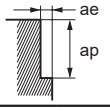
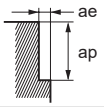
RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the K009 page correction factor by overhang length.

(mm)

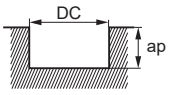
Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
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																		

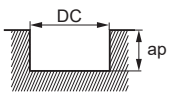
Workpiece Material	Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631						Heat resistant alloys Inconel718					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Width of Cut ae
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 alloy and heat resistant alloy, 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) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

■ Slot milling

(mm)

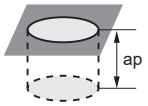
Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V				
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
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. (Cutting diameter)														

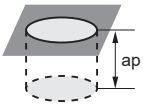
Workpiece Material	Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631					Heat resistant alloys Inconel718				
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Tooth (mm/t)	Feed rate (mm/min)	Depth of cut ap
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. (Cutting diameter)									

Note 1) For stainless steel, titanium alloy and heat resistant alloy, 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) Vibration may occur if there is poor rigidity of the machine or workpiece material. In that case, please adjust the revolution, feed rate and depth of cut.

■ Plunging

(mm)

Workpiece Material	Carbon steel, Alloy steel, Mild steel, Copper, Copper alloys AISI 1045, AISI 4140, ASTM A36, AISI 1010						Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT						Austenitic stainless steel, Ferritic and Martensitic stainless steels, Titanium alloy AISI 304, AISI 316, AISI 304LN, AISI 316LN, AISI 410, AISI 430, AISI 431, AISI 420J2, Ti-6Al-4V					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Rev. (mm/rev)	Feed rate (mm/min)	Drilled Depth ap	Step ap2	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Rev. (mm/rev)	Feed rate (mm/min)	Drilled Depth ap	Step ap2	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Rev. (mm/rev)	Feed rate (mm/min)	Drilled Depth ap	Step ap2
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																		

Workpiece Material	Precipitation-hardening stainless steel, Cobalt chromium alloy AISI 630, AISI 631					
Dia. **DC**	Cutting Speed (m/min)	Revolution (min^{-1})	Feed per Rev. (mm/rev)	Feed rate (mm/min)	Drilled Depth ap	Step ap2
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						

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