High Precision Linear Shafts

Both Ends Threaded / Both Ends Threaded with Wrench Flats

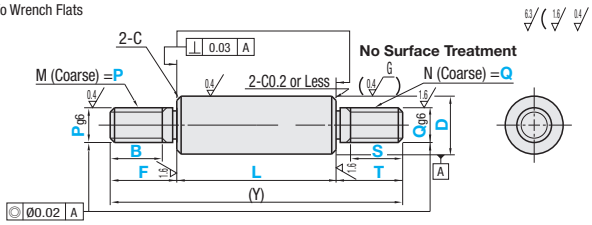
■Suitable for assemblies of parts requiring high precision and high perpendicular precision of the shaft end (⊥ 0.03).

RoHS 10

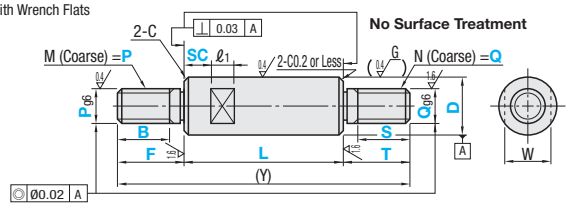
Type		D Tolerance	M Material	H Hardness	S Surface Treatment
W/o Wrench Flats	With Wrench Flats				
VFBM	VFBU	g6	SUJ2 Equivalent	Induction Hardened Effective Hardened Depth P.112	-
VSFBM	VSFBU		SUS440C or 13Cr stainless		
VPFBM	VPFBU		SUJ2 Equivalent		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VPSFBM	VPSFBU		SUJ2 Equivalent	58HRC~	
VRBM	VRBU		SUS440C or 13Cr stainless	56HRC~	Low Temp. Black Chrome Plating
			SUJ2 Equivalent		

D Tol.	
D	g6
5	-0.004 -0.012
6	
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

W/o Wrench Flats



With Wrench Flats



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 Type		D	1mm Increment L	F, T	B, S	P, Q Selection	Wrench Flats Dimensions SC	W	ℓ1	(Y) Max.	C
(W/o Wrench Flats) (D5~30)	(With Wrench Flats) (D6~30)	5	25~292	2≤F≤Px5 2≤T≤Qx5	(When P≤6) B≤F-2 (When P=8, 10) B≤F-3 (When P≥12) B≤F-5 (When Q≤6) S≤T-2 (When Q=8, 10) S≤T-3 (When Q≥12) S≤T-5 (W/o Threads) B=0 S=0 ◆B, S≥Pitchx3	3	-	-	-	300	0.2 or Less
		6	25~292			3 4	SC=1mm Increment ◆SC+ℓ1≤L ◆SC≥0 ◆Details of Wrench Flats P.112	5	8	300	0.5 or Less
		8	25~292			3 4 5 6		7		300	
		10	25~340			4 5 6 8		8		350	
		12	25~340			5 6 8 10		10	10	350	
VFBM	VFBU	13	25~340			5 6 8 10		11		350	
VSFBM	VSFBU	15	25~340			5 6 8 10 12		13		350	
VPFBM	VPFBU	16	25~340			5 6 8 10 12		14		350	
VPSFBM	VPSFBU	18	25~340			5 6 8 10 12 16		16		350	
VRBM	VRBU	20	25~440			6 8 10 12 16		17		450	1.0 or Less
		25	25~440			8 10 12 16 20		22		450	
		30	25~440			8 10 12 16 20 24		27	15	450	

Coarse Thread Dimension M	Pitch
3	0.5
4	0.7
5	0.8
6	1.0
8	1.25
10	1.5
12	1.75
16	2.0
20	2.5
24	3.0

◆Shafts have grinding undercuts at the bottom of threads. ◆Shaft ends may have centering holes. ◆Thread machining will not be applied to B=0 or S=0. ◆D>P(Q)

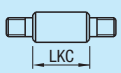
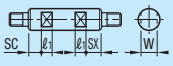
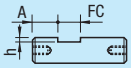
Ordering Example

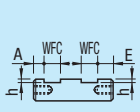
Part Number	L	F	B	P	T	S	Q	SC
VFBU15	200	F28	B16	P6	T17	S12	Q12	SC8

Alterations

Part Number	L	F	B	P (PMC, PMS)	T	S	Q (QMC, QMS)	SC	(LKC···etc.)
VSFBU30	300	F40	B30	P20	T50	S40	Q16	SC10	LKC

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC ⊗Not applicable when D-P(Q)≤2. L dimensions can be specified in 0.1mm increment for LKC. ◆L≤200 ···L±0.03
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes D=6 or more Only applicable to Shafts with Wrench Flats. SX=1mm Increment ◆SC+SX+ℓ1x2<L ◆SX≥0 ⊗Orientation between two set screw flats is not coplanar. D W ℓ1: 6 5 8 / 8 7 8 / 10 8 / 12 10 / 13 11 / 15 13 / 16 14 10 D W ℓ1: 18 16 / 20 17 10 / 25 22 / 30 27 15
	FC	Set Screw Flat at One Location Ordering Code FC10-A8 Application Notes FC, A=1mm Increment ◆FC≤3xD ◆When 1.5xD<FC, FC≤L/2 ◆A=0 or A≥2 ⊗Not available in combination with WFC. D h: 5~18 1 / 20~30 2

Alterations	Code	Spec.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E2 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. D h: 5~18 1 / 20~30 2
	PMC PMS QMC QMS	Change to Fine Thread Ordering Code PMC14 (P is changed to PMC) PMS14 (P is changed to PMC) QMC14 (Q is changed to QMC) QMS14 (Q is changed to QMS) For details, see Shaft Alteration Overview. P.113

◆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. P.114

◆Alterations may lower hardness. See P.112