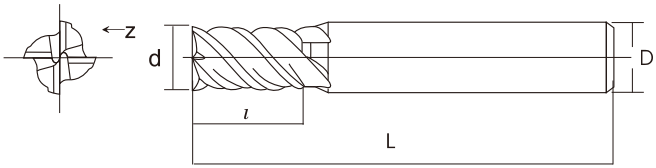
Dimensions



UMG-FHP

4 flutes · Short(Heavy-duty operation type)

Tool Material : Ultra Micro Grain Carbide
Serface Treament : AlTin Coating
Tolerance for outerDiameter : 0 ~ -0.02mm
Helix Angle : 45°

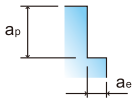
MODE	d	L	l	D	Stock
FHP 030	3	60	8	6	○
FHP 040	4	60	11	6	○
FHP 050	5	60	13	6	○
FHP 060	6	60	13	6	○
FHP 080	8	60	19	8	○

MODE	d	L	l	D	Stock
FHP 100	10	75	22	10	○
FHP 120	12	100	26	12	○
FHP 160	16	100	35	16	○
FHP 200	20	100	40	20	○

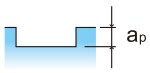
Recommended milling conditions

UMG-FHPS & UMG-FHP & UMG-CR-FHP

Side Milling

Work material	Mild steels, Carbom steels, Cast iron SS400, S55c, FC250 (~750N/mm²)		Alloy steels, Tool steels, SCM, SKT, SKS, SKD (~30HRC)		Hardened steels, Prehardened steels, (Free-cutting) SKT, SKD, NAK55, HPM1		Hardened steels, Stainless steels SUS304, SKD		Hardened steels, Titanium alloys, Heat resistant alloys steels,		Hardened steels,	
Cutting Speed	100m/min		78m/min		66m/min		62m/min		60m/min		30m/min	
MILL DIA. (mm)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)
3	10600	975	8300	760	7000	560	6600	555	6035	485	3200	190
4	7950	1000	6200	820	5250	565	4950	590	4750	515	2400	190
5	6350	1050	4950	845	4200	590	3950	630	3800	535	1900	190
6	5300	1250	4150	945	3500	700	3300	660	3200	545	1600	190
8	4000	1250	3100	895	2650	660	2450	640	2400	555	1200	175
10	3200	1100	2500	855	2100	605	1950	590	1900	525	955	160
12	2650	1100	2050	850	1750	565	1650	535	1600	475	795	160
16	2000	955	1550	745	1300	500	1250	445	1200	400	595	160
20	1600	765	1250	595	1050	455	985	395	955	355	475	160
Depth of cut					ap: 1.5D, ae: 0.2D		ap: 1.5D, ae: 0.1D		ap: 1D, ae: 0.05D			

Slotting

Work material	Mild steels, Carbom steels, Cast iron SS400, S55c, FC250 (~750N/mm²)		Alloy steels, Tool steels, SCM, SKT, SKS, SKD (~30HRC)		Hardened steels, Prehardened steels, (Free-cutting) SKT, SKD, NAK55, HPM1		Hardened steels, Stainless steels SUS304, SKD		Hardened steels, Titanium alloys, Heat resistant alloys steels,		Hardened steels,	
Cutting Speed	100m/min		78m/min		66m/min		62m/min		60m/min		30m/min	
MILL DIA. (mm)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)
3	8500	705	6350	959	5850	455	5500	400	4450	320	2100	110
4	6350	705	4750	675	4400	455	4150	450	3350	360	1600	120
5	5100	715	3800	660	3500	475	3300	475	2650	385	1250	125
6	4250	715	3200	560	2900	500	2750	495	2250	400	1050	125
8	3200	660	2400	550	2200	545	2050	515	1650	415	795	125
10	2550	610	1900	535	1750	475	1650	470	1350	380	635	115
12	2100	610	1600	475	1450	450	1400	440	1100	355	530	115
16	1600	610	1200	430	1100	370	1050	370	835	300	400	88
20	1250	510	955	380	875	350	830	330	670	265	320	89
Depth of cut					a_p=0.5D				a_p=0.05D			

Caution

1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
3. Please use a suitable fluid with high smoke retardant properties.
4. During Dry(no fluid) milling, please use air bolw to remove disposable chips from the milling area and tho eliminate chip packing.

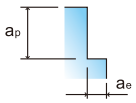
Recommended milling conditions

UMG-FHPS & UMG-FHP & UMG-CR-FHP

Caution:
Sparks generated during operation or heat caused by tool breakage can cause fire. Be sure to use all proper fire-prevention measures.

High Speed Side Milling

The conditions below are for high speed / high precision machining centers.

Work material	Mild steels, Carbom steels, Cast iron SS400, S55c, FC250 (~750N/mm²)		Alloy steels, Tool steels, SCM, SKT, SKS, SKD (~30HRC)		Hardened steels, Prehardened steels, (Free-cutting) SKT, SKD, NAK55, HPM1		Hardened steels, Stainless steels SUS304, SKD		Hardened steels, Titanium alloys, Heat resistant alloys steels,		Hardened steels,	
Cutting Speed	100m/min		78m/min		66m/min		62m/min		60m/min		30m/min	
MILL DIA. (mm)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)
3	21200	2150	21200	2400	21200	1300	15900	1150	10600	680	8500	440
4	15900	2050	15900	2300	15900	1300	11900	1250	7950	795	6350	460
5	12700	1900	12700	2150	12700	1250	9550	1350	6350	840	5100	510
6	10600	3050	10600	2650	10600	2000	7950	1450	5300	910	4250	610
8	7950	2800	7950	2400	7950	1900	5950	1400	4000	860	3200	575
10	6350	2550	6350	2200	6350	1850	4750	1350	3200	830	2550	510
12	5300	2550	5300	2200	5300	1800	4000	1350	2650	830	2100	510
16	4000	1900	4000	1900	4000	1700	3000	1350	2000	830	1600	510
20	3200	1550	3200	1550	3200	1550	2400	1150	1600	730	1250	510
Depth of cut												

	a_p	a_e
D<Ø6	1.5D	0.02D
Ø6≦D	1.5D	0.05D

a_eMax=0.5mm

	a_p	a_e
D<Ø6	1.5D	0.01D
Ø6≦D	1.5D	0.02D

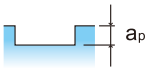
a_eMax=0.5mm

	a_p	a_e
D<Ø6	1D	0.01D
Ø6≦D	1D	0.02D

a_eMax=0.5mm

The conditions below are for high speed / high precision machining centers.

High Speed Slotting

Work material	Mild steels, Carbom steels, Cast iron SS400, S55c, FC250 (~750N/mm²)		Alloy steels, Tool steels, SCM, SKT, SKS, SKD (~30HRC)		Hardened steels, Prehardened steels, (Free-cutting) SKT, SKD, NAK55, HPM1		Hardened steels, Stainless steels SUS304, SKD	
Cutting Speed	100m/min		78m/min		66m/min		62m/min	
MILL DIA. (mm)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)	Speed (mm^{-1})	Speed (mm/min)
3	12700	1050	10600	935	9550	745	6350	460
4	9550	1150	7950	1000	7150	745	5150	560
5	7650	1200	7000	1100	6350	865	4150	595
6	3650	1550	5850	1150	5300	910	3700	670
8	4750	1450	4400	1300	4000	985	2800	690
10	3800	1400	3500	1200	3200	865	2250	635
12	3200	1250	2900	1150	2650	815	1850	595
16	2400	1050	2200	965	2000	675	1400	500
20	1900	840	1750	770	1600	635	1100	445
Depth of cut								

a_p=0.2D
a_pMax=3mm

Caution

1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
3. Please use a suitable fluid with high smoke retardant properties.
4. During Dry(no fluid) milling, please use air bolw to remove disposable chips from the milling area and tho eliminate chip packing.