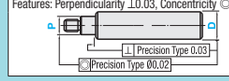
Shafts

One End Stepped and Threaded / Both Ends Stepped and Threaded

High Precision Linear Shafts for High Precision Assembly
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02


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For products uncovered by the e-Catalog Standards, see P.131.

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.235.

RoHS10

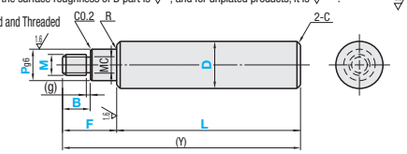
- Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.142
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.141
- Features of Low Temp. Black Chrome Plating P.156

Type: One End Stepped and Threaded D Tol. g6	One End Stepped and Threaded D Tol. h5	One End Stepped and Threaded D Tol. f8	Both Ends Stepped and Threaded D Tol. g6	Both Ends Stepped and Threaded D Tol. h5	Both Ends Stepped and Threaded D Tol. f8	Material	Hardness	Surface Treatment
SFAF	SFUF	-	SFAX	SFUX	-	SUJ2	Effective Hardened Depth of Induction Hardening P.142	-
SSFAF	SSFUF	-	SSFAX	SSFUX	-	SUS440C Equivalent		
PSFAF	PSFUF	-	PSFAX	PSFUX	-	SUJ2		Hard Chrome Plating - Plating Hardness: HV750 ~, Plating Thickness: 5μ or More ~
PSSFAF	PSSFUF	-	PSSFAX	PSSFUX	-	SUS440C Equivalent	SUJ2 58HRC~ SUS440C Equivalent 56HRC~	
RSFAF	-	-	RSFAX	-	-	SUJ2		Low Temp. Black Chrome Plating
-	-	PSFGF	-	-	PSFGX	S45C Equivalent	-	Hard Chrome Plating - Plating Hardness: HV750 ~, Plating Thickness: 10μ or More ~
-	-	PSSFGF	-	-	PSSFGX	SUS304		

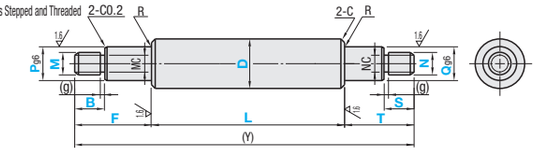
D	D Tol. g6	D Tol. h5	D Tol. f8
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12			
13			
15	-0.006 -0.017	0 -0.008	-0.016 -0.043
16			
18			
20			
25	-0.007 -0.020	0 -0.009	-0.020 -0.053
30			
35			
40	-0.009 -0.025	0 -0.011	-0.025 -0.064
50			

For plated products, the surface roughness of D part is 0.4S; and for unplated products, it is 0.4S G. (6.3S / 1.6S / 0.4S / 0.4S G)

One End Stepped and Threaded



Both Ends Stepped and Threaded



Part Number Type: One End Stepped and Threaded (D Tol. g6)	(D Tol. h5)	Both Ends Stepped and Threaded (D Tol. g6)	(D Tol. h5)	D	L	F, T	B, S	P, Q
SFAF	SFUF	SFAX	SFUX	8	25~ 990	10≤F≤Px5 10≤T≤Qx5	Pitchx3+(g)≤B≤Mx3 Pitchx3+(g)≤S≤Nx3	M<P<D N<Q<D
SSFAF	SSFUF	SSFAX	SSFUX	10	25~ 990			
PSFAF	PSFUF	PSFAX	PSFUX	12	25~1190			
PSSFAF	PSSFUF	PSSFAX	PSSFUX	13	25~1190			
RSFAF (D≤30, L≤500)		RSFAX (D≤30, L≤500)		15	25~1190			
(D Tol. f8)		(D Tol. f8)		16	25~1190			
PSFGF		PSFGX		18	25~1190			
PSSFGF		PSSFGX		20	25~1190			
				25	25~1190			
				30	25~1490			
				35	25~1480	20≤F≤Px5 20≤T≤Qx5		
				40	25~1480			
				50	25~1480			

* For RSFAF and RSFAX, L≤500 and Ymax≤800.

M (Coarse), N (Coarse) Selection	(Y) Max.	R	C
6	800	0.3 or Less	0.5 or Less
6 8	800		
6 8 10	1000		
6 8 10	1000		
6 8 10 12	1000		
6 8 10 12	1200		
6 8 10 12 16	1200		
6 8 10 12 16	1200		
8 10 12 16 20	1200		1.0 or Less
8 10 12 16 20 24	1500		
10 12 16 20 24 30	1500	0.5 or Less	
12 16 20 24 30	1500		
16 20 24 30	1500		

Coarse Thread Undercut Dimensions

M N	Pitch	MC NC	(g)
6	1.0	4.4	2
8	1.25	6.0	3
10	1.5	7.7	
12	1.75	9.4	4
16	2.0	13.0	
20	2.5	16.4	5
24	3.0	19.6	
30	3.5	25.0	

F-B(T-S)≥2 is required.

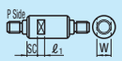
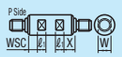
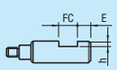
Ordering Example

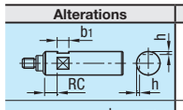
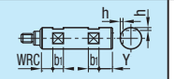
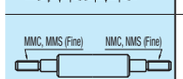
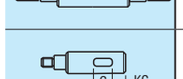
Part Number	L	F	B	P	M	T	S	Q	N
SFAX20	400	F30	B20	P10	M8	T20	S15	Q10	N8

Alterations

Part Number	L	F	B	P	M(MMC, MMS)	T	S	Q	N(NMC, NMS)	(LKC~etc.)
SFAX30	300	F40	B30	P20	M16	T50	S30	Q16	N10	LKC

Alteration Details P.143

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03 200≤L<500 ···L±0.05 L≥500 ···L±0.1
	SC	Wrench Flats at One Location Ordering Code SC5 SC = 1mm Increment SC+ℓ1≤L SC≥0 Not available in combination with WSC. D: 8, 10, 12, 15, 16, 18, 20, 25, 30, 35, 40, 50 / W: 7, 8, 10, 13, 15, 16, 17, 22, 27, 30, 36, 41 / ℓ1: 8, 10, 15, 20
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC(X)≥0 Orientation between wrench flats is not coplanar. Not available in combination with SC. Not applicable to One End Stepped and Threaded. D: 16, 18, 20, 25, 35, 40, 50 / W: 14, 16, 17, 22, 30, 35, 41 / ℓ1: 10, 15, 20
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment D≤30:FC≤5xD,D≥35:FC≥3xD E=0 or E≥2 Not available in combination with WFC. Not applicable to Both Ends Stepped and Threaded. D: 8~18, 20~40, 50 / h: 1, 2, 3
	WFC	Set Screw Flats at Two Locations Ordering Code WFC10-A8-E20 WFC, A, E=1mm Increment D≤30:WFC≤5xD,D≥35:WFC≥3xD A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. Not applicable to Both Ends Stepped and Threaded. D: 8~18, 20~40, 50 / h: 1, 2, 3

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code RC10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code WRC10-Y10 Application Notes Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	MMC MMS NMC NMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MMS) NMC14 (N is changed to NMC) NMS14 (N is changed to NMS)
	KC	Keyway is added at one location. Ordering Code KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30. Not applicable to Both Ends Stepped and Threaded.

For details, see Shaft Alteration Overview. P.143

Please see Shaft Alteration Overview for details if provided. P.143
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness. See P.142.

Undercut Dimensions for Fine Threads (1)

MMC NMC	Pitch	MC NC	(g)
6	0.75	4.8	2
8	1.0	6.4	
10		8.4	
12		10.4	
15		13.4	
17		15.4	
20		18.4	
25	1.5	22.7	3
30		27.7	

Undercut Dimensions for Fine Threads (2)

MMS NMS	Pitch	MC NC	(g)
10	1.25	8	3
12	1.5	9.7	
14		11.7	
18		15.7	

Part Number Type	D	Unit Price Min. L ~50	L51 ~100	L101 ~150	L151 ~200	L201 ~300	L301 ~400	L401 ~500	L501 ~600	L601 ~800	L801 ~1000	L1001 ~1200	L1201 ~1480
SFAF SFUF	8											-	-
	10											-	-
	12												-
	13												-
	15												-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												
SSFAF SSFUF	8											-	-
	10											-	-
	12												-
	13												-
	15												-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												
PSFGF	8												
	10												
	12, 13												
	15, 16												
	18, 20												
	25												
	30												
	35												
	40												
	50												
PSSFGF	8												
	10												
	12, 13												
	15, 16												
	18, 20												
	25												
	30												
	35												
	40												
	50												

Part Number Type	D	Unit Price Min. L ~50	L51 ~100	L101 ~150	L151 ~200	L201 ~300	L301 ~400	L401 ~500
RSFAF	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

For D tolerance h5, add the relevant surcharge to the prices above.

Part Number Type	D	Unit Price Min. L 50	L51 100	L101 150	L151 200	L201 300	L301 400	L401 500	L501 600	L601 800	L801 1000	L1001 1200	L1201 1480
SFAX SFUX	8											-	-
	10											-	-
	12												-
	13												-
	15												-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												
SSFAX SSFUX	8											-	-
	10											-	-
	12												-
	13												-
	15												-
	16												-
	18												-
	20												-
	25												-
	30												
	35												
	40												
	50												

For D tolerance h5, add the relevant surcharge to the prices above.

Part Number Type	D	Unit Price Min. L 100	L101 200	L201 400	L401 600	L601 800	L801 1000	L1001 1200	L1201 1490
PSFGF	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSFGF	8						-	-	-
	10						-	-	-
	12, 13								-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number Type	D	Unit Price Min. L 100	L101 200	L201 400	L401 600	L601 800	L801 1000	L1001 1200	L1201 1490
PSFGX	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSFGX	8						-	-	-
	10						-	-	-
	12, 13								-
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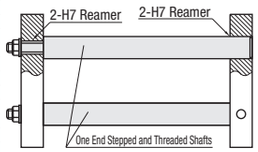
ex Example