


# High Precision Linear Shafts

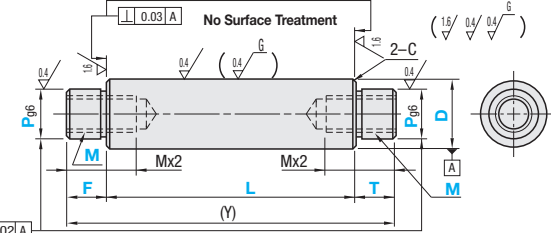
Both Ends Stepped and Tapped / Both Ends Stepped and Tapped with Wrench Flats

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

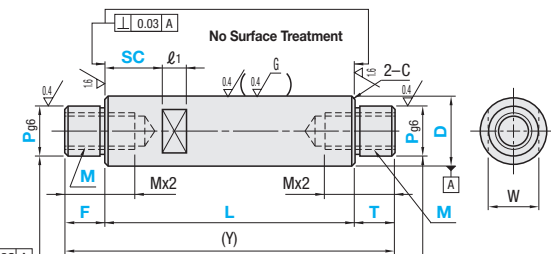


Type	D Tol.	Material	Hardness	Surface Treatment
<b>W/o Wrench Flats</b>	g6	SUJ2 Equivalent	Induction Hardened Effective Hardened Depth $\geq$ P.112	Hard Chrome Plating Plating Hardness HW750 - Plating Thickness: 5µ or More Low Temp. Black Chrome Plating
<b>With Wrench Flats</b>		SUS440C or 13Cr stainless		
<b>VFAH</b>		SUJ2 Equivalent		
<b>VFAH</b>		SUS440C or 13Cr stainless		
<b>VPSFAH</b>		SUJ2 Equivalent		
<b>VPSFAH</b>		SUS440C or 13Cr stainless		

**W/o Wrench Flats**



**With Wrench Flats**



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

RoHS 10


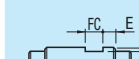
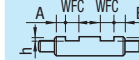
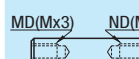
- Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 1.0mm).  $\geq$  P.112
- Full Length Hardness Guaranteed Shafts  $\geq$  P.127
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness  $\geq$  P.111
- Features of Low Temp. Black Chrome Plating  $\geq$  P.128

Part Number Type	D	1mm Increment		M (Coarse) Selection		Wrench Flats Dimensions		(Y) Max.	C	
		L	F, T	P	Selection	SC	W			
(W/o Wrench Flats) (With Wrench Flats) <b>VFAH</b> <b>VFPFH</b> <b>VSAFH</b> <b>VSPFH</b> <b>VPSFAH</b> <b>VPSFPFH</b> <b>VRAH</b> <b>VRPH</b> <b>VSAH</b> <b>VSRPH</b>	8	25-296		6	3	SC=1mm Increment $\bullet$ SC+ $\ell_1$ ≤L $\bullet$ SC≥0 Details of Wrench Flats $\geq$ P.112	7	8	300	0.5 or Less            1.0 or Less
	10	25-346		6-8	3 4 5		8		350	
	12	25-346		6-10	3 4 5 6		10		350	
	13	25-346	2≤F≤Px4	6-11	3 4 5 6 8		11		350	
	15	25-346		6-13	3 4 5 6 8 10		13		350	
	16	25-346	2≤T≤Px4	6-14	3 4 5 6 8 10		14	10	350	
	18	25-346		8-16	4 5 6 8 10 12		16		350	
	20	25-446		8-17	4 5 6 8 10 12		17		450	
	25	25-446		8-22	4 5 6 8 10 12 16		22		450	
	30	25-446		9-27	5 6 8 10 12 16 20 24		27	15	450	

$\bullet$  P dimensions require M+3≤P.  $\bullet$  (Y) dimensions require Mx4≤(Y). Tap pilot holes may go through.

Ordering Example: Part Number - L - F - P - M - T - SC  
 VFAH20 - 100 - F20 - P10 - M8 - T20 - SC20  
 VFPFH20 - 100 - F20 - P10 - M8 - T20 - SC20

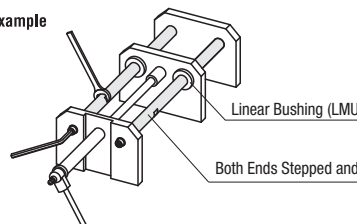
Alterations Example: Part Number - L - F - P - M (MD,ND) - T - SC - (LKC...etc)  
 VFAH20 - 100 - F20 - P10 - M8 - T20 - SC - LKC  
 VFPFH20 - 100 - F20 - P10 - M8 - T20 - SC20 - FC10-E8

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		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.
	WFC	Second Set of Wrench Flats Ordering Code: SX15 Application Notes: Only applicable to Shafts with Wrench Flats. WSC, X=1mm Increment Orientation between two set screw flats is not coplanar.		MD/ND	Change the effective tap depth to M(N)x3. Ordering Code: MD6/ND6 (M is changed to MD, N is changed to ND) Application Notes: Only applicable to D=12-30, M(N)=6-20 One End Tapped: MDx3.5+4:L Both Ends Tapped: MDx3.5+4+NDx3.5+4: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 446			Min. L 50	L51 100	L101 200	L201 300	L301 446		
VFAH	8						VFPFH	8							
	10							10							
	12							12							
	13							13							
	15							15							
	16							16							
	18							18							
	20							20							
	25							25							
	30							30							
	VSAFH	8							VSPFH	8					
		10								10					
12							12								
13							13								
15							15								
16							16								
18							18								
20							20								
25							25								
30							30								
VPSFAH		8						VPSFPFH		8					
		10								10					
	12						12								
	13						13								
	15						15								
	16						16								
	18						18								
	20						20								
	25						25								
	30						30								
	VRAH	8							VRPH	8					
		10								10					
12							12								
13							13								
15							15								
16							16								
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VSAH		8						VSRPH		8					
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	25						25								
	30						30								

**ex** Example



Linear Bushing (LMU)  
Both Ends Stepped and Tapped with Wrench Flats/Linear Shaft (VSFPFH)