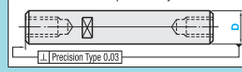
Shafts

Both Ends Tapped with Wrench Flats / Both Ends Tapped with Cross-Drilled Hole

High Precision Linear Shafts when high precision assembly is needed
Features: Perpendicularity ⊥ 0.03



P.191

■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.191.
■For Shafts w/o Wrench Flats or Cross-Drilled Hole, see P.119.

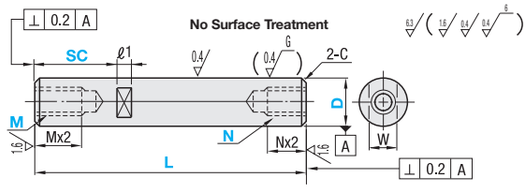
RoHS10

- Annealing may lower hardness at wrench flats, cross-drilled hole and shaft end machined areas (effective thread length + approx. 10mm). P.112
- Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation.
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of LTBC Plating P.128

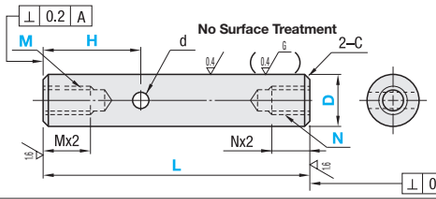
Type					Material	Hardness	Surface Treatment
With Wrench Flats			With Cross-Drilled Hole				
D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. f8			
SFJZ	SFUZ	-	SFHZ	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112	-
SSFJZ	SSFUZ	-	SSFHZ	-	EN 1.4037 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSFJZ	PSFUZ	-	PSFHZ	-	EN 1.3505 Equiv.	EN 1.3505 Equiv. 58HRC~ EN 1.4037 Equiv. 56HRC~	
PSSFJZ	PSSFUZ	-	PSSFHZ	-	EN 1.4037 Equiv.		LTBC Plating
RSFJZ	-	-	RSFHZ	-	EN 1.3505 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSFGZ	-	PSGHZ	EN 1.1191 Equiv.	-	
-	-	PSSFGZ	-	-	EN 1.4301 Equiv.		

D	D Tol. g6	D Tol. h5	D Tol. f8
6	-0.004 -0.012	0 -0.005	-0.010 -0.028
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			

With Wrench Flats



With Cross-Drilled Hole (8≤D≤30,L≤500)



Part Number Type	D	L specified in 1mm Increment	M (Coarse), N (Coarse) Selection	Wrench Flats Dimensions SC	W	ℓ1	Cross-Drilled Hole Dimensions H	d	C
(With Wrench Flats)	6	20~600	3	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	5	8	-	-	0.5 or Less
(With Cross-Drilled Hole) 8≤D≤30, L≤500	8	20~800	3 4 5		7		H=1mm Increment L≥H+d/2+Nx2.5+6 H≥Mx2.5+d/2+6	3	
(D Tolerance g6) SFJZ SSFJZ PSFJZ PSSFJZ RSFJZ (D≤30,L≤500)	10	20~800	3 4 5 6		8				
(D Tolerance h5) SFUZ SSFUZ PSFUZ PSSFUZ	12	20~1000	4 5 6 8		10	10		4	
(D Tolerance g6) SFHZ SSFHZ PSFHZ PSSFHZ RSFHZ	13	25~1000	4 5 6 8		11				
	15	25~1000	4 5 6 8 10		13				
	16	30~1200	4 5 6 8 10		14			6	
	18	30~1200	4 5 6 8 10 12		16				
	20	30~1200	4 5 6 8 10 12		17				
	25	35~1200	4 5 6 8 10 12 16		22			7	1.0 or Less
(D Tolerance f8) PSFGZ PSSFGZ	30	35~1500	6 8 10 12 16 20		27	15			
	35	35~1500	8 10 12 16 20 24		30		-	-	
	40	50~1500	10 12 16 20 24 30		36	20			
(D Tolerance g6) PSGHZ	50	65~1500	12 16 20 24 30		41				

- L requires Mx2+Nx2≤L. - When Mx2.5+4+Nx2.5+4≥L, tap pilot holes may go through.

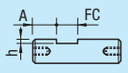
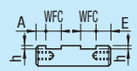
Ordering Example

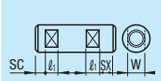
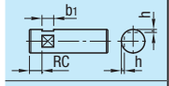
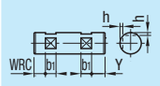
Part Number	L	M	N	SC	H
SFJZ10	200	M5	N5	SC10	
SSFHZ20	500	M6	N10		H20

Alterations

Part Number	L	M (MSC, MD)	N (NSC, ND)	SC	H	(LKC…etc.)
SFJZ30	500	M8	N10	SC10		LKC

Alteration Details P.113

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
	FC	Set Screw Flat at One Location Ordering Code: FC10-A8 FC, A=1mm Increment FC≤3xD When 1.5xD<FC, FC≤L/2 A=0 or A≥2 Not available in combination with WFC. D: 6~18 h:1; 20~40 h:2; 50 h:3
	WFC	Set Screw Flats at Two Locations Ordering Code: WFC8-A8-E2 WFC,A,E=1mm Increment WFC≤3xD When 1.5xD<WFC, 2WFC≤L/2 A(E)=0 or A(E)≥2 Two set screw flats cannot be machined coplanar. Not available in combination with FC. D: 6~18 h:1; 20~40 h:2; 50 h:3

Alterations	Code	Spec.
	SX	Second Set of Wrench Flats Ordering Code: SX15 Application Notes: Only applicable to Shafts with Wrench Flats. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Orientation between two set screw flats is not coplanar. D: 6 W:5 ℓ1:8; 8 7 8; 10 8 8; 12 10 10; 13 11 10; 15 13 10; 16 14 10; 18 16 10; 20 17 10; 25 22 15; 30 27 15; 35 30 20; 40 36 20; 50 41 20
MSC (Fine) NSC (Fine)	MSC NSC	Change to Fine Tapped Thread Ordering Code: MSC14 (M is changed to MSC) NSC14 (N is changed to NSC) Application Notes: Applicable to D=12 or more
	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. For details, see Shaft Alteration Overview. P.113
	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.
MD(Mx3) ND(Nx3)	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=6~30, 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.
- The distance between wrench flats and cross-drilled holes should be greater than 2mm for alterations.
- 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 ≥ 1500
SFJZ SFUZ SFHZ	6													-	-	-	-	-	-	-	-	-	-	-	-	-
	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
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	40																									
	50	-																								
SSFJZ SSFUZ SSFHZ	6													-	-	-	-	-	-	-	-	-	-	-	-	-
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	10																	-	-	-	-	-	-	-	-	-
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PSFJZ PSFUZ PSFHZ	6													-	-	-	-	-	-	-	-	-	-	-	-	-
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	50	-																								
PSSFJZ PSSFUZ PSSFHZ	6													-	-	-	-	-	-	-	-	-	-	-	-	-
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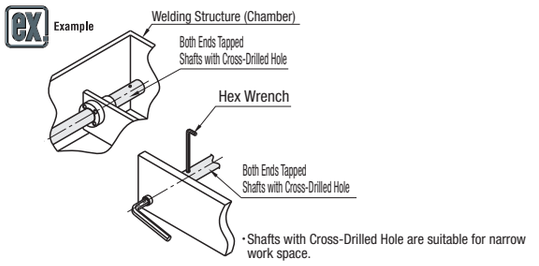
	40																									
	50	-																								

Part Number Type	D	Unit Price Min. L ≥ 50	L51 ≥ 100	L101 ≥ 150	L151 ≥ 200	L201 ≥ 300	L301 ≥ 400	L401 ≥ 500
RSFJZ RSFHZ	6							
	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

Example



- Shafts with Cross-Drilled Hole are suitable for narrow work space.

Part Number Type	D	Unit Price Min. L ≥ 100	L101 ≥ 200	L201 ≥ 400	L401 ≥ 600	L601 ≥ 800	L801 ≥ 1000	L1001 ≥ 1200	L1201 ≥ 1500
PSFGZ PSGHZ	6					-	-	-	-
	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 ≥ 1500
PSSFGZ	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								