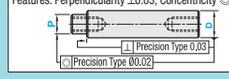
Shafts

One End Stepped, Both Ends Tapped with Wrench Flats

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



P.197

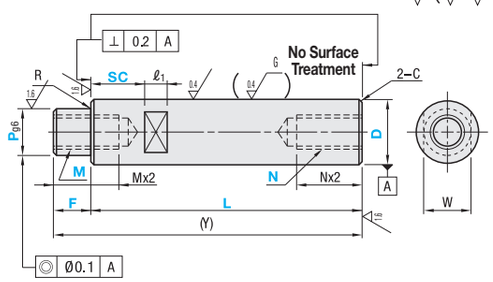
■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.197.
■For Shafts w/o Wrench Flats, see P.133.

RoHS10

- Annealing required for wrench flats machining and shaft end threading (effective thread 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			
SFPPA	SFUP	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFPA	SSFUP	-	EN 1.4037 Equiv.		
PSFPA	PSFUP	-	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More ~
PSSFPA	PSSFUP	-	EN 1.4037 Equiv.		
RSFPA	-	-	EN 1.3505 Equiv.	EN 1.4037 Equiv. 56HRC~	LTBC Plating
-	-	PFPGA	EN 1.1191 Equiv.	-	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More ~
-	-	PSFPGA	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	L	F	P	M (Coarse) Selection	N (Coarse) Selection	Wrench Flats Dimensions SC	W	ℓ1	(Y) Max.	R	C
(D Tolerance g6) SFPPA SSFPA PSFPA PSSFPA RSFPA (D≤30, L≤500) (D Tolerance f8) PFPGA PSFPGA / (D Tolerance h5) SFUP SSFUP PSFUP PSSFUP	8	25~798	2≤F≤Px4	6	3	3 4 5	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	25~798		6~ 8	3 4 5	3 4 5 6		8		800		
	12	25~998		6~10	3 4 5 6	4 5 6 8		10	10	1000		
	13	25~998		6~11	3 4 5 6 8	4 5 6 8		11		1000		
	15	25~998		6~13	3 4 5 6 8 10	4 5 6 8 10		13		1000		
	16	25~1198		6~14	3 4 5 6 8 10	4 5 6 8 10		14		1200		
	18	25~1198		8~16	4 5 6 8 10 12	4 5 6 8 10 12		16		1200		
	20	25~1198		8~17	4 5 6 8 10 12	4 5 6 8 10 12		17		1200		1.0 or Less
	25	25~1198		8~22	4 5 6 8 10 12 16	4 5 6 8 10 12 16		22		1200		
	30	25~1498		9~27	5 6 8 10 12 16 20 24	6 8 10 12 16 20		27	15	1500		
	35	25~1498		9~32	5 6 8 10 12 16 20 24	8 10 12 16 20 24		30		1500	0.5 or Less	
	40	25~1498		11~37	6 8 10 12 16 20 24 30	10 12 16 20 24 30		36	20	1500		
	50	25~1498		11~47	6 8 10 12 16 20 24 30	12 16 20 24 30		41		1500		

- P dimensions require M+3≤P.
- When Mx2.5+4+Nx2.5+4≥(Y), tap pilot holes may go through. When Mx2+Nx2≥(Y), effective depth of larger diameter tap has priority.

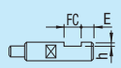
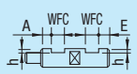
Ordering Example

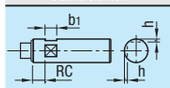
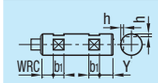
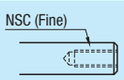
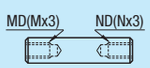
Part Number	L	F	P	M	N	SC
SFPPA20	400	F25	P16	M10	N10	SC10
SSFPA20	400	F25	P16	M10	N10	SC10

Alterations

Part Number	L	F	P	M (MD)	N (NSC, ND)	SC	(LKC, NSC…etc.)
SFPPA30	400	F25	P16	M10	N10	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 10; 16 14; 18 16 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
	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=8~30, M(N)=6~20 Both Ends 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 ~1498
SFPPA SFUP	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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	50																									
SSFPA SSFUP	8																	-	-	-	-	-	-	-	-	-
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	12																					-	-	-	-	-
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PSFPA PSFUP	8																	-	-	-	-	-	-	-	-	-
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PSSFPA PSSFUP	8																	-	-	-	-	-	-	-	-	-
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	40																									
	50																									

Part Number Type	D	Unit Price Min. L ~50	L51 ~100	L101 ~150	L151 ~200	L201 ~300	L301 ~400	L401 ~500
RSFPA	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
PFPGA	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
PSFPGA	8						-	-	-
	10						-	-	-
	12							-	-
	13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								