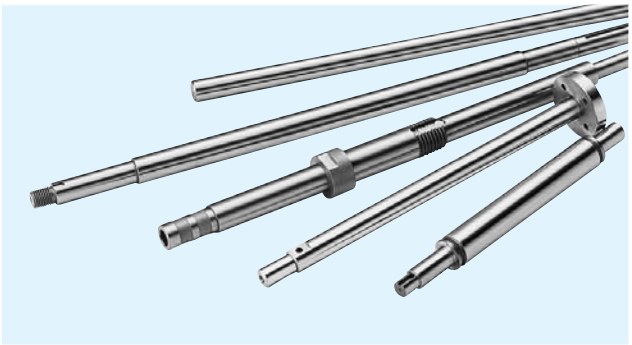
# SN TYPE

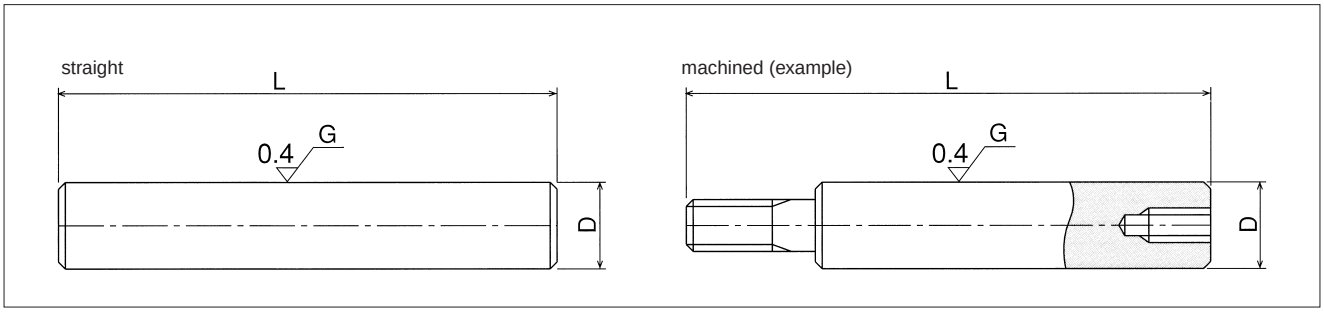
## − NB Shaft −



part number structure example

SN | 20 | h5 × 576

- SN: SN type
- 20: outer diameter (D)
- h5: outer diameter tolerance (g6 when blank)
- 576: length (L)

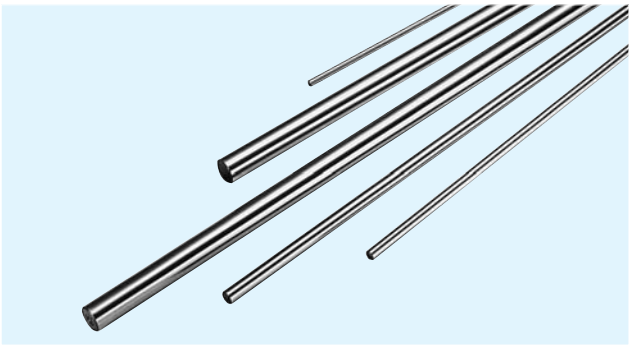



| part number | outer diameter D mm | tolerance g6* μm | length L mm | mass kg/m |
|---|---|---|---|---|
| SN 3 | 3 | −2/−8 | 50◀▶400 | 0.06 |
| SN 4 | 4 | −4 −12 | 100◀▶500 | 0.10 |
| SN 5 | 5 | | 100◀▶700 | 0.16 |
| SN 6 | 6 | | 100◀▶1000 | 0.23 |
| SN 8 | 8 | −5 −14 | 200◀▶1500 | 0.40 |
| SN 10 | 10 | | 200◀▶2000 | 0.62 |
| SN 12 | 12 | −6 −17 | 200◀▶3000 | 0.89 |
| SN 13 | 13 | | 200◀▶3000 | 1.04 |
| SN 15 | 15 | | 300◀▶4000 | 1.39 |
| SN 16 | 16 | | 300◀▶4000 | 1.58 |
| SN 20 | 20 | −7 −20 | 300◀▶5000 | 2.47 |
| SN 25 | 25 | | 300◀▶6000 | 3.85 |
| SN 30 | 30 | | 300◀▶6000 | 5.55 |
| SN 35 | 35 | −9 −25 | 400◀▶6000 | 7.55 |
| SN 40 | 40 | | 400◀▶6000 | 9.87 |
| SN 50 | 50 | | 500◀▶6000 | 15.4 |
| SN 60 | 60 | −10 −29 | 600◀▶6000 | 22.2 |
| SN 80 | 80 | | 800◀▶6000 | 39.5 |
| SN100 | 100 | −12 −34 | 1000◀▶6000 | 61.7 |
| SN120 | 120 | | 1500◀▶4500 | 88.8 |
| SN150 | 150 | −14/−39 | 1500◀▶4500 | 139 |

material: high-carbon chromium bearing steel(SUJ2) hardness: HV697 (60HRC) or more
Tolerances other than *g6 are available upon request.

# SNS TYPE

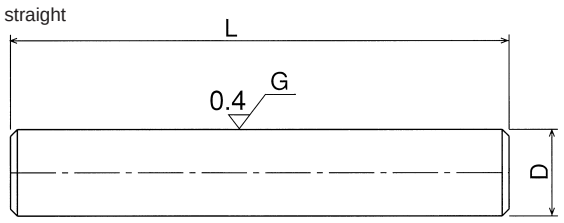
## − NB Stainless Steel Shaft −

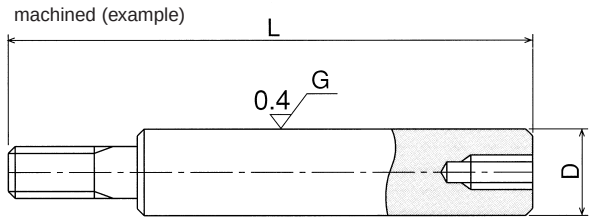


part number structure example

**SNS** **20** **h5** × **576**

- SNS → SNS type
- 20 → outer diameter (D)
- h5 → outer diameter tolerance g6 when blank
- 576 → length (L)




| part number | outer diameter D mm | tolerance g6* μm | length L mm | mass kg/m |
|---|---|---|---|---|
| **SNS 3** | 3 | −2/−8 | 50◀▶300 | 0.06 |
| **SNS 4** | 4 | − 4 | 100◀▶400 | 0.10 |
| **SNS 5** | 5 | −12 | 100◀▶500 | 0.16 |
| **SNS 6** | 6 | | 100◀▶600 | 0.22 |
| **SNS 8** | 8 | − 5 | 200◀▶1000 | 0.39 |
| **SNS 10** | 10 | −14 | 200◀▶1500 | 0.61 |
| **SNS 12** | 12 | − 6 | 200◀▶2500 | 0.88 |
| **SNS 13** | 13 | −17 | 200◀▶3000 | 1.03 |
| **SNS 16** | 16 | | 300◀▶4000 | 1.56 |
| **SNS 20** | 20 | − 7 | 300◀▶5000 | 2.43 |
| **SNS 25** | 25 | −20 | 300◀▶6000 | 3.80 |
| **SNS 30** | 30 | | 300◀▶6000 | 5.48 |
| **SNS 35** | 35 | − 9 | 400◀▶6000 | 7.23 |
| **SNS 40** | 40 | −25 | 400◀▶6000 | 9.44 |
| **SNS 50** | 50 | | 500◀▶6000 | 15.2 |
| **SNS 60** | 60 | −10 | 600◀▶6000 | 21.9 |
| **SNS 80** | 80 | −29 | 800◀▶6000 | 39.0 |
| **SNS100** | 100 | −12/−34 | 1000◀▶6000 | 60.9 |

material: Martensite stainless steel (equivalent to SUS440C)
hardness: HV613 (56HRC) or more
The length of hardening is up to 4500mm for shafts with diameter over 80mm.
Tolerances other than *g6 are available upon request.

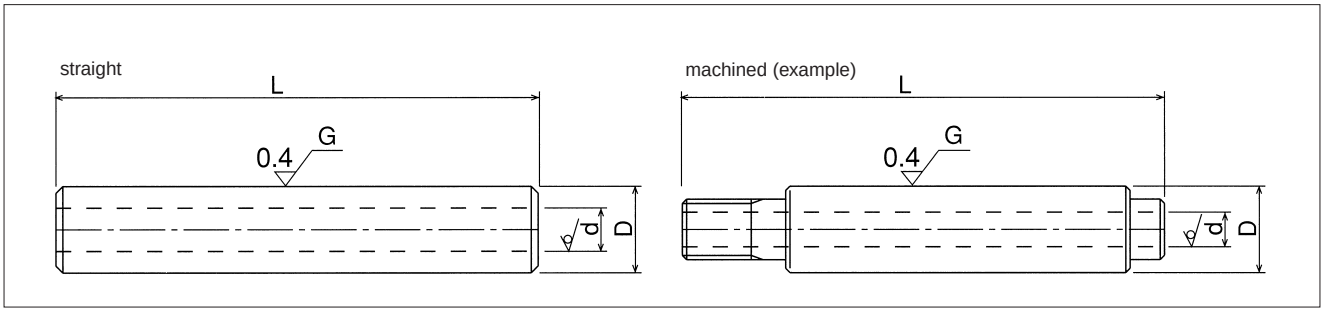
# SNT TYPE

## − NB Pipe Shaft −

part number structure example

SNT | 25 | h5 × | 576

- SNT type
- outer diameter (D)
- outer diameter tolerance g6 when blank
- length (L)




| part number | outer diameter D mm | outer diameter tolerance *g6 μm | inner diameter d mm | length L mm | mass kg/m |
|---|---|---|---|---|---|
| **SNT 6** | 6 | −4/−12 | 2 | 100◀——▶400 | 0.20 |
| **SNT 8** | 8 | − 5 −14 | 3 | 200◀——▶600 | 0.34 |
| **SNT 10** | 10 | | 4 | 200◀——▶1000 | 0.52 |
| **SNT 12** | 12 | − 6 −17 | 5 | 200◀——▶1500 | 0.73 |
| **SNT 13** | 13 | | 6 | 200◀——▶1500 | 0.82 |
| **SNT 16** | 16 | | 8 | 300◀——▶2500 | 1.18 |
| **SNT 20** | 20 | − 7 −20 | 10 | 300◀——▶4000 | 1.85 |
| **SNT 25** | 25 | | 15 | 300◀——▶4000 | 2.46 |
| **SNT 30** | 30 | | 16 | 300◀——▶4500 | 3.97 |
| **SNT 35** | 35 | − 9 −25 | 19 | 400◀——▶4500 | 5.32 |
| **SNT 40** | 40 | | 20 | 400◀——▶4500 | 7.39 |
| **SNT 50** | 50 | | 26 | 500◀——▶4500 | 11.3 |
| **SNT 60** | 60 | −10 −29 | 32 | 600◀——▶4500 | 15.9 |
| **SNT 80** | 80 | | 48 | 800◀——▶4500 | 25.3 |
| **SNT100** | 100 | −12/−34 | 60 | 1000◀——▶4500 | 39.5 |

material: high-carbon chromium bearing steel (SUJ2)  hardness: HV697 (60HRC) or more

Tolerances other than *g6 are available upon request.

# NB CENTER-LINED TAPPED SHAFT

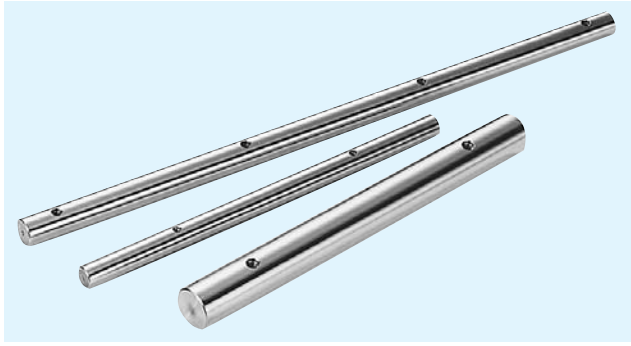
A larger diameter shaft can overcome problems in maintaining precision functionality when a high or unbalanced load is applied. The application of the center-lined tapped shaft together with the SA type support base is ideal in such cases (see SA dimensional table on pages E-32 and E-33). The center-lined tapped shaft is standardized to simplify selection.

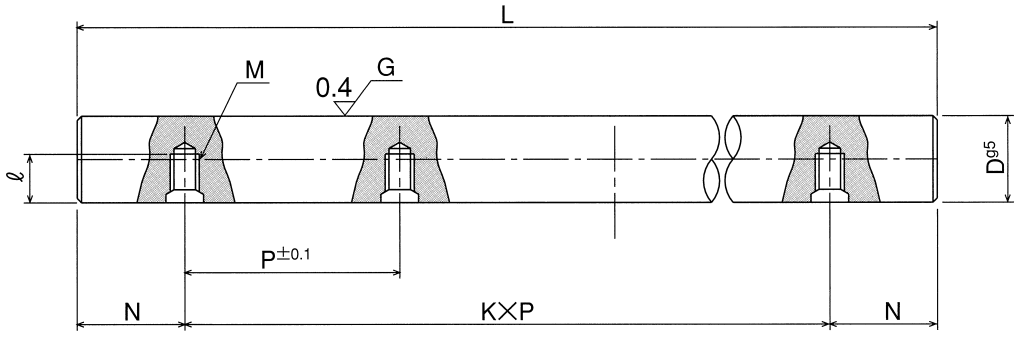
part number structure example

**SNSB** **25** × **576**

- SNSB: material
- 25: outer diameter (D)
- 576: length (L)

| material | |
|---|---|
| SNB | SUJ2 |
| SNSB | equivalent to SUS440C |






N: $\frac{L-K\times P}{2}$

K: number of pitches

NB Center-Lined Tapped Shaft

| part number | outer diameter D mm | tolerance g6* μm | pitch P mm | bolt size M | tap depth ℓ mm | maximum length Lmax mm |
|---|---|---|---|---|---|---|
| SNB10 | 10 | −5/−14 | 100 | M 4 | 4.5 | 1,500 |
| SNB12 | 12 | −6/−17 | 100 | M 4 | 5.5 | 1,800 |
| SNB13 | 13 | | 100 | M 4 | 6 | 2,000 |
| SNB16 | 16 | | 150 | M 5 | 7 | 2,000 |
| SNB20 | 20 | −7/−20 | 150 | M 6 | 9 | 3,000 |
| SNB25 | 25 | | 200 | M 6 | 12 | 4,000 |
| SNB30 | 30 | | 200 | M 8 | 15 | 4,500 |
| SNB35 | 35 | −9/−25 | 200 | M 8 | 15 | 5,000 |
| SNB40 | 40 | | 300 | M 8 | 18 | 6,000 |
| SNB50 | 50 | | 300 | M10 | 22 | 6,000 |

material: high-carbon chromium bearing steel (SUJ2)
hardness: HV697 (60HRC) or more
*g6 is standard tolerance for the outer diameter.

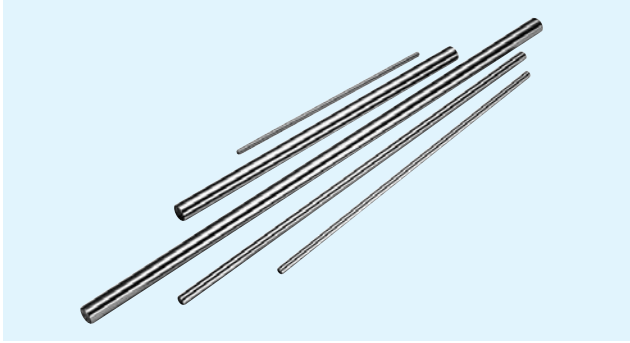
NB Center-Lined Stainless Tapped Shaft

| part number | outer diameter D mm | tolerance g6* μm | pitch P mm | bolt size M | tap depth ℓ mm | maximum length Lmax mm |
|---|---|---|---|---|---|---|
| SNSB16 | 16 | −6/−17 | 150 | M 5 | 7 | 2,000 |
| SNSB20 | 20 | −7/−20 | 150 | M 6 | 9 | 3,000 |
| SNSB25 | 25 | | 200 | M 6 | 12 | 4,000 |
| SNSB30 | 30 | | 200 | M 8 | 15 | 4,500 |
| SNSB35 | 35 | −9/−25 | 200 | M 8 | 15 | 5,000 |
| SNSB40 | 40 | | 300 | M 8 | 18 | 6,000 |
| SNSB50 | 50 | | 300 | M10 | 22 | 6,000 |

material: Martensite stainless steel (equivalent to SUS440C)
hardness: HV613 (56HRC) or more
*g6 is standard tolerance for the outer diameter.

# SNW TYPE

## − NB Inch Shaft −

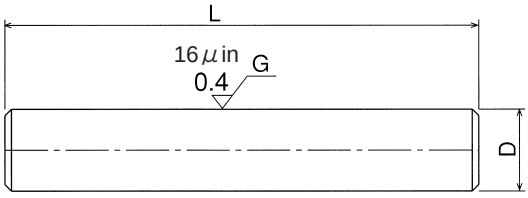


part number structure
example

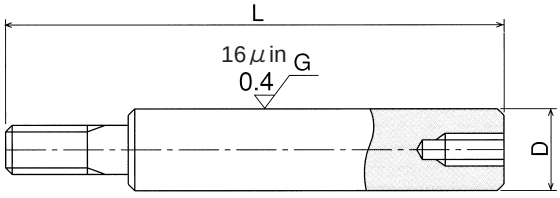
SNW | 24 | h5 × 4000 mm

- SNW type
- size
- outer diameter tolerance g6 when blank
- length (L)

straight




machined (example)




| part number | outer diameter D inch / mm | tolerance g6* inch/μm | length L inch / mm | mass lbs/inch / kg/m |
|---|---|---|---|---|
| SNW 4 | 1/4 6.350 | −.0002 −.0006 | 3.94 (100) ◀▶ 39.37 (1000) | 0.014 0.25 |
| SNW 6 | 3/8 9.525 | −5 −14 | 7.84 (200) ◀▶ 59.06 (1500) | 0.031 0.56 |
| SNW 8 | 1/2 12.700 | −.0002 −.0007 | 7.84 (200) ◀▶ 118.11 (3000) | 0.056 0.99 |
| SNW10 | 5/8 15.875 | −6 −17 | 7.84 (200) ◀▶ 157.48 (4000) | 0.086 1.55 |
| SNW12 | 3/4 19.050 | −.0003 −.0008 | 11.81 (300) ◀▶ 157.48 (4000) | 0.125 2.24 |
| SNW16 | 1 25.400 | −7 −20 | 11.81 (300) ◀▶ 157.48 (4000) | 0.222 3.98 |
| SNW20 | 1-1/4 31.750 | −.0004 −.0010 | 11.81 (300) ◀▶ 157.48 (4000) | 0.420 6.22 |
| SNW24 | 1-1/2 38.100 | −9 −25 | 15.75 (400) ◀▶ 157.48 (4000) | 0.500 8.95 |
| SNW32 | 2 50.800 | −.0004 −.0011 −10 −29 | 19.69 (500) ◀▶ 157.48 (4000) | 0.890 15.91 |
| SNW40 | 2-1/2 63.500 | | 23.62 (600) ◀▶ 157.48 (4000) | 1.391 25.00 |
| SNW48 | 3 76.200 | | 23.62 (600) ◀▶ 157.48 (4000) | 2.003 37.92 |
| SNW64 | 4 101.600 | −.0005/−.0013 −12/−34 | 39.37 (1000) ◀▶ 157.48 (4000) | 3.560 64.02 |

material：high-carbon chromium bearing steel（SUJ2）
hardness：HV 697（60HRC） or more
Tolerances other than *g6 are available upon request.
Longer lengths are also available.

1kg ≒ 2.205lbs

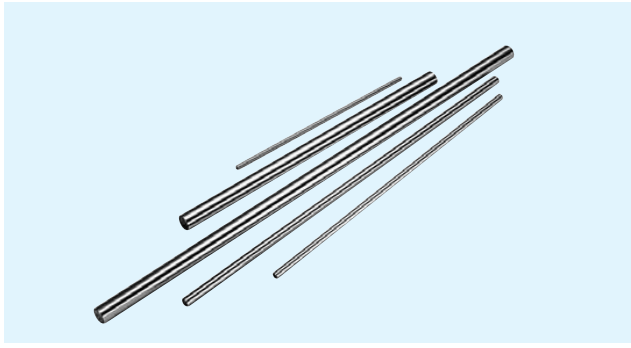
# SNWS TYPE

## − NB Inch Stainless Steel Shaft −

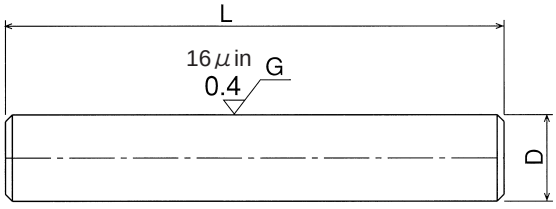
part number structure example

SNWS | 24 | h5 × 4000 mm

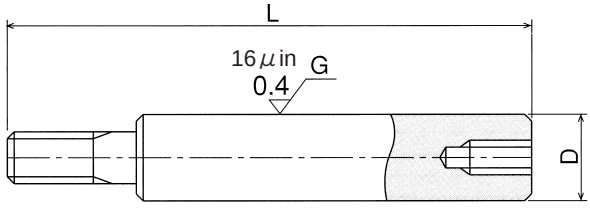
- SNWS type
- size
- outer diameter tolerance g6 when blank
- length (L)



straight




machined (example)




| part number | outer diameter D inch mm | outer diameter tolerance g6* inch/μm | length L inch mm | mass lbs/inch kg/m |
|---|---|---|---|---|
| SNWS 4 | 1/4 6.350 | −.0002 −.0006 | 3.94 100 ◀——▶ 23.62 600 | 0.014 0.25 |
| SNWS 6 | 3/8 9.525 | −5 −14 | 7.84 200 ◀——▶ 39.37 1000 | 0.031 0.55 |
| SNWS 8 | 1/2 12.700 | −.0002 −.0007 | 7.84 200 ◀——▶ 98.43 2500 | 0.056 0.98 |
| SNWS10 | 5/8 15.875 | −6 −17 | 7.84 200 ◀——▶ 118.11 3000 | 0.086 1.54 |
| SNWS12 | 3/4 19.050 | −.0003 −.0008 | 11.81 300 ◀——▶ 157.48 4000 | 0.125 2.22 |
| SNWS16 | 1 25.400 | −7 −20 | 11.81 300 ◀——▶ 157.48 4000 | 0.222 3.95 |
| SNWS20 | 1-1/4 31.750 | −.0004 −.0010 | 11.81 300 ◀——▶ 157.48 4000 | 0.420 6.16 |
| SNWS24 | 1-1/2 38.100 | −9 −25 | 15.75 400 ◀——▶ 157.48 4000 | 0.500 8.88 |
| SNWS32 | 2 50.800 | −.0004/−.0011 −10/−29 | 19.69 500 ◀——▶ 157.48 4000 | 0.890 15.78 |

material：Martensite stainless steel（equivalent to SUS440C）

hardness：HV 613（56HRC） or more

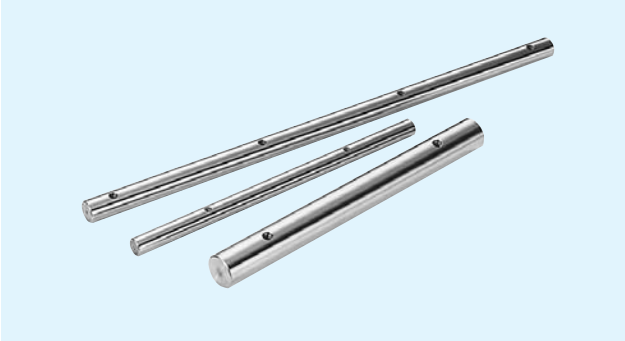
Tolerances other than *g6 are available upon request.

Longer lengths are also available.

1kg ≒ 2.205lbs

# SNW-PD

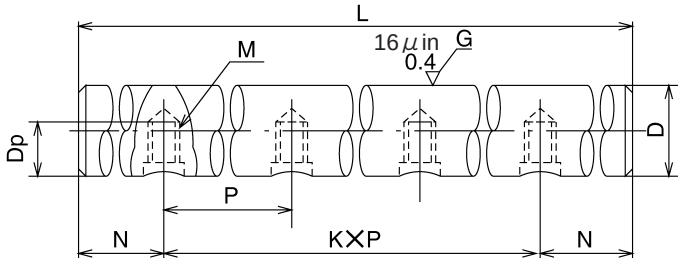
## − NB Inch Pre-Drilled Shaft −



part number structure example

SNW | 20 | h5 × 72 inch- PD

- SNW type
- size
- outer diameter tolerance g6 when blank
- length (L)
- pre-drilled shaft




$N = \frac{L - K \times P}{2}$

K : number of pitches

| part number | outer diameter D inch mm | outer diameter tolerance g6* inch/μm | pitch P inch/mm | bolt size M | tapped hole depth Dp inch/mm | maximum length L inch/mm |
|---|---|---|---|---|---|---|
| **SNW 8-PD** | 1/2<br>12.700 | −.0002<br>−.0007<br>−6<br>−17 | 4<br>101.6 | #6-32 | 0.280<br>7.1 | 72<br>1,828.8 |
| **SNW10-PD** | 5/8<br>15.875 | | | 8-32 | 0.350<br>8.9 | |
| **SNW12-PD** | 3/4<br>19.050 | −.0003<br>−.0008<br>−7<br>−20 | 6<br>152.4 | 10-32 | 0.400<br>10.2 | |
| **SNW16-PD** | 1<br>25.400 | | | 1/4-20 | 0.500<br>12.7 | |
| **SNW20-PD** | 1-1/4<br>31.750 | −.0004<br>−.0010<br>−9<br>−25 | | 5/16-18 | 0.650<br>16.5 | |
| **SNW24-PD** | 1-1/2<br>38.100 | | | 3/8-16 | 0.700<br>17.8 | |
| **SNW32-PD** | 2<br>50.800 | −.0004/−.0011<br>−10/−29 | 8<br>203.2 | 1/2-13 | 0.850<br>21.6 | |

material : high-carbon chromium beering steel（SUJ2）.

hardness : HV 697（60HRC） or more

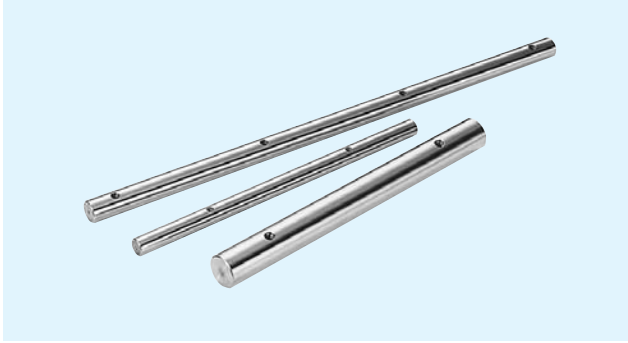
Tolerances other than *g6 are available upon request.

Longer lengths are also available.

1kg ≒ 2.205lbs

# SNWS-PD

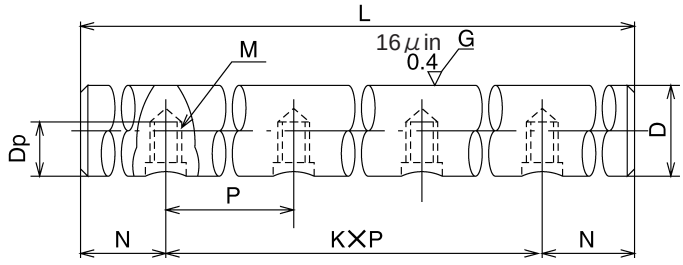
## – NB Inch Pre-Drilled Stainless Steel Shaft –



part number structure example

SNWS 24 h5 × 72 inch- PD

- SNWS type
- size
- outer diameter tolerance g6 when blank
- length (L)
- pre-drilled shaft




$N = \frac{L-K\times P}{2}$

K : number of pitches

| part number | outer diameter D inch mm | outer diameter tolerance g6* inch/μm | pitch P inch/mm | bolt size M | tapped hole depth Dp inch/mm | maximum length L inch/mm |
|---|---|---|---|---|---|---|
| **SNWS12-PD** | 3/4<br>19,050 | −.0003<br>−.0008<br>−7<br>−20 | 6<br>152.4 | #10−32 | 0.400<br>10.2 | 72<br>1,828.8 |
| **SNWS16-PD** | 1<br>25,400 | | | 1/4−20 | 0.500<br>12.7 | |
| **SNWS20-PD** | 1−1/4<br>31,750 | −.0004<br>−.0010<br>−9<br>−25 | | 5/16−18 | 0.650<br>16.5 | |
| **SNWS24-PD** | 1−1/2<br>38,100 | | 8<br>203.2 | 3/8−16 | 0.700<br>17.8 | |
| **SNWS32-PD** | 2<br>50,800 | −.0004/−.0011<br>−10/−29 | | 1/2−13 | 0.850<br>21.6 | |

material : Martensite stainless steel (equivalent to SUS440C)

hardness : HV613 (56HRC) or more

Tolerances other than *g6 are available upon request.

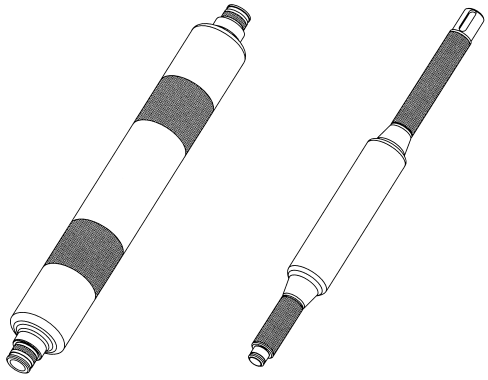
Longer lengths are also available.

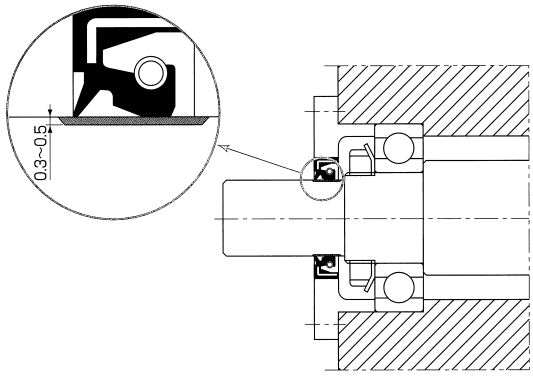
# THERMAL-SPRAYING CERAMIC-COATING SPECIFICATION

## ADVANTAGES:

Parts that require wear and corrosion resistance may be thermal-sprayed with a ceramic material per NB's ceramic-coating specifications. Material so treated may be used in a wide variety of applications. The pores in the coated layer result in good lubrication characteristics and can be sealed to achieve high corrosion resistance.

## APPLICATION EXAMPLES:






Application of a ceramic coating to oil-sealing parts, rollers, and shafts results in good lubrication and high wear/corrosion resistance characteristics.

Note: Ceramic coated surface cannot be used as the inner race for a slide bush.

## REFERENCE:

Standard Coated Materials

| | |
|---|---|
| High-carbon chromium bearing steel (SUJ2) | Martensite stainless steel (equivalent to SUS440C) |
| Chrome molybdenum steel (SCM415, 435) | Austenite stainless steel (SUS303, 304) |
| Carbon steel for machinery (S45C) | Steel alloy for tools (SKS3, SK4) |

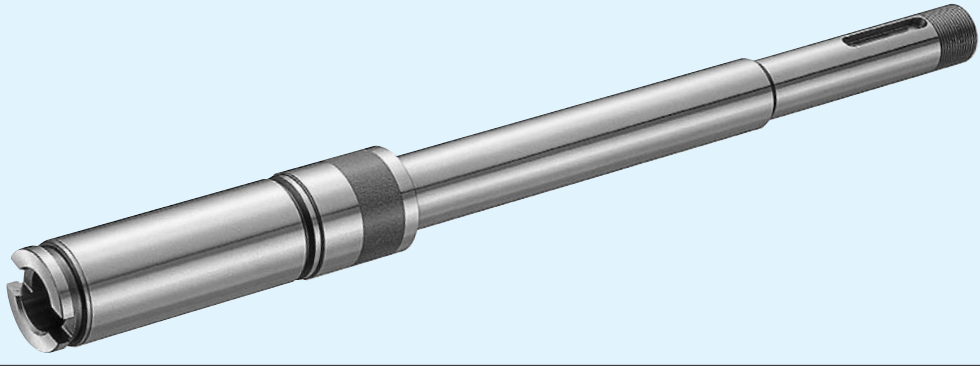
Proper heat treatment is done on your request. Thermal-spraying ceramic-coating is also available to be applied to other materials.

Standard Ceramic for Melt-Spray

| main component | specific gravity | hardness | characteristics |
|---|---|---|---|
| $TiO_2$ titanium dioxide | 4.7 | 60HRC | max. temp. 540℃ color: black wear resistant fine coating fine surface finish |

thermal-spraying layer thickness : 0.3-0.5mm
Other types of ceramic materials can be thermal-sprayed. Contact NB for more information.

## Example of Ceramic Coating



## SPECIAL REQUIREMENTS

# MACHINING EXAMPLE

NB can fabricate shafts to fit specific customer requirements.

### Machining/Grinding:

Shafts can be machined or ground up to a diameter of 400mm and a length of 6000mm.

### Internal Surface Grinding:

The straight/tapered portion of the inner spindle can be ground.

### Deep Hole Machining:

Non-standard holes can be machined using a gun drill and BT machining methods. (Ref. to Table G-6.)

### Screw Machining:

Triangular and trapezoidal screws can be handled.

### Compatible Parts:

Special nuts compatible with a given shaft may be machined. The inner surface and outer diameter of the tapered portion can be ground.

### Material and Heat Treatment:

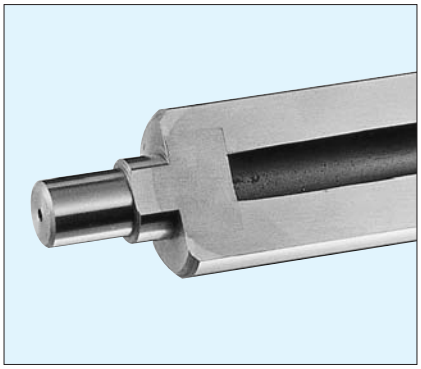
Non-NB material and non-NB shape parts can be heat treated. Please specify the heat treatment method and hardness.

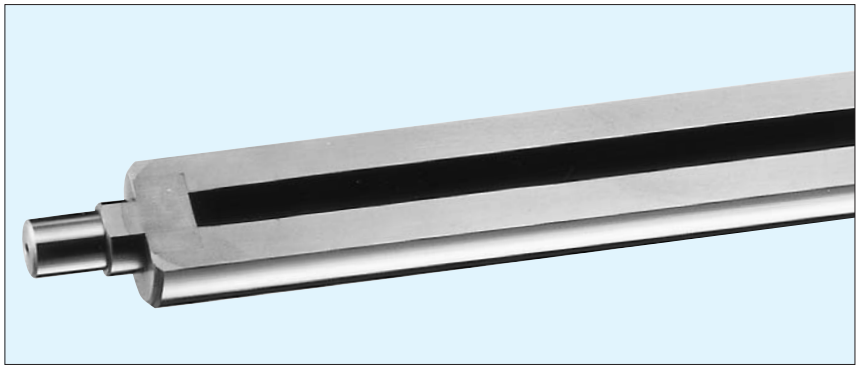
Table G-6 Deep Hole Machining Range unit/mm

| | hole diameter | maximum length |
|---|---|---|
| gun drill machining | $\phi$2～ | 850(single-side machining) |
| BT machining | $\phi$30～ | 2000(single-side machining) |

Contact NB for maximum length versus hole diameter information.
Machining of up to twice the maximum length listed above for double-side machining.

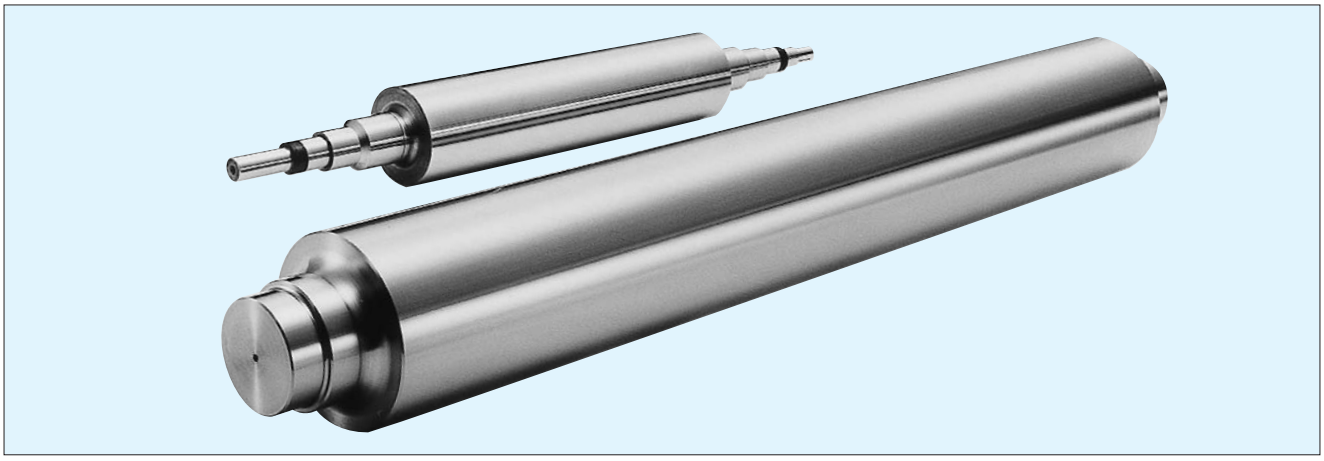
### Gun Drill Machining



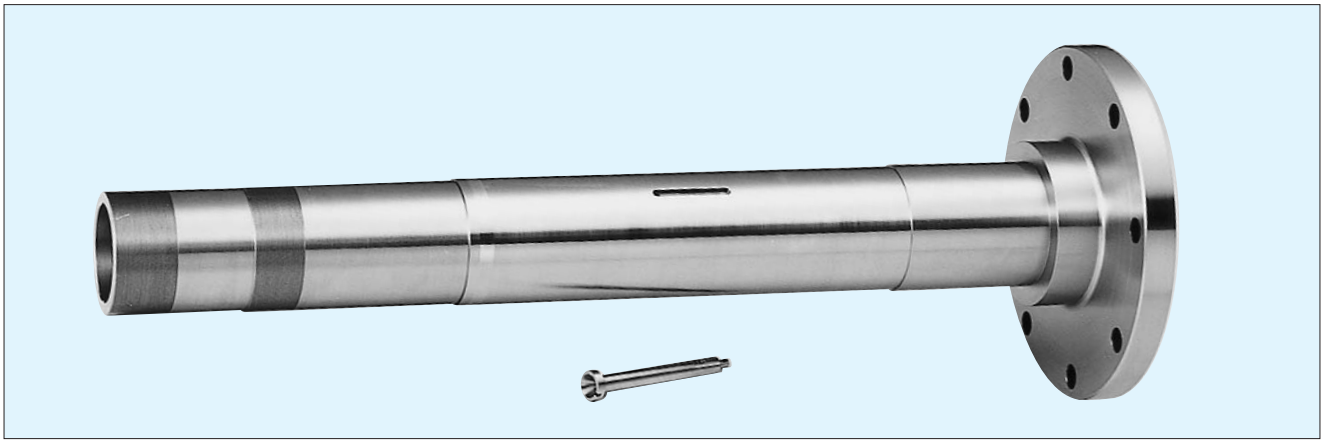


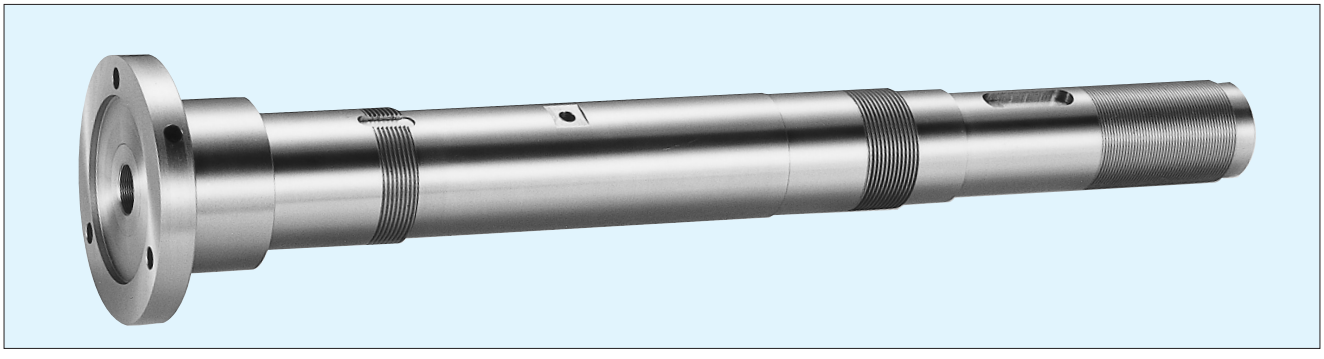
# MACHINING EXAMPLES

## Roll Shaft

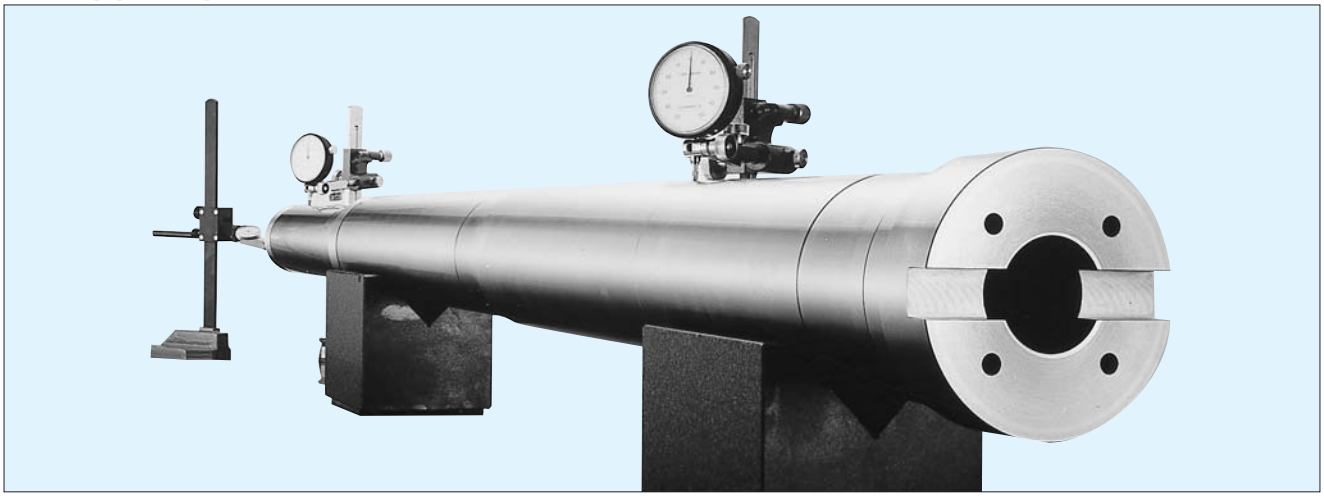


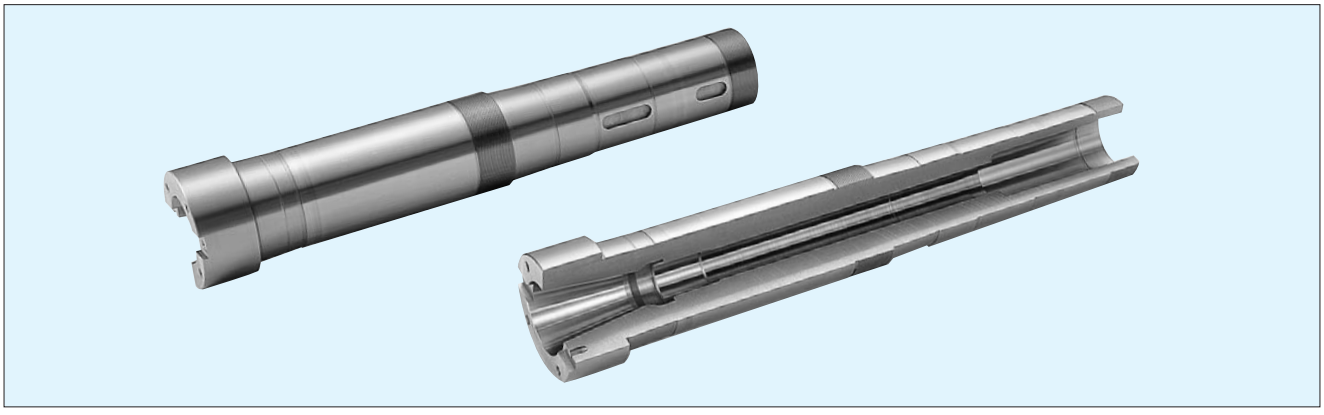
## Flanged Shaft



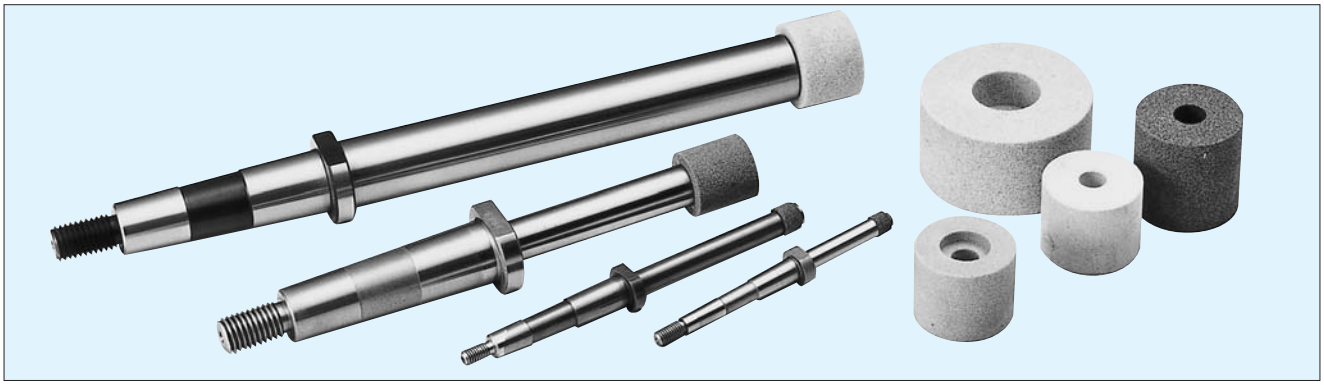


## Shaft (spindle)



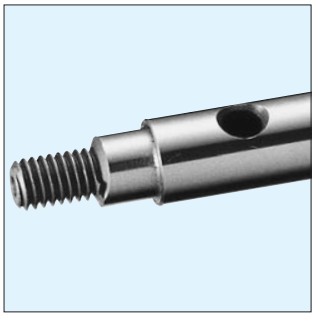
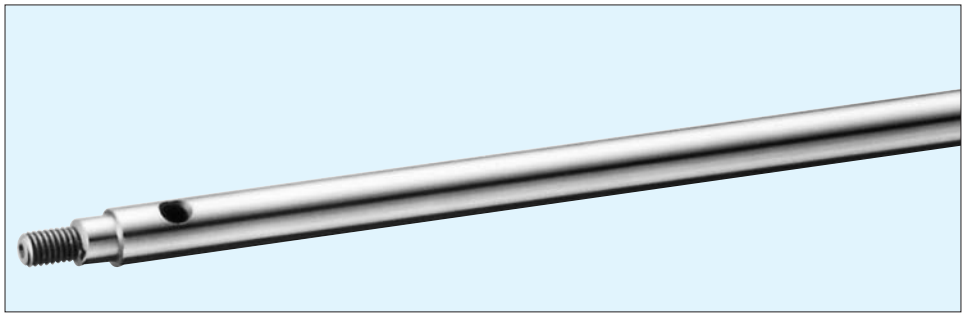
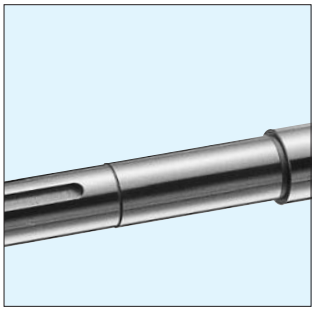
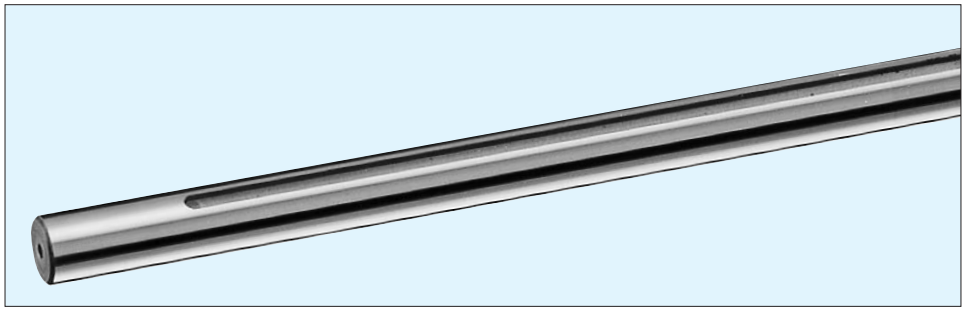
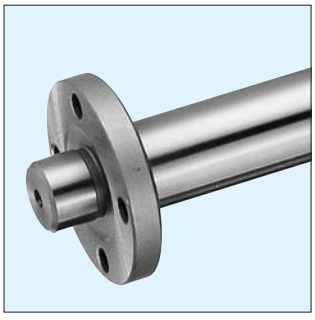
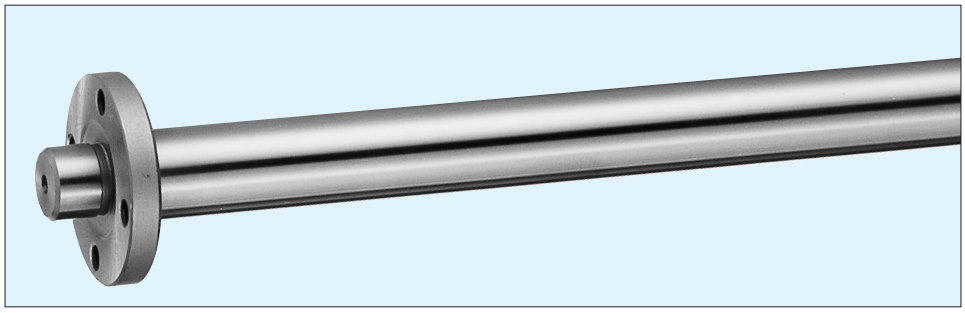
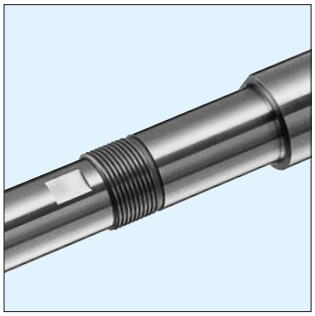
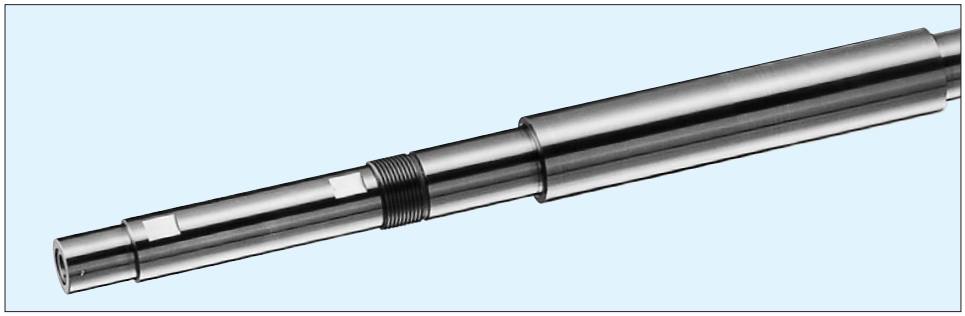


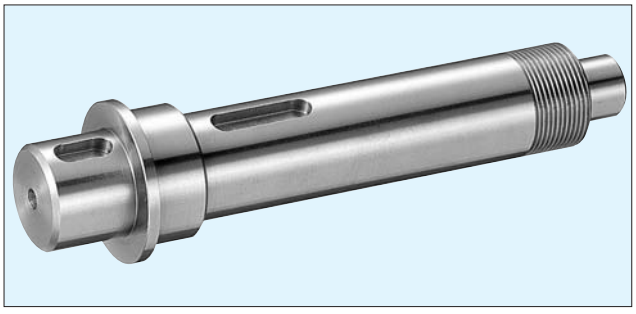
## Shaft (Quill)

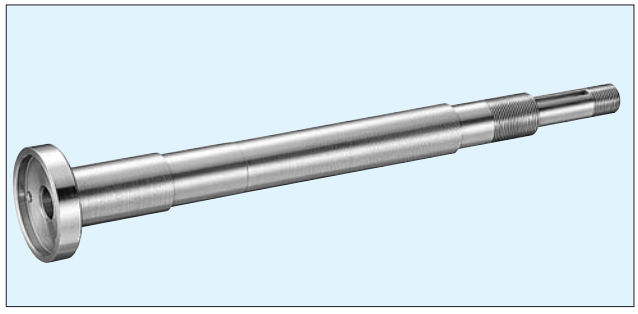


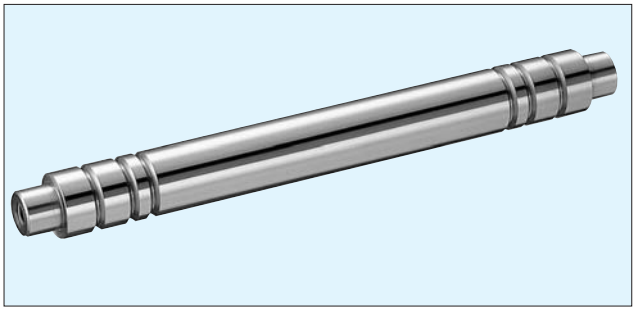
Please send drawing for quotation on custom configurations.

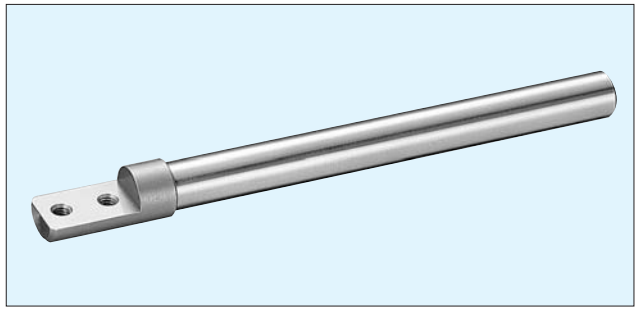
## MACHINING EXAMPLES

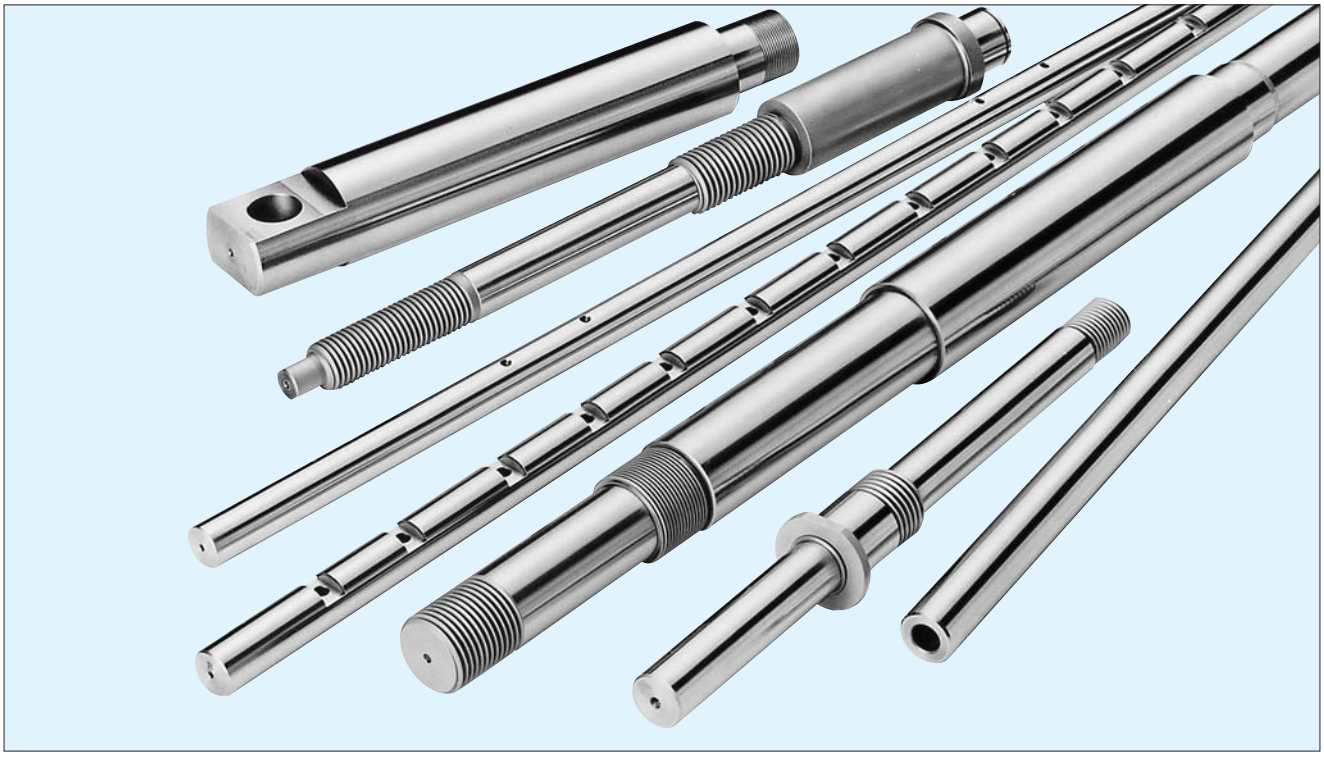



















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