

General Purpose Multi Corner Insert Type Face Milling Cutter

Environmentally Friendly Product

# AHX Series



Grade  
Expansion

## Economical double sided inserts with 14 cutting edges.



2016-028

JTA ECO PRODUCT

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環境調和製品 ☆☆☆

Please refer to the last page for more information on certified environmentally friendly products.

# General Purpose Multi Corner Insert Type Face Milling Cutter

# AHX Series

## Unique 14 Corner Insert

### Economical Heptagonal Double Sided Insert

Double positive cutting edge geometry offers lower cutting resistance for improved machining efficiency.

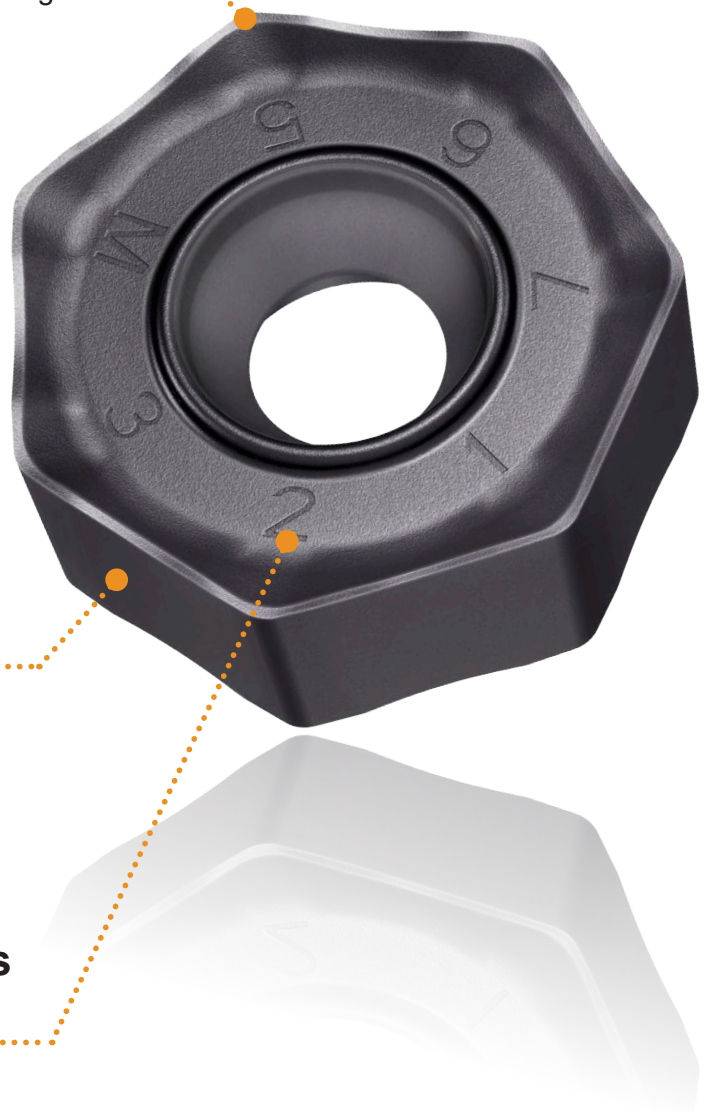
(mm)

Tool Holder Type	IC	APMX
<b>AHX440S</b>	13.4	3.0
<b>AHX475S</b>	13.4	1.6
<b>AHX640S</b>	20.0	6.0

"APMX" of AHX440 will vary depending on the chip breaker of the insert.

### High Rigidity Created by Increasing the Thickness of the Inserts

Corner Number is Clearly Shown



# A Unique Face Mill for Machining of Steel, Stainless Steel and Cast Iron

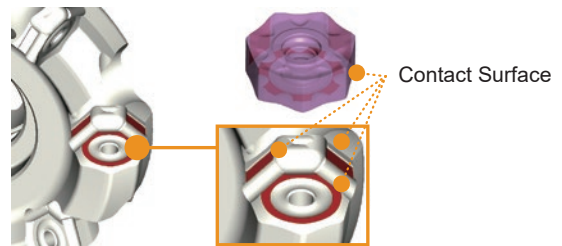
## AHX440S AHX475S AHX640S

AHX475S is not compatible with stainless steel.

### Designed to Control Abnormal Insert Breakage and Body Damage

The unique conical insert shim and Anti Fly mechanism (A.F.I) hold the insert securely. The outer edge of the insert is not in contact with the body, thereby preventing damage when sudden fracturing occurs.

The thick insert negates the need for a shim.



### Through Coolant Holes

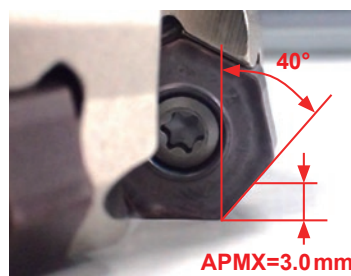
Improves chip discharge and prevents chip welding.



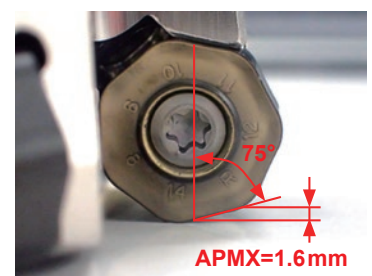
### AHX475S For High Feed Machining

High feed is possible with AHX440S by setting an RE = 3.2 mm insert to be used in a cutter body with a corner angle of 75° (KAPR15°).

The maximum depths of cut (APMX) will be limited to 1.6 mm.



AHX440S L Breaker



AHX475S

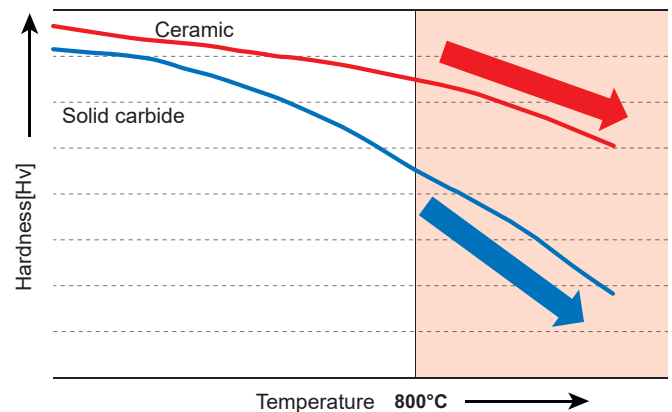
## CVD Coated Ceramic Grade

# XC5010 NEW

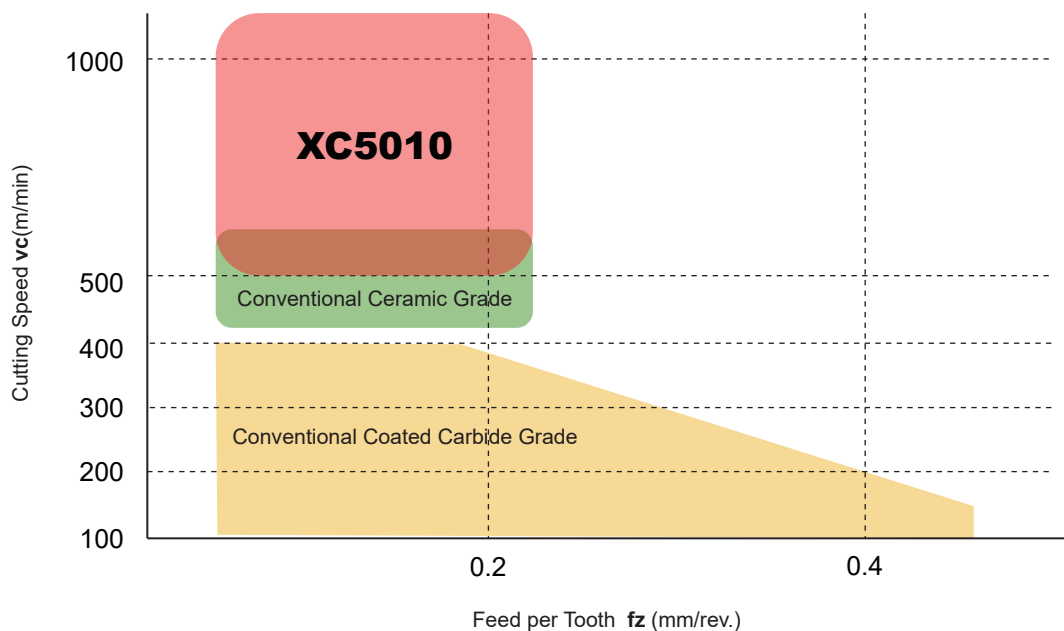
The strength of ceramics allows for stable machining even when cutting at high-speeds.

### High Temperature Hardness of Cemented Carbide and Ceramic

Cemented carbide inserts are significantly reduced in strength when exceeding 800 degrees. However, the strength of ceramic inserts is not affected at these high temperatures, therefore can be used at the high-speeds and depths of cut required to generate sufficient heat to enable machining.

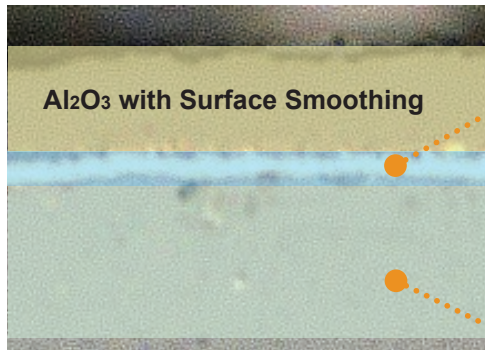


The combination of the unique shape and the coated ceramic grade achieves stable machining even at a cutting speeds of 1000 m/min.



## Surface-smoothing Al<sub>2</sub>O<sub>3</sub> coating suppresses the transmission of cutting heat

By applying an Al<sub>2</sub>O<sub>3</sub> coating, which suppresses the transmission of cutting heat to the ceramic substrate, and together with a surface smoothing treatment, abnormal wear and adhesion of the workpiece material are suppressed.



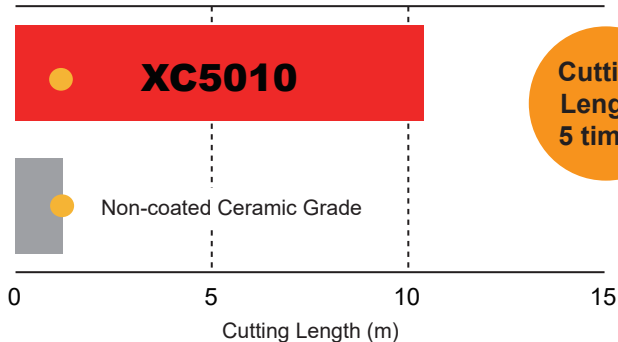
### Technology Improves Adhesion Strength

Mitsubishi Materials' own adhesion technology has greatly improved the adhesion between the ceramic base material and the coating layer.

### Silicon Nitride Ceramic Substrate

By adopting a high toughness silicon nitride ceramic substrate as the base material, ultra-high-speed milling of ductile cast iron can be achieved even at high temperatures with minimal loss of strength.

## Achieves 5 times the cutting length of non-coated ceramic grade when used at high-speeds



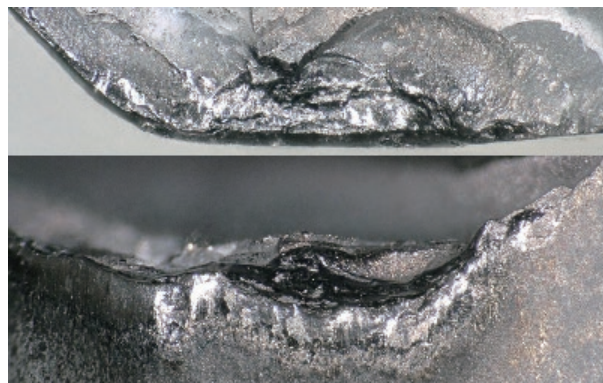
#### <Cutting Conditions>

Workpiece Material : JIS FCD600  
 Tool : AHX640S DC=80mm  
 Cutting Speed : vc=1000m/min  
 Feed per Tooth : fz=0.1mm/t  
 Depth of Cut : ap=2.0mm  
 ae=50mm  
 Cutting Mode : Dry Cutting

● After 1.2m Machining



**XC5010**



Non-coated Ceramic Grade

Machining video at VC=1200 m/min

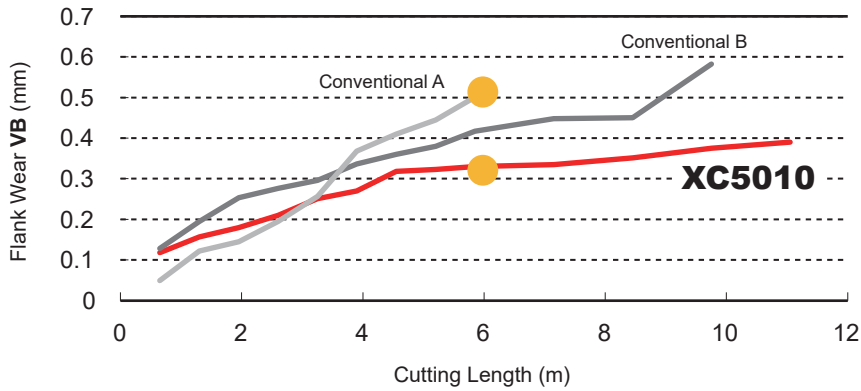


YouTube

# Cutting Performance

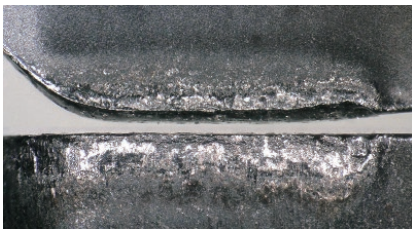
## Comparison of Wear when machining FCD700 $vc=1000m/min$

Achieves a level of wear resistance that greatly surpasses carbide grades when high-speed roughing.

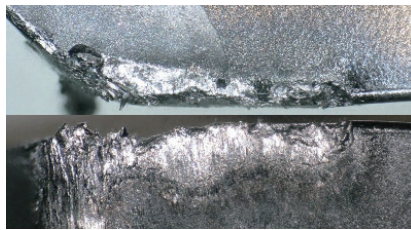


<Cutting Conditions>  
 Workpiece Material : JIS FCD700  
 Tool : AHX640S DC=80mm  
 Cutting Speed :  $vc=1000m/min$   
 Feed per Tooth :  $fz=0.1mm/t$   
 Depth of Cut :  $ap=2.0mm$   
                    $ae=40mm$   
 Cutting Mode : Dry Cutting  
                   Single Insert

● After Machining 6m



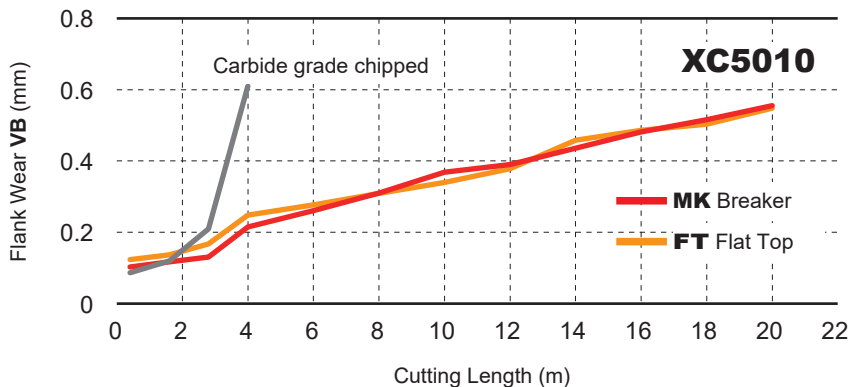
**XC5010**



Conventional A, Coated Carbide Grade

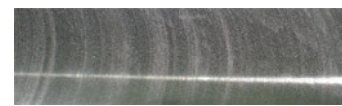
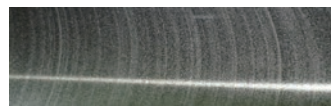
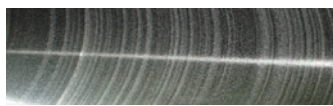
## Comparison of finished surfaces when machining FCD700 at $vc=1000m/min$

A high quality machined surface is maintained even after a cutting length of 20m.

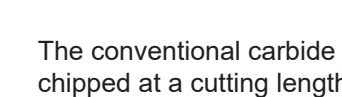
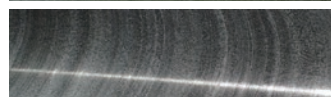
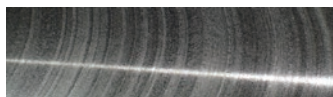


<Cutting Conditions>  
 Workpiece Material : JIS FCD700  
 Tool : AHX640S DC=125mm  
 Cutting Speed :  $vc=1000m/min$   
 Feed per Tooth :  $fz=0.1mm/t$   
 Depth of Cut :  $ap=2.0mm$   
                    $ae=100mm$   
 Cutting Mode : Dry Cutting  
                   Single Insert

Cutting Length 4m



Cutting Length 20m

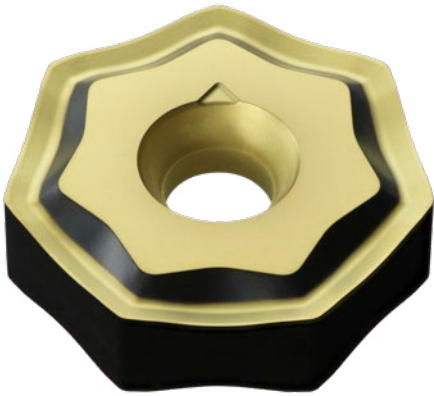


**XC5010**    **MK Breaker**    **XC5010**    **FT Flat Top**

The conventional carbide grade chipped at a cutting length of 4m.

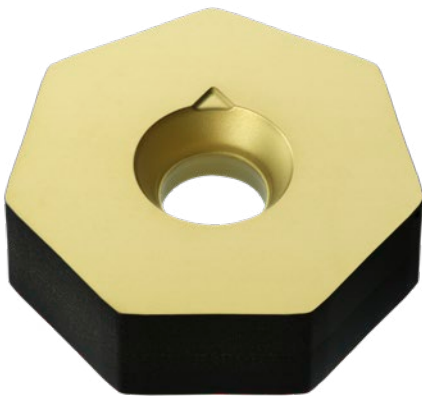
# XC5010 Chip Breaker System

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## **MK** Breaker    **General Cutting**

When compared to flat top inserts, the cutting resistance is lower when using the MK breaker. This reduces the load on the spindle thereby making it suitable for high speed cutting.



## **FT** Flat Top    **Cutting Edge Strength**

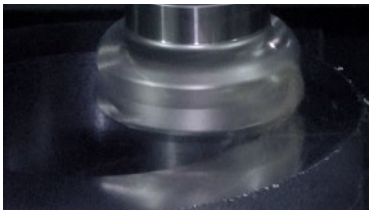
The high cutting edge strength of the flat top type enables stable cutting over long periods and helps to prevent sudden edge chipping.

The height setting when using MK inserts is different than when using FT type inserts.

## FCD600 Finish Surface Comparison

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A high quality machined surface is maintained even when high speed cutting conditions are used.



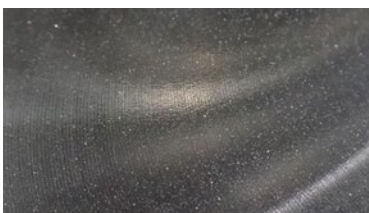
Cutting Speed : **vc=250 m/min**



Cutting Speed : **vc=1000 m/min**

<Cutting Conditions>

Workpiece Material : JIS FCD600  
Tool : AHX640S DC=63mm  
Feed per Tooth : fz=0.1 mm/t  
Depth of Cut : ap=1.0mm  
ae=32mm  
Cutting Mode : Dry Cutting



Conventional, Coated Carbide Grade



**XC5010**    **MK Breaker**



YouTube

# AHX Steel Series Selection Reference Table (Cutting Edge Count and Cutting Conditions)

(mm)

DC	Type	Number of Teeth	AHX440S			AHX475S			AHX640S		
			General Cutting			High Feed Machining			General Cutting		
			Stock	fr (mm/rev)	APMX	Stock	fr (mm/rev)	APMX	Stock	fr (mm/rev)	APMX
40	Fine Pitch	3	●	0.6—1.2	3						
	Extra Fine Pitch	4	●	0.8—1.6	3						
50	Fine Pitch	4	●	0.8—1.6	3	●	2.4—4.0	1.6			
	Extra Fine Pitch	5	●	1.0—2.0	3	●	3.0—5.0	1.6			
	Super Extra Fine Pitch	6	●	1.2—2.4	3						
63	Coarse Pitch	4							●	0.8—1.6	6
	Fine Pitch	5	●	1.0—2.0	3	●	3.0—5.0	1.6	●	1.0—2.0	6
	Extra Fine Pitch	6	●	1.2—2.4	3	●	3.6—6.0	1.6			
	Super Extra Fine Pitch	8	●	1.6—3.2	3						
80	Coarse Pitch	4							●	0.8—1.6	6
	Fine Pitch	6	●	1.2—2.4	3	●	3.6—6.0	1.6	●	1.2—2.4	6
	Extra Fine Pitch	8	●	1.6—3.2	3	●	4.8—8.0	1.6			
	Super Extra Fine Pitch	10	●	2.0—4.0	3						
100	Coarse Pitch	5							●	1.0—2.0	6
	Fine Pitch	7	●	1.4—2.8	3	●	4.2—7.0	1.6	●	1.4—2.8	6
	Extra Fine Pitch	9				●	5.4—9.0	1.6			
		10	●	2.0—4.0	3						
	Super Extra Fine Pitch	12	●	2.4—4.8	3						
125	Coarse Pitch	6							●	1.2—2.4	6
	Fine Pitch	8	●	1.6—3.2	3	●	4.8—8.0	1.6	●	1.6—3.2	6
	Extra Fine Pitch	10				●	6.0—10.0	1.6			
		12	●	2.4—4.8	3						
	Super Extra Fine Pitch	14	●	2.8—5.6	3						
160	Coarse Pitch	7							●	1.4—2.8	6
	Fine Pitch	10	●	2.0—4.0	3	●	6.0—10.0	1.6	●	2.0—4.0	6
	Extra Fine Pitch	12				●	7.2—12.0	1.6			
		14	●	2.8—5.6	3						
	Super Extra Fine Pitch	16	●	3.2—6.4	3						
200	Coarse Pitch	8							●	1.6—3.2	6
	Fine Pitch	12							●	2.4—4.8	6

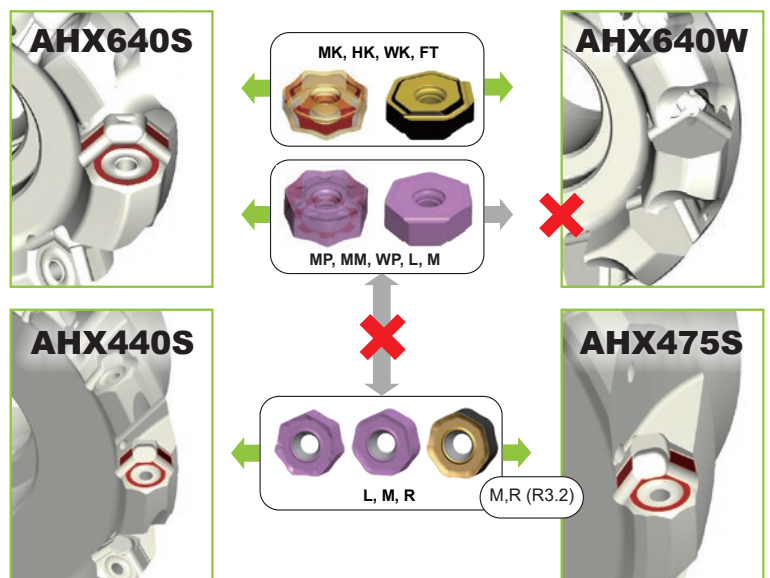
(Note 1) fr: Feed rate per revolution (AHX475S: the feed rate per cutter (fz) will be limited by the cutting width ae. Please refer to page 21 for details.)

(Note 2) APMX: Maximum depths of cut (AHX440S: the maximum depths of cut will vary depending on the type of chip breaker.)

(Note 3) The depths of cut and feed rate are identical to the recommended conditions for carbon steel and alloy steel.

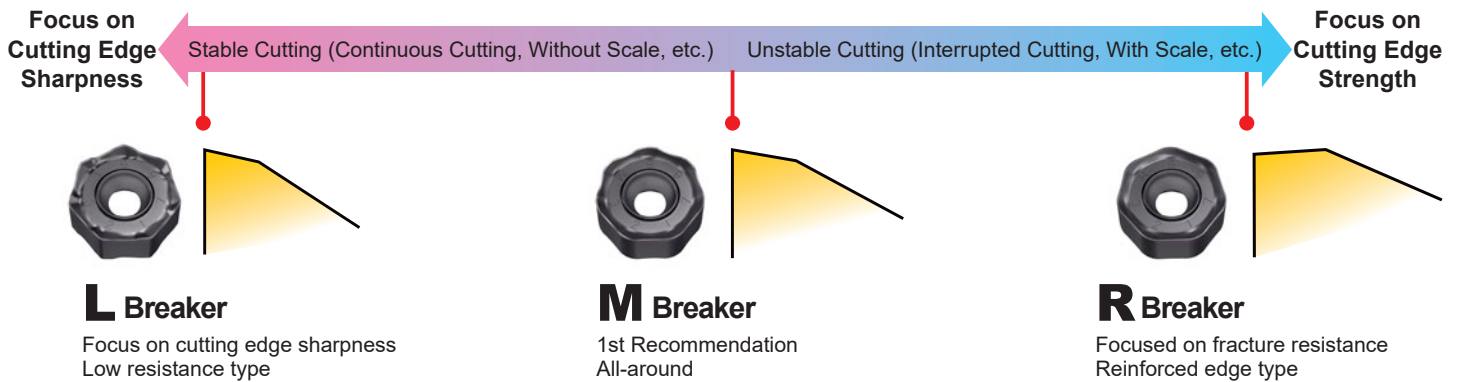
## Compatibility with Inserts for AHX Series

The RE = 3.2 mm insert for use with AHX440S can be mounted on AHX475S. All inserts for use with AHX640 can be mounted on AHX640S (note, however, that the height setting will differ). The inserts for mounting on AHX640W are the MK, HK, WK and FT breakers for casting.



# Chip Breaker System

## Chip Breaker System for Varied Cutting Conditions



Workpiece Material	Cutting Conditions		
	Stable Cutting	General Cutting	Unstable Cutting
<b>P</b>	<b>AHX440S</b>	<b>M</b> (R0.8) With Wiper	<b>M</b> (R3.2) Shared with AHX475
	<b>AHX640S</b>	<b>L</b> With Wiper	<b>R</b> Shared with AHX475
<b>M</b>	<b>AHX440S</b>	<b>M</b> (R0.8) With Wiper	<b>M</b> (R3.2)
	<b>AHX640S</b>	<b>MP</b>	<b>R</b>
<b>K</b>	<b>AHX440S</b>	<b>M</b> (R0.8) With Wiper	<b>M</b> (R3.2) Shared with AHX475
	<b>AHX640S</b>	<b>MM</b>	<b>HK</b> <b>FT</b>

## Wiper Insert of AHX640S

Based on the number of inserts and the cutting conditions, use of wiper inserts can improve overall surface finishes.

**P** **WP** + combination with **MP**  
Right-hand 2 corners,  
left-hand 2 corners.



**K** **WK** + combination with **MK**  
Right-hand 2 corners,  
left-hand 2 corners.



# Face Milling Cutter for High Efficiency Machining of Cast Iron

# AHX640W

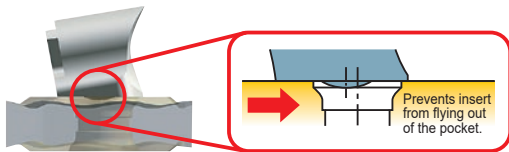
**High Rigidity Inserts Suitable for High Feed Milling of Cast Iron**



Sloped cutting edge and large rake angle

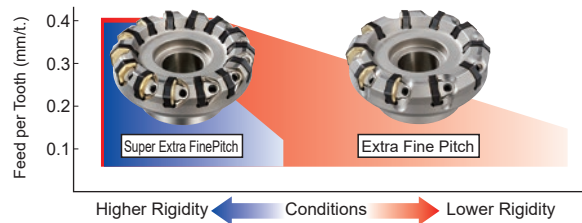
## Innovative Clamp System

New wedge geometry developed to increase the permissible number of teeth. Unique wedge geometry uses a protruding section that fits inside the insert hole and acts as an Anti-Fly Insert (AFI) mechanism.



## 2 Variations for Different Applications

Extra fine pitch and super extra fine pitch types allow high efficiency milling under various machining conditions. Additionally, left hand types for use on special machines are also available as standard. Inserts can be used with both right and left hand type cutters.



## Insert Applications



**MK General-Purpose Insert**

20° Rake

Accurate tolerance M-class insert. Neutral, double sided 14 corners. 20° rake angle for low cutting resistance. First recommendation for roughing and finishing.

**HK Strong Cutting Edge Insert**

0° Rake

Accurate tolerance M-class insert. Neutral, double sided 14 corners. High cutting edge strength to prevent fracturing of the cutting edge during unstable machining of non-uniform workpieces and high feed machining.

**WK Wiper Insert**

Improved Surface Finish

Right-hand 2 corners, left-hand 2 corners. Based on the number of inserts and the cutting conditions, by using the wiper inserts it is possible to improve the overall surface finish.

The insert for AHX640W is compatible with AHX640S. Please refer to P6 for the proper use of the XC5010 insert.

## Coated Carbide Grade for Milling

# MV1020/MV1030

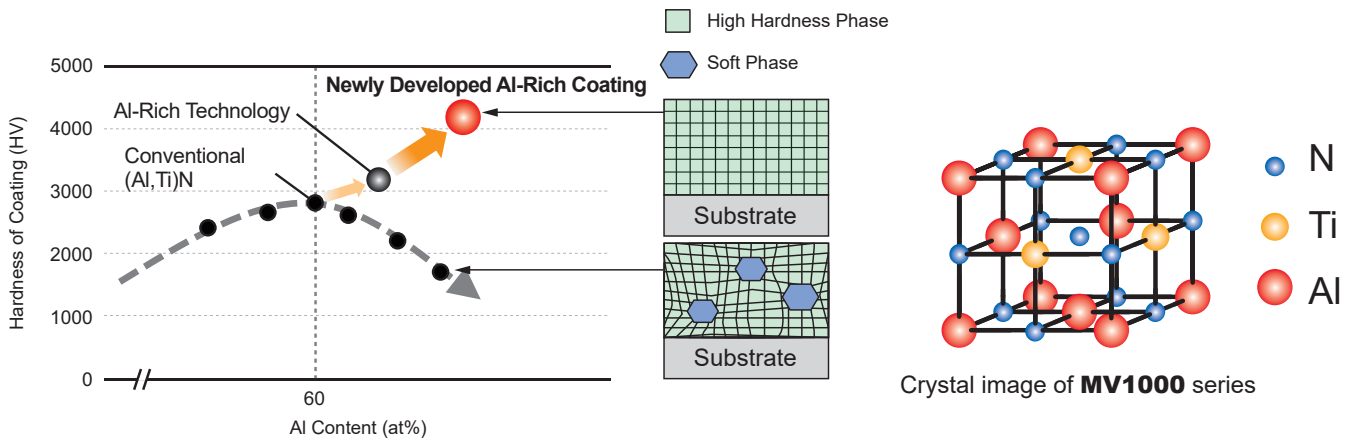
## Newly Developed Al-Rich Coating

### Advanced Wear and Thermal Shock Resistant

By adopting the newly developed Al-Rich coating technology, the (Al,Ti)N with a high Al content ratio displays a very high hardness. This greatly improves oxidation and wear resistance.

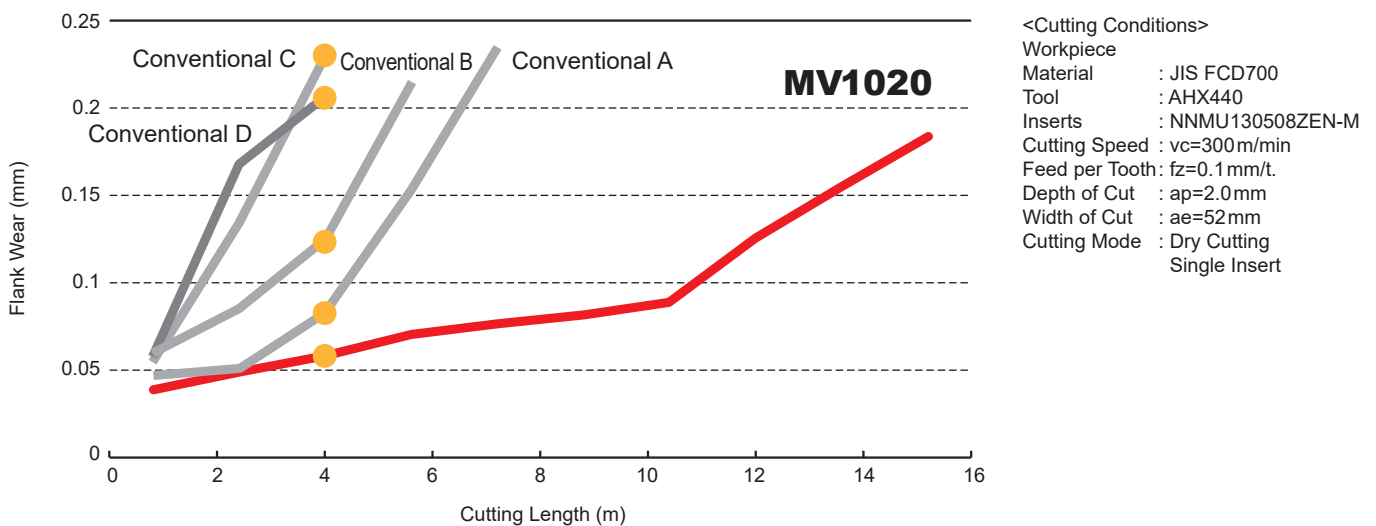
The extreme heat resistance of this new series achieves amazing stability not only during dry cutting, but also when wet cutting where inserts are usually prone to thermal cracking.

MV1020 offers overwhelmingly superior performance in high-speed cutting, and MV1030 achieves stable performance during interrupted and stainless steel machining.

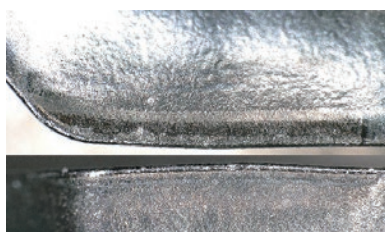


## Cutting Performance

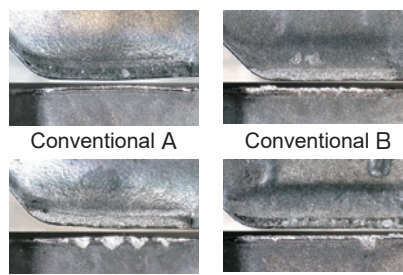
### Comparison of wear resistance when machining ductile cast Iron FCD700



● Taken after cutting length of 4.0 m

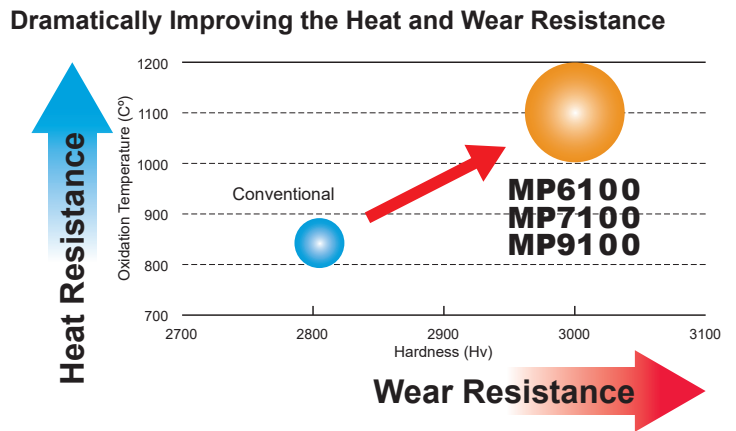
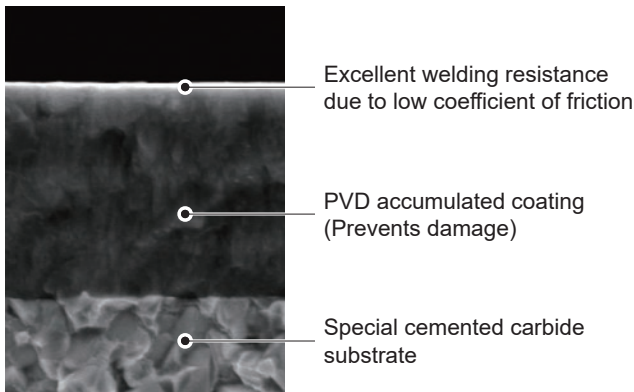


**MV1020**



## Insert Grades for a Wide Range of Materials

### Accumulated Al-Ti-Cr-N Based PVD Coating



### Excellent Welding Resistance due to Low Coefficient of Friction

	Workpiece Material	Grade	Coefficient of Friction		
			Measured at 600 Degree		
			S55C	SUS304	Ti-6Al-4V
<b>P</b>	Carbon Steel, Alloy Steel	<b>MP6100</b>	<b>0.4</b>		
<b>M</b>	Stainless Steel	<b>MP7100</b>		<b>0.5</b>	
<b>S</b>	Titanium and Heat Resistant Alloys	<b>MP9100</b>			<b>0.3</b>
	Conventional		0.7	0.7	0.7

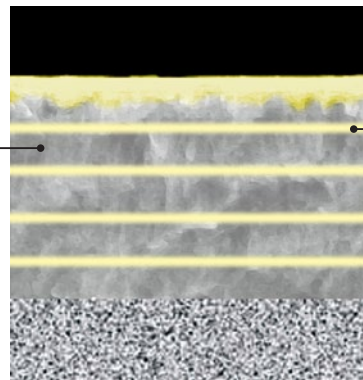
## TOUGH-Σ Technology

A fusion of the separate coating technologies; PVD and multi-layering realizes extra toughness.

### Accumulated Al-Ti-Cr-N Based PVD Coating

#### Base Layer High Al-(Al, Ti)N

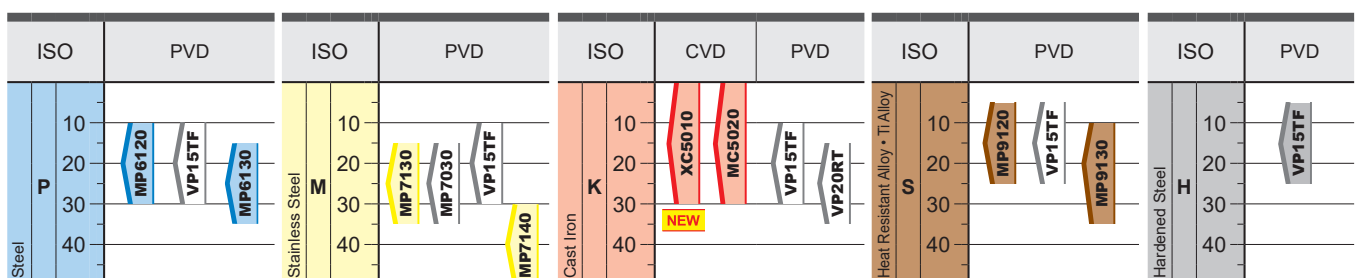
The new technology Al-(Al, Ti)N coating provides stabilisation of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.



### Each Grade has a Layer Suitable for Each Application Area

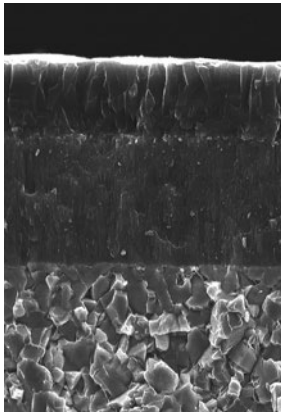
<b>P</b>		<b>(Al,Cr)N</b>	Tough Against Thermal Cracks
<b>M</b>		<b>TiN</b>	Tough Against Notching
<b>S</b>		<b>CrN</b>	Tough! Resistant Chipping

## Selection Standard



# MC5020

MC5020 has excellent wear, chipping and thermal crack resistance. These features prevent the problems usually associated with machining cast iron over prolonged periods.



Structure of MC5020

## Improved Wear Resistance

The micro-grain wear resistant  $Al_2O_3$  and fibrous TiCN layers deliver excellent wear resistance when milling a wide range of cast irons.

## Improved Fracture Resistance

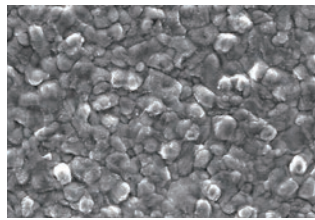
Use of a specially developed cemented carbide that provides superior resistance to fracture and thermal cracking prevents the cutting edge from sudden fracturing.

## Reduced Abnormal Damage

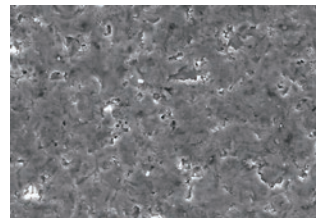
A black super smooth coating prevents abnormal damage such as weld chipping.

## Black Super Smooth Coating

### Comparison of Coating Surface



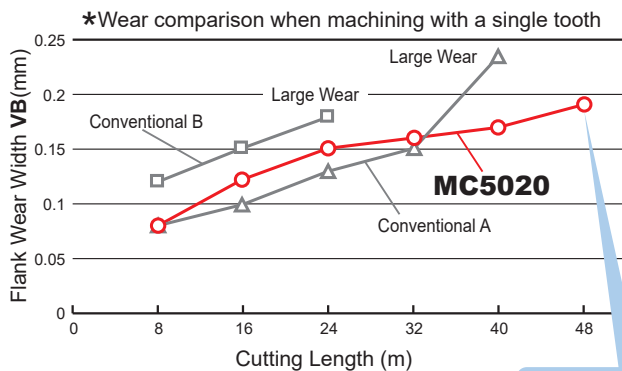
Conventional Coating



Black Super Smooth Coating

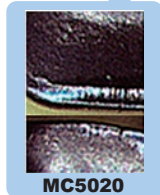
## Cutting Performance

### Wear Resistance



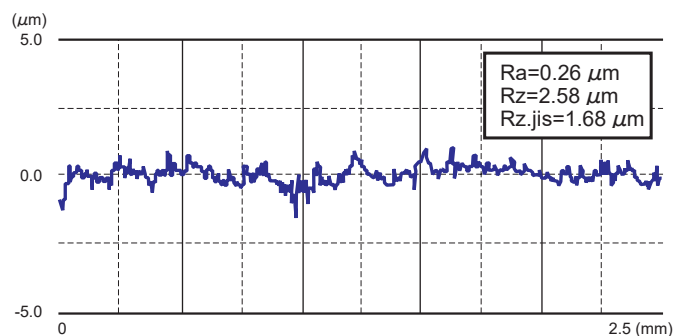
#### <Cutting Conditions>

Workpiece Material : JIS FC300  
 Tool : AHX640WR10010D  
 Insert : NNMU200608ZEN-MK (1 piece)  
 Cutting Speed : 300 m/min  
 Feed per Tooth : 0.3 mm/t.  
 Depth of Cut :  $a_p=5$  mm  
 Cutting Mode : Dry Cutting  
 Single Insert



MC5020

### Surface Finish



#### Surface Finish Condition



#### <Cutting Conditions>

Workpiece Material : JIS FCD700  
 Tool : AHX640WR10014D  
 Insert : NNMU200608ZEN-MK (13 piece)  
 Wiper Insert : WNEU2006ZEN7C-WK (1 piece)  
 Cutting Speed : 350 m/min  
 Feed per Tooth : 0.1 mm/t.  
 Depth of Cut :  $a_p=0.4$  mm  
 $a_e=80$  mm  
 Cutting Mode : Air Blow

# Memo

---

A series of horizontal dashed lines for writing, spanning the width of the page.

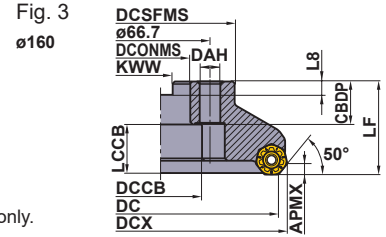
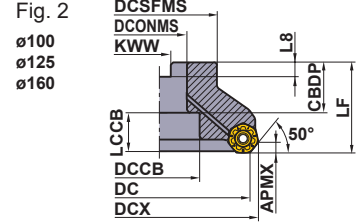
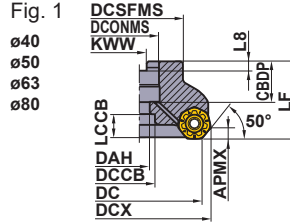
# FACE MILLING

<GENERAL CUTTING>



# AHX440S

- P
- M
- K
- N
- S
- H



Right hand tool holder only.

DC=mm size, DCON=Inch size

(mm)

DC	Order Number	Stock	Coolant Hole	No.T *	LF	DCX	DCONMS	Fig.	WT(kg)	APMX
80	AHX440SR08006CA	●	○	6	50	88.4	25.4	1	1.1	3
	AHX440SR08008CA	●	○	8	50	88.4	25.4	1	1.1	3
	AHX440SR08010CA	●	○	10	50	88.4	25.4	1	1.1	3
100	AHX440SR10007DA	●	○	7	50	108.4	31.75	2	1.6	3
	AHX440SR10010DA	●	○	10	50	108.4	31.75	2	1.6	3
	AHX440SR10012DA	●	○	12	50	108.3	31.75	2	1.6	3
125	AHX440SR12508EA	●	○	8	63	133.4	38.1	2	3.0	3
	AHX440SR12512EA	●	○	12	63	133.4	38.1	2	3.0	3
	AHX440SR12514EA	●	○	14	63	133.3	38.1	2	2.9	3
160	AHX440SR16010FA	●	○	10	63	168.4	50.8	2	4.8	3
	AHX440SR16014FA	●	○	14	63	168.4	50.8	2	4.6	3
	AHX440SR16016FA	●	○	16	63	168.4	50.8	2	4.7	3

(Note 1) The cutter body does not have a set bolt for an arbor. Please refer to page 15 when ordering.

(Note 2) The above "APMX" will vary depending on the chip breaker insert.

\* Number of Teeth

## Spare Parts

Tool Holder Type	*	*
		Clamp Screw
<b>AHX440S</b>	TS35R	TKY15T

\* Clamp Torque (N • m) : TS35R=3.5

# General Purpose Multi Corner Insert Type Face Milling Cutter

DC=mm size, DCON=mm size

(mm)

DC	Order Number	Stock	Coolant Hole	No.T *	LF	DCX	DCONMS	Fig.	WT(kg)	APMX
40	AHX440S-040A03AR	●	○	3	40	48.4	16	1	0.3	3
	AHX440S-040A04AR	●	○	4	40	48.4	16	1	0.2	3
50	AHX440S-050A04AR	●	○	4	40	58.4	22	1	0.4	3
	AHX440S-050A05AR	●	○	5	40	58.4	22	1	0.4	3
	AHX440S-050A06AR	●	○	6	40	58.4	22	1	0.4	3
63	AHX440S-063A05AR	●	○	5	40	71.4	22	1	0.6	3
	AHX440S-063A06AR	●	○	6	40	71.4	22	1	0.6	3
	AHX440S-063A08AR	●	○	8	40	71.4	22	1	0.5	3
80	AHX440S-080A06AR	●	○	6	50	88.4	27	1	1.1	3
	AHX440S-080A08AR	●	○	8	50	88.4	27	1	1.1	3
	AHX440S-080A10AR	●	○	10	50	88.4	27	1	1.1	3
100	AHX440S-100B07AR	●	○	7	50	108.4	32	2	1.6	3
	AHX440S-100B10AR	●	○	10	50	108.4	32	2	1.6	3
	AHX440S-100B12AR	●	○	12	50	108.3	32	2	1.6	3
125	AHX440S-125B08AR	●	○	8	63	133.4	40	2	3.0	3
	AHX440S-125B12AR	●	○	12	63	133.4	40	2	3.0	3
	AHX440S-125B14AR	●	○	14	63	133.3	40	2	2.9	3
160	AHX440S-160C10NR	●	—	10	63	168.4	40	3	4.8	3
	AHX440S-160C14NR	●	—	14	63	168.4	40	3	4.6	3
	AHX440S-160C16NR	●	—	16	63	168.4	40	3	4.7	3

(Note 1) The cutter body does not have a set bolt for an arbor. Please refer to the table below when ordering.

(Note 2) The above "APMX" will vary depending on the chip breaker insert.

\* Number of Teeth

## Optional Parts

(mm)

Tool Holder Type	Set Bolt		Fig.	Reference Dimensions							Geometry
	With Coolant Hole	Without Coolant Hole		a	b	c	d	e	f	g	
	Order Number	Order Number									
AHX440S-040A○○AR	HSC08025H	HSC08040	1	13	M8×1.25	33	8	5	—	—	
AHX440S-050A○○AR	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	—	—	
AHX440S-063A○○AR	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	—	—	
AHX440S-080A○○AR	HSC12035H	HSC12035 HSC12045	1	18	M12×1.75	47 57	12	10	—	—	
AHX440S-100B○○AR	MBA16033H	—	2	40	M16×2	43	10	14	6	23	
AHX440S-125B○○AR	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27	
AHX440S-160C○○NR	No coolant hole	—	2	50	M20×2.5	54	14	17	6	27	
AHX440SR080○○CA	HSC12035H	HSC12035 HSC12045	1	18	M12×1.75	47 57	12	10	—	—	
AHX440SR100○○DA	MBA16033H	—	2	40	M16×2	43	10	14	6	23	
AHX440SR125○○EA	MBA20040H	—	2	50	M20×2.5	54	14	17	6	27	
AHX440SR160○○FA	MBA24045H	—	2	65	M24×3	59	14	17	10	37	

(Note 1) Internal coolant is necessary with the set bolt.

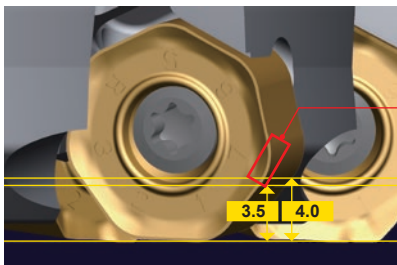
● : Inventory maintained in Japan. (10 inserts in one case)

# Inserts

(mm)

Application	Shape	Order Number	Class	Honing	Coated								Dimensions (mm)					Geometry		
					MV1020	MV1030	MC5020	MP6120	MP6130	MP7130	MP7140	VP15TF	IC	RE	BS	S	APMX			
Stable Cutting		<b>NNMU130508ZER-L</b>	M	E	●	●	●	●	●	●	●	●	●	●	13.4	0.8	1	5.09	3	
General Cutting		<b>NNMU130508ZEN-M</b>	M	E	●	●	●	●	●	●	●	●	●	●	13.4	0.8	1	5.09	*4	
		<b>NNMU130532ZEN-M</b>	M	E	●	●	●	●	●	●	●	●	●	●	13.4	3.2	—	5.09	*4	
Unstable Cutting		<b>NNMU130532ZEN-R</b>	M	E	●	●	●	●	●	●	●	●	●	●	13.4	3.2	—	5.09	*4	
Finish Cutting		<b>WNEU1305ZEN4C-M</b>	E	E		●	●					●		13.4	2.7	4	5.09	0.5		
	Wiper																			

This is the selection guideline for AHX440S.  
 Please note that the cutting conditions differ depending on multiple factors, for more details refer to the Recommended Cutting Conditions.  
**Edge Preparation :**  
 E : Round



Next corner radius to be used.

When the next corner is not to be used, the APMX is 4.0 mm. When the next corner is to be used later (clockwise insert indexing), the APMX is 3.5 mm. This is to ensure that the next cutting edge isn't already worn from use at 4.0 mm depth of cut.

## Instructions for Use of Wiper Inserts

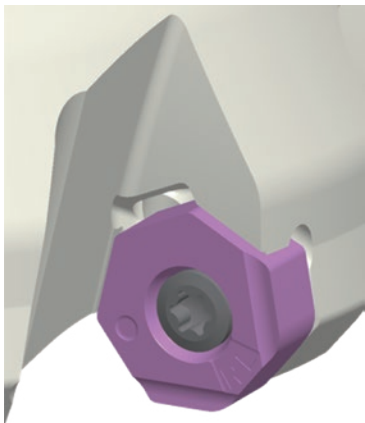


Fig.1



Fig.2

(Note 1) These wiper inserts have 2 cutting edges for left hand use and 2 corners for right hand use. Position as shown in figure 1.

(Note 2) A satisfactory finished surface can be achieved with one wiper insert.

However, if the feed rate per revolution will be equal to or greater than the width of the wiper edge, it is recommended to install the second and further wiper inserts spaced evenly within the cutting body.

# General Purpose Multi Corner Insert Type Face Milling Cutter

## Recommended Cutting Conditions

### ■ Dry Cutting

(mm)

Workpiece Material	Properties	Grade	vc (m/min)	fz (mm/t.)	ap (mm)	ae (mm)	
P	Mild Steel	MV1020	300 (200–400)	0.30 (0.20–0.40)	≤3	≤0.8DC	
		MP6120,VP15TF	250 (200–300)	0.30 (0.20–0.40)	≤3	≤0.8DC	
		MV1030	245 (190–300)	0.30 (0.20–0.40)	≤3	≤0.8DC	
		MP6130	240 (190–290)	0.30 (0.20–0.40)	≤3	≤0.8DC	
	Carbon Steel, Alloy Steel	Hardness 180–280HB	MV1020	260 (170–350)	0.30 (0.20–0.40)	≤3	≤0.8DC
			MP6120,VP15TF	220 (170–270)	0.30 (0.20–0.40)	≤3	≤0.8DC
			MV1030	210 (150–270)	0.30 (0.20–0.40)	≤3	≤0.8DC
			MP6130	200 (150–250)	0.30 (0.20–0.40)	≤3	≤0.8DC
	Carbon Steel, Alloy Steel	Hardness 280–350HB	MV1020	180 (100–250)	0.30 (0.20–0.40)	≤3	≤0.8DC
			MP6120,VP15TF	140 (100–180)	0.30 (0.20–0.40)	≤3	≤0.8DC
			MV1030	135 (90–180)	0.30 (0.20–0.40)	≤3	≤0.8DC
			MP6130	120 (90–150)	0.30 (0.20–0.40)	≤3	≤0.8DC
	Alloy Tool Steel	Hardness ≤350HB (annealing)	MP6120,VP15TF	140 (100–180)	0.15 (0.10–0.20)	≤1	≤0.8DC
			MP6130	120 (90–150)	0.15 (0.10–0.20)	≤1	≤0.8DC
Pre-hardened Steel	Hardness 35–45HRC	MP6120	140 (100–180)	0.15 (0.10–0.20)	≤1	≤0.8DC	
		MP6130	120 (90–150)	0.15 (0.10–0.20)	≤1	≤0.8DC	
M	Austenitic Stainless Steel	Hardness ≤200HB	MP7130,VP15TF	200 (150–250)	0.20 (0.10–0.30)	≤3	≤0.8DC
			MV1030	185 (120–250)	0.20 (0.10–0.30)	≤3	≤0.8DC
			MP7140	180 (120–230)	0.20 (0.10–0.30)	≤3	≤0.8DC
		Hardness > 200HB	MP7130,VP15TF	150 (100–200)	0.20 (0.10–0.30)	≤3	≤0.8DC
			MV1030	140 (80–200)	0.20 (0.10–0.30)	≤3	≤0.8DC
			MP7140	130 (80–180)	0.20 (0.10–0.30)	≤3	≤0.8DC
	Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	MP7130,VP15TF	200 (150–250)	0.20 (0.10–0.30)	≤3	≤0.8DC
			MV1030	185 (120–250)	0.20 (0.10–0.30)	≤3	≤0.8DC
			MP7140	180 (120–230)	0.20 (0.10–0.30)	≤3	≤0.8DC
		Hardness > 200HB	MP7130,VP15TF	150 (100–200)	0.20 (0.10–0.30)	≤3	≤0.8DC
			MV1030	140 (80–200)	0.20 (0.10–0.30)	≤3	≤0.8DC
			MP7140	130 (80–180)	0.20 (0.10–0.30)	≤3	≤0.8DC
	Two-Phase Stainless Steel	Hardness ≤280HB	MP7130,VP15TF	140 (100–180)	0.15 (0.05–0.25)	≤3	≤0.8DC
			MP7140	120 (80–160)	0.15 (0.05–0.25)	≤3	≤0.8DC
Precipitation-Hardened Stainless Steel	Hardness < 450HB	MP7130,VP15TF	130 (100–160)	0.15 (0.05–0.25)	≤3	≤0.8DC	
		MP7140	110 (80–140)	0.15 (0.05–0.25)	≤3	≤0.8DC	
K	Gray Cast Iron	Tensile Strength ≤350MPa	MC5020	220 (150–300)	0.30 (0.20–0.40)	≤3	≤0.8DC
			VP15TF	180 (130–230)	0.30 (0.20–0.40)	≤3	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤450MPa	MV1020	240 (130–350)	0.20 (0.10–0.30)	≤3	≤0.8DC
			MC5020	220 (150–300)	0.20 (0.10–0.30)	≤3	≤0.8DC
			MV1030	185 (120–250)	0.20 (0.10–0.30)	≤3	≤0.8DC
			VP15TF	170 (120–220)	0.20 (0.10–0.30)	≤3	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	MV1020	220 (80–350)	0.20 (0.10–0.30)	≤3	≤0.8DC
			MC5020	170 (150–200)	0.20 (0.10–0.30)	≤3	≤0.8DC
			MV1030	150 (100–200)	0.20 (0.10–0.30)	≤3	≤0.8DC
			VP15TF	140 (100–180)	0.20 (0.10–0.30)	≤3	≤0.8DC
H	Hardened Steel	Hardness 40–55HRC	VP15TF	80 (60–100)	0.15 (0.10–0.20)	≤1	≤0.8DC

## Wet Cutting

(mm)

Workpiece Material	Properties	Grade	vc (m/min)	fz (mm/t.)	ap (mm)	ae (mm)
M Austenitic Stainless Steel	Hardness ≤200HB	MP7130,VP15TF	125 (100–150)	0.15 (0.10–0.20)	≤3	≤0.8DC
		MP7140	100 (80–140)	0.15 (0.10–0.20)	≤3	≤0.8DC
	Hardness > 200HB	MP7130,VP15TF	100 (75–125)	0.15 (0.10–0.20)	≤3	≤0.8DC
		MP7140	80 (55–105)	0.15 (0.10–0.20)	≤3	≤0.8DC
Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	MP7130,VP15TF	125 (100–150)	0.15 (0.10–0.20)	≤3	≤0.8DC
		MP7140	100 (80–140)	0.15 (0.10–0.20)	≤3	≤0.8DC
	Hardness > 200HB	MP7130,VP15TF	100 (75–125)	0.15 (0.10–0.20)	≤3	≤0.8DC
		MP7140	80 (55–105)	0.15 (0.10–0.20)	≤3	≤0.8DC
Two-Phase Stainless Steel	Hardness ≤280HB	MP7130,VP15TF	80 (60–100)	0.10 (0.05–0.15)	≤3	≤0.8DC
		MP7140	60 (40–80)	0.10 (0.05–0.15)	≤3	≤0.8DC
Precipitation-Hardening Stainless Steel	Hardness < 450HB	MP7130,VP15TF	70 (50–90)	0.10 (0.05–0.15)	≤3	≤0.8DC
		MP7140	50 (30–70)	0.10 (0.05–0.15)	≤3	≤0.8DC

## Cutting Conditions with Wiper Insert

(mm)

Workpiece Material	Properties	Grade	vc (m/min)	fz (mm/t.)	ap	
P Mild Steel	≤180HB	MP6120,VP15TF	250 (200–300)	0.3 (0.2–0.4)	≤0.5	
	180–280HB	MP6120,VP15TF	220 (170–270)	0.3 (0.2–0.4)	≤0.5	
		MP6120,VP15TF	140 (100–180)	0.3 (0.2–0.4)	≤0.5	
	Alloy Tool Steel	≤350HB (annealing)	MP6120,VP15TF	140 (100–180)	0.15 (0.1–0.2)	≤0.5
Pre-hardened Steel	35–45HRC	MP6120,VP15TF	140 (100–180)	0.15 (0.1–0.2)	≤0.5	
M Austenitic Stainless Steel	≤200HB	VP15TF	125 (100–150)	0.15 (0.1–0.2)	≤0.5	
	> 200HB	VP15TF	100 (75–125)	0.15 (0.1–0.2)	≤0.5	
	Ferritic and Martensitic Stainless Steel	≤200HB	VP15TF	125 (100–150)	0.15 (0.1–0.2)	≤0.5
		> 200HB	VP15TF	100 (75–125)	0.15 (0.1–0.2)	≤0.5
Two-Phase Stainless Steel	≤280HB	VP15TF	80 (60–100)	0.1 (0.05–0.15)	≤0.5	
Precipitation-Hardening Stainless Steel	< 450HB	VP15TF	70 (50–90)	0.1 (0.05–0.15)	≤0.5	
K Gray Cast Iron	Tensile Strength ≤350MPa	MC5020	320 (250–400)	0.3 (0.2–0.4)	≤0.5	
		VP15TF	220 (150–300)	0.3 (0.2–0.4)	≤0.5	
	Ductile Cast Iron	Tensile Strength ≤450MPa	MC5020	250 (200–300)	0.2 (0.1–0.3)	≤0.5
			VP15TF	200 (150–250)	0.2 (0.1–0.3)	≤0.5
		Tensile Strength ≤800MPa	MC5020	220 (200–250)	0.2 (0.1–0.3)	≤0.5
VP15TF	170 (150–200)		0.2 (0.1–0.3)	≤0.5		
H Hardened Steel	40–55HRC	VP15TF	80 (60–100)	0.15 (0.1–0.2)	≤0.5	

(Note 1) Refer to the table above and set up cutting conditions according to cutting applications.

(Note 2) When placing emphasis on surface finish quality, wet cutting is recommended. (tool life is lowered when compared to dry cutting)

(Note 3) The recommended depth of cut differs according to insert geometry.

(Note 4) When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30%.

(Note 5) Wet cutting is recommended for good surface finishing of stainless steel. (Tool life is short compared to dry cutting.)

# General Purpose Multi Corner Insert Type Face Milling Cutter

## FACE MILLING

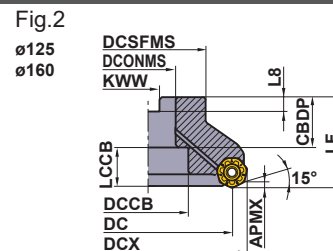
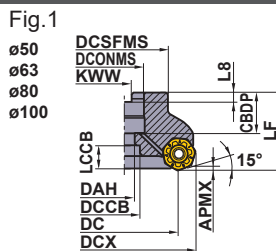
<HIGH FEED CUTTING FOR CAST IRON>

15°  
KAPR



# AHX475S

P M **K** N S H



Right hand tool holder only.

DC=mm size, DCON=Inch size

(mm)

DC	Order Number	Stock	Coolant Hole	No.T *	LF	DCX	DCONMS	Fig.	WT(kg)	APMX
80	AHX475SR08006DA	●	○	6	63	95.6	31.75	1	2.0	1.6
	AHX475SR08008DA	●	○	8	63	95.6	31.75	1	2.0	1.6
100	AHX475SR10007DA	●	○	7	63	115.6	31.75	1	3.2	1.6
	AHX475SR10009DA	●	○	9	63	115.6	31.75	1	3.2	1.6
125	AHX475SR12508EA	●	○	8	63	140.6	38.1	2	4.0	1.6
	AHX475SR12510EA	●	○	10	63	140.6	38.1	2	4.0	1.6
160	AHX475SR16010FA	●	○	10	63	175.6	50.8	2	5.5	1.6
	AHX475SR16012FA	●	○	12	63	175.6	50.8	2	5.5	1.6

(Note 1) The cutter body does not have a set bolt for an arbor. Please refer to page 20 when ordering.

\* Number of Teeth

DC=mm size, DCON=mm size

(mm)



DC	Order Number	Stock	Coolant Hole	No.T *	LF	DCX	DCONMS	Fig.	WT(kg)	APMX
50	AHX475S-050A04AR	●	○	4	50	65.7	22	1	0.6	1.6
	AHX475S-050A05AR	●	○	5	50	65.7	22	1	0.6	1.6
63	AHX475S-063A05AR	●	○	5	50	78.7	22	1	1.0	1.6
	AHX475S-063A06AR	●	○	6	50	78.7	22	1	1.0	1.6
80	AHX475S-080A06AR	●	○	6	50	95.6	27	1	1.6	1.6
	AHX475S-080A08AR	●	○	8	50	95.6	27	1	1.6	1.6
100	AHX475S-100A07AR	●	○	7	63	115.6	32	1	3.3	1.6
	AHX475S-100A09AR	●	○	9	63	115.6	32	1	3.3	1.6
125	AHX475S-125B08AR	●	○	8	63	140.6	40	2	4.0	1.6
	AHX475S-125B10AR	●	○	10	63	140.6	40	2	4.0	1.6
160	AHX475S-160B10AR	●	○	10	63	175.6	40	2	6.0	1.6
	AHX475S-160B12AR	●	○	12	63	175.6	40	2	6.0	1.6

(Note 1) The cutter body does not have a set bolt for an arbor. Please refer to page 19 when ordering.

\* Number of Teeth


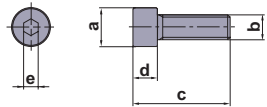









● : Inventory maintained in Japan. (10 inserts in one case)

## Spare Parts

Tool Holder Type		*	
	Clamp Screw		Wrench (Insert)
<b>AHX475S</b>	TS35R		TKY15T


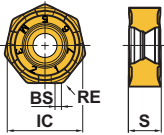
\* Clamp Torque (N · m) : TS35R=3.5

## Optional Parts

Tool Holder Type	Set Bolt		Fig.	Reference Dimensions							Geometry
	With Coolant Hole	Without Coolant Hole		a	b	c	d	e	f	g	
	Order Number	Order Number									
<b>AHX475S-050A</b>  <b>AR</b>	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	–	–	Fig.1 
<b>AHX475S-063A</b>  <b>AR</b>	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	–	–	
<b>AHX475S-080A</b>  <b>AR</b>	HSC12035H	HSC12035 HSC12045	1	18	M12×1.75	47 57	12	10	–	–	
<b>AHX475S-100B</b>  <b>AR</b>	HSC16040H	–	1	24	M16×2	56	16	14	–	–	
<b>AHX475S-125B</b>  <b>AR</b>	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
<b>AHX475S-160C</b>  <b>AR</b>	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
<b>AHX475SR080</b>  <b>DA</b>	HSC16040H	–	1	24	M16×2	56	16	14	–	–	
<b>AHX475SR100</b>  <b>DA</b>	HSC16040H	–	1	24	M16×2	56	16	14	–	–	
<b>AHX475SR125</b>  <b>EA</b>	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
<b>AHX475SR160</b>  <b>FA</b>	MBA24045H	–	2	65	M24×3	59	14	17	10	37	

(Note 1) Internal coolant is necessary with the set bolt.

## Inserts

Application	Shape	Order Number	Class	Honing	Coated					Dimensions (mm)					Geometry	
					MV1020	MV1030	MC5020	MP6120	MP6130	VP15TF	IC	RE	BS	S		APMX
General Cutting		<b>NNMU130532ZEN-M</b>	M	E	●	●	●	●	●	●	13.4	3.2	–	5.09	1.6	
Unstable Cutting		<b>NNMU130532ZEN-R</b>	M	E	●	●	●	●	●	●	13.4	3.2	–	5.09	1.6	

## Recommended Cutting Conditions

### ■ Dry Cutting

(mm)

	Workpiece Material	Properties	Grade	vc (m/min)
<b>P</b>	Mild Steel	Hardness ≤180HB	<b>MV1020</b>	220 (170–270)
			<b>MP6120</b>	150 (100–200)
			<b>MV1030</b>	140 (80–200)
			<b>MP6130</b>	130 (80–180)
	Carbon Steel, Alloy Steel	Hardness 180–280HB	<b>MV1020</b>	200 (150–250)
			<b>MP6120</b>	130 (80–180)
			<b>MV1030</b>	120 (60–180)
			<b>MP6130</b>	110 (60–160)
	Carbon Steel, Alloy Steel	Hardness 280–350HB	<b>MV1020</b>	150 (100–200)
			<b>MP6120</b>	100 (50–150)
			<b>MV1030</b>	90 (30–150)
			<b>MP6130</b>	80 (30–130)
	Alloy Tool Steel	Hardness ≤350HB (annealing)	<b>MP6120</b>	100 (50–150)
			<b>MP6130</b>	80 (30–120)
Pre-hardened Steel	Hardness 35–45HRC	<b>MP6120</b>	100 (70–130)	
		<b>MP6130</b>	80 (50–110)	
<b>K</b>	Gray Cast Iron	Tensile Strength ≤350MPa	<b>MC5020</b>	150 (100–200)
			<b>VP15TF</b>	120 (80–160)
	Ductile Cast Iron	Tensile Strength ≤450MPa	<b>MV1020</b>	200 (150–250)
			<b>MC5020</b>	150 (100–200)
			<b>MV1030</b>	140 (80–200)
			<b>VP15TF</b>	120 (80–160)
	Ductile Cast Iron	Tensile Strength ≤800MPa	<b>MV1020</b>	180 (130–230)
			<b>MC5020</b>	150 (100–200)
			<b>MV1030</b>	140 (80–200)
			<b>VP15TF</b>	120 (80–160)
<b>H</b>	Hardened Steel	Hardness 40–55HRC	<b>VP15TF</b>	70 (50–90)

## ■ Dry Cutting

(mm)

Workpiece Material	Properties	Grade	ap (mm)	Width of Cut ae						
				≤0.5DC		0.5DC–0.8DC		0.8DC–DC		
				Breaker	fz (mm/t.)	Breaker	fz (mm/t.)	Breaker	fz (mm/t.)	
<b>P</b>	Mild Steel	Hardness ≤180HB	MV1020 MV1030 MP6120 MP6130	≤1.6	R	0.6	R	0.8	M	1.0
	Carbon Steel, Alloy Steel	Hardness 180–280HB	MV1020 MV1030 MP6120 MP6130	≤1.6	R	0.6	R	0.8	M	1.0
	Carbon Steel, Alloy Steel	Hardness 280–350HB	MV1020 MV1030 MP6120 MP6130	≤1.6	R	0.5	R	0.6	R	0.7
	Alloy Tool Steel	Hardness ≤350HB (annealing)	MP6120 MP6130	≤1.6	R	0.5	R	0.6	R	0.7
	Pre-hardened Steel	Hardness 35-45HRC	MP6120 MP6130	≤1.6	R	0.5	R	0.6	R	0.7
<b>K</b>	Gray Cast Iron	Tensile Strength ≤350MPa	MC5020	≤1.6	R	0.6	R	0.8	M	1.0
			VP15TF	≤1.6	M	0.6	M	0.8	M	1.0
	Ductile Cast Iron	Tensile Strength ≤450MPa	MV1020 MV1030 MC5020 VP15TF	≤1.6	R	0.6	R	0.8	M	1.0
	Ductile Cast Iron	Tensile Strength ≤800MPa	MV1020 MV1030 MC5020 VP15TF	≤1.6	R	0.5	R	0.6	R	0.7
<b>H</b>	Hardened Steel	Hardness 40–55HRC	VP15TF	≤1.6	R	0.4	R	0.5	R	0.6

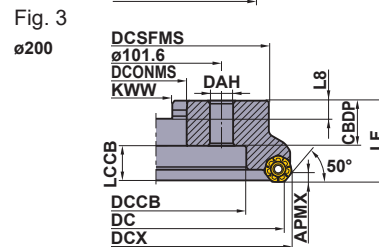
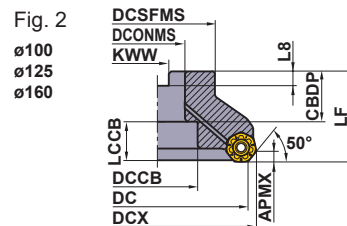
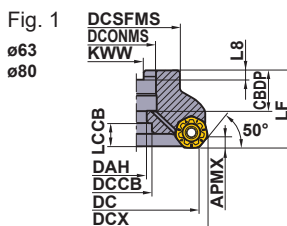
# General Purpose Multi Corner Insert Type Face Milling Cutter

## FACE MILLING <GENERAL CUTTING>



# AHX640S

- P
- M
- K
- N
- S
- H



Right hand tool holder only.

DC	Set Bolt	Geometry	
ø63	HSC10030H	①	
ø80	HSC12035H		
ø100	MBA16033H	②	
ø125	MBA20040H		
ø160	MBA24045H		
ø200	—		

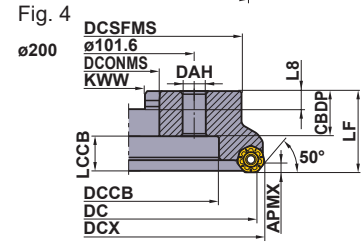
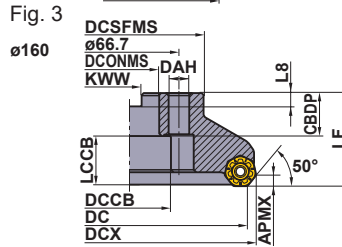
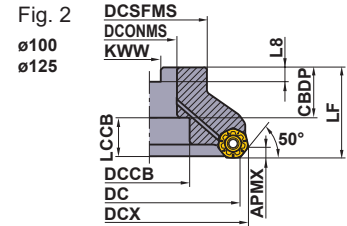
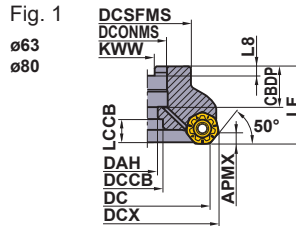
DC=mm size, DCON=Inch size

(mm)

DC	Order Number	Stock	Coolant Hole	No.T	LF	DCX	DCONMS	Fig.	WT(kg)	APMX
80	AHX640SR08004CA	●	○	4	50	92.55	25.4	1	1.1	6
	AHX640SR08006CA	●	○	6	50	92.55	25.4	1	1.0	6
100	AHX640SR10005DA	●	○	5	50	112.55	31.75	2	1.7	6
	AHX640SR10007DA	●	○	7	50	112.55	31.75	2	1.5	6
125	AHX640SR12506EA	●	○	6	63	137.55	38.1	2	3.0	6
	AHX640SR12508EA	●	○	8	63	137.55	38.1	2	2.9	6
160	AHX640SR16007FA	●	○	7	63	172.55	50.8	2	4.9	6
	AHX640SR16010FA	●	○	10	63	172.55	50.8	2	4.7	6
200	AHX640SR20008KN	●	—	8	63	212.55	47.625	3	8.2	6
	AHX640SR20012KN	●	—	12	63	212.55	47.625	3	7.9	6

\* Number of Teeth

● : Inventory maintained in Japan.



Right hand tool holder only.

DC	Set Bolt	Geometry	
$\phi 63$	HSC10030H	①	
$\phi 80$	HSC12035H		
$\phi 100$	MBA16033H	②	
$\phi 125$	MBA20040H		
$\phi 160$	—	—	—
$\phi 200$	—	—	—

DC=mm size, DCON=mm size

(mm)

DC	Order Number	Stock	Coolant Hole	No.T *	LF	DCX	DCONMS	Fig.	WT(kg)	APMX
63	AHX640S-063A04AR	●	○	4	50	75.55	22	1	0.7	6
	AHX640S-063A05AR	●	○	5	50	75.55	22	1	0.6	6
80	AHX640S-080A04AR	●	○	4	50	92.55	27	1	1.1	6
	AHX640S-080A06AR	●	○	6	50	92.55	27	1	1.0	6
100	AHX640S-100B05AR	●	○	5	50	112.55	32	2	1.7	6
	AHX640S-100B07AR	●	○	7	50	112.55	32	2	1.6	6
125	AHX640S-125B06AR	●	○	6	63	137.55	40	2	3.1	6
	AHX640S-125B08AR	●	○	8	63	137.55	40	2	3.0	6
160	AHX640S-160C07NR	●	—	7	63	172.55	40	3	5.4	6
	AHX640S-160C10NR	●	—	10	63	172.55	40	3	5.2	6
200	AHX640S-200C08NR	●	—	8	63	212.55	60	4	7.8	6
	AHX640S-200C12NR	●	—	12	63	212.55	60	4	7.5	6

\* Number of Teeth

## Spare Parts

Tool Holder Type	*	
<b>AHX640S</b>	Clamp Screw CS5015060T	Wrench (Insert) TKY20T

\* Clamp Torque (N · m) : CS5015060T=5.0

# General Purpose Multi Corner Insert Type Face Milling Cutter

## Inserts

(mm)

Application	Shape	Order Number	Class	Honing	Coated								Dimensions (mm)					Geometry				
					XC5010	MC5020	MP6120	MP6130	MP7030	MP9120	MP9130	VP15TF	VP20RT	IC	RE	BS	S		APMX			
Workpiece Material		P	Steel																	This is the selection guideline for AHX640S. Please note that the cutting conditions differ depending on multiple factors, for more details refer to the Recommended Cutting Conditions.  <b>Edge Preparation : E : Round</b>		
		M	Stainless Steel																			
		K	Cast Iron																			
		S	Heat Resistant and Titanium Alloys																			
		H	Hardened Steel																			
For Titanium Alloys and Heat Resistant Alloys		NNMU200712ZER-L	M	E																	 	
General Cutting		NNMU200708ZEN-M	M	E			●	●													 	
		NNMU200708ZEN-MP	M	E																	 	
		NNMU200712ZER-MM	M	E					●												 	
		NNMU200608ZEN-MK	M	E	●	●																 
		NNMU200608ZEN-HK	M	E		●																 
For Cast Iron Strong Cutting Edge Type		NNMQ200708ZEN-FT	M	E	●																 	


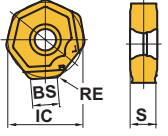

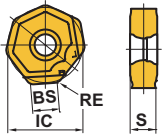

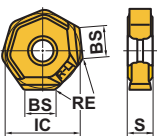
Note 1) The height of the cutter when setting MK or HK inserts is different from when setting MP, MM and FT inserts.

● = NEW

● : Inventory maintained in Japan. (10 inserts in one case)

# Wiper Inserts

(mm)

Application	Shape	Order Number	Class	Honing	Coated								Dimensions (mm)					Geometry													
					XC5010	MC5020	MP6120	MP6130	MP7030	MP9120	MP9130	VP15TF	VP20RT	IC	RE	BS	S		APMX												
Workpiece Material		<table border="1"> <tr><td>P</td><td>Steel</td></tr> <tr><td>M</td><td>Stainless Steel</td></tr> <tr><td>K</td><td>Cast Iron</td></tr> <tr><td>S</td><td>Heat Resistant and Titanium Alloys</td></tr> <tr><td>H</td><td>Hardened Steel</td></tr> </table>	P	Steel	M	Stainless Steel	K	Cast Iron	S	Heat Resistant and Titanium Alloys	H	Hardened Steel																			<p>This is the selection guideline for AHX640S. Please note that the cutting conditions differ depending on multiple factors, for more details refer to the Recommended Cutting Conditions.</p> <p><b>Edge Preparation : E : Round</b></p>
P	Steel																														
M	Stainless Steel																														
K	Cast Iron																														
S	Heat Resistant and Titanium Alloys																														
H	Hardened Steel																														
For Finish Cutting	 Wiper	WNEU2007ZEN7C-M	E	E			●									20	0.8	7.2	6.85	0.5											
For Finish Cutting	 Wiper	WNEU2007ZEN7C-WP	E	E												20	0.8	7.1	6.85	0.5											
For Finish Cutting	 Wiper	WNEU2006ZEN7C-WK	E	E			●									20	0.8	7.4	6.55	0.5											

## Instructions for Use of Wiper Inserts

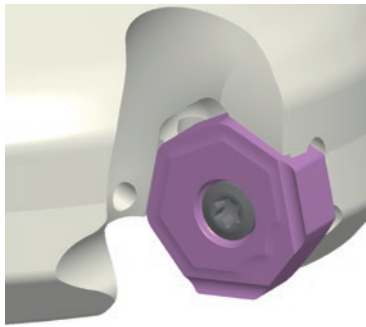


Fig.1

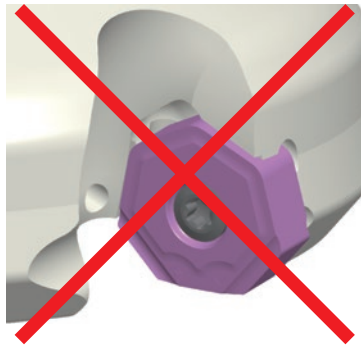


Fig.2

(Note 1) These wiper inserts have 2 cutting edges for left hand use and 2 corners for right hand use. Position as shown in figure 1.

(Note 2) A satisfactory finish surface can be achieved with one wiper insert.

However, if the feed rate per revolution will be equal to or greater than the width of the wiper edge, it is recommended to install the second and further wiper inserts spaced evenly within the cutting body.

# General Purpose Multi Corner Insert Type Face Milling Cutter

## Recommended Cutting Conditions

### ■ Dry Cutting

(mm)

Workpiece Material	Properties	Cutting Conditions	Grade	Breaker	vc (m/min)	fz (mm/t.)	ap	ae	
P	Mild Steel	☑	MP6120	M	250(200-300)	0.3(0.2-0.4)	≤5	≤0.8DC	
		☑	VP15TF	MP	250(200-300)	0.3(0.2-0.4)	≤5	≤0.8DC	
		✘	MP6130	M	220(170-270)	0.4(0.3-0.5)	≤5	≤0.8DC	
	Carbon Steel, Alloy Steel	Hardness 180-280HB	☑	MP6120	M	220(170-270)	0.3(0.2-0.4)	≤5	≤0.8DC
			☑	VP15TF	MP	220(170-270)	0.3(0.2-0.4)	≤5	≤0.8DC
			✘	MP6130	M	190(140-240)	0.4(0.3-0.5)	≤5	≤0.8DC
	Carbon Steel, Alloy Steel	Hardness 280-350HB	☑	MP6120	M	140(100-180)	0.3(0.2-0.4)	≤5	≤0.8DC
			☑	VP15TF	MP	140(100-180)	0.3(0.2-0.4)	≤5	≤0.8DC
			✘	MP6130	M	110(70-150)	0.4(0.3-0.5)	≤5	≤0.8DC
	Alloy Tool Steel	Hardness ≤350HB (annealing)	☑	MP6120	M	140(100-180)	0.15(0.1-0.2)	≤3	≤0.8DC
			☑	VP15TF	MP	140(100-180)	0.15(0.1-0.2)	≤3	≤0.8DC
			✘	MP6130	M	110(70-150)	0.25(0.2-0.3)	≤3	≤0.8DC
Pre-hardened Steel	Hardness 35-45HRC	☑	MP6120	M	140(100-180)	0.15(0.1-0.2)	≤3	≤0.8DC	
		☑	VP15TF	MP	140(100-180)	0.15(0.1-0.2)	≤5	≤0.8DC	
		✘	MP6130	M	110(70-150)	0.25(0.2-0.3)	≤3	≤0.8DC	
M	Austenitic Stainless Steel	Hardness ≤200HB	☑	MP7030	MM	200(150-250)	0.2(0.1-0.3)	≤5	≤0.8DC
	Austenitic Stainless Steel	Hardness > 200HB	☑	MP7030	MM	150(100-200)	0.2(0.1-0.3)	≤5	≤0.8DC
	Two-phase Stainless Steel	Hardness ≤280HB	☑	MP7030	MM	140(100-180)	0.15(0.05-0.25)	≤5	≤0.8DC
	Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	☑	MP7030	MM	200(150-250)	0.2(0.1-0.3)	≤5	≤0.8DC
	Ferritic and Martensitic Stainless Steel	Hardness > 200HB	☑	MP7030	MM	150(100-200)	0.2(0.1-0.3)	≤5	≤0.8DC
	Precipitation-Hardening Stainless Steel	Hardness < 450HB	☑	MP7030	MM	130(100-160)	0.15(0.05-0.25)	≤5	≤0.8DC
K	Gray Cast Iron	Tensile Strength ≤350MPa	☑	XC5010	MK, FT	800(500-1000)	0.1(0.1-0.3)	≤3	≤0.8DC
			☑	MC5020	MK, HK	220(150-300)	0.3(0.2-0.4)	≤5	≤0.8DC
			☑	VP15TF	MP	180(130-230)	0.3(0.2-0.4)	≤5	≤0.8DC
			✘	VP15TF, VP20RT	MK, HK	180(130-230)	0.3(0.2-0.4)	≤5	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤450MPa	☑	XC5010	MK, FT	800(500-1000)	0.1(0.1-0.3)	≤3	≤0.8DC
			☑	MC5020	MK, HK	200(150-250)	0.2(0.1-0.3)	≤5	≤0.8DC
			☑	VP15TF	MP	170(120-220)	0.2(0.1-0.3)	≤5	≤0.8DC
			✘	VP15TF, VP20RT	MK, HK	170(120-220)	0.2(0.1-0.3)	≤5	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	☑	XC5010	MK, FT	800(500-1000)	0.1(0.1-0.3)	≤3	≤0.8DC
			☑	MC5020	MK, HK	170(150-200)	0.2(0.1-0.3)	≤5	≤0.8DC
			☑	VP15TF	MP	140(100-180)	0.2(0.1-0.3)	≤5	≤0.8DC
			✘	VP15TF, VP20RT	MK, HK	140(100-180)	0.2(0.1-0.3)	≤5	≤0.8DC
H	Hardened Steel	40-55HRC	☑	VP15TF	MP	80(60-100)	0.15(0.1-0.2)	≤3	≤0.8DC

(Note1) Wet cutting is recommended for good surface finishing of stainless steel. (Tool life is short compared to dry cutting.)

(Note2) Wet cutting with internal coolant is recommended for titanium and heat resistant alloys.

(Note3) If the clamping rigidity of the work material is low and the tool overhang is long, adjust the cutting speed and feed in the table above.

## Recommended Cutting Conditions

### Wet Cutting

(mm)

Workpiece Material	Properties	Breaker	Grade	vc (m/min)	fz (mm/t.)	ap	ae	
<b>M</b>	Austenitic Stainless Steel	≤200HB	<b>MP7030</b>	<b>MM</b>	125(100–150)	0.15(0.1–0.2)	≤5	≤0.8DC
	Austenitic Stainless Steel	> 200HB	<b>MP7030</b>	<b>MM</b>	100(75–125)	0.15(0.1–0.2)	≤5	≤0.8DC
	Two-phase Stainless Steel	≤280HB	<b>MP7030</b>	<b>MM</b>	80(60–100)	0.1(0.05–0.15)	≤5	≤0.8DC
	Ferritic and Martensitic Stainless Steel	≤200HB	<b>MP7030</b>	<b>MM</b>	125(100–150)	0.15(0.1–0.2)	≤5	≤0.8DC
	Ferritic and Martensitic Stainless Steel	> 200HB	<b>MP7030</b>	<b>MM</b>	100(75–125)	0.15(0.1–0.2)	≤5	≤0.8DC
	Precipitation-Hardening Stainless Steel	< 450HB	<b>MP7030</b>	<b>MM</b>	70(50–90)	0.1(0.05–0.15)	≤5	≤0.8DC
<b>S</b>	Titanium Alloys	–	<b>MP7030</b>	<b>MM</b>	40(20–50)	0.15(0.1–0.2)	≤3	≤0.6DC
		–	<b>MP9120</b>	<b>L</b>	60(50–70)	0.1(0.05–0.15)	≤3	≤0.6DC
		–	<b>MP9130</b>	<b>L</b>	40(20–50)	0.15(0.1–0.2)	≤3	≤0.6DC
	Heat Resistant Alloys	–	<b>MP7030</b>	<b>MM</b>	40(20–50)	0.15(0.1–0.2)	≤3	≤0.6DC
		–	<b>MP9120</b>	<b>L</b>	60(50–70)	0.1(0.05–0.15)	≤3	≤0.6DC
		–	<b>MP9130</b>	<b>L</b>	40(20–50)	0.15(0.1–0.2)	≤3	≤0.6DC

(Note1) Wet cutting is recommended for good surface finishing of stainless steel. (Tool life is short compared to dry cutting.)

(Note2) Wet cutting with internal coolant is recommended for titanium and heat resistant alloys.

(Note3) When clamp rigidity is low and tool overhang is long, it is recommended to reduce the cutting speed and the feed rate by 30%.

### Cutting Conditions with Wiper Insert

(mm)

Workpiece Material	Properties	Main Insert	Grade	Wiper Insert	Grade	vc (m/min)	fz (mm/t.)	ap	ae	
<b>P</b>	Mild Steel	Hardness ≤180HB	<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	250(200–300)	0.3(0.2–0.4)	≤0.5	≤0.8DC
			<b>MP6120</b>	<b>M</b>	<b>MP6120</b>	<b>M</b>	250(200–300)	0.3(0.2–0.4)	≤0.5	≤0.8DC
	Carbon Steel, Alloy Steel	Hardness 180–280HB	<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	220(170–270)	0.3(0.2–0.4)	≤0.5	≤0.8DC
			<b>MP6120</b>	<b>M</b>	<b>MP6120</b>	<b>M</b>	220(170–270)	0.3(0.2–0.4)	≤0.5	≤0.8DC
Carbon Steel, Alloy Steel	Hardness 280–350HB	<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	140(100–180)	0.3(0.2–0.4)	≤0.5	≤0.8DC	
		<b>MP6120</b>	<b>M</b>	<b>MP6120</b>	<b>M</b>	140(100–180)	0.3(0.2–0.4)	≤0.5	≤0.8DC	
<b>K</b>	Gray Cast Iron	Tensile Strength ≤350MPa	<b>MC5020</b>	<b>MK, HK</b>	<b>MC5020</b>	<b>WK</b>	320(250–400)	0.3(0.2–0.4)	≤0.5	≤0.8DC
			<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	220(150–300)	0.3(0.2–0.4)	≤0.5	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤450MPa	<b>MC5020</b>	<b>MK, HK</b>	<b>MC5020</b>	<b>WK</b>	250(200–300)	0.2(0.1–0.3)	≤0.5	≤0.8DC
			<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	200(150–250)	0.2(0.1–0.3)	≤0.5	≤0.8DC
Ductile Cast Iron	Tensile Strength ≤800MPa	<b>MC5020</b>	<b>MK, HK</b>	<b>MC5020</b>	<b>WK</b>	220(200–250)	0.2(0.1–0.3)	≤0.5	≤0.8DC	
		<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	170(150–200)	0.2(0.1–0.3)	≤0.5	≤0.8DC	
<b>S</b>	Heat Resistant Alloys	–	<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	40(20–50)	0.15(0.1–0.2)	≤0.5	≤0.8DC
<b>H</b>	Hardened Steel	40–55HRC	<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	80(60–100)	0.15(0.1–0.2)	≤0.5	≤0.8DC

(Note 1) When clamp rigidity is low and tool overhang is long, it is recommended to reduce the cutting speed and the feed rate by 30%.

(Note 2) Please use WP geometry insert in combination with MP geometry inserts, and use WK geometry insert in combination with MK or HK geometry inserts

# General Purpose Multi Corner Insert Type Face Milling Cutter

## FACE MILLING

<HIGH FEED CUTTING FOR CAST IRON>



# AHX640W

P M **K** N S H



Fig.1

ø80

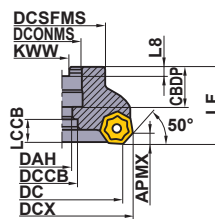


Fig.2

ø100  
ø125  
ø160

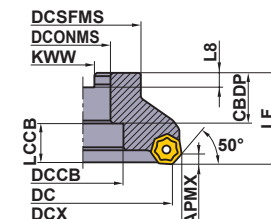


Fig.3

ø200  
ø250

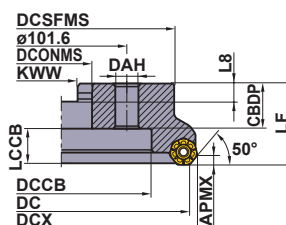
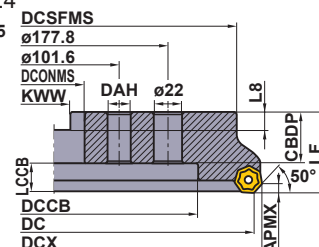


Fig.4

ø315



Right Hand Tool Holder

DC=mm size, DCON=Inch size

Right hand tool holder shown.

(mm)

DC	Order Number	Stock	Coolant Hole	No.T *	LF	DCX	DCONMS	Fig.	WT(kg)	APMX
80	AHX640WR08008C	●	—	8	50	92.6	25.4	1	1.5	6
	AHX640WR08010C	●	—	10	50	92.6	25.4	1	1.5	6
100	AHX640WR10010D	●	—	10	50	112.6	31.75	2	2.1	6
	AHX640WR10014D	●	—	14	50	112.6	31.75	2	2.1	6
125	AHX640WR12512E	●	—	12	63	137.6	38.1	2	3.5	6
	AHX640WR12518E	●	—	18	63	137.6	38.1	2	3.5	6
160	AHX640WR16016F	●	—	16	63	172.6	50.8	2	5.6	6
	AHX640WR16022F	●	—	22	63	172.6	50.8	2	5.6	6
200	AHX640WR20020K	●	—	20	63	212.6	47.625	3	9.0	6
	AHX640WR20028K	●	—	28	63	212.6	47.625	3	9.0	6
250	AHX640WR25024K	●	—	24	63	262.6	47.625	3	14.4	6
	AHX640WR25036K	●	—	36	63	262.6	47.625	3	14.4	6
315	AHX640WR31528P	●	—	28	63	327.6	47.625	4	23.8	6
	AHX640WR31544P	●	—	44	63	327.6	47.625	4	23.8	6

Left Hand Tool Holder

DC=mm size, DCON=Inch size

(mm)

DC	Order Number	Stock	Coolant Hole	No.T *	LF	DCX	DCONMS	Fig.	WT(kg)	APMX
80	AHX640WL08008C	●	—	8	50	92.6	25.4	1	1.5	6
	AHX640WL08010C	●	—	10	50	92.6	25.4	1	1.5	6
100	AHX640WL10010D	●	—	10	50	112.6	31.75	2	2.1	6
	AHX640WL10014D	●	—	14	50	112.6	31.75	2	2.1	6
125	AHX640WL12512E	●	—	12	63	137.6	38.1	2	3.5	6
	AHX640WL12518E	●	—	18	63	137.6	38.1	2	3.5	6
160	AHX640WL16016F	●	—	16	63	172.6	50.8	2	5.6	6
	AHX640WL16022F	●	—	22	63	172.6	50.8	2	5.6	6
200	AHX640WL20020K	●	—	20	63	212.6	47.625	3	9.0	6
	AHX640WL20028K	●	—	28	63	212.6	47.625	3	9.0	6
250	AHX640WL25024K	●	—	24	63	262.6	47.625	3	14.4	6
	AHX640WL25036K	●	—	36	63	262.6	47.625	3	14.4	6
315	AHX640WL31528P	●	—	28	63	327.6	47.625	4	23.8	6
	AHX640WL31544P	●	—	44	63	327.6	47.625	4	23.8	6

\* Number of Teeth

● : Inventory maintained in Japan.



Fig.1  
ø80

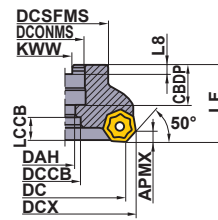


Fig.2  
ø100  
ø125

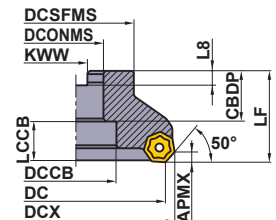


Fig.3  
ø160

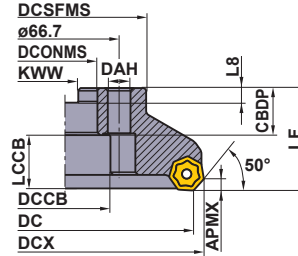


Fig.4  
ø200  
ø250

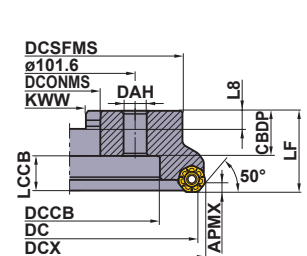
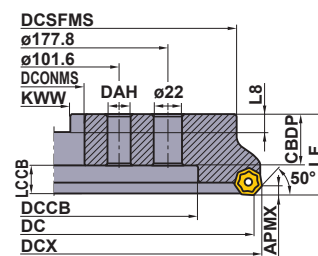


Fig.5  
ø315



Right Hand Tool Holder

DC=mm size, DCON=mm size

Right hand tool holder shown.

(mm)

DC	Order Number	Stock	Coolant Hole	No.T *	LF	DCX	DCONMS	Fig.	WT(kg)	APMX
80	AHX640W-080A08R	●	—	8	50	92.6	27	1	1.5	6
	AHX640W-080A10R	●	—	10	50	92.6	27	1	1.5	6
100	AHX640W-100B10R	●	—	10	50	112.6	32	2	2.1	6
	AHX640W-100B14R	●	—	14	50	112.6	32	2	2.1	6
125	AHX640W-125B12R	●	—	12	63	137.6	40	2	3.1	6
	AHX640W-125B18R	●	—	18	63	137.6	40	2	3.1	6
160	AHX640W-160C16R	●	—	16	63	172.6	40	3	5.6	6
	AHX640W-160C22R	●	—	22	63	172.6	40	3	5.6	6
200	AHX640W-200C20R	●	—	20	63	212.6	60	4	8	6
	AHX640W-200C28R	●	—	28	63	212.6	60	4	8	6
250	AHX640W-250C24R	●	—	24	63	262.6	60	4	12.6	6
	AHX640W-250C36R	●	—	36	63	262.6	60	4	12.6	6
315	AHX640W-315C28R	●	—	28	80	327.6	60	5	31.5	6
	AHX640W-315C44R	●	—	44	80	327.6	60	5	31.5	6

Left Hand Tool Holder

DC=mm size, DCON=mm size

(mm)

DC	Order Number	Stock	Coolant Hole	No.T *	LF	DCX	DCONMS	Fig.	WT(kg)	APMX
80	AHX640W-080A08L	●	—	8	50	92.6	27	1	1.5	6
	AHX640W-080A10L	●	—	10	50	92.6	27	1	1.5	6
100	AHX640W-100B10L	●	—	10	50	112.6	32	2	2.1	6
	AHX640W-100B14L	●	—	14	50	112.6	32	2	2.1	6
125	AHX640W-125B12L	●	—	12	63	137.6	40	2	3.1	6
	AHX640W-125B18L	●	—	18	63	137.6	40	2	3.1	6
160	AHX640W-160C16L	●	—	16	63	172.6	40	3	5.6	6
	AHX640W-160C22L	●	—	22	63	172.6	40	3	5.6	6
200	AHX640W-200C20L	●	—	20	63	212.6	60	4	8.0	6
	AHX640W-200C28L	●	—	28	63	212.6	60	4	8.0	6
250	AHX640W-250C24L	●	—	24	63	262.6	60	4	12.6	6
	AHX640W-250C36L	●	—	36	63	262.6	60	4	12.6	6
315	AHX640W-315C28L	●	—	28	80	327.6	60	5	31.5	6
	AHX640W-315C44L	●	—	44	80	327.6	60	5	31.5	6

\* Number of Teeth


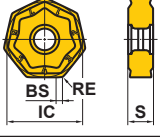

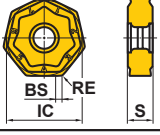
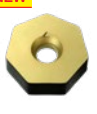
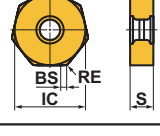

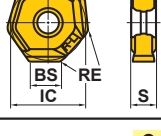
MOUNTING DIMENSION > P35

CUTTING CONDITIONS > P32

# General Purpose Multi Corner Insert Type Face Milling Cutter

## Inserts




(mm)

Workpiece Material		K	Cast Iron	◆	◆	◆	This is the selection guideline for AHX640W. Please note that the cutting conditions differ depending on multiple factors, for more details refer to the Recommended Cutting Conditions. <b>Edge Preparation :</b> E : Round						
Application	Shape	Order Number	Class	Honing	Coated			Dimensions(mm)					Geometry
					NEW XC5010	MC5020	VP20RT	IC	RE	BS	S	APMX	
General Cutting		NNMU200608ZEN-MK	M	E	●	●	●	20	0.8	1.0	6.1	6	
Unstable Cutting		NNMU200608ZEN-HK	M	E		●	●	20	0.8	1.0	6.1	6	
		NNMQ200708ZEN-FT	M	E	●			20	0.8	1.0	6.55	6	
Finishi Cutting		WNEU2006ZEN7C-WK	E	E		●		20	0.8	7.4	6.55	0.5	

● = NEW



## Spare Parts

Tool Holder Type			
	Wedge	Clamp Screw	Wrench
<b>AHX640W</b>	CWAHX640WN	LS0622T	TKY15T

\* Clamp Torque (N · m) : LS0622T=6.0

● : Inventory maintained in Japan. (10 inserts in one case)

## Recommended Cutting Conditions

### ■ Dry-Wet Cutting

(mm)

Workpiece Material	Properties	Cutting Conditions	Grade	Breaker	vc (m/min)	fz (mm/t.)	ap	ae
Gray Cast Iron	Tensile Strength ≤350MPa	☹	<b>XC5010</b>	<b>MK, FT</b>	800(500—1000)	0.1(0.1—0.3)	≤3	≤0.8DC
		☹	<b>MC5020</b>	<b>MK, HK</b>	220(150—300)	0.3(0.2—0.4)	≤5	≤0.8DC
		☹✘	<b>VP15TF,VP20RT</b>	<b>MK, HK</b>	180(130—230)	0.3(0.2—0.4)	≤5	≤0.8DC
Ductile Cast Iron	Tensile Strength ≤450MPa	☹	<b>XC5010</b>	<b>MK, FT</b>	800(500—1000)	0.1(0.1—0.3)	≤3	≤0.8DC
		☹	<b>MC5020</b>	<b>MK, HK</b>	200(150—250)	0.2(0.1—0.3)	≤5	≤0.8DC
		☹✘	<b>VP15TF,VP20RT</b>	<b>MK, HK</b>	170(120—220)	0.2(0.1—0.3)	≤5	≤0.8DC
Ductile Cast Iron	Tensile Strength ≤800MPa	☹	<b>XC5010</b>	<b>MK, FT</b>	800(500—1000)	0.1(0.1—0.3)	≤3	≤0.8DC
		☹	<b>MC5020</b>	<b>MK, HK</b>	170(150—200)	0.2(0.1—0.3)	≤5	≤0.8DC
		☹✘	<b>VP15TF,VP20RT</b>	<b>MK, HK</b>	140(100—180)	0.2(0.1—0.3)	≤5	≤0.8DC

(Note 1) With reference to the above examples, adjust the cutting conditions according to the machining set up.

(Note 2) Tool life when wet cutting is short compared to dry cutting.

### ■ Finishing (Use of Wiper Inserts)

(mm)

Workpiece Material	Properties	Cutting Conditions	Grade	Breaker	vc (m/min)	fz (mm/t.)	ap
Gray Cast Iron	Tensile Strength ≤350MPa	☹	<b>MC5020</b>	<b>MK, HK</b>	320(250—400)	0.2(0.1—0.3)	<0.5
		☹	<b>MC5020</b>	<b>MK, HK</b>	270(200—350)	0.2(0.1—0.3)	0.5—3
Ductile Cast Iron	Tensile Strength ≤450MPa	☹	<b>MC5020</b>	<b>MK, HK</b>	270(200—350)	0.2(0.1—0.3)	<0.5
		☹	<b>MC5020</b>	<b>MK, HK</b>	220(200—250)	0.2(0.1—0.3)	0.5—3

(Note 3) Please use 2-3 pcs of Wiper inserts where the feed rate exceeds 6mm/rev.

## AHX440S, AHX475S, AHX640S Mounting Dimensions

Fig. 1

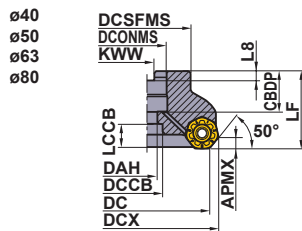


Fig. 2

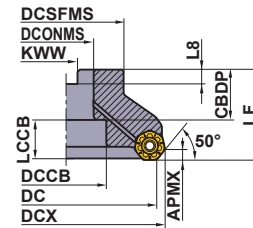
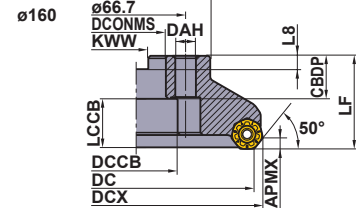


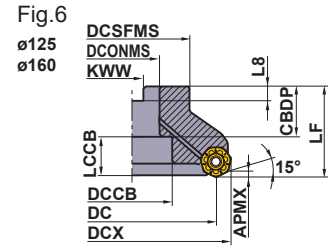
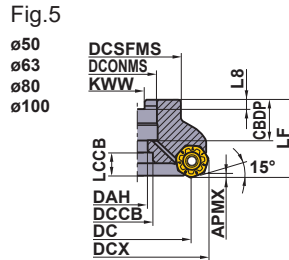
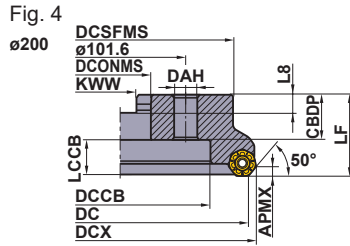
Fig. 3



Right hand tool holder only.

(mm)

DCONMS	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
16	40	AHX440S-040A03AR	18	9	14	13.9	37	8.4	5.6	1
16	40	AHX440S-040A04AR	18	9	14	13.9	37	8.4	5.6	1
22	50	AHX440S-050A04AR	20	11	17	11.9	47	10.4	6.3	1
22	50	AHX440S-050A05AR	20	11	17	11.9	47	10.4	6.3	1
22	50	AHX440S-050A06AR	20	11	17	11.9	47	10.4	6.3	1
22	50	AHX475S-050A04AR	20	11	17	16.7	47	10.4	6.3	5
22	50	AHX475S-050A05AR	20	11	17	16.7	47	10.4	6.3	5
22	63	AHX440S-063A05AR	20	11	17	11.9	50	10.4	6.3	1
22	63	AHX440S-063A06AR	20	11	17	11.9	50	10.4	6.3	1
22	63	AHX440S-063A08AR	20	11	17	11.9	50	10.4	6.3	1
22	63	AHX475S-063A05AR	20	11	17	16.7	60	10.4	6.3	5
22	63	AHX475S-063A06AR	20	11	17	16.7	60	10.4	6.3	5
22	63	AHX640S-063A04AR	20	11	17	16.2	50	10.4	6.3	1
22	63	AHX640S-063A05AR	20	11	17	16.2	50	10.4	6.3	1
25.4	80	AHX440SR08006CA	26	13	20	14.9	56	9.5	6	1
25.4	80	AHX440SR08008CA	26	13	20	14.9	56	9.5	6	1
25.4	80	AHX440SR08010CA	26	13	20	14.9	56	9.5	6	1
25.4	80	AHX640SR08004CA	26	13	20	14.2	56	9.5	6	1
25.4	80	AHX640SR08006CA	26	13	20	14.2	56	9.5	6	1
27	80	AHX440S-080A06AR	23	13	20	14.9	56	12.4	7	1
27	80	AHX440S-080A08AR	23	13	20	14.9	56	12.4	7	1
27	80	AHX440S-080A10AR	23	13	20	14.9	56	12.4	7	1
27	80	AHX475S-080A06AR	23	13	20	14.7	76	12.4	7	5
27	80	AHX475S-080A08AR	23	13	20	14.7	76	12.4	7	5
27	80	AHX640S-080A04AR	23	13	20	15.2	56	12.4	7	1
27	80	AHX640S-080A06AR	23	13	20	15.2	56	12.4	7	1
31.75	80	AHX475SR08006DA	32	17	26	19.7	76	12.7	8	5
31.75	80	AHX475SR08008DA	32	17	26	19.7	76	12.7	8	5
31.75	100	AHX440SR10007DA	37	—	45	11.9	70	12.7	8	2
31.75	100	AHX440SR10010DA	37	—	45	11.9	70	12.7	8	2
31.75	100	AHX440SR10012DA	37	—	45	11.9	70	12.7	8	2
31.75	100	AHX475SR10007DA	32	17	26	19.7	96	12.7	8	5
31.75	100	AHX475SR10009DA	32	17	26	19.7	96	12.7	8	5
31.75	100	AHX640SR10005DA	35	—	45	13.2	70	12.7	8	2
31.75	100	AHX640SR10007DA	35	—	45	13.2	70	12.7	8	2



Right hand tool holder only.

(mm)

DCONMS	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
32	100	AHX440S-100B07AR	32	—	45	16.9	78	14.4	8	2
32	100	AHX440S-100B10AR	32	—	45	16.9	78	14.4	8	2
32	100	AHX440S-100B12AR	32	—	45	16.9	78	14.4	8	2
32	100	AHX475S-100A07AR	26	17	26	25.7	96	14.4	8	5
32	100	AHX475S-100A09AR	26	17	26	25.7	96	14.4	8	5
32	100	AHX640S-100B05AR	32	—	45	16.2	78	14.4	8	2
32	100	AHX640S-100B07AR	32	—	45	16.2	78	14.4	8	2
38.1	125	AHX440SR12508EA	42	—	56	19.9	80	15.9	10	2
38.1	125	AHX440SR12512EA	42	—	56	19.9	80	15.9	10	2
38.1	125	AHX440SR12514EA	42	—	56	19.9	80	15.9	10	2
38.1	125	AHX475SR12508EA	42	—	56	19.7	100	15.9	10	6
38.1	125	AHX475SR12510EA	42	—	56	19.7	100	15.9	10	6
38.1	125	AHX640SR12506EA	42	—	56	19.2	80	15.9	10	2
38.1	125	AHX640SR12508EA	42	—	56	19.2	80	15.9	10	2
40	125	AHX440S-125B08AR	40	—	56	21.9	89	16.4	9	2
40	125	AHX440S-125B12AR	40	—	56	21.9	89	16.4	9	2
40	125	AHX440S-125B14AR	40	—	56	21.9	89	16.4	9	2
40	125	AHX475S-125B08AR	40	—	56	21.7	100	16.4	9	6
40	125	AHX475S-125B10AR	40	—	56	21.7	100	16.4	9	6
40	125	AHX640S-125B06AR	42	—	56	19.2	89	16.4	9	2
40	125	AHX640S-125B08AR	42	—	56	19.2	89	16.4	9	2
40	160	AHX440S-160C10NR	40	14	56	21.9	100	16.4	9	3
40	160	AHX440S-160C14NR	40	14	56	21.9	100	16.4	9	3
40	160	AHX440S-160C16NR	40	14	56	21.9	100	16.4	9	3
40	160	AHX475S-160B10AR	40	—	56	21.7	100	16.4	9	6
40	160	AHX475S-160B12AR	40	—	56	21.7	100	16.4	9	6
40	160	AHX640S-160C07NR	29	14	56	32.2	120	16.4	9	3
40	160	AHX640S-160C10NR	29	14	56	32.2	120	16.4	9	3
47.625	200	AHX640SR20008KN	35	18	140	26.2	175	25.4	14.22	4
47.625	200	AHX640SR20012KN	35	18	140	26.2	175	25.4	14.22	4
50.8	160	AHX440SR16010FA	45	—	72	16.9	100	19.1	11	2
50.8	160	AHX440SR16014FA	45	—	72	16.9	100	19.1	11	2
50.8	160	AHX440SR16016FA	45	—	72	16.9	100	19.1	11	2
50.8	160	AHX475SR16010FA	45	—	72	16.7	100	19.1	11	6
50.8	160	AHX475SR16012FA	45	—	72	16.7	100	19.1	11	6
50.8	160	AHX640SR16007FA	43	—	72	18.2	100	19.1	11	2
50.8	160	AHX640SR16010FA	43	—	72	18.2	100	19.1	11	2
60	200	AHX640S-200C08NR	32	18	140	29.2	175	25.7	14.22	4
60	200	AHX640S-200C12NR	32	18	140	29.2	175	25.7	14.22	4

## AHX640W Mounting Dimensions

Fig.1

ø80

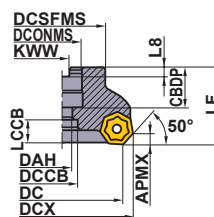
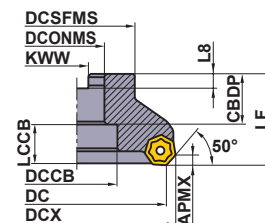


Fig.2

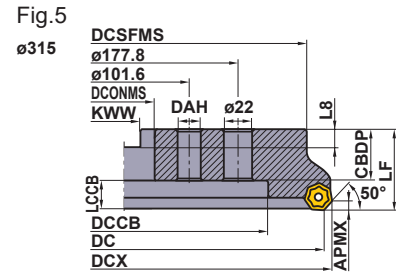
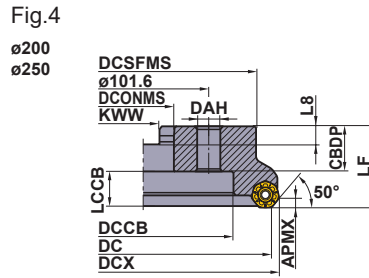
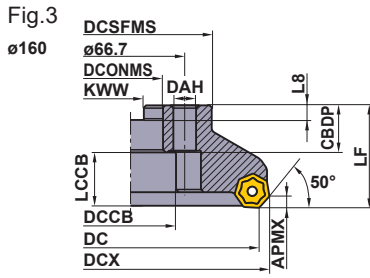
ø100  
ø125  
ø160



Right hand tool holder shown.

(mm)

DCONMS	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
25.4	80	AHX640WL08008C	26	13	20	14.8	56	9.5	6	1
25.4	80	AHX640WL08010C	26	13	20	14.8	56	9.5	6	1
25.4	80	AHX640WR08008C	26	13	20	14.8	56	9.5	6	1
25.4	80	AHX640WR08010C	26	13	20	14.8	56	9.5	6	1
27	80	AHX640W-080A08L	23	13	20	14.8	56	12.4	7	1
27	80	AHX640W-080A08R	23	13	20	14.8	56	12.4	7	1
27	80	AHX640W-080A10L	23	13	20	14.8	56	12.4	7	1
27	80	AHX640W-080A10R	23	13	20	14.8	56	12.4	7	1
31.75	100	AHX640WL10010D	32	—	45	16.8	70	12.7	8	2
31.75	100	AHX640WL10014D	32	—	45	16.8	70	12.7	8	2
31.75	100	AHX640WR10010D	32	—	45	16.8	70	12.7	8	2
31.75	100	AHX640WR10014D	32	—	45	16.8	70	12.7	8	2
32	100	AHX640W-100B10L	32	—	45	16.8	70	14.4	8	2
32	100	AHX640W-100B10R	32	—	45	16.8	70	14.4	8	2
32	100	AHX640W-100B14L	32	—	45	16.8	70	14.4	8	2
32	100	AHX640W-100B14R	32	—	45	16.8	70	14.4	8	2
38.1	125	AHX640WL12512E	35	—	56	26.8	80	15.9	10	2
38.1	125	AHX640WL12518E	35	—	56	26.8	80	15.9	10	2
38.1	125	AHX640WR12512E	35	—	56	26.8	80	15.9	10	2
38.1	125	AHX640WR12518E	35	—	56	26.8	80	15.9	10	2
40	125	AHX640W-125B12L	32	—	56	29.8	80	16.4	9	2
40	125	AHX640W-125B12R	32	—	56	29.8	80	16.4	9	2
40	125	AHX640W-125B18L	32	—	56	29.8	80	16.4	9	2
40	125	AHX640W-125B18R	32	—	56	29.8	80	16.4	9	2
40	160	AHX640W-160C16L	29	14	56	32.8	100	16.4	9	3
40	160	AHX640W-160C16R	29	14	56	32.8	100	16.4	9	3
40	160	AHX640W-160C22L	29	14	56	32.8	100	16.4	9	3
40	160	AHX640W-160C22R	29	14	56	32.8	100	16.4	9	3



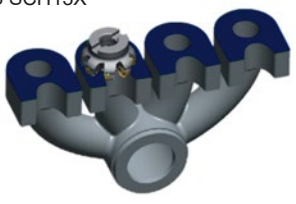

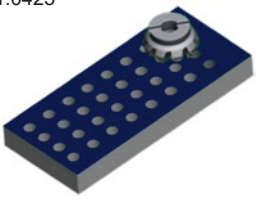
Right hand tool holder shown.

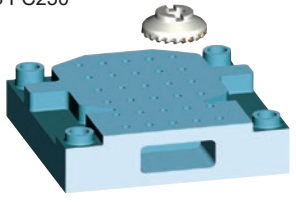

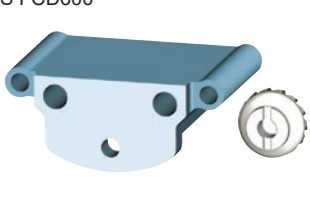
(mm)

DCONMS	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
47.625	200	AHX640WL20020K	35	18	140	26.8	175	25.4	14.22	4
47.625	200	AHX640WL20028K	35	18	140	26.8	175	25.4	14.22	4
47.625	200	AHX640WR20020K	35	18	140	26.8	175	25.4	14.22	4
47.625	200	AHX640WR20028K	35	18	140	26.8	175	25.4	14.22	4
47.625	250	AHX640WL25024K	35	18	180	26.8	220	25.4	14.22	4
47.625	250	AHX640WL25036K	35	18	180	26.8	220	25.4	14.22	4
47.625	250	AHX640WR25024K	35	18	180	26.8	220	25.4	14.22	4
47.625	250	AHX640WR25036K	35	18	180	26.8	220	25.4	14.22	4
47.625	315	AHX640WL31528P	40	18	225	21.8	285	25.4	14.22	5
47.625	315	AHX640WL31544P	40	18	225	21.8	285	25.4	14.22	5
47.625	315	AHX640WR31528P	40	18	225	21.8	285	25.4	14.22	5
47.625	315	AHX640WR31544P	40	18	225	21.8	285	25.4	14.22	5
50.8	160	AHX640WL16016F	38	—	72	23.8	100	19.1	11	2
50.8	160	AHX640WL16022F	38	—	72	23.8	100	19.1	11	2
50.8	160	AHX640WR16016F	38	—	72	23.8	100	19.1	11	2
50.8	160	AHX640WR16022F	38	—	72	23.8	100	19.1	11	2
60	200	AHX640W-200C20L	32	18	135	29.8	155	25.7	14	4
60	200	AHX640W-200C20R	32	18	135	29.8	155	25.7	14	4
60	200	AHX640W-200C28L	32	18	135	29.8	155	25.7	14	4
60	200	AHX640W-200C28R	32	18	135	29.8	155	25.7	14	4
60	250	AHX640W-250C24L	32	18	180	29.8	200	25.7	14	4
60	250	AHX640W-250C24R	32	18	180	29.8	200	25.7	14	4
60	250	AHX640W-250C36L	32	18	180	29.8	200	25.7	14	4
60	250	AHX640W-250C36R	32	18	180	29.8	200	25.7	14	4
60	315	AHX640W-315C28L	57	18	225	21.8	285	25.7	14	5
60	315	AHX640W-315C28R	57	18	225	21.8	285	25.7	14	5
60	315	AHX640W-315C44L	57	18	225	21.8	285	25.7	14	5
60	315	AHX640W-315C44R	57	18	225	21.8	285	25.7	14	5

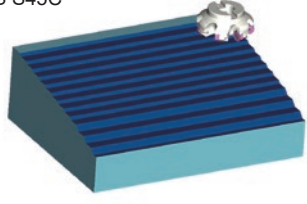

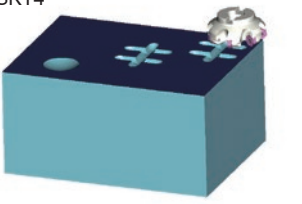
# General Purpose Multi Corner Insert Type Face Milling Cutter

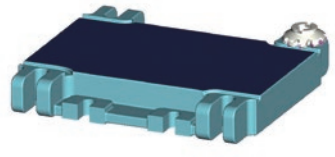
## Application Example

Component	Parts for Turbo	Automobile Parts	Steel Plate for Pressure Containers	
Workpiece	JIS SCH13X 	JIS FCD500 	W-nr 1.0425 	
Tool	<b>AHX440S-063A08AR</b>	<b>AHX440S-050A04AR</b>	<b>AHX440S-100B10AR</b>	
Cutting Conditions	Cutting Speed (m/min)	99	141	251
	Feed per Tooth (mm/t.)	0.3	0.15	0.15
	Depth of Cut <b>ap</b> (mm)	3	0.8	1.5
	Depth of Cut <b>ae</b> (mm)	50	35	80
Cutting Mode	Dry Cutting	Dry Cutting	Wet Cutting	
Results	AHX440S achieved 1.4 times the tool life of conventional products.	AHX440S achieved 1.3 times the tool life of conventional products. The tool life, in rough and finish cutting was expanded.	AHX440S gave 1.3 times longer tool life than that of conventional products during heavy interrupted cutting. Tool life was evaluated based on whether burrs were generated around the holes.	

Component	Press Mould Base	Housing Case	Automotive Suspension Part	
Workpiece	JIS FC250 	JIS FC250 	JIS FCD600 	
Tool	<b>AHX640WR16016F</b>	<b>AHX640WR12512E</b>	<b>AHX640WR10014D</b>	
Cutting Conditions	Cutting Speed (m/min)	240	150	240
	Table Feed (mm/min)	3060	500	3000
	Feed per Tooth (mm/t.)	0.4	0.1	0.28
	Depth of Cut <b>ap</b> (mm)	3-4	3	3-4
	Depth of Cut <b>ae</b> (mm)	160	40	80
Cutting Mode	Dry Cutting	Dry Cutting	Dry Cutting	
Results	In comparison with the conventional insert that suffered sudden fracturing during machining of surface scale, AHX640W gave a stable performance even at 3 times higher table feeds, thus substantially improving machining efficiency and reliability.	In comparison with a conventional 8 corner insert that fractured while machining an unstable component, the AHX640W gave double tool life. In combination with the longer tool life and the use of the extra cutting edges, substantial savings were made.	Even when machining ductile cast iron, AHX640W gave double tool life compared to a conventional tool.	

- With reference to the above examples, adjust the cutting conditions according to the machine specifications, workpiece geometry and clamping method used.

Component		Machine Parts		Machine Parts		Mould	
Workpiece	JIS S45C			JIS SCM440			
	JIS SKT4						
Tool		Conventional	<b>AHX640SR10007DA</b>	Conventional	<b>AHX640SR10007DA</b>	Conventional	<b>AHX640SR10007DA</b>
Cutting Conditions	Cutting Speed (m/min)	200	250	75	100	95	95
	Feed per Tooth (mm/t.)	0.19	0.22	0.05	0.17	0.2	0.26
	Depth of Cut <b>ap</b> (mm)	5	5	1	2	3	3
	Depth of Cut <b>ae</b> (mm)	75	75	70	70	60	60
Cutting Mode		Air Blow	Air Blow	Air Blow	Air Blow	Air Blow	Air Blow
Results		With older products, raising the cutting speed to 250 m/min caused chattering and damage to the inserts, but the AHX640S enables stable machining even when the feed is raised. In addition, the inserts have more usable corners, helping to reduce costs.		Previously, low rigidity workpiece clamping led to chattering, making it impossible to raise cutting conditions. However, with the low cutting resistance of the AHX640S, cutting conditions can be raised, achieving more than 6 times the efficiency of existing products.		With conventional products, insert wear occurred frequently. In contrast, the AHX640S with 30% higher feed enables stable cutting with no damage to the inserts.	

Component		Mould	
Workpiece	JIS FC300		
Tool		Conventional	<b>AHX640SR16010FA</b>
Cutting Conditions	Cutting Speed (m/min)	70	240
	Feed per Tooth (mm/t.)	1.5	0.3
	Depth of Cut <b>ap</b> (mm)	1	3
	Depth of Cut <b>ae</b> (mm)	100	100
Cutting Mode		Air Blow	Air Blow
Results		Compared with older tools for high feed milling, depth of cut is 3 times greater with the equivalent table feed. In addition, the inserts have more usable corners than previous products, helping to reduce costs.	

- With reference to the above examples, adjust the cutting conditions according to the machine specifications, workpiece geometry and clamping method used.



General Purpose Multi Corner Insert Type Face Milling Cutter

# AHX Series

## Environmentally Friendly Product

This product has been certified as an environmentally friendly product in the machine tool industry by the Japan Cutting & Wear-resistant Tool Association. This is a product unique to the industry, in harmony with the environment, and with the aim of fulfilling the social responsibilities of the machine tool industry.

The Japan Cutting & Wear-resistant Tool Association evaluates the product's environmental impact during the manufacturing and usage stages and issues a certification according to the evaluation score.



## AHX440S

### For People, Society and the Earth

More information about MITSUBISHI MATERIALS' efforts to address social and environmental issues can be found in the website below or by scanning the QR code.

<https://mmc.disclosure.site/en/>



#### For Your Safety

●Don't handle inserts and chips without gloves. ●Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage. ●Please use safety covers and wear safety glasses. ●When using compounded cutting oils, please take fire precautions. ●When attaching inserts or spare parts, please use only the correct wrench or driver. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

## MITSUBISHI MATERIALS CORPORATION

### MITSUBISHI MATERIALS CORPORATION

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<http://www.mmc-carbide.com/>

(Tools specifications subject to change without notice.)