


High Precision Linear Shafts

One End Stepped, Both Ends Tapped / One End Stepped, Both Ends Tapped with Wrench Flats

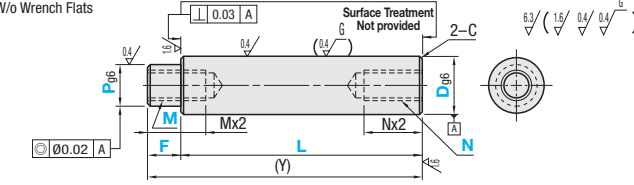
Suitable for assemblies of parts requiring high precision and high perpendicular precision of the shaft end ($\perp 0.03$).



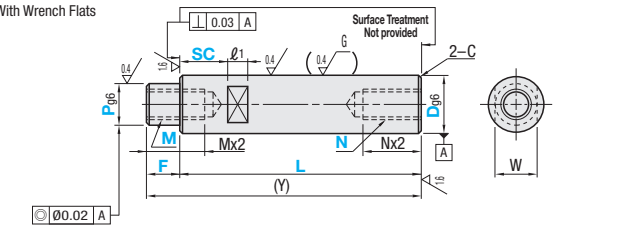
Type	D Tol.	Material	Hardness	Surface Treatment
W/o Wrench Flats	g6	SUJ2	Induction Hardened Effective Hardened Depth \geq P.112	Hard Chrome Plating Plating Hardness HV750 - Plating Thickness: 5 μ or More
VFAA		SUS440C Equivalent		
VSFAA		SUJ2		
VPFAA		SUS440C Equivalent		
VPSFAA		SUJ2		
VSRPA		SUS440C Equivalent		

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). \geq P.112
- Full Length Hardness Guaranteed Shafts \geq P.127
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness \geq P.111
- Features of Low Temp. Black Chrome Plating \geq P.128

Part Number	1mm Increment				M (Coarse) Selection	N (Coarse) Selection	Wrench Flats Dimensions			(Y) Max.	C
	Type	D	L	F, T			P	SC	W		
(W/o Wrench Flats)	8	25-298			6	3					0.5 or Less
(With Wrench Flats)	10	25-348			6-8	3 4 5					
VFAA	12	25-348			6-10	3 4 5 6					
VSFAA	13	25-348			6-11	3 4 5 6 8					
VPFAA	15	25-348			6-13	3 4 5 6 8 10					
VPSFAA	16	25-348			6-14	3 4 5 6 8 10					
VRAA	18	25-348			8-16	4 5 6 8 10 12					
VSRPA	20	25-448			8-17	4 5 6 8 10 12					
	25	25-448			8-22	4 5 6 8 10 12 16					
	30	25-448			9-27	5 6 8 10 12 16 20 24					

P dimensions require $M+3 \leq P$. (Y) dimensions require $M \times 2 + N \times 2 \leq (Y)$. Tap pilot holes may go through.

Ordering Example

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

VFAA20 - 100 - F20 - P10 - M8 - N8




VFPA20 - 100 - F20 - P10 - M8 - N8 - SC20



Alterations

Part Number - L - F - P - M(MD) - N(ND) - SC - (LKC...etc)

VFAA20 - 100 - F20 - P10 - M8 - N8 - LKC

Alteration Details \geq P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Application Notes Applicable when L=200 or less. Not applicable when D-P \leq 2. L dimensions can be specified in 0.1mm increment for LKC. L \leq 200 \rightarrow L \pm 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+ ℓ_1 \times 2<L SX \geq 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 \leq 3xD When 1.5xD<FC, FC \leq L/2 E=0 or E \geq 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 \leq 3xD When 1.5xD<WFC, 2WFC \leq L/2 A(E)=0 or A(E) \geq 2 Orientation between set screw flats is not coplanar. Not available in combination with FC.
	MD ND	Change the effective tap depth to M(N) \times 3. Ordering Code MD6/ND6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=10-30, M(N)=6-20 One End Tapped: MD \times 3.5+4 \geq L Both Ends Tapped: MD \times 3.5+4+ND \times 3.5+4 \geq L

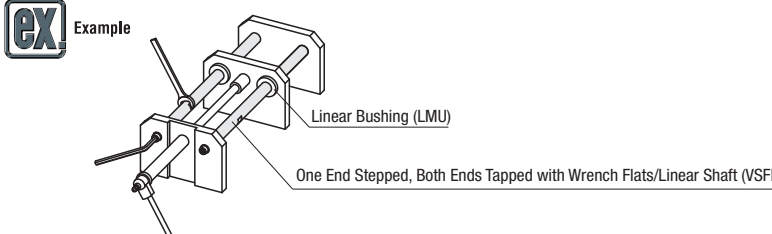
Please see Shaft Alteration Overview for details if provided. \geq P.113

When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.

Alterations may lower hardness. See \geq P.112

Part Number	Type	D	Unit Price					Part Number	Type	D	Unit Price				
			Min. L 50	L51 100	L101 200	L201 300	L301 448				Min. L 50	L51 100	L101 200	L201 300	L301 448
VFAA		8						VFPA		8					
		10								10					
		12								12					
		13								13					
		15								15					
		16								16					
		18								18					
		20								20					
		25								25					
		30								30					
VSFAA		8						VSPFAA		8					
		10								10					
		12								12					
		13								13					
		15								15					
		16								16					
		18								18					
		20								20					
		25								25					
		30								30					
VPFAA		8						VPSFAA		8					
		10								10					
		12								12					
		13								13					
		15								15					
		16								16					
		18								18					
		20								20					
		25								25					
		30								30					
VRAA		8						VRPA		8					
		10								10					
		12								12					
		13								13					
		15								15					
		16								16					
		18								18					
		20								20					
		25								25					
		30								30					
VSRPA		8						VSRPA		8					
		10								10					
		12								12					
		13								13					
		15								15					
		16								16					
		18								18					
		20								20					
		25								25					
		30								30					

Example



Linear Bushing (LMU)

One End Stepped, Both Ends Tapped with Wrench Flats/Linear Shaft (VSFPA)