

SLIDE SHAFT SPINDLE SHAFT

SLIDE SHAFT

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SPINDLE SHAFT

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NIPPON BEARING

SHAFT

The NB shaft can be used in a wide range of applications as a mechanical component from straight shaft to spindle shaft. NB's expertise in machining and heat-treatment turns into manufacturing spindle shaft, roll shaft, and general machinery shaft for rotational motion. NB's high accuracy technology answers various shaft machining requirements.

ADVANTAGES

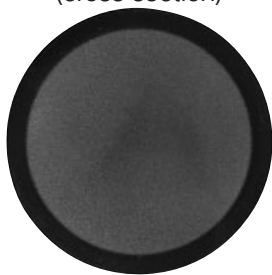
Advanced Machining Technology

NB performs a wide variety of highly accurate machining processes to provide custom shafting from relatively simple machining, such as tapping and shaft stepping to the more demanding high-speed rotating shafts and spindles. NB can also answer the special grinding and bore machining requirements.

Excellent Wear Resistance

Most commonly used materials are high-carbon chromium bearing steel (SUJ2) and martensite stainless steel (SUS440C or equivalent). NB's advanced heat-treatment technology gives these materials an excellent wear resistance by quenching and tempering to achieve a uniform hardened layer in the circumferential and axial directions. The cross-sectional picture below shows the hardened layer-depth of the NB shaft.

Hardened Layer
(cross section)

**Surface Roughness**

Precision grinding results in a surface roughness of less than Ra0.4.

Wide Selection of Shaft Types

SN type, SNS type, SNT type,
SNB, SNSB type (Center-lined tapped shaft)
Spindle shaft, roll shaft

Special Requirements

Based on the customer drawings and specifications NB will answer the customer requirements in material (SCM, SKS etc.), heat-treatment, surface treatment, etc.

Shaft Supporter and Shaft Support Rail

These components ease the shaft installation and help save the design/assembling time. (refer to page F-10)

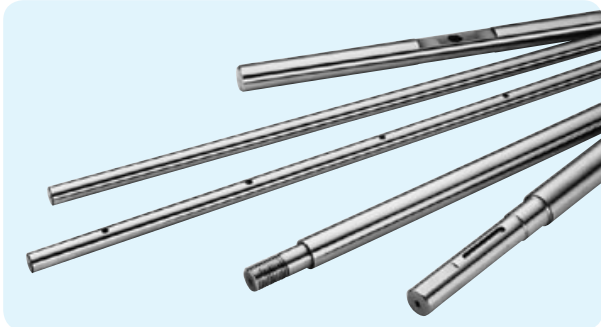
FIT Series

This series is a set of NB slide bush and NB shaft. By precise shaft-grinding, FIT series achieves the best-fit clearance adjustment for a smooth, high accuracy linear motion. (refer to page F-33)

SHAFT

TYPES

SN/SNS/SNT type (NB Shaft)

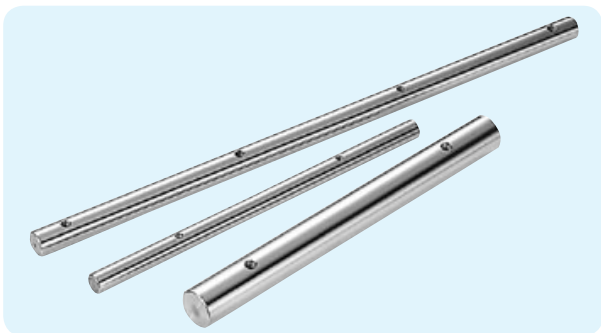


NB shaft is a high-precision shaft that can be used with slide bush or any other bearings. A wide range of machining is provided for customer drawings and requirements.

Table F-1 Specifications

type	SN type	SNS type	SNT type
material	SUJ2	equivalent to SUS440C	SUJ2 (hollow shaft)
outer diameter tolerance	g6 or to be specified		
hardness	60HRC or more	56HRC or more	60HRC or more
surface roughness	Ra0.4 or less		
page	page F-6	page F-7	page F-8

SNB/SNSB type (NB Center-lined Tapped Shaft)

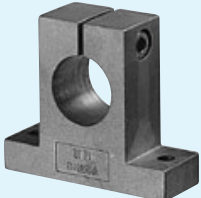


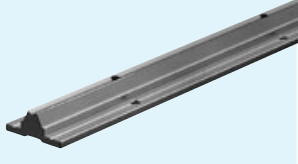
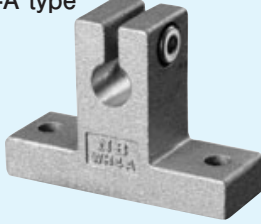
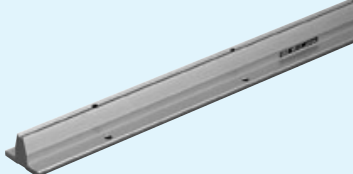
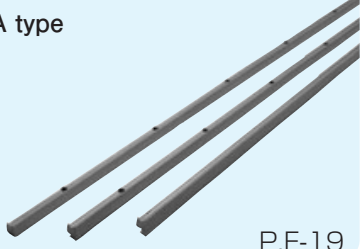


Center-lined tapped shafts are standardized series for easy selection that can be used with the SA shaft support rails. (refer to page F-14)

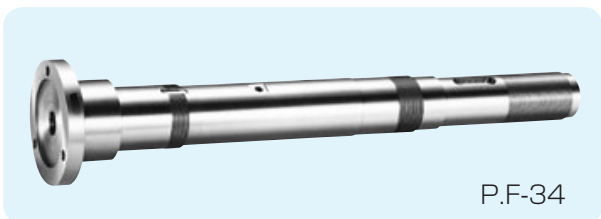
Table F-2 Specifications

type	SNB type	SNSB type
material	SUJ2	equivalent to SUS440C
outer diameter tolerance	g6 or to be specified	
hardness	60HRC or more	56HRC or more
surface roughness	Ra0.4 or less	
page	page F-9	

Shaft Supporter and Shaft Support Rail

<p>SH-A type</p>  <p>P.F-11</p>	<p>SH type</p>  <p>P.F-12</p>	<p>SHF type SHF-FC type</p>  <p>P.F-13</p>	<p>SA type</p>  <p>P.F-14</p>
<p>WH-A type</p>  <p>P.F-16</p>	<p>WA type</p>  <p>P.F-18</p>	<p>LWA type</p>  <p>P.F-19</p>	

Special Specifications



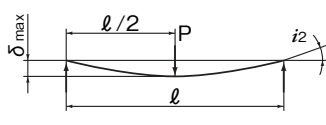
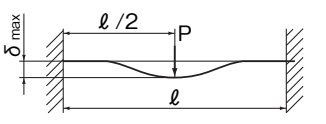
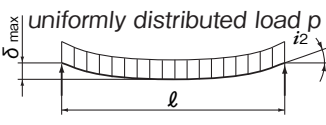
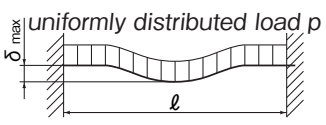
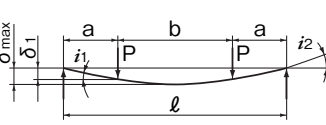
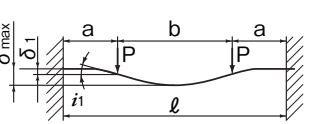
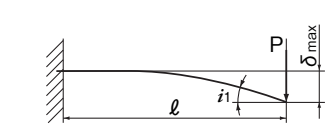
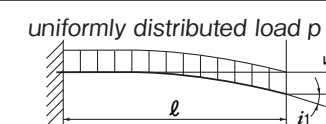
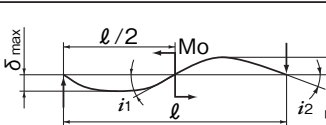
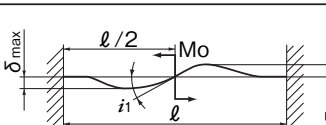
Based on drawings and specifications, NB manufactures spindle shafts, and roll shafts for the rotary motion application. Material, heat-treatment (hardening/tempering), surface treatment, etc, NB meets customer requirements. Please contact NB for details.

NIPPON BEARING

CALCULATION OF DEFLECTION AND DEFLECTION ANGLE

The following formulas are used to obtain the deflection and its angle of the shaft. Typical conditions are listed in Table F-3.

Table F-3 Formulas for Calculating Deflection and Deflection Angle

support method	specification	formula for deflection	formula for deflection angle
1 support support		$\delta_{max} = \frac{P\ell^3}{48EI} = P\ell^3C$	$i_1 = 0$ $i_2 = \frac{P\ell^2}{16EI} = 3P\ell^2C$
2 fixed fixed		$\delta_{max} = \frac{P\ell^3}{192EI} = \frac{1}{4}P\ell^3C$	$i_1 = 0$ $i_2 = 0$
3 support support		$\delta_{max} = \frac{5p\ell^4}{384EI} = \frac{5}{8}p\ell^4C$	$i_2 = \frac{p\ell^3}{24EI} = 2p\ell^3C$
4 fixed fixed		$\delta_{max} = \frac{p\ell^4}{384EI} = \frac{1}{8}p\ell^4C$	$i_2 = 0$
5 support support		$\delta_1 = \frac{Pa^3}{6EI} \left(2 + \frac{3b}{a} \right) = 8Pa^3 \left(2 + \frac{3b}{a} \right) C$ $\delta_{max} = \frac{Pa^3}{24EI} \left(\frac{3\ell^2}{a^2} - 4 \right) = 2Pa^3 \left(\frac{3\ell^2}{a^2} - 4 \right) C$	$i_1 = \frac{Pab}{2EI} = 24PabC$ $i_2 = \frac{Pa(a+b)}{2EI} = 24Pa(a+b)C$
6 fixed fixed		$\delta_1 = \frac{Pa^3}{6EI} \left(2 - \frac{3a}{\ell} \right) = 8Pa^3 \left(2 - \frac{3a}{\ell} \right) C$ $\delta_{max} = \frac{Pa^3}{24EI} \left(2 + \frac{3b}{a} \right) = 2Pa^3 \left(2 + \frac{3b}{a} \right) C$	$i_1 = \frac{Pa^2b}{2EI\ell} = \frac{24Pa^2bC}{\ell}$ $i_2 = 0$
7 fixed free		$\delta_{max} = \frac{P\ell^3}{3EI} = 16P\ell^3C$	$i_1 = \frac{P\ell^2}{2EI} = 24P\ell^2C$ $i_2 = 0$
8 fixed free		$\delta_{max} = \frac{p\ell^4}{8EI} = 6p\ell^4C$	$i_1 = \frac{p\ell^3}{6EI} = 8p\ell^3C$ $i_2 = 0$
9 support support		$\delta_{max} = \frac{\sqrt{3}Mo\ell^2}{216EI} = \frac{2\sqrt{3}}{9}Mo\ell^2C$	$i_1 = \frac{Mo\ell}{12EI} = 4Mo\ell C$ $i_2 = \frac{Mo\ell}{24EI} = 2Mo\ell C$
10 fixed fixed		$\delta_{max} = \frac{Mo\ell^2}{216EI} = \frac{2}{9}Mo\ell^2C$	$i_1 = \frac{Mo\ell}{16EI} = 3Mo\ell C$ $i_2 = 0$

δ_1 : deflection at the concentrated load point (mm) δ_{max} : maximum deflection (mm) i_1 : deflection angle at the concentrated load point (rad)
 i_2 : deflection angle at the support point (rad) Mo : moment (N · mm) P : concentrated load (N)
 p : uniformly distributed load (N/mm) a, b : concentrated load point distance (mm) ℓ : span (mm) I : moment of inertia of area (mm⁴)
 E : modulus of longitudinal elasticity (SUJ2) 2.06×10^5 (N/mm²) (SUS) 2.0×10^5 (N/mm²) C : $1/48EI$ (1/N · mm²)

SHAFT

The moment of inertia of area (I) is obtained using the following formulas:

● For solid shaft

● For hollow shaft

$$I = \frac{\pi D^4}{64}$$

$$I = \frac{\pi}{64} (D^4 - d^4)$$

I: moment of inertia of area (mm⁴)

D: outer diameter (mm) d: inner diameter (mm)

The values of the moment of inertia of area and C (=1/48 EI) for NB shafts are listed in Table F-4 and F-5.

Calculation Examples

1. Calculating the maximum deflection of a 30mm shaft with a 500mm span when a concentrated load of 980 N is applied at the mid-point of the shaft ... (neglecting the shaft weight)

① In case the support method is support-support:

From the given conditions, P = 980 N, $l = 500$ mm

From Table F-4, C for an outer diameter of 30 mm,

$C = 2.54 \times 10^{-12}$ (N·mm²).

Substituting these values into the corresponding formula (No. 1) in Table F-3,

$\delta_{\max} = P l^3 C = 0.31$ (mm)

② In case the support method is fixed-fixed:

Substituting the values into the corresponding formula (No. 2) given in Table F-3,

$\delta_{\max} = \frac{1}{4} P l^3 C = 0.08$ (mm)

2. Calculating the maximum deflection of a 60mm shaft with an inner diameter of 32 mm and a 2,000 mm span by its own weight ...

From Table F-5, C for an outer diameter of 60 mm,

$C = 1.73 \times 10^{-13}$ (N·mm²)

The mass per unit length of a shaft with an outer diameter of 60 mm and an inner diameter of 32 mm is 15.9kg/m. Therefore, a uniformly distributed load of 0.156 N/mm is applied. Substituting these values into the formula (No. 3) given in Table F-3.

$\delta_{\max} = \frac{5}{8} p l^4 C = 0.27$ (mm)

Table F-4 Solid Shaft

outer diameter D (mm)	moment of inertia of area I (mm ⁴)	C=1/48EI (1/N·mm ²)	
		SUJ2	equivalent to SUS440C
3	3.98	2.54×10^{-8}	2.62×10^{-8}
4	1.26×10	8.05×10^{-9}	8.29×10^{-9}
5	3.07×10	3.30×10^{-9}	3.40×10^{-9}
6	6.36×10	1.59×10^{-9}	1.64×10^{-9}
8	2.01×10^2	5.03×10^{-10}	5.18×10^{-10}
10	4.91×10^2	2.06×10^{-10}	2.12×10^{-10}
12	1.02×10^3	9.94×10^{-11}	1.02×10^{-10}
13	1.40×10^3	7.21×10^{-11}	7.43×10^{-11}
15	2.49×10^3	4.07×10^{-11}	4.19×10^{-11}
16	3.22×10^3	3.14×10^{-11}	3.24×10^{-11}
20	7.85×10^3	1.29×10^{-11}	1.33×10^{-11}
25	1.92×10^4	5.27×10^{-12}	5.43×10^{-12}
30	3.98×10^4	2.54×10^{-12}	2.62×10^{-12}
35	7.37×10^4	1.37×10^{-12}	1.41×10^{-12}
40	1.26×10^5	8.05×10^{-13}	8.29×10^{-13}
50	3.07×10^5	3.30×10^{-13}	3.40×10^{-13}
60	6.36×10^5	1.59×10^{-13}	1.64×10^{-13}
80	2.01×10^6	5.03×10^{-14}	5.18×10^{-14}
100	4.91×10^6	2.06×10^{-14}	2.12×10^{-14}
120	1.02×10^7	9.94×10^{-15}	—
150	2.49×10^7	4.07×10^{-15}	—

Table F-5 Hollow Shaft

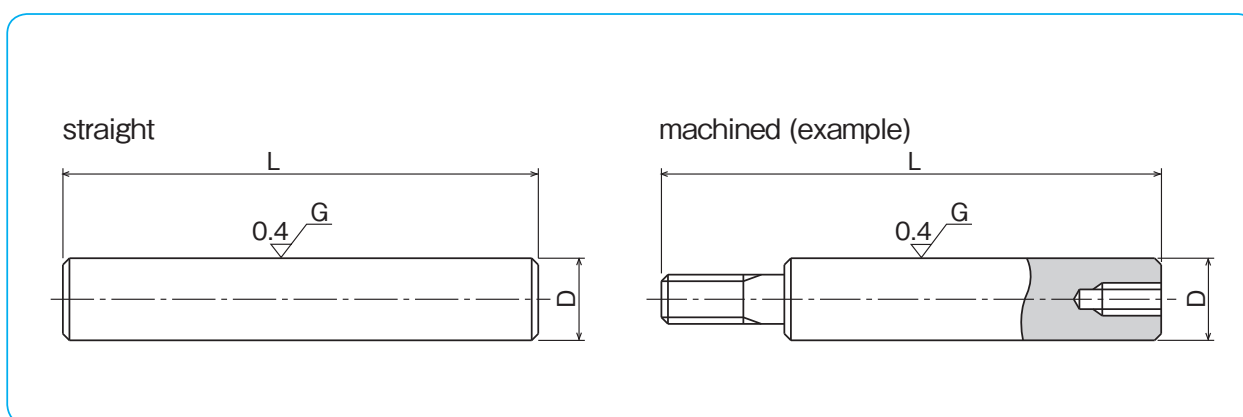
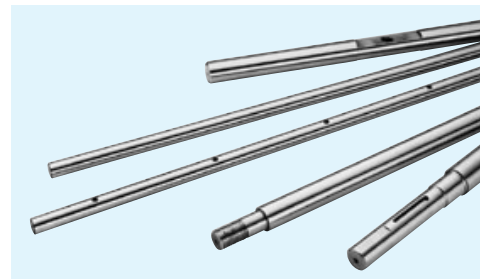
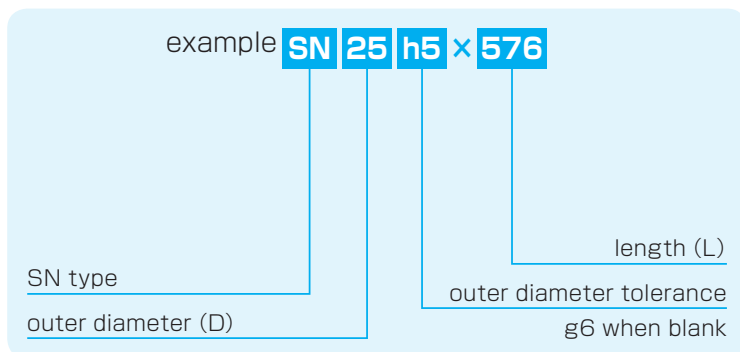
outer diameter D (mm)	inner diameter d (mm)	moment of inertia of area I (mm ⁴)	C=1/48EI (1/N·mm ²)
6	2	6.28×10	1.61×10^{-9}
8	3	1.97×10^2	5.13×10^{-10}
10	4	4.78×10^2	2.11×10^{-10}
12	5	9.87×10^2	1.02×10^{-10}
13	6	1.34×10^3	7.55×10^{-11}
16	8	3.02×10^3	3.36×10^{-11}
20	10	7.36×10^3	1.37×10^{-11}
25	15	1.67×10^4	6.06×10^{-12}
30	16	3.65×10^4	2.77×10^{-12}
35	19	6.73×10^4	1.50×10^{-12}
40	20	1.18×10^5	8.57×10^{-13}
50	26	2.84×10^5	3.56×10^{-13}
60	32	5.85×10^5	1.73×10^{-13}
80	48	1.75×10^6	5.78×10^{-14}
100	60	4.27×10^6	2.37×10^{-14}

NIPPON BEARING

SN TYPE

– NB Shaft –

part number structure



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

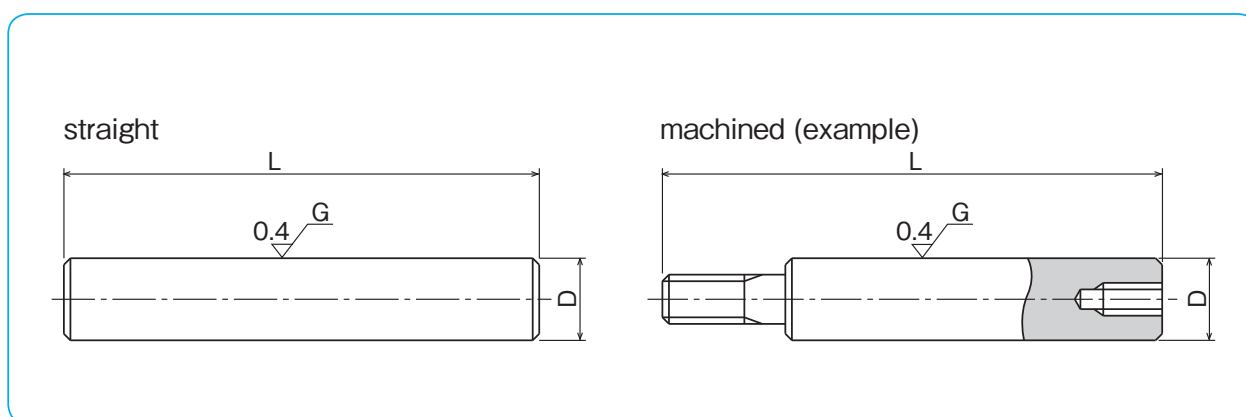
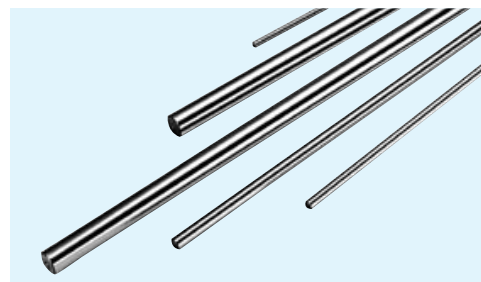
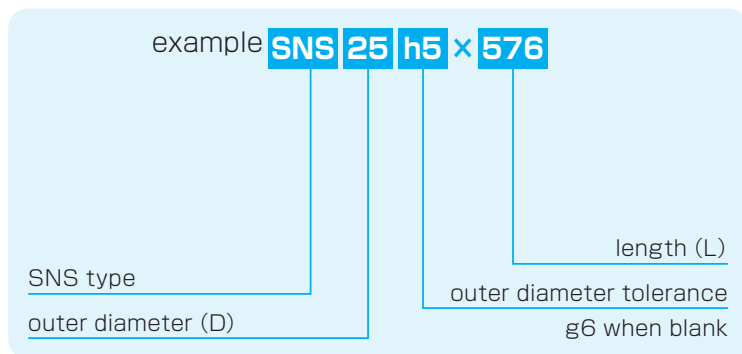
material: high-carbon chromium bearing steel (SUJ2) hardness: 60HRC (HV697) or more
Tolerances other than g6 are available upon request.

SHAFT

SNS TYPE

– NB Stainless Steel Shaft –

part number structure



part number	outer diameter		length		mass
	D	tolerance	L		
	mm	g6 μm	mm		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	-5	100	600	0.22
SNS 8	8	-14	200	1000	0.39
SNS 10	10	-6	200	1500	0.61
SNS 12	12	-17	200	2500	0.88
SNS 13	13	-7	200	3000	1.03
SNS 16	16	-20	300	4000	1.56
SNS 20	20	-9	300	5000	2.43
SNS 25	25	-25	300	6000	3.80
SNS 30	30	-10	300	6000	5.48
SNS 35	35	-29	400	6000	7.46
SNS 40	40	-12/-34	400	6000	9.75
SNS 50	50		500	6000	15.2
SNS 60	60		600	6000	21.9
SNS 80	80		800	6000	39.0
SNS100	100		1000	6000	60.9

material: martensite stainless steel (equivalent to SUS440C)

hardness: 56HRC (HV613) or more

The maximum length of hardening is up to 4500mm for shafts with diameter over 80mm.

Tolerances other than g6 are available upon request.

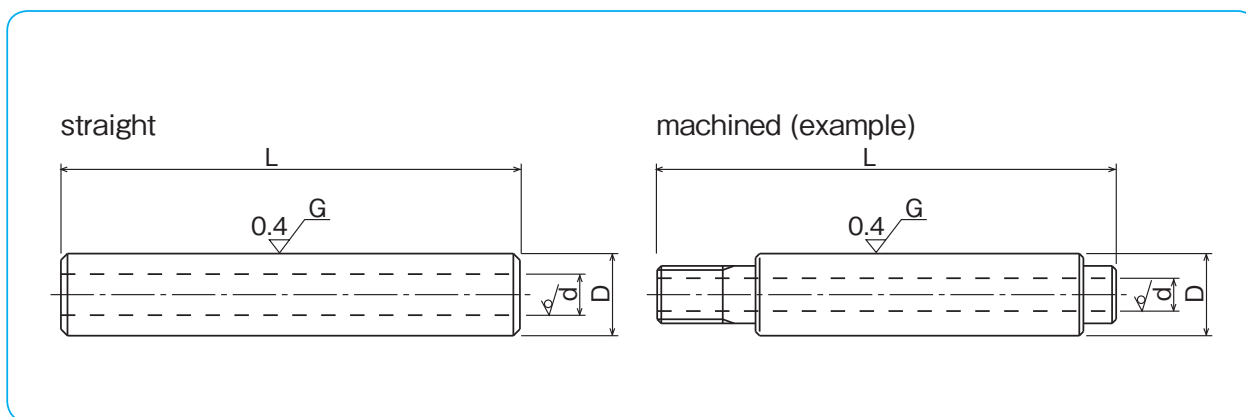
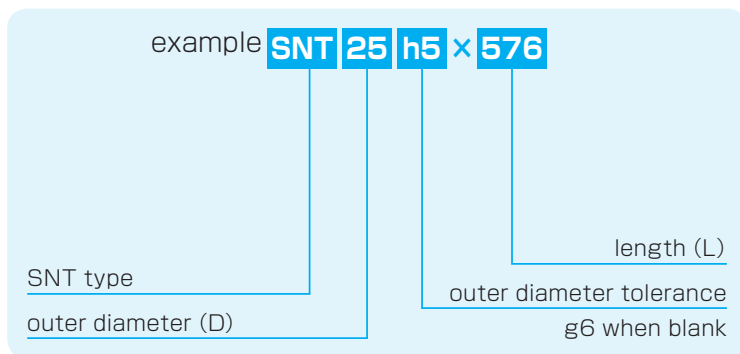
SHAFT

NIPPON BEARING

SNT TYPE

– NB Hollow Shaft –

part number structure



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

material: high-carbon chromium bearing steel (SUJ2)

hardness: 60HRC (HV697) or more

Tolerances other than g6 are available upon request.

SHAFT

NB CENTER-LINED TAPPED SHAFT

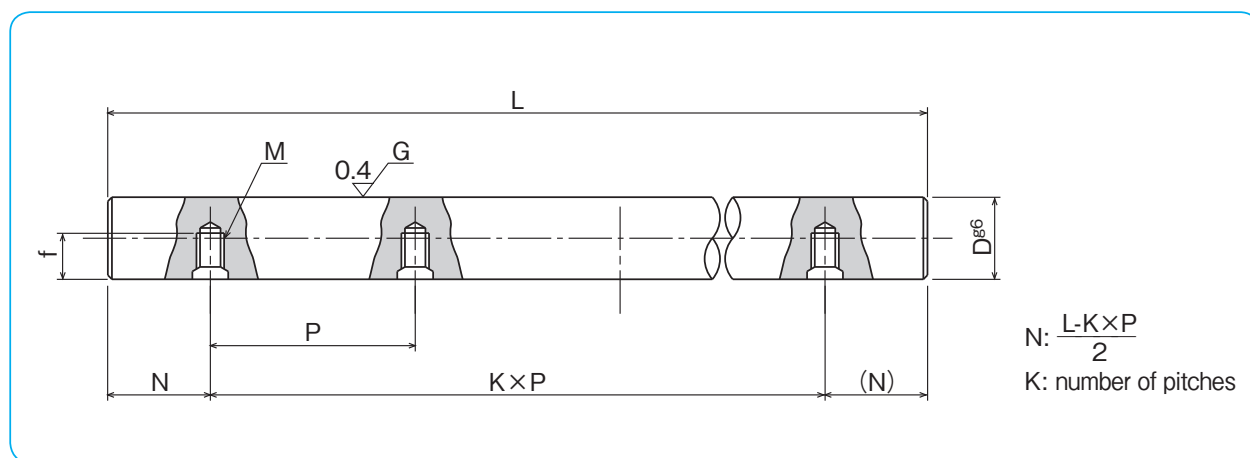
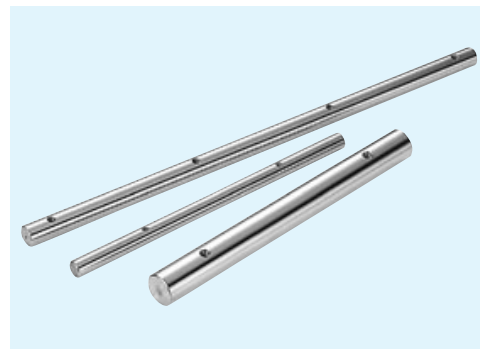
A larger diameter shaft can overcome problems in maintaining precision functionality when a high or unbalanced load is applied. A combination of the center-lined tapped shaft together with the SA type support rail is ideal in such cases. (see pages F-18,19) The center-lined tapped shaft is standardized to simplify shaft selection.

part number structure

example **SNSB 25 x 576**

material
SNB: SUJ2
SNSB: equivalent to SUS440C

length (L)
 outer diameter (D)
 g6 when blank



NB Center-Lined Tapped Shaft

part number	outer diameter D mm	tolerance g6* μm	pitch P mm	screw size M	tap depth f mm	maximum length L _{max} mm
SNB10	10	-5/-14	100	M4	4.5	1,500
SNB12	12	-6	100	M4	5.5	1,800
SNB13	13	-17	100	M4	6	2,000
SNB16	16	-17	150	M5	7	4,000
SNB20	20	-7	150	M6	9	4,000
SNB25	25	-20	200	M6	12	4,000
SNB30	30	-20	200	M8	15	4,500
SNB35	35	-9	200	M8	15	5,000
SNB40	40	-25	300	M8	18	6,000
SNB50	50	-25	300	M10	22	6,000

material: high-carbon chromium bearing steel (SUJ2)

hardness: 60HRC (HV697) or more

*g6 is a standard tolerance of the outer diameter.

NB Center-Lined Tapped Stainless Steel Shaft

part number	outer diameter D mm	tolerance g6* μm	pitch P mm	screw size M	tap depth f mm	maximum length L _{max} mm
SNSB16	16	-6/-17	150	M5	7	2,000
SNSB20	20	-7	150	M6	9	3,000
SNSB25	25	-20	200	M6	12	4,000
SNSB30	30	-20	200	M8	15	4,500
SNSB35	35	-9	200	M8	15	5,000
SNSB40	40	-25	300	M8	18	6,000
SNSB50	50	-25	300	M10	22	6,000

material: martensite stainless steel (equivalent to SUS440C)

hardness: 56HRC (HV613) or more

*g6 is a standard tolerance of the outer diameter.

SHAFT

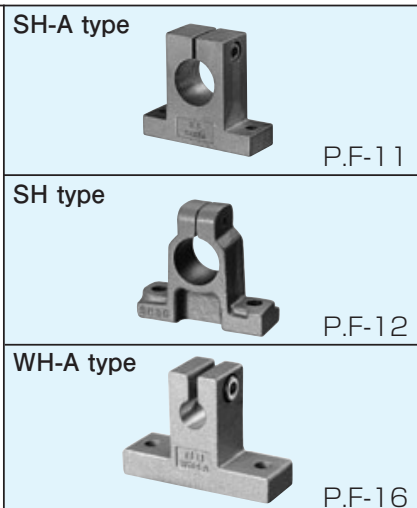
NIPPON BEARING

SHAFT SUPPORTER AND SHAFT SUPPORT RAIL

These components save design/assembling time and ease shaft installation.

SH·SH-A·WH-A type

These are most commonly used compact shaft supporters. SH type is made of cast iron and SH-A/WH-A type is made of aluminum alloy.



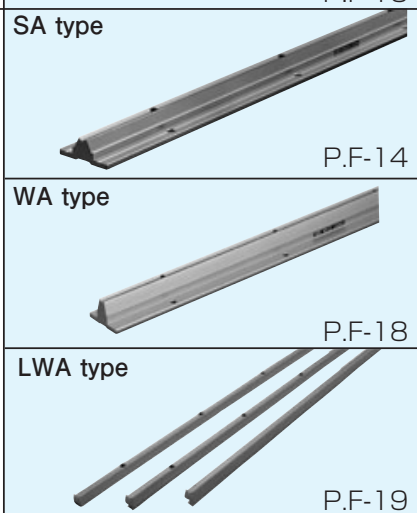
SHF·SHF-FC type

These are flanged type shaft supporters for a compact design. SHF is made of aluminum alloy and SHF-FC (shaft diameter 35 and over) is made of cast iron.



SA·WA·LWA type (shaft support rail)

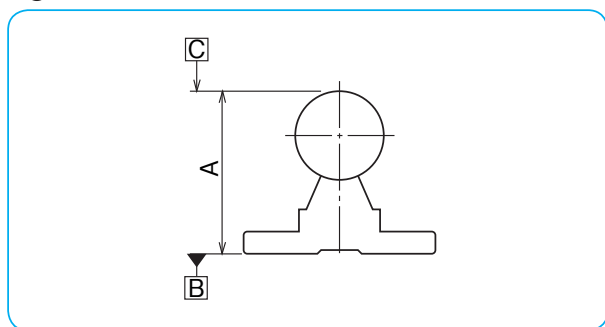
These support rails support shafts from below to avoid shaft deflection for a long-stroke/high load application. This type is made of aluminum alloy.



ACCURACY OF SA TYPE SUPPORT RAIL

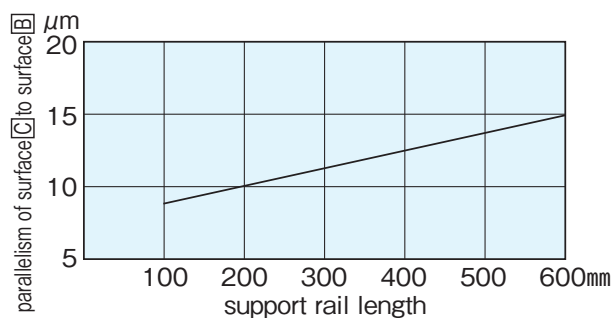
The accuracy of the SA support rails are measured as shown in Figure F-1.

Figure F-1 Measurement Method



F-10

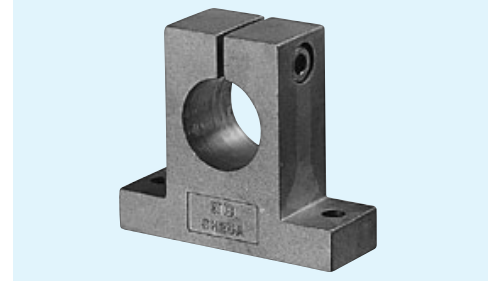
Figure F-2 Accuracy of SA type Support Rail



SHAFT

SH-A TYPE

– Shaft Supporter –

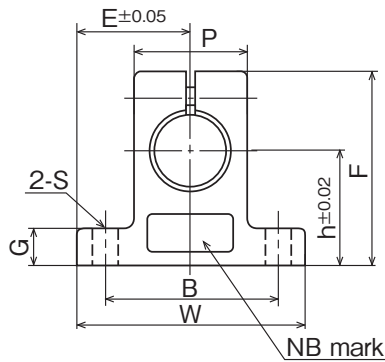


part number structure

example SH 25 A

SH-A type

shaft diameter



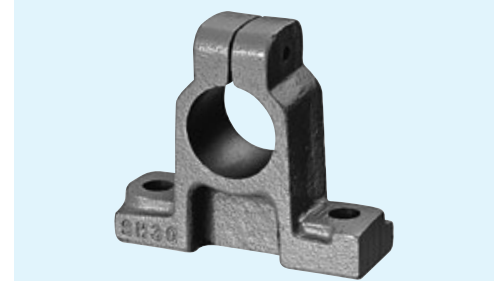
part number	shaft diameter mm	major dimensions									tightening screw		mass g
		h mm	E mm	W mm	L mm	F mm	G mm	P mm	B mm	S mm	size	recommended torque N · m	
SH 8A	8	20	21	42	14	32.8	6	18	32	5.5 (M5)	M4	2	24
SH10A	10	20	21	42	14	32.8	6	18	32	5.5 (M5)	M4	2	24
SH12A	12	23	21	42	14	37.5	6	20	32	5.5 (M5)	M4	2	30
SH13A	13	23	21	42	14	37.5	6	20	32	5.5 (M5)	M4	2	30
SH16A	16	27	24	48	16	44	8	25	38	5.5 (M5)	M4	2	40
SH20A	20	31	30	60	20	51	10	30	45	6.6 (M6)	M5	3	70
SH25A	25	35	35	70	24	60	12	38	56	6.6 (M6)	M6	5.5	130
SH30A	30	42	42	84	28	70	12	44	64	9 (M8)	M6	5.5	180
SH35A	35	50	49	98	32	82	15	50	74	11 (M10)	M8	13.5	270
SH40A	40	60	57	114	36	96	15	60	90	11 (M10)	M8	13.5	420
SH50A	50	70	63	126	40	120	18	74	100	14 (M12)	M12	29	750
SH60A	60	80	74	148	45	136	18	90	120	14 (M12)	M12	29	1,100

SHAFT

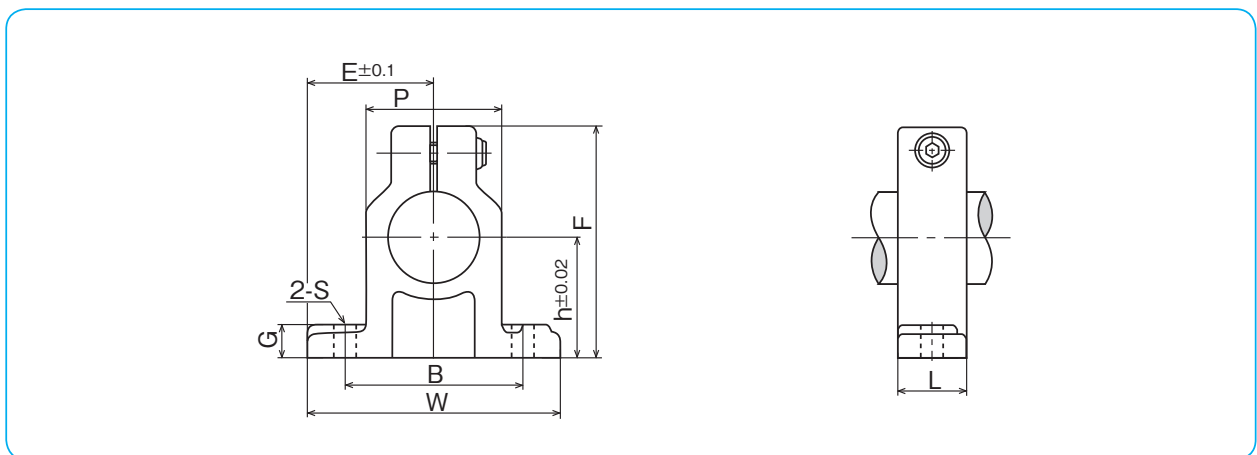
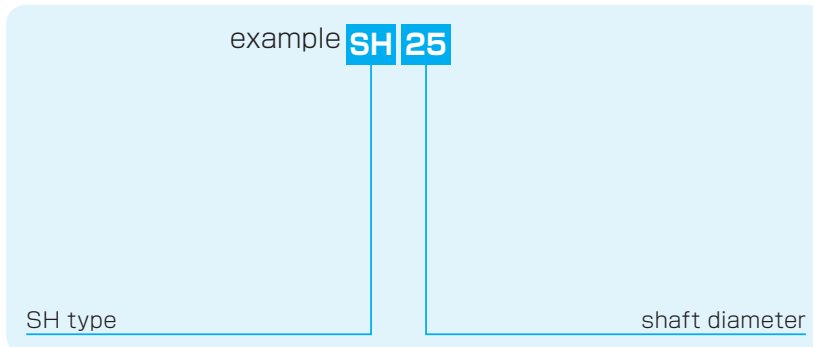
NIPPON BEARING

SH TYPE

– Shaft Supporter –



part number structure



part number	shaft diameter mm	major dimensions									tightening screw size	recommended torque N · m	mass g
		h mm	E mm	W mm	L mm	F mm	G mm	P mm	B mm	S mm			
SH10	10	20	22	44	15	35	7	19	32	4.5 (M4)	M4	2	80
SH13	13	23	25	50	17	40	8	17	32	7 (M5)	M4	2	120
SH16	16	27	27.5	55	17	45	10	25	38	7 (M5)	M4	2	120
SH20	20	31	32.5	65	20	53	12	30	45	8 (M6)	M5	3	190
SH25	25	35	38	76	24	61	12	35	56	8 (M6)	M6	5.5	300
SH30	30	42	42.5	85	28	73	15	42	64	10 (M8)	M6	5.5	490
SH35	35	50	50	100	32	87	15	50	74	12 (M10)	M8	13.5	690
SH40	40	60	60	120	36	104	18	58	90	12 (M10)	M10	29	1,200
SH50	50	70	70	140	40	122	20	68	100	14 (M12)	M12	29	1,700
SH60	60	80	82.5	165	45	140	23	80	120	14 (M12)	M12	29	2,500

SHAFT

SHF TYPE

– Shaft Supporter Flange Type –



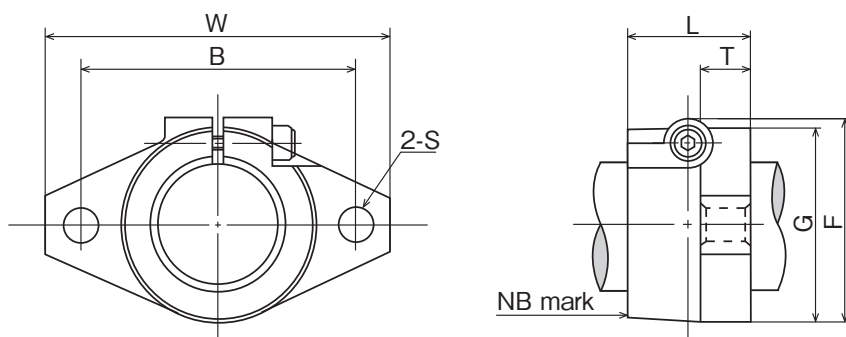
part number structure

example SHF 35 FC

SHF type

shaft diameter

blank: aluminum alloy
FC: cast iron



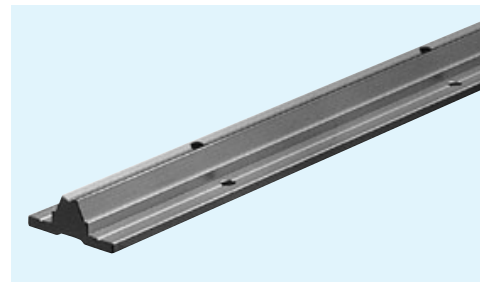
part number		shaft diameter mm	major dimensions							S mm	tightening screw		mass	
aluminum alloy	cast iron		W mm	L mm	T mm	F mm	G mm	B mm	size		recommended torque N · m	aluminum alloy	cast iron	
SHF10	—	10	43	10	5	24	20	32	5.5 (M5)	M4	2	13	—	
SHF12	—	12	47	13	7	28	25	36	5.5 (M5)	M4	2	20	—	
SHF13	—	13	47	13	7	28	25	36	5.5 (M5)	M4	2	20	—	
SHF16	—	16	50	16	8	31	28	40	5.5 (M5)	M4	2	27	—	
SHF20	—	20	60	20	8	37	34	48	7 (M6)	M5	3	40	—	
SHF25	—	25	70	25	10	42	40	56	7 (M6)	M5	3	60	—	
SHF30	—	30	80	30	12	50	46	64	9 (M8)	M6	5.5	110	—	
SHF35	SHF35FC	35	92	35	14	58	50	72	12 (M10)	M8	13.5	140	380	
SHF40	SHF40FC	40	102	40	16	67	56	80	12 (M10)	M10	29	205	510	
SHF50	SHF50FC	50	122	50	19	83	70	96	14 (M12)	M12	29	360	890	
SHF60	SHF60FC	60	140	60	23	95	82	112	14 (M12)	M12	29	530	1,500	

SHAFT

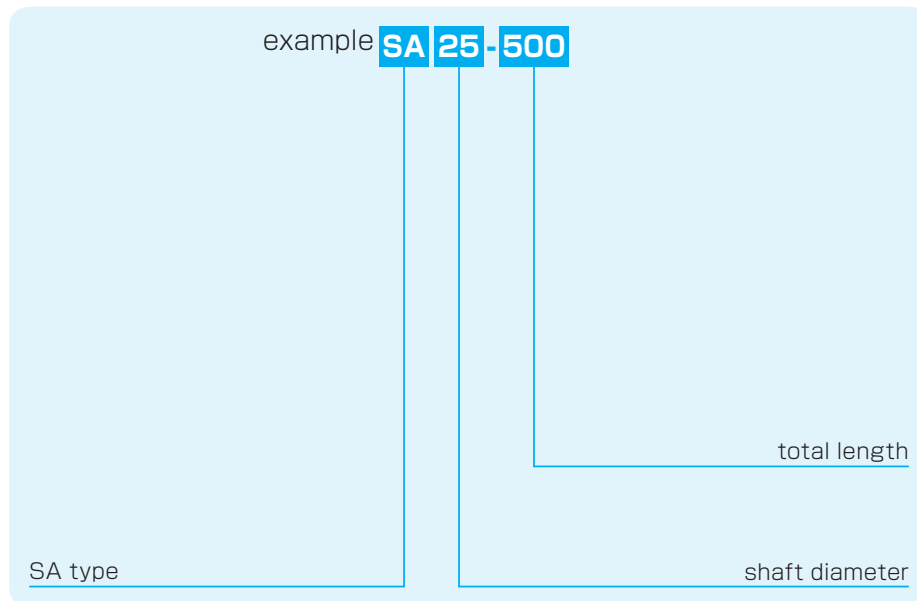
NIPPON BEARING

SA TYPE

– Shaft Support Rail –

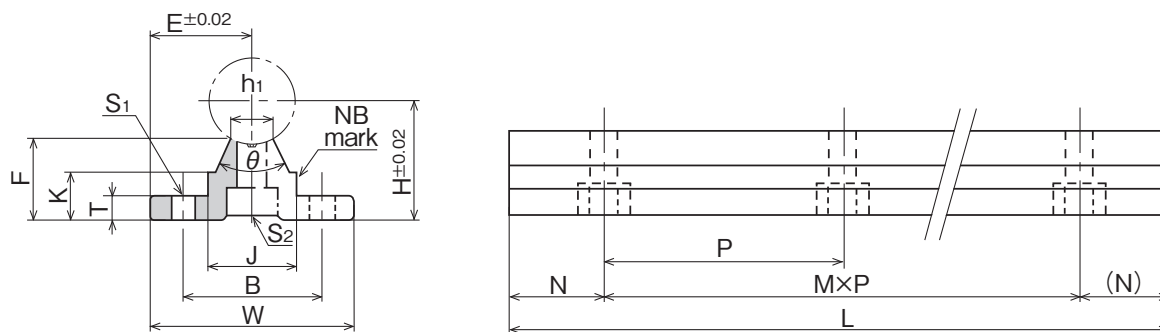


part number structure



part number	shaft diameter mm	major dimensions														mass g		
		H mm	E mm	W mm	L mm	F mm	T mm	K mm	J mm	h ₁ mm	θ	B mm	N mm	M×P mm	S ₁ mm		S ₂	
SA10-200	10	18	16	32	200	13.5	4	8.9	12.4	4.7	80°	22	50	1×100	4.5	M4	110	
SA10-300					300								50	2×100				160
SA10-400					400								50	3×100				220
SA10-500					500								50	4×100				270
SA10-600					600								50	5×100				330
SA13-200					13								21	17				34
SA13-300	300	50	2×100	210														
SA13-400	400	50	3×100	280														
SA13-500	500	50	4×100	350														
SA13-600	600	50	5×100	420														
SA16-200	16	25	20	40		200	17.8	5	11.7	18.5	8	80°			30	25	1×150	
SA16-300					300	75							1×150	300				
SA16-400					400	50							2×150	400				
SA16-500					500	25							3×150	500				
SA16-600					600	75							3×150	600				
SA20-200					20	27							22.5	45		200	17.7	5
SA20-300	300	75	1×150	300														
SA20-400	400	50	2×150	400														
SA20-500	500	25	3×150	510														
SA20-600	600	75	3×150	610														
SA25-200	25	33	27.5	55			200	21	6	12	21.5	8			50°	35		
SA25-300					300	50	1×200						430					
SA25-400					400	100	1×200						580					
SA25-500					500	50	2×200						730					
SA25-600					600	100	2×200						880					

SHAFT



※ Mounting screws for the SN(S)B center-lined tapped shaft are included.

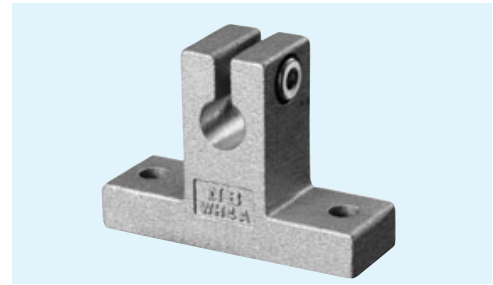
part number	shaft diameter mm	major dimensions										mass g						
		H mm	E mm	W mm	L mm	F mm	T mm	K mm	J mm	h ₁ mm	θ		B mm	N mm	M×P mm	S ₁ mm	S ₂	
SA30-200	30	37	30	60	200	22.8	7	13	26.5	10.3	50°	40	25	1×150	6.5	M8	730	
SA30-300					300								50	1×200				920
SA30-400					400								100	1×200				
SA30-500					500								50	2×200				
SA30-600					600								100	2×200				
SA35-200					35								43	32.5				
SA35-300	300	50	1×200	1,190														
SA35-400	400	100	1×200															
SA35-500	500	50	2×200															
SA35-600	600	100	2×200															
SA40-200	40	48	37.5			75	200	29.4	9	17	38	16			50°	55	25	1×150
SA40-300				300	75		1×150						1,610					
SA40-400				400	50		1×300											
SA40-500				500	100		1×300											
SA40-600				600	150		1×300											
SA50-200				50	62		47.5							95			200	38.8
SA50-300	300	75	1×150			3,000												
SA50-400	400	50	1×300															
SA50-500	500	100	1×300															
SA50-600	600	150	1×300															

SHAFT

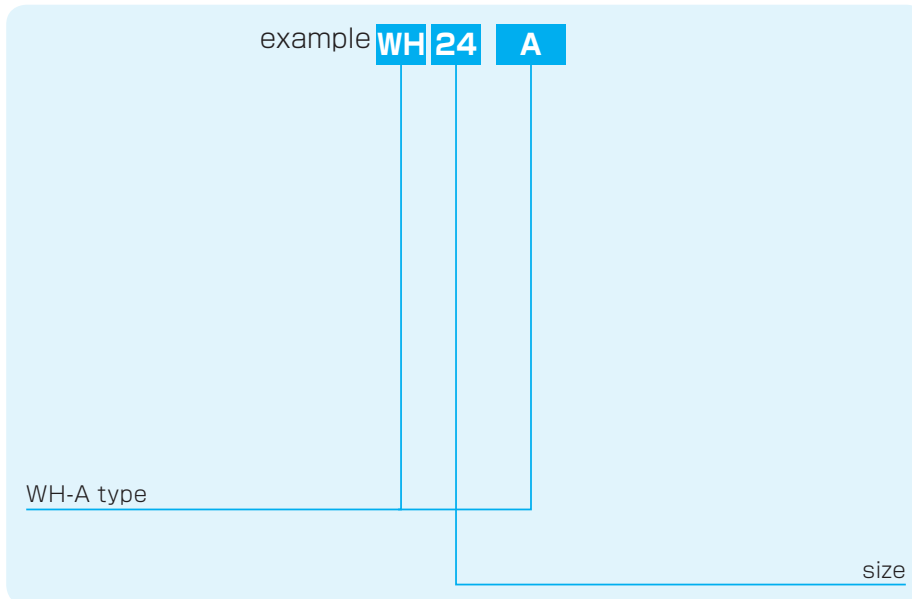
NIPPON BEARING

WH-A TYPE

– Shaft Supporter –
(Inch Standard)

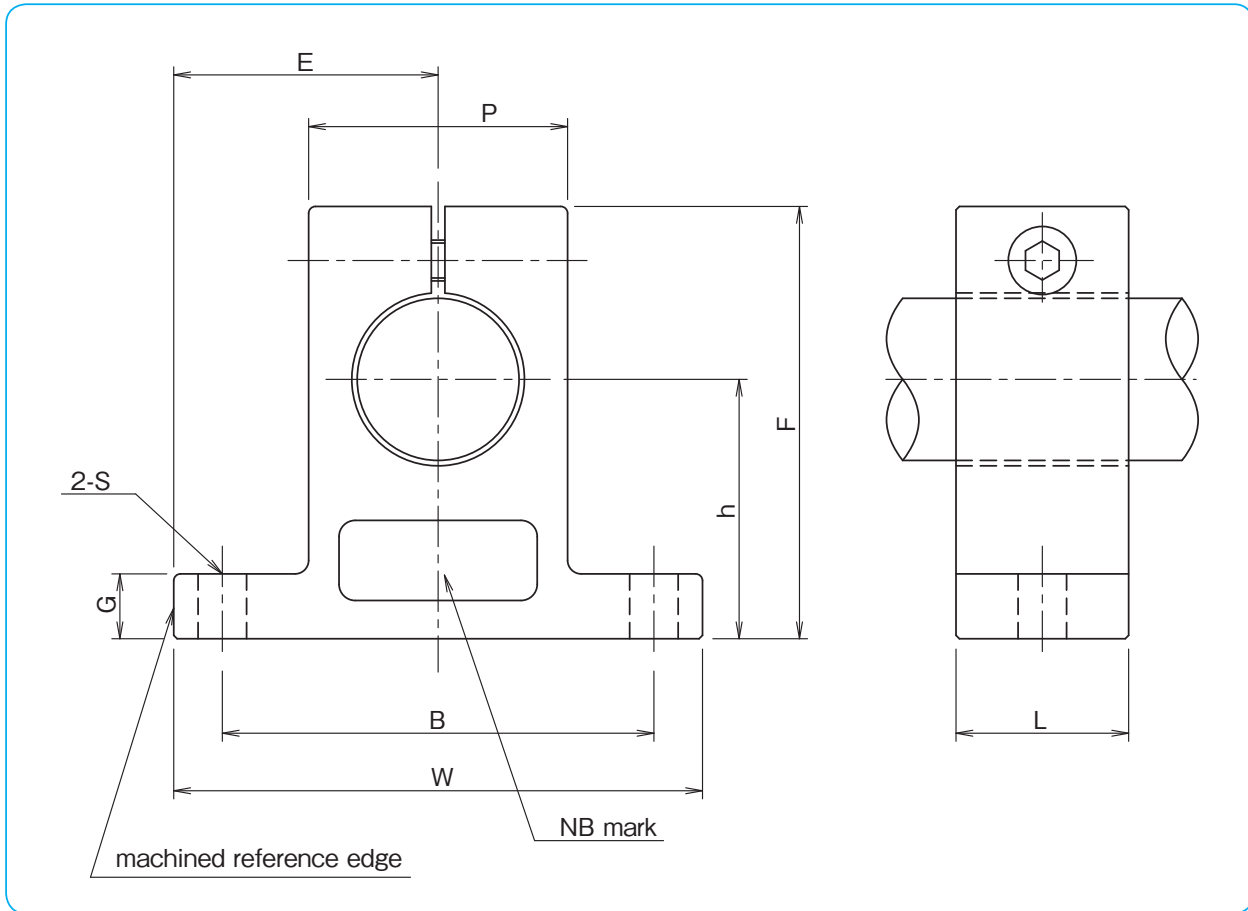


part number structure



part number	shaft diameter	major dimensions				
		h ±.001 inch	E ±.005 inch	W inch	L inch	F inch
WH 4A	.2500	.6875	.7500	1.500	.500	1.063
WH 6A	.3750	.7500	.8125	1.625	.563	1.187
WH 8A	.5000	1.0000	1.0000	2.000	.625	1.625
WH 10A	.6250	1.0000	1.2500	2.500	.688	1.750
WH 12A	.7500	1.2500	1.2500	2.500	.750	2.063
WH 16A	1.0000	1.5000	1.5315	3.063	1.000	2.500
WH 20A	1.2500	1.7500	1.8750	3.750	1.125	3.000
WH 24A	1.5000	2.0000	2.1875	4.375	1.250	3.437
WH 32A	2.0000	2.5000	2.7500	5.500	1.500	4.375

SHAFT



G	P	major dimensions			bolt#	mass	part number
		B ±.01 inch	S	inch			
.250	.500	1.125	.156	# 6	.033	WH 4A	
.250	.688	1.250	.156	# 6	.044	WH 6A	
.250	.875	1.500	.188	# 8	.075	WH 8A	
.313	1.000	1.875	.218	# 10	.106	WH 10A	
.313	1.250	2.000	.218	# 10	.156	WH 12A	
.375	1.500	2.500	.281	1/4	.294	WH 16A	
.438	2.000	3.000	.346	5/16	.531	WH 20A	
.500	2.250	3.500	.346	5/16	.725	WH 24A	
.625	3.000	4.500	.406	3/8	1.400	WH 32A	

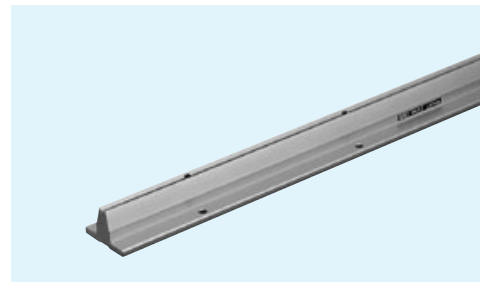
1kg ≅ 2.205lbs
1lb ≅ 0.454kg

SHAFT

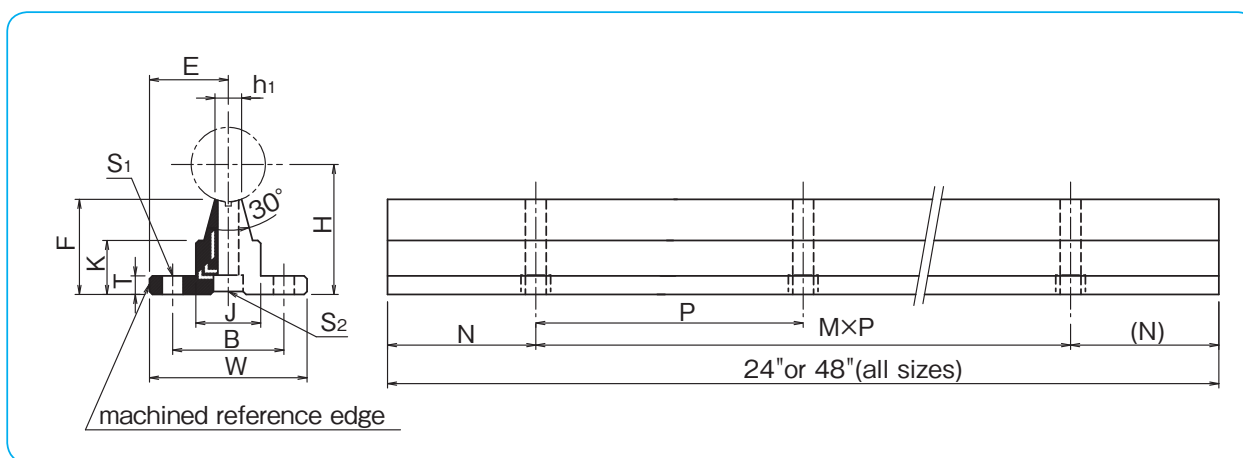
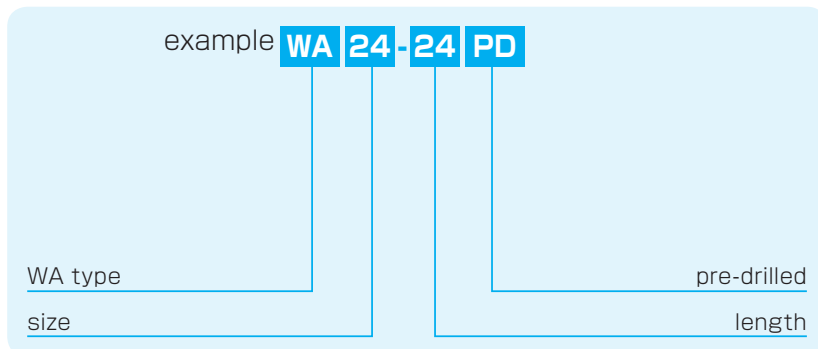
NIPPON BEARING

WA TYPE

— Shaft Support Rail —
(Inch Standard)



part number structure



part number	shaft diameter inch	major dimensions								mounting dimensions						mass lbs		
		H ±.001 inch	E ±.005 inch	W inch	F inch	T inch	K inch	J inch	h ₁ inch	B ±.01 inch	N inch	M×P inch	S ₁ hole inch	S ₁ bolt #	S ₂ hole inch		S ₂ bolt #	
WA 8-	24PD	.5000	1.125	.7500	1.500	.903	.188	.466	.500	.255	1.000	2	5×4	.169	#6	.169	#6	1.326
	48PD												11×4					2.652
WA10-	24PD	.6250	1.125	.8125	1.625	.841	.250	.423	.500	.276	1.125	2	5×4	.193	#8	.193	#8	1.488
	48PD												11×4					2.976
WA12-	24PD	.7500	1.500	.8750	1.750	1.158	.250	.592	.625	.322	1.250	3	3×6	.221	#10	.221	#10	2.100
	48PD												7×6					4.200
WA16-	24PD	1.0000	1.750	1.0625	2.125	1.280	.250	.727	.875	.359	1.500	3	3×6	.281	1/4	.281	1/4	2.776
	48PD												7×6					5.552
WA20-	24PD	1.2500	2.125	1.2500	2.500	1.537	.313	.799	1.100	.437	1.875	3	3×6	.343	5/16	.343	5/16	4.060
	48PD												7×6					8.120
WA24-	24PD	1.5000	2.500	1.5000	3.000	1.798	.375	.922	1.375	.558	2.250	4	2×8	.343	5/16	.406	3/8	5.840
	48PD												5×8					11.680
WA32-	24PD	2.0000	3.250	1.8750	3.750	2.322	.500	1.450	1.500	.800	2.750	4	2×8	.406	3/8	.531	1/2	9.500
	48PD												5×8					19.000

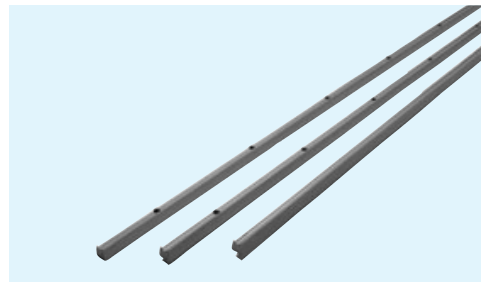
All sizes are also available without pre-drilled mounting holes.
Complete shaft-rail assemblies are also available as well as custom drilling and lengths.
Please send drawings with customer specifications.
Product of NB Corporation of America

1kg ≅ 2.205lbs
1lb ≅ 0.454kg

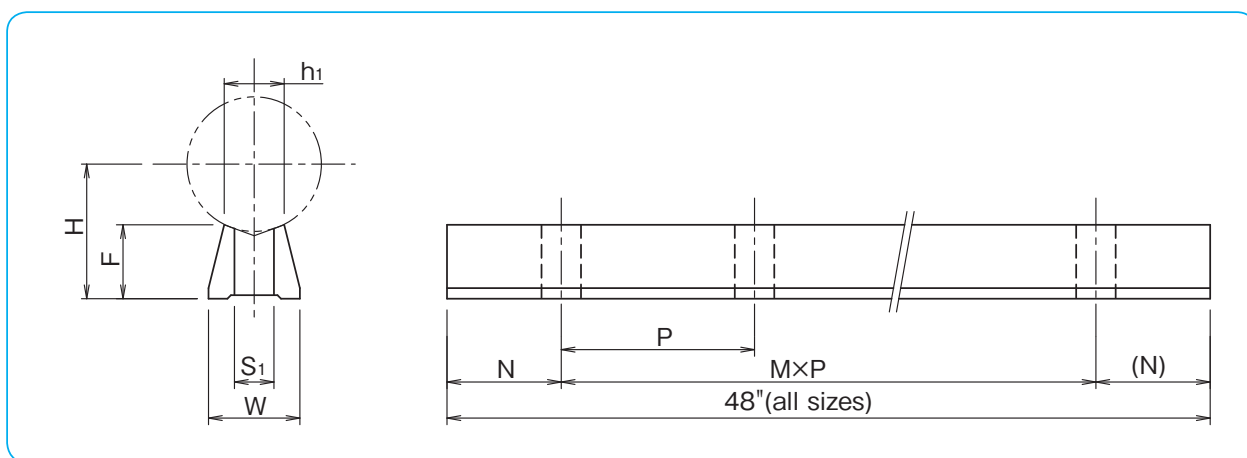
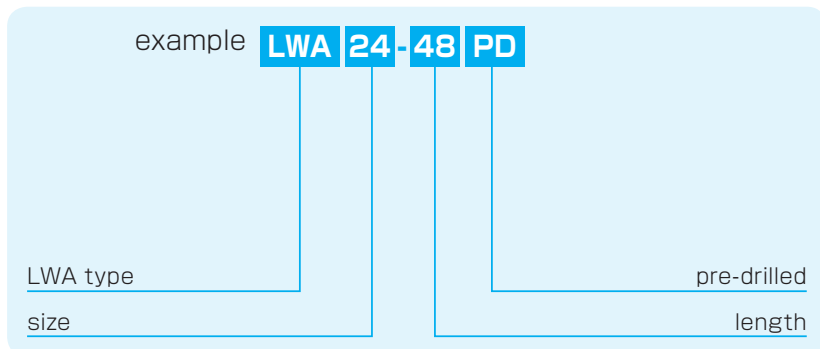
SHAFT

LWA TYPE

– Low Shaft Support Rail –
(Inch Standard)



part number structure



part number	shaft diameter inch	major dimensions			mounting dimensions				mass lb
		H ±.002 inch	W inch	F inch	N inch	M×P inch	h ₁ inch	S ₁ inch	
LWA 8-48 PD	.5000	.5625	.37	.342	2	11×4	0.25	.169	0.11
LWA 10-48 PD	.6250	.6875	.45	.405	2	11×4	0.276	.193	0.17
LWA 12-48 PD	.7500	.7500	.51	.409	3	7×6	0.317	.220	0.20
LWA 16-48 PD	1.0000	1.0000	.69	.545	3	7×6	0.422	.283	0.35
LWA 20-48 PD	1.2500	1.1875	.78	.617	3	7×6	0.520	.343	0.44
LWA 24-48 PD	1.5000	1.3750	.93	.691	4	5×8	0.630	.406	0.58
LWA 32-48 PD	2.0000	1.7500	1.18	.836	4	5×8	0.824	.531	0.89

Product of NB Corporation of America

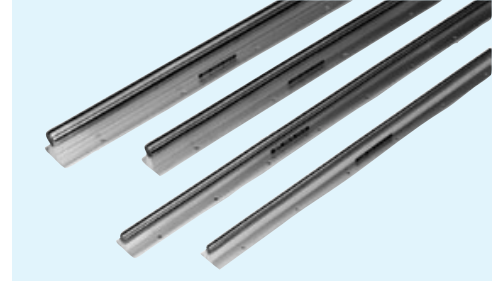
1kg ≅ 2.205lbs
1lb ≅ 0.454kg

SHAFT

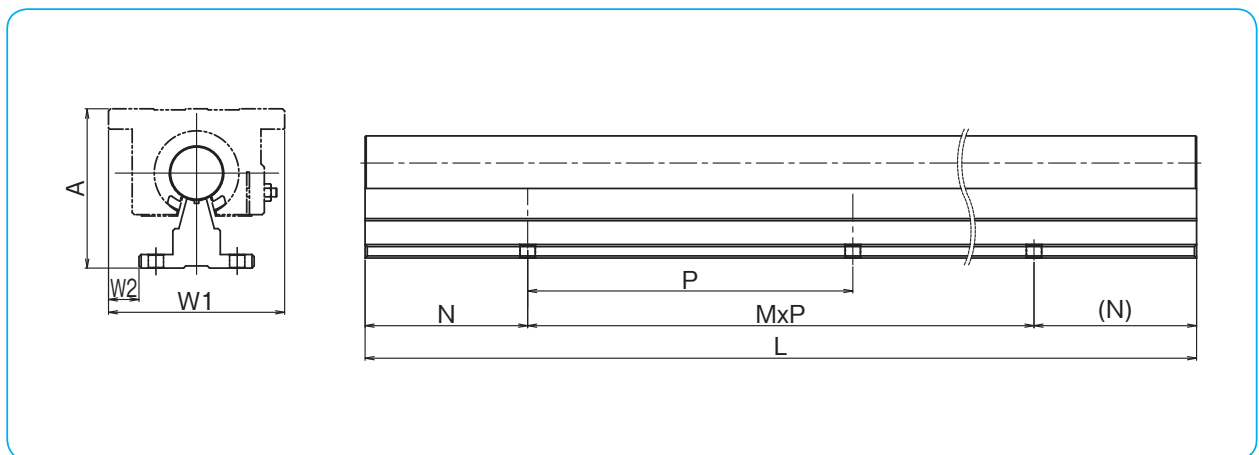
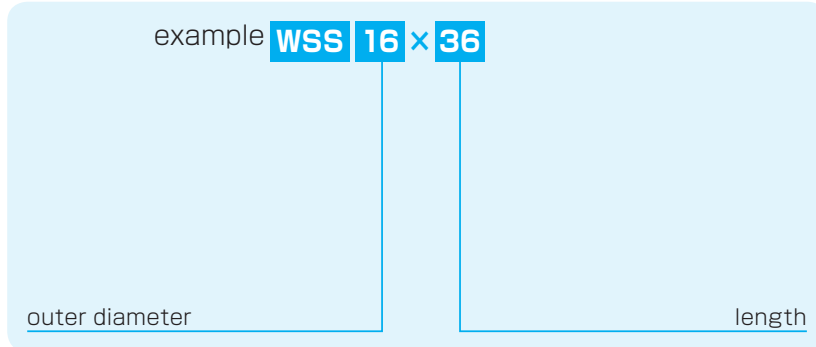
NIPPON BEARING

WSS TYPE

– Shaft Support Assembly –
(Standard Type)



part number structure



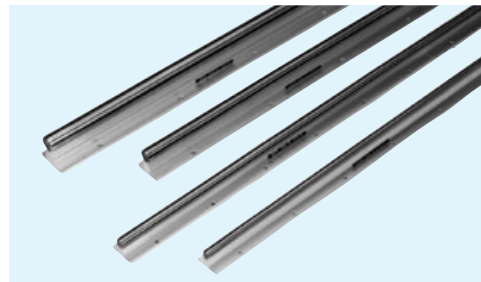
Part Number	Outer Diameter inch/mm	Outer Assembly Dimensions			Base Mounting Holes		Maximum Length	Weight lbs/ft kg/m
		A inch/mm	W1 inch/mm	W2 inch/mm	N inch/mm	P inch/mm		
WSS 8	1/2	1.812	2.000	0.2500	2.000	4.000	168	1.26
	12.700	46.02	50.80	6.35	50.80	101.60	4267.2	1.88
WSS 10	5/8	2.000	2.500	0.4375	2.000	4.000	180	1.83
	15.875	50.80	63.50	11.11	50.80	101.60	4572.0	2.72
WSS 12	3/4	2.437	2.750	0.5000	3.000	6.000	204	2.50
	19.050	61.90	69.85	12.70	76.20	152.40	5181.6	3.72
WSS 16	1	2.937	3.250	0.5625	3.000	6.000	204	4.06
	25.400	74.60	82.55	14.29	76.20	152.40	5181.6	6.04
WSS 20	1-1/4	3.625	4.000	0.7500	3.000	6.000	204	6.28
	31.750	92.08	101.60	19.05	76.20	152.40	5181.6	9.35
WSS 24	1-1/2	4.250	4.750	0.8750	4.000	8.000	204	8.60
	38.100	107.95	120.65	22.23	101.60	203.20	5181.6	12.8
WSS 32	2	5.375	6.000	1.1250	4.000	8.000	204	14.88
	50.800	136.53	152.40	28.58	101.60	203.20	5181.6	22.14

Product of NB Corporation of America

SHAFT

WSS-SS TYPE

– Shaft Support Assembly –
(Stainless Steel Type)

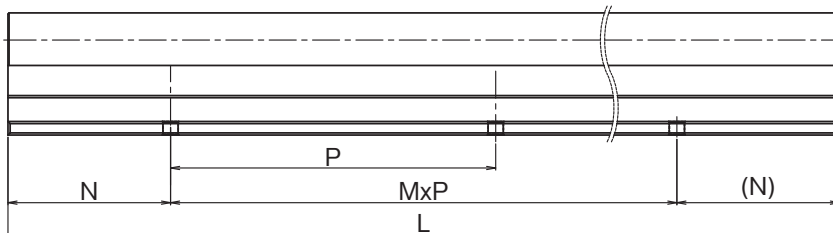
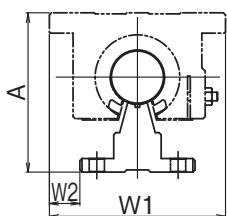


part number structure

example **WSS 8 x 36 - SS**

outer diameter

length



Part Number	Outer Diameter inch/mm	Outer Assembly Dimensions			Base Mouting Holes		Maximum Length	Weight	
		A inch/mm	W1 inch/mm	W2 inch/mm	N inch/mm	P inch/mm		lbs/ft	kg/m
WSS 8-SS	1/2	1.812	2.000	0.2500	2.000	4.000	158	1.26	
	12.700	46.02	50.80	6.35	50.80	101.60	4013.2	1.88	
WSS 10-SS	5/8	2.000	2.500	0.4375	2.000	4.000	158	1.83	
	15.875	50.80	63.50	11.11	50.80	101.60	4013.2	2.72	
WSS 12-SS	3/4	2.437	2.750	0.5000	3.000	6.000	158	2.50	
	19.050	61.90	69.85	12.70	76.20	152.40	4013.2	3.72	
WSS 16-SS	1	2.937	3.250	0.5625	3.000	6.000	158	4.06	
	25.400	74.60	82.55	14.29	76.20	152.40	4013.2	6.04	
WSS 20-SS	1-1/4	3.625	4.000	0.7500	3.000	6.000	158	6.28	
	31.750	92.08	101.60	19.05	76.20	152.40	4013.2	9.35	
WSS 24-SS	1-1/2	4.250	4.750	0.8750	4.000	8.000	158	8.60	
	38.100	107.95	120.65	22.23	101.60	203.20	4013.2	12.8	
WSS 32-SS	2	5.375	6.000	1.1250	4.000	8.000	204	14.88	
	50.800	136.53	152.40	28.58	101.60	203.20	5181.6	22.14	

Product of NB Corporation of America

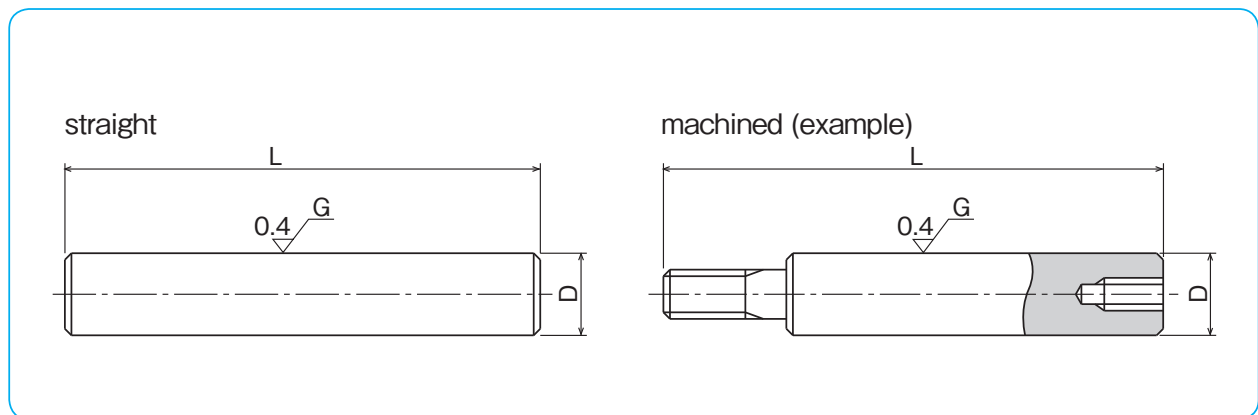
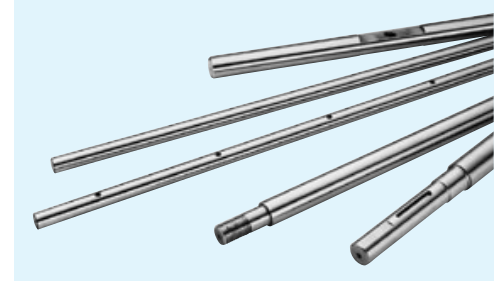
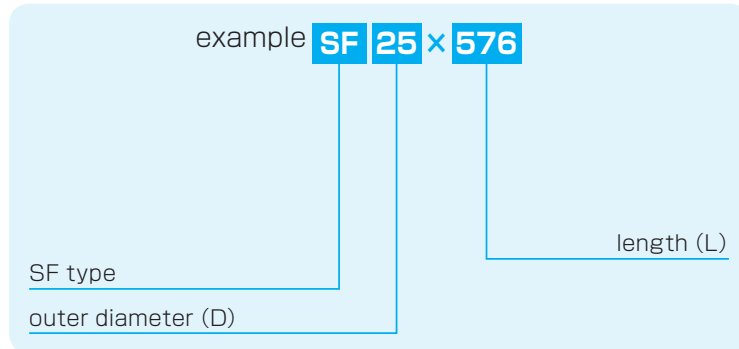
SHAFT

NIPPON BEARING

SF TYPE

– NBCA Shaft –

part number structure



part number	outer diameter		length L mm	mass Kg/m
	D mm	tolerance g6 μm		
SF 6	6	-4/-12	100 ← → 3000	0.23
SF 8	8	- 5	100 ← → 3000	0.40
SF 10	10	-14	100 ← → 3000	0.62
SF 12	12		100 ← → 3000	0.89
SF 13	13	- 6	100 ← → 3000	1.04
SF 15	15	-17	100 ← → 3000	1.39
SF 16	16		100 ← → 3000	1.58
SF 20	20	- 7	100 ← → 3000	2.47
SF 25	25	-20	100 ← → 3000	3.85
SF 30	30		100 ← → 3000	5.55
SF 35	35	- 9	100 ← → 3000	7.55
SF 40	40	-25	100 ← → 3000	9.87
SF 50	50		100 ← → 3000	15.4

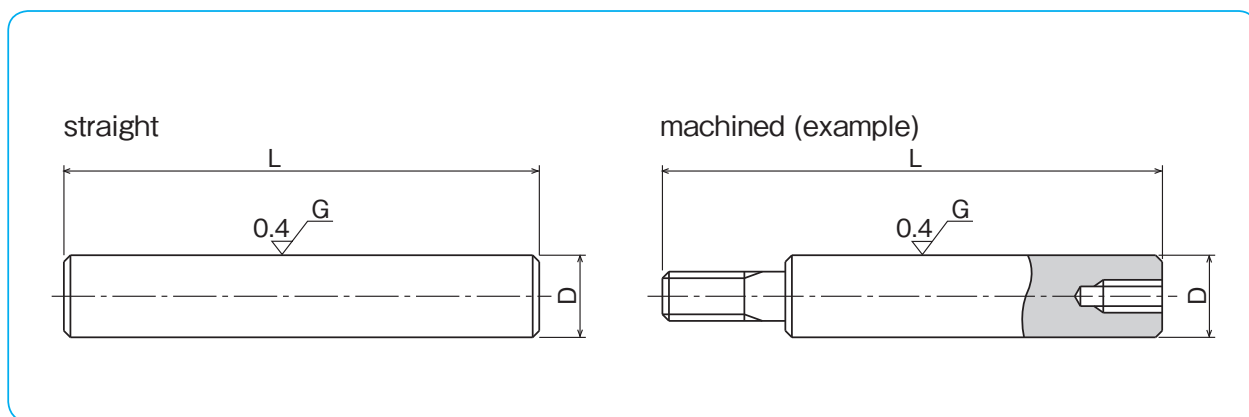
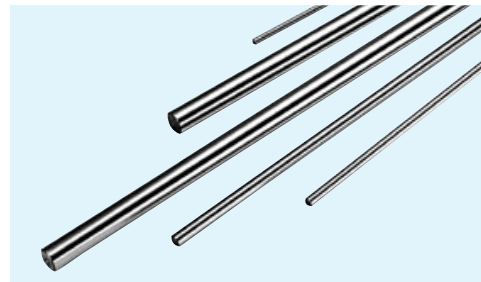
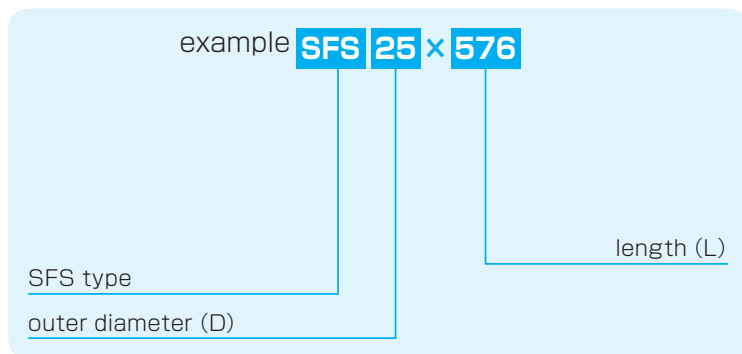
material: CF53 or Equivalent hardness: 60HRC (HV697) or more
Product of NB Corporation of America

SHAFT

SFS TYPE

– NBCA Stainless Steel Shaft –

part number structure



part number	outer diameter		length L mm	mass Kg/m
	D mm	tolerance g6 μm		
SFS 6	6	-4/-12	100 ← → 3000	0.22
SFS 8	8	- 5	100 ← → 3000	0.39
SFS 10	10	-14	100 ← → 3000	0.61
SFS 12	12		100 ← → 3000	0.88
SFS 13	13	- 6	100 ← → 3000	1.03
SFS 16	16	-17	100 ← → 3000	1.56
SFS 20	20		100 ← → 3000	2.43
SFS 25	25	- 7	100 ← → 3000	3.80
SFS 30	30	-20	100 ← → 3000	5.48
SFS 35	35		100 ← → 3000	7.46
SFS 40	40	- 9	100 ← → 3000	9.75
SFS 50	50	-25	100 ← → 3000	15.2

material: X46Cr13 or Equivalent
 hardness: 52HRC (HV544) or more
 Product of NB Corporation of America

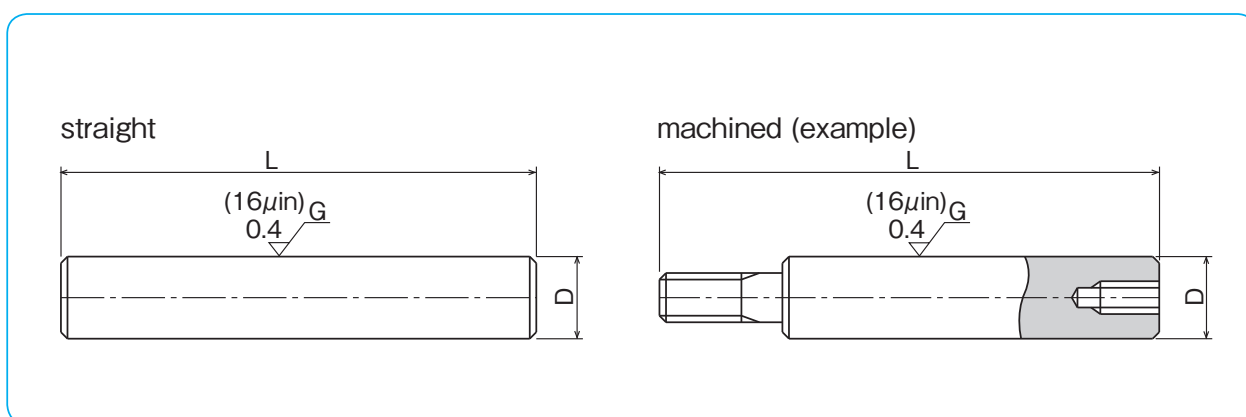
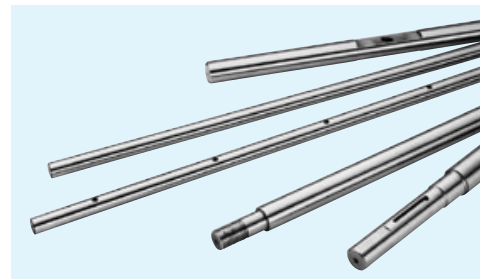
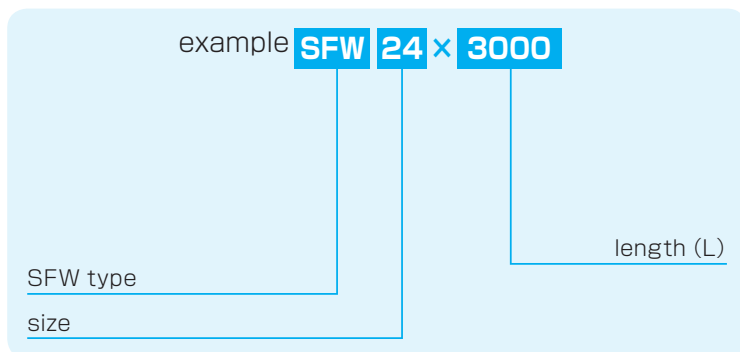
SHAFT

NIPPON BEARING

SFW TYPE

– NBCA Inch Shaft –

part number structure



Part Number	Outer Diameter D		Length L inch/mm	Mass lbs/inch kg/m
	inch/mm	inch/µm		
SFW 4	1/4	-0.0005	2	120
	6.350		50.8 ← → 3048	0.014
SFW 6	3/8	-0.0010	2	120
	9.525		50.8 ← → 3048	0.031
SFW 8	1/2	-13	2	120
	12.700		50.8 ← → 3048	0.056
SFW 10	5/8	-25	2	120
	15.875		50.8 ← → 3048	0.086
SFW 12	3/4	-0.0006~-0.0011	2	120
	19.050		50.8 ← → 3048	0.125
SFW 16	1	-15~-27	2	120
	25.400		50.8 ← → 3048	0.222
SFW 20	1-1/4	-0.0006~-0.0013	2	120
	31.750		50.8 ← → 3048	0.348
SFW 24	1-1/2	-15~-33	2	120
	38.100		50.8 ← → 3048	0.500
SFW 32	2		2	120
	50.800		50.8 ← → 3048	0.890

material: CF53 or Equivalent

hardness: 60 HRC or more

Product of NB Corporation of America

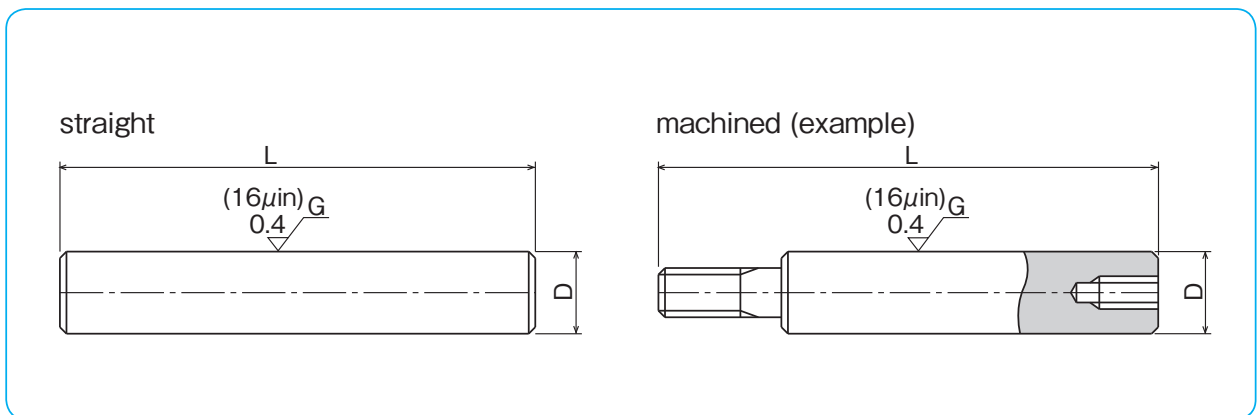
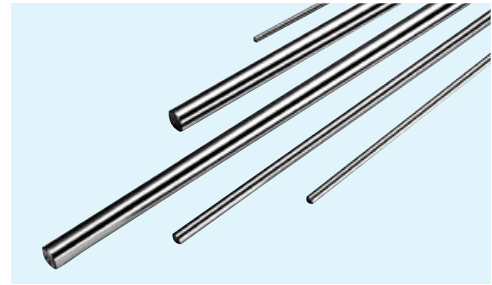
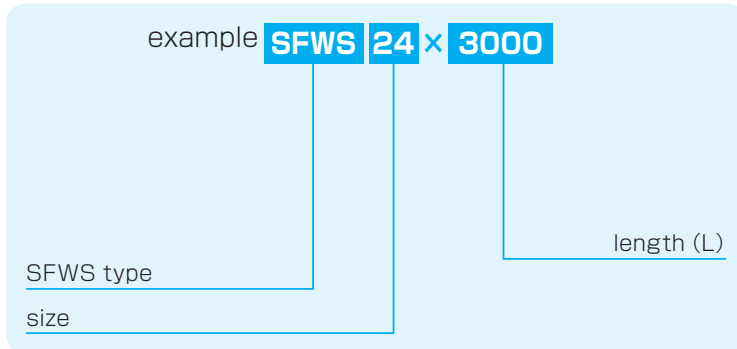
1kg ≅ 2.205lbs

SHAFT

SFWS TYPE

– NBCA Inch Stainless Steel Shaft –

part number structure



Part Number	Outer Diameter		Length L	Mass	
	D inch/mm	inch/µm			L inch/mm
SFWS 2	1/8	-.0002~--.0005	2	16	0.004
	3.175	-4~-12	50.8 ← →	406.4	0.10
SFWS 3	3/16	-.0002~--.0006	2	16	0.008
	4.763	-5~-14	50.8 ← →	406.4	0.20
SFWS 4	1/4	-.0005 -.0010 -13 -25	2	120	0.014
	6.350		50.8 ← →	3048	0.25
SFWS 6	3/8		2	120	0.031
	9.525		50.8 ← →	3048	0.56
SFWS 8	1/2		2	120	0.056
	12.700		50.8 ← →	3048	0.99
SFWS 10	5/8		2	120	0.086
	15.875		50.8 ← →	3048	1.55
SFWS 12	3/4		2	120	0.125
	19.050		50.8 ← →	3048	2.24
SFWS 16	1		2	120	0.222
	25.400		50.8 ← →	3048	3.98
SFWS 20	1-1/4	2	120	0.348	
	31.750	50.8 ← →	3048	6.22	
SFWS 24	1-1/2	-.0006~--.0011	2	120	0.500
	38.100	-15~-27	50.8 ← →	3048	8.95
SFWS 32	2	-.0006~--.0013	2	120	0.890
	50.800	-15~-33	50.8 ← →	3048	15.91

material: X46Cr13 or Equivalent

hardness: 52 HRC or more

Product of NB Corporation of America

1kg ≅ 2.205lbs

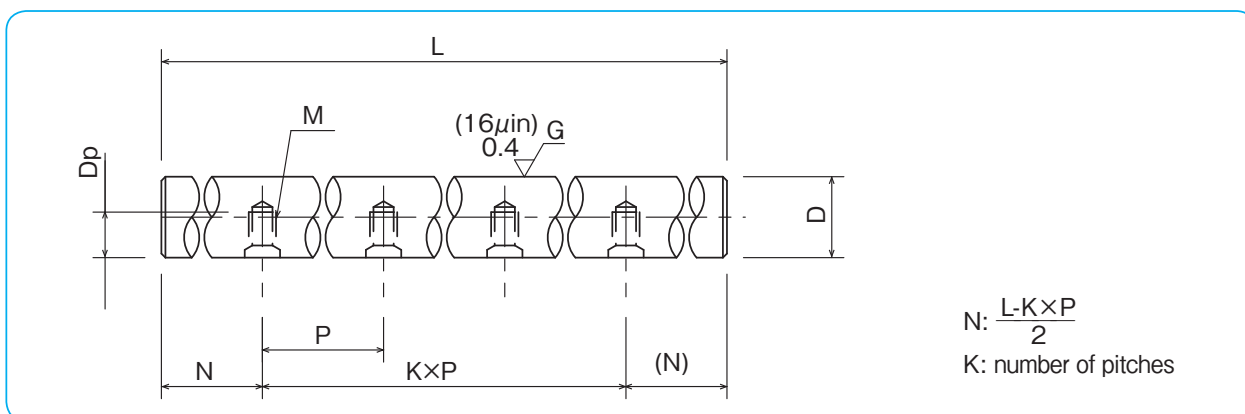
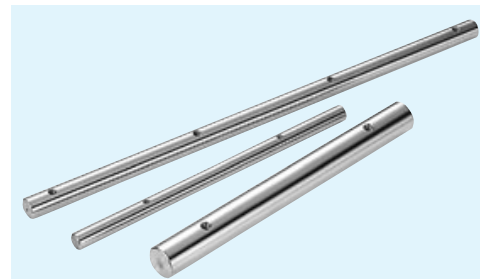
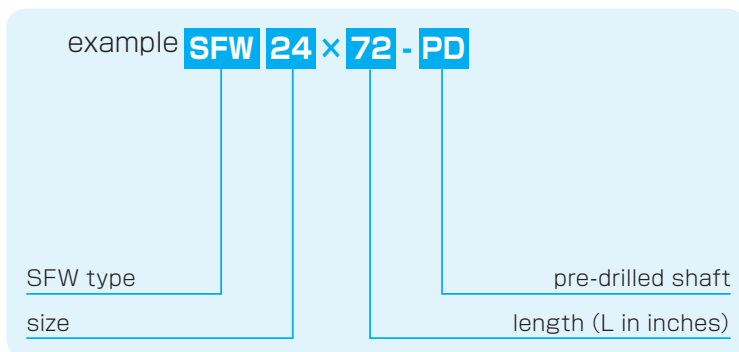
SHAFT

NIPPON BEARING

SFW-PD

– NBCA Inch Pre-Drilled Shaft –

part number structure



Part Number	Outer Diameter		Pitch P inch/mm	Bolt Size M	Tapped Hole Depth Dp inch/mm	Maximum Length L inch/mm	
	D inch/mm	inch/ μ m					
SFW 8-PD	1/2	-.0005	4	# 6-32	0.280	168	
	12.700	-.0010					
SFW 10-PD	5/8	-13	101.6	# 8-32	0.350	180	
	15.875	-25					
SFW 12-PD	3/4	-.0005	6	# 10-32	0.400	204	
	19.050	-.0010					
SFW 16-PD	1	-13	152.4	1/4-20	0.500	204	
	25.400	-25					
SFW 20-PD	1-1/4	-15	8	5/16-18	0.650	204	
	31.750	-27					
SFW 24-PD	1-1/2	-.0006	203.2	3/8-16	0.700	204	
	38.100	-.0011					
SFW 32-PD	2	-15	1	1/2-13	0.850	204	
	50.800	-.0006					21.6
		-.0013					

material: CF53 or Equivalent

hardness: 60 HRC or more

Product of NB Corporation of America

1kg \approx 2.205lbs

SHAFT

SFWS-PD

– NBCA Inch Pre-Drilled Stainless Steel Shaft –

part number structure

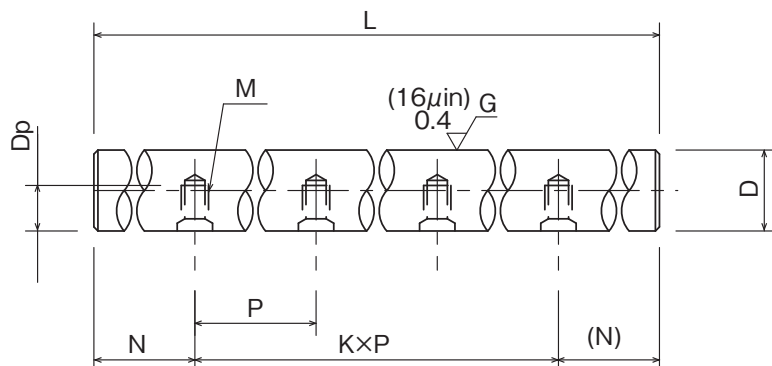
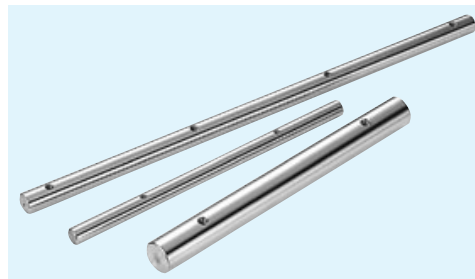
example **SFWS 24 x 72 - PD**

SFWS type

size

pre-drilled shaft

length (L in inches)



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

K: number of pitches

Part Number	Outer Diameter		Pitch P inch/mm	Bolt Size M	Tapped Hole Depth Dp inch/mm	Maximum Length L inch/mm
	D inch/mm	inch/µm				
SFWS 8-PD	1/2	-.0005	4	# 6-32	0.280	158
	12.700	-.0010				
SFWS 10-PD	5/8	-13	101.6	# 8-32	0.350	158
	15.875	-25				
SFWS 12-PD	3/4	-.0005	6	# 10-32	0.400	158
	19.050	-.0010				
SFWS 16-PD	1	-13	152.4	1/4-20	0.500	158
	25.400	-25				
SFWS 20-PD	1-1/4	-.0006	8	5/16-18	0.650	158
	31.750	-.0011				
SFWS 24-PD	1-1/2	-15	203.2	3/8-16	0.700	158
	38.100	-27				
SFWS 32-PD	2	-.0006		1/2-13	0.850	158
	50.800	-.0013				
		-15			21.6	4013.2
		-33				

material: X46Cr13 or Equivalent

hardness: 52 HRC or more

Product of NB Corporation of America

1kg ≈ 2.205lbs

SHAFT

NIPPON BEARING

SFW-FS102/SFWS-FS102 TYPE

– Format Single End Tapped Inch Shaft –



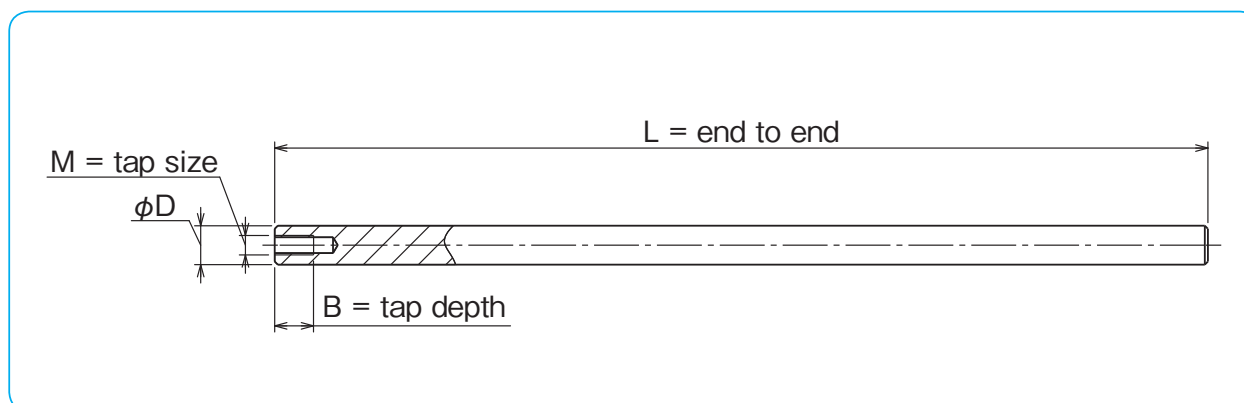
part number structure

example **SFW 16 × 18 - FS102**

material
SFW: CF53 or Equivalent
SFWS: X46Cr13 or Equivalent

size

FS102-Single End Tapped length(L in inches)



Part Number		Outer Diameter		Tap Size	Tap Depth	Length															
SFW	SFWS	D		M	B	in mm															
		inch/mm	inch/μm																		
SFW 4-FS102		1/4		# 5-40	0.250"	6	8				12	18	24								
		6.350				152.4	203.2				304.8	457.2	609.6								
SFW 6-FS102	SFWS 6-FS102	3/8		# 8-32	0.330"	6	8*	9*	10*	12	18	24	36								
		9.525				152.4	203.2	228.6	254	304.8	457.2	609.6	914.4								
SFW 8-FS102	SFWS 8-FS102	1/2	-0.0005	1/4-20	0.500"	6	8*	9*	10*	12	18	24	36								
		12.700				152.4	203.2	228.6	254	304.8	457.2	609.6	914.4								
SFW 10-FS102	SFWS10-FS102	5/8	-0.0010	1/4-20	0.500"	6	8*	9*	10*	12	18	24	36								
		15.875				152.4	203.2	228.6	254	304.8	457.2	609.6	914.4								
SFW 12-FS102	SFWS12-FS102	3/4	-0.0025	5/16-18	0.625"	6	8*	9*	10*	12	18	24	36								
		19.050				152.4	203.2	228.6	254	304.8	457.2	609.6	914.4								
SFW 16-FS102	SFWS16-FS102	1		3/8-16	0.750"	6	8*	9*	10*	12	18	24	36								
		25.400				152.4	203.2	228.6	254	304.8	457.2	609.6	914.4								
SFW 20-FS102	SFWS20-FS102	1-1/4		1/2-13	1.000"	6	8*	9*	10*	12	18	24	36								
		31.750				152.4	203.2	228.6	254	304.8	457.2	609.6	914.4								
SFW 24-FS102	SFWS24-FS102	1-1/2	-0.0006	5/8-11	1.250"	6					12	18	24	36							
			-0.0011												152.4						
		38.100	-0.0015																		

hardness of SFW: 60 HRC or more
 hardness of SFWS: 52 HRC or more
 Product of NB Corporation of America
 * SFWS is not available

SHAFT

SFW-FS103/SFWS-FS103 TYPE

– Format Both Ends Tapped Inch Shaft –



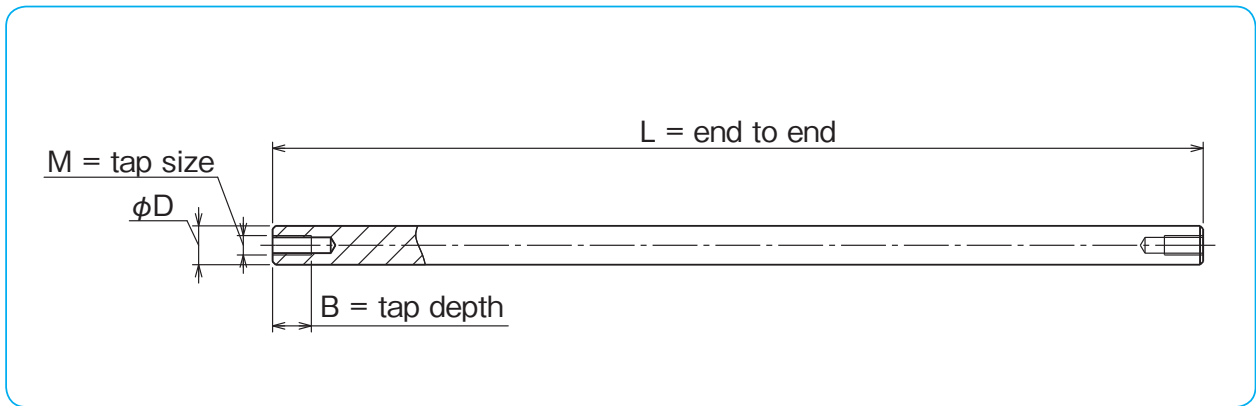
part number structure

example **SFWS 16 x 18 - FS103**

material
SFW: CF53 or Equivalent
SFWS: X46Cr13 or Equivalent

size

FS103-Both Ends Tapped
 length(L in inches)



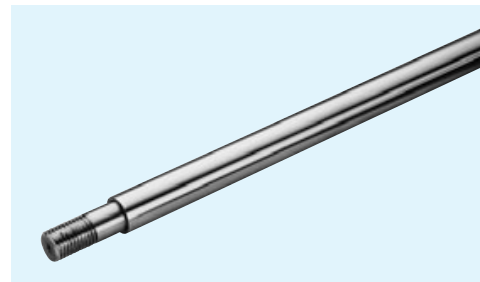
Part Number		Outer Diameter		Tap Size	Tap Depth	Length							
SFW	SFWS	D	inch/ μ m	M	B	in mm							
SFW 4-FS103		1/4	6.350	# 5-40	0.250"	6	8			12	18	24	
		152.4				203.2			304.8	457.2	609.6		
SFW 6-FS103	SFWS 6-FS103	3/8	9.525	# 8-32	0.330"	6	8*	9*	10*	12	18	24	36
		152.4				203.2	228.6	254	304.8	457.2	609.6	914.4	
SFW 8-FS103	SFWS 8-FS103	1/2	12.700	1/4-20	0.500"	6	8*	9*	10*	12	18	24	36
		152.4				203.2	228.6	254	304.8	457.2	609.6	914.4	
SFW 10-FS103	SFWS 10-FS103	5/8	15.875	1/4-20	0.500"	6	8*	9*	10*	12	18	24	36
		152.4				203.2	228.6	254	304.8	457.2	609.6	914.4	
SFW 12-FS103	SFWS 12-FS103	3/4	19.050	5/16-18	0.625"	6	8*	9*	10*	12	18	24	36
		152.4				203.2	228.6	254	304.8	457.2	609.6	914.4	
SFW 16-FS103	SFWS 16-FS103	1	25.400	3/8-16	0.750"	6	8*	9*	10*	12	18	24	36
		152.4				203.2	228.6	254	304.8	457.2	609.6	914.4	
SFW 20-FS103	SFWS 20-FS103	1-1/4	31.750	1/2-13	1.000"	6	8*	9*	10*	12	18	24	36
		152.4				203.2	228.6	254	304.8	457.2	609.6	914.4	
SFW 24-FS103	SFWS 24-FS103	1-1/2	38.100	5/8-11	1.250"	6				12	18	24	36
		152.4							304.8	457.2	609.6	914.4	

hardness of SFW: 60 HRC or more
 hardness of SFWS: 52 HRC or more
 Product of NB Corporation of America
 * SFWS is not available

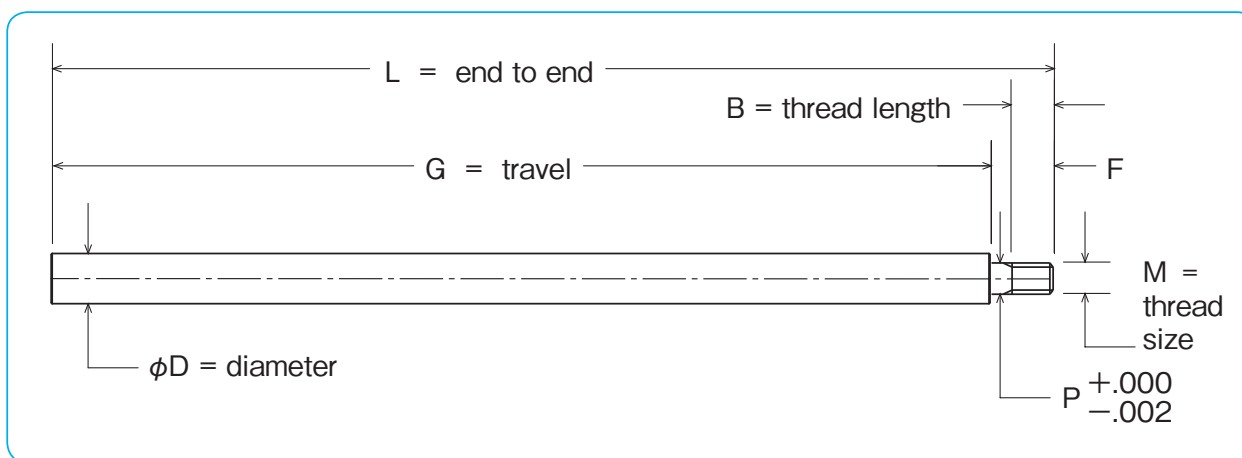
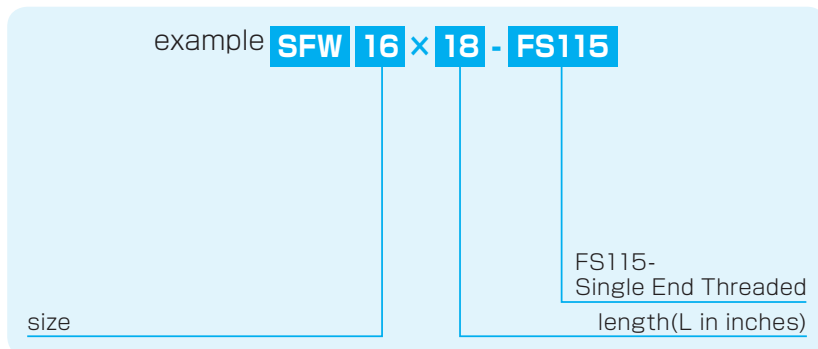
NIPPON BEARING

SFW-FS115 TYPE

– Format Single End Threaded Inch Shafts –



part number structure



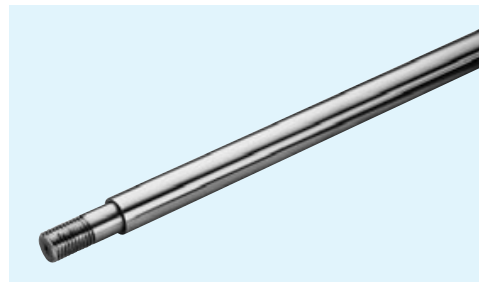
Part Number	Outer Diameter		Thread Size M	Thread Length B inch/mm	Journal Length F inch/mm	Journal DIA P inch/mm	4" Travel	6" Travel	8" Travel	12" Travel	24" Travel	36" Travel	48" Travel
	D inch/mm	inch/μm					G Length L inch/mm	G Length L inch/mm	G Length L inch/mm	G Length L inch/mm	G Length L inch/mm	G Length L inch/mm	G Length L inch/mm
SFW 6-FS115	3/8	- .0005 - .0010	1/4-20	0.31 7.87	0.50 12.70	0.250 6.35	4.500 114.3	6.500 165.1	8.500 215.9	12.500 317.5	24.500 622.3		
	9.525												
SFW 8-FS115	1/2	-13 -25	5/16-18	0.39 9.91	0.63 15.88	0.313 7.95	4.625 117.5	6.625 168.3	8.625 219.1	12.625 320.7	24.625 625.5		
	12.700												
SFW 10-FS115	5/8	-13 -25	3/8-16	0.47 11.94	0.75 19.05	0.375 9.53	4.750 120.7	6.750 171.5	8.750 222.3	12.750 323.9	24.750 628.7		
	15.875												
SFW 12-FS115	3/4	-13 -25	1/2-13	0.63 16.00	1.00 25.40	0.500 12.70	5.000 127.0	7.000 177.8	9.000 228.6	13.000 330.2	25.000 635.0		
	19.050												
SFW 16-FS115	1	-13 -25	5/8-11	0.78 19.81	1.25 31.75	0.625 15.88		7.250 184.2	9.250 235.0	13.250 336.6	25.250 641.4	37.250 946.2	
	25.400												
SFW 20-FS115	1-1/4	-13 -25	3/4-10	0.94 23.88	1.50 38.10	0.750 19.05		7.500 190.5	9.500 241.3	13.500 342.9	25.500 647.7	37.500 952.5	
	31.750												
SFW 24-FS115	1-1/2	- .0006 ~ - .0011 -15 ~ -27	1-8	1.25 31.75	2.00 50.80	1.000 25.40			10.000 254.0	14.000 355.6	26.000 660.4	38.000 965.2	50.000 1270.0
	38.100												

material: CF53 or Equivalent
 hardness: 60 HRC or more
 stainless steel sizes are available on this series by quote only
 Product of NB Corporation of America

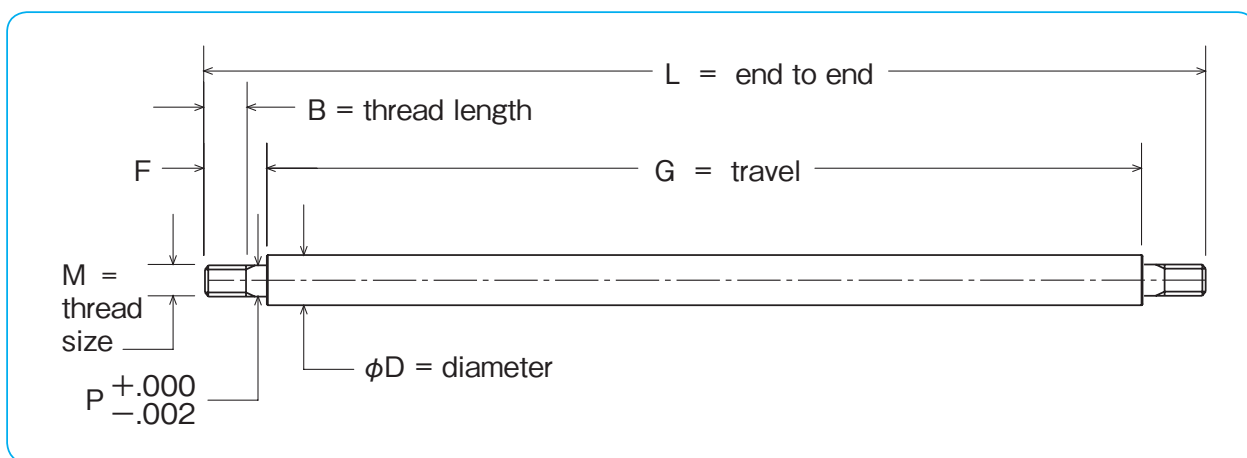
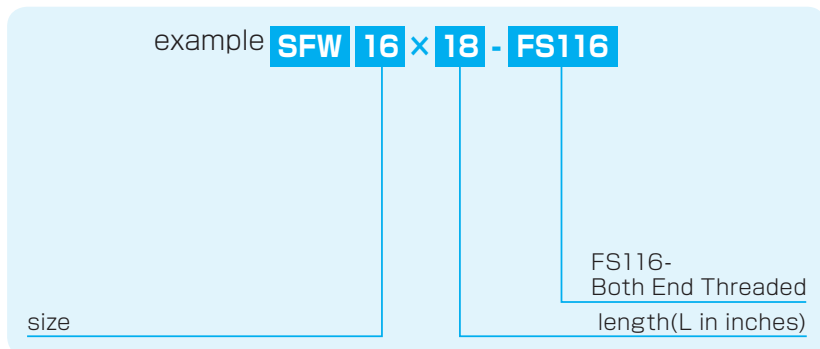
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SFW-FS116 TYPE

– Format Both Ends Threaded Inch Shafts –



part number structure



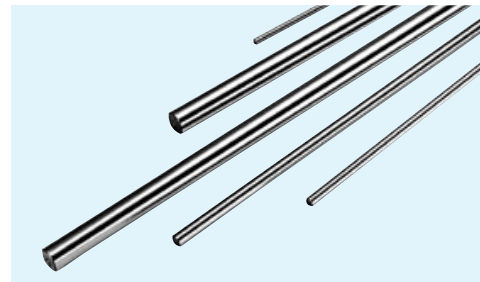
Part Number	Outer Diameter		Thread Size M	Thread Length B	Journal Length F	Journal DIA P	4" Travel	6" Travel	8" Travel	12" Travel	24" Travel	36" Travel	48" Travel
	D						G	G	G	G	G	G	G
	inch/mm	inch/μm		inch/mm	inch/mm	inch/mm	inch/mm	inch/mm	inch/mm	inch/mm	inch/mm	inch/mm	inch/mm
SFW 6-FS116	3/8	-0.0005 -0.0010	1/4-20	0.31 7.87	0.50 12.70	0.250 6.35	5.000 127.0	7.000 177.8	9.000 228.6	13.000 330.2	25.000 635.0		
	9.525												
SFW 8-FS116	1/2	-13 -25	5/16-18	0.39 9.91	0.63 15.88	0.313 7.95	5.250 133.4	7.250 184.2	9.250 235.0	13.250 336.6	25.250 641.4		
	12.700												
SFW 10-FS116	5/8	-0.0006~-0.0011 -15~-27	3/8-16	0.47 11.94	0.75 19.05	0.375 9.53	5.500 139.7	7.500 190.5	9.500 241.3	13.500 342.9	25.500 647.7		
	15.875												
SFW 12-FS116	3/4	-0.0006~-0.0011 -15~-27	1/2-13	0.63 16.00	1.00 25.40	0.500 12.70	6.000 152.4	8.000 203.2	10.000 254.0	14.000 355.6	26.000 660.4		
	19.050												
SFW 16-FS116	1	-0.0006~-0.0011 -15~-27	5/8-11	0.78 19.81	1.25 31.75	0.625 15.88	8.500 215.9	10.500 266.7	14.500 368.3	26.500 673.1	38.500 977.9		
	25.400												
SFW 20-FS116	1-1/4	-0.0006~-0.0011 -15~-27	3/4-10	0.94 23.88	1.50 38.10	0.750 19.05	9.000 228.6	11.000 279.4	15.000 381.0	27.000 685.8	39.000 990.6		
	31.750												
SFW 24-FS116	1-1/2	-0.0006~-0.0011 -15~-27	1-8	1.25 31.75	2.00 50.80	1.000 25.40	12.000 304.8	16.000 406.4	28.000 711.2	40.000 1016.0	52.000 1320.8		
	38.100												

material: CF53 or Equivalent
 hardness: 60 HRC or more
 stainless steel sizes are available on this series by quote only
 Product of NB Corporation of America

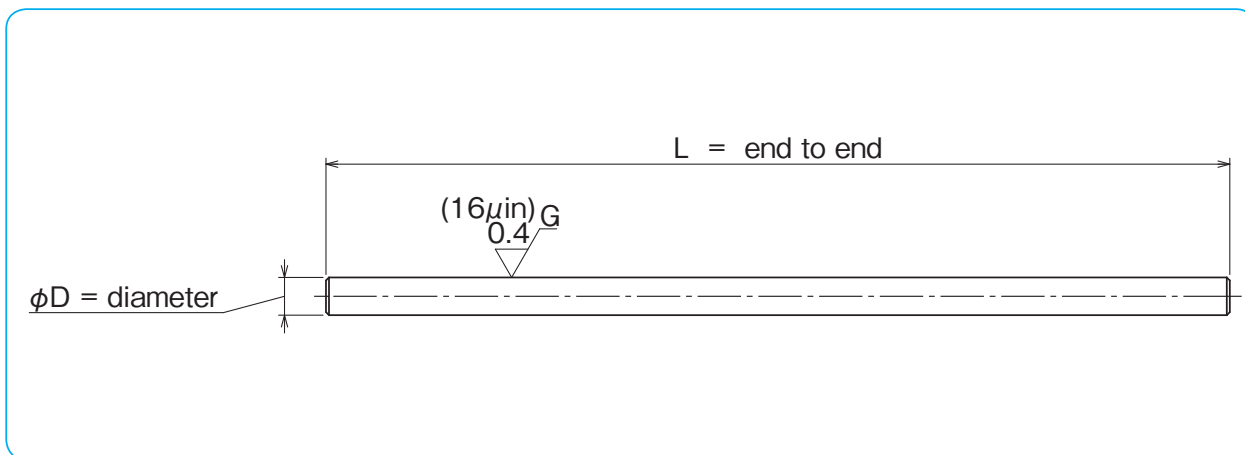
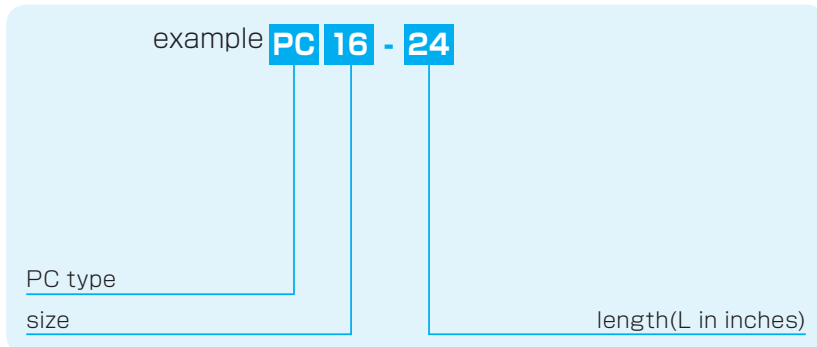
NIPPON BEARING

PC TYPE

– Pre-Cut Slide Shafts –



part number structure



Part Number	Outer Diameter		Length L							Mass		
	D inch/mm	inch/μm	6	12	18	24				lbs/inch	kg/m	
PC 4	1/4	-0.0005 -0.0010 -13 -25	6	12	18	24				0.014	0.25	
	6.350		152.4	304.8	457.2	609.6						
PC 6	3/8		6	12	18	24				0.031	0.56	
	9.525		152.4	304.8	457.2	609.6						
PC 8	1/2			12	18	24	30	36		0.056	0.99	
	12.700			304.8	457.2	609.6	762	914.4				
PC 10	5/8			12	18	24	30	36		0.086	1.55	
	15.875			304.8	457.2	609.6	762	914.4				
PC 12	3/4				18	24	30	36	42	48	0.125	2.24
	19.050				457.2	609.6	762	914.4	1066.8	1219.2		
PC 16	1				18	24	30	36	42	48	0.222	3.98
	25.400				457.2	609.6	762	914.4	1066.8	1219.2		
PC 20	1-1/4				18	24	30	36	42	48	0.348	6.22
	31.750				457.2	609.6	762	914.4	1066.8	1219.2		
PC 24	1-1/2	-0.0006~-0.0011		18	24		36		48	0.500	8.95	
	38.100	-15~-27		457.2	609.6		914.4		1219.2			

material: CF53 or Equivalent
 hardness: 60 HRC or more
 Product of NB Corporation of America

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FIT SERIES

Due to the combined tolerances of the bush's bore and the shaft's diameter, accuracy can be affected by clearance or increased dynamic friction caused by preloading.

NB's FIT Series takes advantages of the lower cost slide bush and the precision ground shaft to achieve a target clearance in order for the linear system to produce a smooth, high-accuracy performance.

part number structure

example

F- **SMS25GUU** **x1** / **SNS25x550**

FIT series

shaft part number

slide bush part number

number of slide bush on one shaft

- Please refer to corresponding catalog pages for details.
- Please specify on the drawing about the shaft machining, radial clearance, match-marking, etc.

Recommended Radial Clearance

Depending on the type of application, the clearance range varies, please use the chart below as a guideline.

target	clearance (+)	← 0 →	clearance (-)
light motion	[Bar chart showing positive clearance range]		
high accuracy	[Bar chart showing positive and negative clearance range]		
no play	[Bar chart showing negative clearance range]		

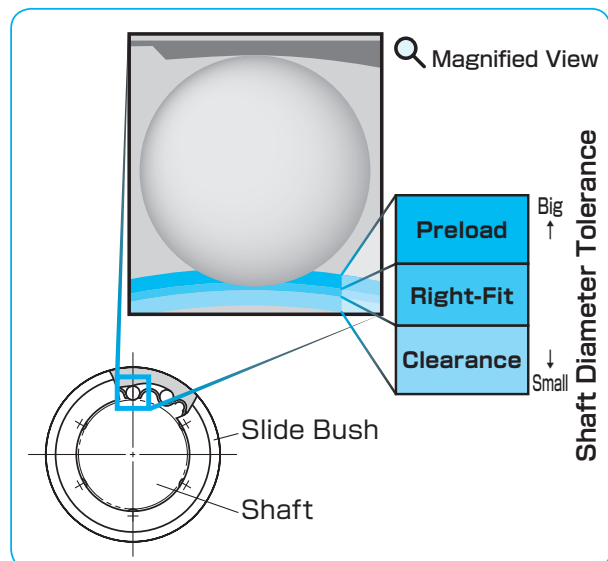
Slide Bush, Radial Clearance (-) , Negative Limit

Negative clearance is opted to reduce backlash. Please refer to the chart below for the negative clearance limits.

size	3~8	10~13	16~25	30~35	40	50~60
radial clearance limit	-3μm	-4μm	-6μm	-8μm	-10μm	-13μm

- The off-center of the housing causes uneven loading on the slide bush, please pay special attention to the centering of the housing especially when negative clearance is a requirement.
- Please contact NB for details on the extra preloading requirement or on other part numbers like SRE, SR, etc.

Figure F-3 Radial Clearance between Slide Bush and Shaft



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