切削條件表
Cutting Condition Table

切削條件表
Cutting Condition Table

Table 01 鎢鋼鑽鉸刀切濕式加工條件表

Carbide Drill Reamer Cutting Condition Table

被削材	一般鋼		合金鋼		模具鋼		鑄鐵	
Work Material	SS400.S50C		SCM440		SKD61		FC250.FCD400	
	~200HB		20~30HRC		30~40HRC		~200HB	
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
3	7000	350	3700	190	2700	130	7000	420
4	5200	350	2800	190	2000	140	5200	460
5	4200	360	2200	200	1600	140	4200	530
6	3500	380	1900	200	1300	150	3500	540
8	2600	420	1400	230	1000	160	2600	550
10	2100	400	1100	210	800	150	2100	540
12	1700	380	900	200	700	150	1700	530
16	1300	370	700	200	500	140	1300	510

Notes
1.The cutting conditions listed are recommended reference values. Actual conditions may vary depending on machine rigidity and machining environment.
2.If abnormal noise, vibration, or tool damage occurs during machining, adjust cutting conditions immediately.
3.Ensure secure clamping of the tool and workpiece, and always follow safe machining practices.
4.Use appropriate coolant for lubrication to prevent excessive heat and tool wear.
5.Recommended cutting conditions may vary by ±10% depending on actual machining conditions.
6.For machining depths exceeding 5D, pre-drilling is recommended.
7.When machining on a lathe, ensure accurate alignment between the tool center and spindle center.

Table 02 鎢鋼油孔鑽鉸刀切濕式加工條件表

Carbide Drill Reamer With Internal Coolant Holes Cutting Condition Table

被削材	一般鋼		合金鋼		模具鋼		白鐵	
Work Material	SS400.S50C		SCM440		SKD61		SUS 400/600	
	~200HB		20~30HRC		30~40HRC			
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
3	9100	680	7000	520	3700	230	4800	310
4	6800	820	5200	620	2800	250	3600	360
5	5400	900	4200	690	2200	280	2900	480
6	4500	910	3500	690	1900	280	2400	480
8	3400	990	2600	750	1400	360	1800	560
10	2700	880	2100	680	1100	360	1400	480
12	2300	770	1700	580	900	320	1200	400
16	1700	700	1300	540	700	290	900	370

Notes
1.The cutting conditions listed are recommended reference values. Actual conditions may vary depending on machine rigidity and machining environment.
2.If abnormal noise, vibration, or tool damage occurs during machining, adjust cutting conditions immediately.
3.Ensure secure clamping of the tool and workpiece, and always follow safe machining practices.
4.Use appropriate coolant for lubrication to prevent excessive heat and tool wear.
5.Recommended cutting conditions may vary by ±10% depending on actual machining conditions.
6.For machining depths exceeding 5D, pre-drilling is recommended.
7.When machining on a lathe, ensure accurate alignment between the tool center and spindle center.

Table 03 鎢鋼高速鑽頭/加強型鎢鋼鑽鉸刀切濕式加工條件表

Carbide High Speed Drill / Reinforced Carbide Drill Reamer Cutting Condition Table

被削材	一般鋼		合金鋼		模具鋼		白鐵	
Work Material	SS400.S50C.FC250		SCM440		SKD61		SUS 400/600	
	~200HB		20~30HRC		30~40HRC			
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
3	7650	380	6300	320	3330	170	4200	100
5	4590	590	3690	490	1980	230	2500	100
8	2880	590	2340	490	1260	230	2000	100
10	2300	590	1890	460	990	230	1600	100
12	1890	590	1530	430	860	210	1300	75
16	1440	500	1170	400	630	190	1000	75

Notes
1.The cutting conditions shown are recommended reference values, measured under standard machining environments. If cutting conditions are too severe, reduce spindle speed and feed rate accordingly.
2.During machining, of abnormal noise, vibration, or tool damage occurs, adjust the cutting conditions immediately.
3.Use proper safety protection during operation to ensure safe machining.
4.Avoid excessive tool wear, and inspect tool condition regularly.
5.For machining depths exceeding 5D, pre-drilling is recommended.
6.When machining on a lathe, ensure accurate alignment between the tool center and the spindle center.

Table 04 強力鎢鋼油孔鑽頭/加強型鎢鋼油孔鑽鉸刀切濕式加工條件表

Carbide Drill With Internal Coolant Holes / Reinforced Carbide Drill Reamer With Internal Coolant Holes Cutting Condition Table

被削材	一般鋼		合金鋼		模具鋼		白鐵	
Work Material	SS400.S50C.FC250		SCM440		SKD61		SUS 400/600	
	~200HB		20~30HRC		30~40HRC			
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
3	7650	456	6300	384	3330	204	4200	120
5	4590	708	3690	588	1980	276	2500	120
8	2880	708	2340	588	1260	276	2000	120
10	2300	708	1890	552	990	276	1600	120
12	1890	708	1530	516	860	252	1300	90
16	1440	500	1170	480	630	228	1000	90

Notes
1.The cutting conditions shown are recommended reference values, measured under standard machining environments. If cutting conditions are too severe, reduce spindle speed and feed rate accordingly.
2.During machining, of abnormal noise, vibration, or tool damage occurs, adjust the cutting conditions immediately.
3.Use proper safety protection during operation to ensure safe machining.
4.Avoid excessive tool wear, and inspect tool condition regularly.
5.For machining depths exceeding 5D, pre-drilling is recommended.
6.When machining on a lathe, ensure accurate alignment between the tool center and the spindle center.

Table 05 鎢鋼平底鑽頭/加強型鎢鋼平底鑽鉸刀切濕式加工條件表

Carbide Flat Drills / Reinforced Carbide Flat Drill Reamer Cutting Condition Table

被削材	一般鋼		合金鋼		淬硬鋼	
Work Material	SS400.S50C.FC		SCM440			
	~200HB		20~30HRC		30~40HRC	
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
3	7950	400	6900	280	3700	150
4	5950	420	5150	360	2800	170
5	4800	420	4150	360	2200	170
6	4000	420	3450	360	1800	170
8	3000	420	2600	360	1400	170
10	2400	420	2050	360	1100	170
12	2000	420	1700	360	950	170
16	1500	420	1300	360	700	170

Notes

1.The cutting conditions shown are recommended reference values, measured under standard machining environments. If cutting conditions are too severe, reduce spindle speed and feed rate accordingly.
2.During machining, of abnormal noise, vibration, or tool damage occurs, adjust the cutting conditions immediately.
3.Use proper safety protection during operation to ensure safe machining.
4.Avoid excessive tool wear, and inspect tool condition regularly.
5.For machining depths exceeding 5D, pre-drilling is recommended.
6.When machining on a lathe, ensure accurate alignment between the tool center and the spindle center.

Table 06 鎢鋼定位鑽切削條件表

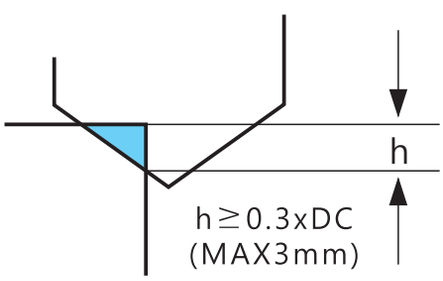
Carbide Position Drill Cutting Condition Table

Centering

被削材	一般鋼		合金鋼		模具鋼		不銹鋼		鋁合金(有色金屬)	
Work Material	SS400.S50C		SCM440		SKD61.NAK.HPM		SUS304		Aluminum Nonferrous Alloy	
	~200HB		20~30HRC		30~40HRC					
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
3	4770	290	2880	170	1440	65	1440	65	7200	540
4	3600	290	2160	160	1080	65	1080	65	5400	540
5	2880	290	1710	160	860	60	860	60	4320	540
6	2430	290	1440	150	720	60	720	60	3600	540
8	1800	270	1080	140	540	60	540	60	2700	540
10	1440	260	864	120	430	60	430	60	2160	430
12	1170	230	720	110	360	50	360	50	1800	400
16	900	220	540	100	270	50	270	50	1350	350

Chamfering

被削材	一般鋼		合金鋼		模具鋼		不銹鋼		鋁合金(有色金屬)	
Work Material	SS400.S50C		SCM440		SKD61.NAK.HPM		SUS304		Aluminum Nonferrous Alloy	
	~200HB		20~30HRC		30~40HRC					
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
3	4770	180	2880	90	1440	40	1440	40	7200	360
4	3600	180	2160	90	1080	40	1080	40	5400	360
5	2880	180	1710	90	860	40	860	40	4320	360
6	2430	180	1440	90	720	40	720	40	3600	360
8	1800	180	1080	90	540	40	540	40	2700	360
10	1440	180	860	90	430	40	430	40	2160	360
12	1170	180	720	90	360	40	360	40	1800	360
16	900	160	540	90	270	40	270	40	1350	360



Chamfering / Spotting Depth Reference:
Recommended chamfering or spotting depth should be at least 0.3 times the drill diameter,with a maximum depth of 3 mm. ensure safe machining.

Notes
1.The cutting conditions shown are recommended reference values, measured under standard machining environments. If cutting conditions are too severe, reduce spindle speed and feed rate accordingly.
2.During machining, of abnormal noise, vibration, or tool damage occurs, adjust the cutting conditions immediately.
3.Use appropriate safety protection during operation to ensure safe machining.

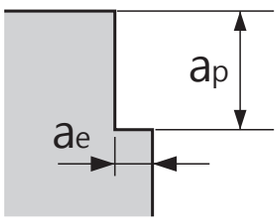
Table 07 AA3604 / AC3804 / CB4204 / TM3604 鎢鋼不等式立銑刀切削工作表

Asymmetric Helix Angle, Antivibration Carbid End Mills Cutting Condition Table

Side Milling

被削材	碳鋼/鑄鋼		合金鋼/調質鋼		調質鋼/淬硬鋼		淬硬鋼		不銹鋼	
Work Material	S-C/FC		SCM/NAK.HPM						SUS304.SUS316	
	150~250HB		25~35HRC		35~45HRC		45~55HRC			
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
1	23400	460	21780	300	15930	200	12330	140	14220	150
2	12600	570	12240	390	9000	250	6840	170	7920	180
4	6840	740	6480	500	4680	320	3600	230	4140	230
6	4590	780	4320	520	3150	330	2430	230	2880	240
8	3420	780	3240	520	2430	330	1800	230	2160	240
10	2700	760	2610	520	1890	330	1440	230	1710	240
12	2250	760	2250	520	1620	330	1260	230	1440	240
16	1620	620	1620	420	1170	300	900	190	1080	200
切削量 ap	1Dc						0.5Dc			
切削量 ae	0.05Dc						0.02Dc			

Side Milling

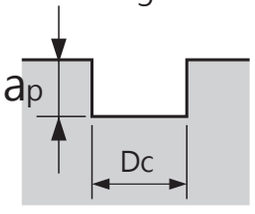


Side Milling Reference
ap：Axial depth of cut
ae：Radial depth of cut
Dc：End mill diameter

Slot Milling

被削材	碳鋼/鑄鋼		合金鋼/調質鋼		調質鋼/淬硬鋼		淬硬鋼		不銹鋼	
Work Material	S-C/FC		SCM/NAK.HPM						SUS304.SUS316	
	150~250HB		25~35HRC		35~45HRC		45~55HRC			
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
1	23400	460	21780	360	15930	200	12330	140	14220	100
2	12600	570	12240	390	9000	250	6840	170	7920	120
4	6840	740	6480	500	4680	320	3600	230	4140	140
6	4590	780	4320	520	3150	330	2430	230	2880	170
8	3420	780	3240	520	2430	330	1800	230	2160	170
10	2700	760	2610	520	1890	330	1440	230	1710	170
12	2250	760	2250	520	1620	330	1260	230	1440	170
16	1620	620	1620	420	1170	300	900	190	1080	140
切削量ap	0.5Dc				0.2Dc		0.05Dc		0.2Dc	

Slot Milling



Slot Milling Reference
ap：Axial depth of cut
Dc：End mill diameter

Notes
1.The cutting conditions shown are recommended reference values, measured under standard machining environments. If cutting conditions are too severe, reduce spindle speed and feed rate accordingly.
2.During machining, of abnormal noise, vibration, or tool damage occurs, adjust the cutting conditions immediately.
3.Use proper safety protection during operation to ensure safe machining.

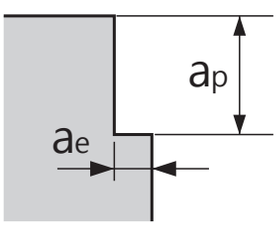
Table 08 CA4004 / EA3504 / EB4504 鎢鋼立銑刀切削條件表

Carbide End Mills Cutting Condition Table

Side Milling

被削材	碳鋼/鑄鋼		合金鋼/調質鋼		調質鋼/淬硬鋼		淬硬鋼		不銹鋼	
Work Material	S-C/FC		SCM/NAK.HPM						SUS304.SUS316	
	150~250HB		25~35HRC		35~45HRC		45~55HRC			
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
1	20800	410	19360	260	14160	180	10960	130	12640	120
2	11200	500	10880	340	8000	220	6080	150	7040	160
4	6080	660	5760	440	4160	280	3200	200	3680	200
6	4080	700	3840	470	2800	300	2160	210	2560	220
8	3040	700	2880	470	2080	300	1600	210	1920	220
10	2400	670	2320	470	1680	300	1280	210	1520	220
12	2000	670	2000	470	1440	300	1120	210	1280	220
16	1440	550	1440	380	1040	260	800	170	960	180
切削量 ap	1Dc						0.5Dc			
切削量 ae	0.05Dc						0.02Dc			

Side Milling

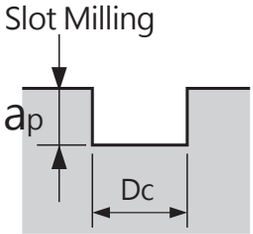


Side Milling Reference
ap：Axial depth of cut
ae：Radial depth of cut
Dc：End mill diameter

Slot Milling

被削材	碳鋼/鑄鋼		合金鋼/調質鋼		調質鋼/淬硬鋼		淬硬鋼		不銹鋼	
Work Material	S-C/FC		SCM/NAK.HPM						SUS304.SUS316	
	150~250HB		25~35HRC		35~45HRC		45~55HRC			
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
1	20800	410	19360	260	14160	180	10960	130	12640	90
2	11200	500	10880	340	8000	220	6080	150	7040	100
4	6080	660	5760	440	4160	280	3200	200	3680	130
6	4080	700	3840	460	2800	300	2160	210	2560	150
8	3040	700	2880	460	2080	300	1600	210	1920	150
10	2400	670	2320	460	1680	300	1280	210	1520	150
12	2000	670	2000	460	1440	300	1120	210	1280	150
16	1440	550	1440	380	1040	260	800	170	960	130
切削量ap	0.5Dc				0.2Dc		0.05Dc		0.2Dc	

Slot Milling



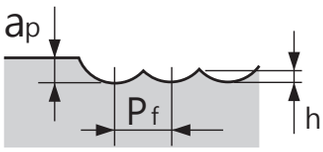
Slot Milling Reference
ap：Axial depth of cut
Dc：End mill diameter

Notes
1.The cutting conditions shown are recommended reference values, measured under standard machining environments. If cutting conditions are too severe, reduce spindle speed and feed rate accordingly.
2.During machining, of abnormal noise, vibration, or tool damage occurs, adjust the cutting conditions immediately.
3.Use proper safety protection during operation to ensure safe machining.

Table 09 QA3002 / QG3003 / TG3003 鎢鋼球刀切削條件表

Carbide Ball Nose End Mills Cutting Condition Table

球刀半徑		被削材		一般鋼		合金鋼/調質鋼		模具鋼/不銹鋼		鑄鐵	
				SS.S-C		SCM/NAK.HPM		SKD.SUS		FC.FCD	
		切削量		回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
		ap	pf								
粗加工	R1	0.8	0.8	6480	110	4320	70	3600	60	6480	130
	R2	1.6	1.6	3240	130	2160	70	1800	70	3240	140
	R3	2.4	2.4	2160	140	1440	80	1170	70	2160	140
	R5	4	4	1260	140	860	90	720	80	1260	150
	R8	6.4	6.4	810	140	540	80	450	80	810	150
	R10	8	8	650	140	430	80	360	80	650	150
	R12.5	10	10	510	130	340	70	290	70	510	140
精加工	R1	0.2	0.3	10800	540	7200	320	5940	230	10800	570
	R2	0.2	0.4	7380	590	4950	360	4140	260	7380	620
	R3	0.5	0.5	3870	420	2610	260	2160	190	3870	450
	R5	0.5	0.6	2970	530	1980	320	1620	230	2970	560
	R8	0.5	0.8	2340	660	1530	390	1260	280	2340	690
	R10	0.5	0.9	2070	700	1350	410	1170	320	2070	740
	R12.5	0.5	1	1800	760	1260	480	990	340	1800	790



Ball Nose Milling Reference
ap: Axial depth of cut
pf: Pick feed
h: Scallop height
Dc: End mill diameter
R: Ball nose radius

Notes
1.The cutting conditions shown are recommended reference values, measured under standard machining environments. If cutting conditions are too severe, reduce spindle speed and feed rate accordingly.
2.During machining, of abnormal noise, vibration, or tool damage occurs, adjust the cutting conditions immediately.
3.Use proper safety protection during operation to ensure safe machining.

Table 10 DB5053 / DA5003 / JA5003 鎢鋼圓溝立銑刀(鋁用)切削條件表

Carbid Aluminum End Mills(U-Flute Shape) Cutting Condition Table

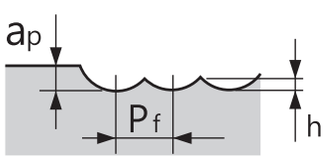
		Slot Milling				Side Milling			
被削材		鋁合金(有色金屬)		紅銅		鋁合金(有色金屬)		紅銅	
外徑 Diameter (mm)		回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
3		20000	1000	20000	500	20000	1200	20000	600
4		16000	1000	16000	500	16000	1200	16000	750
5		12500	1200	12500	600	12500	1500	12500	750
6		10000	1200	10000	600	10000	1500	10000	750
8		8000	1200	8000	600	8000	1500	8000	750
10		6000	1200	6000	600	6000	1500	6000	750
12		5500	1200	5500	600	5500	1500	5500	750
16		4000	1000	4000	600	4000	1200	4000	600
切削量	ap	1D		1D		1D		1D	
	ae	1D		1D		0.3D		0.3D	

Notes
1.The cutting conditions shown are recommended reference values, measured under standard machining environments. If cutting conditions are too severe, reduce spindle speed and feed rate accordingly.
2.During machining, of abnormal noise, vibration, or tool damage occurs, adjust the cutting conditions immediately.
3.Use proper safety protection during operation to ensure safe machining.

Table 11 RA4502 / RG4503 鎢鋼球刀(鋁用)切削條件表

Carbie Ball Nose Aluminum End Mills Cutting Condition Table

球刀半徑		被削材		鋁合金/銅合金 (有色金屬)	
		切削量		回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
		ap	pf		
粗加工	R1	0.8	0.8	12600	370
	R2	1.6	1.6	6100	410
	R3	2.4	2.4	4050	430
	R5	4	4	2430	460
	R8	6.4	6.4	1530	460
	R10	8	8	1260	460
	R12.5	10	10	990	440
精加工	R1	0.2	0.3	20700	1260
	R2	0.2	0.4	14400	1350
	R3	0.5	0.5	7380	990
	R5	0.5	0.6	5580	1170
	R8	0.5	0.8	4410	1440
	R10	0.5	0.9	3870	1620
	R12.5	0.5	1	3510	1800



Ball Nose Milling Reference
ap: Axial depth of cut
pf: Pick feed
h: Scallop height
Dc: End mill diameter
R: Ball nose radius

Notes
1.The cutting conditions shown are recommended reference values, measured under standard machining environments. If cutting conditions are too severe, reduce spindle speed and feed rate accordingly.
2.During machining, of abnormal noise, vibration, or tool damage occurs, adjust the cutting conditions immediately.
3.Use proper safety protection during operation to ensure safe machining.

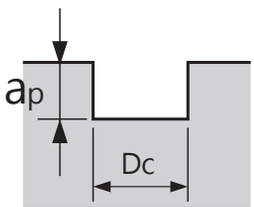
Table 12 BB4453 鎢鋼不等式鑽銑刀(鋁用)切削條件表

Asymmetric Helix Angle , Anti Vibration Carbide Boring & Milling Cutting Condition Table

Boring

被削材	鋁合金	
Work Material	AL	
米速 VC (mm/min)	150	
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
4	12000	480~600
6	8000	320~400
8	6000	240~300
10	4800	190~240
12	4000	160~200
16	3000	120~150
切削量ap	Max. 1Dc	

Boring Reference
ap : Axial depth of cut
Dc : End mill diameter

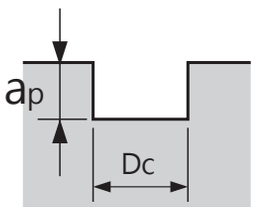


Maximum cutting depth : Max. 1Dc

Slot Milling(Long Type × 0.75)

被削材	鋁合金	
Work Material	AL	
米速 VC (mm/min)	150	
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
4	12000	720~1200
6	8000	560~1120
8	6000	420~840
10	4800	380~770
12	4000	320~640
16	3000	300~600
切削量ap	Max. 1Dc	

Slot Milling Reference
ap : Axial depth of cut
Dc : End mill diameter

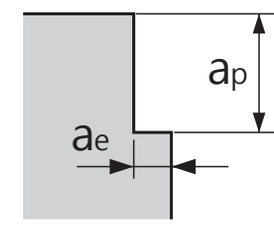


Maximum cutting depth : Max. 1Dc

Side Milling(Long Type × 0.75)

被削材		鋁合金	
Work Material		AL	
米速 VC (mm/min)		150	
外徑 Diameter (mm)		回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
4		12000	1200~1560
6		8000	800~1200
8		6000	720~1080
10		4800	580~860
12		4000	480~800
16		3000	450~720
切削量	ap	1Dc	
	ae	0.3D	

Side Milling Reference
ap : Axial depth of cut
ae : Radial depth of cut
Dc : End mill diameter



Notes
1.The cutting conditions shown are recommended reference values, measured under standard machining environments. If cutting conditions are too severe, reduce spindle speed and feed rate accordingly.
2.During machining, of abnormal noise, vibration, or tool damage occurs, adjust the cutting conditions immediately.
3.Use appropriate safety protectionduring operation and follow safe machining practices.

Table 13 AB4003 / AD4004 / TB4003 / TD4004 鎢鋼不等式鑽銑刀切削工作表

Asymmetric Helix Angle, Antivibration Carbid Boring & Milling Cutting Condition Table

Boring

被削材	碳鋼/鑄鋼		合金鋼/調質鋼		鑄鐵		不銹鋼		鈦合金	
Work Material	S-C/FC		SCM/NAK.HPM		FC250.FCD400		SUS304.SUS316		TI	
米速 VC (mm/min)	100		80		80		60		30	
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
4	8000	240~320	6400	190~260	6400	190~260	4800	100~190	2400	50~100
6	5300	160~210	4300	130~170	4300	130~170	3200	60~130	1600	30~60
8	4000	120~160	3200	100~130	3200	100~130	2400	50~100	1200	20~50
10	3200	100~130	2600	80~100	2600	80~100	1900	40~80	1000	20~40
12	2700	80~110	2100	60~80	2100	60~80	1600	30~60	800	20~30
16	2000	60~80	1600	50~60	1600	50~60	1200	20~50	600	10~20
切削量ap	Max. 1Dc									

Slot Milling

被削材	碳鋼/鑄鋼		合金鋼/調質鋼		鑄鐵		不銹鋼		鈦合金	
Work Material	S-C/FC		SCM/NAK.HPM		FC250.FCD400		SUS304.SUS316		TI	
米速 VC (mm/min)	100		80		80		60		30	
外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
4	8000	480~800	6400	380~640	6400	380~640	4800	240~380	2400	120~190
6	5300	370~640	4300	300~520	4300	300~520	3200	190~320	1600	100~160
8	4000	280~480	3200	220~380	3200	220~380	2400	140~240	1200	70~120
10	3200	260~420	2600	210~340	2600	210~340	1900	130~210	1000	70~110
12	2700	220~380	2100	170~290	2100	170~290	1600	110~190	800	60~100
16	2000	200~300	1600	160~240	1600	160~240	1200	110~160	600	50~80
切削量ap	Max. 1Dc									

Side Milling

被削材		碳鋼/鑄鋼		合金鋼/調質鋼		鑄鐵		不銹鋼		鈦合金	
Work Material		S-C/FC		SCM/NAK.HPM		FC250.FCD400		SUS304.SUS316		TI	
米速 VC (mm/min)		100		80		80		60		30	
外徑 Diameter (mm)		回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
4		8000	640~1040	6400	510~830	6400	510~830	4800	380~580	2400	190~290
6		5300	480~800	4300	390~650	4300	390~650	3200	290~450	1600	140~220
8		4000	400~600	3200	320~480	3200	320~480	2400	240~340	1200	120~170
10		3200	380~540	2600	310~440	2600	310~440	1900	230~300	1000	120~160
12		2700	320~540	2100	250~420	2100	250~420	1600	190~290	800	100~140
16		2000	240~400	1600	190~320	1600	190~320	1200	140~220	600	70~110
切削量	ap	1Dc									
	ae	0.3D									

Notes

1.The cutting conditions shown are recommended reference values, measured under standard machining environments. If cutting conditions are too severe, reduce spindle speed and feed rate accordingly.

2.During machining, of abnormal noise, vibration, or tool damage occurs, adjust the cutting conditions immediately.

3.Use appropriate safety protectionduring operation and follow safe machining practices.

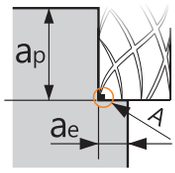
Table 14 GMST / GMLT 複合材料銑刀切削條件表

Cutter Specialized In Cutting Fiber End Mills Cutting Condition Table

Side Milling

外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
4	16000	1600
6	13000	2000
8	10000	2000
10	8000	2000
12	6600	1600
16	5000	1500
切削量 ap	1.5DC	
切削量 ae	0.05DC	

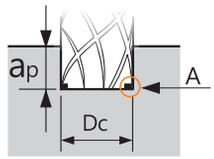
Side Milling Reference
ap : Axial depth of cut
ae : Radial depth of cut
Dc : End mill diameter



Slot Milling

外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
4	16000	1600
6	13000	2000
8	10000	2000
10	8000	2000
12	6600	1600
16	5000	1500
切削量ap	0.3Dc	

Slot Milling Reference
ap : Axial depth of cut
Dc : End mill diameter



Notes
1.The cutting conditions shown are recommended reference values, obtained under standard machining environments. If cutting conditions are too severe, reduce spindle speed and feed rate accordingly.
2.During machining, of abnormal noise, vibration, or tool wear occurs, adjust the cutting conditions based on actual machining results.
3.Use appropriate safety protectionduring operation and follow safe machining practices.
4.For composite materials, compared with conventional carbide tools, dedicated composite cutters significantly reduce delamination and fiber pull-out, especially during slotting and boring operations.

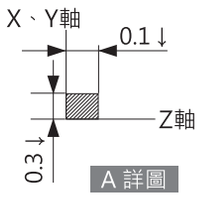


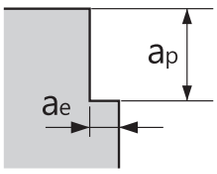
Table 15 GDE 複合材料鑽銑刀切削條件表

Cutter Specialized In Cutting Fiber Boring & Milling Cutting Condition Table

Side Milling

外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
4	16000	1280
6	13000	1600
8	10000	1600
10	8000	1600
12	6600	1280
16	5000	1200
切削量 ap	2DC	
切削量 ae	0.05DC	

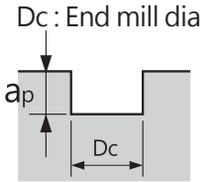
Side Milling Reference
ap : Axial depth of cut
ae : Radial depth of cut
Dc : End mill diameter



Slot Milling

外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
4	16000	1200
6	13000	1300
8	10000	1500
10	8000	1500
12	6600	1320
16	5000	1250
切削量ap	0.5Dc	

Slot Milling Reference
ap : Axial depth of cut
Dc : End mill diameter



Dc：複合式材料專用刀外徑

Boring

外徑 Diameter (mm)	回轉速 Rotation (min^{-1})	進刀速度 Feed (mm/min)
4	8000	200
6	5500	200
8	4000	250
10	3200	250
12	2600	250
16	2000	250

Notes
1.The cutting conditions shown are recommended reference values, obtained under standard machining environments. If cutting conditions are too severe,reduce spindle speed and feed rate accordingly.
2.During machining, of abnormal noise, vibration, or tool wear occurs, adjust the cutting conditions based on actual machining results.
3.Use appropriate safety protectionduring operation and follow safe machining practices.
4.For composite materials, compared with conventional carbide tools, dedicated composite cutters significantly reduce delamination and fiber pull-out, especially during slotting and boring operations.
5.Usestable, light cutting conditions to maintain hole quality and dimensional accuracy.

Table 15 鎢鋼小徑車刀加工條件表

Carbide Internal Boring Bars Condition Table

被削材	Carbon Steel		Alloy Steel / Mold Steel		Refining Steel / Quenching Hardening Steel		Stainless Steel	
Work Material	S-C		SCM/SKD				SUS300 / SUS400	
最小加工徑 Minimum Bore Diameter (mm)	米數 VC (m/min)	進刀速度 Feed (mm/r)	米數 VC (m/min)	進刀速度 Feed (mm/r)	米數 VC (m/min)	進刀速度 Feed (mm/r)	米數 VC (m/min)	進刀速度 Feed (mm/r)
1.5~2.5	25~50	0.01~0.03	25~40	0.01~0.03	20~40	0.01~0.03	15~25	0.015~0.03
2.5~4	30~60	0.01~0.04	30~45	0.01~0.04	25~45	0.01~0.04	20~30	0.015~0.04
4~6	35~75	0.01~0.05	35~55	0.01~0.05	30~55	0.01~0.05	25~35	0.015~0.05

被削材	Titanium Alloy / Nickel Alloy		Aluminum Alloy		Brass / Bronze	
Work Material			AL			
最小加工徑 Minimum Bore Diameter (mm)	米數 VC (m/min)	進刀速度 Feed (mm/r)	米數 VC (m/min)	進刀速度 Feed (mm/r)	米數 VC (m/min)	進刀速度 Feed (mm/r)
1.5~2.5	10~20	0.003~0.02	30~70	0.02~0.04	30~50	0.02~0.04
2.5~4	15~25	0.005~0.03	40~80	0.03~0.06	40~60	0.03~0.06
4~6	20~30	0.01~0.04	45~95	0.04~0.08	45~75	0.04~0.08

Notes

1.For deep-hole boring, reduce cutting conditions by20–30%to ensure machining stability and tool life.