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 (⊥ 0.03).

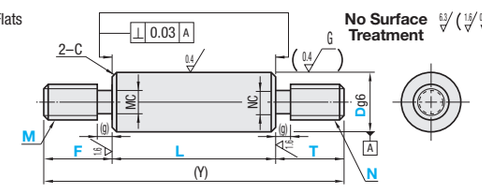
RoHS 10

- 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

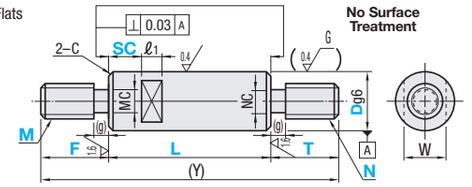
Type		D Tol.	M Material	H Hardness	S Surface Treatment
W/o Wrench Flats	With Wrench Flats				
VAFM	VAFU	g6	SUJ2	Effective Hardened Depth of Induction Hardening P.112	-
VSAFM	VSAFU		SUS440C Equivalent		
VPAFM	VPAFU		SUJ2	SUJ2 58HRC~	Hard Chrome Plating Plating Hardness: HV750 ~ Plating Thickness: 5μ or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

D Tol.	
D	g6
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		1mm Increment		Selection	Wrench Flats Dimensions			(Y) Max.	C
Type	D	L	F, T	M, N (Coarse)	SC	W	ℓ1		
(W/o Wrench Flats) VAFM VSAFM VPAFM VPSAFM VRFM	(With Wrench Flats) VAFU VSAFU VPAFU VPSAFU VRFU	8	25~290	5≤F≤Mx3 5≤T≤Nx3	6	SC=1mm Increment SC+ℓ1≤L SC≥0 Details of Wrench Flats P.112	7	8	300	0.5 or Less
		10	25~340		6 8		8		350	
		12	25~340		6 8 10		10	10	350	
		13	25~340		6 8 10		11		350	
		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	1.0 or Less
		25	25~440	F-(g)≥Pitchx3	8 10 12 16 20		22		450	
		30	25~440	T-(g)≥Pitchx3	8 10 12 16 20 24		27	15	450	

Shaft ends may have centering holes.

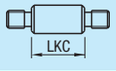
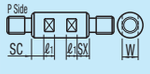
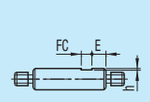
Coarse Thread Undercut Dimension			
M N	Pitch	MC NC	(g)
6	1.0	4.2	2
8	1.25	6.0	3
10	1.5	7.7	
12	1.75	9.4	4
16	2.0	13.0	
20	2.5	16.4	5
24	3.0	19.6	
30	3.5	25.0	

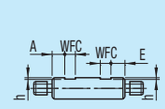
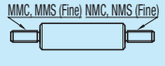
Ordering Example

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+ℓ1x2<L SX≥0 ⊗Orientation between two set screw flats is not coplanar. D W ℓ1: 8 7 8; 10 8; 12 10; 13 11; 15 13 10; 16 14; 18 16 D W ℓ1: 20 17 10; 25 22; 30 27 15
	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. D h: 8~18 1; 20~30 2

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. D h: 8~18 1; 20~30 2
	MMC MMS NMC NMS	Change to Fine Thread Ordering Code MMC14 (M is changed to MMC) MMS14 (M is changed to MMSC) 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

Part Number		Unit Price				
Type	D	Min. L ~ 50	L51~100	L101~200	L201~300	L301~440
VAFM	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSAFM	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPAFM	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSAFM	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRFM	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					

Part Number		Unit Price				
Type	D	Min. L ~ 50	L51~100	L101~200	L201~300	L301~440
VAFU	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VSAFU	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPAFU	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VPSAFU	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					
VRFU	8					-
	10					
	12					
	13					
	15					
	16					
	18					
	20					
	25					
	30					