


# High Precision Linear Shafts

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

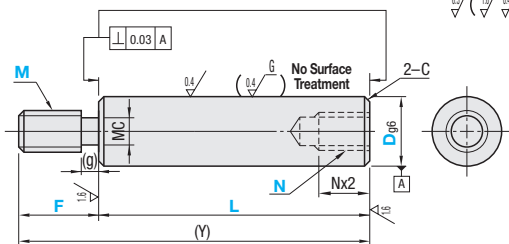
■ Suitable for assemblies of parts requiring high precision and high perpendicular precision of the shaft end ( $\perp 0.03$ ).



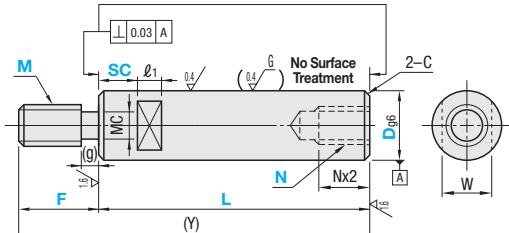
Type		D Tol.	Material	Hardness	Surface Treatment
W/o Wrench Flats	With Wrench Flats				
VAFD	VAFZ	g6	SUSJ2 SUS440C Equivalent	Effective Hardened Depth of Induction Hardening P.112 58HRC~ SUS440C Equivalent 56HRC~	Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5µ or More Low Temp. Black Chrome Plating
VSAFD	VSAFZ				
VPAFD	VPAFZ				
VPSAFD	VPSAFZ				
VRFD	VRFZ				

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

W/o Wrench Flats



With Wrench Flats



RoHS10

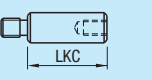
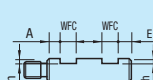
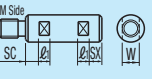
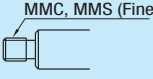
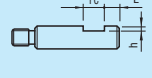
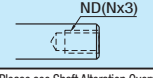
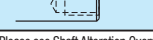
- Annealing may lower hardness at shaft end machined areas (effective thread length+approx.10mm). P.112
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Features of Low Temp. Black Chrome Plating P.128

Part Number	1mm Increment			M (Coarse) Selection	N (Coarse) Selection	Wrench Flats Dimensions			Y Max.	C	Coarse Thread Undercut Dimension				
	Type	D	L			F	SC	W			ℓ1	M	Pitch	MC	(g)
8	25-295			6	3 4 5	7	8	300				6	1.0	4.2	2
10	25-345			6 8	3 4 5 6	8	8	350				8	1.25	6.0	3
12	25-345			6 8 10	4 5 6 8	10	10	350				10	1.5	7.7	
13	25-345			6 8 10	4 5 6 8	11	11	350				12	1.75	9.4	
15	25-345			6 8 10 12	4 5 6 8 10	13	13	350				16	2.0	13.0	4
16	25-345			6 8 10 12	4 5 6 8 10	14	14	350				20	2.5	16.4	
18	25-345			6 8 10 12 16	4 5 6 8 10 12	16	16	350				24	3.0	19.6	5
20	25-445			6 8 10 12 16	4 5 6 8 10 12	17	17	450				30	3.5	25.0	
25	25-445			8 10 12 16 20	4 5 6 8 10 12 16	22	22	450							
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

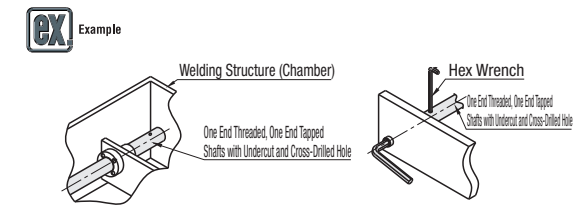
Alterations Example: Part Number - L - F - M (MMC, MMS) - N (NSC, ND) - SC - (LKC~etc.)  
VAFZ30 - 250 - F40 - M20 - N20 - SC10 - LKC

Alterations	Code	Spec.	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		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.
	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.		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. P.113
	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.		NSC	Change to Fine Tapped 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: MDx3.5+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

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

Part Number	Type	D	Unit Price				
			Min. L 50	L51 100	L101 200	L201 300	L301 445
8	VAFZ	8					
10		10					
12		12					
13		13					
15		15					
16		16					
18		18					
20		20					
25		25					
30		30					
8	VSAFZ	8					
10		10					
12		12					
13		13					
15		15					
16		16					
18		18					
20		20					
25		25					
30		30					
8	VPAFZ	8					
10		10					
12		12					
13		13					
15		15					
16		16					
18		18					
20		20					
25		25					
30		30					
8	VPSAFZ	8					
10		10					
12		12					
13		13					
15		15					
16		16					
18		18					
20		20					
25		25					
30		30					
8	VRFZ	8					
10		10					
12		12					
13		13					
15		15					
16		16					
18		18					
20		20					
25		25					
30		30					



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