


# 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 ( $\perp 0.03$ ).



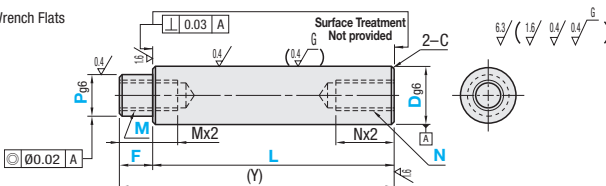
RoHS10

- ⊕ Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). **P.112**
- ⊕ Full Length Hardness Guaranteed Shafts **P.127**
- ⊕ L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness **P.111**
- ⊕ Features of Low Temp. Black Chrome Plating **P.128**

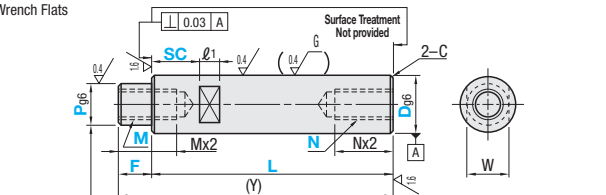
Type		D Tol.	Material	Hardness	Surface Treatment
W/o Wrench Flats	With Wrench Flats	g6	SUJ2 Equivalent	Induction Hardened Effective Hardened Depth <b>P.112</b>	Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More  Low Temp. Black Chrome Plating
VFAA	VFPA		SUS440C or 13Cr stainless		
VSFAA	VSFPA		SUJ2 Equivalent		
VPFAA	VPFPA		SUS440C or 13Cr stainless		
VPSFAA	VPSFPA		SUJ2 Equivalent		
VRAA	VRPA		SUS440C or 13Cr stainless		
VSRAA	VSRPA		SUS440C or 13Cr stainless		

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



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			3	3 4 5	SC=1mm Increment ⊕ SC+ℓ <sub>1</sub> ≤L ⊕ SC=0 ⊕ Details of Wrench Flats <b>P.112</b>	8	10	300	0.5 or Less
(With Wrench Flats)	10	25-348			3 4 5	3 4 5 6				350	
	12	25-348			3 4 5 6	4 5 6 8				350	
	13	25-348			3 4 5 6 8	4 5 6 8				350	
VFAA	15	25-348	2≤F≤Px4		3 4 5 6 8 10	4 5 6 8 10				350	
VSFAA	16	25-348			3 4 5 6 8 10	4 5 6 8 10				350	
VPFAA	18	25-348			3 4 5 6 8 10 12	4 5 6 8 10 12				350	
VPSFAA	20	25-448			4 5 6 8 10 12	4 5 6 8 10 12				450	
VRAA	25	25-448			4 5 6 8 10 12 16	4 5 6 8 10 12 16				450	
VSRAA	30	25-448			5 6 8 10 12 16 20 24	6 8 10 12 16 20 24				450	

⊕ P dimensions require M+3≤P. ⊕ (Y) dimensions require Mx2+Nx2≤(Y). Tap pilot holes may go through.

**Ordering Example**

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

VFAA20 - 100 - F20 - P10 - M8 - N8




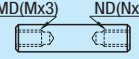

VFPA20 - 100 - F20 - P10 - M8 - N8 - SC20

**Alterations**

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

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

Alteration Details **P.113**

Alterations	Code	Spec.	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≤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 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+ℓ <sub>1</sub> ×2<L ⊕ SX≥0 ⊕ Orientation between two set screw flats is not coplanar.		MD ND	Change the effective tap depth to M(N)x3. Ordering Code MDG/NDG (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: MDx3.5+4≥L ⊕ Both Ends Tapped: MDx3.5+4+NDx3.5+4≥L
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment ⊕ FC≤3xD ⊕ When 1.5xD<FC, FC≤L/2 ⊕ E=0 or E≥2 ⊕ Not available in combination with WFC.			

⊕ 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**