


# High Precision Linear Shafts

One End Threaded One End Tapped with Undercut / One End Threaded One End Tapped with Undercut and Wrench Flats

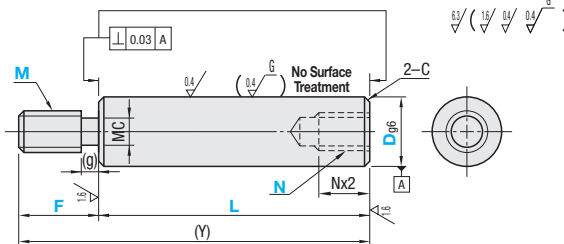
☑ Suitable for assemblies of parts requiring high precision and high perpendicular precision of the shaft end ( $\perp 0.03$ ).



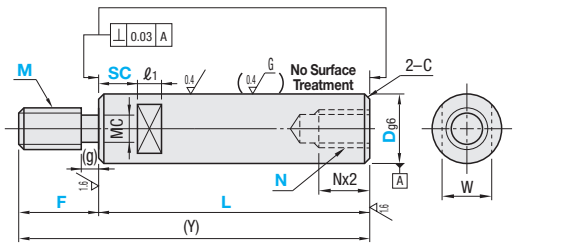
Type		D Tol.	Material	Hardness	Surface Treatment
W/o Wrench Flats	With Wrench Flats				
VAFD	VAFZ	g6	SUJ2 Equivalent	Effective Hardened Depth of Induction Hardening	-
VSAFD	VSAFZ		SUS440C or 13Cr stainless		
VPAFD	VPAFZ		SUJ2 Equivalent	☑ P.112	
VPSAFD	VPSAFZ		SUS440C or 13Cr stainless	SUJ2 Equivalent 58HRC~	
VRFD	VRFZ		SUJ2 Equivalent	SUS440C or 13Cr stainless 56HRC~	
				Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More	
				Low Temp. Black Chrome Plating	

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

W/o Wrench Flats



With Wrench Flats



RoHS10


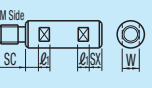
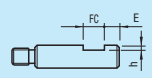
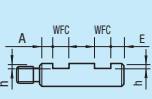
- ☑ Annealing may lower hardness at shaft end machined areas (effective thread length+approx.10mm). ☑ P.112
- ☑ L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness ☑ P.111
- ☑ Features of Low Temp. Black Chrome Plating ☑ P.128

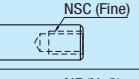
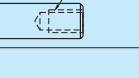
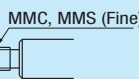
Part Number	1mm Increment			M (Coarse) Selection	N (Coarse) Selection	Wrench Flats Dimensions			C	Coarse Thread Undercut Dimension				
	Type	D	L			F	SC	W		ℓ1	M	Pitch	MC	(g)
(W/o Wrench Flats)	VAFD	8	25-295	6	3 4 5	SC=1mm Increment	7	8	300	0.5 or Less	6	1.0	4.2	2
(With Wrench Flats)	VAFZ	10	25-345	6 8	3 4 5 6		8	8	350		8	1.25	6.0	3
	VSAFD	12	25-345	6 8 10	4 5 6 8		10	8	350		10	1.5	7.7	3
	VSAFZ	13	25-345	6 8 10	4 5 6 8		11	10	350		12	1.75	9.4	4
	VPAFD	15	25-345	6 8 10 12	4 5 6 8 10		13	10	350		16	2.0	13.0	4
	VPAFZ	16	25-345	6 8 10 12	4 5 6 8 10		14	10	350		20	2.5	16.4	5
	VPSAFD	18	25-345	6 8 10 12 16	4 5 6 8 10 12	16	10	350	25	3.0	19.6	5		
	VPSAFZ	20	25-445	6 8 10 12 16	4 5 6 8 10 12	17	10	450	30	3.5	25.0	5		
	VRFD	25	25-445	8 10 12 16 20	4 5 6 8 10 12 16	22	15	450						
	VRFZ	30	25-445	8 10 12 16 20 24	6 8 10 12 16 20	27	15	450						

☑ Overall length L requires Nx3-L. ☑ Shaft ends may have centering holes.

Ordering Example: Part Number - L - F - M - N - SC  
 VPAFD20 - 300 - F25 - M16 - N12

Alterations: Part Number - L - F - M (MMC, MMS) - N (NSC, ND) - SC - (LKC~etc.)  
 VAFZ30 - 250 - F40 - M20 - N20 - SC10 - LKC

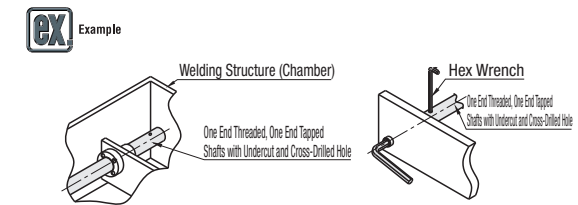
Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code: LKC ☑ Not applicable when D-M≤2. L dimensions can be specified in 0.1mm increment for LKC. L≤200 → L≤0.03
	SX	Second Set of Wrench Flats Ordering Code: SX15 Application Notes: Only applicable to Shafts with Wrench Flats. SX=1mm Increment ☑ SC+SX+ℓ1×2<L ☑ SX≥0 ☑ Orientation between two set screw flats is not coplanar.
	FC	Set Screw Flat at One Location Ordering Code: FC10-E8 Application Notes: 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 Application Notes: 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.
	NSC	Change to Fine Tapped Thread Ordering Code: NSC14 (N is changed to NSC) Application Notes: Applicable to D=12 or more ☑ For details, see Shaft Alteration Overview. ☑ P.113
	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: MDx3.5+4×L
	MMC MMS	Change to Fine Thread Ordering Code: MMC14 (M is changed to MMC) MMS14 (M is changed to MMS) Undercut Dimensions for Fine Threads (1)    Undercut Dimensions for Fine Threads (2)

☑ 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

Part Number	Type	D	Unit Price				
			Min. L 50	L51 100	L101 200	L201 300	L301 445
VAFD		8					
		10					
		12					
		13					
		15					
		16					
		18					
		20					
		25					
		30					
VSAFD		8					
		10					
		12					
		13					
		15					
		16					
		18					
		20					
		25					
		30					
VPAFD		8					
		10					
		12					
		13					
		15					
		16					
		18					
		20					
		25					
		30					
VPSAFD		8					
		10					
		12					
		13					
		15					
		16					
		18					
		20					
		25					
		30					
VRFD		8					
		10					
		12					
		13					
		15					
		16					
		18					
		20					
		25					
		30					

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VAFZ		8					
		10					
		12					
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		15					
		16					
		18					
		20					
		25					
		30					
VSAFZ		8					
		10					
		12					
		13					
		15					
		16					
		18					
		20					
		25					
		30					
VPAFZ		8					
		10					
		12					
		13					
		15					
		16					
		18					
		20					
		25					
		30					
VPSAFZ		8					
		10					
		12					
		13					
		15					
		16					
		18					
		20					
		25					
		30					
VRFZ		8					
		10					
		12					
		13					
		15					
		16					
		18					
		20					
		25					
		30					



☑ Shafts with Cross-Drilled Hole are suitable for narrow work space.