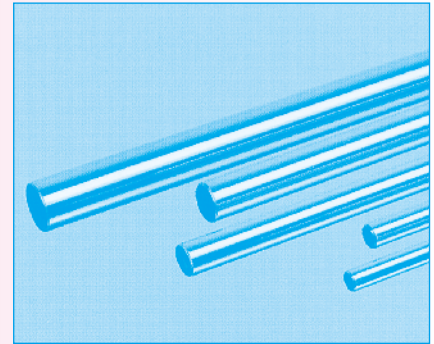


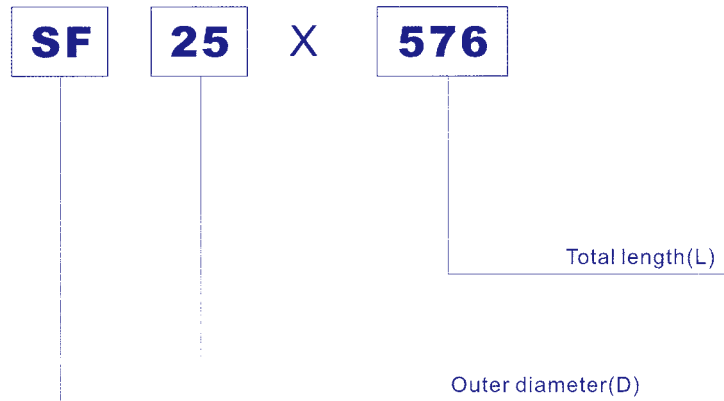
<NSB Linear Ball Bushing System> <NSB LM Shaft>

Fine Shaft

The NSB fine shaft is standardized as the most frequently used slide shafts with the NSB linear bush. The diversification of industrial needs for rationalization, energy conservation, lower cost, etc. is proceeding rapidly. In such an environment, NSB Fine Shafts are mass produced to maintain the highest quality and accuracy while lowering the component cost.



Part number structure example



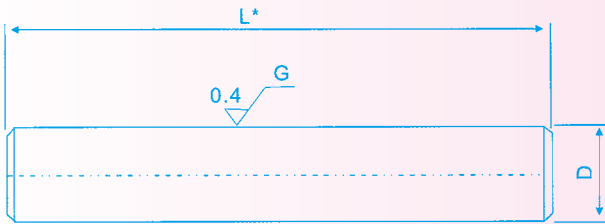
Material	Material	Material
SF	SUJ2	(solid)
SFH	SUJ2	(hollow)
SFC	SUJ2	(solid chrome plating)
SFHC	SUJ2	(hollow chrome plating)
SSF	SUS 440	(solid)
SSFH	SUS 440	(hollow)
SFS	S45	(solid)
SFSC	S45	(solid chrome plating)

Fine Shaft (SF Type)

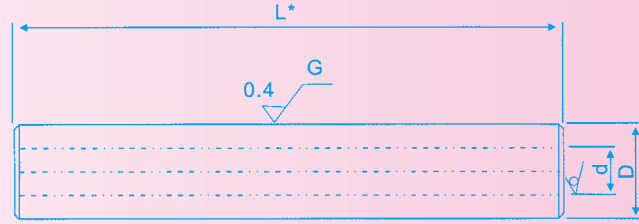
Part Number	Outer Diameter		Length L mm													Mass kg/m
	D mm	Tolerance g6 μm	100	200	300	400	500	600	800	1000	1200	1500	1800	2000		
SF 6	6	-4/-12	100				600								0.23	
SF 8	8	-5						800							0.40	
SF 10	10	-14		200					1000						0.62	
SF 12	12	-6									1500				0.89	
SF 13	13														1.04	
SF 16	16	-17			300								2000		1.58	
SF 20	20	-7													2.47	
SF 25	25					400									3.85	
SF 30	30	-20													5.55	
SF 35	35						500								7.55	
SF 40	40	-9													9.87	
SF 40	40														9.87	
SF 50	50	-25						600							15.4	

Material: high-carbon chromium bearing steel (SUJ 2) hardness: HV697 (60HRC) or more

SF/SFH



SFH/SFHC



*JISB0405 coarse-grade applies to the length (L).

Pipe Fine Shaft (SFH Type)

Part Number	Outer Diameter		Inner diameter d mm	Length L mm													Mass kg/m
	D mm	Tolerance g6 μm		100	200	300	400	500	600	800	1000	1200	1500	1800	2000		
SFH 6	6	-4/-12	2	100		400											0.20
SFH 8	8	-5	3					600									0.34
SFH 10	10	-14	4		200					1000							0.52
SFH 12	12	-6	5								1500						0.73
SFH 13	13	-17	6														0.82
SFH 16	16	-7	8			300									2000		1.18
SFH 20	20	-20	10				400										1.85
SFH 25	25	-9	15					400									2.46
SFH 30	30	-25	16														3.97
SFH 35	35	-9	19					500									5.32
SFH 40	40	-17	20						600								7.39
SFH 50	50	-25	26							600							11.3

Material: high-carbon chromium bearing steel (SUJ 2) hardness: HV697 (60HRC) or more

Stainless Fine Shaft (SSF & SSFH Type)

Part Number	Outer Diameter		Length L mm	Mass kg/m
	D mm	Tolerance g6 μm		
SSF 6	6	-4/-12	100, 600	0.33
SSF 8	8	-5	800	0.39
SSF 10	10	-14	200, 1000	0.61
SSF 12	12	-6	1500	0.88
SSF 13	13	-17		1.03
SSF 16	16	-7	300, 2000	1.56
SSF 20	20	-20		2.43
SSF 25	25	-9	400	3.80
SSF 30	30	-17		5.48
SSF 35	35	-9	500	7.23
SSF 40	40	-17		9.44
SSF 50	50	-25	600	15.2

Material: Martensite stainless steel (equivalent to SUS 440C)
hardness: HV653 (58HRC) or more, HV613 (56HRC) or more for φ3-6

Fine Shaft S45C Material (SFS & SFSC)

Part number	Outer Diameter		Length L mm												Mass kg/m		
	D Mm	Tolerance g6 μm															
			500	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000			
SFS/SFSC 2	2	-2															0.02
SFS/SFSC 3	3	-8															0.06
SFS/SFSC 4	4	-4															0.10
SFS/SFSC 5	5		-12														0.16
SFS/SFSC 6	6																0.23
SFS/SFSC 7	7	-5															0.30
SFS/SFSC 8	8		-14														0.40
SFS/SFSC 9	9																0.50
SFS/SFSC 10	10																0.62
SFS/SFSC 11	11																0.75
SFS/SFSC 12	12																0.89
SFS/SFSC 13	13																1.04
SFS/SFSC 14	14																1.21
SFS/SFSC 15	15																1.39
SFS/SFSC 16	16																1.56
SFS/SFSC 17	17																1.78
SFS/SFSC 18	18																2.00
SFS/SFSC 19	19	-17															2.23
SFS/SFSC 20	20		-20														2.47
SFS/SFSC 22	22																2.98
SFS/SFSC 25	25	-7															3.85
SFS/SFSC 28	28	-16															4.83
SFS/SFSC 30	30																5.55
SFS/SFSC 32	32	-9															6.31
SFS/SFSC 35	35																7.55
SFS/SFSC 38	38		-25														8.90
SFS/SFSC 40	40																9.87
SFS/SFSC 45	45																12.50
SFS/SFSC 50	50																15.40
SFS/SFSC 55	55	-10															18.70
SFS/SFSC 60	60																22.20
SFS/SFSC 65	65																26.65
SFS/SFSC 70	70	-29															30.20
SFS/SFSC 75	75																34.70
SFS/SFSC 80	80																39.40
SFS/SFSC 85	85	-12															44.50
SFS/SFSC 90	90																50.00
SFS/SFSC 95	95		-34														55.60
SFS/SFSC 100	100																61.70

Chemical composition of S45C Material

S45C	C	Si	Mn	P	S	Cu	Ni	Cr	Mo
	0.42~0.48	0.15~0.35	0.6~0.9	0.03~0.012	0.01~0.03	0.1~0.3	0.06~0.2	0.06~0.2	0.145

Rockwell : HRC 54~56
 Roughness : 0.6S~1.5S Rmax(μm)
 Tolerance : 96
 Out Diameter : φ2~φ100

Order Length : 500mm~3000mm(6,000mm)
 Straightness : 60 μm/m(30 μm/m)
 Roundness : 96(6~17 μm/m)
 Cylindericity : 4~14 μm(φ2~φ100)