

# High Precision Linear Shafts

## One End Threaded with Undercut / 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
VAFN	VAFS	g6	SUJ2 Equivalent SUS440C or 13Cr stainless	Effective Hardened Depth of Induction Hardening	-	8	-0.005
VSAFN	VSAFS					10	-0.014
VPAFN	VPAFS					12	-0.006
VPSAFN	VPSAFS					13	-0.017
VRFN	VRFS					15	-0.006
						16	-0.017
		18	-0.007				
		20	-0.020				
		25					
		30					

  

**W/o Wrench Flats**

**With Wrench Flats**

⚠️ 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	1mm Increment			Selection	Wrench Flats Dimensions			(Y) Max.	C	Coarse Thread Details						
	Type	D	L		F	M (Coarse)	SC			W	l1	M	Pitch	MC	Undercut (g)	
(W/o Wrench Flats) (With Wrench Flats) VAFN VAFS VSAFN VSAFS VPAFN VPAFS VPSAFN VPSAFS VRFN VRFS	8	25-295		6	SC=1mm Increment	7	8	300	0.5 or Less	6	1.0	4.2	2			
	10	25-345		6 8		8	350	⚠️ SC+l1≤L ⚠️ SC≥0 ⚠️ Details of Wrench Flats <b>P.112</b>		10	350	8	1.25	6.0	3	
	12	25-345		6 8 10		10	350			11	350	10	1.5	7.7	4	
	13	25-345		6 8 10		11	350			13	350	12	1.75	9.4		
	15	25-345	5≤F≤Mx3	6 8 10 12		13	350			14	10	350	16	2.0	13.0	5
	16	25-345	⚠️ F-(g)≥Pitchx3	6 8 10 12		14	350			16	17	450	20	2.5	16.4	
	18	25-345		6 8 10 12 16		16	350			17	17	450	24	3.0	19.6	
	20	25-445		6 8 10 12 16		17	450			22	15	450				
	25	25-445		8 10 12 16 20		22	450									
	30	25-445		8 10 12 16 20 24		27	15			450						

⚠️ Shaft ends may have centering holes.

Ordering Example: Part Number - L - F - M - SC  
 VAFS13 - 200 - F20 - M10 - SC10

Alterations: Part Number - L - F - M (MMC, MMS) - SC - (LKC-etc.)  
 VAFS30 - 250 - F20 - M10 - SC20 - LKC

Alterations	Code	Spec.	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-M≤2.		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 ⚠️ FC≤3xD ⚠️ When 1.5xD<FC, FC≤L/2 ⚠️ E=0 or E≥2 ⚠️ Not available in combination with WFC.		MMC MMS	Change to Fine Thread (Ordering Code) MMC14 (M is changed to MMC) MMS14 (M is changed to MMS)  For details, see Shaft Alteration Overview. <b>P.113</b>
	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.			

⚠️ 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					Part Number	Type	D	Unit Price				
			Min. L ~ 50	L51-100	L101-200	L201-300	L301-445				Min. L ~ 50	L51-100	L101-200	L201-300	L301-445
8	VAFN	8					8	VAFS	8						
10		10					10								
12		12					12								
13		13					13								
15		15					15								
16		16					16								
18	VSAFN	18					18	VSAFS	18						
20		20					20								
25		25					25								
30		30					30								
8		VPAFN	8						8	VPAFS	8				
10			10						10						
12	12						12								
13	13						13								
15	15						15								
16	16						16								
18	VPSAFN	18					18	VPSAFS	18						
20		20					20								
25		25					25								
30		30					30								
8		VRFN	8						8	VRFS	8				
10			10						10						
12	12						12								
13	13						13								
15	15						15								
16	16						16								
18		18				18									
20		20				20									
25		25				25									
30		30				30									