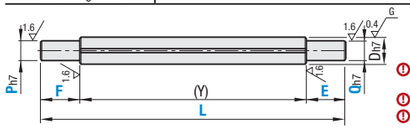
Ball Splines

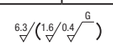
Both Ends Stepped

Both Ends Stepped

RoHS 10

Both Ends Stepped	Spline Shaft / 52100 Bearing Steel Nut / 4115 Alloy Steel Equivalent / Hardness: 58HRC min.	Spline Shaft, Nut / 440C Stainless Steel Equivalent / Hardness: 55HRC min.
	Nut 1 pc.	Nut 1 pc.
With Round Flange Nut	BSJM	BSJMS
With Compact Flange Nut	BSJN	—
With Straight Nut	BSJS	BSJSS

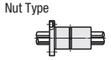




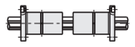
! When selecting Overall Length (L Dimension), check the Annealing Range. **P.409**
! Accuracy **P.407**
! Choose Accessories Nuts from the following Shapes.

Flanged Nut Orientation

1 Nut Type

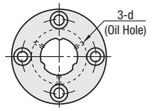


2 Nut Type
(When Alteration NTW is specified)

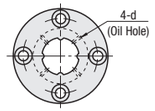


Round Flange Nuts

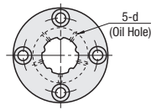
No. 6, 8

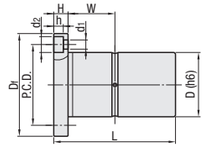


No. 10, 13



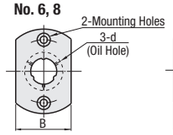
No. 16, 20, 25, 30



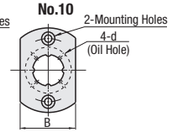


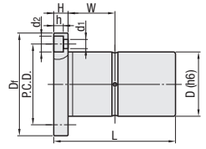
Compact Flange Nuts

No. 6, 8



No.10

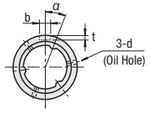




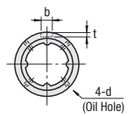
* The key is press-fit into the nut.

Straight Nuts

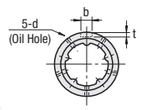
No. 6, 8

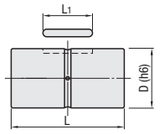


No. 10, 13

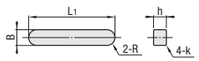


No. 16, 20, 25, 30





Dimension of Attached Key



Spline Shafts

Part Number Type	No.	1mm Increment L 1-Nut Type	F, E	P, Q	D	(Y) 1-Nut Type min–max	Mass (kg/m)
BSJM BSJN BSJS BSJMS BSJSS	*6	60–400 (190)	When P, Q=3 2≤F, E≤9 When P, Q=4 2≤F, E≤16 When P, Q≥5 2≤F, E≤P, Q≤5	3 4 5	6	56–396 (186)	0.23
	*8	60–400 (190)		4 5 6	8	56–396 (186)	0.39
	*10	60–600 (390)		4 5 6 8	10.4	56–596 (386)	0.65
	*13	60–600 (390)		5 6 8 10	13.4	56–596 (386)	1.11
	*16	70–600 (390)		5 6 8 10 12 13	16.6	66–596 (386)	1.65
	20	80–700		8 10 12 13 15 16	20.6	76–696	2.57
	25	90–900		8 10 12 13 15 16 20	25.8	86–896	4.04
	30	100–1150		10 12 13 15 16 20 25	30.8	96–1146	5.85

! For BSJSS and BSJMS, only *marked sizes are available, and the Max. L and Y dimensions are in ( ).
! For BSJN, only No. 6, 8 and 10 are available.

Round Flange Nuts / Compact Flange Nuts

No.	D (h6)	L	Df	H	P.C.D.	d_1	d_2	h	W	d	B	Basic Rated Torque Dynamic C_t (N-m)	Basic Rated Torque Static C_{0t} (N-m)	Basic Load Rating Dynamic C (kN)	Basic Load Rating Static C_0 (kN)	Allowable Static Moment M_{01} (N-m)	Allowable Static Moment M_{02} (N-m)	Mass (kg)
6	14	25	30	6	22	3.5	6	3.1	6.5	1.5	18	3.8	7	1.2	2.1	5	36	0.03
8	16		32		24						21	4.8	8.7	1.2	2.1	5	36	0.04
10	21	40 (33)	42 (41)	6 (8)	32 (30)	4.5	8	4.4 (5.3)	14 (8.5)		25	19 (11)	34 (21)	3.8 (2.4)	6.9 (4.3)	26 (15)	181 (102)	0.09
13	24	44 (36)	44 (45)	7 (8)	33 (34)				15 (10)		—	28 (20)	52 (37)	4.6 (3.3)	8.3 (5.9)	36 (22)	251 (148)	0.11
16	31	50	51	7	40			4.4	18			51	93	6.2	11.1	56	386	0.2
20	35	63	58	9	45	5.5	9.5	5.4	22.5	2		85	154	8.5	15.3	83	611	0.3
25	42	71	65		52				26.5			193	348	15.4	27.7	173	1248	0.4
30	47	80	75	10	60	6.6	11	6.5	30	2.5		272	490	18.5	33.3	212	1581	0.57

! Dimensions in ( ) are for 440C Stainless Steel. ! Allowable static moment M_{01} is a value measured when a single nut is used, and M_{02} is a value measured when two nuts are used.

Straight Nuts

No.	D (h6)	L	b	Tolerance	t +0.05 0	d	α	Basic Rated Torque Dynamic C_t (N-m)	Basic Rated Torque Static C_{0t} (N-m)	Basic Load Rating Dynamic C (kN)	Basic Load Rating Static C_0 (kN)	Allowable Static Moment M_{01} (N-m)	Allowable Static Moment M_{02} (N-m)	Mass (kg)	Dimension of Key (Included) B	Tolerance	h	Tolerance	L_1	R
6	14	25	2.5	+0.014 0	1.2	1.5	15°	3.8	7	1.2	2.1	5	36	0.012	2.5	+0.016 +0.006	2.5	0 -0.025	10.5	1.25
8	16						25°	4.8	8.7	1.2	2.1	5	36	0.013					10.5	
10	21	40 (33)	3		1.5		—	19 (11)	34 (21)	3.8 (2.4)	6.9 (4.3)	26 (15)	181 (102)	0.06	3		3		17 (14)	1.5
13	24	44 (36)						28 (20)	52 (37)	4.6 (3.3)	8.3 (5.9)	36 (22)	251 (148)	0.07					17 (14)	
16	31	50	3.5		2			51	93	6.2	11.1	56	386	0.15	3.5		3.5		18	1.75
20	35	63	4	+0.018 0	2.5	2		85	154	8.5	15.3	83	611	0.2	4	+0.024 +0.012	4	0 -0.030	29	2
25	42	71						193	348	15.4	27.7	173	1248	0.29					33	
30	47	80				2.5		272	490	18.5	33.3	212	1581	0.37					42	

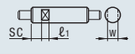
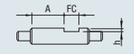
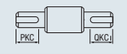
! Dimensions in ( ) are for 440C Stainless Steel. ! Allowable static moment M_{01} is a value measured when a single nut is used, and M_{02} is a value measured when two nuts are used.

Ball Splines

Both Ends Stepped, *continued*

Part Number Alterations

Part Number	-	L	-	F	-	E	-	P	-	Q	-	(SC, FC ··· etc.)
BSJS	-	350	-	F20	-	E20	-	P5	-	Q5	-	SC15

Alterations	Wrench Flats	Set Screw Flat	Keyway on Shaft End	Retaining Ring Groove	Additional Spline Nuts
					
Code	SC	FC	PKC, QKC	TA, TB	NTW
Spec.	Adds a wrench flat. SC=1mm Increment ! SC+ℓ_1≤Y No. W ℓ_1 6 5 8 7 8 10 8 13 11 16 14 10 20 17 25 22 30 27 15	Adds a set screw flat. **Ordering Code:** FC10-A8 FC, A=1mm Increment ! FC≤3xD ! When 1.5xD<FC, FC≤Y/2 ! A=0 or A≥2 No. h 6 8 10 1 13 16 20 25 2 30	Adds a keyway on the shaft end P (Q). **Ordering Code:** PKC10 (QKC10) ! P, Q≥8 ! PKC, QKC =1mm Increment ! PKC, QKC≤P, Q≥3 PKC (QKC)≤F (E)-1 ! Keyway Details **P.408**	Adds retaining ring grooves. **Ordering Code:** TA10-TB10 TA, TB=1mm Increment ! P, Q≥6 ! 4≤TA, TB<F, E/2 ! For Retaining Ring Groove Details **P.408**	Adds a nut. (from one to two) ! Applicable to BSJS, BSJM, BSJN only.

! When selecting multiple alteration additions, more than 2 mm is needed between each feature to be added.
Orientation between wrench flats or set screw flats to the spline nut keyway or flange counterbores are random and cannot be specified.

Part Number Example

Part Number	-	L	-	F	-	E	-	P	-	Q
BSJS8	-	300	-	F30	-	E20	-	P6	-	Q5
BSJS8G	-	300	-	F30	-	E20	-	P6	-	Q5
BSJS8L	-	300	-	F30	-	E20	-	P6	-	Q5

! Alternative grease types available.

Cautions for Ball Spline

Lubrication
Ball splines are shipped greased. Reapply lubrication with Lithium soap based grease (Alvania Grease S2 by Showa Shell Sekiyu K.K), etc. as needed.

Tolerance for Mating Bores
An H7 tolerance is recommended for mating bores for the spline nuts.

Nut Removal
Balls do not fall out when the spline shaft is pulled out. Once the nuts are removed from the spline shaft, reassemble the ball spline while confirming match No.'s, character orientations, and positional relationship of these parts.
Nuts and shafts are offered as the set product. Thus, when using multiple pcs. of them, do not change the default combination.

Adding Nuts
The ball spline ensures clearance and accuracy by integrating the nuts and shaft into one set. Thus, the nuts or shafts are not sold as separate items. When two nuts are required, select the 2-nut type part number.