

Double-sided Insert Type High Feed Radius Milling Cutter

# WJX Series

New Product

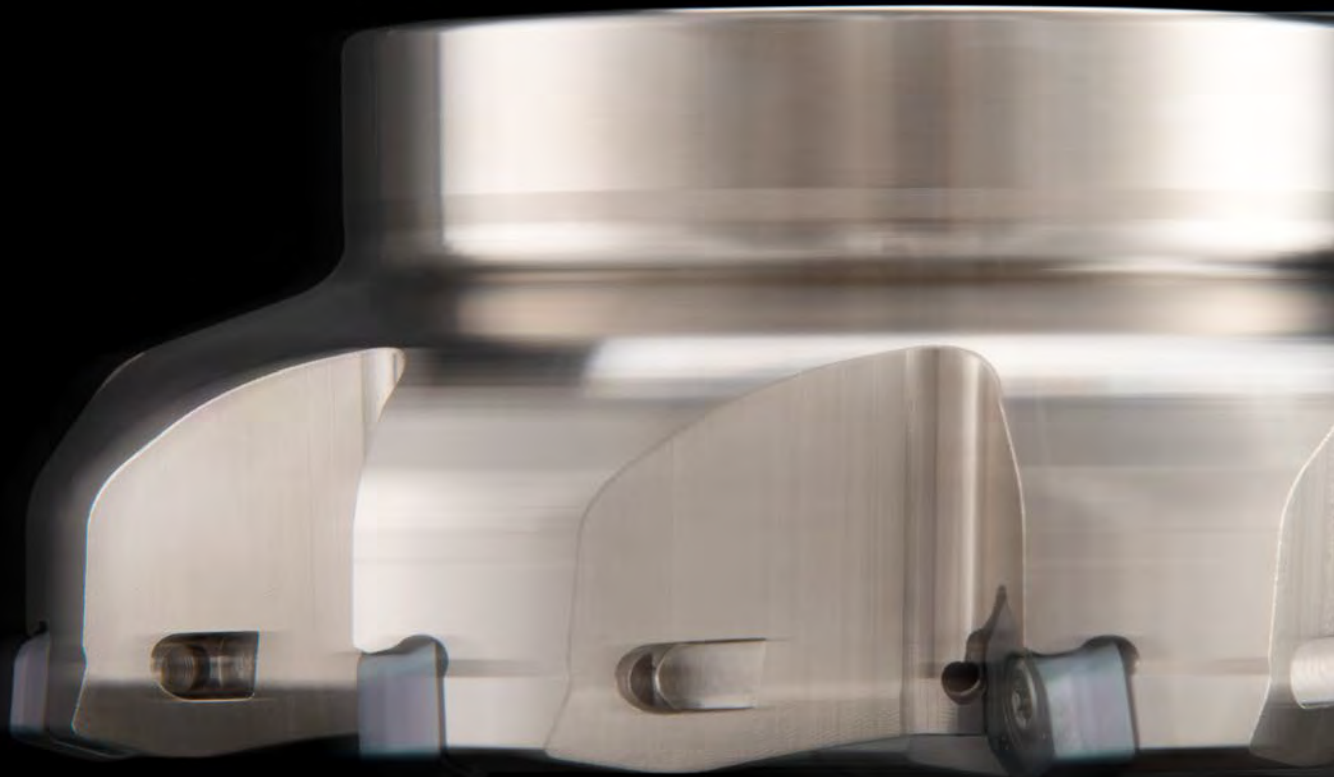
Improved Sharpness and Stability to  
**Achieve High Efficiency Machining**



# Fast Sha

## WJX Series

High feed radius milling cutter, with stronger double-sided insert type. Experiences low cutting resistance on start up, maintains stable machining even during interrupted machining and large depth of cut.

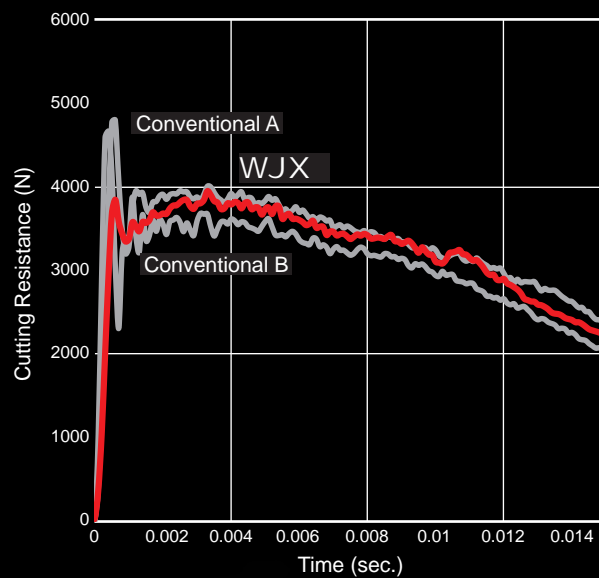


# up Strong

<Cutting Conditions>

Workpiece Material : AISI 4140  
Cutter Dia. : DCX=Ø2.48"  
Cutting Speed : vc=490 SFM  
Feed per Tooth : fz=.059 IPT  
Depth of Cut : ap=.059"  
Width of Cut : ae=1.24"  
Cutting Mode : Single Insert

WJX produces low cutting resistance when entering the cut.



# Reliable Milling Cutter even in High Efficiency Machining

Covers both high feed and large depth of cut, for high efficiency machining.  
Economical double-sided insert provides the capability for multi-functionality.  
Provides excellent sharpness and gives a long tool life, reducing cutting noise.  
The WJX series was developed for creating reliable and economical tools even in high efficiency machining.



## Unconventional Cutting Edge Design for Stable Milling



### Wiper Cutting Edge

The wiper edge offers good surface finishes sufficient for rough machining.

### Straight Cutting Edge

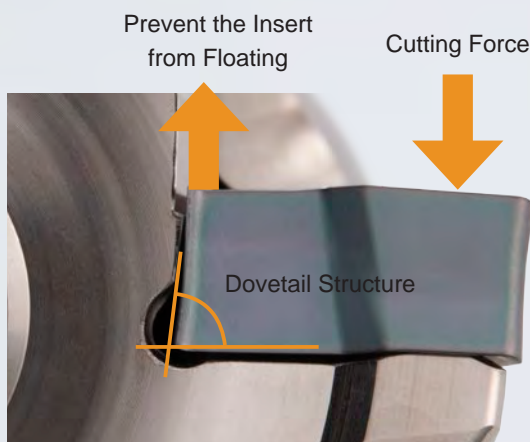
The straight cutting edge extending to the maximum depth of cut (APMX) allows for high feed machining even at large depths of cut.

### Minor Cutting Edge

Stable chip formation is possible with the straight cutting edge even at high ramping angle.

## Highly-reliable Clamping System

The dovetail structure prevents the insert from floating and gives stable clamping without using a clamp bridge.



# Complex Shape Flank Face Suitable for Ramping

The flank shape combines the strength and economy of negative inserts, with the sharpness and multi-functionality of positive inserts.



Single-sided : Positive Insert  
Ramping Performance  
Sharpness

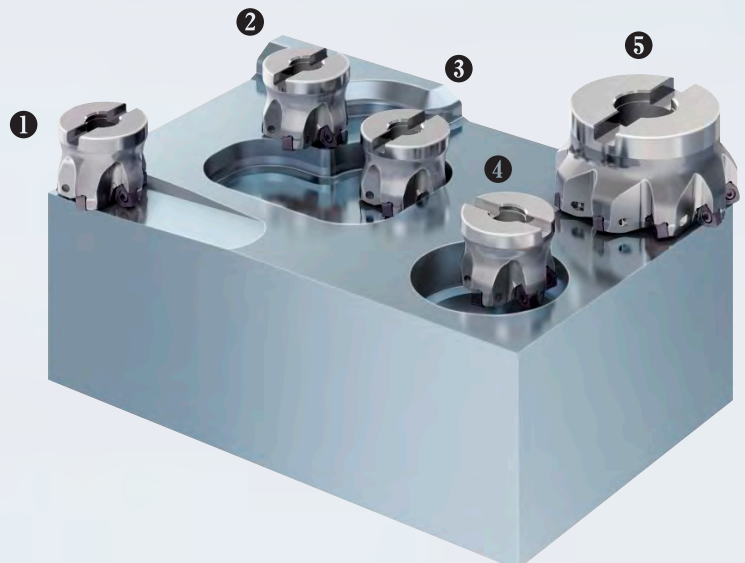


Double-sided : Negative Insert  
Cost Efficiency  
Insert Strength  
Fracture Resistance



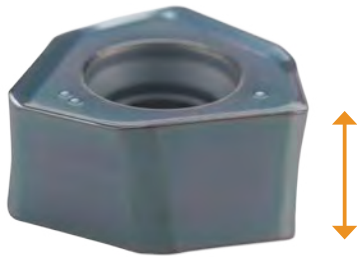
## Different Types of Milling Cover a Wide Variety of Situations

- ① Ramping
- ② Shoulder Milling
- ③ Pocket Milling
- ④ Helical Milling
- ⑤ Face Milling

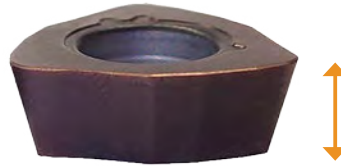


# High Strength Insert with Increased Insert Thickness

Increased thickness prevents the inserts from fracturing and makes the cutter body resistant to breakage.



WJX



Conventional



Cutting Length  
15.748 feet



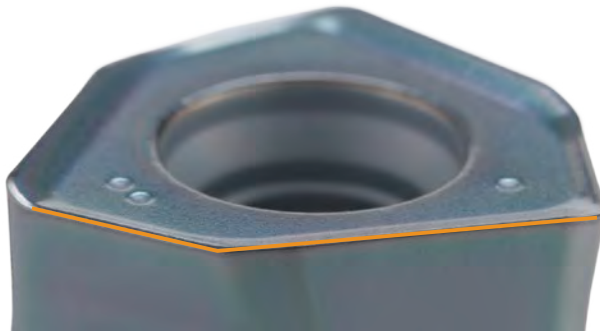
Cutting Length  
11.811 feet

<Cutting Conditions>

Workpiece Material : AISI 4140  
 Cutter Dia. : DCX=ø2.48"  
 Cutting Speed : vc=490 SFM  
 Feed per Tooth : fz=.079 IPT  
 Depth of Cut : ap=.079"  
 Width of Cut : ae=1.772"  
 Cutting Mode : Dry Cutting  
 Single Insert

# Good Chip Formation

The cutting edge forms short chips that prevent the cutter body from chip jamming and tangling as well as allowing for easy cleaning inside of machine tools.



WJX



Conventional

<Cutting Conditions>

Workpiece Material : AISI 4140  
 Cutter Dia. : DCX=ø2.48"  
 Cutting Speed : vc=490 SFM  
 Feed per Tooth : fz=.079 IPT  
 Depth of Cut : ap=.079"  
 Width of Cut : ae=1.772"  
 Cutting Mode : Dry Cutting  
 Single Insert

# PVD Coated Grade for Milling

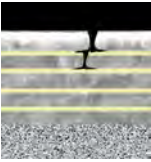
## MP6100/MP7100/MP9100 Series

### TOUGH-Σ Technology

A fusion of the separate coating technologies; PVD and multi-layering provides extra toughness.

**Base Layer High Al-(Al, Ti)N**

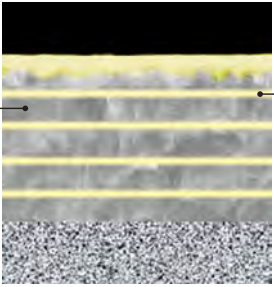
The new technology Al-(Al, Ti)N coating provides stabilisation of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.



Multi-layering of the coating prevents any cracks penetrating through to the substrate.







\*Graphical Representation.

**Al-Ti-Cr-N Based PVD Coating**



\*Graphical Representation.

**Best Layer of Each Workpiece Material**

<b>P</b> 	(Al,Cr)N	
	<b>Tough! Thermal Cracks</b>	Thermal Cracks
<b>M</b> 	TiN	
	<b>Tough! Notching</b>	Notching
<b>S</b> 	CrN	
	<b>Tough! Resistant Chipping</b>	Welding by Chipping

### VP15TF

Stable machining properties are enabled when the coating is combined with a high wear and fracture resistant carbide substrate.

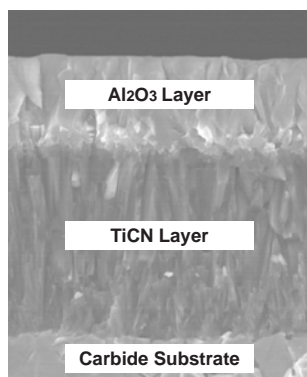
### VP30RT

Ideal for heavy interrupted cutting of stainless and general steels because of the excellent fracture resistance properties.

## CVD Coated Grade for Milling of Steels and Stainless Steels

### NEW MC7020

MC7020 suppresses crater wear which occurs in high speed cutting, and achieves stable processing in high efficiency machining.



Structure of MC7020

#### Improved Wear Resistance

The micro-grain wear resistant Al<sub>2</sub>O<sub>3</sub> and fibrous TiCN layers deliver excellent wear resistance in high speed cutting.

#### 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.

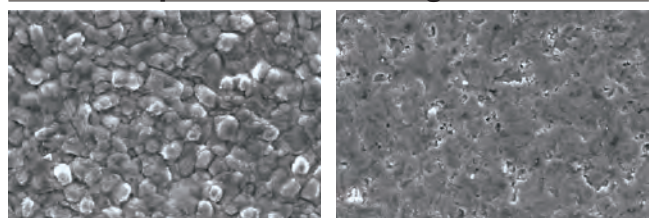
#### Reduced Abnormal Damage

An extremely smooth black super-smooth coating prevents abnormal damage such as chip welding.

### All Black Super-smooth Coating

This smooth outer layer helps to prevent chip welding.

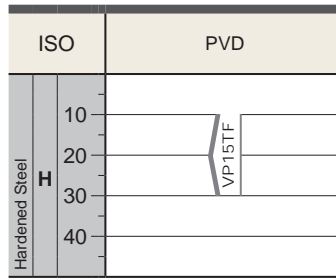
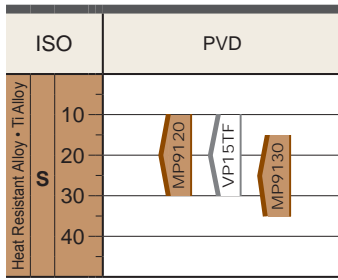
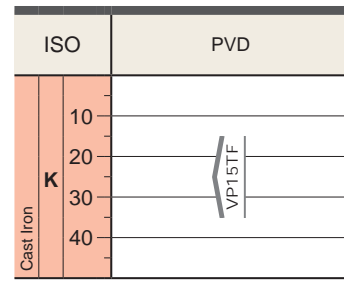
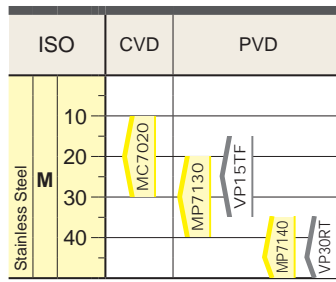
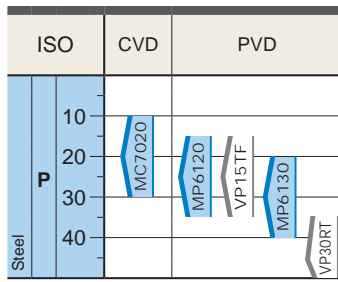
#### Comparison of Coating Surface



Conventional Coating

All Black Super-smooth Coating

## Insert Grades for a Wide Range of Materials

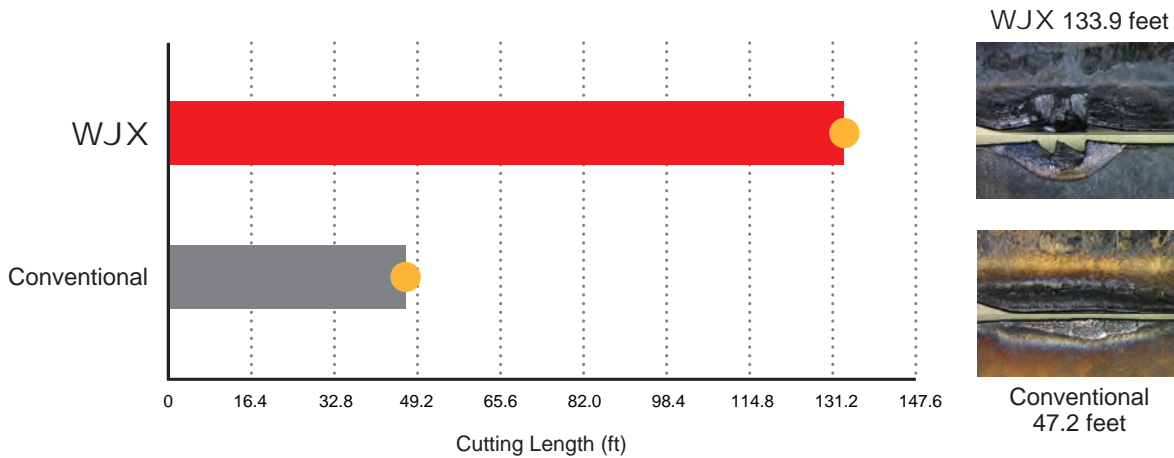




# Cutting Performance

## AISI 4140 Wear Resistance Comparison

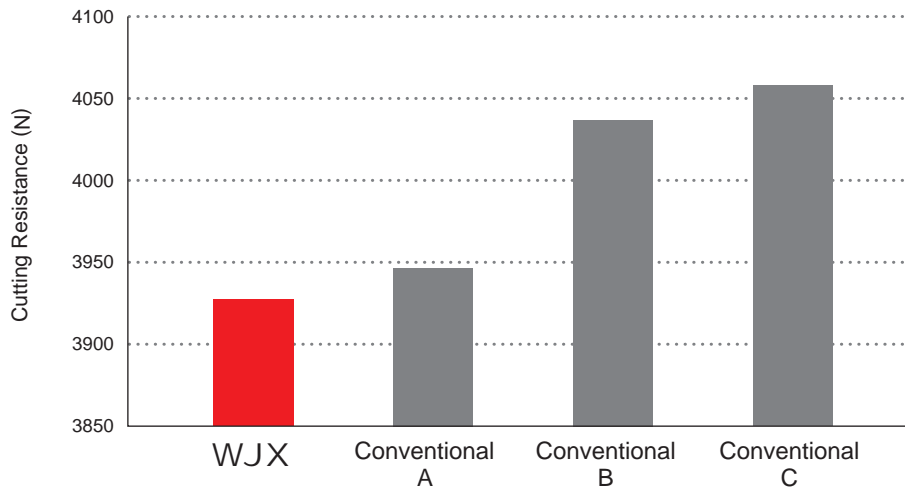
MC7020 has excellent crater wear resistance in high speed cutting.



<Cutting Conditions>  
 Workpiece Material : AISI 4140  
 Cutter Dia. : DCX=ø2.48"  
 Inserts : JOMU140715ZZER-M  
 Grade : MC7020  
 Cutting Speed : vc=755 SFM  
 Feed per Tooth : fz=.059 IPT  
 Depth of Cut : ap=.059"  
 Width of Cut : ae=1.772"  
 Cutting Mode : Dry Cutting  
 Single Insert

## AISI 4140 Cutting Resistance Comparison

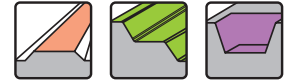
WJX reduces the spindle load for low cutting resistance.



<Cutting Conditions>  
 Workpiece Material : AISI 4140  
 Cutter Dia. : DCX=ø2.48"  
 Inserts : JOMU140715ZZER-M  
 Grade : VP15TF  
 Cutting Speed : vc=490 SFM  
 Feed per Tooth : fz=.039 IPT  
 Depth of Cut : ap=.079"  
 Width of Cut : ae=1.772"  
 Cutting Mode : Dry Cutting  
 Single Insert

# Double-sided Insert Type High Feed Radius Milling Cutter

## MULTI-FUNCTIONAL MILLING



# WJX



Fig.1  
 ø2.500  
 ø3.000  
 ø4.000

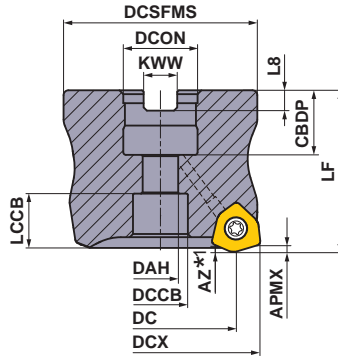
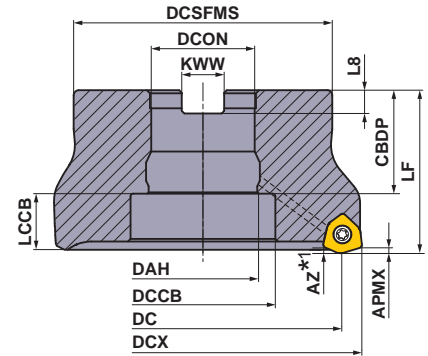
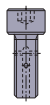
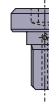


Fig.2  
 ø5.000  
 ø6.000



Right hand tool holder only.

(inch)

DCX	DCON	Set Bolt	Geometry
ø2.500", ø3.000"	ø1.000"	HSCU50014H	①  ② 
ø3.000"	ø1.250"	HSCU62516H	
ø4.000"	ø1.500"	HSCU75016H	
ø5.000"	ø1.500"	MBAU75016H	
ø6.000"	ø2.000"	MBAU100016H	

### Arbor Type

With Coolant Hole

GAMP: -6° T: +13°  
 GAMF: -10° I: +7°

DCX=inch size, DCON=inch size

(inch)

DCX	Order Number	Stock	*2	DC	LF	DCON	WT (lbs)	APMX	RMPX	RPMX (min <sup>-1</sup> )	Fig.
		R	No.T								
2.500	WJX14UR2.5004CA	●	4	1.887	2.000	1.000	1.5	.079	3°	18100	1
2.500	WJX14UR2.5005CA	●	5	1.887	2.000	1.000	1.5	.079	3°	18100	1
3.000	WJX14UR3.0005CA	●	5	2.387	2.000	1.000	2.3	.079	2.2°	16100	1
3.000	WJX14UR3.0006CA	●	6	2.387	2.000	1.000	2.3	.079	2.2°	16100	1
3.000	WJX14UR3.0005DA	●	5	2.387	2.500	1.250	2.7	.079	2.2°	16100	1
3.000	WJX14UR3.0006DA	●	6	2.387	2.500	1.250	2.7	.079	2.2°	16100	1
4.000	WJX14UR4.0006EA	●	6	3.386	2.500	1.500	5.4	.079	1.5°	13300	1
4.000	WJX14UR4.0007EA	●	7	3.386	2.500	1.500	5.5	.079	1.5°	13300	1
5.000	WJX14UR5.0007EA	●	7	4.386	2.500	1.500	7.0	.079	1.1°	11500	2
5.000	WJX14UR5.0009EA	●	9	4.386	2.500	1.500	7.0	.079	1.1°	11500	2
6.000	WJX14UR6.0009FA	●	9	5.386	2.500	2.000	10.3	.079	0.9°	9900	2

\*1 Refer to page 16, for the maximum drilling depth (AZ).

\*2 Number of Teeth




Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.

Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

**CUTTING CONDITIONS > P14,15,16**

## Spare Parts

(inch)

Tool Holder Type	*			
		Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
<b>WJX14</b>		TS5R	TKY20T	MK1KS

\* Clamp Torque (lbf-in) : TS5R = 44

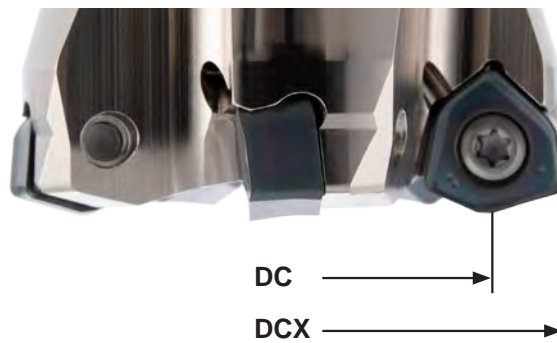
## Mounting Dimensions

(inch)

DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
2.500	<b>WJX14UR2.5004CA</b>	1.000	.945	.539	.787	.689	2.375	.375	.219	1
2.500	<b>WJX14UR2.5005CA</b>	1.000	.945	.539	.787	.689	2.375	.375	.219	1
3.000	<b>WJX14UR3.0005CA</b>	1.000	.945	.539	.787	.689	2.750	.375	.219	1
3.000	<b>WJX14UR3.0006CA</b>	1.000	.945	.539	.787	.689	2.750	.375	.219	1
3.000	<b>WJX14UR3.0005DA</b>	1.250	1.260	.669	1.024	.874	2.875	.500	.281	1
3.000	<b>WJX14UR3.0006DA</b>	1.250	1.260	.669	1.024	.874	2.875	.500	.281	1
4.000	<b>WJX14UR4.0006EA</b>	1.500	1.181	.787	1.181	.953	3.813	.625	.375	1
4.000	<b>WJX14UR4.0007EA</b>	1.500	1.181	.787	1.181	.953	3.813	.625	.375	1
5.000	<b>WJX14UR5.0007EA</b>	1.500	1.654	1.575	2.205	.795	3.813	.625	.375	2
5.000	<b>WJX14UR5.0009EA</b>	1.500	1.654	1.575	2.205	.795	3.813	.625	.375	2
6.000	<b>WJX14UR6.0009FA</b>	2.000	1.693	2.087	3.228	.756	4.875	.750	.437	2

## Cutter Diameter and Flat Surface Milling

The maximum cutting diameter (DCX) shown in the WJX items table is not the same as the possible dimensions for plane cutting. The possible dimensions for plane cutting are given as the cutting axle DC value. Please note that this is smaller than the DCX value.



Youtubeの購み込み



電子メールの購み込み

# Double-sided Insert Type High Feed Radius Milling Cutter

## MULTI-FUNCTIONAL MILLING



# WJX



Fig.1  
 ø63  
 ø66  
 ø80  
 ø100

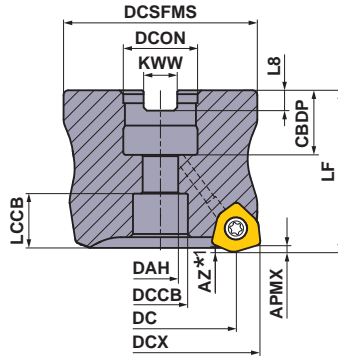
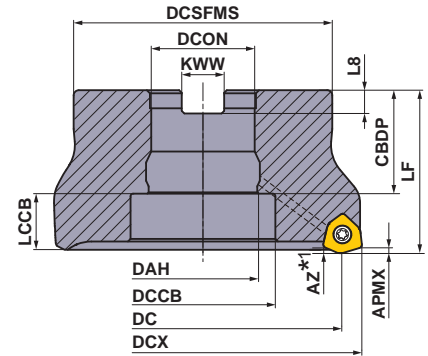


Fig.2  
 ø125  
 ø160



Right hand tool holder only.

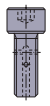

### Metric Standard

#### Arbor Type

With Coolant Hole

GAMP: -6° T: +13°  
 GAMF: -10° I: +7°

DCX=mm size, DCON=inch size, **DCON=mm size**

DCX		Set Bolt	Geometry
DCON inch size	DCON mm size		
ø63	ø63(22)	HSC10030H	① 
ø63, ø66, ø80	ø63(27), ø66, ø80	HSC12035H	
ø80, ø100	ø100	HSC16040H	② 
ø125	ø125, ø160	MBA20040H	
ø160		MBA24045H	

DCX	Order Number	Stock	*2 No.T	DC	LF	DCON	WT (kg)	APMX	RMPX	RPMX (min <sup>-1</sup> )	Fig.
		R									
63	WJX14-063A04AR	★	4	47.5	50	22	0.7	2	3°	18200	1
63	WJX14-063A05AR	★	5	47.5	50	22	0.7	2	3°	18200	1
63	WJX14R06304BA	★	4	47.5	50	22.225	0.7	2	3°	18200	1
63	WJX14R06305BA	★	5	47.5	50	22.225	0.7	2	3°	18200	1
63	WJX14-063X05AR	★	5	47.5	50	27	0.6	2	3°	18200	1
66	WJX14-066X05AR	★	5	50.4	50	27	0.7	2	2.8°	17700	1
80	WJX14-080A05AR	★	5	64.4	50	27	1.2	2	2.1°	15600	1
80	WJX14-080A06AR	★	6	64.4	50	27	1.2	2	2.1°	15600	1
80	WJX14R08005DA	★	5	64.4	63	31.75	1.4	2	2.1°	15600	1
80	WJX14R08006DA	★	6	64.4	63	31.75	1.4	2	2.1°	15600	1
100	WJX14R10006DA	★	6	84.4	63	31.75	2.5	2	1.5°	13500	1
100	WJX14R10007DA	★	7	84.4	63	31.75	2.5	2	1.5°	13500	1
100	WJX14-100A06AR	★	6	84.4	63	32	2.5	2	1.5°	13500	1
100	WJX14-100A07AR	★	7	84.4	63	32	2.5	2	1.5°	13500	1
125	WJX14R12507EA	★	7	109.4	63	38.1	3.2	2	1.2°	11600	2
125	WJX14R12509EA	★	9	109.4	63	38.1	3.1	2	1.2°	11600	2
125	WJX14-125B07AR	★	7	109.4	63	40	3.2	2	1.2°	11600	2
125	WJX14-125B09AR	★	9	109.4	63	40	3.1	2	1.2°	11600	2
160	WJX14-160B09AR	★	9	144.4	63	40	4.9	2	0.8°	9900	2
160	WJX14R16009FA	★	9	144.4	63	50.8	4.5	2	0.8°	9900	2

\*1 Refer to page 16, for the maximum drilling depth (AZ).

\*2 Number of Teeth




Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.

Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

CUTTING CONDITIONS > P14,15,16

## Spare Parts

(mm)

Tool Holder Type	*			
		Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
<b>WJX14</b>		TS5R	TKY20T	MK1KS

\* Clamp Torque (lbf-in) : TS5R = 44

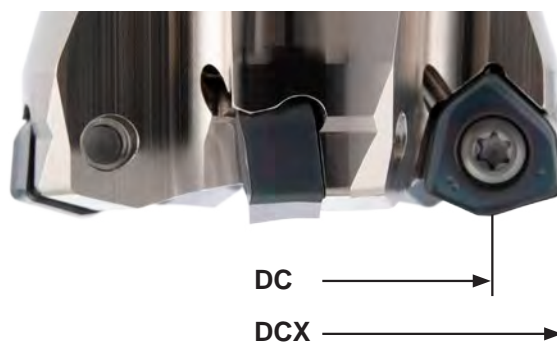
## Mounting Dimensions

(mm)

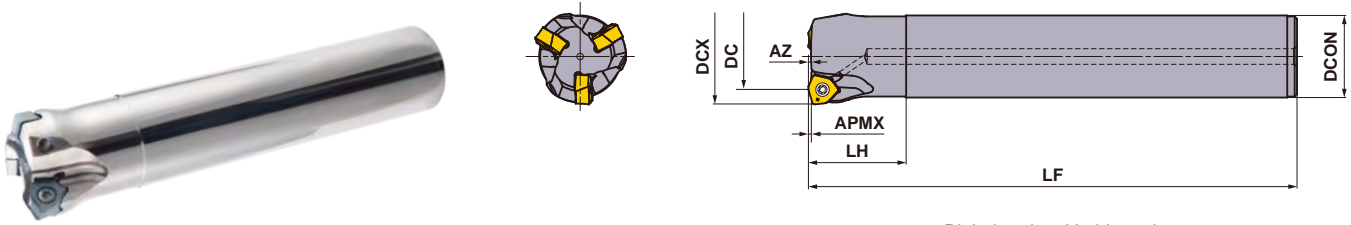
DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
63	WJX14-063A04AR	22	20	11	17	16.7	60	10.4	6.3	1
63	WJX14-063A05AR	22	20	11	17	16.7	60	10.4	6.3	1
63	WJX14R06304BA	22.225	19	11	17	17.7	60	8.4	5	1
63	WJX14R06305BA	22.225	19	11	17	17.7	60	8.4	5	1
63	WJX14-063X05AR	27	23	13	20	15.7	60	12.4	7	1
66	WJX14-066X05AR	27	23	13	20	15.7	60	12.4	7	1
80	WJX14-080A05AR	27	23	13	20	15.7	76	12.4	7	1
80	WJX14-080A06AR	27	23	13	20	15.7	76	12.4	7	1
80	WJX14R08005DA	31.75	32	17	26	19.7	76	12.7	8	1
80	WJX14R08006DA	31.75	32	17	26	19.7	76	12.7	8	1
100	WJX14R10006DA	31.75	32	17	26	19.7	96	12.7	8	1
100	WJX14R10007DA	31.75	32	17	26	19.7	96	12.7	8	1
100	WJX14-100A06AR	32	26	17	26	25.7	96	14.4	8	1
100	WJX14-100A07AR	32	26	17	26	25.7	96	14.4	8	1
125	WJX14R12507EA	38.1	40	40	56	21.7	100	15.9	10	2
125	WJX14R12509EA	38.1	40	40	56	21.7	100	15.9	10	2
125	WJX14-125B07AR	40	40	42	56	21.7	100	16.4	9	2
125	WJX14-125B09AR	40	40	42	56	21.7	100	16.4	9	2
160	WJX14-160B09AR	40	40	42	56	21.7	100	16.4	9	2
160	WJX14R16009FA	50.8	43	53	72	18.7	100	19.1	11	2

## ■ Cutter Diameter and Flat Surface Milling

The maximum cutting diameter (DCX) shown in the WJX items table is not the same as the possible dimensions for plane cutting. The possible dimensions for plane cutting are given as the cutting axle DC value. Please note that this is smaller than the DCX value.



# Double-sided Insert Type High Feed Radius Milling Cutter



Right hand tool holder only.

## Shank Type

With Coolant Hole

(mm)

DCX	Order Number	Stock	* No.T	DC	LF	LH	DCON	APMX	RMPX	RPMX (min <sup>-1</sup> )
		R								
50	<b>WJX14R5003SA42S</b>	★	3	34.5	150	50	42	2	4.4°	21200
50	<b>WJX14R5003SA42L</b>	★	3	34.5	250	50	42	2	4.4°	21200

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.

Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

**CUTTING CONDITIONS > P14,15,16**

\* Number of Teeth

## Spare Parts

Tool Holder Type	*		
<b>WJX14</b>	TS5R	TKY20D	MK1KS

\* Clamp Torque (lbf-in) : TS5R = 44

## Inserts

(inch)

Workpiece Material	P	Steels	●	●	●	●	●	●	●	●	●	●	●	<b>Cutting Conditions (Guide) :</b> ● : Stable Cutting ● : General Cutting ✖ : Unstable Cutting  <b>Edge Preparation (Honing) :</b> E : Round
	M	Stainless Steels	●	●	●	●	●	●	●	●	●	●	●	
Shape	K	Cast Irons	●	●	●	●	●	●	●	●	●	●	IC S BS RE Geometry 	
	S	Heat Resistant Alloys, Titanium Alloys	●	●	●	●	●	●	●	●	●	●		
Order Number	H	Hardened Steels	●	●	●	●	●	●	●	●	●	●	Coated IC S BS RE Geometry	
	JOMU140715ZZER-M		●	●	●	●	●	●	●	●	●	●		
													Right hand insert only.	

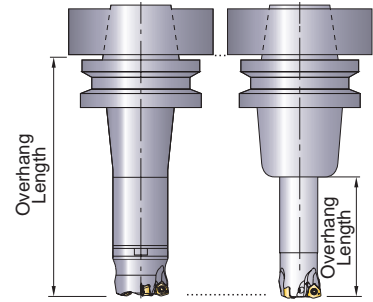
★ : Inventory maintained in Japan. ● : Inventory maintained.  
(10 inserts in one case)

## Recommended Cutting Conditions

### Correction Value According to Overhang Length

Multiply the recommended cutting conditions on pages 14 and 15 by the corrections factor x overhang length.

Type	Cutting Dia. Max. DCX	Overhang Length	Correction Value According		
			Cutting Speed vc (SFM)	Depth of Cut ap	Feed fz (IPT)
Shank Type	1.969	< 2.5×DCON	100%	100%	100%
		3.0×DCON	90%	100%	90%
		4.0×DCON	80%	80%	90%
Arbor Type	2.500—3.150	< 2.5×DCX	100%	100%	100%
		3.0×DCX	85%	100%	90%
		4.0×DCX	80%	80%	80%
		5.0×DCX	75%	75%	60%
	≥ 3.937	6.0×DCX	70%	70%	40%
		8.0	100%	100%	100%
		12.0	85%	100%	90%
		16.0	80%	80%	80%



DCON=Connection Dia.

### Cutting Speed (Dry Cutting)

Workpiece Material	Properties	Cutting Speed vc (SFM)				
		MP6130	MP6120	MC7020	VP15TF	VP30RT
<b>P</b>		MP6130	MP6120	MC7020	VP15TF	VP30RT
Mild Steels	≤180HB	460 (295—590)	490 (330—655)	720 (560—885)	490 (330—655)	395 (260—525)
Carbon Steels Alloy Steels	180—280HB	395 (230—590)	460 (260—655)	655 (490—820)	460 (260—655)	330 (195—490)
Carbon Steels Alloy Steels	280—350HB	395 (230—590)	460 (260—655)	655 (490—820)	460 (260—655)	330 (195—490)
Alloy Tool Steels	≤350HB (Annealing)	395 (230—590)	460 (260—655)	655 (490—820)	460 (260—655)	330 (195—490)
Pre-hardened Steels	35—45HRC	295 (165—425)	360 (230—490)	—	360 (230—490)	260 (130—395)
<b>M</b>		MP7130	MP7140	MC7020	VP30RT	
Austenitic Stainless Steels	≤200HB	525 (425—655)	490 (395—590)	720 (560—885)	490 (395—590)	
Austenitic Stainless Steels	>200HB	460 (330—655)	425 (260—590)	620 (460—785)	425 (260—590)	
Ferritic and Martensitic Stainless Steels	≤200HB	490 (330—655)	425 (260—590)	720 (560—885)	425 (260—590)	
Duplex Stainless Steels	≤280HB	425 (260—590)	360 (195—525)	590 (425—755)	360 (195—525)	
Precipitation Hardening Stainless Steels	<450HB	360 (195—525)	295 (165—425)	560 (395—720)	295 (165—425)	
<b>K</b>		VP15TF				
Gray Cast Irons	≤350MPa	525 (395—655)				
Ductile Cast Irons	≤450MPa	490 (330—655)				
Ductile Cast Irons	≤800MPa	395 (260—525)				
<b>S</b>		MP9130	MP9120	VP15TF		
Heat Resistant Alloys	—	100 (65—130)	130 (65—165)	130 (65—165)		
<b>H</b>		VP15TF				
Hardened Steels	40—55HRC	230 (130—330)				

Note 1) To discharge chips effectively, use an air blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.

Note 2) When wet cutting, tool life may become shorter than dry cutting. When carrying out wet cutting for the applications recommended with dry cutting, reduce the cutting speed by 25%.

Note 3) When large vibration occurs, reduce the cutting conditions.

Note 4) For interrupted cutting, reduce the cutting speed and feed rate by 20%.

# Double-sided Insert Type High Feed Radius Milling Cutter

## Depth of Cut / Feed per Tooth

(inch)

Workpiece Material	Properties	Depth of Cut ap	Cutting Dia. Max. DCX=50mm	Cutting Dia. Max. DCX≥2.500", 63mm	
			Feed fz (IPT)	Feed fz (IPT)	
<b>P</b>	Mild Steels	≤180HB	≤.040	.059(.024-.098)	.067(.024-.110)
			≤.060	.051(.024-.079)	.059(.024-.098)
			≤.080	.047(.024-.079)	.051(.024-.098)
			≤.100	.031(.012-.059)	.039(.012-.063)
			≤.120	.016(.008-.039)	.020(.008-.047)
	Carbon Steels Alloy Steels	180-280HB	≤.040	.059(.020-.079)	.067(.020-.098)
			≤.060	.047(.020-.067)	.051(.020-.098)
			≤.080	.039(.020-.059)	.047(.020-.079)
			≤.100	.028(.012-.047)	.035(.012-.059)
			≤.120	.012(.008-.031)	.016(.008-.039)
	Carbon Steels Alloy Steels	280-350HB	≤.040	.059(.020-.079)	.067(.020-.098)
			≤.060	.047(.020-.067)	.051(.020-.087)
			≤.080	.039(.020-.059)	.047(.020-.079)
			≤.100	.028(.012-.047)	.035(.012-.059)
			≤.120	.012(.008-.031)	.016(.008-.039)
	Alloy Tool Steels	≤350HB (Annealing)	≤.040	.059(.020-.079)	.067(.020-.098)
			≤.060	.047(.020-.067)	.051(.020-.087)
			≤.080	.039(.020-.059)	.047(.020-.079)
			≤.100	.028(.012-.047)	.035(.012-.059)
			≤.120	.012(.008-.031)	.016(.008-.039)
Pre-hardened Steels	35-45HRC	≤.040	.051(.016-.067)	.059(.016-.079)	
		≤.060	.039(.016-.059)	.047(.016-.059)	
		≤.080	.031(.016-.047)	.039(.016-.051)	
<b>M</b>	Austenitic Stainless Steels	≤200HB	≤.040	.039(.020-.047)	.039(.020-.047)
			≤.060	.039(.020-.039)	.039(.020-.039)
	Austenitic Stainless Steels	>200HB	≤.040	.039(.020-.047)	.039(.020-.047)
			≤.060	.039(.020-.039)	.039(.020-.039)
	Ferritic and Martensitic Stainless Steels	≤200HB	≤.040	.039(.020-.047)	.039(.020-.047)
			≤.060	.039(.020-.039)	.039(.020-.039)
	Duplex Stainless Steels	≤280HB	≤.040	.031(.016-.039)	.031(.016-.039)
			≤.060	.031(.016-.031)	.031(.016-.031)
	Precipitation Hardening Stainless Steels	<450HB	≤.040	.031(.016-.039)	.031(.016-.039)
			≤.060	.031(.016-.031)	.031(.016-.031)
<b>K</b>	Gray Cast Irons	≤350MPa	≤.040	.067(.024-.098)	.071(.024-.110)
			≤.060	.059(.024-.079)	.067(.024-.098)
			≤.080	.051(.024-.079)	.059(.024-.098)
			≤.100	.031(.012-.059)	.039(.012-.063)
			≤.120	.016(.008-.039)	.020(.008-.047)
	Ductile Cast Irons	≤450MPa	≤.040	.059(.020-.079)	.067(.020-.098)
			≤.060	.051(.020-.071)	.059(.020-.079)
			≤.080	.047(.020-.071)	.051(.020-.079)
			≤.100	.028(.012-.047)	.035(.012-.059)
			≤.120	.012(.008-.031)	.016(.008-.039)
	Ductile Cast Irons	≤800MPa	≤.040	.051(.016-.071)	.059(.016-.079)
			≤.060	.047(.016-.059)	.051(.016-.071)
Heat Resistant Alloys	-	≤.040	.039(.012-.051)	.039(.012-.051)	
		≤.060	.031(.012-.047)	.031(.012-.047)	
		≤.080	.028(.012-.047)	.028(.012-.047)	
<b>H</b>	Hardened Steels	40-55HRC	≤.040	.031(.012-.047)	.031(.012-.047)
			≤.060	.024(.012-.039)	.024(.012-.039)
			≤.080	.020(.012-.031)	.020(.012-.031)

Note 1) To discharge chips effectively, use an air blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.

Note 2) When large vibration occurs, reduce the cutting conditions.

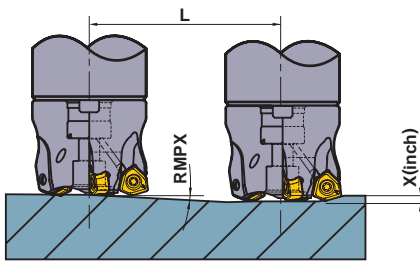
Note 3) For interrupted cutting, reduce the cutting speed and feed rate by 20%.

Note 4) If ap is set at .079" or more, avoid machining on the walls or ramping.

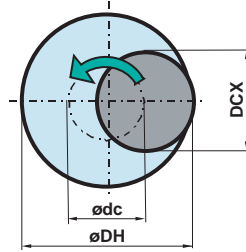


# Maximum Capacities by Mode

## Ramping



## Helical Milling



● How to derive a locus of the center of the tool.

$$\text{ødc} = \text{øDH} - \text{DCX}$$

Locus of the Center of the Tool
Desired Hole Diameter
Cutting Diameter Maximum

(inch)

Tool Holder Type	DCX	DC	APMX	Ramping			Helical Milling (Blind Hole, Flat Bottom)		Helical Milling (Through Hole)	AZ
				RMPX	L (inch) Required Distance for X inch Depth		DH		DH	
					x = .039	x = .079	Min.	Max.	Min.	
WJX14UR2.500	2.500	1.887	.079	3.0°	.752	1.503	4.283	4.901	3.912	.082
WJX14UR3.000	3.000	2.387	.079	2.2°	1.025	2.050	5.283	5.901	4.909	.082
WJX14UR4.000	4.000	3.386	.079	1.5°	1.504	3.007	7.282	7.901	6.906	.082
WJX14UR5.000	5.000	4.386	.079	1.1°	2.051	4.101	9.281	9.901	8.904	.082
WJX14UR6.000	6.000	5.386	.079	0.9°	2.507	5.013	11.281	11.901	10.903	.082
WJX14R50	1.969	1.358	.079	4.4°	.512	1.024	3.228	3.819	2.874	.082
WJX14-063	2.480	1.870	.079	3.0°	.752	1.504	4.252	4.843	3.898	.082
WJX14R063	2.480	1.870	.079	3.0°	.752	1.504	4.252	4.843	3.898	.082
WJX14-066	2.598	1.984	.079	2.8°	.807	1.610	4.488	5.079	4.134	.082
WJX14-080	3.150	2.535	.079	2.1°	1.075	2.150	5.591	6.181	5.236	.082
WJX14R080	3.150	2.535	.079	2.1°	1.075	2.150	5.591	6.181	5.236	.082
WX14-100	3.937	3.323	.079	1.5°	1.504	3.008	7.165	7.756	6.811	.082
WJX14R100	3.937	3.323	.079	1.5°	1.504	3.008	7.165	7.756	6.811	.082
WJX14-125	4.921	4.307	.079	1.2°	1.882	3.760	9.134	9.724	8.780	.082
WJX14R125	4.921	4.307	.079	1.2°	1.882	3.760	9.134	9.724	8.780	.082
WJX14-160	6.299	5.685	.079	0.8°	2.823	5.642	11.890	12.480	11.535	.082
WJX14R160	6.299	5.685	.079	0.8°	2.823	5.642	11.890	12.480	11.535	.082

**DCX** = Cutting Dia. Max.  
**APMX** = Depth of Cut Max.

**DC** = Cutting Dia.  
**RMPX** = Ramping Angle Max.

**DH** = Desired Hole Dia.  
**AZ** = Plunge Depth Max.

Note 1) When ramping and helical milling, it is recommended to reduce the feed per tooth.

Note 2) When ramping, helical milling and drilling, long continuous chips may be scattered so please be careful.

### <Helical Milling>

To obtain a flat bottom surface when helical milling, it requires to remove "the uncut part" in the center of the workpiece material at a final pass. When helical milling, make sure that the depth of cut per helical pass doesn't exceed the maximum depth of cut (APMX).

### <Drilling>

When drilling, set the axial feed per revolution at .008 IPR or less.

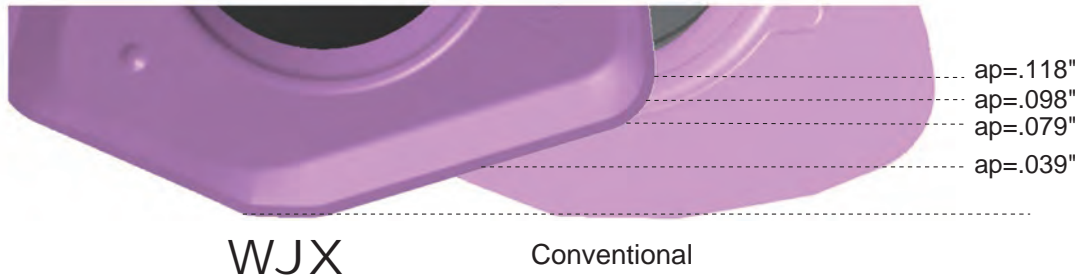
## Operational Guidance

### Depth of Cut

The straight cutting edge is .079" at maximum depth of cut (APMX).

When plane cutting steels and cast irons, the depth of cut can be set at up to .118" until you reach the corner radius.

When you exceed .079", you will need to decrease the feed rate. See the cutting conditions on page 15 for reference.

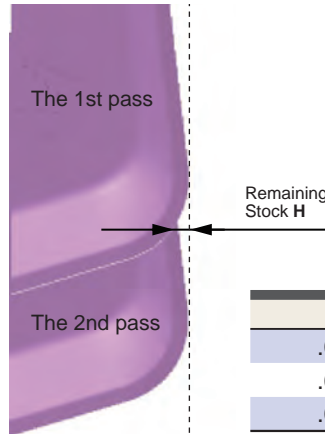
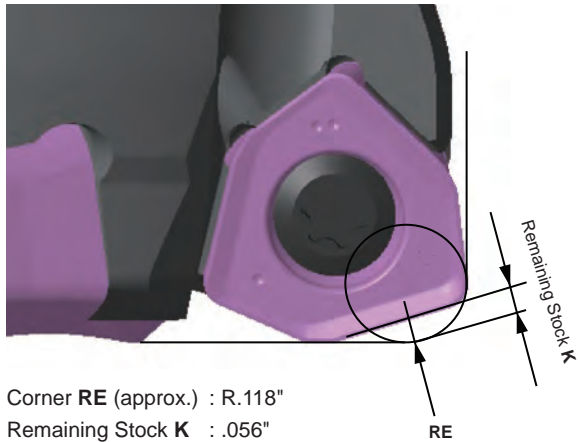


### Remaining Stock

When using the WJX, please program as a radius cutter.

The approximate remaining stock **K** for the program is shown below.

Also see the table on the right for the remaining stock **H** of the vertical wall.



(inch)	
ap	Remaining Stock H
.039	.002
.059	.003
.079	.005





Double-sided Insert Type High Feed Radius Milling Cutter

# WJX Series

**For your safety**

●Don't touch breakers and chips without gloves. ●Please machine within recommended application range, and exchange expired tools with new parts in advance. ●Please use safety cover and wear safety glasses. ●When using compounded cutting oils, please take fire prevention. ●When attaching inserts or spare parts, please use the attached wrench or driver. ●When using tools in revolution machining, please make a trial run to check run-out, vibration, abnormal sounds etc.

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