

Shafts

Standard & Precision Type / One End Threaded with Wrench Flats / One End Threaded with Cross-Drilled Holes

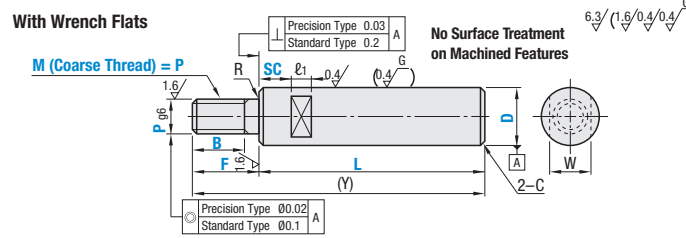
Shafts – Standard & Precision Type / One End Threaded with Wrench Flats / One End Threaded with Cross-Drilled Holes



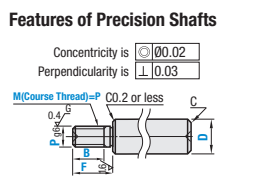
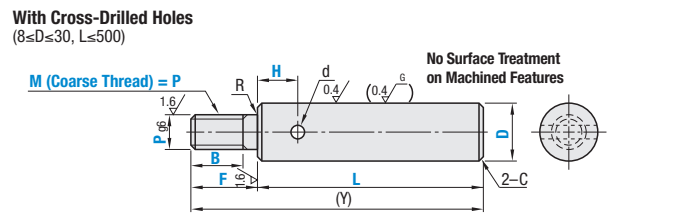
RoHS10

- Annealing may lower hardness at wrench flats, cross-drilled hole and shaft end machined areas (effective thread length + approx. 10 mm). P.199
- Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation.
- Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.198.
- Features of Low Temp. Black Chrome Plating P.213.
- For Shafts without wrench flats or cross-drilled holes, please see P.220.

Precision Type	Type					Material	Hardness	Surface Treatment
	With Wrench Flats		With Cross-Drilled Holes					
	D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. f8			
VFBS	SFAS	SFUS	—	SFHN	—	SUJ2	Effective Hardened Depth of Induction Hardened P.199 SUJ 58 HRC min. SUS440C (13Cr) Stainless Steel Equivalent	
VSFBS	SSFAS	SSFUS	—	SSFHN	—	SUS440C (13Cr) Stainless Steel Equivalent		
VPFBS	PSFAS	PSFUS	—	PSFHN	—	SUJ2	Hard Chrome Plating Plating Hardness: HV 750~ Plating Thickness: 5 μ or More	
VPSFBS	PSSFAS	PSSFUS	—	PSSFHN	—	SUS440C (13Cr) Stainless Steel Equivalent		
VRBS	RSFAS	—	—	RSFHN	—	SUJ2	Low Temperature Black Chrome Plating	
—	—	—	PSFGS	—	PSGHN	S45C	Hard Chrome Plating Plating Hardness: HV 750~ Plating Thickness: 10 μ or More	
—	—	—	PSSFGS	—	—	SUS304		



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



Precision shafts have centering holes at the ends and grinding undercut at the bottom of threads.

Part Number	1 mm Increment				P	Wrench Flats Dimensions			(Y) Max.	R	C	Coarse Thread Dimensions	
	Type	D	L	F		B	SC	W				ℓ ₁	M
Precision Type Shafts with Wrench Flats D Tolerance g6 VFBS VSFBS VPFBS VPSFBS VRBS	6	25-296	2 ≤ F ≤ P × 5	B ≤ F-2	3 4	SC=1 mm Inc. SC+ℓ ₁ ≤ L SC ≥ 0 Details of Wrench Flats P.199	5	8	300	0.3 or Less	0.5 or Less	3	0.5
	8	25-296			4 5 6		7	300	4			0.7	
	10	25-345			4 5 6 8		8	350	5			0.8	
	12	25-345			5 6 8 10		10	350	6			1.0	
	13	25-345			5 6 8 10		11	350	8			1.25	
	15	25-345			5 6 8 10 12		13	350	10			1.5	
	16	25-345			5 6 8 10 12		14	350	12			1.75	
	18	25-345			5 6 8 10 12 16		16	350	16			2.0	
	20	25-445			6 8 10 12 16		17	450	20			2.5	
	25	25-445			8 10 12 16 20		22	450	24			3.0	
30	25-445	8 10 12 16 20 24	27	450	30	3.5							

Shafts have grinding undercuts at the bottom of threads. Shaft ends may have centering holes.

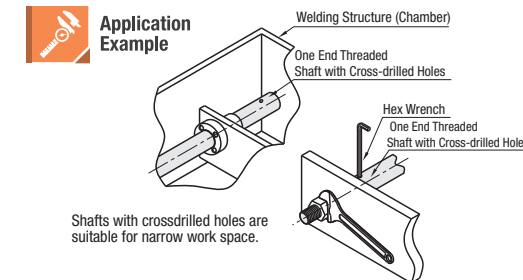
Part Number	1 mm Increment				P	Wrench Flats Dimensions			Cross-Drilled Hole Dimensions		(Y) Max.	R	C															
	Type	D	L	F		B	SC	W	ℓ ₁	H				d														
Standard Type Shafts with Wrench Flats D Tol. g6 SFAS SSFAS PSFAS PSSFAS RSFAS D Tol. h5 SFUS SSFUS PSFUS PSSFUS D Tol. f8 PSFGS PSSFGS	Shafts with Crossdrilled Holes 8 ≤ D ≤ 30, L ≤ 500 D Tol. g6 SFHN SSFHN PSFHN PSSFHN D Tol. h5 SFHN SSFHN PSFHN PSSFHN D Tol. f8 PSFGS PSSFGS	6	25-798	2 ≤ F ≤ P × 5	B ≤ F-2	SC=1 mm Inc. SC+ℓ ₁ ≤ L SC ≥ 0 Details of Wrench Flats P.199	5	8	—	H=Specified in 1 mm Inc. L ≥ H+d/2+2 H ≥ d/2+2	—	—	0.5 or Less															
		8	25-998											3 4 5 6	3	800												
		10	25-998											4 5 6 8			1000											
		12	25-1198											5 6 8 10				1200										
		13	25-1198											5 6 8 10 12					1500									
		15	25-1198											5 6 8 10 12						1800								
		16	25-1198											5 6 8 10 12							2000							
		18	25-1198											5 6 8 10 12 16								2200						
		20	25-1198											6 8 10 12 16									2400					
		25	25-1198											8 10 12 16 20 24										2600				
		30	25-1498											8 10 12 16 20 24											2800			
		35	25-1498											10 12 16 20 24 30												3000		
		40	25-1498											12 16 20 24 30													3200	
		50	25-1498											16 20 24 30														3400

Shafts

Standard & Precision Type / One End Threaded with Wrench Flats / One End Threaded with Cross-Drilled Holes, continued

Part Number Example

Part Number	L	F	B	P	SC	H
VFBS12	- 200	- F20	- B15	- P8	- SC5	- H10
SFHN18	- 450	- F40	- B25	- P12	-	-



Part Number Alterations

Part Number	L	F	B	P (PMC / PSC)	SC	H	(LKC.etc.)
SFAS30	- 250	- F40	- B30	- P10	- SC10	-	- LKC

Alteration Details P.200

Alterations	Code	Spec.
	LKC	Alteration to L Dimension Tolerance Ordering Code: LKC Application Notes: Applicable when L=200 or less for precision type. L dimensions can be specified in 0.1 increment FOR LKC. L < 200 → L ± 0.03 200 ≤ L < 500 → L ± 0.05 L ≥ 500 → L ± 0.1 Not applicable when D-P ≤ 2
	FC	Set Screw Flat at One Location Ordering Code: FC10-E8 Application Notes: Not applicable to precision shafts. FC, E = 1 mm increment FC ≤ 3xD When 1.5xD < FC, FC ≤ L/2 E = 0 or E ≥ 2 Not available in combination with WFC
	WFC	Set Screw Flats at Two Locations Ordering Code: WFC8-A8-E4 Application Notes: Not applicable to precision shafts. WFC, A, E = 1 mm increment WFC ≤ 3xD When 1.5xD < FC, 2WFC ≤ L/2 A (E) = 0 or A (E) ≥ 2 Orientation between set screw flats is random. Not available in combination with FC.
	SX	Second Set of Wrench Flats Ordering Code: SX15 Application Notes: Only applicable for Shafts with Wrench Flats. SX = 1 mm increment SC+SX+ℓ ₁ × 2 < L SX = 0 or SX ≥ 1 Orientation between wrench flat features is random.

Alterations	Code	Spec.
	RC	90° Set Screw Flat at One Location Ordering Code: RC10 Application Notes: Only applicable to D=10-30 Not applicable to precision shafts. Not available in combination with WRC. For details, see Shaft Alteration Overview P.200.
	WRC	90° Set Screw Flat at Two Locations Ordering Code: WRC10-Y10 Application Notes: Applicable for D=10-30 Not applicable to precision shafts. Not available in combination with RC. Orientation between set screw features is random. For details, see Shaft Alteration Overview P.200.
	PMC PMS	Change to Fine Threads. Ordering Code: PMC14 (P is changed to PMC) PMS14 (P is changed to PMS) For details, see Shaft Alteration Overview P.200.
	KC	Keyway is added at one location Ordering Code: KC10-G10 Application Notes: Only applicable only to D=12, 16, 20, 25 and 30. Not applicable to precision shafts. For details, see Shaft Alteration Overview P.200.

- Please see Shaft Alteration Overview for details if provided. P.200
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2 mm. P.201
- The distance between wrench flats and cross-drilled holes should be greater than 2 mm for alterations.
- Alterations may lower hardness. P.199