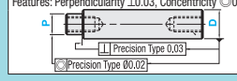
Shafts

One End Stepped, Both Ends Tapped / One End Stepped, One End Tapped

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.227. For One End Stepped, Both Ends Tapped with Wrench Flats, see P.163.

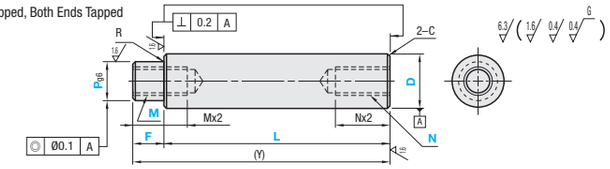
RoHS

Type: One End Stepped, Both Ends Tapped D Tol. g6	One End Stepped, Both Ends Tapped D Tol. h5	One End Stepped, Both Ends Tapped D Tol. f8	One End Stepped, One End Tapped D Tol. g6	One End Stepped, One End Tapped D Tol. h5	One End Stepped, One End Tapped D Tol. f8	M Material	H Hardness	S Surface Treatment
SFAA	SFUE	-	SFNA	SFEU	-	SUJ2	Effective Hardened Depth of Induction Hardening P.142 SUJ2 58HRC~ SUS440C Equivalent 56HRC~	-
SSFAA	SSFUE	-	SSFNA	SSFEU	-	SUS440C Equivalent		
PSFAA	PSFUE	-	PSFNA	PSFEU	-	SUJ2		Hard Chrome Plating - Plating Hardness: HV750 ~, Plating Thickness: 5μ or More ~
PSSFAA	PSSFUE	-	PSSFNA	PSSFEU	-	SUS440C Equivalent		
RSFAA	-	-	RSFNA	-	-	SUJ2		Low Temp. Black Chrome Plating
-	-	PSFGA	-	-	PSNGA	S45C Equivalent	-	Hard Chrome Plating - Plating Hardness: HV750 ~, Plating Thickness: 10μ or More ~
-	-	PSSFGA	-	-	PSSNGA	SUS304		

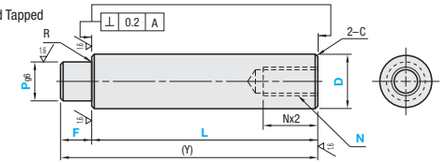
D	D Tol. g6	D Tol. h5	D Tol. f8
8	-0.005 / -0.014	0 / -0.006	-0.013 / -0.035
10			
12	-0.006 / -0.017	0 / -0.008	-0.016 / -0.043
13			
15			
16			
18			
20	-0.007 / -0.020	0 / -0.009	-0.020 / -0.053
25			
30			
35	-0.009 / -0.025	0 / -0.011	-0.025 / -0.064
40			
50			

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

One End Stepped, Both Ends Tapped



One End Stepped, One End Tapped



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

Part Number Type	D	L	F	P	M (Coarse) Selection	N (Coarse) Selection	(Y) Max.	R	C
One End Stepped, Both Ends Tapped (D Tol. g6) SFAA (D Tol. h5) SFUE; One End Stepped One End Tapped (D Tol. g6) SFNA (D Tol. h5) SFEU	8	25~ 998	2≤F≤Px4	6	3	3 4 5	800	0.3 or Less	0.5 or Less
SSFAA SSFUE SSFNA SSFEU	10	25~ 998		6~ 8	3 4 5	3 4 5 6	800		
PSFAA PSFUE PSFNA PSFEU	12	25~1198		6~10	3 4 5 6	4 5 6 8	1000		
PSSFAA PSSFUE PSSFNA PSSFEU	13	25~1198		6~11	3 4 5 6 8	4 5 6 8	1000		
RSFAA (D≤30, L≤500) RSFNA (D≤30, L≤500)	15	25~1198		6~13	3 4 5 6 8 10	4 5 6 8 10	1000		
(D Tol. f8) PSFGA PSNGA	16	25~1198		6~14	3 4 5 6 8 10	4 5 6 8 10	1200		
PSSFGA PSSNGA	18	25~1198		8~16	4 5 6 8 10 12	4 5 6 8 10 12	1200		
	20	25~1198		8~17	4 5 6 8 10 12	4 5 6 8 10 12	1200		
	25	25~1198		8~22	4 5 6 8 10 12 16	4 5 6 8 10 12 16	1200		
	30	25~1498		9~27	5 6 8 10 12 16 20 24	6 8 10 12 16 20	1500		1.0 or Less
	35	25~1498		9~32	5 6 8 10 12 16 20 24	8 10 12 16 20 24	1500	0.5 or Less	
	40	25~1498		11~37	6 8 10 12 16 20 24 30	10 12 16 20 24 30	1500		
	50	25~1498		11~47	6 8 10 12 16 20 24 30	12 16 20 24 30	1500		

P dimensions require M+3≤P. When D-P≤4, stepped section chamfer C is 0.2 or less. For One End Stepped One End Tapped Type, L dimensions require Nx3≤L.
When Mx2.5+4+Nx2.5+4≥(Y), tap pilot holes may go through. When Mx2+Nx2≥(Y), the effective depth of larger diameter tap has priority.

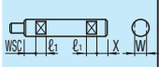
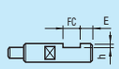
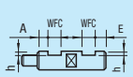
Ordering Example

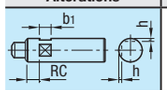
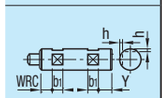
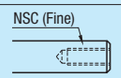
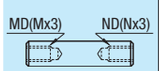
Part Number	L	F	P	M	N
SFAA20	400	F25	P16	M10	N10
SFUE20	400	F25	P16	M10	N10
SFNA20	400	F25	P15		N10

Alterations

Part Number	L	F	P	M(MD, ND)	N(NSC)	(LKC, WSC…etc.)
SFAA30	400	F25	P16	M10	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
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 WSC, X=1mm Increment WSC+X+ℓ1x2<L WSC(X)≥ 0 Orientation between two set screw flats is not coplanar. D: 8, 10, 12, 13, 15, 16, 18 — W: 7, 8, 10, 11, 13, 14, 16 — ℓ1: 8; D: 20, 25, 30, 35, 40, 50 — W: 17, 22, 27, 30, 36, 41 — ℓ1: 10, 10, 15, 15, 20, 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. D: 8~18 — h: 1; 20~40 — 2; 50 — 3
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 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. D: 8~18 — h: 1; 20~40 — 2; 50 — 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. For details, see Shaft Alteration Overview. P.143
	NSC	Change to Fine Tapped Thread Ordering Code NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more
	MD ND	Change the effective tap depth to M(N)x3. Ordering Code MD6/ND6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=12~30 and M (N) = 6~20 One End Tapped: MDx3.5+4≤L Both Ends Tapped: MDx3.5+4+NDx3.5+4≤L
	LFC	Set Screw Flat at Step Parts Ordering Code LFC10-A0 LFC≤F D-M(N)≥1 P: 6~18 — H: 1; 20~40 — 2; 41~ — 2

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

Part Number Type	D	Unit Price Min. L ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 250	L251 ~ 300	L301 ~ 350	L351 ~ 400	L401 ~ 450	L451 ~ 500	L501 ~ 550	L551 ~ 600	L601 ~ 650	L651 ~ 700	L701 ~ 750	L751 ~ 800	L801 ~ 850	L851 ~ 900	L901 ~ 950	L951 ~ 1000	L1001 ~ 1100	L1101 ~ 1200	L1201 ~ 1300	L1301 ~ 1400	L1401 ~ 1498
SFAA SFUE SFNA SFEU	8																					-	-	-	-	-
	10																					-	-	-	-	-
	12																							-	-	-
	13																							-	-	-
	15																							-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFAA SSFUE SSFNA SSFEU	8																					-	-	-	-	-
	10																					-	-	-	-	-
	12																							-	-	-
	13																							-	-	-
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	50																									
PSFAA PSFUE PSFNA PSFEU	8																					-	-	-	-	-
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	12																							-	-	-
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	40																									
	50																									
PSSFAA PSSFUE PSSFNA PSSFEU	8																					-	-	-	-	-
	10																					-	-	-	-	-
	12																							-	-	-
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	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									

• One End Stepped, Both Ends Tapped
For D tolerance h5, add the relevant surcharge to the prices above.

• One End Stepped, One End Tapped
For D tolerance h5, add the relevant surcharge to the prices above.
For D tolerance g6, subtract the relevant charge from the prices above.

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

For One End Stepped One End Tapped Shafts, subtract the relevant charge from 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 ~ 1498
PSFGA PSNGA	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15·16								-
	18·20								-
	25								-
	30								
	35								
	40								
	50								

For One End Stepped One End Tapped Shafts, subtract the relevant charge from 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 ~ 1498
PSSFGA PSSNGA	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15·16								-
	18·20								-
	25								-
	30								
	35								
	40								
	50								

For One End Stepped One End Tapped Shafts, subtract the relevant charge from the prices above.