


# High Precision Linear Shafts

## Both Ends Tapped / Both Ends Tapped with Wrench Flats

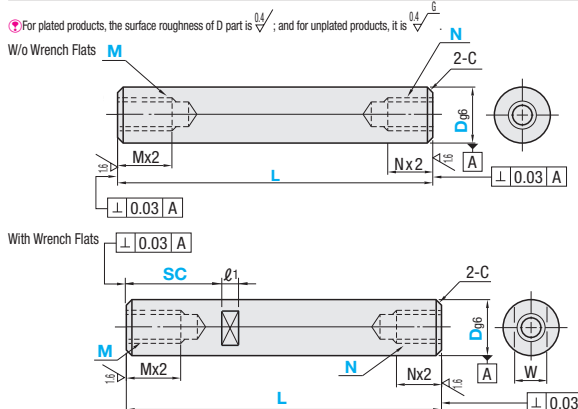
This type of Shaft is suitable for being used in environments where combination of high perpendicular precision ( $\perp 0.03$ ) and high accuracy is required.

For products uncovered by the e-Catalog Standards, see P.131.



| Type              | D Tol. | Material                  | Hardness   | Surface Treatment   |
|-------------------|--------|---------------------------|--|---|
| W/o Wrench Flats  | g6     | SUJ2 Equivalent           | Induction Hardened Effective Hardened Depth $\geq$ P.142 | Hard Chrome Plating<br>Plating Hardness HV750 ~<br>Plating Thickness: 5 $\mu$ or More<br>Low Temp. Black Chrome Plating |
| VFJW              |        | SUS440C or 13Cr stainless |  |   |
| VSFJW             |        | SUJ2 Equivalent           |  |   |
| VPFJW             |        | SUS440C or 13Cr stainless |  |   |
| VPSFJW            |        | SUJ2 Equivalent           |  |   |
| With Wrench Flats |        |                           |  |   |
| VRJW              |        |                           |  |   |
| VRJZ              |        |                           |  |   |

For plated products, the surface roughness of D part is  $\sqrt{0.4}$ ; and for unplated products, it is  $\sqrt{0.6}$ .



RoHS10

- Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.142
- Full Length Hardness Guaranteed Shafts P.155
- Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.141
- Features of Low Temp. Black Chrome Plating P.156

| Part Number Type  | D  | L specified in 1mm Increments | M (Coarse), N (Coarse) Selection | Wrench Flats Dimensions |   |                | C           |
|---|----|-------------------------------|----------------------------------|-------------------------|---|----------------|-------------|
|   |    |                               |                                  | SC                      | W | l <sub>1</sub> |             |
| W/o Wrench Flats (D4-D30)<br>VFJW<br>VSFJW<br>VPFJW<br>VPSFJW<br>VRJW | 4  | 25-200                        | 2                                | -                       | - | -              | 0.2 or Less |
|   | 5  | 25-300                        | 2, 6, 3                          | -                       | - | -              | 0.5 or Less |
|   | 6  | 25-350                        | 3                                | 5                       | 8 | 10             |             |
|   | 8  | 25-350                        | 3, 4, 5                          | 7                       |   |                |             |
|   | 10 | 25-400                        | 3, 4, 5, 6                       | 8                       |   |                |             |
|   | 12 | 25-400                        | 4, 5, 6, 8                       | 10                      |   |                |             |
|   | 13 | 25-400                        | 4, 5, 6, 8                       | 11                      |   |                |             |
|   | 15 | 25-400                        | 4, 5, 6, 8, 10                   | 13                      |   |                |             |
|   | 16 | 25-400                        | 4, 5, 6, 8, 10                   | 14                      |   |                |             |
|   | 18 | 25-400                        | 4, 5, 6, 8, 10, 12               | 16                      |   |                |             |
|   | 20 | 30-500                        | 4, 5, 6, 8, 10, 12               | 17                      |   |                |             |
|   | 25 | 30-500                        | 4, 5, 6, 8, 10, 12, 16           | 22                      |   |                | 1.0 or Less |
|   | 30 | 30-500                        | 6, 8, 10, 12, 16, 20             | 27                      |   |                |             |

SC = 1mm Increment  
 $\bullet$  SC+l<sub>1</sub>≤L  
 $\bullet$  SC≥0  
 $\bullet$  Details of Wrench Flats P.142

L requires Mx2+Nx2≤L. When Mx2.5+4+Nx2.5+4≥L, tap pilot holes may go through and the effective length of the smaller tap part may be shortened.


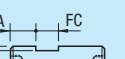
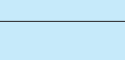
Ordering Example

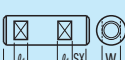
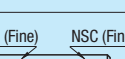
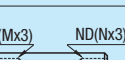
| Part Number | L   | M  | N  | SC   |
|-------------|-----|----|----|------|
| VFJW20      | 100 | M8 | N8 | SC10 |
| VFJZ20      | 100 | M8 | N8 | SC10 |

Alterations

| Part Number | L   | M(MSC, MD) | N(NSC, ND) | SC   | (LKC--etc.) |
|-------------|-----|------------|------------|------|-------------|
| VFJW20      | 100 | M8         | N8         | SC10 | LKC         |
| VFJZ20      | 100 | M8         | N8         | SC10 | FC10-A8     |

Alteration Details P.143

| Alterations   | Code | Spec.   |
|---|------|---|
|  | LKC  | Alteration to L dimension tolerance (Ordering Code) LKC<br>Application Notes] Applicable when L=200 or less. L dimensions can be specified in 0.1mm increment for LKC.<br>L≤200 → L±0.03                            |
|  | FC   | Set Screw Flat at One Location (Ordering Code) FC10-A8<br>FC, A=1mm Increment<br>FC≤5xD<br>E=0 or A≥2<br>Not available in combination with WFC.   |
|  | WFC  | Set Screw Flats at Two Locations (Ordering Code) WFC8-A8-E2<br>WFC, A, E=1mm Increment<br>WFC≤5xD<br>A(E)=0 or A(E)≥2<br>Orientation between set screw flats is not coplanar. Not available in combination with FC. |

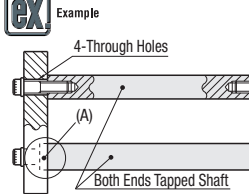
| Alterations   | Code                     | Spec.  |
|---|--------------------------|--|
|  | SX                       | Second Set of Wrench Flats (Ordering Code) SX15<br>Application Notes] Applicable to D=8 or more<br>SX=1mm Increment<br>SC+SX+l <sub>1</sub> ×2<L<br>SX>0<br>Orientation between two set screw flats is not coplanar.                       |
|  | MSC (Fine)<br>NSC (Fine) | Change to Fine Tapped Thread (Ordering Code) MSC14<br>MSC14 (M is changed to MSC)<br>NSC14 (N is changed to NSC)<br>Application Notes] Applicable to D=12 or more  |
|  | MD (Mx3)<br>ND (Nx3)     | Change the effective tap depth to M(N)×3. (Ordering Code) MD6/ND6 (M is changed to MD, N is changed to ND)<br>Application Notes] Only applicable to D=10-30 and M (N) = 6-20<br>One End Tapped: MDx3.5+4<L<br>Both Ends Tapped: MDx3.5+4<L |

Please see Shaft Alteration Overview for details if provided. P.143  
 When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm. P.144  
 Alterations may lower hardness. See P.142.

| Part Number Type | D      | Unit Price |         |          |          |          |          |  |
|------------------|--------|------------|---------|----------|----------|----------|----------|--|
|                  |        | Min. L 50  | L51 100 | L101 200 | L201 300 | L301 450 | L451 500 |  |
| VFJW             | 4      |            |         |          |          |          |          |  |
|                  | 5      |            |         |          |          |          |          |  |
|                  | 6      |            |         |          |          |          |          |  |
|                  | 8      |            |         |          |          |          |          |  |
|                  | 10     |            |         |          |          |          |          |  |
|                  | 12     |            |         |          |          |          |          |  |
|                  | 13     |            |         |          |          |          |          |  |
|                  | 15, 16 |            |         |          |          |          |          |  |
|                  | 18     |            |         |          |          |          |          |  |
|                  | 20     |            |         |          |          |          |          |  |
|                  | 25     |            |         |          |          |          |          |  |
|                  | 30     |            |         |          |          |          |          |  |
|                  | VSFJW  | 4          |         |          |          |          |          |  |
|                  |        | 5          |         |          |          |          |          |  |
|                  |        | 6          |         |          |          |          |          |  |
|                  |        | 8          |         |          |          |          |          |  |
| 10               |        |            |         |          |          |          |          |  |
| 12               |        |            |         |          |          |          |          |  |
| 13               |        |            |         |          |          |          |          |  |
| 15, 16           |        |            |         |          |          |          |          |  |
| 18               |        |            |         |          |          |          |          |  |
| 20               |        |            |         |          |          |          |          |  |
| 25               |        |            |         |          |          |          |          |  |
| 30               |        |            |         |          |          |          |          |  |
| VPFJW            |        | 4          |         |          |          |          |          |  |
|                  |        | 5          |         |          |          |          |          |  |
|                  |        | 6          |         |          |          |          |          |  |
|                  |        | 8          |         |          |          |          |          |  |
|                  | 10     |            |         |          |          |          |          |  |
|                  | 12     |            |         |          |          |          |          |  |
|                  | 13     |            |         |          |          |          |          |  |
|                  | 15, 16 |            |         |          |          |          |          |  |
|                  | 18     |            |         |          |          |          |          |  |
|                  | 20     |            |         |          |          |          |          |  |
|                  | 25     |            |         |          |          |          |          |  |
|                  | 30     |            |         |          |          |          |          |  |
|                  | VPSFJW | 4          |         |          |          |          |          |  |
|                  |        | 5          |         |          |          |          |          |  |
|                  |        | 6          |         |          |          |          |          |  |
|                  |        | 8          |         |          |          |          |          |  |
| 10               |        |            |         |          |          |          |          |  |
| 12               |        |            |         |          |          |          |          |  |
| 13               |        |            |         |          |          |          |          |  |
| 15, 16           |        |            |         |          |          |          |          |  |
| 18               |        |            |         |          |          |          |          |  |
| 20               |        |            |         |          |          |          |          |  |
| 25               |        |            |         |          |          |          |          |  |
| 30               |        |            |         |          |          |          |          |  |
| VRJW             |        | 4          |         |          |          |          |          |  |
|                  |        | 5          |         |          |          |          |          |  |
|                  |        | 6          |         |          |          |          |          |  |
|                  |        | 8          |         |          |          |          |          |  |
|                  | 10     |            |         |          |          |          |          |  |
|                  | 12     |            |         |          |          |          |          |  |
|                  | 13     |            |         |          |          |          |          |  |
|                  | 15, 16 |            |         |          |          |          |          |  |
|                  | 18     |            |         |          |          |          |          |  |
|                  | 20     |            |         |          |          |          |          |  |
|                  | 25     |            |         |          |          |          |          |  |
|                  | 30     |            |         |          |          |          |          |  |

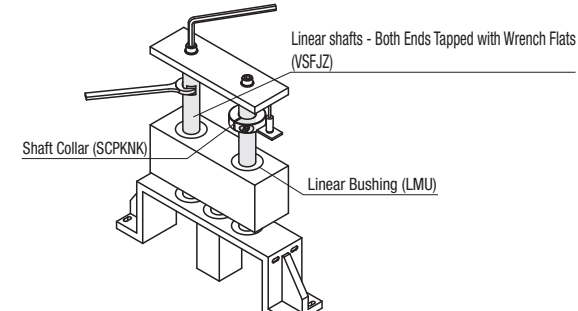
| Part Number Type | D      | Unit Price |         |          |          |          |          |  |
|------------------|--------|------------|---------|----------|----------|----------|----------|--|
|                  |        | Min. L 50  | L51 100 | L101 200 | L201 300 | L301 450 | L451 500 |  |
| VFJZ             | 6      |            |         |          |          |          |          |  |
|                  | 8      |            |         |          |          |          |          |  |
|                  | 10     |            |         |          |          |          |          |  |
|                  | 12     |            |         |          |          |          |          |  |
|                  | 13     |            |         |          |          |          |          |  |
|                  | 15, 16 |            |         |          |          |          |          |  |
|                  | 18     |            |         |          |          |          |          |  |
|                  | 20     |            |         |          |          |          |          |  |
|                  | 25     |            |         |          |          |          |          |  |
|                  | 30     |            |         |          |          |          |          |  |
|                  | VSFJZ  | 6          |         |          |          |          |          |  |
|                  |        | 8          |         |          |          |          |          |  |
|                  |        | 10         |         |          |          |          |          |  |
|                  |        | 12         |         |          |          |          |          |  |
|                  |        | 13         |         |          |          |          |          |  |
|                  |        | 15, 16     |         |          |          |          |          |  |
| 18               |        |            |         |          |          |          |          |  |
| 20               |        |            |         |          |          |          |          |  |
| 25               |        |            |         |          |          |          |          |  |
| 30               |        |            |         |          |          |          |          |  |
| VPFJZ            |        | 6          |         |          |          |          |          |  |
|                  |        | 8          |         |          |          |          |          |  |
|                  |        | 10         |         |          |          |          |          |  |
|                  |        | 12         |         |          |          |          |          |  |
|                  |        | 13         |         |          |          |          |          |  |
|                  |        | 15, 16     |         |          |          |          |          |  |
|                  | 18     |            |         |          |          |          |          |  |
|                  | 20     |            |         |          |          |          |          |  |
|                  | 25     |            |         |          |          |          |          |  |
|                  | 30     |            |         |          |          |          |          |  |
|                  | VPSFJZ | 6          |         |          |          |          |          |  |
|                  |        | 8          |         |          |          |          |          |  |
|                  |        | 10         |         |          |          |          |          |  |
|                  |        | 12         |         |          |          |          |          |  |
|                  |        | 13         |         |          |          |          |          |  |
|                  |        | 15, 16     |         |          |          |          |          |  |
| 18               |        |            |         |          |          |          |          |  |
| 20               |        |            |         |          |          |          |          |  |
| 25               |        |            |         |          |          |          |          |  |
| 30               |        |            |         |          |          |          |          |  |
| VRJZ             |        | 6          |         |          |          |          |          |  |
|                  |        | 8          |         |          |          |          |          |  |
|                  |        | 10         |         |          |          |          |          |  |
|                  |        | 12         |         |          |          |          |          |  |
|                  |        | 13         |         |          |          |          |          |  |
|                  |        | 15, 16     |         |          |          |          |          |  |
|                  | 18     |            |         |          |          |          |          |  |
|                  | 20     |            |         |          |          |          |          |  |
|                  | 25     |            |         |          |          |          |          |  |
|                  | 30     |            |         |          |          |          |          |  |

Example



4-Through Holes  
 Shaft Collar (SCPKNK)  
 Both Ends Tapped Shaft  
 Linear Bushing (LMU)

Precision Type does not require stepped machining as (A), which enables effective assembly.



Linear shafts - Both Ends Tapped with Wrench Flats (VSFJZ)  
 Shaft Collar (SCPKNK)  
 Linear Bushing (LMU)