DIA EDGE

TOOL NEWS

2023.10 Update
B195G

General Purpose Multi Corner Insert Type Face Milling Cutter

Environmentally Friendly Product

Grade Expansion

AHX Series

Economical double sided inserts with 14 cutting edges.

MITSUBISHI MATERIALS CORPORATION

2016-028
JTA ECO PRODUCT
(一社) 日本機械工具工業会 (JTA)
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

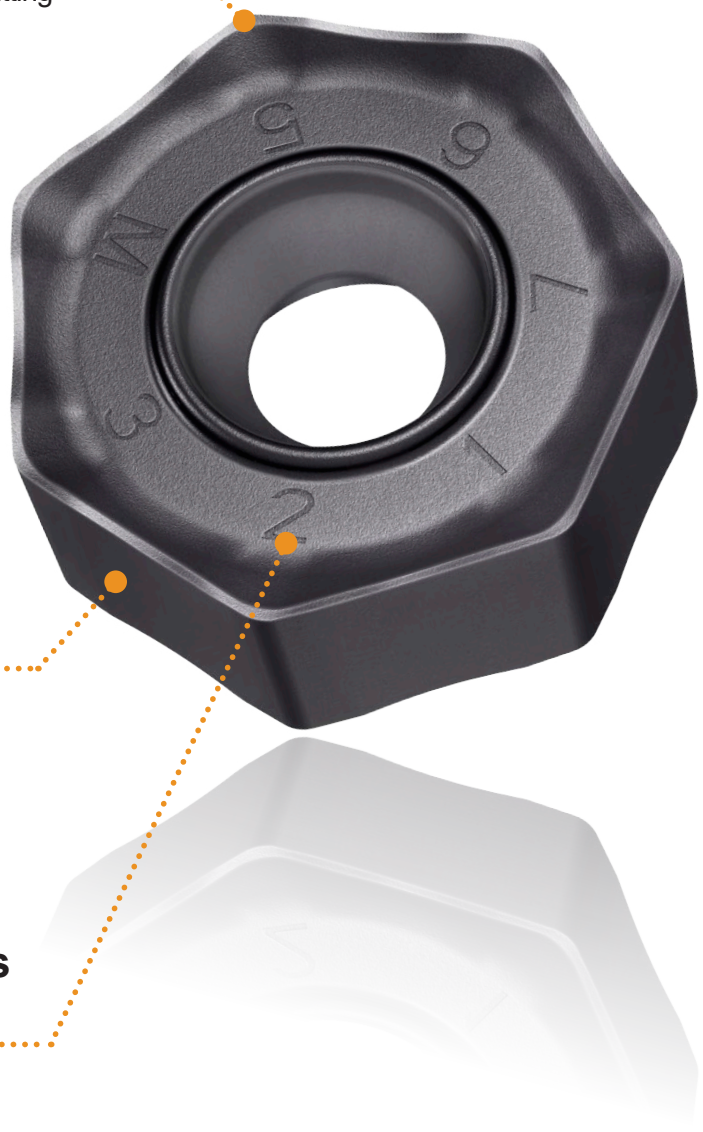
Economical Heptagonal Double Sided Insert

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

(mm)

Tool Holder Type	IC	APMX
AHX440S	13.4	3.0
AHX475S	13.4	1.6
AHX640S	20.0	6.0

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



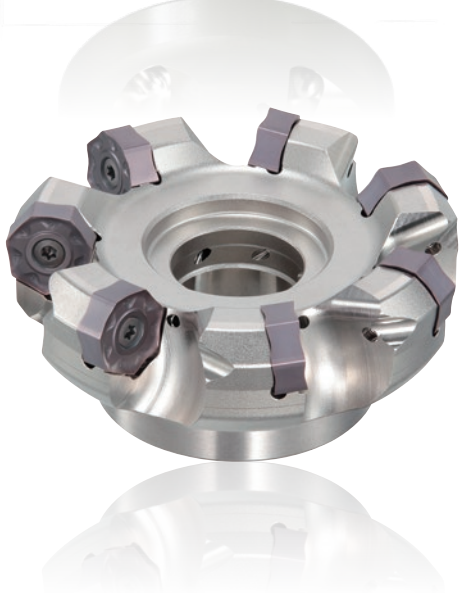
High Rigidity Created by Increasing the Thickness of the Inserts

Corner Number is Clearly Shown

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

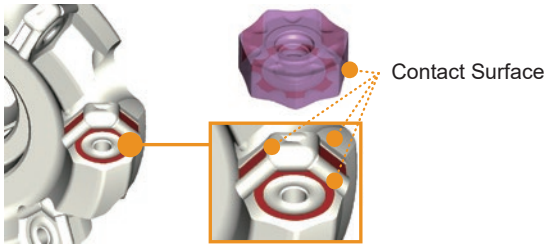
AHX440S
AHX475S
AHX640S

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.

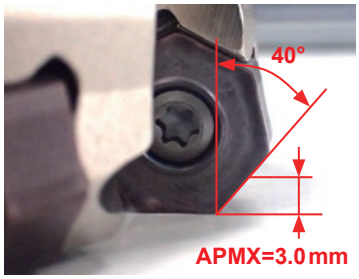


Through Coolant Holes

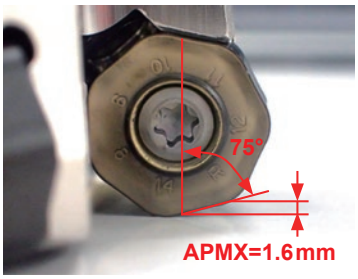
Improves chip discharge and prevents chip welding.

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

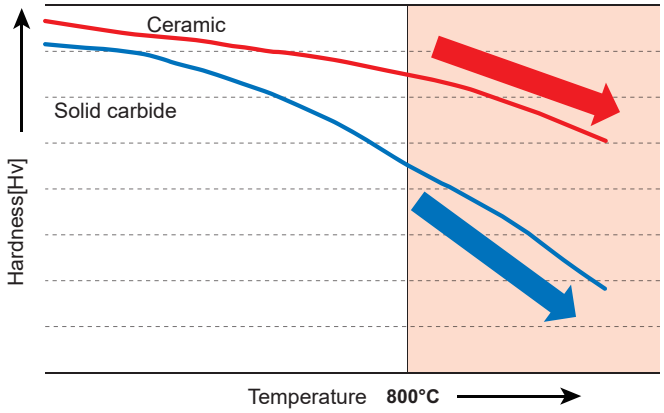
CVD Coated Ceramic Grade

XC5010 NEW

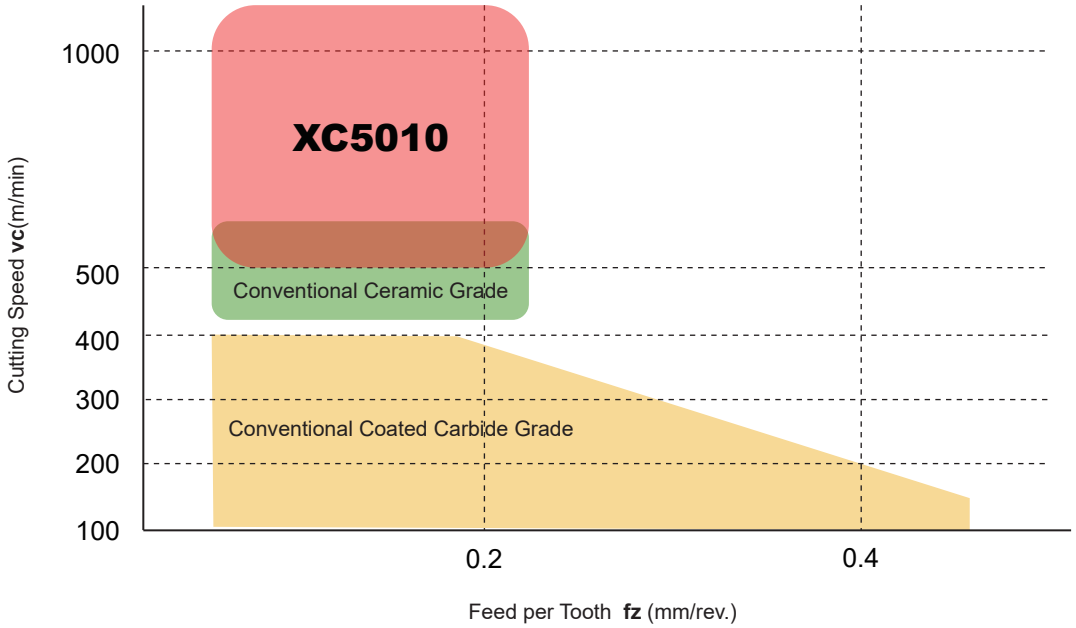
The strength of ceramics allows for stable machining even when cutting at high-speeds.

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.

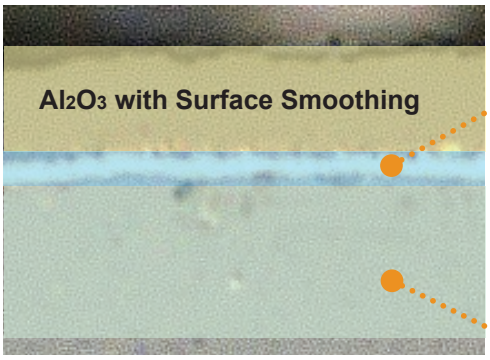


The combination of the unique shape and the coated ceramic grade achieves stable machining even at a cutting speeds of 1000 m/min.



Surface-smoothing Al_2O_3 coating suppresses the transmission of cutting heat

By applying an Al_2O_3 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.



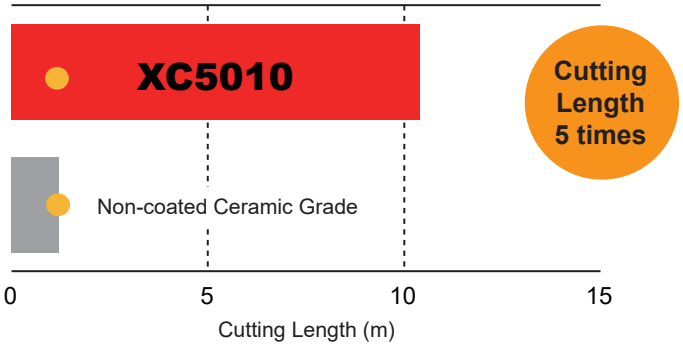
Technology Improves Adhesion Strength

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

Silicon Nitride Ceramic Substrate

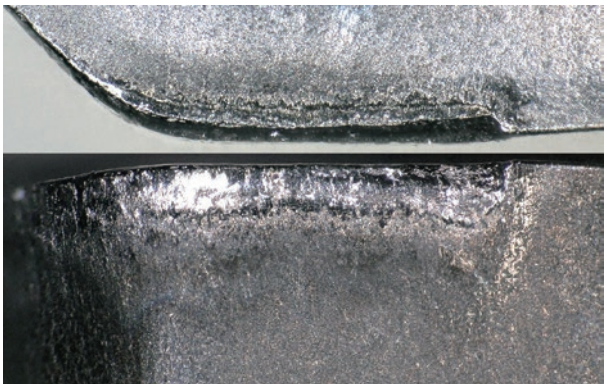
By adopting a high toughness silicon nitride ceramic substrate as the base material, ultra-high-speed milling of ductile cast iron can be achieved even at high temperatures with minimal loss of strength.

Achieves 5 times the cutting length of carbide when used at high-speeds

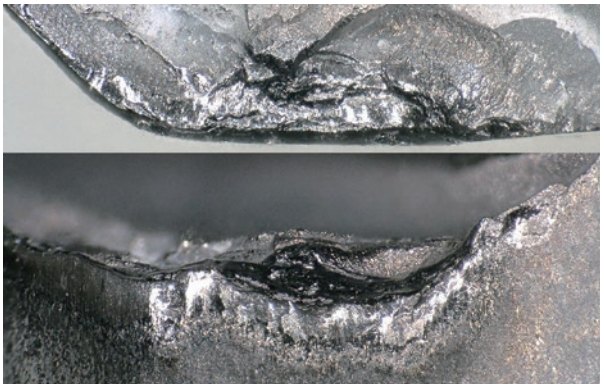


<Cutting Conditions>
Workpiece Material : JIS FCD600
Tool : AHX640S DC=80mm
Cutting Speed : vc=1000m/min
Feed per Tooth : fz=0.1mm/t
Depth of Cut : ap=2.0mm
ae=50mm
Cutting Mode : Dry Cutting

After 1.2m Machining



XC5010



Non-coated Ceramic Grade

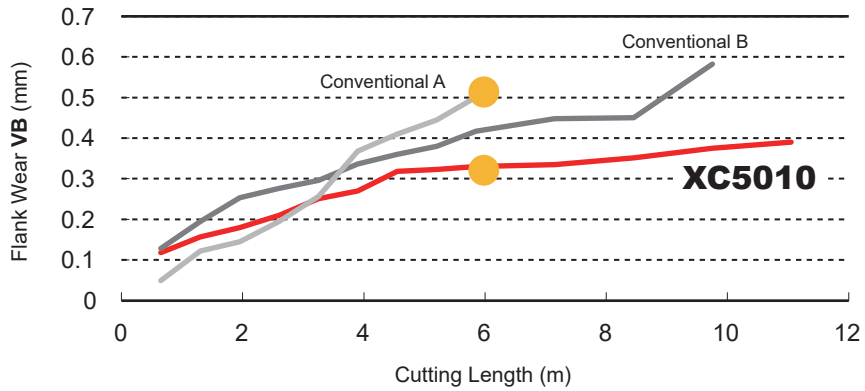
Machining video at VC=1200 m/min

YouTube

Cutting Performance

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

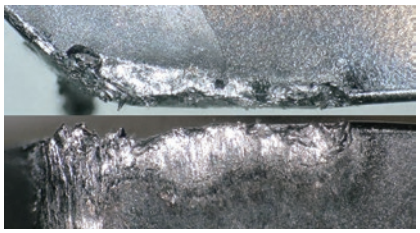
Achieves a level of wear resistance that greatly surpasses carbide grades when high-speed roughing.



<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

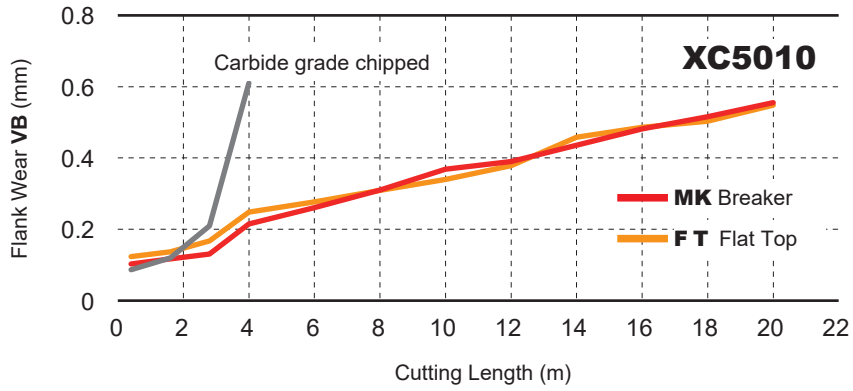
XC5010



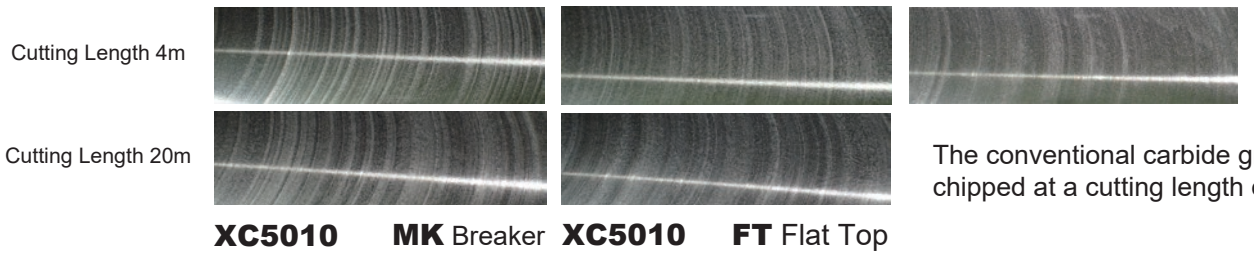
Conventional A, Coated Carbide Grade

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.



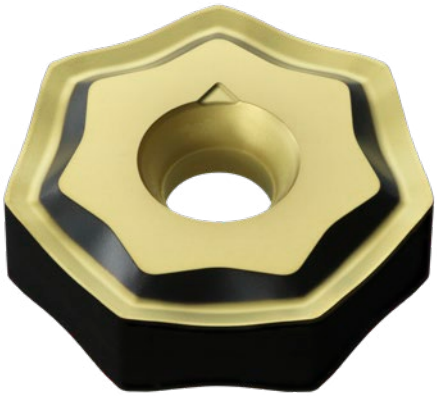
<Cutting Conditions>
Workpiece Material : JIS FCD700
Tool : AHX640S DC=125mm
Cutting Speed : vc=1000m/min
Feed per Tooth : fz=0.1mm/t
Depth of Cut : ap=2.0mm
ae=100mm
Cutting Mode : Dry Cutting



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

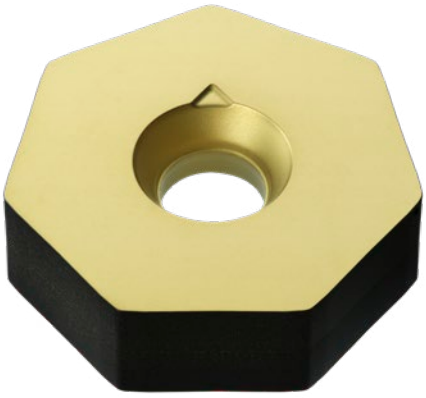
The conventional carbide grade chipped at a cutting length of 4m.

XC5010 Chip Breaker System



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.



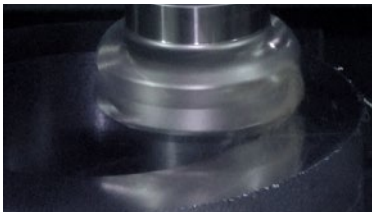
FT Flat Top Cutting Edge Strength

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

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=0.1mm/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)

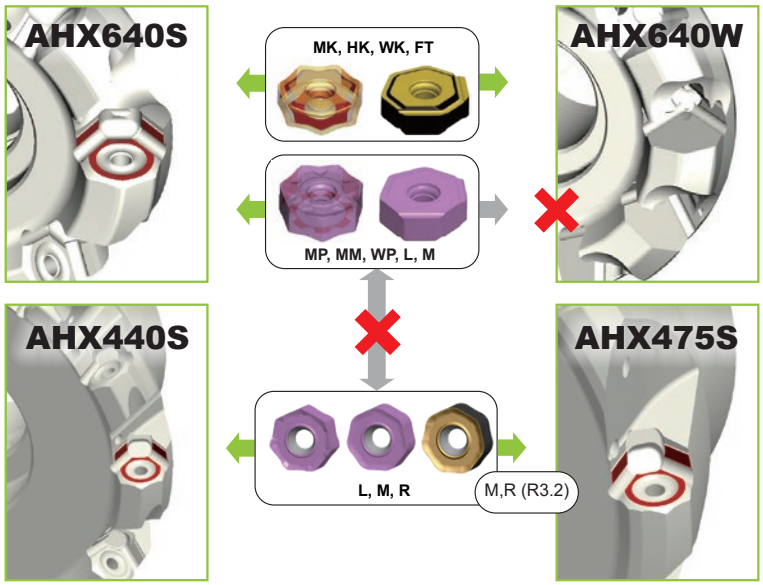
(mm)

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.

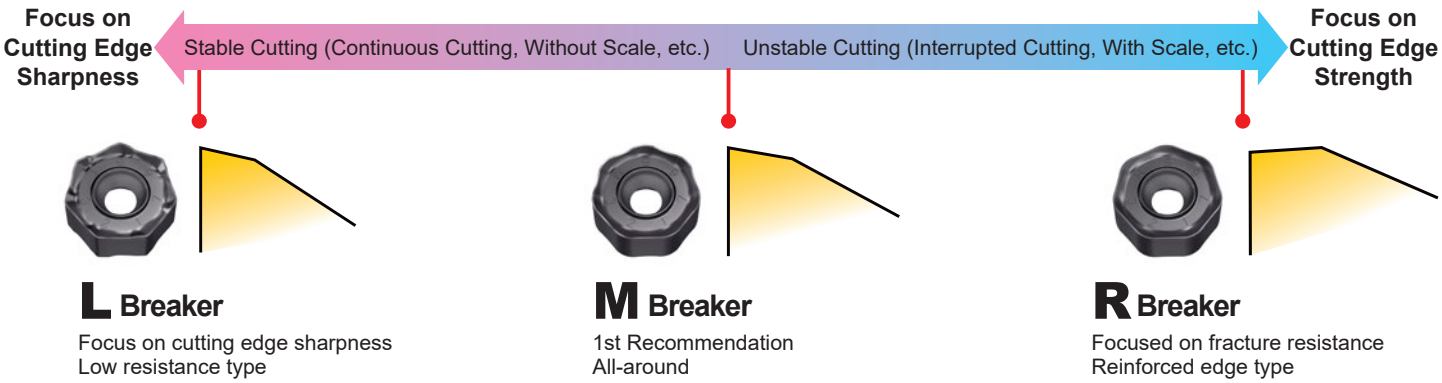
Compatibility with Inserts for AHX Series

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



L Breaker
Focus on cutting edge sharpness
Low resistance type

M Breaker
1st Recommendation
All-around

R Breaker
Focused on fracture resistance
Reinforced edge type

Workpiece Material	Cutting Conditions		
	Stable Cutting	General Cutting	Unstable Cutting
P	**AHX440S**: **L** With Wiper; **M** (R0.8) With Wiper; **M** (R3.2) Shared with AHX475; **R** Shared with AHX475		
	AHX640S: **M**; **MP**		
M	**AHX440S**: **L** With Wiper; **M** (R0.8) With Wiper; **M** (R3.2); **R**		
	AHX640S: **MM**		
K	**AHX440S**: **L** With Wiper; **M** (R0.8) With Wiper; **M** (R3.2) Shared with AHX475; **R** Shared with AHX475		
	AHX640S: **MK**; **HK**; **FT**		

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

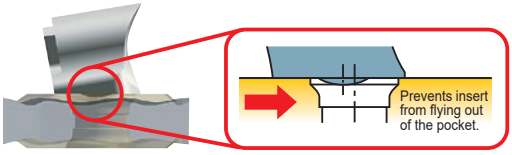
AHX640W

High Rigidity Inserts Suitable for High Feed Milling of Cast Iron

Sloped cutting edge and large rake angle

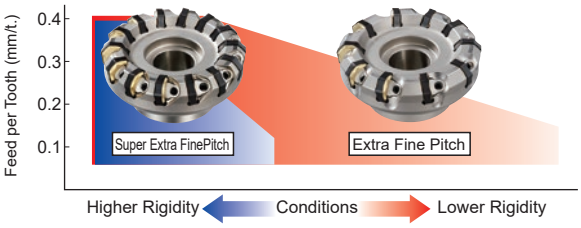
Innovative Clamp System

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.

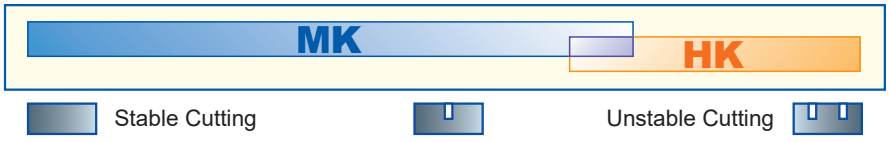


2 Variations for Different Applications

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



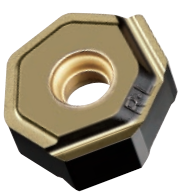
MK General-Purpose Insert

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

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.

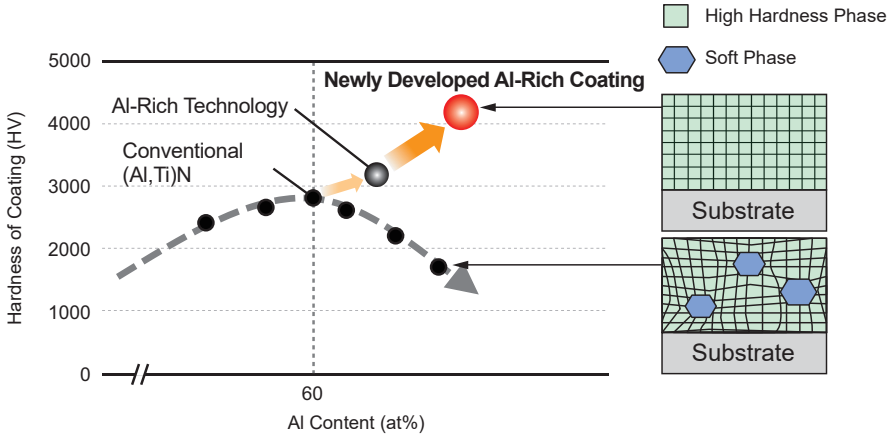
Coated Carbide Grade for Milling

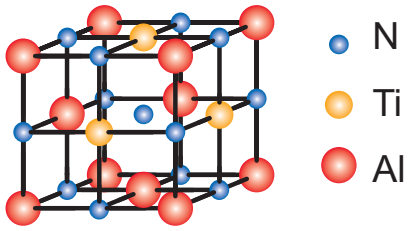
MV1020 / MV1030

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.

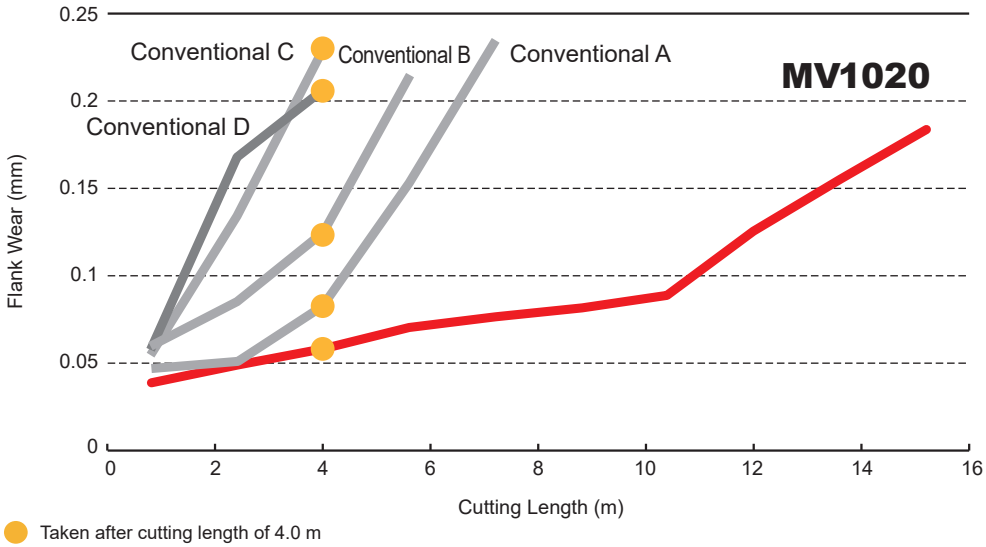




Crystal image of **MV1000** series

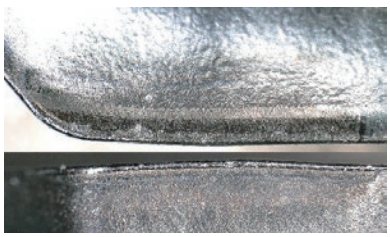
Cutting Performance

Comparison of wear resistance when machining ductile cast Iron FCD700



<Cutting Conditions>
Workpiece
Material : JIS FCD700
Tool : AHX440
Inserts : NNMU130508ZEN-M
Cutting Speed : vc=300 m/min
Feed per Tooth : fz=0.1 mm/t.
Depth of Cut : ap=2.0 mm
Width of Cut : ae=52 mm
Cutting Mode : Dry Cutting
Single Insert

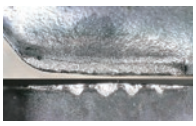
● Taken after cutting length of 4.0 m



MV1020

Conventional A

Conventional B

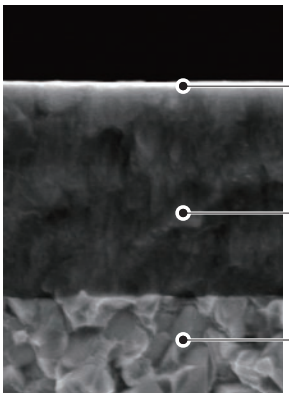


Conventional C

Conventional D

Insert Grades for a Wide Range of Materials

Accumulated Al-Ti-Cr-N Based PVD Coating

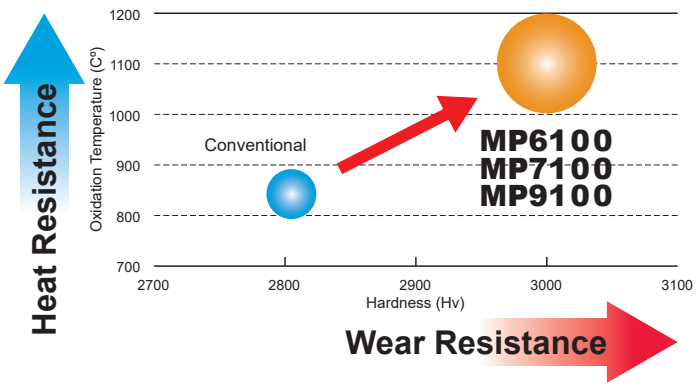


Excellent welding resistance due to low coefficient of friction

PVD accumulated coating (Prevents damage)

Special cemented carbide substrate

Dramatically Improving the Heat and Wear Resistance



Excellent Welding Resistance due to Low Coefficient of Friction

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

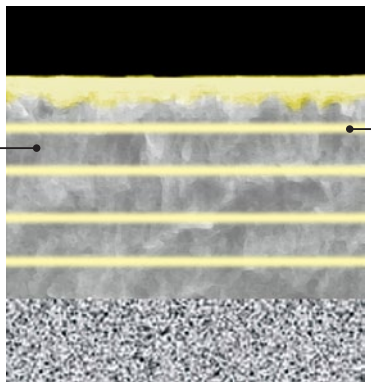
TOUGH-Σ Technology

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.

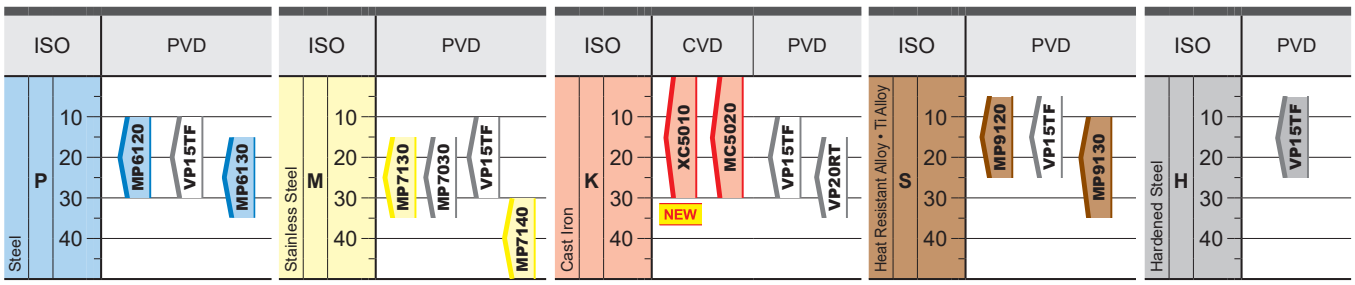


*Graphical Representation.

Each Grade has a Layer Suitable for Each Application Area

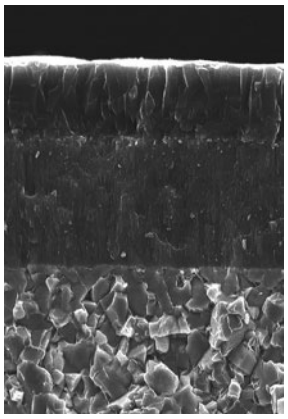
P		(Al,Cr)N Tough Against Thermal Cracks
M		TiN Tough Against Notching
S		CrN Tough! Resistant Chipping

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

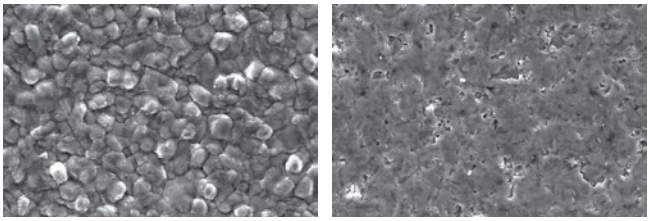
Use of a specially developed cemented carbide that provides superior resistance to fracture and thermal cracking prevents the cutting edge from sudden fracturing.

Reduced Abnormal Damage

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

Black Super Smooth Coating

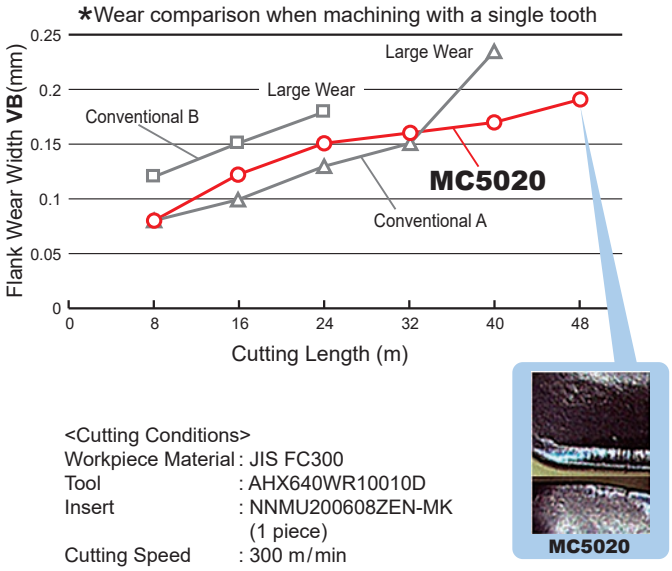
Comparison of Coating Surface



Conventional Coating　　Black Super Smooth Coating

Cutting Performance

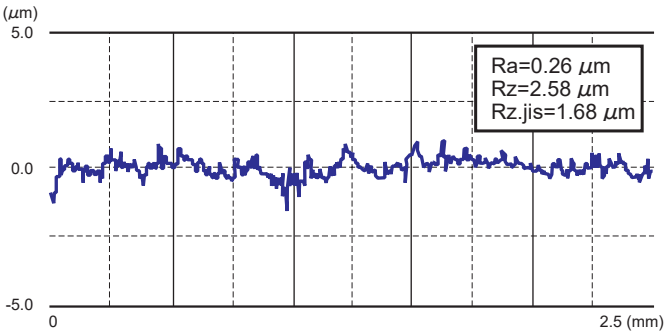
Wear Resistance



MC5020

<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 : ap=5 mm
Cutting Mode : Dry Cutting Single Insert

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 : ap=0.4 mm
: ae=80 mm
Cutting Mode : Air Blow

Memo

FACE MILLING
<GENERAL CUTTING>

50° KAPR

AHX440S

P M K N S H

Fig. 1
ø40
ø50
ø63
ø80

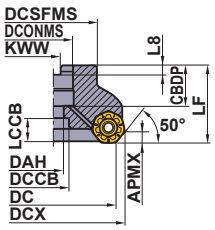


Fig. 2
ø100
ø125
ø160

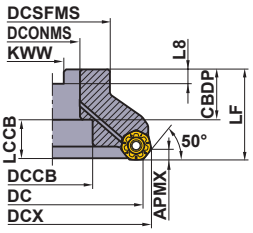
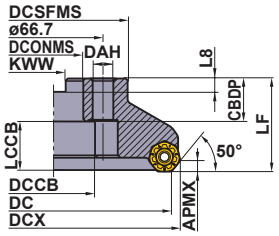


Fig. 3
ø160



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	Wrench (Insert)
AHX440S	TS35R	TKY15T

* Clamp Torque (N • m) : TS35R=3.5

● : Inventory maintained in Japan.

MOUNTING DIMENSION ➤ P33
CUTTING CONDITIONS ➤ P17,18

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	–	–	Fig.1
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	Fig.2
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.

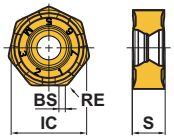
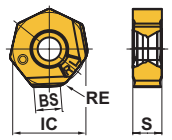
● : **Inventory maintained in Japan. (10 inserts in one case)**

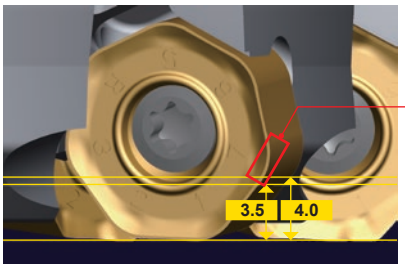
Inserts

(mm)

Workpiece Material			MV1020	MV1030	MC5020	MP6120	MP6130	MP7130	MP7140	VP15TF
	P	Steel	◆	◆		◆	◆			◆
	M	Stainless Steel	◇	◇				◇	◇	◇
	K	Cast Iron	◆	◆	◆					◆
	H	Hardened Steel								◆

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

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



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

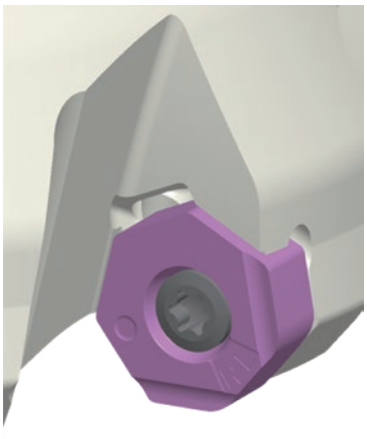


Fig.1

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.

MOUNTING DIMENSION ➤ P33
CUTTING CONDITIONS ➤ P17,18

Recommended Cutting Conditions

Dry Cutting

(mm)

	Workpiece Material	Properties	Grade	vc (m/min)	fz (mm/t.)	ap (mm)	ae (mm)
P	Mild Steel	Hardness ≤180HB	**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
	Ferritc and Martensitic Stainles 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
	Preciptation-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
	Carbon Steel,Alloy Steel	180－280HB	**MP6120,VP15TF**	220 (170－270)	0.3 (0.2－0.4)	≤0.5
		280－350HB	**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.)

FACE MILLING

<HIGH FEED CUTTING FOR CAST IRON>

15° KAPR

AHX475S

P M K N S H

Fig.1

ø50
ø63
ø80
ø100

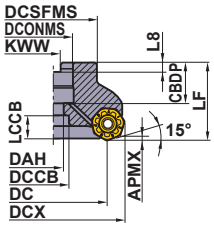
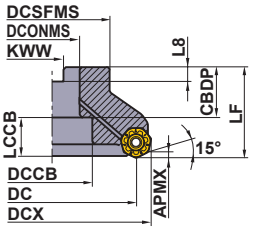


Fig.2

ø125
ø160



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)
AHX475S	TS35R	TKY15T

* Clamp Torque (N • m) : TS35R=3.5

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									
AHX475S-050A○○AR	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	–	–	Fig.1
AHX475S-063A○○AR	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	–	–	
AHX475S-080A○○AR	HSC12035H	HSC12035 HSC12045	1	18	M12×1.75	47 57	12	10	–	–	
AHX475S-100B○○AR	HSC16040H	–	1	24	M16×2	56	16	14	–	–	
AHX475S-125B○○AR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	Fig.2
AHX475S-160C○○AR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
AHX475SR080○○DA	HSC16040H	–	1	24	M16×2	56	16	14	–	–	
AHX475SR100○○DA	HSC16040H	–	1	24	M16×2	56	16	14	–	–	
AHX475SR125○○EA	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
AHX475SR160○○FA	MBA24045H	–	2	65	M24×3	59	14	17	10	37	

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

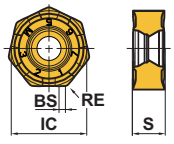
Inserts

(mm)

Workpiece Material		
P	Steel	◆ ◆ ◆ ◆ ◆
K	Cast Iron	◆ ◆ ◆ ◆
H	Hardened Steel	◆

This is the selection guideline for AHX475S.
Please note that the cutting conditions differ depending on multiple factors, for more details refer to the Recommended Cutting Conditions.

Edge Preparation :
E : Round

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

MOUNTING DIMENSION ➤ P33
CUTTING CONDITIONS ➤ P21, 22

Recommended Cutting Conditions

■ Dry Cutting

(mm)

	Workpiece Material	Properties	Grade	vc (m/min)
P	Mild Steel	Hardness ≤180HB	**MV1020**	220 (170–270)
			MP6120	150 (100–200)
			MV1030	140 (80–200)
			MP6130	130 (80–180)
	Carbon Steel, Alloy Steel	Hardness 180–280HB	**MV1020**	200 (150–250)
			MP6120	130 (80–180)
			MV1030	120 (60–180)
			MP6130	110 (60–160)
	Carbon Steel, Alloy Steel	Hardness 280–350HB	**MV1020**	150 (100–200)
			MP6120	100 (50–150)
			MV1030	90 (30–150)
			MP6130	80 (30–130)
	Alloy Tool Steel	Hardness ≤350HB (annealing)	**MP6120**	100 (50–150)
			MP6130	80 (30–120)
	Pre-hardened Steel	Hardness 35–45HRC	**MP6120**	100 (70–130)
			MP6130	80 (50–110)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	150 (100–200)
			VP15TF	120 (80–160)
	Ductile Cast Iron	Tensile Strength ≤450MPa	**MV1020**	200 (150–250)
			MC5020	150 (100–200)
			MV1030	140 (80–200)
			VP15TF	120 (80–160)
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MV1020**	180 (130–230)
			MC5020	150 (100–200)
			MV1030	140 (80–200)
			VP15TF	120 (80–160)
H	Hardened Steel	Hardness 40–55HRC	**VP15TF**	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.)
P	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
K	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
H	Hardened Steel	Hardness 40–55HRC	**VP15TF**	≤1.6	**R**	0.4	**R**	0.5	**R**	0.6

FACE MILLING
<GENERAL CUTTING>

50° KAPR

AHX640S

P M K N S H

Fig. 1
ø63
ø80

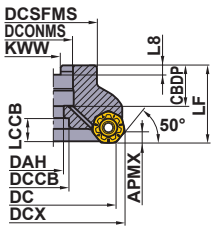


Fig. 2
ø100
ø125
ø160

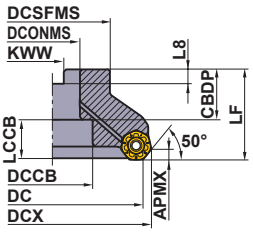
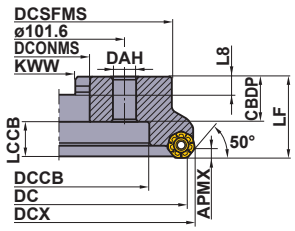
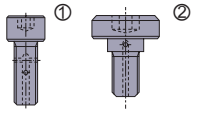


Fig. 3
ø200



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ63	HSC10030H	①
ϕ80	HSC12035H	
ϕ100	MBA16033H	②
ϕ125	MBA20040H	
ϕ160	MBA24045H	
ϕ200	—	—



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.

Fig. 1
ø63
ø80

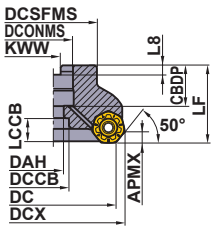


Fig. 2
ø100
ø125

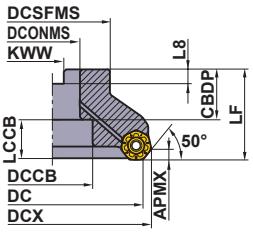


Fig. 3
ø160

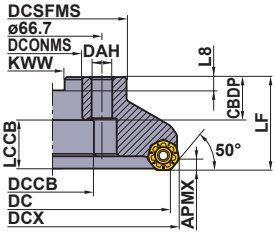
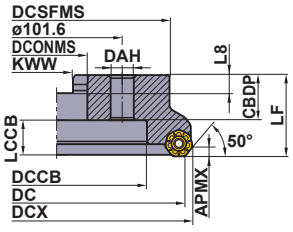
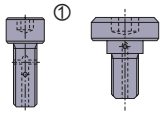


Fig. 4
ø200



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ63	HSC10030H	①
ϕ80	HSC12035H	
ϕ100	MBA16033H	②
ϕ125	MBA20040H	
ϕ160	—	—
ϕ200	—	—



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	 *	
	Clamp Screw	Wrench (Insert)
AHX640S	CS5015060T	TKY20T

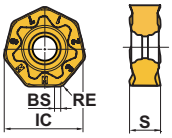
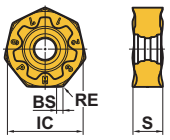
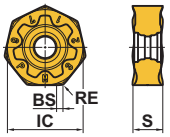
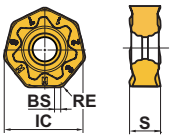
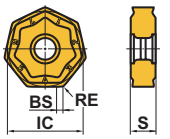
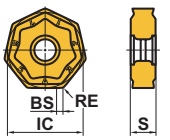
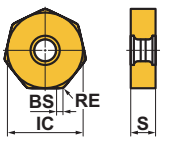
* Clamp Torque (N • m) : CS5015060T=5.0

MOUNTING DIMENSION ➤ P33
CUTTING CONDITIONS ➤ P27,28

Inserts

(mm)

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. **Edge Preparation : E :** Round
	M	Stainless Steel								◇	◇	
	K	Cast Iron	◆	◆						◆	◆	
	S	Heat Resistant and Titanium Alloys						◆	◆			
	H	Hardened Steel								◆	◆	

Application	Shape	Order Number	Class	Honing	Coated									Dimensions (mm)					Geometry
					NEW XC5010	MC5020	MP6120	MP6130	MP7030	MP9120	MP9130	VP15TF	VP20RT	IC	RE	BS	S	APMX	
For Titanium Alloys and Heat Resistant Alloys		**NNMU200712ZER-L**	M	E						●	●			20	1.2	1	7.24	6	
General Cutting		**NNMU200708ZEN-M**	M	E			●	●						20	0.8	1	7.28	6	
		**NNMU200708ZEN-MP**	M	E								●		20	0.8	1	7.28	6	
		**NNMU200712ZER-MM**	M	E					●					20	1.2	1	7.28	6	
		**NNMU200608ZEN-MK**	M	E	●	●						●	●	20	0.8	1	6.1	6	
For Cast Iron Strong Cutting Edge Type		**NNMU200608ZEN-HK**	M	E		●						●	●	20	0.8	1	6.1	6	
	NEW 	**NNMQ200708ZEN-FT**	M	E	●									20	0.8	1	6.55	6	

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)

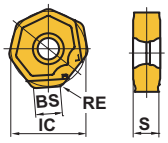
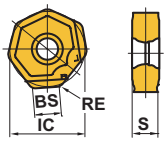
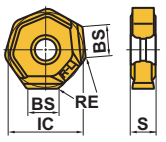
Wiper Inserts

(mm)

Workpiece Material			XC5010	MC5020	MP6120	MP6130	MP7030	MP9120	MP9130	VP15TF	VP20RT
	P	Steel			◆					◆	
	M	Stainless Steel								◇	
	K	Cast Iron		◆						◆	
	S	Heat Resistant and Titanium Alloys									
	H	Hardened 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.

Edge Preparation : E : Round

Application	Shape	Order Number	Class	Honing	Coated XC5010	MC5020	MP6120	MP6130	MP7030	MP9120	MP9130	VP15TF	VP20RT	Dimensions (mm) IC	RE	BS	S	APMX	Geometry
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

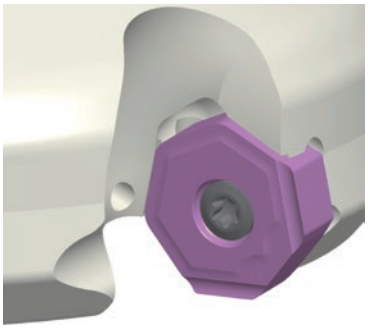


Fig.1

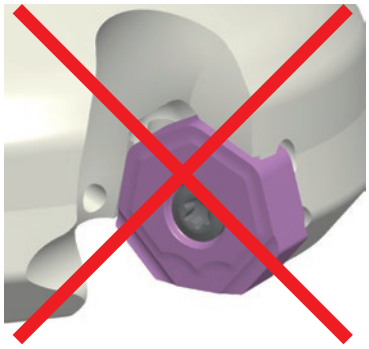


Fig.2

(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.

Recommended Cutting Conditions

Dry Cutting

(mm)

	Workpiece Material	Properties	Cutting Conditions	Grade	Breaker	vc (m/min)	fz (mm/t.)	ap	ae
P	Mild Steel	Hardness ≤180HB	●	**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
M	Austenitic Stainless Steel	≤200HB	**MP7030**	**MM**	125(100－150)	0.15(0.1－0.2)	≤5	≤0.8DC
	Austenitic Stainless Steel	> 200HB	**MP7030**	**MM**	100(75－125)	0.15(0.1－0.2)	≤5	≤0.8DC
	Two-phase Stainless Steel	≤280HB	**MP7030**	**MM**	80(60－100)	0.1(0.05－0.15)	≤5	≤0.8DC
	Ferritic and Martensitic Stainless Steel	≤200HB	**MP7030**	**MM**	125(100－150)	0.15(0.1－0.2)	≤5	≤0.8DC
	Ferritic and Martensitic Stainless Steel	> 200HB	**MP7030**	**MM**	100(75－125)	0.15(0.1－0.2)	≤5	≤0.8DC
	Precipitation-Hardening Stainless Steel	< 450HB	**MP7030**	**MM**	70(50－90)	0.1(0.05－0.15)	≤5	≤0.8DC
S	Titanium Alloys	－	**MP7030**	**MM**	40(20－50)	0.15(0.1－0.2)	≤3	≤0.6DC
		－	**MP9120**	**L**	60(50－70)	0.1(0.05－0.15)	≤3	≤0.6DC
		－	**MP9130**	**L**	40(20－50)	0.15(0.1－0.2)	≤3	≤0.6DC
	Heat Resistant Alloys	－	**MP7030**	**MM**	40(20－50)	0.15(0.1－0.2)	≤3	≤0.6DC
		－	**MP9120**	**L**	60(50－70)	0.1(0.05－0.15)	≤3	≤0.6DC
		－	**MP9130**	**L**	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
P	Mild Steel	Hardness ≤180HB	**VP15TF**	**MP**	**VP15TF**	**WP**	250(200－300)	0.3(0.2－0.4)	≤0.5	≤0.8DC
			MP6120	**M**	**MP6120**	**M**	250(200－300)	0.3(0.2－0.4)	≤0.5	≤0.8DC
	Carbon Steel,Alloy Steel	Hardness 180－280HB	**VP15TF**	**MP**	**VP15TF**	**WP**	220(170－270)	0.3(0.2－0.4)	≤0.5	≤0.8DC
			MP6120	**M**	**MP6120**	**M**	220(170－270)	0.3(0.2－0.4)	≤0.5	≤0.8DC
	Carbon Steel,Alloy Steel	Hardness 280－350HB	**VP15TF**	**MP**	**VP15TF**	**WP**	140(100－180)	0.3(0.2－0.4)	≤0.5	≤0.8DC
			MP6120	**M**	**MP6120**	**M**	140(100－180)	0.3(0.2－0.4)	≤0.5	≤0.8DC
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	**MK,HK**	**MC5020**	**WK**	320(250－400)	0.3(0.2－0.4)	≤0.5	≤0.8DC
			VP15TF	**MP**	**VP15TF**	**WP**	220(150－300)	0.3(0.2－0.4)	≤0.5	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	**MK,HK**	**MC5020**	**WK**	250(200－300)	0.2(0.1－0.3)	≤0.5	≤0.8DC
			VP15TF	**MP**	**VP15TF**	**WP**	200(150－250)	0.2(0.1－0.3)	≤0.5	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MC5020**	**MK,HK**	**MC5020**	**WK**	220(200－250)	0.2(0.1－0.3)	≤0.5	≤0.8DC
			VP15TF	**MP**	**VP15TF**	**WP**	170(150－200)	0.2(0.1－0.3)	≤0.5	≤0.8DC
S	Heat Resistant Alloys	－	**VP15TF**	**MP**	**VP15TF**	**WP**	40(20－50)	0.15(0.1－0.2)	≤0.5	≤0.8DC
H	Hardened Steel	40－55HRC	**VP15TF**	**MP**	**VP15TF**	**WP**	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

FACE MILLING

<HIGH FEED CUTTING FOR CAST IRON>

50° KAPR

F R

AHX640W

P M **K** N S H

Fig.1 ø80

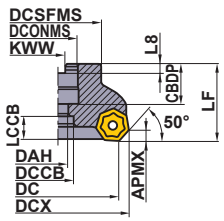


Fig.2 ø100 ø125 ø160

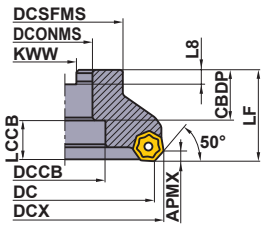


Fig.3 ø200 ø250

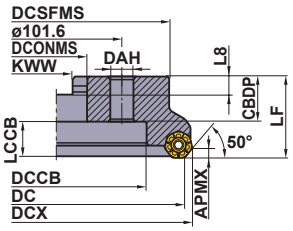
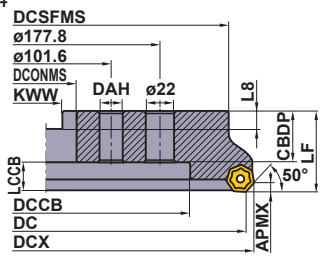


Fig.4 ø315



Right hand tool holder shown.

Right 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	**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

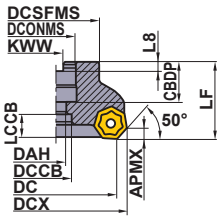


Fig.2
ø100
ø125

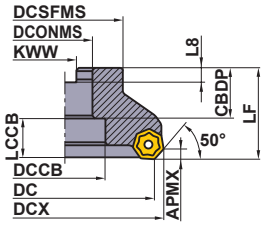


Fig.3
ø160

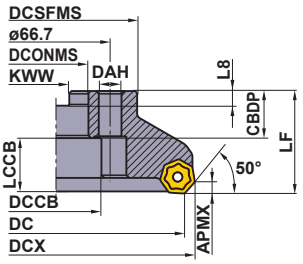


Fig.4
ø200
ø250

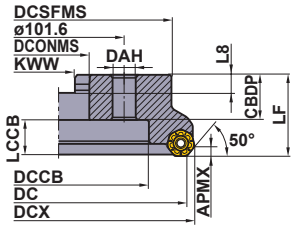
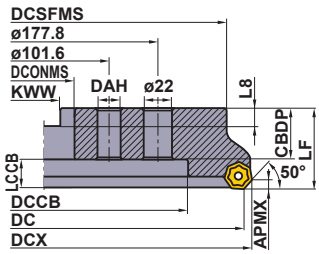


Fig.5
ø315



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

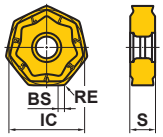
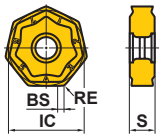
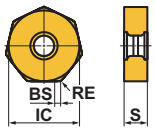
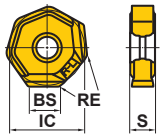
MOUNTING DIMENSION ➤ P35
CUTTING CONDITIONS ➤ P32

Inserts

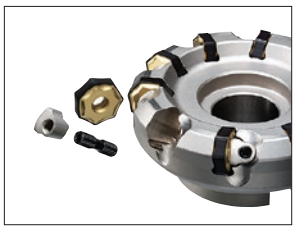
(mm)

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.
Edge Preparation :
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	
	NEW 	**NNMQ200708ZEN-FT**	M	E	●			20	0.8	1.0	6.55	6	
Finishi Cutting	 Wiper	**WNEU2006ZEN7C-WK**	E	E		●		20	0.8	7.4	6.55	0.5	

● = NEW



Spare Parts

Tool Holder Type		 *	
	Wedge	Clamp Screw	Wrench
AHX640W	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
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,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,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,VP20RT	**MK, HK**	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
K	Gray Cast Iron	Tensile Strength ≤350MPa		**MC5020**	**MK, HK**	320(250—400)	0.2(0.1—0.3)	<0.5
				MC5020	**MK, HK**	270(200—350)	0.2(0.1—0.3)	0.5—3
	Ductile Cast Iron	Tensile Strength ≤450MPa		**MC5020**	**MK, HK**	270(200—350)	0.2(0.1—0.3)	<0.5
				MC5020	**MK, HK**	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

ø40
ø50
ø63
ø80

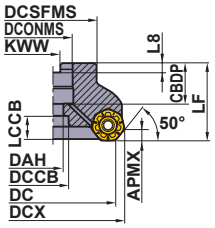


Fig. 2

ø100
ø125
ø160

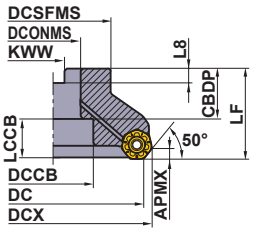
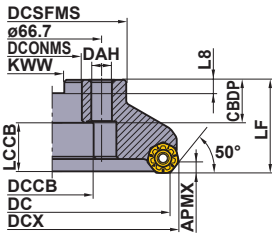


Fig. 3

ø160



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

Fig. 4
ø200

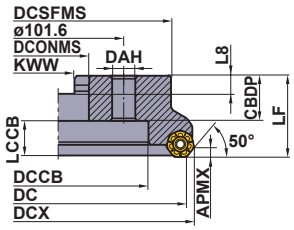


Fig.5
ø50
ø63
ø80
ø100

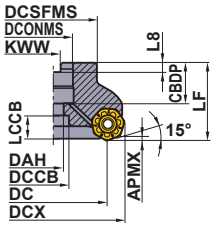
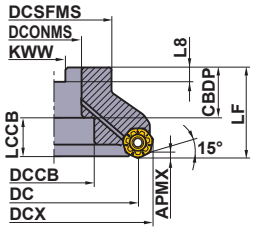


Fig.6
ø125
ø160



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

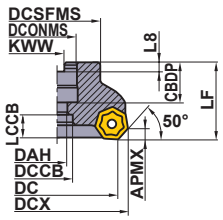
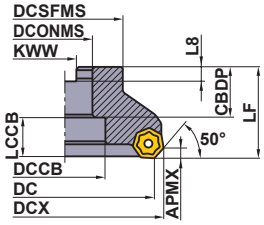


Fig.2

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

Fig.3

ø160

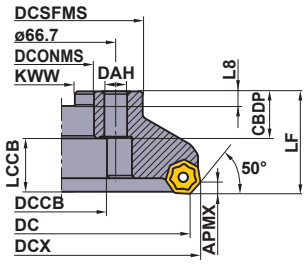


Fig.4

ø200
ø250

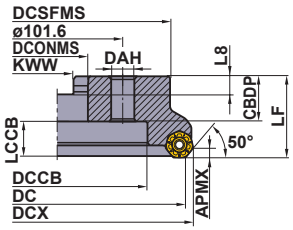
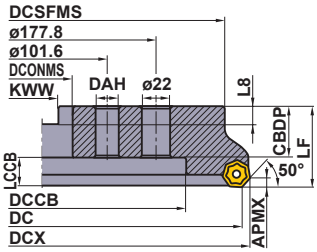


Fig.5

ø315

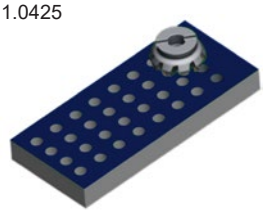


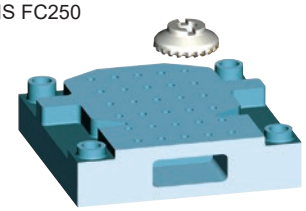
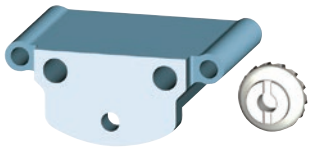
Right hand tool holder shown.

(mm)

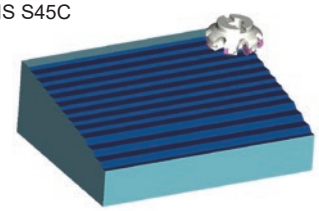
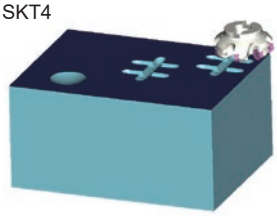
DCONMS	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
47.625	200	**AHX640WL20020K**	35	18	140	26.8	175	25.4	14.22	4
47.625	200	**AHX640WL20028K**	35	18	140	26.8	175	25.4	14.22	4
47.625	200	**AHX640WR20020K**	35	18	140	26.8	175	25.4	14.22	4
47.625	200	**AHX640WR20028K**	35	18	140	26.8	175	25.4	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

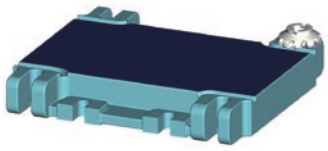
Application Example

Component		Parts for Turbo	Automobile Parts	Steel Plate for Pressure Containers
Workpiece		JIS SCH13X 	JIS FCD500 	W-nr 1.0425 
Tool		**AHX440S-063A08AR**	**AHX440S-050A04AR**	**AHX440S-100B10AR**
Cutting Conditions	Cutting Speed (m/min)	99	141	251
	Feed per Tooth (mm/t.)	0.3	0.15	0.15
	Depth of Cut **ap** (mm)	3	0.8	1.5
	Depth of Cut **ae** (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 wheather burrs were generated around the holes.

Component		Press Mould Base	Housing Case	Automotive Suspension Part
Workpiece		JIS FC250 	JIS FC250 	JIS FCD600 
Tool		**AHX640WR16016F**	**AHX640WR12512E**	**AHX640WR10014D**
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 **ap** (mm)	3–4	3	3–4
	Depth of Cut **ae** (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	**AHX640SR10007DA**	Conventional	**AHX640SR10007DA**	Conventional	**AHX640SR10007DA**
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 **ap** (mm)	5	5	1	2	3	3
	Depth of Cut **ae** (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	**AHX640SR16010FA**
Cutting Conditions	Cutting Speed (m/min)	70	240
	Feed per Tooth (mm/t.)	1.5	0.3
	Depth of Cut **ap** (mm)	1	3
	Depth of Cut **ae** (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

Overseas Sales Dept, Asian Region
Marunouchi Nijubashi Building 22F, 3-2-3, Marunouchi, Chiyoda-ku, Tokyo 100-8117, Japan

Overseas Sales Dept, European & American Region
Marunouchi Nijubashi Building 22F, 3-2-3, Marunouchi, Chiyoda-ku, Tokyo 100-8117, Japan

http://www.mmc-carbide.com/
(Tools specifications subject to change without notice.)

EXP-16-E006
2023.10.E