Shafts

Both Ends Tapped Hollow Shafts / Both Ends Tapped Hollow Shafts with Wrench Flats / One End Threaded Hollow Shafts / One End Threaded Hollow Shafts with Wrench Flats

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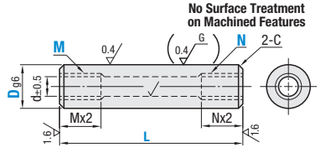
RoHS 10

Type				Material	Hardness	Surface Treatment
Both Ends Tapped	Both Ends Tapped with Wrench Flats	One End Threaded	One End Threaded with Wrench Flats			
SPJW	SPWR	SPJN	SPNR	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.	—
SSPJW	SSPWR	—	—	SUS440C (13Cr) Stainless Steel Equivalent		
PSPJW	PSPWR	PSPJN	PSPNR	52100 Bearing Steel Equivalent		Hard Chrome Plating Plating Hardness: 750 HV min. Plating Thickness: 5μ or More
RSPJW	RSPWR	RSPJN	RSPNR	52100 Bearing Steel Equivalent		Low Temperature Black Chrome Plating

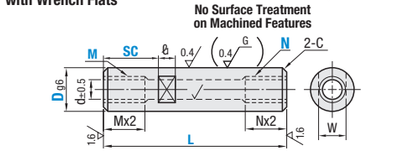
D Tolerance	
6	-0.004 -0.012
8–10	-0.005 -0.014
12–16	-0.006 -0.017
20–30	-0.007 -0.020
35–50	-0.009 -0.025

- Features of Low Temperature Black Chrome Plating **P.213**.
- Circularity and O.D. tolerance may not meet precision specification in areas approximately 15mm from wrench flats machined ends.
- Circularity, Straightness, Perpendicularity and Changes in Hardness **P.198**.
- Low temperature black chrome plating is not applied to the inside of hollow shafts, taps, bored holes and lateral holes, and may rust.
- Annealing required for wrench flats machining and shaft end threading (effective thread length + approx. 10 mm) may lower hardness. **P.199**

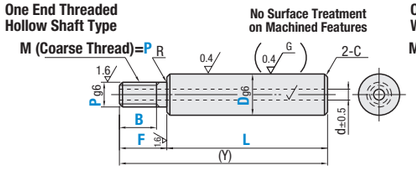
Both Ends Tapped Hollow Shaft Type



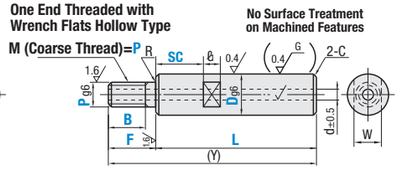
Both Ends Tapped Hollow Shafts with Wrench Flats



One End Threaded Hollow Shaft Type



One End Threaded with Wrench Flats Hollow Type



! About Hollow Shaft Wall Thickness Deviations **P.198**.

Both Ends Tapped Hollow Shafts

Part Number Type	D	L 1 mm Increments	M (Coarse Threads) / N (Coarse Threads)	Wrench Flats Dimensions SC	W	ℓ1	d	C
Both Ends Tapped Hollow Shafts SPJW SSPJW (*marked sizes only) PSPJW RSPJW (D≤30, L≤500)	6	20–600	3	SC=1 mm Increment ! When D≤25 SC+ℓ1≤L-Nx2 SC≥Mx2 ! When D≥30 SC+ℓ1≤L SC≥0 ! Details of Wrench Flats **P.199**	5	8	2	0.5 or Less
	*8	20–800 (300)	4 *5		7		3 (3)	
	*10	20–800 (400)	5 *6		8		4 (4)	
	*12	32–1000 (500)	*8 *T1 (RC1/8)		10	10	6 (5)	
	*13	40–1000 (500)	*10 *T1 (RC1/8)		11		7 (5)	
	*16	48–1200 (600)	*12 *T2 (RC1/4)		14		10 (6)	
Both Ends Tapped Hollow Shafts with Wrench flats SPWR SSPWR (*marked sizes only) PSPWR RSPWR (D≤30, L≤500)	*20	64–1200 (800)	*16 *T3 (RC3/8)		17		14 (8)	1.0 or Less
	*25	80–1200 (1000)	*20		22		16 (10)	
	*30	80–1500 (1000)	*20		27	15	17 (12)	
	35	96–1500	24		30		19	
	40	96–1500	24 30		36	20	20	
	50	120–1500	30		41		26	

! When T1, T2 or T3 is selected as M or N, tapered thread machining is applied. (Ordering Code: MT1, NT1) ! L requires Mx2+Nx2≤L.
! When Mx25+4+Nx2.5+4≤L, tap pilot holes may go through. ! When L≤Mx2+Nx2, effective depth of larger diameter tap has priority.
! Only * marked D, M and N dimensions are applicable to Stainless Steel Shafts. L and d dimensions in ( ) are applicable.

One End Threaded Hollow Shafts

Part Number Type	D	1 mm Increments L	F	B	P	Wrench Flats Dimensions SC	W	ℓ1	d	(Y) Max.	R	C
One End Threaded Hollow Shafts SPJN PSPJN RSPJN (D≤30, L≤500)	6	25–598	2≤F≤Px5	B≤F-2 (When P=6)	6	SC=1 mm Increment ! SC+ℓ1≤L ! SC≥0 ! Details of Wrench Flats **P.199**	5	8	2	600	0.3 or Less	0.5 or Less
	8	25–798			8		7		3	800		
	10	25–798			8 10		8		4			
	12	25–998		B≤F-3 (When P=8, 10)	10 12		10	10	6	1000		
	13	25–998			12		11		7			
One End Threaded Hollow Shafts with Wrench Flats SPNR PSPNR RSPNR (D≤30, L≤500)	16	25–1198		B≤F-5 (When P≤12)	16		14		10	1200		
	20	25–1198			20		17		14			
	25	25–1198		B=0 (Without threads)	24		22		16			
	30	25–1498			24 30		27	15	17	1500	0.5 or Less	1.0 or Less
	35	25–1498		! B≥Pitchx3	30		30		19			
	40	25–1498			30		36	20	20			

! When D=P, please specify F=B as B dimensions. L and F dimensions, however, have priority to build, thus B dimensions should be F-(Pitch x 2).
! Thread machining will not be applied when B = 0 is specified.

Shafts

Both Ends Tapped Hollow Shafts / Both Ends Tapped Hollow Shafts with Wrench Flats / One End Threaded Hollow Shafts / One End Threaded Hollow Shafts with Wrench Flats, *continued*

Part Number Example

Both Ends Tapped Hollow Shafts

Part Number	-	L	-	M	-	N	-	SC
SPJW20	-	500	-	M16	-	N16		
SPWR30	-	680	-	M20	-	N20	-	SC10

One End Threaded Hollow Shafts

Part Number	-	L	-	F	-	B	-	P	-	SC
SPJN20	-	1051	-	F30	-	B30	-	P20		
SPNR30	-	1270	-	F60	-	B28	-	P24	-	SC5

Part Number Alterations

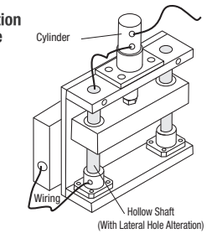
Both Ends Tapped Hollow Shafts

Part Number	-	L	-	M	-	N	-	SC	-	(DKC...etc.)
SPJW30	-	500	-	M20	-	N20			-	WSC12-X8

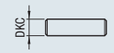
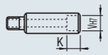
One End Threaded Hollow Shafts

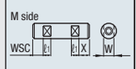
Part Number	-	L	-	F	-	B	-	P	-	SC	-	(DKC...etc.)
SPJN30	-	250	-	F40	-	B30	-	P24			-	DKC

Application Example



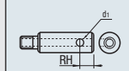
Alteration Details **P.200**

Alterations		Code	Spec.
Revise O.D. Tolerance (Precision Grade)		DKC	Outer diameter tolerance is altered to h5. **Ordering Code:** DKC D: 6 → 0 -0.005; 8–10 → 0 -0.006; 12–16 → 0 -0.008; 20–30 → 0 -0.009; 35–50 → 0 -0.011 ⊗ Not applicable to Stainless Steel and Low Temperature Chrome Plated Shafts.
Alteration to L Dimension Tolerance		LKC	Changes L Tolerance. **Ordering Code:** LKC ! L<200 → L±0.03; 200≤L<500 → L±0.05; L≥500 → L±0.1 ! L dimensions can be specified in 0.1 mm increment for LKC. ⊗ Not applicable to One End Threaded Type when D-P≤2
One End Bored		VC	Boring added to right end (Use as pilots) Hole diameter V_{H7} shown in the table below. K=1 mm Increment ! 3<K≤Vx2 **Ordering Code:** VC-K5 D: 10, 12, 13, 16, 20, 25, 30, 35, 40 → V_{H7}: 6, 8, 10, 12, 16, 20, 20, 24, 24 ⊗ Not applicable to Both End Tapped Hollow Shafts.

Alterations		Code	Spec.
Wrench Flats at Two Locations		WSC	Adds Wrench Flats at two locations. **Ordering Code:** WSC12-X8 ! WSC,X = 1 mm Increment ! When D≤25: WSC+X+ℓ1x2<L, WSC≥Mx2, X≥Mx2 ! When D≥30: WSC+X+ℓ1x2<L, WSC≥0, X≥0 ! Orientation between two wrench flat features is random

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

! Applicable to Both Ends Tapped Hollow Shafts only.

Alterations		Code	Spec.
Lateral Hole on One Side		RH	Adds a lateral hole to one side. Lateral hole diameters are shown in the table below. RH=1 mm Increment ! d_1+1<RH≤Dx3 **Ordering Code:** RH5

D	d_1	D	d_1
10	2 (2)	20	6 (4)
12	3 (2)	25, 30	6 (5)
13	3 (2)	35, 40	8
16	5 (3)	50	10

Values in ( ) are for Stainless Steel Shafts.
! The hollow I.D. "d" may vary due to the wall thickness deviations.
! Not applicable to threaded side of One End Threaded Shafts.
! Burrs might remain inside after alteration.
! Orientation in relation to other features will be random.
⊗ Not applicable to Both Ends Tapped Shafts
⊗ Not applicable if interfering with other alterations.

! When selecting multiple alteration additions, the distance between machined areas should be greater than 2 mm. **P.201**
! Alterations may lower hardness. **P.199**