

# TORQUE RESISTANT BALL BUSHINGS

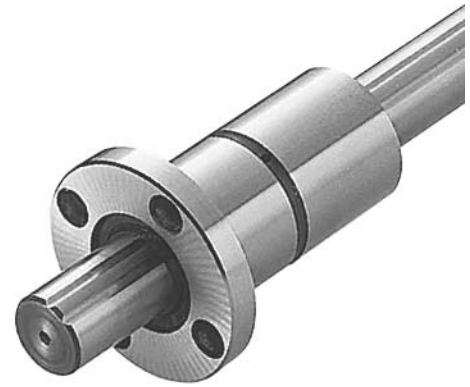
Torque resistant ball bushings enable torque to be transmitted whilst the bush travels linearly. Our torque-resistant ball bushings are a high precision linear motion system. The bushing as well as the shaft is equipped with ball guide grooves with special gothic arch profiles. This 4 point contact design offers a considerable load capacity and a high rigidity through slight pre-loading.

High torque loads (via driven shaft or driven bush) and shock resistance are ensured with this particularly compact space-saving design.

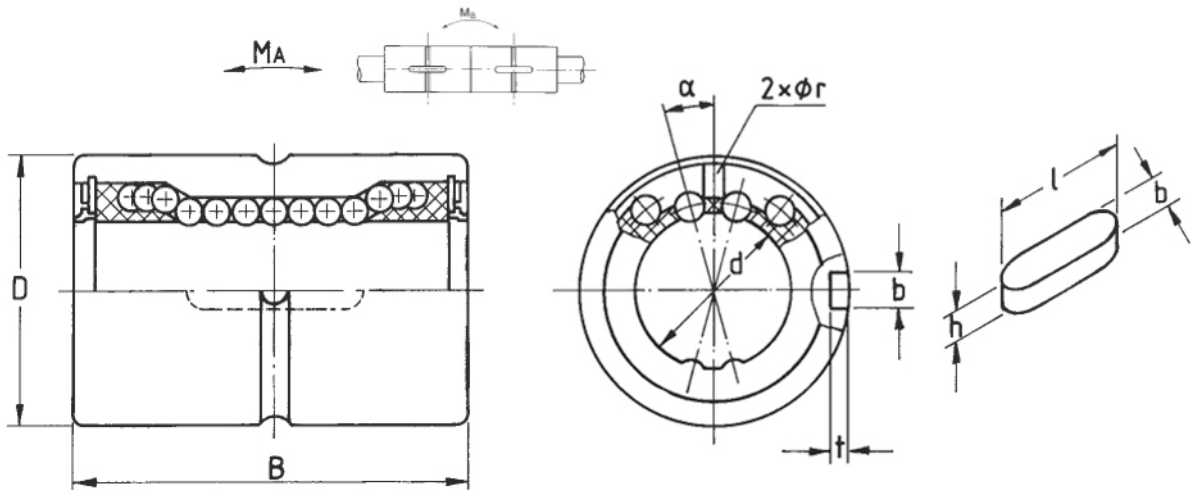
Through optimised load carrying tracks and the polyamide cage very smooth running is achieved. The bushing has a lubrication hole.

To retain the lubricant inside the bushing the seals at both ends are designed to fit snugly into the ball grooves.

See following pages for the necessary special splined shafting.



See website for full range of sizes



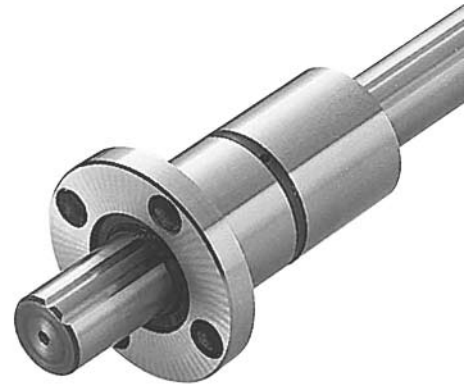
PART	d	D	B	b	t	h	l	r	alpha	Torque Ct (Nm)	Torque C <sub>0</sub> t (Nm)	Load C (N)	Load C <sub>0</sub> (N)	Moment Ma (Nm)	Moment Mb (Nm)	Weight (kg)
SSP4-304	4	10	16	2.0	1.2	2.0	6	-	60	0.7	1.0	860	1220	2.0	10	0.01
SSP4-306	6	14	25	2.5	1.2	2.5	10.5	1	60	1.5	2.4	1220	2280	5.1	40	0.02
SSP4-308	8	16	25	2.5	1.2	2.5	10.5	1.5	60	2.1	3.7	1450	2870	7.4	50	0.02
SSP4-310	10	21	33	3.0	1.5	3.0	13	1.5	60	4.4	8.2	2730	5070	18.0	116	0.05
SSP4-314	13	24	36	3.0	1.5	3.0	15	1.5	25	21	40	2700	4900	13.7	109	0.07
SSP4-316	16	31	50	3.5	2.0	3.5	17.5	2.0	25	60	110	6150	11200	46	299	0.15
SSP4-320	18.2	32	60	4.0	2.5	4.0	26	2.0	16	85	136	8000	11500	64	500	0.20
SSP4-325	23	37	70	5.0	3.0	5.0	33	3.0	16	165	244	12600	16400	106	830	0.22
SSP4-330	28	45	80	7.0	4.0	7.0	41	3.0	16	295	420	19000	23700	185	1470	0.35
SSP4-340	37.4	60	100	10	4.5	8.0	55	4.0	16	650	900	31400	38300	365	2940	0.81
SSP4-350	47	75	112	15	5.0	10	60	4.0	16	1420	3240	47000	75700	710	4400	1.50
SSP4-360	56.5	90	127	18	6.0	11	68	4.0	16	2100	4800	58000	127000	1300	8800	2.50

# TORQUE RESISTANT FLANGED BALL BUSHINGS

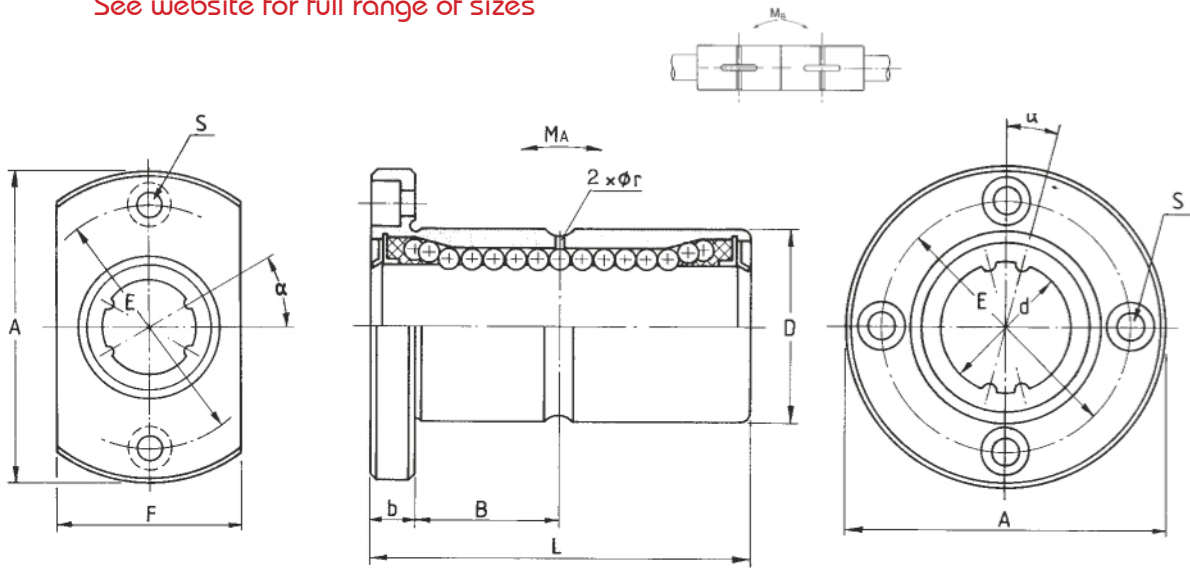
The torque resistant flanged ball bushings have all the same characteristics as described on the previous page but have the advantage of being easily secured in position via the flange.

Please note shaft diameters 6,8 & 10 have a flange that has been cut away (see left hand drawing below)

Shaft diameters 14 to 60 have a round flange (right hand drawing below)



See website for full range of sizes



PART	d	D	L	b	A	B	€	F	r	S	alpha	C <sub>T</sub> (Nm)	C <sub>OT</sub> (Nm)	Load C (kN)	Load C <sub>0</sub> (kN)	Ma (Nm)	Mb (Nm)	Weight (kg)
SPF4-306	6	14	25	5	30	7.5	22	18	1.0	M3	30	1.5	2.4	1.22	2.28	5.1	40	0.03
SPF4-308	8	16	25	5	32	7.5	24	21	1.5	M3	30	2.1	3.7	1.45	2.87	7.4	50	0.04
SPF4-310	10	21	33	6	42	10.5	32	25	1.5	M4	30	4.4	8.2	2.73	5.07	18	116	0.08
SPF4-314	13	24	36	7	43	11	33	-	1.5	M4	25	21	40	2.70	4.90	13.7	109	0.10
SPF4-316	16	31	50	7	50	18	40	-	2.0	M4	25	60	110	6.15	11.20	46	299	0.20
SPF4-320	18.2	32	60	7	51	23	40	-	2.0	M4	16	85	136	8.00	11.50	64	500	0.22
SPF4-325	23	37	70	9	60	26	47	-	3.0	M5	16	165	244	12.6	16.40	106	830	0.32
SPF4-330	28	45	80	10	70	30	54	-	3.0	M6	16	295	420	19.0	23.7	185	1470	0.51
SPF4-340	37.4	60	100	14	90	36	72	-	4.0	M8	16	650	900	31.4	38.3	365	2940	1.15
SPF4-350	47	75	112	16	113	40	91	-	4.0	M10	16	1420	3240	47.0	75.7	710	4400	2.10
SPF4-360	56.5	90	127	18	129	45.5	107	-	4.0	M10	16	2100	4800	58.0	127.0	1300	8800	3.30

# TORQUE RESISTANT SLIDING/ROTATING BUSHINGS

This unit combines:

- The sliding properties of a ball bushing
- The anti-torque of a spline shaft (the shaft is grooved to allow 4 circuits of balls to engage in it)
- the anti-friction, high load capacity & rigidity of a cross roller bearing

All in one tidy unit !!

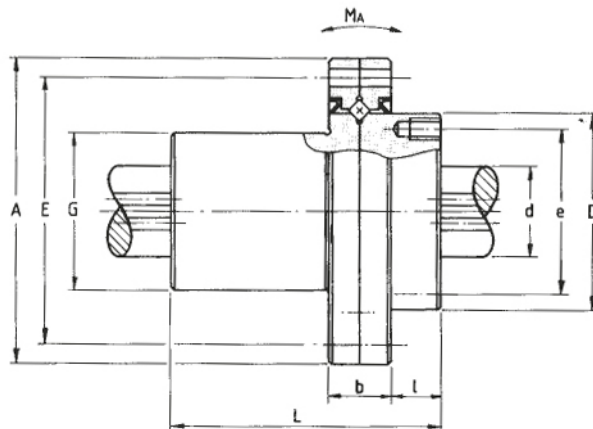
Mounting holes are provided in the the faces of the torque resistant bush (PCD values in column e) and the radial bearing (PCD values in column €)



This unit is designed for heavy duty applications.

Examples of applications:

- Rotating Z axis on pick and place machine or robot
- Tool turret on machine tool
- Spooling and winding machines



PART	d	D	L	A	b	€	S	G	l	e	S	Torque C <sub>T</sub> (Nm)	Torque C <sub>OT</sub> (Nm)	Load C (kN)	Load C <sub>0</sub> (N)	Ma (Nm)	Load C (kN)	Load C <sub>0</sub> (kN)	Max rpm
SPR1-314	13	29	36	50	9	42	3.4	24	8	24	M3X5	21	39	2.6	4.9	13	3	3.7	1800
SPR1-316	16	36	50	60	11	50	4.5	31	10	30	M4X6	60	110	6.1	11.2	46	5.6	6.7	1500
SPR1-320	18.2	40	60	66	13	56	4.5	34	12	34	M4X7	83	133	7.8	11.3	63	5.9	7.3	1200
SPR1-325	23	50	70	78	16	68	4.5	40	13	42	M5X8	162	239	12.3	16.1	104	9.1	11.5	1000
SPR1-330	28	61	80	100	17	86	6.6	47	17	52	M6X10	289	412	18.6	23.2	181	13.2	18	800
SPR1-340	37.4	76	100	120	20	104	6.6	62	23	64	M6X10	637	882	30.8	37.5	358	22.8	32.3	600
SPR1-350	47	88	112	130	22	114	9.0	75	24	77	M8X13	1390	3180	46.1	74.2	696	27.2	42.1	570
SPR1-360	56.5	102	127	150	25	132	9.0	90	25	90	M8X13	2100	4800	58	127.4	1300	30	48.2	500

# SPLINE SHAFTS FOR TORQUE RESISTING BUSHES

Our induction hardened steel spline shafts have four gothic arch profiled grooves to accept the balls from the spline nuts SSP, SPF and SPR.

Two types of spline shafts are available:

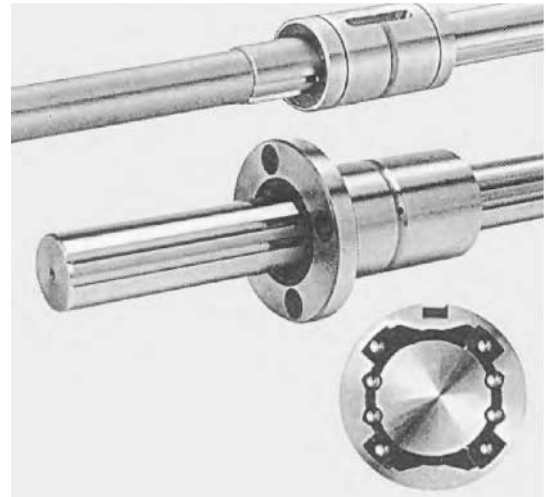
Ground Spline Shaft Type SP..S when high precision and/or high pre-load is required.

Three levels of pre-load are available: Zero, Light (suffix T1) or Medium (suffix T2).

Tolerance for twist is  $6\mu$  per 100mm on precision types.

Tolerance for twist is  $13\mu$  per 100mm on standard types.

Straightness values are given in the table below.

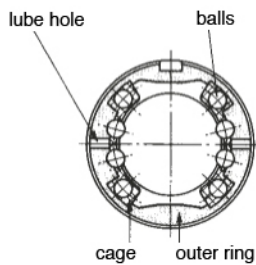


Drawn Spline Shaft Type SP..C when normal precision level is required. Available from size 20 to 50 and only without pre-load.

Tolerance for twist is  $100\mu$  per 100mm.

Straightness tolerance is 1mm per 1000mm.

The load capacities for drawn spline shafts are 70% of the values for ground splines shafts.



Ball race design



PART	d (h7)	Max length (mm)	Standard Straightness (microns/mt)	Precision Straightness (microns/mt)	No Preload (Microns)		Light Preload T1 (Microns)		Medium Preload T2 (Microns)	
SP04S	4	300	160	110	-2	1	-6	-2	N/A	N/A
SP06S	6	400	160	110	-2	1	-6	-2	N/A	N/A
SP08S	8	500	160	110	-2	1	-6	-2	N/A	N/A
SP10S	10	630	100	65	-3	1	-9	-3	N/A	N/A
SP14S	13	1500	75	50	-3	1	-9	-3	-13	-7
SP16S	16	1500	75	50	-3	1	-9	-3	-13	-7
SP20S	18.2	2000	170	120	-4	2	-12	-4	-20	-12
SP25S	23	2000	170	120	-4	2	-12	-4	-20	-12
SP30S	28	2000	170	120	-4	2	-12	-4	-20	-12
SP40S	37.4	2000	120	80	-6	3	-18	-6	-30	-18
SP50S	47	2000	120	80	-6	3	-18	-6	-30	-18
SP60S	56.5	2000	90	60	-6	3	-18	-6	-30	-18