High Precision Linear Shafts

One End Threaded / One End Threaded with Wrench Flats

■Suitable for assemblies of parts requiring high precision and high perpendicular precision of the shaft end (⊥ 0.03).

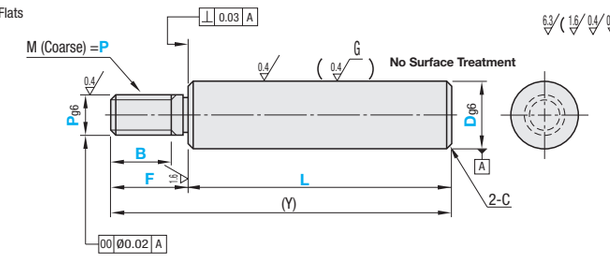
RoHS

- 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 Low Temp. Black Chrome Plating P.128

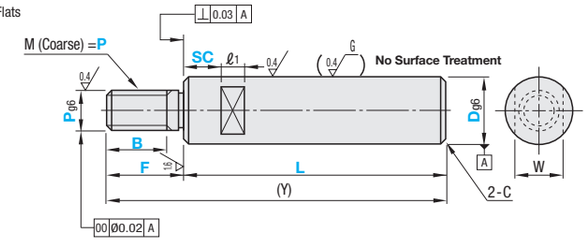
Type		D Tol.	Material	Hardness	Surface Treatment
W/o Wrench Flats	With Wrench Flats				
VFBN	VFBS	g6	SUJ2	Induction Hardened Effective Hardened Depth P.112 SUJ2 58HRC~ SUS440C Equivalent 56HRC~	-
VSFBN	VSFBS		SUS440C Equivalent		
VPFBN	VPFBS		SUJ2		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VPSFBN	VPSFBS		SUS440C Equivalent		
VRBN	VRBS		SUJ2		Low Temp. Black Chrome Plating

D	D Tol. g6
5	-0.004 -0.012
6	
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

W/o Wrench Flats



With Wrench Flats



Part Number Type	D	1mm Increment L	F	B	P Selection	Wrench Flats Dimensions SC	W	ℓ1	(Y) Max.	C
(W/o Wrench Flats) (D5~D30) VFBN VSFBN VPFBN VPSFBN VRBN	(With Wrench Flats) (D6~D30) VFBS VSFBS VPFBS VPSFBS VRBS	5	25~296	2≤F≤Px5	(When P≤6) B≤F-2 (when P=8 or 10) B≤F-3 (When P≥12) B≤F-5 B≥Pitchx3	3	-	-	300	0.2 or Less
		6	25~296			3 4	5	8	300	0.5 or Less
		8	25~296			3 4 5 6	7		300	
		10	25~345			4 5 6 8	8		350	
		12	25~345			5 6 8 10	10		350	
		13	25~345			5 6 8 10	11		350	
		15	25~345			5 6 8 1012	13		350	
		16	25~345			5 6 8 1012	14	10	350	
		18	25~345			5 6 8 101216	16		350	
		20	25~445			6 8 101216	17		450	1.0 or Less
		25	25~445			8 10121620	22		450	
		30	25~445			8 1012162024	27	15	450	

SC=1mm Increment
- SC+ℓ1≤L
- SC≥0

Details of Wrench Flats P.112

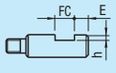
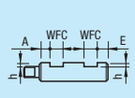
Coarse Thread Undercut Dimension M	Pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0

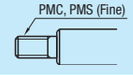
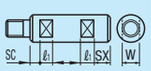
- Shafts have grinding undercuts at the bottom of threads.
- Shaft ends may have centering holes.

Ordering Example: Part Number - L - F - B - P - SC
VFBS12 - 200 - F20 - B15 - P8 - SC5

Alterations: Part Number - L - F - B - P(PMC, PMS) - SC - (LKC···etc.)
VFBS30 - 250 - F40 - B30 - P10 - SC10 - LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Application Notes Applicable when L=200 or less. L dimensions can be specified in 0.1mm increment for LKC. L≤200 ···▸L±0.03 ⊗Not applicable when D-P≤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: 5~18 h: 1; 20~30 h: 2
	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: 5~18 h: 1; 20~30 h: 2

Alterations	Code	Spec.
	PMC PMS	Change to Fine Thread Ordering Code PMC14 (M is changed to PMC.) PMS14 (M is changed to PMS) For details, see Shaft Alteration Overview. P.113
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Applicable to Shafts with Wrench Flats only. Applicable to D=6 or more. SX=1mm Increment SC+SX+ℓ1x2<L SX≥0 Only applicable to Shafts with Wrench Flats. ⊗Orientation between two set screw flats is not coplanar. D: 6 5; 8 7; 10 8; 12 10; 13 11; 15 13; 16 14; 18 16; 20 17; 25 22; 30 27 — W: 15 — ℓ1: 8; 10

- 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 ~ 50	L51~100	L101~200	L201~300	L301~445
VFBN	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFBN	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFBN	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFBN	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRBN	5					-
	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Part Number Type	D	Unit Price Min. L ~ 50	L51~100	L101~200	L201~300	L301~445
VFBS	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSFBS	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPFBS	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSFBS	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRBS	6					-
	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					