

QUALITY+

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代理商尋求中

Distributor



高速 及 高硬度 切削用

High Speed Cutting
& High Hard Cutting



Vol. 2008
HSC & HHC

鎢鋼種類 Carbide



極超微粒。
Super Micro Grain.

顆粒大小 Grain Size



粉末顆粒是0.2μm。
Grain size is 0.2μm.



粉末顆粒是0.4μm。
Grain size is 0.4μm.

螺旋角度 Helix Angle



螺旋角度是 0°, 5°, 25°, 30°, 35°, 45°。
Helix is 0°, 5°, 25°, 30°, 35°, 45°.

被加工材質的硬度

Work Material Hardness



被切削工件硬度是在HRC60以下。
Work material hardness is up to HRC60.



被切削工件硬度是在HRC65以下。
Work material hardness is up to HRC65.



特別適用於3D曲面切削。
Good at three-dimensional curved surface cutting.

縮頸 Shrink Neck



適用於深溝加工。
Best for long neck machining.

刃數 Flute



鍍層種類 Coating



適用於高速及高硬度切削。
乾式切削、油霧切削。
Good at high speed cutting & high hard cutting.
For dry cutting and MQL.



適用於高速及高硬度切削。
乾式切削、油霧切削。
Good at high speed cutting & high hard cutting.
For dry cutting and MQL.



適用於高速及高硬度切削。
乾式切削、油霧切削、濕式切削（乾濕兩用）。
Good at high speed cutting & high hard cutting.
For dry cutting, MQL, and wet cutting.



適用於高速及高硬度切削。
乾式切削、油霧切削、濕式切削（乾濕兩用）。
Good at high speed cutting & high hard cutting.
For dry cutting, MQL, and wet cutting.

圓隅角 Corner R



圓隅角。
Corner Radius.

切削性能

Cutting Performance



禁止
No



尚可
Acceptable



良
Good

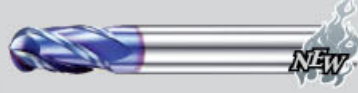
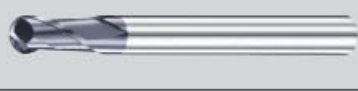
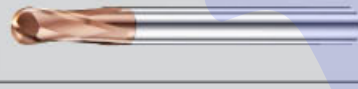
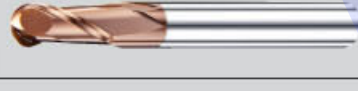
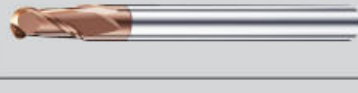
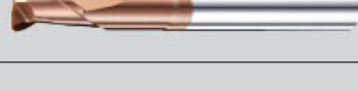


優
Excellent

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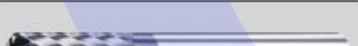
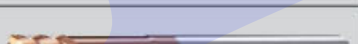
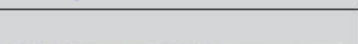
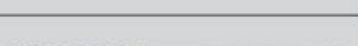
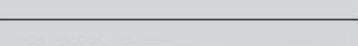
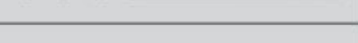
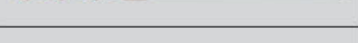
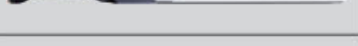
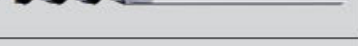
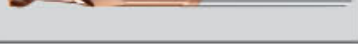
產品型號 Type No.	產品圖片 Photo	被切削材 Work Material									
		鑄鐵 Cast Iron	碳鋼 Carbon Steels	合金鋼・工具鋼 Alloy Steels, Tool Steels	預硬化鋼 Prehardened Steels	不銹鋼 Stainless Steels	鈦合金 Titanium Alloys	耐熱合金鋼 高溫合金鋼 Heat Resistant Alloy Steels High temp Alloys Steels	熱處理鋼 ~55HRC Hardened Steels	熱處理鋼 55HRC~ Hardened Steels	
UBT-4T P. 4		★★★★	★★★★	★★★★	★★★★	★★★★	★	★	★★★★	★★★★	
UOB P. 5		★	★	★★	★★	★			★★★★	★★★★	
UBX P. 6		★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★	★	
UHBX UIBX, UJBX P. 7		★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★	★	
UBT-2T P. 8		★★	★★	★★★★	★★★★	★★	★★	★★★★	★★★★	★★★★	
UHT UBT, UBT P. 9		★★	★★	★★★★	★★★★	★★	★★	★★★★	★★★★	★★★★	
UQB P. 10		★★★★	★★	★★★★	★★★★	★★	★★	★★	★★★★	★★★★	
UBG P. 12		★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	
UHBG UIBG P. 13		★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	
UB P. 14		★★	★★	★★★★	★★★★	★★★★	★★	★★	★★★★	★	
UHB UIB, UJB P. 15		★★	★★	★★★★	★★★★	★★★★	★★	★★	★★★★	★	
UPB P. 16		★★★★	★★★★	★★★★	★★★★	★★★★	★★	★★	★★	★	
USB P. 17		★★★★	★★★★	★★★★	★★★★	★★★★	★★	★★	★★	★	
UOR P. 18		★★★★	★★	★★★★	★★★★	★			★★★★	★★	
UKR P. 20		★★★★	★★★★	★★★★	★★★★	★★★★	★★	★★	★★★★	★	
UNR P. 21		★★★★	★★★★	★★★★	★★★★	★★	★★	★★	★★	★	
UXR P. 22		★★	★★★★	★★★★	★★★★	★★★★	★★	★★	★★★★	★★	

Page. 44 球刀實際切削直徑 / Ball Nose Real Cutting Diameter

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Page. 47 產品回函卡 / Reply



產品型號 Type No.	產品圖片 Photo	被切削材 Work Material								
		鑄鐵 Cast Iron	碳鋼 Carbon Steels	合金鋼、工具鋼 Alloy Steels, Tool Steels	調質鋼 Prehardened Steels	不銹鋼 Stainless Steels	鈦合金 Titanium Alloys	耐熱合金鋼 高溫合金鋼 Heat Resistant Alloy Steels High Temp Alloy Steels	熱處理鋼 ~55HRC Hardened Steels	熱處理鋼 55HRC~ Hardened Steel
頁碼 Page										
ULXR P. 23		★★	★★★★	★★★★	★★★★	★★★★	★★	★★	★★★★	★★
UER P. 24			★★★★	★★★★	★★★★	★★★★	★★	★★	★★★★	★★
ULR P. 25			★★★★	★★★★	★★★★	★★★★	★★	★★	★★★★	★★
UGR P. 26		★★★★	★★	★★★★	★★★★	★★	★★	★★★★	★★★★	★★★★
UPR P. 27		★★★★	★★	★★★★	★★★★	★★	★★	★★★★	★★★★	★★★★
UYR P. 28		★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★
UZR P. 29		★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★
UVTR P. 30			★★	★★★★	★★★★	★★	★★	★★	★★★★	★★★★
UVR P. 31			★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★
UHR P. 32			★★	★★	★★	★★	★★	★★	★★	★
UVT P. 33			★★	★★★★	★★★★	★★	★★	★★	★★★★	★★★★
UEX P. 34			★★★★	★★	★★★★	★★	★★	★★	★★★★	★★★★
UPS P. 36			★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★	★
UET-2T P. 38		★★	★★★★	★★	★★	★	★	★	★★	
UET-4T P. 40			★★★★	★★★★	★★★★	★	★	★	★★	★
ULE-2T P. 42			★★★★	★★★★	★★	★	★	★	★★	
ULE-4T P. 43			★★★★	★★★★	★★	★	★	★	★★	



極超微粒圓頭立銑刀

Ball Nose End Mills



型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UBT0204	R1	4	50	6
UBT0304	R1.5	6	50	6
UBT0404	R2	8	50	6
UBT0504	R2.5	10	50	6
UBT0604	R3	12	50	6
UBT0804	R4	16	60	8
UBT1004	R5	20	75	10
UBT1204	R6	24	75	12

unit: mm

List of recommended milling conditions for UBT-4T (Roughing)

被切削材 Work Material	Mild steels, Carbon steels, Cast iron, Alloy steels, Tool steels, SS400, SS50C, FC, SCM, SKT, SKS, SKD	Prehardened steels, SKT, SKD, NAK55, HPM1 (30~38HRC)	Prehardened steels, SKT, SKD, NAK60, HPM50 (38~45HRC)	Hardened steels, (45~55HRC)	Hardened steels, (55~60HRC)	Hardened steels, (60~65HRC)
型號 Type No.	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)
UBT0604	11100	4060	8380	3060	7960	2600
UBT0804	8360	3960	6290	2980	5970	2520
UBT1004	6680	3850	5030	2900	4770	2440
UBT1204	5570	3570	4190	2660	3980	2140
UBT1604	4180	2670	3140	2010	2980	1720
UBT2004	3340	2140	2510	1610	2390	1380

加工深度 Depth of cut 直徑 D : Diameter	a_p	a_a	a_p	a_a	a_p	a_a
	$D \leq \phi 1$	0.1D	0.2D	$D \leq \phi 1$	0.1D	0.1D
	$\phi 6 < D$	0.1D	0.2D	$\phi 4 < D$	0.05D	0.1D
	a_a Max=below 1mm		a_a Max=below 0.5mm		a_a Max=below 0.5mm	

● The machining path is on condition of contouring line operation.

List of recommended milling conditions for UBT-4T (Finishing)

被切削材 Work Material	Mild steels, Carbon steels, Cast iron, Alloy steels, Tool steels, SS400, SS50C, FC, SCM, SKT, SKS, SKD	Prehardened steels, SKT, SKD, NAK55, HPM1 (30~38HRC)	Prehardened steels, SKT, SKD, NAK60, HPM50 (38~45HRC)	Hardened steels, (45~55HRC)	Hardened steels, (55~60HRC)	Hardened steels, (60~65HRC)
型號 Type No.	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)
UBT0604	11900	5270	9280	3920	8750	3530
UBT0804	8950	4580	6960	3570	6570	3030
UBT1004	7160	4130	5570	3210	5250	2690
UBT1204	5970	3820	4640	2970	4380	2520
UBT1604	4480	2860	3480	2230	3280	1890
UBT2004	3580	2290	2790	1780	2630	1510

加工深度 Depth of cut 直徑 D : Diameter	a_p	a_a	a_p	a_a
	$D \leq \phi 1$	0.02D	0.05D	0.05D

● The machining path is on condition of contouring line operation.



直徑 D1
球徑公差值 R tolerance

R0.5	±0.01
R0.75	±0.01
R1.0	±0.01
R1.5	±0.01
R2.0	±0.01
R2.5	±0.01
R3	±0.01
R4	±0.01
R5	±0.015
R6	±0.015
R8	±0.02
柄徑公差值 D2 tolerance	
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø 10	0 -0.009
Ø 12	0 -0.011
Ø 16	0 -0.011



極超微粒直刃圓頭立銑刀

Ball Nose End Mills

型號 Type No.	直徑 D1 Diameter	頸徑 D3 Neck Dia	刃長 L1 Flute Length	有效長 L2 Effective Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UOB0102	R0.5	0.95	1	3	50	4
UOB0152	R0.75	1.44	2	5	50	4
UOB0202	R1	1.92	3	6	50	6
UOB0302S	R1.5	2.90	4	8	50	4
UOB0302	R1.5	2.90	4	8	50	6
UOB0302L	R1.5	2.90	4	8	75	6
UOB0402S	R2	3.90	5	10	50	4
UOB0402	R2	3.90	5	10	50	6
UOB0402L	R2	3.90	5	10	75	6
UOB0602	R3	5.80	6	12	50	6
UOB0602M	R3	5.80	6	12	75	6
UOB0602L	R3	5.80	6	16	100	6
UOB0802	R4	7.70	8	16	60	8
UOB0802L	R4	7.70	8	25	100	8
UOB1002	R5	9.60	10	20	75	10
UOB1002L	R5	9.60	10	30	100	10

unit: mm

精銑
Finishing

中銑
Semi-finishing

粗銑
Roughing



直徑 D1
球徑公差值 R tolerance

R0.5	±0.01
R0.75	±0.01
R1	±0.01
R1.5	±0.01
R2	±0.01
R3	±0.01
R4	±0.01
R5	±0.01
柄徑公差值 D2 tolerance	
Ø 4	0 -0.008
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø 10	0 -0.009

List of recommended milling conditions for UOB

被切削材 Work Material	NAK80 HRC40		SKD61 HRC50		SKD11 HRC60	
型號 Type No.	Speed (mm- ¹)	Feed (mm/min)	Speed (mm- ¹)	Feed (mm/min)	Speed (mm- ¹)	Feed (mm/min)
UOB0202	40000	2000	15000	1200	10000	1000
UOB0302	26000	2000	15000	1200	10000	1000
UOB0302L	26000	2000	15000	1200	10000	1000
UOB0402	20000	3200	15000	1200	10000	1000
UOB0402L	20000	3200	15000	1200	10000	1000
UOB0602	13000	4800	10000	4000	6400	1500
UOB0602L	13000	4800	10000	4000	6400	1500
UOB0802	10000	4000	10000	3600	4800	1500
UOB0802L	10000	4000	10000	3600	4800	1500
UOB1002	8000	3600	8000	3200	3800	1500
UOB1002L	8000	3600	8000	3200	3800	1500

加工深度 Depth of cut 直徑 D : Diameter	$a_p=0.3D$ $a_a=0.05D$	$a_p=0.15D$ $a_a=0.4D$	$a_p=0.1D$ $a_a=0.3D$
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極超微粒圓頭立銼刀

Ball Nose End Mills

型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UBX0102	R0.5	2	50	6
UBX0152	R0.75	3	50	6
UBX0202	R1	4	50	6
UBX0302	R1.5	6	50	6
UBX0402	R2	8	50	6
UBX0502	R2.5	10	50	6
UBX0602	R3	12	50	6
UBX0802	R4	16	60	8
UBX1002	R5	20	75	10
UBX1202	R6	24	75	12
UBX1602	R8	32	100	16

unit: mm

List of recommended milling conditions for UBX

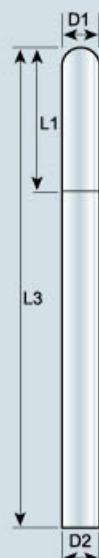
被切削材 Work Material	HRC42-48	HRC48-52	HRC52-56	HRC56-63
切削速度 Cutting Speed (V)	200 m/min	160 m/min	130 m/min	100 m/min
型號 Type No.	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)
UBX0302	60000 7200	50000 6000	40000 4800	10600 1200
UBX0402	46550 7500	37000 6000	30000 4800	8000 1200
UBX0502	37500 7500	30000 6000	24000 4800	6400 1200
UBX0602	31000 5600	25000 4500	20000 3600	5300 950
UBX0802	23000 5600	18500 4500	15000 3600	4000 950
UBX1002	18500 5600	15000 4500	12000 3600	3200 950
UBX1202	15500 3700	12500 3000	10000 2400	2650 850
UBX1602	11500 3700	9300 3000	7500 2400	2000 850

加工深度
Depth of cut
直徑
D : Diameterap=0.06D
aa=0.03D

被切削材 Work Material	HRC42-48	HRC48-52	HRC52-56	HRC56-63
切削速度 Cutting Speed (V)	250 m/min	200 m/min	180 m/min	140 m/min
型號 Type No.	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)
UBX0302	31500 2800	25000 2200	22500 2000	15000 1350
UBX0402	23500 2800	19000 2200	17000 2000	11000 1350
UBX0502	19000 2800	15000 2200	13500 2000	9000 1350
UBX0602	15800 1850	12500 1500	11000 1300	7400 880
UBX0802	12000 1850	9500 1500	8500 1300	5500 880
UBX1002	9500 1850	7500 1500	6800 1300	4500 880
UBX1202	7800 950	6300 750	5600 700	3700 450
UBX1602	5900 950	4700 750	4200 700	2800 450

加工深度
Depth of cut
直徑
D : Diameter6.0 down ap=0.15D
6.0 up ap=0.10D
aa=0.012D

直徑 D1	球徑公差值 R tolerance
R0.5	±0.01
R0.75	±0.01
R1.0	±0.01
R1.5	±0.01
R2.0	±0.01
R2.5	±0.01
R3	±0.01
R4	±0.01
R5	±0.015
R6	±0.015
R8	±0.02
柄徑 shank (h6)	柄徑公差值 D2 tolerance
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø 10	0 -0.009
Ø 12	0 -0.011
Ø 16	0 -0.011



Long Shank



極超微粒長柄圓頭立銼刀

Ball Nose End Mills

型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UHBX0302	R1.5	6	75	6
UHBX0402	R2	8	75	6
UHBX0502	R2.5	10	75	6
UHBX0602	R3	12	75	6
UHBX0802	R4	16	75	8
UIBX0602	R3	12	100	6
UIBX0802	R4	16	100	8
UIBX1002	R5	20	100	10
UIBX1202	R6	24	100	12

unit: mm

UJBX1002	R5	20	150	10
UJBX1202	R6	24	150	12
UJBX1602	R8	32	200	16
UJBX2002	R10	40	200	20

List of recommended milling conditions for UHBX, UIBX

被切削材 Work Material	HRC30-50	HRC50-55	HRC55-62
切削速度 Cutting Speed (V)	200 m/min	180 m/min	100 m/min
型號 Type No.	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)
UHBX0302	21000 3200	19000 2900	10600 1500
UHBX0402	16000 3200	14000 2900	8000 1500
UHBX0502	12750 3200	11450 2900	6400 1500
UHBX0602	10600 2000	9500 1800	5300 1200
UHBX0802	8000 2000	7200 1800	4000 1200
UIBX0602	10600 2000	9500 1800	5300 1200
UIBX0802	8000 2000	7200 1800	4000 1200
UIBX1002	6400 2000	5700 1800	3200 1200
UIBX1202	5300 1800	5700 1600	2700 1200
UIBX1602	4000 1600	3600 1500	2000 1100

加工深度
Depth of cut
直徑
D : Diameterap=0.05D
aa=0.025D

直徑 D1	球徑公差值 R tolerance
R1.5	±0.01
R2.0	±0.01
R2.5	±0.01
R3	±0.01
R4	±0.01
R5	±0.01
R6	±0.015
R8	±0.02
R10	±0.02
柄徑 shank (h6)	柄徑公差值 D2 tolerance
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø 10	0 -0.009
Ø 12	0 -0.011
Ø 16	0 -0.011
Ø 20	0 -0.013





極超微粒圓頭立銑刀

Ball Nose End Mills

型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UBT0102	R0.5	2.0	50	4
UBT0152	R0.75	3.0	50	4
UBT0202	R1	4.0	50	6
UBT0302	R1.5	6.0	50	6
UBT0402	R2	8.0	50	6
UBT0502	R2.5	10.0	50	6
UBT0602	R3	12.0	50	6
UBT0802	R4	16.0	60	8
UBT1002	R5	20.0	75	10
UBT1202	R6	24.0	75	12
UBT1602	R8	32.0	100	16

unit: mm

List of recommended milling conditions for UBT

被切削材 Work Material	Carbon Steels S45C, S50C HB150-250	Alloy Steels SCM420, PDS3, PDS3, SKD11 HRC20-35	Prehardened Steels NAK80 HRC35-45	Hardened Steels SKD61 HRC45-55
切削速度 Cutting Speed (V)	375 m/min	314 m/min	314 m/min	250 m/min
型號 Type No.	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)
UBT0202	25000 1800	20000 1200	20000 1200	15000 1200
UBT0302	25000 1800	20000 1200	20000 1200	15000 1200
UBT0402	22000 1200	18000 1000	18000 1000	15000 1200
UBT0602	20000 6000	16500 5000	16500 5000	13000 4500
UBT0802	15000 5000	12500 4500	12500 4500	10000 3600
UBT1002	12000 4500	10000 4000	10000 4000	8000 3200
UBT1202	10000 4000	8300 3200	8300 3200	6600 2000

加工深度 Depth of cut 直徑 D : Diameter	a_p a_a	$a_p=0.5D$ $a_a=0.2-0.3D$	$a_p=0.3D$ $a_a=0.2-0.3D$	$a_p=0.15D$ $a_a=0.05-0.04D$
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被切削材 Work Material	HRC42-48	HRC48-52	HRC52-56	HRC56-63
切削速度 Cutting Speed (V)	200 m/min	160 m/min	130 m/min	100 m/min
型號 Type No.	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)
UBT0302	60000 7200	50000 6000	40000 4800	10600 1200
UBT0402	46550 7500	37000 6000	30000 4800	8000 1200
UBT0502	37500 7500	30000 6000	24000 4800	6400 1200
UBT0602	31000 5600	25000 4500	20000 3600	5300 950
UBT0802	23000 5600	18500 4500	15000 3600	4000 950
UBT1002	18500 3700	15000 4500	12000 3600	3200 950
UBT1202	15500 3700	12500 3000	10000 2400	2650 850
UBT1602	11500 3700	9300 3000	7500 2400	2000 850

加工深度 Depth of cut 直徑 D : Diameter	a_p a_a	$a_p=0.06D$ $a_a=0.03D$
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被切削材 Work Material	HRC42-48	HRC48-52	HRC52-56	HRC56-63
切削速度 Cutting Speed (V)	250 m/min	200 m/min	180 m/min	140 m/min
型號 Type No.	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)
UBT0302	31500 2800	25000 2200	22500 2000	15000 1350
UBT0402	23500 2800	19000 2200	17000 2000	11000 1350
UBT0502	19000 2800	15000 2200	13500 2000	9000 1350
UBT0602	15800 1850	12500 1500	11000 1300	7400 880
UBT0802	12000 1850	9500 1500	8500 1300	5500 880
UBT1002	9500 1850	7500 1500	6800 1300	4500 880
UBT1202	7800 950	6300 750	5600 700	3700 450
UBT1602	5900 950	4700 750	4200 700	2800 450

加工深度 Depth of cut 直徑 D : Diameter	a_p a_a	6.0 down $a_p=0.15D$ 6.0 up $a_p=0.10D$ $a_a=0.012D$
--	----------------	--

直徑 D1	球徑公差值 R tolerance
R0.5	±0.01
R0.75	±0.01
R1	±0.01
R1.5	±0.01
R2	±0.01
R2.5	±0.01
R3	±0.01
R4	±0.01
R5	±0.015
R6	±0.015
R8	±0.02
柄徑 shank (h6)	柄徑公差值 D2 tolerance
Ø 4	0 -0.008
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø 10	0 -0.009
Ø 12	0 -0.011
Ø 16	0 -0.011

Long Shank



極超微粒長柄圓頭立銑刀

Ball Nose End Mills

型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UHBT0302	R1.5	6	75	6
UHBT0402	R2	8	75	6
UHBT0502	R2.5	10	75	6
UHBT0602	R3	12	75	6
UHBT0802	R4	16	75	8
UIBT0602	R3	12	100	6
UIBT0802	R4	16	100	8
UIBT1002	R5	20	100	10
UIBT1202	R6	24	100	12
UJBT1002	R5	20	150	10
UJBT1202	R6	24	150	12
UJBT1602	R8	32	200	16
UJBT2002	R10	40	200	20

unit: mm

List of recommended milling conditions for UHBT, UIBT

被切削材 Work Material	HRC30-50	HRC50-55	HRC55-62
切削速度 Cutting Speed (V)	200 m/min	180 m/min	100 m/min
型號 Type No.	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)
UHBT0302	21000 3200	19000 2900	10600 1500
UHBT0402	16000 3200	14000 2900	8000 1500
UHBT0502	12750 3200	11450 2900	6400 1500
UHBT0602	10600 2000	9500 1800	5300 1200
UHBT0802	8000 2000	7200 1800	4000 1200
UIBT0602	10600 2000	9500 1800	5300 1200
UIBT0802	8000 2000	7200 1800	4000 1200
UIBT1002	6400 2000	5700 1800	3200 1200
UIBT1202	5300 1800	5700 1600	2700 1200
UIBT1602	4000 1600	3600 1500	2000 1100

加工深度 Depth of cut 直徑 D : Diameter	a_p a_a	$a_p=0.05D$ $a_a=0.025D$
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直徑 D1	球徑公差值 R tolerance
R1.5	±0.01
R2	±0.01
R2.5	±0.01
R3	±0.01
R4	±0.01
R5	±0.01
R6	±0.015
R8	±0.02
R10	±0.02
柄徑 shank (h6)	柄徑公差值 D2 tolerance
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø 10	0 -0.009
Ø 12	0 -0.011
Ø 16	0 -0.011
Ø 20	0 -0.013



極超微粒短刃圓頭立銑刀

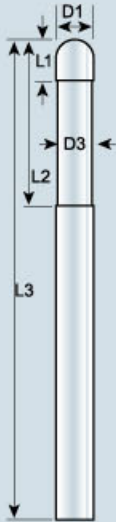
Ball Nose End Mills

型號 Type No.	直徑 D1 Diameter	頸徑 D3 Neck Dia	刃長 L1 Flute Length	有效長 L2 Effective Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UQB0102	R0.5	0.95	1	2.5	50	4
UQB0152	R0.75	1.45	1	3	50	4
UQB0202	R1	1.92	1.5	5	50	4
UQB0302S	R1.5	2.90	2	8	50	4
UQB0302	R1.5	2.90	2	8	50	6
UQB0402S	R2	3.90	4	10	50	4
UQB0402	R2	3.90	4	10	50	6
UQB0502	R2.5	4.80	5	13	50	6
UQB0602	R3	5.80	6	15	50	6
UQB0802	R4	7.70	8	20	60	8
UQB1002	R5	9.60	10	25	75	10
UQB1202	R6	11.5	12	30	75	12

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

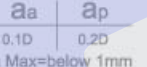
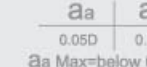
List of recommended milling conditions for UQB

			被切削材 Work Material		HRC25-35		HRC35-45		HRC45-55		HRC55-65			
			切削速度 Cutting Speed (V)		314 m/min		250 m/min		200 m/min		160 m/min			
			型號 Type No.		Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)		
			UQB0402S		25000	3000	20000	2400	16000	2000	12800	1500		
			UQB0402		25000	3000	20000	2400	16000	2000	12800	1500		
			UQB0502		20000	3000	16000	2400	12800	2000	10000	1500		
			UQB0602		16500	3000	13000	2400	10000	2000	8500	1500		
			UQB0802		12500	2000	10000	1600	8000	1300	6400	1000		
			UQB1002		10000	2000	8000	1600	6400	1300	5100	1000		
			UQB1202		8300	2000	6600	1600	5300	1300	4200	1000		
			柄徑公差值 shank (h8) D2 tolerance			加工深度 Depth of cut 直徑 D : Diameter				6.0 down 6.0 up		ap=0.15D ap=0.10D aa=0.012D		
R0.5			±0.01											
R0.75			±0.01											
R1.0			±0.01											
R1.5			±0.01											
R2.0			±0.01											
R2.5			±0.01											
R3			±0.01											
R4			±0.01											
R5			±0.015											
R6			±0.015											
Ø 4			0 -0.008											
Ø 6			0 -0.008											
Ø 8			0 -0.008											
Ø10			0 -0.009											
Ø12			0 -0.011											

High Speed Milling conditions for UQB

High Speed Roughing

* The conditions below are for high speed / high precision machining centers.

被切剛材 Work Material	Mild steels, Carbon steels, Cast iron, Alloy steels, FC, Tool steels, SS400, S55C, SCM		Prehardened steels, SKT, SKD, NAK55, HPM1 (30~38HRC)		Prehardened steels, SKT, SKD, NAK80, HPM50 (38~45HRC)		Hardened steels, (45~55HRC)		Hardened steels, (55~60HRC)		Hardened steels, (60~65HRC)	
型號 Type No.	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)
UQB0302	33400	4610	32400	4470	31800	3630	26500	2860	20200	1940	18000	1570
UQB0402	25100	4410	24300	4270	23900	3530	19900	2710	15100	1870	13500	1520
UQB0502	20100	4210	19400	4080	19100	3340	15900	2550	12100	1810	10800	1460
UQB0602	16700	3810	16180	3690	15900	3250	13300	2390	10100	1690	9020	1410
UQB0802	12500	3710	12100	3590	11900	3150	9950	2310	7560	1630	6760	1350
UQB1002	10000	3610	9710	3500	9550	3060	7960	2230	6050	1570	5410	1300
UQB1202	8360	3340	8090	3240	7960	2670	6630	2070	5040	1450	4510	1080
加工深度 Depth of cut 直徑 D : Diameter												
	0.1D 0.2D		0.1D 0.2D		0.08D 0.2D		0.08D 0.2D		0.05D 0.1D		0.05D 0.1D	
	aa Max=below 1mm		aa Max=below 1mm		aa Max=below 0.8mm		aa Max=below 0.8mm		aa Max=below 0.5mm		aa Max=below 0.5mm	

- Use a rigid and precise machine and holder.
- We suggest using air blow or MQL(mist).
- The above conditions shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur, depending on the machining shape, cutting amount, rigidity of the machine or work holding condition, etc., please adjust the speed, feed and the depth of cut.
- When the radius of curvature is less than 1.8 times of the tool diameter, please reduce the speed to 50-80%, the feed rate to 50-80%, and the pick feed to 20-60% of the above shown cutting conditions.
- If the cutting depth is small, it is possible to further increase the speed and feed.

High Speed Finishing

* The conditions below are for high speed / high precision machining centers.

被切剛材 Work Material	Mild steels, Carbon steels, Cast iron, Alloy steels, FC, Tool steels, SS400, S55C, SCM		Prehardened steels, SKT,SKD,NAK55, HPM1 (30~38HRC)		Prehardened steels, SKT,SKD,NAK80, HPM50 (38~45HRC)		Hardened steels, (45~55HRC)		Hardened steels, (55~60HRC)		Hardened steels, (60~65HRC)	
型號 Type No.	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)
UQB0302	36100	5840	34000	5300	32900	4930	27600	4140	22300	3070	20100	2420
UQB0402	27100	5410	25500	4890	24700	4540	20700	3810	16700	2810	15100	2180
UQB0502	21600	5190	20400	4690	19700	4340	16500	3390	13400	2540	12100	2060
UQB0602	18000	4980	17000	4480	16400	4140	13800	3140	11100	2270	10100	1940
UQB0802	13500	4330	12700	4070	12300	3550	10300	2650	8360	2010	7560	1690
UQB1002	10800	3900	10200	3670	9870	3160	8280	2320	6680	1740	6050	1450
UQB1202	9020	3610	8490	3400	7980	2870	6900	2150	5570	1600	5040	1210
加工深度 Depth of cut 直徑 D : Diameter												
			aa ap 0.08D 0.05D aa Max=below 0.3mm									

- Use a rigid and precise machine and holder.
- We suggest using air blow or MQL(mist).
- The above conditions shows an approximate standard for contouring operation (side milling) with a low machining load. If abnormal cutting sounds, vibration or chattering occur, depending on the machining shape, cutting amount, rigidity of the machine or work holding condition, etc., please adjust the speed, feed and the depth of cut.
- When the radius of curvature is less than 1.8 times of the tool diameter, please reduce the speed to 50-80%, the feed rate to 50-80%, and the pick feed to 20-60% of the above shown cutting conditions.
- If the cutting depth is small, it is possible to further increase the speed and feed.



極超微粒圓頭立銑刀

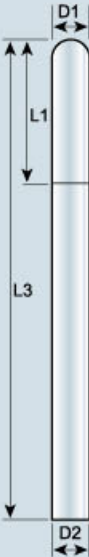
Ball Nose End Mills

型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UBG0102	R0.5	2	50	4
UBG0152	R0.75	3	50	4
UBG0202	R1	4	50	4
UBG0302	R1.5	6	50	4
UBG0402	R2	8	50	4
UBG0502	R2.5	10	50	6
UBG0602	R3	12	50	6
UBG0802	R4	16	60	8
UBG1002	R5	20	75	10
UBG1202	R6	24	75	12
UBG1602	R8	32	100	16

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

List of recommended milling conditions for UBG

	DHF	直徑 D1	球徑公差值 R tolerance	被切削材 Work Material	HRC20-30		HRC30-40		HRC40-50		HRC50-58	
		R0.5	±0.01	切削速度 Cutting Speed (V)	314 m/min		250 m/min		200 m/min		160 m/min	
		R0.75	±0.01	型號 Type No.	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
		R1.0	±0.01	UBG0402	25000	3000	20000	2400	16000	2000	12800	1500
		R1.5	±0.01	UBG0502	20000	3000	16000	2400	12800	2000	10000	1500
		R2.0	±0.01	UBG0602	16500	3000	13000	2400	10000	2000	8500	1500
		R2.5	±0.01	UBG0802	12500	2000	10000	1600	8000	1300	6400	1000
		R3	±0.01	UBG1002	10000	2000	8000	1600	6400	1300	5100	1000
		R4	±0.01	UBG1202	8300	2000	6600	1600	5300	1300	4200	1000
		R5	±0.015		加工深度 Depth of cut		6.0 down		ap=0.15D			
		R6	±0.015		直徑 Diameter		6.0 up		ap=0.10D			
		R8	±0.02					aa=0.012D				
	柄徑 shank (h6)	柄徑公差值 D2 tolerance										
	Ø 4	0 -0.008										
	Ø 6	0 -0.008										
	Ø 8	0 -0.008										
	Ø10	0 -0.009										
	Ø12	0 -0.011										
	Ø16	0 -0.011										

Long Shank



極超微粒長柄圓頭立銑刀

Ball Nose End Mills

型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UHBG0202	R1	4	75	6
UHBG0302	R1.5	6	75	6
UHBG0402	R2	8	75	6
UHBG0502	R2.5	10	75	6
UHBG0602	R3	12	75	6
UHBG0802	R4	16	75	8
UIBG0402	R2	8	100	6
UIBG0602	R3	12	100	6
UIBG0802	R4	16	100	8
UIBG1002	R5	20	100	10
UIBG1202	R6	24	100	12

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

List of recommended milling conditions for UHBG

	直徑 D1	球徑公差值 R tolerance
	R1	±0.01
	R1.5	±0.01
	R2	±0.01
	R2.5	±0.01
	R3	±0.01
	R4	±0.01
	R5	±0.01
	R6	±0.015
	柄徑 shank (h6)	柄徑公差值 D2 tolerance
	Ø 6	$\begin{matrix} 0 \\ -0.008 \end{matrix}$
	Ø 8	$\begin{matrix} 0 \\ -0.008 \end{matrix}$
Ø10	$\begin{matrix} 0 \\ -0.009 \end{matrix}$	
Ø12	$\begin{matrix} 0 \\ -0.011 \end{matrix}$	

被切削材 Work Material	HRC20-30		HRC30-40		HRC40-50		HRC50-60	
切削速度 Cutting Speed (V)	250 m/min		200 m/min		180 m/min		100 m/min	
型號 Type No.	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)
UHBG0202	40000	5000	32000	3200	29000	2900	16000	1500
UHBG0302	27000	5000	21000	3200	19000	2900	10600	1500
UHBG0402	20000	5000	16000	3200	14000	2900	8000	1500
UHBG0602	13500	3000	10600	2000	9500	1800	5300	1200
UHBG0802	10000	3000	8000	2000	7200	1800	4000	1200
UHBG1002	8000	3000	6400	2000	5700	1800	3200	1200
UHBG1202	6700	2500	5300	1800	4800	1600	2700	1200
加工深度 Depth of cut 直徑 D : Diameter			$a_p=0.1D$ $a_a=0.05D$					



極超微粒圓頭立銑刀

Ball Nose End Mills

型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UB0102	R0.5	2	50	4
UB0152	R0.75	3	50	4
UB0202	R1	4	50	6
UB0302	R1.5	6	50	6
UB0402	R2	8	50	6
UB0502	R2.5	10	50	6
UB0602	R3	12	50	6
UB0802	R4	16	60	8
UB1002	R5	20	75	10
UB1202	R6	24	75	12
UB1602	R8	32	100	16

unit: mm

List of recommended milling conditions for UB

被切削材 Work Material	NAK80 HRC40					
	376 m/min		250 m/min		188 m/min	
型號 Type No.	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
UB0202	40000	2000	40000	2000	30000	2000
UB0302	30000	2000	26000	2000	20000	2000
UB0402	25000	4800	20000	3200	15000	2400
UB0602	20000	6000	13000	4800	10000	4000
UB0802	15000	4500	10000	4000	7500	3300
UB1002	12000	4000	8000	3600	6000	2200
UB1202	10000	3500	6600	2400	5000	1800

加工深度
Depth of cut
直徑
D : Diameter

$a_p = 0.3D$
 $a_a = 0.05D$

被切削材 Work Material	Hardened Steels SKD61 HRC52					
	376 m/min		250 m/min		188 m/min	
型號 Type No.	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
UB0202	20000	2000	15000	1200	10000	1000
UB0302	20000	2000	15000	1200	10000	1000
UB0402	20000	2000	15000	1200	10000	1000
UB0602	20000	6000	13000	4500	6400	1500
UB0802	15000	4000	10000	3600	4800	1500
UB1002	12000	4000	8000	3200	3800	1500
UB1202	10000	3600	6600	1800	3200	1500

加工深度
Depth of cut
直徑
D : Diameter

$a_p = 0.1D$
 $a_a = 0.02D$

直徑 D1	球徑公差值 R tolerance
R0.5	±0.01
R0.75	±0.01
R1.0	±0.01
R1.5	±0.01
R2.0	±0.01
R2.5	±0.01
R3	±0.01
R4	±0.01
R5	±0.015
R6	±0.015
R8	±0.02

柄徑 shank (h6)	柄徑公差值 D2 tolerance
Ø 4	0 -0.008
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø10	0 -0.009
Ø12	0 -0.011
Ø16	0 -0.011

Long Shank



極超微粒長柄圓頭立銑刀

Ball Nose End Mills

型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UHB0202	R1	4	75	6
UHB0302	R1.5	6	75	6
UHB0402	R2	8	75	6
UHB0502	R2.5	10	75	6
UHB0602	R3	12	75	6
UHB0802	R4	16	75	8
UIB0402	R2	8	100	6
UIB0602	R3	12	100	6
UIB0802	R4	16	100	8
UIB1002	R5	20	100	10
UIB1202	R6	24	100	12
UJB1002	R5	20	150	10
UJB1202	R6	24	150	12
UJB1602	R8	32	150	16
UJB2002	R10	40	150	20

unit: mm

List of recommended milling conditions for UHB, UIB

被切削材 Work Material	Carbon Steels S45C, S50C HB150-250		Alloy Steels SCM.P20.PDS5.PDS3.SKD11 HRC20-35		Prehardened Steels NAK80 HRC35-45		Hardened Steels SKD61 HRC45-55	
	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
UIB0402	20000	3000	15000	2800	12000	2800	10000	2200
UIB0602	15000	3000	13000	2600	10000	2600	10000	2000
UIB0802	12000	3200	10000	3200	10000	3200	9000	3000
UIB1002	12000	3200	10000	3200	10000	3200	7000	2500

加工深度
Depth of cut
直徑
D : Diameter

$a_p = 0.2 \sim 0.3D$
 $a_a = 0.4D$

被切削材 Work Material	HRC30-50		HRC50-55		HRC55-62	
	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
UHB0202	15000	1000	15000	875	15000	750
UHB0302	15000	1500	15000	1200	12000	660
UHB0402	15000	1500	15000	1250	10000	600
UHB0502	15000	1500	15000	1300	9000	580
UHB0602	15000	1500	15000	1300	8000	550
UIB0402	15000	1500	15000	1250	10000	600
UIB0602	15000	1500	15000	1300	8000	550
UIB0802	15000	1500	12000	1000	6000	420
UIB1002	12500	1250	9500	800	4800	340
UIB1202	10000	1000	8000	700	4000	280

加工深度
Depth of cut
直徑
D : Diameter

$a_p = 0.06D$
 $a_a = 0.03D$

List of recommended milling conditions for UJB

被切削材 Work Material	Carbon Steels S45C, S50C HB150-250		Alloy Steels SCM.P20.PDS5.PDS3 HRC20-35		Prehardened Steels NAK80 HRC35-48		Hardened Steels SKD61 HRC48-60	
	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
UJB1002	4400	990	3650	640	2950	510	1830	260
UJB1202	3700	990	3050	720	2500	540	1530	300
UJB1602	2800	1080	2300	720	1850	540	1150	270
UJB2002	2200	1080	1850	720	14500	540	750	270

加工深度
Depth of cut
直徑
D : Diameter

$a_p = 0.1D$
 $a_a = 0.03D$

UPB

高速及高硬度切削用 · High Speed Cutting & High Hard Cutting

Strong Power

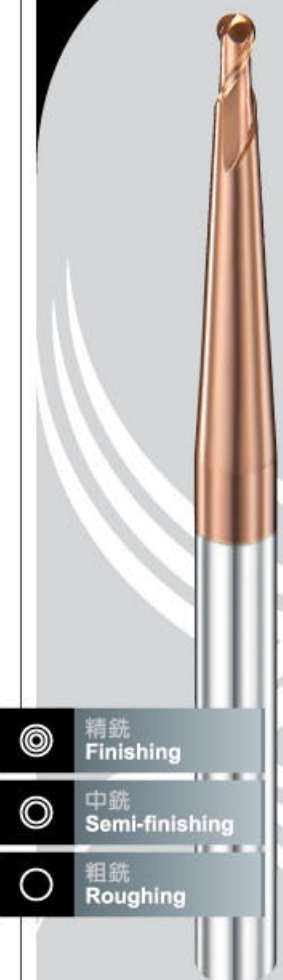
斜頸圓頭立銑刀

Ball Nose End Mills



型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	有效長 L2 Effective Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia	斜角 α Taper Angle
UPB0205	R1	3	60	100	6	0.5°
UPB0210	R1	3	60	100	6	1°
UPB0215	R1	3	60	100	6	1.5°
UPB0220	R1	3	57	100	6	2°
UPB0305	R1.5	4	60	100	6	0.5°
UPB0310	R1.5	4	60	100	6	1°
UPB0315	R1.5	4	57	100	6	1.5°
UPB0320	R1.5	4	43	100	6	2°
UPB0405	R2	5	60	100	6	0.5°
UPB0410	R2	5	57	100	6	1°
UPB0415	R2	5	38	100	6	1.5°
UPB0420	R2	5	29	100	6	2°

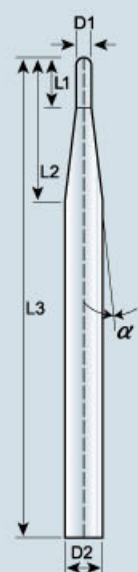
unit: mm



- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

ODHF

直徑 D1	球徑公差值 R tolerance
R1	±0.01
R1.5	±0.01
R2	±0.01
柄徑 shank (h6)	柄徑公差值 D2 tolerance
Ø 6	0 -0.008



USB

高速及高硬度切削用 · High Speed Cutting & High Hard Cutting

Strong Power

斜頸圓頭立銑刀

Ball Nose End Mills



型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia	斜角 α Taper Angle
USB0203	R1	4	75	6	3°
USB0205	R1	4	75	6	5°
USB0315	R1.5	6	100	6	1.5°
USB0303	R1.5	6	75	6	3°
USB0305	R1.5	6	75	6	5°
USB0415	R2	8	100	6	1.5°
USB0405	R2	8	75	6	5°
USB0615	R3	12	100	8	1.5°
USB0603	R3	12	75	8	3°
USB0605	R3	12	100	8	5°
USB0603B	R3	12	100	10	3°
USB0605B	R3	12	100	10	5°

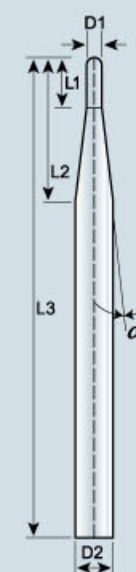
unit: mm



- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

ODHF

直徑 D1	球徑公差值 R tolerance
R1	±0.01
R1.5	±0.01
R2	±0.01
R3	±0.01
柄徑 shank (h6)	柄徑公差值 D2 tolerance
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø10	0 -0.009



Roughing

直刃圓鼻角立銑刀 End Mills

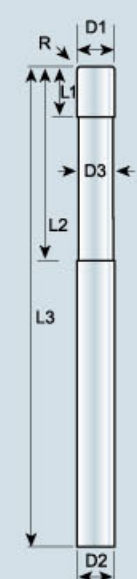


型號 Type No.	直徑 D1 Diameter	頸徑 D3 Neck Dia	R角 R Corner R	刃長 L1 Flute Length	有效長 L2 Effective Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UOR0203	2.0	1.8	0.3	0.8	5	50	6
UOR0205	2.0	1.8	0.5	0.8	5	50	6
UOR0308	3.0	2.7	0.8	1.2	8	50	6
UOR0310	3.0	2.7	1.0	1.2	8	50	6
UOR0405	4.0	3.6	0.5	1.6	10	50	6
UOR0405L	4.0	3.6	0.5	1.6	10	75	6
UOR0410	4.0	3.6	1.0	1.6	10	50	6
UOR0410L	4.0	3.6	1.0	1.6	10	75	6
UOR0610	6.0	5.4	1.0	2.5	13	50	6
UOR0610M	6.0	5.4	1.0	2.5	13	75	6
UOR0610L	6.0	5.4	1.0	2.5	13	100	6
UOR0615	6.0	5.4	1.5	2.5	13	50	6
UOR0615M	6.0	5.4	1.5	2.5	13	75	6
UOR0615L	6.0	5.4	1.5	2.5	13	100	6
UOR0810	8.0	7.2	1.0	3.5	16	60	8
UOR0810L	8.0	7.2	1.0	3.5	16	100	8
UOR0820	8.0	7.2	2.0	3.5	16	60	8
UOR0820L	8.0	7.2	2.0	3.5	16	100	8
UOR1010	10.0	9.0	1.0	4.0	20	75	10
UOR1010L	10.0	9.0	1.0	4.0	20	100	10
UOR1020	10.0	9.0	2.0	4.0	20	75	10
UOR1020L	10.0	9.0	2.0	4.0	20	100	10
UOR1220	12.0	11.0	2.0	5.0	25	75	12
UOR1220L	12.0	11.0	2.0	5.0	25	100	12
UOR1230	12.0	11.0	3.0	5.0	25	75	12
UOR1230L	12.0	11.0	3.0	5.0	25	100	12

unit: mm

ODH 柄徑公差值 D2 tolerance

柄徑 shank (h6)	柄徑公差值 D2 tolerance
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø 10	0 -0.009
Ø 12	0 -0.011



High Speed Milling conditions for UOR

Regular Milling (Low-speed, high-feed milling)

* Caution: Sparks generated during operation or heat caused by tool breakage can cause fire, be sure to use all proper fire-prevention measures.
* The conditions below are for high speed / high precision machining centers.

被切削材 Work Material	Mild steels, Carbon steels, Cast iron, SS400, S55C, FC250 (~750N/mm ²)	Alloy steels, Tool steels, SCM, SKT, SKS, SKD	Prehardened steels, (Free-cutting) SKT, SKD, NAK55, HPM1	Stainless steels SUS304, SKD, NAK80	Hardened steels, Titanium alloys, Heat resistant alloys steels.	Hardened steels
Mill Dia. (mm)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
2 x R0.5	15200	4990	15200	4510	11870	3610
3 x R0.75	9970	5940	9970	5320	8070	4270
4 x R1	7550	6270	7550	5700	6030	4560
5 x R1.2	6030	6650	6030	6030	4840	4840
6 x R1.5	5030	6650	5030	6030	4040	4840
8 x R2	3800	6650	3800	6030	3040	4840
10 x R2	3040	6650	3040	6030	2420	4840
12 x R3	2520	6650	2520	6030	2000	4840

- Use a rigid and precise machine and holder.
- These milling conditions are based on milling with circular interpolation at corners. For milling without circular interpolation (such as right angle corners), reduce the speed to 50-70% and the cutting depth to 50-80% of the above conditions.
- We recommend using dry air blow or MQL(mist).
- Please adjust the speed, feed and cutting depth according to actual cutting conditions.
- When UOR enters in Z axis, reduce the feed speed to 30-60% of the above conditions with machining incline angle(β) $\leq 2^\circ$.
- These milling conditions are for a tool extension length:less than 4xD.

For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with the respective coefficients, to prevent chattering.

Tool extension coefficients

Overshang Length	Milling Speed	a _a	Feed Speed
L/D ≤ 4	100	100	100
L/D ≤ 5	80~100	70~90	80~90
L/D ≤ 6	60~80	50~70	60~80

High Speed Cutting conditions

* Caution: Sparks generated during operation or heat caused by tool breakage can cause fire, be sure to use all proper fire-prevention measures.
* The conditions below are for high speed / high precision machining centers.

被切削材 Work Material	Mild steels, Carbon steels, Cast iron, SS400, S55C, FC250 (~750N/mm ²)	Alloy steels, Tool steels, SCM, SKT, SKS, SKD	Prehardened steels, (Free-cutting) SKT, SKD, NAK55, HPM1	Stainless steels SUS304, SKD, NAK80	Hardened steels, Titanium alloys, Heat resistant alloys steels.	Hardened steels
Mill Dia. (mm)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
2 x R0.5	30250	9970	30400	9070	30400	9070
3 x R0.75	19950	11870	19950	11400	19950	11400
4 x R1	15200	12350	15200	11400	15200	11400
5 x R1.2	11870	13300	11870	11870	11870	11870
6 x R1.5	10070	13300	10070	12060	10070	12060
8 x R2	7550	13300	7550	12060	7550	12060
10 x R2	6030	13300	6030	12060	6030	12060
12 x R3	5030	13300	5030	12060	5030	12060

- Use a rigid and precise machine and holder.
- These milling conditions are based on milling with circular interpolation at corners. For milling without circular interpolation (such as right angle corners), reduce the speed to 50-70% and the cutting depth to 50-80% of the above conditions.
- We recommend using dry air blow or MQL(mist).
- Please adjust the speed, feed and cutting depth according to actual cutting conditions.
- When UOR enters in Z axis, reduce the feed speed to 30-60% of the above conditions with machining incline angle(β) $\leq 2^\circ$.
- These milling conditions are for a tool extension length:less than 4xD.

For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with the respective coefficients, to prevent chattering.

Tool extension coefficients

Overshang Length	Milling Speed	a _a	Feed Speed
L/D ≤ 4	100	100	100
L/D ≤ 5	60~80	60~80	70~90
L/D ≤ 6	40~60	40~60	60~80

Ultra-high speed conditions

When milling flat areas with a stable load, the speed and the feed rate of the high-speed conditions can be further increased to 150-200%. The ultra-high speed conditions are for a tool extension length:less than 4xD. If the tool extension length is over 4D, do not refer to it.

Corner Radius

極超微粒圓鼻角立銑刀

End Mills



型號 Type No.	直徑 D1 Diameter	R角 R Corner R	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UKR0102	1.0	0.2	3	50	4
UKR0152	1.5	0.2	4	50	4
UKR0202	2.0	0.2	6	50	4
UKR0205	2.0	0.5	6	50	4
UKR0252	2.5	0.2	8	50	4
UKR0255	2.5	0.5	8	50	4
UKR0302	3.0	0.2	8	50	4
UKR0303	3.0	0.3	8	50	4
UKR0305	3.0	0.5	8	50	4
UKR0402	4.0	0.2	11	50	4
UKR0403	4.0	0.3	11	50	4
UKR0405	4.0	0.5	11	50	4
UKR0503	5.0	0.3	13	50	6
UKR0505	5.0	0.5	13	50	6
UKR0602	6.0	0.2	16	50	6
UKR0603	6.0	0.3	16	50	6
UKR0605	6.0	0.5	16	50	6
UKR0610	6.0	1.0	16	50	6
UKR0803	8.0	0.3	20	60	8
UKR0805	8.0	0.5	20	60	8
UKR0810	8.0	1.0	20	60	8
UKR1002	10.0	0.2	25	75	10
UKR1003	10.0	0.3	25	75	10
UKR1005	10.0	0.5	25	75	10
UKR1010	10.0	1.0	25	75	10
UKR1203	12.0	0.3	30	75	12
UKR1205	12.0	0.5	30	75	12
UKR1210	12.0	1.0	30	75	12
UKR1215	12.0	1.5	30	75	12
UKR1220	12.0	2.0	30	75	12

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing



直徑 D1	R角公差值 R tolerance	直徑公差值 D1 tolerance
1.0	+0.02 0	0 -0.02
1.5	+0.02 0	0 -0.02
2.0	+0.02 0	0 -0.02
2.5	+0.02 0	0 -0.02
3.0	+0.02 0	0 -0.02
4.0	+0.02 0	0 -0.02
5.0	+0.02 0	0 -0.02
6.0	+0.02 0	-0.005 -0.025
8.0	+0.02 0	-0.01 -0.025
10.0	+0.02 0	-0.01 -0.03
12.0	+0.02 0	-0.01 -0.035
柄徑 shank (h6)	柄徑公差值 D2 tolerance	
Ø 4	0	-0.008
Ø 6	0	-0.008
Ø 8	0	-0.008
Ø 10	0	-0.009
Ø 12	0	-0.011

Corner Radius

極超微粒圓鼻角立銑刀

End Mills



型號 Type No.	直徑 D1 Diameter	頸徑 D3 Neck Dia	R角 R Corner R	刃長 L1 Flute Length	有效長 L2 Effective Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UNR0402	4.0	3.90	0.2	6	12	50	6
UNR0405	4.0	3.90	0.5	6	12	50	6
UNR0602	6.0	5.80	0.2	8	18	50	6
UNR0605	6.0	5.80	0.5	8	18	50	6
UNR0610	6.0	5.80	1.0	8	18	50	6
UNR0802	8.0	7.70	0.2	10	24	60	8
UNR0805	8.0	7.70	0.5	10	24	60	8
UNR0810	8.0	7.70	1.0	10	24	60	8
UNR1003	10.0	9.60	0.3	12	30	75	10
UNR1005	10.0	9.60	0.5	12	30	75	10
UNR1010	10.0	9.60	1.0	12	30	75	10
UNR1020	10.0	9.60	2.0	12	30	75	10
UNR1210	12.0	11.5	1.0	15	36	75	12
UNR1220	12.0	11.5	2.0	15	36	75	12
UNR1605	16.0	15.4	0.5	24	40	100	16
UNR1610	16.0	15.4	1.0	24	40	100	16

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing



直徑 D1	R角公差值 R tolerance	直徑公差值 D1 tolerance
4.0	+0.02 0	0 -0.02
6.0	+0.02 0	0 -0.025
8.0	+0.03 0	0 -0.025
10.0	+0.03 0	0 -0.03
12.0	+0.03 0	0 -0.035
16.0	+0.03 0	0 -0.04
柄徑 shank (h6)	柄徑公差值 D2 tolerance	
Ø 6	0	-0.008
Ø 8	0	-0.008
Ø 10	0	-0.009
Ø 12	0	-0.011
Ø 16	0	-0.011

UXR

高速及高硬度切削用 · High Speed Cutting & High Hard Cutting

Corner Radius

極超微粒圓鼻角立銑刀

End Mills



型號 Type No.	直徑 D1 Diameter	頸徑 D3 Neck Dia	R角 R Corner R	刃長 L1 Flute Length	有效長 L2 Effective Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UXR0403	4.0	3.90	0.3	6	12	50	6
UXR0405	4.0	3.90	0.5	6	12	50	6
UXR0603	6.0	5.80	0.3	8	18	50	6
UXR0605	6.0	5.80	0.5	8	18	50	6
UXR0610	6.0	5.80	1.0	8	18	50	6
UXR0803	8.0	7.70	0.3	10	24	60	8
UXR0805	8.0	7.70	0.5	10	24	60	8
UXR0810	8.0	7.70	1.0	10	24	60	8
UXR1005	10.0	9.60	0.5	12	30	75	10
UXR1010	10.0	9.60	1.0	12	30	75	10
UXR1020	10.0	9.60	2.0	12	30	75	10
UXR1030	10.0	9.60	3.0	12	30	75	10
UXR1205	12.0	11.5	0.5	15	36	75	12
UXR1210	12.0	11.5	1.0	15	36	75	12
UXR1605	16.0	15.5	0.5	24	40	100	16
UXR1610	16.0	15.5	1.0	24	40	100	16

unit: mm

List of recommended milling conditions for UXR

被切削材 Work Material	Carbon Steels S45C, S50C HRC20-40	Alloy Steels NAK80 HRC40-50	Hardened Steels SKD61 HRC50-60	Hardened Steels SKD11 up HRC60
型號 Type No.	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
UXR04--	24000	2000	24000	2400
UXR06--	20000	4000	16000	3000
UXR08--	16000	3600	12000	2700
UXR10--	12000	3000	9500	2000
UXR12--	10000	2400	8000	1800

被切削材 Work Material	Carbon Steels S45C, S50C HRC20-40	Alloy Steels NAK80 HRC40-50	Hardened Steels SKD61 HRC50-55	Hardened Steels SKD11 HRC55-60
型號 Type No.	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
UXR04--	12800	5600	11000	4800
UXR06--	8500	4000	7400	3550
UXR08--	6400	3400	5570	3000
UXR10--	5000	3000	4500	2600
UXR12--	4200	2900	3700	2500
UXR16--	3200	2550	2800	2200

加工深度
Depth of cut
直徑
D : Diameter

*Side Milling (側銑) $a_p=0.1D$

*Slot Milling (溝銑) $a_p=0.05D$

ULXR

高速及高硬度切削用 · High Speed Cutting & High Hard Cutting

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End Mills



型號 Type No.	直徑 D1 Diameter	頸徑 D3 Neck Dia	R角 R Corner R	刃長 L1 Flute Length	有效長 L2 Effective Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
ULXR0605	6.0	5.80	0.5	6	18	75	6
ULXR0610	6.0	5.80	1.0	6	18	75	6
ULXR0805	8.0	7.80	0.5	8	24	100	8
ULXR0810	8.0	7.80	1.0	8	24	100	8
ULXR1005	10.0	9.60	0.5	10	30	100	10
ULXR1010	10.0	9.60	1.0	10	30	100	10
ULXR1020	10.0	9.60	2.0	10	30	100	10
ULXR1205	12.0	11.5	0.5	12	36	100	12
ULXR1210	12.0	11.5	1.0	12	36	100	12
ULXR1220	12.0	11.5	2.0	12	36	100	12
ULXR1610	16.0	15.5	1.0	16	40	150	16
ULXR1620	16.0	15.5	2.0	16	40	150	16

unit: mm

List of recommended milling conditions for ULXR

被切削材 Work Material	HRC42-48	HRC48-52	HRC52-56	HRC56-62
切削速度 Cutting Speed	160 m/min	140 m/min	110 m/min	70 m/min
型號 Type No.	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
ULXR06--	8500	4000	7400	3550
ULXR08--	6350	3400	5600	3000
ULXR10--	5100	2900	4500	2500
ULXR12--	4250	2900	3700	2500

被切削材 Work Material	Carbon Steels S45C, S50C HRC20-40	Alloy Steels NAK80 HRC40-50	Hardened Steels SKD61 HRC50-55	Hardened Steels SKD11 HRC55-60
型號 Type No.	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
ULXR06--	7400	2500	5800	3000
ULXR08--	5600	2200	4400	2500
ULXR10--	4500	1950	3500	2200
ULXR12--	3700	2000	2900	2200
ULXR16--	2800	1800	2200	2000

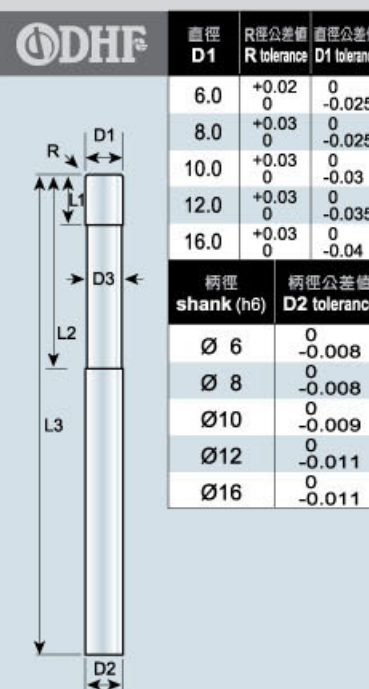
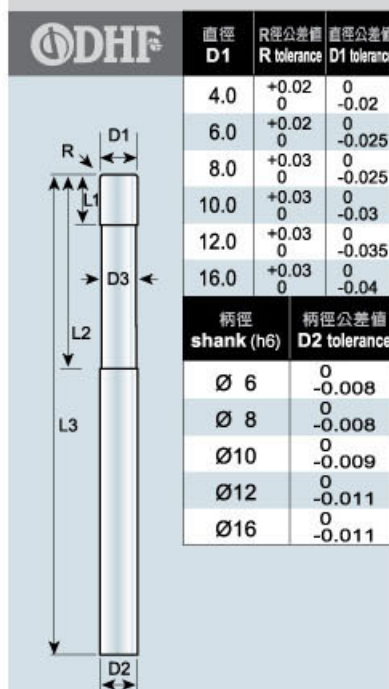
加工深度
Depth of cut
直徑
D : Diameter

*Side Milling (側銑) $a_p=0.1D$

*Slot Milling (溝銑) $a_p=0.05D$

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing



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End Mills



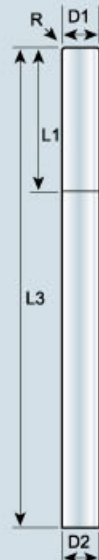
型號 Type No.	直徑 D1 Diameter	R角 R Corner R	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UER0202	2.0	0.2	6	50	4
UER0205	2.0	0.5	6	50	4
UER0302	3.0	0.2	8	50	3
UER0305	3.0	0.5	8	50	3
UER0402	4.0	0.2	10	50	4
UER0405	4.0	0.5	10	50	4
UER0505	5.0	0.5	13	50	6
UER0510	5.0	1.0	13	50	6
UER0605	6.0	0.5	16	50	6
UER0610	6.0	1.0	16	50	6
UER0805	8.0	0.5	20	60	8
UER0810	8.0	1.0	20	60	8
UER1005	10.0	0.5	30	75	10
UER1010	10.0	1.0	30	75	10
UER1020	10.0	2.0	30	75	10
UER1030	10.0	3.0	30	75	10
UER1210	12.0	1.0	30	75	12
UER1220	12.0	2.0	30	75	12
UER1230	12.0	3.0	30	75	12
UER1610	16.0	1.0	45	100	16
UER1620	16.0	2.0	45	100	16
UER1630	16.0	3.0	45	100	16

unit: mm

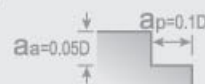
- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

List of recommended milling conditions for UER

DHF		被切削材 Work Material		Carbon Steels S45C, S50C HRC20-40		Alloy Steels NAK80 HRC40-50		Hardened Steels SKD61 HRC50-55		Hardened Steels SKD11 HRC55-60	
直徑 D1	R徑公差值 R tolerance	直徑公差值 D1 tolerance	切削速度 Cutting Speed (V)	140 m/min		120 m/min		100 m/min		80 m/min	
型號 Type No.	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	
UER0405	11000	5500	9500	5000	8000	4500	6400	3400			
UER0605	7400	5000	6400	4600	5300	4000	4250	3000			
UER0610	7400	5000	6400	4600	5300	4000	4250	3000			
UER0805	5600	4500	4800	4000	4000	3200	3200	2300			
UER0810	5600	4500	4800	4000	4000	3200	3200	2300			
UER1010	4500	4000	3800	3500	3200	2800	2500	2000			
UER1020	4500	4000	3800	3500	3200	2800	2500	2000			
UER1030	4500	4000	3800	3500	3200	2800	2500	2000			
UER1210	3700	3400	3200	3000	2650	2300	2100	1700			
UER1220	3700	3400	3200	3000	2650	2300	2100	1700			
UER1230	3700	3400	3200	3000	2650	2300	2100	1700			
加工深度 Depth of cut 直徑 D : Diameter			*Side Milling (側銑) 								



柄徑 shank (h6)	柄徑公差值 D2 tolerance
Ø 3	0 -0.006
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø10	0 -0.009
Ø12	0 -0.011
Ø16	0 -0.011



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End Mills



型號 Type No.	直徑 D1 Diameter	R角 R Corner R	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
ULR0605	6.0	0.5	16	75	6
ULR0610	6.0	1.0	16	75	6
ULR0805	8.0	0.5	20	100	8
ULR0810	8.0	1.0	20	100	8
ULR1005	10.0	0.5	25	100	10
ULR1010	10.0	1.0	25	100	10
ULR1020	10.0	2.0	25	100	10
ULR1205	12.0	0.5	30	100	12
ULR1210	12.0	1.0	30	100	12
ULR1220	12.0	2.0	30	100	12
ULR1610	16.0	1.0	45	150	16
ULR1620	16.0	2.0	45	150	16

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

List of recommended milling conditions for ULR

	ODHF	直徑 D1	R徑公差值 R tolerance	D徑公差值 D1 tolerance	被切削材 Work Material	Carbon Steels S45C, S50C HRC20-40	Alloy Steels NAK80 HRC40-50	Hardened Steels SKD61 HRC50-55	Hardened Steels SKD11 HRC55-60					
	切削速度 Cutting Speed (V)					80 m/min	60 m/min	40 m/min	20 m/min					
	型號 Type No.					Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)			
	ULR0605					4250	780	3200	580	2100	380	1000	160	
	ULR0610					4250	780	3200	580	2100	380	1000	160	
	ULR0805					3200	780	2400	580	1600	380	800	160	
	ULR0810					3200	780	2400	580	1600	380	800	160	
	ULR1005					2500	780	1900	580	1280	380	640	160	
	ULR1010					2500	780	1900	580	1280	380	640	160	
	ULR1020					2500	780	1900	580	1280	380	640	160	
ULR1205					2100	780	1600	580	1000	380	530	160		
ULR1210					2100	780	1600	580	1000	380	530	160		
ULR1220					2100	780	1600	580	1000	380	530	160		
ULR1610					1600	780	1200	580	800	380	400	160		
ULR1620					1600	780	1200	580	800	380	400	160		
加工深度 Depth of cut 直徑 D : Diameter					*Side Milling (側銑) 					*Side Milling (側銑) 				





型號 Type No.	直徑 D1 Diameter	R角 R Corner R	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UGR0202	2.0	0.2	6	50	6
UGR0205	2.0	0.5	6	50	6
UGR0302	3.0	0.2	8	50	3
UGR0305	3.0	0.5	8	50	3
UGR0402	4.0	0.2	10	50	6
UGR0405	4.0	0.5	10	50	6
UGR0505	5.0	0.5	13	50	6
UGR0510	5.0	1.0	13	50	6
UGR0605	6.0	0.5	16	50	6
UGR0610	6.0	1.0	16	50	6
UGR0805	8.0	0.5	20	60	8
UGR0810	8.0	1.0	20	60	8
UGR1005	10.0	0.5	25	75	10
UGR1010	10.0	1.0	25	75	10
UGR1020	10.0	2.0	25	75	10
UGR1030	10.0	3.0	25	75	10
UGR1210	12.0	1.0	30	75	12
UGR1220	12.0	2.0	30	75	12
UGR1230	12.0	3.0	30	75	12
UGR1610	16.0	1.0	45	100	16
UGR1620	16.0	2.0	45	100	16
UGR1630	16.0	3.0	45	100	16

unit: mm



List of recommended milling conditions for UGR

被切削材 Work Material	HRC42-48	HRC48-52	HRC52-56	HRC56-62
切削速度 Cutting Speed (V)	160 m/min	140 m/min	110 m/min	70 m/min
型號 Type No.	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
UGR03--	17000	4700	15000	4200
UGR04--	12700	4500	11000	4000
UGR05--	10000	4400	8900	3900
UGR06--	8500	4000	7400	3550
UGR08--	6350	3400	5600	3000
UGR10--	5100	2900	4500	2500
UGR12--	4250	2900	3700	2500
UGR16--	3200	2550	2800	2200
加工深度 Depth of cut 直徑 D : Diameter	*Side Milling (側銑) a _a =0.05D a _p =0.1D			



型號 Type No.	直徑 D1 Diameter	頸徑 D3 Neck Dia	R角 R Corner R	刃長 L1 Flute Length	有效長 L2 Effective Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UPR0305	3.0	2.90	0.5	3	12	50	6
UPR0405	4.0	3.90	0.5	4	12	50	6
UPR0605	6.0	5.80	0.5	6	15	50	6
UPR0610	6.0	5.80	1.0	6	15	50	6
UPR0805	8.0	7.70	0.5	8	20	60	8
UPR0810	8.0	7.70	1.0	8	20	60	8
UPR1010	10.0	9.60	1.0	10	25	75	10
UPR1020	10.0	9.60	2.0	10	25	75	10
UPR1030	10.0	9.60	3.0	10	25	75	10
UPR1210	12.0	11.5	1.0	12	30	75	12
UPR1220	12.0	11.5	2.0	12	30	75	12

unit: mm



List of recommended milling conditions for UPR

被切削材 Work Material	HRC42-48	HRC48-52	HRC52-56	HRC56-62
切削速度 Cutting Speed (V)	160 m/min	140 m/min	110 m/min	70 m/min
型號 Type No.	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
UPR0605	8500	4000	7400	3550
UPR0610	8500	4000	7400	3550
UPR0805	6350	3400	5600	3000
UPR0810	6350	3400	5600	3000
UPR1010	5100	2900	4500	2500
UPR1020	5100	2900	4500	2500
UPR1030	5100	2900	4500	2500
UPR1210	4250	2900	3700	2500
UPR1220	4250	2900	3700	2500
加工深度 Depth of cut 直徑 D : Diameter	*Side Milling (側銑) a _a =0.05D a _p =0.1D			

UYR

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End Mills



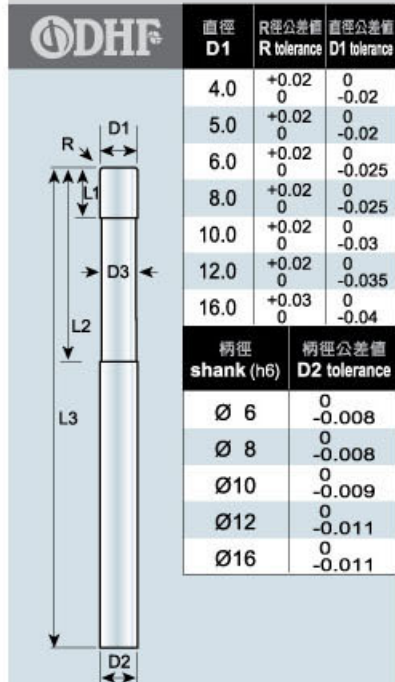
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UYR0405	4.0	3.90	0.5	4	12	50	6
UYR0505	5.0	4.80	0.5	5	15	50	6
UYR0510	5.0	4.80	1.0	5	15	50	6
UYR0605	6.0	5.80	0.5	6	18	50	6
UYR0610	6.0	5.80	1.0	6	18	50	6
UYR0805	8.0	7.70	0.5	8	24	60	8
UYR0810	8.0	7.70	1.0	8	24	60	8
UYR1005	10.0	9.60	0.5	10	30	75	10
UYR1010	10.0	9.60	1.0	10	30	75	10
UYR1020	10.0	9.60	2.0	10	30	75	10
UYR1030	10.0	9.60	3.0	10	30	75	10
UYR1210	12.0	11.5	1.0	12	30	75	12
UYR1220	12.0	11.5	2.0	12	30	75	12
UYR1230	12.0	11.5	3.0	12	30	75	12
UYR1610	16.0	15.4	1.0	16	40	100	16
UYR1620	16.0	15.4	2.0	16	40	100	16
UYR1630	16.0	15.4	3.0	16	40	100	16

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

List of recommended milling conditions for UYR

被切削材 Work Material	HRC40-48	HRC48-55	HRC55-65
切削速度 Cutting Speed (V)	120 m/min	100 m/min	80 m/min
型號 Type No.	Speed (mm-1) Feed (mm/min)	Speed (mm-1) Feed (mm/min)	Speed (mm-1) Feed (mm/min)
UYR06--	6350 2550	5300 2100	4250 1700
UYR08--	4800 2200	4000 1800	3200 1450
UYR10--	3800 1900	3200 1600	2550 1280
UYR12--	3200 1900	2650 1600	2100 1280
UYR16--	2400 1700	2000 1400	1600 1150
加工深度 Depth of cut 直徑 D : Diameter	*Side Milling (側銑) $a_p=0.08D$ $a_p=0.1D$		
被切削材 Work Material	HRC30-40	HRC40-52	HRC52-62
切削速度 Cutting Speed (V)	160 m/min	140 m/min	110 m/min
型號 Type No.	Speed (mm-1) Feed (mm/min)	Speed (mm-1) Feed (mm/min)	Speed (mm-1) Feed (mm/min)
UYR06--	8500 4000	7400 3500	5800 2800
UYR08--	6400 3400	5580 3000	4400 2400
UYR10--	5100 2950	4500 2600	3500 2000
UYR12--	4250 2880	3700 2500	2900 2000
UYR16--	3200 2550	2800 2200	2200 1750
加工深度 Depth of cut 直徑 D : Diameter	*Side Milling (側銑) $a_p=0.05D$ $a_p=0.1D$		



UZR

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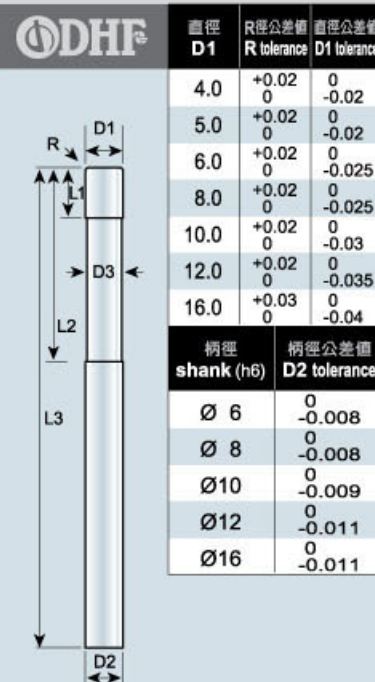
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UZR0405	4.0	3.90	0.5	10	12	50	6
UZR0505	5.0	4.80	0.5	13	15	50	6
UZR0510	5.0	4.80	1.0	13	15	50	6
UZR0605	6.0	5.80	0.5	16	18	50	6
UZR0610	6.0	5.80	1.0	16	18	50	6
UZR0805	8.0	7.70	0.5	20	24	60	8
UZR0810	8.0	7.70	1.0	20	24	60	8
UZR1005	10.0	9.60	0.5	10	30	75	10
UZR1010	10.0	9.60	1.0	10	30	75	10
UZR1020	10.0	9.60	2.0	10	30	75	10
UZR1030	10.0	9.60	3.0	10	30	75	10
UZR1210	12.0	11.5	1.0	12	30	75	12
UZR1220	12.0	11.5	2.0	12	30	75	12
UZR1230	12.0	11.5	3.0	12	30	75	12
UZR1610	16.0	15.4	1.0	16	40	100	16
UZR1620	16.0	15.4	2.0	16	40	100	16
UZR1630	16.0	15.4	3.0	16	40	100	16

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

List of recommended milling conditions for UZR

被切削材 Work Material	HRC40-48	HRC48-55	HRC55-65
切削速度 Cutting Speed (V)	120 m/min	100 m/min	80 m/min
型號 Type No.	Speed (mm-1) Feed (mm/min)	Speed (mm-1) Feed (mm/min)	Speed (mm-1) Feed (mm/min)
UZR06--	6350 2550	5300 2100	4250 1700
UZR08--	4800 2200	4000 1800	3200 1450
UZR10--	3800 1900	3200 1600	2550 1280
UZR12--	3200 1900	2650 1600	2100 1280
UZR16--	2400 1700	2000 1400	1600 1150
加工深度 Depth of cut 直徑 D : Diameter	*Side Milling (側銑) $a_p=0.08D$ $a_p=0.1D$		
被切削材 Work Material	HRC30-40	HRC40-52	HRC52-62
切削速度 Cutting Speed (V)	160 m/min	140 m/min	110 m/min
型號 Type No.	Speed (mm-1) Feed (mm/min)	Speed (mm-1) Feed (mm/min)	Speed (mm-1) Feed (mm/min)
UZR06--	8500 4000	7400 3500	5800 2800
UZR08--	6400 3400	5580 3000	4400 2400
UZR10--	5100 2950	4500 2600	3500 2000
UZR12--	4250 2880	3700 2500	2900 2000
UZR16--	3200 2550	2800 2200	2200 1750
加工深度 Depth of cut 直徑 D : Diameter	*Side Milling (側銑) $a_p=0.05D$ $a_p=0.1D$		



UVTR

高速及高硬度切削用 · High Speed Cutting & High Hard Cutting

High Hardness

高硬度圓鼻立銑刀
End Mills



型號 Type No.	直徑 D1 Diameter	R角 R Corner R	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UVTR0605	6.0	0.5	16	50	6
UVTR0610	6.0	1.0	16	50	6
UVTR0805	8.0	0.5	20	60	8
UVTR0810	8.0	1.0	20	60	8
UVTR1010	10.0	1.0	25	75	10
UVTR1210	12.0	1.0	30	75	12
UVTR1610	16.0	1.0	40	100	16
UVTR1620	16.0	2.0	40	100	16
UVTR2020	20.0	2.0	45	100	20

unit: mm



List of recommended milling conditions for UVTR

被切削材 Work Material	Carbon Steels S45C, S50C HRC20-40	Alloy Steels NAK80 HRC40-50	Hardened Steels SKD61 HRC50-55	Hardened Steels SKD11 HRC55-60
切削速度 Cutting Speed (V)	120 m/min	100 m/min	80 m/min	60 m/min
型號 Type No.	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)
UVTR0605	15500 2800	13000 2000	7950 1200	6350 960
UVTR0610	15500 2800	13000 2000	7950 1200	6350 960
UVTR0805	11500 2800	9900 2050	5950 1250	4750 955
UVTR0810	11500 2800	9900 2050	5950 1250	4750 955
UVTR1010	9500 2800	7950 2100	4750 1250	3800 955
UVTR1210	7950 2600	6600 1950	3950 1150	3150 875
UVTR1610	5950 2300	4950 1600	2950 970	2350 740
UVTR1620	5950 2300	4950 1600	2950 970	2350 740
UVTR2020	4750 1850	3950 1350	2350 785	1900 625
加工深度 Depth of cut 直徑 D : Diameter	*Side Milling (側銑) $D \leq \phi 12$ $a_a = 1D, a_p = 0.01D$ $\phi 12 < D$ $a_a = 1D, a_p = 0.02D$			

UVR

高速及高硬度切削用 · High Speed Cutting & High Hard Cutting

High Hardness

高硬度圓鼻立銑刀
End Mills



型號 Type No.	直徑 D1 Diameter	頸徑 D3 Neck Dia	R角 R Corner R	刃長 L1 Flute Length	有效長 L2 Effective Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UVR0606	6.0	5.80	0.3	8	20	50	6
UVR0806	8.0	7.70	0.3	10	25	60	8
UVR1006	10.0	9.60	0.5	12	30	75	10
UVR1206	12.0	11.5	0.5	15	36	75	12
UVR1606	16.0	15.4	1.0	24	40	100	16
UVR2006	20.0	19.4	1.0	30	50	100	20

unit: mm



List of recommended milling conditions for UVR

被切削材 Work Material	HRC40-48	HRC48-55	HRC55-65
切削速度 Cutting Speed (V)	160 m/min	140 m/min	110 m/min
型號 Type No.	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)	Speed (mm ⁻¹) Feed (mm/min)
UVR0606	8500 5100	7400 4450	5800 3000
UVR0806	6400 4400	5580 3800	4400 2600
UVR1006	5100 3800	4450 3350	3500 2300
UVR1206	4250 3450	3700 3000	2900 2100
UVR1606	3200 3200	2800 2800	2200 2200
加工深度 Depth of cut 直徑 D : Diameter	*Side Milling (側銑) $a_a = 0.05D$ $a_p = 0.1D$		



極超微粒立銑刀 End Mills

型號 Type No.	直徑 D1 Diameter	頸徑 D3 Neck Dia	R角 R Corner R	刃長 L1 Flute Length	有效長 L2 Effective Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UHR0605	6.0	5.80	0.5	8	30	75	6
UHR0805	8.0	7.70	0.5	10	40	100	8
UHR1005	10.0	9.60	0.5	12	50	100	10
UHR1010	10.0	9.60	1.0	12	50	100	10
UHR1205	12.0	11.6	0.5	15	50	100	12
UHR1610	16.0	11.6	1.0	24	50	150	16

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing



直徑 D1	R角公差值 R tolerance	直徑公差值 D1 tolerance
6.0	+0.02 0	0 -0.025
8.0	+0.02 0	0 -0.025
10.0	+0.02 0	0 -0.03
12.0	+0.02 0	0 -0.035
16.0	+0.03 0	0 -0.04

柄徑 shank (h6)	柄徑公差值 D2 tolerance
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø 10	0 -0.009
Ø 12	0 -0.011
Ø 16	0 -0.011



High Hardness 高硬度用立銑刀 End Mills

型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UVT0606	6.0	16	50	6
UVT0806	8.0	20	60	8
UVT1006	10.0	25	75	10
UVT1206	12.0	30	75	12
UVT1606	16.0	40	100	16
UVT2006	20.0	45	100	20

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing



直徑 D1	直徑公差值 D1 tolerance
6.0	0 -0.02
8.0	0 -0.02
10.0	0 -0.03
12.0	0 -0.03
16.0	0 -0.04
20.0	0 -0.04

柄徑 shank (h6)	柄徑公差值 D2 tolerance
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø 10	0 -0.009
Ø 12	0 -0.011
Ø 16	0 -0.011
Ø 20	0 -0.013

List of recommended milling conditions for UVT

被切削材 Work Material	Carbon Steels Alloy Steels <HRC50		Hardened Steels HRC50-60		Hardened Steels >HRC60	
	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)
型號 Type No.						
UVT0606	16000	5800	8000	2900	4000	1400
UVT0806	12000	5800	6000	2900	3000	1400
UVT1006	9500	5700	4800	2900	2400	1400
UVT1206	8000	4800	4000	2400	2000	1200
UVT1606	6000	3600	3000	1800	1500	900
加工深度 Depth of cut 直徑 D : Diameter	$a_p < 0.05D$ $a_a = 1 \sim 1.5D$		$a_p < 0.05D$ max 0.5mm $a_a = 1D$		$a_p < 0.2D$ $a_a = 1D$	

UEX

高速及高硬度切削用 · High Speed Cutting & High Hard Cutting

High Hardened

無敵高硬度立銼刀

End Mills



型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UEX0104	1.0	3	50	6
UEX0154	1.5	4	50	6
UEX0204	2.0	6	50	6
UEX0304	3.0	8	50	6
UEX0404	4.0	11	50	6
UEX0504	5.0	13	50	6
UEX0604	6.0	16	50	6
UEX0804	8.0	20	60	8
UEX1004	10.0	22	75	10
UEX1204	12.0	26	75	12
UEX1604	16.0	36	100	16
UEX2004	20.0	40	100	20

unit: mm

● The special negative top rake specializes in cutting the hardened steel with HRC above 50.

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

ODHT

直徑 D1	直徑公差值 D1 tolerance
1.0	0 -0.02
1.5	0 -0.02
2.0	0 -0.02
3.0	0 -0.02
4.0	0 -0.02
5.0	0 -0.02
6.0	0 -0.025
8.0	0 -0.03
10.0	0 -0.03
12.0	0 -0.035
16.0	0 -0.04
20.0	0 -0.05
柄徑 shank (h6)	柄徑公差值 D2 tolerance
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø 10	0 -0.009
Ø 12	0 -0.011
Ø 16	0 -0.011
Ø 20	0 -0.013

High Speed Milling conditions for UEX

高速側面切削 High Speed Side Cutting

* 以下條件適用於高速精密加工機器。

* The conditions below are for high speed / high precision machining centers.

被切削材 Work Material	Mild steels, Carbon steels, Cast iron, SS400, S55C, FC250 (~750N/mm ²)	Alloy steels, Tool steels, SCM, SKT, SKS, SKD (~30HRC)	Prehardened steels (Free-cutting) SKT, SKD, NAK55, HPM1 (30~38HRC)	Stainless steels SUS304, SKD (38~45HRC)	Hardened steels, Titanium alloys, Heat resistant alloys steels. (45~55HRC)	Hardened steels (55~60HRC)
切削速度 Cutting Speed (V)	200 m/min	200 m/min	200 m/min	150 m/min	100 m/min	80 m/min
Mill Dia. (mm)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
3	21200	2150	21200	2400	21200	1300
4	15900	2050	15900	2300	15900	1300
5	12700	1900	12700	2150	12700	1250
6	10600	3050	10600	2650	10600	2000
8	7950	2800	7950	2400	7950	1900
10	6350	2550	6350	2200	6350	1850
12	5300	2550	5300	2200	5300	1800
16	4000	1900	4000	1900	4000	1700
20	3200	1550	3200	1550	3200	1550
加工深度 Depth of cut 直徑 D : Diameter						
	a_a a_p $D < \phi 6$ 1.5D 0.02D $\phi 6 \leq D$ 1.5D 0.05D $a_a \text{ Max} = 0.5\text{mm}$		a_a a_p $D < \phi 6$ 1.5D 0.01D $\phi 6 \leq D$ 1.5D 0.02D $a_a \text{ Max} = 0.5\text{mm}$		a_a a_p $D < \phi 6$ 1.5D 0.01D $\phi 6 \leq D$ 1.5D 0.02D $a_a \text{ Max} = 0.5\text{mm}$	

高速溝切削 High Speed Slotting

* 以下條件適用於高速精密加工機器。

* The conditions below are for high speed / high precision machining centers.

被切削材 Work Material	Mild steels, Carbon steels, Cast iron, SS400, S55C, FC250 (~750N/mm ²)	Alloy steels, Tool steels, SCM, SKT, SKS, SKD (~30HRC)	Prehardened steels (Free-cutting) SKT, SKD, NAK55, HPM1 (30~38HRC)	Stainless steels SUS304, SKD (38~45HRC)
切削速度 Cutting Speed (V)	120 m/min	110 m/min	90~100 m/min	60~70 m/min
Mill Dia. (mm)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
3	12700	1050	10600	935
4	9550	1150	7950	1000
5	7650	1200	7000	1100
6	6350	1550	5850	1150
8	4750	1450	4400	1300
10	3800	1400	3500	1200
12	3200	1250	2900	1150
16	2400	1050	2200	965
20	1900	840	1750	770
加工深度 Depth of cut 直徑 D : Diameter				
	a_a $a_a = 0.2D$ $a_a \text{ Max} = 3\text{mm}$			

- 請使用準確性和高剛性之機器及刀把。
- 當切削深度過大或機器剛性不足請調整轉速。
- 請使用有效抑止煙霧之流體。
- 在乾式切削時請使用吹氣去除切削範圍之碎屑。

- Use a rigid and precise machine and holder.
- Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
- Please use a suitable fluid with high smoke retardant properties.
- During Dry (no fluid) milling, please use air bolw to remove disposable chips from the milling area and to eliminate chip packing.



型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 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
UPS1804	18.0	40	100	18
UPS2004	20.0	40	100	20
UPS2004L	20.0	50	120	20

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

ODH

直徑 D1	直徑公差值 D1 tolerance
3.0	0 -0.02
4.0	0 -0.02
5.0	0 -0.02
6.0	0 -0.025
8.0	0 -0.03
10.0	0 -0.03
12.0	0 -0.035
16.0	0 -0.04
18.0	0 -0.04
20.0	0 -0.05
柄徑 shank (h6)	柄徑公差值 D2 tolerance
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø 10	0 -0.009
Ø 12	0 -0.011
Ø 16	0 -0.011
Ø 18	0 -0.011
Ø 20	0 -0.013

Regular Milling conditions for UPS

側面切削 Side Cutting

被切削材 Work Material	Mild steels, Carbon steels, Cast iron, SS400, S55C, FC250 (~750N/mm²)	Alloy steels, Tool steels, SCM, SKT, SKS, SKD (~30HRC)	Prehardened steels (Free-cutting) SKT, SKD, NAK55, HPM1 (30~38HRC)	Stainless steels SUS304, SKD (38~45HRC)	Hardened steels, Titanium alloys, Heat resistant alloys steels. (45~55HRC)	Hardened steels (55~60HRC)
切削速度 Cutting Speed (V)	100 m/min	78 m/min	66 m/min	62 m/min	60 m/min	30 m/min
Mill Dia. (mm)	Speed (mm⁻¹)	Feed (mm/min)	Speed (mm⁻¹)	Feed (mm/min)	Speed (mm⁻¹)	Feed (mm/min)
3	10600	975	8300	760	7000	560
4	7950	1000	6200	820	5250	565
5	6350	1050	4950	845	4200	590
6	5300	1250	4150	945	3500	700
8	4000	1250	3100	895	2650	660
10	3200	1100	2500	855	2100	605
12	2650	1100	2050	850	1750	565
16	2000	955	1550	745	1300	500
20	1600	765	1250	595	1050	455
加工深度 Depth of cut 直徑 D : Diameter	$aa=1.5D$ $ap=0.2D$		$aa=1.5D$ $ap=0.2D$		$aa=1.5D$ $ap=0.2D$	

溝切削 Slotting

被切削材 Work Material	Mild steels, Carbon steels, Cast iron, SS400, S55C, FC250 (~750N/mm²)	Alloy steels, Tool steels, SCM, SKT, SKS, SKD (~30HRC)	Prehardened steels (Free-cutting) SKT, SKD, NAK55, HPM1 (30~38HRC)	Stainless steels SUS304, SKD (38~45HRC)	Hardened steels, Titanium alloys, Heat resistant alloys steels. (45~55HRC)	Hardened steels (55~60HRC)
切削速度 Cutting Speed (V)	80 m/min	60 m/min	55 m/min	52 m/min	42 m/min	20 m/min
Mill Dia. (mm)	Speed (mm⁻¹)	Feed (mm/min)	Speed (mm⁻¹)	Feed (mm/min)	Speed (mm⁻¹)	Feed (mm/min)
3	8500	705	6350	959	5850	455
4	6350	705	4750	675	4400	455
5	5100	715	3800	660	3500	475
6	4250	715	3200	560	2900	500
8	3200	660	2400	550	2200	545
10	2550	610	1900	535	1750	475
12	2100	610	1600	475	1450	450
16	1600	610	1200	430	1100	370
20	1250	610	955	380	875	370
加工深度 Depth of cut 直徑 D : Diameter	$aa=0.5D$		$aa=0.5D$		$aa=0.5D$	

- 請使用準確性和高剛性之機器及刀把。
- 當切削深度過大或機器剛性不足請調整轉速。
- 請使用有效抑止煙霧之流體。
- 在乾式切削時請使用吹氣去除此範圍之碎屑。
- Use a rigid and precise machine and holder.
- Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
- Please use a suitable fluid with high smoke retardant properties.
- During Dry (no fluid) milling, please use air bolw to remove disposable chips from the milling area and to eliminate chip packing.



極超微粒立銑刀 End Mills

型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UET0102S	1.0	3	50	3
UET0102	1.0	3	50	4
UET0152S	1.5	4	50	3
UET0152	1.5	4	50	4
UET0202S	2.0	6	50	3
UET0202	2.0	6	50	4
UET0302S	3.0	8	50	3
UET0302M	3.0	8	50	4
UET0302	3.0	8	50	6
UET0402M	4.0	11	50	4
UET0402	4.0	11	50	6
UET0502	5.0	13	50	6
UET0602	6.0	16	50	6
UET0802	8.0	20	60	8
UET1002	10.0	25	75	10
UET1202	12.0	30	75	12
UET1602	16.0	45	100	16

unit: mm

○ 精銑
Finishing◎ 中銑
Semi-finishing◎ 粗銑
Roughing

List of recommended milling conditions for UET-2T

被切削材 Work Material	Carbon Steels S45C, S50C HB225	Alloy Steels SK, SCM, SUS HB225-325	Prehardened Steels NAK, SKD HRC30-45	Hardened Steels SKD11, 61, SKT HRC45-55
型號 Type No.	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
UET0102	20000	125	15000	120
UET0202	11000	130	8500	120
UET0302	7400	195	6400	145
UET0402	5900	230	5000	190
UET0502	5300	310	4200	230
UET0602	4400	305	3500	230
UET0802	3300	290	2600	230
UET1002	2600	275	2100	225
UET1202	2200	275	1750	225

加工深度 Depth of cut 直徑 D : Diameter	*Slot Milling (溝銑)	D ≤ ø1 ø1 ≤ D < ø3 ø3 ≤ D	ø1 ≤ D < ø3 ø3 ≤ D
		a _a = 0.1D a _a = 0.3D a _a = 0.5D	a _a = 0.01D a _a = 0.02D a _a = 0.05D

High Speed Milling conditions for UET-2T

High Speed Slotting

被切削材 Work Material	Mild steels, Carbon steels, Cast iron, SS400, S55C, FC250 (~750N/mm ²)		Alloy steels, Tool steels, SCM, SKT, SKS, SKD (~30HRC)		Prehardened steels, SKT, SKD, NAK55, HPM1 (30~38HRC)		Stainless steels, Prehardened steels, SUS304, SKD, NAK80, HPM50 (38~45HRC)		Hardened steels, (45~55HRC)	
Mill Dia. (mm)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)
UET0102	30200	545	28600	515	25500	405	19100	275	12700	120
UET0152	20800	550	20200	530	17500	405	12900	270	8700	120
UET0202	15900	550	15500	530	13500	405	9900	270	6700	120
UET0252	13100	550	12700	535	11100	405	8000	265	5450	125
UET0302	10600	605	10600	575	8500	410	6350	285	4800	145
UET0402	8750	560	8750	560	7150	400	5150	270	3750	135
UET0452	8150	550	8150	550	6700	390	4800	255	3400	130
UET0502	7650	535	7650	535	6400	380	4450	250	3200	130
UET0602	6350	535	6350	535	5300	380	3700	250	2650	130
UET0802	4800	535	4800	535	4000	380	2800	250	2000	130
UET1002	3800	535	3800	535	3200	380	2250	250	1600	130
UET1202	3200	535	3200	535	2650	380	1850	250	1350	130

加工深度
Depth of cut
直徑
D : Diameter



$D \leq \phi 1$
 $a_a = 0.15D$
 $\phi 3 < D$
 $a_a = 0.2D$

$D \leq \phi 1$
 $a_a = 0.1D$
 $\phi 6 < D$
 $a_a = 0.15D$



極超微粒立銑刀 End Mills

型號 Type No.	直徑 D1 Diameter	刃長 L1 Flute Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
UET0104	1.0	3	50	4
UET0154	1.5	4	50	4
UET0204	2.0	6	50	4
UET0304S	3.0	8	50	3
UET0304M	3.0	8	50	4
UET0304	3.0	8	50	6
UET0404S	4.0	11	50	4
UET0404	4.0	11	50	6
UET0504	5.0	13	50	6
UET0604	6.0	16	50	6
UET0804	8.0	20	60	8
UET1004	10.0	25	75	10
UET1204	12.0	30	75	12
UET1604	16.0	45	100	16
UET2004	20.0	45	100	20

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

List of recommended milling conditions for UET-4T

	直徑 D1	直徑公差值 D1 tolerance
	1.0	0
	1.5	-0.02
	2.0	-0.02
	3.0	-0.02
	4.0	-0.02
	5.0	-0.02
	6.0	-0.025
	8.0	-0.025
	10.0	-0.03
12.0	-0.035	
16.0	-0.04	
20.0	-0.05	
柄徑 shank (h6)	柄徑公差值 D2 tolerance	
Ø 3	0	
Ø 4	-0.006	
Ø 6	-0.008	
Ø 8	0	
Ø 10	-0.008	
Ø12	-0.009	
Ø16	-0.011	
Ø18	-0.011	
Ø20	0	
	-0.013	

被切削材 Work Material	HRC20-30		HRC30-48		HRC48-58		HRC58-62	
切削速度 Cutting Speed (V)	170 m/min		110 m/min		80 m/min		50 m/min	
型號 Type No.	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)	Speed (mm ⁻¹)	Feed (mm/min)
UET0204	26500	850	17500	560	12800	410	8000	250
UET0304	18000	720	11500	465	8500	340	3200	130
UET0404	13500	810	8800	525	6350	380	2400	145
UET0504	11000	650	7000	420	5100	305	1900	115
UET0604	9000	720	5800	465	4250	340	1600	130
UET0804	6800	675	4400	440	3200	320	1200	120
UET1004	5400	755	3500	490	2500	355	1000	140
UET1204	4500	720	2900	465	2100	340	800	130
UET1604	3400	745	2200	480	1600	350	600	130
UET2004	2700	745	1750	480	1280	350	320	130
加工深度 Depth of cut 直徑 D : Diameter	*Side Milling (側銑) 						*Side Milling (側銑) 	

High Speed Milling conditions for UET-4T

被切削材 Work Material	Carbon Steels S45C.S50C HB150-225		Alloy Steels SKD.NAK55.HPM1 HRC20-35		Prehardened Steels NAK80 HRC35-45		Hardened Steels SKD61 HRC45-55	
切削速度 Cutting Speed (V)	60-100 m/min		50-70 m/min		35-60 m/min		20-40 m/min	
型號 Type No.	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)
UET0304	8500	580	6400	320	4800	180	3200	210
UET0404	6400	580	4800	380	3600	180	2400	230
UET0504	5100	780	3800	380	2900	200	1900	250
UET0604	4300	780	3200	380	2400	200	1600	250
UET0804	3200	780	2400	380	1800	200	1200	250
UET1004	2600	780	1900	380	1400	200	1000	250
UET1204	2100	780	1600	380	1200	200	800	250
UET1604	1600	710	1200	330	900	160	600	200
UET2004	1300	710	1000	330	700	160	500	200
加工深度 Depth of cut 直徑 D : Diameter	*Side Milling (側銑) 		*Side Milling (側銑) 					

被切削材 Work Material	Carbon Steels S45C.S50C HB150-250		Alloy Steels SCM.P20.PDS5.PDS3.SKD11 HRC20-35		Prehardened Steels NAK80 HRC35-45		Hardened Steels SKD61 HRC45-55	
型號 Type No.	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)
UET0604	21000	2500	18000	1500	8000	800	4200	420
UET0804	16000	2500	13500	1500	6000	800	3150	420
UET1004	12500	2500	11000	1500	5000	800	2500	420
UET1204	10000	2500	9000	1500	4000	800	2100	420
加工深度 Depth of cut 直徑 D : Diameter								

被切削材 Work Material	Carbon Steels S45C.S50C HB150-250		Alloy Steels SCM.P20.PDS5.PDS3.SKD11 HRC20-35		Prehardened Steels NAK80 HRC35-45		Hardened Steels SKD61 HRC45-55	
型號 Type No.	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)	Speed (mm-1)	Feed (mm/min)
UET0604	21000	2500	18000	1500	8000	800	4200	420
UET0804	16000	2500	13500	1500	6000	800	3150	420
UET1004	12500	2500	11000	1500	5000	800	2500	420
UET1204	10000	2500	9000	1500	4000	800	2100	420
加工深度 Depth of cut 直徑 D : Diameter								



極超微粒長柄立銑刀 End Mills

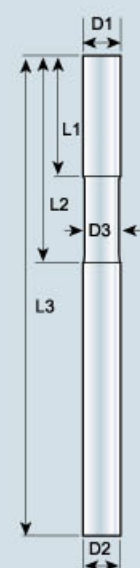
型號 Type No.	直徑 D1 Diameter	頸徑 D3 Neck Dia	刃長 L1 Flute Length	有效長 L2 Effective Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
ULE0602	6.0	5.80	16	40	100	6
ULE0602X	6.0	5.80	16	40	150	6
ULE0802	8.0	7.70	20	50	100	8
ULE0802X	8.0	7.70	20	50	150	8
ULE1002	10.0	9.60	25	50	100	10
ULE1002X	10.0	9.60	25	50	150	10
ULE1202	12.0	11.5	30	50	100	12
ULE1202X	12.0	11.5	30	50	150	12

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing



直徑 D1	直徑公差值 D1 tolerance
6.0	-0.01 -0.025
8.0	-0.01 -0.025
10.0	-0.01 -0.03
12.0	-0.01 -0.035
柄徑 (h6) shank (h6)	柄徑公差值 D2 tolerance
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø 10	0 -0.009
Ø 12	0 -0.011



極超微粒長柄立銑刀 End Mills

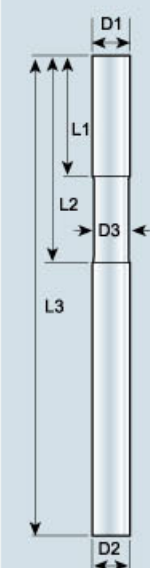
型號 Type No.	直徑 D1 Diameter	頸徑 D3 Neck Dia	刃長 L1 Flute Length	有效長 L2 Effective Length	全長 L3 O. A. L.	柄徑 D2 Shank Dia
ULE0604	6.0	5.80	16	40	100	6
ULE0604X	6.0	5.80	13	40	150	6
ULE0804	8.0	7.70	20	50	100	8
ULE0804X	8.0	7.70	20	50	150	8
ULE1004	10.0	9.60	25	50	100	10
ULE1004X	10.0	9.60	25	50	150	10
ULE1204	12.0	11.5	30	50	100	12
ULE1204X	12.0	11.5	30	50	150	12
ULE1604X	16.0	15.5	40	65	150	16
ULE2004X	20.0	19.0	45	70	150	20

unit: mm

- 精銑
Finishing
- 中銑
Semi-finishing
- 粗銑
Roughing

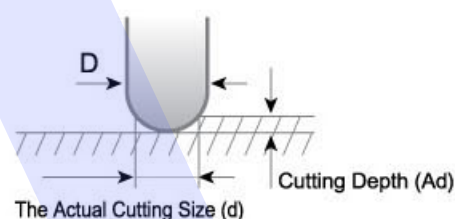


直徑 D1 (mm)	直徑公差值 D1 tolerance (mm)
6.0	-0.01 -0.025
8.0	-0.01 -0.025
10.0	-0.01 -0.03
12.0	-0.01 -0.035
柄徑 (h6) shank (mm)	柄徑公差值 D2 tolerance (mm)
Ø 6	0 -0.008
Ø 8	0 -0.008
Ø 10	0 -0.009
Ø 12	0 -0.011
Ø 16	0 -0.011
Ø 20	0 -0.013



Ball Nose Real Cutting Diameter

實際直徑計算

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

$$V = \frac{\pi D N}{1000}$$

$$F = N \times Z \times f$$

F: 進 給 Feed (mm/min)





- ★變形鎢鋼立銑刀規格直徑10-32mm，長度75L-300L，相同規格可自由搭配替換。
A variety of size are available to match up and exchange, Diameter range: 10mm to 32mm. Length range: 75mm to 300mm.
- ★鎢鋼銑刀頭與抗震鎢鋼刀桿組合之後，其精密度可達0.02mm以下。
The precision will reach 0.02mm below after the threaded solid carbide head is combined with the solid carbide shank.

Exchangeable Head Endmill

變形鎢鋼立銑刀

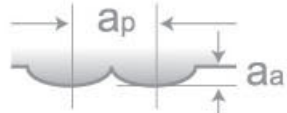
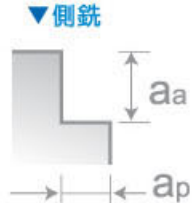
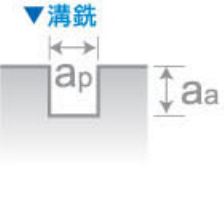
HOT

台灣專利
第M316765號
中國專利
第1005938號

產品回函卡 REPLY



客戶名稱／

產品型號	被加工材質	硬度 (HRC)
	是否經過熱處理 ☐ 是 ☐ 否	
使用機台型式／ 型號／	使用軟體版本	
	☐ UG ☐ CIMATRON ☐ Power-Mill	☐ Master CAM
	☐ Pro-E ☐ Work NC	
挾持方式／	☐ ER夾頭 ☐ 後拉式夾頭 ☐ 油壓夾頭 ☐ 燒結式夾頭	
所使用夾頭的品牌／		
冷卻方式／	☐ 乾式切削 ☐ 油霧方式 ☐ 油性切削 (大量) ☐ 水溶性切削	
加工方式／	☐ 順銑  ☐ 逆銑 	
1.球刀	2.平刀	
轉速／ min ⁻¹	轉速／ min ⁻¹	
進給／ m/min	進給／ m/min	
	 	
aa= mm	aa= mm	
ap= mm	ap= mm	
結果／	結果／	

Messrs.

Type No. (Size Description)	Work Material		Hardness (HRC)
	Heat Treatment ☐ YES ☐ NO		
Machine Type/ Model/	Programming Method		
	☐ UG	☐ CIMATRON	☐ Power-Mill
	☐ Pro-E	☐ Work NC	☐ Master CAM
Tool Holding System/ Brand/	☐ ER Collect Chuck ☐ Draw Back Chuck ☐ Hydraulic Chuck ☐ Shrink Fit Chuck		
Cooling Type/	☐ Dry Machining ☐ MQL (Mist) ☐ Oil Machining ☐ Emulsion (Coolant) Machining		
Processing Method/	☐ Down Milling ☐ Up Milling		
1. Ball Nose End Mill		2. Flat End Mill	
Speed/ min ⁻¹ Feed/ m/min aa= mm ap= mm		Speed/ min ⁻¹ Feed/ m/min ▼ Side Milling ▼ Slotting aa= mm aa= mm ap= mm ap= mm	
Result/		Result/	