

# High Precision Linear Shafts

One End Stepped and Tapped / One End 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	D Tol.	
W/o Wrench Flats	With Wrench Flats					D	g6
VFAG	VFPG	g6	SUU2 Equivalent	Induction Hardened Effective Hardened Depth P112	Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5µ or More	8	-0.005
VSFAG	VSFPG		SUS440C or 13Cr stainless			10	-0.014
VPFAG	VPFPG		SUU2 Equivalent			12	-0.006
VPSFAG	VPSFPG		SUS440C or 13Cr stainless			15	
VRAG	VRPG		SUU2 Equivalent			16	
VSRAG	VSRPG		SUS440C or 13Cr stainless			18	-0.007
						20	-0.020
			25				
			30				

  

W/o Wrench Flats

With Wrench Flats

RoHS 10

- ⚠ Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P112
- ⚠ Full Length Hardness Guaranteed Shafts P127
- ⚠ Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P111
- ⚠ Features of Low Temp. Black Chrome Plating P128

Part Number	1mm Increment				M (Coarse) Selection	Wrench Flats Dimensions			(Y) Max.	C
	Type	D	L	F		SC	W	ℓ <sub>1</sub>		
(W/o Wrench Flats)	8	25-298			6	3	7	8	300	0.5 or Less
(With Wrench Flats)	10	25-348			6-8	3 4 5	8		350	
VFAG	12	25-348			6-10	3 4 5 6	10		350	
VFPG	13	25-348			6-11	3 4 5 6 8	11		350	
VSFAG	15	25-348			6-13	3 4 5 6 8 10	13		350	
VSFPG	16	25-348	2 ≤ F ≤ P x 4		6-14	3 4 5 6 8 10	14	10	350	
VPFAG	18	25-348			8-16	4 5 6 8 10 12	16		350	
VPFPG	20	25-448			8-17	4 5 6 8 10 12	17		450	
VPSFAG	25	25-448			8-22	4 5 6 8 10 12 16	22		450	
VPSFPG	30	25-448			9-27	5 6 8 10 12 16 20 24	27	15	450	

⚠ P dimensions require M+3≤P. ⚠ (Y) dimensions require Mx4≤(Y). ⚠ When Mx2.5+4>Y, tap pilot holes may go through. ⚠ Shafts may have centering holes at end faces.

Ordering Example: Part Number - L - F - P - M - SC  
 VFAG20 - 100 - F20 - P10 - M8 - SC20  
 VFPG20 - 100 - F20 - P10 - M8 - SC20

Alterations: Part Number - L - F - P - M (MD) - SC (LKC-etc.)  
 VFAG20 - 100 - F20 - P10 - M8 - LKC

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
	MD	Change the effective length of tapped part to Mx3. Ordering Code: MD6 (M is changed to MD) Application Notes: Only applicable to D=12-30, M=6-20 ⚠ One End Tapped: MDx3.5+4<L
	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> x2<L ⚠ SX≤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≤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 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.

⚠ Please see Shaft Alteration Overview for details if provided. P113  
 ⚠ When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.  
 ⚠ Alterations may lower hardness. See P112

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
VFAG	VFPG	8							8						
		10							10						
		12							12						
		13							13						
		15							15						
		16							16						
		18							18						
		20							20						
		25							25						
		30							30						
VSFAG	VSFPG	8							8						
		10							10						
		12							12						
		13							13						
		15							15						
		16							16						
		18							18						
		20							20						
		25							25						
		30							30						
VPFAG	VPFPG	8							8						
		10							10						
		12							12						
		13							13						
		15							15						
		16							16						
		18							18						
		20							20						
		25							25						
		30							30						
VPSFAG	VPSFPG	8							8						
		10							10						
		12							12						
		13							13						
		15							15						
		16							16						
		18							18						
		20							20						
		25							25						
		30							30						
VRAG	VRPG	8							8						
		10							10						
		12							12						
		13							13						
		15							15						
		16							16						
		18							18						
		20							20						
		25							25						
		30							30						
VSRAG	VSRPG	8							8						
		10							10						
		12							12						
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