

# Shafts

## Both Ends Stepped and Tapped / Both Ends Stepped

High Precision Linear Shafts for High Precision Assembly  
 Features: Perpendicularity  $\perp 0.03$ , Concentricity  $\odot 0.02$

P.225

For High Precision Linear Shafts with high perpendicular precision of the shaft end ( $\perp 0.03$ ), see P.225. For Both Ends Stepped and Tapped with Wrench Flats, see P.159.

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

Type		Material	Hardness	Surface Treatment	D Tol.		
Both Ends Stepped and Tapped	Both Ends Stepped				g6	h5	f8
SFAH	SFUH	SUJ2 Equivalent	Effective Hardened	8	-0.005	0	-0.013
SSFAH	SSFUH	SUS440C or 13Cr stainless	Depth of Induction	10	-0.014	-0.006	-0.035
PSFAH	PSFUH	SUJ2 Equivalent	Hardening P.142	12	-0.006	0	-0.016
PSSFAH	PSSFUH	SUS440C or 13Cr stainless	SUJ2 Equivalent 58HRC-	15	-0.017	-0.008	-0.043
RSFAH	RSFUH	SUJ2 Equivalent	SUS440C or 13Cr stainless 56HRC-	16	-	-	-
-	PSFGH	S45C Equivalent	Hard Chrome Plating - Plating Thickness: 5µ or More	18	-	-	-
-	PSSFGH	SUS304	Low Temp. Black Chrome Plating	20	-0.007	0	-0.020
-	-	-	Hard Chrome Plating - Plating Thickness: 10µ or More	25	-0.020	-0.009	-0.053
-	-	-	-	30	-	-	-
-	-	-	-	35	-0.009	0	-0.025
-	-	-	-	40	-0.025	-0.011	-0.064
-	-	-	-	50	-	-	-

For plated products, the surface roughness of D part is  $R_a 0.4$  and for unplated products, it is  $R_a 0.6$ .

Both Ends Stepped and Tapped

Both Ends Stepped

RoHS 10

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	1mm Increments	M (Coarse) Selection	(Y) Max.	R	C
Both Ends Stepped and Tapped (D Tol. g6)	Both Ends Stepped (D Tol. h5)	8	25-996	F, T	6	3	800	0.5 or Less
SFAH	SFUH	10	25-996	2sF≤Px4	6-8	3 4 5	800	
SSFAH	SSFUH	12	25-1196	2sT≤Px4	6-10	3 4 5 6	1000	
PSFAH	PSFUH	13	25-1196		6-11	3 4 5 6 8	1000	
PSSFAH	PSSFUH	15	25-1196		6-13	3 4 5 6 8 10	1000	
RSFAH	RSFUH	16	25-1196		6-14	3 4 5 6 8 10	1200	
(D≤30, L≤500) (D Tol. f8)	(D≤30, L≤500) (D Tol. f8)	18	25-1196		8-16	4 5 6 8 10 12	1200	
PSFGH	PSFUH	20	25-1196		8-17	4 5 6 8 10 12	1200	
PSSFGH	PSSFUH	25	25-1196		8-22	4 5 6 8 10 12 16	1200	
		30	25-1496		9-27	5 6 8 10 12 16 20 24	1500	
		35	25-1496		9-32	5 6 8 10 12 16 20 24	1500	
		40	25-1496		11-37	6 8 10 12 16 20 24 30	1500	
		50	25-1496		11-47	6 8 10 12 16 20 24 30	1500	

Both Ends Tapped P dimensions require M+3≤P. When (Mx2.5+4)x2≥(Y), tap pilot hole may go through and the effective length of the smaller tap part may be shortened.

Ordering Example: SSFAH18 - 200 - F20 - P15 - M8 - T20

Alterations: SFAH20 - 400 - F25 - P16 - M10 - T20

Alterations (LKC, WSC, MD, ND, etc.)

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 → ±0.03 200≤L<500 → ±0.05 L≥500 → ±0.1
	WSC	Wrench Flats at Two Locations Ordering Code WSC12-X8 WSC, X=1mm Increment WSC(X)≥0 Orientation between two set screw flats is not coplanar.
	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.
	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.

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. P.143
	KC	Keyway Ordering Code KC10-G10
	WKC	Keyways at Two Locations Ordering Code WKC10-C8-KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30.
	MD, ND	Change the effective tap depth to M(N)x3. Ordering Code MD(N)x3 (M is changed to ND, N is changed to ND) Application Notes Only applicable to D=12-30 and M(N)=6-20 Both Ends Stepped and Tapped: MDx3.5+4+NDx3.5+4≤L Not available in combination with KC, WSC.
	LFC, RFC	Set Screw Flat at Step Parts Ordering Code LFC10-A0 RFC10-E0 LFC(RFC)+A(E)≤F(T) D-M≥1 Orientation between two set screw flats is not coplanar.

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.

Alteration Details P.143

Part Number	Type	D	Unit Price																												
			Min. L	L51	L101	L151	L201	L251	L301	L351	L401	L451	L501	L551	L601	L651	L701	L751	L801	L851	L901	L951	L1001	L1101	L1201	L1301	L1401				
SFAH SFUH SFAJ SFUJ	SFAH SFUH SFAJ SFUJ	8																													
		10																													
		12																													
		13																													
		15																													
		16																													
		18																													
		20																													
		25																													
		30																													
PSFAH PSFUH PSFAJ PSFUJ	PSFAH PSFUH PSFAJ PSFUJ	8																													
		10																													
		12																													
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		15																													
		16																													
		18																													
		20																													
		25																													
		30																													
PSSFAH PSSFUH PSSFAJ PSSFUJ	PSSFAH PSSFUH PSSFAJ PSSFUJ	8																													
		10																													
		12																													
		13																													
		15																													
		16																													
		18																													
		20																													
		25																													
		30																													

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

Both Ends Stepped 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	Min. L	L51	L101	L151	L201	L251	L301	L351	L401		
RSFAH RSFAJ	RSFAH RSFAJ	8											
		10											
		12											
		13											
		15											
		16											
		18											
		20											
		25											
		30											

For Both Ends Stepped Type, subtract the relevant charge from the prices above.

Part Number	Type	D	Min. L	L101	L201	L401	L601	L801	L1001	L1201		
PSFGH PSSFGJ	PSFGH PSSFGJ	8, 10										
		12, 13										
		15, 16										
		18, 20										
		25										
		30										
		35										
		40										
		50										

For Both Ends Stepped Type, subtract the relevant charge from the prices above.

Part Number	Type	D	Min. L	L101	L201	L401	L601	L801	L1001	L1201		
PSSFGH PSSFGJ	PSSFGH PSSFGJ	8, 10										
		12, 13										
		15, 16										
		18, 20										
		25										
		30										
		35										
		40										
		50										

For Both Ends Stepped Type, subtract the relevant charge from the prices above.