

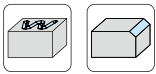
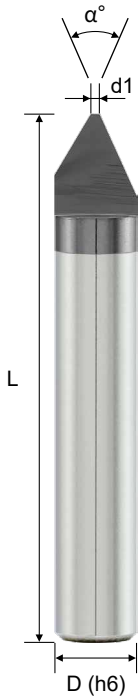
S960 - Engraving

雕刻銑刀

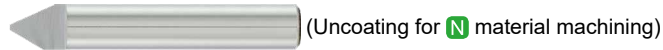
- Flat tipped engraving end mill with 30°, 60° or 90° angle.
- For steel, stainless steel, cast iron, aluminum alloy, titanium alloy and non-ferrous materials machining.
- TACO (Al, Ti, N) coating provide superior wear resistance.



EPESF



Order No.	Tip Dia. (d1)	Angle (α°)	OAL (L)	Shank (D)	Flutes (Z)
-----------	---------------	------------	---------	-----------	------------



EPESF1401030	0.1	30°	50	4	1
EPESF1402030	0.2	30°	50	4	1
EPESF1403030	0.3	30°	50	4	1
EPESF1405030	0.5	30°	50	4	1
EPESF1407030	0.7	30°	50	4	1
EPESF1403060	0.3	60°	50	4	1
EPESF1405060	0.5	60°	50	4	1
EPESF1407060	0.7	60°	50	4	1
EPESF1405090	0.5	90°	50	4	1
EPESF1407090	0.7	90°	50	4	1
EPESF1410090	1.0	90°	50	4	1
EPESF1415090	1.5	90°	50	4	1



EPESF1401030T	0.1	30°	50	4	1
EPESF1402030T	0.2	30°	50	4	1
EPESF1403030T	0.3	30°	50	4	1
EPESF1405030T	0.5	30°	50	4	1
EPESF1407030T	0.7	30°	50	4	1
EPESF1403060T	0.3	60°	50	4	1
EPESF1405060T	0.5	60°	50	4	1
EPESF1407060T	0.7	60°	50	4	1
EPESF1405090T	0.5	90°	50	4	1
EPESF1407090T	0.7	90°	50	4	1
EPESF1410090T	1.0	90°	50	4	1
EPESF1415090T	1.5	90°	50	4	1



Material	Carbon Steel	Stainless Steel	Cast Iron	Aluminum Alloys	Titanium Alloys	Plastic							
Vc	≥ 75 m/min												
Angle (α°)	Tip Dia. (d1)	RPM	F (mm/min)	RPM	F (mm/min)	RPM	F (mm/min)	RPM	F (mm/min)	RPM	F (mm/min)	RPM	F (mm/min)
30°	0.1~0.7	≥ 6000	60~90	≥ 6000	45~70	≥ 6000	100~150	≥ 6000	100~150	≥ 6000	45~70	≥ 6000	145~220
60°	0.3~0.7	≥ 6000	70~100	≥ 6000	60~90	≥ 6000	120~170	≥ 6000	120~170	≥ 6000	60~90	≥ 6000	180~260
90°	0.5~1.5	≥ 6000	90~120	≥ 6000	75~100	≥ 6000	150~200	≥ 6000	150~200	≥ 6000	75~100	≥ 6000	225~300
		ap ≤ 0.25											

Solid End Milling

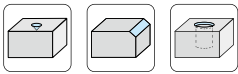
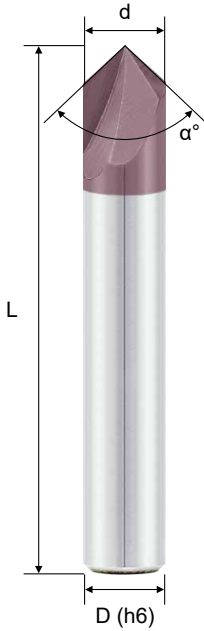
S960 - Chamfer Endmill · 2F

倒角銑刀 · 2 刃

- Sharp cutting edge design for milling machine or lathe chamfering.
- Chamfering angle is 45°.
- Suitable for alloy steel, stainless steel, cast iron, hardened steel & aluminum alloy.
- UNICO (Ti, Al, N) coating provides excellent wear resistance.



EPFSA

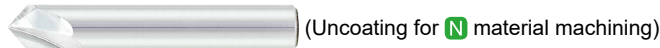


α° Tolerance	
α°	±1°

Order No.	Dia. (d)	OAL (L)	Shank (D)	Tip Angle α°	Flutes (Z)
-----------	----------	---------	-----------	--------------	------------



EPFSA233090U	3	50	3	90°	2
EPFSA244090U	4	50	4	90°	2
EPFSA206090U	6	50	6	90°	2
EPFSA208090U	8	60	8	90°	2
EPFSA210090U	10	75	10	90°	2
EPFSA212090U	12	75	12	90°	2



EPFSA233090	3	50	3	90°	2
EPFSA244090	4	50	4	90°	2
EPFSA206090	6	50	6	90°	2
EPFSA208090	8	60	8	90°	2
EPFSA210090	10	75	10	90°	2
EPFSA212090	12	75	12	90°	2

Material	Carbon Steel / Alloy Steel / Cast iron			Alloy Steel / Tool Steel / Pre-Hardened Steel (SCM, SKT, SKD)			Stainless Steel (SUS304, SUS316)			Hardened Steel			Aluminum Alloys		
Hardness	HRC < 30			HRC 30 ~ 40			-			HRC 40 ~ 55			-		
Vc	80 ~ 230 m/min			60 ~ 180 m/min			45 ~ 140 m/min			25 ~ 30 m/min			100 ~ 200 m/min		
Dia. (d)	fz (mm)	α = 90°		fz (mm)	α = 90°		fz (mm)	α = 90°		fz (mm)	α = 90°		fz (mm)	α = 90°	
		ap (mm)	ae (mm)		ap (mm)	ae (mm)		ap (mm)	ae (mm)		ap (mm)	ae (mm)		ap (mm)	ae (mm)
3mm	0.04	0.2	0.2	0.04	0.2	0.2	0.04	0.2	0.2	0.04	0.2	0.2	0.04	0.2	0.2
4mm	0.04	0.2	0.2	0.04	0.2	0.2	0.04	0.2	0.2	0.04	0.2	0.2	0.04	0.2	0.2
6mm	0.04	0.3	0.3	0.04	0.3	0.3	0.04	0.3	0.3	0.04	0.3	0.3	0.04	0.3	0.3
8mm	0.05	0.4	0.4	0.05	0.4	0.4	0.05	0.4	0.4	0.05	0.4	0.4	0.05	0.4	0.4
10mm	0.06	0.5	0.5	0.06	0.5	0.5	0.06	0.5	0.5	0.06	0.5	0.5	0.06	0.5	0.5
12mm	0.07	0.6	0.6	0.07	0.6	0.6	0.07	0.6	0.6	0.07	0.6	0.6	0.07	0.6	0.6

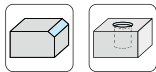
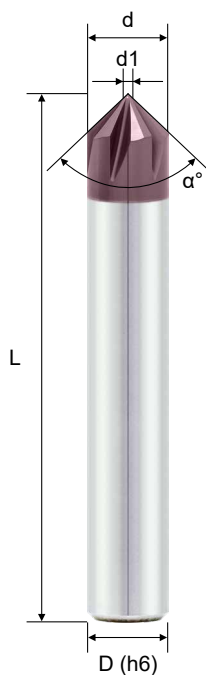
※ For machining on two sides, Feed rate reduce 20~30%.
For vertical plunging, Feed rate reduce 30~40%.

S960 - Chamfer Endmill · 4F / 5F / 6F 倒角銑刀 · 4刃 / 5刃 / 6刃

- Designed for chamfer milling.
- Chamfering angle can be divided into 30° or 45°.
- Suitable for alloy steel, stainless steel, cast iron & hardened steel.
- UNICO (Ti, Al, N) coating provides excellent wear resistance.



EPFSA



α° Tolerance	
α°	±1°

Order No.	Dia. (d)	Tip Dia. (d1)	OAL (L)	Shank (D)	Tip Angle α°	Flutes (Z)
EPFSA444060U	4	0.5	50	4	60°	4
EPFSA406060U	6	1.0	60	6	60°	4
EPFSA508060U	8	1.5	60	8	60°	5
EPFSA610060U	10	1.5	75	10	60°	6
EPFSA612060U	12	2.0	75	12	60°	6
EPFSA444090U	4	0.5	50	4	90°	4
EPFSA406090U	6	1.0	60	6	90°	4
EPFSA508090U	8	1.5	60	8	90°	5
EPFSA610090U	10	1.5	75	10	90°	6
EPFSA612090U	12	2.0	75	12	90°	6
EPFSA616090U	16	2.0	100	16	90°	6
EPFSA620090U	20	2.0	100	20	90°	6

Material	Carbon Steel / Alloy Steel / Cast iron				Alloy Steel / Tool Steel / Pre-Hardened Steel (SCM, SKT, SKD)				Stainless Steel (SUS304, SUS316)				Hardened Steel							
	HRC < 30				HRC 30 ~ 40				-				HRC 40 ~ 55							
Vc	80 ~ 230 m/min				60 ~ 180 m/min				45 ~ 140 m/min				25 ~ 30 m/min							
Dia. (d)	fz (mm)	α = 60°		α = 90°		α = 60°		α = 90°		α = 60°		α = 90°		α = 60°		α = 90°				
		ap	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap	ae	ap	ae			
4mm	0.04	0.30	0.2	0.2	0.2	0.04	0.30	0.2	0.2	0.2	0.04	0.30	0.2	0.2	0.2	0.04	0.30	0.2	0.2	0.2
6mm	0.04	0.45	0.3	0.3	0.3	0.04	0.45	0.3	0.3	0.3	0.04	0.45	0.3	0.3	0.3	0.04	0.45	0.3	0.3	0.3
8mm	0.05	0.60	0.4	0.4	0.4	0.05	0.60	0.4	0.4	0.4	0.05	0.60	0.4	0.4	0.4	0.05	0.60	0.4	0.4	0.4
10mm	0.06	0.75	0.5	0.5	0.5	0.06	0.75	0.5	0.5	0.5	0.06	0.75	0.5	0.5	0.5	0.06	0.75	0.5	0.5	0.5
12mm	0.07	0.90	0.6	0.6	0.6	0.07	0.90	0.6	0.6	0.6	0.07	0.90	0.6	0.6	0.6	0.07	0.90	0.6	0.6	0.6

※ Effective Cutter Diameter = (d + d1)/2
 For machining on two sides, Feed rate reduce 20~30%.
 For vertical plunging, Feed rate reduce 30~40%.

Solid End Milling

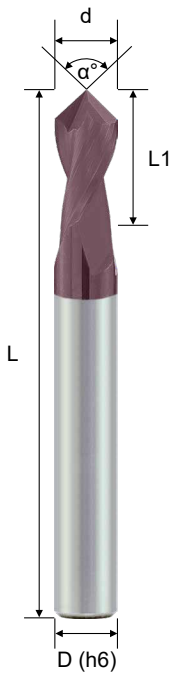
S960 - Drill Mills · 2F

倒角兼用銑刀 · 2 刃

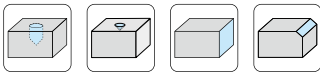
- Multiple application : drilling, chamfering, spotting, side milling, countersinking.
- Chamfering angle can be divided into 30°, 45° or 60°.
- Suitable for alloy steel, stainless steel and aluminum alloy.
- UNICO (Ti, Al, N) coating provides excellent wear resistance.



EPFSC



Order No.	Dia. (d)	CL (L1)	OAL (L)	Shank (D)	α°	Flutes (Z)
EPFSC203060U	3	6	50	6	60°	2
EPFSC204060U	4	8	50	6	60°	2
EPFSC205060U	5	10	50	6	60°	2
EPFSC206060U	6	12	50	6	60°	2
EPFSC208060U	8	16	60	8	60°	2
EPFSC210060U	10	20	75	10	60°	2
EPFSC212060U	12	24	75	12	60°	2
EPFSC203090U	3	6	50	6	90°	2
EPFSC204090U	4	8	50	6	90°	2
EPFSC205090U	5	10	50	6	90°	2
EPFSC206090U	6	12	50	6	90°	2
EPFSC208090U	8	16	60	8	90°	2
EPFSC210090U	10	20	75	10	90°	2
EPFSC212090U	12	24	75	12	90°	2
EPFSC203012U	3	6	50	6	120°	2
EPFSC204012U	4	8	50	6	120°	2
EPFSC205012U	5	10	50	6	120°	2
EPFSC206012U	6	12	50	6	120°	2
EPFSC208012U	8	16	60	8	120°	2
EPFSC210012U	10	20	75	10	120°	2
EPFSC212012U	12	24	75	12	120°	2



Tolerance	
∅d ≤ 6	0 ~ -0.02
6 < ∅d ≤ 12	0 ~ -0.03
∅d > 12	0 ~ -0.04

Working Material	Normal Steel (S45C)		Alloy Steel / Tool Steel (SCM, SKT, SKD)		Stainless Steel (SUS304)		Aluminum Alloy					
Hardness	HRC < 20		HRC < 30~40		-		-					
Vc	60 m/min		50 m/min		40 m/min		100 m/min					
Dia. (d)	RPM	Feed (mm/min)		Feed (mm/min)		Feed (mm/min)		Feed (mm/min)				
		Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal			
3 mm	6400	25	50	5300	20	40	4200	20	40	10600	40	80
4 mm	4800	25	55	4000	20	45	3200	20	45	8000	40	85
6 mm	3200	25	60	2650	20	50	2100	20	50	5300	40	90
8 mm	2400	25	65	2000	20	55	1600	20	55	4000	40	110
10 mm	1900	25	70	1600	20	60	1300	20	60	3200	40	110
12 mm	1600	25	70	1350	20	60	1050	20	60	2700	40	120



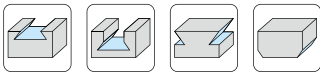
S960 - Dovetail Endmill · 4F

鳩尾槽銑刀 · 4刃

- For dovetail slotting and side milling.
- Suitable for chamfering the bottom edge of the workpiece.
- Neck grinding is suitable for deep machining.
- Provide 30°, 60°, 90° and 120° included angle.
- UNICO (Ti, Al, N) coating provides excellent wear resistance.



EPSDT



d Tolerance	
d ≤ 6	0 ~ -0.02
6 < d ≤ 12	0 ~ -0.03
d > 12	0 ~ -0.04

α° Tolerance	
α°	±1°

Order No.	Dia. (d)	α°	CL (L1)	NL (L2)	ND (d1)	OAL (L)	Shank (D)	Flutes (Z)
EPSDT40330030U	3	30°	2.0	3	2.0	50	6	4
EPSDT40360030U	3	60°	0.9	3	2.0	50	6	4
EPSDT40390030U	3	90°	0.8	3	1.5	50	6	4
EPSDT40312030U	3	120°	0.4	3	1.5	50	6	4
EPSDT40430040U	4	30°	2.6	4	2.6	50	6	4
EPSDT40460040U	4	60°	1.2	4	2.6	50	6	4
EPSDT40490040U	4	90°	1.0	4	2.0	50	6	4
EPSDT40412040U	4	120°	0.6	4	2.0	50	6	4
EPSDT40530050U	5	30°	3.3	5	3.3	50	6	4
EPSDT40560050U	5	60°	1.5	5	3.3	50	6	4
EPSDT40590050U	5	90°	1.3	5	2.5	50	6	4
EPSDT40512050U	5	120°	0.7	5	2.5	50	6	4
EPSDT40630060U	6	30°	3.9	6	3.9	50	6	4
EPSDT40660060U	6	60°	1.8	6	3.9	50	6	4
EPSDT40690060U	6	90°	1.5	6	3.0	50	6	4
EPSDT40612060U	6	120°	0.9	6	3.0	50	6	4
EPSDT40830080U	8	30°	5.2	8	5.2	60	8	4
EPSDT40860080U	8	60°	2.4	8	5.2	60	8	4
EPSDT40890080U	8	90°	2.0	8	4.0	60	8	4
EPSDT40812080U	8	120°	1.2	8	4.0	60	8	4
EPSDT41030100U	10	30°	6.5	10	6.5	75	10	4
EPSDT41060100U	10	60°	3.0	10	6.5	75	10	4
EPSDT41090100U	10	90°	2.5	10	5.0	75	10	4
EPSDT41012100U	10	120°	1.4	10	5.0	75	10	4
EPSDT41230120U	12	30°	7.8	12	7.8	75	12	4
EPSDT41260120U	12	60°	3.6	12	7.8	75	12	4
EPSDT41290120U	12	90°	3.0	12	6.0	75	12	4
EPSDT41212120U	12	120°	1.7	12	6.0	75	12	4

※ α° < 90°, helix angle = 15° ; α° ≥ 90°, helix angle = 0°.

Working Material	Carbon / Alloy steel (< HRC 30)		Stainless Steel		Aluminum Alloys	
	Vc	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
	25 - 30 - 35 m/min		20 - 25 - 30 m/min		50 - 60 - 70 m/min	
Diameter (d)	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
4mm	2400	96	2000	77	4800	125
6mm	1600	96	1350	77	3200	125
8mm	1200	90	1000	72	2400	117
10mm	960	85	800	68	2000	111
12mm	800	85	670	68	1600	111

※If α° ≤ 90°, increase Vc and feed 30%.

Solid End Milling

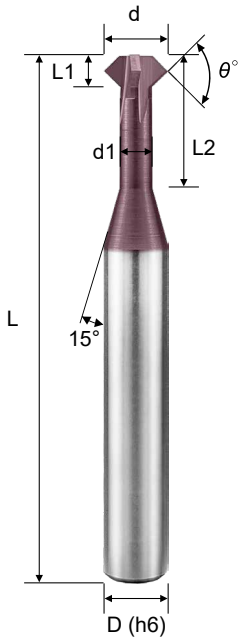
S960 - Front Back Chamfer Endmill · 4F

上下倒角銑刀 · 4 刃

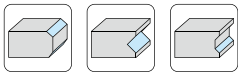
- For front / back chamfering.
- Suitable for alloy steel, stainless steel and aluminum alloy.
- UNICO (Ti, Al, N) coating provides excellent wear resistance.



EPTSV



Order No.	Dia. (d)	Nd (d1)	Angle (θ)	CL (L1)	EFF-L (L2)	OAL (L)	Shank (D)	Flutes (Z)
EPTSV404090U	4	2.0	90°	2.0	8	50	6	4
EPTSV405090U	5	2.5	90°	2.4	10	50	6	4
EPTSV406090U	6	3.0	90°	2.8	12	60	6	4
EPTSV408090U	8	4.0	90°	3.8	16	60	8	4
EPTSV410090U	10	5.0	90°	4.8	20	75	10	4



α° Tolerance	
α°	±1°

Working Material	Carbon / Alloy steel (< HRC 30)		Stainless Steel		Aluminum Alloys	
	Vc		Vc		Vc	
Vc	25 - 30 - 35 m/min		20 - 25 - 30 m/min		50 - 60 - 70 m/min	
Diameter (d)	RPM	Feed (mm/min)	RPM	Feed (mm/min)	RPM	Feed (mm/min)
4mm	2400	96	2000	77	4800	125
6mm	1600	96	1350	77	3200	125
8mm	1200	90	1000	72	2400	117
10mm	960	85	800	68	2000	111
12mm	800	85	670	68	1600	111

※If α° ≤ 90°, increase Vc and feed 30%.

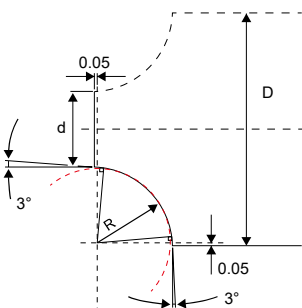
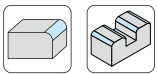
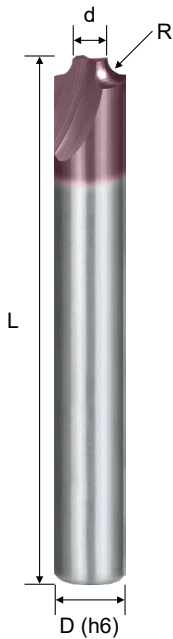
S960 - Inner Radius Endmill · 2F / 4F

內 R 角銑刀 · 2 刃 / 4 刃

- Inner radius tools are suitable for chamfering with round corner application.
- Suitable for alloy steel, stainless steel, cast iron & hardened steel.
- UNICO (Ti, Al, N) coating provides excellent wear resistance.

ASIA
(Metric)

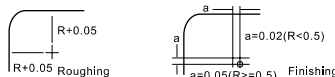
EPISA



Order No.	Radius (R)	Dia. (d)	OAL (L)	Shank (D)	Flutes (Z)
EPISA242905U	0.5R	2.9	50	4	2
EPISA204905U	0.5R	4.9	50	6	2
EPISA241910U	1.0R	1.9	50	4	2
EPISA203910U	1.0R	3.9	50	6	2
EPISA205910U	1.0R	5.9	60	8	2
EPISA204915U	1.5R	4.9	60	8	2
EPISA205920U	2.0R	5.9	75	10	2
EPISA204925U	2.5R	4.9	75	10	2
EPISA205930U	3.0R	5.9	75	12	2
EPISA203940U	4.0R	3.9	75	12	2
EPISA205950U	5.0R	5.9	75	16	2
EPISA203960U	6.0R	3.9	75	16	2

EPISA442905U	0.5R	2.9	50	4	4
EPISA404905U	0.5R	4.9	50	6	4
EPISA441910U	1.0R	1.9	50	4	4
EPISA403910U	1.0R	3.9	50	6	4
EPISA405910U	1.0R	5.9	60	8	4
EPISA404915U	1.5R	4.9	60	8	4
EPISA405920U	2.0R	5.9	75	10	4
EPISA404925U	2.5R	4.9	75	10	4
EPISA405930U	3.0R	5.9	75	12	4
EPISA403940U	4.0R	3.9	75	12	4
EPISA405950U	5.0R	5.9	75	16	4
EPISA403960U	6.0R	3.9	75	16	4

Working Material	CARBON STEEL			ALLOY STEEL / TOOL STEEL			HARDENED STEEL		
Hardness	HRC < 20			HRC 30 ~ 40			HRC 40~50		
Vc	30~40 m/min			20~30 m/min			15~25 m/min		
Diameter (d)	R.P.M	Roughing Feed (mm/min)	Finishing Feed (mm/min)	R.P.M	Roughing Feed (mm/min)	Finishing Feed (mm/min)	R.P.M	Roughing Feed (mm/min)	Finishing Feed (mm/min)
0.50R	8,800	50	80	6,400	40	55	5,100	30	50
0.75R	7,200	50	80	5,100	40	55	4,100	30	50
1.00R	5,000	50	80	3,500	40	55	3,400	30	50
1.25R	4,300	50	80	3,100	40	55	2,900	30	50
1.50R	3,000	50	80	2,200	40	55	2,600	30	50
2.00R	2,600	50	80	1,900	40	55	2,200	30	50
2.50R	2,200	50	80	1,800	40	55	2,000	30	50
3.00R	2,000	50	80	1,600	40	55	1,700	30	50
4.00R	1,500	50	80	1,200	40	55	1,300	30	50
5.00R	1,300	50	80	960	40	55	1,000	30	50
6.00R	1,200	50	80	880	40	55	900	30	50



- Divide the cutting depth into several time paths.
- Use cutting fluid.

Solid End Milling