

Rotating Product Introduction

演讲人:

难加工材料切削专家
THE EXPERT OF DIFFICULT MACHINING

·ACHTECK·

01

Face Milling

难加工材料切削专家
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AFM45/75/88-SN12/19 series

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SN12 series Cutter features

Approaching angle (Kr) : 45°, 75°, 88°

Diameter (Dc) : Ø 2" -12"

Max. cutting depth (apmax) :

Kr=45° apmax=0.26"

Kr=75° apmax=0.31"

Kr=88° apmax=0.39"

Pitch options: close and coarse pitch

➤ SN19 series Cutter features

Approaching angle (Kr) : 45°

Diameter (Dc) : Ø6" – 10"

Max cutting depth (apmax) : 0.433"

Pitch option: coarse pitch

Coupling type: Arbor

Milling cutters with diameter below Ø5" (included)

have internal coolant

Milling cutter surface Ni-plated



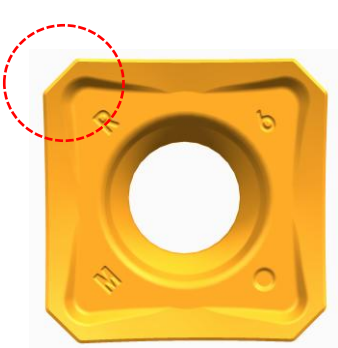
- **Milling cutter without N** (AFM88-080-Z07-A27R-SN12-C)
Screw: AST411-60W-M (M4) Wrench: ADT-T15
- **Milling cutter with N (upgraded)** (AFM88-080-Z07-A27R-SN12-**N**-C)
Screw: SP050120 (M5) Wrench: DT-TP20

AFM45/75/88-SN12/19 series

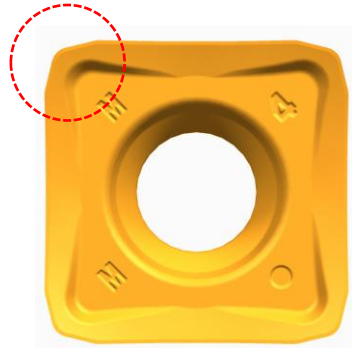
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Insert features:

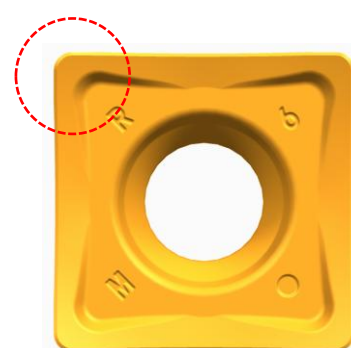
- Negative
- 8 cutting edges
- Round nose radius (0.8/1.2/2.0) , short wiper (ANN/ENN/ZNN) , long wiper (-W)
- M class inserts, G class inserts
- Geometries: MM3, MM4, MR6, RR2, FM2
- Grades:
AP301U/AP351U/AP351K/AC301K/AC301P/AW100K



ANN



ENN

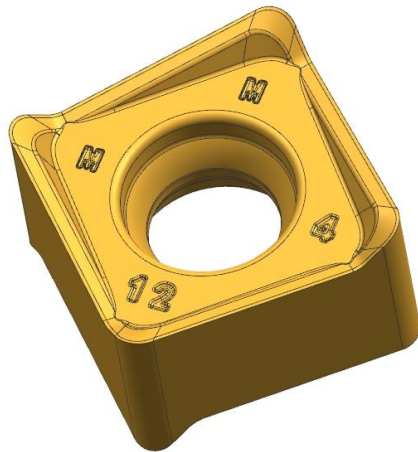


ZNN

AFM45/75/88-SN12/19 series

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Product Name	Dimension			Grade						
	l	s	r	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
SNMX 120612R-MM4	0.5"	0.27"	0.05"	●	●	●		●	●	

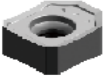


Big rake angle decreases cutting force effectively.

AFM45/75/88-SN12/19 series

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SNHX12 long wiper inserts

Insert	Product Name	Dimensions			Grade						
		l	s	b	AP301U	AP351U	AC301P	AP401U	AC301K	AP351K	AW100K
	SNHX 1206ANN-W	0.5"	0.27"	0.26"	●				●		
	SNHX 1206ENN-W	0.5"	0.27"	0.05"	●				●		
	SNHX 1206ZNN-W	0.5"	0.27"	0.17"	●				●		



ANN-W



ENN-W



ZNN-W

AFM45/75/88-SN12/19 Geometries

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RR2 → Heavy Roughing Geometries

For stable machining condition; Mainly for cast iron and steel milling.



MR6 → Roughing Geometries

Suitable for unstable cutting conditions with cutting edge reliability; High feed rate.



MM4 → Universal Geometries

Suitable for machining most materials under medium cutting conditions.



MM3 → Sharp Geometries

Suitable for semi-finishing and finishing under good cutting conditions with low cutting force; Medium feed rate.



FM2 → Sharp Geometries For Aluminum

Low cutting force, sharp cutting edges.



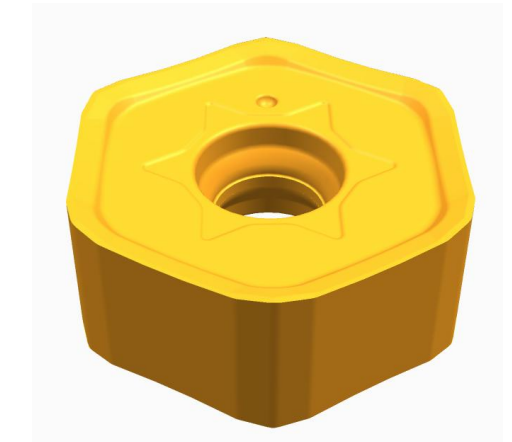
HN09 face milling insert



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Insert features:

- Max. cutting depth: $ap_{\max} = 0.19''$;
- Double-sided, 12 cutting edges, cost efficient;
- Wiper design for better surface quality;
- M class insert;
- Grades: AC151K, AC251P.



Success Story



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Workpiece: Engine block

Material: GG25

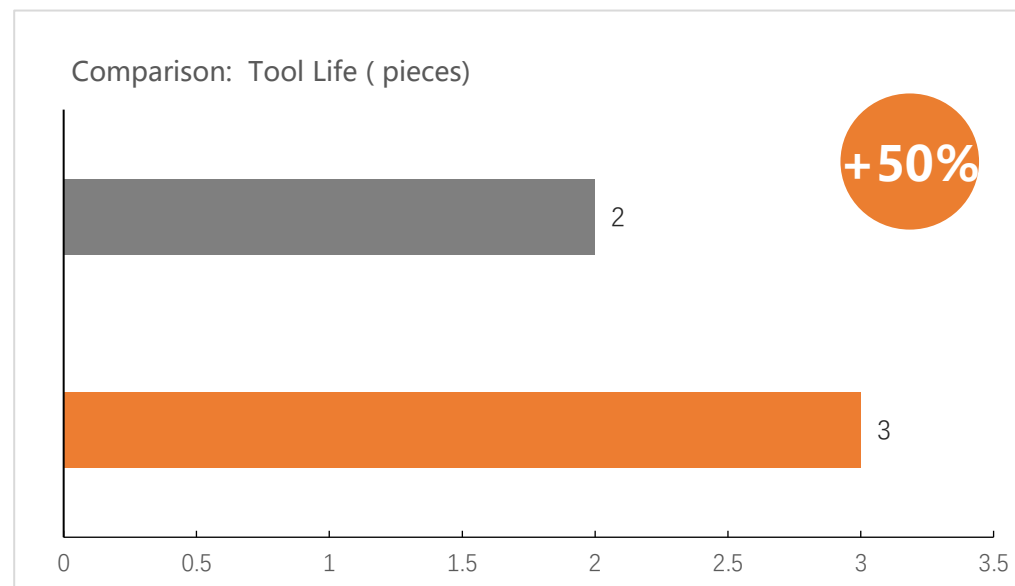
Insert: HNGX 0906ANN-MR6

Grade: AC151K

Application: Rough milling



Parameters:	Competitor	Achteck
Vc [ft/min]	984	984
fz [in]	0.01	0.01
ap [in]	0.098	0.098
Coolant	Dry	Dry
Tool life (pcs)	2	3



AFM45-XN07/09 series

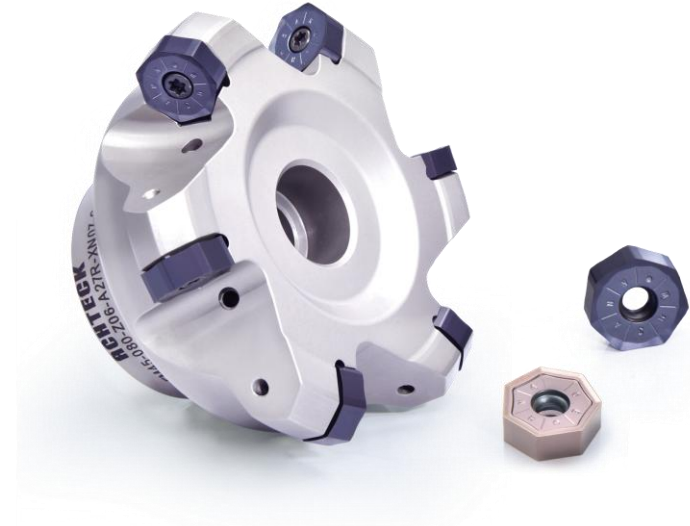
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Insert features:

- Double-sided, 14 cutting edges;
- Geometries: MM3, MM4, MR6;
- G class, M class;
- Round nose radius, short wiper, long wiper;
- XN07 and XN09 two insert sizes.

Cutter features:

- 45° approaching angle;
- Diameter (DC) : Ø1.5" -12" ;
- Coupling type: Screw head, Weldon, Arbor;
- Insert clamping: Screw
- Milling cutters with diameter below Ø5" (included) with internal coolant;
- Ni-plated cutter surface.



AFM45-XN07/09 series

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• Precautions when using wiper insert

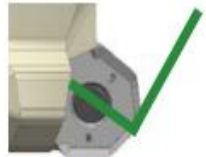


Fig.1(Right)



Fig.2(Wrong)

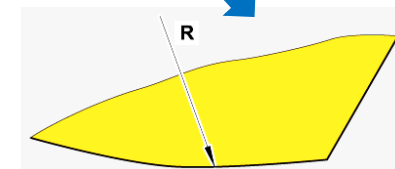
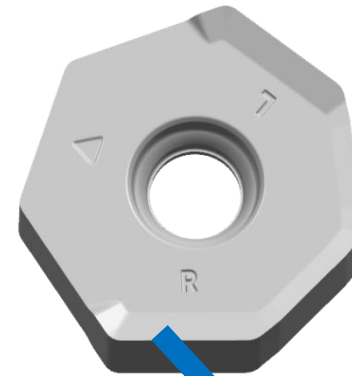
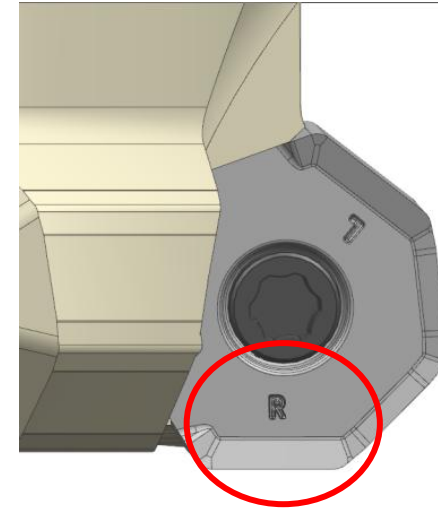


Fig.3(Wrong)



Fig.4(Wrong)

- Wiper inserts used with XN0705ANN or XN0906ANN ONLY;
- Two right-handed cutting edges and two left-handed cutting edges;
- Wiper insert edges are 0.001-0.002 in higher than main cutting insert edges;
- Surface finishing less than Ra1.6
- $f_n < 90\%$ of wiper edge length

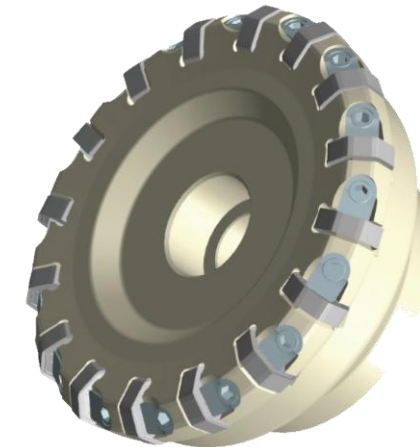


AFM45-XN07/09 series

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XN09-W 45° with wedge clamping

Heavy Roughing Geometries	D	d1	L	l1	apmax	Coolant	Z	Inserts
AFM45-080-Z09-A27R-XN09-W	80	27	50	-	6.0		9	XN..U 0906
AFM45-100-Z12-A32R-XN09-W	100	32	50	-	6.0		12	
AFM45-125-Z16-A40R-XN09-W	125	40	63	-	6.0		16	
AFM45-125-Z16-A40L-XN09-W	125	40	63	-	6.0		16	
AFM45-160-Z20-A40R-XN09-W	160	40	63	-	6.0		20	
AFM45-160-Z20-A40L-XN09-W	160	40	63	-	6.0		20	
AFM45-200-Z26-A60R-XN09-W	200	60	63	-	6.0		26	
AFM45-200-Z26-A60L-XN09-W	200	60	63	-	6.0		26	

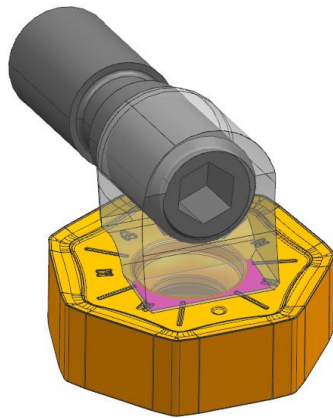


Size (mm)	Accessories			
Diameters	Wedge	Screw	Wrench	Torque
φ80-200				7.0Nm
	AWG-8H	AWS830F	AWH4	

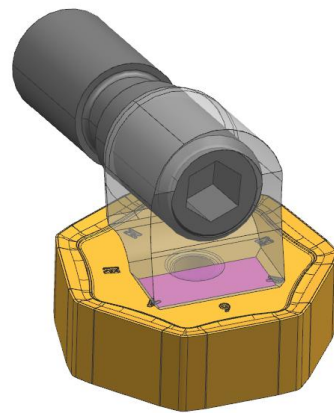
XNMF09 insert series (For cast iron machining)

New Products:

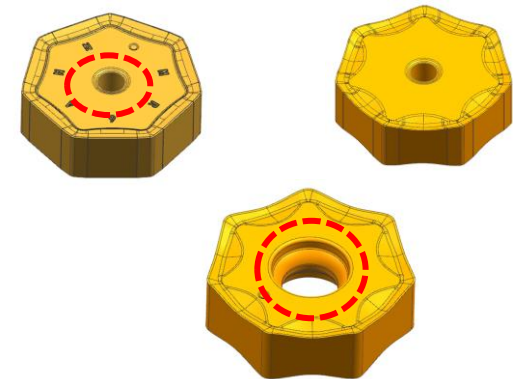
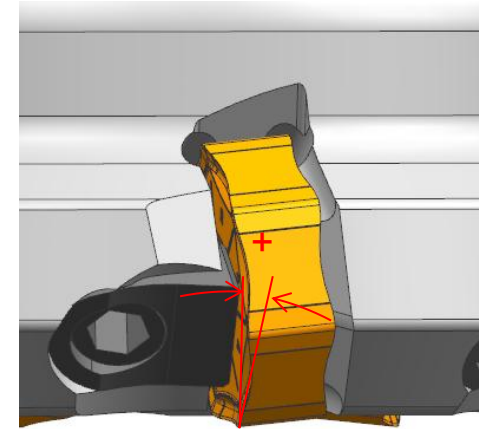
1. Upgraded XNMU09 insert into XNMF09 without screw hole
2. Wavy geometries added: MM3N, MM4N



Old (XNMU09)



New (XNMF09)



AFM40-ON05 series

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Insert features:

- Octagon, negative insert;
- Double-sided, 16 cutting edges, highly cost efficient;
- Geometries: MM3, MM4;
- G class, M class.

Cutter features:

- Approaching angle (Kr) : 40°
- Diameter (DC) : Ø2" -6" ;
- Coupling type: Arbor
- Milling cutters with diameter below Ø5" (included) have internal coolant;
- Milling cutter surface Ni-plated.



AFF45-ON05-C-S finishing milling cutter

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Special type	Standard type
AFM110-1000211	AFF45-080-Z06-A27R-ON05-C-S
AFM110-1000165	AFF45-100-Z07-A32R-ON05-C-S
AFM110-1000201	AFF45-125-Z09-A40R-ON05-C-S
AFM110-1000202	AFF45-160-Z12-A40R-ON05-C-S

- Diameter range: Ø3-6 inch
- Shim design applied to the whole series, blackened surface
 - S:** with shim AFF: finish milling
- **Inserts:** ONHU 050408-MM3
ONHU 050408-WC
- **Grades:** AP301U, AP501U, AP2921, AP2932
- Steel and stainless steel finish milling

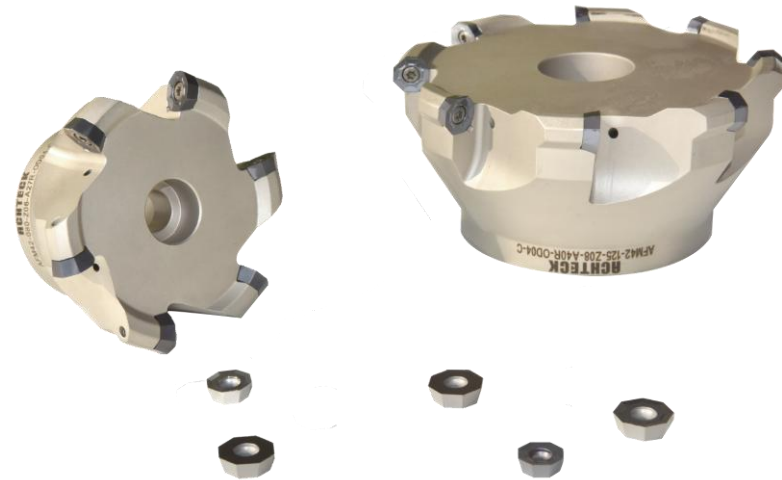


Insert features:

- Positive rake angle, sharp cutting edge, smooth and light cutting;
- positive insert, eight cutting edges;
- Geometries: MM3, HR2, FM2;
- G class, M class;
- With OD04 and OD06 insert sizes.

Cutter features:

- Approach angle 42°;
- Diameter (DC) : Ø0.05-6 inch;
- Coupling type: Screw head, Weldon, Arbor;
- Milling cutters with diameter below Ø5" (included) have internal coolant design;
- Milling cutter surface Ni-plated.



AFM45/75/90-SD09/12 series

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Insert features:

- Positive, four cutting edges;
- Geometries: MM3, MM4, MR2, MR6, HR2;
- G class (M) , M class (H) ;
- SD09 and SD12 two insert sizes.

Cutter features:

- Approach angle (Kr) : 45°, 75° (phased out) , 90°
- Diameter range (DC) : Ø0.63-5 inch;
- Coupling type: Weldon, Arbor;
- The whole series milling cutters have internal coolant;
- Milling cutter surface Ni-plated.



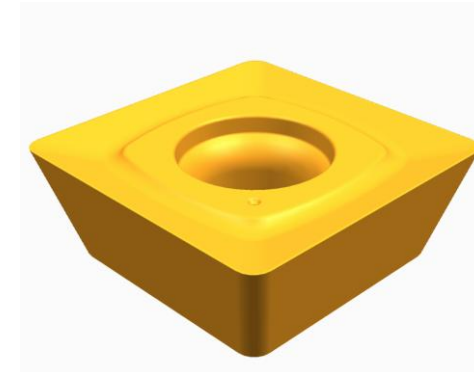
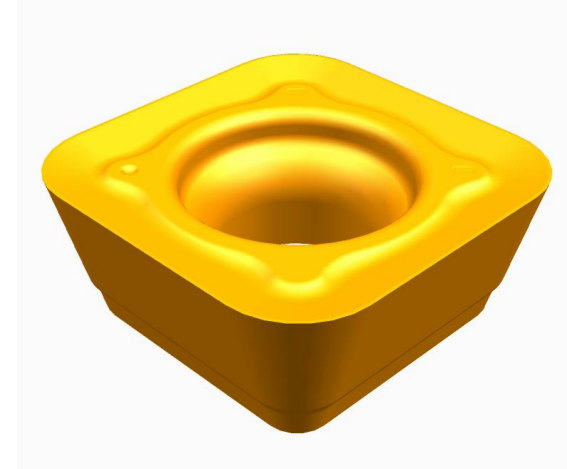
AFM89/AHM15/ACM45-SD09/12 series

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Insert series:

- Geometries: MM4 (universal) , MR2 (upgraded)
- Positive, single-sided 4 cutting edges, smooth and light cutting;
- M class insert, cost efficient;
- Insert sizes: 09 and 12
- Various radius choices: R0.8, R2.0, R2.5;
- Grades: AP251U, AP403M, AP351M, AP251K, AC151K, AP403S.



AFM89/AHM15/ACM45-SD09/12 series

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Cutter features:

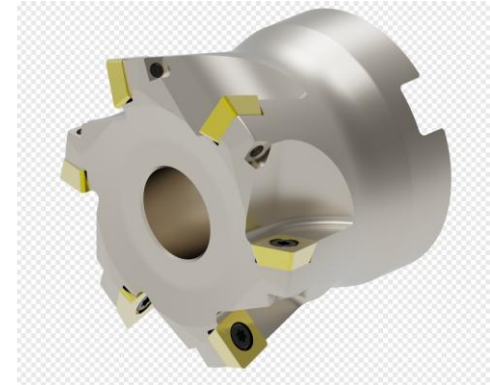


- Milling cutter types: AFM89 (Face milling) , AHM15 (High feed milling) , ACM45 (Chamfer)
- Coupling types: Arbor, Cylindrical, Weldon, Screw head;
- Approach angle (Kr) : Face milling 89.5°, High feed milling 15°, Chamfer 45°
- The whole series milling cutters have external coolant design, cost efficient
- The milling cutter surface Ni-plated, wear resistance, corrosion resistance and good-looking;
- Various products cover all kinds of applications.

Face milling cutter diameter: Ø1-5inch

High feed milling cutter diameter: Ø1-5 inch

Chamfer milling cutter diameter: Ø0.5-1.25inch



AFM89/AHM15/ACM45-SD09/12 series



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➤ Product Name

Old

SDMT 09T308~~EN~~-MM4

SDMT 120408~~EN~~-MM4

SDMT 09T320-MM4



New

SDMT 09T308~~N~~-MM4

SDMT 120408~~N~~-MM4

SDMT 09T320~~N~~-MM4

➤ Geometries

Old

MM3, MM4, MR2,

MR6, HR2



New

MM4, MR2

AFM89/AHM15/ACM45-SD09/12 series



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Old



New



Strengthened
toughness reduces
edge breakage

SD09: screw M4 → M3.5

SD12: screw M4.5 → M4



Upgraded design:

- Locking screw (Torx upgraded to Torxplus)
- Better Geometries design
- Stricter standards in production

AFF40-LN12/15 cast iron finish milling series

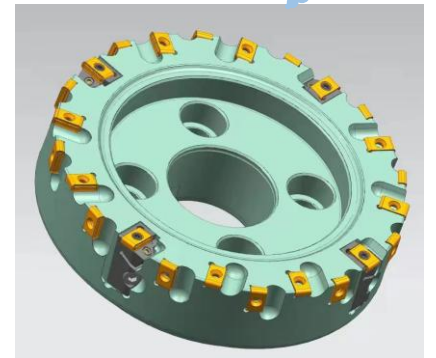
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Cutter features:

- 40° approach angle, matched with negative octagon G class inserts in 16 cutting edges, cost efficient;
- Wedge clamped main inserts, stable and convenient;
- Preloaded fine-tuning wiper clamping technology, small and convenient adjustment, the tolerance can be limited within $2\mu\text{m}$ ($7.874\text{e-}5''$);
- Blackened treatment for better cutter appearance and corrosion resistance;
- Standard diameter range: $\Phi 3$ - $\Phi 10$ inch, Special diameter range: $\Phi 12$ - $\Phi 20$ inch;
- Grade: AP151H, with high-hardness substrate and high wear-resistance coating.



Special design



Application:

Suitable for all cast iron milling, such as gray cast iron, nodular cast iron and CGI;

Used for finish milling engine cylinder block and cylinder head, pump housing, valve housing, and so on.

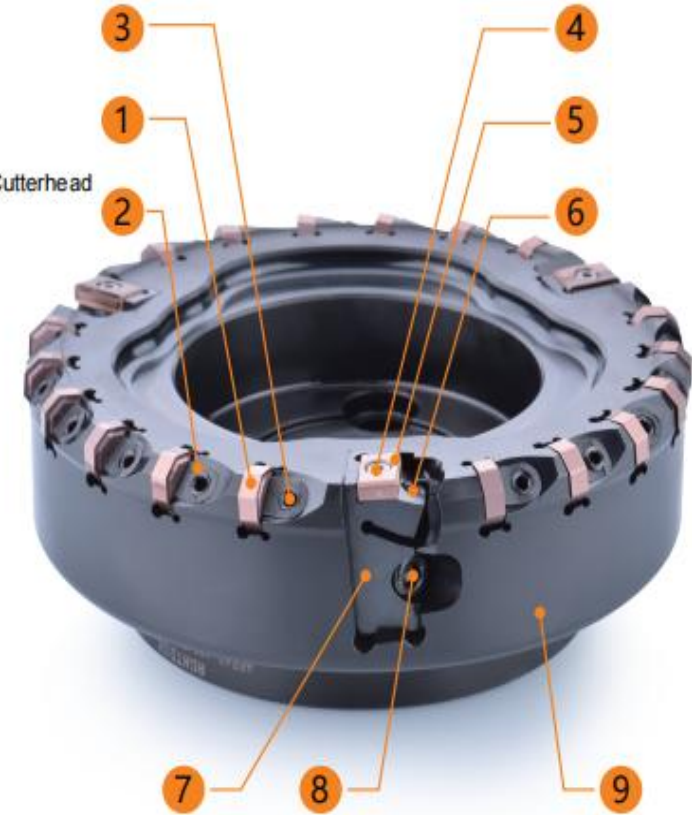
AFF40-LN12/15 cast iron finish milling series

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Cast iron finish milling cutter handling instructions:

1. Clean wiper cartridge (7), completely release adjusting screw (6);
2. Clean each insert pocket, cartridge pocket, clean inserts and cartridges;
3. Install roughing inserts (1), wiper cartridges (7) and use finger to push them to the locating surface and lock the screws;
4. Install wiper inserts (5);
5. Measure the axial run out of each roughing and wiper insert;
6. Adjusting wiper inserts height through adjusting screw (6);
7. Wiper inserts Max. run out should be higher than roughing inserts by 0.001- 0.002 inch.

1. Rough machining inserts(ON..05..)
2. Locking wedge
3. Double-headed wedge Locking bolts
4. Wiper inserts locking bolts
5. Wiper inserts (LN12/15)
6. Adjusting screw
7. wiper inserts Cutterhead
8. Locking bolt for wiper inserts Cutterhead
9. Cutter



02

High Feed Milling

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Profile Milling

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RD/RP round insert series

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RD^{HT}/RD^{MT}-MM3

Clearance angle

Screw hole

RD.. 0702MOE-MM3

15

2.8

RD.. 1003MOE-MM3

15

4.4

RD.. 12T3MOE-MM3

15

4.4

RD.. 1604MOE-MM3

15

5.5

RD.. 1606MOE-MM3

15

5.5



RD^{HW}/RD^{MW}/RP^{MW}-HR2

Clearance angle

Screw hole

RD.. 0702MOE-HR2

15

2.8

RD.. 1003MOE-HR2

15

4.4

RD.. 12T3MOE-HR2

15

4.4

RD.. 1604MOE-HR2

15

5.5

RD.. 1606MOE-HR2

15

5.5

RP.. 1003MOE-HR2

11

4.4

RP.. 10T3MOE-HR2

11

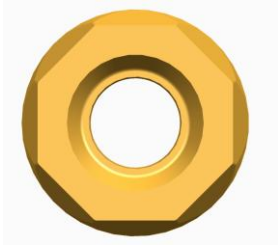
4.4

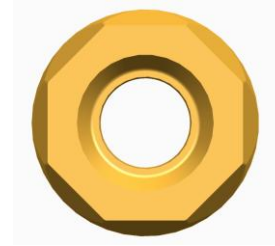


RD/RP round insert series

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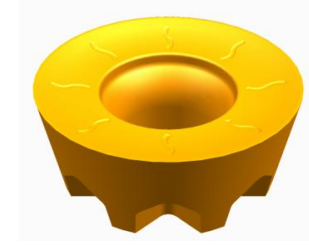
	Clearance Angle	Screw hole		
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RPMT 1204MOE	11	4.4		
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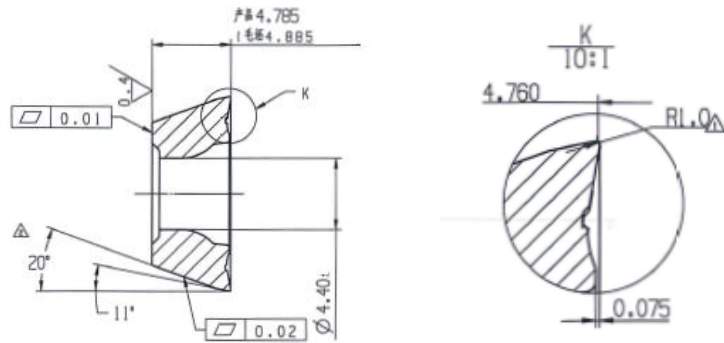


	Clearance Angle	Screw hole		
--	-----------------	------------	--	--

RPHT 1204M8E-MM3	11	4.4		
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RPMT 1204MOE-T1000



Clearance
Angle

11

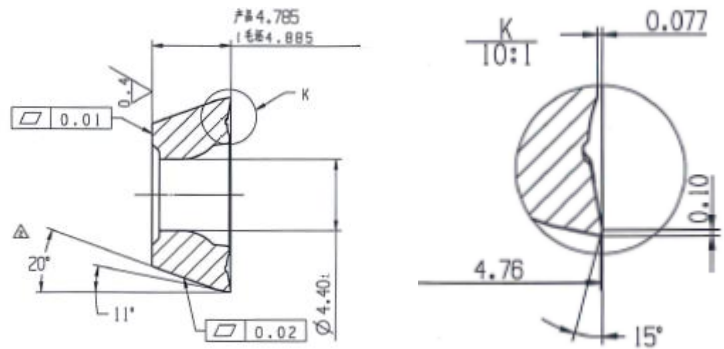
Screw hole

4.4

Anti-rotation design



RPMT 1204MOE-T1015



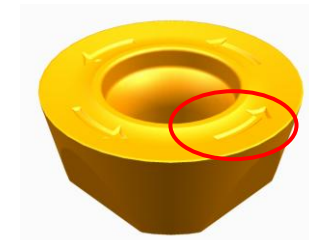
Clearance
Angle

11

Screw hole

4.4

Anti-rotation design



APM00-RO08/10/12/16/20 round insert series

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MM3



ROHT...MM3



MM4



ROMT...MM4

New



MR6



ROMT...MR6

APM00-RO08/10/12/16/20 round insert series

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ROHT-MM3 Clearance Angle Screw hole

ROHT 0803MOE-MM3	15	2.8
ROHT 10T3M8E-MM3	11	4.4
ROHT 1204M4E-MM3	11	4.4
ROHT 1204M6E-MM3	11	4.4
ROHT 1605M8E-MM3	11	5.5
ROHT 2006M8E-MM3	11	5.5



ROMT-MR6 Clearance Angle Screw hole

ROMT 10T3M4E-MR6	11	2.8
ROMT 1204M4E-MR6	11	4.4
ROMT 1605M4E-MR6	11	5.5
ROMT 2006M4E-MR6	11	5.5



APM00-RO08/10/12/16/20 round insert series

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APM00-RO08

Coupling type: Weldon shank (D16) Cylindrical shank (D25) Screw head (D20)

APM00-RO10

Coupling type: Cylindrical shank (D25-32) Screw head (D25-32) Arbor (D40-50)

APM00-RO12

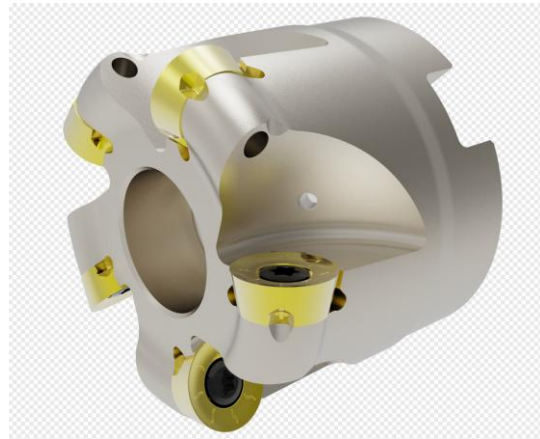
Coupling type: Cylindrical shank (D32) Screw head (D40) Arbor (D40-80)

APM00-RO16

Coupling type: Arbor (D63-100)

APM00-RO20

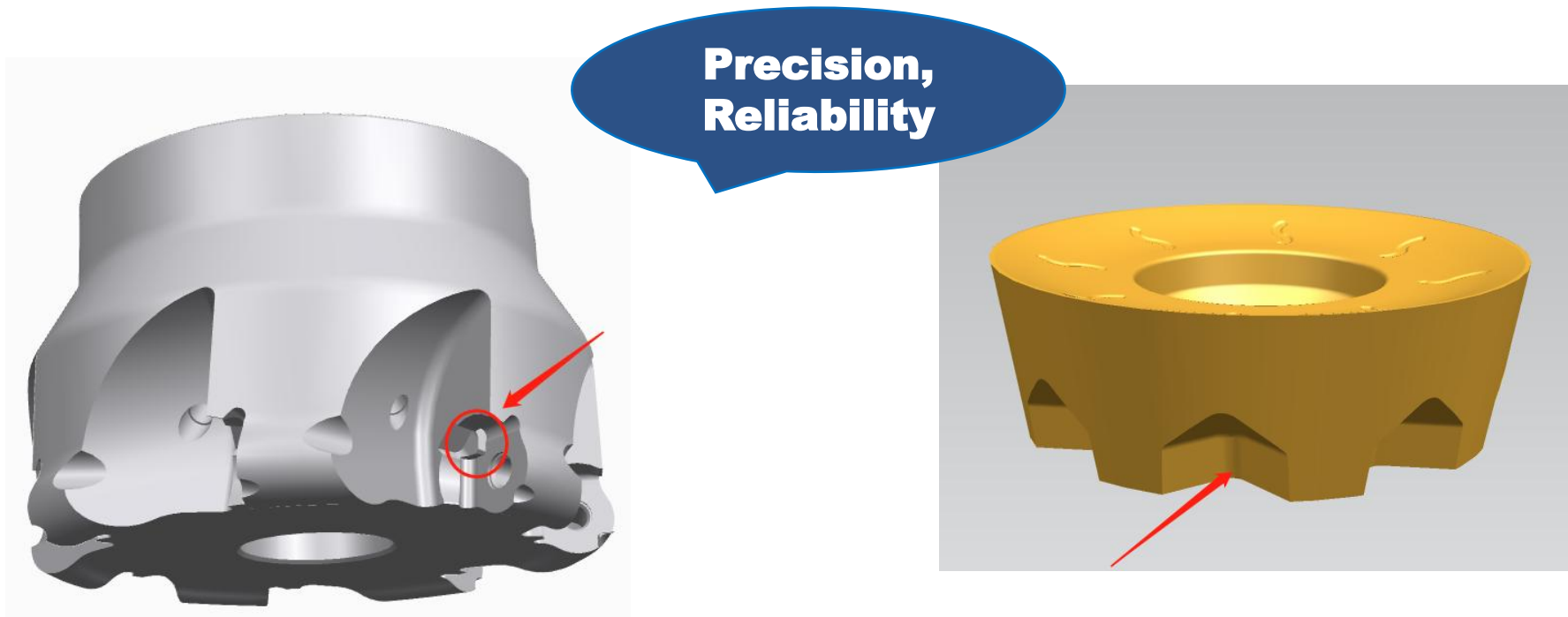
Coupling type: Arbor (D100-160)



Anti-Rotation design

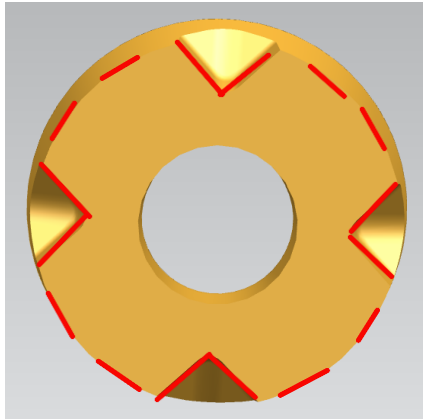
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- The Anti-Rotation design prevents the rotation of insert in the pocket, for reliability and precision during all kinds of applications.
- The same milling cutter can match with the insert in different index;
- The proper inserts can be chosen according to different cutting depth.

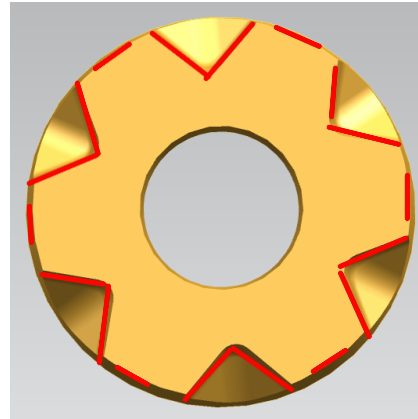


Transform times

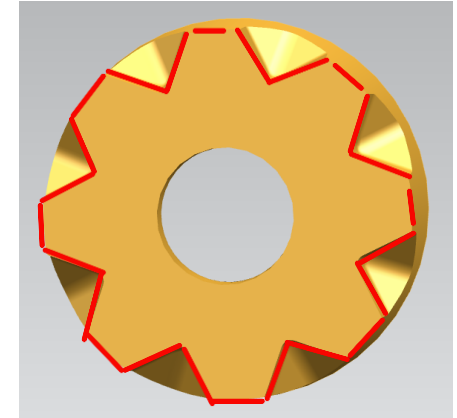
·ACHTECK·



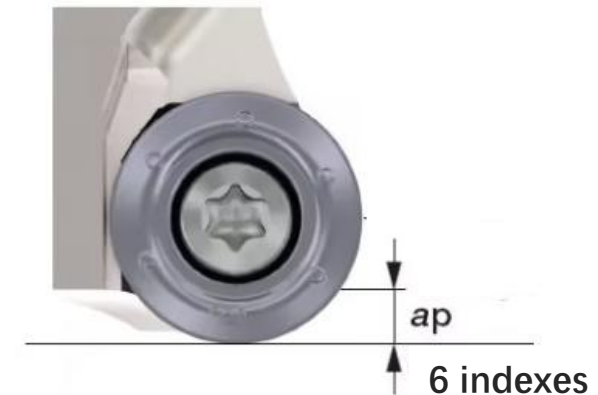
RO...M4E..
4 times



RO...M6E..
6 times



RO...M8E..
8 times



Max. cutting depth

04

Shoulder Milling

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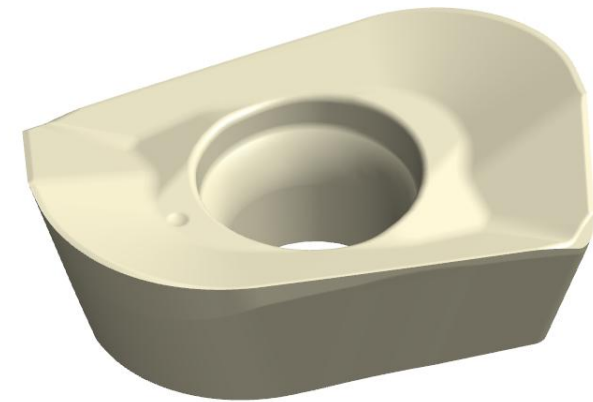


ASM90-AO12 Series



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- New positive shoulder milling tool with two spiral cutting edges
- Light and fast cutting with reinforced cutting edge
- Insert grades are suitable for machining various materials, especially heat-resistant alloy, Titanium alloy and stainless steel.



ASM90-AO12 insert features



·ACHTECK·

Wiper edge
Great surface finish

Strong geometry design
Tool performance improvement

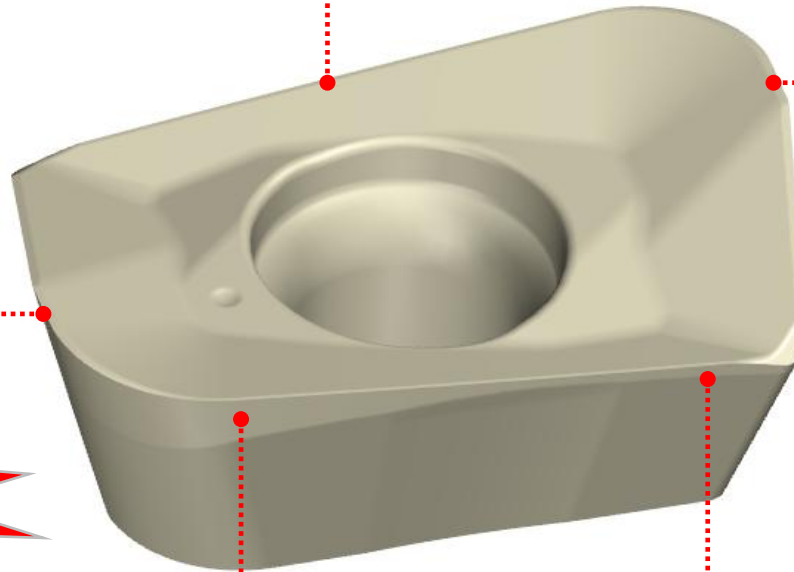
Strong cutting edge
Longer tool life

**Reduced
cutting force**

Cutter with inserts:
axial angle $+8^\circ$
radial angle -5.5°

Spiral edge design
Light cutting

Variable angle
Strong cutting edge



ASM90-AO12 insert features



·ACHTECK·



R0.8



R1.2



R1.6



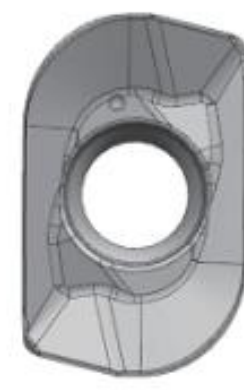
R2.0



R2.4



R3.1



R4.0

- Approach angle: 90° positive shoulder milling cutters
- Inserts with helical edge design for light cutting,
- Max. depth of cut: $a_{pmax}=0.433$ in
- Geometry: MM4
- Inserts with wiper design can get great surface finish
- Corner radius: R0.8/1.2/1.6/2.0/2.4/3.1/4.0.

ASM90-AO12 cutter features



·ACHTECK·

Four types of coupling can meet different needs



Screw head



Cylindrical shank



Weldon



Arbor

- Two pitch types: close and coarse pitch
- Screw head Diameter: $\varnothing 0.79-1.38\text{in}$
- Cylindrical shank Diameter: $\varnothing 0.79-1.25\text{in}$
- Weldon shank Diameter: $\varnothing 0.79-1.5\text{in}$
- Arbor diameter: $\varnothing 1.5-3\text{in}$

Chip breaker features

Geometry	Cutting edge shape	Application
MM4 General purpose		- Used for medium machining - First choice of general machining

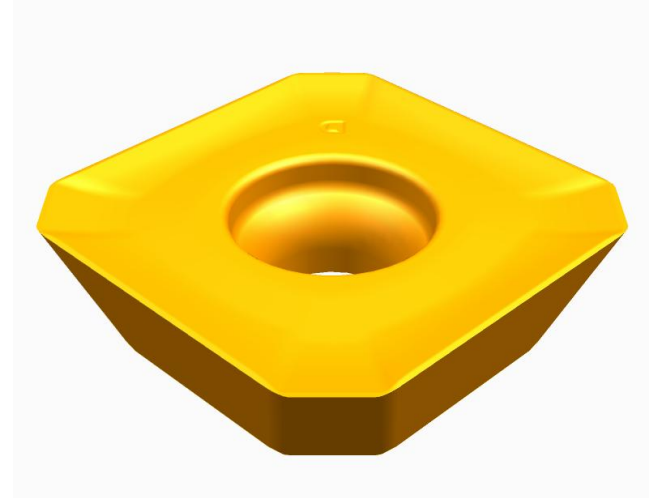
Grade application

Grade	Coating	ISO material group					
		P	M	K	N	S	H
AP251U	PVD	●	◐				
AP351M	PVD	◐	●			◐	
AP403M	PVD	◐	●			◐	
AP251K	PVD			●			
AP403S	PVD		●			●	

● Marked: 1st choice ◐ Marked: 2nd choice

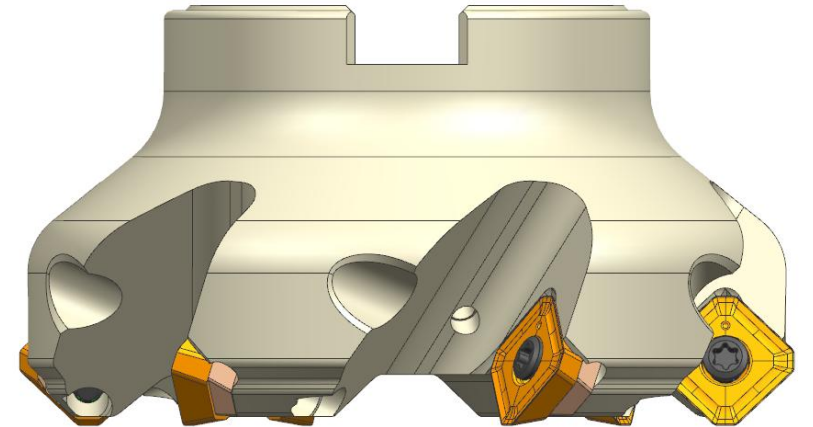
□ Insert

- Clearance angle: 20°, and 29° for wiper inserts
- Max cutting depth: $ap_{\max}=0.24\text{in}$
- Positive, 4 cutting edges, low cutting force and smooth cutting
- Wiper edge design for better surface finish
- Both pressed and ground insert options
- Geometries: MM3/MM4/MR6/FM2
- Grades: AP251U, AP351M, AP403M, AP403S, AC151K, AP251K, AP151H, AW100K, cermet



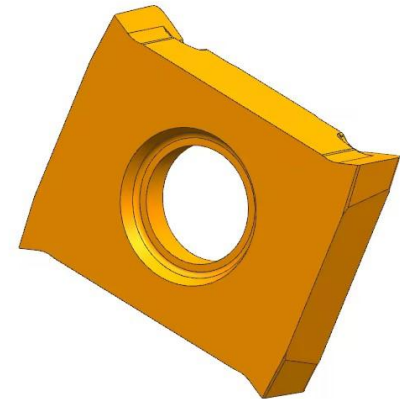
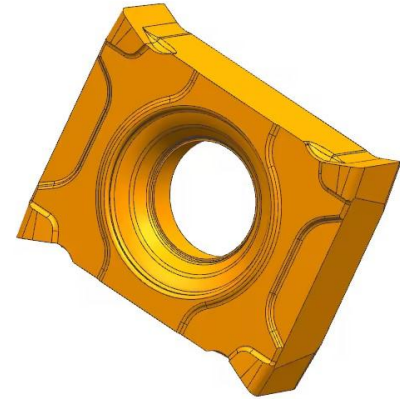
□ Cutter

- 45° approach angle
- With shim to protect the cutter, and better reliability
- Pitch options: close and coarse pitch
- Coupling:
 - Cylindrical: Ø1.25-2.5in
 - Waldon: Ø1.25-2.5in
 - Arbor: Ø2-10in



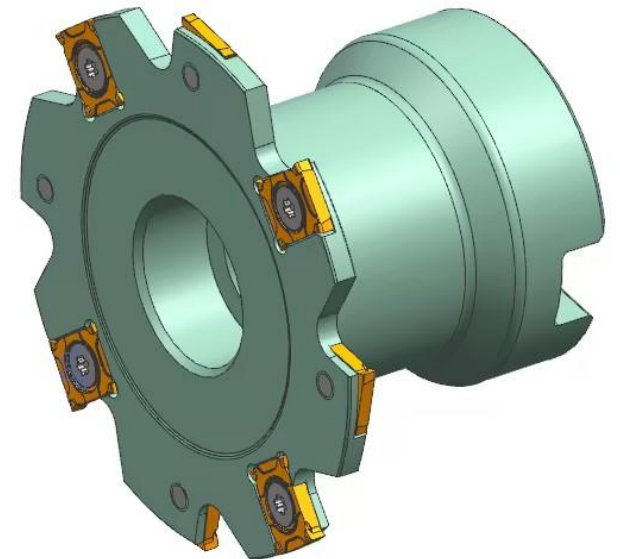
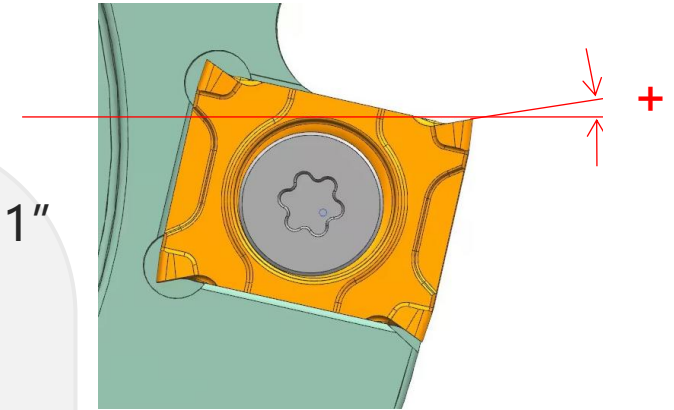
□ Insert

- Ground insert, double clearance angle design
- 4 cutting edges—2 right handed and 2 left handed
- Big screw hole for bigger screw with high clamping torque
- Countersink hole on the insert back side for longer screw clamping length
- Wiper design on the side edge for better surface finish
- General purpose geometry is suitable for most applications.
- Grades: AP351M, AP403M



□ Cutter

- Min. cutter thickness is 0.16" , Max. cutter thickness is 0.31"
- Insert pocket is reinforced for better cutter rigidity
- Positive radial angle for smooth cutting
- High strength pre-hardened cutter avoid cutter deformation
- Coupling types: screw head, arbor and cylindrical shank
- Suitable for most grooving and parting off applications

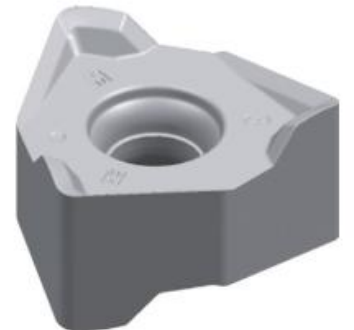


WNMU 08 insert features



·ACHTECK·

- Negative insert with 6 cutting edges, cost efficient.
- Corner radius: R0.8, 1.2, 1.6 for different applications.
- Different insert geometries, suitable for different applications.
- Coupling types: arbor, Cylindrical shank, and Weldon shank.
- Various pitches: coarse, close and extra-close pitch for wide applications.



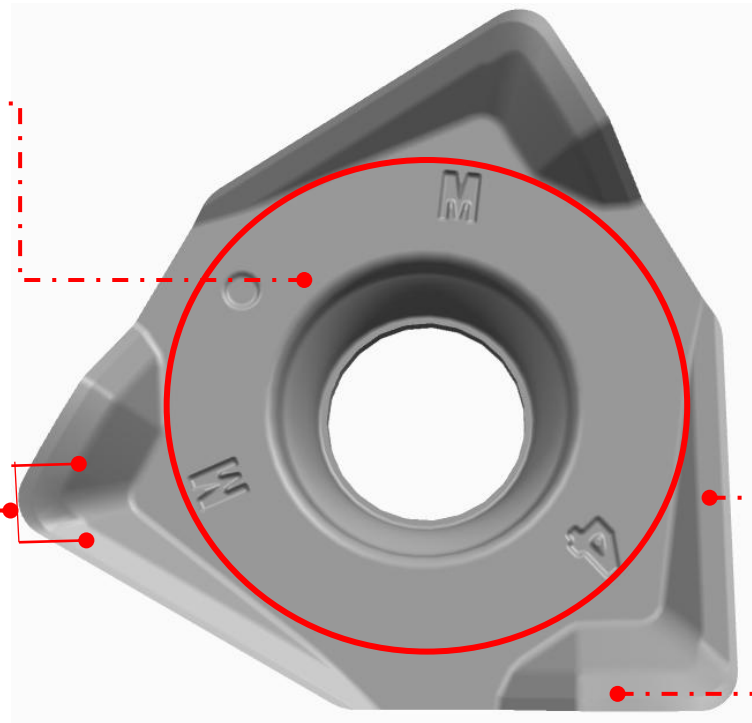
WNMU 08 insert features



·ACHTECK·

Large locating surface improves stability

Large rake angle reduces cutting force



Chip breaker with large rake angle
Smooth chip breaking

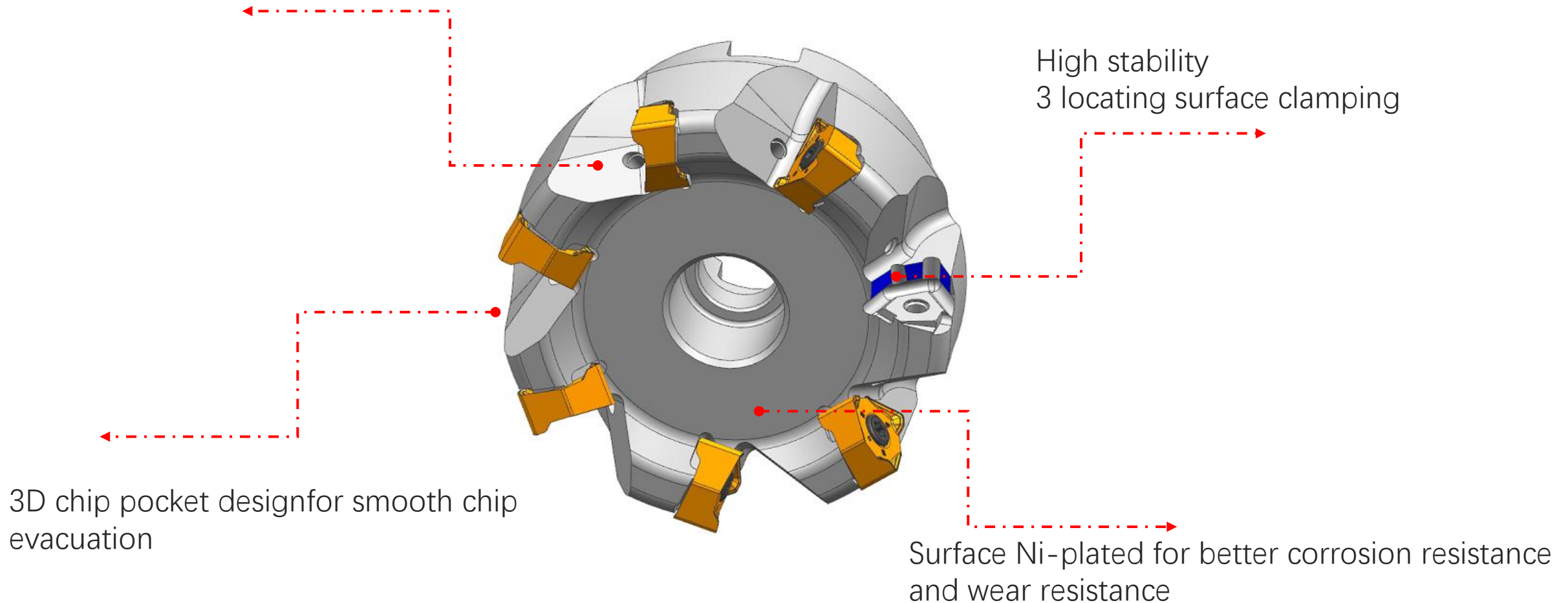
Wiper design improves surface finish

ASM90-WN08-N cutter features



·ACHTECK·

Precise internal cooling towards cutting edge for longer tool life.

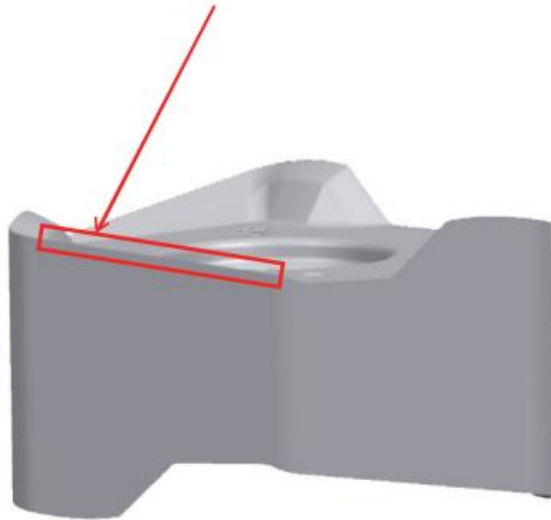


WNMU 08 insert features



·ACHTECK·

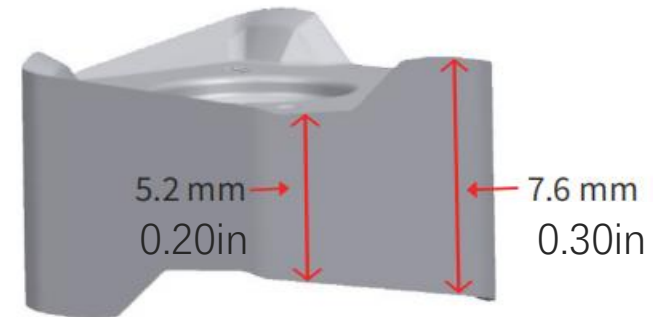
Positive axial angle provides light cutting and good chip evacuation.



The thickest: 7.6 mm; The thinnest: 5.2 mm

0.30in

0.20in



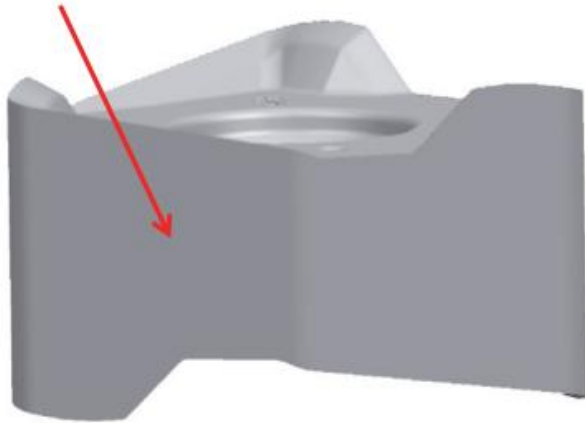
Strong insert design

WNMU08 compared to WNGU



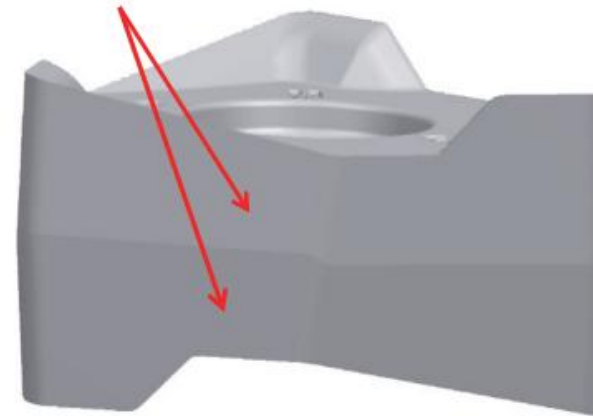
·ACHTECK·

Single flank surface



New product: WNM(G)U 0806..insert

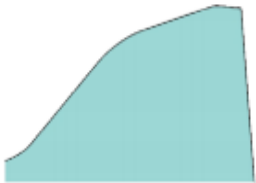
Double flank surface



Old product: WNGU 0806..insert

• WNMU 08 geometry introduction



Chip breaker	Cutting edge shape	Application
MR2 Strong type		• Suitable for poor machining conditions • High cutting edge reliability • High feeding speed
MM4 General type		• Suitable for medium machining conditions • Good geometry choice for general machining
MM3 Easy cutting type		• Suitable for good machining conditon and finishing • Low cutting force(used in low power machine)

ASM90-WN08 cutter features

·ACHTECK·

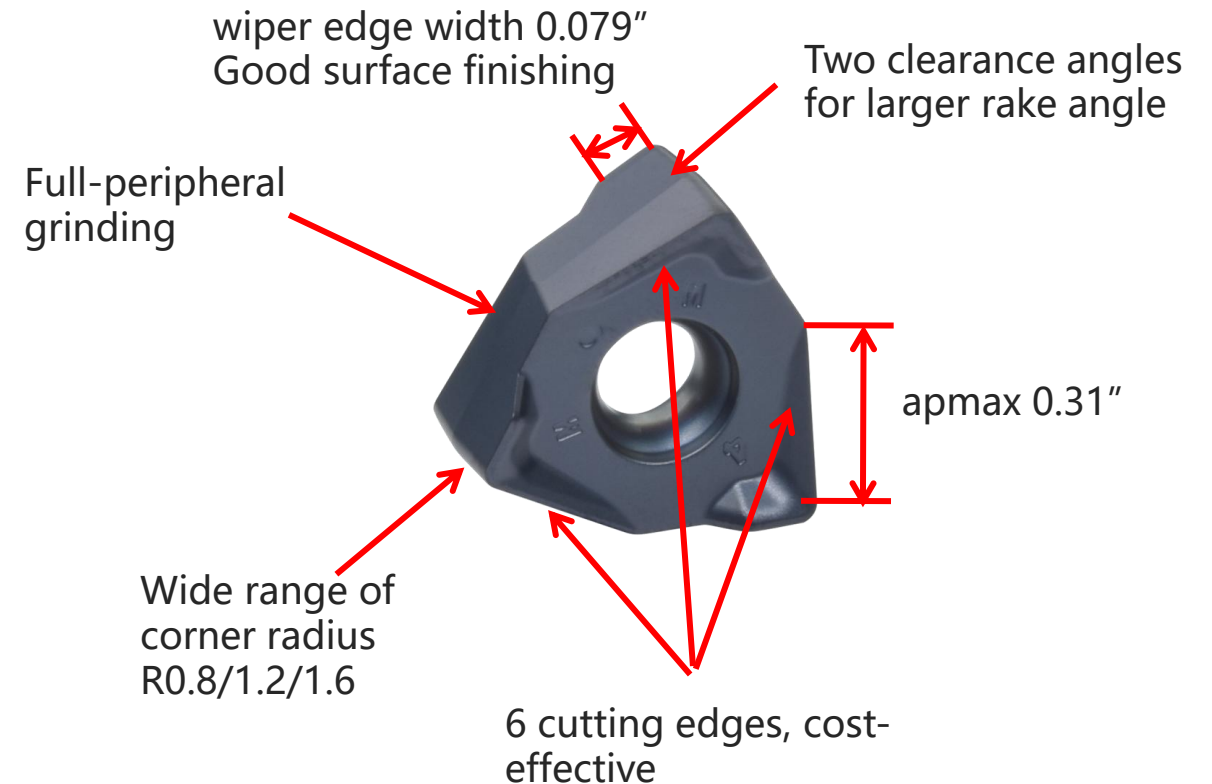
- Approach angle (Kr) : 90 °
- Tool Diameter (Dc) :
WN08..: Ø1.25-10in
- Max. cutting depth (ap max.) :
apmax=0.28
- Three pitches
 - Coarse pitch, slot milling, shoulder milling
 - Close pitch, shoulder milling
 - Extra close pitch, short chip material and small ap machining
- Coupling Type
 - Arbor
 - Cylindrical
 - Weldon
 - Screw head
- Internal coolant for cutter body up to Ø5" (incl.) diameter
- Insert Screws WN08..SP040090 (Torx Plus 15)
- Ni-plated cutter surface



ASM90-WN08 insert features

·ACHTECK·

- Negative inserts with 6 cutting edges
 - Cost efficient
 - Strong Geometries with thickness 0.31in;
- Four geometries with short wiper: FM2, MM3, MM4, MR2, wide range of applications. Great surface finish;
- Two types of long wiper inserts
 - For finish milling with high efficiency;
 - Suitable for workpieces with different rigidity;
- Insert corner radius
 - R0.8/1.2/1.6



• Chip breaker Features

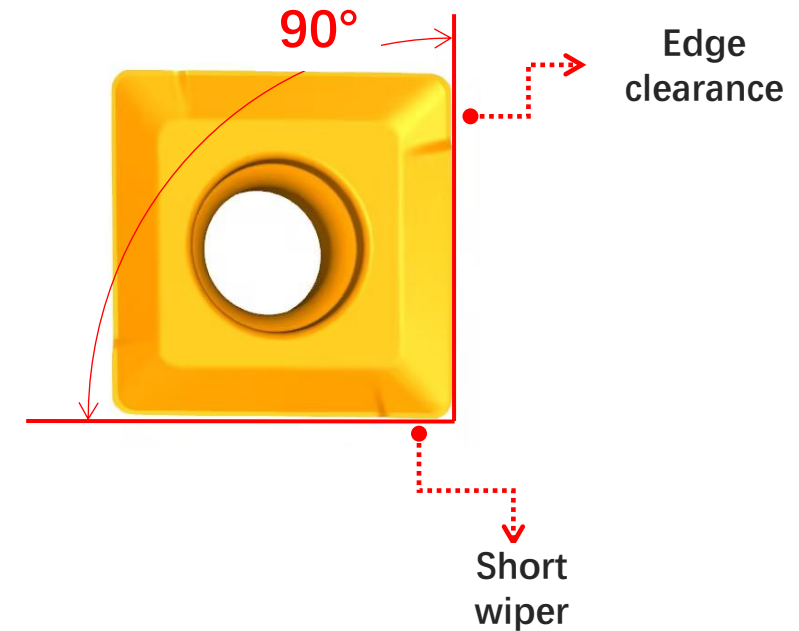
Chip breaker name	Edge Preparation	Feature
MR2 Stable type		• Suitable for unstable cutting conditions • Best cutting edge stability; • High feedrate.
MM4 General type		• First choice • Medium cutting conditions • General machining
MM3 Sharp type		• Fine cutting conditions and finish operation; • Low cutting force (used for small power machine)

ASM90-SO12 square shoulder milling cutter

·ACHTECK·

□ Insert

- Positive, 4 edges, low cutting force
- Double clearance angle design: 11° for the 1st clearance angle, 15° for the 2nd.
- Short wiper edge design for better surface quality
- Pressed insert for cost effective
- Geometry: MM4
- Grades: AP251U, AP351M, AP403M, AP403S, AC151K, AP251K

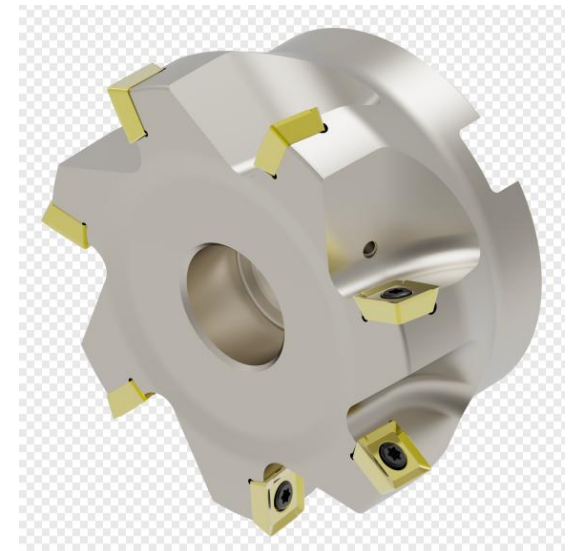
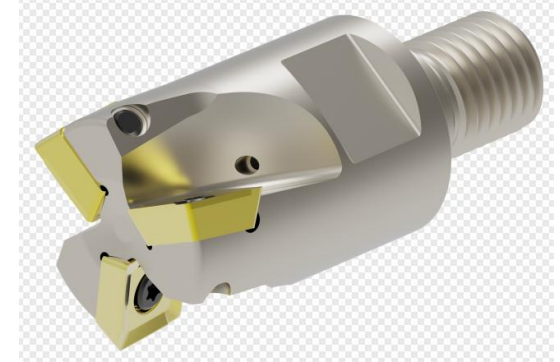


ASM90-SO12 square shoulder milling cutter

·ACHTECK·

□ Cutter

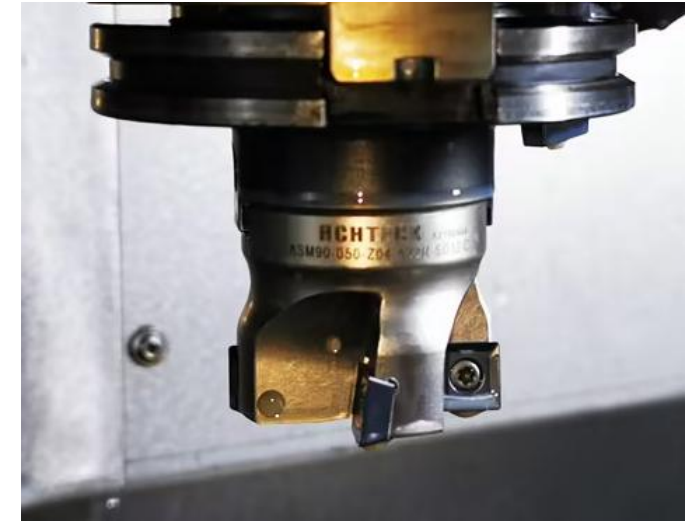
- Accurate 90° approach angle
- Max cutting depth: $ap_{\max}=0.35''$
- Coupling: cylindrical, Waldon and arbor
- Diameter range:
Cylindrical: Ø1.25-2in
Weldon: Ø1.25-1.5in
Arbor: Ø2-10in
- Internal coolant for cutter body up to Ø5" (incl.) diameter
- Can be used in face milling, square shoulder milling, slot milling and plunge milling



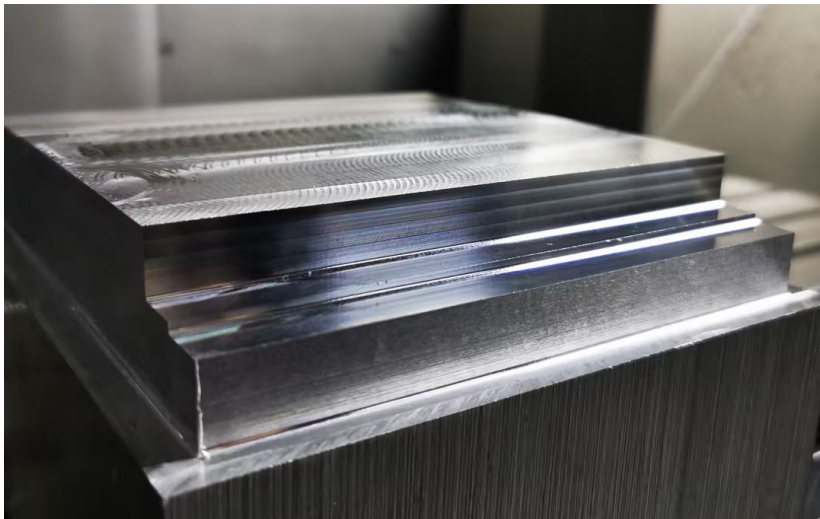
Lab test

□ Test

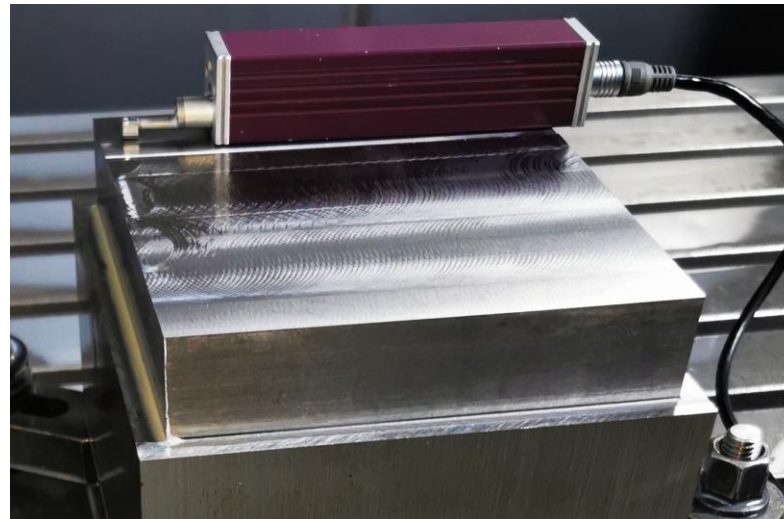
·ACHTECK·



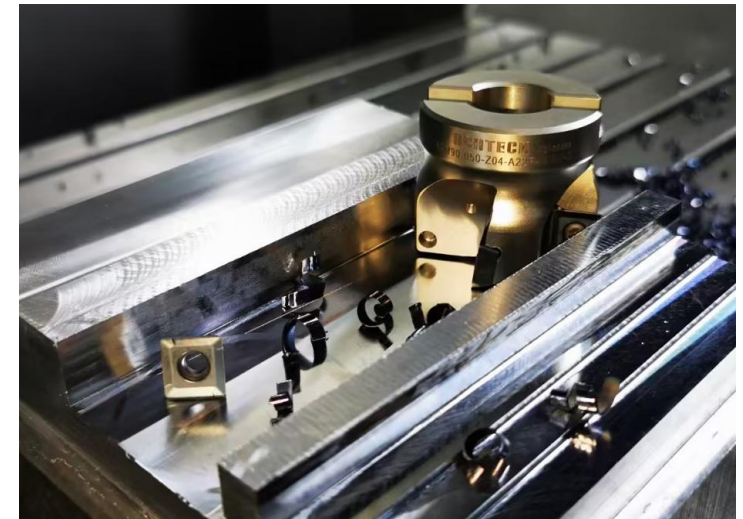
Side edge milling result



Face milling result



Slot milling result



Success story

·ACHTECK·

Workpiece: Structure part

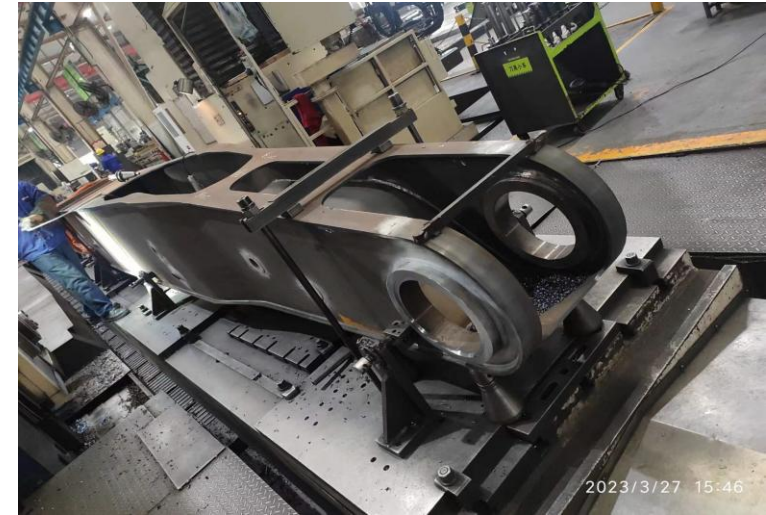
Material: High strength steel

Cutter: ASM90-100-Z07-A32R-SO12-C

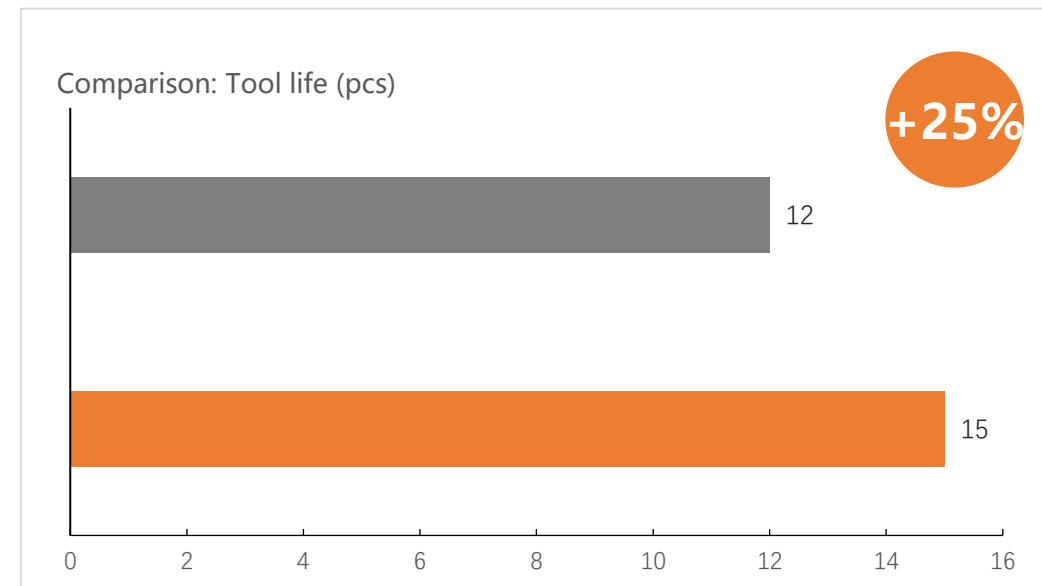
Insert: SOMT 120408PDER-MM4

Grade: AP351M

Application: Face milling

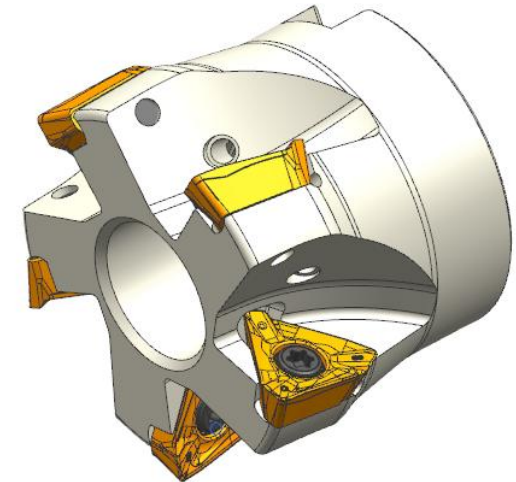
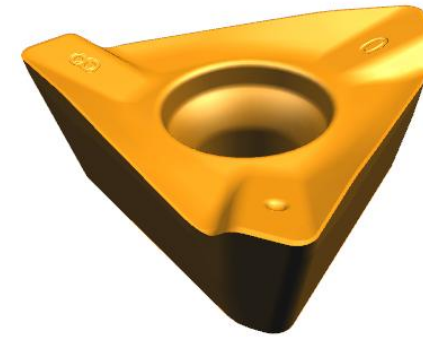


Cutting data:	Competitor	Achteck
Vc [m/min]	515	515
fz [in]	0.001	0.001
ap [in]	0.20	0.20
Coolant	Dry	Dry
Tool life (pcs)	12	15



Insert Features:

- Positive milling insert
- Three cutting edges, cost efficient
- Positive rake angle and helix angle design, light cutting.
- Insert with short wiper edge
- Available with M and H class insert options





- **Insert Type**

- Radius range: R0.8, R1.2, R1.6, R2.0, R2.4, R3.1, R4.0
- Geometry: MM4, MM3, FM2
- Grade: AP301U, AP351M, AP403M, AC301K, AP351K

ASM90-TD15 cutter features

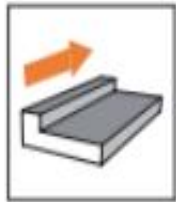
·ACHTECK·



ASM90-TD15 cutter features

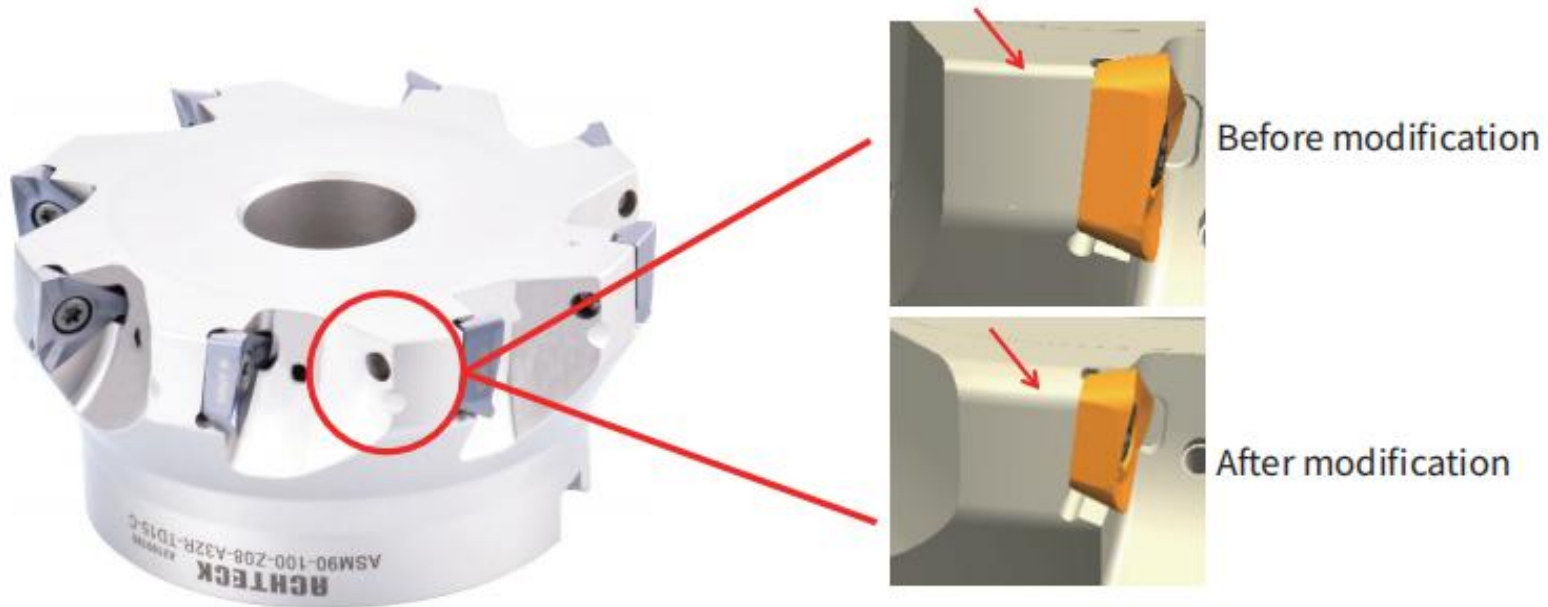
·ACHTECK·

- Application range: Can be used for shoulder milling, face milling, slot milling, ramping, helical interpolate milling;
- Good Universality: Can be used for steel, cast iron, stainless steel roughing and semi-finishing milling;
- Two kinds of coupling:
Cylindrical shank: $\phi 32-40\text{mm}$
Shell mill(Arbor): $\phi 40-200\text{mm}$



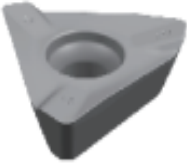
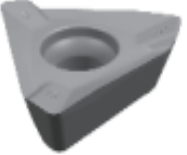
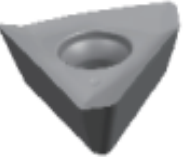
- **ASM90-TD15 Cutter introduction**

When big corner radius inserts are used, the tool body needs to be modified



TDMT 150531R-MM4	Modify the tool body corner radius to R2.0
TDMT 150540R-MM4	Modify the tool body corner radius to R4.0

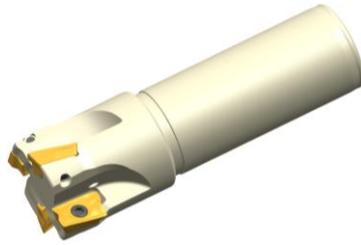
• Geometry introduction

Insert	Geometry	Cutting edge	Application Range
	MM4		· For medium cutting conditions · 1st choice for general machining
	MM3		· For good cutting conditions, finishing · Low cutting force, can be used for low-power machines
	FM2		· Sharp geometry · Low cutting force · Used for aluminum machining

ASM90-AP10/17 Series

·ACHTECK·

- ASM90-AP10 Tool Diameter: Ø0.63- Ø2.5in
- ASM90-AP17 Tool Diameter: Ø1- Ø4in
- ASM90-AP10 Max. depth of cut: 0.31in
- ASM90-AP17 Max. depth of cut: 0.63in
- Helical cutting edge design, sharp Geometries, light cutting, suitable for machining under weak rigidity and can achieve good surface finish on the side face.
- Coupling Types: Cylindrical shank, Screw head, Arbor
- APKT 10 series can be compatible with Iscar.
- APKT 17 series can be compatible with TaeguTec.



ASM90-AP10/17 Geometries and grades

·ACHTECK·

Geometry	Cutting edge types	Range of application
IT		Sharp type • Low cutting force with sharp Geometry • For medium and finishing machining conditions
DT		Universal use type Geometry • Strong cutting edge, good impact resistance • mainly used for medium and rough machining conditions

• Range of Grades application

Grades	Coating	Materials					
		P	M	K	S	N	H
AP401U	PVD	●	●				
AP403S	PVD		●		●		
AP351U	PVD	●	●				
AP301U	PVD	●	●				

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

ASM90-LN cutter features

·ACHTECK·

- Approach angle (Kr) : 90°
- Tool diameter (Dc) :
LN09..: Ø0.79-3in
LN13..: Ø1.5-6in
LN16..: Ø2.5-6in
- Max. depth of cut (ap max.) :
LN09..: 0.31in
LN13..: 0.47in
LN16..: 0.59in
- Coarse, standard and close pitch are available.
- Coupling types: Weldon shank, cylindrical shank and Arbor.
- Internal coolant for cutter body up to Ø5" (incl.) diameter
- Inserts screws: LN09.. (Torx Plus 09) , LN13.LN16. (Torx Plus 15 20)
- Nickel-plated surface

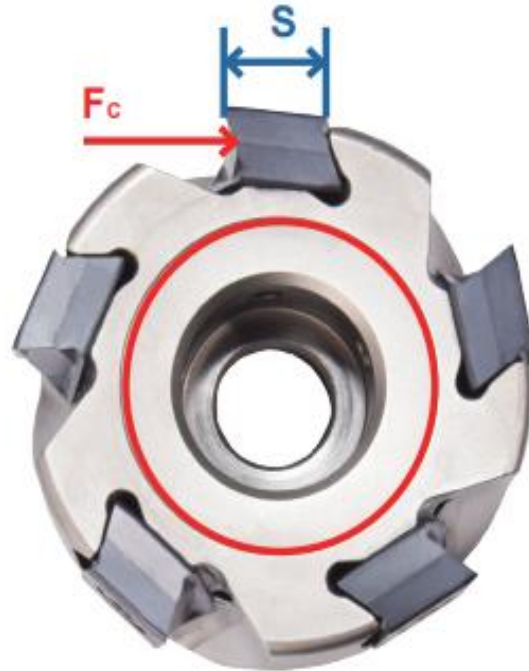


ASM90-LN cutter features

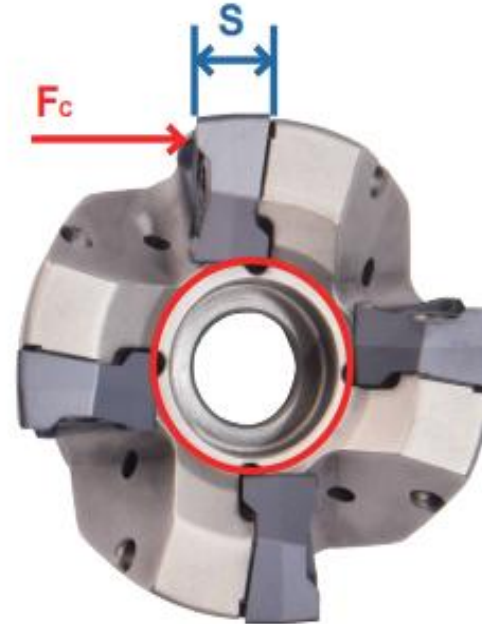
·ACHTECK·

- Positive rake angle inserts
 - Light cutting
- 4 cutting edges
 - Cost-effective;
 - Strong cutting edge for reliable machining;
- Universal Geometry MR2 with short wiper edge
 - Wide range of applications
 - Good surface finish
- Two types of long wiper edge inserts
 - Finish milling for higher machining efficiency;
 - Suitable for workpieces with different rigidity;
- Insert corner radius
 - R0.8/1.2/1.6/2.0/2.4/3.1





Tangential inserts



Radial inserts

- Advantages for Tangential allocation cutters:
 - Tool body core area was greatly increased and the rigidity of the cutter body is strengthened;
 - large inser thickness on cuting force direction , can resist greater cutting force and achieve higher feed;

• Geometry features

Geometry	Cutting edge shapes	Working conditions
MR2		• used stable cutting conditions • Suitable for medium, cutting and roughing operation

Geometry	Cutting edge shapes	Working conditions
MM3		• Easy-to-cut type • Used on weak cutting conditions Suitable for semi-finishing and medium roughing

Geometry	Cutting edge shapes	Working conditions
FM2		• Sharp type • Specially designed for aluminum materials machining • Low cutting force and sharp cutting edge

APE90-LN09/13 Denomination

·ACHTECK·

A₁ PE₂ 90₃ - 063₄ - Z04₅ - A₆ 27₇ R₈ - LN13₉ - L56₁₀ - F₁₁ - C₁₂

1-Achteck

2-Machining type

PE	Porcupine milling
SM	Square shoulder milling
PM	Profile milling
HM	High feed milling
DM	Side and face milling

3-Approch angle (Kr)

Figure	Angle
90	90°
88	88°
60	60°
45	45°

4-Cutter dia.

025	25mm
063	63mm
080	80mm
.	.
250	250mm

5-Number of teeth

Z02	2 teeth
Z04	4 teeth
Z05	5 teeth
.	.
Z30	30 teeth

6-Connection

A	Arbor
W	Weldon shank
C	Cylinder shank
N	Whistle noich shank
M	Screw modular

7-Connection size

27	Connection diameter 27mm
----	--------------------------

8-Hand of tool

R	Right
L	Left
N	Neutral

9-Insert

LN13	LN13 series insert
------	--------------------

10-Valid cutting edge length Max

L30	30mm
L45	45mm
L56	56mm

11-Cutter type

F	Full teeth
H	Half teeth

12-Other

-C	With internal coolant
No mark	Without internal coolant

APE90-LN09/13 Porcupine Milling Cutter

·ACHTECK·

➤ Tool diameter (Dc) :

LN..09..: Ø1- Ø2n

LN..13..: Ø1.5- Ø3in

➤ Cutting depth (ap) :

LN..09..: 0.94-1.89in

LN..13..: 1.34-2.20in

➤ Full-tooth design with precise internal coolant towards each insert cutting edge

➤ Insert mounting:

APE90-LN09..Cutter body:

- End edge mounted insert covers R0.4 or R0.8;

- Side edge mounted insert covers R0.4;

APE90-LN13..Cutter body:

- End edge mounted insert covers $\leq R2.4$;

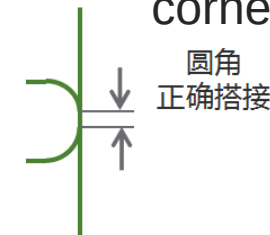
- Side edge mounted insert covers R0.8;

➤ Internal coolant applies to all cutters

➤ Coupling Type: Screw head, Cylindrical shank, Arbor

➤ Ni-plated cutter surface

Correct overlapping of
corner radius



Wrong overlapping of
corner radius

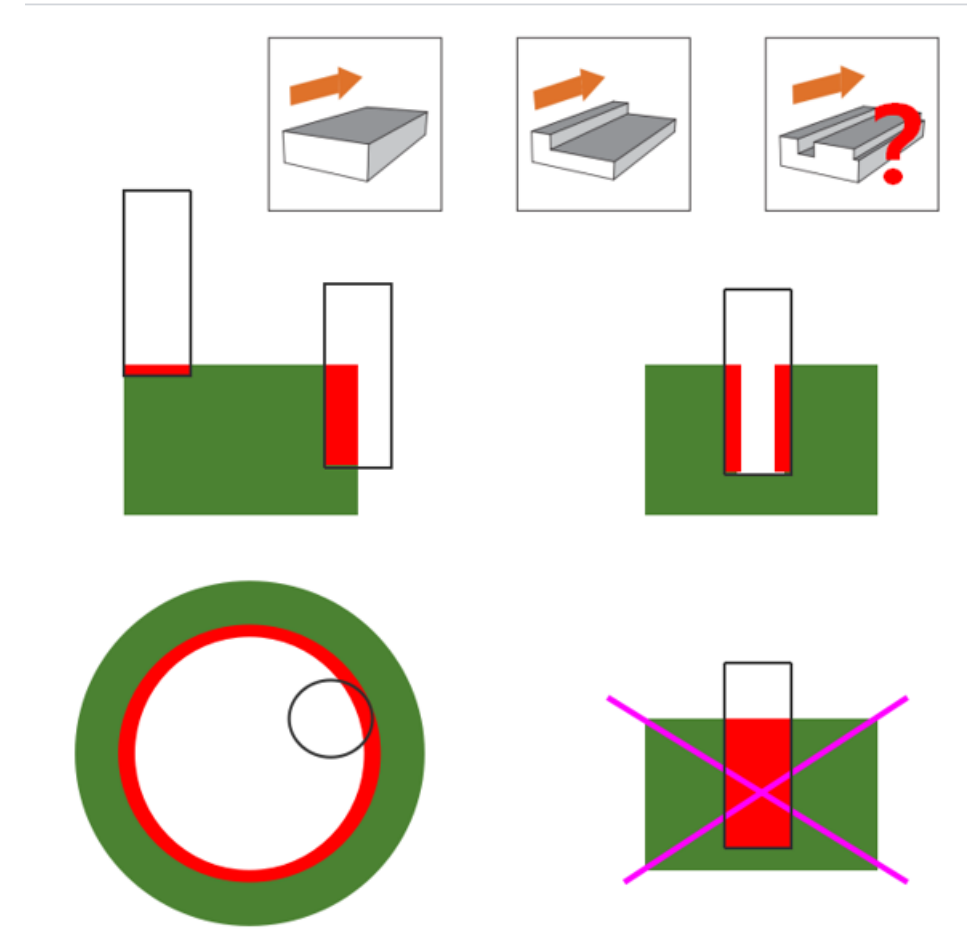


Side cutting edges for large cutting depth and small cutting width.

For large cutting width and small cutting depth on the end edges.

For slot milling and helical interpolation.

Not recommended for long chip materials, full cutting width, large cutting depth and full slot milling.

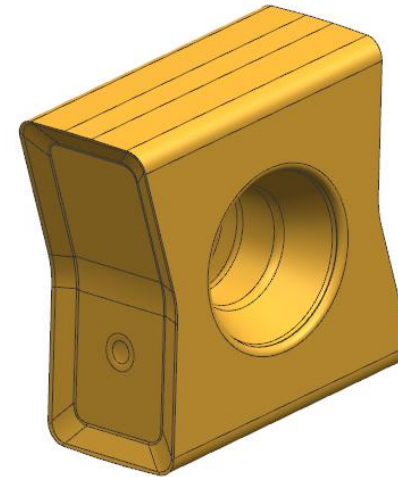


ASM90-LNET12 Butterfly milling insert

·ACHTECK·

Insert features:

- Negative vertical insert
- 8 cutting edges including left-handed and right-handed cutting edges
- Cutting edge with short wiper design
- E class ground insert
- MM4 Geometry
- Grades: AP251U, AP403M, AP251K, AC151K

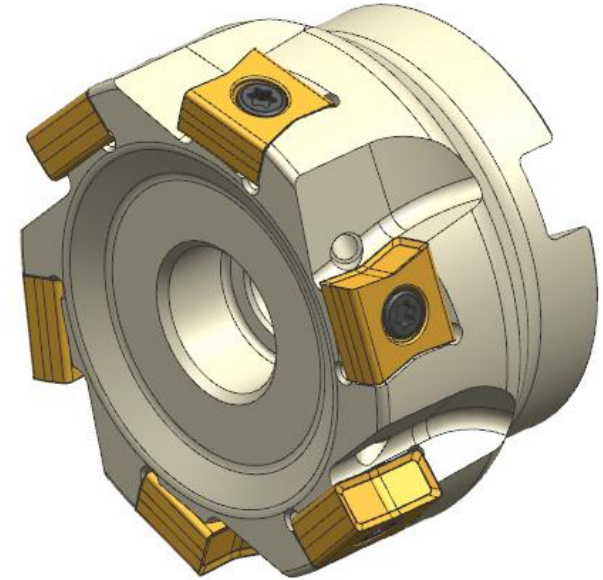


ASM90-LNET12 Butterfly milling cutter

·ACHTECK·

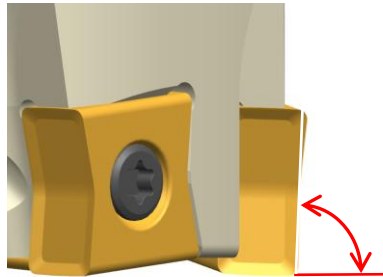
Cutter features:

- Tool diameter range (Dc): Ø2.5- Ø10in (left-handed and right-handed milling cutter)
- Close pitch and coarse pitch
- 8 cutting edges including left-handed and right-handed cutting edges
- Suitable for cast iron, steel and stainless-steel medium roughing, semi-finishing and finish milling
- Coupling type: Arbor
- Right-handed milling cutters are kept in stock, left-handed milling cutter will be produced according to orders

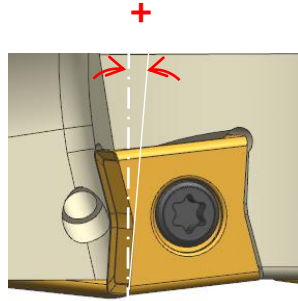


ASM90-LNET12 Butterfly milling cutter

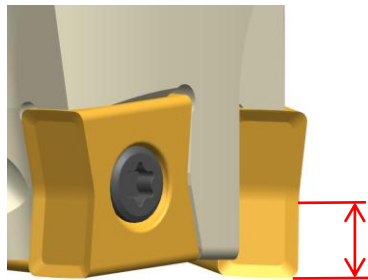
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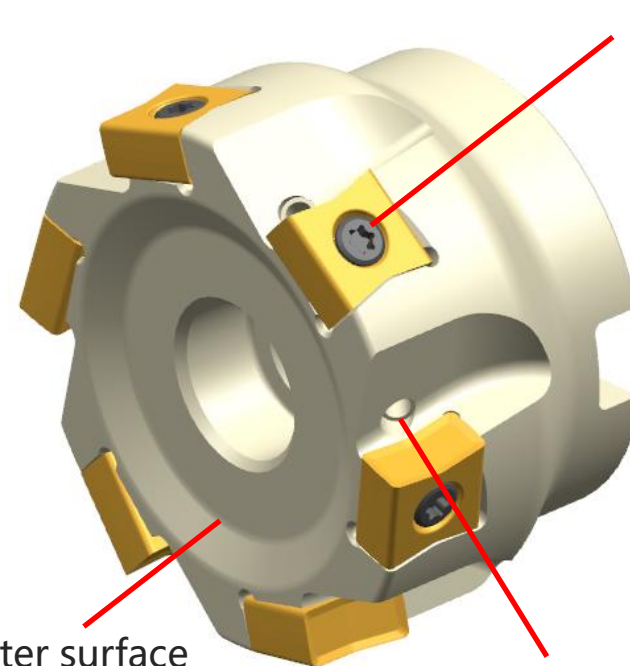
Approach angle: 89°



Positive rake angle milling



Max. DOC (a_{pmax}) : 0.20in



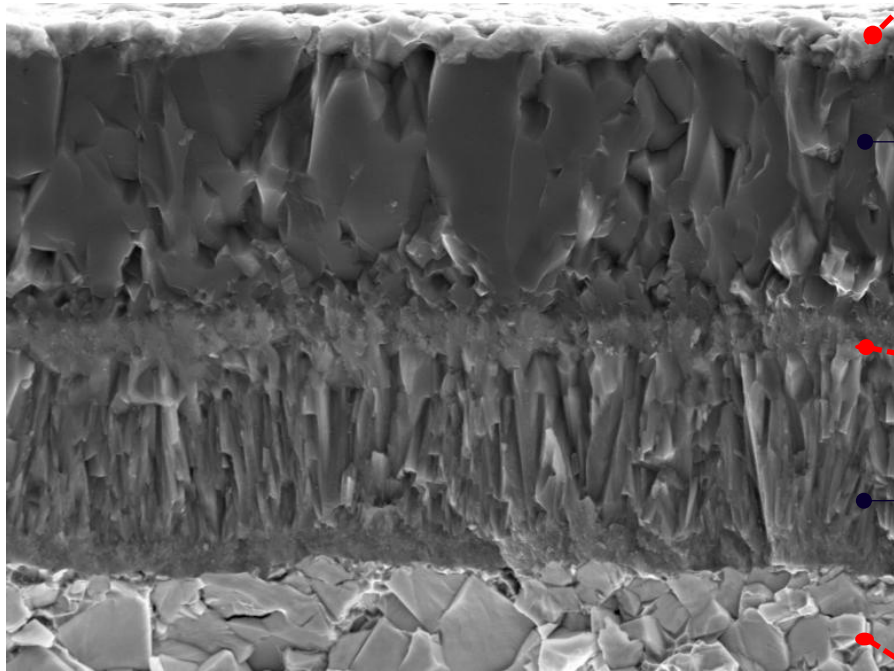
Screw:
TorxPlus15

Ni-plated cutter surface

With internal coolant

CVD coating

Bi-colored insert: black rake surface and gold relief surface



Special treatment after coating for smooth coating surface

Dramatically reduced built-up edge and edge breakage

$\alpha\text{-Al}_2\text{O}_3$

Gradient transition layer enhanced coating adhesion

Improved coating adhesion for less coating peeling

M-TiCN

New substrate

Balanced wear resistance and toughness for better tool life

Success story

·ACHTECK·

Workpiece: Welded structure part

Material: St60-2

Cutter: ASM90-063-Z06-A22R-LN13-C

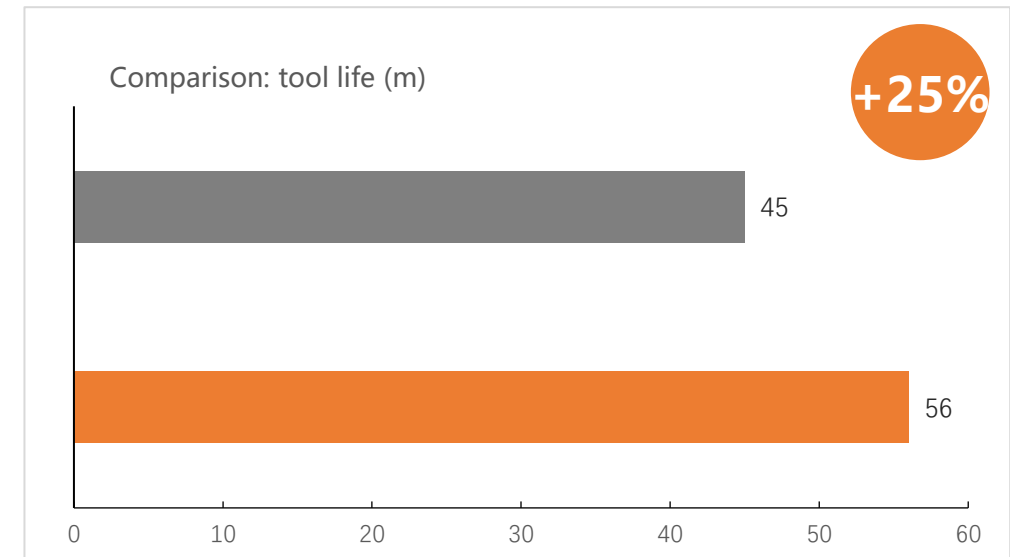
Insert: LNHU 130608ER-MR2

Grade: AC251P

Application: rough milling



Cutting data:	AC301P	AC251P
Vc [ft/min]	984	984
fz [in]	0.01	0.01
ap [in]	0.10	0.10
Coolant	Emulsion	Emulsion
Tool life (ft)	148	148

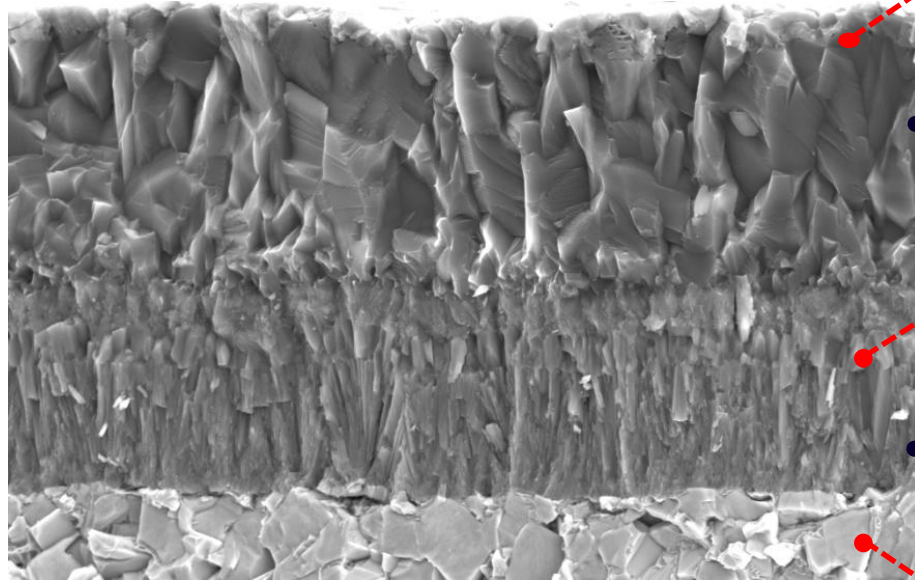


AC151K – high speed cast iron milling grade

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CVD coating

Bi-colored insert: black rake surface and gold relief surface



Special surface treatment after coating

Effectively reduced tensile residual stress in the coating

α -Al₂O₃

Nano structured coating for better wear resistance

Fine and uniform crystal for better wear resistance

M-TiCN

Better wear resistant substrate

Higher hot hardness and better wear resistance

Success story

·ACHTECK·

Workpiece: exhaust manifold

Material: GGG50

Cutter: AFM45-125-Z08-A40R-XN07-C

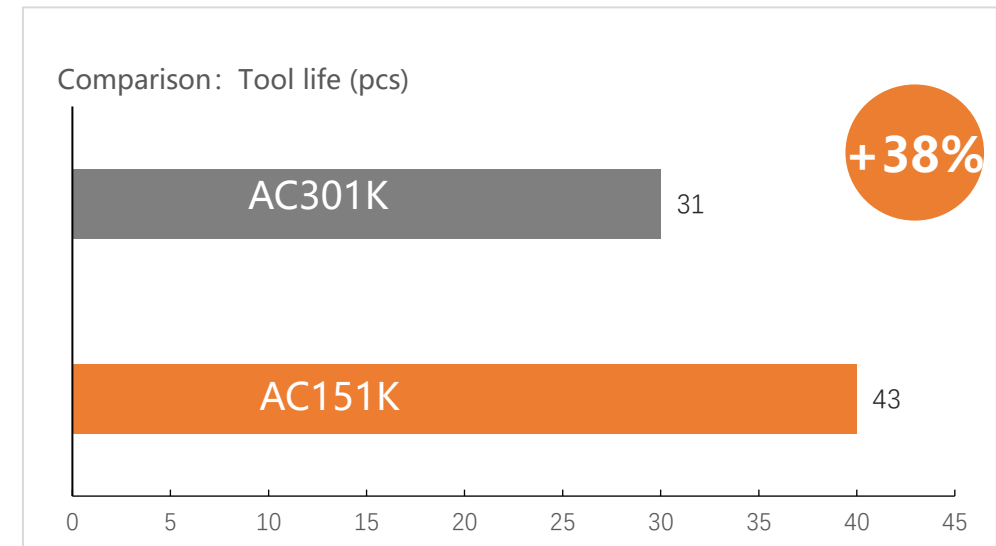
Insert: XNMU 070508-MM4

Grade: AC151K

Application: rough face milling



Cutting data:	AC301K	AC151K
Vc [ft/min]	918	918
fz [in]	0.01	0.01
ap [in]	0.10	0.10
Coolant	Emulsion	Emulsion
Tool life (pcs)	31	43



Special Tools

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Application:

Engineering machinery part, finish bore with long overall length. The customer uses the tool with 12.60in length, 1.97in diameter, with low RPM and feed rate at $n=300$, $F=0.79$ to do this application with very low productivity.

Improvement solution:

Machine tool: Double spindle boring/milling machine tool

Material: St60-2

Tool: DFB-041-074-BBT50-L280

RPM: $n=950$ rev/min, $F=5.67$ in/min

Finish boring cutting depth: 0.01in

Internal coolant

Insert: TCMT 110204E-PB1 AC250P

Result:

1. Tool life is 5 pcs and surface finish is Ra2.4
2. Machining time has reduced from 450 seconds to 62 seconds



Special tool

·ACHTECK·

Workpiece: **Injection molding machine part**

Workpiece: **GG25**

Application: **Finish boring**

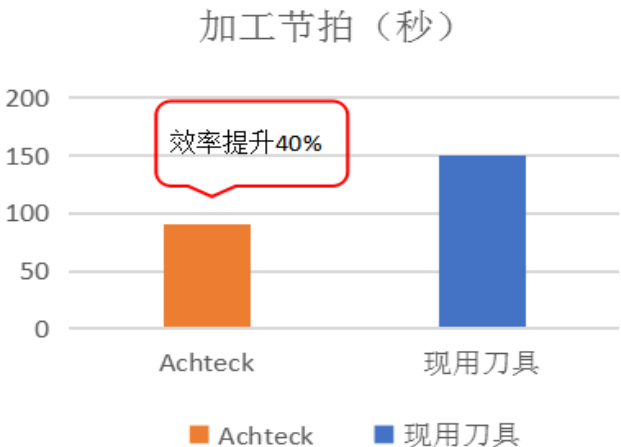
Machine **Mazak horizontal machining center**
Tool:

Coupling: **BT50**



Cutting data:

	Achteck TCMT 110204E-KC2 AC202K	Current tool Without anti-vibration
v_c [m/min] :	515	154
n [rev/min] :	1000	300
Z [Teeth] :	1	1
f_n [in/rev] :	0.004	0.008
OAL [in] :	18.70(including inference length)	18.70(including inference length)
ap [in] :	0.008	0.008



Special tool

·ACHTECK·

Milling top surface of engine block

Cutter: Special (D500, **Z48**)
Coupling: Arbor 60 (standard coupling)
Insert: LNKX15061.5X45PN-N IC910

Cutting data:

- $V_c = 590$ ft/min
- $n = 115$ rpm
- $F = 21.65$ in/min
- $f_z = 0.004$ in

Tool life: **160** pcs

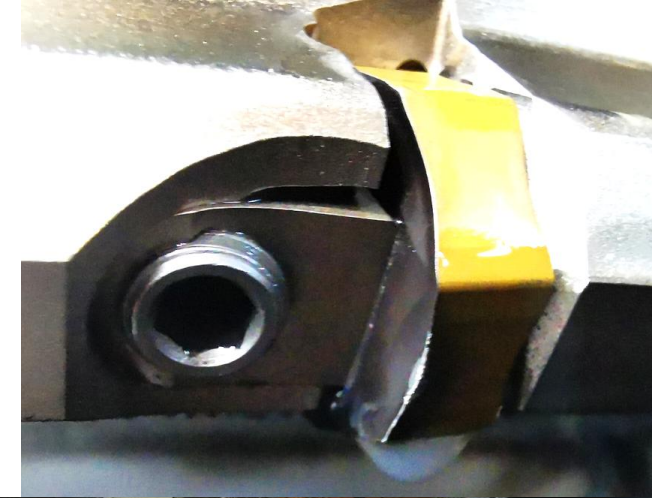
Achteck

Cutter: Special (D500, **Z32**)
Coupling: Arbor 60 (standard coupling)
Insert: XNMF 0906ANN MR6 AP251K

Cutting data:

- $V_c = 590$ ft/min
- $n = 115$ rpm
- $F = 21.65$ in/min
- $f_z = \mathbf{0.006}$ in

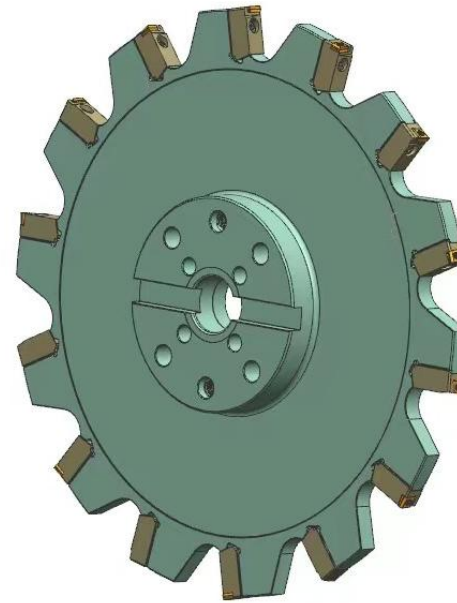
Tool life: **160** pcs



Special tool

Oil & gas industry, compressor cylinder block machining

Special:
AFM120-1001672 $\Phi 24.80''$, Z=8x2



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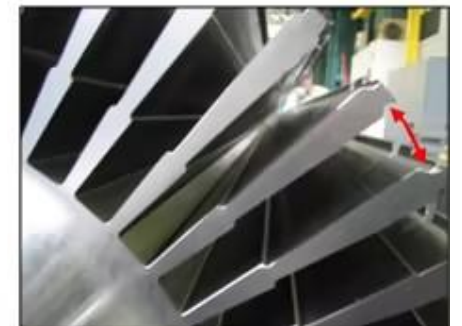
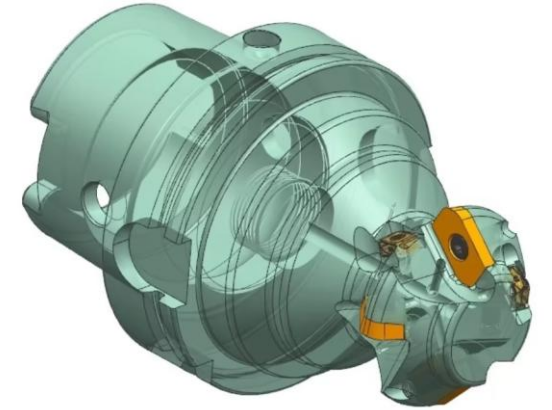
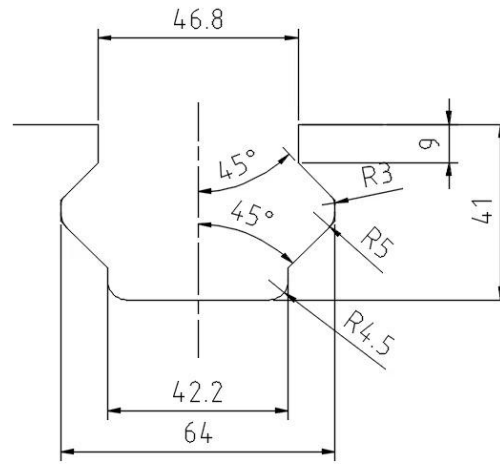
Special tool

·ACHTECK·

Power generator shaft dovetail slot milling, special tool:

APM110-1004514 (with internal coolant)

APM110-1004515 (with internal coolant)



THANKS