


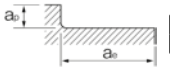
# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions

## AM-HFC

High Feed Radius type


Frontal Milling

	Prehardened Steel • Hardened Steel ~45HRC		Hardened Steel ~62HRC		Hardened Steel ~70HRC		Stainless Steel ≤200HB		Cobalt Chromium Based Alloy (Stellite)		Titanium Alloy		Ni based Alloy (Inconel 718)					
Vc	90~110m/min		70~90m/min		50~70m/min		100~120m/min		90~110m/min		70~90m/min		30~50m/min					
DC x rt	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)				
4 × R0,5	7.960	5.730	6.370	4.590	4.780	1.720	8.760	6.310	7.960	5.730	6.370	4.590	3.180	760				
5 × R0,6	6.370	5.730	5.100	4.590	3.820	1.720	7.010	6.310	6.370	5.730	5.100	4.590	2.550	770				
6 × R0,8	5.310	5.730	4.250	4.590	3.180	1.720	5.840	6.310	5.310	5.730	4.250	4.590	2.120	760				
8 × R1	3.980	5.730	3.180	4.580	2.390	1.720	4.380	6.310	3.980	5.730	3.180	4.580	1.590	760				
10 × R1,2	3.180	5.720	2.550	4.590	1.910	1.720	3.500	6.300	3.180	5.720	2.550	4.590	1.270	760				
12 × R1,5	2.650	5.720	2.120	4.580	1.590	1.720	2.920	6.310	2.650	5.720	2.120	4.580	1.060	760				
Depth of cut	<div><table><tr><td>ae</td><td>ap</td></tr><tr><td>Max: 0,5D</td><td>Max: 0,04D</td></tr></table><p>If the pick amount is 0.5 x D or more, cusp may occur on the machined surface.</p></div>														ae	ap	Max: 0,5D	Max: 0,04D
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Max: 0,5D	Max: 0,04D																	
During machining, please program the milling paths according to the recommended simulated R (rt) respective to the individual end mill diameter.																		

## AM-HFC

High Feed Radius type

Side Milling

	Prehardened Steel • Hardened Steel ~45HRC		Hardened Steel ~62HRC		Hardened Steel ~70HRC		Stainless Steel ≤200HB		Cobalt Chromium Based Alloy (Stellite)		Titanium Alloy		Ni based Alloy (Inconel 718)																	
Vc	80~100m/min		50~70m/min		30~50m/min		90~110m/min		80~100m/min		50~70m/min		20~40m/min																	
DC x rt	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)	S (min <sup>-1</sup> )	F (mm/min)																
4 × R0,5	7.170	1.200	4.780	570	3.180	230	7.960	1.340	7.170	1.200	4.780	570	2.390	230																
5 × R0,6	5.730	1.200	3.820	570	2.550	230	6.370	1.340	5.730	1.200	3.820	570	1.910	230																
6 × R0,8	4.780	1.200	3.180	570	2.120	230	5.310	1.340	4.780	1.200	3.180	570	1.590	230																
8 × R1	3.580	1.720	2.390	800	1.590	380	3.980	1.910	3.580	1.720	2.390	800	1.190	230																
10 × R1,2	2.870	1.720	1.910	800	1.270	380	3.180	1.910	2.870	1.720	1.910	800	960	230																
12 × R1,5	2.390	1.720	1.590	800	1.060	380	2.650	1.910	2.390	1.720	1.590	800	800	230																
Depth of cut	<table><tr><td>ae</td><td>ap</td></tr><tr><td>Max: 0,05D</td><td>Max: 1,5D</td></tr></table>		ae	ap	Max: 0,05D	Max: 1,5D	<table><tr><td>ae</td><td>ap</td></tr><tr><td>Max: 0,02D</td><td>Max: 1,5D</td></tr></table>		ae	ap	Max: 0,02D	Max: 1,5D	<table><tr><td>ae</td><td>ap</td></tr><tr><td>Max: 0,02D</td><td>Max: 1D</td></tr></table>		ae	ap	Max: 0,02D	Max: 1D	<table><tr><td>ae</td><td>ap</td></tr><tr><td>Max: 0,05D</td><td>Max: 1,5D</td></tr></table>		ae	ap	Max: 0,05D	Max: 1,5D	<table><tr><td>ae</td><td>ap</td></tr><tr><td>Max: 0,02D</td><td>Max: 1,5D</td></tr></table>		ae	ap	Max: 0,02D	Max: 1,5D
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<div><p>1. This tool is recommended for the roughing of additive manufacturing and mold overlay surfaces.</p><p>2.Please use machines and holders that are rigid and highly accurate.</p><p>3. The values listed above are for reference. Please set the cutting condition in accordance with the actual machining environment.</p><p>4. Please reduce the feed rate when the depth of cut is greater than specified.</p><p>5. The above table is a guide when the amount of protrusion of the tool is 4 x D or less. If the amount of protrusion is large, chattering is likely to occur, so adjust the rotation speed, feed rate and depth of cut with reference to the coefficients.</p><p>6. Please use a suitable fluid with high smoke retardant properties.</p><p>7. During dry (no fluid) milling, please use air blow to remove disposable chips from the milling area and to eliminate chip packing.</p><p>8. Please use water-soluble coolant when machining stainless steel, cobalt-chromium alloy, titanium alloy, and Ni-based alloy.</p><p>9.Tool runout should be kept to a minimum for maximum accuracy.</p><p>10. When the cutting load fluctuates in areas such as the corners, please reduce the rotational speed.</p></div>																														

Tool extension coefficients


Overhang Length	Cutting Speed	ap	fz
L/D ≤ 4	100%	100%	100%
4 < L/D ≤ 5	90%	75%	80%
5 < L/D ≤ 6	80%	50%	60%

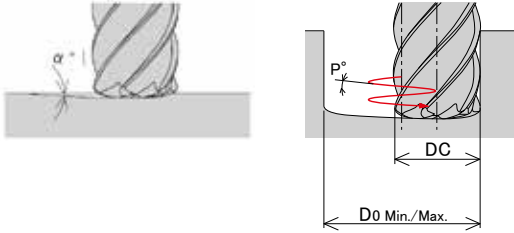
# CUTTING CONDITIONS

Milling | Endmills | Cutting conditions


## AM-HFC

High Feed Radius type    Maximum Ramping Angle (E°)

 DC x rt	Ramping Angle E°	Helical Milling (mm)		Helical Angle P°
		D0 Min.	D0 Max.	
4xR0,5	3°	6	7	1,5°
5xR0,6	3°	7,5	9	1,5°
6xR0,8	3°	9	11	1,5°
8xR1	3°	12	15	1,5°
10xR1,2	3°	15	19	1,5°
12xR1,5	3°	18	23	1,5°



### Edge shape definitions for the purpose of creating a program

 DC	rt	Remainder Z
4	R0,5	0,11
5	R0,6	0,15
6	R0,8	0,17
8	R1	0,22
10	R1,2	0,31
12	R1,5	0,36

During machining, please program the milling paths according to the recommended simulated R (rt) respective to the individual end mill diameter.

