Shafts

Standard & Precision Type / One End Threaded & One End Tapped with Wrench Flats / One End Threaded & One End Tapped with Cross-Drilled Hole

Shafts – Standard & Precision Type / One End Threaded & One End Tapped with Wrench Flats / One End Threaded & One End Tapped with Cross-Drilled Hole

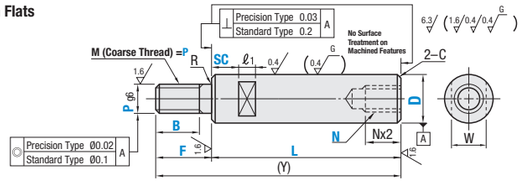
RoHS10

Type						Material	Hardness	Surface Treatment
	With Wrench Flats			With Cross-Drilled Hole				
Precision Type	Standard							
D Tol. g6	D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. f8			
VFAZ	SFAZ	SFZU	—	SFZH	—	52100 Bearing Steel Equivalent	Effective Hardened Depth of Induction Hardened **P.199** 52100 Bearing Steel Equivalent 58 HRC min. SUS440C (13Cr) Stainless Steel Equivalent 56 HRC min.	—
VSFAZ	SSFAZ	SSFZU	—	SSFZH	—	SUS440C (13Cr) Stainless Steel Equivalent		
VPFAZ	PSFAZ	PSFZU	—	PSFZH	—	52100 Bearing Steel Equivalent		Hard Chrome Plating Plating Hardness: HV 750~ Plating Thickness 5 μ or More
VPSFAZ	PSSFAZ	PSSFZU	—	PSSFZH	—	SUS440C (13Cr) Stainless Steel Equivalent		
VRAZ	RSFAZ	—	—	RSFZH	—	52100 Bearing Steel Equivalent		Low Temperature Black Chrome Plating
—	—	—	PSGGZ	—	PSGZH	1045 Carbon Steel Equivalent	—	Hard Chrome Plating Plating Hardness: HV 750~ Plating Thickness: 10 μ or More
—	—	—	PSSGGZ	—	—	304 Stainless Steel		

D	D Tolerance g6	D Tolerance h5	D Tolerance f8
6	-0.004 -0.012	0 -0.005	-0.010 -0.028
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12	-0.006 -0.017	0 -0.008	-0.016 -0.043
13			
15			
16			
18			
20	-0.007 -0.020	0 -0.009	-0.020 -0.053
25			
30			
35	-0.009 -0.025	0 -0.011	-0.025 -0.064
40			
50			

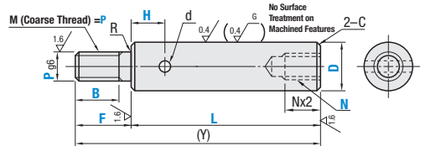
- Annealing caused by machining wrench flats and shaft end threading (effective thread length + approx. 10 mm) may lower hardness. **P.199**
- Cross-drilled hole areas may be out of O.D. tolerances due to annealing-induced deformation
- Circularity, Straightness, Perpendicularity Concentricity, Changes in Hardness **P.198**.
- Features of Low Temp. Black Chrome Plating **P.213**.
- For Shafts without wrench flats or cross-drilled holes, please see **P.238**.

With Wrench Flats



With Cross-Drilled Holes

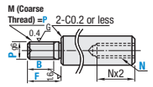
(8≤D≤30, L≤500)



Features of Precision Shafts

Concentricity is ◎ Ø0.02

Perpendicularity is ⊥ 0.03



- Precision shafts have grinding undercut section at the bottom of threads. Shaft ends faces have centering holes.

- Overall length L requires Nx3≤L.
- When D=P, please specify F=B as B dimensions. However, L and F dimensions have manufacturing priority and B dimensions should be F-(Pitch x 2).

Part Number Type	D	1 mm Increment L	F	B	P (Coarse Thread)	N (Coarse Thread)	Wrench Flats Dimensions SC	W	ℓ1	(Y) Max.	R	C
Precision Type With Wrench Flats D Tolerance g6 VFAZ VSFAZ VPFAZ VPSFAZ VRAZ	6	25–296	2≤F≤Px5	When P≤6 B≤F-2 When P=8, 10 B≤F-3 When P≤12 B≤F-5 When without Threads B=0 ⓘ B≥Pitchx3	3 4	3	SC= 1 mm Inc. ⓘ SC+ℓ1≤L ⓘ SC≥0 ⓘ Details of Wrench Flats **P.199**	5	8	300	0.3 or Less	0.5 or Less
	8	25–296			3 4 5 6	3 4 5		7		300		
	10	25–345			4 5 6 8	3 4 5 6		8		350		
	12	25–345			5 6 8 10	4 5 6 8		10		350		
	13	25–345			5 6 8 10	4 5 6 8		11		350		
	15	25–345			5 6 8 10 12	4 5 6 8 10		13		350		
	16	25–345			5 6 8 10 12	4 5 6 8 10		14	10	350		
	18	25–345			5 6 8 10 12 16	4 5 6 8 10 12		16		350		
	20	25–445			6 8 10 12 16	4 5 6 8 10 12		17		450		1.0 or Less
	25	25–445			8 10 12 16 20	4 5 6 8 10 12 16		22		450		
	30	25–445			8 10 12 16 20 24	6 8 10 12 16 20		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
30	3.5

Part Number Type	D	1 mm Increment L	F	B	P (Coarse Thread)	N (Coarse Thread)	Wrench Flats Dimensions SC	W	ℓ1	Cross-Drilled Hole Dimensions H	d	(Y) Max.	R	C
Standard Type With Wrench Flats D Tol. g6 SFAZ SSFAZ PSFAZ PSSFAZ RSFAZ D≤30, L≤500 D Tol. f8 PSGGZ PSSGGZ	6	25–798	2≤F≤Px5	When P≤6 B≤F-2 When P=8, 10 B≤F-3 When P≤12 B≤F-5 When without Threads B=0 ⓘ B≥Pitchx3	3 4 5 6	3 4 5 6	SC= 1 mm Inc. ⓘ SC+ℓ1≤L ⓘ SC≥0 ⓘ Details of Wrench Flats **P.199**	5	8	H=Specified in 1 mm Inc. ⓘ L≥H+d/2+6 +Nx2.5 ⓘ H≥d/2+2	–	600	0.3 or Less	0.5 or Less
With Cross-Drilled Hole 8≤D≤30, L≤500 D Tol. g6 SFZH SSFZH PSFZH PSSFZH RSFZH D Tol. h5 SFZU SSFZU PSFZU PSSFZU D Tol. f8 PSGZH	8	25–998			3 4 5 6 8	3 4 5 6 8		7			3	800		
	10	25–998			4 5 6 8 10	4 5 6 8 10		8				800		
	12	25–1198			5 6 8 10 12	5 6 8 10 12		10	10			1000		
	13	25–1198			5 6 8 10 12	5 6 8 10 12		11			4	1000		
	15	25–1198			5 6 8 10 12	5 6 8 10 12		13				1000		
	16	25–1198			5 6 8 10 12 16	5 6 8 10 12 16		14				1200		
	18	25–1198			5 6 8 10 12 16	5 6 8 10 12 16		16			6	1200		
	20	25–1198			6 8 10 12 16 20	6 8 10 12 16 20		17				1200		1.0 or Less
	25	25–1198			8 10 12 16 20 24	8 10 12 16 20 24		22			7	1200		
	30	25–1498			8 10 12 16 20 24 30	8 10 12 16 20 24 30		27	15			1500		
	35	25–1498			10 12 16 20 24 30	10 12 16 20 24 30		30			—	1500	0.5 or Less	
	40	25–1498			12 16 20 24 30	12 16 20 24 30		36	20			1500		
	50	25–1498			16 20 24 30	16 20 24 30		41				1500		

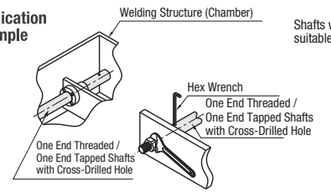
Shafts

Standard & Precision Type / One End Threaded & One End Tapped with Wrench Flats / One End Threaded & One End Tapped with Cross-Drilled Hole, *continued*

Part Number Example

Part Number	- L	- F	- B	- P	- N	- SC	- H
VFAZ16	- 200	- F20	- B12	- P10	- N8	- SC10	
SFAZ20	- 277	- F25	- B12	- P10	- N12	- SC10	
SSFZH20	- 277	- F25	- B12	- P10	- N12		- H10

Application Example

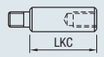
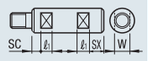
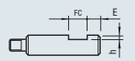
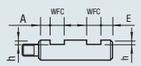


Shafts with Cross-Drilled holes are suitable for narrow work space.

Part Number Alterations

Part Number	- L	- F	- B	- P (PMC / PSC)	- N (NSC)	- SC	- H	- (LKC...etc.)
SFAZ30	- 250	- F40	- B30	- P10	- N10	- SC10	-	- LKC

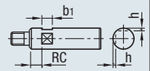
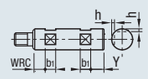
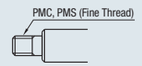
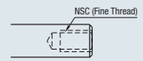
Alteration Details **P.200**

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance **Ordering Code:** LKC **Application Notes:** Applicable when L=200 or less for precision type. ⊗ Not applicable when D-P≤2 When using LKC, L dimensions can be specified in 0.1 increments. ⓘ 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 **Application Notes:** Applicable to Shafts with Wrench Flats only. SX = 1 mm increment ⓘ SC+SX+ℓ1x2<L ⓘ SX≥0 ⊗ Orientation between wrench flat features is random.
	FC	Set Screw Flat at One Location **Ordering Code:** FC10-E8 **Application Notes:** ⊗ Not applicable to precision shafts. FC, E = 1 mm 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 **Application Notes:** ⊗ Not applicable to precision shafts. WFC, A, E = 1 mm increment ⓘ WFC≤3xD ⓘ When 1.5xD<FC, 2WFC≤L/2 ⓘ A (E)=0 or A (E)≥2 ⊗ Orientation between set screw flats is random. Not available in combination with FC.

D	W	ℓ1	D	W	ℓ1
6	5	8	18	16	10
8	7		20	17	
10	8	10	25	22	15
12	10		30	27	
13	11		35	30	
15	13		40	36	20
16	14		50	41	

D	h
6–18	1
20–40	2
50	3

D	h
6–18	1
20–40	2
50	3

Alterations	Code	Spec.
	RC	90° Set Screw Flat at One Location **Ordering Code:** RC10 **Application Notes:** Applicable for D=10–30 ⊗ Not applicable to precision shafts. ⊗ Not available in combination with WRC. ⓘ For details, see Shaft Alteration Overview **P.200**.
	WRC	90° Set Screw Flats at Two Locations **Ordering Code:** WRC10-Y10 **Application Notes:** Applicable to D=10–30 ⊗ Not applicable to precision shafts. ⊗ Not available in combination with RC. ⊗ Orientation between set screw features is random. ⓘ For details, see Shaft Alteration Overview **P.200**.
	PMC PMS	Change to Fine Thread **Ordering Code:** PMC14 (P is changed to PMC) PMS14 (P is changed to PMS) ⓘ For details, see Shaft Alteration Overview **P.200**.
	NSC	Change to Fine Tapped Thread **Ordering Code:** NSC14 (N is changed to NSC) **Application Notes:** Applicable for D=6 or more ⓘ For details, see Shaft Alteration Overview **P.200**.

- Please see Shaft Alteration Overview for details if provided. **P.200**
- When selecting multiple alteration additions, the distance between machined areas should be greater than 2 mm. **P.201**
- Alterations may lower hardness. **P.199**