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Shafts

Standard & Precision Type / One End Stepped & Both Ends Tapped / One End Stepped & One End Tapped

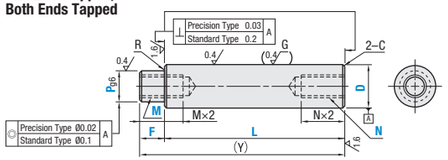
Shafts – Standard & Precision Type / One End Stepped & Both Ends Tapped / One End Stepped & One End Tapped

RoHS 10

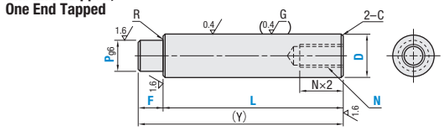
Type							Material	Hardness	Surface Treatment
Both Ends Tapped				One End Tapped					
Precision Type	Standard								
D Tol. g6	D Tol. g6	D Tol. h5	D Tol. f8	D Tol. g6	D Tol. h5	D Tol. f8			
VFAA	SFAA	SFUE	—	SFNA	SFEU	—	52100 Bearing Steel Equivalent	Effective Hardened Depth of Induction Hardened **P.199** 52100 Bearing Steel Equivalent 58 HRC min. SUS440C (13Cr) Stainless Steel Equivalent 56 HRC min.	—
VSFAA	SSFAA	SSFUE	—	SSFNA	SSFEU	—	SUS440C (13Cr) Stainless Steel Equivalent		
VPFAA	PSFAA	PSFUE	—	PSFNA	PSFEU	—	52100 Bearing Steel Equivalent		Hard Chrome Plating Plating Hardness: 750 HV min. Plating Thickness 5μ or More
VPSFAA	PSSFAA	PSSFUE	—	PSSFNA	PSSFEU	—	SUS440C (13Cr) Stainless Steel Equivalent		
VRAA	RSFAA	—	—	RSFNA	—	—	52100 Bearing Steel Equivalent		Low Temperature Black Chrome Plating
VSRAA	—	—	—	—	—	—	SUS440C (13Cr) Stainless Steel Equivalent		
—	—	—	PSFGA	—	—	PSNGA	1045 Carbon Steel Equivalent	—	Hard Chrome Plating Plating Hardness: 750 HV min. Plating Thickness 10μ or More
—	—	—	PSSFGA	—	—	PSSNGA	304 Stainless Steel		

- Shaft End Machined Area (Effective Thread Length + approx. 10 mm) hardness may be reduced by annealing **P.199**.
- Circularity, Straightness, Perpendicularity **P.198**.
- Features of Low Temperature Black Chrome Plating **P.213**.
- For Both Ends Stepped and Tapped with Wrench Flats, see **P.256**.

One End Stepped, Both Ends Tapped — No Surface Treatment on Machined Areas



One End Stepped, One End Tapped — No Surface Treatment on Machined Areas



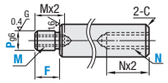
6.3 (1.6 0.4 0.4) G

D	D Tolerance g6	h5	f8
8	-0.005 -0.014	0 -0.006	-0.013 -0.035
10			
12			
13	-0.006 -0.017	0 -0.008	-0.016 -0.043
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			

Features of Precision Shafts

Concentricity is ◎ Ø0.02

Perpendicularity is ⊥ 0.03



- Precision shafts have grinding undercuts at stepped sections (max. width 1 mm / max. depth 0.1 mm).

Part Number Type	D	1 mm Increment L	F	P	M (Coarse Thread)	N (Coarse Thread)	(Y) Max.	R	C
Precision Type One End Stepped, Both Ends Tapped (D Tolerance g6) VFAA VSFAA VPFAA VPSFAA VRAA VSRAA	8	25–298	2≤F≤Px4	6	3	3 4 5	300	0.3 or Less	0.5 or Less
	10	25–348		6–8	3 4 5	3 4 5 6	350		
	12	25–348		6–10	3 4 5 6	4 5 6 8	350		
	13	25–348		6–11	3 4 5 6 8	4 5 6 8	350		
	15	25–348		6–13	3 4 5 6 8 10	4 5 6 8 10	350		
	16	25–348		6–14	3 4 5 6 8 10	4 5 6 8 10	350		
	18	25–348		8–16	4 5 6 8 10 12	4 5 6 8 10 12	350		
	20	25–448		8–17	4 5 6 8 10 12	4 5 6 8 10 12	450		
	25	25–448		8–22	4 5 6 8 10 12 16	4 5 6 8 10 12 16	450		1.0 or Less
	30	25–448		9–27	5 6 8 10 12 16 20 24	6 8 10 12 16 20	450		

- P Dimensions require M+3≤P.
- For Precision Type, (Y) dimensions require Mx2+Nx2≤(Y).
- When Mx2.5+4+Nx2.5+4≥(Y), tap pilot holes may go through and the effective thread length of the smaller tapping may be made shorter to prioritize the effective thread of the larger tapping.

Part Number Type	D	1 mm Increment L	F	P	M (Coarse Threads)	N (Coarse Threads)	(Y) Max.	R	C
Standard Type One End Stepped, Both Ends Tapped D Tolerance g6 SFAA SSFAA PSFAA PSSFAA RSFAA (D≤30, L≤500) D Tolerance h5 SFUE SSFUE PSFUE PSSFUE D Tolerance f8 PSFGA PSSFGA / One End Stepped, One End Tapped D Tolerance g6 SFNA SSFNA PSFNA PSSFNA RSFNA (D≤30, L≤500) D Tolerance h5 SFEU SSFEU PSFEU PSSFEU D Tolerance f8 PSNGA PSSNGA	8	25–1098	D Tol. g6 8≤D≤30 2≤F≤Px5 D Tol. g6 D≥35 D Tol. f8/ h5 2≤F≤Px4	(3–)6	3	3 4 5	1100	0.3 or Less	0.5 or Less
	10	25–1198		6(3)–8	3 4 5	3 4 5 6	1200		
	12	25–1398		6(3)–10	3 4 5 6	(3) 4 5 6 8	1400		
	13	25–1398		6(4)–11	3 4 5 6 8	(3) 4 5 6 8	1400		
	15	25–1398		6(4)–13	3 4 5 6 8 10	(3) 4 5 6 8 10	1400		
	16	25–1398		6(4)–14	3 4 5 6 8 10	4 5 6 8 10	1400		
	18	25–1398		8(5)–16	4 5 6 8 10 12	4 5 6 8 10 12	1400		
	20	25–1398		8(5)–17	4 5 6 8 10 12	4 5 6 8 10 12	1400		
	25	25–1398		8(6)–22	4 5 6 8 10 12 16	4 5 6 8 10 12 16	1400		1.0 or Less
	30	25–1498		9(8)–27	5 6 8 10 12 16 20 24	6 8 10 12 16 20	1500		
	35	25–1498		9–32	5 6 8 10 12 16 20 24	8 10 12 16 20 24	1500	0.5 or Less	
	40	25–1498		11–37	6 8 10 12 16 20 24 30	10 12 16 20 24 30	1500		
	50	25–1498		11–47	6 8 10 12 16 20 24 30	12 16 20 24 30	1500		

- P( ) and N( ) dimensions are applicable only for D diameter tolerance with g6.
- Total length (Y) requires Mx2+Nx2≤(Y).
- For One End Stepped Both Ends Tapped types, P dimensions require M+3≤P.
- When D-P≤4, stepped section chamfer C is 0.2 or less.
- For One End Stepped One End Tapped Type, L dimensions require Nx3≤L.
- When Mx2.5+4+Nx2.5+4≥(Y), tap pilot holes may go through and the effective thread length of the smaller tapping may be made shorter to prioritize the effective thread of the larger tapping.

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Shafts

Standard & Precision Type / One End Stepped & Both Ends Tapped / One End Stepped & One End Tapped, *continued*

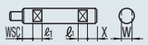
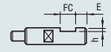
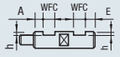
Part Number Example

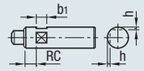
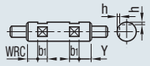
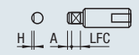
Part Number	-	L	-	F	-	P	-	M	-	N
VFAA20	-	400	-	F25	-	P16	-	M10	-	N10
SFAA20	-	400	-	F25	-	P16	-	M10	-	N10
SFNA20	-	400	-	F25	-	P15			-	N10

Part Number Alterations

Part Number	-	L	-	F	-	P	-	M	-	N (NSC)	-	(LKC / WSC...etc.)
SFAA30	-	400	-	F25	-	P16	-	M10	-	N10	-	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 L dimensions can be specified in 0.1 increment for LKC. ! L<200 →L±0.03 200≤L<500 →L±0.05 L≥500 →L±0.1
	WSC	Wrench Flats at Two Locations **Ordering Code:** WSC12-X8 WSC, X in 1 mm Increment. ! WSC+X+ℓ1x2<L ! WSC (X)≥0 ⊗ Orientation between set screw flats is random. D: 8 10 12 13 15 16 18 / W: 7 8 10 11 10 14 16 / ℓ1: 8 10 15 20 D: 20 25 30 35 40 50 / W: 17 22 27 30 36 41 / ℓ1: 10 15 20
	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. D: 8–18 / h: 1 D: 20–40 / h: 2 D: 50 / h: 3
	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: 8–18 / h: 1 D: 20–40 / h: 2 D: 50 / h: 3

Alterations	Code	Spec.
	RC	90° Set Screw Flat at One Location **Ordering Code:** RC10 **Application Notes:** Applicable to 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 flats is random. 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 to D=12 or more For details, see Shaft Alteration Overview, **P.200**.
	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 and M (N) = 6–20 ! One End Tapped: MDx3.5+4≤L ! Both Ends Tapped: MDx3.5+4+NDx3.5+4≤L
	LFC	Set Screw Flat at Step Parts **Ordering Code:** LFC10-A0 ! LFC≤F ! D-M(N)≥1 P: 6–18 20–40 41– / H: 1 2 2

Alteration Details **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 2mm. **P.201**
- Alterations may lower hardness. **P.199**