# Shafts

## Hollow / One End Tapped Hollow Shafts / One End Tapped Hollow Shafts with Wrench Flats

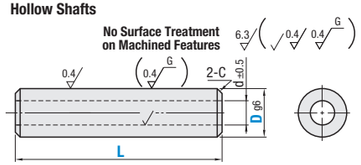
**Shafts – Hollow / One End Tapped Hollow Shafts / One End Tapped Hollow Shafts with Wrench Flats**

RoHS 10

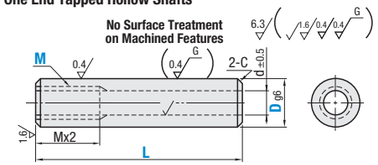
| Type | | | Material | Hardness | Surface Treatment |
|---|---|---|---|---|---|
| SPJ | SPJT | SPTR | 52100 Bearing Steel Equivalent | Effective Hardened Depth of Induction Hardened **P.199** 52100 Bearing Steel Equivalent 58 HRC min. SUS440C (13Cr) Stainless Steel Equivalent 56 HRC min. | — |
| SSPJ | SSPJT | SSPTR | SUS440C (13Cr) Stainless Steel Equivalent | | |
| PSPJ | PSPJT | PSPTR | 52100 Bearing Steel Equivalent | | Hard Chrome Plating Plating Hardness: 750 HV min. Plating Thickness: 5μ or More |
| RSPJ | RSPJT | RSPTR | 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 |

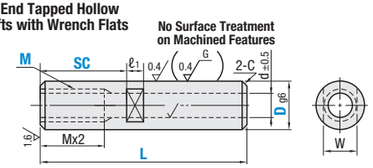
**Hollow Shafts**




**One End Tapped Hollow Shafts**




**One End Tapped Hollow Shafts with Wrench Flats**




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

| Part Number Type | D | L 1 mm Increments | M (Coarse Threads) | Wrench Flats Dimensions SC | W | ℓ1 | d | C |
|---|---|---|---|---|---|---|---|---|
| **Hollow Shafts** SPJ | 6 | 20–600 | 3 | SC=1 mm Increment ! When D≤25 SC+ℓ1≤L SC≥Mx2 ! When D≥30 SC+ℓ1≤L SC≥0 ! Details of Wrench Flats **P.199** | 5 | 8 | 2 | 0.5 or Less |
| SSPJ (*marked sizes only) | *8 | 20–800 (300) | 4 *5 | | 7 | | 3 (3) | |
| PSPJ | *10 | 20–800 (400) | 5 *6 | | 8 | | 4 (4) | |
| RSPJ (D≤30, L≤500) | *12 | 20–1000 (500) | *8 *T1 (RC1/8) | | 10 | 10 | 6 (5) | |
| **One End Tapped Hollow Shafts** SPJT | *13 | 25–1000 (500) | *10 *T1 (RC1/8) | | 11 | | 7 (5) | |
| SSPJT (*marked sizes only) | *16 | 30–1200 (600) | *12 *T2 (RC1/4) | | 14 | | 10 (6) | |
| PSPJT | *20 | 30–1200 (800) | *16 *T3 (RC3/8) | | 17 | | 14 (8) | 1.0 or Less |
| RSPJT (D≤30, L≤500) | *25 | 35–1200 (1000) | *20 | | 22 | | 16 (10) | |
| **One End Tapped Hollow Shafts with Wrench Flats** | *30 | 35–1500 (1000) | *20 | | 27 | 15 | 17 (12) | |
| SPTR | 35 | 35–1500 | 24 | | 30 | | 19 | |
| SSPTR (*marked sizes only) | 40 | 50–1500 | 24 30 | | 36 | 20 | 20 | |
| PSPTR | | | | | | | | |
| RSPTR (D≤30, L≤500) | 50 | 60–1500 | 30 | | 41 | | 26 | |

! When T1, T2 or T3 is selected as M, tapered thread machining is applied. (Ordering Code: MT1)
! When Mx2.5+4≥L, tap pilot holes may go through.
! Only * marked D and M dimensions are applicable to Stainless Steel Shafts. L and d dimensions in ( ) are applicable.







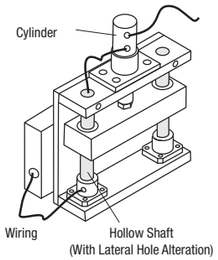
# Shafts

## Hollow / One End Tapped Hollow Shafts / One End Tapped Hollow Shafts with Wrench Flats, *continued*

**Part Number Example**

| Part Number | - | L | - | M | - | SC |
|---|---|---|---|---|---|---|
| SPJ20 | - | 350 | | | | |
| SPJT20 | - | 525 | - | MT3 | | |
| SPTR30 | - | 730 | - | M20 | - | SC8 |

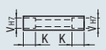
**Application Example**



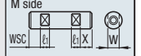
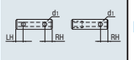

**Part Number Alterations**

| Part Number | - | L | - | M | - | SC | - | (KKC...etc.) |
|---|---|---|---|---|---|---|---|---|
| SPJ30 | - | 250 | | | | | - | DKC |
| SPJT30 | - | 250 | - | M20 | | | - | WSC12-X8 |

Alteration Details **P.200**

| Alterations | | Code | Spec. |
|---|---|---|---|
| Revise O.D. Tolerance (Precision Grade) |  | DKC | Outer diameter tolerance is altered to h5. **Ordering Code:** DKC<br>D: 6 → h5 Tolerance 0 -0.005; 8–10 → 0 -0.006; 12–16 → 0 -0.008; 20–30 → 0 -0.009; 35–50 → 0 -0.011<br>⊗ Not applicable to Stainless Steel and Low Temperature Chrome Plated Shafts. |
| Alteration to L Dimension Tolerance |  | LKC | Changes L Tolerance. **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 0.1 mm increment for LKC. |
| End Boring |  | VC / WVC | One end or both ends are bored. (Used as pilot holes)<br>Hole diameter $V_{H7}$ is shown in the table below.<br>K=1 mm Increment<br>! 3<K≤Vx2<br>**Ordering Code:** One End: VC-K5 / Both Ends: WVC-K10<br>D → $V_{H7}$: 10→6; 12→8; 13→10; 16→12; 20→16; 25, 30→20; 35, 40→24; 50→30<br>! WVC is only applicable for Hollow Shafts. |

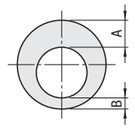
! When selecting multiple alteration additions, the distance between machined areas should be greater than 2 mm. **P.201**
! Alterations may lower hardness. **P.199**

| Alterations | | Code | Spec. |
|---|---|---|---|
| Wrench Flats at Two Locations |  | WSC | Adds wrench flats at two locations. **Ordering Code:** WSC12-X8<br>! Specify WSC/X=1 mm Increment<br>! When D≤25 WSC+X+ℓ1x2<L WSC≥Mx2, X≥Mx2<br>! When D≥30 WSC+X+ℓ1x2<L WSC≥0 X≥0<br>! Orientation between two wrench flats is random.<br>D: 6→W 5, ℓ1 8; 8→7, 8; 10→8, 10; 12→10, 10; 13→11, 10; 16→14, 10; 20→17, 10; 25→22, 10; 30→27, 15; 35→30, 15; 40→36, 20; 50→41, 20<br>⊗ Not applicable to One End Tapped Hollow Shafts |
| Lateral Hole on One Side |  | RH / LH | Adds a lateral hole on one side. Lateral hole diameters are shown in the table below. RH, LH = 1 mm Increment<br>! $d_1$+1<RH, LH≤Dx3<br>**Ordering Code:** One End RH5, Both Ends RH5-LH6<br>! Orientation between two cross-drilled holes is random.<br>D: 10→$d_1$ 2 (2); 12→3 (2); 13→3 (2); 16→5 (3); 20→6 (4); 25, 30→6 (5); 35, 40→8; 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 tapped end of One End Tapped Type.<br>! Burrs might remain inside after alteration.<br>! Orientation in relation to other features will be random.<br>⊗ Not applicable if interferes with other alterations. |

## About Hollow Shaft Wall Thickness Deviations

Unit: mm

| Outer Diameter (D) | 52100 Bearing Steel Equivalent Wall Thickness Deviation Value | SUS440C (13Cr) Stainless Steel Equivalent Wall Thickness Deviation Value |
|---|---|---|
| 6 | 0.3 or Less | — |
| 8 | 0.4 or Less | 1.5 or Less |
| 10 | | 4.0 or Less |
| 12 | | |
| 13 | | |
| 16 | | |
| 20 | | |
| 25 | 0.6 or Less | |
| 30 | 1.0 or Less | |
| 35 | | — |
| 40 | 1.5 or Less | |
| 50 | | |




Deviation Value=A-B

! About Hollow Shaft Wall Thickness Deviations, please see **P.198**.