

iMX

EXCHANGEABLE HEAD END MILLS

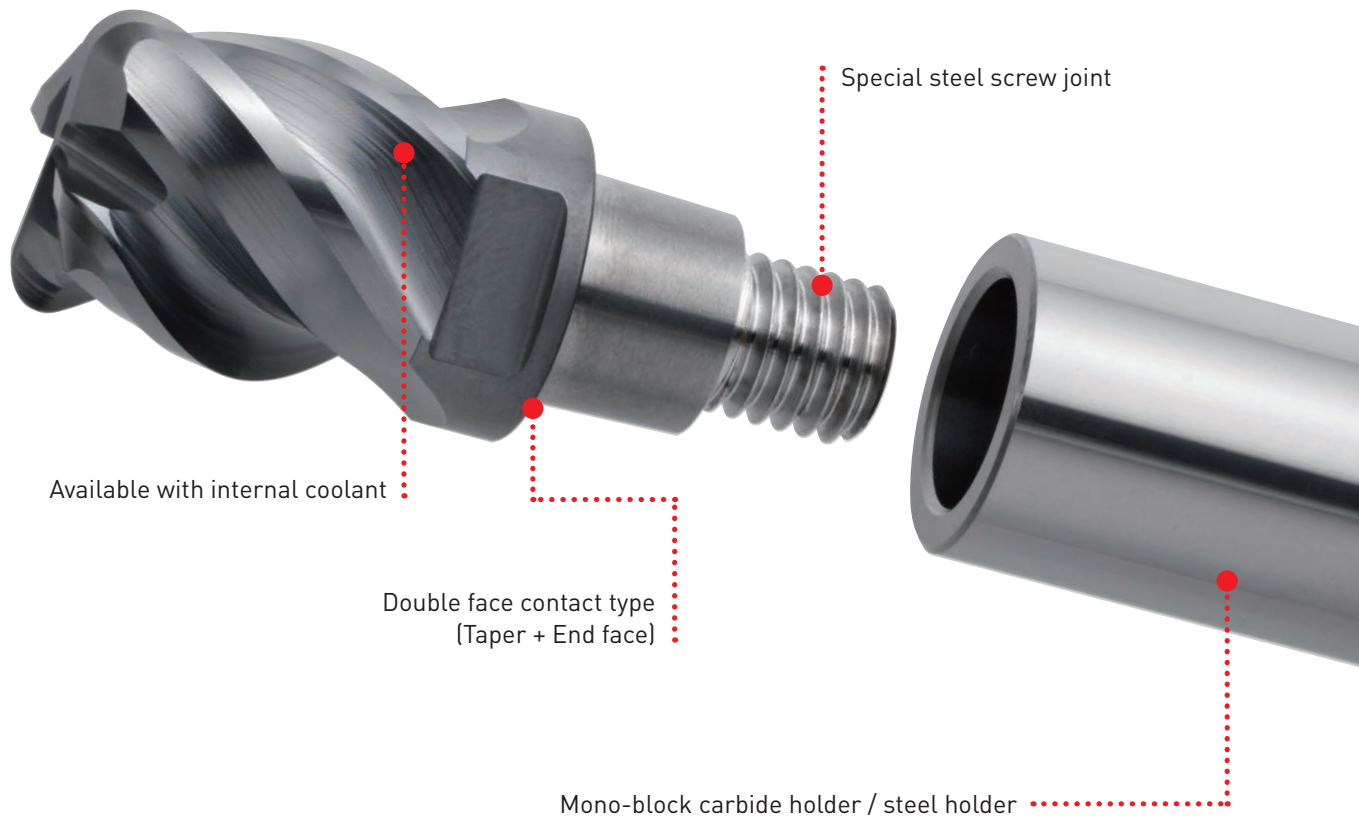


DIAEDGE

 **MITSUBISHI MATERIALS**

iMX

EXCHANGEABLE HEAD END MILLS

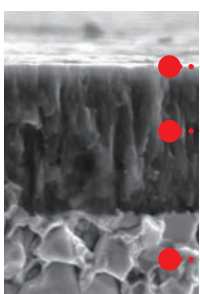


FEATURES

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 carbide end mill because the clamping faces are all solid carbide. Excellent for reduced inventory over a variety of applications due to the exchangeable head.

HIGHLY VERSATILE GRADES



EP7020

- Smoothed surface "ZERO- μ Surface"
- Newly developed (Al, Cr)N group coating
- Super-fine particle, super-hard base material

EP7020

Suitable for difficult-to-cut materials.

EP6120

Suitable for high feed milling of steel.

ET2020 (Uncoated)

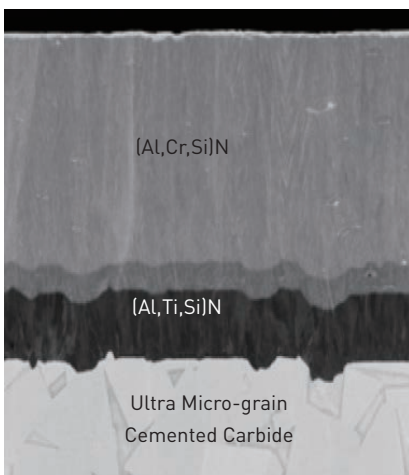
Suitable for milling aluminium.

iMX

EXCHANGEABLE HEAD END MILLS

NEW EP8100 SERIES (EP8110/EP8120)

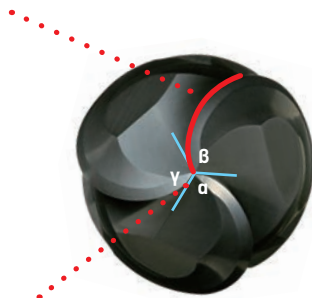
The combination of the [Al,Cr,Si]N coating (newly-developed), which has a high oxidation temperature and high lubricity, together with the [Al,Ti,Si]N coating, which has better wear resistance and high adhesion, allows hardened steel with even greater strength to be maintained.



- High Oxidation Temperature
- High Lubricity
- Better Wear Resistance
- High Adhesion

NEW iMX-B3FV

High Helical tooth improves fracture resistance.



Reduced vibration by optimised irregular curve.

$$\alpha \neq \beta \neq \gamma$$

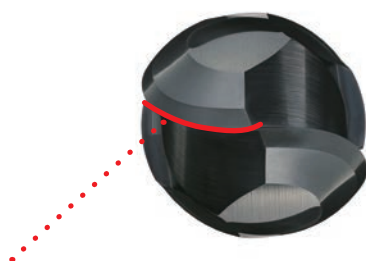
Stable wall machining is possible with a strong back taper angle.



EP 8120 is ideal for processing hot forging dies.

NEW iMX-B2S/4S

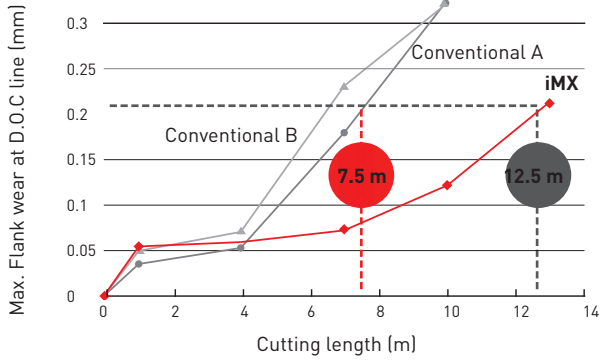
Low helix tooth is suitable for finishing.



EP8110 is ideal for processing high hardened steel.
($\leq 65\text{HRC}$)

TOOL LIFE COMPARISON WHEN MACHINING FLAT SURFACES IN INCONEL 718

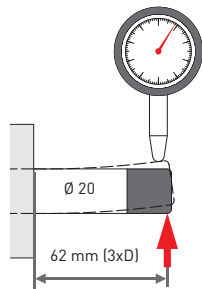
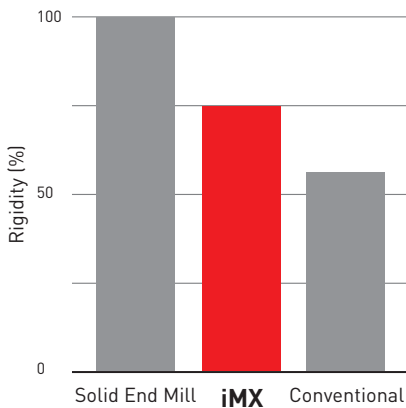
EP7020 is a new grade that enables extended tool life when machining difficult-to-cut materials.



Material	Inconel 718 (43HRC)
Tool	MX12-U12N041L100C
Holder	IMX12B4HV12012
Revolution n (min ⁻¹)	1.700
Cutting Speed Vc (m/min)	28
Table Feed Vf (mm/min)	350
Feed per Tooth fz (mm/t.)	0.05
Depth of Cut ap (mm)	0.6
Width of Cut ae (mm)	1.2
Overhang (mm)	65
Cutting Mode	Down cut
Coolant	Wet (Emulsion)
Machine	Vertical MC (BT40)

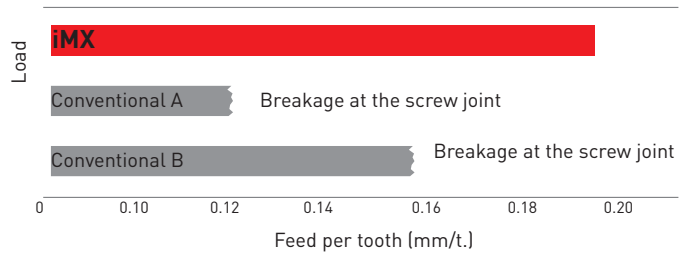
RIGIDITY

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



STRENGTH COMPARISON WHEN SLOT MILLING TITANIUM

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



Material	Ti-6Al-4V (32HRC)
Tool	IMX20-U20N030L090C
Holder	IMX20C4HV200R10021
Revolution n (min ⁻¹)	1.100
Cutting Speed Vc (m/min)	69
Table Feed Vf (mm/min)	880
Feed per Tooth fz (mm/t.)	0.20
Depth of Cut ap (mm)	10
Width of Cut ae (mm)	20
Overhang (mm)	72
Cutting Mode	Down cut
Coolant	Wet (Emulsion)
Machine	Vertical MC (BT50)

iMX

EXCHANGEABLE HEAD END MILLS

TAPER FLUTE, CORNER RADIUS, WITH COOLANT HOLE



Taper flute, corner radius end mills are regularly used for finish milling turbine blades. The iMX taper flute corner radius type offers equivalent performance but can achieve overall lower production costs.

FEATURES

EXTENSIVE RANGE OF CORNER RADII

For a wide range of applications



THROUGH COOLANT HOLE

For more stable chip evacuation

MULTI FLUTE

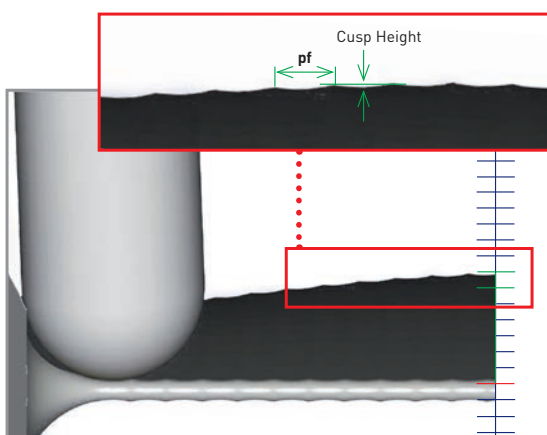
Higher efficiency milling with a multi-flute design.



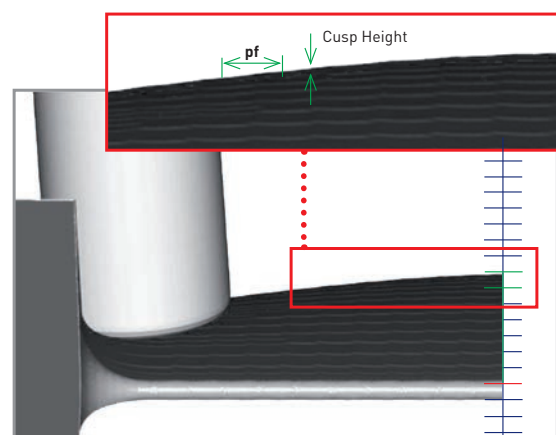
Taper angle = 8°

DRASTICALLY REDUCES CUTTING TIME

Corner radius geometry makes it possible to machine using a larger pick feed (pf) and simultaneously reduce the cusp height.



Set pf = 2.0mm, with R5 of the ball nose end mill

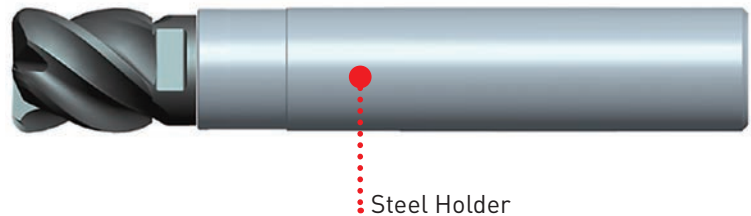


Set pf = 2.0mm, with IMX10C8T080R10T080C

iMX

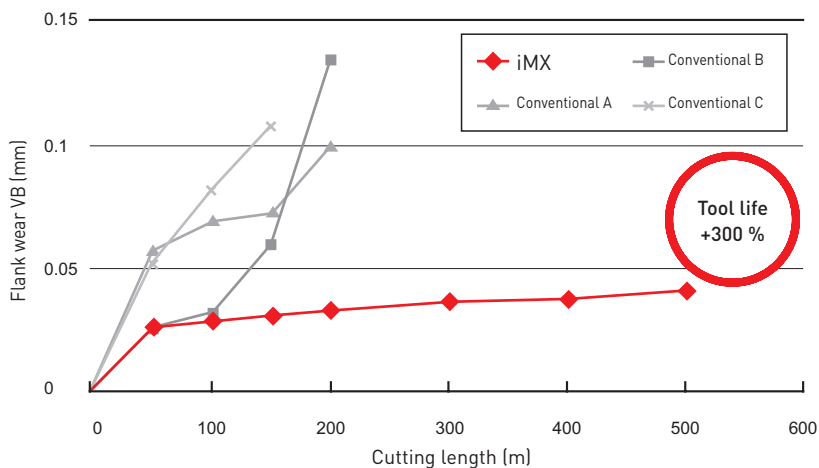
STEEL HOLDER

Cost efficient steel holders for low cut depth of cut machining when the overhang is short.



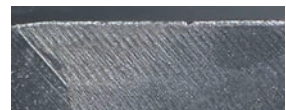
CUTTING PERFORMANCE

Tool life is at least 3 x longer when compared with conventional steel shanks.

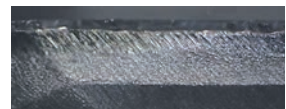


EDGE CONDITION

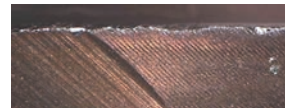
iMX S4HV
(Cutting length 150 m)



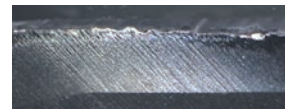
Conventional A
(Cutting length 100 m)



Conventional B
(Cutting length 100 m)

















Conventional C
(Cutting length 100 m)










Material	S55C
Tool	iMX10-U10N014L070S
Holder	IMX10C4HV100R10010
Revolution n (min ⁻¹)	5.100
Cutting Speed Vc (m/min)	160
Table Feed Vf (mm/min)	1.530
Feed per Tooth fz (mm/t.)	0.075
Depth of Cut ap (mm)	5
Width of Cut ae (mm)	0.5
Overhang (mm)	30
Cutting Mode	Down cut
Coolant	Emulsion (External)
Machine	BT50 M/C

iMX






HEAD

Product Code	Shape	Flutes	Size Range	Coolant	Long cutting edge	P	H	M	S	N
SQUARE	iMX-S3HV	Square head, 3 flute, Irregular helix		3	Ø 10 – Ø 25		⊙	⊙	⊙	○
	iMX-S4HV	Square head, 4 flute, Irregular helix		4	Ø 10 – Ø 32		⊙	⊙	⊙	○
		Square head, 4 flute, Irregular helix, Long cutting edge type			Ø 16, Ø 20	✓	⊙	⊙	⊙	○
	iMX-S4HV-S	Square head, 4 flute, Irregular helix, with coolant hole		4	Ø 10 – Ø 25	✓	⊙	⊙	⊙	○
	iMX-S3A	Square head, 3 flute, For aluminium alloy		3	Ø 10 – Ø 28					⊙
	iMX-R4F	Roughing head, 4 flute		4	Ø 10 – Ø 25		⊙	⊙	⊙	○
RADIUS	iMX-C4HV	Corner radius head, 4 flute, Irregular helix		4	Ø 10 – Ø 28		○	⊙	⊙	○
		Corner radius head, 4 flute, Irregular helix, Long cutting edge type			Ø 16, Ø 20	✓	○	⊙	⊙	○
	iMX-C4HV-S	Corner radius head, 4 flute, Irregular helix, with coolant hole		4	Ø 10 – Ø 25	✓	○	⊙	⊙	○
	iMX-C6HV			6	Ø 10, Ø 12		⊙	⊙	⊙	
	iMX-C10HV	Corner radius head, Multi-flute, Irregular helix		10	Ø 16		⊙	⊙	⊙	
	iMX-C12HV			12	Ø 20, Ø 25		⊙	⊙	⊙	
	iMX-C4FD-C	Duplex corner radius head with coolant hole, 4 flute, For high feed		4	Ø 10 – Ø 25	✓	⊙	⊙	⊙	○
	iMX-C4FV	Corner radius head for high efficiency machining, 4 flute, Irregular helix		4	Ø 10 – Ø 25		⊙	⊙		
	iMX-C3A	Corner radius head, 3 flute, For aluminium alloy		3	Ø 10 – Ø 28					⊙
	iMX-C8T			8	Ø 8	✓			⊙	⊙
	iMX-C10T			10	Ø 10	✓			⊙	⊙
	iMX-C12T	Corner radius, Taper head, Multi-flute, with coolant hole		12	Ø 15, Ø 19	✓			⊙	⊙
iMX-C15T				15	Ø 15, Ø 19	✓			⊙	⊙

Product Code	Shape	Flutes	Size Range	Coolant	Long cutting edge	P	H	M	S	N
BALL	iMX-B4HV	Ball nose head, 4 flute, Irregular curve		4	Ø 10 – Ø 25		⊙	⊙	⊙	○
	iMX-B4HV-E	Ball nose head, 4 flute, Irregular curve, with coolant hole		4	Ø 10 – Ø 25	✓	⊙	⊙	⊙	○
	iMX-B6HV	Ball nose head, 6 flute, Irregular curve		6	Ø 10 – Ø 25		⊙	⊙	⊙	○
	NEW iMX-B2S	Ball nose head, 2 flute, For hardened steel		2	Ø 10 - Ø 20		⊙			
	NEW iMX-B3FV	Ball nose head, For high efficiency machining, 3 flute, Irregular curve		3	Ø 10 - Ø 20		⊙	⊙		
	CHAMFER	iMX-CH3L	Chamfer head, 3 flute		3	Ø 10 – Ø 20		⊙	○	⊙
iMX-CH6V		Chamfer head, 6 flute		6	Ø 12 – Ø 20		⊙	○	⊙	⊙

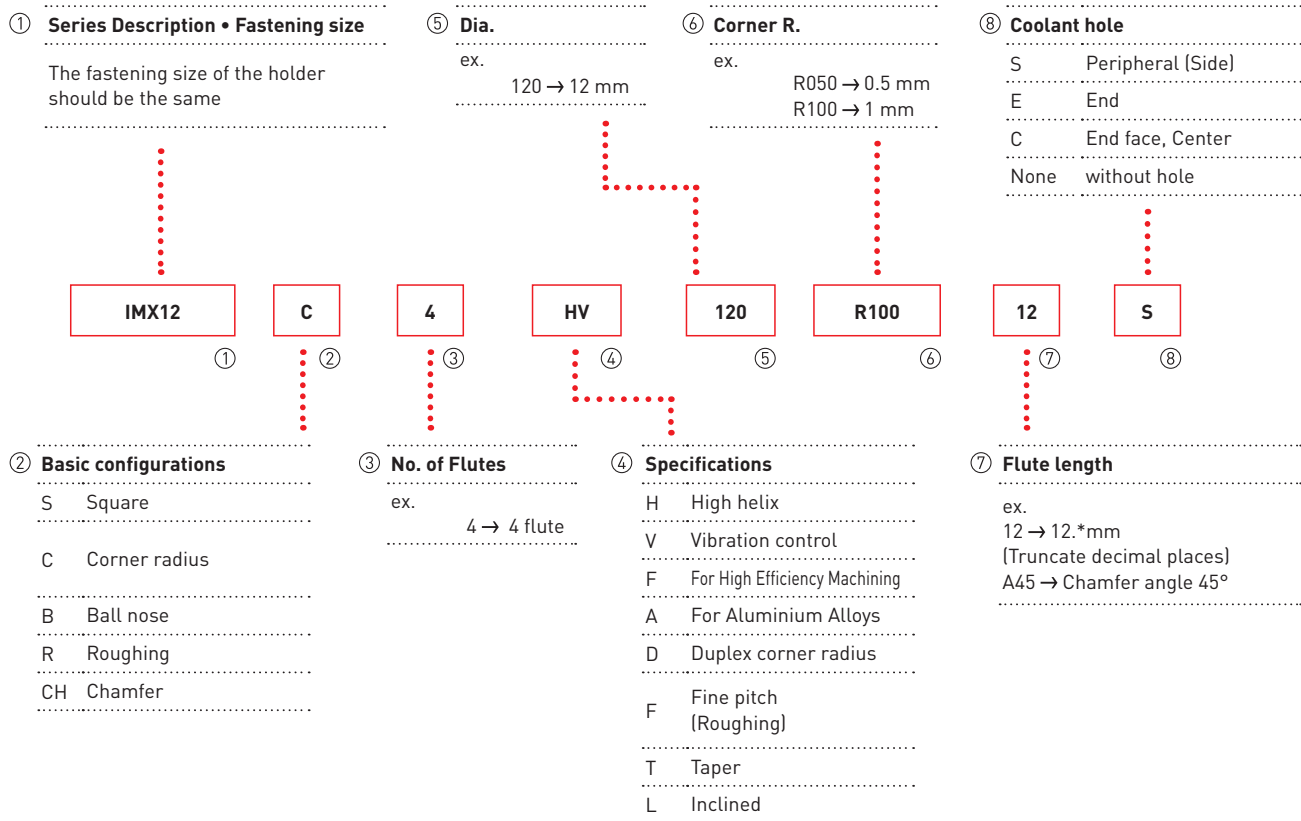
HOLDER

The undercut type holders are available in medium, semi-long and long lengths.

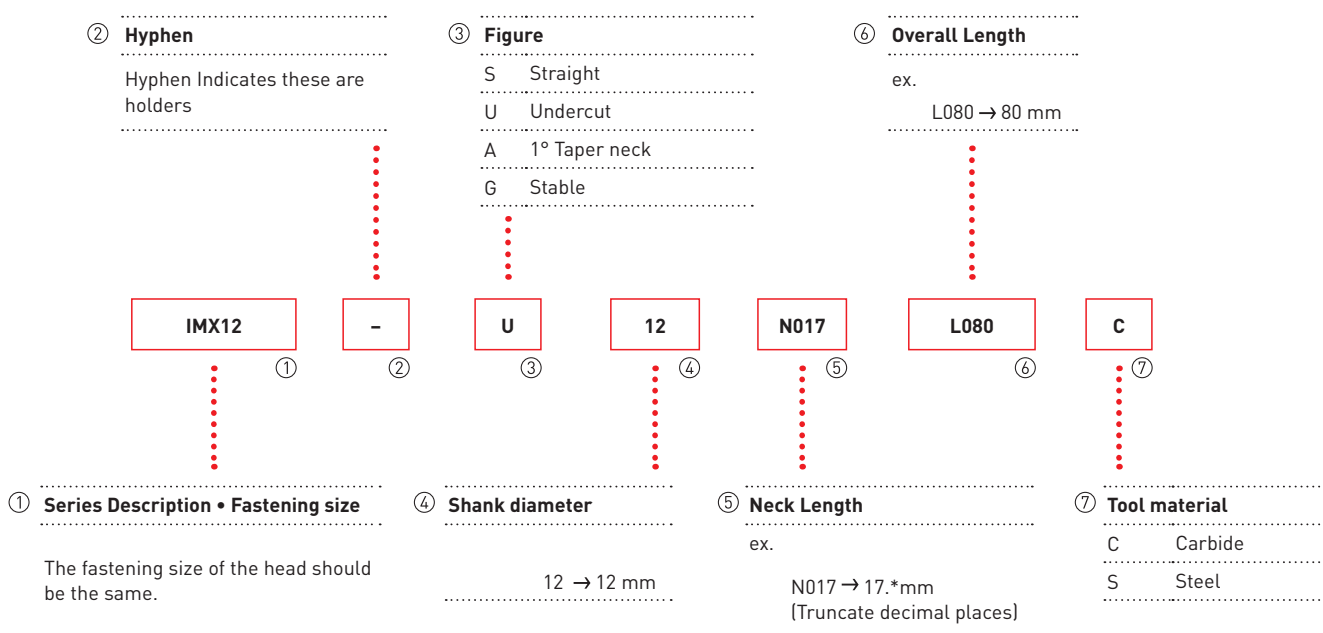
Type		Length	Taper Angle	Material
Under cut		Medium Semi-long Long	—	Carbide
		Medium	—	Steel
Straight		Semi-long Long	—	Carbide
		Medium	—	Steel
Taper neck		Long	1°	Carbide

iMX > IDENTIFICATION

HEAD



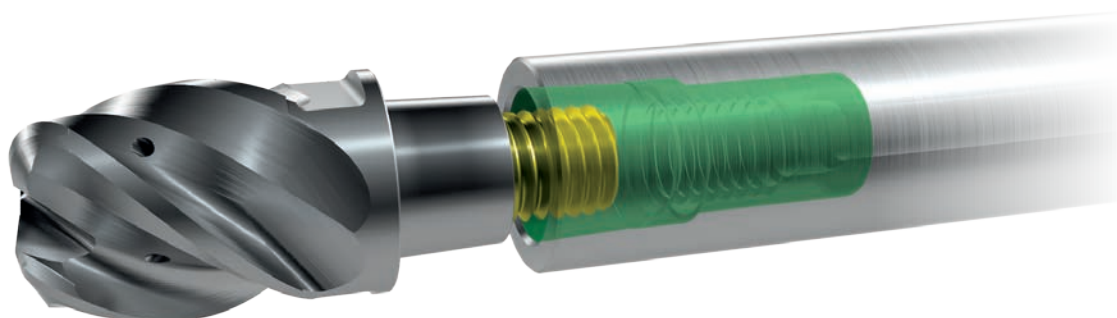
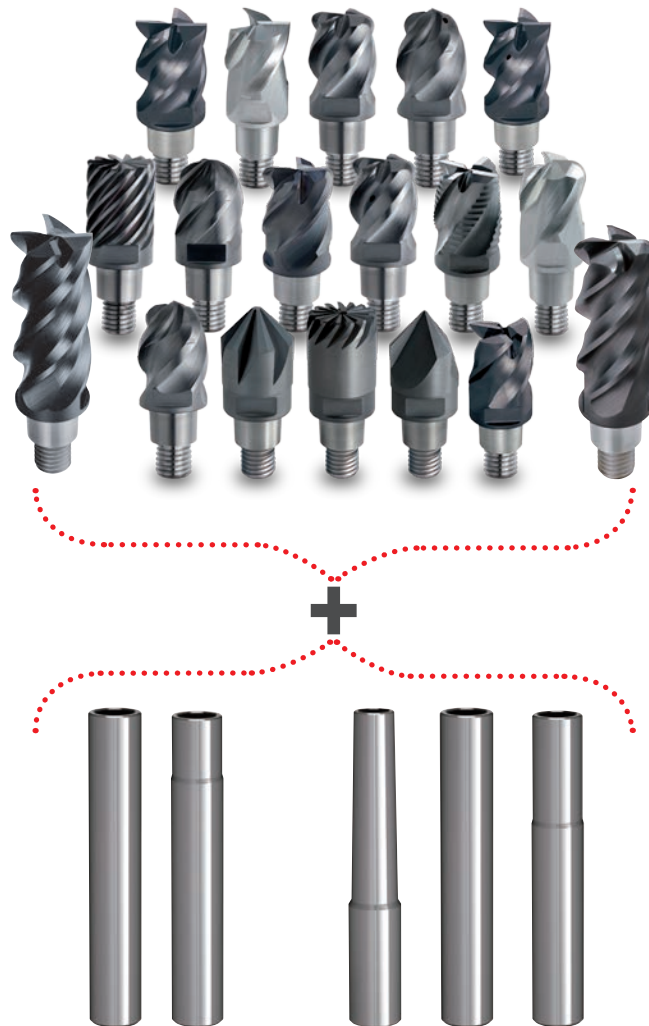
HOLDER



RUN-OUT ACCURACY AND HEAD EXCHANGE ACCURACY

Unit : mm

External diameter D1	Run-out of the peripheral cutting edge	Axial head exchange accuracy
<Ø25	0.015	±0.02
>Ø25	0.020	

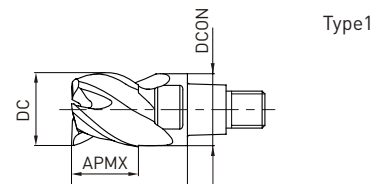


iMX-S3HV



SQUARE HEAD, 3 FLUTE, IRREGULAR HELIX

P M N S



	DC < 12	DC > 12
	0	0
	-0.020	-0.030

3-flute end mills suitable for side milling, slotting and plunging.
Irregular helix controls vibration and achieves stable machining.

Order Number	DC	APMX	LH	DCON	Flutes	EP7020	Type
IMX10S3HV10008	10	8.5	16	9.7	3	●	1
IMX12S3HV12010	12	10.1	19	11.7	3	●	1
IMX16S3HV16013	16	13.3	24	15.5	3	●	1
IMX20S3HV20017	20	17	30	19.5	3	●	1
IMX25S3HV25021	25	21	37.5	24.5	3	●	1

CUTTING CONDITIONS

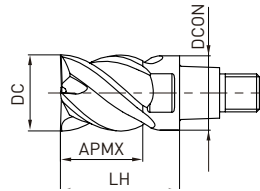
P36,37,38

iMX-S4HV

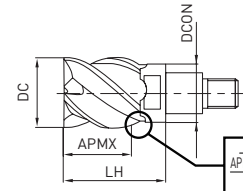


SQUARE HEAD, 4 FLUTE, IRREGULAR HELIX

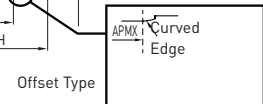
P M N S



Type1



Type2

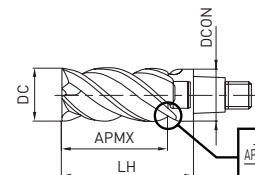


↓	DC < 12	DC > 12
	0	0
	-0.020	-0.030

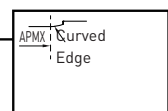
Irregular helix controls vibration and achieves stable machining even when machining difficult-to-cut materials and for applications with a long overhang.

Order Number	DC	APMX	LH	DCON	Flutes	EP7020	Type
IMX10S4HV10010	10	10.5	16	9.7	4	●	1
IMX10S4HV12012	12	12.5	19	9.7	4	●	2
IMX12S4HV12012	12	12.5	19	11.7	4	●	1
IMX12S4HV14014	14	14.5	22.5	11.7	4	●	2
IMX16S4HV16016	16	16.5	24	15.5	4	●	1
IMX16S4HV18018	18	18.5	27	15.5	4	●	2
IMX20S4HV20021	20	21	30	19.5	4	●	1
IMX20S4HV22023	22	23	33	19.5	4	●	2
IMX25S4HV25026	25	26	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

LONG CUTTING EDGE TYPE



Type3



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

CUTTING CONDITIONS

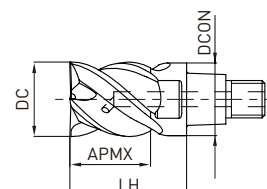
P35 - P38

iMX-S4HV-S



SQUARE HEAD, 4 FLUTE, IRREGULAR HELIX, WITH COOLANT HOLE

P M N S



Type1

(Peripheral cutting edge with coolant hole)

↑	DC < 12	DC > 12
	0	0
	-0.020	-0.030

Coolant holes in each flute enables a stable coolant supply.
Irregular helix controls vibration and achieves stable machining.

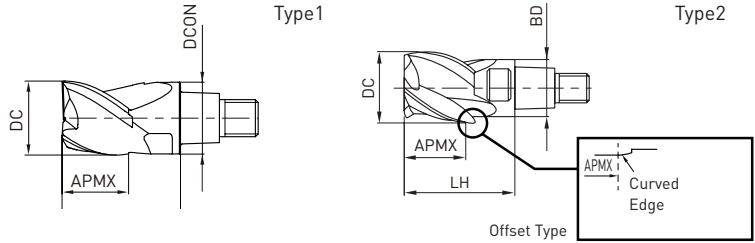
Order Number	DC	APMX	LH	DCON	Flutes	EP7020	Type
IMX10S4HV10010S	10	10.5	16	9.7	4	●	1
IMX12S4HV12012S	12	12.5	19	11.7	4	●	1
IMX16S4HV16016S	16	16.5	24	15.5	4	●	1
IMX20S4HV20021S	20	21	30	19.5	4	●	1
IMX25S4HV25026S	25	26	37.5	24.5	4	●	1

iMX-S3A



SQUARE HEAD, 3 FLUTE, FOR ALUMINIUM ALLOY

N



	DC < 12	DC > 12
	0	0
	-0.020	-0.030

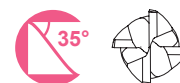
High efficiency machining is possible due to the polished rake face and sharp cutting edge.

Order Number	DC	APMX	LH	DCON	Flutes	ET2020	Type
IMX10S3A10008	10	8.5	16	9.7	3	●	1
IMX10S3A12010	12	10.1	19	9.7	3	●	2
IMX12S3A12010	12	10.1	19	11.7	3	●	1
IMX12S3A14011	14	11.7	22.5	11.7	3	●	2
IMX16S3A16013	16	13.3	24	15.5	3	●	1
IMX16S3A18014	18	14.9	27	15.5	3	●	2
IMX20S3A20017	20	17	30	19.5	3	●	1
IMX20S3A22018	22	18.6	33	19.5	3	●	2
IMX25S3A25021	25	21	37.5	24.5	3	●	1
IMX25S3A28023	28	23.4	41.5	24.5	3	●	2

CUTTING CONDITIONS

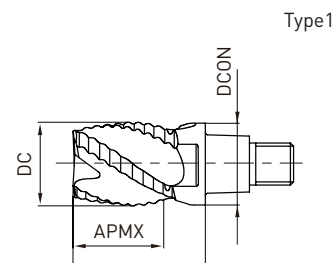
P51, P52

iMX-R4F



ROUGHING HEAD, 4 FLUTE

P M N S



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

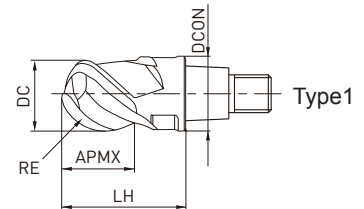
Order Number	DC	APMX	LH	DCON	Flutes	EP7020	Type
IMX10R4F10010	10	10.5	16	9.7	4	●	1
IMX12R4F12012	12	12.5	19	11.7	4	●	1
IMX16R4F16016	16	16.5	24	15.5	4	●	1
IMX20R4F20021	20	21	30	19.5	4	●	1
IMX25R4F25026	25	26	37.5	24.5	4	●	1

iMX-B3FV



BALL NOSE HEAD, FOR HIGH EFFICIENCY MACHINING, 3 FLUTE, IRREGULAR CURVE

P H



R	RE<6	RE>6
	±0.010	±0.020

High efficiency machining is possible in deep engraving processing (DCx5)

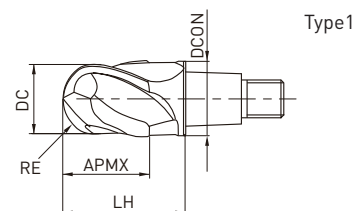
Order Number	RE	DC	APMX	LH	DCON	Flutes	EP8120	Type
NEW IMX10B3FV10008	5	10	8	16	9.7	3	★	1
NEW IMX12B3FV12009	6	12	9.6	19	11.7	3	★	1
NEW IMX16B3FV16012	8	16	12.8	24	15.5	3	★	1
NEW IMX20B3FV20016	10	20	16	30	19.5	3	★	1

iMX-B2S



BALL NOSE HEAD, 2 FLUTE, FOR HARDENED STEEL

H

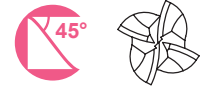


R	RE<6	RE>6
	±0.010	±0.020

Ideal for machining with long overhangs.

Order Number	RE	DC	APMX	LH	DCON	Flutes	EP8110	Type
NEW IMX10B2S10010	5	10	10	16	9.7	2	★	1
NEW IMX12B2S12012	6	12	12	19	11.7	2	★	1
NEW IMX16B2S16016	8	16	16	24	15.5	2	★	1
NEW IMX20B2S20020	10	20	20	30	19.5	2	★	1

iMX-B4HV

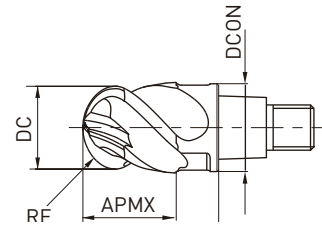


BALL NOSE HEAD, 4 FLUTE, IRREGULAR CURVE

P M S



Type1



R	DC < 12	DC > 12
	±0.010	±0.020
RF	DC < 12	DC > 12
	0	0
	-0.020	-0.030

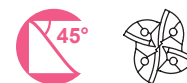
Irregular curved cutting edge controls vibration and achieves stable machining of difficult-to-cut materials and is suitable for long overhang applications.

Order Number	RE	DC	APMX	LH	DCON	Flutes	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

CUTTING CONDITIONS

P45

iMX-B4HV-E

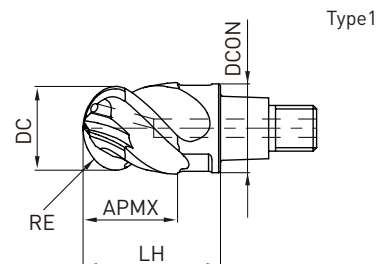


BALL NOSE HEAD, 4 FLUTE, IRREGULAR CURVE, WITH COOLANT HOLE

P **M** **S**



(End cutting edge with coolant hole)



	DC<12	DC>12
	±0.010	±0.020

	DC<12	DC>12
	0	0
	-0.020	-0.030

Coolant holes in each flute enable a stable coolant supply.
Irregular curved cutting edge controls vibration and achieves stable machining of difficult-to-cut materials and is suitable for long overhang applications.

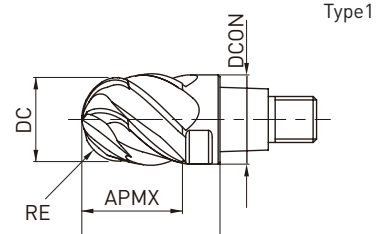
Order Number	RE	DC	APMX	LH	DCON	Flutes	EP7020	Type
IMX10B4HV10010E	5	10	10.5	16	9.7	4	●	1
IMX12B4HV12012E	6	12	12.5	19	11.7	4	●	1
IMX16B4HV16016E	8	16	16.5	24	15.5	4	●	1
IMX20B4HV20021E	10	20	21	30	19.5	4	●	1
IMX25B4HV25026E	12.5	25	26	37.5	24.5	4	●	1

iMX-B6HV



BALL NOSE HEAD, 6 FLUTE, IRREGULAR CURVE

P M S

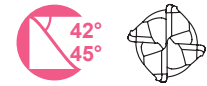


R	DC < 12	DC > 12
	±0.010	±0.020
N	DC < 12	DC > 12
	0 -0.020	0 -0.030

Irregular curved cutting edge for vibration control and stable machining of difficult-to-cut materials.
6 flutes enable a high machining efficiency.

Order Number	RE	DC	APMX	LH	DCON	Flutes	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

iMX-C4HV

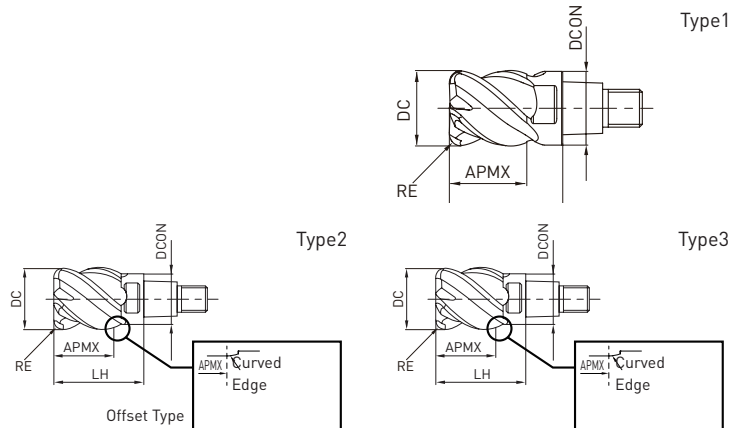


CORNER RADIUS HEAD, 4 FLUTE, IRREGULAR HELIX

P M S H



R	±0.020
D	D1 < 12 DC > 12
	0 0
	-0.020 -0.030

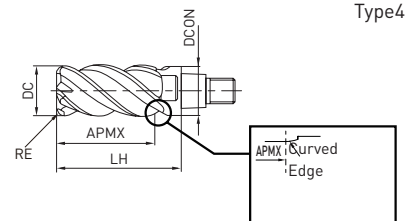


Vibration control corner radius type achieves stable machining of difficult-to-cut materials and is suitable for long overhang applications due to the irregular helix.

Order Number	DC	RE	APMX	LH	DCON	Flutes	EP7020	Type
IMX10C4HV100R03010	10	0.3	10	16	9.7	4	●	3
IMX10C4HV100R05010	10	0.5	10.5	16	9.7	4	●	1
IMX10C4HV100R10010	10	1	10.5	16	9.7	4	●	1
IMX10C4HV100R15010	10	1.5	10.5	16	9.7	4	●	1
IMX10C4HV100R20010	10	2	10.5	16	9.7	4	●	1
IMX10C4HV100R25010	10	2.5	10.5	16	9.7	4	●	1
IMX10C4HV100R30010	10	3	10.5	16	9.7	4	●	1
IMX10C4HV110R05011	11	0.5	11.5	16	9.7	4	★	2
IMX10C4HV110R10011	11	1	11.5	16	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	★	3
IMX12C4HV120R05012	12	0.5	12.5	19	11.7	4	●	1
IMX12C4HV120R10012	12	1	12.5	19	11.7	4	●	1
IMX12C4HV120R15012	12	1.5	12.5	19	11.7	4	●	1
IMX12C4HV120R20012	12	2	12.5	19	11.7	4	●	1
IMX12C4HV120R25012	12	2.5	12.5	19	11.7	4	●	1
IMX12C4HV120R30012	12	3	12.5	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
IMX16C4HV160R05016	16	0.3	16	24	15.5	4	●	3
IMX16C4HV160R05016	16	0.5	16.5	24	15.5	4	●	1
IMX16C4HV160R10016	16	1	16.5	24	15.5	4	●	1
IMX16C4HV160R15016	16	1.5	16.5	24	15.5	4	●	1

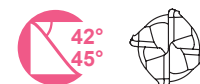
Order Number	DC	RE	APMX	LH	DCON	Flutes	EP7020	Type
IMX16C4HV160R20016	16	2	16.5	24	15.5	4	●	1
IMX16C4HV160R25016	16	2.5	16.5	24	15.5	4	●	1
IMX16C4HV160R30016	16	3	16.5	24	15.5	4	●	1
IMX16C4HV160R40016	16	4	16.5	24	15.5	4	●	1
IMX16C4HV160R50016	16	5	16.5	24	15.5	4	●	1
IMX16C4HV170R05017	17	0.5	17.5	26	15.5	4	★	2
IMX16C4HV170R10017	17	1	17.5	26	15.5	4	★	2
IMX16C4HV180R03018	18	0.3	18.5	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	●	3
IMX20C4HV200R05021	20	0.5	21	30	19.5	4	●	1
IMX20C4HV200R10021	20	1	21	30	19.5	4	●	1
IMX20C4HV200R15021	20	1.5	21	30	19.5	4	●	1
IMX20C4HV200R20021	20	2	21	30	19.5	4	●	1
IMX20C4HV200R25021	20	2.5	21	30	19.5	4	●	1
IMX20C4HV200R30021	20	3	21	30	19.5	4	●	1
IMX20C4HV200R40021	20	4	21	30	19.5	4	●	1
IMX20C4HV200R50021	20	5	21	30	19.5	4	●	1
IMX20C4HV200R60020	20	6	20	30	19.5	4	●	3
IMX20C4HV200R63521	20	6.35	21	30	19.5	4	●	1
IMX20C4HV220R05023	23	0.5	23	33	19.5	4	★	2
IMX20C4HV220R10023	22	1	23	33	19.5	4	●	2
IMX20C4HV220R20023	23	2	23	33	19.5	4	●	2
IMX20C4HV220R30023	22	3	23	33	19.5	4	●	2
IMX25C4HV250R10026	25	1	26	37.5	24.5	4	●	1
IMX25C4HV250R20026	25	2	26	37.5	24.5	4	●	1
IMX25C4HV250R30026	25	3	26	37.5	24.5	4	●	1
IMX25C4HV250R40026	25	4	26	37.5	24.5	4	●	1
IMX25C4HV250R50026	25	5	26	37.5	24.5	4	●	1
IMX25C4HV250R60025	25	6	25	37.5	24.5	4	●	3
IMX25C4HV250R63526	25	6.35	26	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

LONG CUTTING EDGE TYPE



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

iMX-C4HVS



CORNER RADIUS HEAD, 4 FLUTE, IRREGULAR HELIX, WITH COOLANT HOLE

P **M** **S** **H**

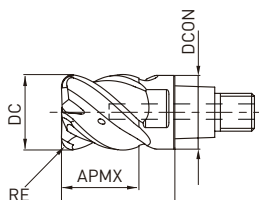


R

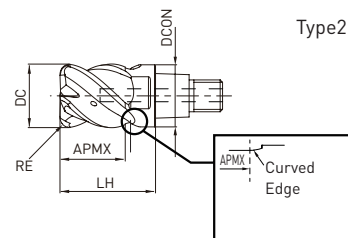
±0.020

↓

D1 < 12	DC > 12
0	0
- 0.020	- 0.030



Type1

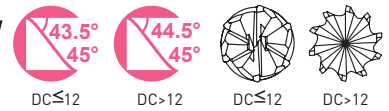


Type2

Coolant holes in each flute enables a stable coolant supply. Vibration control corner radius type for the stable machining of difficult-to-cut materials and long overhang applications due to the irregular helix.

Order Number	DC	RE	APMX	LH	DCON	Flutes	EP7020	Type
IMX10C4HV100R03010S	10	0.3	10	16	9.7	4	●	2
IMX10C4HV100R05010S	10	0.5	10	16	9.7	4	●	2
IMX10C4HV100R10010S	10	1	10.5	16	9.7	4	●	1
IMX10C4HV100R15010S	10	1.5	10	16	9.7	4	●	2
IMX10C4HV100R20010S	10	2	10	16	9.7	4	●	2
IMX10C4HV100R30010S	10	3	10	16	9.7	4	●	2
IMX12C4HV120R03012S	12	0.3	12	19	11.7	4	●	2
IMX12C4HV120R05012S	12	0.5	12	19	11.7	4	●	2
IMX12C4HV120R10012S	12	1	12.5	19	11.7	4	●	1
IMX12C4HV120R15012S	12	1.5	12	19	11.7	4	●	2
IMX12C4HV120R20012S	12	2	12	19	11.7	4	●	2
IMX12C4HV120R30012S	12	3	12	19	11.7	4	●	2
IMX12C4HV120R40012S	12	4	12	19	11.7	4	●	2
IMX16C4HV160R05016S	16	0.5	16	24	15.5	4	●	2
IMX16C4HV160R10016S	16	1	16.5	24	15.5	4	●	1
IMX16C4HV160R15016S	16	1.5	16	24	15.5	4	●	2
IMX16C4HV160R20016S	16	2	16	24	15.5	4	●	2
IMX16C4HV160R30016S	16	3	16	24	15.5	4	●	2
IMX16C4HV160R40016S	16	4	16	24	15.5	4	●	2
IMX20C4HV200R05020S	20	0.5	20	30	19.5	4	●	2
IMX20C4HV200R10021S	20	1	21	30	19.5	4	●	1
IMX20C4HV200R15020S	20	1.5	20	30	19.5	4	●	2
IMX20C4HV200R20020S	20	2	20	30	19.5	4	●	2
IMX20C4HV200R30020S	20	3	20	30	19.5	4	●	2
IMX20C4HV200R40020S	20	4	20	30	19.5	4	●	2
IMX20C4HV200R60020S	20	6	20	30	19.5	4	●	2
IMX20C4HV200R63520S	20	6.35	20	30	19.5	4	●	2
IMX25C4HV250R10026S	25	1	26	37.5	24.5	4	●	1
IMX25C4HV250R15025S	25	1.5	25	37.5	24.5	4	●	2
IMX25C4HV250R20025S	25	2	25	37.5	24.5	4	●	2
IMX25C4HV250R30025S	25	3	25	37.5	24.5	4	●	2
IMX25C4HV250R40025S	25	4	25	37.5	24.5	4	●	2
IMX25C4HV250R60025S	25	6	25	37.5	24.5	4	●	2
IMX25C4HV250R63525S	25	6.35	25	37.5	24.5	4	●	2

iMX-C6HV/C10HV/C12HV

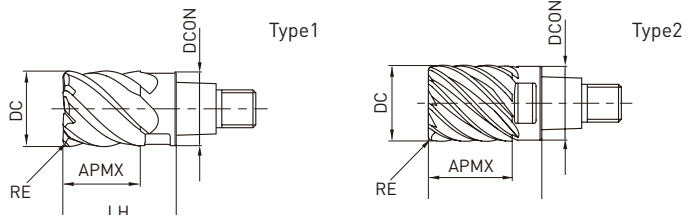


CORNER RADIUS HEAD, MULTI-FLUTE, IRREGULAR HELIX

P M S



R	±0.020	
	DC < 12	DC > 12
↓	0	0
	-0.020	-0.030



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

Order Number	DC	RE	APMX	LH	DCON	Flutes	EP7020	Type
IMX10C6HV100R05010	10	0.5	10.5	16	9.7	6	●	1
IMX10C6HV100R10010	10	1	10.5	16	9.7	6	●	1
IMX12C6HV120R10012	12	1	12.5	19	11.7	6	●	1
IMX16C10HV160R10016	16	1	16.5	24	15.5	10	●	2
IMX20C12HV200R10021	20	1	21	30	19.5	12	●	2
IMX25C12HV250R10026	25	1	26	37.5	24.5	12	●	2

CUTTING CONDITIONS

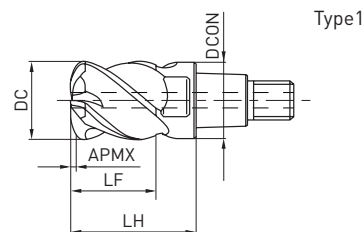
P53

IMX-C4FD-C



DUPLEX CORNER RADIUS HEAD WITH COOLANT HOLE, 4 FLUTE, FOR HIGH FEED

P **M** **S** **H**



	DC < 12	DC > 12
	0	0
	- 0.020	- 0.030

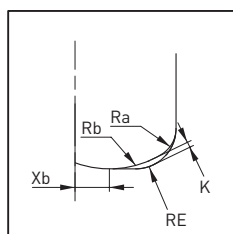
The duplex corner radius and 4 flute geometry enables efficient machining at higher feed rates. End face centre coolant hole provides a stable supply of coolant.

Order Number	DC	*1				LH	DCON	Flutes	*2		Type
		RE	APMX	LF	RMPX				EP7020		
IMX10C4FDC0010C	10	1.99	0.7	10.5	16	9.7	4	2.1	●	1	
IMX12C4FDC2012C	12	2.1	0.8	12.5	19	11.7	4	2.8	●	1	
IMX16C4FDC6016C	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. The fastening size of the holder and head should be the same. [refer to P7]
2. Duplex corner radius end mill is not suitable for corner radius machining due to the possibility of leaving unmachined areas.

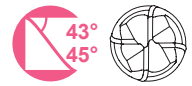
*1 RE : Approximate Radius
*2 RMPX : Max. Ramping Angle

Order Number	RE *	Duplex corner radius			
		K	Xb	Ra	Rb
IMX10C4FDC0010C	1.99	0.27	1.7	1.5	5
IMX12C4FDC2012C	2.1	0.33	2.25	1.5	6
IMX16C4FDC6016C	2.75	0.42	3.1	2	8
IMX20C4FD20021C	3.07	0.59	4	2	10
IMX25C4FD25026C	4.21	0.67	5	3	12



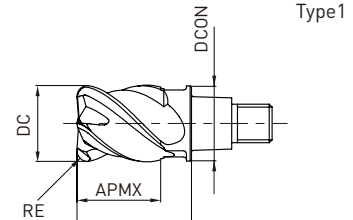
*Note for programming
Approximate Radius = RE
Uncut portion = K

iMX-C4FV



CORNER RADIUS HEAD FOR HIGH EFFICIENCY MACHINING, 4 FLUTE, IRREGULAR HELIX

P H



R	DC < 20	DC = 25
	±0.010	±0.020
↕	DC < 12	DC > 12
	0	0
	-0.020	-0.030

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

Order Number	DC	RE	APMX	LH	DCON	Flutes	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

CUTTING CONDITIONS

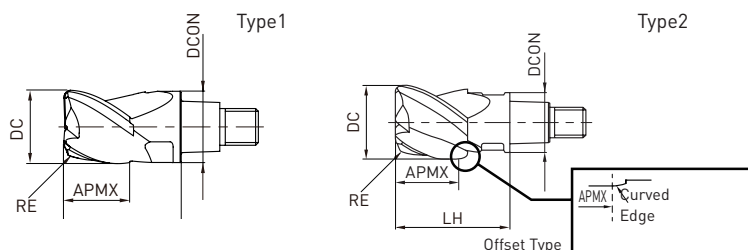
P53



iMX-C3A

CORNER RADIUS HEAD, 3 FLUTE, FOR ALUMINIUM ALLOY

N



	±0.020	
	DC < 12	DC > 12
	0	0
	-0.020	-0.030

High efficiency machining is possible due to polished rake face and sharp cutting edge.

Order Number	DC	RE	APMX	LH	DCON	Flutes	EP7020	Type
IMX10C3A100R10008	10	1	8.5	16	9.7	3	●	1
IMX10C3A100R25008	10	2.5	8.5	16	9.7	3	●	1
IMX10C3A120R10010	12	1	10.1	19	9.7	3	●	2
IMX12C3A120R10010	12	1	10.1	19	11.7	3	●	1
IMX12C3A120R32010	12	3.2	10.1	19	11.7	3	●	1
IMX12C3A140R10011	14	1	11.7	22.5	11.7	3	●	2
IMX16C3A160R10013	16	1	13.3	24	15.5	3	●	1
IMX16C3A160R32013	16	3.2	13.3	24	15.5	3	●	1
IMX16C3A180R32014	18	3.2	14.9	27	15.5	3	●	2
IMX20C3A200R10017	20	1	17	30	19.5	3	●	1
IMX20C3A200R32017	20	3.2	17	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
IMX25C3A250R32021	25	3.2	21	37.5	24.5	3	●	1
IMX25C3A250R50021	25	5	21	37.5	24.5	3	●	1
IMX25C3A280R32023	28	3.2	23.4	41.5	24.5	3	●	2

iMX-C8T/C10T/C12T/C15T

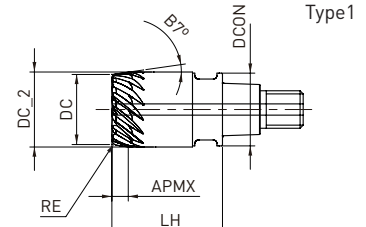


CORNER RADIUS, TAPER HEAD, MULTI-FLUTE,
WITH COOLANT HOLE

M S



(End mill with end face centre coolant hole)



R	±0.015	
	DC < 12	DC > 12
↓	0	0
	- 0.020	- 0.030

Suitable for machining 3-dimensional surfaces such as blades.
High feed cutting is possible due to multiple cutting edges and wide chip pocket.

Order Number	DC	RE	APMX	DC_2	LH	DCON	B7	Flutes	EP7020	Type
IMX10C8T080R05T080C	8	0.5	7.12	10	16.0	9.7	8	8	●	1
IMX10C8T080R10T080C	8	1	7.12	10	16.0	9.7	8	8	●	1
IMX12C10T100R05T080C	10	0.5	7.12	12	19.0	11.7	8	10	●	1
IMX12C10T100R10T080C	10	1	7.12	12	19.0	11.7	8	10	●	1
IMX16C15T150R05T080C	15	0.5	3.56	16	24.0	15.5	8	15	●	1
IMX16C15T150R10T080C	15	1	3.56	16	24.0	15.5	8	15	●	1
IMX16C12T150R20T080C	15	2	3.56	16	24.0	15.5	8	12	●	1
IMX20C15T190R05T080C	19	0.5	3.56	20	30.0	19.5	8	15	●	1
IMX20C15T190R10T080C	19	1	3.56	20	30.0	19.5	8	15	●	1
IMX20C12T190R20T080C	19	2	3.56	20	30.0	19.5	8	12	●	1

CUTTING CONDITIONS

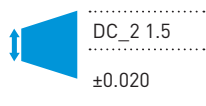
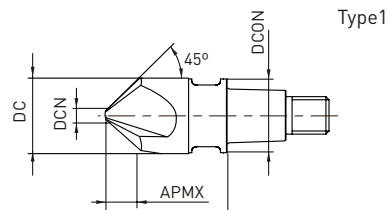
P54



iMX-CH3L

CHAMFER HEAD, 3 FLUTE

P M S H



Cutting head suitable for chamfering
Anti-vibration design.

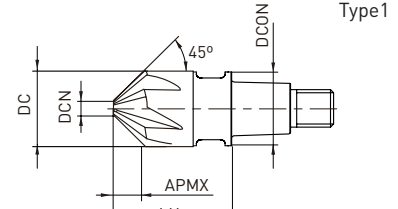
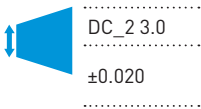
Order Number	DC	APMX	DCN	LH	DCON	Flutes	EP7020	Type
IMX10CH3L100A45	10	4.2	1.5	16.0	9.7	3	●	1
IMX12CH3L120A45	12	5.2	1.5	19.0	11.7	3	●	1
IMX16CH3L160A45	16	7.2	1.5	24.0	15.5	3	●	1
IMX20CH3L200A45	20	9.2	1.5	30.0	19.5	3	●	1

iMX-CH6V



CHAMFER HEAD, 6 FLUTE

P M S H



Suitable for outer edge chamfering.
Multiple edge design for long tool life.

Order Number	DC	APMX	DCN	LH	DCON	Flutes	EP7020	Type
IMX12CH6V120A45	12	4.5	3.0	19.0	11.7	6	●	1
IMX16CH6V160A45	16	6.5	3.0	24.0	15.5	6	●	1
IMX20CH6V200A45	20	8.5	3.0	30.0	19.5	6	●	1

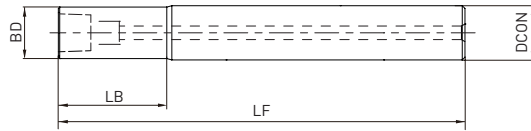
CUTTING CONDITIONS

P55

iMX

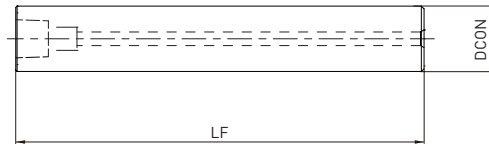
CARBIDE HOLDER

Undercut



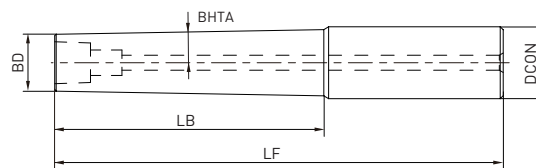
Type1

Straight



Type2

Taper neck type



Type3

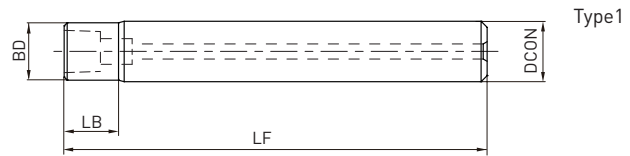
h6	DCON=10	12<D4<16	20<D4<25
	0	0	0
	- 0.009	- 0.011	- 0.013

Order Number	BHTA	LB	BD	LF	DCON	Stock	Type	Suitable Head	Wrench	Anti-seize Lubricant
IMX10-U10N014L070C	-	14	9.7	70	10	●	1	IMX10	IMX10-WR	MK1KS
IMX10-S10L090C	-	-	-	90	10	●	2	IMX10	IMX10-WR	MK1KS
IMX10-U10N034L090C	-	34	9.7	90	10	●	1	IMX10	IMX10-WR	MK1KS
IMX10-S10L110C	-	-	-	110	10	●	2	IMX10	IMX10-WR	MK1KS
IMX10-U10N054L110C	-	54	9.7	110	10	●	1	IMX10	IMX10-WR	MK1KS
IMX10-A12N054L110C	1	54	9.7	110	12	●	3	IMX10	IMX10-WR	MK1KS
IMX12-U12N017L080C	-	17	11.7	80	12	●	1	IMX12	IMX12-WR	MK1KS
IMX12-S12L100C	-	-	-	100	12	●	2	IMX12	IMX12-WR	MK1KS
IMX12-U12N041L100C	-	41	11.7	100	12	●	1	IMX12	IMX12-WR	MK1KS
IMX12-S12L130C	-	-	-	130	12	●	2	IMX12	IMX12-WR	MK1KS
IMX12-U12N065L130C	-	65	11.7	130	12	●	1	IMX12	IMX12-WR	MK1KS
IMX12-A16N065L130C	1	65	11.7	130	16	●	3	IMX12	IMX12-WR	MK1KS
IMX16-U16N024L080C	-	24	15.5	80	16	●	1	IMX16	IMX16-WR	MK1KS
IMX16-S16L110C	-	-	-	110	16	●	2	IMX16	IMX16-WR	MK1KS
IMX16-U16N056L110C	-	56	15.5	110	16	●	1	IMX16	IMX16-WR	MK1KS
IMX16-S16L150C	-	-	-	150	16	●	2	IMX16	IMX16-WR	MK1KS
IMX16-U16N088L150C	-	88	15.5	150	16	●	1	IMX16	IMX16-WR	MK1KS
IMX16-A20N088L150C	1	88	15.5	150	20	●	3	IMX16	IMX16-WR	MK1KS
IMX20-U20N030L090C	-	30	19.5	90	20	●	1	IMX20	IMX20-WR	MK1KS
IMX20-S20L130C	-	-	-	130	20	●	2	IMX20	IMX20-WR	MK1KS
IMX20-U20N070L130C	-	70	19.5	130	20	●	1	IMX20	IMX20-WR	MK1KS
IMX20-S20L180C	-	-	-	180	20	●	2	IMX20	IMX20-WR	MK1KS
IMX20-U20N110L180C	-	110	19.5	180	20	●	1	IMX20	IMX20-WR	MK1KS
IMX20-A25N110L180C	1	110	19.5	180	25	●	3	IMX20	IMX20-WR	MK1KS
IMX25-U25N037L110C	-	37.5	24.5	110	25	●	1	IMX25	IMX25-WR	MK1KS
IMX25-S25L160C	-	-	-	160	25	●	2	IMX25	IMX25-WR	MK1KS
IMX25-U25N087L160C	-	87.5	24.5	160	25	●	1	IMX25	IMX25-WR	MK1KS
IMX25-S25L210C	-	-	-	210	25	●	2	IMX25	IMX25-WR	MK1KS

iMX

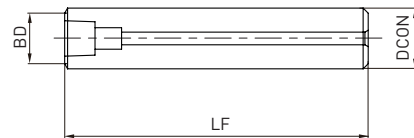
STEEL HOLDER

Undercut





Type1

Straight



Type2

h6	DCON=10	12<D4<16	20<D4<25	DCON=32
	0 - 0.009	0 - 0.011	0 - 0.013	0 - 0.160

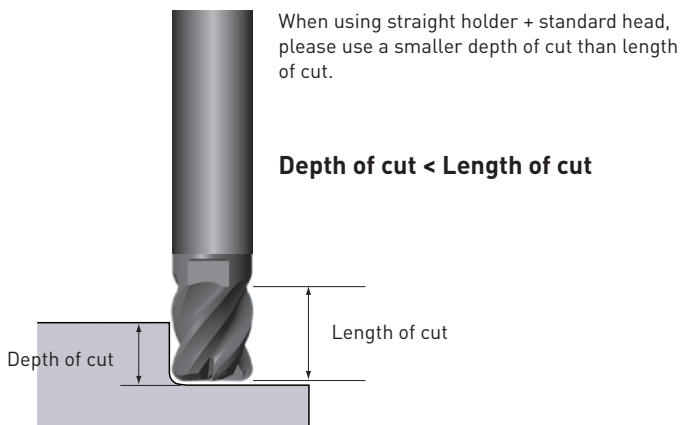
Order Number	LB	BD	LF	DCON	Stock	Type	Suitable Head	 Wrench	 Anti-seize Lubricant
IMX10-U10N009L070S	9	9.7	70	10	●	1	IMX10	IMX10-WR	MK1KS
IMX10-G12L060S	-	-	60	12	●	2	IMX10	IMX10-WR	MK1KS
IMX12-U12N011L080S	11	11.7	80	12	●	1	IMX12	IMX12-WR	MK1KS
IMX12-G16L070S	-	-	70	16	●	2	IMX12	IMX12-WR	MK1KS
IMX16-U16N016L080S	16	15.5	80	16	●	1	IMX16	IMX16-WR	MK1KS
IMX16-G20L070S	-	-	70	20	●	2	IMX16	IMX16-WR	MK1KS
IMX20-U20N020L090S	20	19.5	90	20	●	1	IMX20	IMX20-WR	MK1KS
IMX20-G25L080S	-	-	80	25	●	2	IMX20	IMX20-WR	MK1KS
IMX25-U25N025L110S	25	24.5	110	25	●	1	IMX25	IMX25-WR	MK1KS
IMX25-G32L100S	-	-	100	32	●	2	IMX25	IMX25-WR	MK1KS

HOW TO SELECT iMX HOLDERS

When using straight holder + standard head, interference will occur in cases where the depth of cut is larger than the length of cut of the head.

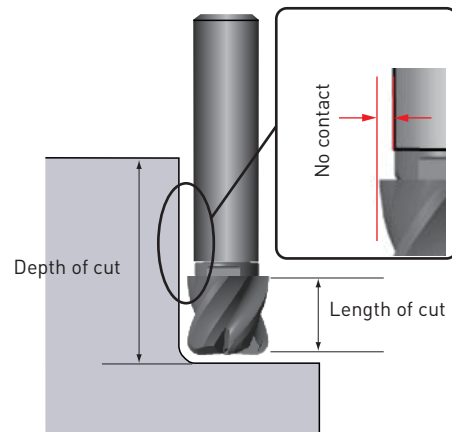
When using straight holder + offset head, larger depths of cut are possible because the diameter of the head is larger than the holder.

STRAIGHT + STANDARD HEAD



Less than 3D overhang is recommended when depth of cut < length of cut.

STRAIGHT + OFFSET HEAD

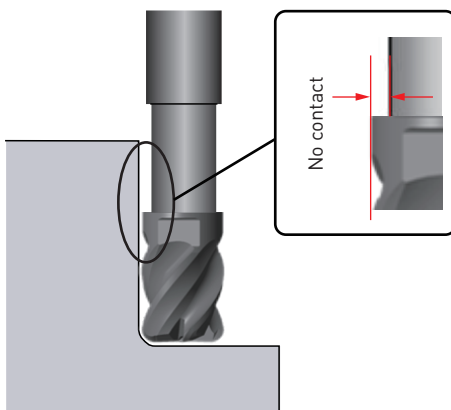


Undercut type with relieved neck is suitable for vertical wall machining.

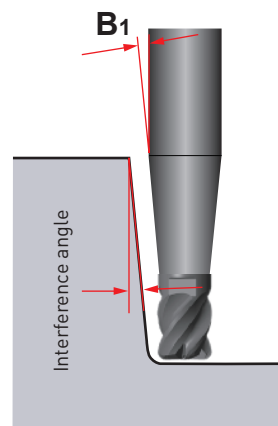
The large diameter of the taper neck holder provides stability in long overhang applications.

Undercut and taper neck types are now also available. (Please refer to diameter D5 of each type for minimum diameter.)

UNDERCUT + STANDARD HEAD



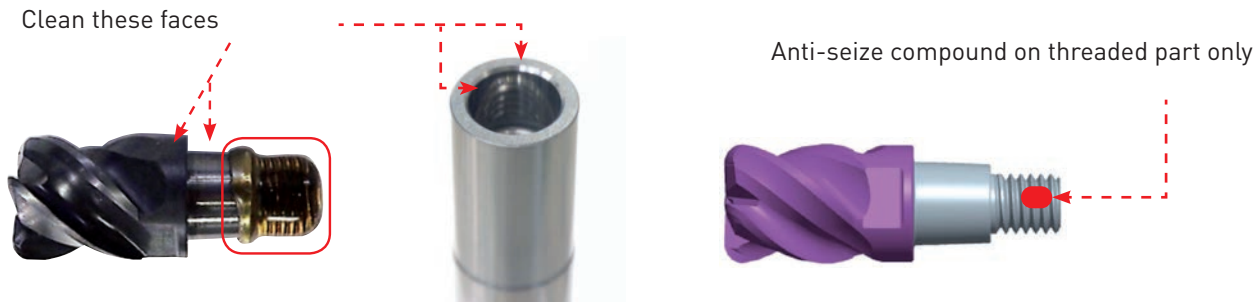
TAPER NECK + STANDARD HEAD



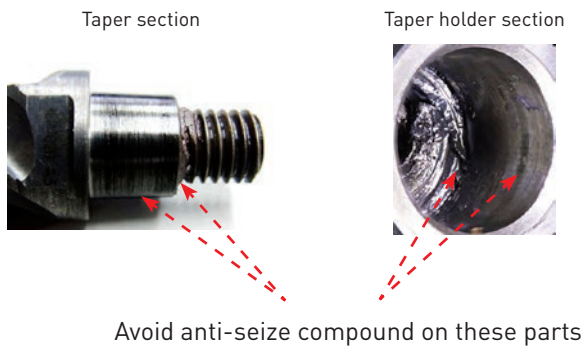
HOW TO INSTALL THE HEAD

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

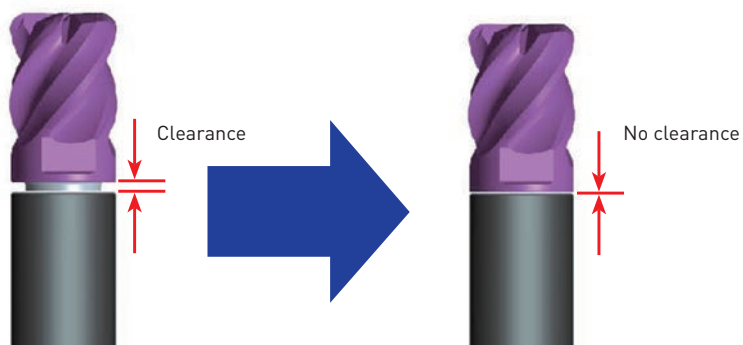
2 Apply a small amount of anti-seize compound to the threaded part only.



3 Do not over apply anti-seize compound, it may affect clamping.

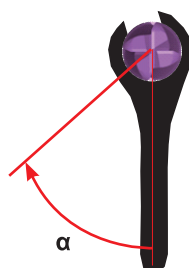


4 Securely fasten the head and holder using the enclosed wrench.



5 Refer to the table for tightening angles and recommended torque.

Fastening size	Reference tightening angle α	Recommended clamping torque (Nm)
\varnothing 10	50°	10
\varnothing 12	50°	15
\varnothing 16	50°	30
\varnothing 20	40°	50
\varnothing 25	35°	75



1. Use safety gloves and other necessary safety tools to avoid the possibility of injury.
2. Use the enclosed wrench only. (Standard wrenches may be too thick)

RECOMMENDED CUTTING CONDITIONS

IDENTIFICATION

Use the overhang (L/D) multiplying factor below for all recommended cutting conditions on the following pages.

Material	P				N				P						
	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys								Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel						
L/D	Vc (m/min)	n (min ⁻¹)	fz (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	ae (mm)			
2	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %			
3	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %			
4	80 %	80 %	90 %	70 %	80 %	80 %	90 %	70 %	80 %	80 %	90 %	70 %			
5	60 %	60 %	80 %	40 %	60 %	60 %	80 %	40 %	60 %	60 %	80 %	40 %			
6	50 %	50 %	70 %	30 %	50 %	50 %	70 %	30 %	50 %	50 %	70 %	30 %			
7	40 %	40 %	70 %	20 %	40 %	40 %	70 %	20 %	40 %	40 %	70 %	20 %			
8	40 %	40 %	60 %	10 %	40 %	40 %	60 %	10 %	40 %	40 %	60 %	10 %			
9	30 %	30 %	60 %	10 %	30 %	30 %	60 %	10 %	30 %	30 %	60 %	10 %			

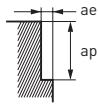
Material	M				S			
	Precipitation hardening stainless steel, Cobalt chromium alloy, Heat resistant alloys Austenitic and Ferritic stainless steel, Precipitation hardening stainless steel, Titanium alloy							
L/D	Vc (m/min)	n (min ⁻¹)	fz (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	ae (mm)
2	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
3	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
4	80 %	80 %	90 %	70 %	80 %	80 %	90 %	70 %
5	60 %	60 %	80 %	40 %	60 %	60 %	80 %	40 %
6	50 %	50 %	70 %	30 %	50 %	50 %	70 %	30 %
7	30 %	30 %	60 %	20 %	30 %	30 %	60 %	20 %
8	30 %	30 %	50 %	10 %	30 %	30 %	50 %	10 %
9	20 %	20 %	50 %	10 %	20 %	20 %	50 %	10 %

iMX-S3HV

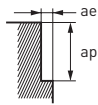
RECOMMENDED CUTTING CONDITIONS

SIDE MILLING

Material	P						N						P										
	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys												Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel										
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)					
10	150	4800	0.09	1300	8	2	120	3800	0.06	680	8	2	120	3800	0.06	680	8	2					
12	150	4000	0.09	1100	9.6	2.4	120	3200	0.065	620	9.6	2.4	120	3200	0.065	620	9.6	2.4					
16	150	3000	0.1	900	12.8	3.2	120	2400	0.075	540	12.8	3.2	120	2400	0.075	540	12.8	3.2					
20	150	2400	0.1	720	16	4	120	1900	0.075	430	16	4	120	1900	0.075	430	16	4					
25	150	1900	0.12	680	20	5	120	1500	0.075	340	20	5	120	1500	0.075	340	20	5					



Material	M						S						M						S																
	Precipitation hardening stainless steel, Cobalt chromium alloy												Heat resistant alloys												Austenitic and Ferritic stainless steel, Precipitation hardening stainless steel, Titanium alloy										
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)																	
10	75	2400	0.06	430	8	2	40	1300	0.04	160	8	1	100	3200	0.075	720	8	2																	
12	75	2000	0.065	390	9.6	2.4	40	1100	0.045	150	9.6	1.2	100	2700	0.08	650	9.6	2.4																	
16	75	1500	0.075	340	12.8	3.2	40	800	0.05	120	12.8	1.6	100	2000	0.09	540	12.8	3.2																	
20	75	1200	0.075	270	16	4	40	640	0.05	96	16	2	100	1600	0.09	430	16	4																	
25	75	950	0.075	210	20	5	40	510	0.05	77	20	2.5	100	1300	0.09	350	20	5																	



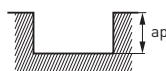
1. For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2. If the depth of cut is shallow, the revolution and feed rate can be increased.
3. Irregular helix flute end mills have a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

iMX-S3HV

RECOMMENDED CUTTING CONDITIONS

SLOTTING

Material	P					N					P				
	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys										Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel				
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)
10	100	3200	0.04	380	5	80	2500	0.03	230	5	80	2500	0.03	230	5
12	100	2700	0.05	410	6	80	2100	0.04	250	6	80	2100	0.04	250	6
16	100	2000	0.07	420	8	80	1600	0.05	240	8	80	1600	0.05	240	8
20	100	1600	0.07	340	10	80	1300	0.05	200	10	80	1300	0.05	200	10
25	100	1300	0.08	310	12	80	1000	0.05	150	12	80	1000	0.05	150	12



Material	M					S					M					S								
	Precipitation hardening stainless steel, Cobalt chromium alloy										Heat resistant alloys					Austenitic and Ferritic stainless steel, Precipitation hardening stainless steel, Titanium alloy								
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)				
10	60	1900	0.025	100	5	30	950	0.02	57	2	75	2400	0.03	200	5	75	2400	0.03	200	5				
12	60	1600	0.035	170	6	30	800	0.03	72	2.4	75	2000	0.04	240	6	75	2000	0.04	240	6				
16	60	1200	0.05	180	8	30	600	0.05	90	3.2	75	1500	0.06	270	8	75	1500	0.06	270	8				
20	60	950	0.05	140	10	30	480	0.05	72	4	75	1200	0.06	220	10	75	1200	0.06	220	10				
25	60	760	0.05	110	12	30	380	0.05	57	5	75	950	0.06	170	12	75	950	0.06	170	12				



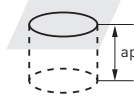
1. For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2. If the depth of cut is shallow, the revolution and feed rate can be increased.
3. Irregular helix flute end mills have a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

iMX-S3HV

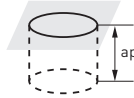
RECOMMENDED CUTTING CONDITIONS

PLUNGING

Material	P						N						P										
	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys												Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel										
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Step ap2 (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Step ap2 (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Step ap2 (mm)					
10	100	3200	0.14	450	5	2.5	70	2200	0.09	200	5	2	70	2200	0.09	200	5	2					
12	100	2700	0.14	380	6	2.5	70	1900	0.09	170	6	2	70	1900	0.09	170	6	2					
16	100	2000	0.14	280	8	2.5	70	1400	0.09	130	8	2	70	1400	0.09	130	8	2					
20	100	1600	0.14	220	10	2.5	70	1100	0.09	99	10	2	70	1100	0.09	99	10	2					
25	100	1300	0.14	180	12.5	2.5	70	890	0.09	80	12.5	2	70	890	0.09	80	12.5	2					



Material	M						M						S										
	Precipitation hardening stainless steel, Cobalt chromium alloy												Austenitic and Ferritic stainless steel, Precipitation hardening stainless steel, Titanium alloy										
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Step ap2 (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Step ap2 (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Step ap2 (mm)					
10	40	1300	0.03	39	5	0.6	60	1900	0.03	57	5	0.6	60	1900	0.03	57	5	0.6					
12	40	1100	0.03	33	6	0.6	60	1600	0.03	48	6	0.6	60	1600	0.03	48	6	0.6					
16	40	800	0.03	24	8	0.6	60	1200	0.03	36	8	0.6	60	1200	0.03	36	8	0.6					
20	40	640	0.03	19	10	0.6	60	950	0.03	29	10	0.6	60	950	0.03	29	10	0.6					
25	40	510	0.03	15	12.5	0.6	60	760	0.03	23	12.5	0.6	60	760	0.03	23	12.5	0.6					



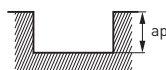
1. For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2. Irregular helix flute end mills have a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

iMX-S4HV/S4HV-S/C4HV/C4HV-S

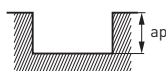
RECOMMENDED CUTTING CONDITIONS

SLOTTING

Material	P					N					P				
	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys										Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel				
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)
10	100	3200	0.04	510	5	80	2500	0.03	300	5	80	2100	0.04	340	6
12	100	2700	0.05	540	6	80	1600	0.05	320	8	80	1300	0.05	260	10
16	100	2000	0.07	560	8	80	1000	0.05	200	12					
20	100	1600	0.07	450	10										
25	100	1300	0.08	420	12										



Material	M					S					M		S		
	Precipitation hardening stainless steel, Cobalt chromium alloy					Heat resistant alloys					Austenitic and Ferritic stainless steel, Precipitation hardening stainless steel, Titanium alloy				
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)
10	60	1900	0.025	190	5	30	950	0.02	76	2	75	2400	0.03	290	5
12	60	1600	0.035	220	6	30	800	0.03	96	2.4	75	2000	0.04	320	6
16	60	1200	0.05	240	8	30	600	0.05	120	3.2	75	1500	0.06	360	8
20	60	950	0.05	190	10	30	480	0.05	96	4	75	1200	0.06	290	10
25	60	760	0.05	150	12	30	380	0.05	76	5	75	950	0.06	230	12

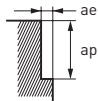


iMX-S4HV/S4HV-S/C4HV/C4HV-S

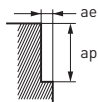
RECOMMENDED CUTTING CONDITIONS

SIDE MILLING

Material	P						N						P					
	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel											
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)
10	150	4800	0.09	1700	10	2	120	3800	0.06	910	10	2	120	3800	0.06	910	10	2
12	150	4000	0.09	1400	12	2.4	120	3200	0.065	830	12	2.4	120	3200	0.065	830	12	2.4
16	150	3000	0.1	1200	16	3.2	120	2400	0.075	720	16	3.2	120	2400	0.075	720	16	3.2
20	150	2400	0.1	960	20	4	120	1900	0.075	570	20	4	120	1900	0.075	570	20	4
25	150	1900	0.12	910	25	5	120	1500	0.075	450	25	5	120	1500	0.075	450	25	5



Material	M						S						M		S			
	Precipitation hardening stainless steel, Cobalt chromium alloy						Heat resistant alloys						Austenitic and Ferritic stainless steel, Precipitation hardening stainless steel, Titanium alloy					
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)
10	75	2400	0.06	580	10	2	40	1300	0.04	210	10	1	100	3200	0.075	960	10	2
12	75	2000	0.065	520	12	2.4	40	1100	0.045	200	12	1.2	100	2700	0.08	860	12	2.4
16	75	1500	0.075	450	16	3.2	40	800	0.05	160	16	1.6	100	2000	0.09	720	16	3.2
20	75	1200	0.075	360	20	4	40	640	0.05	130	20	2	100	1600	0.09	580	20	4
25	75	950	0.075	290	25	5	40	510	0.05	100	25	2.5	100	1300	0.09	470	25	5



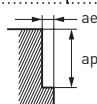
1. For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2. If the depth of cut is shallow, the revolution and feed rate can be increased.
3. Irregular helix flute end mills have a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

iMX-S4HV/S4HV-S/C4HV/C4HV-S

RECOMMENDED CUTTING CONDITIONS

SIDE MILLING

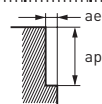
		P			N			P					
Material		Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel					
L/D	DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)
3	12	150	4000	0.09	1400	12	1.2	120	3200	0.06	770	12	1.2
	14	150	3400	0.09	1200	14	1.4	120	2700	0.065	700	14	1.4
	18	150	2700	0.1	1100	18	1.8	120	2100	0.075	630	18	1.8
	22	150	2200	0.1	880	22	2.2	120	1700	0.075	510	22	2.2
	28	150	1700	0.12	820	28	2.8	120	1400	0.075	420	28	2.8
	30	150	1600	0.12	770	30	3	120	1300	0.075	390	30	3
	32	150	1500	0.12	720	32	3.2	120	1200	0.075	360	32	3.2
5	12	90	2400	0.07	670	12	0.5	70	1900	0.05	380	12	0.5
	14	90	2000	0.07	560	14	0.6	70	1600	0.05	320	14	0.6
	18	90	1600	0.08	510	18	0.7	70	1200	0.06	290	18	0.7
	22	90	1300	0.08	420	22	0.9	70	1000	0.06	240	22	0.9
	28	90	1000	0.1	400	28	1.1	70	800	0.06	190	28	1.1
	30	90	950	0.1	380	30	1.2	70	740	0.06	180	30	1.2
7	12	60	1600	0.06	380	12	0.2	50	1300	0.04	210	12	0.2
	14	60	1400	0.06	340	14	0.3	50	1100	0.05	220	14	0.3
	18	60	1100	0.07	310	18	0.4	50	880	0.05	180	18	0.4
	22	60	870	0.07	240	22	0.4	50	720	0.05	140	22	0.4
	28	60	680	0.08	220	28	0.6	50	570	0.05	110	28	0.6
	30	60	640	0.08	200	30	0.6	50	530	0.05	110	30	0.6
32	60	600	0.08	190	32	0.6	50	500	0.05	100	32	0.6	



iMX-S4HV/S4HV-S/C4HV/C4HV-S

RECOMMENDED CUTTING CONDITIONS

		M						S						M		S			
Material		Precipitation hardening stainless steel, Cobalt chromium alloy						Heat resistant alloys						Austenitic and Ferritic stainless steel, Precipitation hardening stainless steel, Titanium alloy					
L/D	DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)
≤3	12	75	2000	0.06	480	12	1.2	30	800	0.04	130	12	0.9	100	2700	0.075	810	12	1.2
	14	75	1700	0.065	440	14	1.4	30	680	0.045	120	14	1.1	100	2300	0.08	740	14	1.4
	18	75	1300	0.075	390	18	1.8	40	710	0.05	140	18	1.4	100	1800	0.09	650	18	1.8
	22	75	1100	0.075	330	22	2.2	40	580	0.05	120	22	1.7	100	1400	0.09	500	22	2.2
	28	75	850	0.075	260	28	2.8	40	450	0.05	90	28	2.1	100	1100	0.09	400	28	2.8
	30	75	800	0.075	240	30	3	40	420	0.05	84	30	2.3	100	1100	0.09	400	30	3
	32	75	750	0.075	230	32	3.2	40	400	0.05	80	32	2.4	100	990	0.09	360	32	3.2
5	12	50	1300	0.05	260	12	0.5	10	270	0.03	32	12	0.4	60	1600	0.06	380	12	0.5
	14	50	1100	0.05	220	14	0.6	10	230	0.04	37	14	0.4	60	1400	0.06	340	14	0.6
	18	50	880	0.06	210	18	0.7	19	340	0.04	54	18	0.6	60	1100	0.07	310	18	0.7
	22	50	720	0.06	170	22	0.9	19	270	0.04	43	22	0.7	60	870	0.07	240	22	0.9
	28	50	570	0.06	140	28	1.1	19	220	0.04	35	28	0.8	60	680	0.07	190	28	1.1
	30	50	530	0.06	130	30	1.2	19	200	0.04	32	30	0.9	60	640	0.07	180	30	1.2
	32	50	500	0.06	120	32	1.3	19	190	0.04	30	32	1.0	60	600	0.07	170	32	1.3
7	12	24	640	0.04	100	12	0.2	-	-	-	-	-	-	32	850	0.05	170	12	0.2
	14	24	550	0.05	110	14	0.3	-	-	-	-	-	-	32	730	0.06	180	14	0.3
	18	24	420	0.05	84	18	0.4	-	-	-	-	-	-	32	570	0.06	140	18	0.4
	22	24	350	0.05	70	22	0.4	-	-	-	-	-	-	32	460	0.06	110	22	0.4
	28	24	270	0.05	54	28	0.6	-	-	-	-	-	-	32	360	0.06	86	28	0.6
	30	24	250	0.05	50	30	0.6	-	-	-	-	-	-	32	340	0.06	82	30	0.6
	32	24	240	0.05	48	32	0.6	-	-	-	-	-	-	32	320	0.06	77	32	0.6



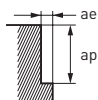
1. For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2. If the depth of cut is shallow, the revolution and feed rate can be increased.
3. Irregular helix flute end mills have a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

iMX-R4F

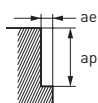
RECOMMENDED CUTTING CONDITIONS

SIDE MILLING

Material	P						N						P										
	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys												Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel										
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)					
10	150	4800	0.045	860	8	4	120	3800	0.03	460	8	4	120	3800	0.03	460	8	4					
12	150	4000	0.045	720	9.6	4.8	120	3200	0.033	420	9.6	4.8	120	3200	0.033	420	9.6	4.8					
16	150	3000	0.05	600	12.8	6.4	120	2400	0.038	360	12.8	6.4	120	2400	0.038	360	12.8	6.4					
20	150	2400	0.05	480	16	8	120	1900	0.038	290	16	8	120	1900	0.038	290	16	8					
25	150	1900	0.06	460	20	10	120	1500	0.038	230	20	10	120	1500	0.038	230	20	10					



Material	M						S						M						S																
	Precipitation hardening stainless steel, Cobalt chromium alloy												Heat resistant alloys												Austenitic and Ferritic stainless steel, Precipitation hardening stainless steel, Titanium alloy										
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)																	
10	75	2400	0.03	290	8	4	40	1300	0.04	210	8	1	100	3200	0.038	480	8	4																	
12	75	2000	0.033	260	9.6	4.8	40	1100	0.045	200	9.6	1.2	100	2700	0.04	430	9.6	4.8																	
16	75	1500	0.038	230	12.8	6.4	40	800	0.05	160	12.8	1.6	100	2000	0.045	360	12.8	6.4																	
20	75	1200	0.038	180	16	8	40	640	0.05	130	16	2	100	1600	0.045	290	16	8																	
25	75	950	0.038	140	20	10	40	510	0.05	100	20	2.5	100	1300	0.045	230	20	10																	



1. For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2. If the depth of cut is shallow, the revolution and feed rate can be increased.
3. Vibration may occur if the rigidity of machine or workpiece is low.
In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

iMX-R4F

RECOMMENDED CUTTING CONDITIONS

SLOTTING

	P					N					P				
Material	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys										Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel				
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)
10	100	3200	0.04	510	5	80	2500	0.03	300	5	80	2500	0.03	300	5
12	100	2700	0.045	490	6	80	2100	0.032	270	6	80	2100	0.032	270	6
16	100	2000	0.05	400	8	80	1600	0.038	240	8	80	1600	0.038	240	8
20	100	1600	0.05	320	10	80	1300	0.038	200	10	80	1300	0.038	200	10
25	100	1300	0.06	310	12	80	1000	0.038	150	12	80	1000	0.038	150	12



	M					M					S				
Material	Precipitation hardening stainless steel, Cobalt chromium alloy										Austenitic and Ferritic stainless steel, Precipitation hardening stainless steel, Titanium alloy				
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)
10	40	1300	0.016	83	4	60	1900	0.02	150	4	60	1900	0.02	150	4
12	40	1100	0.02	88	4.8	60	1600	0.025	160	4.8	60	1600	0.025	160	4.8
16	40	800	0.024	77	6.4	60	1200	0.03	140	6.4	60	1200	0.03	140	6.4
20	40	640	0.027	70	8	60	950	0.034	130	8	60	950	0.034	130	8
25	40	510	0.027	55	10	60	760	0.034	100	10	60	760	0.034	100	10



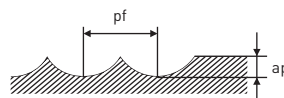
1. For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2. If the depth of cut is shallow, the revolution and feed rate can be increased.
3. Vibration may occur if the rigidity of machine or workpiece is low. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

iMX-B4HV/B4HV-E

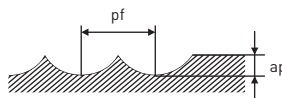
RECOMMENDED CUTTING CONDITIONS

SHOULDER MILLING

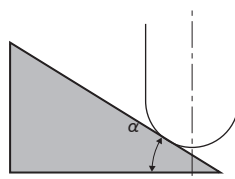
		P				N				S											
Material		Carbon steel, Alloy steel, Mild Steel, Pre-hardened steel, Copper, Copper alloys								Heat resistant alloys											
Inclination angle		$\alpha < 15^\circ$				$\alpha > 15^\circ$						$\alpha < 15^\circ$				$\alpha > 15^\circ$					
DC (mm)	RE (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	pf (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	pf (mm)
10	5	300	9600	0.106	4100	200	6400	0.07	1800	1	2.5	60	1900	0.055	420	40	1300	0.035	180	0.5	1
12	6	300	8000	0.125	4000	200	5300	0.085	1800	1.2	3	60	1600	0.055	350	40	1100	0.035	150	0.6	1.2
16	8	300	6000	0.134	3200	200	4000	0.088	1400	1.6	4	60	1200	0.062	300	40	800	0.04	130	0.8	1.6
20	10	300	4800	0.156	3000	200	3200	0.1	1300	2	5	60	1000	0.062	250	40	640	0.04	100	1	2
25	12.5	300	3800	0.16	2400	200	2500	0.1	1000	2.5	6	60	760	0.062	190	40	510	0.04	80	1.2	2.5



		M				S					
Material		Austenitic and Ferritic stainless steel, Precipitation hardening stainless steel, Cobalt chromium alloy, Titanium alloy									
Inclination angle		$\alpha < 15^\circ$				$\alpha > 15^\circ$					
DC (mm)	RE (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	pf (mm)
10	5	225	7200	0.105	3000	150	4800	0.067	1300	1	2.5
12	6	225	6000	0.125	3000	150	4000	0.08	1300	1.2	3
16	8	225	4500	0.14	2500	150	3000	0.09	1100	1.6	4
20	10	225	3600	0.16	2300	150	2400	0.105	1000	2	5
25	12.5	225	2900	0.16	1900	150	1900	0.105	800	2.5	6



- For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
- If the depth of cut is shallow, the revolution and feed rate can be increased.
- Irregular helix flute end mills have a large 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 reduce the revolution and feed rate proportionately, or set a lower depth of cut.
- α is the inclination angle of the machined surface.

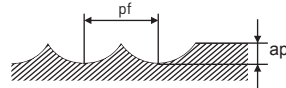


iMX-B3FV

RECOMMENDED CUTTING CONDITIONS

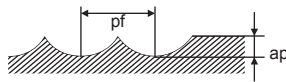
SHOULDER MILLING (L/D=5)

		P										H									
Work Material		Pre-hardened Steel, Alloy Tool Steel										Hardened Steel (40-55HRC)									
Inclination Angle		$\alpha \leq 15^\circ$					$\alpha > 15^\circ$					$\alpha \leq 15^\circ$					$\alpha > 15^\circ$				
DC	RE	vc	n	fz	vf	vc	n	fz	vf	ap	pf	vc	n	fz	vf	vc	n	fz	vf	ap	pf
		(m/min)	(min ⁻¹)	(mm/t.)	(mm/min)	(m/min)	(min ⁻¹)	(mm/t.)	(mm/min)			(m/min)	(min ⁻¹)	(mm/t.)	(mm/min)	(m/min)	(min ⁻¹)	(mm/t.)	(mm/min)		
10	5	175	5600	0.22	3700	115	3700	0.15	1700	0.7	2.6	150	4800	0.18	2600	100	3200	0.12	1200	0.5	2
12	6	175	4600	0.22	3000	115	3100	0.15	1400	1	3.2	150	4000	0.18	2200	100	2700	0.12	970	0.7	2.5
16	8	175	3500	0.22	2300	115	2300	0.15	1000	1.1	3.8	150	3000	0.18	1600	100	2000	0.12	720	0.9	3.5
20	10	175	2800	0.22	1800	115	1800	0.15	810	1.2	4.8	150	2400	0.18	1300	100	1600	0.12	580	1.1	4.2

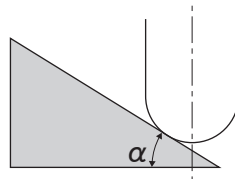


SHOULDER MILLING (L/D=7)

		P										H									
Work Material		Pre-hardened Steel, Alloy Tool Steel										Hardened Steel (40-55HRC)									
Inclination Angle		$\alpha \leq 15^\circ$					$\alpha > 15^\circ$					$\alpha \leq 15^\circ$					$\alpha > 15^\circ$				
DC	RE	vc	n	fz	vf	vc	n	fz	vf	ap	pf	vc	n	fz	vf	vc	n	fz	vf	ap	pf
		(m/min)	(min ⁻¹)	(mm/t.)	(mm/min)	(m/min)	(min ⁻¹)	(mm/t.)	(mm/min)			(m/min)	(min ⁻¹)	(mm/t.)	(mm/min)	(m/min)	(min ⁻¹)	(mm/t.)	(mm/min)		
10	5	120	3800	0.2	2300	80	2500	0.13	980	0.5	1.3	100	3200	0.13	1200	65	2100	0.085	540	0.4	1
12	6	120	3200	0.2	1900	80	2100	0.13	820	0.7	1.6	100	2700	0.13	1100	65	1700	0.085	430	0.6	1.3
16	8	120	2400	0.2	1400	80	1600	0.13	620	0.8	1.9	100	2000	0.13	780	65	1300	0.085	330	0.7	1.8
20	10	120	1900	0.2	1100	80	1300	0.13	510	0.9	2.4	100	1600	0.13	620	65	1000	0.085	260	0.8	2.1



- [Note 1] If the depth of cut is shallow, the revolution and feed rate can be increased.
- [Note 2] 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 reduce the revolution and feed rate proportionately, or set a lower depth of cut.
- [Note 3] % is the inclination angle of the machined surface.

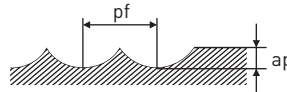


iMX-B2S

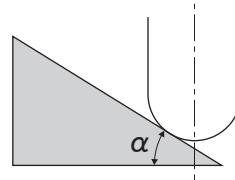
RECOMMENDED CUTTING CONDITIONS

SIDE MILLING

H											
Work Material		Hardened Steel (40-55HRC) Hardened Steel (62-70HRC)									
Inclination Angle		$\alpha \leq 15^\circ$				$\alpha > 15^\circ$				ap	pf
DC	RE	vc (m/min)	n (min ⁻¹)	fz (mm/t.)	vf (mm/min)	vc (m/min)	n (min ⁻¹)	fz (mm/t.)	vf (mm/min)		
10	5	300	9500	0.14	2700	150	4800	0.08	770	0.2	1
12	6	300	8000	0.14	2200	150	4000	0.08	640	0.3	1.2
16	8	300	6000	0.14	1700	150	3000	0.08	480	0.3	1.6
20	10	300	4800	0.14	1300	150	2400	0.08	380	0.3	2



1. If the depth of cut is shallow, the revolution and feed rate can be increased.
2. α is the inclination angle of the machined surface.

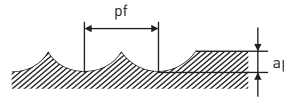


iMX-B6HV

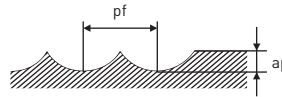
RECOMMENDED CUTTING CONDITIONS

SHOULDER MILLING

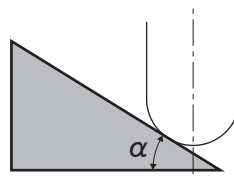
		P										S											
Material		Carbon steel, Alloy steel, Mild Steel, Pre-hardened steel										Heat resistant alloys											
Inclination angle		$\alpha < 15^\circ$				$\alpha > 15^\circ$				ap		$\alpha < 15^\circ$				$\alpha > 15^\circ$				ap		pf	
DC (mm)	RE (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	pf (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	pf (mm)		
10	5	300	9600	0.106	6100	200	6400	0.07	2700	0.5	2	60	1900	0.055	630	40	1300	0.035	270	0.5	1		
12	6	300	8000	0.125	6000	200	5300	0.085	2700	0.6	2.4	60	1600	0.055	520	40	1100	0.035	220	0.6	1.2		
16	8	300	6000	0.134	4800	200	4000	0.088	2100	0.8	3.2	60	1200	0.062	450	40	800	0.04	190	0.8	1.6		
20	10	300	4800	0.156	4500	200	3200	0.1	1900	1	4	60	1000	0.062	370	40	640	0.04	150	1	2		
25	12.5	300	3800	0.16	3600	200	2500	0.1	1500	1.2	5	60	760	0.062	300	40	510	0.04	120	1.2	2.5		



		M								S			
Material		Austenitic and Ferritic stainless steel, Precipitation hardening stainless steel, Cobalt chromium alloy, Titanium alloy											
Inclination angle		$\alpha < 15^\circ$				$\alpha > 15^\circ$				ap		pf	
DC (mm)	RE (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	pf (mm)		
10	5	225	7200	0.105	4500	150	4800	0.067	1900	0.5	2		
12	6	225	6000	0.125	4500	150	4000	0.08	1900	0.6	2.4		
16	8	225	4500	0.14	3700	150	3000	0.09	1600	0.8	3.2		
20	10	225	3600	0.16	3400	150	2400	0.105	1500	1	4		
25	12.5	225	2900	0.16	2800	150	1900	0.105	1200	1.2	5		



- For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
- If the depth of cut is shallow, the revolution and feed rate can be increased.
- Irregular helix flute end mills have a large 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 reduce the revolution and feed rate proportionately, or set a lower depth of cut.
- α is the inclination angle of the machined surface.

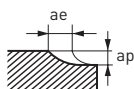


iMX-C4FD-C

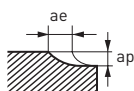
RECOMMENDED CUTTING CONDITIONS

SIDE MILLING

Material	P						N						P										
	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys												Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel										
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)					
10	150	4800	0.4	7700	0.5	6	135	4300	0.4	6900	0.5	6	135	4300	0.4	6900	0.5	6					
12	150	4000	0.45	7200	0.6	7.2	135	3600	0.45	6500	0.6	7.2	135	3600	0.45	6500	0.6	7.2					
16	150	3000	0.5	6000	0.8	9.6	135	2700	0.5	5400	0.8	9.6	135	2700	0.5	5400	0.8	9.6					
20	150	2400	0.5	4800	1	12	135	2100	0.5	4200	1	12	135	2100	0.5	4200	1	12					
25	150	1900	0.5	3800	1.25	15	135	1700	0.5	3400	1.25	15	135	1700	0.5	3400	1.25	15					



Material	M						S						H						M																
	Austenitic stainless steel, Titanium alloy, Cobalt chromium alloy												Heat resistant alloys												Hardened steel (≤ 55 HRC), Precipitation hardening stainless steel, Ferritic stainless steel, Precipitation hardening stainless steel										
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)																	
10	40	1300	0.2	1000	0.5	6	25	800	0.1	320	0.5	6	120	3800	0.3	4600	0.5	6																	
12	40	1100	0.2	880	0.6	7.2	25	660	0.1	260	0.6	7.2	120	3200	0.3	3800	0.6	7.2																	
16	40	800	0.3	960	0.8	9.6	25	500	0.15	300	0.8	9.6	120	2400	0.4	3800	0.8	9.6																	
20	40	640	0.3	770	1	12	25	400	0.15	240	1	12	120	1900	0.4	3000	1	12																	
25	40	510	0.3	610	1.25	15	25	320	0.15	190	1.25	15	120	1500	0.4	2400	1.25	15																	



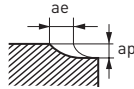
- For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
- If the depth of cut is shallow, the revolution and feed rate can be increased.
- Irregular helix flute end mills have a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece installation is poor, vibration or abnormal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.
- Reduce the feed by 1/2 for ramping process.

iMX-C4FV

RECOMMENDED CUTTING CONDITIONS

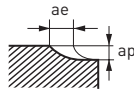
HIGH DEPTH OF CUT CONDITIONS

		P												H					
Material		Carbon steel, Alloy steel, Gray Cast Iron						Pre-hardened steel, Alloy tool steel						Hardened steel (45-55HRC)					
DC (mm)	RE (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)
10	2	90	2900	0.25	2900	1.2	4.5	75	2400	0.21	2000	1	4.5	60	1900	0.22	1700	0.7	4.5
12	2	90	2400	0.25	2400	1.8	6	75	2000	0.21	1700	1.4	6	60	1600	0.22	1400	0.9	6
16	3	90	1800	0.25	1800	1.8	7.5	75	1500	0.2	1200	1.4	7.5	60	1200	0.22	1100	0.9	7.5
20	3	90	1400	0.25	1400	1.8	9	75	1200	0.2	1000	1.4	9	60	950	0.22	850	0.9	9
25	4	90	1100	0.25	1100	2.4	11.5	75	950	0.2	750	1.8	11.5	60	750	0.22	650	1.2	11.5



HIGH SPEED MILLING

		P												H					
Material		Carbon steel, Alloy steel, Gray Cast Iron						Pre-hardened steel, Alloy tool steel						Hardened steel (45-55HRC)					
DC (mm)	RE (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)
10	2	150	4800	0.51	9800	0.6	4.5	125	4000	0.43	6900	0.46	4.5	100	3200	0.43	5500	0.36	4.5
12	2	150	4000	0.56	9000	0.9	6	125	3300	0.48	6400	0.7	6	100	2700	0.47	5100	0.45	6
16	3	150	3000	0.6	7200	0.9	7.5	125	2500	0.53	5300	0.7	7.5	100	2000	0.54	4300	0.45	7.5
20	3	150	2400	0.6	5800	0.9	9	125	2000	0.37	3000	0.7	9	100	1600	0.39	2500	0.45	9
25	4	150	1900	0.6	4500	1.2	11.5	125	1600	0.39	2500	0.9	11.5	100	1300	0.39	2000	0.6	11.5



1. If the depth of cut is shallow, the revolution and feed rate can be increased.
2. Air blow or oil mist is recommended for good chip evacuation.
3. For profile machining such as moulds, 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.
4. Irregular helix flute end mills have 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 reduce the revolution and feed rate proportionately, or set a lower depth of cut.

iMX-S3A/C3A

RECOMMENDED CUTTING CONDITIONS

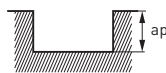
SIDE MILLING

N							
Material	Aluminium alloy						
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	
10	500	16000	0.117	5600	8	3	
12	500	13000	0.118	4600	9.6	3.6	
16	500	10000	0.153	4600	12.8	4.8	
20	500	8000	0.175	4200	16	6	
25	500	6000	0.211	3800	20	7.5	



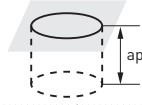
SLOTING

N						
Material	Aluminium alloy					
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm)	ap (mm)	
10	500	16000	0.068	3300	5	
12	500	13000	0.072	2800	6	
16	500	10000	0.093	2800	8	
20	500	8000	0.108	2600	10	
25	500	6000	0.127	2300	12.5	



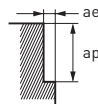
PLUNGING

N							
Material	Aluminium alloy						
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	Step ap2 (mm)	
10	300	9600	0.1	960	5	2.5	
12	300	8000	0.1	800	6	2.5	
16	300	6000	0.1	600	8	2.5	
20	300	4800	0.1	480	10	2.5	
25	300	3800	0.1	380	12.5	2.5	



SIDE MILLING

N							
Material	Aluminium alloy A6061, A7075						
L/D	DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)
≤3	12	500	13000	0.117	4600	9.6	2.4
	14	500	11000	0.118	3900	11.2	2.8
	18	500	8800	0.153	4000	14.4	3.6
	22	500	7200	0.175	3800	17.6	4.4
	28	500	5700	0.211	3600	22.4	5.6
5	12	300	8000	0.09	2200	9.6	1.0
	14	300	6800	0.09	1800	11.2	1.1
	18	300	5300	0.12	1900	14.4	1.4
	22	300	4300	0.14	1800	17.6	1.8
	28	300	3400	0.17	1700	22.4	2.2
7	12	200	5300	0.08	1300	9.6	0.5
	14	200	4500	0.08	1100	11.2	0.6
	18	200	3500	0.11	1200	14.4	0.7
	22	200	2900	0.12	1000	17.6	0.9
	28	200	2300	0.15	1000	22.4	1.1



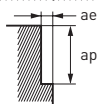
1. The use of water-soluble coolant is recommended.
2. Vibration may occur if the rigidity of the machine or workpiece is low.
In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

iMX-C6HV/C10HV/C12HV

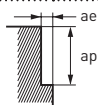
RECOMMENDED CUTTING CONDITIONS

SIDE MILLING

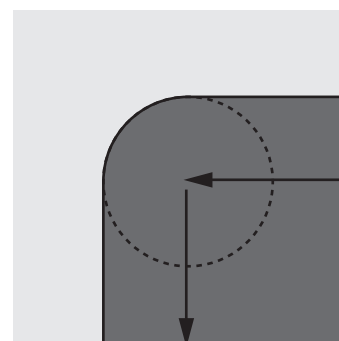
Material	P						M					
	Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel						Precipitation hardening stainless steel, Cobalt chromium alloy					
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)
10	200	6400	0.07	2700	10	1	100	3200	0.07	1300	10	1
12	200	5300	0.085	2700	12	1.2	100	2700	0.085	1400	12	1.2
16	200	4000	0.07	2800	16	0.64	100	2000	0.07	1400	16	0.64
20	200	3200	0.08	3100	20	0.8	100	1600	0.08	1500	20	0.8
25	200	2500	0.08	2400	25	1	100	1300	0.08	1200	25	1



Material	M						S					
	Austenitic and Ferritic stainless steel, hhPrecipitation hardening stainless steel, Titanium alloy						Heat resistant alloys					
DC (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)
10	150	4800	0.07	2000	10	1	40	1300	0.033	260	10	0.5
12	150	4000	0.085	2000	12	1.2	40	1100	0.035	230	12	0.6
16	150	3000	0.088	2600	16	0.64	40	800	0.038	300	16	0.64
20	150	2400	0.1	2900	20	0.8	40	640	0.04	310	20	0.8
25	150	1900	0.1	2300	25	1	40	510	0.04	240	25	1



1. For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
2. If the depth of cut is shallow, the revolution and feed rate can be increased.
3. Irregular helix flute end mills have a large 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 reduce the revolution and feed rate proportionately, or set a lower depth of cut.
4. 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.

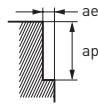


iMX-C8T/C10T/C12T/C15T

RECOMMENDED CUTTING CONDITIONS

SIDE MILLING

		M						M						S						S					
Material		Austenitic and Ferritic stainless steel, Precipitation hardening stainless steel						Precipitation hardening stainless steel, Titanium alloy						Heat resistant alloys											
DC (mm)	Flutes	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)						
8	8	300	12000	0.10	9600	0.3	1.2	200	8000	0.10	6400	0.3	1.2	60	2400	0.08	1500	0.3	0.8						
10	10	300	9500	0.10	9500	0.3	1.5	200	6400	0.10	6400	0.3	1.5	60	1900	0.08	1500	0.3	1.0						
15	12	300	6400	0.12	9200	0.3	2.2	200	4200	0.12	6000	0.3	2.2	60	1300	0.10	1600	0.3	1.5						
15	15	300	6400	0.10	9600	0.3	2.2	200	4200	0.10	6300	0.3	2.2	60	1300	0.08	1600	0.3	1.5						
19	12	300	5000	0.12	7200	0.3	2.8	200	3400	0.12	4900	0.3	2.8	60	1000	0.10	1200	0.3	1.9						
19	15	300	5000	0.10	7500	0.3	2.8	200	3400	0.10	5100	0.3	2.8	60	1000	0.08	1200	0.3	1.9						



1. The use of water-soluble coolant is recommended.
2. Vibration may occur if the rigidity of the machine or workpiece is low.
In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

iMX-CH6V

RECOMMENDED CUTTING CONDITIONS

SIDE MILLING

		P						M											
Material		Carbon steel, Alloy steel, Gray Cast Iron						Alloy tool steel, Carbon steel, Alloy steel, Pre-hardened steel						Austenitic stainless steel, Alloy steel					
DC (mm)	Flutes	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)
12	6	100	2700	0.05	810	2.4	2.4	70	1900	0.05	510	2.4	2.4	60	1600	0.04	380	2.4	2.4
16	6	100	2000	0.05	600	2.7	2.7	70	1400	0.05	380	2.7	2.7	60	1200	0.04	290	2.7	2.7
20	6	100	1600	0.05	480	3.2	3.2	70	1100	0.05	300	3.2	3.2	60	950	0.04	230	3.2	3.2

		H						S											
Material		Hardened steel (45-55HRC)						Heat resistant alloys											
DC (mm)	Flutes	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)
12	6	50	1300	0.03	230	2.4	2.4	30	800	0.04	190	2.4	2.4	30	800	0.04	190	2.4	2.4
16	6	50	990	0.03	180	2.7	2.7	30	600	0.04	140	2.7	2.7	30	600	0.04	140	2.7	2.7
20	6	50	800	0.03	140	3.2	3.2	30	480	0.04	120	3.2	3.2	30	480	0.04	120	3.2	3.2

1. The use of water-soluble coolant is recommended.
2. Vibration may occur if the rigidity of the machine or workpiece is low.
In this case, please reduce the revolution and feed rate proportionately.

iMX-CH3L

RECOMMENDED CUTTING CONDITIONS

SIDE MILLING

		P						M											
Material		Carbon steel, Alloy steel, Gray Cast Iron						Alloy tool steel, Carbon steel, Alloy steel, Pre-hardened steel						Austenitic stainless steel, Alloy steel					
DC (mm)	Flutes	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)
10	3	40	1300	0.04	160	1.8	1.8	40	1300	0.03	120	1.8	1.8	30	950	0.03	86	1.8	1.8
12	3	40	1100	0.04	130	2.2	2.2	40	1100	0.03	99	2.2	2.2	30	800	0.03	72	2.2	2.2
16	3	40	800	0.04	96	2.4	2.4	40	800	0.03	72	2.4	2.4	30	600	0.03	54	2.4	2.4
20	3	40	640	0.04	77	2.6	2.6	40	640	0.03	58	2.6	2.6	30	480	0.03	43	2.6	2.6

		H						S					
Material		Hardened steel (45-55HRC)						Heat resistant alloys					
DC (mm)	Flutes	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)	Vc (m/min)	n (min ⁻¹)	fz (mm)	Vf (mm/min)	ap (mm)	ae (mm)
10	3	30	950	0.02	57	1.8	1.8	30	950	0.04	110	1.8	1.8
12	3	30	800	0.02	48	2.2	2.2	30	800	0.04	96	2.2	2.2
16	3	30	600	0.02	36	2.4	2.4	30	600	0.04	72	2.4	2.4
20	3	30	480	0.02	29	2.6	2.6	30	480	0.04	58	2.6	2.6

1. The use of water-soluble coolant is recommended.
2. Vibration may occur if the rigidity of the machine or workpiece is low.
In this case, please reduce the revolution and feed rate proportionately.

iMX-C4FD-C

FEATURES

Duplex corner radius



Conventional radius



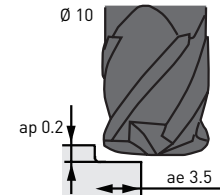
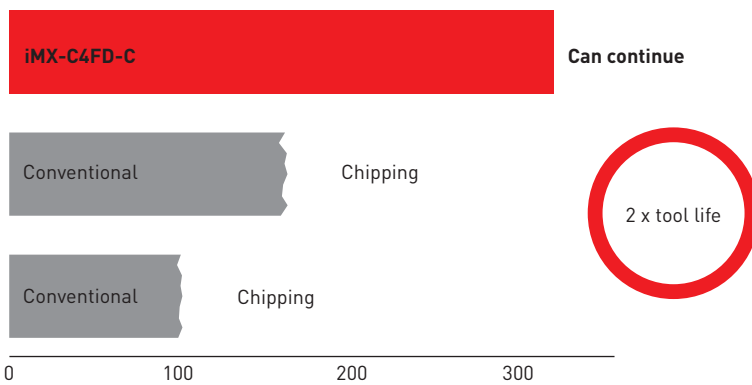
Thin chips and a long cutting edge combine to provide both high performance and long tool life.

CUTTING PERFORMANCE

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

Tool life comparison in cobalt-chromium alloy (Ø10)

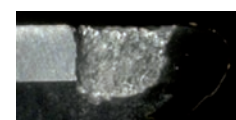
Tool Life (Co-Cr Alloy)



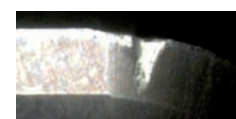
Material	Co-Cr alloy
Tool	Ø 10
Revolution n (min ⁻¹)	3,185
Cutting Speed Vc (m/min)	100
Table Feed Vf (mm/min)	1,911
Feed per Tooth fz (mm/t.)	0,15
Depth of Cut ap (mm)	0,2
Width of Cut ae (mm)	3,5
Overhang (mm)	45
Coolant	Soluble
Cutting Method	Down Cut
Machine	Vertical (BT40)



iMX-C4FD-C
(Cutting Length 320 m)



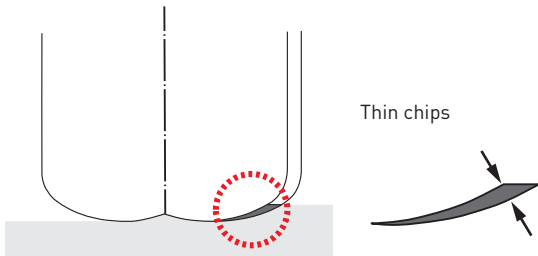
Conventional
(Cutting Length 160 m)



Conventional
(Cutting Length 96 m)

iMX-C4FD-C

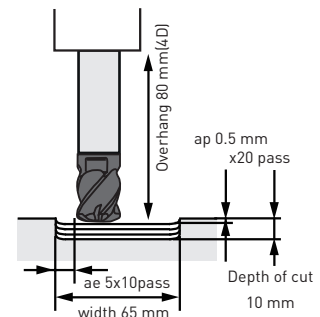
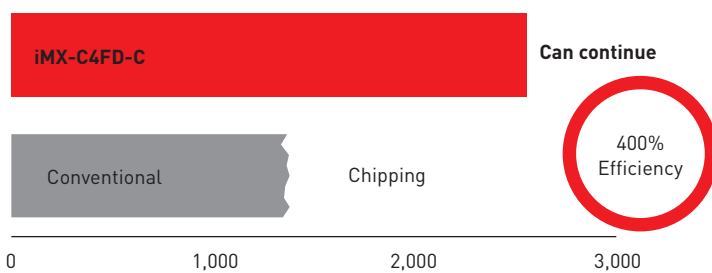
FEATURES



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

EFFICIENCY COMPARISON IN SKD61(Ø20)

Machining efficiency comparison in SKD61



Material	SKD61 (52HRC)
Tool	Ø 20
Revolution n [min ⁻¹]	1,600
Cutting Speed Vc [m/min]	100
Table Feed Vf [mm/min]	640-2,560
Feed per Tooth fz [mm/t.]	0.10-0.40
Depth of Cut ap [mm]	0.3
Width of Cut ae [mm]	5
Overhang [mm]	80
Coolant	Air Blow
Cutting Method	Slot & down cut
Machine	Vertical (BT50)



No chipping
iMX-C4FD-C
(Feed rate 2,560 mm/min)

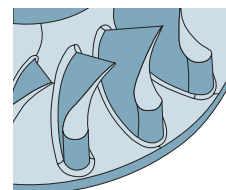


Micro chipping
Conventional
(Feed rate 1,280 mm/min)

APPLICATION EXAMPLES

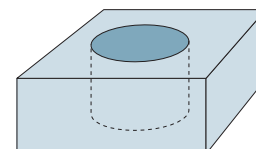
The examples shown are actual applications and can differ from the recommended cutting conditions.

Head	IMX12-U12N041L100C
Holder	IMX12B6HV12012
Workpiece	DIN Cf53
Component	Impeller for torque converter
Intended process	Finishing of blade faces
Cutting Speed (m/min)	200
Feed per Tooth fz (mm/tooth)	0.08
Radial Depth of cut ae (mm)	Approx. 1.4
Axial Depth of cut ap (mm)	Approx. 1.0
Overhang length (mm)	70
Cutting method	Trochoid milling
Machine	5-axis M/C (HSK A63)



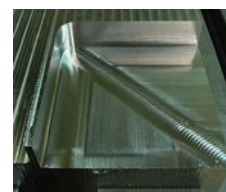
Results The tool reduced machining time by 30% and also produced a good surface finish.

Head	IMX20-U20N070L130C
Holder	IMX20C4HV200R10021
Workpiece	DIN S235
Component	Die steel
Intended process	Hole finishing
Cutting Speed (m/min)	100
Feed per Tooth fz (mm/tooth)	0.05
Radial Depth of cut ae (mm)	1
Axial Depth of cut ap (mm)	3
Overhang length (mm)	105
Cutting method	helical cutting
Machine	Machining centre



Results Irregular helix flutes combined with the solid carbide holder gave better performance than the competitors tools.

Head	IMX16-U16N024L080C
Holder	IMX16C10HV160R10016
Workpiece	Titanium Alloy (Ti-6Al4V)
Component	Test work
Intended process	Side milling (down cut)
Cutting Speed (m/min)	151
Feed per Tooth fz (mm/tooth)	0.08
Radial Depth of cut ae (mm)	0.5
Axial Depth of cut ap (mm)	16
Overhang length (mm)	52
Coolant	Emulsion
Machine	Machining centre



Results Machining without vibration was achieved even when the workpiece radius and tool radius were the same.

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