

AHX

ECONOMICAL, HEPTAGONAL DOUBLE SIDED INSERTS
WITH 14 CUTTING EDGES



DIAEDGE

 **MITSUBISHI MATERIALS**

AHX

MULTI CORNER INSERT FACE MILLING CUTTERS

AHX440S



IDEAL FOR ROUGHING AND FINISHING ON SMALL AND LOW POWER MACHINES

- Diameter range $\varnothing 40 - 160$ mm (3 – 16 teeth)
- Double sided insert with 14 cutting edges
- Maximum depth of cut 3 mm (APMX)
- With through coolant holes ($\varnothing 40 - 125$ mm)
- Insert corner radius 0.8 mm and 3.2 mm
- ISO application range:

P	M	K
		H

NEW AHX475S



IDEAL FOR HIGH FEED FACE MILLING

- Diameter range $\varnothing 50 - 160$ mm (4 – 12 teeth)
- Double sided insert with 14 cutting edges
- Maximum depth of cut 1.6 mm (APMX)
- With through coolant holes ($\varnothing 50 - 160$ mm)
- Feed rate up to 2 mm/tooth
- ISO application range:

P		K
		H

AHX640S



IDEAL FOR GENERAL ROUGHING ON MEDIUM AND LARGER MACHINES

- Diameter range $\varnothing 63 - 200$ mm (4 – 12 teeth)
- Double sided insert with 14 cutting edges
- Maximum depth of cut 6 mm (APMX)
- With through coolant holes ($\varnothing 63 - 125$ mm)
- ISO application range:

P	M	K
		H

AHX640W



IDEAL FOR GENERAL ROUGHING OF CAST IRON ON MEDIUM AND LARGER MACHINES

- Diameter range $\varnothing 80 - 315$ mm (8 – 44 teeth)
- Double sided insert with 14 cutting edges
- Maximum depth of cut 6 mm (APMX)
- High rigidity Anti-Fly (AFI) wedge clamping system
- ISO application range:

		K

DOUBLE SIDED INSERT WITH 14 CUTTING EDGES FOR MACHINING OF STEEL, STAINLESS STEEL AND CAST IRON

ECONOMICAL HEPTAGONAL DOUBLE SIDED INSERT

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

HIGH RIGIDITY

Increasing the thickness of the insert offers higher rigidity for greater reliability.

CUTTING EDGE NUMBER

For easy handling and to recognize used and unused corners.



GRADE SELECTION

ISO	APPLICATION RANGE													
P	PVD			M	PVD		K	CVD	PVD	S	PVD		H	PVD
P10	MP6120	VP15TF	VP20RT	M10	VP15TF	VP20RT	K10	MC5.020	VP15TF	S10	VP20RT	MP9120	H10	VP15TF
P20				M20			K20			S20		NEW	H20	
P30	NEW			M30		MP7030	K30		VP20RT	S30		MP9130	H30	
P40			NEW	M40		MP7130	K40			S40		NEW	H40	
						MP7140								
						NEW								

AHX440S

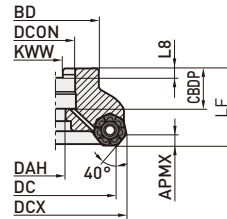


FACE MILLING GENERAL CUTTING

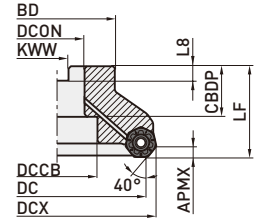


KAPR: 50°
GAMP: -10°
GAMF: -7°

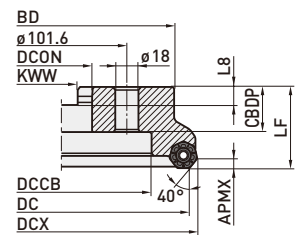
Type 1
Ø 40
Ø 50
Ø 60
Ø 80



Type 2
Ø 100
Ø 125



Type 3
Ø 160



Right hand tool holder only.

Order Number	DC	Stock	Coolant Hole	Teeth	LF	DCX	DCONMS	CBDP	DAH	DCCB	BD	KWW	L8	WT	APMX	Type
AHX440S-040A03AR	40	●	○	3	40	48.4	16	18	9	-	37	8.4	5.6	0.3	3	1
AHX440S-040A04AR		●	○	4	40	48.4	16	18	9	-	37	8.4	5.6	0.2	3	1
AHX440S-050A04AR		●	○	4	40	58.4	22	20	11	-	47	10.4	6.3	0.4	3	1
AHX440S-050A05AR	50	●	○	5	40	58.4	22	20	11	-	47	10.4	6.3	0.4	3	1
AHX440S-050A06AR		●	○	6	40	58.4	22	20	11	-	47	10.4	6.3	0.4	3	1
AHX440S-063A05AR	63	●	○	5	40	71.4	22	20	11	-	50	10.4	6.3	0.6	3	1
AHX440S-063A06AR		●	○	6	40	71.4	22	20	11	-	50	10.4	6.3	0.6	3	1
AHX440S-063A08AR		●	○	8	40	71.4	22	20	11	-	50	10.4	6.3	0.5	3	1
AHX440S-080A06AR	80	●	○	6	50	88.4	27	23	13	-	56	12.4	7	1.1	3	1
AHX440S-080A08AR		●	○	8	50	88.4	27	23	13	-	56	12.4	7	1.1	3	1
AHX440S-080A10AR		●	○	10	50	88.4	27	23	13	-	56	12.4	7	1.1	3	1
AHX440S-100B07AR	100	●	○	7	50	108.4	32	32	-	45	78	14.4	8	1.6	3	2
AHX440S-100B10AR		●	○	10	50	108.4	32	32	-	45	78	14.4	8	1.6	3	2
AHX440S-100B12AR		●	○	12	50	108.3	32	32	-	45	78	14.4	8	1.6	3	2
AHX440S-125B08AR	125	●	○	8	63	133.4	40	40	-	56	89	16.4	9	3.0	3	2
AHX440S-125B12AR		●	○	12	63	133.4	40	40	-	56	89	16.4	9	3.0	3	2
AHX440S-125B14AR		●	○	14	63	133.3	40	40	-	56	89	16.4	9	2.9	3	2
AHX440S-160C10NR	160	●	-	10	63	168.4	40	40	-	56	100	16.4	9	4.8	3	3
AHX440S-160C14NR		●	-	14	63	168.4	40	40	-	56	100	16.4	9	4.6	3	3
AHX440S-160C16NR		●	-	16	63	168.4	40	40	-	56	100	16.4	9	4.7	3	3

The cutter body is not supplied with the set bolt for the arbor. Please order a set bolt separately.



Roughing



Finishing

INSERTS

Order Number	Class	Honing	MP6120	MP6130	MP7130	MP7140	MC5020	VP15TF	IC	RE	BS	APMX	Geometry
NNMU130508ZER-L	M	E	●	●	●	●	●	★	13.4	0.8	1	3	
NNMU130508ZEN-M	M	E	●	●	●	●	●	★	13.4	0.8	1	4	
NNMU130532ZEN-M	M	E	●	●	●	●	●	★	13.4	3.2	-	4*	
NNMU130532ZEN-R	M	E	●	●	●	●	●	★	13.4	3.2	-	4	
NEW WNEU1305ZEN4C-M	G	E	●				●	★	13.4	2.7	-	3.5	

*When not using a Wiper, APMX = 3.5mm

GRADE SELECTION

ISO	APPLICATION RANGE											
P	PVD			M	PVD		K	CVD	PVD	H	PVD	
P10	MP6120	VP15TF	MP6130	M10	VP15TF	MP7130	MP7140	K10	MC5020	VP15TF	H10	VP15TF
P20				M20				K20			H20	
P30				M30				K30			H30	
P40				M40				K40			H40	

SPARE PARTS

Tool Holder Number	Clamp Screw	Wrench (Insert)
AHX440S	TS35R	TKY15T

*Clamp Torque (Nm) = 3.5

OPTIONAL PARTS LIST

Tool Holder Number	Set Bolt Order Number		Type	Geometry
	With coolant hole	Without coolant hole		
AHX440S-040A [○] AR	HSC08025H	HSC08040	1	
AHX440S-050A [○] AR	HSC10030H	HSC10035	1	
AHX440S-063A [○] AR	HSC10030H	HSC10035	1	
AHX440S-080A [○] AR	HSC12035H	HSC12035	1	
		HSC12045		
AHX440S-100B [○] AR	MBA16033H	-	2	
AHX440S-125B [○] AR	MBA20040H	-	2	

Fig.1

Fig.2

RECOMMENDED CUTTING CONDITIONS

Material	Hardness	Grade	Vc (m/min)	fz (mm/t.)	ap (mm)		
P	Mild Steel	MP6120	250 (200-300)	0.3 (0.2-0.4)	≤ 3		
		MP6130	240 (190-290)	0.3 (0.2-0.4)	≤ 3		
	Carbon Steel Alloy Steel	180-280HB	MP6120	220 (170-270)	0.3 (0.2-0.4)	≤ 3	
			MP6130	200 (150-250)	0.3 (0.2-0.4)	≤ 3	
		280-350HB	MP6120	140 (100-180)	0.3 (0.2-0.4)	≤ 3	
			MP6130	120 (90-150)	0.3 (0.2-0.4)	≤ 3	
	Pre-Hardened Steel Alloy Tool Steel	180-280HB	MP6120	140 (100-180)	0.15 (0.1-0.2)	≤ 1	
			MP6130	120 (90-150)	0.15 (0.1-0.2)	≤ 1	
	M	Austenitic Stainless Steel	≤200HB	MP7130	200 (150-250)	0.2 (0.1-0.3)	≤ 3
				MP7140	180 (120-230)	0.2 (0.1-0.3)	≤ 3
≥200HB			MP7130	150 (100-200)	0.2 (0.1-0.3)	≤ 3	
			MP7140	130 (80-180)	0.2 (0.1-0.3)	≤ 3	
Ferritic and Martensitic Stainless Steel		≤200HB	MP7130	200 (150-250)	0.2 (0.1-0.3)	≤ 3	
			MP7140	180 (120-230)	0.2 (0.1-0.3)	≤ 3	
		≥200HB	MP7130	150 (100-200)	0.2 (0.1-0.3)	≤ 3	
			MP7140	130 (80-180)	0.2 (0.1-0.3)	≤ 3	
Two-phase Stainless Steel		≤280HB	MP7130	140 (100-180)	0.15 (0.05-0.25)	≤ 3	
			MP7140	120 (80-160)	0.15 (0.05-0.25)	≤ 3	
Hardened Stainless Steel		≥280HB	MP7130	130 (100-160)	0.15 (0.05-0.25)	≤ 3	
			MP7140	110 (80-140)	0.15 (0.05-0.25)	≤ 3	
K		Grey Cast Iron	<350MPa	MC5020	220 (150-300)	0.3 (0.2-0.4)	≤ 3
				VP15TF	180 (130-230)	0.3 (0.2-0.4)	≤ 3
	Ductile Cast Iron	<450MPa	MC5020	200 (150-250)	0.2 (0.1-0.3)	≤ 3	
			VP15TF	170 (120-220)	0.2 (0.1-0.3)	≤ 3	
	Ductile Cast Iron	<800MPa	MC5020	170 (150-200)	0.2 (0.1-0.3)	≤ 3	
			VP15TF	140 (100-180)	0.2 (0.1-0.3)	≤ 3	
H	Hardened Steel	40-55HRC	VP15TF	80 (60-100)	0.15 (0.1-0.2)	≤ 1	

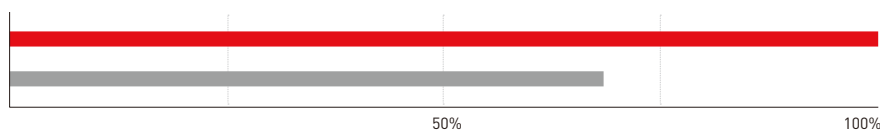
Reduce the cutting speed when using coolant.

APPLICATION EXAMPLES

Component	Turbocharger exhaust manifold
Workpiece	GX40CrNiSi25-12
Tool	AHX440S-063A08AR
Cutting Speed Vc (m/min)	99
Feed per Tooth fz (mm/t.)	0.3
Depth of Cut ap (mm)	3
Width of Cut ae (mm)	50
Coolant	Dry



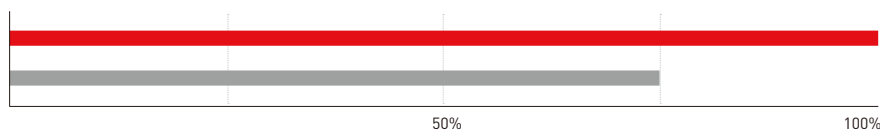
Results AHX440S achieved 1.4 times the tool life of conventional cutters.



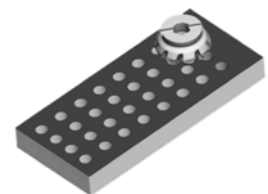
Component	Automobile part
Workpiece	EN-GJS-500
Tool	AHX440S-050A04AR
Cutting Speed Vc (m/min)	141
Feed per Tooth fz (mm/t.)	0.15
Depth of Cut ap (mm)	0.8
Width of Cut ae (mm)	35
Coolant	Dry



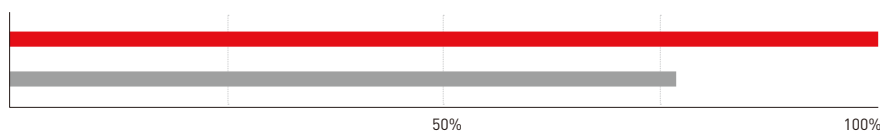
Results The tool life was expanded from 120 minutes to 160 minutes when rough and finish machining.



Component	Steel plate for pressure containers
Workpiece	Ck45 / 1.1191
Tool	AHX440S-100B10AR
Cutting Speed Vc (m/min)	251
Feed per Tooth fz (mm/t.)	0.15
Depth of Cut ap (mm)	1.5
Width of Cut ae (mm)	80
Coolant	Wet



Results AHX440S gave 1.3 times longer tool life during heavy interrupted cutting. Tool life was evaluated based on whether burrs were generated around the holes.



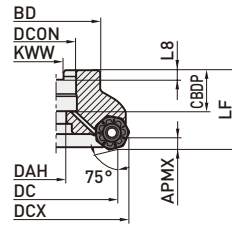
AHX475S



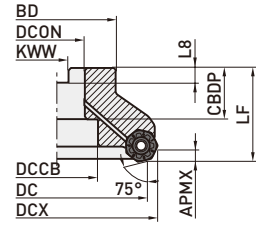
FACE MILLING GENERAL CUTTING



Type 1
 Ø 50
 Ø 60
 Ø 80



Type 2
 Ø 100
 Ø 125
 Ø 160



Right hand tool holder only.

KAPR: 15°
 T: 16°
 GAMP: -6° / 9°
 GAMF: -10°

Order Number	DC	Stock	Coolant Hole	Teeth	LF	DCX	DCON	CDBP	DAH	DCCB	BD	KWW	L8	WT	APMX	Type
NEW AHX475S-050A04AR	50	●	○	4	50	65.6	22	20	11	17	47	10.4	6.3	0.6	1.6	1
NEW AHX475S-050A05AR		●	○	5	50	65.6	22	20	11	17	47	10.4	6.3	0.6	1.6	1
NEW AHX475S-063A05AR	63	●	○	5	50	78.6	22	20	11	17	60	10.4	6.3	1.0	1.6	1
NEW AHX475S-063A06AR		●	○	6	50	78.6	22	20	11	17	60	10.4	6.3	0.9	1.6	1
NEW AHX475S-080A06AR	80	●	○	6	50	95.6	27	23	13	20	76	12.4	7	1.6	1.6	1
NEW AHX475S-080A08AR		●	○	8	50	95.6	27	23	13	20	76	12.4	7	1.5	1.6	1
NEW AHX475S-100A07AR	100	●	○	7	63	115.6	32	26	17	26	96	14.4	8	3.2	1.6	2
NEW AHX475S-100A09AR		●	○	9	63	115.6	32	26	17	26	96	14.4	8	3.2	1.6	2
NEW AHX475S-125B08AR	125	●	○	8	63	140.6	40	40	56	-	100	16.4	9	3.8	1.6	2
NEW AHX475S-125B10AR		●	○	10	63	140.6	40	40	56	-	100	16.4	9	3.8	1.6	2
NEW AHX475S-160B10AR	160	●	○	10	63	175.6	40	40	56	-	100	16.4	9	5.4	1.6	2
NEW AHX475S-160B12AR		●	○	12	63	175.6	40	40	56	-	100	16.4	9	5.3	1.6	2

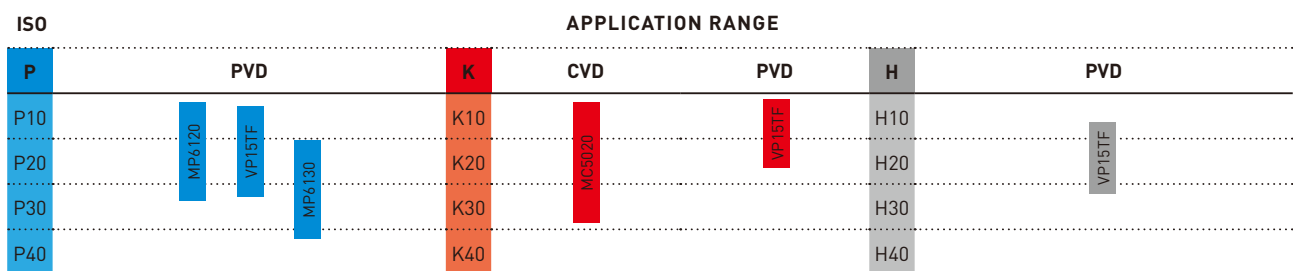
The cutter body is not supplied with a set bolt for the arbor. Please order the set bolt separately.



INSERTS

Order Number	Class	Honing	Grade				IC	RE	BS	APMX	Geometry
			MP6120	MP6130	MC5020	VP15TF					
NNMU130532ZEN-M	M	E	●	●	●	★	13.4	3.2	-	1.6	
NNMU130532ZEN-R	M	E	●	●	●	★	13.4	3.2	-	1.6	

GRADE SELECTION



SPARE PARTS

Tool Holder Number	Spare Parts	
	Clamp Screw	Wrench (Insert)
AHX475S	TS35R	TKY15T

*Clamp Torque (Nm) = 3.5

OPTIONAL PARTS LIST

Tool Holder Number	Set Bolt Order Number		Type	Geometry
	With coolant hole	Without coolant hole		
AHX475S-050A [○] AR	HSC10030H	HSC10035	1	
AHX475S-063A [○] AR	HSC10030H	HSC10035	1	
AHX475S-080A [○] AR	HSC12035H	HSC12035 HSC12045	1	
AHX475S-100B [○] AR	HSC16040H	-	1	
AHX475S-125B [○] AR	MBA20040H	-	2	
AHX475S-160B [○] AR	MBA20040H	-	2	

RECOMMENDED CUTTING CONDITIONS

Material	Hardness	Grade	Breaker	Vc (m/min)	fz (mm/t.)	ap (mm)	ae (mm)	
P	Mild Steel	<180HB	MP6120	R	150 (100 – 200)	0.6	≤1.6	≤0.5DC
			MP6120	R	150 (100 – 200)	0.8	≤1.6	0.5 – 0.8DC
			MP6120	M	150 (100 – 200)	1	≤1.6	0.8 – 1DC
			MP6130	R	130 (80 – 180)	0.6	≤1.6	≤0.5DC
			MP6130	R	130 (80 – 180)	0.8	≤1.6	0.5 – 0.8DC
			MP6130	M	130 (80 – 180)	1	≤1.6	0.8 – 1DC
	Carbon Steel Alloy Steel	180–280HB	MP6120	R	130 (80 – 180)	0.6	≤1.6	≤0.5DC
			MP6120	R	130 (80 – 180)	0.8	≤1.6	0.5 – 0.8DC
			MP6120	M	130 (80 – 180)	1	≤1.6	0.8 – 1DC
			MP6130	R	110 (60 – 160)	0.6	≤1.6	≤0.5DC
			MP6130	R	110 (60 – 160)	0.8	≤1.6	0.5 – 0.8DC
			MP6130	M	110 (60 – 160)	1	≤1.6	0.8 – 1DC
	Pre-Hardened Steel Alloy Tool Steel	280–350HB	MP6120	R	100 (50 – 150)	0.5	≤1.6	≤0.5DC
			MP6120	R	100 (50 – 150)	0.6	≤1.6	0.5 – 0.8DC
			MP6120	R	100 (50 – 150)	0.7	≤1.6	0.8 – 1DC
			MP6130	R	80 (30 – 130)	0.5	≤1.6	≤0.5DC
			MP6130	R	80 (30 – 130)	0.6	≤1.6	0.5 – 0.8DC
			MP6130	R	80 (30 – 130)	0.7	≤1.6	0.8 – 1DC
Pre-Hardened Steel Alloy Tool Steel	35–45HRC	MP6120	R	100 (70 – 130)	0.5	≤1.6	≤0.5DC	
		MP6120	R	100 (70 – 130)	0.6	≤1.6	0.5 – 0.8DC	
		MP6120	R	100 (70 – 130)	0.7	≤1.6	0.8 – 1DC	
		MP6130	R	80 (50 – 110)	0.5	≤1.6	≤0.5DC	
		MP6130	R	80 (50 – 110)	0.6	≤1.6	0.5 – 0.8DC	
		MP6130	R	80 (50 – 110)	0.7	≤1.6	0.8 – 1DC	
K	Grey Cast Iron	<350MPa	MC5020	R	150 (100 – 200)	0.6	≤1.6	≤0.5DC
			MC5020	R	150 (100 – 200)	0.8	≤1.6	0.5 – 0.8DC
			MC5020	M	150 (100 – 200)	1	≤	0.8 – 1DC
			VP15TF	M	120 (80 – 160)	0.6	≤1.6	≤0.5DC
			VP15TF	M	120 (80 – 160)	0.8	≤1.6	0.5 – 0.8DC
			VP15TF	M	120 (80 – 160)	1	≤1.6	0.8 – 1DC
	Ductile Cast Iron	<450MPa	MC5020	R	150 (100 – 200)	0.6	≤1.6	≤0.5DC
			MC5020	R	150 (100 – 200)	0.8	≤1.6	0.5 – 0.8DC
			MC5020	M	150 (100 – 200)	1	≤1.6	0.8 – 1DC
			VP15TF	R	120 (80 – 160)	0.6	≤1.6	≤0.5DC
			VP15TF	R	120 (80 – 160)	0.8	≤1.6	0.5 – 0.8DC
			VP15TF	M	120 (80 – 160)	1	≤1.6	0.8 – 1DC
	Ductile Cast Iron	<800MPa	MC5020	R	150 (100 – 200)	0.5	≤1.6	≤0.5DC
			MC5020	R	150 (100 – 200)	0.6	≤1.6	0.5 – 0.8DC
			MC5020	R	150 (100 – 200)	0.7	≤1.6	0.8 – 1DC
			VP15TF	R	120 (80 – 160)	0.5	≤1.6	≤0.5DC
			VP15TF	R	120 (80 – 160)	0.6	≤1.6	0.5 – 0.8DC
			VP15TF	R	120 (80 – 160)	0.7	≤1.6	0.8 – 1DC
H	Hardened Steel	40–55 HRC	VP15TF	R	70 (50 – 90)	0.4	≤1.6	≤0.5DC
			VP15TF	R	70 (50 – 90)	0.5	≤1.6	0.5 – 0.8DC
			VP15TF	R	70 (50 – 90)	0.6	≤1.6	0.8 – 1DC

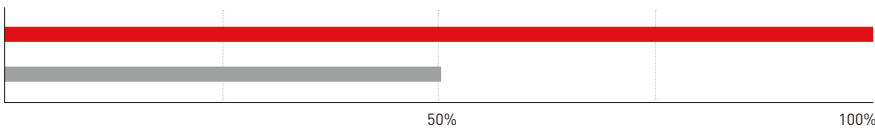
Reduce the cutting speed when using coolant.

APPLICATION EXAMPLES

Component	Steel plate for pressure containers
Workpiece	S355J2
Tool	AHX475S-100A07AR
Cutting Speed Vc (m/min)	200
Feed per Tooth fz (mm/t.)	1.0
Depth of Cut ap (mm)	1
Width of Cut ae (mm)	84
Coolant	Dry



Results AHX4475S achieved double tool life, compared to competitors cutters.



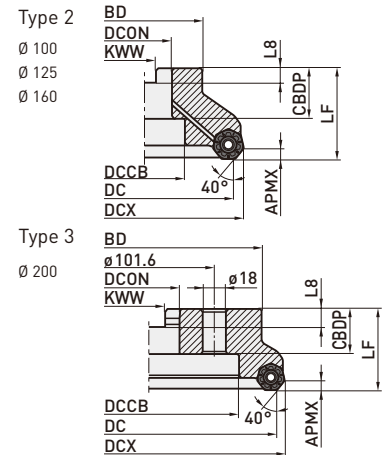
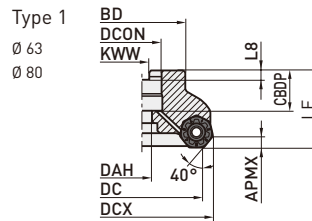
AHX640S



FACE MILLING GENERAL CUTTING



KAPR: 50°
GAMP: -5°
GAMF: -6°




















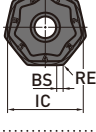


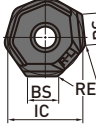



Right hand tool holder only.

Order Number	DC	Stock	Coolant Hole	Teeth	DCX	LF	DCON	CBDP	DAH	DCCB	BD	KWW	L8	WT	APMX	Type
AHX640S-063A04AR	63	●	○	4	75.6	50	22	20	11	-	50	10.4	6.3	0.7	6	1
AHX640S-063A05AR		●	○	5	75.6	50	22	20	11	-	50	10.4	6.3	0.6	6	1
AHX640S-080A04AR	80	●	○	4	92.6	50	27	23	13	-	56	12.4	7	1.1	6	1
AHX640S-080A06AR		●	○	6	92.6	50	27	23	13	-	56	12.4	7	1.0	6	1
AHX640S-100B05AR	100	●	○	5	112.6	50	32	32	-	45	78	14.4	8	1.7	6	2
AHX640S-100B07AR		●	○	7	112.6	50	32	32	-	45	78	14.4	8	1.6	6	2
AHX640S-125B06AR	125	●	○	6	137.6	63	40	42	-	56	89	16.4	9	3.1	6	2
AHX640S-125B08AR		●	○	8	137.6	63	40	42	-	56	89	16.4	9	3.0	6	2
AHX640S-160C07NR	160	●	-	7	172.6	63	40	29	-	56	120	16.4	9	5.4	6	3
AHX640S-160C10NR		●	-	10	172.6	63	40	29	-	56	120	16.4	9	5.2	6	3
AHX640S-200C08NR	200	●	-	8	212.6	63	60	32	-	140	175	25.7	14.22	7.8	6	3
AHX640S-200C12NR		●	-	12	212.6	63	60	32	-	140	175	25.7	14.22	7.5	6	3



INSERTS

Order Number	Class	Honing	NEW MP6120	NEW MP6130	NEW MP9120	NEW MP9130	MC5020	MP7030	VP15TF	VP20RT	IC	S	BS	RE	Geometry
L															
NNMU200712ZER-L	M	E	●	●							20	8.0	1.0	1.2	  
M / MP															
NNMU200708ZEN-MP	M	E						●			20	8.0	1.0	0.8	  
NNMU200708ZEN-M	M	E	●	●							20	8.0	1.0	0.8	  
WP (Wiper)															
WNEU2007ZEN7C-WP	M	E						●			20	7.2	7.1	0.8	  
MM															
NNMU200712ZER-MM	M	E					●				20	8.0	1.0	1.2	  
MK*															
NNMU200608ZEN-MK	M	E				●	●	★			20	6.55	1.0	0.8	  
HK*															
NNMU200608ZEN-HK	M	E				●	●	★			20	6.55	1.0	0.8	  
WK* (Wiper)															
WNEU2006ZEN7C-WK	E	E				●					20	6.55	7.4	0.8	  

*The MK/HK/WK breaker insert is compatible with AHX640S.

1. Possible wiper combinations: MK/HK with WK (wiper) & MP/L/M with WP (wiper)
2. Note that the height differs when MK/HK chip breaker inserts are used.

GRADE SELECTION

ISO	APPLICATION RANGE													
P	PVD			M	PVD		K	CVD	PVD	S	PVD		H	PVD
P10	MP6120	VP15TF	VP20RT	M10	VP15TF	VP20RT	K10	MC5020	VP15TF	S10	VP20RT	MP9120	H10	VP15TF
P20				M20			K20			S20		NEW	H20	
P30	NEW			M30		MP7030	K30		VP20RT	S30		MP9130	H30	
P40				M40			K40			S40		NEW	H40	

SPARE PARTS

Tool Holder Number



Clamp Screw



Wrench (Insert)

AHX640S

CS5015060T

TKY20T

*Clamp Torque (Nm) : CS5015060T = 5.0

OPTIONAL PARTS LIST

Tool Holder Number	Set Bolt	Type	Geometry	
AHX640S-063A [○] AR	HSC10030H	1		Type 1
AHX640S-080A [○] AR	HSC12035H	1		
AHX640S-100B [○] AR	MBA16033H	1		
AHX640S-125B [○] AR	MBA20040H	2		Type 2
AHX640S-160C [○] NR	-	-		
AHX640S-200C [○] NR	-	-		



RECOMMENDED CUTTING CONDITIONS

DRY CUTTING

Material	Hardness	Grade	Chipbreaker	Vc (m/min)	fz (mm/t.)	ap (mm)	ae (mm)	
P Mild Steel	<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	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	
Pre-Hardened Steel Alloy Tool Steel	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	
Pre-Hardened Steel Alloy Tool Steel	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)	≤3	≤0.8DC	
		MP6130	M	110 (70 – 150)	0.25 (0.2 – 0.3)	≤3	≤0.8DC	
M Austenitic Stainless Steel	<200HB	MP7030	MM	200 (150 – 250)	0.2 (0.1 – 0.3)	≤5	≤0.8DC	
	>200HB	MP7030	MM	150 (100 – 200)	0.2 (0.1 – 0.3)	≤5	≤0.8DC	
	Duplex Steel	<280HB	MP7030	MM	140 (100 – 180)	0.15 (0.05 – 0.25)	≤5	≤0.8DC
	Ferritic, Martensitic Stainless Steel	<200HB	MP7030	MM	200 (150 – 250)	0.2 (0.1 – 0.3)	≤5	≤0.8DC
		>200HB	MP7030	MM	150 (100 – 200)	0.2 (0.1 – 0.3)	≤5	≤0.8DC
	PH Stainless Steel	<450HB	MP7030	MM	130 (100 – 160)	0.15 (0.05 – 0.25)	≤5	≤0.8DC
K Cast Iron	Tensile Strength <350MPa	MC5020	MK,MH	220 (150 – 300)	0.3 (0.2 – 0.4)	≤5	≤0.8DC	
		VP15TF, VP20RT	MK,MH	180 (130 – 230)	0.3 (0.2 – 0.4)	≤3	≤0.8DC	
		VP15TF	MP	180 (130 – 230)	0.3 (0.2 – 0.4)	≤3	≤0.8DC	
	Ductile Cast Iron	Tensile Strength <450MPa	MC5020	MK,MH	200 (150 – 250)	0.2 (0.1 – 0.3)	≤3	≤0.8DC
			VP15TF, VP20RT	MK,MH	170 (120 – 220)	0.2 (0.1 – 0.3)	≤5	≤0.8DC
			VP15TF	MP	170 (120 – 220)	0.2 (0.1 – 0.3)	≤5	≤0.8DC
Ductile Cast Iron	Tensile Strength <800MPa	MC5020	MK,MH	170 (150 – 200)	0.2 (0.1 – 0.3)	≤5	≤0.8DC	
		VP15TF, VP20RT	MK,MH	140 (100 – 180)	0.2 (0.1 – 0.3)	≤5	≤0.8DC	
H Hardened Steel	40–55HRC	VP15TF	MP	140 (100 – 180)	0.2 (0.1 – 0.3)	≤5	≤0.8DC	
		VP15TF	MP	80 (60 – 100)	0.15 (0.1 – 0.2)	≤3	≤0.8DC	

1. Wet cutting is recommended for good surface finishing of stainless steel. [Tool life is shorter when compared to dry cutting.]
2. With low workpiece clamping rigidity or when a long overhang of the tool is required, reduce the feed and speed by 20 - 30%.



RECOMMENDED CUTTING CONDITIONS

WET CUTTING

Material	Hardness	Grade	Chipbreaker	Vc (m/min)	fz (mm/t.)	ap (mm)	ae (mm)	
M	Austenitic Stainless Steel	<200HB	MP7030	MM	125 (100 – 150)	0.15 (0.1 – 0.2)	≤5	≤0.8DC
		>200HB	MP7030	MM	100 (75 – 125)	0.15 (0.1 – 0.2)	≤5	≤0.8DC
	Duplex Steel	<280HB	MP7030	MM	80 (60 – 100)	0.10 (0.05 – 0.15)	≤5	≤0.8DC
	Ferritic, Martensitic Stainless Steel	<200HB	MP7030	MM	125 (100 – 150)	0.15 (0.1 – 0.2)	≤5	≤0.8DC
		>200HB	MP7030	MM	100 (75 – 125)	0.15 (0.1 – 0.2)	≤5	≤0.8DC
	PH Stainless Steel	<450HB	MP7030	MM	70 (50 – 90)	0.1 (0.05 – 0.15)	≤5	≤0.8DC
S	Titanium Alloy	-	MP7030	MM	40 (20 – 50)	0.15 (0.1 – 0.2)	≤5	≤0.8DC
		-	MP9120	L	60 (50 – 70)	0.15 (0.1 – 0.2)	≤3	≤0.6DC
		-	MP9130	L	40 (20 – 50)	0.1 (0.05 – 0.15)	≤3	≤0.6DC
	Heat Resistant Alloy	-	MP7030	MM	40 (20 – 50)	0.15 (0.1 – 0.2)	≤3	≤0.6DC
		-	MP9120	L	60 (50 – 70)	0.15 (0.1 – 0.2)	≤3	≤0.6DC
		-	MP9130	L	40 (20 – 50)	0.1 (0.05 – 0.15)	≤3	≤0.6DC

With low workpiece clamping rigidity or when a long overhang of the tool is required, reduce the feed and speed by 20 - 30%.

CUTTING CONDITIONS FOR WIPER INSERT

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

With low workpiece clamping rigidity or when a long overhang of the tool is required, reduce the feed and speed by 20 - 30%.

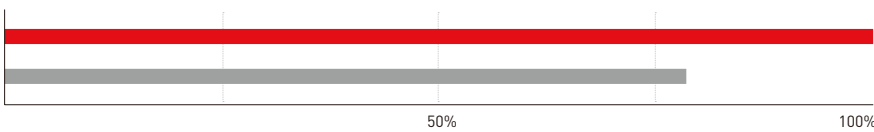
APPLICATION EXAMPLE

Component	Machine parts	
Workpiece	Ck45 / 1.1191	
Tool	Conventional	AHX640S-100B07AR
Cutting Speed Vc (m/min)	200	250
Feed per Tooth fz (mm/t.)	0.19	0.22
Depth of Cut ap (mm)	5	5
Width of Cut ae (mm)	75	75
Coolant	Air blow	Air blow



Results

With older products, raising the cutting speed to 250 m/min caused chattering and insert damage, but the AHX640S enabled stable machining even when the feed was raised. In addition, the inserts have more usable corners, helping to reduce costs.

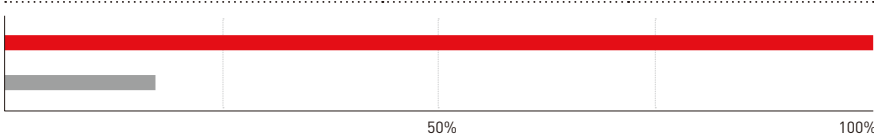


Component	Machine parts	
Workpiece	-	
Tool	Conventional	AHX640S-100B07AR
Cutting Speed Vc (m/min)	75	100
Feed per Tooth fz (mm/t.)	0.05	0.17
Depth of Cut ap (mm)	1	2
Width of Cut ae (mm)	70	70
Coolant	Air blow	Air blow

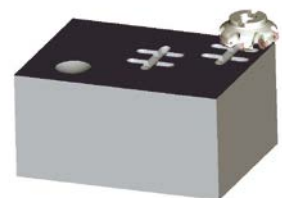


Results

Previously, low rigidity workpiece clamping led to chattering, making it impossible to raise cutting conditions. With the low cutting resistance of the AHX640S, cutting conditions can be raised and provided up to 6 times more efficiency.

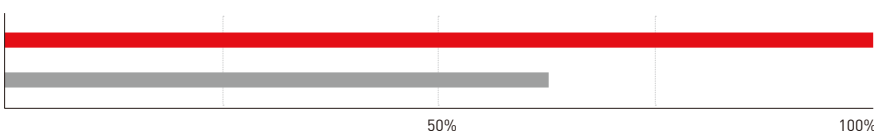


Component	Mould	
Workpiece	-	
Tool	Conventional	AHX640S-100B07AR
Cutting Speed Vc (m/min)	95	95
Feed per Tooth fz (mm/t.)	0.2	0.26
Depth of Cut ap (mm)	3	3
Width of Cut ae (mm)	60	60
Coolant	Air blow	Air blow



Results

With conventional products, insert wear occurred frequently. AHX640S even at 30% higher feed rate displayed stable cutting with no damage to the inserts.



AHX640W

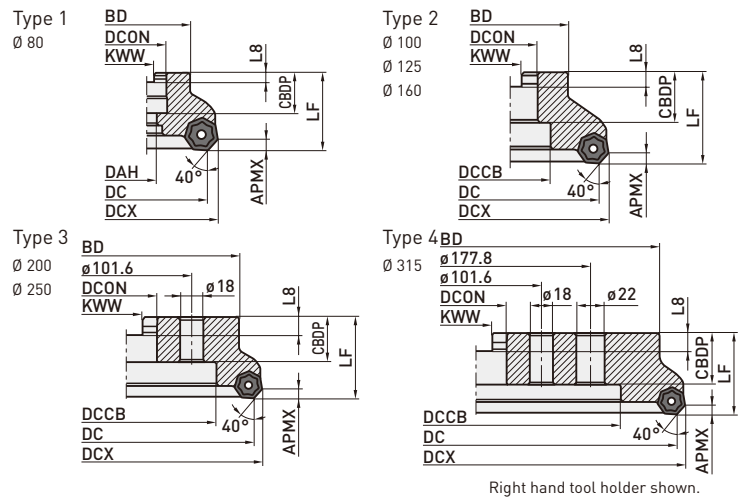


FACE MILLING HIGH FEED CUTTING FOR CAST IRON

K



KAPR: 50°
GAMP: -6°
GAMF: -4°



Order Number	DC	R	L	Teeth	DCX	LF	DCON	CBDP	DAH	DCCB	BD	KWW	L8	WT	APMX	Type
AHX640W-080A08R/L	80	●	★	8	92.6	50	27	23	13	-	56	12.4	7	1.5	6	1
AHX640W-080A10R/L		●	★	10	92.6	50	27	23	13	-	56	12.4	7	1.5	6	1
AHX640W-100B10R/L	100	●	★	10	112.6	50	32	32	-	45	70	14.4	8	2.1	6	2
AHX640W-100B14R/L		●	★	14	112.6	50	32	32	-	45	70	14.4	8	2.1	6	2
AHX640W-125B12R/L	125	●	★	12	137.6	63	40	32	-	56	80	16.4	9	3.1	6	2
AHX640W-125B18R/L		●	★	18	137.6	63	40	32	-	56	80	16.4	9	3.1	6	2
AHX640W-160C16R/L	160	●	★	16	172.6	63	40	29	-	56	100	16.4	9	5.6	6	3
AHX640W-160C22R/L		●	★	22	172.6	63	40	29	-	56	100	16.4	9	5.6	6	3
AHX640W-200C20R/L	200	●	★	20	212.6	63	60	32	-	135	155	25.7	14	8.0	6	4
AHX640W-200C28R/L		●	★	28	212.6	63	60	32	-	135	155	25.7	14	8.0	6	4
AHX640W-250C24R/L	250	●	★	24	262.6	63	60	32	-	180	200	25.7	14	12.6	6	4
AHX640W-250C36R/L		●	★	36	262.6	63	60	32	-	180	200	25.7	14	12.6	6	4
AHX640W-315C28R/L	315	●	★	28	327.6	80	60	57	-	225	285	25.7	14	31.5	6	4
AHX640W-315C44R/L		●	★	44	327.6	80	60	57	-	225	285	25.7	14	31.5	6	4


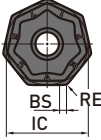


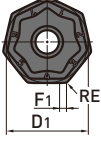






Roughing



Finishing

INSERTS

Order Number	Class	Honing	MC5020	VP15TF	VP20RT	IC	S	BS	RE	Geometry
MK										
NNMU200608ZEN-MK	M	E	●	●	★	20	6.55	1.0	0.8	  
HK										
NNMU200608ZEN-HK	M	E	●	●	★	20	6.55	1.0	0.8	  
WK (Wiper)										
WNEU2006ZEN7C-WK	E	E	●			20	6.55	7.4	0.8	  

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

GRADE SELECTION

ISO	APPLICATION RANGE	
K	CVD	PVD
K10		VP15TF
K20	MC5020	VP20RT
K30		
K40		

SPARE PARTS

Tool Holder Number	 Wedge	 Clamp Screw	 Wrench
AHX640W	CWAHX640WN	LS0622T	TKY15T

*Clamp Torque (Nm) : LS0622T= 6.0

RECOMMENDED CUTTING CONDITIONS

GENERAL CUTTING

Material	Tensile Strength	Grade	Vc (m/min)	ap (mm)
Gray Cast Iron	<350MPa	MC5020	220 (150 – 300)	0.3 (0.2 – 0.4)
		VP15TF	180	0.3
		VP20RT	(130 – 250)	(0.2 – 0.4)
Ductile Cast Iron	<450MPa	MC5020	200 (150 – 250)	0.2 (0.1 – 0.3)
		VP15TF	170	0.2
		VP20RT	(120 – 220)	(0.1 – 0.3)
Ductile Cast Iron	<800MPa	MC5020	170 (150 – 200)	0.2 (0.1 – 0.3)
		VP15TF	140	0.2
		VP20RT	(100 – 180)	(0.1 – 0.3)

FINISHING (USE OF WIPER INSERTS)

Material	Grade	ap (mm)	Vc (m/min)	fz (mm/t.)
Gray Cast Iron	MC5020	<0.5	320 (250 – 400)	0.2 (0.1 – 0.3)
		0.5–3	270 (200 – 350)	
Ductile Cast Iron	MC5020	<0.5	270 (200 – 350)	0.2 (0.1 – 0.3)
		0.5–3	220 (200 – 250)	

Please use 2-3 wiper inserts when the feed is greater than 6mm/rev.

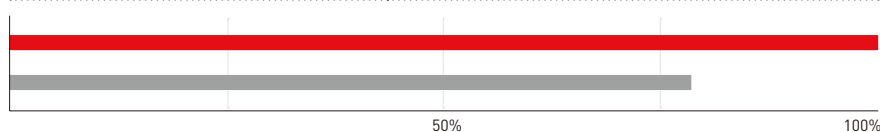
APPLICATION EXAMPLES

Component	Press mould base
Workpiece	EN-GJL-250
Tool	AHX640W-160C16R
Cutting Speed Vc (m/min)	240
Feed Rate f (mm/rev)	3060
Feed per Tooth fz (mm/t.)	0.4
Depth of Cut ap (mm)	3-4
Width of Cut ae (mm)	160
Coolant	Dry



Results

Conventional inserts suffered sudden fracturing during the machining of surface scale, AHX640W gave a stable performance even at 3 times higher table feeds, thus substantially improving machining efficiency and reliability.



Component	Housing case
Workpiece	EN-GJL-250
Tool	AHX640W-125B12R
Cutting Speed Vc (m/min)	150
Feed Rate f (mm/rev)	500
Feed per Tooth fz (mm/t.)	0.1
Depth of Cut ap (mm)	3
Width of Cut ae (mm)	40
Coolant	Dry

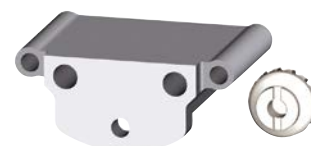


Results

In comparison with a conventional 8 corner insert that fractured when machining an unstable component, AHX640W gave double the tool life.

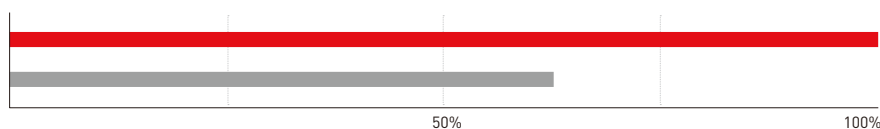


Component	Automotive suspension part
Workpiece	EN-GJS-600-3
Tool	AHX640W-100B14R
Cutting Speed Vc (m/min)	240
Feed Rate f (mm/rev)	3000
Feed per Tooth fz (mm/t.)	0.28
Depth of Cut ap (mm)	3-4
Width of Cut ae (mm)	80
Coolant	Dry



Results

Even when machining ductile cast iron, AHX640W gave double tool life when compared to a conventional tool.



MEMO

A series of horizontal dashed lines for writing.

MEMO

A series of horizontal dashed lines for writing.

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