MITSUBISHI MATERIALS

iMX End Mill Series

EXCHANGEABLE HEAD END MILLS



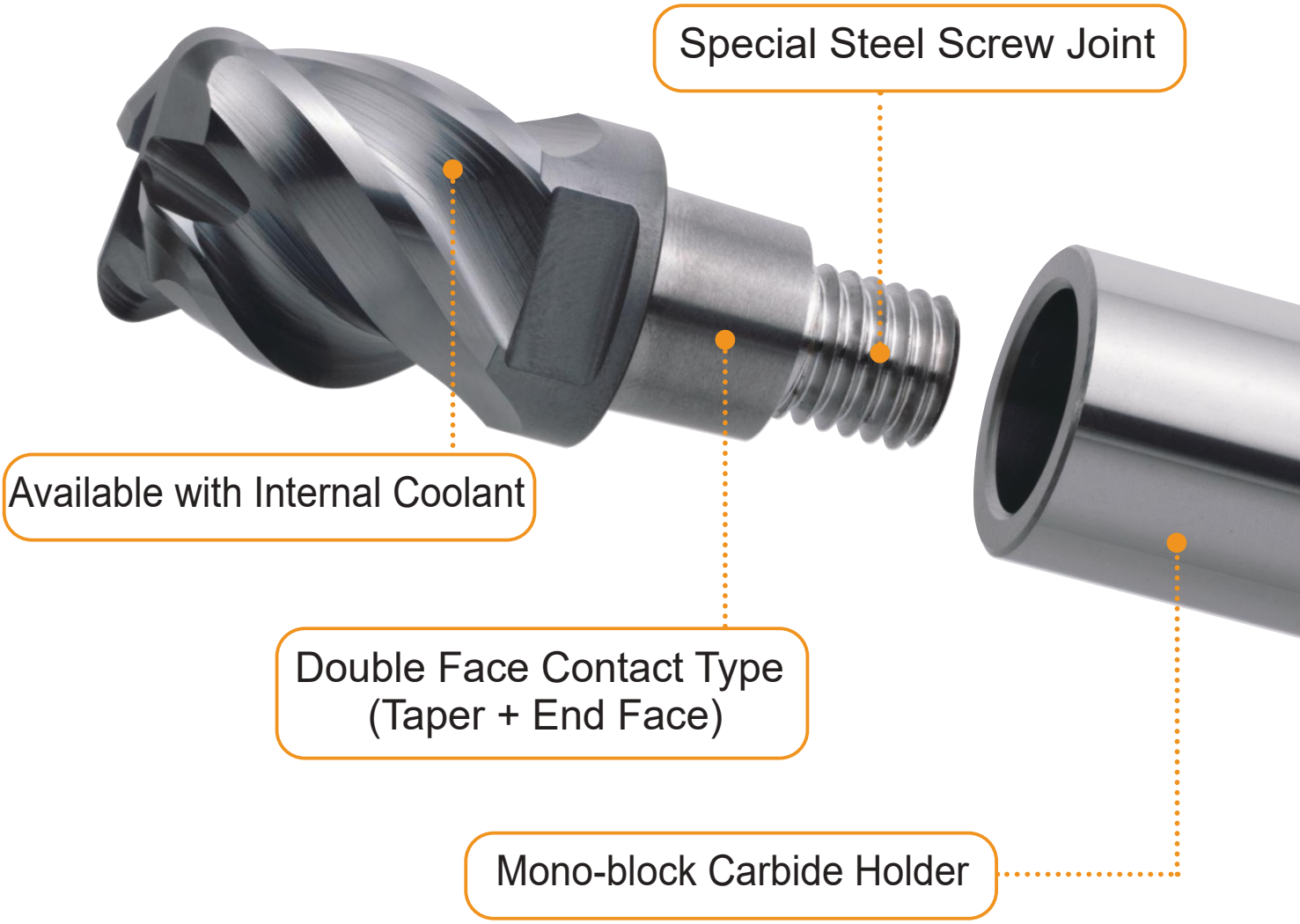


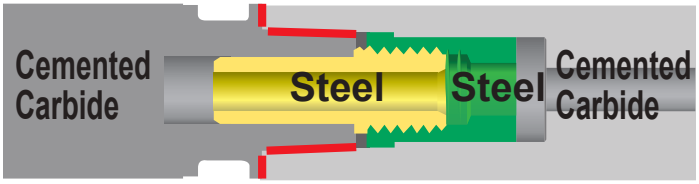


TOOL NEWS **B200A**

Exchangeable Head End Mills

iMX End Mill Series



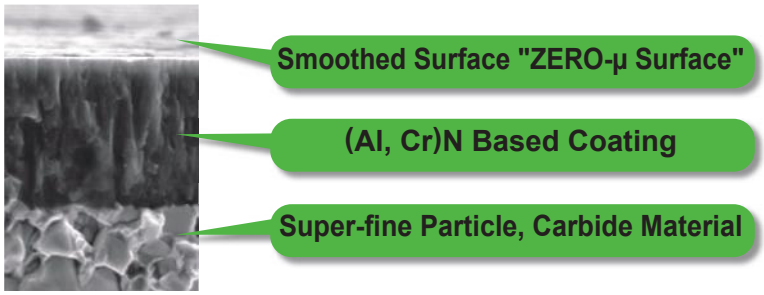


The iMX series is a revolutionary end mill system that enables efficiency, high accuracy and rigidity by combining the advantages of both solid carbide and indexable end mills.
Security and rigidity close to that of a solid type end mill because the contact faces are all carbide.
Excellent for reduced inventory over a variety of applications due to the exchangeable head.

Highly Versatile Grades

EP7020

Suitable for difficult-to-cut materials.



EP8100 Series (EP8110,EP8120)

Suitable for milling of hardened steel.

EP6120

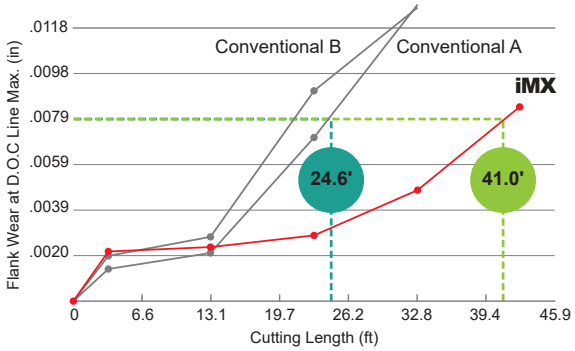
Suitable for high feed milling of steel.

ET2020 (Uncoated)

Suitable for milling of aluminum alloys.

Tool Life Comparison when Machining Flat Surfaces in Inconel 718

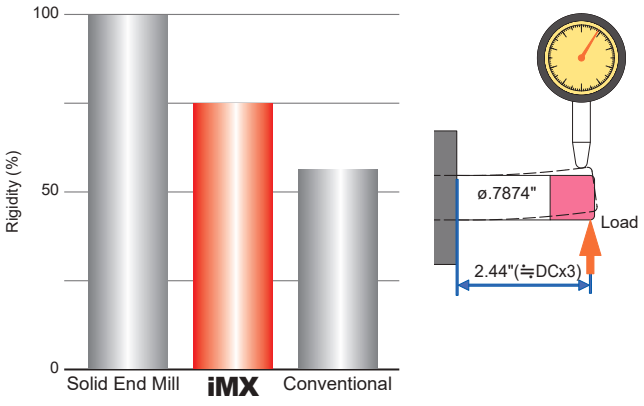
EP7020 is a grade that enables extended tool life when machining difficult-to-cut materials.



Material	: Inconel 718 (43HRC)
Holder	: IMX12-U12N041L100C
Head	: IMX12B4HV12012
Revolution	: n=1700 min^{-1}
Cutting Speed	: vc=90 SFM
Table Feed	: vf=13.8 IPM
Feed per Tooth	: fz=.002 IPT
Depth of Cut	: ap=.024", ae=.047"
Overhang Length	: 2.56"
Cutting Mode	: Down Cut, Wet Cutting(Emulsion)
Machine	: Horizontal MC(BT40)

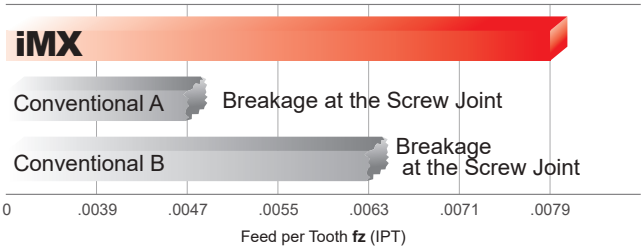
Comparison of Tool Rigidity

The double face contact of the carbide head and carbide holder gives an increase in rigidity of 30%.



Strength Comparison when Slot Milling Titanium Alloys

The reliability of the screw fastening is significantly improved when compared to conventional that employ only steel fastenings. It is also able to cope with high cutting loads.



Material	: Ti-6Al-4V(32HRC)	Feed per Tooth	: Above (Expansion)
Holder	: IMX20-U20N030L090C	Depth of Cut	: ap=.394", ae=.787"
Head	: IMX20C4HV200R10021	Overhang Length	: 2.8"
Revolution	: n=1100 min^{-1}	Cutting Mode	: Wet Cutting (Emulsion)
Cutting Speed	: vc=225 SFM	Machine	: Vertical MC(BT50)

SYMBOL DESCRIPTIONS

Tool Material



Ultra Micro Grain Carbide
Ultra micro grain carbide is used as the substrate material.

Coolant through and Gash land



End Cutting Edge with Coolant Through



Peripheral Cutting Edge with Coolant Through



Gash Land
Indicates the end mill cutting edge has a gash land.

Tolerances



Outside Diameter Tolerance
Indicates diameter tolerance of end mill.



R Tolerance
Indicates the radial tolerance of a ball nose end mill.



R Tolerance
Indicates the radial tolerance of an end mill with a corner radius.



Tolerance of Point Angle
Indicates the tolerance of the point angle.



Shank Diameter Tolerance
Indicates the shank diameter tolerance of end mill.

Correction factor by overhang length (Shoulder Milling)

Use by multiplying the recommended cutting condition by the correction factor by overhang length.
Refer to each recommended condition for the Long cutting, offset type and lollipop type.

(in)

Material	Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys			Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel			Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys		
L/D	Revolution **n** (min^{-1})	Feed per Tooth **fz** (IPT)	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed per Tooth **fz** (IPT)	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed per Tooth **fz** (IPT)	Width of Cut **ae**
2	100%	100%	100%	100%	100%	100%	100%	100%	100%
3	100%	100%	100%	100%	100%	100%	100%	100%	100%
4	80%	90%	70%	80%	90%	70%	80%	90%	70%
5	60%	80%	40%	60%	80%	40%	60%	80%	40%
6	50%	70%	30%	50%	70%	30%	50%	70%	30%
7	40%	70%	20%	40%	70%	20%	30%	60%	20%
8	40%	60%	10%	40%	60%	10%	30%	50%	10%
9	30%	60%	10%	30%	60%	10%	20%	50%	10%

Material	Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys			Heat Resistant Alloys		
L/D	Revolution **n** (min^{-1})	Feed per Tooth **fz** (IPT)	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed per Tooth **fz** (IPT)	Width of Cut **ae**
2	100%	100%	100%	100%	100%	100%
3	100%	100%	100%	100%	100%	100%
4	80%	90%	70%	80%	90%	70%
5	60%	80%	40%	60%	80%	40%
6	50%	70%	30%	50%	70%	30%
7	30%	60%	20%	30%	60%	20%
8	30%	50%	10%	30%	50%	10%
9	20%	50%	10%	20%	50%	10%

CLASSIFICATION

Head

Type	Applications, Features	Flutes	Head Type	Shape	*Coolant Thru	Size (inch,mm)	Dia. DC Min.	Dia. DC Max.	APMX DC Max.	APMX APMX/DC	Material P: Carbon Steel	Material P: Tool Steel	Material H: -55HRC	Material H: 55HRC-	Material M: Stainless Steel	Material S: Titanium Alloys, Heat Resistant Alloys	Material N: Copper Alloys	Material N: Aluminum Alloys	Page
SQUARE																			
	For Difficult-to-cut Materials	3	iMX-S3HV		—	inch	.375	1.000	.800	0.8	◎	○			◎	◎	○		P9
						mm	10	25	20	0.8	◎	○			◎	◎	○		P10
		4	iMX-S4HV		—	inch	.375	1.000	1.000	1	◎	○			◎	◎	○		P14
						mm	10	32	33	1	◎	○			◎	◎	○		P15
		4	iMX-S4HV		—	mm	16	20	40	2	◎	○			◎	◎	○		P15
		4	iMX-S4HV-S		S	inch	.375	1.000	1.000	1	◎	○			◎	◎	○		P16
						mm	10	25	25	1	◎	○			◎	◎	○		P17
	For Aluminum Alloys	3	iMX-S3A		—	inch	.375	1.000	.800	0.8								◎	P23
						mm	10	28	23.4	0.8								◎	P24
RADIUS																			
	For Difficult-to-cut Materials	4	iMX-C4HV		—	inch	.375	1.000	1.000	1	◎	○			◎	◎	○		P27
						mm	10	28	29	1	◎	○			◎	◎	○		P28
		4	iMX-C4HV		—	mm	16	20	40	2	◎	○			◎	◎	○		P29
		4	iMX-C4HV-S		S	inch	.375	1.000	1.000	1	◎	○			◎	◎	○		P30
						mm	10	25	25	1	◎	○			◎	◎	○		P31
		6	iMX-C6HV-C		C	mm	10	25	25	1	◎	○			◎	◎			P37
		6	iMX-C6HV		—	inch	.375	.500	.520	1	◎	○			◎	◎			P39
						mm	10	12	12	1	◎	○			◎	◎			P40
		10	iMX-C10HV		—	inch	—	.625	.645	1	◎	○			◎	◎			P39
						mm	—	16	16	1	◎	○			◎	◎			P40
		12	iMX-C12HV		—	inch	.750	1.000	1.050	1	◎	○			◎	◎			P39
						mm	20	25	25	1	◎	○			◎	◎			P40
	For High Feed Machining	4	iMX-C4FD-C		C	inch	.375	1.000	.067	0.07	◎	◎	◎		◎	◎	○		P42
						mm	10	25	1.6	0.07	◎	◎	◎		◎	◎	○		P43
	For High Efficiency Machining	4	iMX-C4FV		—	inch	.375	1.000	1.050	1	◎	◎	◎						P45
						mm	10	25	26	1	◎	◎	◎						P46
	For Aluminum Alloys	3	iMX-C3A		—	inch	.375	1.000	.800	0.8								◎	P48
						mm	10	28	23.4	0.8								◎	P49
	For Blade Machining	8	NEW iMX-C8T-E		E	mm	—	8	7.12	0.8					◎	◎			P52
			iMX-C8T-C		C	mm	—	8	7.12	0.8					◎	◎			P53

* Coolant thru: C = End face(center), E = Peripheral(end cutting edge), S = Peripheral(side), "—" = Without coolant thru

Note 1) The end cutting edge coolant thru of the blade processing head will be changed from a center through type(-C) to a 4 hole type(-E)

CARBIDE

Head

Type	Applications, Features	No. of Flutes	Head Type	Shape	*Coolant Thru	Size (inch,mm)	Dia. DC Min.	Dia. DC Max.	APMX DC Max.	APMX APMX/DC	Material P Carbon Steel	Material P Tool Steel	Material H -55HRC	Material H 55HRC-	Material M Stainless Steel	Material S Titanium Alloys, Heat Resistant Alloys	Material N Copper Alloys	Material N Aluminum Alloys	Page
RADIUS																			
	For Blade Machining	10	NEW iMX-C10T-E		E	mm	—	10	7.12	0.7					◎	◎			P52
			iMX-C10T-C		C	mm	—	10	7.12	0.7					◎	◎			P53
		12	NEW iMX-C12T-E		E	mm	—	19	3.56	0.2					◎	◎			P52
			iMX-C12T-C		C	mm	15	19	3.56	0.2					◎	◎			P53
		15	NEW iMX-C15T-E		E	mm	15	19	3.56	0.2					◎	◎			P52
			iMX-C15T-C		C	mm	15	19	3.56	0.2					◎	◎			P53
ROUGHING																			
	For Difficult-to-cut Materials	4	iMX-R4F		—	inch	.375	1.000	1.050	1	◎	○			◎	◎	○		P54
						mm	10	25	26	1	◎	○			◎	◎	○		P54
	For Titanium Alloys	4	iMX-RC4F-C		C	mm	10	20	21	1	◎				◎	◎			P57
BALL NOSE																			
	For Hardened Steel	2	iMX-B2S		—	mm	16	20	20	1				◎					P59
		4	iMX-B4S		—	mm	16	20	20	1				◎					P60
	For High Efficiency Machining	3	iMX-B3FV		—	mm	10	20	16	0.8		◎	◎						P61
	For Difficult-to-cut Materials	4	iMX-B4HV		—	inch	.375	1.000	1.050	1	◎	○			◎	◎	○		P63
						mm	10	25	26	1	◎	○			◎	◎	○		P64
		4	iMX-B4HV-E		E	inch	.375	1.000	1.050	1	◎	○			◎	◎	○		P65
						mm	10	25	26	1	◎	○			◎	◎	○		P66
		6	iMX-B6HV		—	inch	.375	1.000	1.050	1	◎	○			◎	◎			P68
						mm	10	25	26	1	◎	○			◎	◎			P69
LOLLIPOP																			
	For Difficult-to-cut Materials	6	iMX-B4WH-S		S	inch	.500	.750	.563	0.8	◎	○			◎	◎	○		P71
						mm	12	20	15	0.8	◎	○			◎	◎	○		P72
CHAMFER																			
	For Chamfer Machining	3	iMX-CH3L		—	inch	.375	.750	.345	0.5	◎	○	○		◎	◎			P74
						mm	10	20	9.2	0.5	◎	○	○		◎	◎			P74
		6	iMX-CH6V		—	inch	.500	.750	.315	0.4	◎	○	○		◎	◎			P77
						mm	12	20	8.5	0.4	◎	○	○		◎	◎			P77

* Coolant thru: C = End face(center), E = Peripheral(end cutting edge), S = Peripheral(side), "—" = Without coolant thru

Note 1) The end cutting edge coolant thru of the blade processing head will be changed from a center through type(-C) to a 4 hole type(-E)

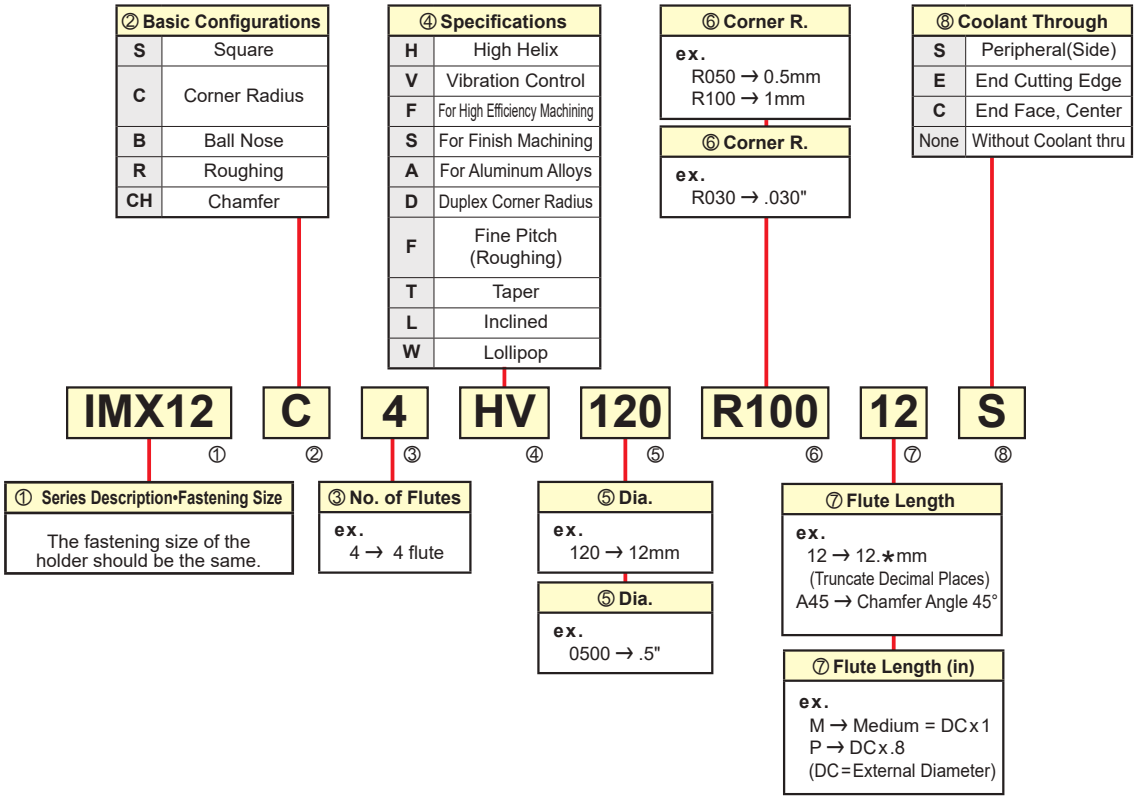
HOLDERS

Figure			Length	Taper angle one side	Tool material	Page
Undercut			Medium Semi-Long Long	—	Carbide	P79,80
					Steel	P81,82
Straight	Straight		Semi-Long Long	—	Carbide	P80
	High Rigidi- tyStraight		Medium	—	Steel	P81,82
Taper neck			Long	1°	Carbide	P79,80
BT30 Mono-Block	Straight		—	—	Steel	P83
	Taper neck		—	8° 10° 15°	Steel	P83
ER collet			—	—	Steel	P84

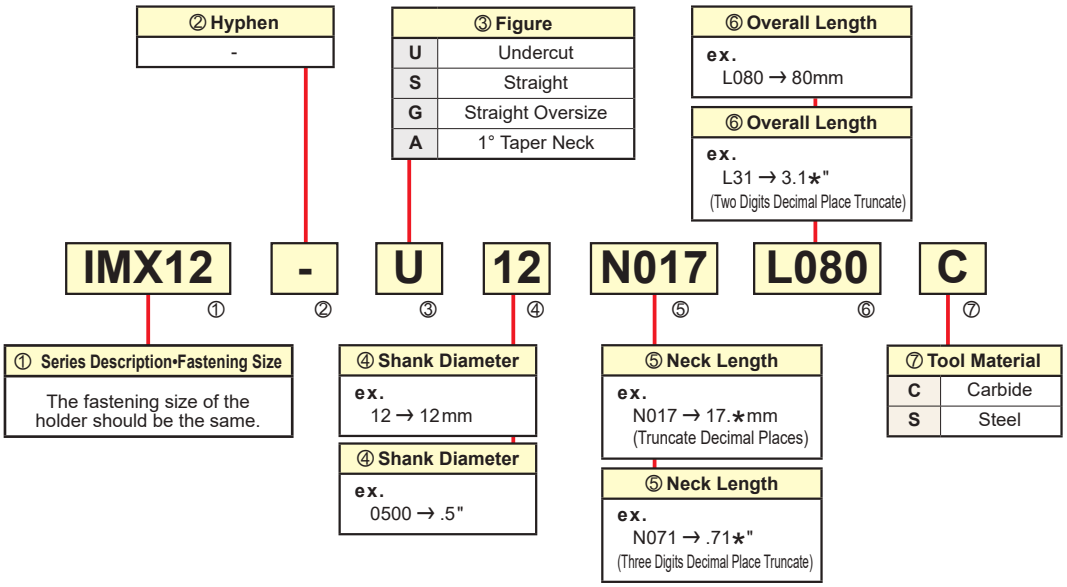
IDENTIFICATION

iMX End Mill Series

Head



Holder



■Run-out Accuracy and Head Exchange Accuracy

Run-out Accuracy for the Peripheral Cutting Edge*	Head Exchange Accuracy (Axial)
.0006" (ø10—20mm)	±.0008"
.0008" (ø25mm)	

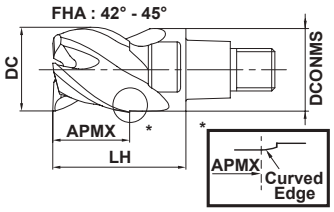
★ Use the carbide holder. (Except iMX-RC4F-C, iMX-R4F roughing head)

iMX-S3HV – Inch Sizes

Square head, 3 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

●3-flute end mills suitable for shoulder milling, slot milling and plunging.
●Irregular helix controls vibration and achieves stable machining.

(in)

Order Number	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10S3HV0375P	.375	.300	.630	.363	3	●	1
IMX12S3HV0500P	.500	.400	.789	.488	3	●	1
IMX16S3HV0625P	.625	.500	.945	.605	3	●	1
IMX20S3HV0750P	.750	.600	1.181	.730	3	●	1
IMX25S3HV1000P	1.000	.800	1.500	.980	3	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

DC = Cutting Dia. **LH** = Head Length
APMX = Depth of Cut Max. **DCONMS** = Connection Dia.

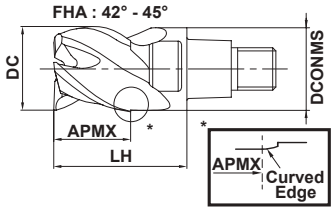
● :USA Stock

iMX-S3HV

Square head, 3 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- 3-flute end mills suitable fo shoulder milling, slot milling and plunging.
- Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10S3HV10008	10	8	16	9.7	3	●	1
IMX12S3HV12009	12	9.6	19	11.7	3	●	1
IMX16S3HV16012	16	12.8	24	15.5	3	●	1
IMX20S3HV20016	20	16	30	19.5	3	●	1
IMX25S3HV25020	25	20	37.5	24.5	3	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

DC = Cutting Dia. **LH** = Head Length
APMX = Depth of Cut Max. **DCONMS** = Connection Dia.

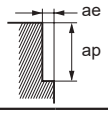
● :USA Stock

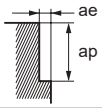
Recommended Cutting Conditions

Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the page 4 correction factor by overhang length.

(in)

Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys			
DC (mm)	DC (in)	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae
	.3750	5000	52.5	.300	.075	4000	28.8	.300	.075	3400	30.6	.300	.075
10	.3937	4800	50.4	.315	.079	3800	27.4	.315	.079	3200	28.8	.315	.079
12	.4724	4000	42.0	.378	.094	3200	25.0	.378	.094	2700	25.1	.378	.094
	.5000	3700	38.9	.400	.100	3000	23.4	.400	.100	2500	23.3	.400	.100
	.6250	3000	35.1	.500	.125	2400	21.6	.500	.125	2000	21.0	.500	.125
16	.6299	3000	35.1	.504	.126	2400	21.6	.504	.126	2000	21.0	.504	.126
	.7500	2500	29.3	.600	.150	2000	18.0	.600	.150	1700	17.9	.600	.150
20	.7874	2400	28.1	.630	.157	1900	17.1	.630	.157	1600	16.8	.630	.157
25	.9843	1900	26.8	.787	.197	1500	13.5	.787	.197	1300	13.7	.787	.197
	1.0000	1900	26.8	.800	.200	1500	13.5	.800	.200	1300	13.7	.800	.200
Depth of Cut													

Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys				Heat Resistant Alloys Inconel718			
DC (mm)	DC (in)	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae
	.3750	2500	18.0	.300	.075	1300	6.2	.300	.038
10	.3937	2400	17.3	.315	.079	1300	6.2	.315	.039
12	.4724	2000	15.6	.378	.094	1100	5.9	.378	.047
	.5000	1900	14.8	.400	.100	990	5.3	.400	.050
	.6250	1500	13.5	.500	.125	790	4.7	.500	.063
16	.6299	1500	13.5	.504	.126	790	4.7	.504	.063
	.7500	1200	10.8	.600	.150	660	4.0	.600	.075
20	.7874	1200	10.8	.630	.157	630	3.8	.630	.079
25	.9843	950	8.6	.787	.197	500	3.0	.787	.098
	1.0000	940	8.5	.800	.200	500	3.0	.800	.100
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

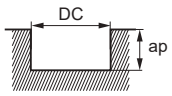
iMX-S3HV

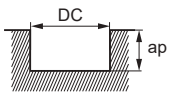
Square head, 3 flute, Irregular helix

Recommended Cutting Conditions

Slot Milling

(in)

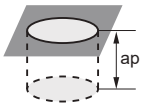
Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys			Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel			Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys		
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**
	.3750	3400	16.1	.188	2600	9.4	.188	2500	9.0	.188
10	**.3937**	3200	15.4	.197	2500	9.0	.197	2400	8.6	.197
12	**.4724**	2700	16.2	.236	2100	10.1	.236	2000	9.6	.236
	.5000	2500	15.0	.250	2000	9.6	.250	1900	9.1	.250
	.6250	2000	16.8	.313	1600	9.6	.313	1500	10.8	.313
16	**.6299**	2000	16.8	.315	1600	9.6	.315	1500	10.8	.315
	.7500	1700	14.3	.375	1300	7.8	.375	1200	8.6	.375
20	**.7874**	1600	13.4	.394	1300	7.8	.394	1200	8.6	.394
25	**.9843**	1300	12.1	.472	1000	6.0	.472	950	6.8	.472
	1.0000	1300	12.1	.480	990	5.9	.480	940	6.8	.480
Depth of Cut		 DC=Dia.								

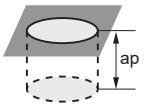
Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys			Heat Resistant Alloys Inconel718		
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**
	.3750	2000	6.0	.188	1000	2.4	.075
10	**.3937**	1900	5.7	.197	970	2.3	.079
12	**.4724**	1600	6.7	.236	810	2.9	.094
	.5000	1500	6.3	.250	760	2.7	.100
	.6250	1200	7.2	.313	610	3.7	.125
16	**.6299**	1200	7.2	.315	610	3.7	.126
	.7500	990	5.9	.375	510	3.1	.150
20	**.7874**	950	5.7	.394	490	2.9	.157
25	**.9843**	760	4.6	.472	390	2.3	.197
	1.0000	740	4.4	.480	380	2.3	.200
Depth of Cut		 DC=Dia.					

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

Plunging

(in)

Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys			
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Drilled Depth **ap**	Step **ap2**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Drilled Depth **ap**	Step **ap2**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Drilled Depth **ap**	Step **ap2**
	.375	3400	18.7	.188	.100	2300	8.1	.188	.080	2000	2.4	.188	.023
10	**.394**	3200	17.6	.197	.100	2200	7.7	.197	.080	1900	2.3	.197	.023
12	**.472**	2700	14.9	.236	.100	1900	6.7	.236	.080	1600	1.9	.236	.023
	.500	2500	13.8	.250	.100	1800	6.3	.250	.080	1500	1.8	.250	.023
	.625	2000	11.0	.313	.100	1400	4.9	.313	.080	1200	1.4	.313	.023
16	**.630**	2000	11.0	.315	.100	1400	4.9	.315	.080	1200	1.4	.315	.023
	.750	1700	9.4	.375	.100	1200	4.2	.375	.080	990	1.2	.375	.023
20	**.787**	1600	8.8	.394	.100	1100	3.9	.394	.080	950	1.1	.394	.023
25	**.984**	1300	7.2	.492	.100	880	3.1	.492	.080	760	.9	.492	.023
	1.000	1300	7.2	.500	.100	880	3.1	.500	.080	740	.9	.500	.023
Depth of Cut													

Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys			
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Drilled Depth **ap**	Step **ap2**
	.375	1300	1.6	.188	.023
10	**.394**	1300	1.6	.197	.023
12	**.472**	1100	1.3	.236	.023
	.500	990	1.2	.250	.023
	.625	790	.9	.313	.023
16	**.630**	790	.9	.315	.023
	.750	660	.8	.375	.023
20	**.787**	630	.8	.394	.023
25	**.984**	500	.6	.492	.023
	1.000	500	.6	.500	.023
Depth of Cut					

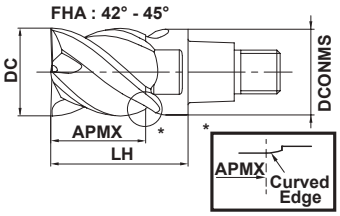
Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.
Note 4) For the feed rate information, the feed per revolution rate is listed.

iMX-S4HV – Inch Sizes

Square head, 4 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

● Irregular helix controls vibration and achieves stable machining.

(in)

Order Number	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10S4HV0375M	.375	.375	.630	.363	4	●	1
IMX12S4HV0500M	.500	.500	.789	.488	4	●	1
IMX16S4HV0625M	.625	.625	.945	.605	4	●	1
IMX20S4HV0750M	.750	.750	1.181	.730	4	●	1
IMX25S4HV1000M	1.000	1.000	1.500	.980	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

DC = Cutting Dia. **LH** = Head Length
APMX = Depth of Cut Max. **DCONMS** = Connection Dia.

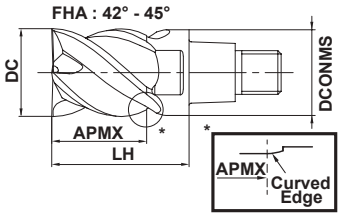
● :USA Stock

iMX-S4HV

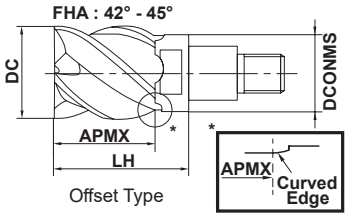
Square head, 4 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1



Type2

Offset Type

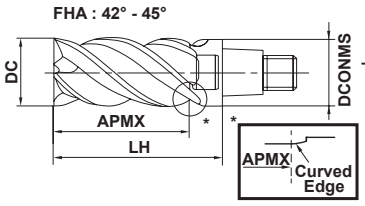
DC ≤12	DC>12			
0 - 0.020	0 - 0.030			

● Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10S4HV10010	10	10	16	9.7	4	●	1
IMX10S4HV12012	12	12.5	19	9.7	4	●	2
IMX12S4HV12012	12	12	19	11.7	4	●	1
IMX12S4HV14014	14	14.5	22.5	11.7	4	●	2
IMX16S4HV16016	16	16	24	15.5	4	●	1
IMX16S4HV18018	18	18.5	27	15.5	4	●	2
IMX20S4HV20020	20	20	30	19.5	4	●	1
IMX20S4HV22023	22	23	33	19.5	4	●	2
IMX25S4HV25025	25	25	37.5	24.5	4	●	1
IMX25S4HV28029	28	29	41.5	24.5	4	●	2
IMX25S4HV30031	30	31	43.5	24.5	4	●	2
IMX25S4HV32033	32	33	45.5	24.5	4	●	2





Type3

Long Cutting Edge Type

(mm)

Order Number	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX16S4HV16032	16	32	40	15.5	4	●	3
IMX20S4HV20040	20	40	50	19.5	4	●	3

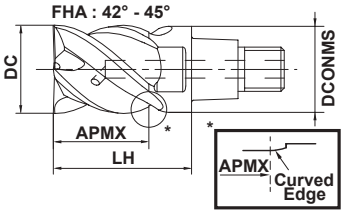
Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

iMX-S4HV-S – Inch Sizes

Square head, 4 flute, Irregular helix, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- Coolant thru for each cutting edge enables a stable coolant supply.
- Irregular helix controls vibration and achieves stable machining.

(in)

Order Number	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10S4HV0375MS	.375	.375	.630	.363	4	●	1
IMX12S4HV0500MS	.500	.500	.789	.488	4	●	1
IMX16S4HV0625MS	.625	.625	.945	.605	4	●	1
IMX20S4HV0750MS	.750	.750	1.181	.730	4	●	1
IMX25S4HV1000MS	1.000	1.000	1.500	.980	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

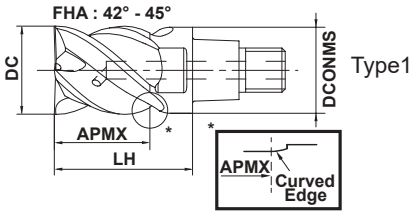
● :USA Stock

iMX-S4HV-S

Square head, 4 flute, Irregular helix, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Coolant thru for each cutting edge enables a stable coolant supply.
- Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10S4HV10010S	10	10	16	9.7	4	●	1
IMX12S4HV12012S	12	12	19	11.7	4	●	1
IMX16S4HV16016S	16	16	24	15.5	4	●	1
IMX20S4HV20020S	20	20	30	19.5	4	●	1
IMX25S4HV25025S	25	25	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

DC = Cutting Dia. **LH** = Head Length
APMX = Depth of Cut Max. **DCONMS** = Connection Dia.

iMX-S4HV/iMX-S4HV-S

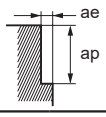
Square head, 4 flute, Irregular helix (With/Without coolant through)

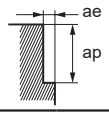
Recommended Cutting Conditions

Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the page 4 correction factor by overhang length.

(in)

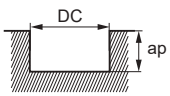
Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys			
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.375	5000	70.0	.375	.075	4000	38.4	.375	.075	3400	40.8	.375	.075
10	**.394**	4800	67.2	.394	.079	3800	36.5	.394	.079	3200	38.4	.394	.079
12	**.472**	4000	56.0	.472	.094	3200	33.3	.472	.094	2700	33.5	.472	.094
	.500	3700	51.8	.500	.100	3000	31.2	.500	.100	2500	31.0	.500	.100
	.625	3000	46.8	.625	.125	2400	28.8	.625	.125	2000	28.0	.625	.125
16	**.630**	3000	46.8	.630	.126	2400	28.8	.630	.126	2000	28.0	.630	.126
	.750	2500	39.0	.750	.150	2000	24.0	.750	.150	1700	23.8	.750	.150
20	**.787**	2400	37.4	.787	.157	1900	22.8	.787	.157	1600	22.4	.787	.157
25	**.984**	1900	35.7	.984	.197	1500	18.0	.984	.197	1300	18.2	.984	.197
	1.000	1900	35.7	1.000	.200	1500	18.0	1.000	.200	1300	18.2	1.000	.200
Depth of Cut													

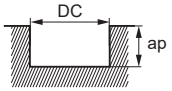
Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys				Heat Resistant Alloys Inconel718			
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.375	2500	24.0	.375	.075	1300	8.3	.375	.038
10	**.394**	2400	23.0	.394	.079	1300	8.3	.394	.039
12	**.472**	2000	20.8	.472	.094	1100	7.9	.472	.047
	.500	1900	19.8	.500	.100	990	7.1	.500	.050
	.625	1500	18.0	.625	.125	790	6.3	.625	.063
16	**.630**	1500	18.0	.630	.126	790	6.3	.630	.063
	.750	1200	14.4	.750	.150	660	5.3	.750	.075
20	**.787**	1200	14.4	.787	.157	630	5.0	.787	.079
25	**.984**	950	11.4	.984	.197	500	4.1	.984	.098
	1.000	940	11.3	1.000	.200	500	4.0	1.000	.100
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

Slot Milling

(in)

Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys			Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel			Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys		
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**
	.375	3400	21.4	.188	2600	12.5	.188	2500	12.0	.188
10	**.394**	3200	20.5	.197	2500	12.0	.197	2400	11.5	.197
12	**.472**	2700	21.6	.236	2100	13.4	.236	2000	12.8	.236
	.500	2500	20.0	.250	2000	12.8	.250	1900	12.2	.250
	.625	2000	22.4	.313	1600	12.8	.313	1500	14.4	.313
16	**.630**	2000	22.4	.315	1600	12.8	.315	1500	14.4	.315
	.750	1700	19.0	.375	1300	10.4	.375	1200	11.5	.375
20	**.787**	1600	17.9	.394	1300	10.4	.394	1200	11.5	.394
25	**.984**	1300	16.1	.472	1000	8.0	.472	950	9.1	.472
	1.000	1300	16.1	.480	990	7.9	.480	940	9.0	.480
Depth of Cut		 DC=Dia.								

Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys			Heat Resistant Alloys Inconel718		
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**
	.375	2000	8.0	.188	1000	3.2	.075
10	**.394**	1900	7.6	.197	970	3.1	.079
12	**.472**	1600	9.0	.236	810	3.9	.094
	.500	1500	8.4	.250	760	3.6	.100
	.625	1200	9.6	.313	610	4.9	.125
16	**.630**	1200	9.6	.315	610	4.9	.126
	.750	1000	7.9	.375	510	4.1	.150
20	**.787**	950	7.6	.394	490	3.9	.157
25	**.984**	760	6.1	.472	390	3.1	.197
	1.000	740	5.9	.480	380	3.0	.200
Depth of Cut		 DC=Dia.					

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

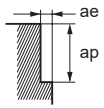
iMX-S4HV

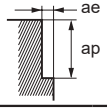
Square head, 4 flute, Irregular helix, Long cutting edge type

Recommended Cutting Conditions

Shoulder Milling

(in)

Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys			
L/D	DC (mm)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
4	**16**	2000	28.0	1.260	.031	1600	17.9	1.260	.031	1200	14.9	1.260	.031
	20	1600	22.4	1.575	.039	1300	14.6	1.575	.039	950	11.8	1.575	.039
6	**16**	1200	13.4	1.260	.031	990	8.0	1.260	.031	790	7.6	1.260	.031
	20	950	10.6	1.575	.039	800	6.4	1.575	.039	630	6.0	1.575	.039
Depth of Cut													

Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys				Heat Resistant Alloys Inconel718			
L/D	DC (mm)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
4	**16**	1000	11.2	1.260	.031	610	4.9	1.260	.016
	20	800	9.0	1.575	.039	490	3.9	1.575	.020
6	**16**	610	4.9	1.260	.031	390	2.5	1.260	.016
	20	490	3.9	1.575	.039	320	2.0	1.575	.020
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.

Note 2) The revolution and feed rate can be increased at smaller depth of cut.

Note 3) The length of the long cutting type is 2 times that of the standard head. L/D demonstrates +1 when installed to a holder of the same size.

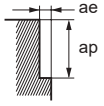
Note 4) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

iMX-S4HV

Square head, 4 flute, Irregular helix, Offset type

Shoulder Milling

(in)

Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys			
L/D	DC (mm)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
3	**12**	4000	56.0	.472	.047	3200	30.7	.472	.047	2700	32.4	.472	.047
	14	3400	47.6	.551	.055	2700	28.1	.551	.055	2300	28.5	.551	.055
	18	2600	40.6	.709	.071	2100	25.2	.709	.071	1800	25.2	.709	.071
	22	2200	34.3	.866	.087	1700	20.4	.866	.087	1500	21.0	.866	.087
	28	1700	32.0	1.102	.110	1400	16.8	1.102	.110	1100	15.4	1.102	.110
	30	1600	30.1	1.181	.118	1300	15.6	1.181	.118	1100	15.4	1.181	.118
	32	1500	28.2	1.260	.126	1200	14.4	1.260	.126	1000	14.0	1.260	.126
5	**12**	2400	26.9	.472	.020	1900	15.2	.472	.020	1600	15.4	.472	.020
	14	2000	22.4	.551	.024	1600	12.8	.551	.024	1400	13.4	.551	.024
	18	1600	19.8	.709	.028	1200	11.5	.709	.028	1100	12.3	.709	.028
	22	1300	16.1	.866	.035	1000	9.6	.866	.035	860	9.6	.866	.035
	28	1000	15.6	1.102	.043	800	7.7	1.102	.043	680	7.6	1.102	.043
	30	950	14.8	1.181	.047	740	7.1	1.181	.047	630	7.1	1.181	.047
	32	890	13.9	1.260	.051	700	6.7	1.260	.051	590	6.6	1.260	.051
7	**12**	1600	15.4	.472	.008	1300	8.3	.472	.008	850	6.8	.472	.008
	14	1400	13.4	.551	.012	1100	8.8	.551	.012	730	7.0	.551	.012
	18	1100	12.3	.709	.016	890	7.1	.709	.016	570	5.5	.709	.016
	22	860	9.6	.866	.016	730	5.8	.866	.016	460	4.4	.866	.016
	28	680	8.4	1.102	.024	570	4.6	1.102	.024	360	3.5	1.102	.024
	30	630	7.8	1.181	.024	530	4.2	1.181	.024	340	3.3	1.181	.024
	32	590	7.3	1.260	.024	500	4.0	1.260	.024	320	3.1	1.260	.024
Depth of Cut													

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.

Note 2) The revolution and feed rate can be increased at smaller depth of cut.

Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

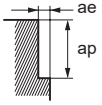
iMX-S4HV

Square head, 4 flute, Irregular helix, Offset type

Recommended Cutting Conditions

Shoulder Milling

(in)

Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys				Heat Resistant Alloys Inconel718			
L/D	DC (mm)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
3	**12**	2000	19.2	.472	.047	810	5.2	.472	.035
	14	1700	17.7	.551	.055	690	5.0	.551	.043
	18	1300	15.6	.709	.071	700	5.6	.709	.055
	22	1100	13.2	.866	.087	570	4.6	.866	.067
	28	850	10.2	1.102	.110	450	3.6	1.102	.083
	30	790	9.5	1.181	.118	420	3.4	1.181	.091
	32	740	8.9	1.260	.126	390	3.1	1.260	.094
5	**12**	1300	10.4	.472	.020	280	1.3	.472	.016
	14	1100	8.8	.551	.024	240	1.5	.551	.016
	18	890	8.5	.709	.028	320	2.0	.709	.024
	22	730	7.0	.866	.035	260	1.7	.866	.028
	28	570	5.5	1.102	.043	210	1.3	1.102	.031
	30	530	5.1	1.181	.047	190	1.2	1.181	.035
	32	500	4.8	1.260	.051	180	1.2	1.260	.039
7	**12**	650	4.2	.472	.008	–	–	–	–
	14	550	4.4	.551	.012	–	–	–	–
	18	430	3.4	.709	.016	–	–	–	–
	22	350	2.8	.866	.016	–	–	–	–
	28	280	2.2	1.102	.024	–	–	–	–
	30	260	2.1	1.181	.024	–	–	–	–
	32	240	1.9	1.260	.024	–	–	–	–
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

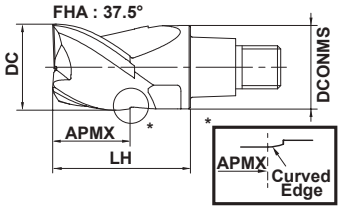
● :USA Stock

iMX-S3A– Inch Sizes

Square head, 3 flute, For aluminum alloys

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
							◎





Type1

DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- High efficiency machining due to the sharp cutting edge and polished rake face making it highly suitable for machining aluminum alloys.

(in)

Order Number	DC	APMX	LH	DCONMS	Flutes	Grade ET2020	Type
IMX10S3A0375P	.375	.300	.630	.363	3	●	1
IMX12S3A0500P	.500	.400	.789	.488	3	●	1
IMX16S3A0625P	.625	.500	.945	.605	3	●	1
IMX20S3A0750P	.750	.600	1.181	.730	3	●	1
IMX25S3A1000P	1.000	.800	1.500	.980	3	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

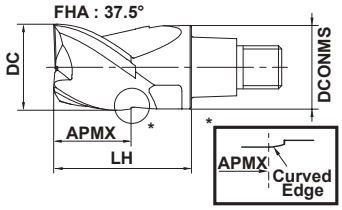
DC = Cutting Dia. **LH** = Head Length
APMX = Depth of Cut Max. **DCONMS** = Connection Dia.

iMX-S3A

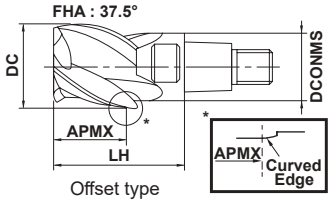
Square head, 3 flute, For aluminum alloys

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
							◎





Type1



Type2

Offset type

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

● High efficiency machining due to the sharp cutting edge and polished rake face making it highly suitable for machining aluminum alloys.

(mm)

Order Number	DC	APMX	LH	DCONMS	Flutes	Grade ET2020	Type
IMX10S3A10008	10	8	16	9.7	3	●	1
IMX10S3A12010	12	10.1	19	9.7	3	●	2
IMX12S3A12009	12	9.6	19	11.7	3	●	1
IMX12S3A14011	14	11.7	22.5	11.7	3	●	2
IMX16S3A16012	16	12.8	24	15.5	3	●	1
IMX16S3A18014	18	14.9	27	15.5	3	●	2
IMX20S3A20016	20	16	30	19.5	3	●	1
IMX20S3A22018	22	18.6	33	19.5	3	●	2
IMX25S3A25020	25	20	37.5	24.5	3	●	1
IMX25S3A28023	28	23.4	41.5	24.5	3	●	2

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

DC = Cutting Dia. **LH** = Head Length
APMX = Depth of Cut Max. **DCONMS** = Connection Dia.

● :USA Stock

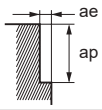
iMX-S3A

Square head, 3 flute, For aluminum alloys

Recommended Cutting Conditions

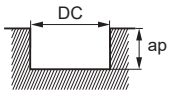
Shoulder Milling (L/D=3)

(in)

Material		Aluminum Alloys			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(in)				
	.375	17000	234.6	.300	.113
10	**.394**	16000	220.8	.315	.118
12	**.472**	13000	179.4	.378	.142
	.500	13000	179.4	.400	.150
	.625	10000	180.0	.500	.188
16	**.630**	9900	178.2	.504	.189
	.750	8400	173.9	.600	.225
20	**.787**	8000	165.6	.630	.236
25	**.984**	6400	159.4	.787	.295
	1.000	6300	156.9	.800	.300
Depth of Cut					

Slot Milling (L/D=3)

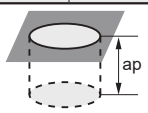
(in)

Material		Aluminum Alloys		
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**
(mm)	(in)			
	.375	17000	137.7	.188
10	**.394**	16000	129.6	.197
12	**.472**	13000	109.2	.236
	.500	13000	109.2	.250
	.625	10000	111.0	.313
16	**.630**	9900	109.9	.315
	.750	8400	108.4	.375
20	**.787**	8000	103.2	.394
25	**.984**	6400	96.0	.492
	1.000	6300	94.5	.500
Depth of Cut				

DC=Dia.

Plunging (L/D=3)

(in)

Material		Aluminum Alloys			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Drilled Depth **ap**	Step **ap2**
(mm)	(in)				
	.375	10000	39.0	.188	.10
10	**.394**	9600	37.4	.197	.10
12	**.472**	8000	31.2	.236	.10
	.500	7500	29.3	.250	.10
	.625	6000	23.4	.313	.10
16	**.630**	6000	23.4	.315	.10
	.750	5000	19.5	.375	.10
20	**.787**	4800	18.7	.394	.10
25	**.984**	3800	14.8	.492	.10
	1.000	3800	14.8	.500	.10
Depth of Cut					

Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The use of water-soluble coolant is effective.
Note 3) For the feed rate information, the feed per revolution rate is listed.

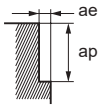
iMX-S3A

Square head, 3 flute, For aluminum alloys, Offset type

Recommended Cutting Conditions

Shoulder Milling

(in)

Material			Aluminum Alloys			
L/D	DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
3	**12**	**.472**	13000	181.1	.378	.094
	14	**.551**	11000	153.5	.441	.110
	18	**.709**	8800	157.5	.567	.142
	22	**.866**	7200	149.6	.693	.173
	28	**1.102**	5700	141.7	.882	.220
5	**12**	**.472**	8000	86.6	.378	.039
	14	**.551**	6800	70.9	.441	.043
	18	**.709**	5300	74.8	.567	.055
	22	**.866**	4300	70.9	.693	.071
	28	**1.102**	3400	66.9	.882	.087
7	**12**	**.472**	5300	51.2	.378	.020
	14	**.551**	4500	43.3	.441	.024
	18	**.709**	3500	47.2	.567	.028
	22	**.866**	2900	39.4	.693	.035
	28	**1.102**	2300	39.4	.882	.043
Depth of Cut						

Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution, feed rate and depth of cut.

Note 2) The use of water-soluble coolant is effective.

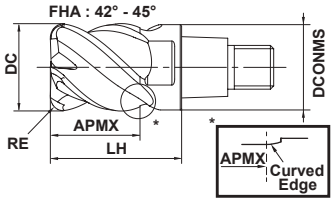
● :USA Stock

iMX-C4HV – Inch Sizes

Corner radius head, 4 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

RE				
±.0008"				
DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

● Irregular helix controls vibration and achieves stable machining.

(in)

Order Number	DC	RE	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10C4HV0375R015M	.375	.015	.375	.630	.363	4	●	1
IMX10C4HV0375R030M	.375	.030	.375	.630	.363	4	●	1
IMX10C4HV0375R060M	.375	.060	.375	.630	.363	4	●	1
IMX12C4HV0500R015M	.500	.015	.500	.789	.488	4	●	1
IMX12C4HV0500R030M	.500	.030	.500	.789	.488	4	●	1
IMX12C4HV0500R060M	.500	.060	.500	.789	.488	4	●	1
IMX16C4HV0625R015M	.625	.015	.625	.945	.605	4	●	1
IMX16C4HV0625R030M	.625	.030	.625	.945	.605	4	●	1
IMX16C4HV0625R060M	.625	.060	.625	.945	.605	4	●	1
IMX20C4HV0750R030M	.750	.030	.750	1.181	.730	4	●	1
IMX20C4HV0750R060M	.750	.060	.750	1.181	.730	4	●	1
IMX20C4HV0750R125M	.750	.125	.750	1.181	.730	4	●	1
IMX20C4HV0750R190M	.750	.190	.750	1.181	.730	4	●	1
IMX20C4HV0750R250M	.750	.250	.750	1.181	.730	4	●	1
IMX25C4HV1000R030M	1.000	.030	1.000	1.500	.980	4	●	1
IMX25C4HV1000R060M	1.000	.060	1.000	1.500	.980	4	●	1
IMX25C4HV1000R125M	1.000	.125	1.000	1.500	.980	4	●	1
IMX25C4HV1000R190M	1.000	.190	1.000	1.500	.980	4	●	1
IMX25C4HV1000R250M	1.000	.250	1.000	1.500	.980	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

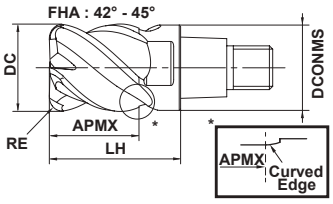
DC = Cutting Dia. **APMX** = Depth of Cut Max. **DCONMS** = Connection Dia.
RE = Corner Radius **LH** = Head Length

iMX-C4HV

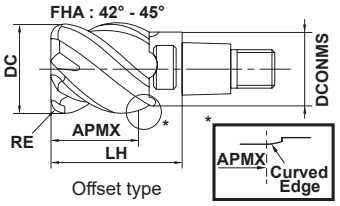
Corner radius head, 4 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1



Type2

Offset type

RE				
±0.020				
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

●Irregular helix controls vibration and achieves stable machining.

(mm)

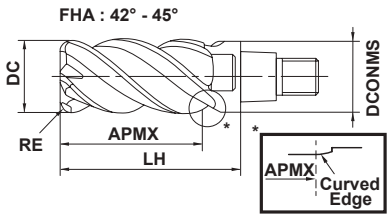
Order Number	DC	RE	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10C4HV100R03010	10	0.3	10	16	9.7	4	●	1
IMX10C4HV100R05010	10	0.5	10	16	9.7	4	●	1
IMX10C4HV100R10010	10	1	10	16	9.7	4	●	1
IMX10C4HV100R15010	10	1.5	10	16	9.7	4	●	1
IMX10C4HV100R20010	10	2	10	16	9.7	4	●	1
IMX10C4HV100R25010	10	2.5	10	16	9.7	4	●	1
IMX10C4HV100R30010	10	3	10	16	9.7	4	●	1
IMX10C4HV110R05011	11	0.5	11.5	18	9.7	4	●	2
IMX10C4HV110R10011	11	1	11.5	18	9.7	4	●	2
IMX10C4HV120R03012	12	0.3	12.5	19	9.7	4	●	2
IMX10C4HV120R05012	12	0.5	12.5	19	9.7	4	●	2
IMX10C4HV120R10012	12	1	12.5	19	9.7	4	●	2
IMX10C4HV120R20012	12	2	12.5	19	9.7	4	●	2
IMX12C4HV120R03012	12	0.3	12	19	11.7	4	●	1
IMX12C4HV120R05012	12	0.5	12	19	11.7	4	●	1
IMX12C4HV120R10012	12	1	12	19	11.7	4	●	1
IMX12C4HV120R15012	12	1.5	12	19	11.7	4	●	1
IMX12C4HV120R20012	12	2	12	19	11.7	4	●	1
IMX12C4HV120R25012	12	2.5	12	19	11.7	4	●	1
IMX12C4HV120R30012	12	3	12	19	11.7	4	●	1
IMX12C4HV120R40012	12	4	12	19	11.7	4	●	1
IMX12C4HV130R05013	13	0.5	13.5	21.5	11.7	4	●	2
IMX12C4HV130R10013	13	1	13.5	21.5	11.7	4	●	2
IMX12C4HV140R03014	14	0.3	14.5	22.5	11.7	4	●	2
IMX12C4HV140R05014	14	0.5	14.5	22.5	11.7	4	●	2
IMX12C4HV140R10014	14	1	14.5	22.5	11.7	4	●	2
IMX12C4HV140R20014	14	2	14.5	22.5	11.7	4	●	2
IMX16C4HV160R03016	16	0.3	16	24	15.5	4	●	1
IMX16C4HV160R05016	16	0.5	16	24	15.5	4	●	1
IMX16C4HV160R10016	16	1	16	24	15.5	4	●	1
IMX16C4HV160R15016	16	1.5	16	24	15.5	4	●	1
IMX16C4HV160R20016	16	2	16	24	15.5	4	●	1
IMX16C4HV160R25016	16	2.5	16	24	15.5	4	●	1
IMX16C4HV160R30016	16	3	16	24	15.5	4	●	1

● **:USA Stock**

Order Number	DC	RE	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX16C4HV160R40016	16	4	16	24	15.5	4	●	1
IMX16C4HV160R50016	16	5	16	24	15.5	4	●	1
IMX16C4HV170R05017	17	0.5	17	26	15.5	4	●	2
IMX16C4HV170R10017	17	1	17	26	15.5	4	●	2
IMX16C4HV180R03018	18	0.3	18	27	15.5	4	●	2
IMX16C4HV180R05018	18	0.5	18.5	27	15.5	4	●	2
IMX16C4HV180R10018	18	1	18.5	27	15.5	4	●	2
IMX16C4HV180R20018	18	2	18.5	27	15.5	4	●	2
IMX16C4HV180R30018	18	3	18.5	27	15.5	4	●	2
IMX20C4HV200R03020	20	0.3	20	30	19.5	4	●	1
IMX20C4HV200R05020	20	0.5	20	30	19.5	4	●	1
IMX20C4HV200R10020	20	1	20	30	19.5	4	●	1
IMX20C4HV200R15020	20	1.5	20	30	19.5	4	●	1
IMX20C4HV200R20020	20	2	20	30	19.5	4	●	1
IMX20C4HV200R25020	20	2.5	20	30	19.5	4	●	1
IMX20C4HV200R30020	20	3	20	30	19.5	4	●	1
IMX20C4HV200R40020	20	4	20	30	19.5	4	●	1
IMX20C4HV200R50020	20	5	20	30	19.5	4	●	1
IMX20C4HV200R60020	20	6	20	30	19.5	4	●	1
IMX20C4HV200R63520	20	6.35	20	30	19.5	4	●	1
IMX20C4HV220R05023	22	0.5	23	33	19.5	4	●	2
IMX20C4HV220R10023	22	1	23	33	19.5	4	●	2
IMX20C4HV220R20023	22	2	23	33	19.5	4	●	2
IMX20C4HV220R30023	22	3	23	33	19.5	4	●	2
IMX25C4HV250R10025	25	1	25	37.5	24.5	4	●	1
IMX25C4HV250R20025	25	2	25	37.5	24.5	4	●	1
IMX25C4HV250R30025	25	3	25	37.5	24.5	4	●	1
IMX25C4HV250R40025	25	4	25	37.5	24.5	4	●	1
IMX25C4HV250R50025	25	5	25	37.5	24.5	4	●	1
IMX25C4HV250R60025	25	6	25	37.5	24.5	4	●	1
IMX25C4HV250R63525	25	6.35	25	37.5	24.5	4	●	1
IMX25C4HV280R10029	28	1	29	41.5	24.5	4	●	2
IMX25C4HV280R30029	28	3	29	41.5	24.5	4	●	2

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)





Type3

Long cutting edge type

(mm)

Order Number	DC	RE	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX16C4HV160R10032	16	1	32	40	15.5	4	●	3
IMX16C4HV160R30032	16	3	32	40	15.5	4	●	3
IMX20C4HV200R10040	20	1	40	50	19.5	4	●	3
IMX20C4HV200R30040	20	3	40	50	19.5	4	●	3

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

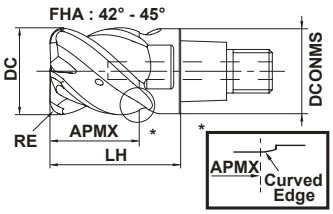
DC = Cutting Dia. **APMX** = Depth of Cut Max. **DCONMS** = Connection Dia.
RE = Corner Radius **LH** = Head Length

iMX-C4HV-S – Inch Sizes

Corner radius head, 4 flute, Irregular helix, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

RE				
±.0008"				

DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- Coolant thru for each cutting edge enables a stable coolant supply.
- Irregular helix controls vibration and achieves stable machining even on difficult-to-cut materials and long overhang applications.

(in)

Order Number	DC	RE	APMX	LH	DCONMS	No. of Flutes	Grade EP7020	Type
IMX10C4HV0375R030MS	.375	.030	.375	.630	.363	4	●	1
IMX12C4HV0500R030MS	.500	.030	.500	.789	.488	4	●	1
IMX16C4HV0625R030MS	.625	.030	.625	.945	.605	4	●	1
IMX20C4HV0750R030MS	.750	.030	.750	1.181	.730	4	●	1
IMX25C4HV1000R030MS	1.000	.030	1.000	1.500	.980	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

DC = Cutting Dia. **APMX** = Depth of Cut Max. **DCONMS** = Connection Dia.
RE = Corner Radius **LH** = Head Length

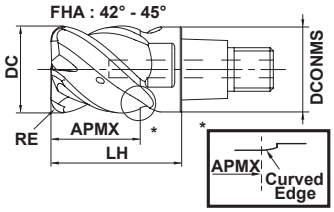
● :USA Stock

iMX-C4HV-S

Corner radius head, 4 flute, Irregular helix, with coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

RE				
±0.020				
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Coolant thru for each cutting edge enables a stable coolant supply.
- Irregular helix controls vibration and achieves stable machining even on difficult-to-cut materials and long overhang applications.

(mm)

Order Number	DC	RE	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10C4HV100R03010S	10	0.3	10	16	9.7	4	●	1
IMX10C4HV100R05010S	10	0.5	10	16	9.7	4	●	1
IMX10C4HV100R10010S	10	1	10	16	9.7	4	●	1
IMX10C4HV100R15010S	10	1.5	10	16	9.7	4	●	1
IMX10C4HV100R20010S	10	2	10	16	9.7	4	●	1
IMX10C4HV100R30010S	10	3	10	16	9.7	4	●	1
IMX12C4HV120R03012S	12	0.3	12	19	11.7	4	●	1
IMX12C4HV120R05012S	12	0.5	12	19	11.7	4	●	1
IMX12C4HV120R10012S	12	1	12	19	11.7	4	●	1
IMX12C4HV120R15012S	12	1.5	12	19	11.7	4	●	1
IMX12C4HV120R20012S	12	2	12	19	11.7	4	●	1
IMX12C4HV120R30012S	12	3	12	19	11.7	4	●	1
IMX12C4HV120R40012S	12	4	12	19	11.7	4	●	1
IMX16C4HV160R05016S	16	0.5	16	24	15.5	4	●	1
IMX16C4HV160R10016S	16	1	16	24	15.5	4	●	1
IMX16C4HV160R15016S	16	1.5	16	24	15.5	4	●	1
IMX16C4HV160R20016S	16	2	16	24	15.5	4	●	1
IMX16C4HV160R30016S	16	3	16	24	15.5	4	●	1
IMX16C4HV160R40016S	16	4	16	24	15.5	4	●	1
IMX20C4HV200R05020S	20	0.5	20	30	19.5	4	●	1
IMX20C4HV200R10020S	20	1	20	30	19.5	4	●	1
IMX20C4HV200R15020S	20	1.5	20	30	19.5	4	●	1
IMX20C4HV200R20020S	20	2	20	30	19.5	4	●	1
IMX20C4HV200R30020S	20	3	20	30	19.5	4	●	1
IMX20C4HV200R40020S	20	4	20	30	19.5	4	●	1
IMX20C4HV200R60020S	20	6	20	30	19.5	4	●	1
IMX20C4HV200R63520S	20	6.35	20	30	19.5	4	●	1
IMX25C4HV250R10025S	25	1	25	37.5	24.5	4	●	1
IMX25C4HV250R15025S	25	1.5	25	37.5	24.5	4	●	1
IMX25C4HV250R20025S	25	2	25	37.5	24.5	4	●	1
IMX25C4HV250R30025S	25	3	25	37.5	24.5	4	●	1
IMX25C4HV250R40025S	25	4	25	37.5	24.5	4	●	1
IMX25C4HV250R60025S	25	6	25	37.5	24.5	4	●	1
IMX25C4HV250R63525S	25	6.35	25	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

iMX-C4HV/iMX-C4HV-S

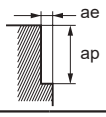
Corner radius head, 4 flute, Irregular helix (With/Without coolant thru)

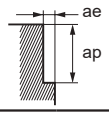
Recommended Cutting Conditions

Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the page 4 correction factor by overhang length.

(in)

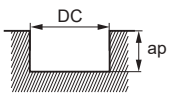
Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(in)												
	.375	5000	70.0	.375	.075	4000	38.4	.375	.075	3400	40.8	.375	.075
10	**.394**	4800	67.2	.394	.079	3800	36.5	.394	.079	3200	38.4	.394	.079
12	**.472**	4000	56.0	.472	.094	3200	33.3	.472	.094	2700	33.5	.472	.094
	.500	3700	51.8	.500	.100	3000	31.2	.500	.100	2500	31.0	.500	.100
	.625	3000	46.8	.625	.125	2400	28.8	.625	.125	2000	28.0	.625	.125
16	**.630**	3000	46.8	.630	.126	2400	28.8	.630	.126	2000	28.0	.630	.126
	.750	2500	39.0	.750	.150	2000	24.0	.750	.150	1700	23.8	.750	.150
20	**.787**	2400	37.4	.787	.157	1900	22.8	.787	.157	1600	22.4	.787	.157
25	**.984**	1900	35.7	.984	.197	1500	18.0	.984	.197	1300	18.2	.984	.197
	1.000	1900	35.7	1.000	.200	1500	18.0	1.000	.200	1300	18.2	1.000	.200
Depth of Cut													

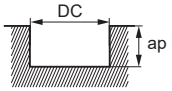
Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys				Heat Resistant Alloys Inconel718			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(in)								
	.375	2500	24.0	.375	.075	1300	8.3	.375	.038
10	**.394**	2400	23.0	.394	.079	1300	8.3	.394	.039
12	**.472**	2000	20.8	.472	.094	1100	7.9	.472	.047
	.500	1900	19.8	.500	.100	990	7.1	.500	.050
	.625	1500	18.0	.625	.125	790	6.3	.625	.063
16	**.630**	1500	18.0	.630	.126	790	6.3	.630	.063
	.750	1200	14.4	.750	.150	660	5.3	.750	.075
20	**.787**	1200	14.4	.787	.157	630	5.0	.787	.079
25	**.984**	950	11.4	.984	.197	500	4.1	.984	.098
	1.000	940	11.3	1.000	.200	500	4.0	1.000	.100
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

Slot Milling

(in)

Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys			Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel			Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys		
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**
	.375	3400	21.4	.188	2600	12.5	.188	2500	12.0	.188
10	**.394**	3200	20.5	.197	2500	12.0	.197	2400	11.5	.197
12	**.472**	2700	21.6	.236	2100	13.4	.236	2000	12.8	.236
	.500	2500	20.0	.250	2000	12.8	.250	1900	12.2	.250
	.625	2000	22.4	.313	1600	12.8	.313	1500	14.4	.313
16	**.630**	2000	22.4	.315	1600	12.8	.315	1500	14.4	.315
	.750	1700	19.0	.375	1300	10.4	.375	1200	11.5	.375
20	**.787**	1600	17.9	.394	1300	10.4	.394	1200	11.5	.394
25	**.984**	1300	16.1	.472	1000	8.0	.472	950	9.1	.472
	1.000	1300	16.1	.480	990	7.9	.480	940	9.0	.480
Depth of Cut		 DC=Dia.								

Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys			Heat Resistant Alloys Inconel718		
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**
	.375	2000	8.0	.188	1000	3.2	.075
10	**.394**	1900	7.6	.197	970	3.1	.079
12	**.472**	1600	9.0	.236	810	3.9	.094
	.500	1500	8.4	.250	760	3.6	.100
	.625	1200	9.6	.313	610	4.9	.125
16	**.630**	1200	9.6	.315	610	4.9	.126
	.750	1000	7.9	.375	510	4.1	.150
20	**.787**	950	7.6	.394	490	3.9	.157
25	**.984**	760	6.1	.472	390	3.1	.197
	1.000	740	5.9	.480	380	3.0	.200
Depth of Cut		 DC=Dia.					

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

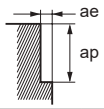
iMX-C4HV

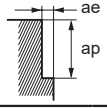
Corner radius head, 4 flute, Irregular helix, Long cutting edge type

Recommended Cutting Conditions

Shoulder Milling

(in)

Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys			
L/D	DC (mm)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
4	**16**	2000	28.0	1.260	.031	1600	17.9	1.260	.031	1200	14.9	1.260	.031
	20	1600	22.4	1.575	.039	1300	14.6	1.575	.039	950	11.8	1.575	.039
6	**16**	1200	13.4	1.260	.031	990	8.0	1.260	.031	790	7.6	1.260	.031
	20	950	10.6	1.575	.039	800	6.4	1.575	.039	630	6.0	1.575	.039
Depth of Cut													

Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys				Heat Resistant Alloys Inconel718			
L/D	DC (mm)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
4	**16**	1000	11.2	1.260	.031	610	4.9	1.260	.016
	20	800	9.0	1.575	.039	490	3.9	1.575	.020
6	**16**	610	4.9	1.260	.031	390	2.5	1.260	.016
	20	490	3.9	1.575	.039	320	2.0	1.575	.020
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.

Note 2) The revolution and feed rate can be increased at smaller depth of cut.

Note 3) The length of the long cutting type is 2 times that of the standard head. L/D demonstrates +1 when installed to a holder of the same size.

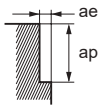
Note 4) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

iMX-C4HV

Corner radius head, 4 flute, Irregular helix, Offset type

Shoulder Milling

(in)

Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys			
L/D	DC (mm)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
3	**11**	4300	60.2	.433	.043	3500	33.6	.433	.043	2900	34.8	.433	.043
	12	4000	56.0	.472	.047	3200	30.7	.472	.047	2700	32.4	.472	.047
	13	3700	51.8	.512	.051	2900	30.2	.512	.051	2500	31.0	.512	.051
	14	3400	47.6	.551	.055	2700	28.1	.551	.055	2300	28.5	.551	.055
	17	2800	43.7	.669	.067	2300	27.6	.669	.067	1900	23.6	.669	.067
	18	2600	40.6	.709	.071	2100	25.2	.709	.071	1800	25.2	.709	.071
	22	2200	34.3	.866	.087	1700	20.4	.866	.087	1500	21.0	.866	.087
	28	1700	32.0	1.102	.110	1400	16.8	1.102	.110	1100	15.4	1.102	.110
	30	1600	30.1	1.181	.118	1300	15.6	1.181	.118	1100	15.4	1.181	.118
	32	1500	28.2	1.260	.126	1200	14.4	1.260	.126	1000	14.0	1.260	.126
5	**11**	2600	29.1	.433	.016	2000	16.0	.433	.016	1700	16.3	.433	.016
	12	2400	26.9	.472	.020	1900	15.2	.472	.020	1600	15.4	.472	.020
	13	2200	24.6	.512	.020	1700	13.6	.512	.020	1500	14.4	.512	.020
	14	2000	22.4	.551	.024	1600	12.8	.551	.024	1400	13.4	.551	.024
	17	1700	21.1	.669	.028	1300	12.5	.669	.028	1100	12.3	.669	.028
	18	1600	19.8	.709	.028	1200	11.5	.709	.028	1100	12.3	.709	.028
	22	1300	16.1	.866	.035	1000	9.6	.866	.035	860	9.6	.866	.035
	28	1000	15.6	1.102	.043	800	7.7	1.102	.043	680	7.6	1.102	.043
	30	950	14.8	1.181	.047	740	7.1	1.181	.047	630	7.1	1.181	.047
	32	890	13.9	1.260	.051	700	6.7	1.260	.051	590	6.6	1.260	.051
7	**11**	1700	16.3	.433	.008	1500	9.6	.433	.008	930	7.4	.433	.008
	12	1600	15.4	.472	.008	1300	8.3	.472	.008	850	6.8	.472	.008
	13	1500	14.4	.512	.012	1200	9.6	.512	.012	780	7.5	.512	.012
	14	1400	13.4	.551	.012	1100	8.8	.551	.012	730	7.0	.551	.012
	17	1100	12.3	.669	.012	940	7.5	.669	.012	600	5.8	.669	.012
	18	1100	12.3	.709	.016	890	7.1	.709	.016	570	5.5	.709	.016
	22	860	9.6	.866	.016	730	5.8	.866	.016	460	4.4	.866	.016
	28	680	8.4	1.102	.024	570	4.6	1.102	.024	360	3.5	1.102	.024
	30	630	7.8	1.181	.024	530	4.2	1.181	.024	340	3.3	1.181	.024
	32	590	7.3	1.260	.024	500	4.0	1.260	.024	320	3.1	1.260	.024
Depth of Cut													

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

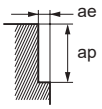
iMX-C4HV

Corner radius head, 4 flute, Irregular helix, Offset type

Recommended Cutting Conditions

Shoulder Milling

(in)

Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys				Heat Resistant Alloys Inconel718			
L/D	DC (mm)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
3	**11**	2200	21.1	.433	.043	880	5.6	.433	.032
	12	2000	19.2	.472	.047	810	5.2	.472	.035
	13	1800	18.7	.512	.051	750	5.4	.512	.039
	14	1700	17.7	.551	.055	690	5.0	.551	.043
	17	1400	14.6	.669	.067	740	5.3	.669	.051
	18	1300	15.6	.709	.071	700	5.6	.709	.055
	22	1100	13.2	.866	.087	570	4.6	.866	.067
	28	850	10.2	1.102	.110	450	3.6	1.102	.083
	30	790	9.5	1.181	.118	420	3.4	1.181	.091
	32	740	8.9	1.260	.126	390	3.1	1.260	.094
5	**11**	1500	12.0	.433	.016	310	1.5	.433	.012
	12	1300	10.4	.472	.020	280	1.3	.472	.016
	13	1200	9.6	.512	.020	260	1.7	.512	.016
	14	1100	8.8	.551	.024	240	1.5	.551	.016
	17	940	9.0	.669	.028	340	2.2	.669	.020
	18	890	8.5	.709	.028	320	2.0	.709	.024
	22	730	7.0	.866	.035	260	1.7	.866	.028
	28	570	5.5	1.102	.043	210	1.3	1.102	.031
	30	530	5.1	1.181	.047	190	1.2	1.181	.035
	32	500	4.8	1.260	.051	180	1.2	1.260	.039
7	**11**	710	4.5	.433	.008	–	–	–	–
	12	650	4.2	.472	.008	–	–	–	–
	13	600	4.8	.512	.012	–	–	–	–
	14	550	4.4	.551	.012	–	–	–	–
	17	460	3.7	.669	.012	–	–	–	–
	18	430	3.4	.709	.016	–	–	–	–
	22	350	2.8	.866	.016	–	–	–	–
	28	280	2.2	1.102	.024	–	–	–	–
	30	260	2.1	1.181	.024	–	–	–	–
	32	240	1.9	1.260	.024	–	–	–	–
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

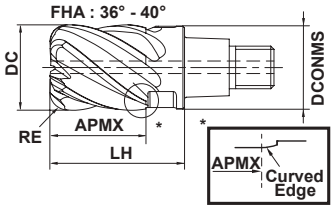
● :USA Stock ★ :Stocked in Japan

iMX-C6HV-C

Corner radius head, 6 flute, Irregular helix, with coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎		





Type1

RE				
±0.020				
DC=10	12≤DC<16	20≤DC≤25		
0 - 0.030	0 - 0.040	0 - 0.050		

- Chatter and vibration are suppressed and stable machining is enabled by using irregular helix flutes.
- Equipped with center through coolant thru to improve chip evacuation.

(mm)

Order Number	DC	RE	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10C6HV100R05010C	10	0.5	10	16	9.7	6	●	1
IMX10C6HV100R10010C	10	1	10	16	9.7	6	●	1
IMX12C6HV120R05012C	12	0.5	12	19	11.7	6	●	1
IMX12C6HV120R10012C	12	1	12	19	11.7	6	●	1
IMX16C6HV160R10016C	16	1	16	24	15.5	6	●	1
IMX16C6HV160R30016C	16	3	16	24	15.5	6	★	1
IMX20C6HV200R10020C	20	1	20	30	19.5	6	★	1
IMX20C6HV200R30020C	20	3	20	30	19.5	6	●	1
IMX25C6HV250R10025C	25	1	25	37.5	24.5	6	●	1
IMX25C6HV250R30025C	25	3	25	37.5	24.5	6	★	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

DC = Cutting Dia. **APMX** = Depth of Cut Max. **DCONMS** = Connection Dia.
RE = Corner Radius **LH** = Head Length

iMX-C6HV-C

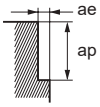
Corner radius head, 6 flute, Irregular helix, with coolant thru

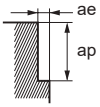
Recommended Cutting Conditions

Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the page 4 correction factor by overhang length.

(in)

Material		Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel				Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys, Titanium Alloys			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(in)												
10	**.394**	6400	106.3	.394	.039	4800	78.7	.394	.039	3200	51.2	.394	.039
12	**.472**	5300	106.3	.472	.047	4000	78.7	.472	.047	2700	55.1	.472	.047
16	**.630**	4000	82.7	.630	.063	3000	63.0	.630	.063	2000	43.3	.630	.063
20	**.787**	3200	74.8	.787	.079	2400	55.1	.787	.079	1600	39.4	.787	.079
25	**.984**	2500	59.1	.984	.098	1900	43.3	.984	.098	1300	31.5	.984	.098
Depth of Cut													

Material		Heat Resistant Alloys Inconel718			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(in)				
10	**.394**	1300	10.2	.394	.020
12	**.472**	1100	9.1	.472	.024
16	**.630**	800	7.1	.630	.031
20	**.787**	640	5.9	.787	.039
25	**.984**	510	4.7	.984	.051
Depth of Cut					

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.

Note 2) The revolution and feed rate can be increased at smaller depth of cut.

Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

● :USA Stock

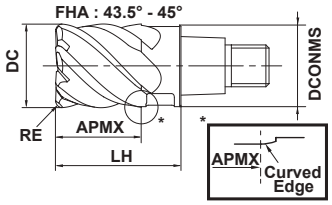
iMX-C6HV/C10HV/C12HV– Inch Sizes

Corner radius head, Multi-flute, Irregular helix

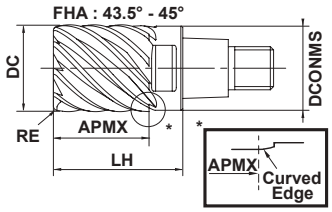


Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎		





Type1



Type2



RE				
±.0008"				



DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- High machining efficiency due to the multi-flute design.
- Irregular helix controls vibration and achieves stable machining.

(in)

Order Number	DC	RE	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10C6HV0375R030M	.375	.030	.395	.630	.363	6	●	1
IMX12C6HV0500R030M	.500	.030	.520	.789	.488	6	●	1
IMX16C10HV0625R030M	.625	.030	.645	.945	.605	10	●	2
IMX20C12HV0750R030M	.750	.030	.800	1.181	.730	12	●	2
IMX25C12HV1000R030M	1.000	.030	1.050	1.500	.980	12	●	2

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

DC = Cutting Dia. **APMX** = Depth of Cut Max. **DCONMS** = Connection Dia.
RE = Corner Radius **LH** = Head Length

iMX-C6HV/C10HV/C12HV

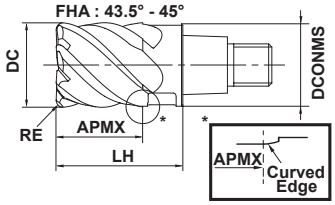
Corner radius head, Multi-flute, Irregular helix

UWC

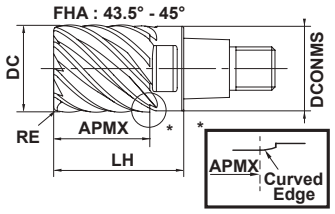
DC≤12 DC>12

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎		





Type1



Type2

RE				
±0.020				
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- High machining efficiency due to the multi-flute design.
- Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	RE	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10C6HV100R05010	10	0.5	10	16	9.7	6	●	1
IMX10C6HV100R10010	10	1	10	16	9.7	6	●	1
IMX12C6HV120R10012	12	1	12	19	11.7	6	●	1
IMX16C10HV160R10016	16	1	16	24	15.5	10	●	2
IMX20C12HV200R10020	20	1	20	30	19.5	12	●	2
IMX25C12HV250R10025	25	1	25	37.5	24.5	12	●	2

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

DC = Cutting Dia. **APMX** = Depth of Cut Max. **DCONMS** = Connection Dia.
RE = Corner Radius **LH** = Head Length

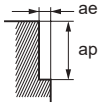
● :USA Stock

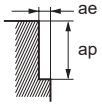
Recommended Cutting Conditions

Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the page 4 correction factor by overhang length.

(in)

Material		Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys				Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(in)												
	.375	6700	112.6	.375	.038	5000	84.0	.375	.038	3400	57.1	.375	.038
10	**.394**	6400	107.5	.394	.039	4800	80.6	.394	.039	3200	53.8	.394	.039
12	**.472**	5300	104.9	.472	.047	4000	79.2	.472	.047	2700	53.5	.472	.047
	.500	5000	99.0	.500	.050	3700	73.3	.500	.050	2500	49.5	.500	.050
	.625	4000	140.0	.625	.025	3000	105.0	.625	.025	2000	70.0	.625	.025
16	**.630**	4000	140.0	.630	.025	3000	105.0	.630	.025	2000	70.0	.630	.025
	.750	3300	154.4	.750	.030	2500	117.0	.750	.030	1700	79.6	.750	.030
20	**.787**	3200	149.8	.787	.031	2400	112.3	.787	.031	1600	74.9	.787	.031
25	**.984**	2500	117.0	.984	.039	1900	88.9	.984	.039	1300	60.8	.984	.039
	1.000	2500	117.0	1.000	.040	1900	88.9	1.000	.040	1300	60.8	1.000	.040
Depth of Cut													

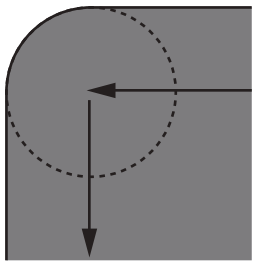
Material		Heat Resistant Alloys Inconel718			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(in)				
	.375	1300	10.1	.375	.019
10	**.394**	1300	10.1	.394	.020
12	**.472**	1100	9.2	.472	.024
	.500	990	8.3	.500	.025
	.625	790	11.9	.625	.025
16	**.630**	790	11.9	.630	.025
	.750	660	12.7	.750	.030
20	**.787**	630	12.1	.787	.031
25	**.984**	500	9.6	.984	.039
	1.000	500	9.6	1.000	.040
Depth of Cut					

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.

Note 2) The revolution and feed rate can be increased at smaller depth of cut.

Note 3) If the machining radius at the corner is the same as the tool radius when using the head with more than 10 flutes, please set the depth of cut and feed rate to half of the above.

Note 4) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.



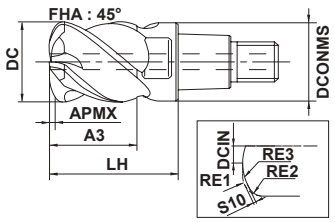
When the corner machining radius and tool radius are the same.

iMX-C4FD-C – Inch Sizes

Duplex corner radius head, 4 flute, For high feed, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	◎	◎		◎	◎	○	





Type1

DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- Multi-task corner radius type and 4 flutes offer high feed and high efficiency.
- Center coolant thru provides effective cooling and stable coolant supply.

(in)

Order Number	DC	RE1 *1	APMX	A3	LH	DCONMS	Flutes	RMPX *2	Grade EP7020	Type
IMX10C4FD0375MC	.375	.076	.024	.395	.630	.363	4	2.3°	●	1
IMX12C4FD0500MC	.500	.086	.033	.520	.789	.488	4	3.6°	●	1
IMX16C4FD0625MC	.625	.110	.039	.645	.945	.605	4	2.8°	●	1
IMX20C4FD0750MC	.750	.117	.047	.800	1.181	.730	4	3.6°	●	1
IMX25C4FD1000MC	1.000	.171	.067	1.050	1.500	.980	4	4.5°	●	1

*1 RE1: Approximate Radius

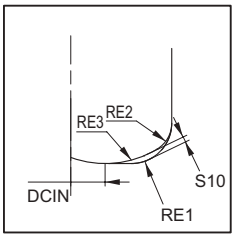
*2 RMPX: Max. Ramping Angle

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

Note 2) Multi-task corner radius is not suitable for corner radius milling that transfers an R-shape because cutting at R is incomplete.

(in)

Order Number	RE1 *1	Multi-task Radius Part			
		S10	DCIN	RE2	RE3
IMX10C4FD0375MC	.076	.009	.134	.060	.181
IMX12C4FD0500MC	.086	.014	.196	.060	.236
IMX16C4FD0625MC	.110	.017	.236	.080	.315
IMX20C4FD0750MC	.117	.020	.314	.080	.354
IMX25C4FD1000MC	.171	.028	.394	.120	.472



Please program CAM as an R2 cutter radius, when using the **iMX**. The approximate uncut portions for the program are as shown in the left table.

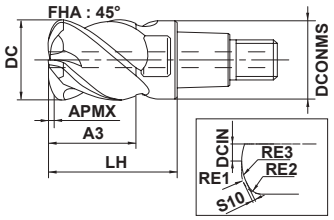
● :USA Stock

iMX-C4FD-C

Duplex corner radius head, 4 flute, For high feed, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	◎	◎		◎	◎	○	





Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Multi-task corner radius type and 4 flutes offer high feed and high efficiency.
- Center coolant thru provides effective cooling and stable coolant supply.

(mm)

Order Number	DC	RE1 *1	APMX	A3	LH	DCONMS	Flutes	RMPX *2	Grade EP7020	Type
IMX10C4FD10010C	10	1.99	0.7	10.5	16	9.7	4	2.1°	●	1
IMX12C4FD12012C	12	2.1	0.8	12.5	19	11.7	4	2.8°	●	1
IMX16C4FD16016C	16	2.75	1	16.5	24	15.5	4	3°	●	1
IMX20C4FD20021C	20	3.07	1.3	21	30	19.5	4	3.3°	●	1
IMX25C4FD25026C	25	4.21	1.6	26	37.5	24.5	4	4.5°	●	1

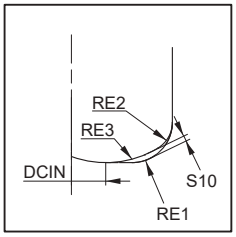
*1 RE1: Approximate Radius

*2 RMPX: Max. Ramping Angle

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)
Note 2) Multi-task corner radius is not suitable for corner radius milling that transfers an R-shape because cutting at R is incomplete.

(mm)

Order Number	RE1 *1	Multi-task Radius Part			
		S10	DCIN	RE2	RE3
IMX10C4FD10010C	1.99	0.27	3.4	1.5	5
IMX12C4FD12012C	2.1	0.33	4.5	1.5	6
IMX16C4FD16016C	2.75	0.42	6.2	2	8
IMX20C4FD20021C	3.07	0.59	8	2	10
IMX25C4FD25026C	4.21	0.67	10	3	12



Please program CAM as an R2 cutter radius, when using the **iMX**. The approximate uncut portions for the program are as shown in the left table.

DC = Cutting Dia. **APMX** = Depth of Cut Max. **DCONMS** = Connection Dia.
RE = Corner Radius **LH** = Head Length **A3** = Cutting Edge Length
DCIN = Cutting Dia. Internal Max.

iMX-C4FD-C

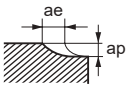
Duplex corner radius head, 4 flute, For high feed, With coolant thru

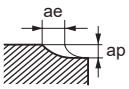
Recommended Cutting Conditions

Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the page 4 correction factor by overhang length.

(in)

Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Hardened Steel, Precipitation Hardening Stainless Steel, Ferritic and Martensitic Stainless Steel			
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.375	5000	314.0	.019	.225	4500	282.6	.019	.225	4000	188.8	.019	.225
10	**.394**	4800	301.4	.020	.236	4300	270.0	.020	.236	3800	179.4	.020	.236
12	**.472**	4000	283.2	.024	.283	3600	254.9	.024	.283	3200	151.0	.024	.283
	.500	3700	262.0	.025	.300	3400	240.7	.025	.300	3000	141.6	.025	.300
	.625	3000	236.4	.031	.375	2700	212.8	.031	.375	2400	150.7	.031	.375
16	**.630**	3000	236.4	.031	.378	2700	212.8	.031	.378	2400	150.7	.031	.378
	.750	2500	197.0	.038	.450	2300	181.2	.038	.450	2000	125.6	.038	.450
20	**.787**	2400	189.1	.039	.472	2200	173.4	.039	.472	1900	119.3	.039	.472
25	**.984**	1900	149.7	.049	.591	1700	134.0	.049	.591	1500	94.2	.049	.591
	1.000	1900	149.7	.050	.600	1700	134.0	.050	.600	1500	94.2	.050	.600
Depth of Cut													

Material		Austenitic Stainless Steel, Titanium Alloys, Cobalt Chromium Alloys				Heat Resistant Alloys Inconel718			
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.375	1300	41.1	.019	.225	810	12.6	.019	.225
10	**.394**	1300	41.1	.020	.236	780	12.2	.020	.236
12	**.472**	1100	34.8	.024	.283	650	10.1	.024	.283
	.500	990	31.3	.025	.300	610	9.5	.025	.300
	.625	790	37.3	.031	.375	490	11.6	.031	.375
16	**.630**	790	37.3	.031	.378	490	11.6	.031	.378
	.750	660	31.2	.038	.450	410	9.7	.038	.450
20	**.787**	630	29.7	.039	.472	390	9.2	.039	.472
25	**.984**	500	23.6	.049	.591	310	7.3	.049	.591
	1.000	500	23.6	.050	.600	310	7.3	.050	.600
Depth of Cut									

Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) Reduce the feed by 1/2 for ramping process.
Note 4) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

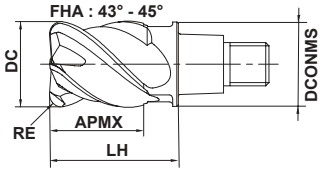
● **:USA Stock**

iMX-C4FV – Inch Sizes

Corner radius head, 4 flute, Irregular helix, For high efficiency machining

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	◎	◎					





Type1

DC≤.750"	DC=1.000"			
±.0004"	±.0008"			
DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- Corner radius end mill for high efficiency machining.
- Irregular helix controls vibration and achieves stable machining.

(in)

Order Number	DC	RE	APMX	LH	DCONMS	Flutes	Grade EP6120	Type
IMX10C4FV0375R090M	.375	.090	.395	.630	.363	4	●	1
IMX12C4FV0500R090M	.500	.090	.520	.789	.488	4	●	1
IMX16C4FV0625R125M	.625	.125	.645	.945	.605	4	●	1
IMX20C4FV0750R125M	.750	.125	.800	1.181	.730	4	●	1
IMX25C4FV1000R190M	1.000	.190	1.050	1.500	.980	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

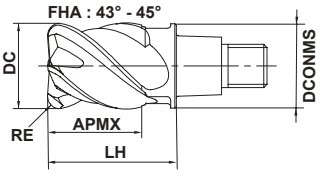
DC = Cutting Dia. **APMX** = Depth of Cut Max. **DCONMS** = Connection Dia.
RE = Corner Radius **LH** = Head Length

iMX-C4FV

Corner radius head for high efficiency machining, 4 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	◎	◎					





Type1

RE≤3	RE=4			
±0.010	±0.020			
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Corner radius end mill for high efficiency machining.
- Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	RE	APMX	LH	DCONMS	Flutes	Grade EP6120	Type
IMX10C4FV100R20010	10	2	10.5	16	9.7	4	●	1
IMX12C4FV120R20012	12	2	12.5	19	11.7	4	●	1
IMX16C4FV160R30016	16	3	16.5	24	15.5	4	●	1
IMX20C4FV200R30021	20	3	21	30	19.5	4	●	1
IMX25C4FV250R40026	25	4	26	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

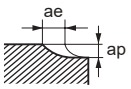
DC = Cutting Dia. **APMX** = Depth of Cut Max. **DCONMS** = Connection Dia.
RE = Corner Radius **LH** = Head Length

● **:USA Stock**

Recommended Cutting Conditions

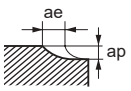
High Depth of Cut Conditions

(in)

Material		Carbon Steel, Alloy Steel, Gray Cast Iron				Pre-hardened Steel, Alloy Tool Steel				Hardened Steel (45—55HRC)			
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.375	3000	117.6	.045	.169	2500	91.0	.038	.169	2000	69.6	.026	.169
10	**.394**	2900	113.7	.047	.177	2400	87.4	.039	.177	1900	66.1	.028	.177
12	**.472**	2400	94.1	.071	.236	2000	72.8	.055	.236	1600	55.7	.035	.236
	.500	2300	90.2	.075	.250	1900	69.2	.058	.250	1500	52.2	.038	.250
	.625	1800	70.6	.070	.293	1500	54.6	.055	.293	1200	41.8	.035	.293
16	**.630**	1800	70.6	.071	.295	1500	54.6	.055	.295	1200	41.8	.035	.295
	.750	1500	58.8	.068	.338	1300	43.7	.053	.338	990	34.5	.034	.338
20	**.787**	1400	54.9	.071	.354	1200	43.7	.055	.354	950	33.1	.035	.354
25	**.984**	1100	43.1	.094	.453	950	34.6	.071	.453	760	26.4	.047	.453
	1.000	1100	43.1	.096	.460	940	34.2	.072	.460	740	25.8	.048	.460
Depth of Cut													

High Speed Milling

(in)

Material		Carbon Steel, Alloy Steel, Gray Cast Iron				Pre-hardened Steel, Alloy Tool Steel				Hardened Steel (40—55HRC)			
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.375	5000	314.0	.023	.169	4200	231.8	.017	.169	3400	160.5	.014	.169
10	**.394**	4800	301.4	.024	.177	4000	220.8	.018	.177	3200	151.0	.014	.177
12	**.472**	4000	283.2	.035	.236	3300	207.2	.028	.236	2700	127.4	.018	.236
	.500	3700	262.0	.038	.250	3100	194.7	.029	.250	2500	118.0	.019	.250
	.625	3000	236.4	.035	.293	2500	177.0	.027	.293	2000	94.4	.018	.293
16	**.630**	3000	236.4	.035	.295	2500	177.0	.028	.295	2000	94.4	.018	.295
	.750	2500	197.0	.034	.338	2100	148.7	.026	.338	1700	93.8	.017	.338
20	**.787**	2400	189.1	.035	.354	2000	141.6	.028	.354	1600	88.3	.018	.354
25	**.984**	1900	149.7	.047	.453	1600	113.3	.035	.453	1300	71.8	.024	.453
	1.000	1900	149.7	.048	.460	1600	113.3	.036	.460	1300	71.8	.024	.460
Depth of Cut													

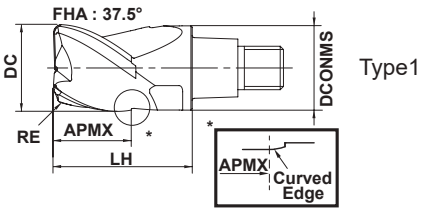
Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sound can occur.
In this case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For profile machining such as molds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece material.
Note 4) Air blow or oil mist is recommended for good chip evacuation.

iMX-C3A – Inch Sizes

Corner radius head, 3 flute, For aluminum alloys

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
							◎





Type1

RE				
±.0008"				
DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

● High efficiency machining due to the sharp cutting edge suitable for aluminum alloys machining and polished rake face.

(in)

Order Number	DC	RE	APMX	LH	DCONMS	Flutes	Grade ET2020	Type
IMX10C3A0375R015P	.375	.015	.300	.630	.363	3	●	1
IMX10C3A0375R030P	.375	.030	.300	.630	.363	3	●	1
IMX12C3A0500R015P	.500	.015	.400	.789	.488	3	●	1
IMX12C3A0500R030P	.500	.030	.400	.789	.488	3	●	1
IMX16C3A0625R030P	.625	.030	.500	.945	.605	3	●	1
IMX16C3A0625R060P	.625	.060	.500	.945	.605	3	●	1
IMX20C3A0750R030P	.750	.030	.600	1.181	.730	3	●	1
IMX20C3A0750R060P	.750	.060	.600	1.181	.730	3	●	1
IMX25C3A1000R060P	1.000	.060	.800	1.500	.980	3	●	1
IMX25C3A1000R125P	1.000	.125	.800	1.500	.980	3	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

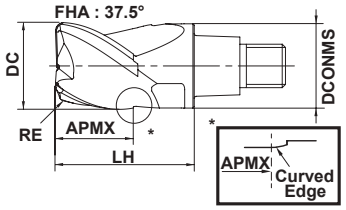
● :USA Stock

iMX-C3A

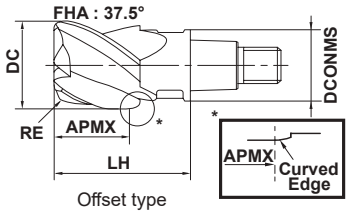
Corner radius head, 3 flute, For aluminum alloys

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
							◎





Type1



Type2

Offset type

RE				
±0.020				
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

● High efficiency machining due to the sharp cutting edge suitable for aluminum alloys machining and polished rake face.

(mm)

Order Number	DC	RE	APMX	LH	DCONMS	Flutes	Grade ET2020	Type
IMX10C3A100R10008	10	1	8	16	9.7	3	●	1
IMX10C3A100R25008	10	2.5	8	16	9.7	3	●	1
IMX10C3A120R10010	12	1	10.1	19	9.7	3	●	2
IMX12C3A120R10009	12	1	9.6	19	11.7	3	●	1
IMX12C3A120R32009	12	3.2	9.6	19	11.7	3	●	1
IMX12C3A140R10011	14	1	11.7	22.5	11.7	3	●	2
IMX16C3A160R10012	16	1	12.8	24	15.5	3	●	1
IMX16C3A160R32012	16	3.2	12.8	24	15.5	3	●	1
IMX16C3A180R32014	18	3.2	14.9	27	15.5	3	●	2
IMX20C3A200R10016	20	1	16	30	19.5	3	●	1
IMX20C3A200R32016	20	3.2	16	30	19.5	3	●	1
IMX20C3A220R32018	22	3.2	18.6	33	19.5	3	●	2
IMX25C3A250R10020	25	1	20	37.5	24.5	3	●	1
IMX25C3A250R32020	25	3.2	20	37.5	24.5	3	●	1
IMX25C3A250R50020	25	5	20	37.5	24.5	3	●	1
IMX25C3A280R32023	28	3.2	23.4	41.5	24.5	3	●	2

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

DC = Cutting Dia. **APMX** = Depth of Cut Max. **DCONMS** = Connection Dia.
RE = Corner Radius **LH** = Head Length

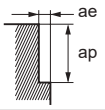
iMX-C3A

Corner radius head, 3 flute, For aluminum alloys

Recommended Cutting Conditions

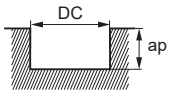
Shoulder Milling (L/D=3)

(in)

Material		Aluminum Alloys			
DC (mm)	DC (in)	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae
	.375	17000	234.6	.300	.113
10	.394	16000	220.8	.315	.118
12	.472	13000	179.4	.378	.142
	.500	13000	179.4	.400	.150
	.625	10000	180.0	.500	.188
16	.630	9900	178.2	.504	.189
	.750	8400	173.9	.600	.225
20	.787	8000	165.6	.630	.236
25	.984	6400	159.4	.787	.295
	1.000	6300	156.9	.800	.300
Depth of Cut					

Slot Milling (L/D=3)

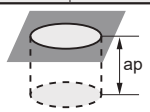
(in)

Material		Aluminum Alloys		
DC (mm)	DC (in)	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap
	.375	17000	137.7	.188
10	.394	16000	129.6	.197
12	.472	13000	109.2	.236
	.500	13000	109.2	.250
	.625	10000	111.0	.313
16	.630	9900	109.9	.315
	.750	8400	108.4	.375
20	.787	8000	103.2	.394
25	.984	6400	96.0	.492
	1.000	6300	94.5	.500
Depth of Cut				

DC=Dia.

Plunging (L/D=3)

(in)

Material		Aluminum Alloys			
DC (mm)	DC (in)	Revolution n (min^{-1})	Feed Rate vf (IPM)	Drilled Depth ap	Step ap2
	.375	10000	39.0	.188	.10
10	.394	9600	37.4	.197	.10
12	.472	8000	31.2	.236	.10
	.500	7500	29.3	.250	.10
	.625	6000	23.4	.313	.10
16	.630	6000	23.4	.315	.10
	.750	5000	19.5	.375	.10
20	.787	4800	18.7	.394	.10
25	.984	3800	14.8	.492	.10
	1.000	3800	14.8	.500	.10
Depth of Cut					

Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The use of water-soluble coolant is effective.
Note 3) For the feed rate information, the feed per revolution rate is listed.

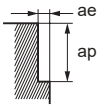
iMX-C3A

Corner radius head, 3 flute, For aluminum alloys, Offset type

Recommended Cutting Conditions

Shoulder Milling

(in)

Material			Aluminum Alloys			
L/D	DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
3	**12**	**.472**	13000	181.1	.378	.094
	14	**.551**	11000	153.5	.441	.110
	18	**.709**	8800	157.5	.567	.142
	22	**.866**	7200	149.6	.693	.173
	28	**1.102**	5700	141.7	.882	.220
5	**12**	**.472**	8000	86.6	.378	.039
	14	**.551**	6800	70.9	.441	.043
	18	**.709**	5300	74.8	.567	.055
	22	**.866**	4300	70.9	.693	.071
	28	**1.102**	3400	66.9	.882	.087
7	**12**	**.472**	5300	51.2	.378	.020
	14	**.551**	4500	43.3	.441	.024
	18	**.709**	3500	47.2	.567	.028
	22	**.866**	2900	39.4	.693	.035
	28	**1.102**	2300	39.4	.882	.043
Depth of Cut						

Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution, feed rate and depth of cut.

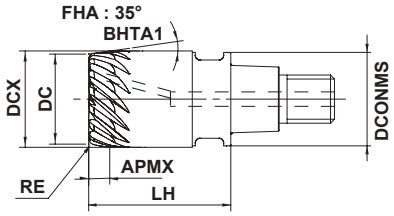
Note 2) The use of water-soluble coolant is effective.

iMX-C8T/C10T/C12T/C15T-E NEW

Corner radius, Taper head, Multi-flute, With 4 coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
				◎	◎		





Type1

RE				
±0.015				

- Suitable for 3-dimensional free-form surface machining such as blades.
- High feed cutting is possible due to multiple cutting edges taper geometry and through 4 coolant thru.

(mm)

Order Number	DC	RE	APMX	DCX	LH	DCONMS	BHTA1	Flutes	Grade EP7020	Type
IMX10C8T080R10T080E	8	1	7.12	10	13	9.7	8°	8	●	1
IMX12C10T100R10T080E	10	1	7.12	12	19	11.7	8°	10	●	1
IMX16C15T150R10T080E	15	1	3.56	16	21	15.5	8°	15	●	1
IMX20C15T190R10T080E	19	1	3.56	20	27	19.5	8°	15	●	1
IMX20C12T190R20T080E	19	2	3.56	20	27	19.5	8°	12	●	1

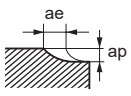
Note 1) The fastening size of the holder and head should be the same. (Refer to page 8)
Note 2) The end cutting edge coolant thru of the blade processing head will be changed from a center through type to a 4 hole type.

Recommended Cutting Conditions

Shoulder Milling (L/D=3)

Other than the L/D = 3, use the following recommended cutting conditions by multiplying the page 4 correction factor by overhang length.

(in)

Material			Austenitic stainless steel, Ferritic and martensitic stainless steel					Precipitation hardening stainless steel, Titanium alloys					Heat resistant alloys				
DC (mm)	DC (in)	No. of Flutes	Cutting Speed **vf** (SFM)	Revolution **n** (min^{-1})	Feed rate **vf** (IPM)	Depth of cut **ap**	Width of Cut **ae**	Cutting Speed **vf** (SFM)	Revolution **n** (min^{-1})	Feed rate **vf** (IPM)	Depth of cut **ap**	Width of Cut **ae**	Cutting Speed **vf** (SFM)	Revolution **n** (min^{-1})	Feed rate **vf** (IPM)	Depth of cut **ap**	Width of Cut **ae**
8	**.315**	**8**	985	12000	378	.012	.047	655	12000	252	.012	.047	195	12000	59	.012	.031
10	**.394**	**10**	985	9500	374	.012	.059	655	9500	252	.012	.059	195	9500	59	.012	.039
15	**.591**	**15**	985	6400	378	.012	.087	655	6400	248	.012	.087	195	6400	63	.012	.059
19	**.748**	**12**	985	5000	283	.012	.110	655	5000	193	.012	.110	195	5000	47	.012	.075
19	**.748**	**15**	985	5000	295	.012	.110	655	5000	201	.012	.110	195	5000	47	.012	.075
Depth of Cut																	

Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The use of water-soluble coolant is effective.

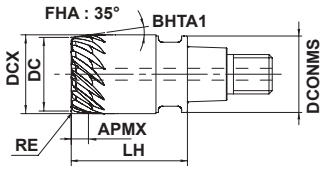
● :USA Stock

iMX-C8T/C10T/C12T/C15T-C

Corner radius, Taper head, Multi-flute, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
				◎	◎		





Type1

RE ≤2				
±0.015				

- Suitable for 3-dimensional free-form surface machining such as blades.
- High feed cutting is possible due to multiple cutting edges.

(mm)

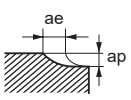
Order Number	DC	RE	APMX	DCX	LH	DCON MS	BHTA	Flutes	Grade EP7020	Type
IMX10C8T080R05T080C	8	0.5	7.12	10	16	9.7	8°	8	●	1
IMX10C8T080R10T080C	8	1	7.12	10	16	9.7	8°	8	●	1
IMX12C10T100R05T080C	10	0.5	7.12	12	19	11.7	8°	10	●	1
IMX12C10T100R10T080C	10	1	7.12	12	19	11.7	8°	10	●	1
IMX16C15T150R05T080C	15	0.5	3.56	16	24	15.5	8°	15	●	1
IMX16C15T150R10T080C	15	1	3.56	16	24	15.5	8°	15	●	1
IMX16C12T150R20T080C	15	2	3.56	16	24	15.5	8°	12	●	1
IMX20C15T190R05T080C	19	0.5	3.56	20	30	19.5	8°	15	●	1
IMX20C15T190R10T080C	19	1	3.56	20	30	19.5	8°	15	●	1
IMX20C12T190R20T080C	19	2	3.56	20	30	19.5	8°	12	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)
Note 2) The end cutting edge coolant thru of the blade processing head will be changed from a center through type to a 4 hole type.

Recommended Cutting Conditions

Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the page 4 correction factor by overhang length. (in)

Material		Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel				Precipitation Hardening Stainless Steel, Titanium Alloys				Heat Resistant Alloys			
DC (mm)	Flutes	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae
8	**8**	12000	378.0	.012	.047	8000	252.0	.012	.047	2400	59.1	.012	.031
10	**10**	9500	374.0	.012	.059	6400	252.0	.012	.059	1900	59.1	.012	.039
15	**12**	6400	362.2	.012	.087	4200	236.2	.012	.087	1300	63.0	.012	.059
15	**15**	6400	378.0	.012	.087	4200	248.0	.012	.087	1300	63.0	.012	.059
19	**12**	5000	283.5	.012	.110	3400	192.9	.012	.110	1000	47.2	.012	.075
19	**15**	5000	295.3	.012	.110	3400	200.8	.012	.110	1000	47.2	.012	.075
Depth of Cut													

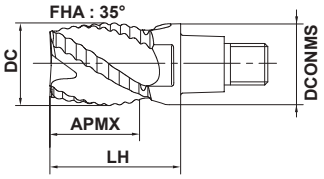
Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The use of water-soluble coolant is effective.

iMX-R4F – Inch Sizes

Roughing head, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

● The roughing edge geometry reduces cutting resistance.
Effective when rigidity of the machine or workpiece is low.

(in)

Order Number	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10R4F0375M	.375	.395	.630	.363	4	●	1
IMX12R4F0500M	.500	.520	.789	.488	4	●	1
IMX16R4F0625M	.625	.645	.945	.605	4	●	1
IMX20R4F0750M	.750	.800	1.181	.730	4	●	1
IMX25R4F1000M	1.000	1.050	1.500	.980	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

iMX-R4F

Roughing head, 4 flute

(mm)

Order Number	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10R4F10010	10	10.5	16	9.7	4	●	1
IMX12R4F12012	12	12.5	19	11.7	4	●	1
IMX16R4F16016	16	16.5	24	15.5	4	●	1
IMX20R4F20021	20	21	30	19.5	4	●	1
IMX25R4F25026	25	26	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

DC = Cutting Dia. **LH** = Head Length
APMX = Depth of Cut Max. **DCONMS** = Connection Dia.

● :USA Stock

iMX-R4F

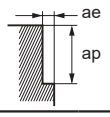
Roughing head, 4 flute

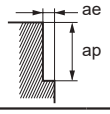
Recommended Cutting Conditions

Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the page 4 correction factor by overhang length.

(in)

Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(in)												
	.375	5000	36.0	.300	.015	4000	19.2	.300	.150	3400	20.4	.300	.150
10	**.394**	4800	34.6	.320	.160	3800	18.2	.320	.160	3200	19.2	.320	.160
12	**.472**	4000	28.8	.380	.190	3200	16.6	.380	.190	2700	17.3	.380	.190
	.500	3700	26.6	.400	.200	3000	15.6	.400	.200	2500	16.0	.400	.200
	.625	3000	24.0	.500	.250	2400	14.4	.500	.250	2000	14.4	.500	.250
16	**.630**	3000	24.0	.500	.250	2400	14.4	.500	.250	2000	14.4	.500	.250
	.750	2500	20.0	.600	.300	2000	12.0	.600	.300	1700	12.2	.600	.300
20	**.787**	2400	19.2	.630	.320	1900	11.4	.630	.320	1600	11.5	.630	.320
25	**.984**	1900	18.2	.790	.390	1500	9.0	.790	.390	1300	9.4	.790	.390
	1.000	1900	18.2	.800	.400	1500	9.0	.800	.400	1300	9.4	.800	.400
Depth of Cut													

Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys				Heat Resistant Alloys Inconel718			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(in)								
	.375	2500	12.0	.300	.150	1300	8.3	.300	.038
10	**.394**	2400	11.5	.320	.160	1300	8.3	.320	.039
12	**.472**	2000	10.4	.380	.190	1100	7.9	.380	.047
	.500	1900	9.9	.400	.200	990	7.1	.400	.050
	.625	1500	9.0	.500	.250	790	6.3	.500	.063
16	**.630**	1500	9.0	.500	.250	790	6.3	.500	.063
	.750	1200	7.2	.600	.300	660	5.3	.600	.075
20	**.787**	1200	7.2	.630	.320	630	5.0	.630	.079
25	**.984**	950	5.7	.790	.390	500	4.0	.790	.098
	1.000	940	5.6	.800	.400	500	4.0	.800	.100
Depth of Cut									

Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

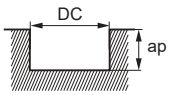
iMX-R4F

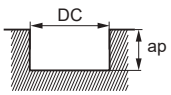
Roughing head, 4 flute

Recommended Cutting Conditions

Slot Milling

(in)

Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloys			Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel			Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloys		
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**
	.375	3400	21.4	.190	2600	12.5	.190	2000	6.4	.150
10	**.394**	3200	20.5	.200	2500	12.0	.200	1900	6.1	.160
12	**.472**	2700	19.4	.240	2100	10.9	.240	1600	6.4	.190
	.500	2500	18.0	.250	2000	10.4	.250	1500	6.0	.200
	.625	2000	16.0	.310	1600	9.6	.310	1200	5.8	.250
16	**.630**	2000	16.0	.320	1600	9.6	.320	1200	5.8	.250
	.750	1700	13.6	.380	1300	7.8	.380	990	5.1	.300
20	**.787**	1600	12.8	.390	1300	7.8	.390	950	4.9	.320
25	**.984**	1300	12.5	.470	1000	6.0	.470	760	4.0	.390
	1.000	1300	12.5	.480	990	5.9	.480	740	3.8	.400
Depth of Cut		 DC=Dia.								

Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys		
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**
	.375	1300	3.1	.150
10	**.394**	1300	3.1	.160
12	**.472**	1100	3.5	.190
	.500	990	3.2	.200
	.625	790	2.8	.250
16	**.630**	790	2.8	.250
	.750	660	2.9	.300
20	**.787**	630	2.8	.320
25	**.984**	500	2.2	.390
	1.000	500	2.2	.400
Depth of Cut		 DC=Dia.		

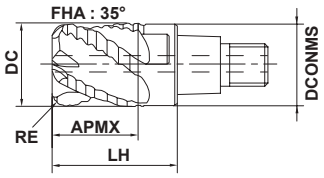
Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

iMX-RC4F-C

Roughing head, 4 flute, with coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎				◎	◎		





Type1

- The roughing edge geometry reduces cutting resistance. Effective when the rigidity of the machine or workpiece is low.
- Center through coolant thru provides excellent chip evacuation.

(mm)

Order Number	DC	RE	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10RC4F100R05010C	10	0.5	10.5	16	9.7	4	●	1
IMX10RC4F100R10010C	10	1	10.5	16	9.7	4	●	1
IMX12RC4F120R05012C	12	0.5	12.5	19	11.7	4	●	1
IMX12RC4F120R10012C	12	1	12.5	19	11.7	4	●	1
IMX12RC4F120R15012C	12	1.5	12.5	19	11.7	4	●	1
IMX12RC4F120R20012C	12	2	12.5	19	11.7	4	●	1
IMX16RC4F160R05016C	16	0.5	16.5	24	15.5	4	●	1
IMX16RC4F160R10016C	16	1	16.5	24	15.5	4	●	1
IMX16RC4F160R15016C	16	1.5	16.5	24	15.5	4	●	1
IMX16RC4F160R20016C	16	2	16.5	24	15.5	4	●	1
IMX16RC4F160R30016C	16	3	16.5	24	15.5	4	●	1
IMX20RC4F200R05021C	20	0.5	21	30	19.5	4	●	1
IMX20RC4F200R10021C	20	1	21	30	19.5	4	●	1
IMX20RC4F200R20021C	20	2	21	30	19.5	4	●	1
IMX20RC4F200R30021C	20	3	21	30	19.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

RE = Corner Radius **APMX** = Depth of Cut Max. **DCONMS** = Connection Dia.
DC = Cutting Dia. **LH** = Head Length

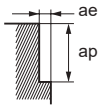
iMX-RC4F-C

Roughing head, 4 flute, with coolant thru

Recommended Cutting Conditions

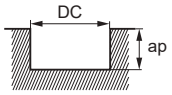
Shoulder Milling

(in)

Material		Carbon Steel, Alloy Steel, Mild Steel				Titanium Alloys, Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel				Precipitation Hardening Stainless Steel			
DC (mm)	DC (in)	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae
10	**.394**	4800	33.9	.315	.157	2000	12.6	.315	.157	1900	9.1	.315	.157
12	**.472**	4000	31.5	.378	.189	1900	13.4	.378	.189	1600	9.1	.378	.189
16	**.630**	3000	23.6	.504	.252	1400	11.0	.504	.252	1200	7.9	.504	.252
20	**.787**	2400	20.9	.630	.315	1100	8.7	.630	.315	950	7.1	.630	.315
Depth of Cut													

Slot Milling

(in)

Material		Carbon Steel, Alloy Steel, Mild Steel			Titanium Alloys, Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel			Precipitation Hardening Stainless Steel		
DC (mm)	DC (in)	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of Cut ap
10	**.394**	3200	20.1	.197	1900	9.1	.197	1300	3.9	.197
12	**.472**	2700	19.3	.236	1600	10.2	.236	1100	4.3	.236
16	**.630**	2000	15.7	.315	1200	8.7	.315	800	3.8	.315
20	**.787**	1600	13.8	.394	950	6.7	.394	640	3.5	.394
Depth of Cut		 DC=Dia.								

Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel and titanium alloys, the use of water-soluble coolant is effective.

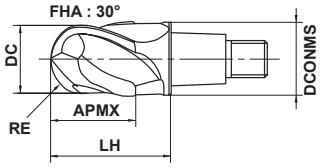
● :USA Stock

iMX-B2S

Ball nose head, 2 flute, For hardened steel

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
			◎				





Type1

RE				
±0.020				

●Ideal for machining applications with long overhangs.

(mm)

Order Number	RE	DC	APMX	LH	DCONMS	Flutes	Grade EP8110	Type
IMX16B2S16016	8	16	16	24	15.5	2	●	1
IMX20B2S20020	10	20	20	30	19.5	2	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

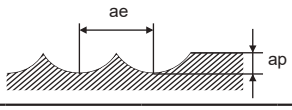
RE = Ball Nose **APMX** = Depth of Cut Max. **DCONMS** = Connection Dia.
DC = Cutting Dia. **LH** = Head Length

Recommended Cutting Conditions

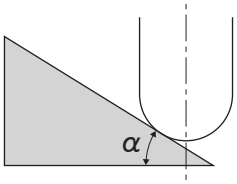
Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the page 4 correction factor by overhang length.

(in)

Material	Hardened Steel (55–65HRC)					
Inclination Angle	α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
DC (mm) / (in) — **RE** (mm) / (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)		
16 **.630** — **8** **.315**	6000	66.9	3000	18.9	.012	.063
20 **.787** — **10** **.394**	4800	51.2	2400	15.0	.012	.079
Depth of Cut						

Note 1) The revolution and feed rate can be increased at smaller depth of cut.
Note 2) α is the inclination angle of the machined surface.

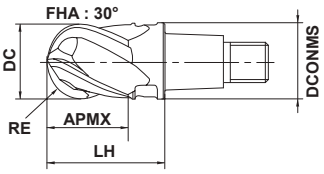


iMX-B4S

Ball nose head, 4 flute, For hardened steel

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
			◎				





Type1

RE				
±0.020				

●High efficiency machining is realized even when only using the very end of the ball nose.

(mm)

Order Number	RE	DC	APMX	LH	DCONMS	Flutes	Grade EP8110	Type
IMX16B4S16016	8	16	16	24	15.5	4	●	1
IMX20B4S20020	10	20	20	30	19.5	4	●	1

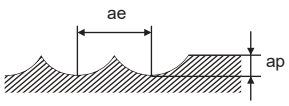
Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

Recommended Cutting Conditions

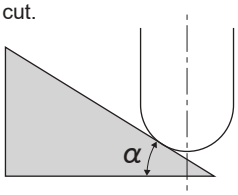
Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the page 4 correction factor by overhang length.

(in)

Material	Hardened Steel (55–65HRC)					
Inclination Angle	α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
DC (mm) / **DC** (in) / **RE** (mm) / **RE** (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)		
16 / **.630** / **8** / **.315**	6000	66.9	3000	28.3	.012	.063
20 / **.787** / **10** / **.394**	4800	51.2	2400	22.8	.012	.079
Depth of Cut						

Note 1) The revolution and feed rate can be increased at smaller depth of cut.
Note 2) α is the inclination angle of the machined surface.



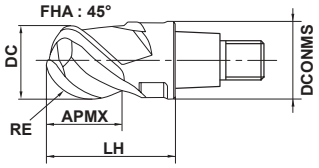
● :USA Stock

iMX-B3FV

Ball nose head, 3 flute, Irregular pitch flutes, For high efficiency machining

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
	◎	◎					





Type1

RE≤6	RE>6			
±0.010	±0.020			

- High efficiency machining is possible in deep applications.(DCx5)
- High wear resistance and good chip evacuation is achieved when rough machining.
- High vibration control enables high efficiency machining.

(mm)

Order Number	RE	DC	APMX	LH	DCONMS	Flutes	Grade EP8120	Type
IMX10B3FV10008	5	10	8	16	9.7	3	●	1
IMX12B3FV12009	6	12	9.6	19	11.7	3	●	1
IMX16B3FV16012	8	16	12.8	24	15.5	3	●	1
IMX20B3FV20016	10	20	16	30	19.5	3	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

RE = Ball Nose
DC = Cutting Dia.
APMX = Depth of Cut Max.
LH = Head Length
DCONMS = Connection Dia.

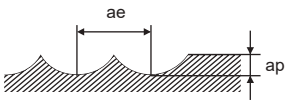
iMX-B3FV

Ball nose head, 3 flute, Irregular pitch flutes, For high efficiency machining

Recommended Cutting Conditions

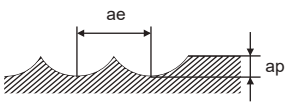
Shoulder Milling (L/D=5)

(in)

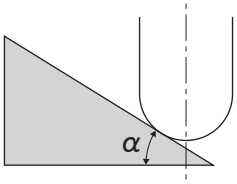
Material				Pre-hardened Steel, Alloy Tool Steel						Hardened Steel (40–55HRC)					
Inclination Angle				α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**	α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
DC		RE		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)			Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)		
(mm)	(in)	(mm)	(in)												
10	**.394**	**5**	**.197**	5600	145.7	3700	66.9	.028	.102	4800	102.4	3200	47.2	.020	.079
12	**.472**	**6**	**.236**	4600	118.1	3100	55.1	.039	.126	4000	86.6	2700	38.2	.028	.098
16	**.630**	**8**	**.315**	3500	90.6	2300	39.4	.043	.150	3000	63.0	2000	28.3	.035	.138
20	**.787**	**10**	**.394**	2800	70.9	1800	31.9	.047	.189	2400	51.2	1600	22.8	.043	.165
Depth of Cut															

Shoulder Milling (L/D=7)

(in)

Material				Pre-hardened Steel, Alloy Tool Steel						Hardened Steel (40–55HRC)					
Inclination Angle				α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**	α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
DC		RE		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)			Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)		
(mm)	(in)	(mm)	(in)												
10	**.394**	**5**	**.197**	3800	90.6	2500	38.6	.020	.051	3200	47.2	2100	21.3	.016	.039
12	**.472**	**6**	**.236**	3200	74.8	2100	32.3	.028	.063	2700	43.3	1700	16.9	.024	.051
16	**.630**	**8**	**.315**	2400	55.1	1600	24.4	.031	.075	2000	30.7	1300	13.0	.028	.071
20	**.787**	**10**	**.394**	1900	43.3	1300	20.1	.035	.094	1600	24.4	1000	10.2	.031	.083
Depth of Cut															

Note 1) The irregular pitch flutes end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) α is the inclination angle of the machined surface.



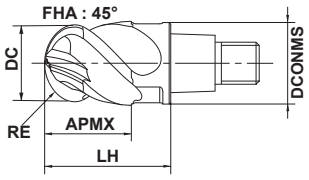
● :USA Stock

iMX-B4HV – Inch Sizes

Ball nose head, 4 flute, Irregular pitch flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

RE≤.250"	RE>.250"			
±.0004"	±.0008"			
DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

● Irregular pitch flutes cutting edge controls vibration and achieves stable machining.

(in)

Order Number	RE	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10B4HV0375M	.1875	.375	.395	.630	.363	4	●	1
IMX12B4HV0500M	.2500	.500	.520	.789	.488	4	●	1
IMX16B4HV0625M	.3125	.625	.645	.945	.605	4	●	1
IMX20B4HV0750M	.3750	.750	.800	1.181	.730	4	●	1
IMX25B4HV1000M	.5000	1.000	1.050	1.500	.980	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

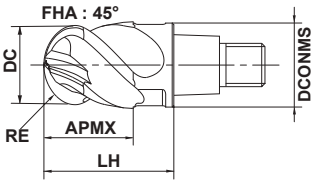
RE = Ball Nose
DC = Cutting Dia.
APMX = Depth of Cut Max.
LH = Head Length
DCONMS = Connection Dia.

iMX-B4HV

Ball nose head, 4 flute, Irregular pitch flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

RE≤6	RE>6			
±0.010	±0.020			
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

●Irregular pitch flutes cutting edge controls vibration and achieves stable machining.

(mm)

Order Number	RE	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10B4HV10010	5	10	10.5	16	9.7	4	●	1
IMX12B4HV12012	6	12	12.5	19	11.7	4	●	1
IMX16B4HV16016	8	16	16.5	24	15.5	4	●	1
IMX20B4HV20021	10	20	21	30	19.5	4	●	1
IMX25B4HV25026	12.5	25	26	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

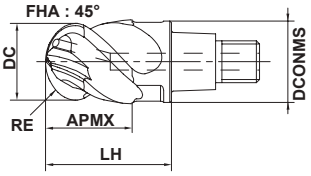
● :USA Stock

iMX-B4HV-E – Inch Sizes

Ball nose head, 4 flute, Irregular pitch flutes, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

RE≤.250"	RE>.250"			
±.0004"	±.0008"			
DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- Coolant thru for each cutting edge provide a stable coolant supply.
- The variable pitch flutes cutting edge controls vibration and achieves stable machining of difficult-to-cut materials and for long overhang applications.

(in)

Order Number	RE	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10B4HV0375ME	.1875	.375	.395	.630	.363	4	●	1
IMX12B4HV0500ME	.2500	.500	.520	.789	.488	4	●	1
IMX16B4HV0625ME	.3125	.625	.645	.945	.605	4	●	1
IMX20B4HV0750ME	.3750	.750	.800	1.181	.730	4	●	1
IMX25B4HV1000ME	.5000	1.000	1.050	1.500	.980	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

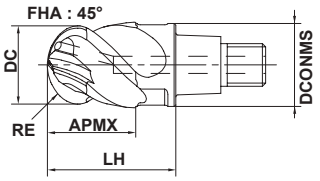
RE = Ball Nose
DC = Cutting Dia.
APMX = Depth of Cut Max.
LH = Head Length
DCONMS = Connection Dia.

iMX-B4HV-E

Ball nose head with coolant thru, 4 flute, Irregular pitch flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

RE≤6	RE>6			
±0.010	±0.020			
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Coolant thru for each cutting edge provide a stable coolant supply.
- The variable pitch flutes cutting edge controls vibration and achieves stable machining of difficult-to-cut materials and for long overhang applications.

(mm)

Order Number	RE	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10B4HV10010E	5	10	10.5	16	9.7	4	●	1
IMX12B4HV12012E	6	12	12.5	19	11.7	4	●	1
IMX16B4HV16016E	8	16	16.5	24	15.5	4	●	1
IMX20B4HV20021E	10	20	21	30	19.5	4	●	1
IMX25B4HV25026E	12.5	25	26	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

RE = Ball Nose
DC = Cutting Dia.
APMX = Depth of Cut Max.
LH = Head Length
DCONMS = Connection Dia.

● **:USA Stock**

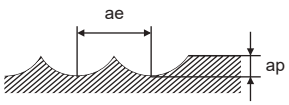
iMX-B4HV/iMX-B4HV-E

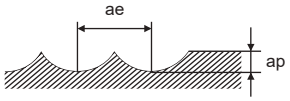
Ball nose head, 4 flute, Irregular pitch flutes (With/Without coolant thru)

Recommended Cutting Conditions

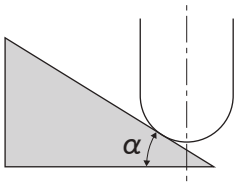
Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the page 4 correction factor by overhang length. (in)

Material		Carbon Steel, Alloy Steel, Mild Steel, Pre-hardened Steel, Copper, Copper Alloys						Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Cobalt Chromium Alloys, Titanium Alloys					
Inclination Angle		α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**	α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
RE		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)			Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)		
(mm)	(in)												
	.188	10000	168.0	6700	75.0	.038	.100	7500	123.0	5000	52.0	.038	.100
5	**.197**	9500	157.5	6400	71.7	.039	.100	7200	118.1	4800	49.9	.039	.100
6	**.236**	8000	156.8	5300	70.0	.047	.120	6000	117.6	4000	49.6	.047	.120
	.250	7500	147.0	5000	66.0	.050	.120	5700	111.7	3700	45.9	.050	.120
	.313	6000	127.2	4000	56.0	.063	.160	4500	99.0	3000	42.0	.063	.160
8	**.315**	6000	127.2	4000	56.0	.063	.160	4500	99.0	3000	42.0	.063	.160
	.375	5000	122.0	3300	51.5	.075	.190	3800	95.8	2500	41.0	.075	.190
10	**.394**	4800	117.1	3200	49.9	.079	.200	3600	90.7	2400	39.4	.079	.200
12.5	**.492**	3800	95.8	2500	39.0	.098	.240	2900	73.1	1900	31.2	.098	.240
	.500	3800	95.8	2500	39.0	.100	.240	2800	70.6	1900	31.2	.100	.240
Depth of Cut													

Material		Heat Resistant Alloys Inconel718					
Inclination Angle		α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
RE		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)		
(mm)	(in)						
	.188	2000	17.6	1300	7.3	.019	.038
5	**.197**	1900	16.7	1300	7.3	.020	.039
6	**.236**	1600	14.1	1100	6.2	.024	.047
	.250	1500	13.2	990	5.5	.025	.050
	.313	1200	11.5	790	5.1	.031	.063
8	**.315**	1200	11.5	790	5.1	.031	.063
	.375	990	9.5	660	4.2	.038	.075
10	**.394**	950	9.1	630	4.0	.039	.079
12.5	**.492**	760	7.3	500	3.2	.047	.100
	.500	740	7.1	500	3.2	.048	.100
Depth of Cut							

Note 1) The irregular pitch flutes end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.
Note 4) α is the inclination angle of the machined surface.

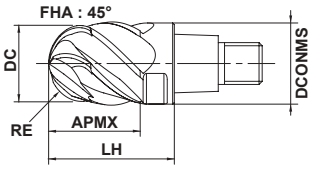


iMX-B6HV – Inch Sizes

Ball nose head, 6 flute, Irregular pitch flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎		





Type1

RE≤.250"	RE>.250"			
±.0004"	±.0008"			
DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- The irregular pitch flutes controls vibration and achieves stable machining of difficult-to-cut materials and for long overhang applications.
- 6 flutes enable high machining efficiency.

(in)

Order Number	RE	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10B6HV0375M	.1875	.375	.395	.630	.363	6	●	1
IMX12B6HV0500M	.2500	.500	.520	.789	.488	6	●	1
IMX16B6HV0625M	.3125	.625	.645	.945	.605	6	●	1
IMX20B6HV0750M	.3750	.750	.800	1.181	.730	6	●	1
IMX25B6HV1000M	.5000	1.000	1.050	1.500	.980	6	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

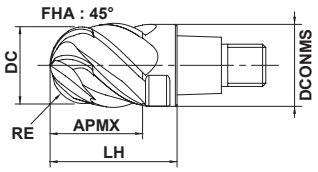
● :USA Stock

iMX-B6HV

Ball nose head, 6 flute, Irregular pitch flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎		





Type1

RE≤6	RE>6			
±0.010	±0.020			

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- The irregular pitch flutes controls vibration and achieves stable machining of difficult-to-cut materials and for long overhang applications.
- 6 flutes enable high machining efficiency.

(mm)

Order Number	RE	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10B6HV10010	5	10	10.5	16	9.7	6	●	1
IMX12B6HV12012	6	12	12.5	19	11.7	6	●	1
IMX16B6HV16016	8	16	16.5	24	15.5	6	●	1
IMX20B6HV20021	10	20	21	30	19.5	6	●	1
IMX25B6HV25026	12.5	25	26	37.5	24.5	6	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

RE = Ball Nose
DC = Cutting Dia.
APMX = Depth of Cut Max.
LH = Head Length
DCONMS = Connection Dia.

iMX-B6HV

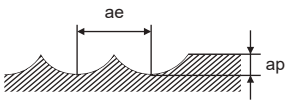
Ball nose head, 6 flute, Irregular pitch flutes

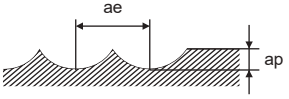
Recommended Cutting Conditions

Shoulder Milling (L/D=3)

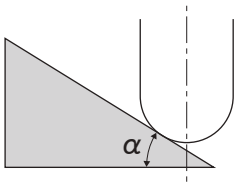
Other than the L/D = 3, use following recommended cutting conditions by multiplying the page 4 correction factor by overhang length.

(in)

Material	Carbon Steel, Alloy Steel, Mild Steel, Pre-hardened Steel						Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Cobalt Chromium Alloys, Titanium Alloys					
Inclination Angle	α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**	α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
RE (mm)	RE (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)			Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)		
	.188	10000	252.0	6700	112.6	.019	.075	7500	184.5	5000	78.0	.019	.075
5	**.197**	9500	236.2	6400	107.5	.020	.079	7200	177.1	4800	74.9	.020	.079
6	**.236**	8000	235.2	5300	104.9	.024	.094	6000	176.4	4000	74.4	.024	.094
	.250	7500	220.5	5000	99.0	.025	.100	5700	167.6	3700	68.8	.025	.100
	.313	6000	190.8	4000	84.0	.031	.125	4500	148.5	3000	63.0	.031	.125
8	**.315**	6000	190.8	4000	84.0	.031	.126	4500	148.5	3000	63.0	.031	.126
	.375	5000	183.0	3300	77.2	.038	.150	3800	143.6	2500	61.5	.038	.150
10	**.394**	4800	175.7	3200	74.9	.039	.157	3600	136.1	2400	59.0	.039	.157
12.5	**.492**	3800	143.6	2500	58.5	.047	.197	2900	109.6	1900	46.7	.047	.197
	.500	3800	143.6	2500	58.5	.048	.200	2800	105.8	1900	46.7	.048	.200
Depth of Cut													

Material	Heat Resistant Alloys Inconel718					
Inclination Angle	α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
RE (mm)	RE (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)		
	.188	2000	26.4	1300	10.9	.019	.038
5	**.197**	1900	25.1	1300	10.9	.020	.039
6	**.236**	1600	21.1	1100	9.2	.024	.047
	.250	1500	19.8	990	8.3	.025	.050
	.313	1200	17.3	790	7.6	.031	.063
8	**.315**	1200	17.3	790	7.6	.031	.063
	.375	990	14.3	660	6.3	.038	.075
10	**.394**	950	13.7	630	6.0	.039	.079
12.5	**.492**	760	10.9	500	4.8	.047	.098
	.500	740	10.7	500	4.8	.048	.100
Depth of Cut							

Note 1) The irregular pitch flutes end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.
Note 4) α is the inclination angle of the machined surface.



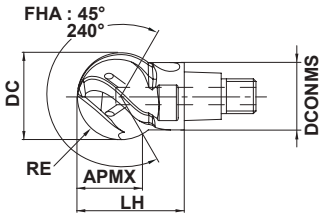
● :USA Stock

iMX-B4WH-S – Inch Sizes

Lollipop head, 4 flute, with coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

RE				
±.0006"				

- Optimal choice for machining undercut and complex shapes when using a 5-axis machine.
- A stable supply of coolant is maintained even when machining complex component geometries.

(in)

Order Number	RE	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10B4WH0500MS	.2500	.500	.375	.693	.382	4	●	1
IMX12B4WH0625MS	.3125	.625	.469	.799	.488	4	●	1
IMX16B4WH0750MS	.3750	.750	.563	.925	.606	4	●	1

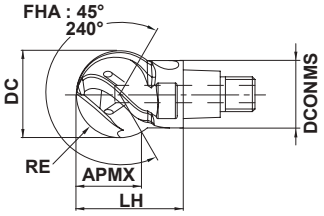
Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

RE = Ball Nose
DC = Cutting Dia.
APMX = Depth of Cut Max.
LH = Head Length
DCONMS = Connection Dia.

iMX-B4WH-S

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○			◎	◎	○	





Type1

RE				
±0.015				

●Optimal choice for machining undercut and complex shapes when using a 5-axis machine.
●A stable supply of coolant is maintained even when machining complex component geometries.

(mm)

Order Number	RE	DC	APMX	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10B4WH12008S	6	12	9	16.5	9.7	4	●	1
IMX12B4WH16008S	8	16	12	20.9	11.7	4	●	1
IMX16B4WH20008S	10	20	15	24.7	15.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

RE = Ball Nose
DC = Cutting Dia.
APMX = Depth of Cut Max.
LH = Head Length
DCONMS = Connection Dia.

● **:USA Stock**

iMX-B4WH-S

Lollipop head, 4 flute, with coolant thru

Recommended Cutting Conditions

Internal Profile Milling, Undercut Machining (L/D=3)

(in)

Material				Mild Steel, Carbon Steel, Alloy Steel, Pre-hardened Steel, Copper Alloys			Austenitic, Ferritic and Martensitic Steel, Precipitation Hardening Stainless Steel, Cobalt Chrome Alloys, Titanium Alloys			Heat Resistant Alloys		
DC		RE		Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of cut ae	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of cut ae	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of cut ae
(mm)	(in)	(mm)	(in)									
12	**.472**	**6**	**.236**	2700	38.2	.018	2100	24.8	.018	800	5.1	.014
	.500		**.250**	2500	35.4	.019	2000	23.6	.019	750	4.7	.015
	.625		**.313**	2000	31.5	.024	1600	20.1	.024	600	4.3	.019
16	**.630**	**8**	**.315**	2000	31.5	.024	1600	20.1	.024	600	4.3	.019
	.750		**.375**	1700	26.8	.028	1300	18.5	.028	500	3.9	.022
20	**.787**	**10**	**.394**	1600	25.2	.030	1300	18.5	.030	480	3.8	.024

Internal Profile Milling, Undercut Machining (L/D=5)

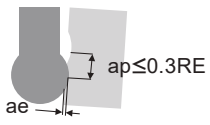
(in)

Material				Mild Steel, Carbon Steel, Alloy Steel, Pre-hardened Steel, Copper Alloys			Austenitic, Ferritic and Martensitic Steel, Precipitation Hardening Stainless Steel, Cobalt Chrome Alloys, Titanium Alloys			Heat Resistant Alloys		
DC		RE		Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of cut ae	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of cut ae	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of cut ae
(mm)	(in)	(mm)	(in)									
12	**.472**	**6**	**.236**	1900	20.9	.012	1300	10.2	.012	530	2.5	.009
	.500		**.250**	1800	19.7	.013	1300	10.2	.013	500	2.4	.010
	.625		**.313**	1400	17.7	.016	1000	9.4	.016	400	2.5	.013
16	**.630**	**8**	**.315**	1400	17.7	.016	990	9.4	.016	400	2.5	.013
	.750		**.375**	1200	15.0	.019	840	9.4	.019	330	2.1	.015
20	**.787**	**10**	**.394**	1100	13.8	.020	800	8.7	.020	320	2.0	.016

Internal Profile Milling, Undercut Machining (L/D=7)

(in)

Material				Mild Steel, Carbon Steel, Alloy Steel, Pre-hardened Steel, Copper Alloys			Austenitic, Ferritic and Martensitic Steel, Precipitation Hardening Stainless Steel, Cobalt Chrome Alloys, Titanium Alloys		
DC		RE		Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of cut ae	Revolution n (min^{-1})	Feed Rate vf (IPM)	Depth of cut ae
(mm)	(in)	(mm)	(in)						
12	**.472**	**6**	**.236**	1300	6.3	.006	800	3.1	.006
	.500		**.250**	1300	6.3	.006	750	3.5	.006
	.625		**.313**	1000	5.5	.008	600	3.3	.008
16	**.630**	**8**	**.315**	990	5.5	.008	600	2.8	.008
	.750		**.375**	840	5.1	.009	500	2.8	.009
20	**.787**	**10**	**.394**	800	5.1	.010	480	2.6	.010



Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution, feed rate and depth of cut.
Note 2) The revolution and feed rate can be increased at smaller depth of cut.
Note 3) In case of L/D >5, it is recommended to use a taper neck type holder.
Note 4) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

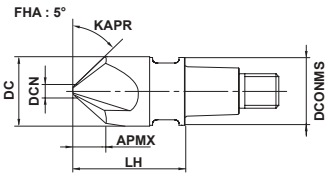
iMX-CH3L – Inch Sizes

Chamfer head, 3 flute

UWC

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○	○		◎	◎		





Type1

DCN				
±0.0008"				

- Chamfer cutting head geometry suitable for inner and outer circumferences.
- Anti-vibration design.

(in)

Order Number	DC	APMX	KAPR	DCN	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10CH3L0375A45	.375	.157	45°	.060	.630	.363	3	●	1
IMX12CH3L0500A45	.500	.220	45°	.060	.789	.488	3	●	1
IMX16CH3L0625A45	.625	.283	45°	.060	.945	.605	3	●	1
IMX20CH3L0750A45	.750	.345	45°	.060	1.181	.730	3	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

iMX-CH3L

Chamfer head, 3 flute

UWC

DCN				
±0.020				

- Chamfer cutting head geometry suitable for inner and outer circumferences.
- Anti-vibration design.

(mm)

Order Number	DC	APMX	KAPR	DCN	LH	DCONMS	Flutes	Grade EP7020	Type
IMX10CH3L100A45	10	4.2	45°	1.5	16	9.7	3	●	1
IMX12CH3L120A45	12	5.2	45°	1.5	19	11.7	3	●	1
IMX16CH3L160A45	16	7.2	45°	1.5	24	15.5	3	●	1
IMX20CH3L200A45	20	9.2	45°	1.5	30	19.5	3	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

DC = Cutting Dia. **KAPR** = Tool Cutting Edge Angle **LH** = Head Lengh
APMX = Depth of Cut Max. **DCN** = Cutting Dia. Min. **DCONMS** = Connection Dia.

● :USA Stock

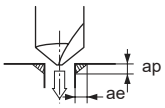
iMX-CH3L

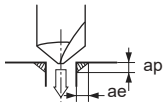
Chamfer head, 3 flute

Recommended Cutting Conditions

Chamfer Milling (Hole Circumference)

(in)

Material		Carbon Steel, Alloy Steel, Gray Cast Iron				Alloy Tool Steel, Carbon Steel, Alloy Steel, Pre-hardened Steel				Austenitic Stainless Steel, Titanium Alloys			
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.375	1300	6.2	.071	.071	1300	4.7	.071	.071	1000	3.6	.071	.071
10	**.394**	1300	6.2	.071	.071	1300	4.7	.071	.071	970	3.5	.071	.071
12	**.472**	1100	5.3	.085	.085	1100	4.0	.085	.085	810	2.9	.085	.085
	.500	990	4.8	.085	.085	990	3.6	.085	.085	760	2.7	.085	.085
	.625	790	3.8	.094	.094	790	2.8	.094	.094	610	2.2	.094	.094
16	**.630**	790	3.8	.094	.094	790	2.8	.094	.094	610	2.2	.094	.094
	.750	660	3.2	.102	.102	660	2.4	.102	.102	510	1.8	.102	.102
20	**.787**	630	3.0	.102	.102	630	2.3	.102	.102	490	1.8	.102	.102
Depth of Cut													

Material		Hardenned Steel (40-55HRC)				Heat Resistant Alloys Inconel718			
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.375	1000	2.4	.071	.071	1000	4.8	.071	.071
10	**.394**	970	2.3	.071	.071	970	4.7	.071	.071
12	**.472**	810	1.9	.085	.085	810	3.9	.085	.085
	.500	760	1.8	.085	.085	760	3.6	.085	.085
	.625	610	1.5	.094	.094	610	2.9	.094	.094
16	**.630**	610	1.5	.094	.094	610	2.9	.094	.094
	.750	510	1.2	.102	.102	510	2.4	.102	.102
20	**.787**	490	1.2	.102	.102	490	2.4	.102	.102
Depth of Cut									

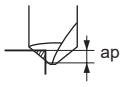
Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution and feed rate.
Note 2) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

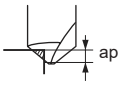
iMX-CH3L

Chamfer head, 3 flute

Chamfer Milling (Shape Circumference)

(in)

Material		Carbon Steel, Alloy Steel, Gray Cast Iron			Alloy Tool Steel, Carbon Steel, Alloy Steel, Pre-hardened Steel			Austenitic Stainless Steel, Titanium Alloys		
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**
	.375	3400	20.4	.079	2300	12.4	.079	2000	9.6	.079
10	**.394**	3200	19.2	.079	2200	11.9	.079	1900	9.1	.079
12	**.472**	2700	16.2	.094	1900	10.3	.094	1600	7.7	.094
	.500	2500	15.0	.094	1800	9.7	.094	1500	7.2	.094
	.625	2000	12.0	.107	1400	7.6	.107	1200	5.8	.107
16	**.630**	2000	12.0	.107	1400	7.6	.107	1200	5.8	.107
	.750	1700	10.2	.126	1200	6.5	.126	990	4.8	.126
20	**.787**	1600	9.6	.126	1100	5.9	.126	950	4.6	.126
Depth of Cut										

Material		Hardenned Steel (40-55HRC)			Heat Resistant Alloys Inconel718		
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**
	.375	1700	6.1	.079	1000	4.8	.079
10	**.394**	1600	5.8	.079	970	4.7	.079
12	**.472**	1300	4.7	.094	810	3.9	.094
	.500	1300	4.7	.094	760	3.6	.094
	.625	1000	3.6	.107	610	2.9	.107
16	**.630**	1000	3.6	.107	610	2.9	.107
	.750	840	3.0	.126	510	2.4	.126
20	**.787**	800	2.9	.126	490	2.4	.126
Depth of Cut							

Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution and feed rate.
Note 2) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

● :USA Stock

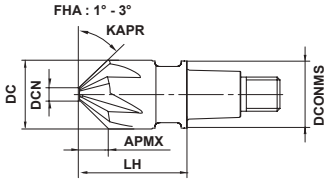
iMX-CH6V – Inch Sizes

Chamfer head, 6 flute

UWC

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≦45HRC)	Hardened Steel (≦55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloys, Heat Resistant Alloys	Copper Alloys	Aluminum Alloys
◎	○	○		◎	◎		





Type1

DCN				
±0.0008"				

- Suitable for outer circumference.
- Multi-functional design for extended tool life.

(in)

Order Number	DC	APMX	KAPR	DCN	LH	DCONMS	Flutes	Grade EP7020	Type
IMX12CH6V0500A45	.500	.190	45°	.120	.789	.488	6	●	1
IMX16CH6V0625A45	.625	.252	45°	.120	.945	.605	6	●	1
IMX20CH6V0750A45	.750	.315	45°	.120	1.181	.730	6	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

iMX-CH6V

Chamfer head, 6 flute

UWC

DCN				
±0.020				

- Suitable for outer circumference.
- Multi-functional design for extended tool life.

(mm)

Order Number	DC	APMX	KAPR	DCN	LH	DCONMS	Flutes	Grade EP7020	Type
IMX12CH6V120A45	12	4.5	45°	3	19	11.7	6	●	1
IMX16CH6V160A45	16	6.5	45°	3	24	15.5	6	●	1
IMX20CH6V200A45	20	8.5	45°	3	30	19.5	6	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

DC = Cutting Dia. **KAPR** = Tool Cutting Edge Angle **LH** = Head Lengh
APMX = Depth of Cut Max. **DCN** = Cutting Dia. Min. **DCONMS** = Connection Dia.

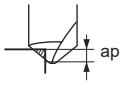
iMX-CH6V

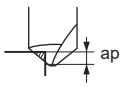
Chamfer head, 6 flute

Recommended Cutting Conditions

Chamfer Milling (Shape Circumference)

(in)

Material		Carbon Steel, Alloy Steel, Gray Cast Iron			Alloy Tool Steel, Carbon Steel, Alloy Steel, Pre-hardened Steel			Austenitic Stainless Steel, Titanium Alloys		
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**
12	**.472**	2700	32.4	.094	1900	20.5	.094	1600	15.4	.094
	.500	2500	30.0	.094	1800	19.4	.094	1500	14.4	.094
	.625	2000	24.0	.107	1400	15.1	.107	1200	11.5	.107
16	**.630**	2000	24.0	.107	1400	15.1	.107	1200	11.5	.107
	.750	1700	20.4	.126	1200	13.0	.126	990	9.5	.126
20	**.787**	1600	19.2	.126	1100	11.9	.126	950	9.1	.126
Depth of Cut										

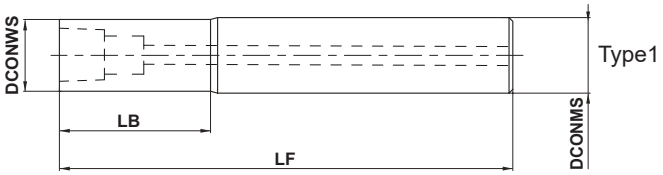
Material		Hardenned Steel (40-55HRC)			Heat Resistant Alloys Inconel718		
DC (mm)	DC (in)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**
12	**.472**	1300	9.4	.094	810	7.8	.094
	.500	1300	9.4	.094	760	7.3	.094
	.625	1000	7.2	.107	610	5.9	.107
16	**.630**	1000	7.2	.107	610	5.9	.107
	.750	840	6.0	.126	510	4.9	.126
20	**.787**	800	5.8	.126	490	4.7	.126
Depth of Cut							

Note 1) Vibration may occur if there is poor rigidity of the machine or workpiece. In that case, please adjust the revolution and feed rate.
Note 2) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

● :USA Stock

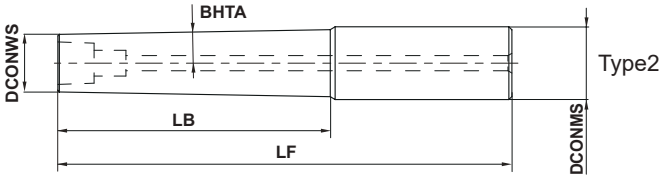
Undercut Type





Taper Neck Type





h6

DCONMS=.375	.500 ≤DCONMS ≤.625	.750 ≤DCONMS ≤1.000		
0 - .00035"	0 - .00043"	0 - .00051"		

Carbide Holder

(in)

Order Number	BHTA	LB	DCONWS	LF	DCONMS	Stock	Type	Suitable Head	Wrench
IMX10-U0375N049L27C	—	.495	.363	2.755	.375	●	1	IMX10	IMX10-WR
IMX10-U0375N124L35C	—	1.245	.363	3.543	.375	●	1	IMX10	IMX10-WR
IMX10-U0375N199L43C	—	1.995	.363	4.330	.375	●	1	IMX10	IMX10-WR
IMX10-A0500N199L43C	1°	1.995	.363	4.330	.500	●	2	IMX10	IMX10-WR
IMX12-U0500N071L31C	—	.711	.488	3.149	.500	●	1	IMX12	IMX12-WR
IMX12-U0500N171L39C	—	1.711	.488	3.937	.500	●	1	IMX12	IMX12-WR
IMX12-U0500N271L51C	—	2.711	.488	5.118	.500	●	1	IMX12	IMX12-WR
IMX12-A0625N271L51C	1°	2.711	.488	5.118	.625	●	2	IMX12	IMX12-WR
IMX16-U0625N093L31C	—	.930	.605	3.149	.625	●	1	IMX16	IMX16-WR
IMX16-U0625N218L43C	—	2.180	.605	4.330	.625	●	1	IMX16	IMX16-WR
IMX16-U0625N343L59C	—	3.430	.605	5.905	.625	●	1	IMX16	IMX16-WR
IMX16-A0750N343L59C	1°	3.430	.605	5.905	.750	●	2	IMX16	IMX16-WR
IMX20-U0750N106L35C	—	1.069	.730	3.543	.750	●	1	IMX20	IMX20-WR
IMX20-U0750N256L51C	—	2.569	.730	5.118	.750	●	1	IMX20	IMX20-WR
IMX20-U0750N406L70C	—	4.069	.730	7.086	.750	●	1	IMX20	IMX20-WR
IMX20-A1000N406L70C	1°	4.069	.730	7.086	1.000	●	2	IMX20	IMX20-WR
IMX25-U1000N150L43C	—	1.500	.980	4.330	1.000	●	1	IMX25	IMX25-WR
IMX25-U1000N350L62C	—	3.500	.980	6.299	1.000	●	1	IMX25	IMX25-WR

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

LB = Body Length **LF** = Functional Length
DCONWS = Connection Dia. Workpiece Side **DCONMS** = Connection Dia. Machine Side

iMX

Carbide Holder

Undercut Type

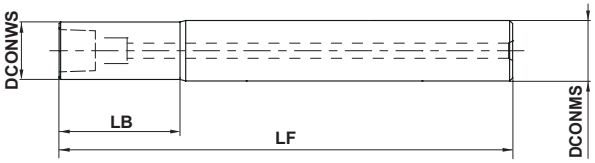


Straight Type

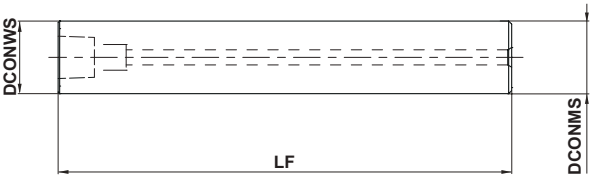


Taper Neck Type

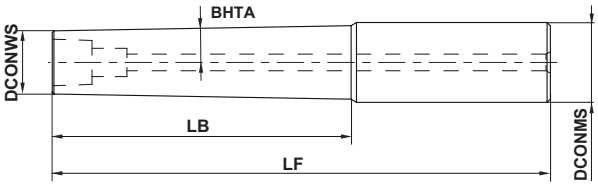




Type1



Type2



Type3

h6

DCONMS=10	12 ≤DCONMS ≤16	20 ≤DCONMS ≤25		
0 - 0.009	0 - 0.011	0 - 0.013		

Carbide Holder

(mm)

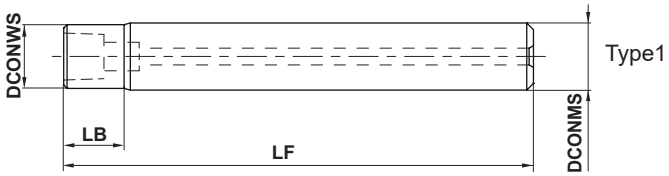
Order Number	BHTA	LB	DCONWS	LF	DCONMS	Stock	Type	Suitable Head	Wrench
IMX10-U10N014L070C	—	14	9.7	70	10	●	1	IMX10	IMX10-WR
IMX10-S10L090C	—	—	10	90	10	●	2	IMX10	IMX10-WR
IMX10-U10N034L090C	—	34	9.7	90	10	●	1	IMX10	IMX10-WR
IMX10-S10L110C	—	—	10	110	10	●	2	IMX10	IMX10-WR
IMX10-U10N054L110C	—	54	9.7	110	10	●	1	IMX10	IMX10-WR
IMX10-A12N054L110C	1°	54	9.7	110	12	●	3	IMX10	IMX10-WR
IMX12-U12N017L080C	—	17	11.7	80	12	●	1	IMX12	IMX12-WR
IMX12-S12L100C	—	—	12	100	12	●	2	IMX12	IMX12-WR
IMX12-U12N041L100C	—	41	11.7	100	12	●	1	IMX12	IMX12-WR
IMX12-S12L130C	—	—	12	130	12	●	2	IMX12	IMX12-WR
IMX12-U12N065L130C	—	65	11.7	130	12	●	1	IMX12	IMX12-WR
IMX12-A16N065L130C	1°	65	11.7	130	16	●	3	IMX12	IMX12-WR
IMX16-U16N024L080C	—	24	15.5	80	16	●	1	IMX16	IMX16-WR
IMX16-S16L110C	—	—	16	110	16	●	2	IMX16	IMX16-WR
IMX16-U16N056L110C	—	56	15.5	110	16	●	1	IMX16	IMX16-WR
IMX16-S16L150C	—	—	16	150	16	●	2	IMX16	IMX16-WR
IMX16-U16N088L150C	—	88	15.5	150	16	●	1	IMX16	IMX16-WR
IMX16-A20N088L150C	1°	88	15.5	150	20	●	3	IMX16	IMX16-WR
IMX20-U20N030L090C	—	30	19.5	90	20	●	1	IMX20	IMX20-WR
IMX20-S20L130C	—	—	20	130	20	●	2	IMX20	IMX20-WR
IMX20-U20N070L130C	—	70	19.5	130	20	●	1	IMX20	IMX20-WR
IMX20-S20L180C	—	—	20	180	20	●	2	IMX20	IMX20-WR
IMX20-U20N110L180C	—	110	19.5	180	20	●	1	IMX20	IMX20-WR
IMX20-A25N110L180C	1°	110	19.5	180	25	●	3	IMX20	IMX20-WR
IMX25-U25N037L110C	—	37.5	24.5	110	25	●	1	IMX25	IMX25-WR
IMX25-S25L160C	—	—	25	160	25	●	2	IMX25	IMX25-WR
IMX25-U25N087L160C	—	87.5	24.5	160	25	●	1	IMX25	IMX25-WR
IMX25-S25L210C	—	—	25	210	25	●	2	IMX25	IMX25-WR

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

● :USA Stock

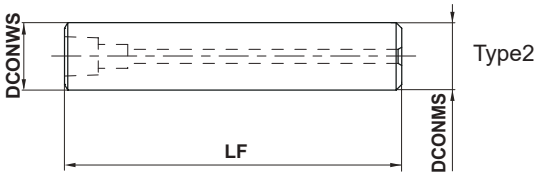
Undercut Type





High Rigidity-Straight Type





h6

DCONMS=.375"	.500" ≤DCONMS≤.625"	.625" ≤DCONMS≤.750"	DCONMS=1.250"	
0 - 0.00035"	0 - 0.00043"	0 - 0.00051"	0 - 0.00063"	

Steel Holder

(in)

Order Number	LB	DCONWS	LF	DCONMS	Stock	Type	Suitable Head	Wrench
IMX10-U0375N030L27S	.308	.363	2.755	.375	●	1	IMX10	IMX10-WR
IMX10-G0500L23S	—	.500	2.362	.500	●	2	IMX10	IMX10-WR
IMX12-U0500N046L31S	.461	.488	3.149	.500	●	1	IMX12	IMX12-WR
IMX12-G0625L27S	—	.625	2.755	.625	●	2	IMX12	IMX12-WR
IMX16-U0625N061L31S	.618	.605	3.149	.625	●	1	IMX16	IMX16-WR
IMX16-G0750L27S	—	.750	2.755	.750	●	2	IMX16	IMX16-WR
IMX20-U0750N069L35S	.694	.730	3.543	.750	●	1	IMX20	IMX20-WR
IMX20-G1000L31S	—	1.000	3.149	1.000	●	2	IMX20	IMX20-WR
IMX25-U1000N100L43S	1.000	.980	4.330	1.000	●	1	IMX25	IMX25-WR
IMX25-G1250L39S	—	1.250	3.937	1.250	●	2	IMX25	IMX25-WR

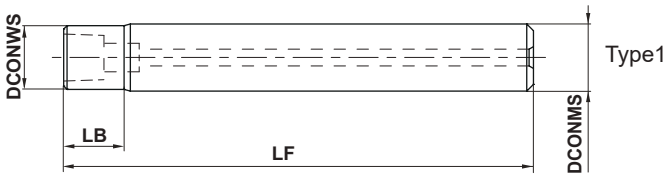
Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

LB = Body Length **LF** = Functional Length
DCONWS = Connection Dia. Workpiece Side **DCONMS** = Connection Dia. Machine Side

iMX
Steel Holder

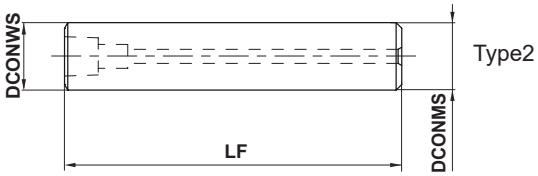
Undercut Type





High Rigidity-Straight Type





h6

DCONMS=10	12 ≤DCONMS ≤16	20 ≤DCONMS ≤25	DCONMS=32
0 - 0.009	0 - 0.011	0 - 0.013	0 - 0.160

Steel Holder

(mm)

Order Number	LB	DCONWS	LF	DCONMS	Stock	Type	Suitable Head	Wrench
IMX10-U10N009L070S	9	9.7	70	10	●	1	IMX10	IMX10-WR
IMX10-G12L060S	—	12	60	12	●	2	IMX10	IMX10-WR
IMX12-U12N011L080S	11	11.7	80	12	●	1	IMX12	IMX12-WR
IMX12-G16L070S	—	16	70	16	●	2	IMX12	IMX12-WR
IMX16-U16N016L080S	16	15.5	80	16	●	1	IMX16	IMX16-WR
IMX16-G20L070S	—	20	70	20	●	2	IMX16	IMX16-WR
IMX20-U20N020L090S	20	19.5	90	20	●	1	IMX20	IMX20-WR
IMX20-G25L080S	—	25	80	25	●	2	IMX20	IMX20-WR
IMX25-U25N025L110S	25	24.5	110	25	●	1	IMX25	IMX25-WR
IMX25-G32L100S	—	32	100	32	●	2	IMX25	IMX25-WR

Note 1) The fastening size of the holder and head should be the same. (refer to page 8)

● :USA Stock ★: Stocked in Japan

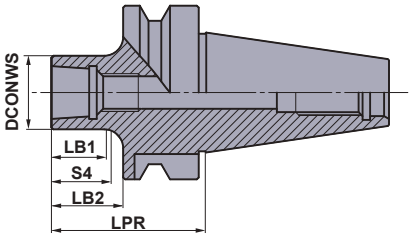
iMX

BT30 Mono-Block Type Steel Holder

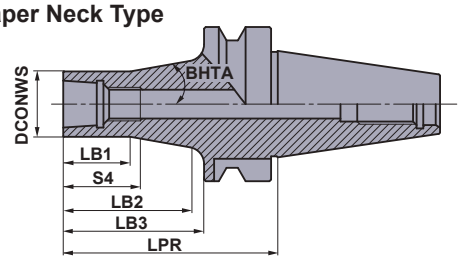


Please see page 86 for features.

Straight Type



Taper Neck Type



Straight Type

Order Number	Stock	Dimensions (mm)						WT (kg)	Suitable Head
		DC	DCONWS	LPR	LB1	LB2	S4		
IMX16-S16GL38-BT30	★	16	15.5	38	11	16	12.5	0.39	IMX16
IMX16-S28GL50-BT30	★	16	15.5	50	23	28	24.5	0.41	IMX16
IMX20-S19GL41-BT30	★	20	19.5	41	14	19	15.5	0.41	IMX20
IMX20-S33GL55-BT30	★	20	19.5	55	28	33	29.5	0.42	IMX20
IMX25-S25GL47-BT30	★	25	24.5	47	20	25	21.5	0.45	IMX25
IMX25-S43GL65-BT30	★	25	24.5	65	38	43	39.5	0.50	IMX25

Taper Neck Type

Order Number	Stock	Dimensions (mm)								WT (kg)	Suitable Head
		DC	DCONWS	LPR	LB1	LB2	LB3	S4	BHTA		
IMX16-A33GL55-BT30	★	16	15.5	55	16	29.2	33	16.7	15°	0.43	IMX16
IMX20-A42GL64-BT30	★	20	19.5	64	20	37.8	42	21.4	10°	0.48	IMX20
IMX25-A53GL75-BT30	★	25	24.5	75	25	48.7	53	26.7	8°	0.57	IMX25

Note 1) The fastening size of the holder and the head should be the same.
Note 2) Please use a special wrench that matches the fastening size. This part is sold separately.
Note 3) Recommended for use with machining centers equipped with high-output spindle motors.
Note 4) The depth of cut should be 50-60% of the recommended conditions for each head.
Note 5) The connection part with the machine tool is not a two-sided shank.

Parts Sold Separately

Holder Type	Wrench
IMX16	IMX16-WR
IMX20	IMX20-WR
IMX25	IMX25-WR

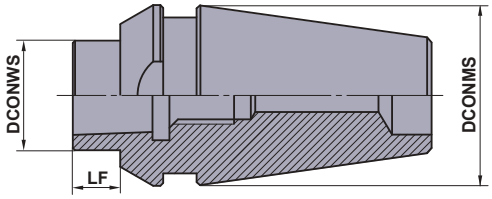
DC = Cutting diameter is the head size
DCONWS = Connection Dia. Workpiece Side
LPR = Protruding Length

iMX

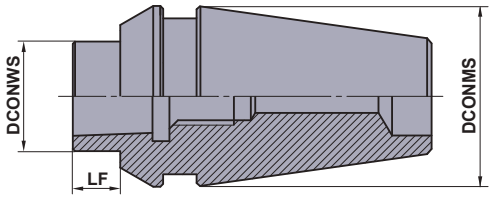
ER Collet



Please see page 85 for features.



Type1



Type2

Order Number	Stock	Dimensions (mm)			Collet Sizes	Suitable Head	Type
		DCONWS	DCONMS	LF			
IMX10-S04-ER16	●	9.7	16	4	ER16	IMX10	1
IMX10-S04-ER20	●	9.7	20	4	ER20	IMX10	2
IMX10-S04-ER25	●	9.7	25	4	ER25	IMX10	2
IMX10-S04-ER32	●	9.7	32	4	ER32	IMX10	2
IMX12-S05-ER16	●	11.7	16	5	ER16	IMX12	1
IMX12-S05-ER20	●	11.7	20	5	ER20	IMX12	2
IMX12-S05-ER25	●	11.7	25	5	ER25	IMX12	2
IMX12-S05-ER32	●	11.7	32	5	ER32	IMX12	2
IMX16-S08-ER25	●	15.5	25	8	ER25	IMX16	2
IMX16-S08-ER32	●	15.5	32	8	ER32	IMX16	2
IMX20-S10-ER32	●	19.5	32	10	ER32	IMX20	2
IMX25-S12-ER32	●	24.5	32	12.5	ER32	IMX25	2

Note 1) The fastening size of the holder and the head should be the same.
Note 2) Please use a special wrench that matches the fastening size. This part is sold separately.
Note 3) The depth of cut should be 50-60% of the recommended conditions for each head.

Parts Sold Separately

Holder Type	Wrench
IMX10	IMX10-WR
IMX12	IMX12-WR
IMX16	IMX16-WR
IMX20	IMX20-WR
IMX25	IMX25-WR

● :USA Stock

DCONWS = Connection Dia. Workpiece Side
DCONMS = Connection Dia. Machine Side
LF = Functional Length

Exchangeable Head End Mills

iMX End Mill Series

ER Collet

Ideal for quick change applications such as Swiss-type automatic lathes, multi-turret processing machines, and high-efficiency machining that requires rigid tool mounting.



The double face constraint of the end face and tapered surface of the IMX fastening mechanism ensures high rigidity and precision.
Four new sizes: ER16, ER20, ER25, and ER32



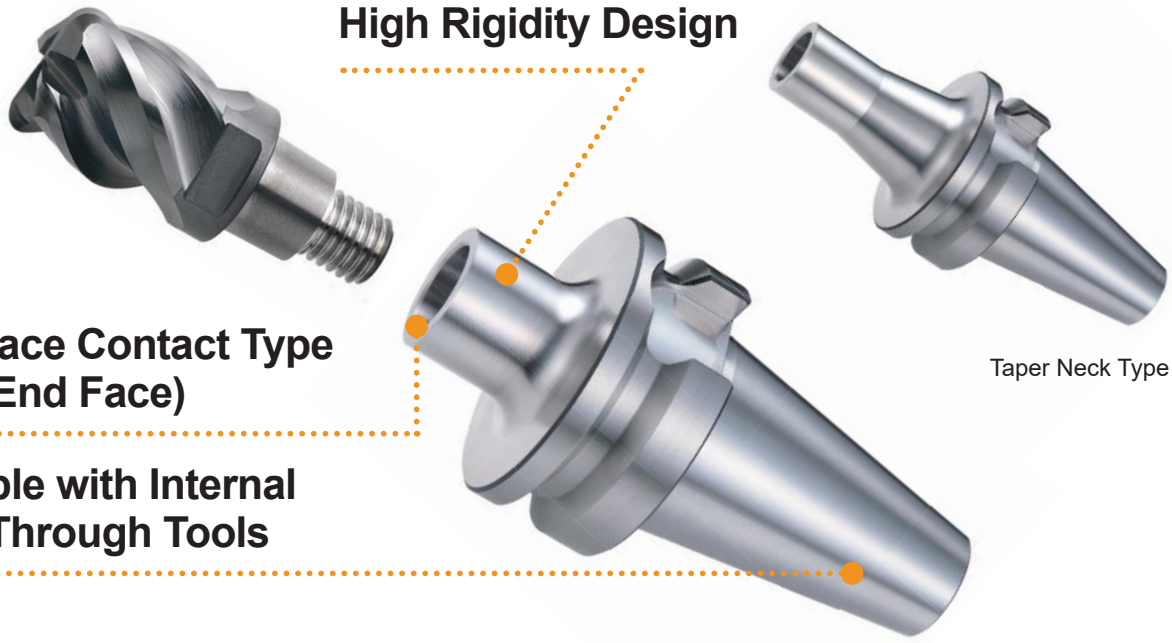
Exchangeable Head End Mills

iMX End Mill Series

BT30 Mono-Block Type Steel Holder

New tool holders for the **iMX** series.

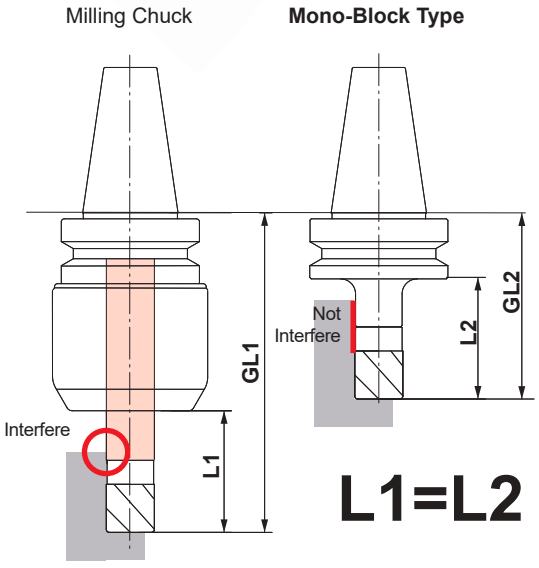
High rigidity provides high efficiency machining



Benefits of Mono-Block Type Holders

The mono-block type holder greatly reduces tool overhang, allowing stable machining even with large diameter tools, achieving high efficiency machining. When a standard milling chuck is used, a screw-in type shank also required. This is not needed when using a mono-block type holder, therefore a reduction in costs can be realized. By undercutting the bottom of the neck, makes it suitable for vertical wall machining.

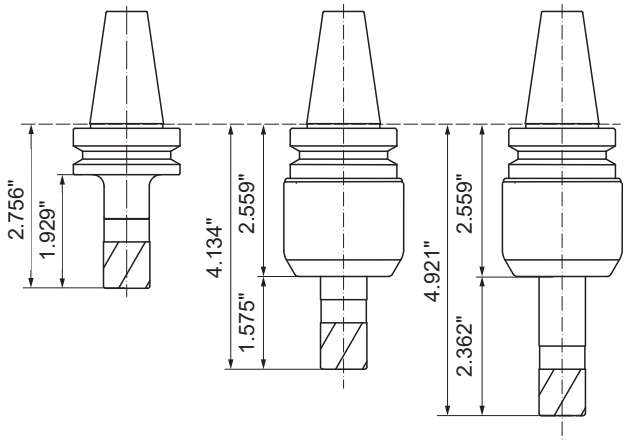
Interference when using a straight type carbide arbor.



Shoulder Milling Comparison in 630

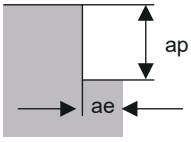
Stable machining is achieved when combined with high-output machine tools.
Carbide holders and milling chucks are no longer required, and cost reductions can be realized.

Overhang Length Comparison



Mono-Block Type | Milling Chuck and a Shortened Carbide Holder | Milling Chuck and Carbide Holder

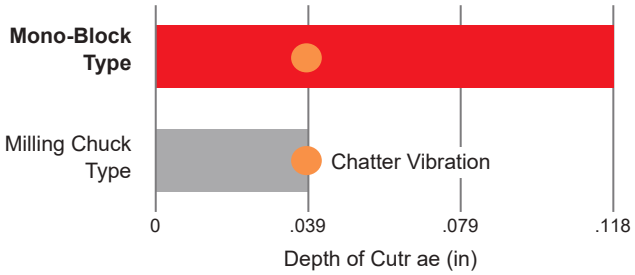
Holder	Depth of cut ae (in)	Table Feed (IPM)		
		15.0	20.1	25.2
		Depth of cut ap=.394"		
Mono-Block Holder	.118"	✓	✓	✓
	.236"	✓	✓	✓
Milling Chuck Cutting a Carbide Holder	.118"	✓	✓	✓
	.236"	✓	✓	✓
Milling Chuck Carbide Holder	.118"	✓	✓	Chatter Vibration
	.236"	Chatter Vibration	Chatter Vibration	✗



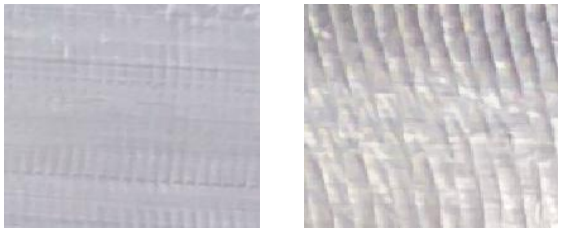
<Cutting Conditions>
Material : AISI 630
Head : IMX20C4HV200R10020S
Cutting Speed : vc = 330 SFM
Feed per Rev. : fr = .0079 IPR
Machine : High Spec Machining Center
Max10000 min^{-1}
Spindle Motor 18.9 HP
Torque 708 lbf-in

Side Milling Comparison in 304

Achieves high efficiency machining with a depth of cut (ae) that is three times that of a standard milling chuck holder.

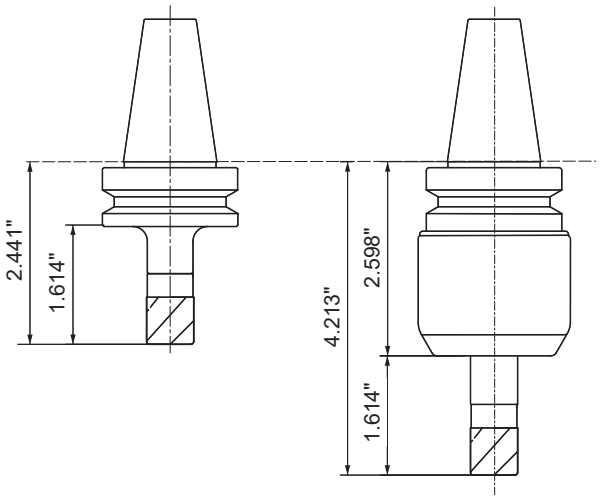


Machined Surface Comparison: ae= .039", fz= .004 IPT



Mono-Block Type | Milling Chuck Type

Overhang Length Comparison



Mono-Block Type | Milling Chuck and a Shortened Carbide Holder

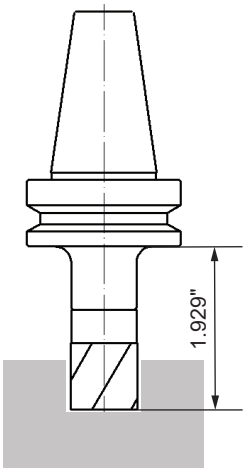
<Cutting Conditions>
Material : AISI 304
Head : IMX16C4HV160R10016
Cutting Speed : vc = 330 SFM
Table Feed : 31 IPM
Depth of Cut : ap=.630"
Machine : High Spec Machining Center
Max10000 min^{-1}
Spindle Motor 18.9 HP
Torque 708 lbf-in

Machining Example

Vertical Machining Center: BROTHER INDUSTRIES, Ltd. S700Xd1

Achieves highly efficient machining of aluminum alloys with a metal removal rate of 38 in^3/min.





<Cutting Conditions>
Material : Aluminum Alloy
Head : IMX20S3A20016 ET2020
DC=20, Square, 3 flute
Holder : IMX20-S19GL41-BT30
Cutting Speed : vc=1230 SFM
Revolution : n=5971 min^{-1}
Table Feed : 94 IPM
Depth of Cut : ap=.512" (Slot)
Metal Removal Rate : 38 in^3/min
Cutting Mode : External Coolant Through (Emulsion)

Spindle Speed Max. 10000 min^{-1} Spindle Motor 34.9 HP Torque 814 lbf-in

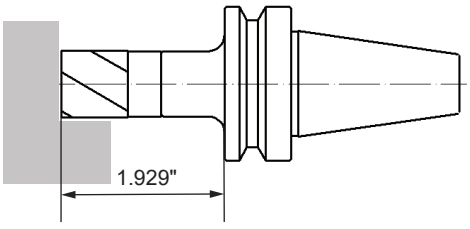
Horizontal Machining Center: ENSHU, Ltd. SH350

When rough machining steel (1045), a metal removal rate of 384 cm3/min was achieved, six times the recommended rate.



<Cutting Conditions>
Material : AISI 1045
Head : IMX20R4F20021 EP7020
Roughing, 4 flute
Holder : IMX20-S19GL41-BT30
Cutting Speed : vc=820 SFM (490 SFM)
Revolution : n=3997 min^{-1} (2400 min^{-1})
Table Feed : 63 IPM (19 IPM)
Depth of Cut : ap=.472", ae=.787"
Metal Removal Rate : 23 in^3/min
Cutting Mode : Down Cut. Air Blow

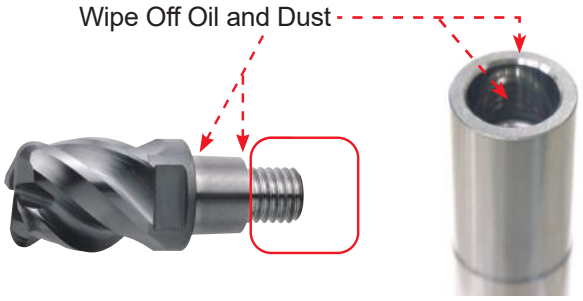
( ) Recommended Conditions



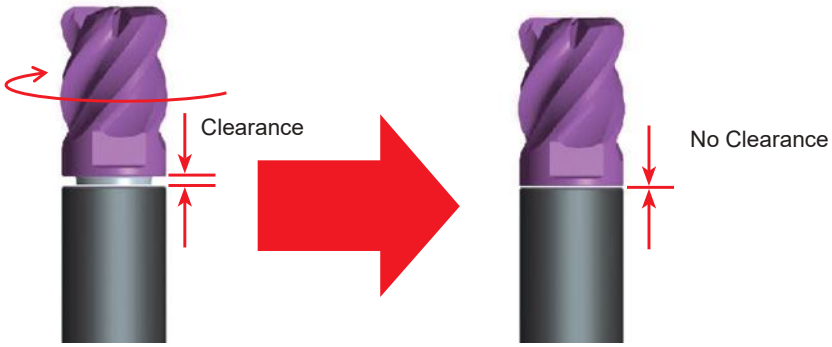
Spindle Speed Max. 12000 min^{-1} Spindle Motor 41.3 HP Torque 275 lbf-in

How to Install the Head

1 Using a clean cloth, wipe away oil and dust from the taper and end surfaces of the head and holder.

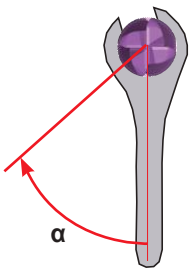


2 Use gloves to protect hands when fastening.
Securely fasten the head and holder end surfaces using the enclosed wrench to close off any remaining gap.



3 Refer to the table below for the amount to rotate after the gap is closed, or refer to the clamping torque.

Fastening Size	Reference Tightening Angle α	Recommended Clamping Torque (lbf-in)
IMX10	50°	88
IMX12	50°	132
IMX16	50°	265
IMX20	40°	440
IMX25	35°	660

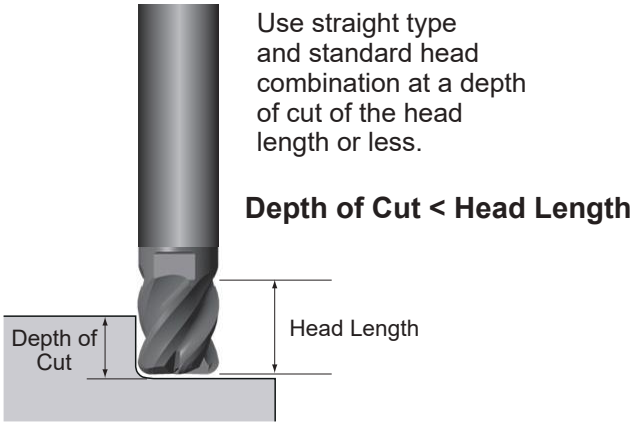


(Note 1) Use the special reduced thickness spanner.

iMX Holders Application

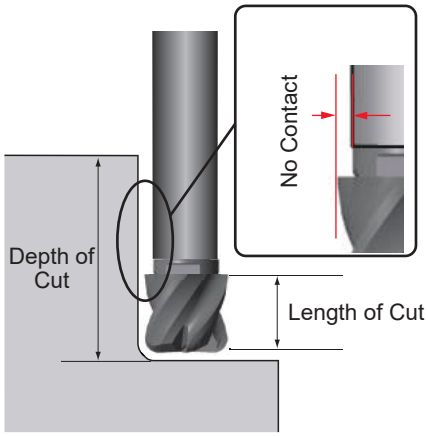
- Straight type holder and head causes workpiece interference when the depth of cut is longer than the head.
- To avoid interference in longer reach applications, use an offset head and holder.

Straight + Standard Head



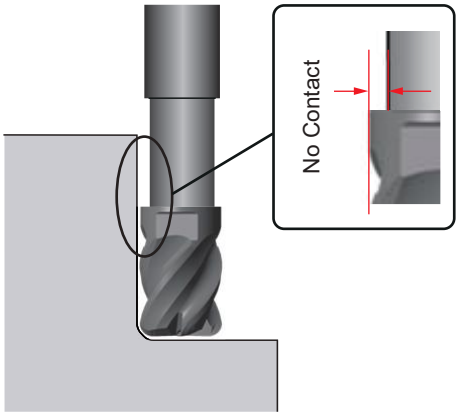
Installation at an overhang of DC×3 or less is also possible,
if the depth of cut < head length is assumed.

Straight + Offset Head

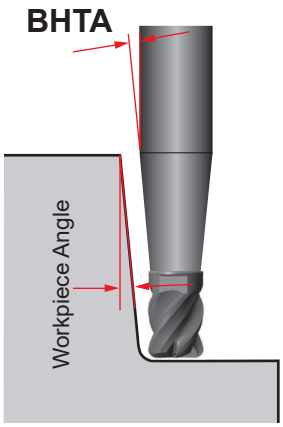


- It is suitable for vertical wall machining, because the undercut type has a relieved neck.
- A taper neck has high rigidity and is especially stable for deeper applications.
- Additional grinding according to customer specifications is also possible.

Undercut Type + Standard Head



Taper Neck Type + Standard Head



● :USA Stock

Exchangeable Head End Mills

iMX



Corner radius head with coolant thru, 6 flute, Irregular helix

iMX-C6HV-C

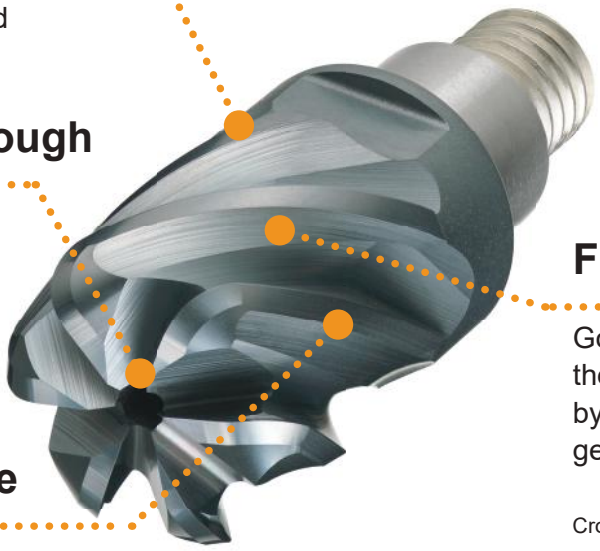
High Efficiency Machining Enables Process Consolidation

Small Relief

Provides a margin effect while maintaining edge sharpness. Also achieves less burr creation and enables vibration damping.

Center Coolant Through

Effective when machining the corner of a pocket where external coolant isn't sufficient.



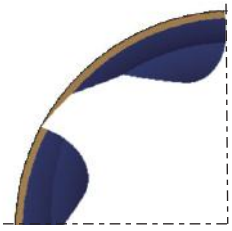
Irregular Helix Angle

Irregularity between each flute provides stability due to reduced vibration.

Flute Geometry

Good chip evacuation in the corners of pockets by adopting an ideal flute geometry.

Cross section of the flute geometry

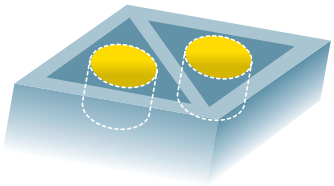


Tool Integration Achieved

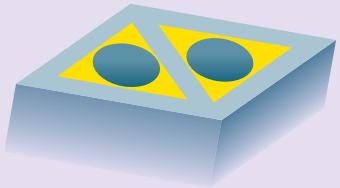
Multi-functionality brings efficiency to the entire machining process.

iMX-C6HV-C

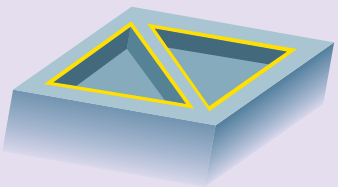
Helical Milling



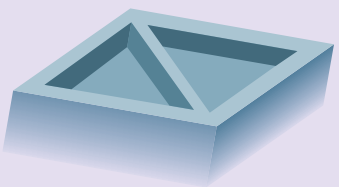
Pocket Milling



Semi-finish Machining

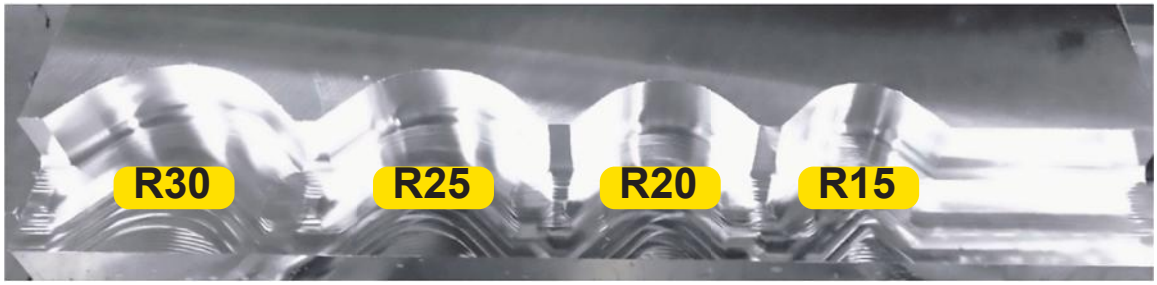


Finish Machining



Comparison of Anti-Vibration when Machining Corners

Excellent vibration damping that prevents the usual problems even when machining corner radii.



Cutting Speed (SFM)

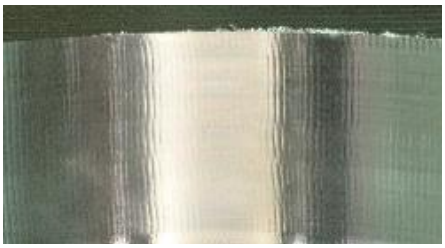
655	×	×	×	×	✓	✓	✓	✓
490	×	×	×	×	✓	✓	✓	✓
330	✓	✓	×	×	✓	✓	✓	✓
	R30	R25	R20	R15	R30	R25	R20	R15
	Conventional				**IMX-C6HV-C**			

✓: Smooth cutting sound and good surface finish.
×: Audible vibrations and poor surface finish. Not the recommended cutting conditions.

vc =655 SFM, R15, Photographed after machining



Conventional



iMX-C6HV-C

<Cutting Conditions>
Material : AISI 304
Tool : IMX16C6HV160R30016C
DC=16, RE=3
Feed Rate : fz=.002 IPT
Depth of Cut : ap=.630"
ae=.039"
Overhang Length : 1.890" (DCx3)
Cutting Mode : Internal Coolant
(Emulsion)
Machine : BT50, Vertical MC

Exchangeable Head End Mills

iMX

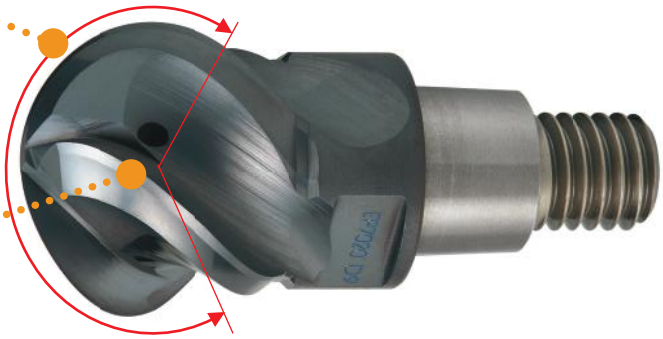


Lollipop head with coolant thru, 4 flute

iMX-B4WH-S

Lollipop Shape

With a true round ball cutting edge that extends 240º, making it ideal for finishing undercut surfaces.

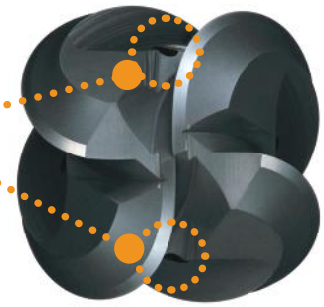


High Helix Cutting Edge

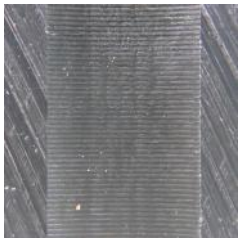
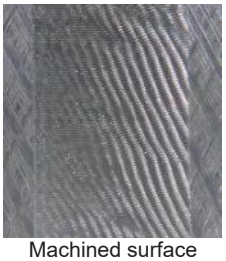
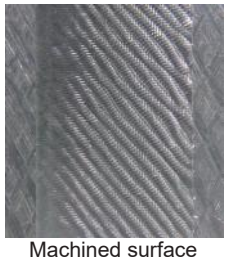
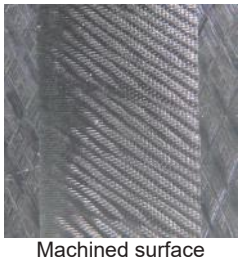
The high helix edge geometry reduces cutting resistance. This results in reduced chatter and vibration even when machining with a long tool overhang.

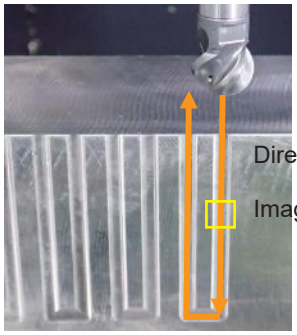
With Coolant Through

A stable supply of coolant is maintained even when machining components with complex geometries.



S17400 Comparison of Vertical Machining

Cutting Speed	130 SFM	195 SFM	260 SFM
iMX-B4WH-S	 Surface machined without chatter	 Surface machined without chatter	 Surface machined without chatter
Conventional	 Machined surface displaying chatter	 Machined surface displaying chatter	 Machined surface displaying chatter



<Cutting Conditions>

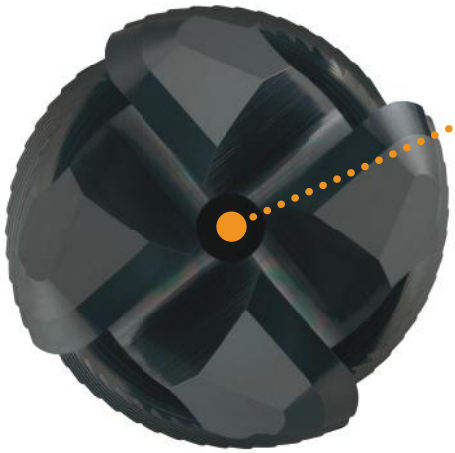
Material	: AISI S17400
Tool	: IMX10B4WH12008S
Feed Rate	: fz=.0012 IPT
Depth of Cut	: ae=.012"
Overhang Length	: 2.362", L/D = 5
Cutting Mode	: Internal Coolant (Emulsion)

Roughing head with coolant thru, 4 flute

iMX-RC4F-C

For Titanium Alloys and Stainless Steel

A corner radius roughing type with a center-thru coolant thru. The roughing edge geometry reduces cutting resistance and is effective for low rigidity and long tool overhang applications.



Center-thru Coolant Through

For improved chip disposal.

Adopting a Roughing Edge Geometry

The optimized edge geometry has improved fracture resistance.



Corner Radius Type

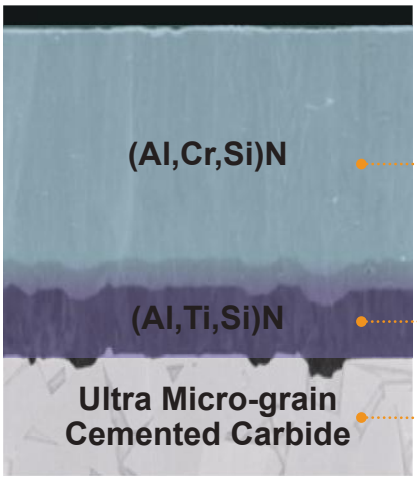
The corner radius geometry is resistant to cutting edge damage.



Exchangeable Head End Mills
iMX

EP8100 Series (EP8110/EP8120)

The combination of the (Al,Cr,Si)N coating, which has a high oxidation temperature and high lubricity,together with the (Al,Ti,Si)N coating,which has better wear resistance and high adhesion, allows high strength hardened steel to be machined.



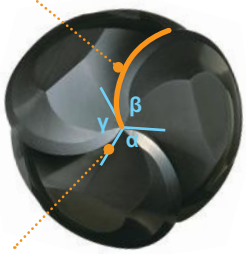
★High Oxidation Temperature
★High Lubricity

★Better Wear Resistance
★High Adhesion

Ball nose head, 3 flute, Irregular pitch flutes, For high efficiency machining

iMX-B3FV

High helical tooth improves fracture resistance.



Reduced vibration by optimized irregular pitch flutes.

α ≠ β ≠ γ

Stable wall machining is possible with a strong back taper angle.



EP8120 is ideal for processing hot forging dies.

Ball nose head, 2 and 4 flute, For hardened steel

iMX-B2S/iMX-B4S

(Picture is **iMX-B2S**)



Low helix tooth is suitable for finishing.



EP8110 is ideal for processing high hardned steel.(≤ 65HRC)

Corner radius, Taper head, Multi-flute, With Coolant thru

iMX-C8T/C10T/C12T/C15T-E NEW

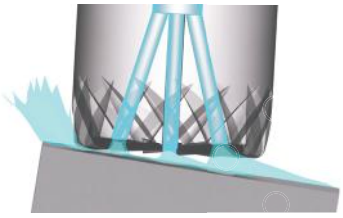


Taper radius end mills (Torus cutter) were conventionally used for turbine blade finishing. iMX taper radius end mill offer equivalent performance to solid end mills but achieve lower process costs.

Features

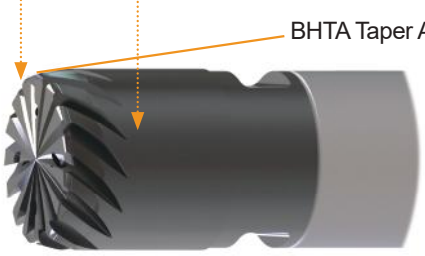
Extensive Range of Corner Radii

For a wide range of applications.



Multi-flute

Multi-flute design enables higher efficiency than conventional types.

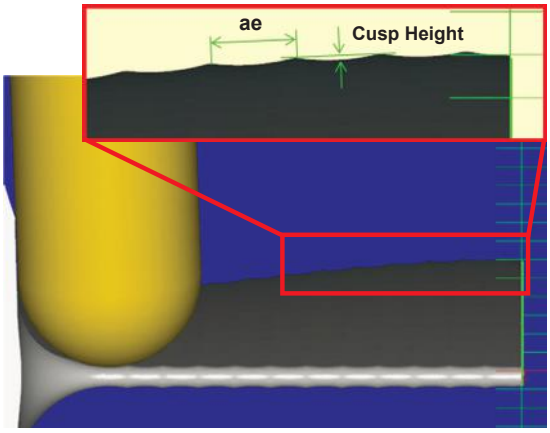


Through Coolant 4 Hole

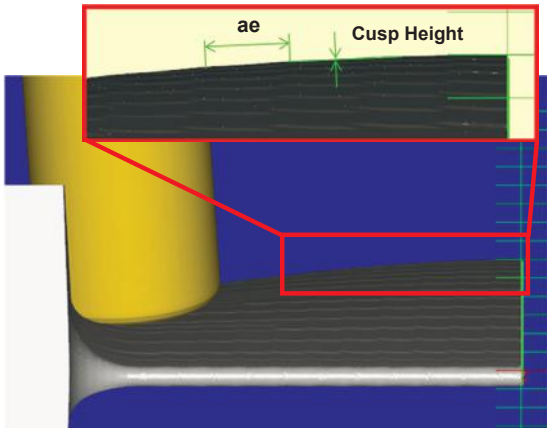
Even when the workpiece is tilted, coolant is reliably supplied to the machining point, improving chip evacuation and long tool life.

Drastically Reduces Cutting Time

Reduces the cusp height when using the same pick feed (ae).



Set pick feed (ae) = .079", with RE5 of the ball nose end mill



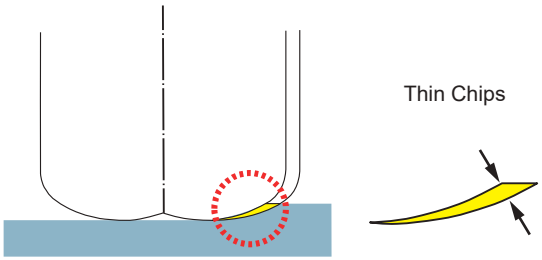
Set pick feed (ae) = .079", with IMX10C8T080R10T080E

iMX-C4FD-C

Duplex corner radius head, 4 flute, For high feed, With coolant thru

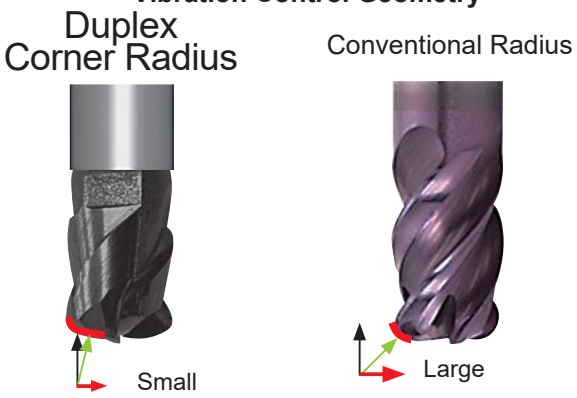
Features

High Efficiency Machining Geometry



Thin chips and a long cutting edge combine to provide both high performance and long tool life.

Vibration Control Geometry

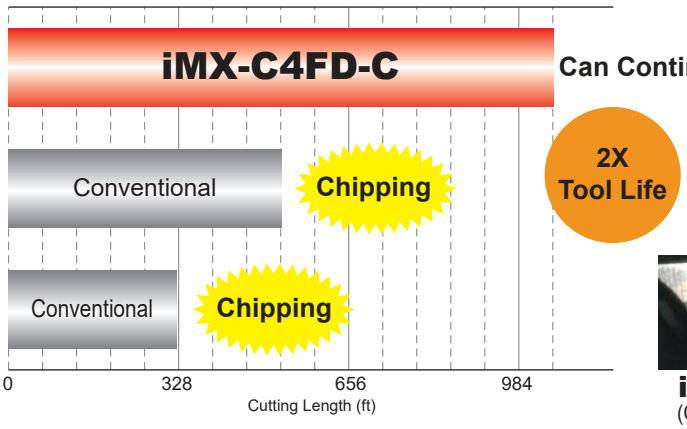


Reduced cutting resistance in the radius direction suppresses tool vibration and reduces deflection.

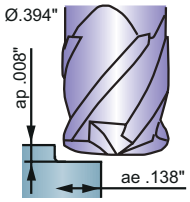
Cutting Performance

Tool Life Comparison in Cobalt Chromium Alloy (DC=.394")

Tool Life (Co-Cr Alloy)



Material	: Co-Cr Alloy
Tool Size	: DC=.394"
Revolution	: n=3185 min^{-1} (330 SFM)
Table Feed	: vf=75.2 IPM (.006 IPT)
Depth of Cut	: ap=.008", ae=.138"
Overhang Length	: 1.260"
Cutting Mode	: Down Cut, Soluble
Machine	: Vertical MC (BT40)





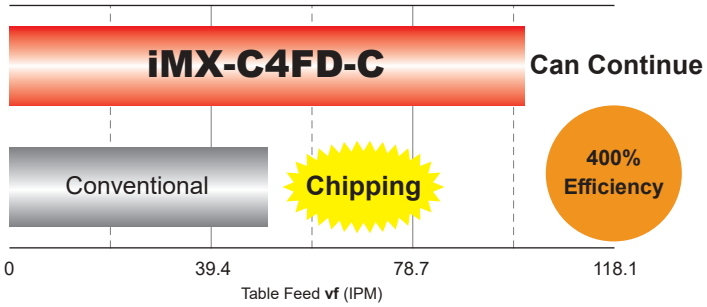
iMX-C4FD-C (Cutting Length 1050')

Conventional (Cutting Length 525')

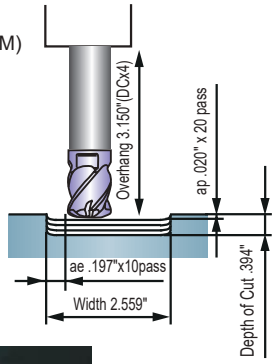
Conventional (Cutting Length 315')

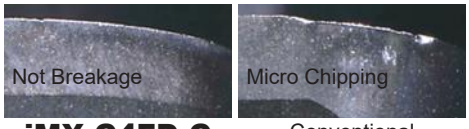
Efficiency Comparison when machining ASTM H13 (DC=.787")

Machining Efficiency Comparison in ASTM H13



Material	: ASTM H13 (52 HRC)
Tool Size	: DC=.787"
Revolution	: n=1600 min^{-1} (330 SFM)
Table Feed	: vf=25.2-100.8 IPM (.004-.016 IPT)
Depth of Cut	: ap=.020", ae=.197"
Overhang Length	: 3.150"
Cutting Mode	: Slot & Down Cut, Air Blow
Machine	: Vertical MC (BT50)





iMX-C4FD-C (Table Feed **vf** 100.8 IPM)

Conventional (Table Feed **vf** 50.4 IPM)

Recommended cutting conditions may vary according to the stability of the set up.

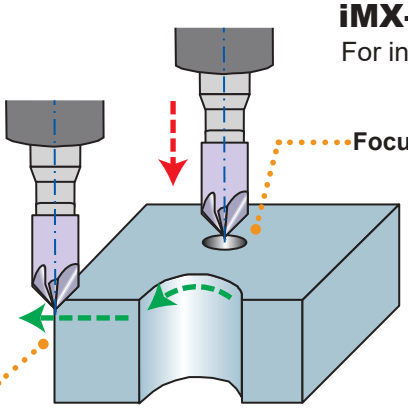
Chamfer Head

Features

Ideal geometry for different chamfering applications.

iMX-CH3L
For inner chamfer applications. 3 flute

iMX-CH6V
For outer chamfer applications. 6 flute



Steel Holder

Features

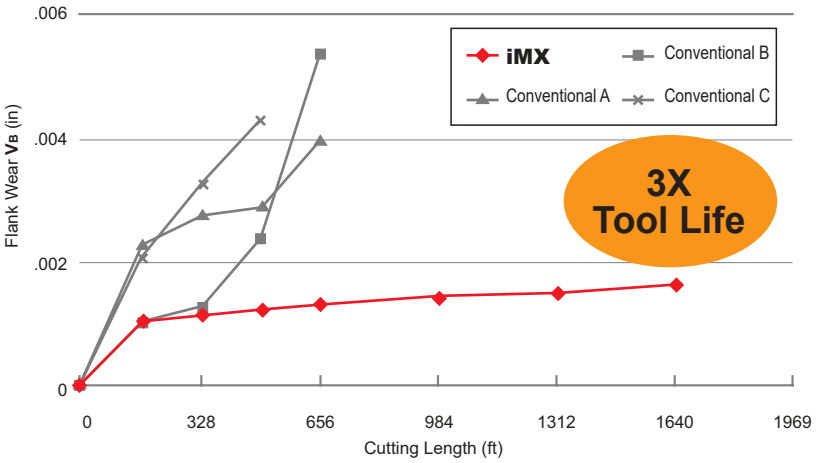
Series expansion of steel holders.



Series of cost effective and capable steel holders suitable for lower depths of cut and short overhang applications.

Cutting Performance

Tool life at least 3 times longer than conventional holders.



<Cutting Conditions>

Material	: AISI 1055	Depth of cut	: ap=.197"
Holder	: iMX10-U10N009L070S	Width of cut	: ae=.020"
Head	: IMX10C4HV100R10010	Overhang Length	: 1.181"
Cutting Speed	: n=5100 min^{-1} (525SFM)	Cutting Mode	: Down Cut
Table Feed	: vf=60IPM (.003IPT)		Wet Cutting (Emulsion)
		Machine	: Vertical MC (BT50)

Tip Damage

iMX S4HV
(Cutting Length 492 feet)



Conventional A
(Cutting Length 328 feet)



Conventional B
(Cutting Length 328')

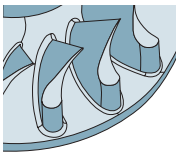
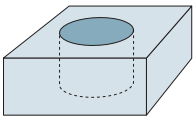
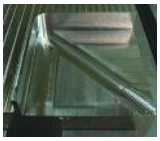


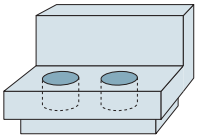
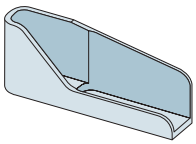
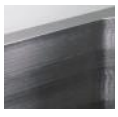
Conventional C
(Cutting Length 328')

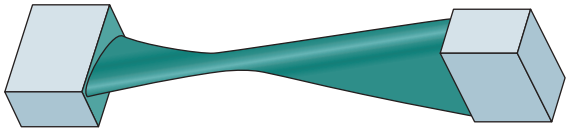


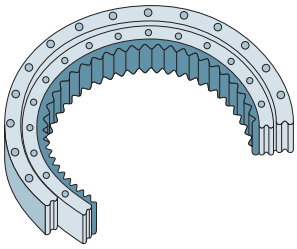
Application Examples

The examples shown are actual applications and can differ from the recommended cutting conditions.

Head		**IMX12B6HV12012**	**IMX20C4HV200R10021**	**IMX16C10HV160R10016**
Holder		**IMX12-U12N041L100C**	**IMX20-U20N070L130C**	**IMX16-U16N024L080C**
Workpiece		AISI 1049 	Mild Steel 	Titanium Alloy (Ti-6Al4V) 
Component		Impeller for Torque Converter	Die Steel	Test Work
Intended Process		Finishing of Blade Faces	Hole Finishing	Shoulder Milling (Down Cut)
Cutting Conditions	Cutting Speed **vc** (SFM)	655	330	495
	Feed per Tooth **fz** (IPT)	.0031	.0020	.0031
	Width of Cut **ae** (in)	Approx. .055	.039	.020
	Depth of Cut **ap** (in)	Approx. .039	.118	.630
	Overhang Length (in)	—	4.134	2.047
Cutting Mode		—	—	Wet Cutting (Emulsion)
Machine		5-Axis MC (HSK A63)	Vertical MC	Vertical MC
Results		The tool reduced machining time by 30% and also produced a good surface finish.	The irregular helix flutes combined with the solid carbide holder gave better performance than the conventional tools.	Machining without vibration was achieved even when the workpiece radius and tool radius were the same.

Head		**IMX10B4HV10010**	**IMX20C4HV220R10023**
Holder		**IMX10-U10N034L090C**	**IMX20-S20L180C**
Workpiece		Stainless Steel 	Titanium Alloy (Ti-6Al4V) 
Component		—	—
Intended Process		—	Deep Wall Machining
Cutting Conditions	Cutting Speed **vc** (SFM)	755	195
	Feed per Tooth **fz** (IPT)	.006	.003
	Width of Cut **ae** (in)	.039	.008
	Depth of Cut **ap** (in)	.055	.591
	Overhang Length (in)	—	5.59 (L/D=7)
Cutting Mode		—	Wet Cutting (Emulsion)
Machine		Vertical MC	Vertical MC
Results		Conventional products machined 8 pieces. iMX produced a good surface finish even after machining 70 pieces, giving 9X tool life.	The oversize type head achieved good surface finishes that reduced step differences in vertical wall surfaces.  **iMX**  Conventional

Head		**IMX20C15T190R10T080C**
Holder		**IMX20-U20N030L090C**
Workpiece		Stainless Steel 
Component		Blade
Intended Process		Finished Wing Surface
Cutting Conditions	Cutting Speed **vc** (SFM)	995
	Feed per Tooth **fz** (IPT)	.004
	Width of Cut **ae** (in)	.098
	Depth of Cut **ap** (in)	.016
	Overhang Length (in)	—
Cutting Mode		Wet Cutting (Emulsion)
Machine		5-Axis MC
Results		Advanced surface finishes compared to conventional tools.

Head		**IMX12CH6V120A45**
Holder		**IMX12-S12L100C**
Workpiece		AISI 4140 
Component		Swing Bearing
Intended Process		Gear Part Chamfer Milling
Cutting Conditions	Cutting Speed **vc** (SFM)	245
	Feed per Tooth **fz** (IPT)	.002
	Width of Cut **ae** (in)	.079
	Depth of Cut **ap** (in)	.079
	Overhang Length (in)	—
Cutting Mode		Dry Cutting
Machine		Machining Center
Results		iMX achieved longer tool life than conventional tools.

Memo

MTEC

MACHINING TECHNOLOGY AND EDUCATION CENTER

Welcome to our new world-class Machining Technology and Education Center (MTEC) in Mooresville, NC providing year round support and services to North America.



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We will review your current processes or outline a new process. From this review, we will improve productivity, analyze programming methods and output a solution with programming, tooling and time savings.

MACHINING SIMULATION

Using the latest CAD/CAM software and our cutting tool experience, we will outline a new process using proper machining techniques to maximize tool life and productivity.

TECHNICAL SUPPORT

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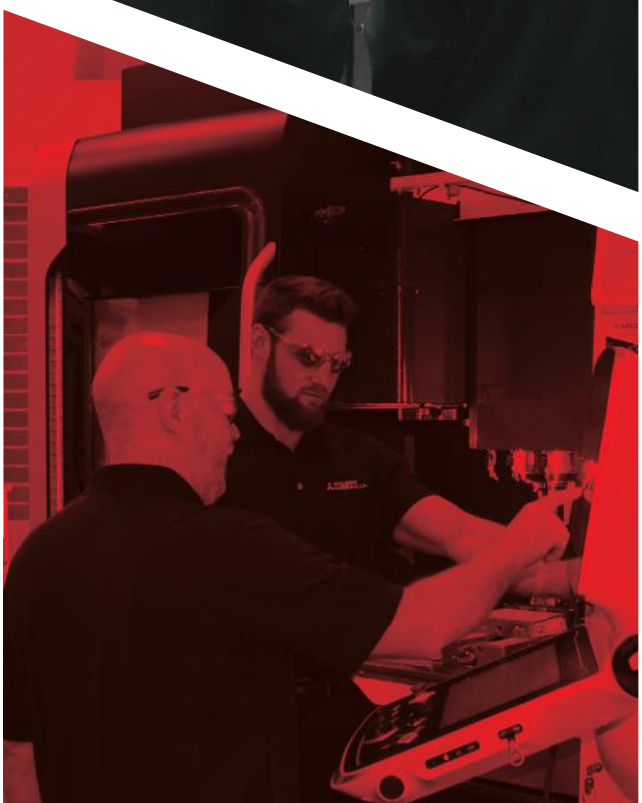
We are excited to offer several levels of training with goals to reach our highest level--Craftsman Machining Technology. At MTEC NC, we will train using a combination of classroom and hands-on machine time to develop skills and real-world understanding of materials, tools and applications. In addition to multi-day courses, we will have Machining Technology skills seminars, as well as seminars from our partners to complement our apprentice level courses, our journeyman courses, and up to our craftsman level courses.

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Information on course schedule,
course description, and accommodations

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California Office
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Customer Service: 800.523.0800
Technical Service: 800.486.2341

Chicago Office
(Engineering)

300 N. Martingale Road, Suite 500
Schaumburg, IL 60173
Main: 847.252.6300
Fax: 847.519.1732

MMC Metal de Mexico, S.A. DE C.V.

Av. La Cañada No.16,
Parque Industrial Bernardo
Quintana, El Marques,
Queretaro C.P. 76246 MEXICO
Main: +52.442.221.61.36
Fax: +52.442.221.61.34

North Carolina-MTEC
(Marketing & Technical Center)

105 Corporate Center Drive, Suite A
Mooresville, NC 28117
Main: 980.312.3100
Fax: 704.746.9292

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(Canada Branch)

600 Matheson Blvd. Unit 5 (Office)
Mississauga, ON L5R 4C1
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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 driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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Tools specifications subject to change without notice.

B200A-US-2026.4