

# Ball Splines

## One End Stepped and Threaded

**One End Stepped and Threaded**

RoHS10

One End Stepped and Threaded	Spline Shaft / 52100 Bearing Steel Nut / 4115 Alloy Steel Equivalent / Hardness: 58 HRC min.	Spline Shaft, Nut / 440C Stainless Steel Equivalent / Hardness: 55 HRC min.
	Nut 1 pc.	
With Round Flange Nut	BSKM	BSKMS
With Compact Flange Nut	BSKN	—
With Straight Nut	BSKS	BSKSS

**Flanged Nut Orientation**

1 Nut Type

2 Nut Type (When Alteration NTW is specified)

**Round Flange Nuts**

No. 6, 8 (3-d Oil Hole) | No. 10, 13 (4-d Oil Hole) | No. 16, 20, 25, 30 (5-d Oil Hole)

**Compact Flange Nuts**

No. 6, 8 (2-Mounting Holes, 3-d Oil Hole) | No. 10 (2-Mounting Holes, 4-d Oil Hole)

**Straight Nuts**

No. 6, 8 (3-d Oil Hole) | No. 10, 13 (4-d Oil Hole) | No. 16, 20, 25, 30 (5-d Oil Hole)

**Dimension of Attached Key**

\* The key is press-fit into the nut.

Part Number	1mm Increment				M (Coarse) (M≤P)	D	Y	Mass (kg/m)
	Type	No.	L	F				
BSKM BSKN BSKS BSKMS BSKSS	*6	60-400 (190)	When P=3 4≤F≤9	When M=3 2≤B≤9	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)	When P=4 4≤F≤16	When M=4 2≤B≤16	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)	When P≥5 4≤F≤Px5	When M≥5 2≤B≤Mx5	5 6 8 10 12 13	16.6	66-596 (386)	1.65
	*20	80-700			8 10 12 13 15 16 20	20.6	76-696	2.57
25	90-900	When P≥5 4≤F≤Px5	When M≥5 2≤B≤Mx5	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	

① For BSKSS and BSKMS, only \*marked sizes are available, and the Max. L and Y dimensions are in ( ).  
 ② For BSKN, only No. 6, 8 and 10 are available.

### Round Flange Nuts / Compact Flange Nuts

No.	D (h6)	L	Df	H	P.C.D.	d <sub>1</sub>	d <sub>2</sub>	h	W	d	B	Basic Rated Torque		Basic Load Rating		Allowable Static Moment		Mass (kg)
												Dynamic C <sub>t</sub> (N-m)	Static C <sub>0t</sub> (N-m)	Dynamic C (kN)	Static C <sub>0</sub> (kN)	M <sub>01</sub> (N-m)	M <sub>02</sub> (N-m)	
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	6	24	4.5	8	4.4 (5.3)	14 (8.5)	1.5	25	19 (11)	34 (21)	3.8 (2.4)	6.9 (4.3)	26 (15)	181 (102)	0.09	
10	21	40 (33)	42 (41)	6 (8)	32 (30)	4.5	8	4.4	18	2	25	28 (20)	52 (37)	4.6 (3.3)	8.3 (5.9)	36 (22)	251 (148)	0.11
13	24	44 (36)	44 (45)	7 (8)	33 (34)							51	93	6.2	11.1	56	386	0.2
16	31	50	51	7	40	5.5	9.5	5.4	22.5	2	—	85	154	8.5	15.3	83	611	0.3
20	35	63	58	9	45							193	348	15.4	27.7	173	1248	0.4
25	42	71	65	52	52	6.6	11	6.5	30	2.5	—	272	490	18.5	33.3	212	1581	0.57
30	47	80	75	10	60							272	490	18.5	33.3	212	1581	0.57

① Dimensions in ( ) are for 440C Stainless Steel. ② Allowable static moment M<sub>01</sub> is a value measured when a single nut is used, and M<sub>02</sub> 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		Basic Load Rating		Allowable Static Moment		Mass (kg)	Dimension of Key (Included)						
								Dynamic C <sub>t</sub> (N-m)	Static C <sub>0t</sub> (N-m)	Dynamic C (kN)	Static C <sub>0</sub> (kN)	M <sub>01</sub> (N-m)	M <sub>02</sub> (N-m)		B	Tolerance	h	Tolerance	L <sub>1</sub>	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	32	3					4.8	8.7	1.2	2.1	5	36	0.013						10.5	
10	21	40 (33)	3	+0.018 0	2	—	—	19 (11)	34 (21)	3.8 (2.4)	6.9 (4.3)	26 (15)	181 (102)	0.06	3	+0.024 +0.012	4	0	-0.030	17 (14)	2
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	+0.018 0	2.5	—	—	51	93	6.2	11.1	56	386	0.15	4	+0.024 +0.012	4	0	-0.030	18	1.75
20	35	63	4					85	154	8.5	15.3	83	611	0.2						29	
25	42	71	4	+0.018 0	2.5	—	—	193	348	15.4	27.7	173	1248	0.29	4	+0.024 +0.012	4	0	-0.030	33	2
30	47	80						272	490	18.5	33.3	212	1581	0.37						42	

① Dimensions in ( ) are for 440C Stainless Steel. ② Allowable static moment M<sub>01</sub> is a value measured when a single nut is used, and M<sub>02</sub> is a value measured when two nuts are used.

# Ball Splines

## One End Stepped and Threaded, *continued*

**Part Number Alterations**

Part Number: BSKS8 - L - F - B - P - M - (SC, FC, NTW)

Alterations: BSKS8 - 250 - F20 - B15 - P6 - M6 - SC15

Alterations	Wrench Flats	Set Screw Flat	Additional Spline Nuts																																																				
	Code	SC	FC	NTW																																																			
Spec.	Adds a wrench flat. SC=1mm Increment ① SC+ℓ <sub>1</sub> ≤L	Adds a set screw flat. Ordering Code: FC10-A8 FC, A=1mm Increment ① FC≤3xD ② When 1.5xD<FC, FC≤Y/2 ③ A=0 or A≥2	Adds a nut. (from one to two) ① Only available for BSKS, BSKM and BSKN.																																																				
	<table border="1" style="font-size: 6px;"> <tr><th>No.</th><th>W</th><th>ℓ<sub>1</sub></th></tr> <tr><td>6</td><td>5</td><td>8</td></tr> <tr><td>8</td><td>7</td><td>8</td></tr> <tr><td>10</td><td>8</td><td>10</td></tr> <tr><td>13</td><td>11</td><td>10</td></tr> <tr><td>16</td><td>14</td><td>10</td></tr> <tr><td>20</td><td>17</td><td>15</td></tr> <tr><td>25</td><td>22</td><td>15</td></tr> <tr><td>30</td><td>27</td><td>15</td></tr> </table>	No.	W	ℓ <sub>1</sub>	6	5	8	8	7	8	10	8	10	13	11	10	16	14	10	20	17	15	25	22	15	30	27	15	<table border="1" style="font-size: 6px;"> <tr><th>No.</th><th>h</th></tr> <tr><td>6</td><td>8</td></tr> <tr><td>8</td><td>10</td></tr> <tr><td>10</td><td>1</td></tr> <tr><td>13</td><td>16</td></tr> <tr><td>16</td><td>16</td></tr> <tr><td>20</td><td>2</td></tr> <tr><td>25</td><td>2</td></tr> <tr><td>30</td><td>2</td></tr> </table>	No.	h	6	8	8	10	10	1	13	16	16	16	20	2	25	2	30	2	<table border="1" style="font-size: 6px;"> <tr><th>M</th><th>(ℓ)</th></tr> <tr><td>6 or Less</td><td>2</td></tr> <tr><td>8, 10</td><td>3</td></tr> <tr><td>12 or More</td><td>5</td></tr> </table>	M	(ℓ)	6 or Less	2	8, 10	3	12 or More
No.	W	ℓ <sub>1</sub>																																																					
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① 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: BSKS8 - L - F - B - P - M

Example: BSKS8 - 250 - F20 - B15 - P6 - M6

● BSKS8G - 250 - F20 - B15 - P6 - M6

● BSKS8L - 250 - F20 - B15 - P6 - M6

① 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.

