Shafts

One End Threaded with Undercut and Wrench Flats / Cross-Drilled Hole

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

P.213

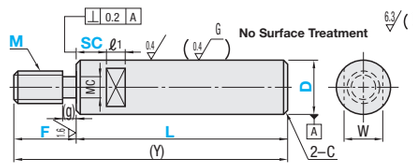
■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.213.
■For Shafts w/o Wrench Flats or Cross-Drilled Hole, see P.167.

RoHS10

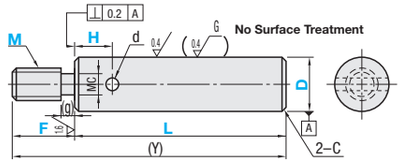
Type					M Material	H Hardness	S Surface Treatment
With Wrench Flats			With Cross-Drilled Hole				
D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. f8			
SAFS	SFSU	-	SFHS	-	EN 1.3505 Equiv.	Effective Hardened Depth of Induction Hardening P.112 EN 1.3505 Equiv. 58HRC~	-
SSAFS	SSFSU	-	SSHFS	-	EN 1.4125 Equiv.		Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or More
PSAFS	PSFSU	-	PSHFS	-	EN 1.3505 Equiv.		
PSSAFS	PSSFSU	-	PSSHFS	-	EN 1.4125 Equiv.		LTBC Plating
RSAFS	-	-	RSHFS	-	EN 1.3505 Equiv.	EN 1.4125 Equiv. 56HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 10μ or More
-	-	PSAGS	-	PSHGS	EN 1.1191 Equiv.	-	
-	-	PSSAGS	-	-	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			
13	-0.006 -0.017	0 -0.008	-0.016 -0.043
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			

With Wrench Flats



With Cross-Drilled Hole (D≤30, L≤500)



- 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

Part Number Type			D	1mm Increment L	1mm Increment F	Selection M (Coarse)
			8	25~795		6
		(With Cross-Drilled Hole)	10	25~795		6 8
(With Wrench Flats)		D≤30, L≤500	12	25~995		6 8 10
(D Tolerance g6)	(D Tolerance h5)	(D Tolerance g6)	13	25~995		6 8 10 12
SAFS	SFSU	SFHS	15	25~995		6 8 10 12
SSAFS	SSFSU	SSHFS	16	25~1195		6 8 10 12
PSAFS	PSFSU	PSHFS	18	25~1195	5≤F≤Mx3	6 8 10 12 16
PSSAFS	PSSFSU	PSSHFS	20	25~1195		6 8 10 12 16
RSAFS(D≤30,L≤500)		RSHFS	25	25~1195		8 10 12 16 20 24
		(D Tolerance f8)	30	25~1495		8 10 12 16 20 24
(D Tolerance f8)		PSHGS	35	25~1495		10 12 16 20 24 30
PSAGS			40	25~1495		12 16 20 24 30
PSSAGS			50	25~1495	F-(g)≥Pitchx3	16 20 24 30

Wrench Flats Dimensions SC	W	ℓ1
SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8
	8	
	10	10
	11	
	13	
	14	
	16	
	17	
	22	
	27	15
	30	
	36	20
	41	

Cross-Drilled Hole Dimensions H	d	(Y) Max.	C
H=1mm Increment L≥H+d/2+2 H≥d/2+2	3	800	0.5 or Less
		1000	
	4	1000	
		1200	
	6	1200	
	7	1200	1.0 or Less
		1500	
	-	1500	
		1500	

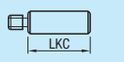
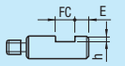
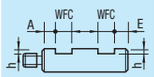
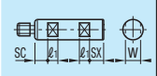
Ordering Example

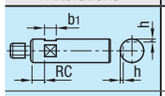
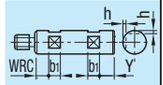
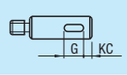
Part Number	L	F	M	SC	H
SAFS13	800	F23	M10		
SSHFS20	450	F28	M12		H15

Alterations

Part Number	L	F	M (MMC, MMS)	SC	H	(LKC···etc.)
SAFS30	250	F20	M10	SC20		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 ⊗Not applicable when D-M≤2.
	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: 8~18 h: 1; 20~40 h: 2; 50 h: 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: 8~18 h: 1; 20~40 h: 2; 50 h: 3
	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 W ℓ1: 8 8 7; 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

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.
	MMC MMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MMS)
	KC	Keyway is added at one location. Ordering Code KC10-G10 Application Notes Only applicable to D=12, 16, 20, 25 and 30.

For details, see Shaft Alteration Overview. P.113

- 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. P.114
- Alterations may lower hardness. See P.112

Part Number Type	D	Unit Price Min. L 1 ~ 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 ~ 1495
SAFS SFSU SFHS	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSAFS SSFSU SSHFS	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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	30																									
	35																									
	40																									
	50																									
PSAFS PSFSU PSHFS	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
	13																					-	-	-	-	-
	15																					-	-	-	-	-
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	35																									
	40																									
	50																									
PSSAFS PSSFSU PSSHFS	8																	-	-	-	-	-	-	-	-	-
	10																	-	-	-	-	-	-	-	-	-
	12																					-	-	-	-	-
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	30																									
	35																									
	40																									
	50																									

Part Number Type	D	Unit Price Min. L 1 ~ 100	L101 ~ 200	L201 ~ 400	L401 ~ 600	L601 ~ 800	L801 ~ 1000	L1001 ~ 1200	L1201 ~ 1495
PSAGS PSHGS	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSAGS	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

Part Number Type	D	Unit Price Min. L 1 ~ 50	L51 ~ 100	L101 ~ 150	L151 ~ 200	L201 ~ 300	L301 ~ 400	L401 ~ 500
RSAFS RSHFS	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							