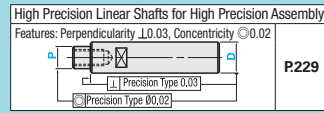


# Shafts

## One End Stepped and Tapped with Wrench Flats



P.229

For High Precision Linear Shafts with high perpendicular precision of the shaft end ( $\perp 0.03$ ), see P.229. For Shafts w/o Wrench Flats, see P.165.

For products uncovered by the e-Catalog Standards, see P.131.

**RoHS**

Annealing required for wrench flats machining and shaft end threading (thread effective length + approx. 10mm) may lower hardness. P.142

L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.141

Features of Low Temp. Black Chrome Plating P.156

Type		Material	Hardness	Surface Treatment
SFPG	SFPU	SUJ2	Effective Hardened	-
SSFPG	SSFPU	SUS440C Equivalent	Depth of Induction Hardening P.142	
PSFPG	PSFPU	SUJ2	SUJ2 58HRC~	Hard Chrome Plating - Plating Hardness: HV750 - Plating Thickness: 5µ or More
PSSFPG	PSSFPU	SUS440C Equivalent	SUS440C Equivalent 56HRC~	
RSFPG	-	SUJ2	56HRC~	Low Temp. Black Chrome Plating
-	-	PFPGG	S45C Equivalent	Hard Chrome Plating - Plating Hardness: HV750 - Plating Thickness: 10µ or More
-	-	PSFPGG	SUS304	

For plated products, the surface roughness of D part is  $\sqrt{0.4}$ ; and for unplated products, it is  $\sqrt{0.6}$ .

Part Number Type	1mm Increments			M(Coarse) Selection	Wrench Flats Dimensions		(Y) Max.	R	C
	D	L	F		SC	W			
(D Tol. g6) SFPG SSFPG PSFPG PSSFPG RSFPG (D≤30, L≤500)	8	25~998	2≤F≤Px4	6	3	7	8	0.3 or Less	0.5 or Less
	10	25~998		6~8	3 4 5	8	8		
	12	25~1198		6~10	3 4 5 6	10	1000		
	13	25~1198		6~11	3 4 5 6 8	11	1000		
	15	25~1198		6~13	3 4 5 6 8 10	13	1000		
	16	25~1198		6~14	3 4 5 6 8 10	14	1200		
	18	25~1198		8~16	4 5 6 8 10 12	16	1200		
	20	25~1198		8~17	4 5 6 8 10 12	17	1200		
	25	25~1198		8~22	4 5 6 8 10 12 16	22	1200		
	30	25~1498		9~27	5 6 8 10 12 16 20 24	27	1500		
(D Tol. f8) PFPGG PSFPGG	35	25~1498	9~32	5 6 8 10 12 16 20 24	30	1500	1.0 or Less	0.5 or Less	
	40	25~1498	11~37	6 8 10 12 16 20 24 30	36	1500			
	50	25~1498	11~47	6 8 10 12 16 20 24 30	41	1500			

P dimensions require  $M+3\leq P$ . (Y) dimensions require  $Mx2.5+4\geq Y$ . Tap pilot holes may go through.

Ordering Example: Part Number - L - F - P - M - SC  
 SFPG20 - 400 - F25 - P16 - M10 - SC10  
 SFPU20 - 500 - F25 - P16 - M10 - SC10

Alterations: Part Number - L - F - P - M(MD) - SC - (LKC, FC--etc.)  
 SFPG30 - 400 - F25 - P16 - M10 - SC10 - LKC

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code: LKC L dimensions can be specified in 0.1mm increment for LKC. L<200 → L±0.03 200≤L<500 → L±0.05 L≥500 → L±0.1
	SX	Second Set of Wrench Flats Ordering Code: SX15 SX=1mm Increment SC+SX+ $\ell_1$ ×2<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 D≤30: FC≤5D, D≥35: FC≥3D 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 D≤30: WFC≤5xD, D≥35: WFC≥3xD 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. P.143  
 When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.144  
 Alterations may lower hardness. See P.142.

Alterations	Code	Spec.
	RC	90-deg. Set Screw Flat at One Location Ordering Code: RC10 Application Notes: Only applicable to D=10 ~ 30. Not available in combination with WRC.
	WRC	90-deg. Set Screw Flats at Two Locations Ordering Code: WRC10-Y10 Application Notes: Only applicable to D=10 ~ 30. Not available in combination with RC. Orientation between two set screw flats is not coplanar.
	KC	Keyway at One Location: KC Ordering Code: KC10-G10
	WKC	Keyways at Two Locations: WKC Ordering Code: WKC10-C8-KC10-G10 Application Notes: Only applicable to D=12, 16, 20, 25 and 30.
	MD	Change the effective length of tapped part to Mx3. Ordering Code: MD6 (M is changed to MD) Application Notes: Only applicable to D=10~30 and M=6~20 One End Tapped: MDx3.5+4≤L Not available in combination with KC, WSC.
	LFC	Set Screw Flat at Step Parts Ordering Code: LFC10-A0 LFC+A≤F D-M≥1

Alteration Details P.143

Part Number Type	D	Unit Price																												
		Min. L	L51	L101	L151	L201	L251	L301	L351	L401	L451	L501	L551	L601	L651	L701	L751	L801	L851	L901	L951	L1001	L1101	L1201	L1301	L1401				
SFPG SFPU	8																													
	10																													
	12																													
	13																													
	15																													
	16																													
	18																													
	20																													
	25																													
	30																													
PSFPG PSFPU	8																													
	10																													
	12																													
	13																													
	15																													
	16																													
	18																													
	20																													
	25																													
	30																													
PSSFPG PSSFPU	8																													
	10																													
	12																													
	13																													
	15																													
	16																													
	18																													
	20																													
	25																													
	30																													

For D tolerance h5, add the relevant surcharge to the prices above.

Part Number Type	D	Unit Price					
		Min. L	L101	L201	L401	L601	L801
RSFPG	8						
	10						
	12						
	13						
	15						
	16						
	18						
	20						
	25						
	30						
PFPGG	8, 10						
	12						
	13						
	15, 16						
	18, 20						
	25						
	30						
	35						
	40						
	50						

Part Number Type	D	Unit Price							
		Min. L	L101	L201	L401	L601	L801	L1001	L1201
PSSFPGG	8, 10								
	12								
	13								
	15, 16								
	18, 20								
	25								
	30								
	35								
	40								
	50								