

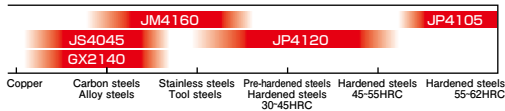
ASF *type*

Face Mill ASF



MOLDINO Tool Engineering, Ltd.

New Product News | No.1214E-8 | 2022-11



Applications



AJ Coating series

JP4120 JM4160 JP4105

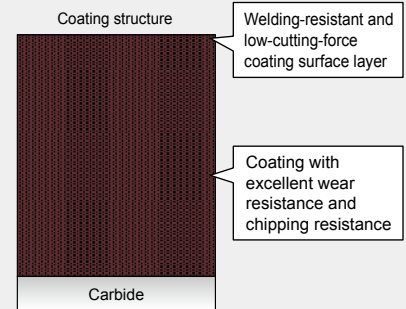
Features of AJ Coating series

- Employs an AlTiN layer with a new composition created by increasing the Al content of conventional layers.
- Excellent wear resistance, chipping resistance, and heat resistance!

New technology!!

- The new layer with high Al content employs a new composition and optimizes the structure to improve wear resistance and chipping resistance!
- Employs a low-friction-effect coating with excellent welding resistance as the top-most surface layer. This reduces welding to the work and decreases cutting force!

Layer structure AJ Coating



PVD Technology

Grade for machining pre-hardened or hardened materials JP4120

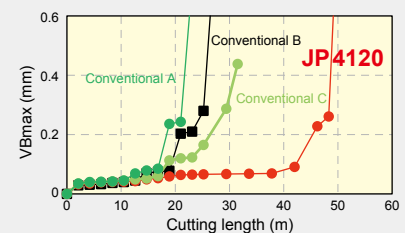
Features

- Employs a fine carbide substrate with an excellent balance between wear resistance and toughness and the new "AJ Coating" to provide improved wear resistance and chipping resistance.
- Highly versatile with excellent wear resistance and chipping resistance when machining steel materials with hardnesses of 30 to 50 HRC.

Strong fields

- Exhibits excellent cutting performance when machining pre-hardened or hardened steels with hardnesses of 30 to 50 HRC.
- Exhibits excellent wear resistance even on difficult-to-cut diecast tool steel or precipitation-hardened stainless steels, or for finishing.

Cutting performance



Work material : P21(40HRC)
 Tool : ASRT5063R-4
 Insert : WDNW140520
 Cutting conditions :
 $V_c=90\text{m/min}$ $f_z=0.8\text{mm/t}$ $a_p \times a_e=1 \times 44\text{mm}$
 Dry ※Single-flute cutting

PVD Technology

Grade for machining stainless-steel materials JM4160

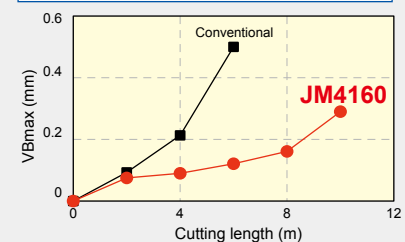
Features

- Employs a carbide substrate with high toughness and the new "AJ Coating" to improve wear resistance and chipping resistance when machining stainless-steel materials.
- Employs AJ Coating with excellent welding resistance to reduce the welding to work material that occurs when machining stainless steel materials.

Strong fields

- Provides long tool life for general processing of stainless steel materials.

Cutting performance



Work material : SUS304
 Tool : ASRS2032R-5
 Insert : EPMT0603EN-8LF
 Cutting conditions :
 $V_c=180\text{m/min}$ $f_z=0.5\text{mm/t}$ $a_p \times a_e=0.8 \times 21\text{mm}$
 Wet ※Single-flute cutting

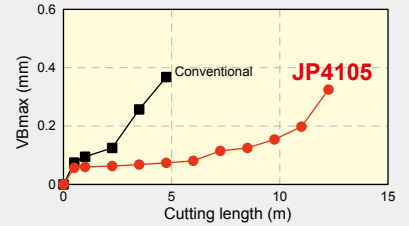
Features

- Employs an ultra-fine cemented carbide substrate and the new "AJ Coating" to improve wear resistance.
- Excellent wear resistance when machining high hardness materials of 50HRC or higher.

Strong fields

- Hardened steels (50 to 60 HRC): SKD11, SKD61, SKH, SUS420, etc.

Cutting performance



Work material : SKD11(61HRC) Tool : ASRS2032-5
 Insert : EPNW0603TN-8
 Cutting conditions :
 $V_c=80\text{m/min}$ $f_z=0.2\text{mm/t}$ $a_p \times a_e=0.5 \times 21\text{mm}$
 Dry ※Single-flute cutting

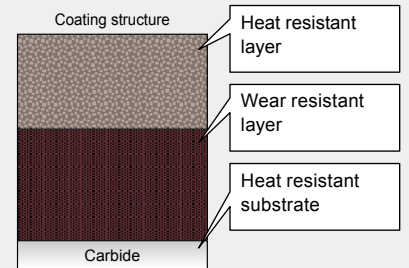
Features

- JS4045 adopts heat resistant layer, reduces the crater wear by high-efficiency cutting.
- JS4045 adopts heat resistant substrate, reduces the wear and improves tool life.
- Especially improves tool life on dry cutting.

Strong fields

- Continuous and light interrupted cutting of less than 35HRC dry cutting.

Layer structure **JS Coating**

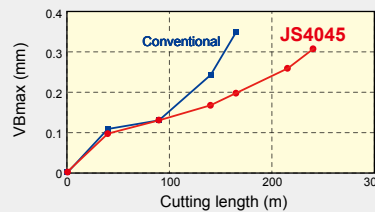


Wear graph after cutting SCM440 (32HRC)



Cutting Conditions	
Work Material	SCM440 (32HRC)
Tool	ASR5063-4
Insert Model	EDNW15T4TN-15
Cutting Speed	$V_c = 180\text{m/min}$
Speed per flute	$f_z = 1.5\text{mm/t}$
Cutting depth	$a_p \times a_e = 1.0 \times 42\text{mm}$
Coolant	Dry cutting Single-flute cutting

Wear graph after cutting P20 (32HRC)



Cutting Conditions	
Work Material	P20 (32HRC)
Tool	ASRS2016R-2
Insert Model	EPNW0603TN-8
Cutting Speed	$V_c = 180\text{m/min}$
Speed per flute	$f_z = 1.5\text{mm/t}$
Cutting depth	$a_p \times a_e = 0.5 \times 13\text{mm}$
Coolant	Dry cutting Single-flute cutting

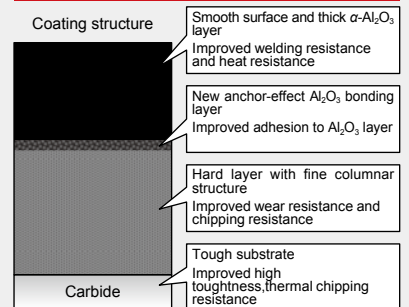
Features

- Smooth surfaced $\alpha\text{-Al}_2\text{O}_3$ coating with improved chipping / welding resistance brings less sudden-tool-edge-chipping.
- Machining efficiency is improved for high-speed,high-feed-rate rough machining by using the hard-layer with fine columnar structure.

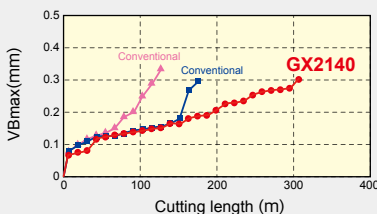
Strong fields

- Exhibits superior wear resistance when cutting mild steel, carbon steels, alloy steels and tool steel use with hardnesses of less than 35HRC.

Layer structure **GX Coating**

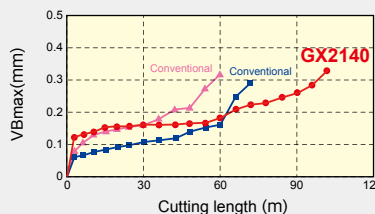


Wear graph after cutting S50C (220HB)



Cutting Conditions	
Work Material	S50C(220HB)
Holder used	ASRT5063R-4
Insert Model	WDNW140520
Cutting Speed	$V_c = 180\text{m/min}$
Speed per flute	$f_z = 2.0\text{mm/t}$
Cutting depth	$a_p \times a_e = 1 \times 44\text{mm}$
Coolant	Dry cutting Single-flute cutting

Wear graph after cutting P20 (30HRC)

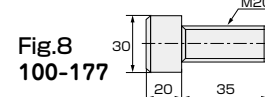
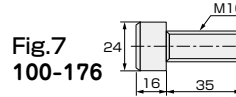
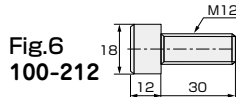
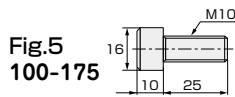
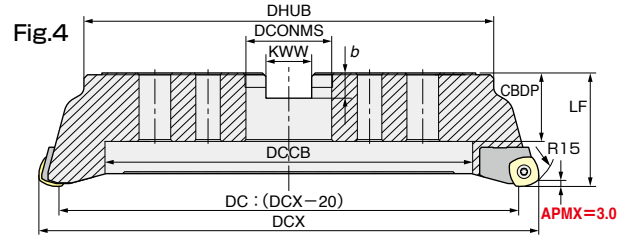
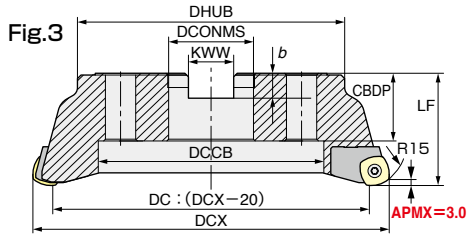
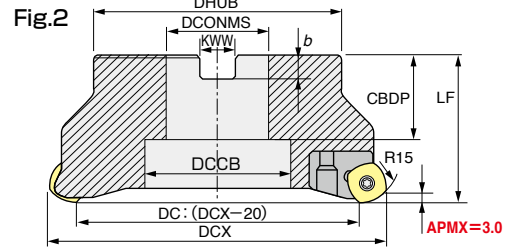
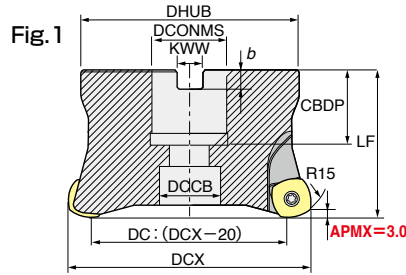


Cutting Conditions	
Work Material	P20(30HRC)
Holder used	ASRT5063R-4
Insert Model	WDNW140520
Cutting Speed	$V_c = 140\text{m/min}$
Speed per flute	$f_z = 1.4\text{mm/t}$
Cutting depth	$a_p \times a_e = 1 \times 43\text{mm}$
Coolant	Dry cutting Single-flute cutting

Line Up

Dimensions

Numeric figure in a circle ○



ASF5○○○R(-○) Internal diameter inch size

Item code	Stock	No. of flutes	Size (mm)									Weight (kgf)	Shape	Arbor screw (Hexagonal socket head bolt)	Inserts
			DCX	DC	LF	CBDP	KWW	b	DCONMS	DCCB	DHUB				
ASF5063R	●	4	63	43	50	19	8.4	5	22.225	17	60	0.65	Fig.1	Fig.5 (M10 x 25)	N class SDNW1505ZDTN-R15 M class SDMT1505ZDTN-R/C15 E class SDEW1505ZDTN-R15
ASF5080R	●	4	80	60	63	32	12.7	8	31.75	26	70	1.35			
ASF5100R	●	5	100	80	63	32	12.7	8	31.75	26	90	2.26	Fig.2	Fig.7 (M16 x 35)	
ASF5125R	●	6	125	105	63	32	12.7	8	31.75	26	100	4.38			
ASF5160R-6		6	160	140	63	38	19.1	11	50.8	69	105	4.60	Fig.3	Commercial arbor parts	
ASF5160R	●	8	160	140	63	38	19.1	11	50.8	69	105	4.60			
ASF5200R-8		8	200	180	63	38	25.4	14	47.625	105	150	7.62	Fig.4	Commercial arbor parts	
ASF5200R	●	10	200	180	63	38	25.4	14	47.625	105	150	7.62			
ASF5250R-9		9	250	230	63	38	25.4	14	47.625	140	200	13.44			
ASF5250R	●	12	250	230	63	38	25.4	14	47.625	140	200	13.44			
ASF5315R		14	315	295	63	38	25.4	14	47.625	220	265	20.77			

ASF5○○○RM(-○) Internal diameter mm size

Item code	Stock	No. of flutes	Size (mm)									Weight (kgf)	Shape	Arbor screw (Hexagonal socket head bolt)	Inserts
			DCX	DC	LF	CBDP	KWW	b	DCONMS	DCCB	DHUB				
ASF5063RM	●	4	63	43	50	20	10.4	6.3	22	17	60	0.65	Fig.1	Fig.5 (M10 x 25)	N class SDNW1505ZDTN-R15 M class SDMT1505ZDTN-R/C15 E class SDEW1505ZDTN-R15
ASF5080RM	●	4	80	60	63	22	12.4	7	27	20	70	1.35			
ASF5100RM	●	5	100	80	63	25.5	14.4	8	32	26	90	2.26	Fig.2	Fig.6 (M12 x 30)	
ASF5125RM	●	6	125	105	63	30	16.4	9	40	32	100	4.38			
ASF5160RM-6		6	160	140	63	30	16.4	9.5	40	69	105	4.60	Fig.3	Commercial arbor parts	
ASF5160RM		8	160	140	63	30	16.4	9.5	40	69	105	4.60			
ASF5200RM-8		8	200	180	63	32	25.7	14	60	105	150	7.62	Fig.4	Commercial arbor parts	
ASF5200RM		10	200	180	63	32	25.7	14	60	105	150	7.62			
ASF5250RM-9		9	250	230	63	32	25.7	14	60	140	200	13.44			
ASF5250RM		12	250	230	63	32	25.7	14	60	140	200	13.44			
ASF5315RM		14	315	295	63	32	25.7	14	60	220	265	20.77			

[Note] The cutter bodies under diameter 125mm include an arbor screw.

Parts

Parts	Clamp screw	Locater	Locater screw	Double screw	Wedge	Wrench	Screw anti-seizure agent		
Shape									
Cutter body	fastening torque (N·m)					Shape			
ASF5063R/RM ~ASF5100R/RM	555-141	4.9	—	—	—	105-T20	A	P-37	
ASF5125R/RM			351-111	156-161 (Applicable Wrench) 100-221	100-143 (Applicable Wrench) 100-221	176-121	105-T20L		B
ASF5160R/RM(-6) ~ASF5315R/RM									

[Note] The clamp screw is a consumable part. Since replacement life depends on the use environment, it is recommended that it be replaced at an early stage. Two spare clamp screws are provided for $\phi 125$ or less, and four for $\phi 160$ or more.

Inserts

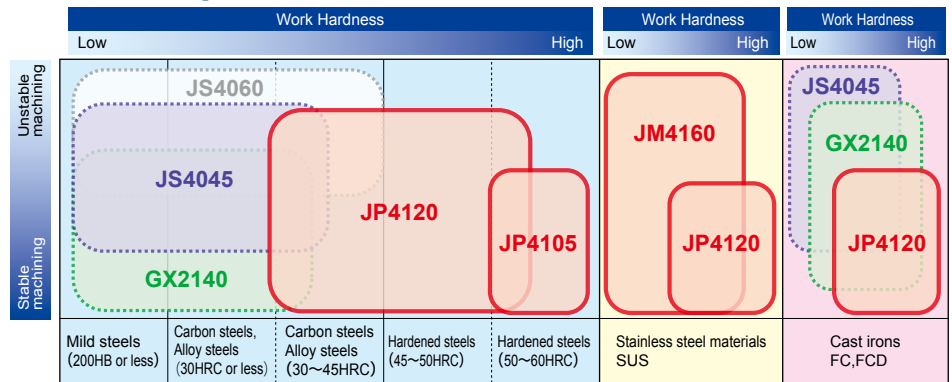
Item code	Tolerance class	Coating							Size (mm)			
		AJ Coating			GX Coating	JS Coating		C Coating	Cermet	R	S	IC
		JP4105	JP4120	JM4160	GX2140	JS4045	JS4060	CY250	CH550			
SDNW1505ZDTN-R15	N	●	●	●	●	●	●	●		15	5.56	15.875
SDMT1505ZDTN-R15 (With breaker)	M	●	●	●	●	●	●					
SDMT1505ZDTN-C15 (With breaker & wiper)	M			●	●	●	●	●				
SDEW1505ZDTN-R15	E					●	●					

[Note] Please note that the GX Coating and JS Coating do not cause a reaction in conductive touch sensors.

Grade map for less than 35HRC



Grade map for work materials



Arbor

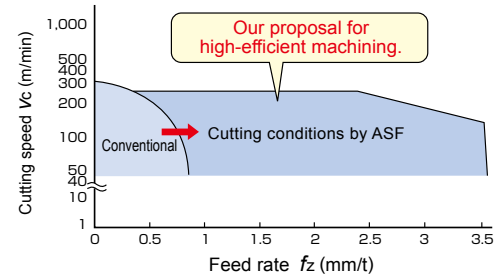
Arbors are specialized with high-rigidity for ASF.

Item code	Stock	Size (mm)				Weight (kgf)	Arbor screw (Hexagonal socket head bolt)	Cutter body
		DCONWS	THSZWS	LB1	BD1			
BT50-22.225- 50-63	●	22.225	M10	50	60	4.8	100-174 (with air-hole)	ASF5063R
BT50-22.225-100-63	●			100		5.9		
BT50-22.225-150-63	●			150		7		
BT50-22.225-200-63	●			200		8.1		
BT50-22.225-250-63	●			250		9.3		
BT50-22.225-350-63	●			350		11.5		
BT50-31.75- 7-80	●	31.75	M16	7	76	4.2	100-213 (with air-hole)	ASF5080R ASF5100R
BT50-31.75- 80-80	●			80		6.8		
BT50-31.75-130-80	●			130		8.5		
BT50-31.75-180-80	●			180		10.2		
BT50-31.75-260-80	●			260		12.9		
BT50-31.75-330-80	●			330		15.4		
BT50-31.75- 7-100	●	31.75	M16	7	96	4.2	100-213 (with air-hole)	ASF5125R
BT50-31.75- 80-100	●			80		8.3		
BT50-31.75-130-100	●			130		11.1		
BT50-31.75-180-100	●			180		13.9		
BT50-31.75-260-100	●			260		18.4		
BT50-31.75-330-100	●			330		22.4		

[Note] Bolts are also equipped with arbors.

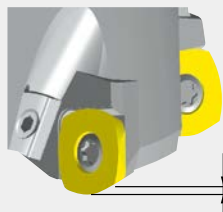
Cutting performance

Super Face Mill ASF proposes you tremendous high-efficiency machining.



Features

01 Unique R shaped insert

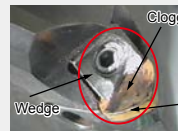


Economical four-edge insert with max. depth of cut $APMX=3.0mm$

$APMX=3.0$

02 Large chip pocket for smooth chip-flow

When big and long chips are created, it is superior chip-removability without interference of chips on the wedges.



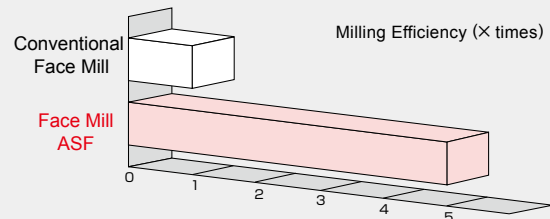
Conventional : Chips are clogged



ASF : Superior chip-removal

03 Machining time and machining cost are reduced with 2-5 times higher efficiency compared with conventional face mill.

Superior higher production speed:
 $Q=1,000-2,000cm^3/min$
 (conventional: $Q=200-400cm^3/min$)

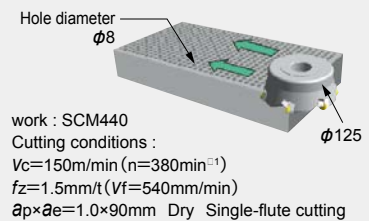
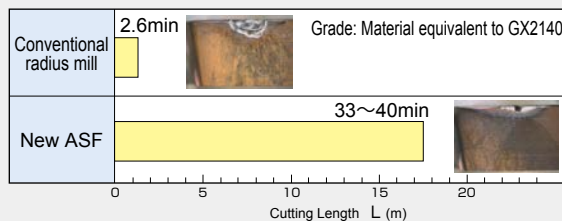


04 Extraordinary High-feed

Cutting with high feed rate is applicable which maximizes the processing machine capability
 (Steel milling: $fz=0.2-3.5mm/t$, Cast iron milling: $fz=0.8-4.0mm/t$)

05 Superior Interrupted performance

In case of heavy interrupted machining of work with many holes, it is not chipped at the beginning of cutting as conventional face mill, and shows 12 times longer tool life.



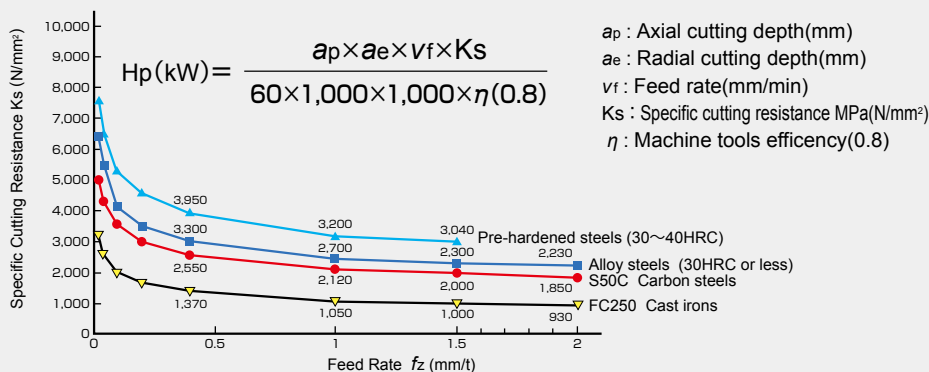
06 Surface finish

Coated carbide inserts: under $Rz12.5$, Cermet inserts: under $Rz6.3$. Cermet(CH550) is recommended for better surface finish.

Inserts	Cutting conditions	Surface roughness
SDNW1505ZDTN-R15 Coting inserts	$v_c=200m/min$ ($n=510min^{-1}$) $v_f=920mm/min$ ($f_z=0.3mm/t$) $a_p=0.3mm$	$Rz=9.5\mu m$
SDMT1505ZDTN-C15 Cermet CH550 (With breker & wiper)	$v_c=250m/min$ ($n=640min^{-1}$) $v_f=570mm/min$ ($f_z=0.15mm/t$) $a_p=0.1mm$	$Rz=4.8\mu m$ Recommended

07 Specific cutting resistance

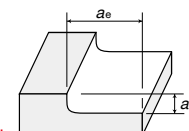
Formula of cutting horse power H_p is shown in the graph with specific cutting resistance K_s .



Field data

No.	Cutter diameter DCX	User	Insert grade	Work material	Cutting conditions			Result
					V_c m/min $n(\text{min}^{-1})$	V_f mm/min $f_z(\text{mm/t})$	$a_p \times a_e$ mm	
1	160	Company B	JS4060	SCM (30HRC)	180 (360)	1150 (0.4)	$a_p=0.5$ $a_e=100$	Enables more stable machining with minimal chipping compared to conventional products.
2	200	Company C	JS4060	S50C (220HB)	200 (320)	2560 (0.8)	$a_p=0.8$ $a_e=150$	Tool life was 1.5 times that of conventional products.

Recommended cutting conditions



※ Red indicates primary recommended grade.

Work material	Recommended grade	Cutting speed v_c (m/min)	Feed rate f_z (mm/t)	$\phi 63$ (4 Flutes)		$\phi 100$ (5 Flutes)		$\phi 160$ (8 Flutes)		$\phi 200$ (10 Flutes)		$\phi 250$ (12 Flutes)	
				Revolution n min^{-1}	Feed speed V_f mm/min	Revolution n min^{-1}	Feed speed V_f mm/min	Revolution n min^{-1}	Feed speed V_f mm/min	Revolution n min^{-1}	Feed speed V_f mm/min	Revolution n min^{-1}	Feed speed V_f mm/min
Mild steels (200HB or less)	※ GX2140 JS4045 JS4060	150~200	1.0~2.0	910	5,460	570	4,300	360	4,320	290	4,350	230	4,140
		$v_c=180\text{m/min}$ $f_z=1.5\text{mm/t}$ $a_p=1.5\text{mm}$ $a_e=0.7\text{DCX}$											
Carbon steels, Alloy steels (30HRC or less)	JP4120 GX2140 JS4045	100~180	1.0~2.0	810	4,860	510	3,830	320	3,840	255	3,830	205	3,700
		$v_c=160\text{m/min}$ $f_z=1.5\text{mm/t}$ $a_p=1.5\text{mm}$ $a_e=0.7\text{DCX}$											
Carbon steels, Alloy steels (30~40HRC)	JP4120 GX2140 JS4045	100~160	1.0~2.0	810	4,860	510	3,830	320	3,840	255	3,830	205	3,700
		$v_c=160\text{m/min}$ $f_z=1.5\text{mm/t}$ $a_p=1.5\text{mm}$ $a_e=0.7\text{DCX}$											
Carbon steels, Alloy steels (40~45HRC)	JP4120 JS4045	80~120	0.4~0.8	505	1,620	320	1,280	200	1,280	160	1,280	127	1,220
		$v_c=100\text{m/min}$ $f_z=0.8\text{mm/t}$ $a_p=1.5\text{mm}$ $a_e=0.7\text{DCX}$											
Stainless steels	JM4160	100	1.0~2.0	455	1,820	286	1,430	180	1,430	143	1,430	115	1,400
		$v_c=90\text{m/min}$ $f_z=1.0\text{mm/t}$ $a_p=2.0\text{mm}$ $a_e=0.7\text{DCX}$											
Cast irons FC, FCD	GX2140 JS4045 JP4120	100~180	1.0~2.0	810	6,480	510	5,100	320	5,100	255	5,100	205	5,000
		$v_c=160\text{m/min}$ $f_z=2.0\text{mm/t}$ $a_p=1.0\text{mm}$ $a_e=1.0\text{DCX}$											
Hardened steels (45~50HRC)	JP4120 JP4105	80~120	0.2~0.4	455	550	286	430	180	430	143	430	115	415
		$v_c=90\text{m/min}$ $f_z=0.3\text{mm/t}$ $a_p=1.5\text{mm}$ $a_e=0.7\text{DCX}$											
Hardened steels (50~60HRC)	JP4105 JP4120	50~100	0.05~0.2	350	280	220	220	140	220	110	220	90	210
		$v_c=70\text{m/min}$ $f_z=0.2\text{mm/t}$ $a_p=1.0\text{mm}$ $a_e=0.7\text{DCX}$											

- [Note] ① Use the appropriate coolant for the work material and machining shape.
 ② These conditions are for general guidance; in actual machining conditions adjust the parameters according to your actual machine and work-piece conditions.
 ③ Please note that the GX Coating and JS Coating do not cause a reaction in conductive touch sensors.
 ④ [JP4105] insert grade specialized in High hardened steel is not suitable for Non-heat-treated steel material.

※ The diagrams and table data are examples of test results, and are not guaranteed values.



The diagrams and table data are examples of test results, and are not guaranteed values.
 "MOLDINO" is a registered trademark of MOLDINO Tool Engineering, Ltd.



Attentions on Safety

1. Attentions regarding handling

- (1) When removing the tool from the case (package), be careful not to drop it on your foot or drop it onto the tips of your bare fingers.
- (2) When actually setting the inserts, be careful not to touch the cutting flute directly with your bare hands.

2. Attentions regarding mounting

- (1) When preparing for use, be sure that the inserts are firmly mounted in place and that they are firmly mounted on the arbor, etc.
- (2) If abnormal chattering occurs during use, stop the machine immediately and remove the cause of the chattering.

3. Attentions during use

- (1) Before use, confirm the dimensions and direction of rotation of the tool and milling work material.
- (2) The numerical values in the standard cutting conditions table should be used as criteria when starting new work. The cutting conditions should be adjusted as appropriate when the cutting depth is large, the rigidity of the machine being used is low, or according to the conditions of the work material.
- (3) The inserts are made of a hard material. During use, they may break and fly off. In addition, cutting chips may also fly off. Since there is a danger of injury to workers, fire, or eye damage from such flying pieces, a safety cover should be installed and safety equipment such as safety glasses should be worn to create a safe environment for work.
 - Do not use where there is a risk of fire or explosion.
 - Do not use non-water-soluble cutting oils. Such oils may result in fire.
- (4) Do not use the tool for any purpose other than that for which it is intended, and do not modify it.

MOLDINO Tool Engineering, Ltd.

Head Office
 Hulic Ryogoku Bldg. 8F, 4-31-11, Ryogoku, Sumida-ku, Tokyo, Japan 130-0026
 International Sales Dept. : TEL +81-3-6890-5103 FAX +81-3-6890-5128

Official Web Site

<http://www.moldino.com/en/>

Database for selection Cutting Tool Products [TOOL SEARCH]

Europe

MOLDINO Tool Engineering Europe GmbH

Itterpark 12, 40724 Hilden, Germany
 Tel +49-(0)2103-24820 Fax +49-(0)2103-248230

China

MOLDINO Tool Engineering (Shanghai), Ltd.

Room 2804-2805, Metro Plaza, 555 Loushanguan Road, Changning District, Shanghai, 200051, China
 Tel +86-(0)21-3366-3058 Fax +86-(0)21-3366-3050

America

MITSUBISHI MATERIALS U.S.A. CORPORATION

DETROIT OFFICE Customer service
 41700 Gardenbrook Road, Suite 120, Novi, MI 48375-1320 U.S.A.
 Tel +1(248) 308-2620 Fax +1(248) 308-2627

Mexico

MMC METAL DE MEXICO, S.A. DE C.V.

Av. La Cañada No.16, Parque Industrial Bernardo Quintana, El Marques, Querétaro, CP 76246, México
 Tel +52-442-1926800

Brazil

MMC METAL DO BRASIL LTDA.

Rua Cincinato Braga, 340 13° andar, Bela Vista – CEP 01333-010 São Paulo – SP., Brasil
 Tel +55(11)3506-5600 Fax +55(11)3506-5677

Thailand

MMC Hardmetal (Thailand) Co.,Ltd. MOLDINO Division

622 Emporium Tower, Floor 22/1-4, Sukhumvit Road, Klong Tan, Klong Toei, Bangkok 10110, Thailand
 Tel +66-(0)2-661-8175 Fax +66-(0)2-661-8176

India

MMC Hardmetal India Pvt Ltd.

H.O.: Prasad Enclave, #118/119, 1st Floor, 2nd Stage, 5th main, BBMP Ward #11, (New #38), Industrial Suburb, Yeshwanthpura, Bengaluru, 560 022, Karnataka, India.
 Tel +91-80-2204-3600

DISTRIBUTED BY: