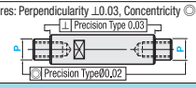
Shafts

Both Ends Stepped and Tapped with Wrench Flats

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02



P.195

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.195.
■For Shafts W/o Wrench Flats, see P.129.

RoHS10

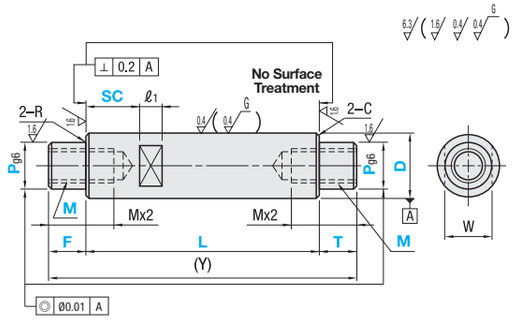
Annealing required for wrench flats machining and shaft end threading (thread effective length + approx. 10mm) may lower hardness. P.112

L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111

Features of LTBC Plating P.128

Type			Material	Hardness	Surface Treatment
D Tol. g6	D Tol. h5	D Tol. f8			
SFPH	SFHU	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFPH	SSFHU	-	EN 1.4037 Equiv.		
PSFPH	PSFHU	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSSFPH	PSSFHU	-	EN 1.4037 Equiv.	EN 1.3505 Equiv. 58HRC~	
RSFPH	-	-	EN 1.3505 Equiv.	EN 1.4037 Equiv. 56HRC~	LTBC Plating
-	-	-	EN 1.4037 Equiv.		
-	-	PFPGH	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSFPGH	EN 1.4301 Equiv.		

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			



Part Number Type	D	1mm Increment L	F, T	P	M (Coarse) Selection	Wrench Flats Dimensions SC	W	ℓ1	(Y) Max.	R	C
(D Tolerance g6) SFPH SSFPH PSFPH PSSFPH RSFPH (D≤30, L≤500) (D Tolerance f8) PFPGH PSFPGH / (D Tolerance h5) SFHU SSFHU PSFHU PSSFHU	8	25~796	2≤F≤Px4 2≤T≤Px4	6	3	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8	800	0.3 or Less	0.5 or Less
	10	25~796		6~ 8	3 4 5		8		800		
	12	25~996		6~10	3 4 5 6		10	10	1000		
	13	25~996		6~11	3 4 5 6 8		11		1000		
	15	25~996		6~13	3 4 5 6 8 10		13		1000		
	16	25~1196		6~14	3 4 5 6 8 10		14		1200		
	18	25~1196		8~16	4 5 6 8 10 12		16		1200		
	20	25~1196		8~17	4 5 6 8 10 12		17		1200		1.0 or Less
	25	25~1196		8~22	4 5 6 8 10 12 16		22		1200		
	30	25~1496		9~27	5 6 8 10 12 16 20 24		27	15	1500		
	35	25~1496		9~32	5 6 8 10 12 16 20 24		30		1500	0.5 or Less	
	40	25~1496		11~37	6 8 10 12 16 20 24 30		36	20	1500		
	50	25~1496		11~47	6 8 10 12 16 20 24 30		41		1500		

P dimensions require M+3≤P. (Y) dimensions require Mx4≤(Y). Tap pilot holes may go through.

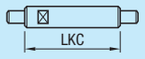
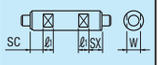
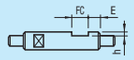
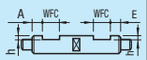
Ordering Example

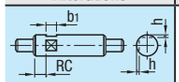
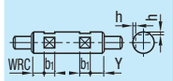
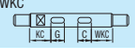
Part Number	-	L	-	F	-	P	-	M	-	T	-	SC
SFPH20	-	300	-	F25	-	P16	-	M10	-	T20	-	SC10
SFHU20	-	400	-	F25	-	P16	-	M10	-	T20	-	SC10

Alterations

Part Number	-	L	-	F	-	P	-	M (MD)	-	T	-	SC	-	(LKC··· etc.)
SFPH20	-	400	-	F25	-	P16	-	M10	-	T20	-	SC10	-	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-P≤2. 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
	SX	Second Set of Wrench Flats Ordering Code SX15 SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar. D W ℓ1: 8 7 8; 10 8; 12 10; 13 11; 15 13; 16 14; 18 16 — 10 D W ℓ1: 20 17 10; 25 22; 30 27 15; 35 30; 40 36 20; 50 41
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 E=0 or E≥2 Not available in combination with WFC. D h: 8~18 1; 20~40 2; 50 3
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC,A,E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Orientation between set screw flats is not coplanar. Not available in combination with FC. D h: 8~18 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.113
•Keyway at One Location : KC •Keyways at Two Locations : WKC 	KC WKC	Keyway Ordering Code KC10-G10 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 MD6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=6~30, M(N)=6~20 Both Ends Stepped and Tapped: MDx3.5+4+NDx3.5+4≥L

Please see Shaft Alteration Overview for details if provided. P.113
When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
Alterations may lower hardness. See P.112

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 ~ 1496
SFPH SFHU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFPH SSFHU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
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	40																									
	50																									
PSFPH PSFHU	8																	-	-	-	-	-	-	-	-	-
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	12																					-	-	-	-	-
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	35																									
	40																									
	50																									
PSSFPH PSSFHU	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
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	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
RSFPH	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Part Number Type	D	Unit Price Min. L ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1496
PFPGH	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 ~ 1496
PSFPGH	8, 10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								