

High Precision Linear Shafts

One End Threaded One End Tapped / One End Threaded One End Tapped 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
W/o Wrench Flats	g6	SUJ2 Equivalent	Effective Hardened Depth of Induction Hardening	- Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5µ or More Low Temp. Black Chrome Plating
With Wrench Flats		SUS440C or 13Cr stainless		
VFB		VFAZ	SUJ2 Equivalent	
VSFBD		VPSFAZ	SUS440C or 13Cr stainless	
VRBD	VRAZ	SUJ2 Equivalent	SUS440C or 13Cr stainless	58HRC-56HRC

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

W/o Wrench Flats

With Wrench Flats

- RoHS 10**
- ⚠ Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). **P.112**
 - ⚠ L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness **P.111**
 - ⚠ Features of Low Temp. Black Chrome Plating **P.128**

Part Number	1mm Increment				P (Coarse) Selection	N (Coarse) Selection	Wrench Flats Dimensions			(Y) Max.	C	Coarse Thread Dimension		
	Type	D	L	F			B	SC	W			l1	M	Pitch
VFB VSFBD VPFB VPSFBD VRB	VFAZ VPSFAZ VRAZ	5	25-296	2sF=Px5	B=F-2	3	2,6,3	-	-	-	300	0.2 or Less	3	0.5
		6	25-296			3,4	3	5	300	4	0.7			
		8	25-296			3,4,5,6	3,4,5	7,8	300	5	0.8			
		10	25-345			4,5,6,8	3,4,5,6	8	350	6	1.0			
		12	25-345			5,6,8,10	4,5,6,8	10	350	8	1.25			
		13	25-345			5,6,8,10	4,5,6,8	11	350	8	1.25			
		15	25-345			5,6,8,10,12	4,5,6,8,10	13	350	10	1.5			
		16	25-345			5,6,8,10,12	4,5,6,8,10	14	350	12	1.75			
		18	25-345			5,6,8,10,12,16	4,5,6,8,10,12	16	350	16	2.0			
		20	25-445			6,8,10,12,16	4,5,6,8,10,12	17	450	20	2.5			
		25	25-445			8,10,12,16,20	4,5,6,8,10,12,16	22	450	24	3.0			
		30	25-445			8,10,12,16,20,24	6,8,10,12,16,20	27	15	450	1.0 or Less			

- ⚠ Overall length L requires Nx3-L.
- ⚠ When D=P, specify F=B as B dimensions. However, L and F dimensions have manufacturing priority and B dimension of the product will be F - (Pitch)x2.
- ⚠ Shaft ends may have centering holes.

Ordering Example

Part Number - L - F - B - P - N - SC

VFAZ16 - 200 - F20 - B12 - P10 - N8 - SC10

VFB12 - 277 - F20 - B12 - P8 - N5

Alterations

Part Number - L - F - B - P (PMC, PMS) - N (NSC, ND) - SC - (LKC-etc.)

VFAZ16 - 200 - F20 - B12 - P10 - N8 - SC10 - LKC

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC ⚠ Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. ⚠ L≤200 → ±0.03
	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.
	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.

Alterations	Code	Spec.
	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.
	PMC PMS	Change to Fine Thread Ordering Code PMC14 (P is changed to PMC) PMS14 (P is changed to PMS)
	NSC	Change to Fine Thread Ordering Code NSC14 (N is changed to NSC) Application Notes Applicable to D=12 or more
	ND	Change the effective length of tapped part to Nx3. Ordering Code ND6 (N is changed to ND) Application Notes Only applicable to D=10-30, N=6-20 ⚠ One End Tapped: NDx3.5+4±L

- ⚠ 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.
- ⚠ Alterations may lower hardness. See **P.112**