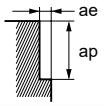
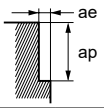
RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the J003 page correction factor of the overhang length.

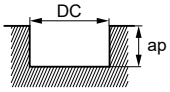
Work material	P / N						P						M / S					
	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel						Austenitic stainless steel, Ferritic and martensitic stainless steel, Titanium alloy					
Dia. **DC** (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)
10	150	4800	0.09	1300	8	2	120	3800	0.06	680	8	2	100	3200	0.075	720	8	2
12	150	4000	0.09	1100	9.6	2.4	120	3200	0.065	620	9.6	2.4	100	2700	0.08	650	9.6	2.4
16	150	3000	0.1	900	12.8	3.2	120	2400	0.075	540	12.8	3.2	100	2000	0.09	540	12.8	3.2
20	150	2400	0.1	720	16	4	120	1900	0.075	430	16	4	100	1600	0.09	430	16	4
25	150	1900	0.12	680	20	5	120	1500	0.075	340	20	5	100	1300	0.09	350	20	5
Depth of cut																		

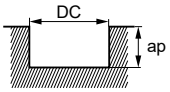
Work material	M / S						S					
	Precipitation hardening stainless steel, Cobalt chromium alloy						Heat resistant alloys					
Dia. **DC** (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t)	Table Feed per Min. (mm/min)	Depth of Cut ap (mm)	Cutting Width ae (mm)
10	75	2400	0.06	430	8	2	40	1300	0.04	160	8	1
12	75	2000	0.065	390	9.6	2.4	40	1100	0.045	150	9.6	1.2
16	75	1500	0.075	340	12.8	3.2	40	800	0.05	120	12.8	1.6
20	75	1200	0.075	270	16	4	40	640	0.05	96	16	2
25	75	950	0.075	210	20	5	40	510	0.05	77	20	2.5
Depth of cut												

Note 1) For stainless steel, titanium and heat resistant alloys, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) The irregular helix flute end mill has 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.

RECOMMENDED CUTTING CONDITIONS

■ Slot milling

Work material	P / N					P					M / S				
	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel					Austenitic stainless steel, Ferritic and martensitic stainless steel, Titanium alloy				
Dia. **DC** (mm)	Cutting speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t)	Table Feed per Min. (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t)	Table Feed per Min. (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t)	Table Feed per Min. (mm/min)	Depth of cut ap (mm)
10	100	3200	0.04	380	5	80	2500	0.03	230	5	75	2400	0.03	200	5
12	100	2700	0.05	410	6	80	2100	0.04	250	6	75	2000	0.04	240	6
16	100	2000	0.07	420	8	80	1600	0.05	240	8	75	1500	0.06	270	8
20	100	1600	0.07	340	10	80	1300	0.05	200	10	75	1200	0.06	220	10
25	100	1300	0.08	310	12	80	1000	0.05	150	12	75	950	0.06	170	12
Depth of cut	 DC:Dia.														

Work material	M / S					S				
	Precipitation hardening stainless steel, Cobalt chromium alloy					Heat resistant alloys				
Dia. **DC** (mm)	Cutting speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t)	Table Feed per Min. (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t)	Table Feed per Min. (mm/min)	Depth of cut ap (mm)
10	60	1900	0.025	140	5	30	950	0.02	57	2
12	60	1600	0.035	170	6	30	800	0.03	72	2.4
16	60	1200	0.05	180	8	30	600	0.05	90	3.2
20	60	950	0.05	140	10	30	480	0.05	72	4
25	60	760	0.05	110	12	30	380	0.05	57	5
Depth of cut	 DC:Dia.									

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Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
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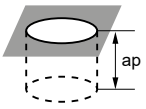
■ Plunging

Work material	P	N	P	M	S
	Carbon steel, Alloy steel, Mild Steel, Copper, Copper alloys		Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel	Austenitic stainless steel, Ferritic and martensitic stainless steel, Titanium alloy	

Dia. **DC** (mm)	Cutting speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Revolution (mm/rev)	Table Feed per Min. (mm/min)	Drilled Depth ap (mm)	Step ap2 (mm)	Cutting speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Revolution (mm/rev)	Table Feed per Min. (mm/min)	Drilled Depth ap (mm)	Step ap2 (mm)	Cutting speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Revolution (mm/rev)	Table Feed per Min. (mm/min)	Drilled Depth ap (mm)	Step ap2 (mm)
10	100	3200	0.14	450	5	2.5	70	2200	0.09	200	5	2	60	1900	0.03	57	5	0.6
12	100	2700	0.14	380	6	2.5	70	1900	0.09	170	6	2	60	1600	0.03	48	6	0.6
16	100	2000	0.14	280	8	2.5	70	1400	0.09	130	8	2	60	1200	0.03	36	8	0.6
20	100	1600	0.14	220	10	2.5	70	1100	0.09	99	10	2	60	950	0.03	29	10	0.6
25	100	1300	0.14	180	12.5	2.5	70	890	0.09	80	12.5	2	60	760	0.03	23	12.5	0.6

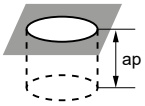
Depth of cut



Work material	M	S
	Precipitation hardening stainless steel, Cobalt chromium alloy	

Dia. **DC** (mm)	Cutting speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Revolution (mm/rev)	Table Feed per Min. (mm/min)	Drilled Depth ap (mm)	Step ap2 (mm)
10	40	1300	0.03	39	5	0.6
12	40	1100	0.03	33	6	0.6
16	40	800	0.03	24	8	0.6
20	40	640	0.03	19	10	0.6
25	40	510	0.03	15	12.5	0.6

Depth of cut



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