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BALL SPLINES
BSP

NTN SNR

www.ntn-snr.com

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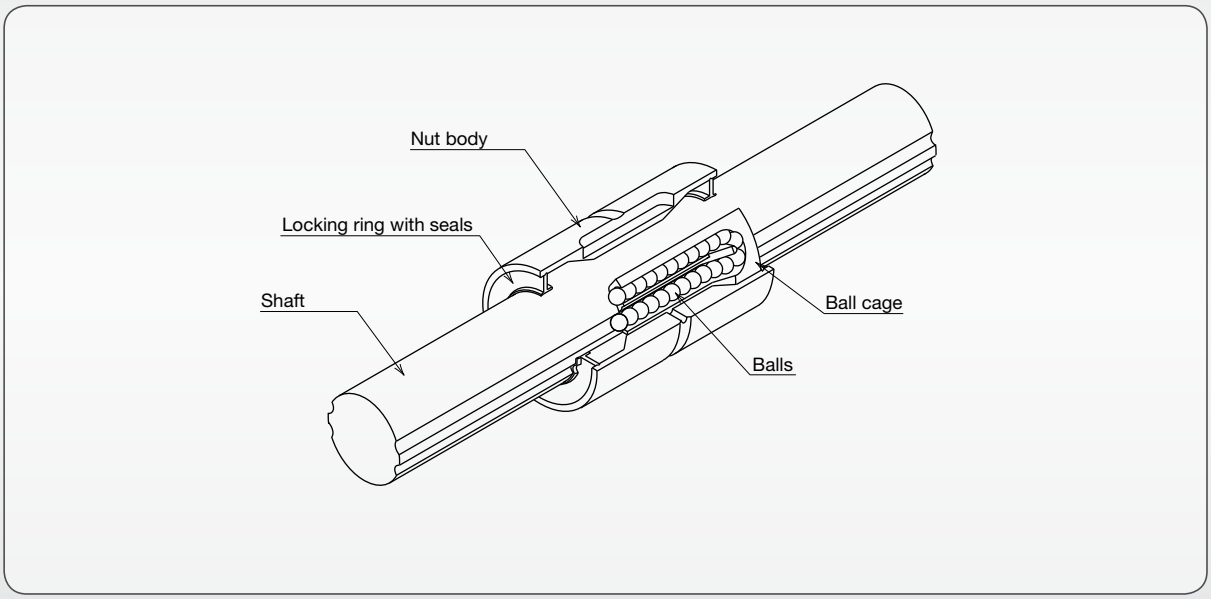
NTN-SNR Ball Splines BSP

NTN-SNR Ball Spline BSP are linear guides on shafts with raceways. The shafts, with the accurate grinded raceways in combination with ball nuts, are able to transfer rotations and also linear strokes. They are suitable for high linear speeds and high rotation speeds.

Structure



Advantages

• High load capacity

By a defined relationship between race way radius and ball diameter, the contact surfaces significantly increase. This allows, unlike conventional sliding guides, very high load ratings with minimum dimensions and long service life time.

• Torque and force transmission

The design principle of the Ball Splines allow the transmission of forces, tilting and rotation moments by simultaneous linear motions.

• Wide range of applications

The combination of an extremely accurate grinded profile rail, the runner block and precision ball screw. The wide product range with shaft diameters from 4 mm up to 100 mm in combination with different nut designs, results in a wide variety of applications in industrial automation.

• Customized machining

It is easy to produce Ball Splines according to customers drawing.

Type code

Example for standard without options and machining:

BSP	25	FN	1	UU	L	0500	N	Z1	-	N
1	2	3	4	5	6	7	8	9		10

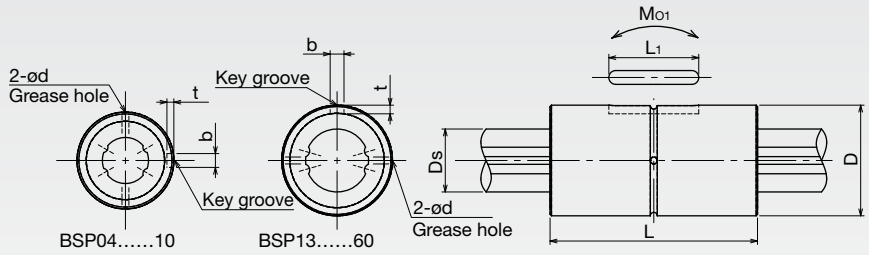
Example special with options and / or machining:

BSP	25	FN	1	UU	L	0500	N	Z1	-	S	-	03	00	1	0	-	1	0
1	2	3	4	5	6	7	8	9		10		11	12	13	14		15	16

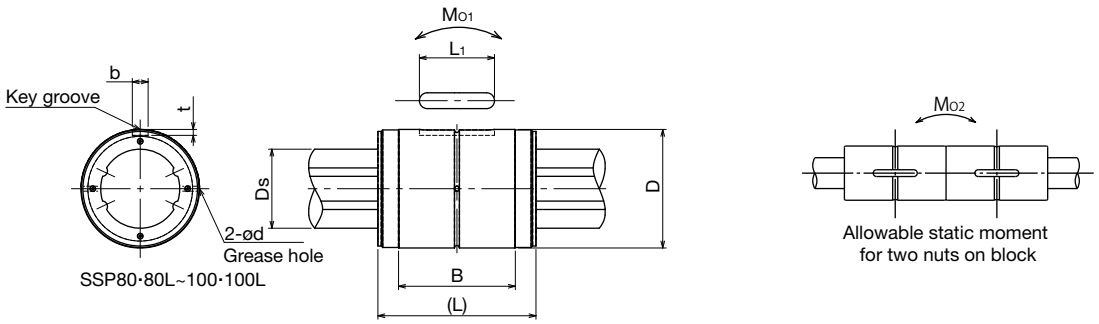
1	BSP	**Serie**
2	25	**Size**
3	FN	**Nut type**
4	1	**Number of nuts**
5	UU	**Seals** UU: with seals — AA: without seals
6	L	**Shaft type** L: Solid shaft — K: Hollow shaft
7	0500	**Shaft length**
8	N	**Precision class** N: Normal precision — P: P - precision
9	Z1	**Precision class** Z0: without preload — Z1: low preload Z2: medium preload
10	N	**Special** N: Standard — S: special version
11	03	**Grease** stipulated in the catalog Ball rail systems page 77
12	00	**Grease connection**
13	1	**Nut material** see materials and coatings
14	0	**Special nuts** 0 Without special options A…Z According to a drawing or text description (Index is given in case of an order issued)
15	1	**Shaft material** see materials and coatings
16	A...Z	**Special shafts** 0 Without special options A…Z According to a drawing or text description (Index is given in case of an order issued)

Data sheets

Ball Splines with cylindrical nuts

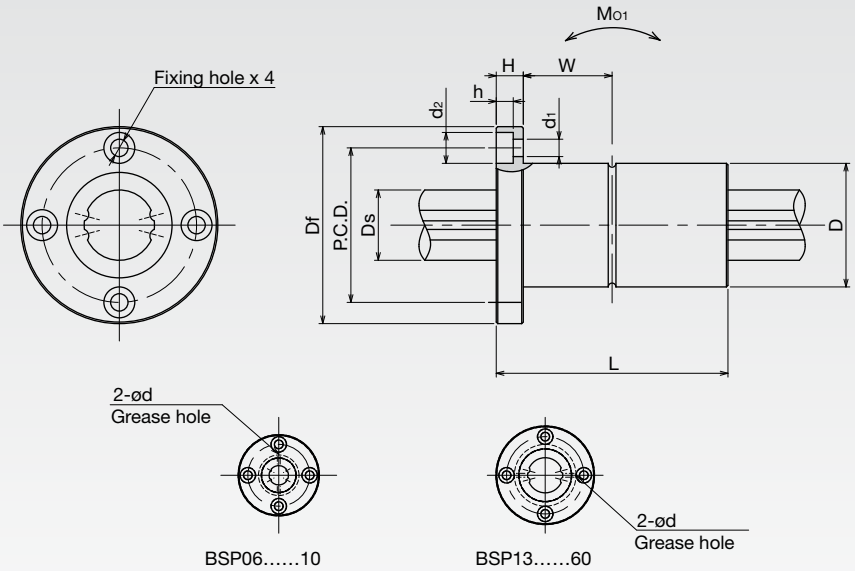


Type			Dimension mm										
			øD h6	L		B	b		t		L1	d	Ds h7
BSP	04	CN	10	16	0 -0,2	--	2.0	+0,014 0	1.2	+0,05 0	6.0	--	4
BSP	06	CN	14	25	0 -0,2	--	2.5	+0,014 0	1.2	+0,05 0	10.5	1.0	6
BSP	08	CN	16	25	0 -0,2	--	2.5	+0,014 0	1.2	+0,05 0	10.5	1.5	8
BSP	10	CN	21	33	0 -0,2	--	3.0	+0,014 0	1.5	+0,05 0	13.0	1.5	10
BSP	13	CN	24	36	0 -0,2	--	3.0	+0,014 0	1.5	+0,05 0	15.0	1.5	13
BSP	16	CN	31	50	0 -0,2	--	3.5	+0,018 0	2.0	+0,05 0	17.5	2.0	16
BSP	20	CN	35	63	0 -0,2	--	4.0	+0,018 0	2.5	+0,05 0	29.0	2.0	20
BSP	25	CN	42	71	0 -0,3	--	4.0	+0,018 0	2.5	+0,05 0	36.0	3.0	25
BSP	30	CN	47	80	0 -0,3	--	4.0	+0,018 0	2.5	+0,05 0	42.0	3.0	30
BSP	40	CN	64	100	0 -0,3	--	6.0	+0,018 0	3.5	+0,05 0	52.0	4.0	40
BSP	50	CN	80	125	0 -0,3	--	8.0	+0,022 0	4.0	+0,05 0	58.0	4.0	50
BSP	60	CN	90	140	0 -0,3	--	12.0	+0,027 0	5.0	+0,05 0	67.0	4.0	60
BSP	80	CN	120	160	--	118.2	16.0	+0,027 0	6.0	+0,05 0	76.0	5.0	80
BSP	80	CL	120	217	--	175.2	16.0	+0,027 0	6.0	+0,05 0	110.0	5.0	80
BSP	100	CN	150	185	--	132.6	20.0	+0,033 0	7.0	+0,05 0	110.0	5.0	100
BSP	100	CL	150	248	--	195.6	20.0	+0,033 0	7.0	+0,05 0	160.0	5.0	100

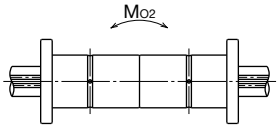


Torque moment kNm		Load rating kN		Allowable static moment kNm		Cross-sectional moment of inertia	Cross-sectional coefficient	Weight kg		Type		
C_T	C_{0T}	C	C0	M_{01}	M_{02}	mm^4	mm^3	Nut kg	Shaft kg/m			
0.00074	0.00105	0.86	1.22	0.002	0.010	11.80	5.90	0.0065	0.10	**BSP**	**04**	**CN**
0.0015	0.0024	1.22	2.28	0.005	0.040	59.00	19.70	0.019	0.21	**BSP**	**06**	**CN**
0.0021	0.0037	1.45	2.87	0.007	0.050	$1,90x10^2$	47.60	0.023	0.38	**BSP**	**08**	**CN**
0.0044	0.0082	2.73	5.07	0.018	0.116	$4,61x10^2$	92.20	0.054	0.60	**BSP**	**10**	**CN**
0.021	0.039	2.67	4.89	0.014	0.109	$1,38x10^3$	$2,13x10^2$	0.07	1.0	**BSP**	**13**	**CN**
0.060	0.110	6.12	11.2	0.046	0.299	$2,98x10^3$	$3,73x10^2$	0.15	1.5	**BSP**	**16**	**CN**
0.105	0.194	8.90	16.3	0.110	0.560	$7,35x10^3$	$7,34x10^2$	0.22	2.4	**BSP**	**20**	**CN**
0.189	0.346	12.8	23.4	0.171	1.029	$1,79x10^4$	$1,43x10^3$	0.33	3.7	**BSP**	**25**	**CN**
0.307	0.439	18.6	23.2	0.181	1.470	$3,66x10^4$	$2,44x10^3$	0.36	5.4	**BSP**	**30**	**CN**
0.674	0.934	30.8	37.5	0.358	2.940	$1,55x10^5$	$5,75x10^3$	0.95	9.6	**BSP**	**40**	**CN**
1.291	2.955	40.3	64.9	0.690	4.084	$2,83x10^5$	$1,13x10^4$	1.90	15.0	**BSP**	**50**	**CN**
1.577	2.629	47.7	79.5	0.881	5.473	$5,91x10^5$	$1,97x10^4$	2.30	21.6	**BSP**	**60**	**CN**
3.860	6.230	83.1	134.0	2.00	11.10	$1,93x10^6$	$4,38x10^4$	5.10	39.0	**BSP**	**80**	**CN**
5.120	9.340	110.0	201.0	4.41	21.10	$1,93x10^6$	$4,38x10^4$	7.60	39.0	**BSP**	**80**	**CL**
6.750	11.570	135.0	199.0	3.36	19.30	$4,69x10^6$	$9,38x10^4$	9.70	61.0	**BSP**	**100**	**CN**
8.960	17.300	179.0	298.0	7.34	37.70	$4,69x10^6$	$9,38x10^4$	13.90	61.0	**BSP**	**100**	**CL**

Ball Splines with flange type nuts



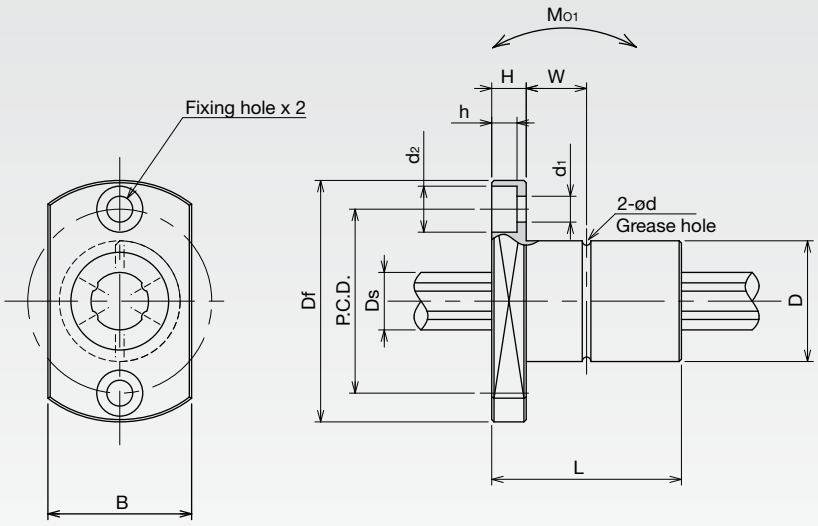
Type			Dimension mm									
			øD h6	L		Df	H	P.C.D.	d1xd2xh	W	d	Ds h7
BSP	**06**	**FN**	14	25	0 -0,2	30	5	22	3,4x6,5x3,3	7.5	1.0	6
BSP	**08**	**FN**	16	25	0 -0,2	32	5	24	3,4x6,5x3,3	7.5	1.5	8
BSP	**10**	**FN**	21	33	0 -0,2	42	6	32	4,5x8,0x4,4	10.5	1.5	10
BSP	**13**	**FN**	24	36	0 -0,2	43	7	33	4,5x8,0x4,4	11.0	1.5	13
BSP	**16**	**FN**	31	50	0 -0,2	50	7	40	4,5x8,0x4,4	18.0	2.0	16
BSP	**20**	**FN**	35	63	0 -0,2	58	9	45	5,5x9,5x5,4	22.5	2.0	20
BSP	**25**	**FN**	42	71	0 -0,3	65	9	52	5,5x9,5x5,4	26.5	3.0	25
BSP	**30**	**FN**	47	80	0 -0,3	75	10	60	6,6x11,0x6,5	30.0	3.0	30
BSP	**40**	**FN**	64	100	0 -0,3	100	14	82	9,0x14,0x8,6	36.0	4.0	40
BSP	**50**	**FN**	80	125	0 -0,3	124	16	102	11,0x17,5x11,0	46.5	4.0	50
BSP	**60**	**FN**	90	140	0 -0,3	129	18	107	11,0x17,5x11,0	52.0	4.0	60



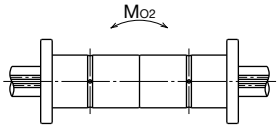
Allowable static moment
for two nuts on block

Torque moment kNm		Load rating kN		Allowable static moment kNm		Cross-sectional moment of inertia	Cross-sectional coefficient	Weight kg		Type		
C_T	C_{0T}	C	C0	M_{01}	M_{02}	mm^4	mm^3	Mutter kg	Welle kg/m			
0.0015	0.0024	1.22	2.28	0.0051	0.0400	59.0	19.7	0.037	0.21	**BSP**	**06**	**FN**
0.0021	0.0037	1.45	2.87	0.0074	0.0500	190.0	47.6	0.042	0.38	**BSP**	**08**	**FN**
0.0044	0.0082	2.73	5.07	0.0180	0.1160	461.0	92.2	0.094	0.60	**BSP**	**10**	**FN**
0.0210	0.0392	2.67	4.89	0.0137	0.1090	$1,38x10^3$	$2,13x10^2$	0.10	1.00	**BSP**	**13**	**FN**
0.060	0.110	6.12	11.20	0.046	0.299	$2,98x10^3$	$3,73x10^2$	0.20	1.50	**BSP**	**16**	**FN**
0.105	0.194	8.90	16.30	0.110	0.560	$7,35x10^3$	$7,34x10^2$	0.33	2.40	**BSP**	**20**	**FN**
0.189	0.346	12.80	23.40	0.171	1.029	$1,79x10^4$	$1,43x10^3$	0.45	3.70	**BSP**	**25**	**FN**
0.307	0.439	18.60	23.20	0.181	1.470	$3,66x10^4$	$2,44x10^3$	0.55	5.38	**BSP**	**30**	**FN**
0.647	0.934	30.80	37.50	0.358	2.940	$1,15x10^5$	$5,75x10^3$	1.41	9.55	**BSP**	**40**	**FN**
1.291	2.955	40.30	64.90	0.690	4.084	$2,83x10^5$	$1,13x10^4$	3.20	15.00	**BSP**	**50**	**FN**
1.577	2.629	47.70	79.50	0.881	5.473	$5,91x10^5$	$1,97x10^4$	3.20	21.60	**BSP**	**60**	**FN**

Ball Splines with flange type nuts and limited stroke



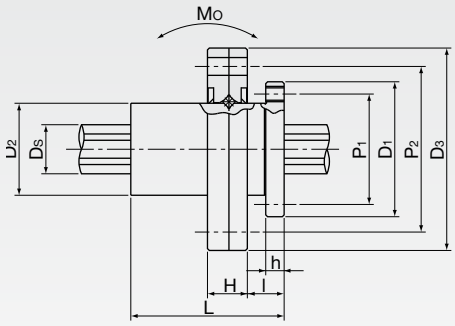
Type	Dimension mm															
	Hub	øD h6	øD1	L		E	Df	H	B	P.C.D.	A	F	S	W	d	Ds h7
BSP 06 FX	22	11	10.0	40	0 -0,2	3.3	23.0	4	14	17.0	--	--	3.4	12.7	1.2	6
BSP 08 FX	20	13	12.5	40	0 -0,2	3.3	25.5	4	16	19.5	--	--	3.4	12.7	1.2	8
BSP 10 FX	28	16	15.5	50	0 -0,2	3.3	28.5	5	20	--	18	13	3.4	16.7	1.5	10
BSP 13 FX	24	20	19.5	50	0 -0,2	4.8	36.0	5	25	--	22	17	3.4	15.2	1.5	13
BSP 16 FX	26	24	23.5	60	0 -0,2	4.8	40.0	7	29	--	25	19	4.5	18.2	2	16

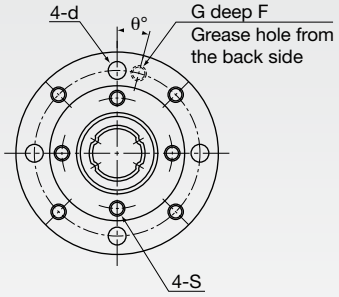


Allowable static moment
for two nuts on block

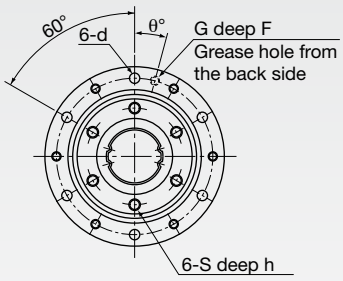
Torque moment kNm		Load rating kN		Allowable static moment kNm		Cross-sectional moment of inertia	Cross-sectional coefficient	Gewicht kg		Type		
C_T	C_{0T}	C	C0	M_{01}	M_{02}	mm^4	mm^3	Nut kg	Shaft kg/m			
0.0023	0.0038	1.80	3.00	0.0112	0.0450	59.0	19.7	0.000	0.210	**BSP**	**06**	**FX**
0.0033	0.0055	2.02	3.37	0.0131	0.0520	190.0	47.6	0.027	0.380	**BSP**	**08**	**FX**
0.0065	0.0109	3.21	5.35	0.0256	0.1020	461.0	92.2	0.048	0.600	**BSP**	**10**	**FX**
0.0276	0.0507	4.15	7.60	0.0388	0.1550	$1{,}38x10^3$	$2{,}13x10^2$	0.075	1.000	**BSP**	**13**	**FX**
0.0628	0.1150	7.66	14.00	0.0883	0.3530	$2{,}98x10^3$	$3{,}73x10^2$	0.123	1.500	**BSP**	**16**	**FX**

Ball Splines with rotary type nuts





BSP06.....10RN



BSP13.....60RN

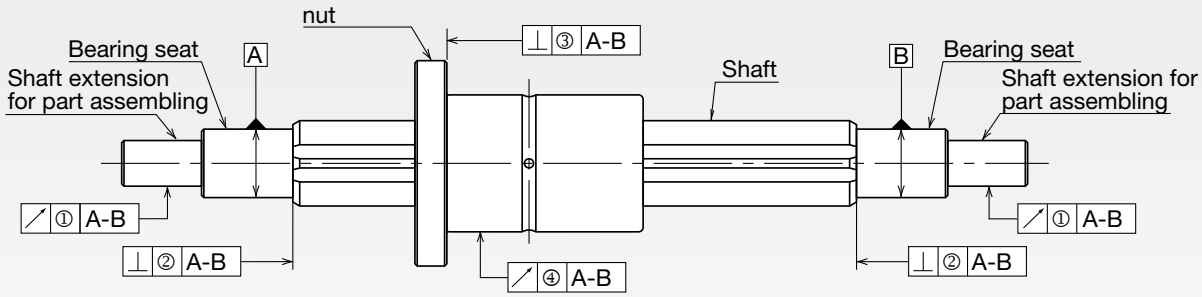
Type	Dimension mm																		°
	øD1 h6	øD2		L		P1	S	h	l	H	B1	øD3 h7	P2	d	G	F	øDs h7	Θ
BSP 06 RN	20.0	13	--	25	0 -0,2	16	M 2	2.5	5.0	6.5	--	30	24	2.4	M 3	2.6	6	20
BSP 08 RN	22.0	15	--	25	0 -0,2	18	M 2,5	3.0	6.0	6.5	--	33	27	2.9	M 3	2.6	8	20
BSP 10 RN	27.0	19	--	33	0 -0,2	22	M 3	4.0	8.0	7.0	--	40	33	3.4	M 3	2.8	10	20
BSP 13 RN	29.0	24	--	36	0 -0,2	24	M 3	5.0	8.0	9.0	--	50	42	3.4	M 3	3.6	13	15
BSP 16 RN	36.0	31	--	50	0 -0,2	30	M 4	6.0	10.0	11.0	--	60	50	4.5	M 3	4.4	16	15
BSP 16 RL	39.5	52	0 -0,007	50	--	32	M 5	8.0	10.0	5.0	37	68	60	4.5	--	--	16	--
BSP 20 RN	44.0	35	--	63	0 -0,2	38	M 4	7.0	12.0	13.0	--	72	62	4.5	M 6 x 0,75	5.2	20	15
BSP 20 RL	43.5	56	0 -0,007	63	--	36	M 5	8.0	12.0	6.0	48	72	64	4.5	--	--	20	--
BSP 25 RN	55.0	42	--	71	0 -0,3	47	M 5	8.0	13.0	16.0	--	82	72	4.5	M 6 x 0,75	6.4	25	15
BSP 25 RL	53.0	62	0 -0,007	71	--	45	M 6	8.0	13.0	6.0	55	78	70	4.5	--	--	25	--
BSP 30 RN	61.0	47	--	80	0 -0,3	52	M 6	10.0	17.0	17.0	--	100	86	6.6	M 6 x 0,75	6.8	30	15
BSP 40 RN	76.0	64	--	100	0 -0,3	66	M 6	10.0	23.0	20.0	--	120	104	9.0	M 6 x 0,75	8.0	40	15
BSP 50 RN	92.0	80	--	125	0 -0,3	80	M 8	13.0	24.0	22.0	--	134	118	9.0	M 6 x 0,75	8.8	50	15
BSP 60 RN	107.0	90	--	140	0 -0,3	95	M 8	13.0	25.0	25.0	--	155	137	9.0	M 6 x 0,75	10.0	60	15

Torque moment Ball Spline kNm		Load rating Ball Spline kN		Load rating cross roller bearing kN		Allowable static moment kNm	Cross-sectional moment of inertia mm⁴	Cross-sectional coefficient mm³	Weight kg		max. rpm min⁻¹	Type		
C_T	C_{0T}	C	C0	C	C0	M_0			Nut kg	Shaft kg/m				
0.0015	0.0024	1.22	2.28	0.60	0.50	0.0051	59.0	19.7	0.04	0.21	2 940	BSP	06	RN
0.0021	0.0037	1.45	2.87	1.20	1.10	0.0074	190.0	47.6	0.05	0.38	2 580	BSP	08	RN
0.0044	0.0082	2.73	5.07	2.40	2.45	0.0180	461.0	92.2	0.09	0.60	2 060	BSP	10	RN
0.0210	0.0392	2.67	4.89	2.90	3.70	0.0180	$1{,}38 \times 10^3$	$2{,}13 \times 10^2$	0.17	1.00	1 350	BSP	13	RN
0.0600	0.1100	6.12	11.20	5.60	6.70	0.0460	$2{,}98 \times 10^3$	$3{,}73 \times 10^2$	0.33	1.50	1 080	BSP	16	RN
0.0600	0.1100	6.12	11.20	13.00	12.80	0.0460	$2{,}98 \times 10^3$	$3{,}73 \times 10^2$	0.45	1.50	4 000	BSP	16	RL
0.105	0.194	8.90	16.30	6.55	8.79	0.0630	$7{,}35 \times 10^3$	$7{,}34 \times 10^2$	0.57	2.40	890	BSP	20	RN
0.1050	0.7940	8.90	16.30	17.40	17.20	0.1100	$2{,}98 \times 10^3$	$3{,}73 \times 10^2$	0.69	2.40	3 600	BSP	20	RL
0.189	0.346	12.80	23.40	9.63	12.70	0.1710	$1{,}79 \times 10^4$	$1{,}43 \times 10^3$	0.81	3.70	700	BSP	25	RN
0.1890	0.3460	12.80	23.40	22.10	22.50	0.1710	$2{,}98 \times 10^3$	$3{,}73 \times 10^2$	0.92	3.70	3 200	BSP	25	RL
0.307	0.439	18.60	23.20	11.80	17.10	0.1810	$3{,}66 \times 10^4$	$2{,}44 \times 10^3$	1.19	5.38	640	BSP	30	RN
0.674	0.934	30.80	37.50	23.00	32.30	0.3580	$1{,}15 \times 10^5$	$5{,}75 \times 10^3$	2.25	9.55	510	BSP	40	RN
1.291	2.955	40.30	64.90	27.80	44.00	0.6900	$2{,}83 \times 10^5$	$1{,}13 \times 10^4$	3.57	15.00	430	BSP	50	RN
1.577	2.629	47.70	79.50	29.00	48.80	0.8810	$5{,}91 \times 10^5$	$1{,}97 \times 10^4$	5.03	21.60	370	BSP	60	RN

Precision

- Ball Splines of the types BSP…CN / CL, BSP…FN and BSP…BN are available in normal precision and P - precision.

- The Ball Splines of the types BSP…RN / RL and BSP…FX are only available in normal precision.



Type		Radial run-out of the bearing seats ① µm		Perpendicularity of the end of the spline shaft section ② µm		Perpendicularity of the flange ③ µm	
		Normal-Precision	P - Precision	Normal-Precision	P - Precision	Normal-Precision	P - Precision
BSP	**04**	14	8	9	6	--	--
BSP	**06**	14	8	9	6	11	8
BSP	**08**	14	8	9	6	11	8
BSP	**10**	17	10	9	6	13	9
BSP	**13**	19	12	11	8	13	9
BSP	**16**	19	12	11	8	13	9
BSP	**20**	19	12	11	8	13	9
BSP	**25**	22	13	13	9	16	11
BSP	**30**	22	13	13	9	16	11
BSP	**40**	25	15	16	11	19	13
BSP	**50**	25	15	16	11	19	13
BSP	**60**	29	17	19	13	22	15
BSP	**80**	29	17	19	13	--	--
BSP	**100**	34	20	22	15	--	--

Type			Radial run-out of outer surface of nut relative to shaft support area (Max.) ④ [µm] Shaft length [mm]									
			up to 200	> 200 up to 315	> 315 up to 400	> 400 up to 500	> 500 up to 630	> 630 up to 800	> 800 up to 1.000	> 1.000 up to 1.250	> 1.250 up to 1.600	> 1.600 up to 2.000
BSP	04	Normal- Präzision	46	89	126	--	--	--	--	--	--	--
		P - Präzision	26	57	82	--	--	--	--	--	--	--
BSP	06	Normal- Präzision	46	89	126	--	--	--	--	--	--	--
		P - Präzision	26	57	82	--	--	--	--	--	--	--
BSP	08	Normal- Präzision	46	89	126	163	--	--	--	--	--	--
		P - Präzision	26	57	82	108	--	--	--	--	--	--
BSP	10	Normal- Präzision	36	54	68	82	102	--	--	--	--	--
		P - Präzision	20	32	41	51	65	--	--	--	--	--
BSP	13	Normal- Präzision	34	45	53	62	75	92	115	153	195	--
		P - Präzision	18	25	31	38	46	58	75	97	127	--
BSP	16	Normal- Präzision	34	45	53	62	75	92	115	153	195	--
		P - Präzision	18	25	31	38	46	58	75	97	127	--
BSP	20	Normal- Präzision	32	39	44	50	57	68	83	102	130	171
		P - Präzision	18	21	25	29	34	42	52	65	85	116
BSP	25	Normal- Präzision	32	39	44	50	57	68	83	102	130	171
		P - Präzision	18	21	25	29	34	42	52	65	85	116
BSP	30	Normal- Präzision	32	39	44	50	57	68	83	102	130	171
		P - Präzision	18	21	25	29	34	42	52	65	85	116
BSP	40	Normal- Präzision	32	36	39	43	47	54	63	76	93	118
		P - Präzision	16	19	21	24	27	32	38	47	59	77
BSP	50	Normal- Präzision	32	36	39	43	47	54	63	76	93	118
		P - Präzision	16	19	21	24	27	32	38	47	59	77
BSP	60	Normal- Präzision	30	34	36	38	41	45	51	59	70	86
		P - Präzision	16	17	19	21	23	26	30	35	43	54
BSP	80	Normal- Präzision	30	34	36	38	41	45	51	59	70	86
		P - Präzision	16	17	19	21	23	26	30	35	43	54
BSP	100	Normal- Präzision	30	32	34	35	37	40	43	48	55	65
		P - Präzision	16	17	17	19	20	22	24	28	33	40

Preload

Preload is a description of the radial clearance of Ball Splines. Applied preload eliminates the radial clearance of the Ball Splines and increases the stiffness. NTN-SNR Ball Splines are available in three preload classes.

Type		Preload / Radial clearance µm		
		Z0	Z1	Z2
BSP	**04**	-2...+1	-6...-2	--
BSP	**06**	-2...+1	-6...-2	--
BSP	**08**	-2...+1	-6...-2	--
BSP	**10**	-3...+1	-8...-3	--
BSP	**13**	-3...+1	-8...-3	-13...-8
BSP	**16**	-3...+1	-8...-3	-13...-8
BSP	**20**	-4...+2	-12...-4	-20...-12
BSP	**25**	-4...+2	-12...-4	-20...-12
BSP	**30**	-4...+2	-12...-4	-20...-12
BSP	**40**	-6...+3	-18...-6	-30...-18
BSP	**50**	-6...+3	-18...-6	-30...-18
BSP	**60**	-6...+3	-18...-6	-30...-18
BSP	**80**	-6...+3	-18...-6	-30...-18
BSP	**100**	-8...+4	-24...-8	-40...-24

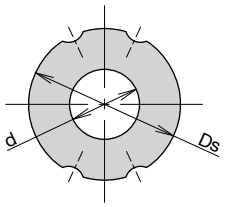
Type	Preload class	Operation conditions
Without preload	Z0	- low load - smooth movement - no alternating load - almost no vibrations and shocks
Low preload	Z1	- low torque moments - high position accuracy - alternating load - low vibrations and shocks
Medium preload	Z2	- torque moments - overhanging loads - strong alternating loads - vibrations and shocks

Shaft options

Hollow shaft

Ball Splines are also available in hollow shaft version.

Type	Shaft diameter Ds mm	Inner diameter d mm	cross-sectional coefficient Z mm^3	Cross-sectional moment of inert I mm^4
BSP 04	4	1.5	5.7	11
BSP 06	6	2.0	19.4	58
BSP 08	8	3.0	46.5	186
BSP 10	10	4.0	89.6	448
BSP 13	13	6.0	193	1 260
BSP 16	16	8.0	348	2 780
BSP 20	20	10.0	686	6 860
BSP 25	25	15.0	1 230	15 400



Maximum length

Type	Maximum length Solid shaft mm	Hollow shaft mm
BSP 04	300	300
BSP 06	400	400
BSP 08	500	500
BSP 10	630	600
BSP 13	1 500	1500
BSP 16	1 500	1500
BSP 20	2 000	2000
BSP 25	2 000	2000
BSP 30	2 000	--
BSP 40	2 000	--
BSP 50	2 000	--
BSP 60	2 000	--
BSP 80	2 000	--
BSP 100	2 000	--

Material / Coating

NTN-SNR Ball Splines are available with different coatings and partially in stainless versions.

Index in the type code	Material / Coating	Remarks
0	Standard material	
1	Stainless version	Only for BSP…CN and BSP…FN up to size 25
2	Blackchrome coating	
5	DURALLOY TDC® coating	From size 25 possible

Notes

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BALL SPLINE

BSP

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