Shafts

Both Ends Threaded with Wrench Flats / Cross-Drilled Hole

High Precision Linear Shafts for High Precision Assembly
Features: Perpendicularity ⊥0.03, Concentricity ◎0.02
P.237

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

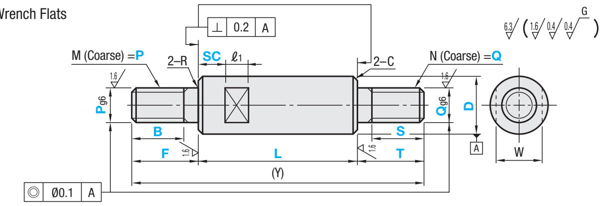
■For High Precision Linear Shafts with high perpendicular precision of the shaft end (⊥ 0.03), see P.237. ■For Shafts w/o Wrench Flats or Cross-Drilled Hole, see P.181.

Annealing may lower hardness at wrench flats, cross-drilled hole and shaft end machined areas (effective thread length + approx. 10mm). P.142
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.141
Features of Low Temp. Black Chrome Plating P.156

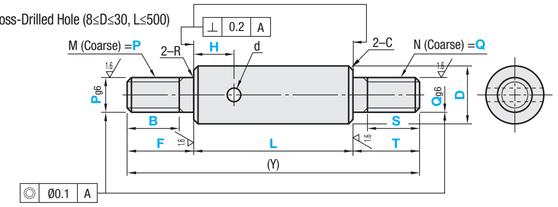
Type: With Wrench Flats D Tol. g6	With Wrench Flats D Tol. h5	With Wrench Flats D Tol. f8	With Cross-Drilled Hole D Tol. g6	With Cross-Drilled Hole D Tol. f8	M Material	H Hardness	S Surface Treatment
SFAU	SFUU	-	SFHM	-	SUJ2 Equivalent	For Effective Hardened Depth of Induction Hardening, see P.142. SUJ2 Equivalent 58HRC~ SUS440C or 13Cr stainless 56HRC~	-
SSFAU	SSFUU	-	SSFHM	-	SUS440C or 13Cr stainless		-
PSFAU	PSFUU	-	PSFHM	-	SUJ2 Equivalent		Hard Chrome Plating - Plating Hardness: HV750 ~, Plating Thickness: 5μ or More
PSSFAU	PSSFUU	-	PSSFHM	-	SUS440C or 13Cr stainless		Hard Chrome Plating - Plating Hardness: HV750 ~, Plating Thickness: 5μ or More
RSFAU	-	-	RSFHM	-	SUJ2 Equivalent		Low Temp. Black Chrome Plating
-	-	PSFGU	-	PSGHM	S45C Equivalent	-	Hard Chrome Plating - Plating Hardness: HV750 ~, Plating Thickness: 10μ or More
-	-	PSSFGU	-	-	SUS304	-	Hard Chrome Plating - Plating Hardness: HV750 ~, Plating Thickness: 10μ or More

For plated products, the surface roughness of D part is 0.4; and for unplated products, it is 0.4 G.

With Wrench Flats



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



D Tol. D	g6	h5	f8
6	-0.004 -0.012	0 -0.005	-0.010 -0.028
8, 10	-0.005 -0.014	0 -0.006	-0.013 -0.035
12, 13, 15, 16, 18	-0.006 -0.017	0 -0.008	-0.016 -0.043
20, 25, 30	-0.007 -0.020	0 -0.009	-0.020 -0.053
35, 40, 50	-0.009 -0.025	0 -0.011	-0.025 -0.064

Part Number Type:
(With Wrench Flats)
(D Tol. g6) SFAU, SSFAU, PSFAU, PSSFAU, RSFAU (D≤30,L≤500,Ymax≤800)
(D Tol. h5) SFUU, SSFUU, PSFUU, PSSFUU
(D Tol. f8) PSFGU, PSSFGU
(With Cross-Drilled Hole) 8≤D≤30, L≤500
(D Tol. g6) SFHM, SSFHM, PSFHM, PSSFHM, RSFHM
(D Tol. f8) PSGHM
8≤D≤30 and L≤500 are applicable for Shafts with Cross-Drilled Hole.

D	L (1mm Increments)	F, T (1mm Increments)	B, S (1mm Increments)	P, Q Selection	Wrench Flats Dimensions SC	W	ℓ1	Cross-Drilled Hole Dimensions H	d	(Y) Max.	R	C
6	25~ 796	2≤F≤Px5 2≤T≤Qx5	(When P≤6) B≤F-2 (When P=8, 10) B≤F-3 (When P≥12) B≤F-5 (When Q≤6) S≤T-2 (When Q=8, 10) S≤T-3 (When Q≥12) S≤T-5 (W/o Threads) B=0 S=0 B, S≥Pitchx3	3 4 5	SC = 1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.142	5	8	H=1mm Increment L≥H+d/2+2 H≥d/2+2	-	600	0.3 or Less	0.5 or Less
8	25~ 996			3 4 5 6		7			3	800		
10	25~ 996			4 5 6 8		8				800		
12	25~1196			5 6 8 10		10	10			1000		
13	25~1196			5 6 8 10 12		11			4	1000		
15	25~1196			5 6 8 10 12		13				1000		
16	25~1196			5 6 8 10 12		14				1200		
18	25~1196			5 6 8 10 12 16		16			6	1200		
20	25~1196			6 8 10 12 16		17				1200		1.0 or Less
25	25~1196			8 10 12 16 20 24		22			7	1200		
30	25~1496			8 10 12 16 20 24		27	15			1500		
35	25~1496			10 12 16 20 24 30		30			-	1500	0.5 or Less	
40	25~1496			12 16 20 24 30		36	20			1500		
50	25~1496			16 20 24 30		41				1500		

Coarse Thread Dimensions M	Pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0
30	3.5

Thread machining will not be applied to B=0 or S=0.

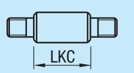
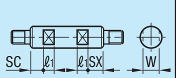
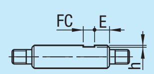
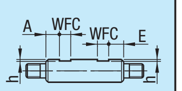
Ordering Example

Part Number	-	L	-	F	-	B	-	P	-	T	-	S	-	Q	-	SC	-	H
SFHM15	-	300	-	F28	-	B16	-	P6	-	T17	-	S12	-	Q12			-	H8

Alterations

Part Number	-	L	-	F	-	B	-	P(PMC, PMS)	-	T	-	S	-	Q(QMC, QMS)	-	SC	-	H	-	(LKC···etc.)
SFAU30	-	300	-	F40	-	B30	-	P20	-	T50	-	S40	-	Q16	-	SC10			-	LKC

Alteration Details P.143

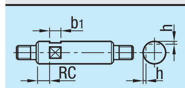
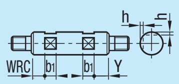
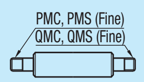
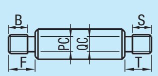
Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance. Ordering Code LKC. L dimensions can be specified in 0.1mm increment for LKC. L<200 ···L±0.03; 200≤L<500 ···L±0.05; L≥500 ···L±0.1
	SX	Second Set of Wrench Flats. Ordering Code SX15. Application Notes: Only applicable to Shafts with Wrench Flats. SX=1mm Increment. SC+SX+ℓ1x2<L. SX≥0. Orientation between two set screw flats is not coplanar.
	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.

SX:

D	W	ℓ1	D	W	ℓ1
6	5	8	18	16	10
8	7		20	17	
10	8		25	22	
12	10	10	30	27	15
13	11		35	30	
15	13		40	36	20
16	14		50	41	

FC / WFC:

D	h
6~18	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. For details, see Shaft Alteration Overview. P.143
	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.
	PMC PMS QMC QMS	Change to Fine Thread. Ordering Code PMC14 (P is changed to PMC); PMS14 (P is changed to PMC); QMC14 (Q is changed to QMC); QMS14 (Q is changed to QMS)
Undercut 	PC QC	PC: Adds undercut(s) on P dimension area. QC: Adds undercut(s) on Q dimension area. Ordering Code PC. For detailed undercut dimensions, see P.141. Application Notes Applicable to M=6 or more. Only D≤8 is applicable. Not applicable to D=Q and D=P.

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. P.144
Alterations may lower hardness. See P.142.

Type	D	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
SFAU, SFUU, SFHM	6																	-	-	-	-	-	-	-	-	-
	8																					-	-	-	-	-
	10																					-	-	-	-	-
	12																							-	-	-
	13																							-	-	-
	15																							-	-	-
	16																							-	-	-
	18																							-	-	-
	20																							-	-	-
	25																							-	-	-
	30																									
	35																									
	40																									
	50																									
SSFAU, SSFUU, SSFHM	6																	-	-	-	-	-	-	-	-	-
	8																					-	-	-	-	-
	10																					-	-	-	-	-
	12																							-	-	-
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	35																									
	40																									
	50																									
PSFAU, PSFUU, PSFHM	6																	-	-	-	-	-	-	-	-	-
	8																					-	-	-	-	-
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	50																									
PSSFAU, PSSFUU, PSSFHM	6																	-	-	-	-	-	-	-	-	-
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	30																									
	35																									
	40																									
	50																									

For D tolerance h5, add the relevant surcharge to the prices above.
For Shafts with Cross-Drilled Hole, subtract the relevant charge from the prices above.

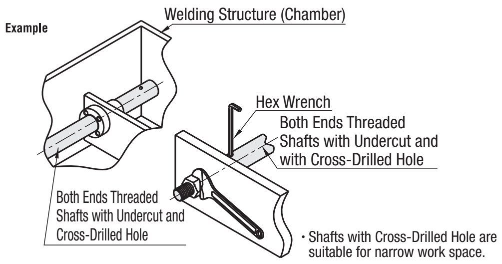
Type	D	Min. L~50	L51~100	L101~150	L151~200	L201~300	L301~400	L401~500
RSFAU, RSFHM	6							
	8							
	10							
	12							
	13							
	15							
	16							
	18							
	20							
	25							
	30							

For Shafts with Cross-Drilled Hole, subtract the relevant charge from the prices above.

Type	D	Min. L~100	L101~200	L201~400	L401~600	L601~800	L801~1000	L1001~1200	L1201~1496
PSFGU, PSGHM	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								
PSSFGU	6					-	-	-	-
	8						-	-	-
	10						-	-	-
	12, 13							-	-
	15, 16								-
	18, 20								-
	25								-
	30								
	35								
	40								
	50								

For Shafts with Cross-Drilled Hole, subtract the relevant charge from the prices above.

Example



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