
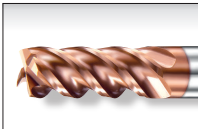

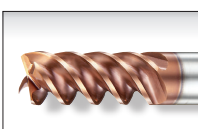
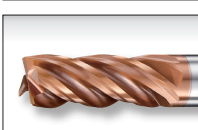
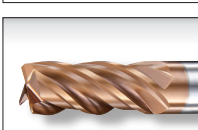

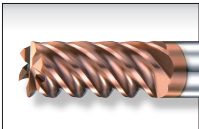
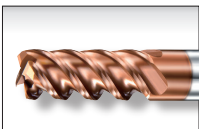



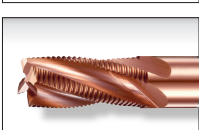


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Guide Line to Icons

圖示說明

鎢鋼種類 CARBIDE



超微粒。
Micro grain.



極超微粒。
Super micro grain.

顆粒大小 GRAIN SIZE



粉末顆粒是0.4 μm。
Grain size is 0.4 μm.



粉末顆粒是0.6 μm。
Grain size is 0.6 μm.

螺旋角 HELIX ANGLE



螺旋角度20°、30°、35°、35-38°、45°、50°、52°
Helix Angle is 20°,30°,35°,35-38°,45°,50°,52°.

圓隅角 CORNER R



圓隅角。
Corner Radius.

刃數 FLUTE



被切削材硬度 WORK MATERIAL HARDNESS



被切削工件硬度可達HRC55、HRC60。
Work material hardness is up to HRC55、HRC60.

鍍層 COATING



適用於高速加工。乾式切削。
Good at high speed cutting. For dry cutting.



適用於難切削材，油霧、溼式切削。
Good at difficult material. For Dry & Wet cutting.

齒形 ROUGHING



細粗齒
Small Roughing.



中粗齒
Middle Roughing.

切削性能 CUTTING PERFORMANCE



優
Excellent



良
Good



尚可
Acceptable



禁止
No

Standard

ETB

極超微粒立銑刀 END MILLS

| | | |
|--|-----------------------------|----------------------|
| | 乾式切削 Dry Machining | |
| | 油霧切削 MQL (Mist) | 精銑 Finishing |
| | 水溶性切削 Emulsion Machining | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | 粗銑 Roughing |

Stainless Steel Cutting

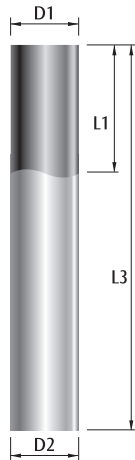


產品規格 SPECIFICATIONS

| 型號 Type No. | D1 直徑 Diameter | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|----------------------|--------------------------|--------------------|------------------------|
| ETB0104 | 1.0 | 3 | 50 | 4 |
| ETB0154 | 1.5 | 4 | 50 | 4 |
| ETB0204S | 2.0 | 6 | 50 | 4 |
| ETB0204 | 2.0 | 6 | 50 | 6 |
| ETB0254S | 2.5 | 8 | 50 | 4 |
| ETB0254 | 2.5 | 8 | 50 | 6 |
| ETB0304S | 3.0 | 8 | 50 | 4 |
| ETB0304 | 3.0 | 8 | 50 | 6 |
| ETB0354 | 3.5 | 10 | 50 | 6 |
| ETB0404S | 4.0 | 11 | 50 | 4 |
| ETB0404 | 4.0 | 11 | 50 | 6 |
| ETB0454 | 4.5 | 11 | 50 | 6 |
| ETB0504 | 5.0 | 13 | 50 | 6 |
| ETB0604 | 6.0 | 16 | 50 | 6 |
| ETB0804 | 8.0 | 20 | 60 | 8 |
| ETB1004Z | 10.0 | 25 | 75 | 10 |
| ETB1004 | 10.0 | 30 | 75 | 10 |
| ETB1204 | 12.0 | 30 | 75 | 12 |
| ETB1604 | 16.0 | 40 | 100 | 16 |
| ETB2004 | 20.0 | 45 | 100 | 20 |

unit : mm

公差表 TOLERANCE



| 直徑 D1 | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|-----------------------|----------|-----------------------|
| 1.0 | $0_{-0.02}$ | Ø4 | $0_{-0.008}$ |
| 1.5 | $0_{-0.02}$ | Ø6 | $0_{-0.008}$ |
| 2.0 | $0_{-0.02}$ | Ø8 | $0_{-0.009}$ |
| 2.5 | $0_{-0.02}$ | Ø10 | $0_{-0.009}$ |
| 3.0 | $0_{-0.02}$ | Ø12 | $0_{-0.011}$ |
| 3.5 | $0_{-0.02}$ | Ø16 | $0_{-0.011}$ |
| 4.0 | $0_{-0.02}$ | Ø20 | $0_{-0.013}$ |
| 4.5 | $0_{-0.02}$ | | |
| 5.0 | $0_{-0.02}$ | | |
| 6.0 | $0_{-0.02}$ | | |
| 8.0 | $0_{-0.025}$ | | |
| 10.0 | $0_{-0.03}$ | | |
| 12.0 | $0_{-0.035}$ | | |
| 16.0 | $0_{-0.04}$ | | |
| 20.0 | $0_{-0.04}$ | | |

unit : mm

ETB

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] :SUS304 : 1.4301 : AISI 304 (HRc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| ETB0104 | 9 | 80 | 25000 | 1100~1300 | 0~0.1 | 1 | 溝銑 SLOTTING |
| ETB0104 | 9 | 80 | 25000 | 600~900 | 0.1~0.2 | 1 | 溝銑 SLOTTING |
| ETB0104 | 9 | 80 | 25000 | 400~600 | 0.2~0.3 | 1 | 溝銑 SLOTTING |
| ETB0104 | 9 | 80 | 25000 | 200~400 | 1~2 | 0~0.1 | 側銑 SIDE MILLING |
| ETB0104 | 9 | 80 | 25000 | 800~1100 | 1 | 0.15 | 側銑 SIDE MILLING |
| ETB0104 | 9 | 80 | 25000 | 600~900 | 1~2 | 0~0.06 | 側銑 SIDE MILLING |
| ETB0154 | 9 | 105 | 22000 | 1100~1300 | 0~0.13 | 1.5 | 溝銑 SLOTTING |
| ETB0154 | 9 | 105 | 22000 | 600~900 | 0.13~0.3 | 1.5 | 溝銑 SLOTTING |
| ETB0154 | 9 | 105 | 22000 | 400~600 | 0.3~0.5 | 1.5 | 溝銑 SLOTTING |
| ETB0154 | 9 | 105 | 22000 | 200~400 | 1.5~3 | 0~0.13 | 側銑 SIDE MILLING |
| ETB0154 | 9 | 105 | 22000 | 800~1100 | 1.5 | 0.25 | 側銑 SIDE MILLING |
| ETB0154 | 9 | 105 | 22000 | 600~900 | 1.5~3 | 0~0.08 | 側銑 SIDE MILLING |
| ETB0204S | 11 | 105 | 16500 | 1100~1300 | 0~0.18 | 2 | 溝銑 SLOTTING |
| ETB0204S | 11 | 105 | 16500 | 600~900 | 0.2~0.3 | 2 | 溝銑 SLOTTING |
| ETB0204S | 11 | 105 | 16500 | 400~600 | 0.3~0.6 | 2 | 溝銑 SLOTTING |
| ETB0204S | 11 | 105 | 16500 | 200~400 | 2~4 | 0~0.18 | 側銑 SIDE MILLING |
| ETB0204S | 11 | 105 | 16500 | 800~1100 | 2 | 0.35 | 側銑 SIDE MILLING |
| ETB0204S | 11 | 105 | 16500 | 600~900 | 2~4 | 0~0.1 | 側銑 SIDE MILLING |
| ETB0204 | 11 | 105 | 16500 | 1100~1300 | 0~0.18 | 2 | 溝銑 SLOTTING |
| ETB0204 | 11 | 105 | 16500 | 600~900 | 0.2~0.3 | 2 | 溝銑 SLOTTING |
| ETB0204 | 11 | 105 | 16500 | 400~600 | 0.3~0.6 | 2 | 溝銑 SLOTTING |
| ETB0204 | 11 | 105 | 16500 | 200~400 | 2~4 | 0~0.18 | 側銑 SIDE MILLING |
| ETB0204 | 11 | 105 | 16500 | 800~1100 | 2 | 0.35 | 側銑 SIDE MILLING |
| ETB0204 | 11 | 105 | 16500 | 600~900 | 2~4 | 0~0.1 | 側銑 SIDE MILLING |
| ETB0254S | 12 | 105 | 13300 | 1200~1400 | 0~0.25 | 2.5 | 溝銑 SLOTTING |
| ETB0254S | 12 | 105 | 13300 | 800~1000 | 0.25~0.6 | 2.5 | 溝銑 SLOTTING |
| ETB0254S | 12 | 105 | 13300 | 500~700 | 0.6~1 | 2.5 | 溝銑 SLOTTING |
| ETB0254S | 12 | 105 | 13300 | 1000~1200 | 2.5~5 | 0~0.25 | 側銑 SIDE MILLING |
| ETB0254S | 12 | 105 | 13300 | 800~1000 | 2.5 | 0.45 | 側銑 SIDE MILLING |
| ETB0254S | 12 | 105 | 13300 | 700~900 | 2.5~5 | 0~0.12 | 側銑 SIDE MILLING |
| ETB0254 | 12 | 105 | 13300 | 1200~1600 | 0~0.25 | 2.5 | 溝銑 SLOTTING |
| ETB0254 | 12 | 105 | 13300 | 800~1000 | 0.25~0.6 | 2.5 | 溝銑 SLOTTING |
| ETB0254 | 12 | 105 | 13300 | 600~800 | 0.6~1 | 2.5 | 溝銑 SLOTTING |
| ETB0254 | 12 | 105 | 13300 | 1000~1200 | 2.5~5 | 0~0.25 | 側銑 SIDE MILLING |
| ETB0254 | 12 | 105 | 13300 | 800~1000 | 2.5 | 0.45 | 側銑 SIDE MILLING |
| ETB0254 | 12 | 105 | 13300 | 700~900 | 2.5~5 | 0~0.12 | 側銑 SIDE MILLING |

被切削材 Work Material
沃斯田鐵系不銹鋼
Stainless Steels [Easy] : SUS304 : 1.4301 : AISI 304 (HRc 28~32)
切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| ETB0304S | 13 | 105 | 11100 | 1200~1600 | 0~0.3 | 3 | 溝銼 SLOTTING |
| ETB0304S | 13 | 105 | 11100 | 800~1000 | 0.3~0.7 | 3 | 溝銼 SLOTTING |
| ETB0304S | 13 | 105 | 11100 | 600~800 | 0.8~1.5 | 3 | 溝銼 SLOTTING |
| ETB0304S | 13 | 105 | 11100 | 1000~1200 | 3~6 | 0~0.3 | 側銼 SIDE MILLING |
| ETB0304S | 13 | 105 | 11100 | 800~1000 | 3 | 0.65 | 側銼 SIDE MILLING |
| ETB0304S | 13 | 105 | 11100 | 700~900 | 3~6 | 0~0.12 | 側銼 SIDE MILLING |
| ETB0304 | 15 | 105 | 11100 | 1200~1600 | 0~0.3 | 3 | 溝銼 SLOTTING |
| ETB0304 | 15 | 105 | 11100 | 800~1000 | 0.3~0.7 | 3 | 溝銼 SLOTTING |
| ETB0304 | 15 | 105 | 11100 | 600~800 | 0.8~1.5 | 3 | 溝銼 SLOTTING |
| ETB0304 | 15 | 105 | 11100 | 1000~1200 | 3~6 | 0~0.3 | 側銼 SIDE MILLING |
| ETB0304 | 15 | 105 | 11100 | 800~1000 | 3 | 0.65 | 側銼 SIDE MILLING |
| ETB0304 | 15 | 105 | 11100 | 700~900 | 3~6 | 0~0.12 | 側銼 SIDE MILLING |
| ETB0354 | 15 | 105 | 9600 | 1200~1600 | 0~0.35 | 3.5 | 溝銼 SLOTTING |
| ETB0354 | 15 | 105 | 9600 | 800~1000 | 0.35~0.8 | 3.5 | 溝銼 SLOTTING |
| ETB0354 | 15 | 105 | 9600 | 600~800 | 0.8~1.6 | 3.5 | 溝銼 SLOTTING |
| ETB0354 | 15 | 105 | 9600 | 1000~1200 | 3.5~7 | 0~0.35 | 側銼 SIDE MILLING |
| ETB0354 | 15 | 105 | 9600 | 800~1000 | 3.5 | 0.75 | 側銼 SIDE MILLING |
| ETB0354 | 15 | 105 | 9600 | 700~900 | 3.5~7 | 0~0.15 | 側銼 SIDE MILLING |
| ETB0404S | 16 | 105 | 8400 | 1200~1600 | 0~0.4 | 4 | 溝銼 SLOTTING |
| ETB0404S | 16 | 105 | 8400 | 800~1000 | 0.4~1 | 4 | 溝銼 SLOTTING |
| ETB0404S | 16 | 105 | 8400 | 600~800 | 1~2 | 4 | 溝銼 SLOTTING |
| ETB0404S | 16 | 105 | 8400 | 1000~1200 | 4~8 | 0~0.4 | 側銼 SIDE MILLING |
| ETB0404S | 16 | 105 | 8400 | 800~1000 | 8 | 0.9 | 側銼 SIDE MILLING |
| ETB0404S | 16 | 105 | 8400 | 700~900 | 4~8 | 0~0.2 | 側銼 SIDE MILLING |
| ETB0404 | 16 | 105 | 8400 | 1400~1800 | 0~0.4 | 4 | 溝銼 SLOTTING |
| ETB0404 | 16 | 105 | 8400 | 1000~1200 | 0.4~1 | 4 | 溝銼 SLOTTING |
| ETB0404 | 16 | 105 | 8400 | 700~900 | 1~2 | 4 | 溝銼 SLOTTING |
| ETB0404 | 16 | 105 | 8400 | 1200~1400 | 4~8 | 0~0.4 | 側銼 SIDE MILLING |
| ETB0404 | 16 | 105 | 8400 | 900~1100 | 8 | 0.9 | 側銼 SIDE MILLING |
| ETB0404 | 16 | 105 | 8400 | 800~1000 | 4~8 | 0~0.2 | 側銼 SIDE MILLING |
| ETB0454 | 16 | 105 | 7500 | 1400~1800 | 0~0.45 | 4.5 | 溝銼 SLOTTING |
| ETB0454 | 16 | 105 | 7500 | 1000~1200 | 0.45~1.1 | 4.5 | 溝銼 SLOTTING |
| ETB0454 | 16 | 105 | 7500 | 750~950 | 1.1~2 | 4.5 | 溝銼 SLOTTING |
| ETB0454 | 16 | 105 | 7500 | 1200~1400 | 4.5~9 | 0~0.45 | 側銼 SIDE MILLING |
| ETB0454 | 16 | 105 | 7500 | 900~1100 | 4.5 | 0.9 | 側銼 SIDE MILLING |
| ETB0454 | 16 | 105 | 7500 | 800~1000 | 4.5~9 | 0~0.2 | 側銼 SIDE MILLING |

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] :SUS304 : 1.4301 : AISI 304 (HRc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| ETB0504 | 19 | 105 | 6700 | 1400~1800 | 0~0.45 | 5 | 溝銑 SLOTTING |
| ETB0504 | 19 | 105 | 6700 | 1000~1200 | 0.45~1.2 | 5 | 溝銑 SLOTTING |
| ETB0504 | 19 | 105 | 6700 | 750~950 | 1.3~2.5 | 5 | 溝銑 SLOTTING |
| ETB0504 | 19 | 105 | 6700 | 1200~1400 | 5~10 | 0~0.45 | 側銑 SIDE MILLING |
| ETB0504 | 19 | 105 | 6700 | 900~1100 | 5~10 | 0.9 | 側銑 SIDE MILLING |
| ETB0504 | 19 | 95 | 6050 | 700~900 | 5~10 | 1.5 | 側銑 SIDE MILLING |
| ETB0504 | 19 | 95 | 6050 | 500~700 | 5 | 2 | 側銑 SIDE MILLING |
| ETB0504 | 19 | 105 | 6700 | 800~1000 | 5~10 | 0~0.25 | 側銑 SIDE MILLING |
| ETB0604 | 21 | 105 | 5600 | 1400~1800 | 0~0.5 | 6 | 溝銑 SLOTTING |
| ETB0604 | 21 | 105 | 5600 | 1000~1200 | 0.5~1.5 | 6 | 溝銑 SLOTTING |
| ETB0604 | 21 | 105 | 5600 | 800~1000 | 1.5~3 | 6 | 溝銑 SLOTTING |
| ETB0604 | 21 | 105 | 5600 | 1200~1400 | 6~12 | 0~0.5 | 側銑 SIDE MILLING |
| ETB0604 | 21 | 105 | 5600 | 900~1100 | 6~12 | 1 | 側銑 SIDE MILLING |
| ETB0604 | 21 | 90 | 4750 | 700~900 | 6~12 | 2 | 側銑 SIDE MILLING |
| ETB0604 | 21 | 90 | 4750 | 550~750 | 6~12 | 3 | 側銑 SIDE MILLING |
| ETB0604 | 21 | 90 | 4750 | 400~600 | 6 | 5 | 側銑 SIDE MILLING |
| ETB0604 | 21 | 105 | 5600 | 800~1000 | 6~12 | 0~0.25 | 側銑 SIDE MILLING |
| ETB0804 | 27 | 105 | 4200 | 1300~1600 | 0~0.5 | 8 | 溝銑 SLOTTING |
| ETB0804 | 27 | 105 | 4200 | 800~1000 | 0.5~2 | 8 | 溝銑 SLOTTING |
| ETB0804 | 27 | 105 | 4200 | 600~800 | 3~4 | 8 | 溝銑 SLOTTING |
| ETB0804 | 27 | 105 | 4200 | 1000~1200 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |
| ETB0804 | 27 | 70 | 2750 | 600~800 | 8~16 | 1 | 側銑 SIDE MILLING |
| ETB0804 | 27 | 70 | 2750 | 300~500 | 8~16 | 2 | 側銑 SIDE MILLING |
| ETB0804 | 27 | 70 | 2750 | 300~500 | 8 | 2~4 | 側銑 SIDE MILLING |
| ETB0804 | 27 | 115 | 4500 | 600~800 | 16 | 0~0.3 | 側銑 SIDE MILLING |
| ETB1004Z | 30 | 115 | 3600 | 1400~1800 | 0~0.6 | 10 | 溝銑 SLOTTING |
| ETB1004Z | 30 | 115 | 3600 | 650~850 | 2~3 | 10 | 溝銑 SLOTTING |
| ETB1004Z | 30 | 115 | 3600 | 500~700 | 3~5 | 10 | 溝銑 SLOTTING |
| ETB1004Z | 30 | 105 | 3300 | 1200~1500 | 10~25 | 0~0.6 | 側銑 SIDE MILLING |
| ETB1004Z | 30 | 105 | 3300 | 600~800 | 20 | 1 | 側銑 SIDE MILLING |
| ETB1004Z | 30 | 65 | 2000or2700 | 250~400 | 20 | 2~4 | 側銑 SIDE MILLING |
| ETB1004Z | 30 | 65 | 2000 | 200~350 | 20 | 4~5 | 側銑 SIDE MILLING |
| ETB1004Z | 30 | 105 | 3400 | 700~900 | 25 | 0~0.3 | 側銑 SIDE MILLING |
| ETB1004 | 34 | 105 | 3350 | 1300~1500 | 0~0.6 | 10 | 溝銑 SLOTTING |
| ETB1004 | 34 | 110 | 3500 | 600~800 | 2~3 | 10 | 溝銑 SLOTTING |
| ETB1004 | 34 | 105 | 3300 | 450~650 | 3~5 | 10 | 溝銑 SLOTTING |

被切削材 Work Material
沃斯田鐵系不銹鋼
Stainless Steels [Easy]:SUS304 : 1.4301 : AISI 304 (HRc 28~32)
切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| ETB1004 | 34 | 105 | 3300 | 1100~1400 | 10~20 | 0~0.6 | 側銑 SIDE MILLING |
| ETB1004 | 34 | 105 | 3300 | 600~800 | 20 | 1 | 側銑 SIDE MILLING |
| ETB1004 | 34 | 65 | 2000 | 250~400 | 20 | 2~4 | 側銑 SIDE MILLING |
| ETB1004 | 34 | 65 | 2000 | 200~350 | 20 | 4~5 | 側銑 SIDE MILLING |
| ETB1004 | 34 | 115 | 3600 | 700~900 | 10~20 | 0~0.3 | 側銑 SIDE MILLING |
| ETB1204 | 37 | 105 | 2800 | 1000~1300 | 0~0.7 | 12 | 溝銑 SLOTTING |
| ETB1204 | 37 | 85 | 2250 | 400~600 | 0.7~2 | 12 | 溝銑 SLOTTING |
| ETB1204 | 37 | 75 | 1950 | 300~400 | 3~4.5 | 12 | 溝銑 SLOTTING |
| ETB1204 | 37 | 105 | 2800 | 800~1000 | 12~24 | 0~0.7 | 側銑 SIDE MILLING |
| ETB1204 | 37 | 80 | 2100 | 500~700 | 12~24 | 1~1.3 | 側銑 SIDE MILLING |
| ETB1204 | 37 | 65 | 1700 | 250~400 | 24 | 1.5~3 | 側銑 SIDE MILLING |
| ETB1204 | 37 | 65 | 1700 | 200~300 | 24 | 3~5 | 側銑 SIDE MILLING |
| ETB1204 | 37 | 105 | 2800 | 600~800 | 12~24 | 0~0.35 | 側銑 SIDE MILLING |
| ETB1604 | 50 | 105 | 2100 | 800~1000 | 0~0.7 | 16 | 溝銑 SLOTTING |
| ETB1604 | 50 | 85 | 1700 | 300~500 | 0.7~2 | 16 | 溝銑 SLOTTING |
| ETB1604 | 50 | 75 | 1500 | 200~300 | 3~4 | 16 | 溝銑 SLOTTING |
| ETB1604 | 50 | 105 | 2100 | 600~800 | 16~32 | 0~0.7 | 側銑 SIDE MILLING |
| ETB1604 | 50 | 80 | 1600 | 400~600 | 16 | 1~1.3 | 側銑 SIDE MILLING |
| ETB1604 | 50 | 105 | 2100 | 400~600 | 16~32 | 0~0.35 | 側銑 SIDE MILLING |
| ETB2004 | 50 | 105 | 1650 | 600~800 | 0~0.7 | 20 | 溝銑 SLOTTING |
| ETB2004 | 50 | 85 | 1350 | 200~400 | 0.7~2 | 20 | 溝銑 SLOTTING |
| ETB2004 | 50 | 75 | 1200 | 150~250 | 3~4 | 20 | 溝銑 SLOTTING |
| ETB2004 | 50 | 105 | 1650 | 450~650 | 20~40 | 0~0.7 | 側銑 SIDE MILLING |
| ETB2004 | 50 | 80 | 1250 | 300~500 | 20 | 1~1.3 | 側銑 SIDE MILLING |
| ETB2004 | 50 | 105 | 1650 | 300~500 | 20~40 | 0~0.35 | 側銑 SIDE MILLING |

附註

- ETB適用於粗、精銑加工，溝銑(Aa)與側銑(Ap)都有0.3~0.5D切削能力。粗切削時建議使用溼式高壓水溶性切削液，以免造成排屑不良；當使用精銑及0.1D以內請用乾式切削（因塗層特性關係）。直徑 ϕ 10以上，需視機器剛性與主軸扭力值的不同，做適當調整。
- 建議冷卻方式為溼式。

NOTE

- ETB is good at Roughing and Finishing. It can do a 0.3~0.5D machining for both Slotting (Aa) and Side milling (Ap). When Roughing, we suggest high pressure emulsion coolant for better chip removal. Please use Dry Maching for Finishing and 0.1D cutting (due to coating features). For diameter above 10.0mm, make necessary adjustment as per the rigidity of machine and the torque of spindle.
- Suggest to use wet coolant.

Standard



ETH

極超微粒立銑刀 END MILLS

產品規格 SPECIFICATIONS

| 型號 Type No. | D1 直徑 Diameter | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|----------------------|--------------------------|--------------------|------------------------|
| ETH0104 | 1.0 | 3 | 50 | 4 |
| ETH0154 | 1.5 | 4 | 50 | 4 |
| ETH0204 | 2.0 | 6 | 50 | 4 |
| ETH0254 | 2.5 | 8 | 50 | 4 |
| ETH0304 | 3.0 | 8 | 50 | 4 |
| ETH0354 | 3.5 | 10 | 50 | 4 |
| ETH0404 | 4.0 | 11 | 50 | 4 |
| ETH0454 | 4.5 | 11 | 50 | 6 |
| ETH0504 | 5.0 | 13 | 50 | 6 |
| ETH0604 | 6.0 | 16 | 50 | 6 |
| ETH0804 | 8.0 | 20 | 60 | 8 |
| ETH1004Z | 10.0 | 25 | 75 | 10 |
| ETH1004 | 10.0 | 30 | 75 | 10 |
| ETH1204 | 12.0 | 30 | 75 | 12 |
| ETH1604 | 16.0 | 40 | 100 | 16 |
| ETH2004 | 20.0 | 45 | 100 | 20 |

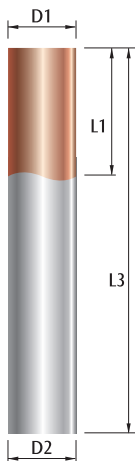
unit : mm

| | | | |
|--|-----------------------------|--|----------------------|
| | 乾式切削 Dry Machining | | |
| | 油霧切削 MQL (Mist) | | 精銑 Finishing |
| | 水溶性切削 Emulsion Machining | | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | | 粗銑 Roughing |

公差表 TOLERANCE

| 直徑 D1 | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|-----------------------|----------|-----------------------|
| 1.0 | $0_{-0.02}$ | Ø4 | $0_{-0.008}$ |
| 1.5 | $0_{-0.02}$ | Ø6 | $0_{-0.008}$ |
| 2.0 | $0_{-0.02}$ | Ø8 | $0_{-0.009}$ |
| 2.5 | $0_{-0.02}$ | Ø10 | $0_{-0.009}$ |
| 3.0 | $0_{-0.02}$ | Ø12 | $0_{-0.011}$ |
| 3.5 | $0_{-0.02}$ | Ø16 | $0_{-0.011}$ |
| 4.0 | $0_{-0.02}$ | Ø20 | $0_{-0.013}$ |
| 4.5 | $0_{-0.02}$ | | |
| 5.0 | $0_{-0.02}$ | | |
| 6.0 | $0_{-0.02}$ | | |
| 8.0 | $0_{-0.025}$ | | |
| 10.0 | $0_{-0.03}$ | | |
| 12.0 | $0_{-0.035}$ | | |
| 16.0 | $0_{-0.04}$ | | |
| 20.0 | $0_{-0.04}$ | | |

unit : mm



Stainless Steel Cutting

ETH

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] : **SUS304** : **1.4301** : **AISI 304** (HRc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| ETH0104 | 9 | 80 | 25000 | 1100~1300 | 0~0.1 | 1 | 溝銑 SLOTTING |
| ETH0104 | 9 | 80 | 25000 | 600~900 | 0.1~0.2 | 1 | 溝銑 SLOTTING |
| ETH0104 | 9 | 80 | 25000 | 400~600 | 0.2~0.3 | 1 | 溝銑 SLOTTING |
| ETH0104 | 9 | 80 | 25000 | 200~400 | 1~2 | 0~0.1 | 側銑 SIDE MILLING |
| ETH0104 | 9 | 80 | 25000 | 800~1100 | 1 | 0.15 | 側銑 SIDE MILLING |
| ETH0104 | 9 | 80 | 25000 | 600~900 | 1~2 | 0~0.06 | 側銑 SIDE MILLING |
| ETH0154 | 9 | 105 | 22000 | 1100~1300 | 0~0.13 | 1.5 | 溝銑 SLOTTING |
| ETH0154 | 9 | 105 | 22000 | 600~900 | 0.13~0.3 | 1.5 | 溝銑 SLOTTING |
| ETH0154 | 9 | 105 | 22000 | 400~600 | 0.3~0.5 | 1.5 | 溝銑 SLOTTING |
| ETH0154 | 9 | 105 | 22000 | 200~400 | 1.5~3 | 0~0.13 | 側銑 SIDE MILLING |
| ETH0154 | 9 | 105 | 22000 | 800~1100 | 1.5 | 0.25 | 側銑 SIDE MILLING |
| ETH0154 | 9 | 105 | 22000 | 600~900 | 1.5~3 | 0~0.08 | 側銑 SIDE MILLING |
| ETH0204 | 11 | 105 | 16500 | 1100~1300 | 0~0.18 | 2 | 溝銑 SLOTTING |
| ETH0204 | 11 | 105 | 16500 | 600~900 | 0.2~0.3 | 2 | 溝銑 SLOTTING |
| ETH0204 | 11 | 105 | 16500 | 400~600 | 0.3~0.6 | 2 | 溝銑 SLOTTING |
| ETH0204 | 11 | 105 | 16500 | 200~400 | 2~4 | 0~0.18 | 側銑 SIDE MILLING |
| ETH0204 | 11 | 105 | 16500 | 800~1100 | 2 | 0.35 | 側銑 SIDE MILLING |
| ETH0204 | 11 | 105 | 16500 | 600~900 | 2~4 | 0~0.1 | 側銑 SIDE MILLING |
| ETH0254 | 12 | 105 | 13300 | 1200~1600 | 0~0.25 | 2.5 | 溝銑 SLOTTING |
| ETH0254 | 12 | 105 | 13300 | 800~1000 | 0.25~0.6 | 2.5 | 溝銑 SLOTTING |
| ETH0254 | 12 | 105 | 13300 | 600~800 | 0.6~1 | 2.5 | 溝銑 SLOTTING |
| ETH0254 | 12 | 105 | 13300 | 1000~1200 | 2.5~5 | 0~0.25 | 側銑 SIDE MILLING |
| ETH0254 | 12 | 105 | 13300 | 800~1000 | 2.5 | 0.45 | 側銑 SIDE MILLING |
| ETH0254 | 12 | 105 | 13300 | 700~900 | 2.5~5 | 0~0.12 | 側銑 SIDE MILLING |
| ETH0304 | 15 | 105 | 11100 | 1200~1600 | 0~0.3 | 3 | 溝銑 SLOTTING |
| ETH0304 | 15 | 105 | 11100 | 800~1000 | 0.3~0.7 | 3 | 溝銑 SLOTTING |
| ETH0304 | 15 | 105 | 11100 | 600~800 | 0.8~1.5 | 3 | 溝銑 SLOTTING |
| ETH0304 | 15 | 105 | 11100 | 1000~1200 | 3~6 | 0~0.3 | 側銑 SIDE MILLING |
| ETH0304 | 15 | 105 | 11100 | 800~1000 | 3 | 0.65 | 側銑 SIDE MILLING |
| ETH0304 | 15 | 105 | 11100 | 700~900 | 3~6 | 0~0.12 | 側銑 SIDE MILLING |

被切削材 Work Material
沃斯田鐵系不銹鋼
Stainless Steels [Easy]:SUS304 : 1.4301 : AISI 304 (HRc 28~32)
切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| ETH0354 | 15 | 105 | 9600 | 1200~1600 | 0~0.35 | 3.5 | 溝銑 SLOTTING |
| ETH0354 | 15 | 105 | 9600 | 800~1000 | 0.35~0.8 | 3.5 | 溝銑 SLOTTING |
| ETH0354 | 15 | 105 | 9600 | 600~800 | 0.8~1.6 | 3.5 | 溝銑 SLOTTING |
| ETH0354 | 15 | 105 | 9600 | 1000~1200 | 3.5~7 | 0~0.35 | 側銑 SIDE MILLING |
| ETH0354 | 15 | 105 | 9600 | 800~1000 | 3.5 | 0.75 | 側銑 SIDE MILLING |
| ETH0354 | 15 | 105 | 9600 | 700~900 | 3.5~7 | 0~0.15 | 側銑 SIDE MILLING |
| ETH0404 | 16 | 105 | 8400 | 1400~1800 | 0~0.4 | 4 | 溝銑 SLOTTING |
| ETH0404 | 16 | 105 | 8400 | 1000~1200 | 0.4~1 | 4 | 溝銑 SLOTTING |
| ETH0404 | 16 | 105 | 8400 | 700~900 | 1~2 | 4 | 溝銑 SLOTTING |
| ETH0404 | 16 | 105 | 8400 | 1200~1400 | 4~8 | 0~0.4 | 側銑 SIDE MILLING |
| ETH0404 | 16 | 105 | 8400 | 900~1100 | 8 | 0.9 | 側銑 SIDE MILLING |
| ETH0404 | 16 | 105 | 8400 | 800~1000 | 4~8 | 0~0.2 | 側銑 SIDE MILLING |
| ETH0454 | 16 | 105 | 7500 | 1400~1800 | 0~0.45 | 4.5 | 溝銑 SLOTTING |
| ETH0454 | 16 | 105 | 7500 | 1000~1200 | 0.45~1.1 | 4.5 | 溝銑 SLOTTING |
| ETH0454 | 16 | 105 | 7500 | 750~950 | 1.1~2 | 4.5 | 溝銑 SLOTTING |
| ETH0454 | 16 | 105 | 7500 | 1200~1400 | 4.5~9 | 0~0.45 | 側銑 SIDE MILLING |
| ETH0454 | 16 | 105 | 7500 | 900~1100 | 4.5 | 0.9 | 側銑 SIDE MILLING |
| ETH0454 | 16 | 105 | 7500 | 800~1000 | 4.5~9 | 0~0.2 | 側銑 SIDE MILLING |
| ETH0504 | 19 | 105 | 6700 | 1400~1800 | 0~0.45 | 5 | 溝銑 SLOTTING |
| ETH0504 | 19 | 105 | 6700 | 1000~1200 | 0.45~1.2 | 5 | 溝銑 SLOTTING |
| ETH0504 | 19 | 105 | 6700 | 750~950 | 1.3~2.5 | 5 | 溝銑 SLOTTING |
| ETH0504 | 19 | 105 | 6700 | 1200~1400 | 5~10 | 0~0.45 | 側銑 SIDE MILLING |
| ETH0504 | 19 | 105 | 6700 | 900~1100 | 5~10 | 0.9 | 側銑 SIDE MILLING |
| ETH0504 | 19 | 95 | 6050 | 700~900 | 5~10 | 1.5 | 側銑 SIDE MILLING |
| ETH0504 | 19 | 95 | 6050 | 500~700 | 5 | 2 | 側銑 SIDE MILLING |
| ETH0504 | 19 | 105 | 6700 | 800~1000 | 5~10 | 0~0.25 | 側銑 SIDE MILLING |
| ETH0604 | 21 | 105 | 5600 | 1400~1800 | 0~0.5 | 6 | 溝銑 SLOTTING |
| ETH0604 | 21 | 105 | 5600 | 1000~1200 | 0.5~1.5 | 6 | 溝銑 SLOTTING |
| ETH0604 | 21 | 105 | 5600 | 800~1000 | 1.5~3 | 6 | 溝銑 SLOTTING |
| ETH0604 | 21 | 105 | 5600 | 1200~1400 | 6~12 | 0~0.5 | 側銑 SIDE MILLING |

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] :SUS304 :1.4301 :AISI 304 (HRC 28~32)

切削條件表 **MILLING CONDITIONS**

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| ETH0604 | 21 | 105 | 5600 | 900~1100 | 6~12 | 1 | 側銑 SIDE MILLING |
| ETH0604 | 21 | 90 | 4750 | 700~900 | 6~12 | 2 | 側銑 SIDE MILLING |
| ETH0604 | 21 | 90 | 4750 | 550~750 | 6~12 | 3 | 側銑 SIDE MILLING |
| ETH0604 | 21 | 90 | 4750 | 400~600 | 6 | 5 | 側銑 SIDE MILLING |
| ETH0604 | 21 | 105 | 5600 | 800~1000 | 6~12 | 0~0.25 | 側銑 SIDE MILLING |
| ETH0804 | 27 | 105 | 4200 | 1300~1600 | 0~0.5 | 8 | 溝銑 SLOTTING |
| ETH0804 | 27 | 105 | 4200 | 800~1000 | 0.5~2 | 8 | 溝銑 SLOTTING |
| ETH0804 | 27 | 105 | 4200 | 600~800 | 3~4 | 8 | 溝銑 SLOTTING |
| ETH0804 | 27 | 105 | 4200 | 1000~1200 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |
| ETH0804 | 27 | 70 | 2750 | 600~800 | 8~16 | 1 | 側銑 SIDE MILLING |
| ETH0804 | 27 | 70 | 2750 | 300~500 | 8~16 | 2 | 側銑 SIDE MILLING |
| ETH0804 | 27 | 70 | 2750 | 300~500 | 8 | 2~4 | 側銑 SIDE MILLING |
| ETH0804 | 27 | 115 | 4500 | 600~800 | 16 | 0~0.3 | 側銑 SIDE MILLING |
| ETH1004Z | 30 | 115 | 3600 | 1400~1800 | 0~0.6 | 10 | 溝銑 SLOTTING |
| ETH1004Z | 30 | 115 | 3600 | 650~850 | 2~3 | 10 | 溝銑 SLOTTING |
| ETH1004Z | 30 | 115 | 3600 | 500~700 | 3~5 | 10 | 溝銑 SLOTTING |
| ETH1004Z | 30 | 105 | 3300 | 1200~1500 | 10~25 | 0~0.6 | 側銑 SIDE MILLING |
| ETH1004Z | 30 | 105 | 3300 | 600~800 | 20 | 1 | 側銑 SIDE MILLING |
| ETH1004Z | 30 | 65 | 2000or2700 | 250~400 | 20 | 2~4 | 側銑 SIDE MILLING |
| ETH1004Z | 30 | 65 | 2000 | 200~350 | 20 | 4~5 | 側銑 SIDE MILLING |
| ETH1004Z | 30 | 105 | 3400 | 700~900 | 25 | 0~0.3 | 側銑 SIDE MILLING |
| ETH1004 | 34 | 105 | 3350 | 1300~1500 | 0~0.6 | 10 | 溝銑 SLOTTING |
| ETH1004 | 34 | 110 | 3500 | 600~800 | 2~3 | 10 | 溝銑 SLOTTING |
| ETH1004 | 34 | 105 | 3300 | 450~650 | 3~5 | 10 | 溝銑 SLOTTING |
| ETH1004 | 34 | 105 | 3300 | 1100~1400 | 10~20 | 0~0.6 | 側銑 SIDE MILLING |
| ETH1004 | 34 | 105 | 3300 | 600~800 | 10~20 | 1 | 側銑 SIDE MILLING |
| ETH1004 | 34 | 65 | 2000 | 250~400 | 20 | 2~4 | 側銑 SIDE MILLING |
| ETH1004 | 34 | 65 | 2000 | 200~350 | 20 | 4~5 | 側銑 SIDE MILLING |
| ETH1004 | 34 | 115 | 3600 | 700~900 | 10~20 | 0~0.3 | 側銑 SIDE MILLING |

被切削材 Work Material
沃斯田鐵系不銹鋼
Stainless Steels [Easy] : SUS304 : 1.4301 : AISI 304 (HRc 28~32)
切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| ETH1204 | 37 | 105 | 2800 | 1000~1300 | 0~0.7 | 12 | 溝銑 SLOTTING |
| ETH1204 | 37 | 85 | 2250 | 400~600 | 0.7~2 | 12 | 溝銑 SLOTTING |
| ETH1204 | 37 | 75 | 1950 | 300~400 | 3~4.5 | 12 | 溝銑 SLOTTING |
| ETH1204 | 37 | 105 | 2800 | 800~1000 | 12~24 | 0~0.7 | 側銑 SIDE MILLING |
| ETH1204 | 37 | 80 | 2100 | 500~700 | 12~24 | 1~1.3 | 側銑 SIDE MILLING |
| ETH1204 | 37 | 65 | 1700 | 250~400 | 24 | 1.5~3 | 側銑 SIDE MILLING |
| ETH1204 | 37 | 65 | 1700 | 200~300 | 24 | 3~5 | 側銑 SIDE MILLING |
| ETH1204 | 37 | 105 | 2800 | 600~800 | 12~24 | 0~0.35 | 側銑 SIDE MILLING |
| ETH1604 | 50 | 105 | 2100 | 800~1000 | 0~0.7 | 16 | 溝銑 SLOTTING |
| ETH1604 | 50 | 85 | 1700 | 300~500 | 0.7~2 | 16 | 溝銑 SLOTTING |
| ETH1604 | 50 | 75 | 1500 | 200~300 | 3~4 | 16 | 溝銑 SLOTTING |
| ETH1604 | 50 | 105 | 2100 | 600~800 | 16~32 | 0~0.7 | 側銑 SIDE MILLING |
| ETH1604 | 50 | 80 | 1600 | 400~600 | 16 | 1~1.3 | 側銑 SIDE MILLING |
| ETH1604 | 50 | 105 | 2100 | 400~600 | 16~32 | 0~0.35 | 側銑 SIDE MILLING |
| ETH2004 | 50 | 105 | 1650 | 600~800 | 0~0.7 | 20 | 溝銑 SLOTTING |
| ETH2004 | 50 | 85 | 1350 | 200~400 | 0.7~2 | 20 | 溝銑 SLOTTING |
| ETH2004 | 50 | 75 | 1200 | 150~250 | 3~4 | 20 | 溝銑 SLOTTING |
| ETH2004 | 50 | 105 | 1650 | 450~650 | 20~40 | 0~0.7 | 側銑 SIDE MILLING |
| ETH2004 | 50 | 80 | 1250 | 300~500 | 20 | 1~1.3 | 側銑 SIDE MILLING |
| ETH2004 | 50 | 105 | 1650 | 300~500 | 20~40 | 0~0.35 | 側銑 SIDE MILLING |

附註

- ETH適用於粗、精銑加工，溝銑(Aa)與側銑(Ap)都有0.3~0.5D切削能力。直徑Ø10以上，需視機器剛性與主軸扭力值的不同，做適當調整。
- 建議冷卻方式為溼式。

NOTE

- ETH is good at Roughing and Finishing. It can do a 0.3~0.5D machining for both Slotting (Aa) and Side milling (Ap). For diameter above 10.0mm, make necessary adjustment as per the rigidity of machine and the torque of spindle.
- Suggest to use wet coolant.

HPC

UPS

無敵高效能立銑刀 END MILLS

| | | |
|--|-----------------------------|----------------------|
| | 乾式切削 Dry Machining | |
| | 油霧切削 MQL (Mist) | 精銑 Finishing |
| | 水溶性切削 Emulsion Machining | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | 粗銑 Roughing |

Stainless Steel Cutting

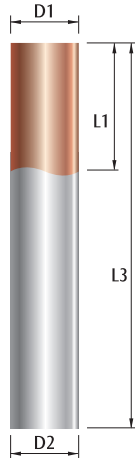


產品規格 SPECIFICATIONS

| 型號 Type No. | D1 直徑 Diameter | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|----------------------|--------------------------|--------------------|------------------------|
| UPS0304 | 3.0 | 8 | 50 | 6 |
| UPS0304L | 3.0 | 12 | 60 | 6 |
| UPS0404 | 4.0 | 11 | 50 | 6 |
| UPS0404L | 4.0 | 16 | 60 | 6 |
| UPS0504 | 5.0 | 13 | 50 | 6 |
| UPS0604 | 6.0 | 16 | 50 | 6 |
| UPS0604L | 6.0 | 20 | 60 | 6 |
| UPS0804 | 8.0 | 20 | 60 | 8 |
| UPS0804L | 8.0 | 25 | 75 | 8 |
| UPS1004 | 10.0 | 22 | 75 | 10 |
| UPS1004L | 10.0 | 30 | 80 | 10 |
| UPS1204 | 12.0 | 26 | 75 | 12 |
| UPS1204L | 12.0 | 35 | 100 | 12 |
| UPS1604 | 16.0 | 36 | 100 | 16 |
| UPS1604L | 16.0 | 50 | 110 | 16 |
| UPS1804 | 18.0 | 40 | 100 | 18 |
| UPS2004 | 20.0 | 40 | 100 | 20 |
| UPS2004L | 20.0 | 50 | 120 | 20 |

unit : mm

公差表 TOLERANCE



| 直徑 D1 | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|-----------------------|----------|-----------------------|
| 3.0 | 0 -0.02 | Ø6 | 0 -0.008 |
| 4.0 | 0 -0.02 | Ø8 | 0 -0.009 |
| 5.0 | 0 -0.02 | Ø10 | 0 -0.009 |
| 6.0 | 0 -0.02 | Ø12 | 0 -0.011 |
| 8.0 | 0 -0.025 | Ø16 | 0 -0.011 |
| 10.0 | 0 -0.03 | Ø18 | 0 -0.011 |
| 12.0 | 0 -0.035 | Ø20 | 0 -0.013 |
| 16.0 | 0 -0.04 | | |
| 18.0 | 0 -0.04 | | |
| 20.0 | 0 -0.04 | | |

unit : mm

UPS

切削條件表 MILLING CONDITIONS

被切削材 Work Material

沃斯田鐵系不銹鋼
Stainless Steels [Easy] :SUS304 : 1.4301 : AISI 304 (HRc 28~32)

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPS0304 | 13 | 110 | 11500 | 1600~2000 | 0~0.25 | 3 | 溝銑 SLOTTING |
| UPS0304 | 13 | 105 | 11000 | 800~1200 | 0.25~0.8 | 3 | 溝銑 SLOTTING |
| UPS0304 | 13 | 105 | 11000 | 400~500 | 0.8~1.2 | 3 | 溝銑 SLOTTING |
| UPS0304 | 13 | 100 | 14800 | 200~350 | 1.2~1.6 | 3 | 溝銑 SLOTTING |
| UPS0304 | 13 | 100 | 11000 | 1400~1800 | 3~6 | 0~0.25 | 側銑 SIDE MILLING |
| UPS0304 | 13 | 100 | 11000 | 500~700 | 3 | 0.25~0.8 | 側銑 SIDE MILLING |
| UPS0304 | 13 | 100 | 11000 | 200~450 | 3 | 0.8~1.2 | 側銑 SIDE MILLING |
| UPS0304 | 13 | 105 | 11000 | 700~900 | 3~6 | 0~0.1 | 側銑 SIDE MILLING |
| UPS0404 | 16 | 110 | 8750 | 1800~2200 | 0~0.3 | 4 | 溝銑 SLOTTING |
| UPS0404 | 16 | 105 | 8350 | 1000~1400 | 0.3~1 | 4 | 溝銑 SLOTTING |
| UPS0404 | 16 | 105 | 8350 | 500~600 | 1~2 | 4 | 溝銑 SLOTTING |
| UPS0404 | 16 | 100 | 8000 | 250~400 | 2~4 | 4 | 溝銑 SLOTTING |
| UPS0404 | 16 | 100 | 8000 | 1600~2000 | 4~8 | 0~0.3 | 側銑 SIDE MILLING |
| UPS0404 | 16 | 100 | 8000 | 600~800 | 4 | 0.3~1 | 側銑 SIDE MILLING |
| UPS0404 | 16 | 100 | 8000 | 300~500 | 4 | 1~2 | 側銑 SIDE MILLING |
| UPS0404 | 16 | 105 | 8350 | 800~1000 | 4~8 | 0~0.13 | 側銑 SIDE MILLING |
| UPS0404L | 21 | 110 | 8750 | 1600~2000 | 0~0.3 | 4 | 溝銑 SLOTTING |
| UPS0404L | 21 | 105 | 8350 | 800~1200 | 0.3~1 | 4 | 溝銑 SLOTTING |
| UPS0404L | 21 | 105 | 8350 | 400~500 | 1~2 | 4 | 溝銑 SLOTTING |
| UPS0404L | 21 | 100 | 8000 | 200~350 | 2~4 | 4 | 溝銑 SLOTTING |
| UPS0404L | 21 | 100 | 8000 | 1400~1800 | 4~8 | 0~0.3 | 側銑 SIDE MILLING |
| UPS0404L | 21 | 100 | 8000 | 500~700 | 4 | 0.3~1 | 側銑 SIDE MILLING |
| UPS0404L | 21 | 100 | 8000 | 200~450 | 4 | 1~2 | 側銑 SIDE MILLING |
| UPS0404L | 21 | 105 | 8350 | 700~850 | 4~8 | 0~0.13 | 側銑 SIDE MILLING |
| UPS0504 | 18 | 110 | 7000 | 1800~2200 | 0~0.35 | 5 | 溝銑 SLOTTING |
| UPS0504 | 18 | 105 | 6700 | 1000~1400 | 0.35~1.2 | 5 | 溝銑 SLOTTING |
| UPS0504 | 18 | 105 | 6700 | 500~600 | 1.2~2.5 | 5 | 溝銑 SLOTTING |
| UPS0504 | 18 | 100 | 6350 | 250~400 | 2.5~5 | 5 | 溝銑 SLOTTING |
| UPS0504 | 18 | 100 | 6350 | 1600~2000 | 5~10 | 0~0.35 | 側銑 SIDE MILLING |
| UPS0504 | 18 | 100 | 6350 | 600~800 | 5 | 2.5 | 側銑 SIDE MILLING |
| UPS0504 | 18 | 100 | 6350 | 300~500 | 5 | 4 | 側銑 SIDE MILLING |
| UPS0504 | 18 | 105 | 6700 | 800~1000 | 5~10 | 0~0.15 | 側銑 SIDE MILLING |
| UPS0604 | 20 | 110 | 5850 | 1700~2100 | 0~0.4 | 6 | 溝銑 SLOTTING |
| UPS0604 | 20 | 105 | 5600 | 1000~1200 | 0.4~1.5 | 6 | 溝銑 SLOTTING |
| UPS0604 | 20 | 105 | 5600 | 500~600 | 1.5~3 | 6 | 溝銑 SLOTTING |
| UPS0604 | 20 | 100 | 5300 | 250~400 | 3~6 | 6 | 溝銑 SLOTTING |

被切削材 Work Material
沃斯田鐵系不銹鋼
Stainless Steels [Easy] : SUS304 : 1.4301 : AISI 304 (HRc 28~32)
切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPS0604 | 20 | 100 | 5300 | 900~1300 | 6~12 | 0~0.4 | 側銑 SIDE MILLING |
| UPS0604 | 20 | 100 | 5300 | 600~800 | 6 | 3 | 側銑 SIDE MILLING |
| UPS0604 | 20 | 100 | 5300 | 300~500 | 6 | 5 | 側銑 SIDE MILLING |
| UPS0604 | 20 | 105 | 5600 | 700~900 | 6~12 | 0~0.2 | 側銑 SIDE MILLING |
| UPS0604L | 26 | 110 | 5850 | 1500~1900 | 0~0.4 | 6 | 溝銑 SLOTTING |
| UPS0604L | 26 | 105 | 5600 | 800~1000 | 0.4~1.5 | 6 | 溝銑 SLOTTING |
| UPS0604L | 26 | 105 | 5600 | 400~500 | 1.5~3 | 6 | 溝銑 SLOTTING |
| UPS0604L | 26 | 100 | 5300 | 200~300 | 3~6 | 6 | 溝銑 SLOTTING |
| UPS0604L | 26 | 100 | 5300 | 800~1000 | 6~12 | 0~0.4 | 側銑 SIDE MILLING |
| UPS0604L | 26 | 100 | 5300 | 500~700 | 6 | 3 | 側銑 SIDE MILLING |
| UPS0604L | 26 | 100 | 5300 | 300~400 | 6 | 5 | 側銑 SIDE MILLING |
| UPS0604L | 26 | 105 | 5600 | 600~800 | 6~12 | 0~0.2 | 側銑 SIDE MILLING |
| UPS0804 | 24 | 115 | 4500 | 1700~2100 | 0~0.5 | 8 | 溝銑 SLOTTING |
| UPS0804 | 24 | 115 | 4500 | 1000~1400 | 0.5~1 | 8 | 溝銑 SLOTTING |
| UPS0804 | 24 | 115 | 4500 | 600~750 | 3~4 | 8 | 溝銑 SLOTTING |
| UPS0804 | 24 | 115 | 4500 | 400~600 | 4~8 | 8 | 溝銑 SLOTTING |
| UPS0804 | 24 | 125 | 5000 | 800~1100 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |
| UPS0804 | 24 | 115 | 4500 | 650~850 | 8 | 3~4 | 側銑 SIDE MILLING |
| UPS0804 | 24 | 105 | 4200 | 600~800 | 8 | 4~8 | 側銑 SIDE MILLING |
| UPS0804 | 24 | 100 | 4000 | 700~900 | 8~16 | 0~0.2 | 側銑 SIDE MILLING |
| UPS1004 | 27 | 110 | 3500 | 1600~2000 | 0~0.5 | 10 | 溝銑 SLOTTING |
| UPS1004 | 27 | 110 | 3500 | 800~1000 | 0.5~1 | 10 | 溝銑 SLOTTING |
| UPS1004 | 27 | 105 | 3300 | 400~600 | 3~5 | 10 | 溝銑 SLOTTING |
| UPS1004 | 27 | 105 | 3300 | 300~500 | 5~8 | 10 | 溝銑 SLOTTING |
| UPS1004 | 27 | 155 | 5000 | 1300~1600 | 10~20 | 0~0.6 | 側銑 SIDE MILLING |
| UPS1004 | 27 | 90 | 2800 | 200~400 | 10~20 | 2~4 | 側銑 SIDE MILLING |
| UPS1004 | 27 | 80 | 2500 | 400~500 | 10 | 3.6~5 | 側銑 SIDE MILLING |
| UPS1004 | 27 | 95 | 3000 | 700~900 | 10~20 | 0~0.25 | 側銑 SIDE MILLING |
| UPS1004L | 37 | 110 | 3500 | 1300~1600 | 0~0.5 | 10 | 溝銑 SLOTTING |
| UPS1004L | 37 | 110 | 3500 | 700~900 | 0.5~1 | 10 | 溝銑 SLOTTING |
| UPS1004L | 37 | 105 | 3300 | 400~600 | 3~5 | 10 | 溝銑 SLOTTING |
| UPS1004L | 37 | 110 | 3500 | 1000~1400 | 10~25 | 0~0.6 | 側銑 SIDE MILLING |
| UPS1004L | 37 | 60 | 1800 | 200~400 | 10~25 | 2 | 側銑 SIDE MILLING |
| UPS1004L | 37 | 65 | 2100 | 300~450 | 10 | 3.6~5 | 側銑 SIDE MILLING |
| UPS1004L | 37 | 95 | 3000 | 600~800 | 10~25 | 0~0.25 | 側銑 SIDE MILLING |

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] :SUS304 : 1.4301 : AISI 304 (HRc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPS1204 | 33 | 110 | 2900 | 900~1200 | 0~0.7 | 12 | 溝銑 SLOTTING |
| UPS1204 | 33 | 80 | 2100 | 600~800 | 2 | 12 | 溝銑 SLOTTING |
| UPS1204 | 33 | 80 | 2100 | 250~350 | 4~6 | 12 | 溝銑 SLOTTING |
| UPS1204 | 33 | 80 | 2100 | 800~1100 | 12~24 | 0~0.7 | 側銑 SIDE MILLING |
| UPS1204 | 33 | 80 | 2100 | 600~800 | 12 | 2 | 側銑 SIDE MILLING |
| UPS1204 | 33 | 110 | 2900 | 300~400 | 24 | 1.2 | 側銑 SIDE MILLING |
| UPS1204 | 33 | 80 | 2100 | 200~300 | 12 | 4~6 | 側銑 SIDE MILLING |
| UPS1204 | 33 | 100 | 2650 | 450~650 | 12~24 | 0~0.3 | 側銑 SIDE MILLING |
| UPS1204L | 40 | 110 | 2900 | 800~1000 | 0~0.7 | 12 | 溝銑 SLOTTING |
| UPS1204L | 40 | 80 | 2100 | 500~600 | 2 | 12 | 溝銑 SLOTTING |
| UPS1204L | 40 | 80 | 2100 | 200~300 | 3~4 | 12 | 溝銑 SLOTTING |
| UPS1204L | 40 | 80 | 2100 | 700~900 | 12~32 | 0~0.7 | 側銑 SIDE MILLING |
| UPS1204L | 40 | 80 | 2100 | 500~700 | 12 | 2 | 側銑 SIDE MILLING |
| UPS1204L | 40 | 80 | 2100 | 200~300 | 24 | 1.2 | 側銑 SIDE MILLING |
| UPS1204L | 40 | 80 | 2100 | 200~300 | 12 | 3~4 | 側銑 SIDE MILLING |
| UPS1204L | 40 | 100 | 2650 | 450~650 | 12~32 | 0~0.3 | 側銑 SIDE MILLING |
| UPS1604 | 43 | 110 | 2200 | 600~850 | 0~0.7 | 16 | 溝銑 SLOTTING |
| UPS1604 | 43 | 80 | 1600 | 400~500 | 2 | 16 | 溝銑 SLOTTING |
| UPS1604 | 43 | 80 | 1600 | 200~250 | 3~4 | 16 | 溝銑 SLOTTING |
| UPS1604 | 43 | 80 | 1600 | 600~750 | 16~32 | 0~0.7 | 側銑 SIDE MILLING |
| UPS1604 | 43 | 80 | 1600 | 400~600 | 16 | 2 | 側銑 SIDE MILLING |
| UPS1604 | 43 | 80 | 1600 | 200~250 | 32 | 1.2 | 側銑 SIDE MILLING |
| UPS1604 | 43 | 80 | 1600 | 200~250 | 16 | 3~4 | 側銑 SIDE MILLING |
| UPS1604 | 43 | 100 | 2000 | 350~550 | 16~32 | 0~0.3 | 側銑 SIDE MILLING |
| UPS1804 | 47 | 110 | 1950 | 500~700 | 0~0.7 | 18 | 溝銑 SLOTTING |
| UPS1804 | 47 | 80 | 1400 | 300~450 | 1.6 | 18 | 溝銑 SLOTTING |
| UPS1804 | 47 | 80 | 1400 | 150~200 | 2~3 | 18 | 溝銑 SLOTTING |
| UPS1804 | 47 | 80 | 1400 | 550~650 | 18~36 | 0~0.7 | 側銑 SIDE MILLING |
| UPS1804 | 47 | 80 | 1400 | 300~500 | 18 | 1.6 | 側銑 SIDE MILLING |
| UPS1804 | 47 | 80 | 1400 | 200~250 | 36 | 1 | 側銑 SIDE MILLING |
| UPS1804 | 47 | 80 | 1400 | 150~200 | 18 | 2~3 | 側銑 SIDE MILLING |
| UPS1804 | 47 | 100 | 1750 | 300~450 | 18~36 | 0~0.3 | 側銑 SIDE MILLING |
| UPS2004 | 47 | 110 | 1750 | 500~700 | 0~0.7 | 20 | 溝銑 SLOTTING |
| UPS2004 | 47 | 80 | 1300 | 300~500 | 1.6 | 20 | 溝銑 SLOTTING |
| UPS2004 | 47 | 80 | 1300 | 200~350 | 2~3 | 20 | 溝銑 SLOTTING |
| UPS2004 | 47 | 80 | 1300 | 300~450 | 20~40 | 0~0.7 | 側銑 SIDE MILLING |

被切削材 Work Material
沃斯田鐵系不銹鋼

 Stainless Steels [Easy] : **SUS304 : 1.4301 : AISI 304** (HRc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPS2004 | 47 | 80 | 1300 | 500~600 | 20 | 1.6 | 側銑 SIDE MILLING |
| UPS2004 | 47 | 80 | 1300 | 500~700 | 40 | 1 | 側銑 SIDE MILLING |
| UPS2004 | 47 | 80 | 1300 | 300~500 | 20 | 2~3 | 側銑 SIDE MILLING |
| UPS2004 | 47 | 100 | 1600 | 200~400 | 20~40 | 0~0.3 | 側銑 SIDE MILLING |
| UPS2004L | 55 | 110 | 1750 | 500~600 | 0~0.7 | 20 | 溝銑 SLOTTING |
| UPS2004L | 55 | 80 | 1300 | 250~450 | 1.6 | 20 | 溝銑 SLOTTING |
| UPS2004L | 55 | 80 | 1300 | 200~300 | 2~3 | 20 | 溝銑 SLOTTING |
| UPS2004L | 55 | 80 | 1300 | 250~350 | 20~40 | 0~0.7 | 側銑 SIDE MILLING |
| UPS2004L | 55 | 80 | 1300 | 500~600 | 20 | 1.6 | 側銑 SIDE MILLING |
| UPS2004L | 55 | 80 | 1300 | 400~550 | 40 | 1 | 側銑 SIDE MILLING |
| UPS2004L | 55 | 80 | 1300 | 300~400 | 20 | 2~3 | 側銑 SIDE MILLING |
| UPS2004L | 55 | 100 | 1600 | 200~400 | 20~40 | 0~0.3 | 側銑 SIDE MILLING |

附註

- UPS適用於粗、精銑加工，溝銑(Aa)與側銑(Ap)都有1.0D切削能力。粗切削時建議使用溼式高壓水溶性切削液，以免造成排屑不良；直徑 ϕ 10以上，需視機器剛性與主軸扭力值的不同，做適當調整。
- 建議冷卻方式為溼式。

NOTE

- UPS is good at Roughing and Finishing. It can do a 1.0D machining for both Slotting (Aa) and Side milling (Ap). When Roughing, we suggest high pressure emulsion coolant for better chip removal. For diameter above 10.0mm, make necessary adjustment as per the rigidity of machine and the torque of spindle.
- Suggest to use wet coolant.



HPC

UPZ

抗震高效能立銑刀
END MILLS

產品規格 SPECIFICATIONS

| 型號 Type No. | D1 直徑 Diameter | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|----------------------|--------------------------|--------------------|------------------------|
| UPZ0304 | 3.0 | 8 | 50 | 6 |
| UPZ0404 | 4.0 | 11 | 50 | 6 |
| UPZ0504 | 5.0 | 13 | 50 | 6 |
| UPZ0604 | 6.0 | 16 | 50 | 6 |
| UPZ0804 | 8.0 | 20 | 60 | 8 |
| UPZ1004 | 10.0 | 22 | 75 | 10 |
| UPZ1204 | 12.0 | 26 | 75 | 12 |
| UPZ1604 | 16.0 | 36 | 100 | 16 |
| UPZ2004 | 20.0 | 40 | 100 | 20 |

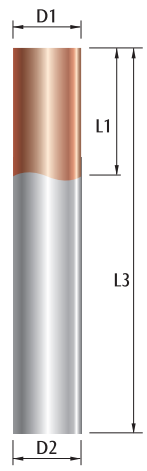
unit : mm

| | | | |
|--|-----------------------------|--|----------------------|
| | 乾式切削 Dry Machining | | |
| | 油霧切削 MQL (Mist) | | 精銑 Finishing |
| | 水溶性切削 Emulsion Machining | | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | | 粗銑 Roughing |

公差表 TOLERANCE

| 直徑 D1 | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|-----------------------|----------|-----------------------|
| 3.0 | $\frac{0}{-0.02}$ | Ø6 | $\frac{0}{-0.008}$ |
| 4.0 | $\frac{0}{-0.02}$ | Ø8 | $\frac{0}{-0.009}$ |
| 5.0 | $\frac{0}{-0.02}$ | Ø10 | $\frac{0}{-0.009}$ |
| 6.0 | $\frac{0}{-0.02}$ | Ø12 | $\frac{0}{-0.011}$ |
| 8.0 | $\frac{0}{-0.025}$ | Ø16 | $\frac{0}{-0.011}$ |
| 10.0 | $\frac{0}{-0.03}$ | Ø20 | $\frac{0}{-0.013}$ |
| 12.0 | $\frac{0}{-0.035}$ | | |
| 16.0 | $\frac{0}{-0.04}$ | | |
| 20.0 | $\frac{0}{-0.04}$ | | |

unit : mm



Stainless Steel Cutting

UPZ

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] :SUS304 : 1.4301 : AISI 304 (Hrc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPZ0304 | 13 | 105 | 11000 | 700~900 | 0~0.7 | 3 | 溝銑 SLOTTING |
| UPZ0304 | 13 | 105 | 11000 | 450~650 | 0.7~1.5 | 3 | 溝銑 SLOTTING |
| UPZ0304 | 13 | 105 | 11000 | 300~400 | 1.5~3 | 3 | 溝銑 SLOTTING |
| UPZ0304 | 13 | 140 | 14800 | 400~550 | 1.5~3 | 3 | 溝銑 SLOTTING |
| UPZ0304 | 13 | 105 | 11000 | 1500~1700 | 3~6 | 0~0.3 | 側銑 SIDE MILLING |
| UPZ0304 | 13 | 105 | 11000 | 600~800 | 3 | 1~1.5 | 側銑 SIDE MILLING |
| UPZ0304 | 13 | 105 | 11000 | 500~700 | 6 | 1~1.5 | 側銑 SIDE MILLING |
| UPZ0304 | 13 | 105 | 11000 | 400~500 | 3 | 1.5~3 | 側銑 SIDE MILLING |
| UPZ0304 | 13 | 140 | 14800 | 500~700 | 3 | 1.5~3 | 側銑 SIDE MILLING |
| UPZ0404 | 16 | 105 | 8300 | 800~1000 | 0~1 | 4 | 溝銑 SLOTTING |
| UPZ0404 | 16 | 105 | 8300 | 500~700 | 1~2 | 4 | 溝銑 SLOTTING |
| UPZ0404 | 16 | 105 | 8300 | 400~500 | 2~4 | 4 | 溝銑 SLOTTING |
| UPZ0404 | 16 | 140 | 11000 | 700~900 | 2~4 | 4 | 溝銑 SLOTTING |
| UPZ0404 | 16 | 105 | 8300 | 1500~1700 | 4~8 | 0~0.4 | 側銑 SIDE MILLING |
| UPZ0404 | 16 | 105 | 8300 | 800~1000 | 4 | 1.6~2 | 側銑 SIDE MILLING |
| UPZ0404 | 16 | 105 | 8300 | 600~800 | 8 | 1.6~2 | 側銑 SIDE MILLING |
| UPZ0404 | 16 | 105 | 8300 | 500~700 | 4 | 2~4 | 側銑 SIDE MILLING |
| UPZ0404 | 16 | 140 | 11000 | 700~900 | 4 | 2~4 | 側銑 SIDE MILLING |
| UPZ0504 | 18 | 105 | 6700 | 900~1100 | 0~1.2 | 5 | 溝銑 SLOTTING |
| UPZ0504 | 18 | 105 | 6700 | 600~800 | 1.2~2.5 | 5 | 溝銑 SLOTTING |
| UPZ0504 | 18 | 105 | 6700 | 500~600 | 2.5~5 | 5 | 溝銑 SLOTTING |
| UPZ0504 | 18 | 140 | 8900 | 900~1100 | 2.5~5 | 5 | 溝銑 SLOTTING |
| UPZ0504 | 18 | 105 | 6700 | 1500~1700 | 5~10 | 0~0.5 | 側銑 SIDE MILLING |
| UPZ0504 | 18 | 105 | 6700 | 900~1100 | 5 | 1.8~2.5 | 側銑 SIDE MILLING |
| UPZ0504 | 18 | 105 | 6700 | 700~900 | 10 | 1.8~2.5 | 側銑 SIDE MILLING |
| UPZ0504 | 18 | 105 | 6700 | 600~800 | 5 | 2.5~5 | 側銑 SIDE MILLING |
| UPZ0504 | 18 | 140 | 8900 | 900~1100 | 5 | 2.5~5 | 側銑 SIDE MILLING |
| UPZ0604 | 20 | 105 | 5500 | 1000~1200 | 0~1.5 | 6 | 溝銑 SLOTTING |
| UPZ0604 | 20 | 105 | 5500 | 700~900 | 1.5~3 | 6 | 溝銑 SLOTTING |
| UPZ0604 | 20 | 105 | 5500 | 600~800 | 3~6 | 6 | 溝銑 SLOTTING |
| UPZ0604 | 20 | 140 | 7400 | 1000~1200 | 3~6 | 6 | 溝銑 SLOTTING |
| UPZ0604 | 20 | 105 | 5500 | 1600~1800 | 6~12 | 0~0.5 | 側銑 SIDE MILLING |
| UPZ0604 | 20 | 105 | 5500 | 1000~1200 | 6 | 2.2~3 | 側銑 SIDE MILLING |
| UPZ0604 | 20 | 105 | 5500 | 700~900 | 12 | 2.2~3 | 側銑 SIDE MILLING |
| UPZ0604 | 20 | 105 | 5500 | 700~900 | 6 | 3~6 | 側銑 SIDE MILLING |
| UPZ0604 | 20 | 140 | 7400 | 1000~1200 | 6 | 3~6 | 側銑 SIDE MILLING |
| UPZ0804 | 25 | 105 | 4200 | 1000~1200 | 0~1.8 | 8 | 溝銑 SLOTTING |
| UPZ0804 | 25 | 105 | 4200 | 800~1000 | 2~4 | 8 | 溝銑 SLOTTING |
| UPZ0804 | 25 | 105 | 4200 | 700~900 | 4~8 | 8 | 溝銑 SLOTTING |
| UPZ0804 | 25 | 140 | 5600 | 900~1100 | 4~8 | 8 | 溝銑 SLOTTING |
| UPZ0804 | 25 | 105 | 4200 | 1400~1600 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |
| UPZ0804 | 25 | 105 | 4200 | 800~1000 | 8 | 3~4 | 側銑 SIDE MILLING |
| UPZ0804 | 25 | 105 | 4200 | 600~800 | 16 | 3~4 | 側銑 SIDE MILLING |
| UPZ0804 | 25 | 105 | 4200 | 700~900 | 8 | 4~8 | 側銑 SIDE MILLING |
| UPZ0804 | 25 | 140 | 5600 | 900~1100 | 8 | 4~8 | 側銑 SIDE MILLING |

被切削材 Work Material
沃斯田鐵系不銹鋼
Stainless Steels [Easy] : SUS304 : 1.4301 : AISI 304 (HRc 28~32)
切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPZ1004 | 30 | 110 | 3500 | 1000~1200 | 0~2 | 10 | 溝銑 SLOTTING |
| UPZ1004 | 30 | 110 | 3500 | 800~1000 | 3~5 | 10 | 溝銑 SLOTTING |
| UPZ1004 | 30 | 110 | 3500 | 700~900 | 5~10 | 10 | 溝銑 SLOTTING |
| UPZ1004 | 30 | 155 | 5000 | 800~1000 | 5~10 | 10 | 溝銑 SLOTTING |
| UPZ1004 | 30 | 110 | 3500 | 1400~1600 | 10~20 | 0~0.6 | 側銑 SIDE MILLING |
| UPZ1004 | 30 | 110 | 3500 | 800~1000 | 10 | 3.6~5 | 側銑 SIDE MILLING |
| UPZ1004 | 30 | 110 | 3500 | 600~800 | 20 | 3.6~5 | 側銑 SIDE MILLING |
| UPZ1004 | 30 | 110 | 3500 | 700~900 | 10 | 5~10 | 側銑 SIDE MILLING |
| UPZ1004 | 30 | 155 | 5000 | 800~1000 | 10 | 5~10 | 側銑 SIDE MILLING |
| UPZ1204 | 34 | 110 | 2900 | 900~1100 | 0~2 | 12 | 溝銑 SLOTTING |
| UPZ1204 | 34 | 110 | 2900 | 600~800 | 2.5~5 | 12 | 溝銑 SLOTTING |
| UPZ1204 | 34 | 110 | 2900 | 500~700 | 5~9 | 12 | 溝銑 SLOTTING |
| UPZ1204 | 34 | 150 | 4000 | 650~850 | 5~9 | 12 | 溝銑 SLOTTING |
| UPZ1204 | 34 | 110 | 2900 | 1400~1600 | 12~24 | 0~0.7 | 側銑 SIDE MILLING |
| UPZ1204 | 34 | 110 | 2900 | 800~1000 | 12 | 4.3~5 | 側銑 SIDE MILLING |
| UPZ1204 | 34 | 110 | 2900 | 600~800 | 24 | 4.3~5 | 側銑 SIDE MILLING |
| UPZ1204 | 34 | 110 | 2900 | 500~700 | 12 | 5~9 | 側銑 SIDE MILLING |
| UPZ1204 | 34 | 150 | 4000 | 650~850 | 12 | 5~9 | 側銑 SIDE MILLING |
| UPZ1604 | 45 | 110 | 2200 | 700~900 | 0~2.5 | 16 | 溝銑 SLOTTING |
| UPZ1604 | 45 | 110 | 2200 | 500~700 | 2.5~6 | 16 | 溝銑 SLOTTING |
| UPZ1604 | 45 | 110 | 2200 | 350~550 | 6~10 | 16 | 溝銑 SLOTTING |
| UPZ1604 | 45 | 150 | 3000 | 450~650 | 6~10 | 16 | 溝銑 SLOTTING |
| UPZ1604 | 45 | 110 | 2200 | 1300~1500 | 16~32 | 0~0.7 | 側銑 SIDE MILLING |
| UPZ1604 | 45 | 110 | 2200 | 700~900 | 16 | 5.7~7 | 側銑 SIDE MILLING |
| UPZ1604 | 45 | 110 | 2200 | 500~700 | 32 | 5.7~7 | 側銑 SIDE MILLING |
| UPZ1604 | 45 | 110 | 2200 | 350~550 | 16 | 7~10 | 側銑 SIDE MILLING |
| UPZ1604 | 45 | 150 | 3000 | 500~700 | 16 | 7~10 | 側銑 SIDE MILLING |
| UPZ2004 | 50 | 110 | 1750 | 500~700 | 0~2.5 | 20 | 溝銑 SLOTTING |
| UPZ2004 | 50 | 110 | 1750 | 300~500 | 2.5~6 | 20 | 溝銑 SLOTTING |
| UPZ2004 | 50 | 110 | 1750 | 200~350 | 6~10 | 20 | 溝銑 SLOTTING |
| UPZ2004 | 50 | 150 | 2400 | 300~450 | 6~10 | 20 | 溝銑 SLOTTING |
| UPZ2004 | 50 | 110 | 1750 | 1000~1200 | 20~40 | 0~0.8 | 側銑 SIDE MILLING |
| UPZ2004 | 50 | 110 | 1750 | 500~700 | 20 | 7~8 | 側銑 SIDE MILLING |
| UPZ2004 | 50 | 110 | 1750 | 300~500 | 40 | 7~8 | 側銑 SIDE MILLING |
| UPZ2004 | 50 | 110 | 1750 | 200~400 | 20 | 8~10 | 側銑 SIDE MILLING |
| UPZ2004 | 50 | 150 | 2400 | 300~450 | 20 | 8~10 | 側銑 SIDE MILLING |

Stainless Steel Cutting

- 附註**
- UPZ適用於粗、精銑加工，溝銑(Aa)與側銑(Ap)都有1.0D切削能力。0.5D以上切削時，請用濕式高壓水溶性切削液，以免造成排屑不良。直徑Ø10以上，需視機器剛性與主軸扭力值的不同，而做適當調整。
 - 注意側銑(Ap)0.2~0.35D禁止使用。
 - 建議冷卻方式為濕式。

- NOTE**
- UPZ is good at Finishing and Roughing. It can do a 1.0D machining for both Slotting (Aa) and Side milling (Ap). When it is above 0.5D machining, we suggest high pressure emulsion coolant for better chip removal. For diameter above 10.0mm, make necessary adjustment as per the rigidity of machine and the torque of spindle.
 - Do not apply it for Side milling (Ap) 0.2~0.35D.
 - Suggest to use wet coolant.

UPZ

被切削材 Work Material

(麻田散鐵, 析出硬化) 系不銹鋼
 Stainless Steels [Difficult] : **SUS420J2 / SUS630 : 1.2083 / 1.4542 : AISI 420 / 17-4PH** (HrC 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPZ0304 | 13 | 100 | 10600 | 650~850 | 0~0.7 | 3 | 溝銑 SLOTTING |
| UPZ0304 | 13 | 100 | 10600 | 400~600 | 0.7~1.5 | 3 | 溝銑 SLOTTING |
| UPZ0304 | 13 | 100 | 10600 | 300~400 | 1.5~3 | 3 | 溝銑 SLOTTING |
| UPZ0304 | 13 | 140 | 14800 | 400~550 | 1.5~3 | 3 | 溝銑 SLOTTING |
| UPZ0304 | 13 | 100 | 10600 | 1500~1700 | 3~6 | 0~0.3 | 側銑 SIDE MILLING |
| UPZ0304 | 13 | 100 | 10600 | 550~750 | 3 | 1~1.5 | 側銑 SIDE MILLING |
| UPZ0304 | 13 | 100 | 10600 | 450~650 | 6 | 1~1.5 | 側銑 SIDE MILLING |
| UPZ0304 | 13 | 100 | 10600 | 400~500 | 3 | 1.5~3 | 側銑 SIDE MILLING |
| UPZ0304 | 13 | 140 | 14800 | 450~650 | 3 | 1.5~3 | 側銑 SIDE MILLING |
| UPZ0404 | 16 | 100 | 8000 | 800~1000 | 0~1 | 4 | 溝銑 SLOTTING |
| UPZ0404 | 16 | 100 | 8000 | 500~700 | 1~2 | 4 | 溝銑 SLOTTING |
| UPZ0404 | 16 | 100 | 8000 | 400~500 | 2~4 | 4 | 溝銑 SLOTTING |
| UPZ0404 | 16 | 140 | 11000 | 700~900 | 2~4 | 4 | 溝銑 SLOTTING |
| UPZ0404 | 16 | 100 | 8000 | 1500~1700 | 4~8 | 0~0.4 | 側銑 SIDE MILLING |
| UPZ0404 | 16 | 100 | 8000 | 800~1000 | 4 | 1.6~2 | 側銑 SIDE MILLING |
| UPZ0404 | 16 | 100 | 8000 | 600~800 | 8 | 1.6~2 | 側銑 SIDE MILLING |
| UPZ0404 | 16 | 100 | 8000 | 500~700 | 4 | 2~4 | 側銑 SIDE MILLING |
| UPZ0404 | 16 | 140 | 11000 | 700~900 | 4 | 2~4 | 側銑 SIDE MILLING |
| UPZ0504 | 18 | 100 | 6400 | 850~1050 | 0~1.2 | 5 | 溝銑 SLOTTING |
| UPZ0504 | 18 | 100 | 6400 | 600~800 | 1.2~2.5 | 5 | 溝銑 SLOTTING |
| UPZ0504 | 18 | 100 | 6400 | 500~600 | 2.5~5 | 5 | 溝銑 SLOTTING |
| UPZ0504 | 18 | 140 | 8900 | 900~1100 | 2.5~5 | 5 | 溝銑 SLOTTING |
| UPZ0504 | 18 | 100 | 6400 | 1500~1700 | 5~10 | 0~0.5 | 側銑 SIDE MILLING |
| UPZ0504 | 18 | 100 | 6400 | 900~1100 | 5 | 1.8~2.5 | 側銑 SIDE MILLING |
| UPZ0504 | 18 | 100 | 6400 | 650~850 | 10 | 1.8~2.5 | 側銑 SIDE MILLING |
| UPZ0504 | 18 | 100 | 6400 | 550~750 | 5 | 2.5~5 | 側銑 SIDE MILLING |
| UPZ0504 | 18 | 140 | 8900 | 800~1000 | 5 | 2.5~5 | 側銑 SIDE MILLING |
| UPZ0604 | 20 | 100 | 5300 | 1000~1200 | 0~1.5 | 6 | 溝銑 SLOTTING |
| UPZ0604 | 20 | 100 | 5300 | 650~850 | 1.5~3 | 6 | 溝銑 SLOTTING |
| UPZ0604 | 20 | 100 | 5300 | 550~750 | 3~6 | 6 | 溝銑 SLOTTING |
| UPZ0604 | 20 | 140 | 7400 | 1000~1200 | 3~6 | 6 | 溝銑 SLOTTING |
| UPZ0604 | 20 | 100 | 5300 | 1600~1800 | 6~12 | 0~0.5 | 側銑 SIDE MILLING |
| UPZ0604 | 20 | 100 | 5300 | 900~1100 | 6 | 2.2~3 | 側銑 SIDE MILLING |
| UPZ0604 | 20 | 100 | 5300 | 700~900 | 12 | 2.2~3 | 側銑 SIDE MILLING |
| UPZ0604 | 20 | 100 | 5300 | 700~900 | 6 | 3~6 | 側銑 SIDE MILLING |
| UPZ0604 | 20 | 140 | 7400 | 900~1100 | 6 | 3~6 | 側銑 SIDE MILLING |
| UPZ0804 | 25 | 100 | 4000 | 1000~1200 | 0~1.8 | 8 | 溝銑 SLOTTING |
| UPZ0804 | 25 | 100 | 4000 | 750~950 | 2~4 | 8 | 溝銑 SLOTTING |
| UPZ0804 | 25 | 100 | 4000 | 650~850 | 4~8 | 8 | 溝銑 SLOTTING |
| UPZ0804 | 25 | 140 | 5600 | 900~1100 | 4~8 | 8 | 溝銑 SLOTTING |
| UPZ0804 | 25 | 100 | 4000 | 1400~1600 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |
| UPZ0804 | 25 | 100 | 4000 | 800~1000 | 8 | 3~4 | 側銑 SIDE MILLING |
| UPZ0804 | 25 | 100 | 4000 | 600~800 | 16 | 3~4 | 側銑 SIDE MILLING |
| UPZ0804 | 25 | 100 | 4000 | 700~900 | 8 | 4~8 | 側銑 SIDE MILLING |
| UPZ0804 | 25 | 140 | 5600 | 800~1000 | 8 | 4~8 | 側銑 SIDE MILLING |

Stainless Steel Cutting

被切削材 Work Material

(麻田散鐵, 析出硬化) 系不銹鋼
 Stainless Steels [Difficult] : **SUS420J2 / SUS630 : 1.2083 / 1.4542 : AISI 420 / 17-4PH** (HRc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------|-------------------------------|------------------------------------|-----------------------|------------------------------|------------------------------|----------------------|
| UPZ1004 | 30 | 100 | 3200 | 1000~1200 | 0~2 | 10 | 溝銑 SLOTTING |
| UPZ1004 | 30 | 100 | 3200 | 800~1000 | 3~5 | 10 | 溝銑 SLOTTING |
| UPZ1004 | 30 | 100 | 3200 | 600~800 | 5~10 | 10 | 溝銑 SLOTTING |
| UPZ1004 | 30 | 155 | 5000 | 700~900 | 5~10 | 10 | 溝銑 SLOTTING |
| UPZ1004 | 30 | 100 | 3200 | 1400~1600 | 10~20 | 0~0.6 | 側銑 SIDE MILLING |
| UPZ1004 | 30 | 100 | 3200 | 800~1000 | 10 | 3.6~5 | 側銑 SIDE MILLING |
| UPZ1004 | 30 | 100 | 3200 | 500~700 | 20 | 3.6~5 | 側銑 SIDE MILLING |
| UPZ1004 | 30 | 100 | 3200 | 600~800 | 10 | 5~10 | 側銑 SIDE MILLING |
| UPZ1004 | 30 | 155 | 5000 | 700~900 | 10 | 5~10 | 側銑 SIDE MILLING |
| UPZ1204 | 34 | 105 | 2800 | 900~1100 | 0~2 | 12 | 溝銑 SLOTTING |
| UPZ1204 | 34 | 105 | 2800 | 600~800 | 2.5~5 | 12 | 溝銑 SLOTTING |
| UPZ1204 | 34 | 105 | 2800 | 450~650 | 5~9 | 12 | 溝銑 SLOTTING |
| UPZ1204 | 34 | 150 | 4000 | 600~800 | 5~9 | 12 | 溝銑 SLOTTING |
| UPZ1204 | 34 | 105 | 2800 | 1400~1600 | 12~24 | 0~0.7 | 側銑 SIDE MILLING |
| UPZ1204 | 34 | 105 | 2800 | 800~1000 | 12 | 4.3~5 | 側銑 SIDE MILLING |
| UPZ1204 | 34 | 105 | 2800 | 500~700 | 24 | 4.3~5 | 側銑 SIDE MILLING |
| UPZ1204 | 34 | 105 | 2800 | 500~700 | 12 | 5~9 | 側銑 SIDE MILLING |
| UPZ1204 | 34 | 150 | 4000 | 600~800 | 12 | 5~9 | 側銑 SIDE MILLING |
| UPZ1604 | 45 | 105 | 2100 | 700~900 | 0~2.5 | 16 | 溝銑 SLOTTING |
| UPZ1604 | 45 | 105 | 2100 | 500~700 | 2.5~6 | 16 | 溝銑 SLOTTING |
| UPZ1604 | 45 | 105 | 2100 | 350~550 | 6~10 | 16 | 溝銑 SLOTTING |
| UPZ1604 | 45 | 150 | 3000 | 450~650 | 6~10 | 16 | 溝銑 SLOTTING |
| UPZ1604 | 45 | 105 | 2100 | 1300~1500 | 16~32 | 0~0.7 | 側銑 SIDE MILLING |
| UPZ1604 | 45 | 105 | 2100 | 650~850 | 16 | 5.7~7 | 側銑 SIDE MILLING |
| UPZ1604 | 45 | 105 | 2100 | 450~650 | 32 | 5.7~7 | 側銑 SIDE MILLING |
| UPZ1604 | 45 | 105 | 2100 | 300~500 | 16 | 7~10 | 側銑 SIDE MILLING |
| UPZ1604 | 45 | 150 | 3000 | 450~650 | 16 | 7~10 | 側銑 SIDE MILLING |
| UPZ2004 | 50 | 105 | 1650 | 500~700 | 0~2.5 | 20 | 溝銑 SLOTTING |
| UPZ2004 | 50 | 105 | 1650 | 300~500 | 2.5~6 | 20 | 溝銑 SLOTTING |
| UPZ2004 | 50 | 105 | 1650 | 200~350 | 6~10 | 20 | 溝銑 SLOTTING |
| UPZ2004 | 50 | 150 | 2400 | 300~450 | 6~10 | 20 | 溝銑 SLOTTING |
| UPZ2004 | 50 | 105 | 1650 | 1000~1200 | 20~40 | 0~0.8 | 側銑 SIDE MILLING |
| UPZ2004 | 50 | 105 | 1650 | 500~700 | 20 | 7~8 | 側銑 SIDE MILLING |
| UPZ2004 | 50 | 105 | 1650 | 300~500 | 40 | 7~8 | 側銑 SIDE MILLING |
| UPZ2004 | 50 | 105 | 1650 | 200~350 | 20 | 8~10 | 側銑 SIDE MILLING |
| UPZ2004 | 50 | 150 | 2400 | 250~400 | 20 | 8~10 | 側銑 SIDE MILLING |

- 附註**
- UPZ適用於粗、精銑加工，溝銑(Aa)與側銑(Ap)都有1.0D切削能力。0.5D以上切削時，請用濕式高壓水溶性切削液，以免造成排屑不良。直徑Ø10以上，需視機器剛性與主軸扭力值的不同，而做適當調整。
 - 注意側銑(Ap)0.2~0.35D禁止使用。
 - 建議冷卻方式為濕式。

- NOTE**
- UPZ is good at Finishing and Roughing. It can do a 1.0D machining for both Slotting (Aa) and Side milling (Ap). When it is above 0.5D machining, we suggest high pressure emulsion coolant for better chip removal. For diameter above 10.0mm, make necessary adjustment as per the rigidity of machine and the torque of spindle.
 - Do not apply it for Side milling (Ap) 0.2~0.35D.
 - Suggest to use wet coolant.

Titanium Cutting

UTH

鈦滿意立銑刀 END MILLS

| | | |
|--|-----------------------------|----------------------|
| | 乾式切削 Dry Machining | |
| | 油霧切削 MQL (Mist) | 精銑 Finishing |
| | 水溶性切削 Emulsion Machining | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | 粗銑 Roughing |

Stainless Steel Cutting

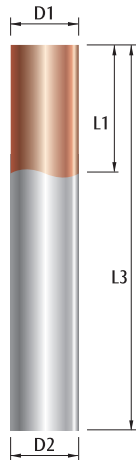


產品規格 SPECIFICATIONS

| 型號 Type No. | D1 直徑 Diameter | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|----------------------|--------------------------|--------------------|------------------------|
| UTH0304 | 3.0 | 8 | 50 | 6 |
| UTH0404 | 4.0 | 11 | 50 | 6 |
| UTH0504 | 5.0 | 13 | 50 | 6 |
| UTH0604 | 6.0 | 16 | 50 | 6 |
| UTH0804 | 8.0 | 20 | 60 | 8 |
| UTH1004 | 10.0 | 25 | 75 | 10 |
| UTH1204 | 12.0 | 30 | 75 | 12 |
| UTH1604 | 16.0 | 40 | 100 | 16 |
| UTH2004 | 20.0 | 45 | 100 | 20 |

unit : mm

公差表 TOLERANCE



| 直徑 D1 | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|-----------------------|----------|-----------------------|
| 3.0 | $0_{-0.02}$ | Ø6 | $0_{-0.008}$ |
| 4.0 | $0_{-0.02}$ | Ø8 | $0_{-0.009}$ |
| 5.0 | $0_{-0.02}$ | Ø10 | $0_{-0.009}$ |
| 6.0 | $0_{-0.02}$ | Ø12 | $0_{-0.011}$ |
| 8.0 | $0_{-0.025}$ | Ø16 | $0_{-0.011}$ |
| 10.0 | $0_{-0.03}$ | Ø20 | $0_{-0.013}$ |
| 12.0 | $0_{-0.035}$ | | |
| 16.0 | $0_{-0.04}$ | | |
| 20.0 | $0_{-0.04}$ | | |

unit : mm

UTH

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] :SUS304 : 1.4301 : AISI 304 (Hrc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UTH0304 | 13 | 120 | 12500~13000 | 1600~2000 | 0~0.25 | 3 | 溝銑 SLOTTING |
| UTH0304 | 13 | 120 | 12500~13000 | 800~1200 | 0.25~0.6 | 3 | 溝銑 SLOTTING |
| UTH0304 | 13 | 120 | 12500~13000 | 400~600 | 0.8~1.5 | 3 | 溝銑 SLOTTING |
| UTH0304 | 13 | 120 | 12500~13000 | 300~450 | 2~2.5 | 3 | 溝銑 SLOTTING |
| UTH0304 | 13 | 155 | 16000~16500 | 1400~1800 | 3~6 | 0~0.25 | 側銑 SIDE MILLING |
| UTH0304 | 13 | 105 | 11000~11500 | 500~700 | 3 | 0.25~0.6 | 側銑 SIDE MILLING |
| UTH0304 | 13 | 105 | 11000~11500 | 400~600 | 3 | 0.8~1.5 | 側銑 SIDE MILLING |
| UTH0304 | 13 | 105 | 11000~11500 | 300~450 | 3 | 2~2.5 | 側銑 SIDE MILLING |
| UTH0304 | 13 | 105 | 11000~11500 | 700~900 | 3~6 | 0~0.1 | 側銑 SIDE MILLING |
| UTH0404 | 16 | 120 | 9300~9800 | 2000~2400 | 0~0.3 | 4 | 溝銑 SLOTTING |
| UTH0404 | 16 | 120 | 9300~9800 | 1000~1300 | 0.3~0.7 | 4 | 溝銑 SLOTTING |
| UTH0404 | 16 | 120 | 9300~9800 | 700~900 | 1~2 | 4 | 溝銑 SLOTTING |
| UTH0404 | 16 | 120 | 9300~9800 | 500~700 | 3~4 | 4 | 溝銑 SLOTTING |
| UTH0404 | 16 | 155 | 12000~12500 | 1600~1800 | 4~8 | 0~0.3 | 側銑 SIDE MILLING |
| UTH0404 | 16 | 105 | 8000~8500 | 800~1000 | 4 | 0.3~1 | 側銑 SIDE MILLING |
| UTH0404 | 16 | 105 | 8000~8500 | 550~750 | 4 | 1~2 | 側銑 SIDE MILLING |
| UTH0404 | 16 | 105 | 8000~8500 | 500~700 | 4 | 3~4 | 側銑 SIDE MILLING |
| UTH0404 | 16 | 105 | 8000~8500 | 700~900 | 4~8 | 0~0.13 | 側銑 SIDE MILLING |
| UTH0504 | 18 | 120 | 7500~7800 | 2000~2400 | 0~0.35 | 5 | 溝銑 SLOTTING |
| UTH0504 | 18 | 120 | 7500~7800 | 1000~1300 | 0.35~0.8 | 5 | 溝銑 SLOTTING |
| UTH0504 | 18 | 120 | 7500~7800 | 700~900 | 1.5~2.5 | 5 | 溝銑 SLOTTING |
| UTH0504 | 18 | 120 | 7500~7800 | 500~700 | 3~5 | 5 | 溝銑 SLOTTING |
| UTH0504 | 18 | 155 | 9600~10000 | 1600~1800 | 5~10 | 0~0.35 | 側銑 SIDE MILLING |
| UTH0504 | 18 | 105 | 6500~6800 | 800~1000 | 5 | 0~1 | 側銑 SIDE MILLING |
| UTH0504 | 18 | 105 | 6500~6800 | 550~750 | 5 | 2.5 | 側銑 SIDE MILLING |
| UTH0504 | 18 | 105 | 6500~6800 | 500~700 | 5 | 4 | 側銑 SIDE MILLING |
| UTH0504 | 18 | 105 | 6500~6800 | 700~900 | 5~10 | 0~0.15 | 側銑 SIDE MILLING |
| UTH0604 | 20 | 120 | 6300~6600 | 2000~2400 | 0~0.4 | 6 | 溝銑 SLOTTING |
| UTH0604 | 20 | 120 | 6300~6600 | 1000~1300 | 0.4~1 | 6 | 溝銑 SLOTTING |
| UTH0604 | 20 | 120 | 6300~6600 | 800~1000 | 2~3 | 6 | 溝銑 SLOTTING |
| UTH0604 | 20 | 120 | 6300~6600 | 600~800 | 5~6 | 6 | 溝銑 SLOTTING |
| UTH0604 | 20 | 155 | 7800~8200 | 1600~1800 | 6~12 | 0~0.4 | 側銑 SIDE MILLING |
| UTH0604 | 20 | 105 | 5600~5800 | 800~1000 | 6 | 0~1.2 | 側銑 SIDE MILLING |
| UTH0604 | 20 | 105 | 5600~5800 | 600~800 | 6 | 2~3 | 側銑 SIDE MILLING |
| UTH0604 | 20 | 105 | 5600~5800 | 500~750 | 6 | 5 | 側銑 SIDE MILLING |
| UTH0604 | 20 | 105 | 5600~5800 | 700~900 | 6~12 | 0~0.2 | 側銑 SIDE MILLING |
| UTH0804 | 24 | 120 | 4700~5000 | 1300~1600 | 0~0.5 | 8 | 溝銑 SLOTTING |
| UTH0804 | 24 | 120 | 4700~5000 | 800~1000 | 0.5~1 | 8 | 溝銑 SLOTTING |
| UTH0804 | 24 | 115 | 4500~4700 | 700~900 | 3~4 | 8 | 溝銑 SLOTTING |
| UTH0804 | 24 | 115 | 4500~4700 | 600~800 | 4~8 | 8 | 溝銑 SLOTTING |
| UTH0804 | 24 | 155 | 6200~6400 | 1000~1200 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |
| UTH0804 | 24 | 95 | 3500~3800 | 650~850 | 8~16 | 0~1.5 | 側銑 SIDE MILLING |
| UTH0804 | 24 | 110 | 4300~4600 | 700~900 | 8 | 3~4 | 側銑 SIDE MILLING |
| UTH0804 | 24 | 110 | 4300~4600 | 600~800 | 8 | 6~7 | 側銑 SIDE MILLING |
| UTH0804 | 24 | 90 | 3300~3500 | 400~600 | 8~16 | 0~0.2 | 側銑 SIDE MILLING |

被切削材 Work Material
沃斯田鐵系不銹鋼
Stainless Steels [Easy] : SUS304 : 1.4301 : AISI 304 (HRc 28~32)
切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UTH1004 | 30 | 115 | 3500~3800 | 1500~1800 | 0~0.5 | 10 | 溝銑 SLOTTING |
| UTH1004 | 30 | 110 | 3300~3600 | 800~1000 | 0.5~1 | 10 | 溝銑 SLOTTING |
| UTH1004 | 30 | 110 | 3300~3600 | 500~700 | 3~5 | 10 | 溝銑 SLOTTING |
| UTH1004 | 30 | 110 | 3300~3600 | 400~600 | 10 | 10 | 溝銑 SLOTTING |
| UTH1004 | 30 | 150 | 4700~5000 | 1000~1200 | 10~20 | 0~0.6 | 側銑 SIDE MILLING |
| UTH1004 | 30 | 90 | 2800~3100 | 300~450 | 10 | 2 | 側銑 SIDE MILLING |
| UTH1004 | 30 | 110 | 3300~3600 | 500~700 | 10 | 4~5 | 側銑 SIDE MILLING |
| UTH1004 | 30 | 110 | 3300~3600 | 400~600 | 10 | 8~9 | 側銑 SIDE MILLING |
| UTH1004 | 30 | 90 | 2800~3000 | 500~700 | 10~20 | 0~0.25 | 側銑 SIDE MILLING |
| UTH1204 | 33 | 115 | 3000~3200 | 1000~1300 | 0~0.6 | 12 | 溝銑 SLOTTING |
| UTH1204 | 33 | 110 | 2800~3000 | 800~1000 | 0.6~1.2 | 12 | 溝銑 SLOTTING |
| UTH1204 | 33 | 110 | 2800~3000 | 400~600 | 4~6 | 12 | 溝銑 SLOTTING |
| UTH1204 | 33 | 110 | 2800~3000 | 300~500 | 6~8 | 12 | 溝銑 SLOTTING |
| UTH1204 | 33 | 150 | 3800~4000 | 900~1100 | 12~24 | 0~0.6 | 側銑 SIDE MILLING |
| UTH1204 | 33 | 90 | 2300~2600 | 300~400 | 12 | 2 | 側銑 SIDE MILLING |
| UTH1204 | 33 | 110 | 2800~3000 | 300~500 | 12 | 4~6 | 側銑 SIDE MILLING |
| UTH1204 | 33 | 110 | 2800~3000 | 300~400 | 12 | 6~8 | 側銑 SIDE MILLING |
| UTH1204 | 33 | 90 | 2300~2600 | 450~650 | 12~24 | 0~0.25 | 側銑 SIDE MILLING |
| UTH1604 | 43 | 115 | 2200~2400 | 800~1100 | 0~0.7 | 16 | 溝銑 SLOTTING |
| UTH1604 | 43 | 110 | 2100~2300 | 600~800 | 2 | 16 | 溝銑 SLOTTING |
| UTH1604 | 43 | 110 | 2100~2300 | 300~500 | 3~4 | 16 | 溝銑 SLOTTING |
| UTH1604 | 43 | 110 | 2100~2300 | 200~350 | 6~8 | 16 | 溝銑 SLOTTING |
| UTH1604 | 43 | 150 | 2800~3200 | 800~1000 | 16~32 | 0~0.7 | 側銑 SIDE MILLING |
| UTH1604 | 43 | 90 | 1700~1900 | 300~400 | 16 | 2 | 側銑 SIDE MILLING |
| UTH1604 | 43 | 110 | 2100~2300 | 250~400 | 16 | 3~4 | 側銑 SIDE MILLING |
| UTH1604 | 43 | 110 | 2100~2300 | 200~350 | 16 | 6~8 | 側銑 SIDE MILLING |
| UTH1604 | 43 | 90 | 1700~1900 | 350~550 | 16~32 | 0~0.3 | 側銑 SIDE MILLING |
| UTH2004 | 47 | 115 | 1750~1950 | 600~800 | 0~0.7 | 20 | 溝銑 SLOTTING |
| UTH2004 | 47 | 110 | 1700~1900 | 400~550 | 2 | 20 | 溝銑 SLOTTING |
| UTH2004 | 47 | 110 | 1700~1900 | 200~350 | 3~4 | 20 | 溝銑 SLOTTING |
| UTH2004 | 47 | 110 | 1700~1900 | 150~250 | 6~8 | 20 | 溝銑 SLOTTING |
| UTH2004 | 47 | 150 | 2300~2500 | 600~800 | 20~40 | 0~0.7 | 側銑 SIDE MILLING |
| UTH2004 | 47 | 90 | 1300~1500 | 300~400 | 20 | 2 | 側銑 SIDE MILLING |
| UTH2004 | 47 | 110 | 1700~1900 | 250~350 | 20 | 3~4 | 側銑 SIDE MILLING |
| UTH2004 | 47 | 110 | 1700~1900 | 200~300 | 20 | 6~8 | 側銑 SIDE MILLING |
| UTH2004 | 47 | 90 | 1300~1500 | 200~400 | 20~40 | 0~0.3 | 側銑 SIDE MILLING |

- 附註**
- UTH適用於粗、中、精銑加工，溝銑(Aa)與側銑(Ap)都有1.0D切削能力。粗切削時，請用濕式高壓水溶性切削液，以免造成排屑不良。直徑 $\phi 10$ 以上，需視機器剛性與主軸扭力值的不同，而做適當調整。
 - 建議冷卻方式為濕式。

- NOTE**
- UTH is good at Roughing, Semi-finishing and Finishing. It can do a 1.0D machining for both Slotting (Aa) and Side milling (Ap). When it is Roughing, we suggest high pressure emulsion coolant for better chip removal. For diameter above 10.0mm, make necessary adjustment as per the rigidity of machine and the torque of spindle.
 - Suggest to use wet coolant.



HPC

UPE

高效能立銑刀 END MILLS

產品規格 SPECIFICATIONS

| 型號 Type No. | D1 直徑 Diameter | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|----------------------|--------------------------|--------------------|------------------------|
| UPE0304 | 3.0 | 8 | 50 | 6 |
| UPE0404 | 4.0 | 11 | 50 | 6 |
| UPE0504 | 5.0 | 13 | 50 | 6 |
| UPE0604 | 6.0 | 16 | 50 | 6 |
| UPE0804 | 8.0 | 20 | 60 | 8 |
| UPE1004 | 10.0 | 22 | 75 | 10 |
| UPE1204 | 12.0 | 26 | 75 | 12 |
| UPE1404 | 14.0 | 30 | 80 | 14 |
| UPE1604 | 16.0 | 36 | 100 | 16 |
| UPE1804 | 18.0 | 40 | 100 | 18 |
| UPE2004 | 20.0 | 40 | 100 | 20 |
| UPE2504 | 25.0 | 45 | 100 | 25 |

unit : mm

| | | | |
|--|-----------------------------|--|----------------------|
| | 乾式切削 Dry Machining | | |
| | 油霧切削 MQL (Mist) | | 精銑 Finishing |
| | 水溶性切削 Emulsion Machining | | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | | 粗銑 Roughing |

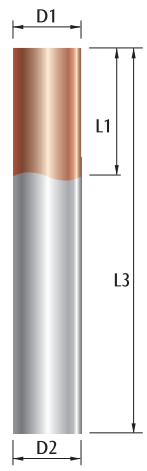
Stainless Steel Cutting



公差表 TOLERANCE

| 直徑 D1 | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|-----------------------|----------|-----------------------|
| 3.0 | $0_{-0.02}$ | Ø6 | $0_{-0.008}$ |
| 4.0 | $0_{-0.02}$ | Ø8 | $0_{-0.009}$ |
| 5.0 | $0_{-0.02}$ | Ø10 | $0_{-0.009}$ |
| 6.0 | $0_{-0.02}$ | Ø12 | $0_{-0.011}$ |
| 8.0 | $0_{-0.025}$ | Ø14 | $0_{-0.011}$ |
| 10.0 | $0_{-0.03}$ | Ø16 | $0_{-0.011}$ |
| 12.0 | $0_{-0.035}$ | Ø18 | $0_{-0.011}$ |
| 14.0 | $0_{-0.04}$ | Ø20 | $0_{-0.013}$ |
| 16.0 | $0_{-0.04}$ | Ø25 | $0_{-0.013}$ |
| 18.0 | $0_{-0.04}$ | | |
| 20.0 | $0_{-0.04}$ | | |
| 25.0 | $0_{-0.04}$ | | |

unit : mm



UPE

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] :SUS304 : 1.4301 : AISI 304 (HRc 28~32)

切削條件表 **MILLING CONDITIONS**

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPE0304 | 13 | 110 | 11600 | 1200~1400 | 0~0.3 | 3 | 溝銑 SLOTTING |
| UPE0304 | 13 | 110 | 11600 | 600~800 | 0.3~0.7 | 3 | 溝銑 SLOTTING |
| UPE0304 | 13 | 110 | 11600 | 500~700 | 0.7~1.5 | 3 | 溝銑 SLOTTING |
| UPE0304 | 13 | 110 | 11600 | 350~550 | 1.5~2 | 3 | 溝銑 SLOTTING |
| UPE0304 | 13 | 110 | 11600 | 900~1200 | 3~6 | 0~0.3 | 側銑 SIDE MILLING |
| UPE0304 | 13 | 110 | 11600 | 900~1200 | 3~6 | 0~0.15 | 側銑 SIDE MILLING |
| UPE0404 | 16 | 115 | 9150 | 1200~1400 | 0~0.4 | 4 | 溝銑 SLOTTING |
| UPE0404 | 16 | 115 | 9150 | 600~800 | 0.4~1 | 4 | 溝銑 SLOTTING |
| UPE0404 | 16 | 115 | 9150 | 500~700 | 1~2 | 4 | 溝銑 SLOTTING |
| UPE0404 | 16 | 115 | 9150 | 350~550 | 2~3 | 4 | 溝銑 SLOTTING |
| UPE0404 | 16 | 115 | 9150 | 900~1200 | 4~8 | 0~0.4 | 側銑 SIDE MILLING |
| UPE0404 | 16 | 115 | 9150 | 900~1200 | 4~8 | 0~0.2 | 側銑 SIDE MILLING |
| UPE0504 | 18 | 115 | 7300 | 1200~1400 | 0~0.4 | 5 | 溝銑 SLOTTING |
| UPE0504 | 18 | 115 | 7300 | 700~900 | 0.4~1.2 | 5 | 溝銑 SLOTTING |
| UPE0504 | 18 | 115 | 7300 | 500~700 | 1.2~2.5 | 5 | 溝銑 SLOTTING |
| UPE0504 | 18 | 115 | 7300 | 400~600 | 2.5~4.5 | 0~1.2 | 溝銑 SLOTTING |
| UPE0504 | 18 | 115 | 7300 | 900~1200 | 5~10 | 0~0.4 | 側銑 SIDE MILLING |
| UPE0504 | 18 | 115 | 7300 | 900~1200 | 5~10 | 0~0.2 | 側銑 SIDE MILLING |
| UPE0604 | 20 | 115 | 6100 | 1300~1500 | 0~0.4 | 6 | 溝銑 SLOTTING |
| UPE0604 | 20 | 115 | 6100 | 700~900 | 0.5~1.5 | 6 | 溝銑 SLOTTING |
| UPE0604 | 20 | 115 | 6100 | 600~800 | 1.5~3 | 6 | 溝銑 SLOTTING |
| UPE0604 | 20 | 115 | 6100 | 500~700 | 3~6 | 6 | 溝銑 SLOTTING |
| UPE0604 | 20 | 115 | 6100 | 900~1200 | 6~12 | 0~0.4 | 側銑 SIDE MILLING |
| UPE0604 | 20 | 130 | 6900 | 900~1200 | 6~12 | 0~0.2 | 側銑 SIDE MILLING |
| UPE0804 | 25 | 115 | 4500 | 1200~1400 | 0~0.5 | 8 | 溝銑 SLOTTING |
| UPE0804 | 25 | 115 | 4500 | 700~900 | 0.5~2 | 8 | 溝銑 SLOTTING |
| UPE0804 | 25 | 115 | 4500 | 600~800 | 2~4 | 8 | 溝銑 SLOTTING |
| UPE0804 | 25 | 115 | 4500 | 400~600 | 4~8 | 8 | 溝銑 SLOTTING |
| UPE0804 | 25 | 115 | 4500 | 800~1100 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |
| UPE0804 | 25 | 125 | 5000 | 800~1100 | 8~16 | 0~0.25 | 側銑 SIDE MILLING |
| UPE1004 | 30 | 110 | 3500 | 1200~1400 | 0~0.6 | 10 | 溝銑 SLOTTING |
| UPE1004 | 30 | 110 | 3500 | 600~800 | 0.6~2 | 10 | 溝銑 SLOTTING |
| UPE1004 | 30 | 110 | 3500 | 400~600 | 3~5 | 10 | 溝銑 SLOTTING |
| UPE1004 | 30 | 110 | 3500 | 300~450 | 5~10 | 10 | 溝銑 SLOTTING |
| UPE1004 | 30 | 110 | 3500 | 1300~1600 | 10~20 | 0~0.6 | 側銑 SIDE MILLING |
| UPE1004 | 30 | 115 | 3700 | 800~1000 | 10~20 | 0~0.3 | 側銑 SIDE MILLING |

Stainless Steel Cutting

被切削材 Work Material

沃斯田鐵系不銹鋼

 Stainless Steels [Easy]: **SUS304 : 1.4301 : AISI 304** (HRc 28~32)

 切削條件表 **MILLING CONDITIONS**

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPE1204 | 34 | 110 | 2900 | 1100~1300 | 0~0.7 | 12 | 溝銼 SLOTTING |
| UPE1204 | 34 | 110 | 2900 | 500~700 | 0.7~2 | 12 | 溝銼 SLOTTING |
| UPE1204 | 34 | 110 | 2900 | 400~600 | 2~4 | 12 | 溝銼 SLOTTING |
| UPE1204 | 34 | 110 | 2900 | 300~400 | 4~7 | 12 | 溝銼 SLOTTING |
| UPE1204 | 34 | 110 | 2900 | 1000~1300 | 12~24 | 0~0.7 | 側銼 SIDE MILLING |
| UPE1204 | 34 | 130 | 3450 | 800~1000 | 12~24 | 0~0.3 | 側銼 SIDE MILLING |
| UPE1404 | 40 | 110 | 2500 | 1000~1200 | 0~0.7 | 14 | 溝銼 SLOTTING |
| UPE1404 | 40 | 110 | 2500 | 500~700 | 0.7~2 | 14 | 溝銼 SLOTTING |
| UPE1404 | 40 | 110 | 2500 | 350~550 | 2~4 | 14 | 溝銼 SLOTTING |
| UPE1404 | 40 | 110 | 2500 | 300~500 | 4~7 | 14 | 溝銼 SLOTTING |
| UPE1404 | 40 | 110 | 2500 | 900~1100 | 14~28 | 0~0.7 | 側銼 SIDE MILLING |
| UPE1404 | 40 | 120 | 2700 | 650~850 | 14~28 | 0~0.3 | 側銼 SIDE MILLING |
| UPE1604 | 45 | 110 | 2200 | 900~1100 | 0~0.7 | 16 | 溝銼 SLOTTING |
| UPE1604 | 45 | 110 | 2200 | 400~600 | 0.7~2 | 16 | 溝銼 SLOTTING |
| UPE1604 | 45 | 110 | 2200 | 300~500 | 2~4 | 16 | 溝銼 SLOTTING |
| UPE1604 | 45 | 110 | 2200 | 250~450 | 4~7 | 16 | 溝銼 SLOTTING |
| UPE1604 | 45 | 110 | 2200 | 800~1000 | 16~32 | 0~0.7 | 側銼 SIDE MILLING |
| UPE1604 | 45 | 110 | 2200 | 500~700 | 16~32 | 0~0.3 | 側銼 SIDE MILLING |
| UPE1804 | 50 | 110 | 1950 | 800~1000 | 0~0.7 | 18 | 溝銼 SLOTTING |
| UPE1804 | 50 | 110 | 1950 | 400~500 | 0.7~2 | 18 | 溝銼 SLOTTING |
| UPE1804 | 50 | 110 | 1950 | 300~400 | 2~4 | 18 | 溝銼 SLOTTING |
| UPE1804 | 50 | 110 | 1950 | 200~400 | 4~7 | 0~2 | 溝銼 SLOTTING |
| UPE1804 | 50 | 110 | 1950 | 700~900 | 18~36 | 0~0.7 | 側銼 SIDE MILLING |
| UPE1804 | 50 | 110 | 1950 | 400~600 | 18~36 | 0~0.3 | 側銼 SIDE MILLING |
| UPE2004 | 50 | 110 | 1750 | 700~900 | 0~0.8 | 20 | 溝銼 SLOTTING |
| UPE2004 | 50 | 110 | 1750 | 300~400 | 0.8~2 | 20 | 溝銼 SLOTTING |
| UPE2004 | 50 | 110 | 1750 | 250~350 | 2~4 | 20 | 溝銼 SLOTTING |
| UPE2004 | 50 | 110 | 1750 | 200~300 | 4~6 | 20 | 溝銼 SLOTTING |
| UPE2004 | 50 | 110 | 1750 | 600~800 | 20~40 | 0~0.7 | 側銼 SIDE MILLING |
| UPE2004 | 50 | 110 | 1750 | 400~550 | 20~40 | 0~0.3 | 側銼 SIDE MILLING |
| UPE2504 | 55 | 110 | 1400 | 600~800 | 0~0.8 | 25 | 溝銼 SLOTTING |
| UPE2504 | 55 | 110 | 1400 | 250~350 | 0.8~2 | 25 | 溝銼 SLOTTING |
| UPE2504 | 55 | 110 | 1400 | 200~300 | 2~4 | 25 | 溝銼 SLOTTING |
| UPE2504 | 55 | 110 | 1400 | 150~250 | 4~6 | 25 | 溝銼 SLOTTING |
| UPE2504 | 55 | 110 | 1400 | 500~700 | 25~50 | 0~0.8 | 側銼 SIDE MILLING |
| UPE2504 | 55 | 110 | 1400 | 350~500 | 25~50 | 0~0.3 | 側銼 SIDE MILLING |

UPE

被切削材 Work Material

(麻田散鐵, 析出硬化) 系不銹鋼
 Stainless Steels [Difficult] : **SUS420J2 / SUS630 : 1.2083 / 1.4542 : AISI 420 / 17-4PH** (HRC 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPE0304 | 13 | 130 | 13800 | 1200~1500 | 0~0.35 | 3 | 溝銑 SLOTTING |
| UPE0304 | 13 | 130 | 13800 | 700~900 | 0.35~0.7 | 3 | 溝銑 SLOTTING |
| UPE0304 | 13 | 130 | 13800 | 500~700 | 0.7~1.5 | 3 | 溝銑 SLOTTING |
| UPE0304 | 13 | 130 | 13800 | 400~600 | 1.5~2 | 3 | 溝銑 SLOTTING |
| UPE0304 | 13 | 130 | 13800 | 1200~1400 | 3~6 | 0~0.35 | 側銑 SIDE MILLING |
| UPE0304 | 13 | 130 | 13800 | 600~800 | 3 | 0.35~0.7 | 側銑 SIDE MILLING |
| UPE0304 | 13 | 130 | 13800 | 500~700 | 3 | 0.7~1.5 | 側銑 SIDE MILLING |
| UPE0304 | 13 | 130 | 13800 | 400~600 | 3 | 1.5~2 | 側銑 SIDE MILLING |
| UPE0304 | 13 | 130 | 13800 | 900~1200 | 3~6 | 0~0.15 | 側銑 SIDE MILLING |
| UPE0404 | 16 | 130 | 10300 | 1200~1500 | 0~0.4 | 4 | 溝銑 SLOTTING |
| UPE0404 | 16 | 130 | 10300 | 700~900 | 0.4~1 | 4 | 溝銑 SLOTTING |
| UPE0404 | 16 | 130 | 10300 | 500~700 | 1~2 | 4 | 溝銑 SLOTTING |
| UPE0404 | 16 | 130 | 10300 | 400~600 | 2~3 | 4 | 溝銑 SLOTTING |
| UPE0404 | 16 | 130 | 10300 | 1200~1400 | 4~8 | 0~0.4 | 側銑 SIDE MILLING |
| UPE0404 | 16 | 130 | 10300 | 600~800 | 4 | 0.4~1 | 側銑 SIDE MILLING |
| UPE0404 | 16 | 130 | 10300 | 500~700 | 4 | 1~2 | 側銑 SIDE MILLING |
| UPE0404 | 16 | 130 | 10300 | 400~600 | 4 | 2~3 | 側銑 SIDE MILLING |
| UPE0404 | 16 | 130 | 10300 | 900~1200 | 4~8 | 0~0.15 | 側銑 SIDE MILLING |
| UPE0504 | 18 | 130 | 8200 | 1200~1500 | 0~0.5 | 5 | 溝銑 SLOTTING |
| UPE0504 | 18 | 130 | 8200 | 700~900 | 0.5~1.2 | 5 | 溝銑 SLOTTING |
| UPE0504 | 18 | 130 | 8200 | 500~700 | 1.2~2.5 | 5 | 溝銑 SLOTTING |
| UPE0504 | 18 | 130 | 8200 | 400~600 | 2.5~5 | 5 | 溝銑 SLOTTING |
| UPE0504 | 18 | 130 | 8200 | 1200~1400 | 5~10 | 0~0.5 | 側銑 SIDE MILLING |
| UPE0504 | 18 | 130 | 8200 | 600~800 | 5 | 0.5~1.2 | 側銑 SIDE MILLING |
| UPE0504 | 18 | 130 | 8200 | 500~700 | 5 | 1.2~2.5 | 側銑 SIDE MILLING |
| UPE0504 | 18 | 130 | 8200 | 400~600 | 5 | 2.5~5 | 側銑 SIDE MILLING |
| UPE0504 | 18 | 130 | 8200 | 900~1200 | 5~10 | 0~0.2 | 側銑 SIDE MILLING |
| UPE0604 | 20 | 125 | 6600 | 1300~1600 | 0~0.5 | 6 | 溝銑 SLOTTING |
| UPE0604 | 20 | 125 | 6600 | 800~1000 | 0.5~1.5 | 6 | 溝銑 SLOTTING |
| UPE0604 | 20 | 125 | 6600 | 600~800 | 1.5~3 | 6 | 溝銑 SLOTTING |
| UPE0604 | 20 | 125 | 6600 | 450~650 | 3~6 | 6 | 溝銑 SLOTTING |
| UPE0604 | 20 | 125 | 6600 | 1200~1400 | 6~12 | 0~0.4 | 側銑 SIDE MILLING |
| UPE0604 | 20 | 125 | 6600 | 700~900 | 6 | 0.5~1.5 | 側銑 SIDE MILLING |
| UPE0604 | 20 | 125 | 6600 | 550~750 | 6 | 1.5~3 | 側銑 SIDE MILLING |
| UPE0604 | 20 | 125 | 6600 | 450~650 | 6 | 3~6 | 側銑 SIDE MILLING |
| UPE0604 | 20 | 130 | 6900 | 900~1200 | 6~12 | 0~0.2 | 側銑 SIDE MILLING |
| UPE0804 | 25 | 135 | 5500 | 1800~2200 | 0~0.5 | 8 | 溝銑 SLOTTING |
| UPE0804 | 25 | 135 | 5500 | 800~1100 | 0.5~2 | 8 | 溝銑 SLOTTING |
| UPE0804 | 25 | 135 | 5500 | 700~900 | 2~4 | 8 | 溝銑 SLOTTING |

被切削材 Work Material

(麻田散鐵, 析出硬化) 系不銹鋼
 Stainless Steels [Difficult] : **SUS420J2 / SUS630 : 1.2083 / 1.4542 : AISI 420 / 17-4PH** (HRc 28~32)

 切削條件表 **MILLING CONDITIONS**

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------|-------------------------------|------------------------------------|-----------------------|------------------------------|------------------------------|----------------------|
| UPE0804 | 25 | 135 | 5500 | 500~700 | 4~8 | 8 | 溝銑 SLOTTING |
| UPE0804 | 25 | 135 | 5500 | 1700~2100 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |
| UPE0804 | 25 | 135 | 5500 | 800~1100 | 8 | 0.5~2 | 側銑 SIDE MILLING |
| UPE0804 | 25 | 135 | 5500 | 700~900 | 8 | 2~4 | 側銑 SIDE MILLING |
| UPE0804 | 25 | 135 | 5500 | 550~750 | 8 | 4~8 | 側銑 SIDE MILLING |
| UPE0804 | 25 | 125 | 5000 | 800~1100 | 8~16 | 0~0.25 | 側銑 SIDE MILLING |
| UPE1004 | 30 | 130 | 4200 | 1400~1800 | 0~0.6 | 10 | 溝銑 SLOTTING |
| UPE1004 | 30 | 130 | 4200 | 800~1000 | 0.6~2 | 10 | 溝銑 SLOTTING |
| UPE1004 | 30 | 130 | 4200 | 600~800 | 3~5 | 10 | 溝銑 SLOTTING |
| UPE1004 | 30 | 130 | 4200 | 500~700 | 5~10 | 10 | 溝銑 SLOTTING |
| UPE1004 | 30 | 130 | 4200 | 1400~1700 | 10~20 | 0~0.6 | 側銑 SIDE MILLING |
| UPE1004 | 30 | 130 | 4200 | 700~1000 | 10 | 0.6~2 | 側銑 SIDE MILLING |
| UPE1004 | 30 | 130 | 4200 | 600~800 | 10 | 3~5 | 側銑 SIDE MILLING |
| UPE1004 | 30 | 130 | 4200 | 500~700 | 10 | 5~10 | 側銑 SIDE MILLING |
| UPE1004 | 30 | 115 | 3700 | 800~1000 | 10~20 | 0~0.3 | 側銑 SIDE MILLING |
| UPE1204 | 34 | 130 | 3450 | 1300~1600 | 0~0.7 | 12 | 溝銑 SLOTTING |
| UPE1204 | 34 | 130 | 3450 | 650~850 | 0.7~2 | 12 | 溝銑 SLOTTING |
| UPE1204 | 34 | 130 | 3450 | 450~650 | 2~5 | 12 | 溝銑 SLOTTING |
| UPE1204 | 34 | 130 | 3450 | 350~550 | 5~10 | 12 | 溝銑 SLOTTING |
| UPE1204 | 34 | 130 | 3450 | 1400~1700 | 12~24 | 0~0.7 | 側銑 SIDE MILLING |
| UPE1204 | 34 | 130 | 3450 | 800~1100 | 12 | 0.7~2 | 側銑 SIDE MILLING |
| UPE1204 | 34 | 130 | 3450 | 450~650 | 12 | 2~5 | 側銑 SIDE MILLING |
| UPE1204 | 34 | 130 | 3450 | 350~550 | 12 | 5~10 | 側銑 SIDE MILLING |
| UPE1204 | 34 | 130 | 3450 | 800~1000 | 12~24 | 0~0.3 | 側銑 SIDE MILLING |
| UPE1404 | 40 | 130 | 2950 | 1200~1500 | 0~0.7 | 14 | 溝銑 SLOTTING |
| UPE1404 | 40 | 130 | 2950 | 600~750 | 0.7~2 | 14 | 溝銑 SLOTTING |
| UPE1404 | 40 | 130 | 2950 | 400~600 | 2~5 | 14 | 溝銑 SLOTTING |
| UPE1404 | 40 | 130 | 2950 | 350~550 | 5~8 | 14 | 溝銑 SLOTTING |
| UPE1404 | 40 | 130 | 2950 | 1300~1600 | 14~28 | 0~0.7 | 側銑 SIDE MILLING |
| UPE1404 | 40 | 130 | 2950 | 700~1000 | 14 | 0.7~2 | 側銑 SIDE MILLING |
| UPE1404 | 40 | 130 | 2950 | 400~600 | 14 | 2~5 | 側銑 SIDE MILLING |
| UPE1404 | 40 | 130 | 2950 | 350~550 | 14 | 5~8 | 側銑 SIDE MILLING |
| UPE1404 | 40 | 130 | 2950 | 700~900 | 14~28 | 0~0.4 | 側銑 SIDE MILLING |
| UPE1604 | 45 | 130 | 2600 | 1100~1400 | 0~0.7 | 16 | 溝銑 SLOTTING |
| UPE1604 | 45 | 130 | 2600 | 550~700 | 0.7~2 | 16 | 溝銑 SLOTTING |
| UPE1604 | 45 | 130 | 2600 | 400~500 | 2~5 | 16 | 溝銑 SLOTTING |
| UPE1604 | 45 | 130 | 2600 | 300~500 | 5~8 | 16 | 溝銑 SLOTTING |
| UPE1604 | 45 | 130 | 2600 | 1200~1400 | 16~32 | 0~0.7 | 側銑 SIDE MILLING |
| UPE1604 | 45 | 130 | 2600 | 700~900 | 16 | 0.7~2 | 側銑 SIDE MILLING |

被切削材 Work Material

(麻田散鐵, 析出硬化) 系不銹鋼
Stainless Steels [Difficult] : SUS420J2 / SUS630 : 1.2083 /
1.4542 : AISI 420 / 17-4PH (HRC 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPE1604 | 45 | 130 | 2600 | 400~500 | 16 | 2~5 | 側銑 SIDE MILLING |
| UPE1604 | 45 | 130 | 2600 | 300~450 | 16 | 5~8 | 側銑 SIDE MILLING |
| UPE1604 | 45 | 130 | 2600 | 600~800 | 16~32 | 0~0.4 | 側銑 SIDE MILLING |
| UPE1804 | 50 | 130 | 2300 | 1000~1300 | 0~0.7 | 18 | 溝銑 SLOTTING |
| UPE1804 | 50 | 130 | 2300 | 500~650 | 0.7~2 | 18 | 溝銑 SLOTTING |
| UPE1804 | 50 | 130 | 2300 | 350~450 | 2~5 | 18 | 溝銑 SLOTTING |
| UPE1804 | 50 | 130 | 2300 | 250~400 | 5~8 | 18 | 溝銑 SLOTTING |
| UPE1804 | 50 | 130 | 2300 | 1000~1200 | 18~36 | 0~0.7 | 側銑 SIDE MILLING |
| UPE1804 | 50 | 130 | 2300 | 600~800 | 18 | 0.7~2 | 側銑 SIDE MILLING |
| UPE1804 | 50 | 130 | 2300 | 300~450 | 18 | 2~5 | 側銑 SIDE MILLING |
| UPE1804 | 50 | 130 | 2300 | 250~350 | 18 | 5~8 | 側銑 SIDE MILLING |
| UPE1804 | 50 | 130 | 2300 | 500~700 | 18~36 | 0~0.4 | 側銑 SIDE MILLING |
| UPE2004 | 50 | 130 | 2050 | 900~1100 | 0~0.7 | 20 | 溝銑 SLOTTING |
| UPE2004 | 50 | 130 | 2050 | 400~600 | 0.7~2 | 20 | 溝銑 SLOTTING |
| UPE2004 | 50 | 130 | 2050 | 300~400 | 2~5 | 20 | 溝銑 SLOTTING |
| UPE2004 | 50 | 130 | 2050 | 200~350 | 5~8 | 20 | 溝銑 SLOTTING |
| UPE2004 | 50 | 130 | 2050 | 800~1000 | 20~40 | 0~0.7 | 側銑 SIDE MILLING |
| UPE2004 | 50 | 130 | 2050 | 500~700 | 20 | 0.7~2 | 側銑 SIDE MILLING |
| UPE2004 | 50 | 130 | 2050 | 250~400 | 20 | 2~5 | 側銑 SIDE MILLING |
| UPE2004 | 50 | 130 | 2050 | 200~300 | 20 | 5~8 | 側銑 SIDE MILLING |
| UPE2004 | 50 | 130 | 2050 | 450~650 | 20~40 | 0~0.7 | 側銑 SIDE MILLING |
| UPE2504 | 55 | 130 | 1650 | 700~950 | 0~0.7 | 25 | 溝銑 SLOTTING |
| UPE2504 | 55 | 130 | 1650 | 300~500 | 0.7~2 | 25 | 溝銑 SLOTTING |
| UPE2504 | 55 | 130 | 1650 | 200~300 | 2~5 | 25 | 溝銑 SLOTTING |
| UPE2504 | 55 | 130 | 1650 | 150~250 | 5~8 | 25 | 溝銑 SLOTTING |
| UPE2504 | 55 | 130 | 1650 | 600~850 | 25~50 | 0~0.7 | 側銑 SIDE MILLING |
| UPE2504 | 55 | 130 | 1650 | 300~500 | 25 | 0.7~2 | 側銑 SIDE MILLING |
| UPE2504 | 55 | 130 | 1650 | 200~300 | 25 | 2~5 | 側銑 SIDE MILLING |
| UPE2504 | 55 | 130 | 1650 | 150~250 | 25 | 5~8 | 側銑 SIDE MILLING |
| UPE2504 | 55 | 130 | 1650 | 350~550 | 25~50 | 0~0.7 | 側銑 SIDE MILLING |

附註

1. UPE適用於粗、精銑加工，溝銑(Aa)與側銑(Ap)都有1.0D切削能力。粗切削時，請用濕式高壓水溶性切削液，以免造成排屑不良。直徑 $\phi 10$ 以上，需視機器剛性與主軸扭力值的不同，而做適當調整。
2. 建議冷卻方式為濕式。

NOTE

1. UPE is good at Roughing and Finishing. It can do a 1.0D machining for both Slotting (Aa) and Sidemilling (Ap). When Roughing, we suggest high pressure emulsion coolant for better chip removal. For diameter above 10.0mm, make necessary adjustment as per the rigidity of machine and the torque of spindle.
2. Suggest to use wet coolant.

HPC

UPG

抗震高效能立銑刀 END MILLS

| | | |
|--|-----------------------------|----------------------|
| | 乾式切削 Dry Machining | |
| | 油霧切削 MQL (Mist) | 精銑 Finishing |
| | 水溶性切削 Emulsion Machining | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | 粗銑 Roughing |

Stainless Steel Cutting

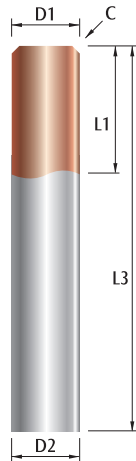


產品規格 SPECIFICATIONS

| 型號 Type No. | D1 直徑 Diameter | C 倒角 Chamfer | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|----------------------|--------------------|--------------------------|--------------------|------------------------|
| UPG0304 | 3.0 | 0.15 | 8 | 50 | 6 |
| UPG0404 | 4.0 | 0.15 | 11 | 50 | 6 |
| UPG0504 | 5.0 | 0.2 | 13 | 50 | 6 |
| UPG0604 | 6.0 | 0.2 | 16 | 50 | 6 |
| UPG0604L | 6.0 | 0.2 | 20 | 60 | 6 |
| UPG0804 | 8.0 | 0.25 | 20 | 60 | 8 |
| UPG0804L | 8.0 | 0.25 | 25 | 75 | 8 |
| UPG1004 | 10.0 | 0.3 | 22 | 75 | 10 |
| UPG1004L | 10.0 | 0.3 | 30 | 80 | 10 |
| UPG1204 | 12.0 | 0.3 | 26 | 75 | 12 |
| UPG1204L | 12.0 | 0.3 | 35 | 100 | 12 |
| UPG1604 | 16.0 | 0.4 | 40 | 100 | 16 |
| UPG1604L | 16.0 | 0.4 | 50 | 120 | 16 |
| UPG1804 | 18.0 | 0.5 | 40 | 100 | 18 |
| UPG2004 | 20.0 | 0.5 | 40 | 100 | 20 |
| UPG2004L | 20.0 | 0.5 | 50 | 120 | 20 |

unit : mm

公差表 TOLERANCE



| 直徑 D1 | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|-----------------------|----------|-----------------------|
| 3.0 | $0_{-0.02}$ | Ø6 | $0_{-0.008}$ |
| 4.0 | $0_{-0.02}$ | Ø8 | $0_{-0.009}$ |
| 5.0 | $0_{-0.02}$ | Ø10 | $0_{-0.009}$ |
| 6.0 | $0_{-0.02}$ | Ø12 | $0_{-0.011}$ |
| 8.0 | $0_{-0.025}$ | Ø16 | $0_{-0.011}$ |
| 10.0 | $0_{-0.03}$ | Ø18 | $0_{-0.011}$ |
| 12.0 | $0_{-0.035}$ | Ø20 | $0_{-0.013}$ |
| 16.0 | $0_{-0.04}$ | | |
| 18.0 | $0_{-0.04}$ | | |
| 20.0 | $0_{-0.04}$ | | |

unit : mm

UPG

切削條件表 MILLING CONDITIONS

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy]: **SUS304 : 1.4301 : AISI 304** (HRc 28~32)

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPG0304 | 13 | 95 | 10000 | 400~600 | 0~0.5 | 3 | 溝銑 SLOTTING |
| UPG0304 | 13 | 95 | 10000 | 300~500 | 0.5~0.9 | 3 | 溝銑 SLOTTING |
| UPG0304 | 13 | 95 | 10000 | 200~400 | 0.9~1.3 | 3 | 溝銑 SLOTTING |
| UPG0304 | 13 | 95 | 10000 | 600~800 | 3 | 0~0.5 | 側銑 SIDE MILLING |
| UPG0304 | 13 | 95 | 10000 | 300~500 | 3 | 0.5~0.9 | 側銑 SIDE MILLING |
| UPG0304 | 13 | 95 | 10000 | 250~450 | 3 | 0.9~1.3 | 側銑 SIDE MILLING |
| UPG0404 | 16 | 95 | 7500 | 500~700 | 0~0.7 | 4 | 溝銑 SLOTTING |
| UPG0404 | 16 | 95 | 7500 | 400~600 | 0.7~1.1 | 4 | 溝銑 SLOTTING |
| UPG0404 | 16 | 95 | 7500 | 250~450 | 1.1~1.6 | 4 | 溝銑 SLOTTING |
| UPG0404 | 16 | 95 | 7500 | 600~800 | 4 | 0~0.7 | 側銑 SIDE MILLING |
| UPG0404 | 16 | 95 | 7500 | 400~600 | 4 | 0.7~1.1 | 側銑 SIDE MILLING |
| UPG0404 | 16 | 95 | 7500 | 300~500 | 4 | 1.1~1.6 | 側銑 SIDE MILLING |
| UPG0504 | 18 | 95 | 6050 | 500~700 | 0~0.9 | 5 | 溝銑 SLOTTING |
| UPG0504 | 18 | 95 | 6050 | 400~600 | 0.9~1.5 | 5 | 溝銑 SLOTTING |
| UPG0504 | 18 | 95 | 6050 | 300~500 | 1.5~2.2 | 5 | 溝銑 SLOTTING |
| UPG0504 | 18 | 95 | 6050 | 600~800 | 5 | 0~0.9 | 側銑 SIDE MILLING |
| UPG0504 | 18 | 95 | 6050 | 400~600 | 5 | 0.9~1.5 | 側銑 SIDE MILLING |
| UPG0504 | 18 | 95 | 6050 | 350~450 | 5 | 1.5~2.2 | 側銑 SIDE MILLING |
| UPG0604 | 20 | 95 | 5050 | 550~750 | 0~1.2 | 6 | 溝銑 SLOTTING |
| UPG0604 | 20 | 95 | 5050 | 500~650 | 1.2~2 | 6 | 溝銑 SLOTTING |
| UPG0604 | 20 | 95 | 5050 | 300~400 | 2~3 | 6 | 溝銑 SLOTTING |
| UPG0604 | 20 | 95 | 5050 | 700~900 | 6 | 0~1.2 | 側銑 SIDE MILLING |
| UPG0604 | 20 | 95 | 5050 | 500~700 | 6 | 1.2~2 | 側銑 SIDE MILLING |
| UPG0604 | 20 | 95 | 5050 | 450~650 | 6 | 2~3 | 側銑 SIDE MILLING |
| UPG0604L | 25 | 95 | 5050 | 500~700 | 0~1 | 6 | 溝銑 SLOTTING |
| UPG0604L | 25 | 95 | 5050 | 400~600 | 1~1.5 | 6 | 溝銑 SLOTTING |
| UPG0604L | 25 | 95 | 5050 | 300~400 | 1.5~2 | 6 | 溝銑 SLOTTING |
| UPG0604L | 25 | 95 | 5050 | 600~800 | 6 | 0~1 | 側銑 SIDE MILLING |
| UPG0604L | 25 | 95 | 5050 | 400~600 | 6 | 1~1.5 | 側銑 SIDE MILLING |
| UPG0604L | 25 | 95 | 5050 | 300~500 | 6 | 1.5~2 | 側銑 SIDE MILLING |
| UPG0804 | 25 | 95 | 3750 | 600~800 | 0~1.5 | 8 | 溝銑 SLOTTING |
| UPG0804 | 25 | 95 | 3750 | 400~600 | 2~4 | 8 | 溝銑 SLOTTING |

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] :SUS304 :1.4301 :AISI 304 (Hrc 28~32)

切削條件表 **MILLING CONDITIONS**

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPG0804 | 25 | 95 | 3750 | 350~550 | 4~6.5 | 8 | 溝銑 SLOTTING |
| UPG0804 | 25 | 95 | 3750 | 800~1100 | 8 | 0~2 | 側銑 SIDE MILLING |
| UPG0804 | 25 | 95 | 3750 | 500~700 | 8 | 2~4 | 側銑 SIDE MILLING |
| UPG0804 | 25 | 95 | 3750 | 400~600 | 8 | 4~6.5 | 側銑 SIDE MILLING |
| UPG0804L | 33 | 95 | 3750 | 500~700 | 0~1 | 8 | 溝銑 SLOTTING |
| UPG0804L | 33 | 95 | 3750 | 400~600 | 1~2 | 8 | 溝銑 SLOTTING |
| UPG0804L | 33 | 95 | 3750 | 300~500 | 2~3 | 8 | 溝銑 SLOTTING |
| UPG0804L | 33 | 95 | 3750 | 700~1000 | 8 | 0~1 | 側銑 SIDE MILLING |
| UPG0804L | 33 | 95 | 3750 | 500~700 | 8 | 1~2 | 側銑 SIDE MILLING |
| UPG0804L | 33 | 95 | 3750 | 400~600 | 8 | 2~3 | 側銑 SIDE MILLING |
| UPG1004 | 30 | 95 | 3050 | 600~800 | 0~2 | 10 | 溝銑 SLOTTING |
| UPG1004 | 30 | 95 | 3050 | 400~500 | 3~5 | 10 | 溝銑 SLOTTING |
| UPG1004 | 30 | 95 | 3050 | 300~400 | 8 | 10 | 溝銑 SLOTTING |
| UPG1004 | 30 | 95 | 3050 | 900~1200 | 10 | 0~2 | 側銑 SIDE MILLING |
| UPG1004 | 30 | 95 | 3050 | 500~700 | 10 | 3~5 | 側銑 SIDE MILLING |
| UPG1004 | 30 | 95 | 3050 | 300~450 | 10 | 8 | 側銑 SIDE MILLING |
| UPG1004L | 40 | 60 | 1900 | 500~700 | 0~1 | 10 | 溝銑 SLOTTING |
| UPG1004L | 40 | 60 | 1900 | 200~400 | 1~2 | 10 | 溝銑 SLOTTING |
| UPG1004L | 40 | 60 | 1900 | 200~350 | 2~3 | 10 | 溝銑 SLOTTING |
| UPG1004L | 40 | 60 | 1900 | 700~1000 | 10~20 | 0~0.5 | 側銑 SIDE MILLING |
| UPG1004L | 40 | 60 | 1900 | 400~600 | 10~20 | 0.5~1 | 側銑 SIDE MILLING |
| UPG1004L | 40 | 60 | 1900 | 200~300 | 10~20 | 1~1.5 | 側銑 SIDE MILLING |
| UPG1204 | 34 | 95 | 2500 | 500~700 | 0~2 | 12 | 溝銑 SLOTTING |
| UPG1204 | 34 | 95 | 2500 | 400~600 | 2~4 | 12 | 溝銑 SLOTTING |
| UPG1204 | 34 | 95 | 2500 | 300~500 | 4~6 | 12 | 溝銑 SLOTTING |
| UPG1204 | 34 | 95 | 2500 | 600~800 | 12 | 0~2 | 側銑 SIDE MILLING |
| UPG1204 | 34 | 95 | 2500 | 400~600 | 12 | 2~4 | 側銑 SIDE MILLING |
| UPG1204 | 34 | 95 | 2500 | 300~500 | 12 | 4~6 | 側銑 SIDE MILLING |
| UPG1204L | 50 | 60 | 1600 | 400~600 | 0~1 | 12 | 溝銑 SLOTTING |
| UPG1204L | 50 | 60 | 1600 | 300~500 | 1~2 | 12 | 溝銑 SLOTTING |
| UPG1204L | 50 | 60 | 1600 | 200~400 | 2~3 | 12 | 溝銑 SLOTTING |
| UPG1204L | 50 | 55 | 1400 | 500~700 | 12~24 | 0~0.5 | 側銑 SIDE MILLING |

被切削材 Work Material

沃斯田鐵系不銹鋼

 Stainless Steels [Easy]: **SUS304 : 1.4301 : AISI 304** (HRc 28~32)

 切削條件表 **MILLING CONDITIONS**

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPG1204L | 50 | 45 | 1200 | 400~600 | 12~24 | 0.5~1 | 側銑 SIDE MILLING |
| UPG1204L | 50 | 45 | 1200 | 400~600 | 12~24 | 1~1.5 | 側銑 SIDE MILLING |
| UPG1604 | 45 | 95 | 1900 | 350~550 | 0~2 | 16 | 溝銑 SLOTTING |
| UPG1604 | 45 | 95 | 1900 | 300~500 | 2~3 | 16 | 溝銑 SLOTTING |
| UPG1604 | 45 | 95 | 1900 | 200~400 | 3~5 | 16 | 溝銑 SLOTTING |
| UPG1604 | 45 | 95 | 1900 | 500~700 | 16 | 0~2 | 側銑 SIDE MILLING |
| UPG1604 | 45 | 95 | 1900 | 400~600 | 16 | 2~3 | 側銑 SIDE MILLING |
| UPG1604 | 45 | 95 | 1900 | 300~500 | 16 | 3~5 | 側銑 SIDE MILLING |
| UPG1604L | 55 | 60 | 1200 | 350~550 | 0~1 | 16 | 溝銑 SLOTTING |
| UPG1604L | 55 | 60 | 1200 | 300~500 | 1~2 | 16 | 溝銑 SLOTTING |
| UPG1604L | 55 | 60 | 1200 | 200~400 | 2~3 | 16 | 溝銑 SLOTTING |
| UPG1604L | 55 | 50 | 1000 | 400~600 | 16~32 | 0~0.5 | 側銑 SIDE MILLING |
| UPG1604L | 55 | 50 | 1000 | 350~550 | 16~32 | 0.5~1 | 側銑 SIDE MILLING |
| UPG1604L | 55 | 50 | 1000 | 300~400 | 16~32 | 1~1.5 | 側銑 SIDE MILLING |
| UPG1804 | 50 | 95 | 1700 | 350~550 | 0~2 | 18 | 溝銑 SLOTTING |
| UPG1804 | 50 | 95 | 1700 | 250~450 | 2~4 | 18 | 溝銑 SLOTTING |
| UPG1804 | 50 | 95 | 1700 | 150~350 | 4~6 | 18 | 溝銑 SLOTTING |
| UPG1804 | 50 | 95 | 1700 | 450~650 | 18 | 0~2 | 側銑 SIDE MILLING |
| UPG1804 | 50 | 95 | 1700 | 350~550 | 18 | 2~4 | 側銑 SIDE MILLING |
| UPG1804 | 50 | 95 | 1700 | 250~450 | 18 | 4~6 | 側銑 SIDE MILLING |
| UPG2004 | 50 | 95 | 1500 | 250~450 | 0~2 | 20 | 溝銑 SLOTTING |
| UPG2004 | 50 | 95 | 1500 | 200~400 | 2~3 | 20 | 溝銑 SLOTTING |
| UPG2004 | 50 | 95 | 1500 | 150~300 | 3~5 | 20 | 溝銑 SLOTTING |
| UPG2004 | 50 | 95 | 1500 | 400~600 | 20 | 0~2 | 側銑 SIDE MILLING |
| UPG2004 | 50 | 95 | 1500 | 300~500 | 20 | 2~3 | 側銑 SIDE MILLING |
| UPG2004 | 50 | 95 | 1500 | 200~400 | 20 | 3~5 | 側銑 SIDE MILLING |
| UPG2004L | 65 | 60 | 950 | 200~400 | 0~1 | 20 | 溝銑 SLOTTING |
| UPG2004L | 65 | 60 | 950 | 150~350 | 1~2 | 20 | 溝銑 SLOTTING |
| UPG2004L | 65 | 60 | 950 | 100~300 | 2~3 | 20 | 溝銑 SLOTTING |
| UPG2004L | 65 | 50 | 800 | 200~400 | 20~40 | 0~0.5 | 側銑 SIDE MILLING |
| UPG2004L | 65 | 50 | 800 | 150~350 | 20~40 | 0.5~1 | 側銑 SIDE MILLING |
| UPG2004L | 65 | 50 | 800 | 100~300 | 20~40 | 1~1.5 | 側銑 SIDE MILLING |

UPG

被切削材 Work Material

(麻田散鐵, 析出硬化) 系不銹鋼
 Stainless Steels [Difficult] : SUS420J2 / SUS630 : 1.2083 /
 1.4542 : AISI 420 / 17-4PH (HRC 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPG0304 | 13 | 95 | 10000 | 400~600 | 0~0.5 | 3 | 溝銑 SLOTTING |
| UPG0304 | 13 | 95 | 10000 | 300~500 | 0.5~0.9 | 3 | 溝銑 SLOTTING |
| UPG0304 | 13 | 95 | 10000 | 200~400 | 0.9~1.3 | 3 | 溝銑 SLOTTING |
| UPG0304 | 13 | 95 | 10000 | 600~800 | 3 | 0~0.5 | 側銑 SIDE MILLING |
| UPG0304 | 13 | 95 | 10000 | 300~500 | 3 | 0.5~0.9 | 側銑 SIDE MILLING |
| UPG0304 | 13 | 95 | 10000 | 250~450 | 3 | 0.9~1.3 | 側銑 SIDE MILLING |
| UPG0404 | 16 | 95 | 7500 | 500~700 | 0~0.7 | 4 | 溝銑 SLOTTING |
| UPG0404 | 16 | 95 | 7500 | 400~600 | 0.7~1.1 | 4 | 溝銑 SLOTTING |
| UPG0404 | 16 | 95 | 7500 | 250~450 | 1.1~1.6 | 4 | 溝銑 SLOTTING |
| UPG0404 | 16 | 95 | 7500 | 600~800 | 4 | 0~0.7 | 側銑 SIDE MILLING |
| UPG0404 | 16 | 95 | 7500 | 400~600 | 4 | 0.7~1.1 | 側銑 SIDE MILLING |
| UPG0404 | 16 | 95 | 7500 | 300~500 | 4 | 1.1~1.6 | 側銑 SIDE MILLING |
| UPG0504 | 18 | 95 | 6050 | 500~700 | 0~0.9 | 5 | 溝銑 SLOTTING |
| UPG0504 | 18 | 95 | 6050 | 400~600 | 0.9~1.5 | 5 | 溝銑 SLOTTING |
| UPG0504 | 18 | 95 | 6050 | 300~500 | 1.5~2.2 | 5 | 溝銑 SLOTTING |
| UPG0504 | 18 | 95 | 6050 | 600~800 | 5 | 0~0.9 | 側銑 SIDE MILLING |
| UPG0504 | 18 | 95 | 6050 | 400~600 | 5 | 0.9~1.5 | 側銑 SIDE MILLING |
| UPG0504 | 18 | 95 | 6050 | 350~450 | 5 | 1.5~2.2 | 側銑 SIDE MILLING |
| UPG0604 | 20 | 95 | 5050 | 550~750 | 0~1.2 | 6 | 溝銑 SLOTTING |
| UPG0604 | 20 | 95 | 5050 | 500~650 | 1.2~2 | 6 | 溝銑 SLOTTING |
| UPG0604 | 20 | 95 | 5050 | 300~400 | 2~3 | 6 | 溝銑 SLOTTING |
| UPG0604 | 20 | 95 | 5050 | 700~900 | 6 | 0~1.2 | 側銑 SIDE MILLING |
| UPG0604 | 20 | 95 | 5050 | 500~700 | 6 | 1.2~2 | 側銑 SIDE MILLING |
| UPG0604 | 20 | 95 | 5050 | 450~650 | 6 | 2~3 | 側銑 SIDE MILLING |
| UPG0604L | 25 | 95 | 5050 | 500~700 | 0~1 | 6 | 溝銑 SLOTTING |
| UPG0604L | 25 | 95 | 5050 | 400~600 | 1~1.5 | 6 | 溝銑 SLOTTING |
| UPG0604L | 25 | 95 | 5050 | 300~400 | 1.5~2 | 6 | 溝銑 SLOTTING |
| UPG0604L | 25 | 95 | 5050 | 600~800 | 6 | 0~1 | 側銑 SIDE MILLING |
| UPG0604L | 25 | 95 | 5050 | 400~600 | 6 | 1~1.5 | 側銑 SIDE MILLING |
| UPG0604L | 25 | 95 | 5050 | 300~500 | 6 | 1.5~2 | 側銑 SIDE MILLING |
| UPG0804 | 25 | 90 | 3600 | 600~800 | 0~1.5 | 8 | 溝銑 SLOTTING |
| UPG0804 | 25 | 90 | 3600 | 400~600 | 2~4 | 8 | 溝銑 SLOTTING |
| UPG0804 | 25 | 90 | 3600 | 300~500 | 4~6.5 | 8 | 溝銑 SLOTTING |
| UPG0804 | 25 | 90 | 3600 | 800~1100 | 8 | 0~2 | 側銑 SIDE MILLING |
| UPG0804 | 25 | 90 | 3600 | 500~700 | 8 | 2~4 | 側銑 SIDE MILLING |

被切削材 Work Material

(麻田散鐵, 析出硬化) 系不銹鋼
 Stainless Steels [Difficult] : **SUS420J2 / SUS630 : 1.2083 / 1.4542 : AISI 420 / 17-4PH** (HRc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPG0804 | 25 | 90 | 3600 | 400~600 | 8 | 4~6.5 | 側銑 SIDE MILLING |
| UPG0804L | 33 | 90 | 3600 | 500~700 | 0~1 | 8 | 溝銑 SLOTTING |
| UPG0804L | 33 | 90 | 3600 | 400~600 | 1~2 | 8 | 溝銑 SLOTTING |
| UPG0804L | 33 | 90 | 3600 | 300~500 | 2~3 | 8 | 溝銑 SLOTTING |
| UPG0804L | 33 | 90 | 3600 | 700~1000 | 8 | 0~1 | 側銑 SIDE MILLING |
| UPG0804L | 33 | 90 | 3600 | 500~700 | 8 | 1~2 | 側銑 SIDE MILLING |
| UPG0804L | 33 | 90 | 3600 | 400~600 | 8 | 2~3 | 側銑 SIDE MILLING |
| UPG1004 | 30 | 90 | 2900 | 600~800 | 0~2 | 10 | 溝銑 SLOTTING |
| UPG1004 | 30 | 90 | 2900 | 400~500 | 3~5 | 10 | 溝銑 SLOTTING |
| UPG1004 | 30 | 90 | 2900 | 300~400 | 8 | 10 | 溝銑 SLOTTING |
| UPG1004 | 30 | 90 | 2900 | 800~1000 | 10 | 0~2 | 側銑 SIDE MILLING |
| UPG1004 | 30 | 90 | 2900 | 500~600 | 10 | 3~5 | 側銑 SIDE MILLING |
| UPG1004 | 30 | 90 | 2900 | 300~500 | 10 | 8 | 側銑 SIDE MILLING |
| UPG1004L | 40 | 60 | 1900 | 500~700 | 0~1 | 10 | 溝銑 SLOTTING |
| UPG1004L | 40 | 60 | 1900 | 200~400 | 1~2 | 10 | 溝銑 SLOTTING |
| UPG1004L | 40 | 60 | 1900 | 200~350 | 2~3 | 10 | 溝銑 SLOTTING |
| UPG1004L | 40 | 60 | 1900 | 700~1000 | 10~20 | 0~0.5 | 側銑 SIDE MILLING |
| UPG1004L | 40 | 60 | 1900 | 400~600 | 10~20 | 0.5~1 | 側銑 SIDE MILLING |
| UPG1004L | 40 | 60 | 1900 | 200~300 | 10~20 | 1~1.5 | 側銑 SIDE MILLING |
| UPG1204 | 34 | 90 | 2400 | 500~700 | 0~2 | 12 | 溝銑 SLOTTING |
| UPG1204 | 34 | 90 | 2400 | 400~600 | 2~4 | 12 | 溝銑 SLOTTING |
| UPG1204 | 34 | 90 | 2400 | 300~500 | 4~6 | 12 | 溝銑 SLOTTING |
| UPG1204 | 34 | 90 | 2400 | 600~800 | 12 | 0~2 | 側銑 SIDE MILLING |
| UPG1204 | 34 | 90 | 2400 | 400~600 | 12 | 2~4 | 側銑 SIDE MILLING |
| UPG1204 | 34 | 90 | 2400 | 300~500 | 12 | 4~6 | 側銑 SIDE MILLING |
| UPG1204L | 50 | 60 | 1600 | 400~600 | 0~1 | 12 | 溝銑 SLOTTING |
| UPG1204L | 50 | 60 | 1600 | 300~500 | 1~2 | 12 | 溝銑 SLOTTING |
| UPG1204L | 50 | 60 | 1600 | 200~400 | 2~3 | 12 | 溝銑 SLOTTING |
| UPG1204L | 50 | 55 | 1400 | 500~700 | 12~24 | 0~0.5 | 側銑 SIDE MILLING |
| UPG1204L | 50 | 45 | 1200 | 400~600 | 12~24 | 0.5~1 | 側銑 SIDE MILLING |
| UPG1204L | 50 | 45 | 1200 | 400~600 | 12~24 | 1~1.5 | 側銑 SIDE MILLING |
| UPG1604 | 45 | 90 | 1800 | 350~550 | 0~2 | 16 | 溝銑 SLOTTING |
| UPG1604 | 45 | 90 | 1800 | 300~500 | 2~3 | 16 | 溝銑 SLOTTING |
| UPG1604 | 45 | 90 | 1800 | 200~400 | 3~5 | 16 | 溝銑 SLOTTING |
| UPG1604 | 45 | 90 | 1800 | 500~700 | 16 | 0~2 | 側銑 SIDE MILLING |

被切削材 Work Material

(麻田散鐵, 析出硬化) 系不銹鋼
Stainless Steels [Difficult] : SUS420J2 / SUS630 : 1.2083 /
1.4542 : AISI 420 / 17-4PH (HRC 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPG1604 | 45 | 90 | 1800 | 400~600 | 16 | 2~3 | 側銑 SIDE MILLING |
| UPG1604 | 45 | 90 | 1800 | 300~500 | 16 | 3~5 | 側銑 SIDE MILLING |
| UPG1604L | 55 | 60 | 1200 | 350~550 | 0~1 | 16 | 溝銑 SLOTTING |
| UPG1604L | 55 | 60 | 1200 | 300~500 | 1~2 | 16 | 溝銑 SLOTTING |
| UPG1604L | 55 | 60 | 1200 | 200~400 | 2~3 | 16 | 溝銑 SLOTTING |
| UPG1604L | 55 | 50 | 1000 | 400~600 | 16~32 | 0~0.5 | 側銑 SIDE MILLING |
| UPG1604L | 55 | 50 | 1000 | 350~550 | 16~32 | 0.5~1 | 側銑 SIDE MILLING |
| UPG1604L | 55 | 50 | 1000 | 300~400 | 16~32 | 1~1.5 | 側銑 SIDE MILLING |
| UPG1804 | 50 | 90 | 1600 | 350~550 | 0~2 | 18 | 溝銑 SLOTTING |
| UPG1804 | 50 | 90 | 1600 | 250~450 | 2~4 | 18 | 溝銑 SLOTTING |
| UPG1804 | 50 | 90 | 1600 | 150~350 | 4~6 | 18 | 溝銑 SLOTTING |
| UPG1804 | 50 | 90 | 1600 | 450~650 | 18 | 0~2 | 側銑 SIDE MILLING |
| UPG1804 | 50 | 90 | 1600 | 350~550 | 18 | 2~4 | 側銑 SIDE MILLING |
| UPG1804 | 50 | 90 | 1600 | 250~450 | 18 | 4~6 | 側銑 SIDE MILLING |
| UPG2004 | 50 | 90 | 1450 | 250~450 | 0~2 | 20 | 溝銑 SLOTTING |
| UPG2004 | 50 | 90 | 1450 | 200~400 | 2~3 | 20 | 溝銑 SLOTTING |
| UPG2004 | 50 | 90 | 1450 | 150~300 | 3~5 | 20 | 溝銑 SLOTTING |
| UPG2004 | 50 | 90 | 1450 | 400~600 | 20 | 0~2 | 側銑 SIDE MILLING |
| UPG2004 | 50 | 90 | 1450 | 300~500 | 20 | 2~3 | 側銑 SIDE MILLING |
| UPG2004 | 50 | 90 | 1450 | 200~400 | 20 | 3~5 | 側銑 SIDE MILLING |
| UPG2004L | 65 | 60 | 950 | 200~400 | 0~1 | 20 | 溝銑 SLOTTING |
| UPG2004L | 65 | 60 | 950 | 150~350 | 1~2 | 20 | 溝銑 SLOTTING |
| UPG2004L | 65 | 60 | 950 | 100~300 | 2~3 | 20 | 溝銑 SLOTTING |
| UPG2004L | 65 | 50 | 800 | 200~400 | 20~40 | 0~0.5 | 側銑 SIDE MILLING |
| UPG2004L | 65 | 50 | 800 | 150~350 | 20~40 | 0.5~1 | 側銑 SIDE MILLING |
| UPG2004L | 65 | 50 | 800 | 100~300 | 20~40 | 1~1.5 | 側銑 SIDE MILLING |

附註

- UPG適用於粗、精銑加工，溝銑(Aa)與側銑(Ap)都有1.0D切削能力。0.5D以上切削時，請用濕式高壓水溶性切削液，以免造成排屑不良。直徑 ϕ 10以上，需視機器剛性與主軸扭力值的不同，而做適當調整。
- 建議冷卻方式為濕式。

NOTE

- UPG is good at Roughing. It can do a 1.0D machining for both Slotting (Aa) and Sidemilling (Ap). When it is above 0.5D machining, we suggest high pressure emulsion coolant for better chip removal. For diameter above 10.0mm, make necessary adjustment as per the rigidity of machine and the torque of spindle.
- Suggest to use wet coolant.



HPC

UPJ

無敵高剛性立銑刀
END MILLS

產品規格 SPECIFICATIONS

| 型號 Type No. | D1 直徑 Diameter | R R角 Corner R | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|----------------------|---------------------|--------------------------|--------------------|------------------------|
| UPJ0304 | 3.0 | 0.2 | 8 | 50 | 6 |
| UPJ0404 | 4.0 | 0.3 | 11 | 50 | 6 |
| UPJ0504 | 5.0 | 0.3 | 13 | 50 | 6 |
| UPJ0604 | 6.0 | 0.4 | 16 | 50 | 6 |
| UPJ0804 | 8.0 | 0.5 | 20 | 60 | 8 |
| UPJ1004 | 10.0 | 0.6 | 25 | 75 | 10 |
| UPJ1204 | 12.0 | 0.6 | 30 | 75 | 12 |
| UPJ1604 | 16.0 | 0.8 | 45 | 110 | 16 |
| UPJ2004 | 20.0 | 1.0 | 50 | 110 | 20 |

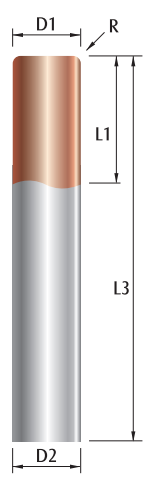
unit : mm

| | | | |
|--|-----------------------------|--|----------------------|
| | 乾式切削 Dry Machining | | |
| | 油霧切削 MQL (Mist) | | 精銑 Finishing |
| | 水溶性切削 Emulsion Machining | | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | | 粗銑 Roughing |

公差表 TOLERANCE

| 直徑 D1 | R R公差值 R Tolerance | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|--|---|----------|---|
| 3.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.02 \end{smallmatrix}$ | Ø6 | $\begin{smallmatrix} 0 \\ -0.008 \end{smallmatrix}$ |
| 4.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.02 \end{smallmatrix}$ | Ø8 | $\begin{smallmatrix} 0 \\ -0.009 \end{smallmatrix}$ |
| 5.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.02 \end{smallmatrix}$ | Ø10 | $\begin{smallmatrix} 0 \\ -0.009 \end{smallmatrix}$ |
| 6.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.02 \end{smallmatrix}$ | Ø12 | $\begin{smallmatrix} 0 \\ -0.011 \end{smallmatrix}$ |
| 8.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$ | Ø16 | $\begin{smallmatrix} 0 \\ -0.011 \end{smallmatrix}$ |
| 10.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.03 \end{smallmatrix}$ | Ø20 | $\begin{smallmatrix} 0 \\ -0.013 \end{smallmatrix}$ |
| 12.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.035 \end{smallmatrix}$ | | |
| 16.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.04 \end{smallmatrix}$ | | |
| 20.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.04 \end{smallmatrix}$ | | |

unit : mm



Stainless Steel Cutting



UPJ

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy]: **SUS304 : 1.4301 : AISI 304** (HRc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPJ0304 | 13 | 115 | 12000 | 2000~2200 | 0~0.3 | 3 | 溝銑 SLOTTING |
| UPJ0304 | 13 | 115 | 12000 | 1400~1600 | 0.3~0.8 | 3 | 溝銑 SLOTTING |
| UPJ0304 | 13 | 115 | 12000 | 900~1200 | 0.8~1.5 | 3 | 溝銑 SLOTTING |
| UPJ0304 | 13 | 115 | 12000 | 600~800 | 1.5~3 | 3 | 溝銑 SLOTTING |
| UPJ0304 | 13 | 115 | 12000 | 1700~2000 | 3~6 | 0~0.3 | 側銑 SIDE MILLING |
| UPJ0304 | 13 | 115 | 12000 | 1400~1600 | 3 | 0.3~0.8 | 側銑 SIDE MILLING |
| UPJ0304 | 13 | 115 | 12000 | 1100~1300 | 3 | 0.8~1.5 | 側銑 SIDE MILLING |
| UPJ0304 | 13 | 115 | 12000 | 700~900 | 6 | 0.8~1.5 | 側銑 SIDE MILLING |
| UPJ0304 | 13 | 115 | 12000 | 800~1000 | 3 | 1.5~2.5 | 側銑 SIDE MILLING |
| UPJ0404 | 16 | 115 | 9200 | 2000~2200 | 0~0.4 | 4 | 溝銑 SLOTTING |
| UPJ0404 | 16 | 115 | 9200 | 1400~1600 | 0.4~1 | 4 | 溝銑 SLOTTING |
| UPJ0404 | 16 | 115 | 9200 | 900~1200 | 1~2 | 4 | 溝銑 SLOTTING |
| UPJ0404 | 16 | 115 | 9200 | 700~900 | 2~4 | 4 | 溝銑 SLOTTING |
| UPJ0404 | 16 | 115 | 9200 | 1700~2000 | 4~8 | 0~0.4 | 側銑 SIDE MILLING |
| UPJ0404 | 16 | 115 | 9200 | 1400~1600 | 4 | 0.4~1 | 側銑 SIDE MILLING |
| UPJ0404 | 16 | 115 | 9200 | 1100~1300 | 4 | 1~2 | 側銑 SIDE MILLING |
| UPJ0404 | 16 | 115 | 9200 | 700~900 | 8 | 1~2 | 側銑 SIDE MILLING |
| UPJ0404 | 16 | 115 | 9200 | 800~1000 | 4 | 2~3 | 側銑 SIDE MILLING |
| UPJ0504 | 18 | 115 | 7400 | 2000~2200 | 0~0.4 | 5 | 溝銑 SLOTTING |
| UPJ0504 | 18 | 115 | 7400 | 1400~1600 | 0.4~1.2 | 5 | 溝銑 SLOTTING |
| UPJ0504 | 18 | 115 | 7400 | 1000~1300 | 1.2~2.5 | 5 | 溝銑 SLOTTING |
| UPJ0504 | 18 | 115 | 7400 | 800~1000 | 2.5~5 | 5 | 溝銑 SLOTTING |
| UPJ0504 | 18 | 115 | 7400 | 1700~2000 | 5~10 | 0~0.4 | 側銑 SIDE MILLING |
| UPJ0504 | 18 | 115 | 7400 | 1400~1600 | 5 | 0.4~1.2 | 側銑 SIDE MILLING |
| UPJ0504 | 18 | 115 | 7400 | 1100~1300 | 5 | 1.2~2.5 | 側銑 SIDE MILLING |
| UPJ0504 | 18 | 115 | 7400 | 700~900 | 10 | 1.2~2.5 | 側銑 SIDE MILLING |
| UPJ0504 | 18 | 115 | 7400 | 900~1100 | 5 | 2.5~4 | 側銑 SIDE MILLING |
| UPJ0604 | 20 | 115 | 6100 | 2000~2200 | 0~0.5 | 6 | 溝銑 SLOTTING |
| UPJ0604 | 20 | 115 | 6100 | 1400~1600 | 0.5~1.5 | 6 | 溝銑 SLOTTING |
| UPJ0604 | 20 | 115 | 6100 | 1000~1300 | 1.5~3 | 6 | 溝銑 SLOTTING |
| UPJ0604 | 20 | 115 | 6100 | 800~1000 | 3~6 | 6 | 溝銑 SLOTTING |
| UPJ0604 | 20 | 115 | 6100 | 1700~2000 | 6~12 | 0~0.5 | 側銑 SIDE MILLING |
| UPJ0604 | 20 | 115 | 6100 | 1400~1600 | 6 | 0.5~1.5 | 側銑 SIDE MILLING |
| UPJ0604 | 20 | 115 | 6100 | 1100~1300 | 6 | 1.5~3 | 側銑 SIDE MILLING |
| UPJ0604 | 20 | 115 | 6100 | 700~900 | 12 | 1.5~3 | 側銑 SIDE MILLING |
| UPJ0604 | 20 | 115 | 6100 | 900~1100 | 6 | 3~5 | 側銑 SIDE MILLING |
| UPJ0804 | 25 | 115 | 4600 | 2000~2200 | 0~0.5 | 8 | 溝銑 SLOTTING |
| UPJ0804 | 25 | 115 | 4600 | 1300~1500 | 0.5~1.8 | 8 | 溝銑 SLOTTING |
| UPJ0804 | 25 | 115 | 4600 | 1000~1300 | 2~4 | 8 | 溝銑 SLOTTING |
| UPJ0804 | 25 | 115 | 4600 | 800~1000 | 4~8 | 8 | 溝銑 SLOTTING |
| UPJ0804 | 25 | 115 | 4600 | 1600~1900 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |

被切削材 Work Material

沃斯田鐵系不銹鋼
Stainless Steels [Easy] :SUS304 : 1.4301 : AISI 304 (HRc 28~32)

切削條件表 **MILLING CONDITIONS**

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPJ0804 | 25 | 115 | 4600 | 1200~1500 | 8 | 0.5~2 | 側銑 SIDE MILLING |
| UPJ0804 | 25 | 115 | 4600 | 1100~1300 | 8 | 3~4 | 側銑 SIDE MILLING |
| UPJ0804 | 25 | 115 | 4600 | 700~900 | 16 | 3~4 | 側銑 SIDE MILLING |
| UPJ0804 | 25 | 115 | 4600 | 900~1100 | 8 | 4~7 | 側銑 SIDE MILLING |
| UPJ1004 | 30 | 115 | 3650 | 1800~2000 | 0~0.6 | 10 | 溝銑 SLOTTING |
| UPJ1004 | 30 | 115 | 3650 | 1200~1400 | 0.6~2 | 10 | 溝銑 SLOTTING |
| UPJ1004 | 30 | 115 | 3650 | 900~1100 | 3~5 | 10 | 溝銑 SLOTTING |
| UPJ1004 | 30 | 115 | 3650 | 700~900 | 5~10 | 10 | 溝銑 SLOTTING |
| UPJ1004 | 30 | 115 | 3650 | 1500~1800 | 10~20 | 0~0.5 | 側銑 SIDE MILLING |
| UPJ1004 | 30 | 115 | 3650 | 900~1100 | 10 | 0.5~2 | 側銑 SIDE MILLING |
| UPJ1004 | 30 | 115 | 3650 | 800~1000 | 10 | 3.6~5 | 側銑 SIDE MILLING |
| UPJ1004 | 30 | 115 | 3650 | 600~800 | 20 | 3.6~5 | 側銑 SIDE MILLING |
| UPJ1004 | 30 | 115 | 3650 | 600~800 | 10 | 5~8.7 | 側銑 SIDE MILLING |
| UPJ1204 | 34 | 115 | 3050 | 1600~1800 | 0~0.6 | 12 | 溝銑 SLOTTING |
| UPJ1204 | 34 | 115 | 3050 | 1000~1200 | 0.6~2 | 12 | 溝銑 SLOTTING |
| UPJ1204 | 34 | 115 | 3050 | 500~700 | 2~3 | 12 | 溝銑 SLOTTING |
| UPJ1204 | 34 | 115 | 3050 | 400~600 | 3~6 | 12 | 溝銑 SLOTTING |
| UPJ1204 | 34 | 115 | 3050 | 1400~1600 | 12~24 | 0~0.6 | 側銑 SIDE MILLING |
| UPJ1204 | 34 | 115 | 3050 | 900~1100 | 12 | 0.6~2 | 側銑 SIDE MILLING |
| UPJ1204 | 34 | 115 | 3050 | 700~900 | 12 | 2~3 | 側銑 SIDE MILLING |
| UPJ1204 | 34 | 115 | 3050 | 600~800 | 24 | 2~3 | 側銑 SIDE MILLING |
| UPJ1204 | 34 | 115 | 3050 | 500~700 | 12 | 3~6 | 側銑 SIDE MILLING |
| UPJ1604 | 50 | 115 | 2300 | 1200~1400 | 0~0.7 | 16 | 溝銑 SLOTTING |
| UPJ1604 | 50 | 115 | 2300 | 700~900 | 0.7~2 | 16 | 溝銑 SLOTTING |
| UPJ1604 | 50 | 115 | 2300 | 400~600 | 2~3 | 16 | 溝銑 SLOTTING |
| UPJ1604 | 50 | 115 | 2300 | 300~500 | 3~7 | 16 | 溝銑 SLOTTING |
| UPJ1604 | 50 | 115 | 2300 | 1100~1300 | 16~32 | 0~0.7 | 側銑 SIDE MILLING |
| UPJ1604 | 50 | 115 | 2300 | 600~800 | 16 | 0.7~2 | 側銑 SIDE MILLING |
| UPJ1604 | 50 | 115 | 2300 | 500~700 | 16 | 2~3 | 側銑 SIDE MILLING |
| UPJ1604 | 50 | 115 | 2300 | 400~600 | 32 | 2~3 | 側銑 SIDE MILLING |
| UPJ1604 | 50 | 115 | 2300 | 300~500 | 16 | 3~7 | 側銑 SIDE MILLING |
| UPJ2004 | 55 | 115 | 1850 | 900~1200 | 0~0.7 | 20 | 溝銑 SLOTTING |
| UPJ2004 | 55 | 115 | 1850 | 550~750 | 0.7~2 | 20 | 溝銑 SLOTTING |
| UPJ2004 | 55 | 115 | 1850 | 400~600 | 2~3 | 20 | 溝銑 SLOTTING |
| UPJ2004 | 55 | 115 | 1850 | 250~450 | 3~7 | 20 | 溝銑 SLOTTING |
| UPJ2004 | 55 | 115 | 1850 | 800~1100 | 20~40 | 0~0.7 | 側銑 SIDE MILLING |
| UPJ2004 | 55 | 115 | 1850 | 500~700 | 20 | 0.7~2 | 側銑 SIDE MILLING |
| UPJ2004 | 55 | 115 | 1850 | 350~550 | 20 | 2~3 | 側銑 SIDE MILLING |
| UPJ2004 | 55 | 115 | 1850 | 250~450 | 40 | 2~3 | 側銑 SIDE MILLING |
| UPJ2004 | 55 | 115 | 1850 | 200~400 | 20 | 3~7 | 側銑 SIDE MILLING |

UPJ

被切削材 Work Material

(麻田散鐵, 析出硬化) 系不銹鋼
 Stainless Steels [Difficult] : **SUS420J2 / SUS630 : 1.2083 / 1.4542 : AISI 420 / 17-4PH** (HRC 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPJ0304 | 13 | 120 | 12700 | 1700~1900 | 0~0.3 | 3 | 溝銑 SLOTTING |
| UPJ0304 | 13 | 120 | 12700 | 1100~1300 | 0.3~0.8 | 3 | 溝銑 SLOTTING |
| UPJ0304 | 13 | 120 | 12700 | 800~1100 | 0.8~1.5 | 3 | 溝銑 SLOTTING |
| UPJ0304 | 13 | 120 | 12700 | 500~700 | 1.5~3 | 3 | 溝銑 SLOTTING |
| UPJ0304 | 13 | 120 | 12700 | 1400~1600 | 3~6 | 0~0.3 | 側銑 SIDE MILLING |
| UPJ0304 | 13 | 120 | 12700 | 1200~1400 | 3 | 0.3~0.8 | 側銑 SIDE MILLING |
| UPJ0304 | 13 | 120 | 12700 | 1000~1200 | 3 | 0.8~1.5 | 側銑 SIDE MILLING |
| UPJ0304 | 13 | 120 | 12700 | 600~800 | 6 | 0.8~1.5 | 側銑 SIDE MILLING |
| UPJ0304 | 13 | 120 | 12700 | 700~900 | 3 | 1.5~2.5 | 側銑 SIDE MILLING |
| UPJ0404 | 16 | 120 | 9500 | 1700~1900 | 0~0.4 | 4 | 溝銑 SLOTTING |
| UPJ0404 | 16 | 120 | 9500 | 1100~1300 | 0.4~1 | 4 | 溝銑 SLOTTING |
| UPJ0404 | 16 | 120 | 9500 | 800~1100 | 1~2 | 4 | 溝銑 SLOTTING |
| UPJ0404 | 16 | 120 | 9500 | 600~800 | 2~4 | 4 | 溝銑 SLOTTING |
| UPJ0404 | 16 | 120 | 9500 | 1400~1600 | 4~8 | 0~0.4 | 側銑 SIDE MILLING |
| UPJ0404 | 16 | 120 | 9500 | 1200~1400 | 4 | 0.4~1 | 側銑 SIDE MILLING |
| UPJ0404 | 16 | 120 | 9500 | 1000~1200 | 4 | 1~2 | 側銑 SIDE MILLING |
| UPJ0404 | 16 | 120 | 9500 | 600~800 | 8 | 1~2 | 側銑 SIDE MILLING |
| UPJ0404 | 16 | 120 | 9500 | 700~900 | 4 | 2~3 | 側銑 SIDE MILLING |
| UPJ0504 | 18 | 120 | 7600 | 1800~2000 | 0~0.4 | 5 | 溝銑 SLOTTING |
| UPJ0504 | 18 | 120 | 7600 | 1200~1400 | 0.4~1.2 | 5 | 溝銑 SLOTTING |
| UPJ0504 | 18 | 120 | 7600 | 900~1200 | 1.2~2.5 | 5 | 溝銑 SLOTTING |
| UPJ0504 | 18 | 120 | 7600 | 700~900 | 2.5~5 | 5 | 溝銑 SLOTTING |
| UPJ0504 | 18 | 120 | 7600 | 1500~1700 | 5~10 | 0~0.4 | 側銑 SIDE MILLING |
| UPJ0504 | 18 | 120 | 7600 | 1300~1500 | 5 | 0.4~1.2 | 側銑 SIDE MILLING |
| UPJ0504 | 18 | 120 | 7600 | 1100~1300 | 5 | 1.2~2.5 | 側銑 SIDE MILLING |
| UPJ0504 | 18 | 120 | 7600 | 700~900 | 10 | 1.2~2.5 | 側銑 SIDE MILLING |
| UPJ0504 | 18 | 120 | 7600 | 800~1000 | 5 | 2.5~4 | 側銑 SIDE MILLING |
| UPJ0604 | 20 | 120 | 6400 | 1800~2000 | 0~0.5 | 6 | 溝銑 SLOTTING |
| UPJ0604 | 20 | 120 | 6400 | 1200~1400 | 0.5~1.5 | 6 | 溝銑 SLOTTING |
| UPJ0604 | 20 | 120 | 6400 | 900~1200 | 1.5~3 | 6 | 溝銑 SLOTTING |
| UPJ0604 | 20 | 120 | 6400 | 700~900 | 3~6 | 6 | 溝銑 SLOTTING |
| UPJ0604 | 20 | 120 | 6400 | 1500~1700 | 6~12 | 0~0.5 | 側銑 SIDE MILLING |
| UPJ0604 | 20 | 120 | 6400 | 1300~1500 | 6 | 0.5~1.5 | 側銑 SIDE MILLING |
| UPJ0604 | 20 | 120 | 6400 | 1100~1300 | 6 | 1.5~3 | 側銑 SIDE MILLING |
| UPJ0604 | 20 | 120 | 6400 | 700~900 | 12 | 1.5~3 | 側銑 SIDE MILLING |
| UPJ0604 | 20 | 120 | 6400 | 800~1000 | 6 | 3~5 | 側銑 SIDE MILLING |
| UPJ0804 | 25 | 120 | 4750 | 1800~2000 | 0~0.5 | 8 | 溝銑 SLOTTING |
| UPJ0804 | 25 | 120 | 4750 | 1200~1400 | 0.5~1.8 | 8 | 溝銑 SLOTTING |
| UPJ0804 | 25 | 120 | 4750 | 900~1100 | 2~4 | 8 | 溝銑 SLOTTING |
| UPJ0804 | 25 | 120 | 4750 | 700~900 | 4~8 | 8 | 溝銑 SLOTTING |
| UPJ0804 | 25 | 120 | 4750 | 1600~1800 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |
| UPJ0804 | 25 | 120 | 4750 | 1200~1400 | 8 | 0.5~2 | 側銑 SIDE MILLING |
| UPJ0804 | 25 | 120 | 4750 | 1000~1200 | 8 | 3~4 | 側銑 SIDE MILLING |
| UPJ0804 | 25 | 120 | 4750 | 700~900 | 16 | 3~4 | 側銑 SIDE MILLING |
| UPJ0804 | 25 | 120 | 4750 | 700~800 | 8 | 4~7 | 側銑 SIDE MILLING |

被切削材 Work Material

(麻田散鐵, 析出硬化) 系不銹鋼
Stainless Steels [Difficult]: SUS420J2 / SUS630 : 1.2083 /
1.4542 : AISI 420 / 17-4PH (HRC 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPJ1004 | 30 | 125 | 4000 | 1500~1700 | 0~0.6 | 10 | 溝銑 SLOTTING |
| UPJ1004 | 30 | 125 | 4000 | 800~1000 | 0.6~2 | 10 | 溝銑 SLOTTING |
| UPJ1004 | 30 | 125 | 4000 | 600~800 | 3~5 | 10 | 溝銑 SLOTTING |
| UPJ1004 | 30 | 125 | 4000 | 500~700 | 5~10 | 10 | 溝銑 SLOTTING |
| UPJ1004 | 30 | 125 | 4000 | 1500~1800 | 10~20 | 0~0.5 | 側銑 SIDE MILLING |
| UPJ1004 | 30 | 125 | 4000 | 900~1100 | 10 | 0.5~2 | 側銑 SIDE MILLING |
| UPJ1004 | 30 | 125 | 4000 | 800~1000 | 10 | 3.6~5 | 側銑 SIDE MILLING |
| UPJ1004 | 30 | 125 | 4000 | 600~800 | 20 | 3.6~5 | 側銑 SIDE MILLING |
| UPJ1004 | 30 | 125 | 4000 | 500~700 | 10 | 5~8.7 | 側銑 SIDE MILLING |
| UPJ1204 | 34 | 120 | 3200 | 1600~1800 | 0~0.6 | 12 | 溝銑 SLOTTING |
| UPJ1204 | 34 | 120 | 3200 | 1000~1200 | 0.6~2 | 12 | 溝銑 SLOTTING |
| UPJ1204 | 34 | 120 | 3200 | 500~700 | 2~3 | 12 | 溝銑 SLOTTING |
| UPJ1204 | 34 | 120 | 3200 | 400~600 | 3~6 | 12 | 溝銑 SLOTTING |
| UPJ1204 | 34 | 120 | 3200 | 1400~1600 | 12~24 | 0~0.6 | 側銑 SIDE MILLING |
| UPJ1204 | 34 | 120 | 3200 | 900~1100 | 12 | 0.6~2 | 側銑 SIDE MILLING |
| UPJ1204 | 34 | 120 | 3200 | 700~900 | 12 | 2~3 | 側銑 SIDE MILLING |
| UPJ1204 | 34 | 120 | 3200 | 600~800 | 24 | 2~3 | 側銑 SIDE MILLING |
| UPJ1204 | 34 | 120 | 3200 | 500~700 | 12 | 3~6 | 側銑 SIDE MILLING |
| UPJ1604 | 50 | 120 | 2400 | 1200~1400 | 0~0.7 | 16 | 溝銑 SLOTTING |
| UPJ1604 | 50 | 120 | 2400 | 700~900 | 0.7~2 | 16 | 溝銑 SLOTTING |
| UPJ1604 | 50 | 120 | 2400 | 400~600 | 2~3 | 16 | 溝銑 SLOTTING |
| UPJ1604 | 50 | 120 | 2400 | 300~500 | 3~7 | 16 | 溝銑 SLOTTING |
| UPJ1604 | 50 | 120 | 2400 | 1100~1300 | 16~32 | 0~0.7 | 側銑 SIDE MILLING |
| UPJ1604 | 50 | 120 | 2400 | 600~800 | 16 | 0.7~2 | 側銑 SIDE MILLING |
| UPJ1604 | 50 | 120 | 2400 | 500~700 | 16 | 2~3 | 側銑 SIDE MILLING |
| UPJ1604 | 50 | 120 | 2400 | 400~600 | 32 | 2~3 | 側銑 SIDE MILLING |
| UPJ1604 | 50 | 120 | 2400 | 300~500 | 16 | 3~7 | 側銑 SIDE MILLING |
| UPJ2004 | 55 | 120 | 1900 | 900~1200 | 0~0.7 | 20 | 溝銑 SLOTTING |
| UPJ2004 | 55 | 120 | 1900 | 550~750 | 0.7~2 | 20 | 溝銑 SLOTTING |
| UPJ2004 | 55 | 120 | 1900 | 400~600 | 2~3 | 20 | 溝銑 SLOTTING |
| UPJ2004 | 55 | 120 | 1900 | 250~450 | 3~7 | 20 | 溝銑 SLOTTING |
| UPJ2004 | 55 | 120 | 1900 | 800~1100 | 20~40 | 0~0.7 | 側銑 SIDE MILLING |
| UPJ2004 | 55 | 120 | 1900 | 500~700 | 20 | 0.7~2 | 側銑 SIDE MILLING |
| UPJ2004 | 55 | 120 | 1900 | 350~550 | 20 | 2~3 | 側銑 SIDE MILLING |
| UPJ2004 | 55 | 120 | 1900 | 250~450 | 40 | 2~3 | 側銑 SIDE MILLING |
| UPJ2004 | 55 | 120 | 1900 | 200~400 | 20 | 3~7 | 側銑 SIDE MILLING |

- 附註** 1. UPJ適用於粗、精銑加工，溝銑(Aa)與側銑(Ap)都有1.0D切削能力。0.5D以上切削時，請用濕式高壓水溶性切削液，以免造成排屑不良。直徑 ϕ 10以上，需視機器剛性與主軸扭力值的不同，而做適當調整。(BT40/SK40主軸需調降)。
2. 建議冷卻方式為濕式。

- NOTE** 1. UPJ is good at Roughing and Finishing. It can do a 1.0D machining for both Slotting (Aa) and Sidemilling (Ap). When it is above 0.5D machining, we suggest high pressure emulsion coolant for better chip removal. For diameter above 10.0mm, make necessary adjustment as per the rigidity of machine and the torque of spindle. (Lower BT40/SK40 spindle)
2. Suggest to use wet coolant.

Standard

VTB

難切削材用立銑刀 END MILLS

| | | | |
|--|-----------------------------|------|----------------------|
| | 乾式切削 Dry Machining | | |
| | 油霧切削 MQL (Mist) | | 精銑 Finishing |
| | 水溶性切削 Emulsion Machining | | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | ---- | 粗銑 Roughing |

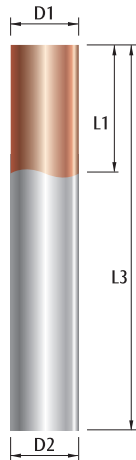


產品規格 SPECIFICATIONS

| 型號 Type No. | D1 直徑 Diameter | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|----------------------|--------------------------|--------------------|------------------------|
| VTB0606 | 6.0 | 16 | 50 | 6 |
| VTB0806 | 8.0 | 20 | 60 | 8 |
| VTB1006 | 10.0 | 25 | 75 | 10 |
| VTB1206 | 12.0 | 30 | 75 | 12 |
| VTB1606 | 16.0 | 40 | 100 | 16 |

unit : mm

Stainless Steel Cutting



公差表 TOLERANCE

| 直徑 D1 | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|-----------------------|----------|-----------------------|
| 6.0 | 0 -0.02 | Ø6 | 0 -0.008 |
| 8.0 | 0 -0.025 | Ø8 | 0 -0.009 |
| 10.0 | 0 -0.03 | Ø10 | 0 -0.009 |
| 12.0 | 0 -0.035 | Ø12 | 0 -0.011 |
| 16.0 | 0 -0.04 | Ø16 | 0 -0.011 |

unit : mm

VTB

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy]: **SUS304 : 1.4301 : AISI 304** (HRc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| VTB0606 | 20 | 155 | 8200 | 1000~1300 | 0.05~0.12 | 4 | 面銑 SURFACE MILLING |
| VTB0606 | 20 | 115 | 6100 | 1600~2000 | 0.12~0.25 | 4~6 | 溝銑 SLOTTING |
| VTB0606 | 20 | 85 | 4500~4800 | 650~850 | 6~12 | 0.05~0.12 | 側銑 SIDE MILLING |
| VTB0606 | 20 | 85 | 4500~4800 | 1400~1800 | 6~12 | 0.12~0.3 | 側銑 SIDE MILLING |
| VTB0806 | 25 | 155 | 6200 | 900~1200 | 0.05~0.15 | 6 | 面銑 SURFACE MILLING |
| VTB0806 | 25 | 115 | 4600 | 1800~2200 | 0.15~0.3 | 6~8 | 溝銑 SLOTTING |
| VTB0806 | 25 | 80 | 3000~3200 | 650~850 | 8~16 | 0.05~0.15 | 側銑 SIDE MILLING |
| VTB0806 | 25 | 80 | 3000~3200 | 1800~2200 | 8~16 | 0.2~0.4 | 側銑 SIDE MILLING |
| VTB1006 | 28 | 155 | 4950 | 900~1200 | 0.05~0.15 | 8 | 面銑 SURFACE MILLING |
| VTB1006 | 28 | 115 | 3600 | 1600~2000 | 0.15~0.3 | 8~10 | 溝銑 SLOTTING |
| VTB1006 | 28 | 85 | 2700~2900 | 700~900 | 10~20 | 0.05~0.2 | 側銑 SIDE MILLING |
| VTB1006 | 28 | 85 | 2700~2900 | 1600~2000 | 10~20 | 0.2~0.45 | 側銑 SIDE MILLING |
| VTB1206 | 35 | 155 | 4200 | 900~1200 | 0.05~0.15 | 10 | 面銑 SURFACE MILLING |
| VTB1206 | 35 | 115 | 3000 | 1400~1800 | 0.15~0.3 | 10~12 | 溝銑 SLOTTING |
| VTB1206 | 35 | 85 | 2200~2400 | 700~900 | 12~24 | 0.05~0.2 | 側銑 SIDE MILLING |
| VTB1206 | 35 | 85 | 2200~2400 | 1400~1800 | 12~24 | 0.2~0.45 | 側銑 SIDE MILLING |
| VTB1606 | 50 | 155 | 3000 | 700~900 | 0.05~0.2 | 14 | 面銑 SURFACE MILLING |
| VTB1606 | 50 | 115 | 2250 | 800~1100 | 0.2~0.4 | 14~16 | 溝銑 SLOTTING |
| VTB1606 | 50 | 85 | 1600~1800 | 600~700 | 16~32 | 0.05~0.2 | 側銑 SIDE MILLING |
| VTB1606 | 50 | 85 | 1600~1800 | 800~1100 | 16~32 | 0.2~0.4 | 側銑 SIDE MILLING |

附註

1. VTB適用於中精加工，禁止粗加工。
2. 建議冷卻方式為濕式。

NOTE

1. VTB is designed for both Semi-finishing and Finishing. Do not apply it for Roughing.
2. Suggest to use wet coolant.

Standard



RTB

超微粒圓鼻角立銑刀 END MILLS

產品規格 SPECIFICATIONS

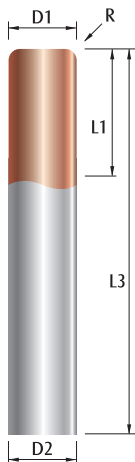
| 型號 Type No. | D1 直徑 Diameter | R R角 Corner R | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|----------------------|---------------------|--------------------------|--------------------|------------------------|
| RTB0305 | 3.0 | 0.5 | 8 | 50 | 3 |
| RTB0405 | 4.0 | 0.5 | 10 | 50 | 4 |
| RTB0505 | 5.0 | 0.5 | 13 | 50 | 6 |
| RTB0510 | 5.0 | 1.0 | 13 | 50 | 6 |
| RTB0605 | 6.0 | 0.5 | 16 | 50 | 6 |
| RTB0610 | 6.0 | 1.0 | 16 | 50 | 6 |
| RTB0805 | 8.0 | 0.5 | 20 | 60 | 8 |
| RTB0810 | 8.0 | 1.0 | 20 | 60 | 8 |
| RTB1005Z | 10.0 | 0.5 | 25 | 75 | 10 |
| RTB1005 | 10.0 | 0.5 | 30 | 75 | 10 |
| RTB1010Z | 10.0 | 1.0 | 25 | 75 | 10 |
| RTB1010 | 10.0 | 1.0 | 30 | 75 | 10 |
| RTB1020Z | 10.0 | 2.0 | 25 | 75 | 10 |
| RTB1020 | 10.0 | 2.0 | 30 | 75 | 10 |
| RTB1030Z | 10.0 | 3.0 | 25 | 75 | 10 |
| RTB1030 | 10.0 | 3.0 | 30 | 75 | 10 |
| RTB1210 | 12.0 | 1.0 | 30 | 75 | 12 |
| RTB1220 | 12.0 | 2.0 | 30 | 75 | 12 |
| RTB1230 | 12.0 | 3.0 | 30 | 75 | 12 |

unit : mm

公差表 TOLERANCE

| 直徑 D1 | R徑公差值 R Tolerance | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|--|---|----------|---|
| 3.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.02 \end{smallmatrix}$ | Ø3 | $\begin{smallmatrix} 0 \\ -0.006 \end{smallmatrix}$ |
| 4.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.02 \end{smallmatrix}$ | Ø4 | $\begin{smallmatrix} 0 \\ -0.008 \end{smallmatrix}$ |
| 5.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.02 \end{smallmatrix}$ | Ø6 | $\begin{smallmatrix} 0 \\ -0.008 \end{smallmatrix}$ |
| 6.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.02 \end{smallmatrix}$ | Ø8 | $\begin{smallmatrix} 0 \\ -0.009 \end{smallmatrix}$ |
| 8.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$ | Ø10 | $\begin{smallmatrix} 0 \\ -0.009 \end{smallmatrix}$ |
| 10.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.03 \end{smallmatrix}$ | Ø12 | $\begin{smallmatrix} 0 \\ -0.011 \end{smallmatrix}$ |
| 12.0 | $\begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$ | $\begin{smallmatrix} 0 \\ -0.035 \end{smallmatrix}$ | | |

unit : mm



| | | | |
|--|-----------------------------|--|----------------------|
| | 乾式切削 Dry Machining | | |
| | 油霧切削 MQL (Mist) | | 精銑 Finishing |
| | 水溶性切削 Emulsion Machining | | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | | 粗銑 Roughing |



Stainless Steel Cutting

RTB

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] :SUS304 : 1.4301 : AISI 304 (HRc 28~32)

切削條件表 **MILLING CONDITIONS**

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|-----------------------------------|----------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| RTB0305 | 18 | 130 | 13500 | 1000~1300 | 0.05~0.1 | 1.8 | 面銑 SURFACE MILLING |
| RTB0305 | 18 | 115 | 12000 | 1600~2000 | 0.1~0.2 | 1.8~3 | 溝銑 SLOTTING |
| RTB0305 | 18 | 100 | 10400~10700 | 700~900 | 3~6 | 0.05~0.1 | 側銑 SIDE MILLING |
| RTB0305 | 18 | 85 | 8900~9200 | 1600~2000 | 3~6 | 0.1~0.2 | 側銑 SIDE MILLING |
| RTB0305 | 18 | 180 | 18000 | 1800~2200 | 0.05~0.1 | 0.12~0.16 | 3D銑 3D MILLING |
| RTB0405 | 18 | 130 | 10300 | 1000~1300 | 0.05~0.1 | 2.8 | 面銑 SURFACE MILLING |
| RTB0405 | 18 | 115 | 9100 | 1600~2000 | 0.1~0.2 | 2.8~4 | 溝銑 SLOTTING |
| RTB0405 | 18 | 100 | 7800~8100 | 700~900 | 4~8 | 0.05~0.12 | 側銑 SIDE MILLING |
| RTB0405 | 18 | 85 | 6600~6900 | 1600~2000 | 4~8 | 0.12~0.22 | 側銑 SIDE MILLING |
| RTB0405 | 18 | 180 | 14000 | 1800~2200 | 0.05~0.1 | 0.13~0.18 | 3D銑 3D MILLING |
| RTB0505 | 18 | 130 | 8200 | 1000~1300 | 0.05~0.12 | 3.8 | 面銑 SURFACE MILLING |
| RTB0505 | 18 | 115 | 7300 | 1600~2000 | 0.12~0.25 | 3.8~5 | 溝銑 SLOTTING |
| RTB0505 | 18 | 100 | 6200~6500 | 700~900 | 5~10 | 0.05~0.12 | 側銑 SIDE MILLING |
| RTB0505 | 18 | 85 | 5300~5600 | 1600~2000 | 5~10 | 0.12~0.25 | 側銑 SIDE MILLING |
| RTB0505 | 18 | 180 | 11000 | 1800~2200 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB0510 | 18 | 130 | 8200 | 1000~1300 | 0.05~0.12 | 3.8 | 面銑 SURFACE MILLING |
| RTB0510 | 18 | 115 | 7300 | 1600~2000 | 0.12~0.25 | 3.8~5 | 溝銑 SLOTTING |
| RTB0510 | 18 | 100 | 6200~6500 | 700~900 | 5~10 | 0.05~0.12 | 側銑 SIDE MILLING |
| RTB0510 | 18 | 85 | 5300~5600 | 1600~2000 | 5~10 | 0.12~0.25 | 側銑 SIDE MILLING |
| RTB0510 | 18 | 180 | 11000 | 1800~2200 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB0605 | 20 | 130 | 6900 | 1000~1300 | 0.05~0.12 | 4.5 | 面銑 SURFACE MILLING |
| RTB0605 | 20 | 115 | 6600 | 1600~2000 | 0.12~0.3 | 4~6 | 溝銑 SLOTTING |
| RTB0605 | 20 | 100 | 5200~5400 | 700~900 | 6~12 | 0.05~0.12 | 側銑 SIDE MILLING |
| RTB0605 | 20 | 85 | 4500~4800 | 1600~2000 | 6~12 | 0.12~0.3 | 側銑 SIDE MILLING |
| RTB0605 | 20 | 180 | 9500 | 1800~2200 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB0610 | 20 | 130 | 6900 | 1000~1300 | 0.05~0.12 | 3.5 | 面銑 SURFACE MILLING |
| RTB0610 | 20 | 115 | 6600 | 1600~2000 | 0.12~0.3 | 4~6 | 溝銑 SLOTTING |
| RTB0610 | 20 | 100 | 5200~5400 | 700~900 | 6~12 | 0.05~0.12 | 側銑 SIDE MILLING |
| RTB0610 | 20 | 85 | 4500~4800 | 1600~2000 | 6~12 | 0.12~0.3 | 側銑 SIDE MILLING |
| RTB0610 | 20 | 180 | 9500 | 1800~2200 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB0805 | 25 | 125 | 5000 | 900~1200 | 0.05~0.15 | 6.5 | 面銑 SURFACE MILLING |
| RTB0805 | 25 | 125 | 5000 | 1800~2200 | 0.15~0.3 | 6~8 | 溝銑 SLOTTING |
| RTB0805 | 25 | 100 | 3800~4000 | 700~900 | 8~16 | 0.05~0.15 | 側銑 SIDE MILLING |
| RTB0805 | 25 | 90 | 3600~3800 | 1600~2000 | 8~16 | 0.2~0.4 | 側銑 SIDE MILLING |
| RTB0805 | 25 | 180 | 7200 | 1600~2000 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |

Stainless Steel Cutting

被切削材 Work Material

沃斯田鐵系不銹鋼

 Stainless Steels [Easy] : **SUS304 : 1.4301 : AISI 304** (HRc 28~32)

 切削條件表 **MILLING CONDITIONS**

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| RTB0810 | 25 | 125 | 5000 | 900~1200 | 0.05~0.15 | 5.5 | 面銑 SURFACE MILLING |
| RTB0810 | 25 | 125 | 5000 | 1800~2200 | 0.15~0.3 | 5.5~8 | 溝銑 SLOTTING |
| RTB0810 | 25 | 100 | 3800~4000 | 700~900 | 8~16 | 0.05~0.15 | 側銑 SIDE MILLING |
| RTB0810 | 25 | 90 | 3600~3800 | 1600~2000 | 8~16 | 0.2~0.4 | 側銑 SIDE MILLING |
| RTB0810 | 25 | 180 | 7200 | 1600~2000 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB1005Z | 28 | 125 | 4000 | 900~1200 | 0.05~0.15 | 8 | 面銑 SURFACE MILLING |
| RTB1005Z | 28 | 125 | 4000 | 1400~1600 | 0.25~0.35 | 8~10 | 溝銑 SLOTTING |
| RTB1005Z | 28 | 105 | 3000~3200 | 600~800 | 10~20 | 0.05~0.2 | 側銑 SIDE MILLING |
| RTB1005Z | 28 | 90 | 2800~3000 | 1600~2000 | 10~20 | 0.2~0.4 | 側銑 SIDE MILLING |
| RTB1005Z | 28 | 185 | 6000 | 1500~1800 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB1005 | 33 | 125 | 4000 | 900~1200 | 0.05~0.15 | 8 | 面銑 SURFACE MILLING |
| RTB1005 | 33 | 125 | 4000 | 1400~1600 | 0.25~0.35 | 8~10 | 溝銑 SLOTTING |
| RTB1005 | 33 | 105 | 3000~3200 | 600~800 | 10~20 | 0.05~0.2 | 側銑 SIDE MILLING |
| RTB1005 | 33 | 90 | 2800~3000 | 1600~2000 | 10~20 | 0.2~0.4 | 側銑 SIDE MILLING |
| RTB1005 | 33 | 185 | 6000 | 1500~1800 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB1010Z | 28 | 125 | 4000 | 900~1200 | 0.05~0.15 | 7.5 | 面銑 SURFACE MILLING |
| RTB1010Z | 28 | 125 | 4000 | 1400~1600 | 0.25~0.35 | 7.5~10 | 溝銑 SLOTTING |
| RTB1010Z | 28 | 105 | 3000~3200 | 600~800 | 10~20 | 0.05~0.2 | 側銑 SIDE MILLING |
| RTB1010Z | 28 | 90 | 2800~3000 | 1600~2000 | 10~20 | 0.2~0.4 | 側銑 SIDE MILLING |
| RTB1010Z | 28 | 185 | 6000 | 1500~1800 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB1010 | 33 | 125 | 4000 | 900~1200 | 0.05~0.15 | 7.5 | 面銑 SURFACE MILLING |
| RTB1010 | 33 | 125 | 4000 | 1400~1600 | 0.25~0.35 | 7.5~10 | 溝銑 SLOTTING |
| RTB1010 | 33 | 105 | 3000~3200 | 600~800 | 10~20 | 0.05~0.2 | 側銑 SIDE MILLING |
| RTB1010 | 33 | 90 | 2800~3000 | 1600~2000 | 10~20 | 0.2~0.4 | 側銑 SIDE MILLING |
| RTB1010 | 33 | 185 | 6000 | 1500~1800 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB1020Z | 28 | 125 | 4000 | 900~1200 | 0.05~0.15 | 5.5 | 面銑 SURFACE MILLING |
| RTB1020Z | 28 | 125 | 4000 | 1400~1600 | 0.25~0.35 | 5.5~10 | 溝銑 SLOTTING |
| RTB1020Z | 28 | 105 | 3000~3200 | 600~800 | 10~20 | 0.05~0.2 | 側銑 SIDE MILLING |
| RTB1020Z | 28 | 90 | 2800~3000 | 1600~2000 | 10~20 | 0.2~0.4 | 側銑 SIDE MILLING |
| RTB1020Z | 28 | 185 | 6000 | 1500~1800 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB1020 | 33 | 125 | 4000 | 900~1200 | 0.05~0.15 | 5.5 | 面銑 SURFACE MILLING |
| RTB1020 | 33 | 125 | 4000 | 1400~1600 | 0.25~0.35 | 5.5~10 | 溝銑 SLOTTING |
| RTB1020 | 33 | 105 | 3000~3200 | 600~800 | 10~20 | 0.05~0.2 | 側銑 SIDE MILLING |
| RTB1020 | 33 | 90 | 2800~3000 | 1600~2000 | 10~20 | 0.2~0.4 | 側銑 SIDE MILLING |
| RTB1020 | 33 | 185 | 6000 | 1500~1800 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] :SUS304 : 1.4301 : AISI 304 (Hrc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|-----------------------------------|----------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| RTB1030Z | 28 | 125 | 4000 | 900~1200 | 0.05~0.15 | 3.5 | 面銑 SURFACE MILLING |
| RTB1030Z | 28 | 125 | 4000 | 1400~1600 | 0.25~0.35 | 3.5~10 | 溝銑 SLOTTING |
| RTB1030Z | 28 | 105 | 3000~3200 | 600~800 | 10~20 | 0.05~0.2 | 側銑 SIDE MILLING |
| RTB1030Z | 28 | 90 | 2800~3000 | 1600~2000 | 10~20 | 0.2~0.4 | 側銑 SIDE MILLING |
| RTB1030Z | 28 | 185 | 6000 | 1500~1800 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB1030 | 33 | 125 | 4000 | 900~1200 | 0.05~0.15 | 3.5 | 面銑 SURFACE MILLING |
| RTB1030 | 33 | 125 | 4000 | 1400~1600 | 0.25~0.35 | 3.5~10 | 溝銑 SLOTTING |
| RTB1030 | 33 | 105 | 3000~3200 | 600~800 | 10~20 | 0.05~0.2 | 側銑 SIDE MILLING |
| RTB1030 | 33 | 90 | 2800~3000 | 1600~2000 | 10~20 | 0.2~0.4 | 側銑 SIDE MILLING |
| RTB1030 | 33 | 185 | 6000 | 1500~1800 | 0.05~0.12 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB1210 | 35 | 125 | 3300 | 800~1100 | 0.05~0.15 | 9.5 | 面銑 SURFACE MILLING |
| RTB1210 | 35 | 115 | 3000 | 1400~1600 | 0.15~0.3 | 9~12 | 溝銑 SLOTTING |
| RTB1210 | 35 | 100 | 2500~2700 | 500~700 | 12~24 | 0.05~0.2 | 側銑 SIDE MILLING |
| RTB1210 | 35 | 90 | 2200~2400 | 1400~1600 | 12~24 | 0.2~0.45 | 側銑 SIDE MILLING |
| RTB1210 | 35 | 185 | 4900 | 1400~1700 | 0.05~0.15 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB1220 | 35 | 125 | 3300 | 800~1100 | 0.05~0.15 | 7.5 | 面銑 SURFACE MILLING |
| RTB1220 | 35 | 115 | 3000 | 1400~1600 | 0.15~0.3 | 7.5~12 | 溝銑 SLOTTING |
| RTB1220 | 35 | 100 | 2500~2700 | 500~700 | 12~24 | 0.05~0.2 | 側銑 SIDE MILLING |
| RTB1220 | 35 | 90 | 2200~2400 | 1400~1600 | 12~24 | 0.2~0.45 | 側銑 SIDE MILLING |
| RTB1220 | 35 | 185 | 4900 | 1400~1700 | 0.05~0.15 | 0.15~0.2 | 3D銑 3D MILLING |
| RTB1230 | 35 | 125 | 3300 | 800~1100 | 0.05~0.15 | 5.5 | 面銑 SURFACE MILLING |
| RTB1230 | 35 | 115 | 3000 | 1400~1600 | 0.15~0.3 | 5.5~12 | 溝銑 SLOTTING |
| RTB1230 | 35 | 100 | 2500~2700 | 500~700 | 12~24 | 0.05~0.2 | 側銑 SIDE MILLING |
| RTB1230 | 35 | 90 | 2200~2400 | 1400~1600 | 12~24 | 0.2~0.45 | 側銑 SIDE MILLING |
| RTB1230 | 35 | 185 | 4900 | 1400~1700 | 0.05~0.15 | 0.15~0.2 | 3D銑 3D MILLING |

附註

1. RTB適用於中精加工及3D銑削加工。
2. 建議冷卻方式為濕式。

NOTE

1. RTB is good at Semi-finishing, Finishing and 3D milling.
2. Suggest to use wet coolant.

Titanium Cutting

UTHR

鈦滿意圓鼻角立銑刀 END MILLS

| | | |
|--|-----------------------------|----------------------|
| | 乾式切削 Dry Machining | |
| | 油霧切削 MQL (Mist) | 精銑 Finishing |
| | 水溶性切削 Emulsion Machining | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | 粗銑 Roughing |

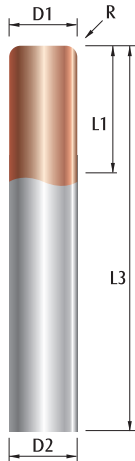


產品規格 SPECIFICATIONS

| 型號 Type No. | D1 直徑 Diameter | R 角 Corner R | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|-------------------|-----------------|-----------------------|-----------------|---------------------|
| UTHR0305 | 3.0 | 0.5 | 8 | 50 | 6 |
| UTHR0405 | 4.0 | 0.5 | 10 | 50 | 6 |
| UTHR0405S | 4.0 | 0.5 | 10 | 50 | 4 |
| UTHR0505 | 5.0 | 0.5 | 13 | 50 | 6 |
| UTHR0605 | 6.0 | 0.5 | 16 | 50 | 6 |
| UTHR0610 | 6.0 | 1.0 | 16 | 50 | 6 |
| UTHR0805 | 8.0 | 0.5 | 20 | 60 | 8 |
| UTHR0810 | 8.0 | 1.0 | 20 | 60 | 8 |
| UTHR1005 | 10.0 | 0.5 | 25 | 75 | 10 |
| UTHR1010 | 10.0 | 1.0 | 25 | 75 | 10 |
| UTHR1020 | 10.0 | 2.0 | 25 | 75 | 10 |
| UTHR1030 | 10.0 | 3.0 | 25 | 75 | 10 |
| UTHR1210 | 12.0 | 1.0 | 30 | 75 | 12 |
| UTHR1220 | 12.0 | 2.0 | 30 | 75 | 12 |
| UTHR1230 | 12.0 | 3.0 | 30 | 75 | 12 |
| UTHR1610 | 16.0 | 1.0 | 40 | 100 | 16 |
| UTHR1620 | 16.0 | 2.0 | 40 | 100 | 16 |
| UTHR1630 | 16.0 | 3.0 | 40 | 100 | 16 |
| UTHR2010 | 20.0 | 1.0 | 45 | 100 | 20 |
| UTHR2020 | 20.0 | 2.0 | 45 | 100 | 20 |
| UTHR2030 | 20.0 | 3.0 | 45 | 100 | 20 |

unit : mm

Stainless Steel Cutting



公差表 TOLERANCE

| 直徑 D1 | R 徑公差值 R Tolerance | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|-----------------------|-----------------------|----------|-----------------------|
| 3.0 | $+0.02$ 0 | 0 -0.02 | Ø6 | 0 -0.008 |
| 4.0 | $+0.02$ 0 | 0 -0.02 | Ø8 | 0 -0.009 |
| 5.0 | $+0.02$ 0 | 0 -0.02 | Ø10 | 0 -0.009 |
| 6.0 | $+0.02$ 0 | 0 -0.02 | Ø12 | 0 -0.011 |
| 8.0 | $+0.02$ 0 | 0 -0.025 | Ø16 | 0 -0.011 |
| 10.0 | $+0.02$ 0 | 0 -0.03 | Ø20 | 0 -0.013 |
| 12.0 | $+0.02$ 0 | 0 -0.035 | | |
| 16.0 | $+0.02$ 0 | 0 -0.04 | | |
| 20.0 | $+0.02$ 0 | 0 -0.04 | | |

unit : mm

UTHR

切削條件表 **MILLING CONDITIONS**

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy]: **SUS304 : 1.4301 : AISI 304** (HRc 28~32)

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UTHR0305 | 13 | 120 | 12500~13000 | 1600~2000 | 0~0.25 | 3 | 溝銑 SLOTTING |
| UTHR0305 | 13 | 120 | 12500~13000 | 800~1200 | 0.25~0.6 | 3 | 溝銑 SLOTTING |
| UTHR0305 | 13 | 120 | 12500~13000 | 300~500 | 0.8~1.5 | 3 | 溝銑 SLOTTING |
| UTHR0305 | 13 | 120 | 12500~13000 | 250~350 | 2~2.5 | 3 | 溝銑 SLOTTING |
| UTHR0305 | 13 | 155 | 16000~16500 | 1400~1800 | 3~6 | 0~0.25 | 側銑 SIDE MILLING |
| UTHR0305 | 13 | 105 | 11000~11500 | 500~700 | 3 | 0.25~0.6 | 側銑 SIDE MILLING |
| UTHR0305 | 13 | 105 | 11000~11500 | 300~450 | 3 | 0.8~1.5 | 側銑 SIDE MILLING |
| UTHR0305 | 13 | 105 | 11000~11500 | 200~300 | 3 | 2~2.5 | 側銑 SIDE MILLING |
| UTHR0305 | 13 | 105 | 11000~11500 | 700~900 | 3~6 | 0~0.1 | 側銑 SIDE MILLING |
| UTHR0405 | 16 | 120 | 9300~9800 | 2000~2400 | 0~0.3 | 4 | 溝銑 SLOTTING |
| UTHR0405 | 16 | 120 | 9300~9800 | 900~1200 | 0.3~0.7 | 4 | 溝銑 SLOTTING |
| UTHR0405 | 16 | 120 | 9300~9800 | 600~750 | 1~2 | 4 | 溝銑 SLOTTING |
| UTHR0405 | 16 | 120 | 9300~9800 | 400~550 | 3~4 | 4 | 溝銑 SLOTTING |
| UTHR0405 | 16 | 155 | 12000~12500 | 1600~1800 | 4~8 | 0~0.3 | 側銑 SIDE MILLING |
| UTHR0405 | 16 | 105 | 8000~8500 | 800~1000 | 4 | 0.3~1 | 側銑 SIDE MILLING |
| UTHR0405 | 16 | 105 | 8000~8500 | 500~700 | 4 | 1~2 | 側銑 SIDE MILLING |
| UTHR0405 | 16 | 105 | 8000~8500 | 400~600 | 4 | 3~4 | 側銑 SIDE MILLING |
| UTHR0405 | 16 | 105 | 8000~8500 | 700~900 | 4~8 | 0~0.13 | 側銑 SIDE MILLING |
| UTHR0505 | 18 | 120 | 7500~7800 | 2000~2400 | 0~0.35 | 5 | 溝銑 SLOTTING |
| UTHR0505 | 18 | 120 | 7500~7800 | 900~1200 | 0.35~0.8 | 5 | 溝銑 SLOTTING |
| UTHR0505 | 18 | 120 | 7500~7800 | 600~750 | 1.5~2.5 | 5 | 溝銑 SLOTTING |
| UTHR0505 | 18 | 120 | 7500~7800 | 400~550 | 3~5 | 5 | 溝銑 SLOTTING |
| UTHR0505 | 18 | 155 | 9600~10000 | 1600~1800 | 5~10 | 0~0.35 | 側銑 SIDE MILLING |
| UTHR0505 | 18 | 105 | 6500~6800 | 800~1000 | 5 | 0~1 | 側銑 SIDE MILLING |
| UTHR0505 | 18 | 105 | 6500~6800 | 500~700 | 5 | 2.5 | 側銑 SIDE MILLING |
| UTHR0505 | 18 | 105 | 6500~6800 | 400~600 | 5 | 4 | 側銑 SIDE MILLING |
| UTHR0505 | 18 | 105 | 6500~6800 | 700~900 | 5~10 | 0~0.15 | 側銑 SIDE MILLING |
| UTHR0605 | 20 | 120 | 6300~6600 | 1800~2200 | 0~0.4 | 6 | 溝銑 SLOTTING |
| UTHR0605 | 20 | 120 | 6300~6600 | 900~1200 | 0.4~1 | 6 | 溝銑 SLOTTING |
| UTHR0605 | 20 | 120 | 6300~6600 | 600~800 | 2~3 | 6 | 溝銑 SLOTTING |
| UTHR0605 | 20 | 120 | 6300~6600 | 450~600 | 5~6 | 6 | 溝銑 SLOTTING |
| UTHR0605 | 20 | 155 | 7800~8200 | 1600~1800 | 6~12 | 0~0.4 | 側銑 SIDE MILLING |
| UTHR0605 | 20 | 105 | 5600~5800 | 700~900 | 6 | 1.2 | 側銑 SIDE MILLING |
| UTHR0605 | 20 | 105 | 5600~5800 | 500~700 | 6 | 3 | 側銑 SIDE MILLING |
| UTHR0605 | 20 | 105 | 5600~5800 | 500~650 | 6 | 5 | 側銑 SIDE MILLING |
| UTHR0605 | 20 | 105 | 5600~5800 | 700~900 | 6~12 | 0~0.2 | 側銑 SIDE MILLING |

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] :SUS304 : 1.4301 : AISI 304 (HRc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UTHR0610 | 20 | 120 | 6300~6600 | 1800~2200 | 0~0.4 | 6 | 溝銑 SLOTTING |
| UTHR0610 | 20 | 120 | 6300~6600 | 800~1000 | 0.4~1 | 6 | 溝銑 SLOTTING |
| UTHR0610 | 20 | 120 | 6300~6600 | 500~650 | 2~3 | 6 | 溝銑 SLOTTING |
| UTHR0610 | 20 | 120 | 6300~6600 | 350~500 | 5~6 | 6 | 溝銑 SLOTTING |
| UTHR0610 | 20 | 155 | 7800~8200 | 1600~1800 | 6~12 | 0~0.4 | 側銑 SIDE MILLING |
| UTHR0610 | 20 | 105 | 5600~5800 | 700~900 | 6 | 1.2 | 側銑 SIDE MILLING |
| UTHR0610 | 20 | 105 | 5600~5800 | 500~700 | 6 | 3 | 側銑 SIDE MILLING |
| UTHR0610 | 20 | 105 | 5600~5800 | 500~650 | 6 | 5 | 側銑 SIDE MILLING |
| UTHR0610 | 20 | 105 | 5600~5800 | 700~900 | 6~12 | 0~0.2 | 側銑 SIDE MILLING |
| UTHR0805 | 24 | 120 | 4700~5000 | 1500~1800 | 0~0.5 | 8 | 溝銑 SLOTTING |
| UTHR0805 | 24 | 115 | 4400~4700 | 1100~1400 | 0.5~1 | 8 | 溝銑 SLOTTING |
| UTHR0805 | 24 | 115 | 4400~4700 | 600~800 | 3~4 | 8 | 溝銑 SLOTTING |
| UTHR0805 | 24 | 115 | 4400~4700 | 550~750 | 4~8 | 8 | 溝銑 SLOTTING |
| UTHR0805 | 24 | 155 | 6200~6400 | 1000~1200 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |
| UTHR0805 | 24 | 85 | 3200~3500 | 700~900 | 8~16 | 0.5~1.5 | 側銑 SIDE MILLING |
| UTHR0805 | 24 | 110 | 4300~4600 | 700~900 | 8 | 3~4 | 側銑 SIDE MILLING |
| UTHR0805 | 24 | 110 | 4300~4600 | 600~800 | 8 | 6~7 | 側銑 SIDE MILLING |
| UTHR0805 | 24 | 90 | 3300~3500 | 700~900 | 8~16 | 0~0.2 | 側銑 SIDE MILLING |
| UTHR0810 | 24 | 120 | 4700~5000 | 1500~1800 | 0~0.5 | 8 | 溝銑 SLOTTING |
| UTHR0810 | 24 | 115 | 4400~4700 | 900~1300 | 0.5~1 | 8 | 溝銑 SLOTTING |
| UTHR0810 | 24 | 115 | 4400~4700 | 500~700 | 3~4 | 8 | 溝銑 SLOTTING |
| UTHR0810 | 24 | 115 | 4400~4700 | 450~600 | 4~8 | 8 | 溝銑 SLOTTING |
| UTHR0810 | 24 | 155 | 6200~6400 | 1000~1200 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |
| UTHR0810 | 24 | 85 | 3200~3500 | 700~900 | 8~16 | 0.5~1.5 | 側銑 SIDE MILLING |
| UTHR0810 | 24 | 110 | 4300~4600 | 600~750 | 8 | 3~4 | 側銑 SIDE MILLING |
| UTHR0810 | 24 | 110 | 4300~4600 | 500~650 | 8 | 6~7 | 側銑 SIDE MILLING |
| UTHR0810 | 24 | 90 | 3300~3500 | 700~900 | 8~16 | 0~0.2 | 側銑 SIDE MILLING |
| UTHR1005 | 30 | 115 | 3800~4000 | 1300~1500 | 0~0.5 | 10 | 溝銑 SLOTTING |
| UTHR1005 | 30 | 115 | 3800~4000 | 700~800 | 0.5~1 | 10 | 溝銑 SLOTTING |
| UTHR1005 | 30 | 110 | 3300~3600 | 400~600 | 3~5 | 10 | 溝銑 SLOTTING |
| UTHR1005 | 30 | 110 | 3300~3600 | 350~450 | 10 | 10 | 溝銑 SLOTTING |
| UTHR1005 | 30 | 150 | 4700~5000 | 1300~1500 | 10~20 | 0~0.5 | 側銑 SIDE MILLING |
| UTHR1005 | 30 | 90 | 2800~3100 | 300~400 | 10~20 | 2 | 側銑 SIDE MILLING |
| UTHR1005 | 30 | 110 | 3300~3600 | 400~600 | 10 | 3.6~5 | 側銑 SIDE MILLING |
| UTHR1005 | 30 | 110 | 3300~3600 | 400~550 | 10 | 7~8 | 側銑 SIDE MILLING |
| UTHR1005 | 30 | 90 | 2800~3000 | 500~700 | 10~20 | 0~0.25 | 側銑 SIDE MILLING |

被切削材 Work Material

沃斯田鐵系不銹鋼

 Stainless Steels [Easy] : **SUS304** : **1.4301** : **AISI 304** (HRc 28~32)

 切削條件表 **MILLING CONDITIONS**

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UTHR1010 | 30 | 115 | 3800~4000 | 1300~1500 | 0~0.5 | 10 | 溝銑 SLOTTING |
| UTHR1010 | 30 | 115 | 3800~4000 | 700~800 | 0.5~1 | 10 | 溝銑 SLOTTING |
| UTHR1010 | 30 | 110 | 3300~3600 | 400~600 | 3~5 | 10 | 溝銑 SLOTTING |
| UTHR1010 | 30 | 110 | 3300~3600 | 350~450 | 10 | 10 | 溝銑 SLOTTING |
| UTHR1010 | 30 | 150 | 4700~5000 | 1300~1500 | 10~20 | 0~0.5 | 側銑 SIDE MILLING |
| UTHR1010 | 30 | 90 | 2800~3100 | 300~400 | 10~20 | 2 | 側銑 SIDE MILLING |
| UTHR1010 | 30 | 110 | 3300~3600 | 400~600 | 10 | 3.6~5 | 側銑 SIDE MILLING |
| UTHR1010 | 30 | 110 | 3300~3600 | 400~550 | 10 | 7~8 | 側銑 SIDE MILLING |
| UTHR1010 | 30 | 90 | 2800~3000 | 500~700 | 10~20 | 0~0.25 | 側銑 SIDE MILLING |
| UTHR1020 | 30 | 115 | 3800~4000 | 1100~1300 | 0~0.5 | 10 | 溝銑 SLOTTING |
| UTHR1020 | 30 | 115 | 3800~4000 | 600~700 | 0.5~1 | 10 | 溝銑 SLOTTING |
| UTHR1020 | 30 | 110 | 3300~3600 | 300~500 | 3~5 | 10 | 溝銑 SLOTTING |
| UTHR1020 | 30 | 110 | 3300~3600 | 250~350 | 10 | 10 | 溝銑 SLOTTING |
| UTHR1020 | 30 | 150 | 4700~5000 | 1200~1400 | 10~20 | 0~0.5 | 側銑 SIDE MILLING |
| UTHR1020 | 30 | 90 | 2800~3100 | 300~400 | 10~20 | 2 | 側銑 SIDE MILLING |
| UTHR1020 | 30 | 110 | 3300~3600 | 300~500 | 10 | 3.6~5 | 側銑 SIDE MILLING |
| UTHR1020 | 30 | 110 | 3300~3600 | 300~450 | 10 | 7~8 | 側銑 SIDE MILLING |
| UTHR1020 | 30 | 90 | 2800~3000 | 500~700 | 10~20 | 0~0.25 | 側銑 SIDE MILLING |
| UTHR1210 | 33 | 115 | 3000~3200 | 1000~1300 | 0~0.6 | 12 | 溝銑 SLOTTING |
| UTHR1210 | 33 | 110 | 2800~3000 | 800~1000 | 0.6~1.2 | 12 | 溝銑 SLOTTING |
| UTHR1210 | 33 | 110 | 2800~3000 | 300~500 | 4~6 | 12 | 溝銑 SLOTTING |
| UTHR1210 | 33 | 110 | 2800~3000 | 250~400 | 6~8 | 12 | 溝銑 SLOTTING |
| UTHR1210 | 33 | 150 | 3800~4000 | 900~1100 | 12~24 | 0~0.6 | 側銑 SIDE MILLING |
| UTHR1210 | 33 | 90 | 2300~2600 | 300~400 | 12 | 2 | 側銑 SIDE MILLING |
| UTHR1210 | 33 | 110 | 2800~3000 | 300~400 | 12 | 4~6 | 側銑 SIDE MILLING |
| UTHR1210 | 33 | 110 | 2800~3000 | 250~350 | 12 | 6~8 | 側銑 SIDE MILLING |
| UTHR1210 | 33 | 90 | 2300~2600 | 450~650 | 12~24 | 0~0.25 | 側銑 SIDE MILLING |
| UTHR1220 | 33 | 115 | 3000~3200 | 900~1200 | 0~0.6 | 12 | 溝銑 SLOTTING |
| UTHR1220 | 33 | 110 | 2800~3000 | 700~900 | 0.6~1.2 | 12 | 溝銑 SLOTTING |
| UTHR1220 | 33 | 110 | 2800~3000 | 300~500 | 4~6 | 12 | 溝銑 SLOTTING |
| UTHR1220 | 33 | 110 | 2800~3000 | 250~400 | 6~8 | 12 | 溝銑 SLOTTING |
| UTHR1220 | 33 | 150 | 3800~4000 | 900~1100 | 12~24 | 0~0.6 | 側銑 SIDE MILLING |
| UTHR1220 | 33 | 90 | 2300~2600 | 300~400 | 12 | 2 | 側銑 SIDE MILLING |
| UTHR1220 | 33 | 110 | 2800~3000 | 300~400 | 12 | 4~6 | 側銑 SIDE MILLING |
| UTHR1220 | 33 | 110 | 2800~3000 | 250~350 | 12 | 6~8 | 側銑 SIDE MILLING |
| UTHR1220 | 33 | 90 | 2300~2600 | 450~650 | 12~24 | 0~0.25 | 側銑 SIDE MILLING |

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] : SUS304 : 1.4301 : AISI 304 (HRc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UTHR1230 | 33 | 115 | 3000~3200 | 900~1200 | 0~0.6 | 12 | 溝銑 SLOTTING |
| UTHR1230 | 33 | 110 | 2800~3000 | 700~900 | 0.6~1.2 | 12 | 溝銑 SLOTTING |
| UTHR1230 | 33 | 110 | 2800~3000 | 300~500 | 4~6 | 12 | 溝銑 SLOTTING |
| UTHR1230 | 33 | 110 | 2800~3000 | 250~400 | 6~8 | 12 | 溝銑 SLOTTING |
| UTHR1230 | 33 | 150 | 3800~4000 | 900~1100 | 12~24 | 0~0.6 | 側銑 SIDE MILLING |
| UTHR1230 | 33 | 90 | 2300~2600 | 300~400 | 12 | 2 | 側銑 SIDE MILLING |
| UTHR1230 | 33 | 110 | 2800~3000 | 300~400 | 12 | 4~6 | 側銑 SIDE MILLING |
| UTHR1230 | 33 | 110 | 2800~3000 | 250~350 | 12 | 6~8 | 側銑 SIDE MILLING |
| UTHR1230 | 33 | 90 | 2300~2600 | 450~650 | 12~24 | 0~0.25 | 側銑 SIDE MILLING |
| UTHR1610 | 43 | 115 | 2200~2400 | 800~1100 | 0~0.7 | 16 | 溝銑 SLOTTING |
| UTHR1610 | 43 | 110 | 2100~2300 | 600~800 | 2 | 16 | 溝銑 SLOTTING |
| UTHR1610 | 43 | 110 | 2100~2300 | 300~400 | 3~4 | 16 | 溝銑 SLOTTING |
| UTHR1610 | 43 | 110 | 2100~2300 | 200~300 | 6~8 | 16 | 溝銑 SLOTTING |
| UTHR1610 | 43 | 150 | 2800~3200 | 800~1000 | 16~32 | 0~0.7 | 側銑 SIDE MILLING |
| UTHR1610 | 43 | 90 | 1700~1900 | 300~400 | 16 | 2 | 側銑 SIDE MILLING |
| UTHR1610 | 43 | 110 | 2100~2300 | 250~400 | 16 | 3~4 | 側銑 SIDE MILLING |
| UTHR1610 | 43 | 110 | 2100~2300 | 200~350 | 16 | 6~8 | 側銑 SIDE MILLING |
| UTHR1610 | 43 | 90 | 1700~1900 | 350~550 | 16~32 | 0~0.3 | 側銑 SIDE MILLING |
| UTHR1620 | 43 | 115 | 2200~2400 | 700~1000 | 0~0.7 | 16 | 溝銑 SLOTTING |
| UTHR1620 | 43 | 110 | 2100~2300 | 500~650 | 2 | 16 | 溝銑 SLOTTING |
| UTHR1620 | 43 | 110 | 2100~2300 | 300~400 | 3~4 | 16 | 溝銑 SLOTTING |
| UTHR1620 | 43 | 110 | 2100~2300 | 200~300 | 5~6 | 16 | 溝銑 SLOTTING |
| UTHR1620 | 43 | 150 | 2800~3200 | 800~1000 | 16~32 | 0~0.7 | 側銑 SIDE MILLING |
| UTHR1620 | 43 | 90 | 1700~1900 | 300~400 | 16 | 2 | 側銑 SIDE MILLING |
| UTHR1620 | 43 | 110 | 2100~2300 | 250~400 | 16 | 3~4 | 側銑 SIDE MILLING |
| UTHR1620 | 43 | 110 | 2100~2300 | 200~350 | 16 | 6~8 | 側銑 SIDE MILLING |
| UTHR1620 | 43 | 90 | 1700~1900 | 350~550 | 16~32 | 0~0.3 | 側銑 SIDE MILLING |
| UTHR1630 | 43 | 115 | 2200~2400 | 700~1000 | 0~0.7 | 16 | 溝銑 SLOTTING |
| UTHR1630 | 43 | 110 | 2100~2300 | 500~650 | 2 | 16 | 溝銑 SLOTTING |
| UTHR1630 | 43 | 110 | 2100~2300 | 300~400 | 3~4 | 16 | 溝銑 SLOTTING |
| UTHR1630 | 43 | 110 | 2100~2300 | 200~300 | 5~6 | 16 | 溝銑 SLOTTING |
| UTHR1630 | 43 | 150 | 2800~3200 | 800~1000 | 16~32 | 0~0.7 | 側銑 SIDE MILLING |
| UTHR1630 | 43 | 90 | 1700~1900 | 300~400 | 16 | 2 | 側銑 SIDE MILLING |
| UTHR1630 | 43 | 110 | 2100~2300 | 250~400 | 16 | 3~4 | 側銑 SIDE MILLING |
| UTHR1630 | 43 | 110 | 2100~2300 | 200~350 | 16 | 6~8 | 側銑 SIDE MILLING |
| UTHR1630 | 43 | 90 | 1700~1900 | 350~550 | 16~32 | 0~0.3 | 側銑 SIDE MILLING |

被切削材 Work Material
沃斯田鐵系不銹鋼
Stainless Steels [Easy] : SUS304 : 1.4301 : AISI 304 (HRc 28~32)
切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UTHR2010 | 47 | 115 | 1750~1950 | 600~800 | 0~0.7 | 20 | 溝銑 SLOTTING |
| UTHR2010 | 47 | 110 | 1700~1900 | 400~550 | 2 | 20 | 溝銑 SLOTTING |
| UTHR2010 | 47 | 110 | 1700~1900 | 200~350 | 3~4 | 20 | 溝銑 SLOTTING |
| UTHR2010 | 47 | 110 | 1700~1900 | 150~250 | 6~8 | 20 | 溝銑 SLOTTING |
| UTHR2010 | 47 | 150 | 2300~2500 | 600~800 | 20~40 | 0~0.7 | 側銑 SIDE MILLING |
| UTHR2010 | 47 | 90 | 1300~1500 | 300~400 | 20 | 2 | 側銑 SIDE MILLING |
| UTHR2010 | 47 | 110 | 1700~1900 | 250~350 | 20 | 3~4 | 側銑 SIDE MILLING |
| UTHR2010 | 47 | 110 | 1700~1900 | 200~300 | 20 | 6~8 | 側銑 SIDE MILLING |
| UTHR2010 | 47 | 90 | 1300~1500 | 200~400 | 20~40 | 0~0.3 | 側銑 SIDE MILLING |
| UTHR2020 | 47 | 115 | 1750~1950 | 600~800 | 0~0.7 | 20 | 溝銑 SLOTTING |
| UTHR2020 | 47 | 110 | 1700~1900 | 400~500 | 2 | 20 | 溝銑 SLOTTING |
| UTHR2020 | 47 | 110 | 1700~1900 | 200~300 | 3~4 | 20 | 溝銑 SLOTTING |
| UTHR2020 | 47 | 110 | 1700~1900 | 120~200 | 6~8 | 20 | 溝銑 SLOTTING |
| UTHR2020 | 47 | 150 | 2300~2500 | 600~800 | 20~40 | 0~0.7 | 側銑 SIDE MILLING |
| UTHR2020 | 47 | 90 | 1300~1500 | 300~400 | 20 | 2 | 側銑 SIDE MILLING |
| UTHR2020 | 47 | 110 | 1700~1900 | 250~300 | 20 | 3~4 | 側銑 SIDE MILLING |
| UTHR2020 | 47 | 110 | 1700~1900 | 150~1250 | 20 | 6~8 | 側銑 SIDE MILLING |
| UTHR2020 | 47 | 90 | 1300~1500 | 200~400 | 20~40 | 0~0.3 | 側銑 SIDE MILLING |
| UTHR2030 | 47 | 115 | 1750~1950 | 600~800 | 0~0.7 | 20 | 溝銑 SLOTTING |
| UTHR2030 | 47 | 110 | 1700~1900 | 400~500 | 2 | 20 | 溝銑 SLOTTING |
| UTHR2030 | 47 | 110 | 1700~1900 | 200~300 | 3~4 | 20 | 溝銑 SLOTTING |
| UTHR2030 | 47 | 110 | 1700~1900 | 120~200 | 6~8 | 20 | 溝銑 SLOTTING |
| UTHR2030 | 47 | 150 | 2300~2500 | 600~800 | 20~40 | 0~0.7 | 側銑 SIDE MILLING |
| UTHR2030 | 47 | 90 | 1300~1500 | 300~400 | 20 | 2 | 側銑 SIDE MILLING |
| UTHR2030 | 47 | 110 | 1700~1900 | 250~300 | 20 | 3~4 | 側銑 SIDE MILLING |
| UTHR2030 | 47 | 110 | 1700~1900 | 150~1250 | 20 | 6~8 | 側銑 SIDE MILLING |
| UTHR2030 | 47 | 90 | 1300~1500 | 200~400 | 20~40 | 0~0.3 | 側銑 SIDE MILLING |

附註

- UTHR適用於粗、中、精銑加工，溝銑(Aa)與側銑(Ap)都有1.0D切削能力。粗切削時，請用濕式高壓水溶性切削液，以免造成排屑不良。直徑 $\phi 10$ 以上，需視機器剛性與主軸扭力值的不同，而做適當調整。
- 建議冷卻方式為濕式。

NOTE

- UTHR is good at Roughing, Semi-finishing and Finishing. It can do a 1.0D machining for both Slotting (Aa) and Side milling (Ap). When it is Roughing, we suggest high pressure emulsion coolant for better chip removal. For diameter above 10.0mm, make necessary adjustment as per the rigidity of machine and the torque of spindle.
- Suggest to use wet coolant.



HPC

UPER

高效能圓鼻角立銑刀 END MILLS

產品規格 SPECIFICATIONS

| 型號 Type No. | D1 直徑 Diameter | R R角 Corner R | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|----------------------|---------------------|--------------------------|--------------------|------------------------|
| UPER0405 | 4.0 | 0.5 | 11 | 50 | 6 |
| UPER0502 | 5.0 | 0.2 | 13 | 50 | 6 |
| UPER0505 | 5.0 | 0.5 | 13 | 50 | 6 |
| UPER0605 | 6.0 | 0.5 | 16 | 50 | 6 |
| UPER0610 | 6.0 | 1.0 | 16 | 50 | 6 |
| UPER0805 | 8.0 | 0.5 | 20 | 60 | 8 |
| UPER0810 | 8.0 | 1.0 | 20 | 60 | 8 |
| UPER1005 | 10.0 | 0.5 | 22 | 75 | 10 |
| UPER1010 | 10.0 | 1.0 | 22 | 75 | 10 |
| UPER1020 | 10.0 | 2.0 | 22 | 75 | 10 |
| UPER1210 | 12.0 | 1.0 | 26 | 75 | 12 |
| UPER1220 | 12.0 | 2.0 | 26 | 75 | 12 |
| UPER1610 | 16.0 | 1.0 | 36 | 100 | 16 |
| UPER1620 | 16.0 | 2.0 | 36 | 100 | 16 |
| UPER2010 | 20.0 | 1.0 | 40 | 100 | 20 |
| UPER2020 | 20.0 | 2.0 | 40 | 100 | 20 |

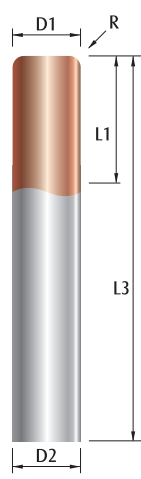
unit : mm

| | | | |
|--|-----------------------------|--|----------------------|
| | 乾式切削 Dry Machining | | |
| | 油霧切削 MQL (Mist) | | 精銑 Finishing |
| | 水溶性切削 Emulsion Machining | | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | | 粗銑 Roughing |

公差表 TOLERANCE

| 直徑 D1 | R徑公差值 R Tolerance | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|----------------------|-----------------------|----------|-----------------------|
| 4.0 | $\frac{+0.02}{0}$ | $\frac{0}{-0.02}$ | Ø6 | $\frac{0}{-0.008}$ |
| 5.0 | $\frac{+0.02}{0}$ | $\frac{0}{-0.02}$ | Ø8 | $\frac{0}{-0.009}$ |
| 6.0 | $\frac{+0.02}{0}$ | $\frac{0}{-0.02}$ | Ø10 | $\frac{0}{-0.009}$ |
| 8.0 | $\frac{+0.02}{0}$ | $\frac{0}{-0.025}$ | Ø12 | $\frac{0}{-0.011}$ |
| 10.0 | $\frac{+0.02}{0}$ | $\frac{0}{-0.03}$ | Ø16 | $\frac{0}{-0.011}$ |
| 12.0 | $\frac{+0.02}{0}$ | $\frac{0}{-0.035}$ | Ø20 | $\frac{0}{-0.013}$ |
| 16.0 | $\frac{+0.02}{0}$ | $\frac{0}{-0.04}$ | | |
| 20.0 | $\frac{+0.02}{0}$ | $\frac{0}{-0.04}$ | | |

unit : mm



Stainless Steel Cutting

UPER

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] :SUS304 : 1.4301 : AISI 304 (Hrc 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPER0405 | 13 | 110 | 8800 | 1800~2200 | 0~0.25 | 4 | 溝銑 SLOTTING |
| UPER0405 | 13 | 110 | 8800 | 800~1100 | 0.25~0.4 | 4 | 溝銑 SLOTTING |
| UPER0405 | 13 | 110 | 8800 | 600~800 | 0.4~0.6 | 4 | 溝銑 SLOTTING |
| UPER0405 | 13 | 100 | 8000 | 1400~1800 | 4~8 | 0~0.3 | 側銑 SIDE MILLING |
| UPER0405 | 13 | 100 | 8000 | 600~850 | 4~8 | 0~0.15 | 側銑 SIDE MILLING |
| UPER0502 | 16 | 110 | 7000 | 1800~2200 | 0~0.3 | 5 | 溝銑 SLOTTING |
| UPER0502 | 16 | 110 | 7000 | 800~1100 | 0.3~0.5 | 5 | 溝銑 SLOTTING |
| UPER0502 | 16 | 110 | 7000 | 600~800 | 0.5~0.7 | 5 | 溝銑 SLOTTING |
| UPER0502 | 16 | 100 | 6400 | 1400~1800 | 5~10 | 0~0.35 | 側銑 SIDE MILLING |
| UPER0502 | 16 | 100 | 6400 | 600~850 | 5~10 | 0~0.15 | 側銑 SIDE MILLING |
| UPER0505 | 16 | 110 | 7000 | 1800~2200 | 0~0.3 | 5 | 溝銑 SLOTTING |
| UPER0505 | 16 | 110 | 7000 | 800~1100 | 0.3~0.5 | 5 | 溝銑 SLOTTING |
| UPER0505 | 16 | 110 | 7000 | 600~800 | 0.5~0.7 | 5 | 溝銑 SLOTTING |
| UPER0505 | 16 | 100 | 6400 | 1400~1800 | 5~10 | 0~0.35 | 側銑 SIDE MILLING |
| UPER0505 | 16 | 100 | 6400 | 600~850 | 5~10 | 0~0.15 | 側銑 SIDE MILLING |
| UPER0605 | 18 | 110 | 5850 | 1800~2200 | 0~0.3 | 6 | 溝銑 SLOTTING |
| UPER0605 | 18 | 110 | 5850 | 800~1100 | 0.3~0.6 | 6 | 溝銑 SLOTTING |
| UPER0605 | 18 | 110 | 5850 | 700~900 | 0.6~0.9 | 6 | 溝銑 SLOTTING |
| UPER0605 | 18 | 100 | 5300 | 1400~1800 | 6~12 | 0~0.4 | 側銑 SIDE MILLING |
| UPER0605 | 18 | 100 | 5300 | 600~850 | 6~12 | 0~0.2 | 側銑 SIDE MILLING |
| UPER0610 | 18 | 110 | 5850 | 1800~2200 | 0~0.3 | 6 | 溝銑 SLOTTING |
| UPER0610 | 18 | 110 | 5850 | 800~1100 | 0.3~0.6 | 6 | 溝銑 SLOTTING |
| UPER0610 | 18 | 110 | 5850 | 700~900 | 0.6~0.9 | 6 | 溝銑 SLOTTING |
| UPER0610 | 18 | 100 | 5300 | 1400~1800 | 6~12 | 0~0.4 | 側銑 SIDE MILLING |
| UPER0610 | 18 | 100 | 5300 | 600~850 | 6~12 | 0~0.2 | 側銑 SIDE MILLING |
| UPER0805 | 22 | 135 | 5500 | 1800~2200 | 0~0.5 | 8 | 溝銑 SLOTTING |
| UPER0805 | 22 | 135 | 5500 | 900~1300 | 0.5~1 | 8 | 溝銑 SLOTTING |
| UPER0805 | 22 | 125 | 5000 | 700~900 | 1~1.5 | 8 | 溝銑 SLOTTING |
| UPER0805 | 22 | 135 | 5500 | 1300~1600 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |
| UPER0805 | 22 | 125 | 5000 | 800~1100 | 8~16 | 0~0.25 | 側銑 SIDE MILLING |
| UPER0810 | 22 | 135 | 5500 | 1800~2200 | 0~0.5 | 8 | 溝銑 SLOTTING |
| UPER0810 | 22 | 135 | 5500 | 900~1300 | 0.5~1 | 8 | 溝銑 SLOTTING |
| UPER0810 | 22 | 125 | 5000 | 700~900 | 1~1.5 | 8 | 溝銑 SLOTTING |
| UPER0810 | 22 | 135 | 5500 | 1300~1600 | 8~16 | 0~0.5 | 側銑 SIDE MILLING |
| UPER0810 | 22 | 125 | 5000 | 800~1100 | 8~16 | 0~0.25 | 側銑 SIDE MILLING |
| UPER1005 | 27 | 130 | 4200 | 1700~2100 | 0~0.5 | 10 | 溝銑 SLOTTING |
| UPER1005 | 27 | 120 | 3800 | 900~1200 | 0.5~1 | 10 | 溝銑 SLOTTING |
| UPER1005 | 27 | 120 | 3800 | 700~900 | 1~1.5 | 10 | 溝銑 SLOTTING |
| UPER1005 | 27 | 120 | 3800 | 800~1000 | 10~20 | 0~0.6 | 側銑 SIDE MILLING |
| UPER1005 | 27 | 115 | 3700 | 800~1000 | 10~20 | 0~0.3 | 側銑 SIDE MILLING |
| UPER1010 | 27 | 130 | 4200 | 1700~2100 | 0~0.5 | 10 | 溝銑 SLOTTING |
| UPER1010 | 27 | 120 | 3800 | 900~1200 | 0.5~1 | 10 | 溝銑 SLOTTING |
| UPER1010 | 27 | 120 | 3800 | 700~900 | 1~1.5 | 10 | 溝銑 SLOTTING |
| UPER1010 | 27 | 120 | 3800 | 800~1000 | 10~20 | 0~0.6 | 側銑 SIDE MILLING |
| UPER1010 | 27 | 115 | 3700 | 800~1000 | 10~20 | 0~0.3 | 側銑 SIDE MILLING |

被切削材 Work Material
沃斯田鐵系不銹鋼
Stainless Steels [Easy] : SUS304 : 1.4301 : AISI 304 (HRc 28~32)
切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| UPER1020 | 27 | 130 | 4200 | 1700~2100 | 0~0.5 | 10 | 溝銑 SLOTTING |
| UPER1020 | 27 | 120 | 3800 | 900~1200 | 0.5~1 | 10 | 溝銑 SLOTTING |
| UPER1020 | 27 | 120 | 3800 | 700~900 | 1~1.5 | 10 | 溝銑 SLOTTING |
| UPER1020 | 27 | 120 | 3800 | 800~1000 | 10~20 | 0~0.6 | 側銑 SIDE MILLING |
| UPER1020 | 27 | 115 | 3700 | 800~1000 | 10~20 | 0~0.3 | 側銑 SIDE MILLING |
| UPER1210 | 32 | 130 | 3450 | 1700~2100 | 0~0.5 | 12 | 溝銑 SLOTTING |
| UPER1210 | 32 | 100 | 2700 | 900~1200 | 0.5~1 | 12 | 溝銑 SLOTTING |
| UPER1210 | 32 | 85 | 2200 | 600~900 | 1~1.5 | 12 | 溝銑 SLOTTING |
| UPER1210 | 32 | 130 | 3450 | 700~900 | 12~24 | 0~0.6 | 側銑 SIDE MILLING |
| UPER1210 | 32 | 95 | 2550 | 500~800 | 12~24 | 0~0.3 | 側銑 SIDE MILLING |
| UPER1220 | 32 | 130 | 3450 | 1700~2100 | 0~0.5 | 12 | 溝銑 SLOTTING |
| UPER1220 | 32 | 100 | 2700 | 900~1200 | 0.5~1 | 12 | 溝銑 SLOTTING |
| UPER1220 | 32 | 85 | 2200 | 600~900 | 1~1.5 | 12 | 溝銑 SLOTTING |
| UPER1220 | 32 | 130 | 3450 | 700~900 | 12~24 | 0~0.6 | 側銑 SIDE MILLING |
| UPER1220 | 32 | 95 | 2550 | 500~800 | 12~24 | 0~0.3 | 側銑 SIDE MILLING |
| UPER1610 | 42 | 130 | 2600 | 1300~1600 | 0~0.5 | 16 | 溝銑 SLOTTING |
| UPER1610 | 42 | 100 | 2000 | 700~900 | 0.5~1 | 16 | 溝銑 SLOTTING |
| UPER1610 | 42 | 85 | 1700 | 500~700 | 1~1.5 | 16 | 溝銑 SLOTTING |
| UPER1610 | 42 | 130 | 2600 | 600~800 | 16~32 | 0~0.6 | 側銑 SIDE MILLING |
| UPER1610 | 42 | 95 | 1900 | 500~650 | 16~32 | 0~0.3 | 側銑 SIDE MILLING |
| UPER1620 | 42 | 130 | 2600 | 1300~1600 | 0~0.5 | 16 | 溝銑 SLOTTING |
| UPER1620 | 42 | 100 | 2000 | 700~900 | 0.5~1 | 16 | 溝銑 SLOTTING |
| UPER1620 | 42 | 85 | 1700 | 500~700 | 1~1.5 | 16 | 溝銑 SLOTTING |
| UPER1620 | 42 | 130 | 2600 | 600~800 | 16~32 | 0~0.6 | 側銑 SIDE MILLING |
| UPER1620 | 42 | 95 | 1900 | 500~650 | 16~32 | 0~0.3 | 側銑 SIDE MILLING |
| UPER2010 | 48 | 130 | 2050 | 900~1300 | 0~0.5 | 20 | 溝銑 SLOTTING |
| UPER2010 | 48 | 100 | 1600 | 500~700 | 0.5~1 | 20 | 溝銑 SLOTTING |
| UPER2010 | 48 | 85 | 1350 | 350~550 | 1~1.5 | 20 | 溝銑 SLOTTING |
| UPER2010 | 48 | 130 | 2050 | 450~650 | 20~40 | 0~0.6 | 側銑 SIDE MILLING |
| UPER2010 | 48 | 95 | 1500 | 350~500 | 20~40 | 0~0.3 | 側銑 SIDE MILLING |
| UPER2020 | 48 | 130 | 2050 | 900~1300 | 0~0.5 | 20 | 溝銑 SLOTTING |
| UPER2020 | 48 | 100 | 1600 | 500~700 | 0.5~1 | 20 | 溝銑 SLOTTING |
| UPER2020 | 48 | 85 | 1350 | 350~550 | 1~1.5 | 20 | 溝銑 SLOTTING |
| UPER2020 | 48 | 130 | 2050 | 450~650 | 20~40 | 0~0.6 | 側銑 SIDE MILLING |
| UPER2020 | 48 | 95 | 1500 | 350~500 | 20~40 | 0~0.3 | 側銑 SIDE MILLING |

附註

建議冷卻方式為濕式。

NOTE

Suggest to use wet coolant.

Standard

WWA

超微粒粗齒細目立銑刀 END MILLS

| | | | |
|--|----------------------------|------|----------------------|
| | 乾式切削 Dry Machining | | |
| | 油霧切削 MQL (Mist) | ---- | 精銑 Finishing |
| | 水性切削 Emulsion Machining | | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | | 粗銑 Roughing |

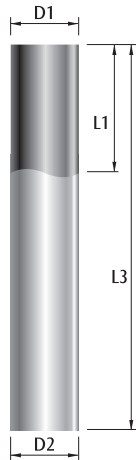


產品規格 SPECIFICATIONS

| 型號 Type No. | D1 直徑 Diameter | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|----------------------|--------------------------|--------------------|------------------------|
| WWA0604 | 6.0 | 16 | 50 | 6 |
| WWA0804 | 8.0 | 20 | 60 | 8 |
| WWA1004 | 10.0 | 25 | 75 | 10 |
| WWA1204 | 12.0 | 30 | 75 | 12 |
| WWA1404 | 14.0 | 35 | 100 | 16 |
| WWA1604 | 16.0 | 40 | 100 | 16 |
| WWA1804 | 18.0 | 40 | 100 | 20 |
| WWA2004 | 20.0 | 45 | 100 | 20 |

unit : mm

Stainless Steel Cutting



公差表 TOLERANCE

| 直徑 D1 | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|-----------------------|----------|-----------------------|
| 6.0 | $0_{-0.04}$ | Ø6 | $0_{-0.008}$ |
| 8.0 | $0_{-0.04}$ | Ø8 | $0_{-0.009}$ |
| 10.0 | $0_{-0.045}$ | Ø10 | $0_{-0.009}$ |
| 12.0 | $0_{-0.045}$ | Ø12 | $0_{-0.011}$ |
| 14.0 | $0_{-0.045}$ | Ø16 | $0_{-0.011}$ |
| 16.0 | $0_{-0.05}$ | Ø20 | $0_{-0.013}$ |
| 18.0 | $0_{-0.05}$ | | |
| 20.0 | $0_{-0.05}$ | | |

unit : mm

WWA

被切削材 Work Material

沃斯田鐵系不銹鋼

Stainless Steels [Easy] : **SUS304** : **1.4301** : **AISI 304** (HRC 28~32)

切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| WWA0604 | 22 | 80 | 4200~4400 | 400~550 | 1 | 6 | 溝銑 SLOTTING |
| WWA0604 | 22 | 80 | 4200~4400 | 350~450 | 1.5 | 6 | 溝銑 SLOTTING |
| WWA0604 | 22 | 80 | 4200~4400 | 300~420 | 3 | 6 | 溝銑 SLOTTING |
| WWA0604 | 22 | 80 | 4200~4400 | 170~220 | 6 | 6 | 溝銑 SLOTTING |
| WWA0604 | 22 | 80 | 4200~4400 | 500~700 | 6 | 1 | 側銑 SIDE MILLING |
| WWA0604 | 22 | 80 | 4200~4400 | 450~600 | 6 | 2 | 側銑 SIDE MILLING |
| WWA0604 | 22 | 80 | 4200~4400 | 250~320 | 6 | 3 | 側銑 SIDE MILLING |
| WWA0604 | 22 | 80 | 4200~4400 | 170~220 | 6 | 5.7 | 側銑 SIDE MILLING |
| WWA0804 | 28 | 80 | 3200~3400 | 350~480 | 2 | 8 | 溝銑 SLOTTING |
| WWA0804 | 28 | 80 | 3200~3400 | 270~360 | 4 | 8 | 溝銑 SLOTTING |
| WWA0804 | 28 | 80 | 3200~3400 | 240~320 | 6 | 8 | 溝銑 SLOTTING |
| WWA0804 | 28 | 80 | 3200~3400 | 200~260 | 8 | 8 | 溝銑 SLOTTING |
| WWA0804 | 28 | 80 | 3200~3400 | 350~480 | 8 | 2 | 側銑 SIDE MILLING |
| WWA0804 | 28 | 80 | 3200~3400 | 270~360 | 8 | 4 | 側銑 SIDE MILLING |
| WWA0804 | 28 | 80 | 3200~3400 | 200~260 | 8 | 7.7 | 側銑 SIDE MILLING |
| WWA1004 | 32 | 80 | 2500~2700 | 350~500 | 2 | 10 | 溝銑 SLOTTING |
| WWA1004 | 32 | 80 | 2500~2700 | 300~400 | 3.5 | 10 | 溝銑 SLOTTING |
| WWA1004 | 32 | 80 | 2500~2700 | 250~320 | 5 | 10 | 溝銑 SLOTTING |
| WWA1004 | 32 | 80 | 2500~2700 | 200~260 | 10 | 10 | 溝銑 SLOTTING |
| WWA1004 | 32 | 80 | 2500~2700 | 350~500 | 10 | 1 | 側銑 SIDE MILLING |
| WWA1004 | 32 | 80 | 2500~2700 | 200~300 | 10 | 5 | 側銑 SIDE MILLING |
| WWA1004 | 32 | 80 | 2500~2700 | 200~260 | 10 | 9.7 | 側銑 SIDE MILLING |
| WWA1204 | 38 | 80 | 2000~2200 | 260~420 | 2 | 12 | 溝銑 SLOTTING |
| WWA1204 | 38 | 80 | 2000~2200 | 200~300 | 4 | 12 | 溝銑 SLOTTING |
| WWA1204 | 38 | 80 | 2000~2200 | 180~260 | 6 | 12 | 溝銑 SLOTTING |
| WWA1204 | 38 | 80 | 2000~2200 | 150~210 | 10 | 12 | 溝銑 SLOTTING |
| WWA1204 | 38 | 80 | 2000~2200 | 120~200 | 12 | 12 | 溝銑 SLOTTING |
| WWA1204 | 38 | 80 | 2000~2200 | 300~400 | 12 | 1 | 側銑 SIDE MILLING |
| WWA1204 | 38 | 80 | 2000~2200 | 180~260 | 12 | 6 | 側銑 SIDE MILLING |
| WWA1204 | 38 | 80 | 2000~2200 | 100~190 | 12 | 11.7 | 側銑 SIDE MILLING |
| WWA1404 | 42 | 80 | 1700~1900 | 200~360 | 2 | 14 | 溝銑 SLOTTING |
| WWA1404 | 42 | 80 | 1700~1900 | 150~250 | 4 | 14 | 溝銑 SLOTTING |
| WWA1404 | 42 | 80 | 1700~1900 | 120~200 | 6 | 14 | 溝銑 SLOTTING |
| WWA1404 | 42 | 80 | 1700~1900 | 100~150 | 10 | 14 | 溝銑 SLOTTING |
| WWA1404 | 42 | 80 | 1700~1900 | 200~300 | 14 | 1 | 側銑 SIDE MILLING |
| WWA1404 | 42 | 80 | 1700~1900 | 70~110 | 14 | 7 | 側銑 SIDE MILLING |
| WWA1404 | 42 | 80 | 1700~1900 | 70~110 | 7 | 13.7 | 側銑 SIDE MILLING |

被切削材 Work Material

沃斯田鐵系不銹鋼

 Stainless Steels [Easy]: **SUS304 : 1.4301 : AISI 304** (HRc 28~32)

 切削條件表 **MILLING CONDITIONS**

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| WWA1604 | 47 | 80 | 1500~1700 | 200~280 | 2 | 16 | 溝銑 SLOTTING |
| WWA1604 | 47 | 80 | 1500~1700 | 130~200 | 4 | 16 | 溝銑 SLOTTING |
| WWA1604 | 47 | 80 | 1500~1700 | 100~170 | 6 | 16 | 溝銑 SLOTTING |
| WWA1604 | 47 | 80 | 1500~1700 | 80~100 | 10 | 16 | 溝銑 SLOTTING |
| WWA1604 | 47 | 80 | 1500~1700 | 180~260 | 16 | 1 | 側銑 SIDE MILLING |
| WWA1604 | 47 | 80 | 1500~1700 | 50~100 | 16 | 8 | 側銑 SIDE MILLING |
| WWA1604 | 47 | 80 | 1500~1700 | 50~100 | 8 | 15.7 | 側銑 SIDE MILLING |
| WWA1804 | 50 | 80 | 1300~1500 | 200~250 | 2 | 18 | 溝銑 SLOTTING |
| WWA1804 | 50 | 80 | 1300~1500 | 130~180 | 4 | 18 | 溝銑 SLOTTING |
| WWA1804 | 50 | 80 | 1300~1500 | 100~150 | 6 | 18 | 溝銑 SLOTTING |
| WWA1804 | 50 | 80 | 1300~1500 | 80~100 | 10 | 18 | 溝銑 SLOTTING |
| WWA1804 | 50 | 80 | 1300~1500 | 170~240 | 18 | 1 | 側銑 SIDE MILLING |
| WWA1804 | 50 | 80 | 1300~1500 | 50~100 | 18 | 6 | 側銑 SIDE MILLING |
| WWA1804 | 50 | 80 | 1300~1500 | 50~100 | 9 | 17.7 | 側銑 SIDE MILLING |
| WWA2004 | 50 | 80 | 1150~1350 | 180~230 | 2 | 20 | 溝銑 SLOTTING |
| WWA2004 | 50 | 80 | 1150~1350 | 120~160 | 4 | 20 | 溝銑 SLOTTING |
| WWA2004 | 50 | 80 | 1150~1350 | 100~140 | 6 | 20 | 溝銑 SLOTTING |
| WWA2004 | 50 | 80 | 1150~1350 | 70~90 | 10 | 20 | 溝銑 SLOTTING |
| WWA2004 | 50 | 80 | 1150~1350 | 160~230 | 20 | 1 | 側銑 SIDE MILLING |
| WWA2004 | 50 | 80 | 1150~1350 | 80~120 | 20 | 5 | 側銑 SIDE MILLING |
| WWA2004 | 50 | 80 | 1150~1350 | 50~80 | 10 | 19.7 | 側銑 SIDE MILLING |

附註

建議冷卻方式為濕式。

NOTE

Suggest to use wet coolant.



產品規格 **SPECIFICATIONS**

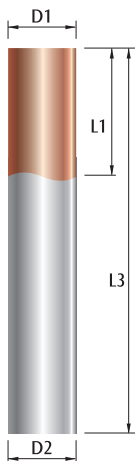
| 型號 Type No. | D1 直徑 Diameter | L1 刃長 Flute Length | L3 全長 O.A.L. | D2 柄徑 Shank Dia. |
|----------------|----------------------|--------------------------|--------------------|------------------------|
| WWB0604 | 6.0 | 16 | 50 | 6 |
| WWB0804 | 8.0 | 20 | 60 | 8 |
| WWB1004 | 10.0 | 25 | 75 | 10 |
| WWB1204 | 12.0 | 30 | 75 | 12 |
| WWB1404 | 14.0 | 35 | 100 | 16 |
| WWB1604 | 16.0 | 40 | 100 | 16 |
| WWB1804 | 18.0 | 40 | 100 | 20 |
| WWB2004 | 20.0 | 45 | 100 | 20 |

unit : mm

公差表 **TOLERANCE**

| 直徑 D1 | 直徑公差值 D1 Tolerance | 柄徑 D2 | 柄徑公差值 D2 Tolerance |
|----------|-----------------------|----------|-----------------------|
| 6.0 | $\frac{0}{-0.04}$ | Ø6 | $\frac{0}{-0.008}$ |
| 8.0 | $\frac{0}{-0.04}$ | Ø8 | $\frac{0}{-0.009}$ |
| 10.0 | $\frac{0}{-0.045}$ | Ø10 | $\frac{0}{-0.009}$ |
| 12.0 | $\frac{0}{-0.045}$ | Ø12 | $\frac{0}{-0.011}$ |
| 14.0 | $\frac{0}{-0.045}$ | Ø16 | $\frac{0}{-0.011}$ |
| 16.0 | $\frac{0}{-0.05}$ | Ø20 | $\frac{0}{-0.013}$ |
| 18.0 | $\frac{0}{-0.05}$ | | |
| 20.0 | $\frac{0}{-0.05}$ | | |

unit : mm



HPC

WWB

抗震粗齒細目銑刀
END MILLS

| | | | |
|--|-----------------------------|-----|----------------------|
| | 乾式切削 Dry Machining | | |
| | 油霧切削 MQL (Mist) | --- | 精銑 Finishing |
| | 水溶性切削 Emulsion Machining | | 中銑 Semi-finishing |
| | 油性切削 Oil Machining | | 粗銑 Roughing |



Stainless Steel Cutting

WWB

切削條件表 MILLING CONDITIONS

被切削材 Work Material

沃斯田鐵系不銹鋼
Stainless Steels [Easy] : **SUS304 : 1.4301 : AISI 304** (HRc 28~32)

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|-----------------------------------|----------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| WWB0604 | 22 | 80 | 4200~4400 | 400~550 | 1 | 6 | 溝銑 SLOTTING |
| WWB0604 | 22 | 80 | 4200~4400 | 350~450 | 1.5 | 6 | 溝銑 SLOTTING |
| WWB0604 | 22 | 80 | 4200~4400 | 300~420 | 3 | 6 | 溝銑 SLOTTING |
| WWB0604 | 22 | 80 | 4200~4400 | 200~270 | 6 | 6 | 溝銑 SLOTTING |
| WWB0604 | 22 | 80 | 4200~4400 | 200~270 | 6 | 5.7 | 側銑 SIDE MILLING |
| WWB0804 | 28 | 80 | 3200~3400 | 350~480 | 2 | 8 | 溝銑 SLOTTING |
| WWB0804 | 28 | 80 | 3200~3400 | 270~360 | 4 | 8 | 溝銑 SLOTTING |
| WWB0804 | 28 | 80 | 3200~3400 | 240~320 | 6 | 8 | 溝銑 SLOTTING |
| WWB0804 | 28 | 80 | 3200~3400 | 200~260 | 8 | 8 | 溝銑 SLOTTING |
| WWB0804 | 28 | 80 | 3200~3400 | 200~260 | 8 | 7.7 | 側銑 SIDE MILLING |
| WWB1004 | 32 | 80 | 2500~2700 | 350~500 | 2 | 10 | 溝銑 SLOTTING |
| WWB1004 | 32 | 80 | 2500~2700 | 300~400 | 3.5 | 10 | 溝銑 SLOTTING |
| WWB1004 | 32 | 80 | 2500~2700 | 250~320 | 5 | 10 | 溝銑 SLOTTING |
| WWB1004 | 32 | 80 | 2500~2700 | 200~260 | 10 | 10 | 溝銑 SLOTTING |
| WWB1004 | 32 | 80 | 2500~2700 | 200~260 | 10 | 9.7 | 側銑 SIDE MILLING |
| WWB1204 | 38 | 80 | 2000~2200 | 260~420 | 2 | 12 | 溝銑 SLOTTING |
| WWB1204 | 38 | 80 | 2000~2200 | 200~300 | 4 | 12 | 溝銑 SLOTTING |
| WWB1204 | 38 | 80 | 2000~2200 | 180~260 | 6 | 12 | 溝銑 SLOTTING |
| WWB1204 | 38 | 80 | 2000~2200 | 150~210 | 10 | 12 | 溝銑 SLOTTING |
| WWB1204 | 38 | 80 | 2000~2200 | 120~200 | 12 | 12 | 溝銑 SLOTTING |
| WWB1204 | 38 | 80 | 2000~2200 | 100~190 | 12 | 11.7 | 側銑 SIDE MILLING |
| WWB1404 | 42 | 80 | 1700~1900 | 200~360 | 2 | 14 | 溝銑 SLOTTING |
| WWB1404 | 42 | 80 | 1700~1900 | 150~250 | 4 | 14 | 溝銑 SLOTTING |
| WWB1404 | 42 | 80 | 1700~1900 | 120~200 | 6 | 14 | 溝銑 SLOTTING |
| WWB1404 | 42 | 80 | 1700~1900 | 100~150 | 10 | 14 | 溝銑 SLOTTING |
| WWB1404 | 42 | 80 | 1700~1900 | 70~110 | 7 | 13.7 | 側銑 SIDE MILLING |
| WWB1604 | 47 | 80 | 1500~1700 | 200~280 | 2 | 16 | 溝銑 SLOTTING |
| WWB1604 | 47 | 80 | 1500~1700 | 130~200 | 4 | 16 | 溝銑 SLOTTING |
| WWB1604 | 47 | 80 | 1500~1700 | 100~170 | 6 | 16 | 溝銑 SLOTTING |
| WWB1604 | 47 | 80 | 1500~1700 | 80~120 | 10 | 16 | 溝銑 SLOTTING |
| WWB1604 | 47 | 80 | 1500~1700 | 50~100 | 8 | 15.7 | 側銑 SIDE MILLING |

被切削材 Work Material
沃斯田鐵系不銹鋼
Stainless Steels [Easy]:SUS304 : 1.4301 : AISI 304 (HRc 28~32)
切削條件表 MILLING CONDITIONS

| 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 (Aa) Depth of Cut | 加工寬度 (Ap) Width of Cut | 加工方式 Milling Type |
|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|------------------------------|------------------------------|----------------------|
| WWB1804 | 50 | 80 | 1300~1500 | 200~250 | 2 | 18 | 溝銼 SLOTTING |
| WWB1804 | 50 | 80 | 1300~1500 | 130~180 | 4 | 18 | 溝銼 SLOTTING |
| WWB1804 | 50 | 80 | 1300~1500 | 100~150 | 6 | 18 | 溝銼 SLOTTING |
| WWB1804 | 50 | 80 | 1300~1500 | 80~100 | 10 | 18 | 溝銼 SLOTTING |
| WWB1804 | 50 | 80 | 1300~1500 | 50~100 | 9 | 17.7 | 側銼 SIDE MILLING |
| WWB2004 | 50 | 80 | 1150~1350 | 180~230 | 2 | 20 | 溝銼 SLOTTING |
| WWB2004 | 50 | 80 | 1150~1350 | 120~160 | 4 | 20 | 溝銼 SLOTTING |
| WWB2004 | 50 | 80 | 1150~1350 | 100~140 | 6 | 20 | 溝銼 SLOTTING |
| WWB2004 | 50 | 80 | 1150~1350 | 70~90 | 10 | 20 | 溝銼 SLOTTING |
| WWB2004 | 50 | 80 | 1150~1350 | 50~80 | 10 | 19.7 | 側銼 SIDE MILLING |

附註

1. WWB適用於粗銼加工，溝銼(Aa)有1.0D切削能力。側銼(Ap)需1.0D滿刀（側銼低於0.95D會產生加工共振，影響刀具壽命）。粗切削時，請用濕式高壓水溶性切削液，以免造成排屑不良。直徑Ø10以上，需視機器剛性與主軸扭力值的不同，而做適當調整。
2. 建議冷卻方式為濕式。

NOTE

1. WWB is good at Roughing. It can do a 1.0D machining for Slotting (Aa). Side milling (Ap) would require 1.0D full cut (When it is less than 0.95D, vibration will cause short tool life.) When Roughing, we suggest high pressure emulsion coolant for better chip removal. For diameter above 10.0mm, make necessary adjustment as per the rigidity of machine and the torque of spindle.
2. Suggest to use wet coolant.

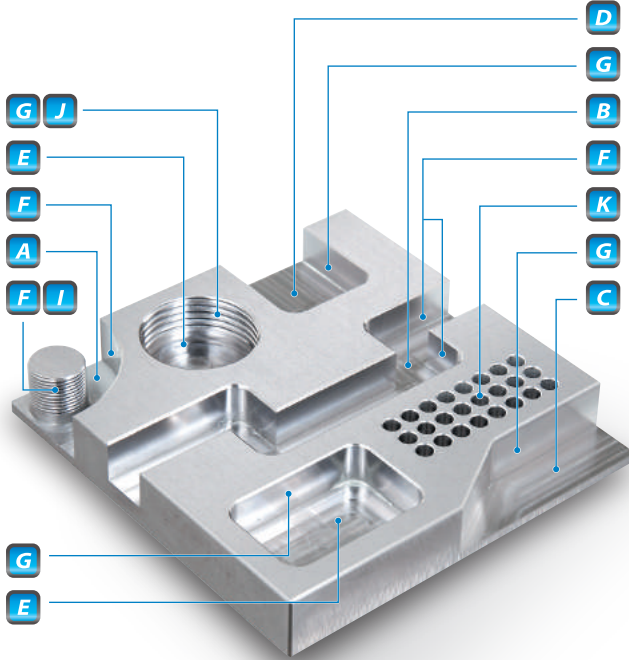
本書中所列之切削條件由DHF應用技術中心測試提供

Above milling conditions are issued by DHF Technical Applications Center.

切削實例 CUTTING DEMO

| | |
|--------------------------------|--|
| 切削材規格 Material Size (mm) | 總加工時間 Total Machining Time (min) |
| L150 x W150 x H35 | 25 |

| |
|--|
| 被切削材 Work Material |
| 沈澱不銹鋼 Stainless Steels : AISI : 17-4PH / JIS : SUS630 (HRC45) |



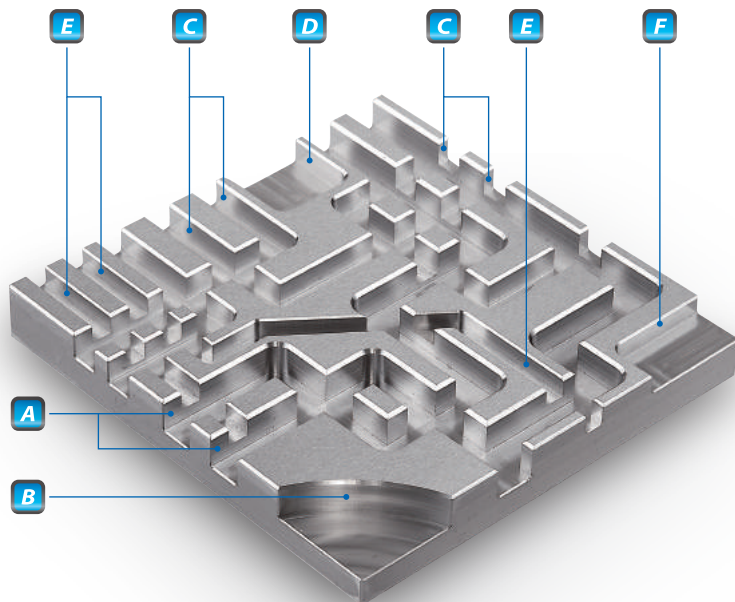
Stainless Steel Cutting

| 標記 Label | 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 Depth of Cut (a _s) | 加工寬度 Width of Cut (a _w) | 冷卻方式 Coolant Type | 每刃切削量 f _z (mm) | 備註 Remark |
|-------------|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|--|--|-------------------------|---------------------------------|-------------------|
| A | WWB1004 | 30 | 80 | 2600 | 200 | 10 | 10 | 濕式水冷 (Wet) | 0.02 | 粗加工 Roughing |
| B | UEW1004 | 30 | 140 | 4500 | 600 | 8 | 10 | 濕式水冷 (Wet) | 0.03 | 粗加工 Roughing |
| C | UPW1005 | 30 | 130 | 4200 | 600 | 10 | 6 | 乾式切削 (Dry) | 0.03 | 粗加工 Roughing |
| D | UPW1005 | 30 | 130 | 4200 | 600 | 8 | 6 | 乾式切削 (Dry) | 0.03 | 粗加工 Roughing |
| E | UXR1010 | 30 | 190 | 6000 | 4800 | 0.25 | 7.5 | 濕式水冷 (Wet) | 0.2 | 粗加工 Roughing |
| F | VTB1006 | 30 | 115 | 3600 | 800 | 20 | 0.15 | 濕式水冷 (Wet) | 0.04 | 精加工 Finishing |
| G | UET1004 | 30 | 115 | 3600 | 500 | 20 | 0.15 | 乾式切削 (Dry) | 0.03 | 精加工 Finishing |
| H | X-TD1003 | 30 | 160 | 5000 | 700 | 1.5 | 1.5 | 氣冷 (Air) | 0.05 | 倒角 Chamfering |
| I | TW07517 M10150 | 28 | 75 | 3200 | 240 | 15 | 0.25 | 濕式水冷 (Wet) | 0.03 | 銑牙 Thread Milling |
| J | X-TW161830 | 30 | 90 | 1800 | 220 | 15 | 0.3 | 濕式水冷 (Wet) | 0.03 | 銑牙 Thread Milling |
| K | DAK060 | 34 | 60 | 3100 | 300 | 12 | 6 | 濕式水冷 (Wet) | 0.05 | 鑽孔 Drill |

切削實例 CUTTING DEMO

| | |
|--------------------------------|--|
| 切削材規格 Material Size (mm) | 總加工時間 Total Machining Time (min) |
| L150 x W150 x H35 | 5 |

| |
|---|
| 被切削材 Work Material |
| 沃斯田鐵系不銹鋼 Austenite Stainless Steels :JIS : SUS304 / DIN : 1.4301 (HRC30) |



Stainless Steel Cutting

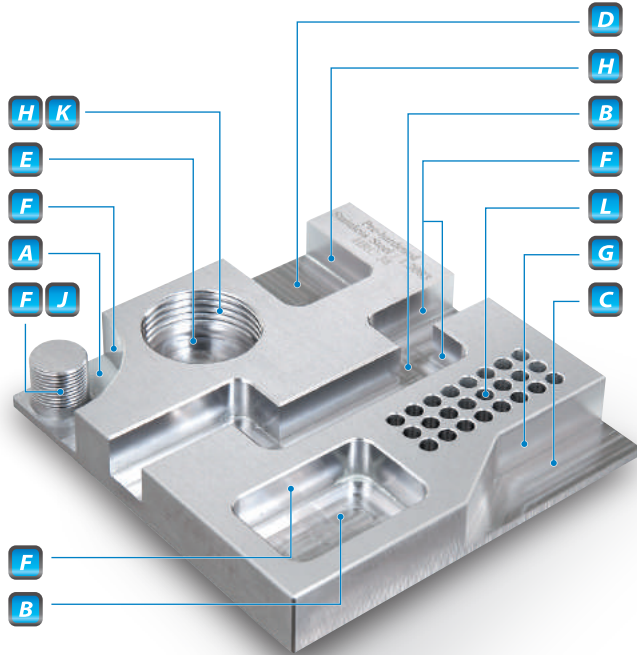
| 標記 Label | 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 Depth of Cut [a ₁] | 加工寬度 Width of Cut [a ₂] | 冷卻方式 Coolant Type | 每刃切削量 fz (mm) | 備註 Remark |
|-------------|----------------|-----------------------------------|----------------------------------|------------------------------------|--------------------------|---|---|----------------------|------------------|---|
| A | UPZ1004 | 30 | 110 | 3500 | 700 | 10 | 10 | 濕式水冷 (Wet) | 0.05 | 粗銑溝銑 <i>Roughing & Slotting</i> |
| B | UPZ1004 | 30 | 110 | 3500 | 700 | 10 | 9 | 濕式水冷 (Wet) | 0.05 | 粗銑側銑 <i>Roughing & Side Milling</i> |
| C | UPZ0804 | 25 | 105 | 4200 | 700 | 8 | 8 | 濕式水冷 (Wet) | 0.04 | 粗銑溝銑 <i>Roughing & Slotting</i> |
| D | UPZ0804 | 25 | 105 | 4200 | 700 | 8 | 7 | 濕式水冷 (Wet) | 0.04 | 粗銑側銑 <i>Roughing & Side Milling</i> |
| E | UPZ0604 | 20 | 105 | 5500 | 600 | 6 | 6 | 濕式水冷 (Wet) | 0.03 | 粗銑溝銑 <i>Roughing & Slotting</i> |
| F | UPZ0604 | 20 | 105 | 5500 | 600 | 6 | 5 | 濕式水冷 (Wet) | 0.03 | 粗銑側銑 <i>Roughing & Side Milling</i> |

切削實例 CUTTING DEMO

| | |
|--------------------------------|--|
| 切削材規格 Material Size (mm) | 總加工時間 Total Machining Time (min) |
| L150 x W150 x H35 | 13 |

被切削材 Work Material

預硬不銹鋼
Pre-Hardened Stainless Steels : **AISt 420 / DIN : 1.2083** (HRC38)



Stainless Steel Cutting

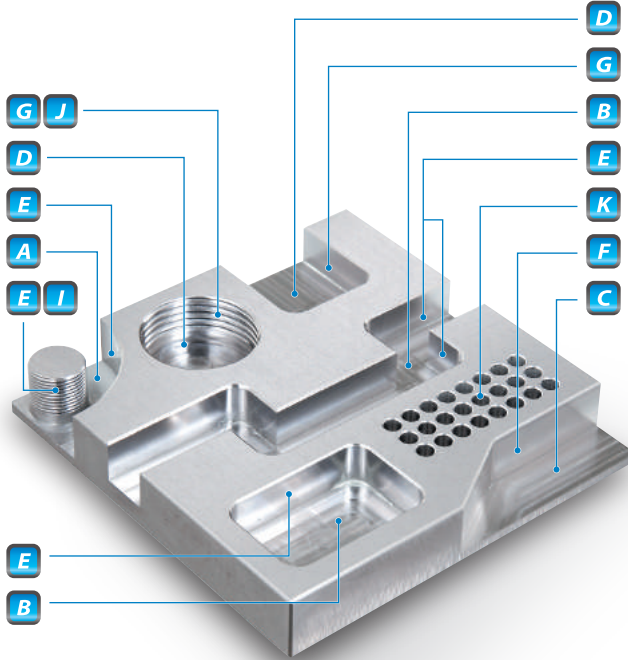
| 標記 Label | 型號 Type No. | 刀具伸長量 Extension Length [mm] | 切削速度 Cutting Speed [m/min] | 迴轉速度 Speed [min ⁻¹] | 進給速度 Feed [mm/min] | 加工深度 Depth of Cut [a _s] | 加工寬度 Width of Cut [a _w] | 每刃 切削量 f _z [mm] | 備註 Remark |
|-------------|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|--|--|-------------------------------------|--------------------------|
| A | WWB1004 | 35 | 85 | 2700 | 270 | 20 | 10 | 0.03 | 粗加工 <i>Roughing</i> |
| B | UEW1004 | 33 | 160 | 5000 | 600 | 8 | 10 | 0.03 | 粗加工 <i>Roughing</i> |
| C | UTHR1010 | 33 | 140 | 4500 | 800 | 10 | 4.5 | 0.04 | 粗加工 <i>Roughing</i> |
| D | UPZ1004 | 33 | 110 | 3500 | 1000 | 8 | 10 | 0.07 | 粗加工 <i>Roughing</i> |
| E | UPZ1004 | 33 | 110 | 3500 | 1000 | 8 | 8 | 0.07 | 粗加工 <i>Roughing</i> |
| F | VTB1006 | 35 | 100 | 3200 | 600 | 20 | 0.2 | 0.03 | 精加工 <i>Finishing</i> |
| G | UTH1004 | 33 | 110 | 3500 | 450 | 20 | 0.2 | 0.03 | 精加工 <i>Finishing</i> |
| H | UTE1004 | 33 | 110 | 3500 | 450 | 16 | 0.2 | 0.03 | 精加工 <i>Finishing</i> |
| I | X-TD1003 | 30 | 190 | 6000 | 900 | 1.5 | 1.5 | 0.05 | 倒角 <i>Chamfering</i> |
| J | TW07517 M10150 | 30 | 110 | 4800 | 300 | 16 | 0.25 | 0.02 | 銑牙 <i>Thread Milling</i> |
| K | X-TW161830 | 40 | 140 | 2800 | 300 | 16 | 0.4 | 0.03 | 銑牙 <i>Thread Milling</i> |
| L | DAK060 | 34 | 80 | 4200 | 800 | 12 | 6 | 0.10 | 鑽孔 <i>Drill</i> |

切削實例 CUTTING DEMO

| | |
|--------------------------------|--|
| 切削材規格 Material Size (mm) | 總加工時間 Total Machining Time (min) |
| L150 x W150 x H35 | 14 |

被切削材 Work Material

不銹鋼 1.2083 熱處理前、後加工
Un-Hardened Stainless Steels / Hardened Stainless Steels
AISI : 420 / DIN : 1.2083 (HRC18) / (HRC52)



Stainless Steel Cutting

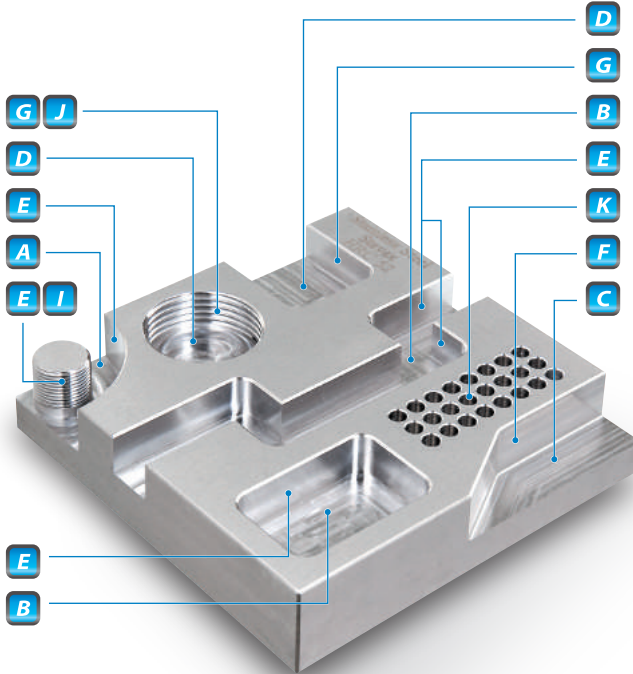
| 標記 Label | 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 Depth of Cut (a _z) | 加工寬度 Width of Cut (a _y) | 每刃 切削量 fz (mm) | 備註 Remark |
|-------------|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|--|--|-------------------------|--|
| A | WVB1004 | 35 | 85 | 2700 | 300 | 20 | 10 | 0.03 | 粗加工 / 熱處理前加工(HRC18) Roughing / Un-Hardened Stainless Steel (HRC18) |
| B | UEW1004 | 33 | 160 | 5000 | 1000 | 8 | 10 | 0.05 | 粗加工 / 熱處理前加工(HRC18) Roughing / Un-Hardened Stainless Steel (HRC18) |
| C | UTHR1010 | 35 | 140 | 4500 | 1000 | 10 | 6 | 0.06 | 粗加工 / 熱處理前加工(HRC18) Roughing / Un-Hardened Stainless Steel (HRC18) |
| D | UPZ1004 | 35 | 110 | 3500 | 1000 | 8 | 10 | 0.07 | 粗加工 / 熱處理前加工(HRC18) Roughing / Un-Hardened Stainless Steel (HRC18) |
| E | UVT1006 | 33 | 70 | 2200 | 400 | 20 | 0.1 | 0.03 | 精加工 / 熱處理後加工(HRC52) Finishing / Hardened Stainless Steel (HRC52) |
| F | UVTR1010 | 33 | 60 | 2000 | 350 | 20 | 0.1 | 0.04 | 精加工 / 熱處理後加工(HRC52) Finishing / Hardened Stainless Steel (HRC52) |
| G | UEX1004 | 33 | 80 | 2500 | 350 | 16 | 0.1 | 0.04 | 精加工 / 熱處理後加工(HRC52) Finishing / Hardened Stainless Steel (HRC52) |
| H | X-TD1003 | 30 | 160 | 5000 | 500 | 1.5 | 1.5 | 0.03 | 倒角 / 熱處理後加工(HRC52) Chamfering / Hardened Stainless Steel (HRC52) |
| I | TW07517 M10150 | 30 | 50 | 2000 | 120 | 16 | 0.15 | 0.02 | 銑牙 / 熱處理後加工(HRC52) Thread Milling / Hardened Stainless Steel (HRC52) |
| J | X-TW161830 | 40 | 50 | 1000 | 220 | 16 | 0.3 | 0.06 | 銑牙 / 熱處理後加工(HRC52) Thread Milling / Hardened Stainless Steel (HRC52) |
| K | DAK060 | 34 | 30 | 1700 | 150 | 12 | 6 | 0.04 | 鑽孔 / 熱處理後加工(HRC52) Drill / Hardened Stainless Steel (HRC52) |

切削實例 CUTTING DEMO

| | |
|--------------------------------|--|
| 切削材規格 Material Size (mm) | 總加工時間 Total Machining Time (min) |
| L150 x W150 x H35 | 13 |

被切削材 Work Material

不銹鋼STAVAX 熱處理前、後加工
Un-Hardened Stainless Steels / Hardened Stainless Steels
ASSAB : STAVAX (S136) (HRC18) / (HRC52)



Stainless Steel Cutting

| 標記 Label | 型號 Type No. | 刀具伸長量 Extension Length (mm) | 切削速度 Cutting Speed (m/min) | 迴轉速度 Speed (min ⁻¹) | 進給速度 Feed (mm/min) | 加工深度 Depth of Cut (a ₁) | 加工寬度 VWidth of Cut (a ₂) | 每刃 切削量 fz (mm) | 備註 Remark |
|-------------|----------------|--------------------------------------|-------------------------------------|---------------------------------------|--------------------------|--|---|-------------------------|--|
| A | WWB1004 | 35 | 85 | 2700 | 300 | 20 | 10 | 0.03 | 粗加工 / 熱處理前加工(HRC18) Roughing / Un-Hardened Stainless Steel (HRC18) |
| B | UEW1004 | 33 | 160 | 5000 | 1000 | 8 | 10 | 0.05 | 粗加工 / 熱處理前加工(HRC18) Roughing / Un-Hardened Stainless Steel (HRC18) |
| C | UTHR1010 | 35 | 140 | 4500 | 1000 | 10 | 6 | 0.06 | 粗加工 / 熱處理前加工(HRC18) Roughing / Un-Hardened Stainless Steel (HRC18) |
| D | UPZ1004 | 35 | 110 | 3500 | 1000 | 8 | 10 | 0.07 | 粗加工 / 熱處理前加工(HRC18) Roughing / Un-Hardened Stainless Steel (HRC18) |
| E | UVT1006 | 33 | 70 | 2200 | 400 | 20 | 0.1 | 0.03 | 精加工 / 熱處理後加工(HRC52) Finishing / Hardened Stainless Steel (HRC52) |
| F | UVTR1010 | 33 | 60 | 2000 | 350 | 20 | 0.1 | 0.04 | 精加工 / 熱處理後加工(HRC52) Finishing / Hardened Stainless Steel (HRC52) |
| G | UEX1004 | 33 | 80 | 2500 | 350 | 16 | 0.1 | 0.04 | 精加工 / 熱處理後加工(HRC52) Finishing / Hardened Stainless Steel (HRC52) |
| H | X-TD1003 | 30 | 160 | 5000 | 500 | 1.5 | 1.5 | 0.03 | 倒角 / 熱處理後加工(HRC52) Chamfering / Hardened Stainless Steel (HRC52) |
| I | TW07517 M10150 | 30 | 50 | 2000 | 120 | 16 | 1.5 | 0.02 | 銼牙 / 熱處理後加工(HRC52) Thread Milling / Hardened Stainless Steel (HRC52) |
| J | X-TW161830 | 40 | 50 | 1000 | 220 | 16 | 0.3 | 0.06 | 銼牙 / 熱處理後加工(HRC52) Thread Milling / Hardened Stainless Steel (HRC52) |
| K | DAK060 | 34 | 30 | 1700 | 150 | 12 | 6 | 0.04 | 鑽孔 / 熱處理後加工(HRC52) Drill / Hardened Stainless Steel (HRC52) |

DHF刀具推薦表 DHF SELECTION OF ENDMILLS

高速高硬度/破壞工/鋁用加工/標準/鈦好切/不鏽鋼/沖 系列 (HSC/HPC/ALU/STD/TAI/SUS/ECM) SERIES

平刀—粗銑 End Mills-Roughing

| 被切削材 Work Material | 第一推薦 First Selection | 第二推薦 Second Selection | 第三推薦 Third Selection |
|--|------------------------------|--------------------------|-------------------------|
| 沃斯田鐵系不銹鋼 <i>Stainless Steels : SUS304 : 1.4301 : AISI 304</i> (HRC 28~32) | UTH / UPZ / UPS / UPE UPG | ETH / ETB | ETA |
| | WWB | WWA / LFTH | LFTA |
| (麻田散鐵, 析出硬化) 系不銹鋼 <i>Stainless Steels : SUS420J2 / SUS630 : 1.2083 / 1.4542 : AISI 420 / 17-4PH</i> (HRC 28~32) | UTH / UPZ / UPS / UPE UPG | ETH / ETB | ETA |
| | WWB | WWA / LFTH | LFTA |

平刀—精銑 End Mills-Finishing

| 被切削材 Work Material | 第一推薦 First Selection | 第二推薦 Second Selection | 第三推薦 Third Selection |
|--|-------------------------|--------------------------|-------------------------|
| 沃斯田鐵系不銹鋼 <i>Stainless Steels : SUS304 : 1.4301 : AISI 304</i> (HRC 28~32) | VTB / UTH / UPE / UPS | ETB / ETH | ETA |
| | | LFTH | LFTA |
| (麻田散鐵, 析出硬化) 系不銹鋼 <i>Stainless Steels : SUS420J2 / SUS630 : 1.2083 / 1.4542 : AISI 420 / 17-4PH</i> (HRC 28~32) | VTB / UTH / UPE / UPS | ETB / ETH / ITH | ETA |
| | | LFTH | LFTA |

圓鼻刀—粗銑 Corner Radius End Mills-Roughing

| 被切削材 Work Material | 第一推薦 First Selection | 第二推薦 Second Selection | 第三推薦 Third Selection |
|--|--------------------------|--------------------------|-------------------------|
| 沃斯田鐵系不銹鋼 <i>Stainless Steels : SUS304 : 1.4301 : AISI 304</i> (HRC 28~32) | UTHR / UPJ ULR / ULXR | UPER | RTB |
| | | LRTD / LRTA | DLRA |
| (麻田散鐵, 析出硬化) 系不銹鋼 <i>Stainless Steels : SUS420J2 / SUS630 : 1.2083 / 1.4542 : AISI 420 / 17-4PH</i> (HRC 28~32) | UTHR / UPJ ULR / ULXR | UPER | RTB |
| | | LRTD / LRTA | DLRA |

圓鼻刀—精銑 Corner Radius End Mills-Finishing

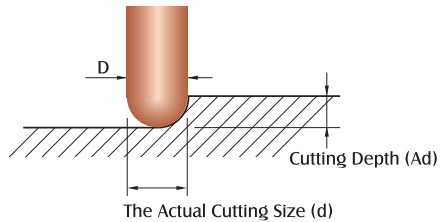
| 被切削材 Work Material | 第一推薦 First Selection | 第二推薦 Second Selection | 第三推薦 Third Selection |
|--|-------------------------|--------------------------|-------------------------|
| 沃斯田鐵系不銹鋼 <i>Stainless Steels : SUS304 : 1.4301 : AISI 304</i> (HRC 28~32) | UTHR ULR / ULXR | UPER | RTB |
| | | LRTD | LRTA |
| (麻田散鐵, 析出硬化) 系不銹鋼 <i>Stainless Steels : SUS420J2 / SUS630 : 1.2083 / 1.4542 : AISI 420 / 17-4PH</i> (HRC 28~32) | UTHR ULR / ULXR | UPER | RTB |
| | | LRTD | LRTA |

球刀實際切削直徑 BALL NOSE REAL CUTTING DIAMETER

| 球徑 R Ball R (mm) | 直徑 Ø Mill Dia. (mm) | 切削深度 (Ad) Depth of Cut (mm/min) | | | | | | | | | | | | | | |
|------------------------|---------------------------|---------------------------------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|-------|-------|
| | | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.08 | 0.1 | 0.15 | 0.2 | 0.3 | 0.5 | 0.8 | 1.0 | 2.0 | 3.0 |
| 0.1 | 0.2 | 0.087 | 0.12 | 0.143 | 0.16 | 0.173 | 0.196 | 0.2 | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| 0.2 | 0.4 | 0.125 | 0.174 | 0.211 | 0.24 | 0.265 | 0.32 | 0.35 | 0.39 | 0.4 | ---- | ---- | ---- | ---- | ---- | ---- |
| 0.3 | 0.6 | 0.154 | 0.215 | 0.262 | 0.299 | 0.332 | 0.41 | 0.45 | 0.52 | 0.57 | 0.6 | ---- | ---- | ---- | ---- | ---- |
| 0.4 | 0.8 | 0.178 | 0.25 | 0.304 | 0.349 | 0.387 | 0.48 | 0.53 | 0.62 | 0.63 | 0.77 | 0.77 | ---- | ---- | ---- | ---- |
| 0.5 | 1 | 0.199 | 0.28 | 0.341 | 0.392 | 0.436 | 0.54 | 0.6 | 0.71 | 0.8 | 0.92 | 1 | ---- | ---- | ---- | ---- |
| 1 | 2 | 0.282 | 0.398 | 0.486 | 0.56 | 0.624 | 0.78 | 0.87 | 1.05 | 1.2 | 1.43 | 1.73 | 1.96 | 2 | ---- | ---- |
| 1.5 | 3 | 0.346 | 0.488 | 0.597 | 0.688 | 0.768 | 0.97 | 1.08 | 1.31 | 1.5 | 1.8 | 2.24 | 2.65 | 2.83 | 2.83 | ---- |
| 2 | 4 | 0.399 | 0.564 | 0.69 | 0.796 | 0.889 | 1.12 | 1.25 | 1.52 | 1.74 | 2.11 | 2.65 | 3.2 | 3.46 | 4 | ---- |
| 2.5 | 5 | 0.447 | 0.631 | 0.772 | 0.891 | 0.995 | 1.25 | 1.4 | 1.71 | 1.96 | 2.37 | 3 | 3.67 | 4 | 4.9 | 4.9 |
| 3 | 6 | 0.489 | 0.692 | 0.846 | 0.977 | 1.091 | 1.38 | 1.54 | 1.87 | 2.15 | 2.62 | 3.32 | 4.08 | 4.47 | 5.66 | 6 |
| 4 | 8 | 0.565 | 0.799 | 0.978 | 1.129 | 1.261 | 1.59 | 1.78 | 2.17 | 2.5 | 3.04 | 3.87 | 4.8 | 5.29 | 6.93 | 7.75 |
| 5 | 10 | 0.632 | 0.894 | 1.094 | 1.262 | 1.411 | 1.78 | 1.99 | 2.43 | 2.8 | 3.41 | 4.36 | 5.43 | 6 | 8 | 9.17 |
| 6 | 12 | 0.693 | 0.979 | 1.198 | 1.383 | 1.546 | 1.95 | 2.18 | 2.67 | 3.07 | 3.75 | 4.8 | 5.99 | 6.63 | 8.94 | 10.39 |
| 7 | 14 | 0.748 | 1.058 | 1.295 | 1.495 | 1.67 | 2.11 | 2.36 | 2.88 | 3.32 | 4.05 | 5.2 | 66.5 | 7.21 | 9.8 | 11.49 |
| 8 | 16 | 0.8 | 1.131 | 1.384 | 1.598 | 1.786 | 2.26 | 2.52 | 3.08 | 3.56 | 4.34 | 5.57 | 6.97 | 7.75 | 10.58 | 12.49 |
| 9 | 18 | 0.848 | 1.199 | 1.468 | 1.695 | 1.895 | 2.39 | 2.68 | 3.27 | 3.77 | 4.61 | 5.92 | 7.42 | 8.25 | 11.31 | 13.42 |
| 10 | 20 | 0.894 | 1.264 | 1.548 | 1.787 | 1.997 | 2.52 | 2.82 | 3.45 | 3.98 | 4.86 | 6.24 | 7.84 | 8.72 | 12 | 14.28 |

實際直徑計算 CALCULATION OF REAL DIA.

$$d = 2\sqrt{Ad(D-Ad)}$$





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