# Shafts

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

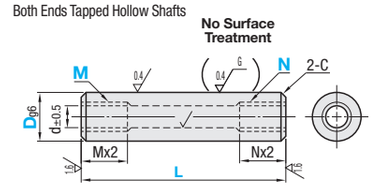
RoHS10

- Features of Low Temp. Black Chrome Plating P.128
- Circularity and O.D. tolerance may not meet precision specification in areas approximately 15mm from wrench flats machined ends.
- L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- Low temp. 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. 10mm) may lower hardness. P.112

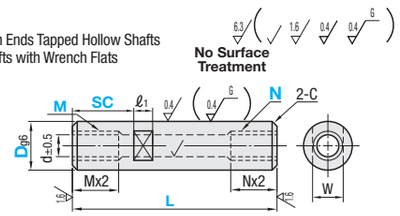
| Type | | | | Material | Hardness | Surface Treatment |
|---|---|---|---|---|---|---|
| Both Ends Tapped | Both Ends Tapped with Wrench Flats | One End Threaded | One End Threaded with Wrench Flats | | | |
| SPJW | SPWR | SPJN | SPNR | SUJ2 Equivalent | Effective Hardened Depth of Induction Hardening P.112<br>SUJ2 Equivalent 58HRC~<br>SUS440C or 13Cr stainless 56HRC~ | - |
| SSPJW | SSPWR | - | - | SUS440C or 13Cr stainless | | |
| PSPJW | PSPWR | PSPJN | PSPNR | SUJ2 Equivalent | | Hard Chrome Plating<br>Plating Hardness: HV750 ~<br>Plating Thickness: 5μ or More |
| RSPJW | RSPWR | RSPJN | RSPNR | SUJ2 Equivalent | | Low Temp. Black Chrome Plating |

| D Tol. | |
|---|---|
| 6 | -0.004<br>-0.012 |
| 8, 10 | -0.005<br>-0.014 |
| 12~16 | -0.006<br>-0.017 |
| 20~30 | -0.007<br>-0.020 |
| 35~50 | -0.009<br>-0.025 |

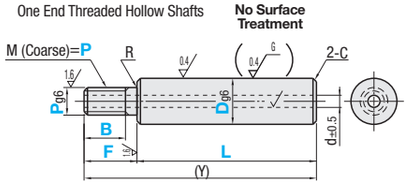
Both Ends Tapped Hollow Shafts



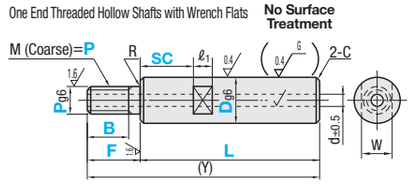

Both Ends Tapped Hollow Shafts with Wrench Flats




One End Threaded Hollow Shafts



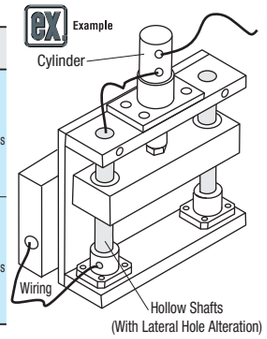

One End Threaded Hollow Shafts with Wrench Flats




- About Hollow Shaft Wall Thickness Deviations See P.111

## Both Ends Tapped Hollow Shafts

| Part Number Type | D | L specified in 1mm Increment | M (Coarse), N (Coarse) Selection | Wrench Flats Dimensions SC | W | ℓ1 | d | C |
|---|---|---|---|---|---|---|---|---|
| Not applicable to Both Ends Tapped Hollow Shafts | 6 | 20~600 | 3 | SC=1mm Increment<br>When D≤25,<br>SC+ℓ1≤L-Nx2<br>SC≥Mx2<br>When D≥30,<br>SC+ℓ1≤L<br>SC≥0<br>Details of Wrench Flats P.112 | 5 | 8 | 2 | 0.5 or Less |
| SPJW | *8 | 20~800(300) | 4 *5 | | 7 | | 3(3) | |
| SSPJW (* marked sizes only) | *10 | 20~800(400) | 5 *6 | | 8 | | 4(4) | |
| PSPJW | *12 | 32~1000(500) | *8 *T1 (RC1/8) | | 10 | 10 | 6(5) | |
| RSPJW (D≤30,L≤500) | *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 with Wrench Flats | *20 | 64~1200(800) | *16 *T3 (RC3/8) | | 17 | | 14(8) | 1.0 or Less |
| SPWR | *25 | 80~1200(1000) | *20 | | 22 | | 16(10) | |
| SSPWR (* marked sizes only) | *30 | 80~1500(1000) | *20 | | 27 | 15 | 17(12) | |
| PSPWR | 35 | 96~1500 | 24 | | 30 | | 19 | |
| RSPWR (D≤30,L≤500) | 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 | 1mm Increment L | F | B | P Selection | Wrench Flats Dimensions SC | W | ℓ1 | d | (Y) Max. | R | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | 25~598 | 2≤F≤Px5 | B≤F-2 (When P=6) | 6 | SC=1mm Increment<br>SC+ℓ1≤L<br>SC≥0<br>Details of Wrench Flats P.112 | 5 | 8 | 2 | 600 | 0.3 or Less | 0.5 or Less |
| One End Threaded Hollow Shafts | 8 | 25~798 | | | 8 | | 7 | | 3 | 800 | | |
| SPJN | 10 | 25~798 | | B≤F-3 (When P=8, 10) | 8 10 | | 8 | | 4 | | | |
| PSPJN | 12 | 25~998 | | | 10 12 | | 10 | 10 | 6 | 1000 | | |
| RSPJN (D≤30,L≤500) | 13 | 25~998 | | | 12 | | 11 | | 7 | | | |
| One End Threaded Hollow Shafts with Wrench Flats | 16 | 25~1198 | | B≤F-5 (When P≥12) | 16 | | 14 | | 10 | 1200 | | |
| | 20 | 25~1198 | | | 20 | | 17 | | 14 | | | |
| SPNR | 25 | 25~1198 | | B=0 (W/o Threads) | 24 | | 22 | | 16 | | | 1.0 or Less |
| PSPNR | 30 | 25~1498 | | | 24 30 | | 27 | 15 | 17 | 1500 | 0.5 or Less | |
| RSPNR (D≤30,L≤500) | 35 | 25~1498 | | B≥Pitchx3 | 30 | | 30 | | 19 | | | |
| | 40 | 25~1498 | | | 30 | | 36 | 20 | 20 | | | |

- When D=P, specify F=B as B dimensions. However, L and F dimensions have manufacturing priority and B dimension of the product will be F -(Pitchx2).
- Thread machining will not be applied when B=0 is specified.

Ordering 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

SPJN 20 - 1051 - F30 - B30 - P20
SPNR 30 - 1270 - F60 - B28 - P24 - SC5

| Part Number Type | D | Unit Price Min. L ~ 50 | L51~100 | L101~150 | L151~200 | L201~300 | L301~400 | L401~500 | L501~600 | L601~800 | L801~1000 | L1001~1200 | L1201~1500 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SPJW SPWR RSPJW RSPWR | 6 | | | | | | | | | - | - | - | - |
| | 8 | | | | | | | | | | - | - | - |
| | 10 | | | | | | | | | | - | - | - |
| | 12 | | | | | | | | | | | - | - |
| | 13 | | | | | | | | | | | - | - |
| | 16 | | | | | | | | | | | | - |
| | 20 | - | | | | | | | | | | | - |
| | 25 | - | | | | | | | | | | | - |
| | 30 | - | | | | | | | | | | | |
| | 35 | - | | | | | | | | | | | |
| | 40 | - | | | | | | | | | | | |
| | 50 | - | - | | | | | | | | | | |
| SSPJW SSPWR | 8 | | | | | | - | - | - | - | - | - | - |
| | 10 | | | | | | | - | - | - | - | - | - |
| | 12 | | | | | | | | - | - | - | - | - |
| | 13 | | | | | | | | - | - | - | - | - |
| | 16 | | | | | | | | | - | - | - | - |
| | 20 | - | | | | | | | | | - | - | - |
| | 25 | - | | | | | | | | | | - | - |
| | 30 | - | | | | | | | | | | - | - |
| PSPJW PSPWR | 6 | | | | | | | | | - | - | - | - |
| | 8 | | | | | | | | | | - | - | - |
| | 10 | | | | | | | | | | - | - | - |
| | 12 | | | | | | | | | | | - | - |
| | 13 | | | | | | | | | | | - | - |
| | 16 | | | | | | | | | | | | - |
| | 20 | - | | | | | | | | | | | - |
| | 25 | - | | | | | | | | | | | - |
| | 30 | - | | | | | | | | | | | |
| | 35 | - | | | | | | | | | | | |
| | 40 | - | | | | | | | | | | | |
| | 50 | - | - | | | | | | | | | | |
| SPJN SPNR RSPJN Price on right + Price in Table 2 below RSPNR | 6 | | | | | | | | | - | - | - | - |
| | 8 | | | | | | | | | | - | - | - |
| | 10 | | | | | | | | | | - | - | - |
| | 12 | | | | | | | | | | | - | - |
| | 13 | | | | | | | | | | | - | - |
| | 16 | | | | | | | | | | | | - |
| | 20 | | | | | | | | | | | | - |
| | 25 | | | | | | | | | | | | - |
| | 30 | | | | | | | | | | | | |
| | 35 | | | | | | | | | | | | |
| | 40 | | | | | | | | | | | | |
| PSPJN PSPNR | 6 | | | | | | | | | - | - | - | - |
| | 8 | | | | | | | | | | - | - | - |
| | 10 | | | | | | | | | | - | - | - |
| | 12 | | | | | | | | | | | - | - |
| | 13 | | | | | | | | | | | - | - |
| | 16 | | | | | | | | | | | | - |
| | 20 | | | | | | | | | | | | - |
| | 25 | | | | | | | | | | | | - |
| | 30 | | | | | | | | | | | | |
| | 35 | | | | | | | | | | | | |
| | 40 | | | | | | | | | | | | |

| (Table 1) Low Temp. Black Chrome Plating Additional Charge | D | Additional Price Min. L ~ 50 | L51~100 | L101~150 | L151~200 | L201~300 | L301~400 | L401~500 |
|---|---|---|---|---|---|---|---|---|
| Suitable for RSPJW RSPWR | 6 | | | | | | | |
| | 8 | | | | | | | |
| | 10 | | | | | | | |
| | 12 | | | | | | | |
| | 13 | | | | | | | |
| | 16 | | | | | | | |
| | 20 | | | | | | | |
| | 25 | | | | | | | |
| | 30 | | | | | | | |

| (Table 2) Low Temp. Black Chrome Plating Additional Charge | D | Additional Price Min. L ~ 50 | L51~100 | L101~150 | L151~200 | L201~300 | L301~400 | L401~500 |
|---|---|---|---|---|---|---|---|---|
| Suitable for RSPJN RSPNR | 6 | | | | | | | |
| | 8 | | | | | | | |
| | 10 | | | | | | | |
| | 12 | | | | | | | |
| | 13 | | | | | | | |
| | 16 | | | | | | | |
| | 20 | | | | | | | |
| | 25 | | | | | | | |
| | 30 | | | | | | | |

- For Low Temp. Black Chrome Plated Shafts, add Low Temp. Black Chrome Plating Additional Charge in (Table 1) and (Table 2) to the non-plated shaft Unit Price above.

Alterations

• Both Ends Tapped Hollow Shafts

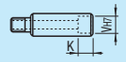
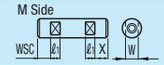
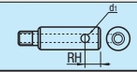
Part Number - L - M - N - SC - (DKC etc.)

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

| Alterations | Revise O.D. Tolerance (Precision Grade) | Alteration to L dimension tolerance | One End Bored | Wrench Flats at Two Locations | Lateral Hole on One Side |
|---|---|---|---|---|---|
| |   |   |   |   |   |
| Code | DKC | LKC | VC | WSC | RH |
| Spec. | O.D. tolerance is altered to h5.<br>Ordering Code DKC<br>D / h5 Tolerance<br>6: 0 -0.005<br>8, 10: 0 -0.006<br>12~16: 0 -0.008<br>20~30: 0 -0.009<br>35~50: 0 -0.011<br>Not applicable to Stainless Steel and Low Temp. Chrome Plated Shafts. | Changes L tolerance.<br>Ordering Code LKC<br>L<200···L±0.03<br>200≤L<500 ···L±0.05<br>L≥500 ···L±0.1<br>L dimensions can be specified in 0.1mm increment for LKC.<br>Not applicable to One End Threaded Type when D-P≤2. | Boring added to right end. (Use as pilots.)<br>Hole diameter VH7 is shown in the table below.<br>K=1mm Increment<br>3<K≤Vx2<br>Ordering Code VC-K5<br>D / VH7<br>10: 6<br>12: 8<br>13: 10<br>16: 12<br>20: 16<br>25: 20<br>30: 20<br>35: 24<br>40: 24<br>For Both Ends Tapped Hollow Shafts, | Adds Wrench Flats at two locations.<br>Ordering Code WSC12-X8<br>WSC, X=1mm Increment<br>When D≤25<br>WSC+X+ℓ1x2<L<br>WSC≥Mx2, X≥Mx2<br>When D≥30<br>WSC+X+ℓ1x2<L<br>WSC≥0<br>X≥0<br>Orientation between two wrench flats is not coplanar.<br>D / W / ℓ1<br>6: 5: 8<br>8: 7: 8<br>10: 8: 8<br>12: 10: 8<br>13: 11: 10<br>16: 14: 10<br>20: 17: 10<br>25: 22: 10<br>30: 27: 15<br>35: 30: 15<br>40: 36: 20<br>50: 41: 20<br>Applicable to Both Ends Tapped Hollow Shafts only. | Adds a lateral hole on one side.<br>Lateral hole diameters are shown in the table below.<br>RH=1mm Increment<br>d1+1<RH≤Dx3<br>Ordering Code RH5<br>D / d1 / D / d1<br>10 / 2 (2) / 20 / 6 (4)<br>12 / 3 (2) / 25, 30 / 6 (5)<br>13 / 3 (2) / 35, 40 / 8<br>16 / 5 (3) / 50 / 10<br>Values in ( ) are for Stainless Steel Shafts.<br>The hollow I.D. "d" may vary due to the wall thickness deviations.<br>Not applicable to threaded side of One End Threaded Shafts.<br>Burrs might remain inside after alteration.<br>Orientation in relation to other features will be random.<br>Not applicable to Both Ends Tapped Shafts.<br>Not applicable if interferes with other alterations. |

- When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.114
- Alterations may lower hardness. See P.112