

## Ball Splines



A Thomson Precision ball spline consists of mating inner and outer races containing concave axial races and a complement of bearing balls. The balls provide the only physical contact between the inner and outer races. Unlimited rolling travel is achieved by diverting the path of the balls at the extremes of the outer race into the end cap return circuit. This provides a closed loop through which the balls recirculate when the races are displaced axially relative to each other. The bearing balls resist radial displacement resulting from torque loads.

- Efficiency — coefficient of friction 0.007 maximum
- Hardness — minimum of RC 56 in ball race
- Lash — 0.005 inch maximum standard play perpendicular to rotational axis



## Precision Rolled Ball Splines

0.625 in to 4.000 in Diameter



### Inner and Outer Spline Races

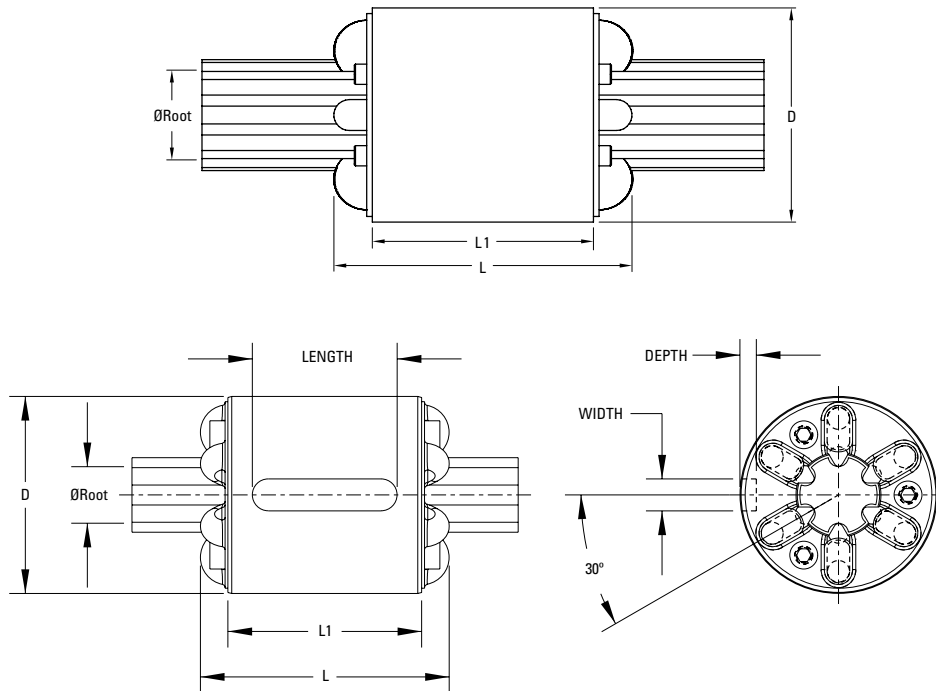
- Offers high speed, anti-friction linear motion under high torsional loads
- All units available with and without keyway
- **All sizes stocked for quick delivery**

Nominal Diameter (in.)	Active Races <sup>(1)(2)</sup>	Inner Race P/N	Outer Race P/N (w/o keyway)	Outer Race P/N (w/ keyway)	Performance Data				Inner Race Specifications		
					Dynamic Load Capacity (C <sub>am</sub> ) (in-lb)	Static Torque Capacity (C <sub>o</sub> ) (in-lb)	Max. Diametral Backlash (in.)	Max. Angular Backlash (radians)	Root Diameter (in.)	Standard Length (in.)	Inner Weight (lb/in)
0.625	3	5707548	5707445	7828128	585	1,770	0.005	0.0160	0.425	48	0.06
0.625	6	5707548	5708943	7828129	1,170	3,540	0.005	0.0160	0.425	48	0.06
1.000	3	5706084	5707472	7828130	1,300	3,900	0.005	0.0100	0.800	72	0.17
1.000	6	5706084	5708944	7828131	2,600	7,800	0.005	0.0100	0.800	72	0.17
1.500	3	5706388	5707528	7828132	4,200	11,588	0.005	0.0067	1.230	72	0.4
1.500	6	5706388	5708945	7828133	8,400	23,176	0.005	0.0067	1.230	72	0.4
2.000	3	5706436	5707530	7828134	8,000	20,138	0.005	0.0050	1.670	72	0.75
2.000	6	5706436	5708946	7828135	16,000	40,276	0.005	0.0050	1.670	72	0.75
2.500	3	5706484	5707532	7828136	13,500	36,625	0.005	0.0040	2.100	72	1.17
2.500	6	5706484	5708947	7828137	27,000	62,250	0.005	0.0040	2.100	72	1.17
4.062	6	5702204	5708330	7828138	57,000	140,000	0.005	0.0025	3.660	72	3.13

(1) Dimensional information on bearing supports and standard end machining is available on page 118 - 137.

(2) Information on required lubrication is on page 177.

### Precision Rolled Ball Splines



Nominal Diameter	Active Races	Outer Race Specifications					
		D (max.)	L	L1	Keyway Dimensions (Optional) (Width x Depth x Length)	Outer Weight	Ball Diameter
(in.)		(in.)	(in.)	(in.)	(in.)	(lb)	(in.)
0.625	3	1.531	2.035	1.505	0.250 x 0.125 x 1.125	0.37	0.187
0.625	6	1.531	2.035	1.505	0.250 x 0.125 x 1.125	0.37	0.187
1.000	3	1.906	2.598	2.068	0.250 x 0.125 x 1.625	0.92	0.187
1.000	6	1.906	2.598	2.068	0.250 x 0.125 x 1.625	0.92	0.187
1.500	3	2.693	3.719	3.005	0.250 x 0.125 x 2.000	3.33	0.250
1.500	6	2.693	3.719	3.005	0.375 x 0.187 x 2.000	3.33	0.250
2.000	3	3.427	4.022	3.130	0.250 x 0.125 x 2.500	5.42	0.312
2.000	6	3.427	4.022	3.130	0.500 x 0.219 x 2.500	5.42	0.312
2.500	3	4.170	4.426	3.380	0.250 x 0.125 x 3.000	7.50	0.375
2.500	6	4.170	4.426	3.380	0.500 x 0.250 x 3.000	7.50	0.375
4.062	6	5.6245	5.495	4.500	1.000 x 0.500 x 3.500	14.50	0.375