

# 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 ( $\perp 0.03$ ).

Type		D Tol.	Material	Hardness	Surface Treatment	D Tol.	
W/o Wrench Flats	With Wrench Flats					D	g6
VFBN	VFBS	g6	SUJ2 Equivalent	Induction Hardened Effective Hardened Depth	-	5	-0.004
VSFBN	VSFBS		SUS440C or 13Cr stainless			6	-0.012
VPFBN	VPFBS		SUJ2 Equivalent	10		-0.005	
VPSFBN	VPSFBS		SUS440C or 13Cr stainless	12		-0.014	
VRBN	VRBS		SUJ2 Equivalent	13		-0.006	
				15		-0.017	
					16	-0.006	
					18	-0.017	
					20	-0.007	
					25	-0.020	
					30	-0.020	

  

W/o Wrench Flats

With Wrench Flats

RoHS 10

- ⚠ 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**

Part Number Type	1mm Increment				P Selection	Wrench Flats Dimensions				C	Coarse Thread Undercut Dimension	
	D	L	F	B		SC	W	l1	(Y) Max.		M	Pitch
(W/o Wrench Flats) (With Wrench Flats)	5	25~296	2sF≤Px5	B	3	SC=1mm Increment	-	-	300	0.2 or Less	3	0.5
	6	25~296			3 4		5	300	4		0.7	
	8	25~296			3 4 5 6		7	300	5		0.8	
	10	25~345			4 5 6 8		8	350	6		1.0	
	12	25~345			(When P=8 or 10)		10	350	8		1.25	
	13	25~345			B≤F-3		11	350	10		1.5	
	15	25~345			(When P≥12)		12	350	12		1.75	
	16	25~345			B≤F-5		13	350	16		2.0	
	18	25~345			(⊙) B≥Pitchx3		14	350	20		2.5	
	20	25~445					16	350	24		3.0	
	25	25~445					17	450				
	30	25~445					18	450				
			22	450								
			24	450								

⚠ 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 - (PMC, PMS) - SC - (LKC-etc.)  
VFBS30 - 250 - F40 - B30 - P10 - SC10 - LKC

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.
	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.

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. <b>P.113</b>
	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.

⚠ 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**