-	-
	Co-based alloy	156,060	320	-	●	◐	◐	-	-	-
	Ni-based alloy	170,709	350	-	●	◐	◐	-	-	-
	Ti-alloy	183,037	370	-	●	◐	◐	-	-	-
N	Aluminum	37,709	75	●	-	-	-	-	-	-
	Aluminum alloy	64,831	130	●	-	-	-	-	-	-
H	Hardened steel	-	50-60HRC	-	-	◐	●	-	-	-
	Chilled cast iron	-	55HRC	-	-	◐	●	-	-	-

● Best choice
◐ 2nd choice
- Inapplicable

Milling Geometry Introduction

Insert geometry	Edge shape	Application
FM2		▪ Low cutting force, for weak machining condition ▪ Sharp geometry ▪ For aluminium material machining
MM3		▪ Low cutting force, for weak machining condition ▪ Sharp geometry ▪ For steel, stainless-steel and heat resistant alloy machining.
MM4		▪ For medium machining condition ▪ Universal geometry ▪ For machining most materials
MR2		▪ For medium or better machining condition ▪ Universal geometry ▪ For machining most materials
MR6		▪ For stable machining condition ▪ Roughing geometry ▪ For machining most materials
HR2		▪ For stable machining condition ▪ Roughing geometry ▪ Mainly for cast iron machining
RR2		▪ For stable machining condition ▪ Heavy roughing geometry ▪ Mainly for cast iron and steel machining
IT		▪ Sharp geometry, for specified product
DT		▪ Universal geometry, for specified product

Grade Application Guide

Milling grade ISO group														
Material Group	Materials	ISO	PVD AP301U	PVD AP351U	PVD AP351M	PVD AP401U	PVD AP403S	PVD AP403M	CVD AP301P	CVD AP301K	PVD AP351K	PVD AP151H	Uncoated AW100K	ISO
P	Unalloyed steels / Alloyed steels	P01	AP301U	AP351U	AP351M	AP401U	AP403S	AP403M	AC301P	AC301K	AP351K	AP151H	AW100K	P01
		P05												P05
		P10												P10
		P15												P15
		P20												P20
		P25												P25
		P30												P30
		P35												P35
		P40												P40
		P45												P45
		P50												P50
M	Stainless steels	M01	AP301U	AP351U	AP351M	AP401U	AP403S	AP403M	AC301P	AC301K	AP351K	AP151H	AW100K	M01
		M05												M05
		M10												M10
		M15												M15
		M20												M20
		M25												M25
		M30												M30
		M35												M35
		M40												M40
		M45												M45
		M50												M50
K	Cast iron	K01	AP301U	AP351U	AP351M	AP401U	AP403S	AP403M	AC301P	AC301K	AP351K	AP151H	AW100K	K01
		K05												K05
		K10												K10
		K15												K15
		K20												K20
		K25												K25
		K30												K30
		K35												K35
		K40												K40
		K45												K45
		K50												K50
S	Heat resistant alloys	S01	AP301U	AP351U	AP351M	AP401U	AP403S	AP403M	AC301P	AC301K	AP351K	AP151H	AW100K	S01
		S05												S05
		S10												S10
		S15												S15
		S20												S20
		S25												S25
		S30												S30
		S35												S35
		S40												S40
		S45												S45
		S50												S50
N	Aluminum/ Aluminum alloys	N01	AP301U	AP351U	AP351M	AP401U	AP403S	AP403M	AC301P	AC301K	AP351K	AP151H	AW100K	N01
		N05												N05
		N10												N10
		N15												N15
		N20												N20
		N25												N25
		N30												N30
H	Hardened steels/ Chilled cast iron	H01	AP301U	AP351U	AP351M	AP401U	AP403S	AP403M	AC301P	AC301K	AP351K	AP151H	AW100K	H01
		H05												H05
		H10												H10
		H15												H15
		H20												H20
		H25												H25
		H30												H30

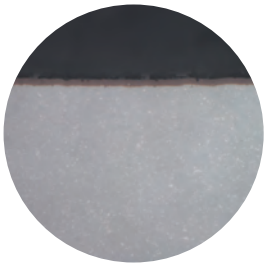
Grade Application Guide

Materials				Milling grade application										
				PVD coated						CVD coated		PVD coated		Uncoated
ISO	Material classification	Tensile strength (1bs/in^2)	Hardness (HB)	AP301U	AP351U	AP351M	AP401U	AP403S	AP403M	AC301P	AC301K	AP351K	AP151H	AW100K
P	Unalloyed steel	<87,022	<180	●	●	●	◐	◐	●	●	◐	-	-	-
		<137,785	<280	●	●	●	◐	◐	●	●	◐	-	-	-
	Alloyed steel	101,526-137,785	200-280	●	●	●	◐	◐	●	●	◐	-	-	-
		137,785-174,044	280-355	●	●	●	◐	◐	●	●	◐	-	-	-
		174,044-203,052	355-415	●	●	●	◐	◐	●	●	◐	-	-	-
M	Duplex stainless steel	112,839	230	◐	●	●	●	●	●	◐	-	-	-	-
	Austenitic stainless steel	97,900	200	◐	●	●	●	●	●	◐	-	-	-	-
	Precipitation-hardening stainless steel	146,923	300	◐	●	●	●	●	●	◐	-	-	-	-
K	Grey cast iron	101,526	220	-	-	-	-	-	-	-	●	●	●	-
	Nodular cast iron	127,633	260	-	-	-	-	-	-	-	●	●	●	-
	Malleable cast iron	116,030	250	-	-	-	-	-	-	-	●	●	●	-
S	Fe-based alloy	136,770	280	-	◐	●	-	●	●	-	-	-	-	-
	Co-based alloy	156,060	320	-	◐	●	-	●	●	-	-	-	-	-
	Ni-based alloy	170,709	350	-	◐	●	-	●	●	-	-	-	-	-
	Ti-alloy	183,037	370	-	◐	●	-	●	●	-	-	-	-	◐
N	Aluminum	37,709	75	-	-	-	-	-	-	-	-	-	-	●
	Aluminum alloy	64,831	130	-	-	-	-	-	-	-	-	-	-	●
H	Hardened steel	-	50-60HRC	-	-	-	-	-	-	-	-	-	●	-
	Chilled cast iron	-	55HRC	-	-	-	-	-	-	-	-	-	●	-

● Best choice
◐ 2nd choice
- Inapplicable

Milling Grade Description

AP301U



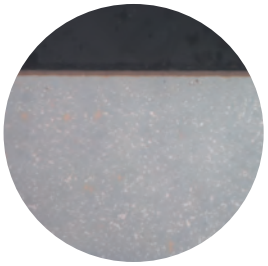
Coating: PVD coating

Suitable for steel, stainless steel and high-temp alloy milling. High strength and wear resistance. Ultra fine carbide substrate with nanostructured PVD coating in controllable layer, high coating adhesion, wear-resistance and strength.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P				AP301U							
M				AP301U							
K											
S											
N											
H											

Remark: Best choice
2nd choice

AP351U



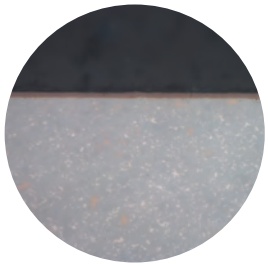
Coating: PVD coating

Suitable for steel, stainless steel and high-temp alloy semi-finishing and roughing milling. High strength carbide substrate with nanostructured PVD coating in controllable layer, high coating adhesion, wear-resistance and strength.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P							AP351U				
M							AP351U				
K											
S							AP351U				
N											
H											

Remark: Best choice
2nd choice

AP401U



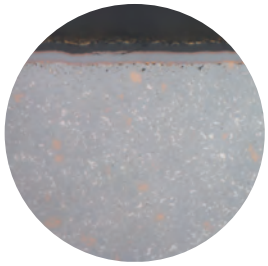
Coating: PVD coating

Suitable for steel, stainless steel and high-temp alloy rough milling. Ultra high strength carbide substrate with nanostructured PVD coating in controllable layer, high coating adhesion, wear-resistance and strength.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P							AP401U				
M							AP401U				
K											
S							AP401U				
N											
H											

Remark: Best choice
2nd choice

AC301P



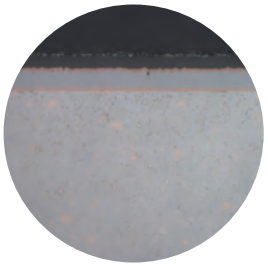
Coating: CVD coating

Suitable for steel and stainless steel semi-finish milling. High strength carbide substrate with multi-layer CVD coating, high coating adhesion, wear resistance and surface finish quality.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P						AC301P					
M						AC301P					
K											
S											
N											
H											

Remark: Best choice
2nd choice

AC301K



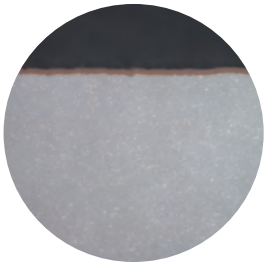
Coating: CVD coating

Suitable for gray and nodular cast iron finish, semi-finish and rough milling. High strength and wear resistance carbide substrate with multi-layer CVD coating, controllable coating layer structure and high adhesive strength.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P											
M											
K			AC301K								
S											
N											
H											

Remark: ☐ Best choice

AP351K



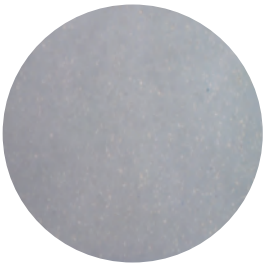
Coating: PVD coating

Suitable for nodular cast iron, finish, semi-finishand rough milling. High strength and wear resistance carbide substrate with nanostructured PVD coating in controllable layer, high coating adhesion, wear resistance and oxidation resistance.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P											
M											
K				AP351K							
S											
N											
H											

Remark: ☐ Best choice

AW100K



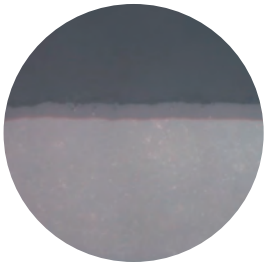
Coating: Uncoated

Uncoated fine grain carbide substrate with special treated cutting edge. Suitable for nonferrous metal milling under various cutting conditions.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P											
M											
K											
S											
N			AW100K								
H											

Remark: ☐ Best choice

AP351M



Coating: PVD Coating

Suitable for steel, stainless-steel and heat resistant alloy milling, with excellent thermal-stability and wear-resistant, good thermal-crack resistance and high coating adhesion.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P						AP351M					
M						AP351M					
K											
S						AP351M					
N											
H											

Remark: ☐ Best choice

AP403M

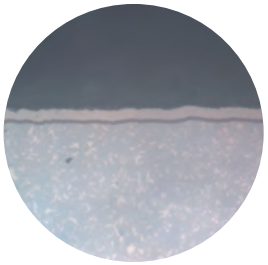
Coating: PVD Coating

Suitable for steel, stainless-steel and heat resistant alloy milling, with good wear-resistance, heat-resistance and high coating adhension, very smooth coating surface.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P								AP403M			
M								AP403M			
K											
S								AP403M			
N											
H											

Remark: ☐ Best choice

AP403S



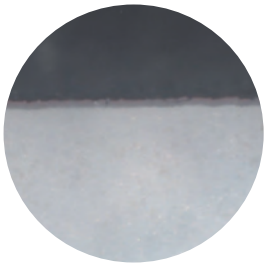
Coating: PVD Coating

Suitable for stainless-steel and heat resistant alloy milling, with new substrate and coating combination, new substrate with high toughness, excellent hot hardness. New generation of PVD coating, with high hardness, high wear-resistance, good performance on heat-conductivity, thermal-stability, smooth surface good for reducing built-up edge.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P											
M								AP403S			
K											
S								AP403S			
N											
H											

Remark: ☐ Best choice

AP151H



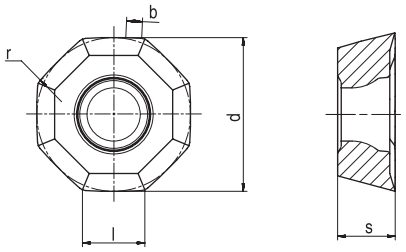
Coating: PVD Coating

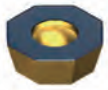
Suitable for hardened steel milling and cast iron finish milling. Ultra fine carbide substrate with high hardness and wear-resistance. Extremely hard PVD coating with good oxidation resistance, wear resistance, and thermal crack resistance.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P											
M											
K											
S											
N											
H			AP151H								

Remark: ☐ Best choice

OD..06
Positive octagonal milling inserts

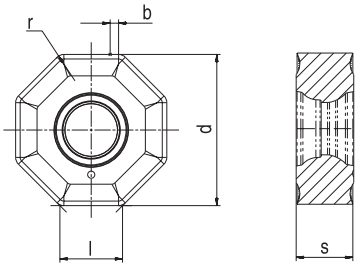


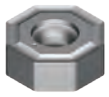
Inserts	Product code	Dimension(in)					Grades						
		l	d	s	r	b	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
	ODET 0605APFN-FM2	0.236	0.629	0.218	-	0.063							●
	ODMT 060508EN-MM3	0.236	0.629	0.218	0.031	-	●	●	●	●	●	●	
	ODMT 060512EN-MM3	0.236	0.629	0.218	0.047	-	●						
	ODHT 0605APEN-MM3	0.236	0.629	0.218	-	0.063	●	●		●	●	●	
	ODEW 0605APSR-HR2	0.236	0.629	0.218	-	0.063					●	●	
	ODEW 0605APSN-HR2	0.236	0.629	0.218	-	0.063					●		
	ODMW 060512EN-HR2	0.236	0.629	0.218	0.047	-					●	●	

Marked: ● Stock available ○ Non-stocked standard

P148 P224

ON..05
Negative octagonal milling inserts

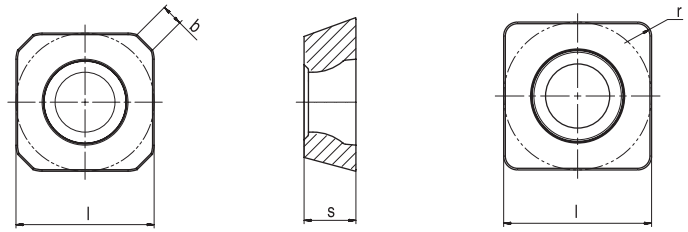


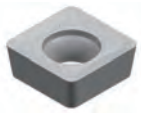
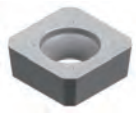
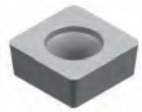
Inserts	Product code	Dimension(in)					Grades						
		l	d	s	r	b	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
	**ONHU 050408-MM3**	0.157	0.500	0.187	0.031	-	●						
	ONMU 050408-MM4	0.157	0.500	0.187	0.031	-	●	●		●	●	●	
	**ONHU 050408AEN-MM3**	0.157	0.500	0.187	0.031	0.028	●	●				●	
	ONHU 050408AEN-MM4	0.157	0.500	0.187	0.031	0.028		●			●	●	
	**ONHU 0504ZNR-MM3**	0.157	0.500	0.187	0.031	0.055	●						

Marked: ● Stock available ○ Non-stocked standard

P148 P224

SC..09/12
Positive square milling inserts



Inserts	Product code	Dimension(in)				Grades						
		l	s	r	b	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
	SCMT 09T304EN-MM3	0.375	0.156	0.016	-	●	●		●			
	SCMT 120412EN-MM3	0.500	0.187	0.047	-		●		●			
	SCMT 12M512EN-MM3	0.500	0.197	0.047	-		●		●			
	SCHT 1204ACEN-MR6	0.500	0.187	-	0.059				●		●	
	SCHT 12M5ACEN-MR6	0.500	0.197	-	0.059				●		●	
	SCMW 12M512EN-HR2	0.500	0.197	0.047	-		●				●	

Marked: ● Stock available ○ Non-stocked standard

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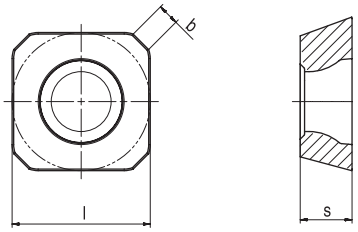
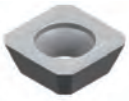
SE..12
Positive square milling inserts



Inserts	Product code	Dimension(in)				Grades						
		l	s	r	b	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
	**SEKT 1204AFER-MR2**	0.500	0.193	0.047	0.071	●	●	●		●	●	

Marked: ● Stock available ○ Non-stocked standard

Milling inserts

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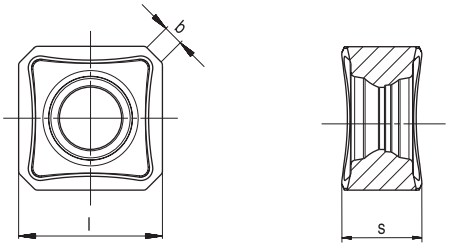
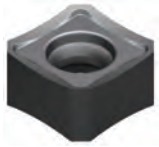
SNGX12/19

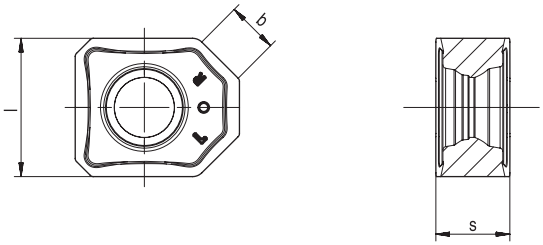
Negative short wiper milling inserts(applicable to AFM45-SN12/SN19 milling cutter)



Inserts	Product code	Dimension(in)			Grades						
		l	s	b	AP301U	AP351U	AP301P	AP401U	AC301K	AP351K	AW100K
	SNHX 1206ANN-FM2	0.500	0.275	0.071							●
	SNGX 1206ANN-MM3	0.500	0.275	0.071	●	●	●		●	●	
	SNGX 1206ANN-MM4	0.500	0.275	0.071	●	●	●		●	●	
	SNGX 1206ANN-MR6	0.500	0.275	0.071	●	●	●		●	●	
	SNGX 1206ANN-RR2	0.500	0.275	0.071	●	●	●		●	●	
	SNMX 1206ANN-MM3	0.500	0.275	0.071	●	●	●		●	●	
	SNMX 1206ANN-MM4	0.500	0.275	0.071	●	●	●		●	●	
	SNMX 1206ANN-MR6	0.500	0.275	0.071	●	●	●		●	●	
	SNGX 1909ANN-MM3	0.750	0.375	0.114		●					
	SNGX 1909ANN-MR6	0.750	0.375	0.114		●					

SNHX12

Negative long wiper milling inserts(applicable to AFM45-SN12 milling cutter)



Inserts	Product code	Dimension(in)			Grades						
		l	s	b	AP301U	AP351U	AP301P	AP401U	AC301K	AP351K	AW100K
	SNHX 1206ANN-W	0.500	0.275	0.264	●				●		

Marked: ● Stock available ○ Non-stocked standard

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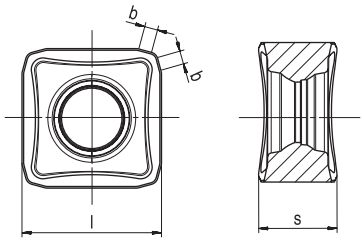
SNGX12

Negative short wiper milling inserts(applicable to AFM75-SN12 milling cutter)



Inserts	Product code	Dimension(in)			Grades						
		l	s	b	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
	SNGX 1206ENN-MM3	0.500	0.275	0.047	●	●	●		●	●	
	SNGX 1206ENN-MM4	0.500	0.275	0.047	●	●	●		●	●	
	SNGX 1206ENN-MR6	0.500	0.275	0.047	●	●	●		●	●	
	SNMX 1206ENN-MM4	0.500	0.275	0.047			●				

Marked: ● Stock available ○ Non-stocked standard

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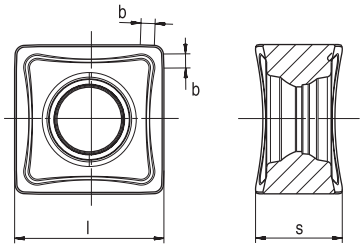
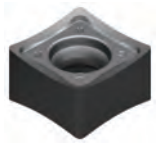
SNGX12

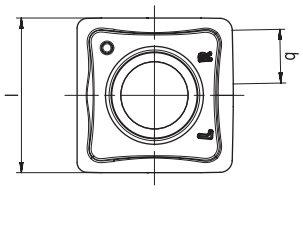
Negative short wiper milling inserts(applicable to AFM88-SN12 milling cutter)

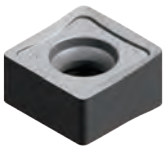


Inserts	Product code	Dimension(in)			Grades						
		l	s	b	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
	SNHX 1206ZNN-FM2	0.020	0.012	0.031							●
	SNGX 1206ZNN-MM4	0.020	0.011	0.047	●	●	●		●	●	
	SNGX 1206ZNN-MR6	0.020	0.011	0.047	●	●	●		●	●	
	SNGX 1206ZNN-MM3	0.020	0.011	0.047	●	●	●		●	●	

SNHX12

Negative long wiper milling inserts(applicable to AFM88-SN12 milling cutter)



Inserts	Product code	Dimension(in)			Grades						
		l	s	b	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
	SNHX 1206ZNN-W	0.500	0.275	0.173	●				●		

Marked: ● Stock available ○ Non-stocked standard

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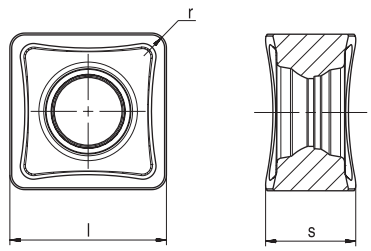
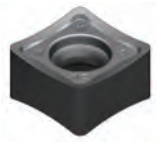
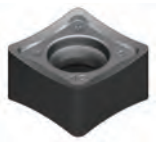
SN.X12
Negative square milling inserts with corner radius



Inserts	Product code	Dimension(in)				Grades						
		l	s	r	b	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
	**SNGX 120608-MM4**	0.500	0.275	0.031	-	●	●	●		●	●	
	SNGX 120612-MM4	0.500	0.275	0.047	-	●						
	**SNMX 120608-MM4**	0.500	0.275	0.031	-	●	●	●		●	●	
	SNMX 120612-MM3	0.500	0.275	0.047	-	●	●	●		●	●	
	SNMX 120612-MM4	0.500	0.275	0.047	-	●	●	●		●	●	
	SNMX 120612-MR6	0.500	0.275	0.047	-	●	●	●		●	●	
	SNMX 120612-RR2	0.500	0.275	0.047	-	●	●	●		●	●	
	SNMX 120620-MM4	0.500	0.275	0.079	-	●	●	●		●	●	
	SNMX 120620-RR2	0.500	0.275	0.079	-	●	●	●		●	●	

Marked: ● Stock available ○ Non-stocked standard

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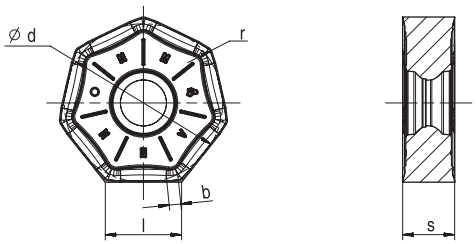
XN.U07/09ANN

Negative heptagonal milling inserts with short wiper



Inserts	Product code	Dimension(in)					Grades						
		l	d	s	r	b	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
	XNGU 0705ANN-MM3	0.276	0.571	0.213	0.031	0.043	●	●			●		
	XNGU 0705ANN-MM4	0.276	0.571	0.213	0.031	0.043	●				●		
	XNMU 0705ANN-MM4	0.276	0.571	0.213	0.031	0.043	●	●	●	●	●	●	
	XNMU 0705ANN-MR6	0.276	0.571	0.213	0.031	0.043	●	●			●	●	
	XNGU 0906ANN-MM3	0.362	0.748	0.246	0.031	0.055	●	●	●		●		
	XNGU 0906ANN-MM4	0.362	0.748	0.246	0.031	0.055	●	●	●		●		
	XNMU 0906ANN-MR6	0.362	0.748	0.246	0.031	0.055	●				●	●	

Marked: ● Stock available ○ Non-stocked standard

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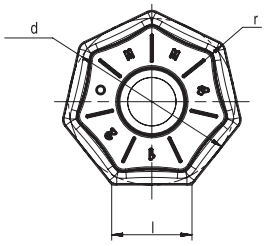
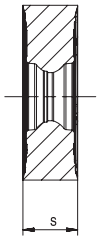
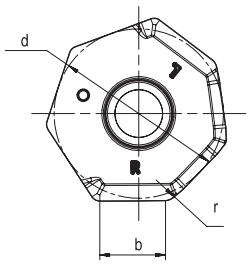
XN.U 07/09
Negative heptagonal milling inserts with corner radius

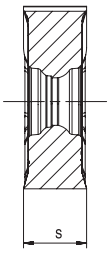


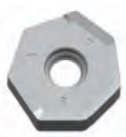


Inserts	Product code	Dimension(in)					Grades						
		l	d	s	r	b	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
	XNMU 070508-MM4	0.276	0.571	0.213	0.031	-		●		●	●	●	
	XNMU 090612-MM4	0.362	0.748	0.246	0.047	-	●	●		●	●	●	

XNGX 07/09ANN-W
Negative milling inserts with long wiper





Inserts	Product code	Dimension(in)					Grades						
		l	d	s	r	b	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
	XNGX 0705ANN-W	-	0.591	0.213	0.039	0.236	●				●		
	XNGX 0906ANN-W	-	0.750	0.244	0.039	0.295	●				●		

Marked: ● Stock available ○ Non-stocked standard

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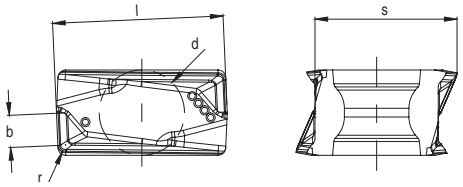
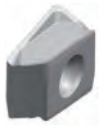
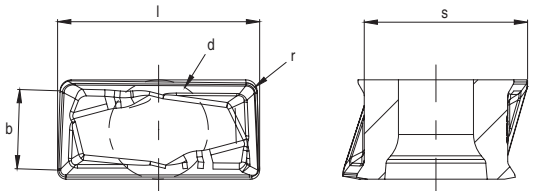
LNHU 0904
Nagative shoulder milling insert



Inserts	Product code	Dimension(in)					Grades						
		l	d	s	r	b	AP301U	AC301P	AP351U	AP403M	AC301K	AP351K	AW100K
	LNHU 090404ER-FM2	0.354	0.177	0.295	0.016	-							●
	LNHU 090404ER-MM3	0.354	0.177	0.295	0.016	-			●	●			
	LNHU 090404ER-MR2	0.354	0.177	0.295	0.016	-	●		●	●	●	●	
	LNHU 090408ER-MR2	0.354	0.177	0.293	0.031	-	●		●	●	●	●	
	LNHU 090412ER-MR2	0.354	0.177	0.291	0.047	-	●			●	●		
	LNHU 090416ER-MR2	0.354	0.177	0.289	0.063	-	●			●	●		
	LNHU 090420ER-MR2	0.354	0.177	0.288	0.079	-	●			●	●		

Wiper insert type



Inserts	Product code	Dimension(in)					Grades						
		l	d	s	r	b	AP301U	AC301P	AP351U	AP403M	AC301K	AP351K	AW100K
	LNHU 0904PDER-W	0.364	0.177	0.291	0.016	0.142	●					●	

Marked: ● Stock available ○ Non-stocked standard

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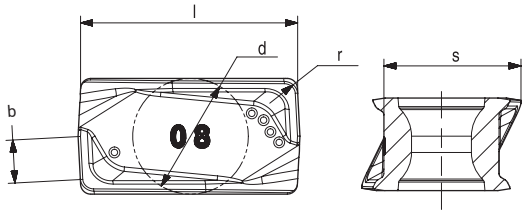
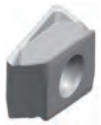
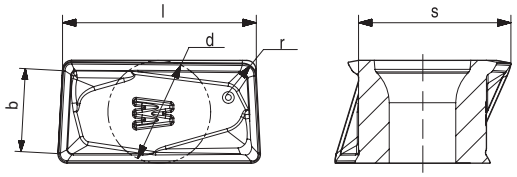
LNHU 1306...
Nagative shoulder millng insert



Inserts	Product code	Dimension(in)					Grades						
		l	d	s	r	b	AP301U	AC301P	AP351U	AP401U	AC301K	AP351K	AW100K
	LNHU 130608ER-FM2	0.513	0.268	0.398	0.031	-							●
	LNHU 130608ER-MM3	0.513	0.268	0.401	0.031	-				●			
	LNHU 130608ER-MR2	0.513	0.268	0.400	0.031	-	●	●	●	●	●	●	
	LNHU 130612ER-MR2	0.513	0.268	0.397	0.047	-			●	●	●		
	LNHU 130616ER-MR2	0.513	0.268	0.395	0.063	-			●	●	●		
	LNHU 130620ER-MR2	0.513	0.268	0.393	0.079	-			●	●			
	LNHU 130624ER-MR2	0.513	0.268	0.391	0.094	-			●	●			
	LNHU 130631ER-MR2	0.513	0.268	0.387	0.122	-			●	●	●		



Inserts	Product code	Dimension(in)					Grades						
		l	d	s	r	b	AP301U	AC301P	AP351U	AP401U	AC301K	AP351K	AW100K
	LNHU 1306PDER-W	0.527	0.268	0.394	0.031	0.220	●					●	

Marked: ● Stock available ○ Non-stocked standard

Milling inserts
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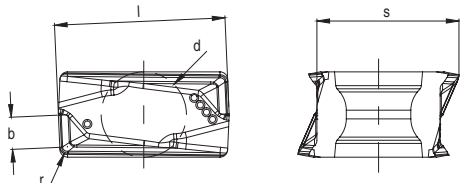
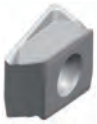
LNHU 1607..
Nagative shoulder milling insert



Inserts	Product code	Dimension(in)				Grades						
		l	d	s	r	AP301U	AC301P	AP351U	AP403M	AC301K	AP351K	AW100K
	**LNHU 160708ER-MR2**	0.630	0.283	0.512	0.031	●		●		●	●	
	LNHU 160716ER-MR2	0.630	0.283	0.512	0.063	●				●		

Marked: ● Stock available ○ Non-stocked standard

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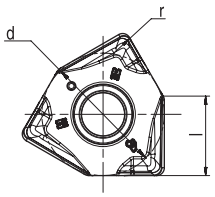
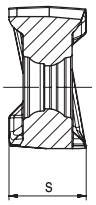
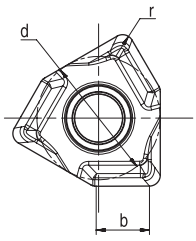
WN..08
Negative milling insert

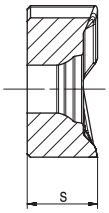




Inserts	Product code	Dimension(in)				Grades							
		l	d	s	r	AP301U	AC301P	AP351U	AP401U	AC301K	AP351K	AW100K	AP151H
	WNHU 080608R-FM2	0.315	0.492	0.310	0.031							●	
	WNGU 080604R-MM3	0.315	0.492	0.310	0.016			●	●				
	WNGU 080608R-MM3	0.315	0.492	0.310	0.031	●		●	●				
	WNGU 080604R-MM4	0.315	0.492	0.310	0.016	●		●	●		●		
	WNGU 080608R-MM4	0.315	0.492	0.310	0.031	●	●	●	●	●	●		●
	WNGU 080612R-MM4	0.315	0.492	0.310	0.047	●		●	●				
	WNGU 080616R-MM4	0.315	0.492	0.310	0.063	●		●	●				
	WNGU 080608R-MR2	0.315	0.492	0.310	0.031	●					●		
	WNGU 080612R-MR2	0.315	0.492	0.310	0.047	●					●		
	WNGU 080616R-MR2	0.315	0.492	0.310	0.063	●					●		

WNGU 08
Negative wiper milling insert





Inserts	Product code	Dimension(in)				Grades						
		d	b	s	r	AP301U	AC301P	AP351U	AP401U	AC301K	AP351K	AW100K
	WNHX 0806ZZR-W	0.445	0.188	0.255	0.043	●				●		

Marked: ● Stock available ○ Non-stocked standard

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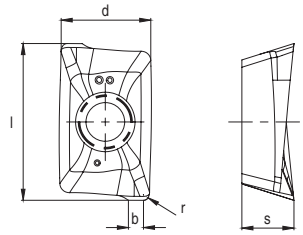
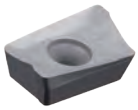
APKT 1003PDER-IT..
Positive shoulder milling insert



Inserts	Product code	Dimension(in)					Grades						
		l	d	s	r	b	AP301U	AC301P	AP351U	AP401U	AC301K	AP351K	AP403S
	**APKT 1003PDER-IT**	0.447	0.262	0.043	0.148	0.031	●		●	●			●

Marked: ● Stock available ○ Non-stocked standard

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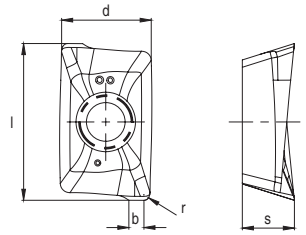
APKT 1705..-DT..
Positive shoulder milling insert



Inserts	Product code	Dimension(in)					Grades						
		l	d	s	r	b	AP301U	AC301P	AP351U	AP401U	AC301K	AP351K	AP403S
	**APKT 1705PER-DT**	0.724	0.424	0.219	0.031	0.085	●	●	●	●		●	●
	APKT 170516R-DT	0.733	0.424	0.219	0.063	0.067	●			●		●	

Marked: ● Stock available ○ Non-stocked standard

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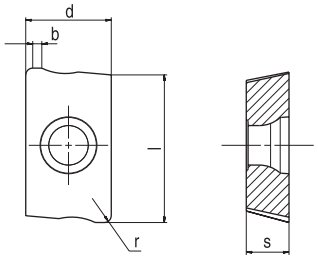
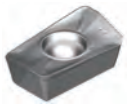
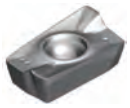
APMT..
Positive shoulder milling inserta



Inserts	Product code	Dimension(in)					Grades						
		l	d	s	r	b	AP301U	AC301P	AP351U	AP401U	AC301K	AP351K	AP151H
	**APMT 1135PDER**	0.445	0.049	0.246	0.138	0.031	●		●				●
	**APMT 1604PDER**	0.682	0.061	0.369	0.204	0.031	●		●				●

Marked: ● Stock available ○ Non-stocked standard

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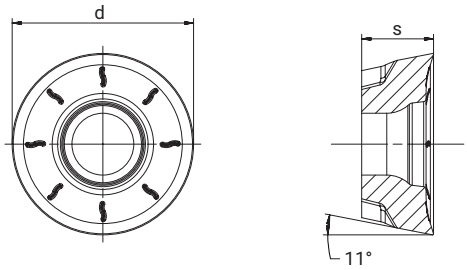
RO..T
Round inserts



Inserts	Product code	Dimension(in)		Grades						
		d	s	AP301U	AC301P	AP351U	AP403M	AC301K	AP351K	AP403S
	**ROHT 0803M0E-MM3**	0.315	0.125				●			●
	ROHT 10T3M8E-MM3	0.394	0.156				●			●
	ROHT 1204M4E-MM3	0.472	0.187				●			●
	ROHT 1204M6E-MM3	0.472	0.187				●			●
	ROHT 1605M8E-MM3	0.630	0.218				●			●
	ROHT 2006M8E-MM3	0.788	0.250				●			●
	**ROMT 10T3M4E-MR6**	0.394	0.156				●			●
	ROMT 1204M6E-MR6	0.472	0.187				●			●
	ROMT 1605M6E-MR6	0.630	0.218				●			●
	ROMT 2006M8E-MR6	0.788	0.250				●			●

Marked: ● Stock available ○ Non-stocked standard

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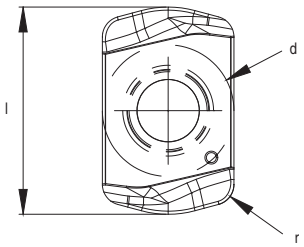
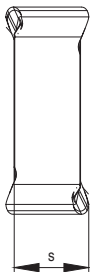
LN..06
High feed milling inserts





Inserts	Product code	Dimension(in)				Grades									
		l	d	s	r	AC301P	AP301U	AP351U	AP401U	AP403M	AC301K	AP351K	AW100K	AP403S	AP151H
	**LNMX 060410R-MM3**	0.393	0.250	0.141	0.039		●	●		●				●	
	**LNMX 060410R-MM4N**	0.393	0.250	0.141	0.039		●	●		●				●	●

Marked: ● Stock available ○ Non-stocked standard

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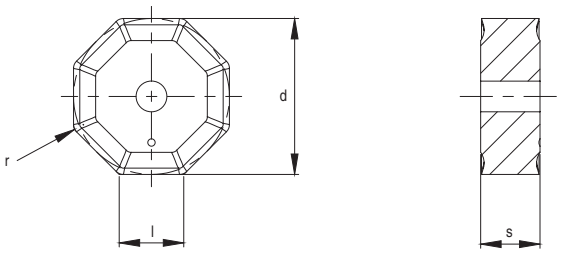
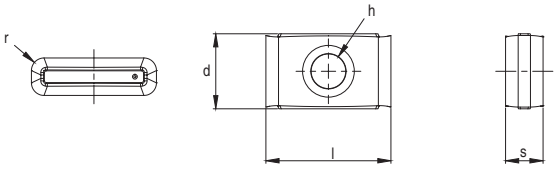
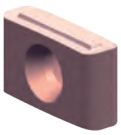
ON05/LN12/LN15
Cast iron finishing machining inserts



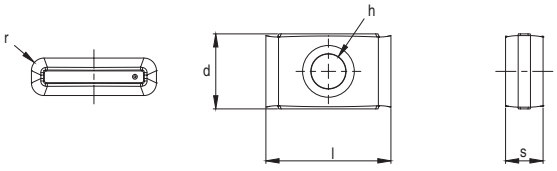
Inserts	Product code	Dimension(in)				Grades
		l	d	s	r	AP151H
	**ONHF 050408-MM3**	0.209	0.500	0.189	0.031	●

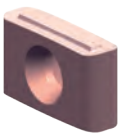
LN12
Cast iron finishing wiper insert



Inserts	Product code	Dimension(in)					Grades
		l	d	s	r	h	AP151H
	**LNHQ 120408FN-W**	0.500	0.375	0.187	0.031	0.165	●

LN15
Cast iron finishing wiper insert



Inserts	Product code	Dimension(in)					Grades
		l	d	s	r	h	AP151H
	**LNHQ 150416FN-W**	0.625	0.375	0.187	0.063	0.165	●

Marked: ● Stock available ○ Non-stocked standard

P148 P224

Cutting Parameter Recommendation Table

Materials																				
ISO	Material classification			Brinell hardness (HB)	Tensile strength Rm(1bs/in²)	AP301U PVD P15-P35 M15-M35 - - - -			AC301P CVD P25-40 - - - -			AP351U PVD P30-P45 M30-M45 S30-S45 - - -			AP351M PVD P25-P45 M25-M45 - S25-S45 - -			
						1/10	1/5	1/1	1/10	1/5	1/1	1/10	1/5	1/1	1/10	1/5	1/1			
P	Unalloyed steel	C ⩽ 0.25%	Annealed	125	62,076	1049	918	787	1246	984	852	918	787	656						
		0.25<C ⩽ 0.55%	Annealed	190	92,679	951	787	656	1148	820	721	820	688	557						
		0.25<C ⩽ 0.55%	Heat-treated	210	102,686	852	688	557	1016	721	623	754	590	459						
		C>0.55%	Annealed	190	92,679	951	787	656	1148	820	721	820	688	557						
		C>0.55%	Heat-treated	300	146,923	688	557	426	820	557	492	524	426	328						
		Free cutting steel (short-chip)	Annealed	220	108,053	820	656	524	984	688	590	721	557	426						
	Low-alloyed steel	Annealed		175	85,717	951	820	656	1115	984	820	885	754	590						
		Heat-treated		300	146,923	820	688	524	951	820	656	754	623	459						
		Heat-treated		380	185,938	754	623	459	820	688	524	688	557	393						
		Heat-treated		430	214,220	623	492	360	688	557	426	557	426	295						
	High-alloyed steel and high-alloyed tool steel	Annealed		200	97,900	721	623	524	787	688	590	656	557	459						
		Hardened and tempered		300	146,923	557	459	360	623	524	426	492	426	295						
		Hardened and tempered		400	197,396	492	393	295	524	426	328	426	328	229						
	Stainless steel	Ferritic/martensitic, annealed		200	97,900	623	524	426	656	557	459	524	459	360	590	492	393			
		Martensitic, heat-treated		330	161,572	524	393	295	557	459	360	459	360	262	492	393	295			
M	Stainless steel	Austenitic, quench hardened		200	97,900	590	492	393				557	459	360	557	492	393			
		Austenitic, precipitation hardened (PH)		300	146,923	524	426	328				492	393	295	492	426	328			
		Austenitic/ferritic, duplex		230	112,839	557	459	360				524	426	328	524	459	360			
K	Malleable cast iron	Ferritic		200	58,015															
		Pearlitic		260	101,526															
	Grey cast iron	Low tensile strength		180	29,007															
		High tensile strength/austenitic		245	50,763															
	Nodular cast iron	Ferritic		155	58,015															
		Pearlitic		265	101,526															
	GGV(CGI)			230	58,015															
N	Wrought aluminium alloys	Non-aging		30	-															
		Aged		100	49,312															
	Cast aluminium alloys	≤ 12% Si, non-aging		75	37,709															
		≤ 12% Si, aged		90	44,961															
		> 12% Si, non-aging		130	65,266															
	Magnesium alloys			70	36,259															
	Copper and copper alloys	Unalloyed, electrolytic copper		100	49,312															
		Brass, bronze, red brass		90	44,961															
		Cu alloys, short-chipping		110	55,114															
		High-tensile, Ampco alloy		300	146,488															
S	Heat-resistant alloys	Fe-based	Annealed	200	98,625							295	262	229	328	295	262			
			Hardened	280	136,335							246	196	164	262	229	196			
		Ni or Co based	Annealed	250	121,831							262	180	147	229	196	164			
			Hardened	350	171,144							196	164	114	196	164	131			
			Cast	320	156,640							196	180	131	213	180	147			
	Titanium alloys	Pure titanium		200	98,625							360	295	262	393	328	295			
		α and β alloys, hardened		375	182,747							164	131	98	180	147	114			
		β alloys		410	203,052							164	131	98	180	147	114			
	Tungsten alloys	1177		300	146,488							213	196	164	229	213	180			
	Molybdenum alloys	1262		300	146,488							213	196	164	229	213	180			
H	Hardened steel	Hardened and tempered		50HRC																
		Hardened and tempered		55HRC																
		Hardened and tempered		60HRC																
	Hardened cast steel	Hardened and tempered		50HRC																

Milling grade application range

	AP403M			AP401U			AP403S			AC301K			AP351K			AP151H			AW100K		
	PVD			PVD			PVD			CVD			PVD			PVD			Uncoated		
	P35-P50			P30-P50			-			-			-			-			-		
	M35-M50			M30-M50			M35-M50			-			-			-			-		
	-			-			-			K10-K35			K15-K40			K15-K40			-		
	S35-S50			-			S35-S50			-			-			-			-		
	-			-			-			-			-			-			N10-N20		
	-			-			-			H10-H20			-			H10-H20			-		
	according to the value of ae/Dc																				
	1/10	1/5	1/1	1/10	1/5	1/1	1/10	1/5	1/1	1/10	1/5	1/1	1/10	1/5	1/1	1/10	1/5	1/1	1/10	1/5	1/1
	Cutting speed (ft/min)																				
	557	459	360	524	459	360															
	459	360	262	459	360	262															
	524	459	360	524	459	360	623	524	459												
	459	393	295	492	426	295	557	459	393												
	492	426	328	492	426	328	524	426	360												
										787	688	590	721	623	524	590	492	393			
										721	623	524	656	557	459	524	426	328			
										918	820	721	852	754	656	688	590	492			
										787	688	590	688	623	524	590	492	393			
										852	754	656	787	688	590	623	524	426			
										623	524	426	557	459	360	492	393	295			
										656	557	459	590	492	393	524	426	328			
																			7216	7216	6560
																			5904	5904	5248
																			1968	1968	1640
																			1640	1640	1312
																			918	918	656
																			1312	1312	984
																			984	984	820
																			656	656	525
	311	278	246				360	328	295												
	262	213	180				295	262	229												
	278	196	164				262	229	196												
	213	180	114				246	213	164												
	213	196	147				246	213	180												
	393	311	278				393	328	295												
	164	131	98				196	164	131												
	164	131	98				196	164	131												
	229	196	164				229	213	196												
	229	196	164				229	213	196												
										229	196	164				213	180	147			
																196	164	131			
																196	164	131			


ACHTECK
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HP-3D220-S32-S07

CUTTING TOOL CATALOGUE

Drilling Insert Denomination System

S	P	M	T
1	2	3	4

1- Shape/Code

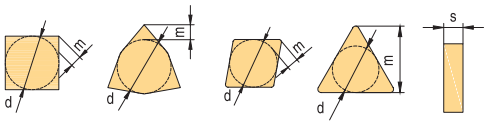
S

W

2- Clearance angle

A	B	C	D	E
				
F	**G**	**N**	**P**	**O**
				Other clearance angle

3- Tolerance



Class	Unit	In.Circle dimension d	Nose height m	Thicknesss
A	mm	± 0,025	± 0,005	± 0,025
C	mm	± 0,025	± 0,013	± 0,025
E	mm	± 0,025	± 0,025	± 0,025
F	mm	± 0,013	± 0,005	± 0,025
G	mm	± 0,025	± 0,025	± 0,13
H	mm	± 0,013	± 0,013	± 0,025
J	mm	*	± 0,005	± 0,025
K	mm	*	± 0,013	± 0,025
L	mm	*	± 0,025	± 0,025
M	mm	*	*	± 0,127
U	mm	*	*	± 0,127
N	mm	*	*	± 0,025

* For details refer to right and below tables

Shape: C, E, H, M, O, P, S, T, R, W				
IC	**d**		**m**	
	J,K,L,M,N	**U**	**M, N**	**U**
4.76	± 0,05	± 0,08	± 0,08	± 0,13
5.56	± 0,05	± 0,08	± 0,08	± 0,13
6	± 0,05	± 0,08	± 0,08	± 0,13
6.35	± 0,05	± 0,08	± 0,08	± 0,13
7.94	± 0,05	± 0,08	± 0,08	± 0,13
8	± 0,05	± 0,08	± 0,08	± 0,13
9.525	± 0,05	± 0,08	± 0,08	± 0,13
10	± 0,05	± 0,08	± 0,08	± 0,13
12	± 0,08	± 0,13	± 0,13	± 0,2
12.7	± 0,08	± 0,13	± 0,13	± 0,2
15.875	± 0,1	± 0,18	± 0,15	± 0,27
16	± 0,1	± 0,18	± 0,15	± 0,27
19.05	± 0,1	± 0,18	± 0,15	± 0,27
20	± 0,1	± 0,18	± 0,15	± 0,27
25	± 0,13	± 0,25	± 0,18	± 0,38
25.4	± 0,13	± 0,25	± 0,18	± 0,38
31.75	± 0,15	± 0,25	± 0,2	± 0,38
32	± 0,15	± 0,25	± 0,2	± 0,38

M&N shape	D shape		V shape	
IC	**d**	**m**	**d**	**m**
5.56	± 0,05	± 0,11		
6.35	± 0,05	± 0,11	± 0,05	± 0,16
7.94	± 0,05	± 0,11	± 0,05	± 0,16
9.525	± 0,05	± 0,11	± 0,05	± 0,16
12.7	± 0,08	± 0,15	± 0,08	± 0,2
15.875	± 0,10	± 0,18	± 0,10	± 0,27
19.05	± 0,10	± 0,18	± 0,10	± 0,27

4- Clamping type

A	B	C	F	G
	 70°-90°	 70°-90°		
H	**J**	**M**	**N**	**Q**
 70°-90°	 70°-90°			 40°-60°
R	**T**	**U**	**W**	**X**
	 40°-60°	 40°-60°	 40°-60°	Special

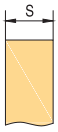
06	02	04	E	-	DP
5	6	7	8	-	9

5- Cutting edge length

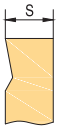
In.Circle Dimension (mm)	S Code	S Length	W Code	W Length
5.56			03	3.8
6.35	06	6.35	04	4.3
7.94			05	5.4
8.0	08	8.0		
9.525	09	9.525	06	6.5
12.7	12	12.7	08	8.7

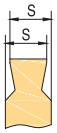
6- Insert thickness

Thickness illustration	Thickness mark	Example		
		00	=	0.79
		T0	=	0.99
		01	=	1.59
		T1	=	1.98
		02	=	2.38
		T2	=	2.58
		03	=	3.18
		T3	=	3.97
		04	=	4.76
		T4	=	4.96
		05	=	5.56
		T5	=	5.95
		06	=	6.35
		07	=	7.94
		09	=	9.53
		11	=	11.11
		12	=	12.70
		14	=	14.29
		15	=	15.88



Insert thickness "S" refers to the distance between cutting edge nose and bottom





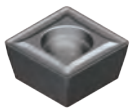
7- Corner radius

Example		
04	=	0.4
08	=	0.8
12	=	1.2

8- Cutting edge shape

Example	Illustration
E	Honed cutting edge
F	Sharp cutting edge
T	Negative land

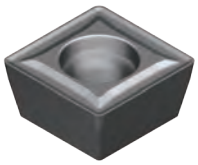
9- Chip breaker code

DP	DU/DG
	

10. Chip breakers' information refer to page 230

Geometry Application Guide

DP



1. DP geometry has high efficiency. Suitable for short hole high speed short hole drilling.
2. Strong square insert with reinforced geometry offers excellent hole straightness.
3. Drilling holder with helical flutes provide excellent chip evacuation and high hole precision.

DU/DG

1. Suitable cutting angle makes perfect cutting force balance.
2. General purpose geometry combined with two grades are suitable for P,M,K,S materials, especially good for the chip control in soft materials.
3. Obtains good surface finish.
4. Good versatility. It's suitable for rotating and non-rotating machining.

Grade Application Guide

Drilling insert grade ISO group							
Material Group	Materials	ISO	AP301U	AP351U	AP351M	AC301P	ISO
P	Unalloy steels / Alloyed steels	P01					P01
		P05					P05
		P10					P10
		P15	AP301U				P15
		P20					P20
		P25			AP351M	AC301P	P25
		P30		AP351U			P30
		P35					P35
		P40					P40
		P45					P45
		P50					P50
M	Stainless steels	M01					M01
		M05					M05
		M10					M10
		M15	AP301U				M15
		M20					M20
		M25			AP351M		M25
		M30		AP351U			M30
		M35					M35
		M40					M40
		M45					M45
K	Cast iron	K01					K01
		K05					K05
		K10					K10
		K15					K15
		K20					K20
		K25					K25
		K30					K30
		K35					K35
		K40					K40
		K45					K45
S	Heat resistant alloys	S01					S01
		S05					S05
		S10					S10
		S15					S15
		S20					S20
		S25			AP351M		S25
		S30		AP351U			S30
		S35					S35
		S40					S40
		S45					S45
N	Aluminum/ Aluminum alloys	N01					N01
		N05					N05
		N10					N10
		N15					N15
		N20					N20
		N25					N25
		N30					N30
H	Hardened steels/ Chilled cast iron	H01					H01
		H05					H05
		H10					H10
		H15					H15
		H20					H20
		H25					H25
		H30					H30

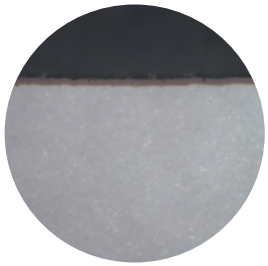
Grade Application Guide

Materials				PVD coated			CVD coated
				AP301U	AP351U	AP351M	AC301P
ISO	Material classification	Tensile strength (N/mm^2)	Hardness (HB)	Priority			
P	Unalloyed steel	<600	<180	●	●	●	●
		<950	<280	●	●	●	●
	Alloyed steel	700-950	200-280	●	●	●	●
		950-1200	280-355	●	●	●	●
		1200-1400	355-415	●	●	●	●
M	Duplex stainless steel	778	230	◐	●	●	-
	Austenitic stainless steel	675	200	◐	●	●	-
	Precipitation-hardening stainless steel	1013	300	◐	●	●	-
K	Grey cast iron	700	220	-	-	-	-
	Nodular cast iron	880	260	-	-	-	-
	Malleable cast iron	800	250	-	-	-	-
S	Fe-based alloy	943	280	-	◐	●	-
	Co-based alloy	1076	320	-	◐	●	-
	Ni-based alloy	1177	350	-	◐	●	-
	Ti-alloy	1262	370	-	◐	●	-
N	Aluminum	260	75	-	-	-	-
	Aluminum alloy	447	130	-	-	-	-
H	Hardened steel	-	50-60HRC	-	-	-	-
	Chilled cast iron	-	55HRC	-	-	-	-

● Best choice
◐ 2nd choice
- Inapplicable

Drilling Grade Description

AP301U



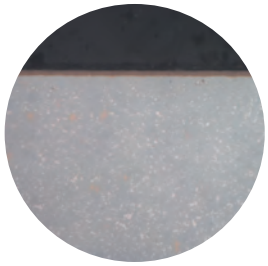
Coating: PVD coating

Suitable for steel, stainless steel drilling. High strength and wear resistance. Ultra fine carbide substrate with nanostructured PVD coating in controllable layer, high coating adhesion, wear-resistance and strength.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P				AP301U							
M				AP301U							
K											
S											
N											
H											

Remark: Best choice
2nd choice

AP351U



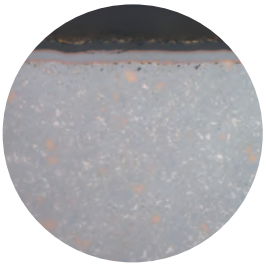
Coating: PVD coating

Suitable for steel, stainless steel and heat resistant alloy drilling. High strength carbide substrate with nanostructured PVD coating in controllable layer, high coating adhesion, wear-resistance and strength.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P							AP351U				
M							AP351U				
K											
S							AP351U				
N											
H											

Remark: Best choice
2nd choice

AC301P



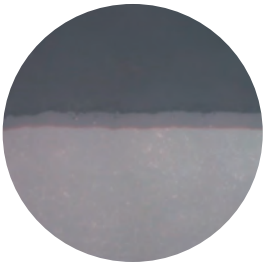
Coating: CVD coating

For steel and cast iron drilling. High strength substrate combined with multi-layer CVD, good coating adhesion and strength.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P						AC301P					
M											
K											
S											
N											
H											

Remark: Best choice
2nd choice

AP351M



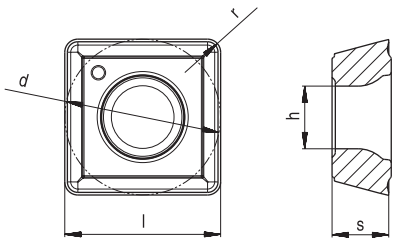
Coating: PVD coating

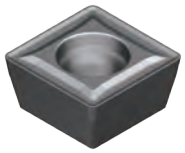
Suitable for steel, stainless steel and heat resistant alloy drilling. Good stability and wear resistance. Good thermal crack resistance and high coating adhesion and strength.

Application range											
ISO Classification	01	05	10	15	20	25	30	35	40	45	50
P						AP351M					
M						AP351M					
K											
S						AP351M					
N											
H											

Remark: Best choice
2nd choice

SPMT-DP Drilling Insert

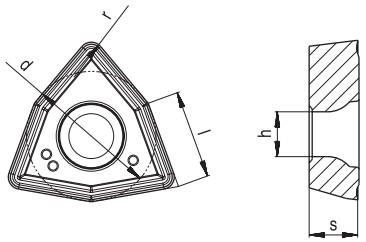


Inserts	Product code	Dimension(in)					Grades								
		l	d	s	r	h	AP301U	AP351U	AC301P	AP351M	AP401U	AP351K	AC301K	AW100K	AP403S
	SPMT 050204E-DP	0.197	0.197	0.094	0.016	0.089	●	●	●	●					
	SPMT 060204E-DP	0.236	0.236	0.094	0.016	0.103	●	●	●	●					
	SPMT 07T308E-DP	0.313	0.313	0.156	0.031	0.112	●	●	●	●					
	SPMT 090408E-DP	0.386	0.386	0.169	0.031	0.159	●	●	●	●					
	SPMT 110408E-DP	0.453	0.453	0.189	0.031	0.175	●	●	●	●					
	SPMT 140512E-DP	0.563	0.563	0.205	0.047	0.226	●	●	●	●					

Marked: ● Stock available

P238

WCMT-DU Drilling Insert



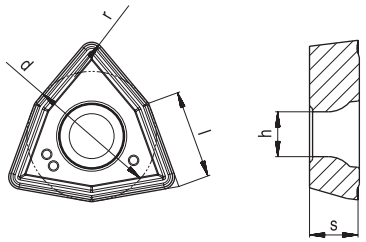
Inserts	Product code	Dimension(in)					Grades								
		l	d	s	r	h	AP301U	AP351U	AC301P	AP351M	AP401U	AP351K	AC301K	AW100K	AP403S
	**WCMT 030208E-DU**	0.150	0.219	0.094	0.031	0.110	●	●							
	WCMT 040208E-DU	0.169	0.250	0.094	0.031	0.118	●	●							
	WCMT 050308E-DU	0.213	0.313	0.125	0.031	0.134	●	●							
	WCMT 06T308E-DU	0.256	0.375	0.156	0.031	0.154	●	●							
	WCMT 080412E-DU	0.343	0.500	0.187	0.047	0.173	●	●							

Note: The DU insert is a universal insert and Achteck does not provide a tool holder.

Marked: ● Stock available

P238

WCMT-DG Drilling Insert



Inserts	Product code	Dimension(in)					Grades								
		l	d	s	r	h	AP301U	AP351U	AC301P	AP351M	AP401U	AP351K	AC301K	AW100K	AP403S
	**WCMT 030204E-DG**	0.150	0.219	0.094	0.016	0.098	●	●							
	WCMT 040204E-DG	0.169	0.250	0.094	0.016	0.110	●	●							
	WCMT 050308E-DG	0.213	0.313	0.125	0.031	0.134	●	●							
	WCMT 06T308E-DG	0.256	0.375	0.156	0.031	0.175	●	●							
	WCMT 080408E-DG	0.343	0.500	0.187	0.031	0.217	●	●							

Marked: ● Stock available

Drilling inserts

P238

Cutting Parameter Recommendation

Materials				SP drilling insert series grade apllication range & cutting parameter recommendation																	
ISO	Material classification	Tensile strength (1bs/in²)	Hardness (HB)	Grade												Feed (in/rev)					
				AP301U			AP351U			AP351M			AC301P								
				P15-35			P30-45			P20-35			P25-40								
				M15-35			M30-45			M20-35			-								
				-			-			-			-								
				-			S 30-45			S20-35			-								
				-			-			-			-								
				-			-			-											
				Feed (in/rev)																	
				Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	ϕ13mm～ϕ15 mm	ϕ15.5mm～ϕ21.5mm	ϕ22mm ～ φ27.5mm	ϕ28mm～ϕ33 mm	ϕ34mm～ϕ41mm	ϕ42mm～ϕ50 mm
				Cutting speed (ft/min)												SPMT 050204E-DP	SPMT 060204E-DP	SPMT 07T308E-DP	SPMT 090408E-DP	SPMT 110408E-DP	SPMT 140512E-DP
P	Unalloyed steel	<87,022	<180	853	787	735	722	607	492	787	722	656	656	574	492	0.002-0.003	0.002-0.004	0.002-0.005	0.003-0.005	0.003-0.006	0.003-0.006
		<137,785	<280	820	689	558	656	558	459	754	623	525	623	533	443	0.002-0.005	0.003-0.006	0.004-0.007	0.005-0.009	0.005-0.009	0.005-0.010
	Alloyed steel	101,526-137,785	200-280	787	656	525	623	525	426	722	590	492	590	492	394	0.002-0.004	0.003-0.006	0.004-0.007	0.005-0.009	0.005-0.009	0.005-0.009
		137,785-174,044	280-355	689	558	426	558	426	295	623	492	361	525	426	328	0.002-0.005	0.003-0.006	0.004-0.007	0.005-0.009	0.005-0.009	0.005-0.010
		174,044-203,052	355-415	558	459	361	525	394	262	492	394	295	459	361	262	0.002-0.004	0.003-0.006	0.004-0.007	0.005-0.009	0.005-0.009	0.005-0.009
M	Duplex stainless steel	112,839	230	853	656	459	590	443	295	787	590	394	-	-	-	0.002-0.004	0.002-0.005	0.003-0.006	0.004-0.006	0.004-0.007	0.004-0.007
	Austenitic stainless steel	97,900	200	722	558	394	394	213	197	656	492	328	-	-	-	0.002-0.004	0.002-0.005	0.003-0.006	0.004-0.006	0.004-0.007	0.004-0.007
	Precipitation-hardening stainless steel	146,923	300	590	459	328	295	213	131	525	394	262	-	-	-	-	-	-	-	-	-
K	Grey cast iron	101,526	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nodular cast iron	127,633	260	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Malleable cast iron	116,030	250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	Fe-based alloy	136,770	280	-	-	-	131	98	66	148	115	82	-	-	-	-	-	-	-	-	-
	Co-based alloy	156,060	320	-	-	-	115	82	49	131	98	66	-	-	-	-	-	-	-	-	-
	Ni-based alloy	170,709	350	-	-	-	115	82	49	131	98	66	-	-	-	-	-	-	-	-	-
	Ti-alloy	183,037	370	-	-	-	131	98	66	148	115	82	-	-	-	0.002-0.004	0.002-0.006	0.003-0.007	0.004-0.009	0.006-0.009	0.006-0.009
N	Aluminum	37,709	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aluminum alloy	64,831	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H	Hardened steel	-	50-60HRC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chilled cast iron	-	55HRC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants.

Cutting Parameter Recommendation

Materials				WC drilling insert series grade apllication range & cutting parameter recommendation													
ISO	Material classification	Tensile strength (1bs/in²)	Hardness (HB)	AP301U			AP351U			AC301P			Feed (in/rev)				
				PVD coated			PVD coated			CVD coated							
				P15-35			P30-45			P25-40							
				M15-35			M30-45			-							
				-			-			-							
				-			S 30-45			-							
				-			-			-							
				-			-			-							
				Feed (in/rev)													
				Max	Med	Min	Max	Med	Min	Max	Med	Min	ϕ16mm ~ ϕ20 mm	ϕ20.5mm ~ ϕ25mm	ϕ25.5mm ~ φ30 mm	ϕ31mm ~ ϕ41 mm	ϕ41mm ~ ϕ58 mm
				Cutting speed (ft/min)									WCMT 030204E-DU/DG	WCMT 040204E-DU/DG	WCMT 050308E-DU/DG	WCMT 06T308E-DU/DG	WCMT 080408E-DU/DG
P	Unalloyed steel	<87,022	<180	853	787	735	722	607	492	656	574	492	0.002-0.003	0.003-0.004	0.003-0.004	0.003-0.004	0.004-0.005
		<137,785	<280	820	689	558	656	558	459	623	533	443	0.002-0.003	0.004-0.004	0.003-0.004	0.003-0.004	0.004-0.005
	Alloyed steel	101,526-137,785	200-280	787	656	525	623	525	426	590	492	394	0.002-0.004	0.003-0.006	0.003-0.006	0.004-0.007	0.004-0.008
		137,785-174,044	280-355	689	558	426	558	426	295	525	426	328	0.002-0.003	0.003-0.004	0.003-0.006	0.004-0.006	0.004-0.007
		174,044-203,052	355-415	558	459	361	525	394	262	459	361	262	0.002-0.003	0.002-0.035	0.003-0.004	0.003-0.005	0.004-0.005
M	Duplex stainless steel	112,839	230	853	656	459	590	443	295	-	-	-	0.002-0.003	0.003-0.004	0.003-0.006	0.003-0.004	0.004-0.005
	Austenitic stainless steel	97,900	200	722	558	394	394	213	197	-	-	-	0.002-0.003	0.003-0.004	0.003-0.005	0.003-0.004	0.003-0.004
	Precipitation-hardening stainless steel	146,923	300	590	459	328	295	213	131	-	-	-	-	-	-	-	-
K	Grey cast iron	101,526	220	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nodular cast iron	127,633	260	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Malleable cast iron	116,030	250	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S	Fe-based alloy	136,770	280	-	-	-	131	98	66	-	-	-	-	-	-	-	-
	Co-based alloy	156,060	320	-	-	-	115	82	49	-	-	-	-	-	-	-	-
	Ni-based alloy	170,709	350	-	-	-	115	82	49	-	-	-	-	-	-	-	-
	Ti-alloy	183,037	370	-	-	-	131	98	66	-	-	-	0.002-0.004	0.002-0.004	0.003-0.005	0.003-0.005	0.003-0.006
N	Aluminum	37,709	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Aluminum alloy	64,831	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H	Hardened steel		50-60HRC	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chilled cast iron		55HRC	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*The recommended cutting conditions always refer to general conditions. These cutting conditions should be adjusted according to the practical machine rigidity, tools, workpiece clamping and coolants.

Deep-hole Drilling Product Introduction

Achteck has launched general-purpose deep-hole drilling inserts, which offer high productivity for many industries: energy, engineering machinery, injection molding, aircraft, shipbuilding, military, etc. It can achieve good hole straightness in deep hole drilling and good surface finish. Existing geometries and grades cover steel, stainless steel and heat resistant alloy drilling.

Product application and features
- The inserts can be mounted on the deep-hole drilling head.
- AP301U(N) is the first choice for drilling steel and stainless steel
- All geometries offer good chip-breaking result
- Increased efficiency due to high feed rate
- Reduces the cost per hole

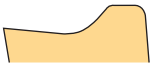
Grade and Application

Grade	Coating	Workpiece material					
		P	M	K	S	N	H
AP301U(N)	PVD	●	●		○		

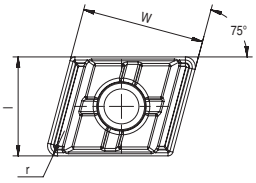
● Marked: 1st Choice ◐ Marked: 2nd Choice ○ Marked: Supplementary application

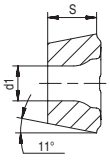
ISO P : (P15-P35) General-purpose PVD coating with excellent wear-resistance and toughness.
ISO M :(M15-M35) General-purpose grade for ISO-M applications, PVD coating with excellent toughness and resistance to built-up edges.
ISO S :(S15-S35) PVD coating with excellent wear resistance and toughness, good resistance to built-up edges.

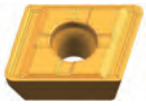
Geometry Types and Features

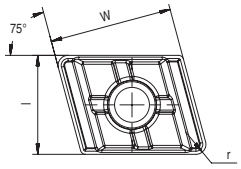
Geometry	Edge shape	Application
DH		● For general purpose. ● Suitable for high cutting speed and feed. ● Good chip control in most of materials.
DL		● Suitable for long chip materials (such as low carbon alloy steel and duplex stainless steel). ● Obtain a reliable production process in drilling materials where chip jamming can be a problem.
LH		● With open geometry; ● Suitable for high cutting speed and feed.

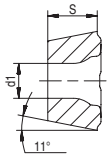
DH Geometry

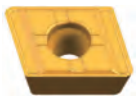




Center insert	Product code	l	w	s	r	d1	Competitor's description	Stock
	**EPMT 050308C-DH AP301U(N)**	0.219	0.315	0.125	0.031	0.098	800-050308M-C-G 1025	●
	EPMT 06T308C-DH AP301U(N)	0.250	0.389	0.156	0.031	0.110	800-06T308M-C-G 1025	●
	EPMT 08T308C-DH AP301U(N)	0.313	0.389	0.156	0.031	0.110	800-08T308M-C-G 1025	●
	EPMT 10T308C-DH AP301U(N)	0.375	0.389	0.156	0.031	0.110	800-10T308M-C-G 1025	●
	EPMT 12T308C-DH AP301U(N)	0.500	0.389	0.156	0.031	0.110	800-12T308M-C-G 1025	●





Intermediate insert	Product code	l	w	s	r	d1	Competitor's description	Stock
	**EPMT 050308I-DH AP301U(N)**	0.219	0.315	0.125	0.031	0.098	800-050308M-I-G 1025	●
	EPMT 06T308I-DH AP301U(N)	0.250	0.389	0.156	0.031	0.110	800-06T308M-I-G 1025	●
	EPMT 08T308I-DH AP301U(N)	0.313	0.389	0.156	0.031	0.110	800-08T308M-I-G 1025	●
	EPMT 12T308I-DH AP301U(N)	0.500	0.389	0.156	0.031	0.110	800-12T308M-I-G 1025	●

Marked: ● Stock available

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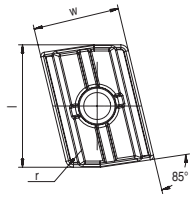
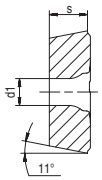
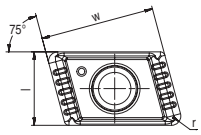
DH Geometry

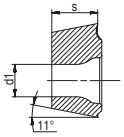




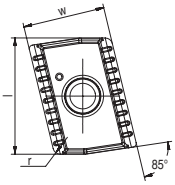
Periphery insert	Product code	l	w	s	r	d1	Competitor's description	Stock
	**APHT 060308P-DH AP301U(N)**	0.256	0.315	0.125	0.031	0.098	800-060308H-P-G 1025	●
	APHT 08T308P-DH AP301U(N)	0.335	0.354	0.156	0.031	0.110	800-08T308H-P-G 1025	●
	APHT 09T308P-DH AP301U(N)	0.380	0.354	0.156	0.031	0.110	800-09T308H-P-G 1025	●
	APHT 11T308P-DH AP301U(N)	0.502	0.354	0.156	0.031	0.110	800-11T308H-P-G 1025	●

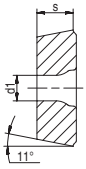
DL Geometry





Intermediate insert	Product code	l	w	s	r	d1	Competitor's description	Stock
	**EPMT 050308I-DL AP301U(N)**	0.219	0.315	0.125	0.031	0.098	800-050308M-I-L 1025	●
	EPMT 06T308I-DL AP301U(N)	0.250	0.389	0.156	0.031	0.110	800-06T308M-I-L 1025	●
	EPMT 08T308I-DL AP301U(N)	0.313	0.389	0.156	0.031	0.110	800-08T308M-I-L 1025	●
	EPMT 12T308I-DL AP301U(N)	0.500	0.389	0.156	0.031	0.110	800-12T308M-I-L 1025	●





Periphery insert	Product code	l	w	s	r	d1	Competitor's description	Stock
	**APHT 060308P-DL AP301U(N)**	0.256	0.315	0.125	0.031	0.098	800-060308H-P-L 1025	●
	APHT 08T308P-DL AP301U(N)	0.335	0.354	0.156	0.031	0.110	800-08T308H-P-L 1025	●
	APHT 09T308P-DL AP301U(N)	0.380	0.354	0.156	0.031	0.110	800-09T308H-P-L 1025	●
	APHT 11T308P-DL AP301U(N)	0.502	0.354	0.156	0.031	0.110	800-11T308H-P-L 1025	●

Marked: ● Stock available

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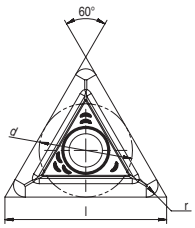
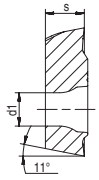
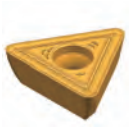
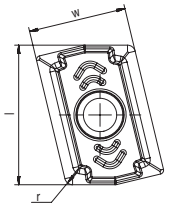
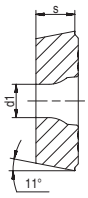
DH Geometry





Center/Intermediate insert	Product code	l	d	s	r	d1	Competitor's description	Stock
	**TPMT 16T312R-DH AP301U(N)**	0.650	0.375	0.156	0.047	0.134	TPMT 16T312R-23 1025	●
	TPMT 220612R-DH AP301U(N)	0.866	0.500	0.250	0.047	0.173	TPMT 220612R-23 1025	●





Periphery insert	Product code	l	d	s	r	d1	Competitor's description	Stock
	**APMT 13T308-DH AP301U(N)**	0.575	0.394	0.156	0.031	0.134	R424.9-13T308-23 1025	●
	APMT 180608-DH AP301U(N)	0.811	0.453	0.250	0.031	0.173	R424.9-180608-23 1025	●

Marked: ● Stock available

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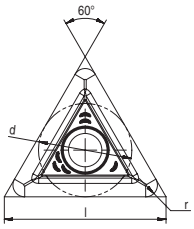
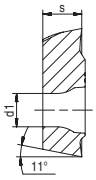
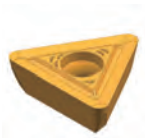
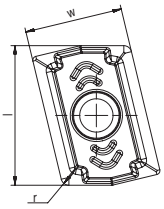
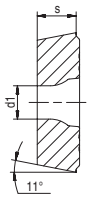
LH Geometry

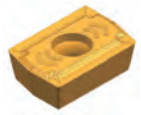




Center/Intermediate insert	Product code	l	d	s	r	d1	Competitor's description	Stock
	**TPMT 16T312R-LH AP301U(N)**	0.650	0.375	0.156	0.047	0.134	TPMT 16T312R-22 1025	●
	TPMT 220612R-LH AP301U(N)	0.866	0.500	0.250	0.047	0.173	TPMT 220612R-22 1025	●





Periphery insert	Product code	l	d	s	r	d1	Competitor's description	Stock
	**APMT 13T308-LH AP301U(N)**	0.575	0.394	0.156	0.031	0.134	R424.9-13T308-22 1025	●
	APMT 180608-LH AP301U(N)	0.811	0.453	0.250	0.031	0.173	R424.9-180608-22 1025	●

Marked: ● Stock available

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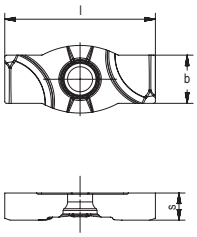
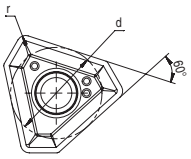
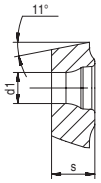
Guiding Pad



Guiding pad	Product code	b	l	s	Competitor's description	Stock
	**GPAD-06A AC301K**	0.236	0.709	0.118	800-06A PM1	●
	GPAD-07A AC301K	0.272	0.787	0.138	800-07A PM1	●
	GPAD-08A AC301K	0.315	0.984	0.177	800-08A PM1	●
	GPAD-10A AC301K	0.394	1.181	0.177	800-10A PM1	●
	GPAD-12A AC301K	0.472	1.378	0.217	800-12A PM1	●

TPMX Series





Sharp	Product code	s	d	r	d1	Competitor's description	Stock
	**TPMX 1403R-DH AP301U(N)**	0.138	0.333	0.031	0.11	TPMX 1403RG TT9030	●
	TPMX 1704R-DH AP301U(N)	0.157	0.406	0.031	0.15	TPMX 1704RG TT9030	●
	TPMX 2405R-DH AP301U(N)	0.217	0.559	0.047	0.17	TPMX 2405RG TT9030	●
	TPMX 2405L-DH AP301U(N)	0.217	0.559	0.047	0.17	TPMX 2405LG TT9030	●
	TPMX 2807R-DH AP301U(N)	0.295	0.669	0.063	0.22	TPMX 2807RG TT9030	●

Marked: ● Stock available

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Recommended Cutting Speed for Materials(Dia 25.00-65.00mm)

Workpiece material			Brinell hardness (HB)	Grade			Cutting speed Vc ft/min	Feed fn in/r	
				Insert				Drilling dia mm	
				P	I	C		25.00-43.00	43.01-65.00
P	Unalloyed steel	C=0.05-0.10%	125	AP301U(N)			230-426	0.004-0.016	0.006-0.018
		C=0.10-0.25%	125				230-426	0.004-0.016	0.006-0.018
		C=0.25-0.55%	150				230-426	0.004-0.016	0.006-0.018
		C=0.55-0.80%	170				230-426	0.004-0.016	0.006-0.018
	High carbon steel	Carbon tool steel	210	AP301U(N)			230-394	0.004-0.016	0.008-0.018
	Low-alloyed steel	Non-Hardened	180	AP301U(N)			180-361	0.004-0.016	0.008-0.018
		Tempered	275				230-394	0.004-0.016	0.008-0.018
		Tempered	350				230-394	0.004-0.016	0.008-0.018
	High-alloyed steel	Annealed	200	AP301U(N)			180-361	0.004-0.015	0.008-0.016
		Hardened tool steel	325				180-361	0.008-0.015	0.008-0.016
	Cast steel	Non-alloyed steel	180	AP301U(N)			180-361	0.004-0.016	0.008-0.018
		Low-alloy (alloy<5%)	200				180-361	0.004-0.016	0.008-0.018
M	Stainless steel	Non-Hardened/Ferritic/martensitic	200	AP301U(N)			131-361	0.004-0.016	0.008-0.018
		Austenitic	200				131-361	0.004-0.016	0.008-0.018
		Austenitic, precipitation hardened (PH)	300				131-361	0.004-0.013	0.008-0.014
		Austenitic/ferritic, duplex	230				131-262	0.004-0.013	0.008-0.014
K	Malleable cast iron	Ferritic	200	AP301U(N)			262-394	0.004-0.015	0.009-0.016
		Pearlitic	260				262-394	0.004-0.015	0.009-0.016
	Grey cast iron	Low tensile strength	180	AP301U(N)			197-361	0.004-0.015	0.009-0.016
		High tensile strength	245				197-361	0.004-0.015	0.009-0.016
	Nodular cast iron	Ferritic	160	AP301U(N)			164-361	0.004-0.015	0.009-0.016
		Pearlitic	250				164-361	0.004-0.015	0.009-0.016
	GGV (CGI)		230						
N	Wrought aluminium alloys	non-aging	30	AP301U(N)			213-492	0.004-0.013	0.009-0.016
		aged	100				213-492	0.004-0.013	0.008-0.013
	Cast aluminium alloys	≤ 12% Si, non-aging	75	AP301U(N)			213-492	0.004-0.013	0.008-0.013
		≤ 12% Si, aged	90				213-492	0.004-0.013	0.008-0.013
		> 12% Si, non-aging	130				213-492	0.004-0.013	0.008-0.013
	Magnesium alloy		70						
	Copper and copper alloys (bronze/brass)	Unalloyed, electrolytic copper	100	AP301U(N)			213-492	0.004-0.013	0.008-0.013
		Brass, bronze, red brass	90				213-492	0.004-0.013	0.008-0.013
		Cu alloys, short-chip	110				213-492	0.004-0.013	0.008-0.013
		High tensile, Ampco alloy	300				213-492	0.004-0.013	0.008-0.013
S	Heat-resistant alloys	Fe-based annealed	200	AP301U(N)			33-180	0.004-0.012	0.008-0.013
		Fe-based hardened	280				33-180	0.004-0.012	0.008-0.013
		Ni or Co-based annealed	250				33-180	0.004-0.012	0.008-0.013
		Ni or Co-based hardened	350				33-180	0.004-0.012	0.008-0.013
		Ni or Co-based cast	320				33-180	0.004-0.012	0.008-0.013
	Titanium alloys	Pure titanium	200	AP301U(N)			98-197	0.004-0.012	0.008-0.013
		α alloys	375				98-197	0.004-0.012	0.008-0.013
		α and β alloys	375				98-197	0.004-0.012	0.008-0.013
		β alloys	410				98-197	0.004-0.012	0.008-0.013
H	Hardened steel	Hardened and tempered	43-47 HRC						
	Hardened cast iron		47-60 HRC						

*) Insert position-P , I , C
P=peripheral insert , I=intermediate insert, C=center insert

Recommended Cutting Speed for Materials(Dia ≥63.50mm)

Workpiece material			Brinell hardness (HB)	Grade			Cutting speed Vc ft/min	Feed fn in/r
				Insert				Drilling dia mm
				P	I	C		⩾ 63.50
P	Unalloyed steel	C=0.05-0.10%	125	AP301U(N)			262-328	0.007-0.014
		C=0.10-0.25%	125				262-328	0.007-0.014
		C=0.25-0.55%	150				262-328	0.007-0.014
		C=0.55-0.80%	170				262-328	0.007-0.014
	High carbon steel	Carbon tool steel	210	AP301U(N)			230-328	0.007-0.012
	Low-alloyed steel	Non-Hardened	180	AP301U(N)			197-328	0.006-0.014
		Tempered	275				230-328	0.007-0.012
		Tempered	350				230-328	0.007-0.012
	High-alloyed steel	Annealed	200	AP301U(N)			197-328	0.006-0.012
		Hardened tool steel	325				197-328	0.006-0.012
	Cast steel	Non-alloyed steel	180	AP301U(N)			164-328	0.006-0.012
		Low-alloy (alloy<5%)	200				164-328	0.006-0.012
M	Stainless steel	Non-Hardened/Ferritic/martensitic	200	AP301U(N)			164-295	0.006-0.014
		Austenitic	200				164-295	0.006-0.014
		Austenitic, precipitation hardened (PH)	300					
		Austenitic/ferritic, duplex	230					
K	Malleable cast iron	Ferritic	200	AP301U(N)				
		Pearlitic	260					
	Grey cast iron	Low tensile strength	180	AP301U(N)				
		High tensile strength	245					
	Nodular cast iron	Ferritic	160	AP301U(N)				
		Pearlitic	250					
	GGV (CGI)		230					
N	Wrought aluminium alloys	non-aging	30	AP301U(N)			213-426	0.004-0.012
		aged	100				213-426	0.004-0.012
	Cast aluminium alloys	≤ 12% Si, non-aging	75	AP301U(N)			213-426	0.004-0.012
		≤ 12% Si, aged	90				213-426	0.004-0.012
		> 12% Si, non-aging	130				213-426	0.004-0.012
	Magnesium alloy		70					
	Copper and copper alloys (bronze/brass)	Unalloyed, electrolytic copper	100	AP301U(N)			213-426	0.004-0.012
		Brass, bronze, red brass	90				213-426	0.004-0.012
		Cu alloys, short-chip	110				213-426	0.004-0.012
		High tensile, Ampco alloy	300				213-426	0.004-0.012
S	Heat-resistant alloys	Fe-based annealed	200	AP301U(N)			66-213	0.006-0.012
		Fe-based hardened	280				66-213	0.006-0.012
		Ni or Co-based annealed	250				66-213	0.006-0.012
		Ni or Co-based hardened	350				66-213	0.006-0.012
		Ni or Co-based cast	320					
	Titanium alloys	Pure titanium	200	AP301U(N)			98-328	0.006-0.012
		α alloys	375				98-328	0.006-0.012
		α and β alloys	375				98-328	0.006-0.012
		β alloys	410				98-328	0.006-0.014
H	Hardened steel	Hardened and tempered	43-47 HRC					
	Hardened cast iron		47-60 HRC					

*) Insert position-P , I , C
P=peripheral insert , I=intermediate insert, C=center insert

ACHTECK

www.achtecktool.com

Technical information

CUTTING TOOL CATALOGUE

Grade Conversion Table

Turning

ISO classification	Material classification	ACHTECK	COROMANT	ISCAR	KENNAMETAL	KORLOY	KYOCERA	MITSUBISHI	SECO	SUMITOMO	TAEGUTEC	TUNGALOY	WALTER	ZCC
P	P10	AC150P	GC4315 GC4215	IC8150	KCP10 KC9110	NC3010 NC3015	CA515 CA5515	MC6015 UE6110	TP1500 TP1501	AC810P AC700G	TT8115	T9115 T9015	WPP10S WPP10	YBC152 YBC151
	P20	AC250P	GC4325 GC4225	IC8250	KCP25 KC9215	NC3220 NC3120	CA525 CA5525	MC6025 UE6020	TP2500 TP2501	AC8025P AC820P	TT8125	T9125 T9025	WPP20S WPP20	YBC251 YBC252
	P30	AC350P	GC4335 GC4235	IC8350	KCP30 KCP40 KC9040	NC3030 NC500H	CA5535	MC6035 UE6035	TP3500	AC830P	TT8135 TT8020*	T9135 T9035	WPP30S WPP30	YBC351 YBC352
M	M10	AP100S*	GC2015 GC1105*	IC907* IC807*	KCM15 KC5510* KCU10*	PC8110*	CA6515 PR1305* PR1310* PR1215*	MC7015 US7020 VP10RT* MP9005*	TS2000* TH1000* CP200*	AC610M AC6020M AC510U*	TT9215 TT5080*	AH110* AH905* AH8005*	WSM10* WSM10S*	YBM151 YBG102* YBG105*
	M20	AP301M*	GC2025 GC1115* GC15*	IC908* IC887*	KCM25 KC5525* KCU25*	NC9025 PC5300*	CA6525 PR930* PR1025* RP1225* PR1325*	MC7025 VP15TF* MP9015*	TM2000 CP500*	AC620M AC6030M AC520U*	TT9225 TT9080*	T6120 T6020 AH120* AH630* AH8015*	WSM20* WSM20S* WMP20S	YBM251 YBG202* YBG212* YBG205*
K	K10	AC100K	GC3205 GC3005	IC5005	KCK05	NC6205	CA4505 CA4010	MC5005 UC5105	TK1001 TK1000	AC405K AC410K	TT7005	T505	WKK10S WAK10	YBD052
	K20	AC150K ACK15A	GC3210 GC3215	IC5010	KCK15 KC9315	NC6110	CA4515 CA415	MC5015 UC5115	TK2001 TK2000	AC415K AC700G	TT7310 TT7015	T5115 T515	WKK20S WAK20	YBD152C YBD152
S	S10	AP100S*	GCS05F GC1105* GC1115*	IC807* IC907*	KCU10* KC5510* KC5010	PC8110*	PR1305* PR1310*	VP10RT* MP9005*	TH1000* TH1500* TS2000*	AC510U*	TT5080*	AH110* AH905* AH8005*	WSM10*	YBG102* YBG105*
	S20	AP301M*	GC15* GC1115*	IC808* IC908*	KCU20* KC5525* KC5025*	PC5300*	PR1025* PR1225* PR1325*	VP15TF* MP9015*	CP500*	AC520U*	TT9080*	AH120* AH8015*	WSM20*	YBG212* YBG202* YBG205*
N	N10	AW100K	H10	IC20	K68 K313	H01	KW10	HTI10	KX	H1	K10	TH10	WK1	YD101

"*"PVD coating grades

Turning Chip Breaker Conversion Table

Negative turning insert

ISO classification	Application	ACHTECK	COROMANT	ISCAR	DURACARB	KENNAMETAL	KORLOY	KYOCERA	MITSUBISHI	SECO	SUMITOMO	TAEGUTEC	TUNGALOY	VALENITE	WALTER	ZCC
P	Finishing			SF		FF, FS	HU, VL	DP, GP, PP VF	FH	FF1, FF2	FA FL	FA, FS FX	TF, 01 ZF	F2	FP5	SF
		PB1	QF	NF, F3P	41	FP LF, FN	VG, VF VQ	XF XP HQ	LP SH FY	MF2	SU SE	FG FM	NS, 11 TS, AS TSF		NF4	NF DF
	Semi-finishing	PB3	PF, XF		43		VB, VC, HC	CQ, PQ CJ	SA		LU	FC, FT			NS6	NM
	Medium machining	PL5	K						ES	UX	GX, HM	VF, DNUX FS	S			
					52	MN	HC	GS		MR3		MC	ASW		MP3	PM
			QM, 23, LC SM, -NGP, 23 SR, SMR	PP TF	42	MS, MP UP, P, -NGP RP	HA VP3 VM	XQ, XS A3, AH MS, MU	MJ, SY MS GJ	MF4, MF5 M5, MR3, MR4	UP, GX, AG EG, EX, UP MU	ML MP	P HMM, SA	M2	NMS, NMT NRS, NRT	
		PC3	PM, XM QM	M3P VL	45	P	VM HS, GS	PG PS	MP, MV MA	MF3 MF5, M3	GE GU	PC	TM	M2	MP5 NM4	PM
		PD3	HM, XMR	GN	46	MP RP, RM	HM, GM	HS CS			UX, UG	MT		M3	NM6 NM9	DM
		PC4		MG-	53	UN	B25	MG-C	MG-	M4 MR4	UZ	MG-	33, 37, 38 DM, MG-		MG-	MG-
	Roughing machining	PD5	PR	NR, R3P		RN	HR, GR	PT, GT PH, HT	MH GH, RP	M5 MR7, M6	ME MU, MX	RT	TH	R3	NR4, RP5	DR
	Heavy machining	PD8	PR			RM		PX				RX			NRF	
			QR MR	R3P NM		MR, RP	GH	HX	HZ	R6, RR9 R4, R5, 37 RR6	MP HG HP	RH	TRS 57	R6	NR6	
		PC9	HR, 31			RH	VT		HCS HX, HBS	R8, 56, 57 R7	HF HU	HT, HD	65 TU		NRR	ER HDR
		PD9					VH		HV, HDS, HXD		HW	HY, HZ				
M	Finishing	MB2	MF	SF, F3M	41	FP	HA, VP2	MQ, GU	FS, LM	MF1	SU	EA, SF	SF	F5	NF4	EF
	Medium machining	MC3	MM	M3M	42	MP, UP	GS, HS	MS, MU	MS, GM, MA	MF4	EX, UP, GU	EM	SS, S		NM4	EM
	Roughing machining	MC4	MR	R3M	45	RP	VM	HU	RM	MR6, MF5	MU, HM	ET	SM	M5	NR4 NRS	ER
K	Medium machining	PC4		MG-	53	RP		C	MG-, GK	M5		MG-	MG-		NM5, RK5	MG-
	Roughing machining	KC4 KD5	KR			UN	GR	ZS, GC	GX, RK	MR7	GZ	KT RT	CH		RK7	DR
S	Finishing	MB2	SF	SF		FS	VP1	MQ	FJ	MF1	EF	EA, SF		F5	NF4	NF
	Medium machining	SC3	SGF SM, -NGP, 23 SR, SMR	PP TF	42	MS UP, P, -NGP RP	VP2 VP3 VM	MS, MU	MJ MS GJ	M1 MF4, MF5 M5, MR3, MR4	SU EG, EX, UP MU	ML MP, SU, MK	HMM, SA	M2	NFT NMS, NMT NRS, NRT	NM
	Roughing machining	MC4	MR	R3M	45	RP	VM	HU	RM	MR6,MF5	MU,HM	ET	SM	M5	NR4 NRS	ER

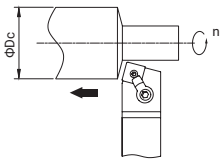
Turning Chip Breaker Conversion Table

Positive turning insert

ISO classification	Application	ACHTECK	COROMANT	DURACARB	ISCAR	KENNAMETAL	KORLOY	KYOCERA	MITSUBISHI	SECO	SUMITOMO	TAEGUTEC	TUNGALOY	VALENITE	WALTER	ZCC
P M K	Finishing		PF, UF		38, PF	UF, 11, GM	VL, VF, HFP	XP GK, GP, DP VF	FV	FF1	LU FP	FA FX	01, PF, PSF		PF4, PF5	SF HF
		PB1 PC2						CF, GF GQ CK	SMG		FC	SA	JS			
			UM XF	51	SM 16, GT-	FP LF	VF HMP, C05	XQ GX	SQ, SV	F1	FK SU SC, SK	FG		PM3 PM4	PS5	HM
	Semi-finishing	PC2	PM	41		MP		HQ				PC FM	PSS PS			EF EM
	Medium machining	KC2	XM PR, UR XR	52	14, 17 19, MT-	MF	C25	MT-	MQ, MV MT-G	F2	SF, MU	MT	PM	PM5	PM5 E47, MT-	HR
N	Semi-finishing	NC2	AL	AU	AF, AS	HP	AK, AR	AH	AZ	AL	AW, AG	FL	AL	IL	PM2	LH

Turning Machining Formula

● Cutting speed



$$Vc = \frac{\pi * Dc * n}{12} \text{ (ft/min)}$$

Vc:Cutting speed(ft/min) π: ≈3.14
Dc:Workpiece diameter(in) n:Spindle speed(rev/min)

● Feed speed

$$Vf = f * n \text{ (in/min)}$$

Vf:Feed Speed(in/min) f:Feed rate(in/rev)
n:Spindle speed(rev/min)

● Chip thickness

$$h = f * \sin kr \text{ (in)}$$

h:Chip thickness(in) f:Feed rate(in/rev)

● Chip width

$$b = \frac{ap}{\sin kr} \text{ (in)}$$

b:Chip width(in) ap:Axial depth of cut (in)

● Chip area

$$A = h * b = ap * f \text{ (in}^2\text{)}$$

A:Chip area(in^2) ap:Axial depth of cut (in)
f:Feed rate(in/rev)

● Cutting power

$$Pmot = \frac{Kc * Vc * Dc * f}{132{,}000 * \eta} \text{ (HP)}$$

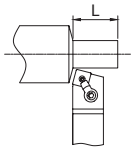
Pmot:Cutting power(HP) Kc:Unit cutting force(lbs/in²)
Vc:Cutting speed(ft/min) Dc:Workpiece diameter(in)
f:Feed rate(in/rev) η:Mechanical efficiency

● Chip removal

$$Q = ap * f * Vc * 12 \text{ (in}^3\text{/min)}$$

Q:Chip removal(in³/min) ap:Axial depth of cut (in)
f:Feed rate(in/rev) Vc:Cutting speed(ft/min)

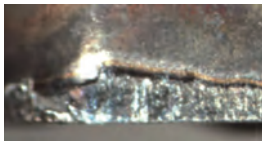
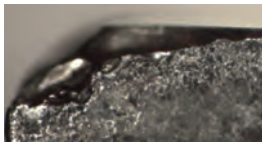
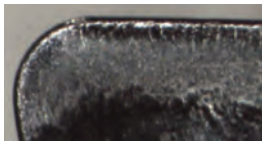
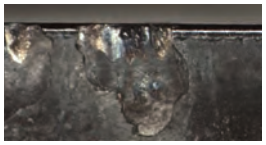
● Work time



$$Tc = \frac{L}{f * n} \text{ (min)}$$

Tc:Work time f:Feed rate(in/rev)
n:Spindle speed(rev/min) L: Working length(in)

Turning Insert Normal Failtures & Solutions

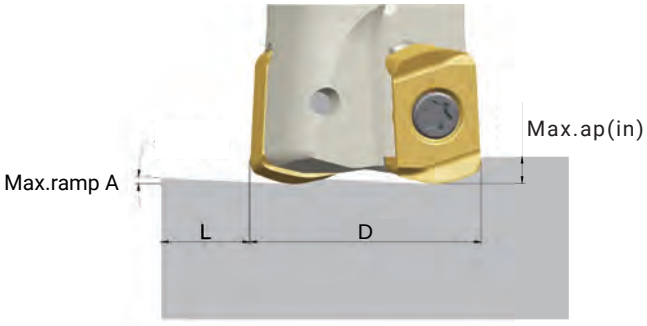
Failtures	Pic.	Analysis	Solution
Flank wear		• Tool materials are too soft • Excessive cutting speed • Less clearance angle • Less feed rate • Insufficient cooling	• Choosing high wear-resistance insert grade • Reduce cutting speed • Enlarge clearance angle • Increase feed rate
Crater wear		• Tool materials are too soft • Excessive cutting speed • Excessive feed rate	• Choosing high wear-resistance insert grade • Reduce cutting speed • Reduce feed rate • Increasing the flow of coolant
Chipping		• Tool materials are too hard • Less cutting strength	• Choosing tougher grade • Enhancing cutting edge strength
Deformation		• Tool materials are too soft • Over strong cutting edge • Excessive cutting depth & feed rate • Insufficient cooling	• Choosing high wear-resistance insert grade • Reduce cutting speed reduce cutting depth & feed rate • Choosing good thermal conductivity grade • Increasing the flow of coolant
Built-up edge		• Less cutting speed • Cutting edge not sharp • Unsuitable grade • Insufficient cooling	• Increase cutting rate • Choosing sharp geometry • Choosing less adhesion grade • Increasing the flow of coolant
Mechanical wear		• Excessive feed rate and cutting depth • Vibration	• Choosing tougher grade • Enlarge lead angle • Choosing bigger corner radius • Change to strong rigidity holder
Thermal cracking		• Excessive cutting heat change on edge	• Choosing dry cutting or adequate cooling • Choosing tougher grade
Peripheral wear		• Excessive feed rate & cutting speed • Tool materials too soft	• Choosing high wear-resistance tool grade • Enlarge rake angle leads to sharp edge • Reduce cutting speed
Coating peeling		• Sticky chip on the cutting edge • Chip evacuation failure	• Enlarge rake angle leads to sharp edge • Use chip breaker with bigger space

Milling Grade Conversion Table

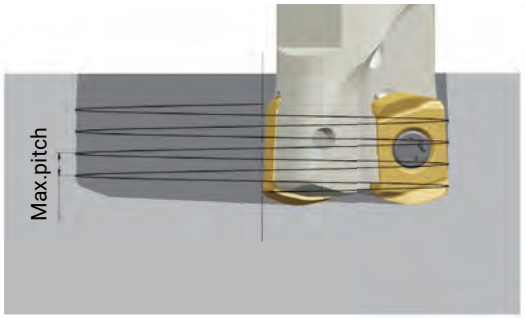
ISO classification	ACHTECK	COROMANT	ISCAR	KENNAMETAL	KORLOY	KYOCERA	MITSUBISHI	SECO	SUMITOMO	TAEGUTEC	TUNGALOY	WALTER
P	AP301U AC301P	GC4220 GC4230	IC950	KC522M KC635M	PC3600 PC3500 PC3535 PC3525	PR630 PR660 PR730	VP15TF	MP1500 MP2500 T250M		TT7080 TT7030	T3130 AH330	WKP25 WAM10 WAM20
P	AP351U	GC1030 GC4240	IC808 IC908	KC522M KC635M KC725M	PC5300 NC5330 PC9530	PR9925 PR830	VP15TF VP20RT	F30M MP3000	ACP2000	TT9080 TT9030	AH120 AH725 AH730 GH330	WAM30
P	AP401U	GC1040	IC830 IC330 IC928	KC735M KC935M	PC3545		VP30RT FH7020X F7030	F40M MP2500	ACP300 ACZ350	TT8020 TT7800 TT8080	AH140 T3130 AH130	WKP235 WXP45 WSP45
M S	AP301U	GC1030 GC2030	IC808 IC908	KC635M	PC5300 NC5330 PC9530	PR730 PR830 PR925 PR1025	VP15TF	MP2500 F30M	ACP2000	TT9300 TT9080	T3130 AH725 AH120	WAM30 WXM35
M S	AP351U	GC2040 S40T	IC830 IC330 IC928	KC7725M	PC3545 PC5300	PR1225 PR905	VP30RT MP9030 F7030	F40M MM4500 MS2500	ACP300 EH20Z EH520Z	TT8020 TT8080	AH130 AH140 SH730	WXM35 WSM35 WSP45
K	AC301K AP351K	GC3220 GC4220	IC810 IC910	KCK15 KC520M	PC6510 PC215K PC5300	PR905 PR510 PR610	MC5020 VP15TF MP8010	MK2050 MK2000 MK3000	ACK2000 ACK3000 ACZ310	TT6080	T1115 AH120 GH110	WKP25 WKP35

High Feed Cutter AHM20-LN06 Application Information

Straight Ramping

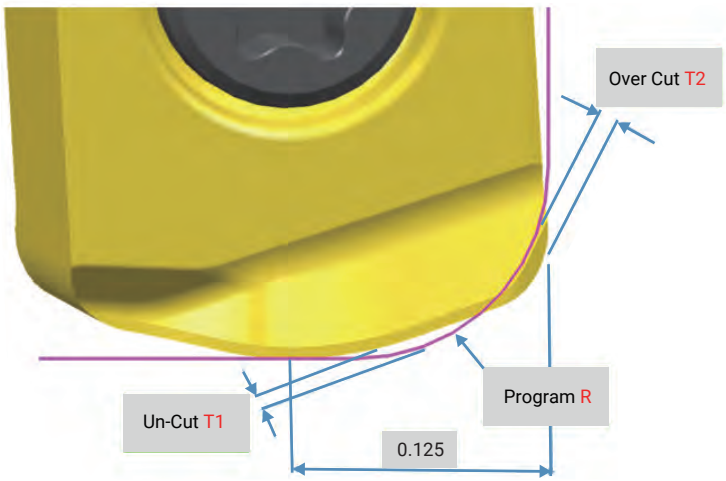


Circular interpolate milling



Cutter Dia(D)	Straight ramp down			Circular interpolate milling	
	Max.ramp-A	Max.ap(in)	Min.length-L(in)	Min.Dia.(in)	Max.Dia(in)
φ0.625	2.9°	0.0027	0.543	0.906	1.259
φ0.669	2.6°	0.0027	0.606	0.985	1.338
φ0.750	1.9°	0.039	1.185	1.221	1.574
φ0.827	1.8°	0.039	1.251	1.300	1.653
φ1.000	1.3°	0.039	1.732	1.615	1.968
φ1.024	1.3°	0.039	1.732	1.693	2.047
φ1.250	0.9°	0.039	2.503	2.166	2.519
φ1.300	0.9°	0.039	2.503	2.245	2.598
φ1.500	0.7°	0.039	3.220	2.796	3.149
φ2.000	0.5°	0.039	4.507	3.583	3.937
φ2.500	0.4°	0.039	5.637	4.607	4.960

NC Program Radius

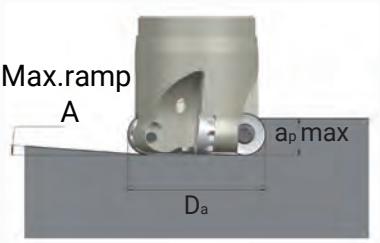


Technical information for NC program

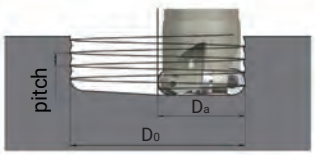
Program R	Un-Cut T1	Over-Cut T2
R0.05	0.016	0
R0.07	0.011	0.002
R0.09	0.005	0.009

Note: select R0.059 as program R , without over-cut.

Ramping Milling Parameters

Ramping	Maximum angle A（°）				
	Da(in)	Indexable inserts diameter d（in）				
		d0.3149	d0.3937	d0.4724	d0.6299	d0.7874
	1.000	3.2°	6.5°	-	-	-
	1.250	-	3.0°	4.2°	-	-
	1.500	-	1.4°	3.0°	-	-
	2.000	-	2.0°	2.1°	-	-
	2.500	-	-	1.5°	2.6°	-
	3.000	-	-	1.4°	1.4°	-
	4.000	-	-	-	1.0°	1.3°
	5.000	-	-	-	-	0.9°
	6.000	-	-	-	-	0.7°
	ap max(in)	0.157	0.196	0.236	0.314	0.393

Circular Interpolate Milling Parameters

Actual circular interpolate milling data on workpiece	Da(in)	Diameter range of the hole that can be milled by one pass（in）									
		Indexable inserts diameter d（in）									
		d0.3149		d0.3937		d0.4724		d0.6299		d0.7874	
		DO min (in)	DO max (in)	DO min (in)	DO max (in)	DO min (in)	DO max (in)	DO min (in)	DO max (in)	DO min (in)	DO max (in)
	1.000	1.440	1.968	1.260	1.968	-	-	-	-	-	-
	1.250	-	-	1.820	2.519	1.674	2.519	-	-	-	-
	1.500	-	-	2.441	3.149	2.323	3.149	-	-	-	-
	2.000	-	-	3.229	3.937	3.091	3.937	-	-	-	-
	2.500	-	-	-	-	4.115	4.960	3.839	4.960	-	-
	3.000	-	-	-	-	5.434	6.299	5.178	6.299	-	-
	4.000	-	-	-	-	-	-	6.752	7.874	6.516	7.874
	5.000	-	-	-	-	-	-	-	-	8.485	9.842
	6.000	-	-	-	-	-	-	-	-	11.241	12.598

Milling General Formula

● **Cutting speed**

$$Vc = \frac{\pi * Dc * n}{12} \text{ (ft/min)}$$

Vc:Cutting speed(ft/min) π: ≈3.14
Dc:Cutter diameter(in) n:Spindle speed(rev/min)

● **Spindle speed**

$$n = \frac{12 * Vc}{\pi * Dc} \text{ (rev/min)}$$

Vc:Cutting speed(ft/min) π: ≈3.14
Dc:Cutter diameter(in) n:Spindle speed(rev/min)

● **Feed speed**

$$Vf = fz * n * Z \text{ (in/min)}$$

Vf:Feed speed(in/min) fz:Feed per tooth(in/z)
n:Spindle speed(rev/min) Z:Number of teeth

● **Feed rate per rev.**

$$fz = \frac{Vf}{n * Z} \text{ (in)}$$

fz:Feed rate per rev.(in) Vf:Feed speed(in/min)
n:Spindle speed(rev/min) Z:Number of teeth

● **Feed rate per rev.**

$$f = \frac{Vf}{n} \text{ (in/rev)}$$

f:Feed rate per rev.(in/rev) Vf:Feed speed(ft/min)
n:Spindle speed(rev/min)

● **Time of cut**

$$Tc = \frac{L}{Vf} \text{ (min)}$$

Tc:Time of cut(min) L:Length of feed(in)
Vf:Feed speed(in/min)

● **Power demand**

$$Pmot = \frac{ap * ae * Vf * Kc}{396000 * \eta} \text{ (HP)}$$

Pmot:Cutting power(HP) ap:Cutting depth ae:Cutting width
Kc:Unit cutting force(lbs/in²) η:Machine efficiency coefficient(0.7-0.95)

● **Average chip thickness**

$$hm = fz * \sqrt{\frac{ae}{Dc}} \text{ (in)}$$

hm:Average chip thickness fz:Feed per tooth(in/z)
ae:Cutting width Dc:Cutter diameter(in)

● **Feed force**

Cutter in the center site

$$\psi s = 2 * \arcsin\left(\frac{ae}{Dc}\right) [^\circ]$$

Cutter in excentric site

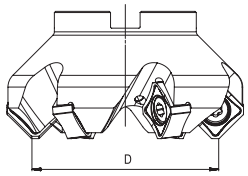
$$\psi s = 90^\circ + \arcsin\frac{ae-(Dc/2)}{(Dc/2)} [^\circ]$$

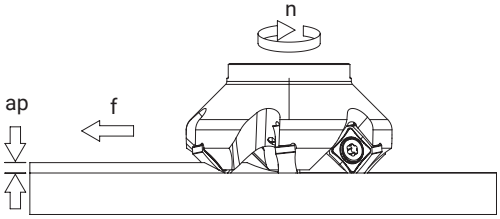
ψs:Pressure angle ae:Cutting width
Dc:Cutter diameter(in)

● **Chip removal**

$$Q = ap * ae * Vf * 12 \ (in^3/min)$$

Q:Chip removal(in³/min) ap:Cutting depth
ae:Cutting width Vf:Feed speed(ft/min)





Drilling General Recommendation

● **Cutting speed**

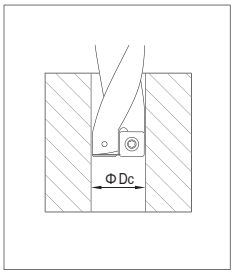
$$Vc = \frac{\pi * Dc * n}{12} (ft/min)$$

Vc:Cutting speed(ft/min) π:≈3.14
Dc:Drill diameter((in) n:Spindle speed(rev/min)

● **Spindle speed**

$$n = \frac{12 * Vc}{\pi * Dc} (rev/min)$$

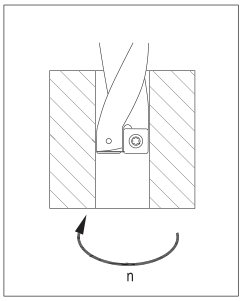
Vc:Cutting speed(ft/min) π: ≈3.14
Dc:Drill diameter(in) n:Spindle speed(rev/min)



● **Feed speed**

$$Vf = fz * n * Z (in/min)$$

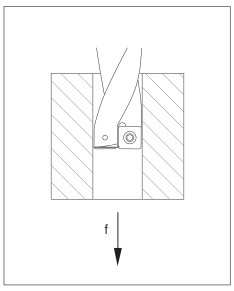
Vf:Feed speed(in/min) fz:Feed per tooth(in/z)
n:Spindle speed(rev/min) Z:Number of teeth



● **Feed rate per rev.**

$$fz = \frac{Vf}{n * Z} (in)$$

fz:Feed rate per rev.(in) Vf:Feed speed(in/min)
n:Spindle speed(rev/min) Z:Number of teeth



● **Feed rate per rev.**

$$f = \frac{Vf}{n} (in/rev)$$

f:Feed rate per rev.(in/rev) Vf:Feed speed(in/min)
n:Spindle speed(rev/min)

● **Chip removal**

$$Q = \frac{Vf * \pi * Dc^2}{4} (in^3/min)$$

Q:Chip removal(in³/min) Vf:Feed speed(in/min)
π:≈3.14 Dc:Drill diameter(in)

● **Horse power**

$$Hp = \frac{Pmot}{0.75}$$

Hp:Horsepowe Pmot:Cutting power(KW)

● **Power demand**

$$Pmot = \frac{Kc * Vc * Dc * f}{132,000 * \eta} (HP)$$

Pmot:Cutting power(HP) Kc:Unit cutting force(lbs/in²)
Vc:Cutting speed(ft/min) Dc:Workpiece diameter(in)
f:Feed rate(in/rev) η:Mechanical efficiency

● **Torque**

$$Mc = \frac{Dc^2 * Kc * fz}{8} (in*lbs)$$

Mc:Torque Dc:Drill diameter(in)
Kc:Unit cutting force(lbs/in²) f:Feed rate per rev.(in/rev)

● **Cutting thickness**

$$h = fz * sink (in)$$

h:Cutting thickness(in) fz:Feed rate(in/rev)

Hardness Conversion Table

Brinell Hardness 10 ball load 3000Kg		Micro Vickers Hardness HV	Rockwell Hardness				Shore's Hardness	Tensile Strength (approximate) kgf/mm
Master ball	WC ball HB		A scale 60kgf diamond brale HRA	B scale 100kgf 1/16in ball HRB	C scale 150kgf diamond brale HRC	D scale 100kgf diamond brale HRD		
-	-	1865	92.0	-	80	-	-	-
-	-	1787	91.5	-	79	-	-	-
-	-	1710	91.0	-	78	-	-	-
-	-	1633	90.5	-	77	-	-	-
-	-	1556	90.0	-	76	-	-	-
-	-	1478	89.5	-	75	-	-	-
-	-	1400	89.0	-	74	-	-	-
-	-	1323	88.5	-	73	-	-	-
-	-	1245	88.0	-	72	-	-	-
-	-	1160	87.0	-	71	-	-	-
-	-	1076	86.5	-	70	-	-	-
-	-	1004	86.0	-	69	-	-	-
-	-	940	85.6	-	68.0	76.9	97	-
-	-	920	85.3	-	67.5	76.5	96	-
-	-	900	85.0	-	67.0	76.1	95	-
-	767	880	84.7	-	66.4	75.7	93	-
-	757	860	84.4	-	65.9	75.3	92	-
-	745	840	84.1	-	65.3	74.8	91	-
-	733	820	83.8	-	64.7	74.3	90	-
-	722	800	93.4	-	64.0	73.8	88	-
-	712	-	-	-	-	-	-	-
-	710	780	83.0	-	63.3	73.3	87	-
-	698	760	82.6	-	62.5	72.6	86	-
-	684	740	82.2	-	61.8	72.1	-	-
-	682	737	82.2	-	61.7	72.0	84	-
-	670	720	81.8	-	61.0	71.5	83	-
-	656	700	81.3	-	60.1	70.8	-	-
-	653	697	81.2	-	60.0	70.7	81	-
-	647	690	81.1	-	59.7	70.5	-	-
-	638	680	80.8	-	59.2	70.1	80	-
-	630	670	80.6	-	58.8	69.8	-	-
-	627	667	80.5	-	58.7	69.7	79	-
-	601	640	79.8	-	57.3	68.7	77	-
-	578	615	79.1	-	56.0	67.7	75	-
-	555	591	78.4	-	54.7	66.7	73	210
-	534	569	77.8	-	53.5	65.8	71	202
-	514	547	76.9	-	52.1	64.7	70	193
	495	528	76.3		51.0	63.8	68	186
-	477	508	75.6	-	49.6	62.7	66	177
-	461	491	74.9	-	48.5	61.7	65	170
-	444	472	74.2	-	47.1	60.8	63	162
429	429	455	73.4	-	45.7	59.7	61	154
415	415	440	72.8	-	44.5	58.8	59	149
401	401	425	72.0	-	43.1	57.8	58	142
388	388	410	71.4	-	41.8	56.8	56	136
375	375	396	70.6	-	40.4	55.7	54	129
363	363	383	70.0	-	39.1	54.6	52	124
352	352	372	69.3	(110.0)	37.9	53.8	51	120
341	341	360	68.7	(109.0)	36.6	52.8	50	115
331	331	350	68.1	(108.5)	36.6	51.9	48	112
321	321	339	67.5	(108.0)	34.3	51.0	47	108
311	311	328	66.9	(107.5)	33.1	50.0	46	105
302	302	319	66.3	(107.0)	32.1	49.3	45	103
293	293	309	65.7	(106.0)	30.9	48.3	43	99
285	285	301	65.3	(105.5)	29.9	47.6	-	97
277	277	292	64.6	(104.5)	28.8	46.7	41	94

Hardness Conversion Table

Brinell Hardness 10 ball load 3000Kg		Micro Vickers Hardness HV	Rockwell Hardness				Shore's Hardness	Tensile Strength (approximate) kgf/mm
Master ball	WC ball HB		A scale 60kgf diamond brale HRA	B scale 100kgf 1/16in ball HRB	C scale 150kgf diamond brale HRC	D scale 100kgf diamond brale HRD		
269	269	284	64.1	(104.0)	28	45.9	40	91
262	262	276	63.6	(103.0)	27	45.0	39	89
255	255	269	63.0	(102.0)	25	44.2	38	86
248	248	261	62.5	(101.0)	24	43.2	37	84
241	241	253	61.8	100	23	42.0	36	82
235	235	247	61.4	99	22	41.4	35	80
229	229	241	60.8	98.2	21	40.5	34	78
223	223	234	-	97.3	(18.8)	-	-	
217	217	228	-	96.4	(17.5)	-	33	74
212	212	222	-	95.5	(16.0)	-	-	72
207	207	218	-	94.6	(15.2)	-	32	70
201	201	212	-	93.8	(13.8)	-	31	69
197	197	207	-	92.8	(12.7)	-	30	67
192	192	202	-	91.9	(11.5)	-	29	65
187	187	196	-	90.7	(10.0)	-	-	63
183	183	192	-	90	(9.0)	-	28	63
179	179	188	-	89	(8.0)	-	27	61
174	174	182	-	87.8	(6.4)	-	-	60
170	170	178	-	86.8	(5.4)	-	26	58
167	167	175	-	86	(4.4)	-		57
163	163	171	-	85	(3.3)	-	25	56
156	156	163	-	82.9	(0.9)		-	53
149	149	156	-	80.8		-	23	51
143	143	150	-	78.7		-	22	50
137	137	143	-	76.4		-	21	47
131	131	137	-	74		-	-	46
126	126	132	-	72		-	20	44
121	121	127	-	69.8		-	19	42
116	116	122	-	67.6		-	18	41
111	111	117	-	65.7		-	17	39

Material Conversion Table

ISO	Country and standard										
	China	International	Germany	U.S.A.	U.K.		France	Sweden	Italy	Spain	Japan
	GB	DIN	W.-nr	AISI/SAE	BS	EN	AFNOR	SS	UNI	UNE	JIS
P	Structural steel										
	15	C15	1.0401	1015	080M15	-	CC12	1350	C15C16	F.111	-
	20	C22	1.0402	1020	050A20	2C	CC20	1450	C20C21	F.112	-
	35	C35	1.0501	1035	060A35	-	CC35	1550	C35	F.113	-
	45	C45	1.0503	1045	080M40	-	CC45	1650	C45	F.114	-
	55	C55	1.0535	1055	070M55	-	-	1655	C55	-	-
	60	C60	1.0601	1060	080A62	43D	CC55	-	C60	-	-
	Y15	9SMn28	1.0715	1213	230M07	-	S250	1912	CF9SMn28	11SMn28	SUM22
	-	9SMnPb28	1.0718	12L13	-	-	S250Pb	1914	CF9MnPb28	11SMnPb28	SUM22L
	-	10SPb20	1.0722	-	-	-	10PbF2	-	CF10Pb20	10SPb20	-
	-	35S20	1.0726	1140	212M36	8M	35MF4	1957	-	F210G	-
	Y13	9SMn36	1.0736	1215	240M07	1B	S300	-	CF9SMn36	12SMn35	-
	-	9SMnPb36	1.0737	12L14	-	-	S300Pb	1926	CF9SMnPb36	12SMnP35	-
	55Si2Mn	55Si9	1.0904	9255	250A53	45	55S7	2085	55Si8	56Si7	-
	-	60SiCr7	1.0961	9262	-	-	60SC7	-	60SiCr8	60SiCr8	-
	15	Ck15	1.1141	1015	080M15	32C	XC12	1370	C16	C15K	S15C
	40Mn	40Mn4	1.1157	1039	150M36	15	35M5	-	-	-	-
	25	Ck25	1.1158	1025	-	-	-	-	-	-	S25C
	35Mn2	36Mn5	1.1167	1335	-	-	40Mn5	2120	-	36Mn5	SMn438(H)
	30Mn	28Mn6	1.117	1330	150M28	14A	20M5	-	C28Mn	-	SCMn1
	35Mn	Cf35	1.1183	1035	060A35	-	XS38TS	1572	C36	-	S35C
	Ck45	45	1.1191	1045	080M46	-	XC42	1672	C45	C45K	S45C
	55	Ck55	1.1203	1055	070M55	-	XC45	-	C50	C55K	S55C
	50	Cf53	1.1213	1050	060A52	-	XC48TS	1674	C53	-	S50C
	60Mn	Ck60	1.1221	1060	080A62	43D	XC60	1678	C60	-	S58C
	-	Ck101	1.1274	1095	060A96	-	-	1870	-	-	SUP4
	-	X120Mn12	1.3401	-	Z120M12	-	X120M12	-	XG120Mn12	X120Mn12	SCMnH/1
	GCr15	100Cr6	1.3505	52100	534A99	31	100C6	2258	100Cr6	F.131	SUJ2
	-	15Mo3	1.5415	ASTM A204Gr.A	1501-240	-	15D3	2912	16Mo3KW	16Mo3	-
	-	16Mo5	1.5426	4520	1503-245-420	-	-	-	16Mo5	16Mo5	-
	-	14Ni6	1.5622	ASTM A350LF5	-	-	16N6	-	14Ni6	15Ni6	-
	-	X8Ni9	1.5662	ASTM A353	1501-509; 510	-	-	-	X10Ni9	XBNi09	-

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	GB	DIN	W.-nr	AISI/SAE	BS	EN	AFNOR	SS	UNI	UNE	JIS
P	Structural steel										
	-	12Ni19	1.5680	2515	-	-	Z18N5	-	-	-	-
	-	36NiCr6	1.5710	3135	640A35	111A	35NC6	-	-	-	SNC236
	-	14NiCr10	1.5732	3415	-	-	14NC11	-	16NiCr11	15NiCr11	SNC415 (H)
	-	14NiCr14	1.5752	34153310	655M13655A12	36A	12NC15	-	-	-	SNC815 (H)
	-	36CrNiMo4	1.6511	9840	816M40	110	40NCD3	-	38CrNiMo4 (KB)	35CrNiMo4	-
	-	21NiCrMo2	1.6523	8620	850M20	362	20NCD2	2503	20NiCrMo2	20NiCrMo2	SNCCM220 (H)
	-	40NiCrMo2	1.6546	8740	311-Type7	-	-	-	40NiCrMo2 (KB)	40NiCrMo2	SNC240
	40CrNiMoA	34CrNiMo6	1.6582	4340	817M40	24	35NCD6	2541	35CrNiMo6 (KB)	-	-
	-	17CrNiMo6	1.6587	-	820A16	-	18NCD6	-	-	14CrNiMo1	-
	15Cr	15Cr3	1.7015	5015	523M15	-	12C3	-	-	-	SCr415(H)
	35Cr	34Cr4	1.7033	5132	530A32	18B	32C4	-	34Cr4(KB)	35Cr4	SCr430(H)
	40Cr	41Cr4	1.7035	5140	530M40	18	42C4	-	41Cr4	42Cr4	SCr440(H)
	40Cr	42Cr4	1.7045	5140	-	-	-	2245	-	42Cr4	SCr440
	18CrMn	16MnCr15	1.7131	5115	(527M20)	-	16MC5	2511	16MnCr15	16MnCr15	-
	20CrMn	55Cr3	1.7176	5155	527A60	48	55C3	-	-	-	SUP9(A)
	30CrMo	25CrMo4	1.7218	4130	1717CDS110	-	25CD4	2225	25CrMo4 (KB)	55Cr3	SCM420; SCM430
	35CrMo	34CrMo4	1.7220	4137;4135	708A37	19B	35CD4	2234	35CrMo4	34CrMo4	SCM432; SCRRM3
	40CrMoA	41CrMo4	1.7223	4140;4142	708M40	19A	42CD4TS	2244	41CrMo4	41CrMo4	SCM440
	42CrMo 42CrMnMo	42CrMo4	1.7225	4140	708M40	19A	42CD4	2244	42CrMo4	42CrMo4	SCM440(H)
	-	15CrMo5	1.7262	-	-	-	12CD4	2216	-	12CrMo4	SCM415(H)
	-	13CrMo44	1.7335	ASTMA182F11; F12	1501-620Gr.27	-	15CD3.5; 15CD4.5	-	14CrMo44	14CrMo45	-
	-	32CrMo12	1.7361	-	722M24	40B	30CD12	2240	32CrMo12	F.124.A	-
	-	10CrMo910	1.7380	ASTMA182F.22	1501-622Gr.31;45	-	12CD9;10	2218	12CrMo9,10	TU.H	-
	-	14MoV63	1.7715	-	1503-660-440	-	-	-	-	13MoCrV6	-
	50CrVA	50CrV4	1.8159	6150	735A50	47	50CV4	2230	50CrV4	51CrV4	SUP10
	-	41CrAlMo7	1.8509	-	905M39	41B	40CAD6,12	2940	41CrAlMo7	41CrAlMo7	-
	-	39CrMoV139	1.8523	-	897M39	40C	-	-	36CrMoV12	-	-

Material Conversion Table

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	GB	DIN	W.-nr	AISI/SAE	BS	EN	AFNOR	SS	UNI	UNE	JIS
P	Tool steel										
	T10	C105W1	1.1545	W.110	-	-	Y1105	1880	C98KU C100KU	F.515 F.516	-
	T12A	C125W	1.1663	W.112	-	-	Y2120	-	C120KU	(C120)	SK20
	GCr15	100Cr6	1.2067	L3	BL3	-	Y100C6	-	-	100Cr6	-
	Cr12	X210Cr12	1.2080	D3	BD3	-	Z200Cr12	-	X210Cr13KU X250Cr12KU	X210Cr12	SKD1
	4Cr5MoVSi	X40CrMoV5 1	1.2344	H13	BH13	-	Z40CDV5	2242	X35CrMoV05KU X40CrMoV51KU	X40CrMoV5	SKD61
	Cr6WV	X100CrMoV5 1	1.2363	A2	BA2	-	Z100CDV5	2260	X100CrMoV51KU	X100CrMoV5	SKD12
	CrWMo	105WCr6	1.2419	-	-	-	105WC13	2140	10WCr6 107WCr5KU	105WCr5	SKS31 SKS2 SKS3
	Cr12W	X210CrW12	1.2436	-	-	-	-	2312	X215CrW12 1KU	X210CrW12	SKD2
	5CrNiMo	45WCrV7	1.2542	S1	BS1	-	-	2710	45WCrV8KU	45WCrSi8	-
	3Cr2W8V	X30WCrV93 X30WCrV93KU	1.2581	H21	BH21	-	Z30WCV9	-	X28W09KU X30WCrV9 3KU	X30WCrV9	SKD5
	Cr12MoV	X165CrMoV 12	1.2601	-	-	-	-	2310	X165CrMoW12KU	X160CrMoV12	SKD11
	5CrNiMo	55NiCrMoV6	1.2713	L6	-	-	55NCDV7	-	-	F.250.S	SKT4
	V	100V1	1.2833	W210	BW2	-	Y1105V	-	-	-	SKS43
	W6Mo5Cr4V2Co5	S6-5-2-5	1.3243	-	-	-	Z85WDKCV	2723	HS6-5-2-5	HS6-5-2-5	SKH55
	W18Cr4VCo5	S18-1-2-5	1.3255	T4	BT4	-	Z80WKCV 10-05-04-01	-	X78WCo1805KU	HS18-1-1-5	SKH3
	W6Mo5Cr4V2	S6-5-2	1.3343	M2	BM2	-	Z85WDCV 06-05-04-02	2722	X82WMo0605KU	HS6-5-2	SKH9
	-	S2-9-2	1.3348	M7	-	- Z -	Z100WCWV 09-02-04-02	2782	HS2-9-2	HS2-9-2	-
	W18Cr4V	S18-0-1	1.3355	T1	BT1	-	Z80WCV 18-04-01	-	X75W18KU	HS18-0-1	SKH2
	W6Mo5Cr4V3	S6-5-3	-	M3	-	-	-	-	-	-	SKH52
	-	-	-	M42	BM42	-	-	-	-	-	SKH59

Material Conversion Table

ISO	Country and standard										
	China	International	Germany	U.S.A.	U.K.		France	Sweden	Italy	Spain	Japan
	GB	DIN	W.-nr	AISI/SAE	BS	EN	AFNOR	SS	UNI	UNE	JIS
M	Stainless steel										
	0Cr13; 1Cr12	403	1.4000	403	403S17	-	Z6C13	2301	X6Cr13	F.3110	SUS403
	-	-	1.4001	-	-	-	-	-	-	F.8401	-
	1Cr13	410	1.4006	410	410S21	56A	X12Cr13	2302	X12Cr13	F.3401	SUS410
	1Cr17	430	1.4016	430	430S15	60	X8Cr17	220	X8Cr17	F.3113	SUS430
	2Cr13	410	1.4021	40	S62	56B;56C	X20C13	-	X20C13	F.3401	SUS410
	-	-	1.4027	-	420C29	56B	-	-	-	-	SCS2
	4Cr13	-	1.4034	-	420S45	56D	X40Cr14	2304	X40Cr14	F.3405	SUS420J2
	1Cr17Ni2	431	1.4057	431	431S29	57	X16CNi16	2321	X16CNi16	F.3427	SUS431
	Y1Cr17	430F	1.4104	430F	-	-	X10CrS17	2383	X10CrS17	F.3117	SUS430F
	1Cr17Mo	434	1.4113	434	434S17	-	X8CrMo17	2325	X8CrMo17	-	SUS434
	-	-	1.4313	-	425C11	-	-	-	-	-	SCS5
	-	-	1.4408	-	316C16	-	-	-	-	F.8414	SCS14
	4Cr9Si2	HW3	1.4718	HW3	401S45	52	X45CrSi8	-	X45CrSi8	F.322	SUH1
	0Cr13Al	405	1.4724	405	403S17	-	X10CrAl12	-	X10CrAl12	F.311	SUS405
	Cr17	430	1.4742	430	430S15	60	X8Cr17	-	X8Cr17	F.3113	SUS430
	8Cr20Si2Ni	HNV6	1.4757	HNV6	443S65	59	X80CrSiNi20	-	X80CrSiNi20	F.320V	SUH4
	2Cr25N	446	1.4762	446	-	-	X16Cr26	2322	X16Cr26	-	SUH446
	Austenitic stainless steel										
	0Cr18Ni9	X5CrNi1810	1.4301	304	304S15	58E	Z6CN18.09	2332	X5CrNi1810	F.3551 F.3541; F.3504	SUS304
	1Cr18Ni9MoZr	X10CrNiS189	1.4305	303	303S21	58M	Z10CNF18.09	2346	X10CrNiS18.09	F.3508	SUS303
	0Cr19Ni10	X2CrNi1911	1.4306	304L	304S12	-	Z2CN18.10	2352	X2CrNi18.11	F.3503	SCS19
	-	G-X6CrNi189	1.4308	-	304C15	-	Z6CN18.10M	-	-	-	SCS13
	Cr17Ni17	X12CrNi177	1.4310	301	-	-	Z12CN17.07	2331	X12CrNi1707	F.3517	SUS301
	-	X2CrNiN1810	1.4311	304LN	304S62	-	Z2CN18.10	2371	-	-	SUS304LN
	0Cr19Ni9	X5CrNi189	1.4350	304	304S31	58E	Z6CN18.09	-	X5CrNi1810	-	SUS304
	0Cr17Ni11Mo2	X5CrNi Mo1712	1.4401	316	316S16	Z6CND 17.11	1.4401	2347	X5CrNiMo1712	F.3543	SUS316
	00Cr17Ni13Mo2	X2CrNi MoN17133	1.4429	316LN	-	-	Z2CND17.13	2375	-	-	SUS316LN
	0Cr27Ni12Mo3	X2CrNi Mo18143	1.4435	316L	316S12	-	Z2CDN17.13	2353	X2CrNiMo1713	-	SCS16
	00Cr19Ni13Mo3	X2CrNi Mo17133	1.4438	317L	317S12	-	Z2CND19.15	2367	X2CrNiMo18.16	-	SUS317L
	-	X8CrNiMo275	1.4460	329L	-	-	-	2324	-	-	SUS329L; SCH11; SCS11

Material Conversion Table

ISO	Country and standard										
	China	International	Germany	U.S.A.	U.K.		France	Sweden	Italy	Spain	Japan
	GB	DIN	W.-nr	AISI/SAE	BS	EN	AFNOR	SS	UNI	UNE	JIS
M	Austenitic stainless steel										
	1Cr18Ni9Ti	X6CrNi Ti1810	1.4541	321	2337	321S12	Z6CNT18.10	58B	X6CrNiTi1811	F.3553	SUS321
	1Cr18Ni11Nb	X6CrNi Nb1810	1.4550	347	347S17	58F	Z6CNNb18.1	2338	X6CrNiTi1811	F.3552	SUS347
	Cr18Ni12Mo2Ti	X6CrNi MoTi17122	1.4571	316Ti	320S17	58J	Z6NDT17.12	2350	X6CrNiMoTi17	F.3535	-
	-	G-X5CrNi MoNb1810	1.4581	-	318C7	-	Z4CNDNb1812M	-	XG8CrNiMo18	-	SCS22
	Cr17Ni12Mo3Nb	X10CrNi MoNb1812	1.4583	318	-	-	Z6CNDNb1713B	-	X6CrNiMoTiNb17	-	-
	1Cr23Ni13	X15CrNi Si2012	1.4828	309	309S24	-	Z15CNS20.1	-	-	-	SUH309
	0Cr25Ni20	X12CrNi2521	1.4845	310S	310S24	-	Z12CN2520	2361	X6CrNi2520	F.331	SUH310
	Cr15Ni36W3Ti	X12NiCr Si3616	1.4864	330	-	-	Z12CNS35.1	-	-	-	SUH330
	-	G-X40NiCr Si3818	1.4865	-	330C11	-	-	-	XG50NiCr3919	-	SCH15
	5Cr2Mn9Ni4N	X53CrMn NiN219	1.4871	EV8	349S54; 321S12	– 58B	Z52CMN21.0	-	X53CrMnNiN219	-	SUH35
	1Cr18Ni9Ti	X12CrNi Ti189	1.4878	321	321S320	58C	Z6CNT18.12	-	X6CrNiTi1811	F.3523	SU321

ISO	Country and standard								
	China	Germany	U.S.A.	U.K.	France	Sweden	Italy	Spain	Japan
	GB	W.-nr	AISI/SAE	EN	AFNOR	SS	UNI	UNE	JIS
K	Nodular cast iron								
	QT400-18	GGG40	60-40-18	400/17	FGS370-17	0717-02	GS370-17	FGE38-17	FCD400
	QT450-10	--	65-45-12	420/12	FGS400-12	--	GS400-12	FGE42-12	FCD450
	QT500-7	GGG50	70-50-05	500/7	FGS500-7	0727-02	GS500-7	FGE50-7	FCD500
	QT600-3	GGG60	80-60-03	600/7	FGS600-2	0732-03	GS600-2	FGE60-2	FCD600
	QT700-2	GGG70	100-70-03	700/2	FGS700-2	0737-01	GS700-2	FGE70-2	FCD700
	QT800-2	GGG80	120-90-02	800/2	FGS800-2	0864-03	GS800-2	FGE80-2	FCD800
	QT900-2	--	--	900/2	--	--	--	--	--
	Grey cast iron								
	--	GG40	NO.60	--	FGL400	0140	--	--	
	HT350	GG35	NO.50	350	FGL350	0135	G35	FG35	FC350
	HT300	GG30	NO.45	300	FGL300	0130	G30	FG30	FC300
	HT250	GG25	NO.35	250	FGL250	0125	G25	FG25	FC250
	HT200	GG20	NO.30	200	FGL200	0120	G20	FG20	FC200
	HT150	GG15	NO.20	150	FGL150	0115	G15	FG15	FC150
	HT100	--	--	100	--	0110	G10	--	FC100

Material Conversion table

ISO	Country and standard									
	China	International	Germany	U.S.A.	U.K.	France	Sweden	Italy	Spain	Japan
	GB	DIN	W.-nr	AISI/SAE	BS	AFNOR	SS	UNI	UNE	JIS
N	Al-based alloy									
	ZAlSi7Mg	Al-Si7Mg(Fe)	~AlSi7Mg	356	LM25	A-S7G	4244	3599	-	AC4C
	ZAlSi7MgA	Al-Si7Mg	AlSi7Mg	A356.0	2L99	A-S7G03	-	8024	-	AC4C
	ZAlSi12	Al-Si12	AlSi12	413;B413.0	LM6	A-S13	4261	4514	-	AC3A
	ZAlSi9Mg	~Al-Si10Mg	AlSi9Mg	360	LM9	A-S9G;A-S10G	4253	3051	-	AC4A
	-	Al-Si5	AlSi5Mg	A 443.0	-	-	-	5077	-	-
	-	Al-Si5Fe	-	B443.0	-	-	-	GD-AlSi5Fe	-	-
	-	(AlSi7Fe)	-	A444.0	-	-	-	-	-	-
	-	Al-Si12Fe	-	413	LM20	~A-S12	4260	5079	-	ADC1

ISO	Country and standard									
	China	International	Germany	U.S.A.	U.K.	France	Sweden	Italy	Spain	Japan
	GB	DIN	W.-nr	AISI/SAE	BS	AFNOR	SS	UNI	UNE	JIS
S	Ni-based alloy									
	-	S-NiCr13A16MoNb	LW2 4670	5391	mar – 46	NC12AD	-	-	-	-
	-	NiCo15Cr10MoAlTi	LW2 4674	AMS 5397	-	-	-	-	-	-
	-	NiFe35Cr14MoTi	LW2.4662	5660	-	ZSNCDT42	-	-	-	-
	-	NiCr19Fe19NbMo	LW2.4668	5383	HR8	NC19eNB	-	-	-	-
	-	NiCr20TiAk	2.4631	-	Hr401.601	NC20TA	-	-	-	-
	-	NiCr19Co11MoTi	2.4973	AMS 5399	-	NC19KDT	-	-	-	-
	-	NiCr19Fe19NbMo	LW2.4668	AMS 5544	-	NC20K14	-	-	-	-
	-	-	2.4603	5390A	-	NC22FeD	-	-	-	-
	-	NiCr22Mo9Nb	2.4856	5666	-	NC22FeDNB	-	-	-	-
	-	NiCr20Ti	2.4630	-	HR5.203-4	NC20T	-	-	-	-
	-	NiCu30AL3Ti	2.4375	4676	3072-76	-	-	-	-	-
	Co-based alloy									
	-	CoCr20W15Ni	-	5537C,AMS	-	KC20WN	-	-	-	-
	-	CoCr22W14Ni	LW2.4964	5772	-	KC22WN	-	-	-	-
	Ti-alloy									
	-	TiAl5Sn2.5	3.7115.1	UNS R54520	TA14/17	T-A5E	-	-	-	-
	-	-	-	-	-	UNS R56400	-	-	-	-
	-	TiAl6V4	3.7165.1	-	TA10-13/ TA28	UNS R56401	-	T-A6V	-	-
	-	TiAl5V5Mo5Cr3	-	-	-	-	-	-	-	-
	-	TiAl4Mo4Sn4Si0.5	3.7185	-	-	-	-	-	-	-

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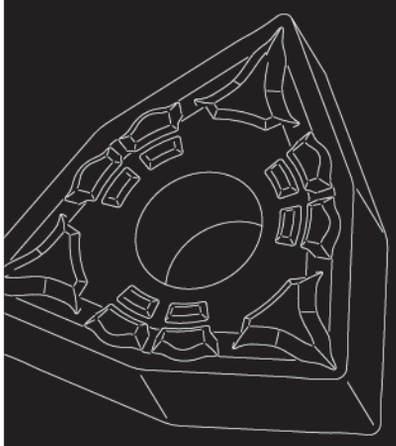

GANZHOU ACHTECK TOOL TECHNOLOGY CO.,LTD

Address: Ganzhou Economic Development Area, Jiangxi , China
Postcode: 341000
Tele: +86-797-8086879
Fax: +86-797-8166100
E-mail: export@achtecktool.com
Website: www.achtecktool.com