

Face Milling Cutter for High Efficiency Machining of Cast Irons

AHX640W

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



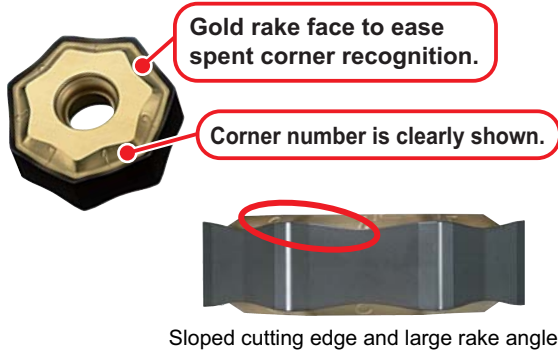
Face Milling Cutter for High Efficiency Machining of Cast Irons

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Features

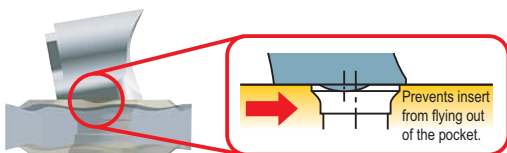
Unique 14 cornered insert

- 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.



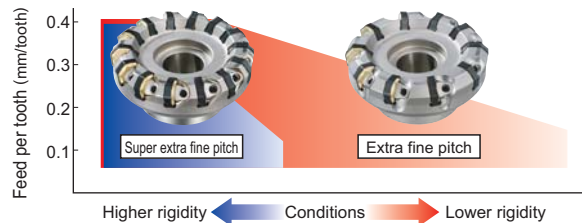
Innovative clamp system

- 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 type 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



- 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



- 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



- 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.
- New MC5020 grade for cast iron machining allows longer tool life.

AHX640W

Light Alloy	Cast Iron	Carbon Steel Alloy Steel	Stainless Steel	Hardened Steel
	➔			



Fig.1
ø80

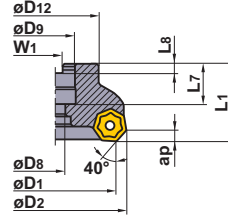


Fig.2
ø100
ø125
ø160

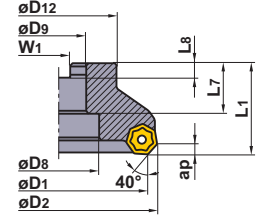


Fig.3
ø200
ø250

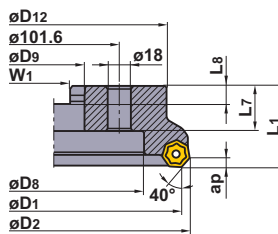
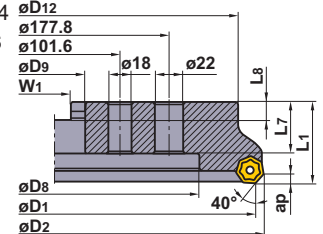


Fig.4
ø315



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

Inserts					
Sharp	Order Number	Class	Honing	Coated	Geometry
MK Breaker	NNMU200608ZEN-MK	M	E	●	
NEW HK Breaker	NNMU200608ZEN-HK	M	E	●	
NEW Wipper	WNEU2006ZEN7C-WK	E	E	●	

* The inserts can be used with both right and left hand cutters.

Recommended Cutting Conditions

General Maching

Work Material	Tensile Strength	Insert Grade	Cutting Speed (m/min)	Feed per Tooth (mm/tooth)
Gray Cast Iron	≤200MPa	MC5020	300 (250-350)	0.3 (0.2-0.4)
	250-350 MPa		220 (150-300)	0.3 (0.2-0.4)
Ductile Cast Iron	≤450MPa		200 (150-250)	0.2 (0.1-0.3)
	500-800 MPa		170 (150-200)	0.2 (0.1-0.3)

Finishing (When using wipper insert)

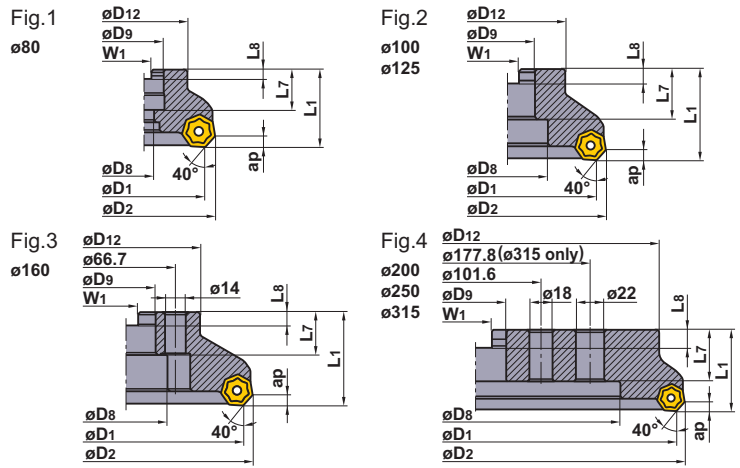
Work Material	Axial Depth of Cut (mm)	Cutting Speed (m/min)	Feed per Revolution (mm/rev.)
Gray Cast Iron	<0.5	320 (250-400)	1-6
	0.5-3	270 (200-350)	
Ductile Cast Iron	<0.5	270 (200-350)	
	0.5-3	220 (200-250)	



For metric arbors

The bore diameter (D9) is equivalent to a metric size.

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)								Tool Weight (kg)	Max. Depth of Cut ap (mm)	Figure	
		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	1.5	6	1
	-100B10R/L	●	●	10	100	112.6	50	32	32	45	70	14.4	8	2.1	6	2
	-125B12R/L	●	●	12	125	137.6	63	40	32	56	80	16.4	9	3.1	6	2
	-160C16R/L	●	●	16	160	172.6	63	40	29	56	100	16.4	9	5.6	6	3
	-200C20R/L	●	●	20	200	212.6	63	60	32	135	155	25.7	14	8.0	6	4
	-250C24R/L	●	●	24	250	262.6	63	60	32	180	200	25.7	14	12.6	6	4
	-315C28R/L	●	●	28	315	327.6	80	60	57	225	285	25.7	14	31.5	6	4
Supper extra fine pitch	AHX640W-080A10R/L	●	●	10	80	92.6	50	27	23	13	56	12.4	7	1.5	6	1
	-100B14R/L	●	●	14	100	112.6	50	32	32	45	70	14.4	8	2.1	6	2
	-125B18R/L	●	●	18	125	137.6	63	40	32	56	80	16.4	9	3.1	6	2
	-160C22R/L	●	●	22	160	172.6	63	40	29	56	100	16.4	9	5.6	6	3
	-200C28R/L	●	●	28	200	212.6	63	60	32	135	155	25.7	14	8.0	6	4
	-250C36R/L	●	●	36	250	262.6	63	60	32	180	200	25.7	14	12.6	6	4
	-315C44R/L	●	●	44	315	327.6	80	60	57	225	285	25.7	14	31.5	6	4



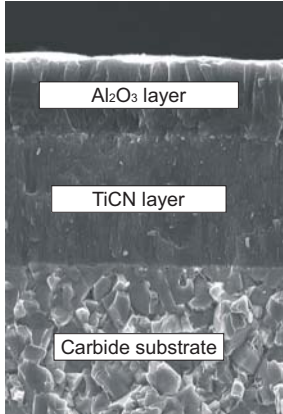
Spare Parts

Order Number		 *	
	Wedge	Clamp Screw	Wrench
AHX640W	CWAHX640WN	LS0622T	TKY15T

* Clamp Torque (N • m) : LS0622T=6.0

Features of MC5020

- MC5020 has excellent wear, chipping and thermal crack resistance and prevents 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

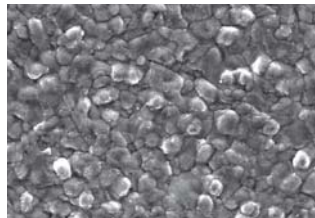
Use of a specially developed cemented carbide that provides superior resistance to fracture and thermal cracking prevents the cutting edge from sudden fracturing.

Reduced abnormal damage

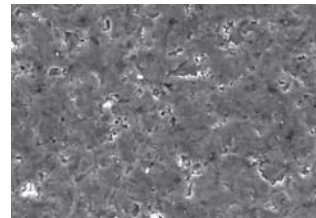
An extremely smooth black super-smooth coating prevents abnormal damage such as weld chipping.

Black super-smooth coating

Comparison of Coating Surface



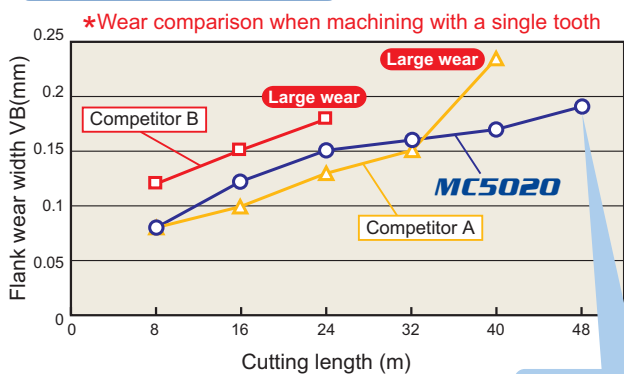
Conventional coating



Black super-smooth coating

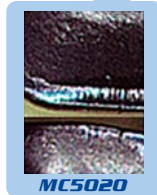
Cutting Performance

Wear Resistance

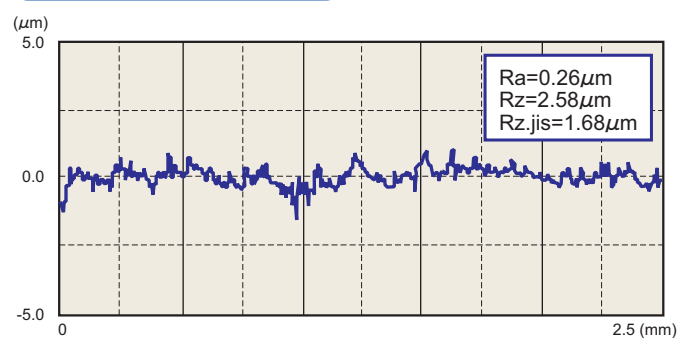


<Cutting Conditions>

Workpiece : JIS FC300
 Tool : AHX640WR10010D
 Insert : NNMU200608ZEN-MK (1 piece)
 Cutting speed : 300m/min
 Feed per Tooth : 0.3mm/tooth
 Axial Depth of Cut : 5mm
 Dry cutting



Surface Finish



<Finish condition>

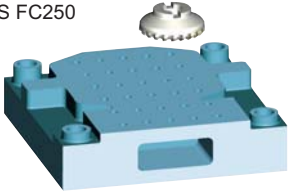

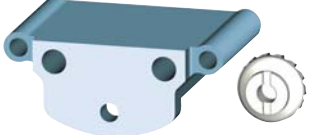


<Cutting Conditions>

Workpiece : JIS FCD700
 Tool : AHX640WR10014D
 Insert : NNMU200608ZEN-MK (13 pieces)
 Wiper insert : WNEU2006ZEN7C-WK (1 piece)
 Cutting speed : 350m/min
 Feed per Tooth : 0.1mm/tooth
 Axial Depth of Cut : 0.4mm
 Radial Depth of Cut : 80mm
 Air blow

AHX640W

Application Examples

Tool		AHX640WR16016F	AHX640WR12512E	AHX640WR10014D
Insert		NNMU200608ZEN-MK	NNMU200608ZEN-MK	NNMU200608ZEN-MK
Workpiece		JIS FC250 	JIS FC250 	JIS FCD600 
	Component	Press mould base	Housing case	Automotive suspension part
Cutting Conditions	Cutting Speed (m/min)	240	150	240
	Table Feed (mm/min)	3060	500	3000
	Feed per Tooth (mm/tooth)	0.4	0.1	0.28
	Axial Depth of Cut (mm)	3-4	3	3-4
	Radial Depth of Cut (mm)	160	40	80
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 whilst 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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