

# High Precision Linear Shafts

Both Ends Threaded with Undercuts / Both Ends Threaded with Undercuts and Wrench Flats

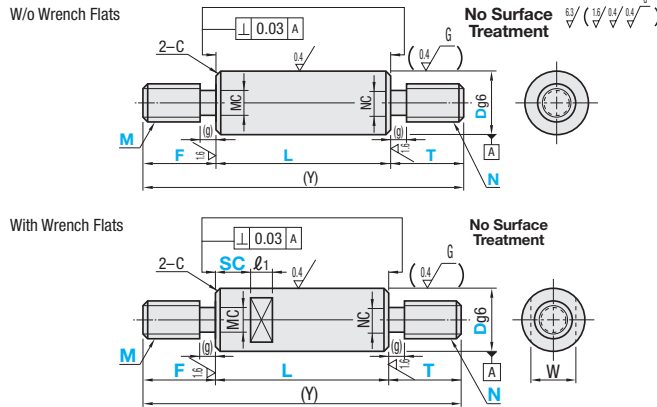
Suitable for assemblies of parts requiring high precision and high perpendicular precision of the shaft end ( $\perp 0.03$ ).

**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**

Type	D Tol.	Material	Hardness	Surface Treatment
W/o Wrench Flats	g6	SUJ2 Equivalent SUS440C or 13Cr stainless	Effective Hardened Depth of Induction Hardening <b>P.112</b>	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5µ or More Low Temp. Black Chrome Plating
VAFM VAFU				
VSAFM VSAFU		SUJ2 Equivalent	SUS440C or 13Cr stainless	
VPAFM VPAFU				
VPSAFM VPSAFU		SUJ2 Equivalent SUS440C or 13Cr stainless	58HRC~ 56HRC~	
VRFM VRFU				

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



Part Number	1mm Increment			Selection	Wrench Flats Dimensions			(Y) Max.	C	
	Type	D	L		F, T	M, N (Coarse)	SC			W
(W/o Wrench Flats) (With Wrench Flats)	VAFM	8	25-290	5 ≤ F ≤ Mx3 5 ≤ T ≤ Nx3	6	SC=1mm Increment SC+l1 ≤ L SC=0 Details of Wrench Flats <b>P.112</b>	7	8	300	0.5 or Less
	VSAFM	10	25-340		6 8		8	350		
	VPAFM	12	25-340		6 8 10		10	350		
	VPSAFM	13	25-340		6 8 10		11	350		
	VRFM	15	25-340		6 8 10 12		13	350		
		16	25-340		6 8 10 12		14	350		
		18	25-340		6 8 10 12 16		16	350		
		20	25-440		6 8 10 12 16		17	450		
		25	25-440		8 10 12 16 20		22	450		
		30	25-440		8 10 12 16 20 24		27	15	450	

Coarse Thread Undercut Dimension			
M	N	Pitch	MC NC (g)
6	1.0	4.2	2
8	1.25	6.0	3
10	1.5	7.7	
12	1.75	9.4	4
16	2.0	13.0	
20	2.5	16.4	
24	3.0	19.6	5
30	3.5	25.0	

Shaft ends may have centering holes.

**Ordering Example**

Part Number - L - F - M - T - N - SC

VAFU20 - 200 - F30 - M10 - T20 - N18 - SC8

**Alterations**

Part Number - L - F - M (MMC, MMS) - T - N (NMC, NMS) - SC - (LKC...etc.)

VAFU30 - 300 - F40 - M20 - T48 - N16 - SC20 LKC

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Not applicable when D-M(N) ≤ 2. L dimensions can be specified in 0.1mm increment for LKC. L ≤ 200 → L ± 0.03
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes: Applicable to Shafts with Wrench Flats only SX=1mm Increment SC+SX+l1 ≤ L SX ≥ 0 Orientation between two set screw flats is not coplanar.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, A=1mm Increment FC ≤ 3xD When 1.5xD < FC, FC ≤ L/2 A=0 or A ≥ 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.
	MMC MMS NMC NMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MMS) NMC14 (N is changed to NMC) NMS14 (N is changed to NMS)

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. **P.112**