

4.7. Cross-sectional Characteristics of the Spline Shaft

4.7.1 Cross-sectional Characteristics of the Spline Shaft for Ball Spline Models LBS, LBST, LBF, LBR, LBH, LBG and LBGT

Table 3 Cross-sectional Characteristics of the Spline Shaft for Models LBS, LBST, LBF, LBR, LBH, LBG and LBGT

Nominal shaft diameter		I : Geometrical moment of inertia mm ⁴	Z : Section modulus mm ³	I _p : Polar geometrical moment of inertia mm ⁴	Z _p : Polar section modulus mm ³
6	Solid shaft	50.6	17.8	1.03×10^2	36.2
8	Solid shaft	1.64×10^2	42.9	3.35×10^2	87.8
10	Solid shaft	3.32×10^2	73.0	6.80×10^2	1.50×10^2
15	Solid shaft	1.27×10^3	2.00×10^2	2.55×10^3	4.03×10^2
20	Solid shaft	3.82×10^3	4.58×10^2	7.72×10^3	9.26×10^2
	Hollow shaft	3.79×10^3	4.56×10^2	7.59×10^3	9.11×10^2
25	Solid shaft	9.62×10^3	9.14×10^2	1.94×10^4	1.85×10^3
	Hollow shaft	9.50×10^3	9.05×10^2	1.90×10^4	1.81×10^3
30	Solid shaft	1.87×10^4	1.50×10^3	3.77×10^4	3.04×10^3
	Hollow shaft	1.78×10^4	1.44×10^3	3.57×10^4	2.88×10^3
40	Solid shaft	6.17×10^4	3.69×10^3	1.25×10^5	7.46×10^3
	Hollow shaft	5.71×10^4	3.42×10^3	1.14×10^5	6.84×10^3
50	Solid shaft	1.49×10^5	7.15×10^3	3.01×10^5	1.45×10^4
	Hollow shaft	1.34×10^5	6.46×10^3	2.69×10^5	1.29×10^4
60	Solid shaft	3.17×10^5	1.26×10^4	6.33×10^5	2.53×10^4
	Hollow shaft	2.77×10^5	1.11×10^4	5.54×10^5	2.21×10^4
70	Solid shaft	5.77×10^5	1.97×10^4	1.16×10^6	3.99×10^4
	Hollow shaft	5.07×10^5	1.74×10^4	1.01×10^6	3.49×10^4
85	Solid shaft	1.33×10^6	3.69×10^4	2.62×10^6	7.32×10^4
	Hollow shaft	1.11×10^6	3.10×10^4	2.22×10^6	6.20×10^4
100	Solid shaft	2.69×10^6	6.25×10^4	5.33×10^6	1.25×10^5
	Hollow shaft	2.18×10^6	5.10×10^4	4.37×10^6	1.02×10^5
120	Solid shaft	5.95×10^6	1.13×10^5	1.18×10^7	2.26×10^5
	Hollow shaft	5.28×10^6	1.01×10^5	1.06×10^7	2.02×10^5
150	Solid shaft	1.61×10^7	2.40×10^5	3.20×10^7	4.76×10^5
	Hollow shaft	1.40×10^7	2.08×10^5	2.79×10^7	4.16×10^5

Note: For the hole-shape of the hollow spline shaft, see pages b-23 and b-60 of the "THK General Catalog - Product Specifications."

4.7.2. Cross-sectional Characteristics of the Spline Shaft for Ball Spline Models LT, LF, LTR and LTR-A

Table 4 Cross-sectional Characteristics of the Spline Shaft for Models LT, LF, LTR and LTR-A

Nominal shaft diameter		I : Geometrical moment of inertia mm ⁴	Z : Section modulus mm ³	I _p : Polar geometrical moment of inertia mm ⁴	Z _p : Polar section modulus mm ³
4	Solid shaft	11.39	5.84	22.78	11.68
5	Solid shaft	27.88	11.43	55.76	22.85
6	Solid shaft	57.80	19.7	1.19 × 10 ²	40.50
	Hollow shaft Type K	55.87	18.9	1.16 × 10 ²	39.20
8	Solid shaft	1.86 × 10 ²	47.4	3.81 × 10 ²	96.60
	Hollow shaft Type K	1.81 × 10 ²	46.0	3.74 × 10 ²	94.60
10	Solid shaft	4.54 × 10 ²	92.6	9.32 × 10 ²	1.89 × 10 ³
	Hollow shaft Type K	4.41 × 10 ²	89.5	9.09 × 10 ²	1.84 × 10 ³
13	Solid shaft	1.32 × 10 ³	2.09 × 10 ²	2.70 × 10 ³	4.19 × 10 ³
	Hollow shaft Type K	1.29 × 10 ³	2.00 × 10 ²	2.63 × 10 ³	4.09 × 10 ³
16	Solid shaft	3.09 × 10 ³	3.90 × 10 ²	6.18 × 10 ³	7.80 × 10 ³
	Hollow shaft Type K	2.97 × 10 ³	3.75 × 10 ²	5.95 × 10 ³	7.51 × 10 ³
		2.37 × 10 ³	2.99 × 10 ²	4.74 × 10 ³	5.99 × 10 ³
	Hollow shaft Type N	2.37 × 10 ³	2.99 × 10 ²	4.74 × 10 ³	5.99 × 10 ³
20	Solid shaft	7.61 × 10 ³	7.67 × 10 ²	1.52 × 10 ⁴	1.53 × 10 ³
	Hollow shaft Type K	7.12 × 10 ³	7.18 × 10 ²	1.42 × 10 ⁴	1.43 × 10 ³
		5.72 × 10 ³	5.77 × 10 ²	1.14 × 10 ⁴	1.15 × 10 ³
	Hollow shaft Type N	5.72 × 10 ³	5.77 × 10 ²	1.14 × 10 ⁴	1.15 × 10 ³
25	Solid shaft	1.86 × 10 ⁴	1.50 × 10 ³	3.71 × 10 ⁴	2.99 × 10 ³
	Hollow shaft Type K	1.75 × 10 ⁴	1.41 × 10 ³	3.51 × 10 ⁴	2.83 × 10 ³
		1.34 × 10 ⁴	1.08 × 10 ³	2.68 × 10 ⁴	2.16 × 10 ³
	Hollow shaft Type N	1.34 × 10 ⁴	1.08 × 10 ³	2.68 × 10 ⁴	2.16 × 10 ³
30	Solid shaft	3.86 × 10 ⁴	2.59 × 10 ³	7.71 × 10 ⁴	5.18 × 10 ³
	Hollow shaft Type K	3.53 × 10 ⁴	2.37 × 10 ³	7.07 × 10 ⁴	4.74 × 10 ³
		2.90 × 10 ⁴	1.95 × 10 ³	5.80 × 10 ⁴	3.89 × 10 ³
	Hollow shaft Type N	2.90 × 10 ⁴	1.95 × 10 ³	5.80 × 10 ⁴	3.89 × 10 ³
32	Solid shaft	5.01 × 10 ⁴	3.15 × 10 ³	9.90 × 10 ⁴	6.27 × 10 ³
	Hollow shaft Type K	4.50 × 10 ⁴	2.83 × 10 ³	8.87 × 10 ⁴	5.61 × 10 ³
		3.64 × 10 ⁴	2.29 × 10 ³	7.15 × 10 ⁴	4.53 × 10 ³
	Hollow shaft Type N	3.64 × 10 ⁴	2.29 × 10 ³	7.15 × 10 ⁴	4.53 × 10 ³
40	Solid shaft	1.22 × 10 ⁵	6.14 × 10 ³	2.40 × 10 ⁵	1.21 × 10 ⁴
	Hollow shaft Type K	1.10 × 10 ⁵	5.55 × 10 ³	2.17 × 10 ⁵	1.10 × 10 ⁴
		8.70 × 10 ⁴	4.39 × 10 ³	1.71 × 10 ⁵	8.64 × 10 ³
	Hollow shaft Type N	8.70 × 10 ⁴	4.39 × 10 ³	1.71 × 10 ⁵	8.64 × 10 ³
50	Solid shaft	2.97 × 10 ⁵	1.20 × 10 ⁴	5.94 × 10 ⁵	2.40 × 10 ⁴
	Hollow shaft Type K	2.78 × 10 ⁵	1.12 × 10 ⁴	5.56 × 10 ⁵	2.24 × 10 ⁴
		2.14 × 10 ⁵	8.63 × 10 ³	4.29 × 10 ⁵	1.73 × 10 ⁴
	Hollow shaft Type N	2.14 × 10 ⁵	8.63 × 10 ³	4.29 × 10 ⁵	1.73 × 10 ⁴
60	Solid shaft	6.16 × 10 ⁵	2.07 × 10 ⁴	1.23 × 10 ⁶	4.14 × 10 ⁴
	Hollow shaft Type K	5.56 × 10 ⁵	1.90 × 10 ⁴	1.13 × 10 ⁶	3.79 × 10 ⁴
80	Solid shaft	1.95 × 10 ⁶	4.91 × 10 ⁴	3.90 × 10 ⁶	9.82 × 10 ⁴
	Hollow shaft Type K	1.58 × 10 ⁶	3.97 × 10 ⁴	3.15 × 10 ⁶	7.95 × 10 ⁴
100	Solid shaft	4.78 × 10 ⁶	9.62 × 10 ⁴	9.56 × 10 ⁶	1.92 × 10 ⁵
	Hollow shaft Type K	3.76 × 10 ⁶	7.57 × 10 ⁴	7.52 × 10 ⁶	1.51 × 10 ⁵

Note: For the hole-shape of the hollow spline shaft,

For type K: see pages b-47 and b-69 of the "THK General Catalog - Product Specifications."

For type N: see pages b-47 and b-69 of the "THK General Catalog - Product Specifications."