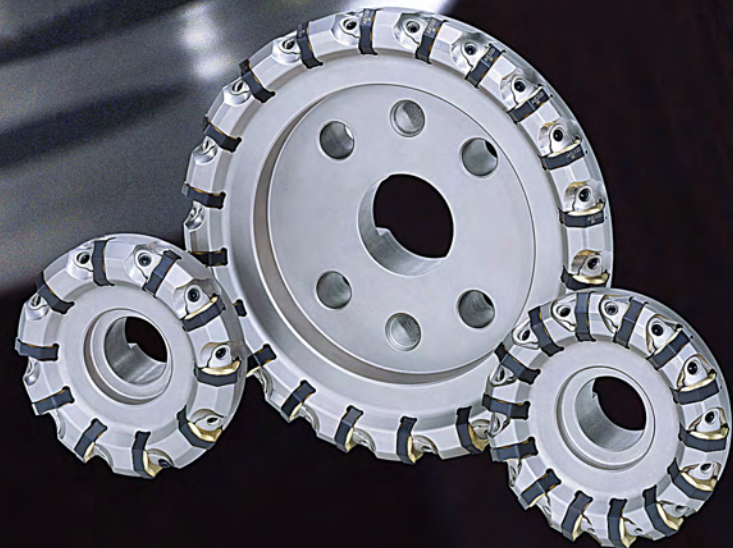
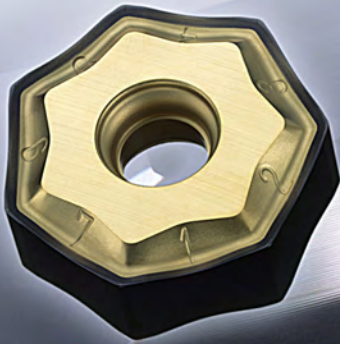


Face Milling Cutter for High Efficiency Machining of Cast Irons

# AHX640W

**Heptagonal double sided insert  
offering a breakthrough in  
cast iron machining.**



# Face Milling Cutter for High Efficiency Machining of Cast Irons

# AHX640W

## Features

### Unique 14 cornered insert

- Economical heptagonal double sided insert.
- Gold rake for easy recognition of used corners.
- Double positive cutting edge geometry offers lower cutting resistance for improved machining efficiency. (MK breaker)
- High rigidity inserts suitable for high feed milling of cast irons.

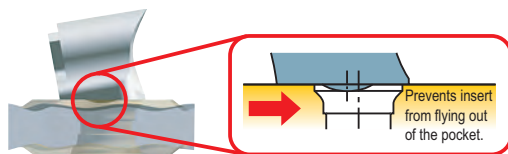


Sloped cutting edge and large rake angle



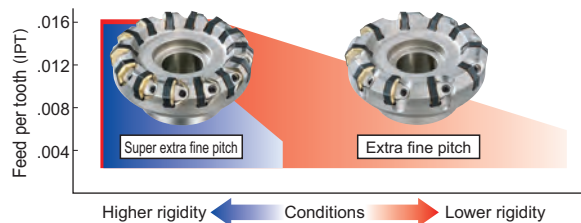
### Innovative clamp system

- New wedge geometry developed to increase the permissible number of teeth.
- Unique wedge geometry uses a protruding section that fits inside the insert hole 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 face mills for use on special machines are also available. Inserts can be used with both right and left hand type cutters.



### Insert applications

**MK** General-purpose insert

20° rake

- High tolerance M-class insert.
- Neutral, double sided 14 corners.
- 20° rake angle for low cutting resistance. First recommendation for roughing and finishing.
- New MC5020 grade for cast iron machining allows longer tool life.

**HK** Strong cutting edge insert

0° rake

- High 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 work pieces and high feed machining.
- New MC5020 grade for cast iron machining allows longer tool life.

**WK** Wiper insert

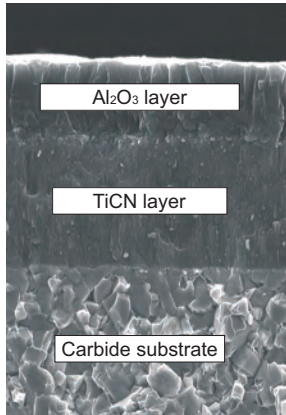
Improved surface finish

- Right-hand 2 corners, left-hand 2 corners.
- Based on the number of inserts and the cutting conditions. It is possible to improve the overall surface finish by using the wiper insert.
- New MC5020 grade for cast iron machining allows longer tool life.



## Features of MC5020

- MC5020 has excellent wear, chipping and thermal crack resistance. These features prevent the problems usually associated with machining cast irons 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

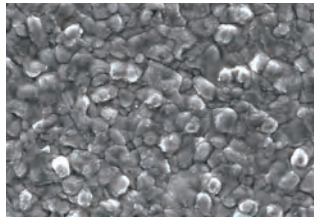
Use of a specially developed cemented carbide that provides superior resistance to fracture and thermal cracking prevents the cutting edge from sudden fracturing.

### Reduced abnormal damage

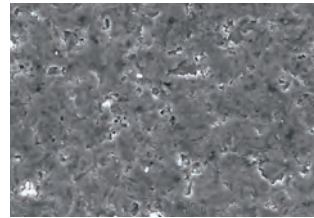
An extremely smooth black super-smooth coating prevents abnormal damage such as weld chipping.

### Black super-smooth coating

#### Comparison of Coating Surface



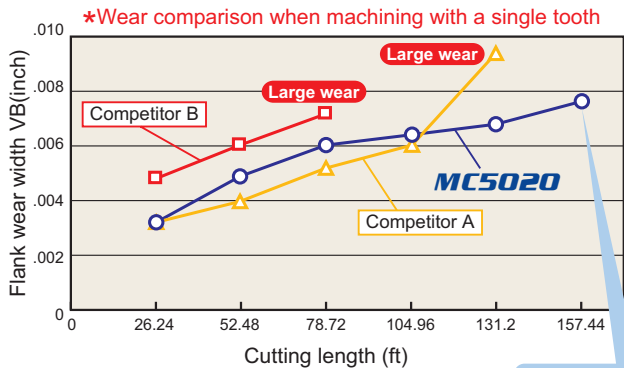
Conventional coating



Black super-smooth coating

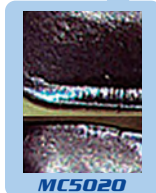
## Cutting Performance

### Wear Resistance

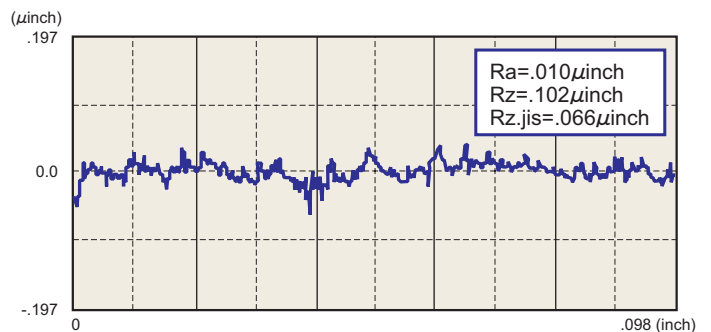


<Cutting Conditions>

Workpiece : AISI No45B  
 Tool : AHX640WR0410E  
 Insert : NNMU200608ZEN-MK (1 piece)  
 Cutting speed : 985 SFM  
 Feed per Tooth: .012 IPT  
 Axial Depth of Cut: .197 inch  
 Dry cutting



### Surface Finish



<Finish condition>



<Cutting Conditions>

Workpiece : AISI 100-70-03  
 Tool : AHX640WR0410E  
 Insert : NNMU200608ZEN-MK (13 pieces)  
 Wiper insert : WNEU2006ZEN7C-MK (1 piece)  
 Cutting speed : 1150 SFM  
 Feed per Tooth: .004 IPT  
 Axial Depth of Cut: .016 inch  
 Radial Depth of Cut : 3.150 inch  
 Air blow

# Face Milling Cutter for High Efficiency machining of Cast Irons

## AHX640W

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel
	➔			



Fig.1

ø3"  
ø4"

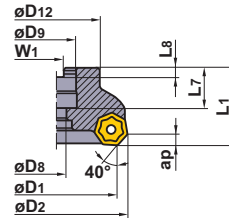


Fig.2

ø5"  
ø6"

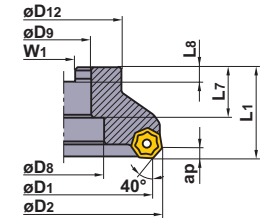


Fig.3

ø8"  
ø10"

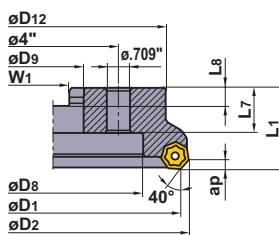
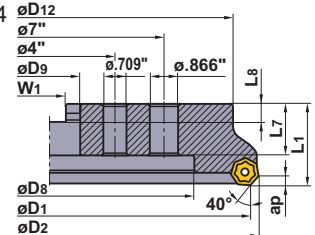


Fig.4

ø12"



C H :40°  
A.R : -6° T : +10°  
R.R : -4° I : +9°—+10° (T, I : When using the MK breaker insert)

Right hand tool holder shown.

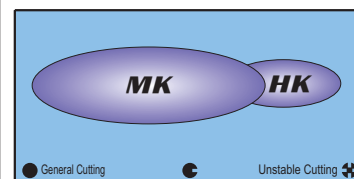
Type	Order Number	Stock		Number of Teeth	Dimensions (inch)								Max. Depth of Cut ap	Mass (lbs)	Type (Fig.)	
		R	L		D1	D2	L1	D9	L7	D8	D12	W1				L8
Extra Fine Pitch	AHX640WR/L0308D	●	□	8	3.000	3.494	2.500	1.250	1.260	.669	2.874	.500	.281	.236	4.2	1
	0410E	●	□	10	4.000	4.494	2.500	1.500	1.181	.787	3.799	.625	.375	.236	7.3	1
	0512E	●	□	12	5.000	5.494	2.500	1.500	1.378	2.362	3.799	.625	.375	.236	8.8	2
	0614F	●	□	14	6.000	6.494	2.500	2.000	1.496	3.150	4.724	.750	.437	.236	12.6	2
	0820M	●	□	20	8.000	8.494	2.500	2.500	1.378	5.512	6.890	1.000	.560	.236	19.6	3
	1024M	●	□	24	10.000	10.494	2.500	2.500	1.378	7.087	8.661	1.000	.560	.236	32.0	3
	1228M	●	□	28	12.000	12.494	2.500	2.500	1.575	9.646	11.220	1.000	.560	.236	49.2	4
Super Extra Fine Pitch	AHX640WR/L0310D	●	□	10	3.000	3.494	2.500	1.250	1.260	.669	2.874	.500	.281	.236	4.2	1
	0414E	●	□	14	4.000	4.494	2.500	1.500	1.181	.787	3.799	.625	.375	.236	7.3	1
	0518E	●	□	18	5.000	5.494	2.500	1.500	1.378	2.362	3.799	.625	.375	.236	8.8	2
	0620F	●	□	20	6.000	6.494	2.500	2.000	1.496	3.150	4.724	.750	.437	.236	12.6	2
	0828M	●	□	28	8.000	8.494	2.500	2.500	1.378	5.512	6.890	1.000	.560	.236	19.6	3
	1036M	●	□	36	10.000	10.494	2.500	2.500	1.378	7.087	8.661	1.000	.560	.236	32.0	3
	1242M	●	□	42	12.000	12.494	2.500	2.500	1.575	9.646	11.220	1.000	.560	.236	49.2	4

### INSERTS

Shape	Order Number	Class	Honing	Coated		Geometry
				MC5020		
	NNMU200608ZEN-MK	M	E	●		
	NNMU200608ZEN-HK	M	E	●		
	WNEU2006ZEN7C-WK	M	E	●		

### RECOMMENDED CUTTING CONDITIONS

Work Material	Tensile Strength	Grade	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)
Gray Cast Iron	≤200MPa	MC5020	985 (820—1150)	.012 (.008—.016)
	250—350 MPa		720 (490—985)	.012 (.008—.016)
Ductile Cast Iron	≤450MPa		655 (490—820)	.008 (.004—.012)
	500—800 MPa		555 (490—655)	.008 (.004—.012)



(Note) When the workpiece has poor clamping rigidity and the tool overhang is long, reduce the cutting speed and feed by 20—30%.

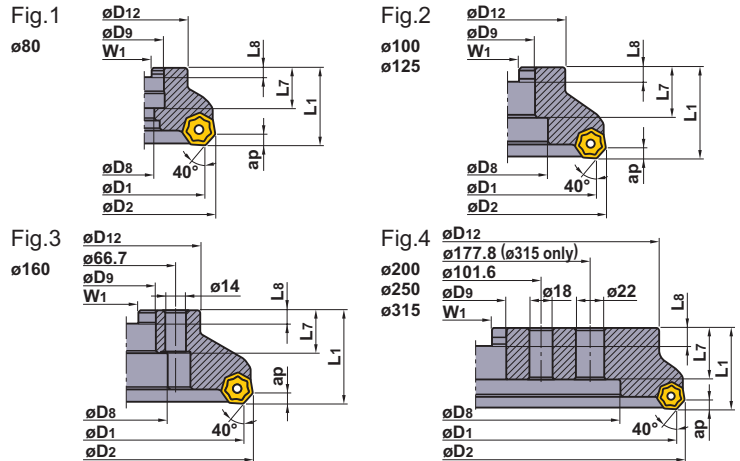
- : Inventory maintained. (10 inserts in one case)
- ★ : Inventory maintained in Japan.
- : Non stock, produced to order only.



**METRIC Standard**

For metric arbors

C H : 40°  
 A.R : -6° T : +10°  
 R.R : -4° I : +9° - +10° (T, I : When using the MK breaker insert)






Right hand tool holder shown.

Type	Order Number	Stock		Number of Teeth	Dimensions (mm)								Max. Depth of Cut ap	Mass (kg)	Type (Fig.)	
		R	L		D1	D2	L1	D9	L7	D8	D12	W1				L8
Extra Fine Pitch	AHX640W-080A08R/L	★	★	8	80	92.6	50	27	23	13	56	12.4	7	6	1.5	1
	-100B10R/L	★	★	10	100	112.6	50	32	32	45	70	14.4	8	6	2.1	2
	-125B12R/L	★	★	12	125	137.6	63	40	32	56	80	16.4	9	6	3.1	2
	-160C16R/L	★	★	16	160	172.6	63	40	29	56	100	16.4	9	6	5.6	3
	-200C20R/L	★	★	20	200	212.6	63	60	32	135	155	25.7	14	6	8.0	4
	-250C24R/L	★	★	24	250	262.6	63	60	32	180	200	25.7	14	6	12.6	4
	-315C28R/L	★	★	28	315	327.6	80	60	57	225	285	25.7	14	6	31.5	4
Super Extra Fine Pitch	AHX640W-080A10R/L	★	★	10	80	92.6	50	27	23	13	56	12.4	7	6	1.5	1
	-100B14R/L	★	★	14	100	112.6	50	32	32	45	70	14.4	8	6	2.1	2
	-125B18R/L	★	★	18	125	137.6	63	40	32	56	80	16.4	9	6	3.1	2
	-160C22R/L	★	★	22	160	172.6	63	40	29	56	100	16.4	9	6	5.6	3
	-200C28R/L	★	★	28	200	212.6	63	60	32	135	155	25.7	14	6	8.0	4
	-250C36R/L	★	★	36	250	262.6	63	60	32	180	200	25.7	14	6	12.6	4
	-315C44R/L	★	★	44	315	327.6	80	60	57	225	285	25.7	14	6	31.5	4



**SPARE PARTS**

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

\* Clamp Torque (lbf-in) : LS0622T=53

# Face Milling Cutter for High Efficiency machining of Cast Irons

## AHX640W

Light Alloy	Cast Iron	General Steel	Stainless Steel	Hardened Steel
	➔			



### METRIC Standard

For inch arbors

C H :40°  
 A.R : -6° T : +10°  
 R.R : -4° I : +9° - +10° (T, I : When using the MK breaker insert)

Fig.1  
ø80

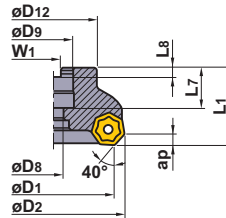


Fig.2  
ø100  
ø125  
ø160

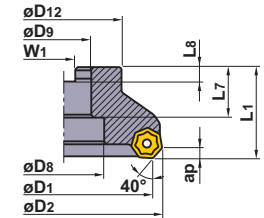


Fig.3  
ø200  
ø250

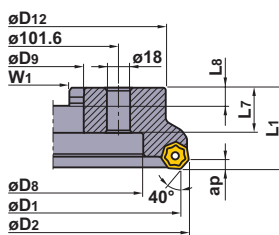
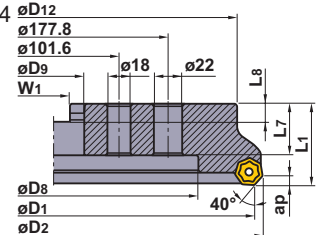


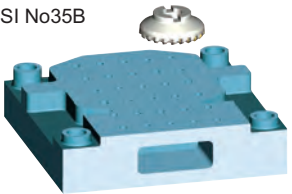


Fig.4  
ø315



Right hand tool holder shown.

Type	Order Number	Stock		Number of Teeth	Dimensions (mm)								Max. Depth of Cut ap	Mass (kg)	Type (Fig.)	
		R	L		D1	D2	L1	D9	L7	D8	D12	W1				L8
Extra Fine Pitch	AHX640WR/L08008C	★	★	8	80	92.6	50	25.4 (1.0")	26	13	56	9.5	6	6	1.5	1
	10010D	★	★	10	100	112.6	50	31.75 (1.25")	32	45	70	12.7	8	6	2.1	2
	12512E	★	★	12	125	137.6	63	38.1 (1.5")	35	56	80	15.9	10	6	3.5	2
	16016F	★	★	16	160	172.6	63	50.8 (2.0")	38	72	100	19.1	11	6	5.6	2
	20020K	★	★	20	200	212.6	63	47.625 (1.875")	35	140	175	25.4	14.22	6	9.0	3
	25024K	★	★	24	250	262.6	63	47.625 (1.875")	35	180	220	25.4	14.22	6	14.4	3
	31528P	★	★	28	315	327.6	63	47.625 (1.875")	40	225	285	25.4	14.22	6	23.8	4
Super Extra Fine Pitch	AHX640WR/L08010C	★	★	10	80	92.6	50	25.4 (1.0")	26	13	56	9.5	6	6	1.5	1
	10014D	★	★	14	100	112.6	50	31.75 (1.25")	32	45	70	12.7	8	6	2.1	2
	12518E	★	★	18	125	137.6	63	38.1 (1.5")	35	56	80	15.9	10	6	3.5	2
	16022F	★	★	22	160	172.6	63	50.8 (2.0")	38	72	100	19.1	11	6	5.6	2
	20028K	★	★	28	200	212.6	63	47.625 (1.875")	35	140	175	25.4	14.22	6	9.0	3
	25036K	★	★	36	250	262.6	63	47.625 (1.875")	35	180	220	25.4	14.22	6	14.4	3
	31544P	★	★	44	315	327.6	63	47.625 (1.875")	40	225	285	25.4	14.22	6	23.8	4

## Application Examples

Tool		AHX640WR0614F	AHX640WR0512E	AHX640WR0414E
Insert		NNMU200608ZEN-MK	NNMU200608ZEN-MK	NNMU200608ZEN-MK
Workpiece		AISI No35B 	AISI No35B 	AISI 100-70-03 
Component		Press mould base	Housing case	Automotive suspension part
Cutting Conditions	Cutting Speed (SFM)	785	490	785
	Table Feed (IPM)	112	19.7	118.1
	Feed per Tooth (IPT)	.016	.004	.011
	Axial Depth of Cut (inch)	.118—.157	.118	.118—.157
	Radial Depth of Cut (inch)	6.30	1.57	3.15
Coolant		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 use of the extra cutting edges a substantial saving can be made.	Even when machining ductile cast irons, 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.

**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 spanner. ●When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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