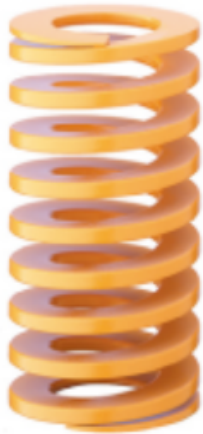


Nitrocut



Tohatsu JIS Standard Springs



TF



TL



TM



TH



TB



TOHATSU SPRINGS



Carga Extra Leve

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		40% do compr. total 1Milhão de ciclos		45% do compr. total 500mil ciclos		50% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TF 8 x 10	8	4	10	15.24	{ 1.55 }	4.0	58.8 { 6.0 }	4.5	68.6 { 7.0 }	5.0	78.5 { 8.0 }
15			15	10.16	{ 1.04 }	6.0		6.8		7.5	
20			20	7.62	{ 0.78 }	8.0		9.0		10.0	
25			25	6.10	{ 0.62 }	10.0		11.3		12.5	
30			30	5.08	{ 0.52 }	12.0		13.5		15.0	
35			35	4.36	{ 0.44 }	14.0		15.8		17.5	
40			40	3.81	{ 0.39 }	16.0		18.0		20.0	
45			45	3.39	{ 0.35 }	18.0		20.3		22.5	
50			50	3.05	{ 0.31 }	20.0		22.5		25.0	
55			55	2.77	{ 0.28 }	22.0		24.8		27.5	
60			60	2.54	{ 0.26 }	24.0		27.0		30.0	
65			65	2.35	{ 0.24 }	26.0		29.3		32.5	
70			70	2.18	{ 0.22 }	28.0		31.5		35.0	
75			75	2.03	{ 0.21 }	30.0		33.8		37.5	
80			80	1.91	{ 0.19 }	32.0		36.0		40.0	
TF 10 x 20	10	5	20	9.81	{ 1.00 }	8.0	78.5 { 8.0 }	9.0	88.3 { 9.0 }	10.0	98.1 { 10.0 }
25			25	7.85	{ 0.80 }	10.0		11.3		12.5	
30			30	6.54	{ 0.67 }	12.0		13.5		15.0	
35			35	5.61	{ 0.57 }	14.0		15.8		17.5	
40			40	4.91	{ 0.50 }	16.0		18.0		20.0	
45			45	4.36	{ 0.44 }	18.0		20.3		22.5	
50			50	3.92	{ 0.40 }	20.0		22.5		25.0	
55			55	3.57	{ 0.36 }	22.0		24.8		27.5	
60			60	3.27	{ 0.33 }	24.0		27.0		30.0	
65			65	3.02	{ 0.31 }	26.0		29.3		32.5	
70			70	2.80	{ 0.29 }	28.0		31.5		35.0	
75			75	2.62	{ 0.27 }	30.0		33.8		37.5	
80			80	2.45	{ 0.25 }	32.0		36.0		40.0	
90			90	2.18	{ 0.22 }	36.0		40.5		45.0	



Carga Extra Leve

TF

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		40% do compr. total 1Milhão de ciclos		45% do compr. total 500mil ciclos		50% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TF 12 × 20	12	6	20	13.62	{ 1.39 }	8.0	107.9 { 11.0 }	9.0	122.6 { 12.5 }	10.0	137.3 { 14.0 }
25			25	10.90	{ 1.11 }	10.0		11.3		12.5	
30			30	9.08	{ 0.93 }	12.0		13.5		15.0	
35			35	7.78	{ 0.79 }	14.0		15.8		17.5	
40			40	6.81	{ 0.69 }	16.0		18.0		20.0	
45			45	6.05	{ 0.62 }	18.0		20.3		22.5	
50			50	5.45	{ 0.56 }	20.0		22.5		25.0	
55			55	4.95	{ 0.51 }	22.0		24.8		27.5	
60			60	4.54	{ 0.46 }	24.0		27.0		30.0	
65			65	4.19	{ 0.43 }	26.0		29.3		32.5	
70			70	3.89	{ 0.40 }	28.0		31.5		35.0	
75			75	3.63	{ 0.37 }	30.0		33.8		37.5	
80			80	3.41	{ 0.35 }	32.0		36.0		40.0	
90			90	3.03	{ 0.31 }	36.0		40.5		45.0	
TF 14 × 25	14	7	25	13.95	{ 1.42 }	10.0	142.2 { 14.5 }	11.3	156.9 { 16.0 }	12.5	176.5 { 18.0 }
30			30	11.62	{ 1.19 }	12.0		13.5		15.0	
35			35	9.96	{ 1.02 }	14.0		15.8		17.5	
40			40	8.72	{ 0.89 }	16.0		18.0		20.0	
45			45	7.75	{ 0.79 }	18.0		20.3		22.5	
50			50	6.97	{ 0.71 }	20.0		22.5		25.0	
55			55	6.34	{ 0.65 }	22.0		24.8		27.5	
60			60	5.81	{ 0.59 }	24.0		27.0		30.0	
65			65	5.36	{ 0.55 }	26.0		29.3		32.5	
70			70	4.98	{ 0.51 }	28.0		31.5		35.0	
75			75	4.65	{ 0.47 }	30.0		33.8		37.5	
80			80	4.36	{ 0.44 }	32.0		36.0		40.0	
90			90	3.87	{ 0.40 }	36.0		40.5		45.0	
100			100	3.49	{ 0.36 }	40.0		45.0		50.0	
TF 16 × 25	16	8	25	16.56	{ 1.69 }	10.0	166.7 { 17.0 }	11.3	186.3 { 19.0 }	12.5	206 { 21.0 }
30			30	13.80	{ 1.41 }	12.0		13.5		15.0	
35			35	11.83	{ 1.21 }	14.0		15.8		17.5	
40			40	10.35	{ 1.06 }	16.0		18.0		20.0	
45			45	9.20	{ 0.94 }	18.0		20.3		22.5	
50			50	8.28	{ 0.84 }	20.0		22.5		25.0	
55			55	7.53	{ 0.77 }	22.0		24.8		27.5	
60			60	6.90	{ 0.70 }	24.0		27.0		30.0	
65			65	6.37	{ 0.65 }	26.0		29.3		32.5	
70			70	5.91	{ 0.60 }	28.0		31.5		35.0	
75			75	5.52	{ 0.56 }	30.0		33.8		37.5	
80			80	5.18	{ 0.53 }	32.0		36.0		40.0	
90			90	4.60	{ 0.47 }	36.0		40.5		45.0	
100			100	4.14	{ 0.42 }	40.0		45.0		50.0	
125			125	3.31	{ 0.34 }	50.0		56.3		62.5	



Carga Extra Leve

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		40% do compr. total 1Milhão de ciclos		45% do compr. total 500mil ciclos		50% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TF 18 × 25	18	9	25	20.09	{ 2.05 }	10.0	206 { 21.0 }	11.3	226 { 23.0 }	12.5	255 { 26.0 }
30			30	16.74	{ 1.71 }	12.0		13.5		15.0	
35			35	14.35	{ 1.46 }	14.0		15.8		17.5	
40			40	12.56	{ 1.28 }	16.0		18.0		20.0	
45			45	11.16	{ 1.14 }	18.0		20.3		22.5	
50			50	10.04	{ 1.02 }	20.0		22.5		25.0	
55			55	9.13	{ 0.93 }	22.0		24.8		27.5	
60			60	8.37	{ 0.85 }	24.0		27.0		30.0	
65			65	7.73	{ 0.79 }	26.0		29.3		32.5	
70			70	7.17	{ 0.73 }	28.0		31.5		35.0	
75			75	6.70	{ 0.68 }	30.0		33.8		37.5	
80			80	6.28	{ 0.64 }	32.0		36.0		40.0	
90			90	5.58	{ 0.57 }	36.0		40.5		45.0	
100			100	5.02	{ 0.51 }	40.0		45.0		50.0	
125			125	4.02	{ 0.41 }	50.0		56.3		62.5	
TF 20 × 25	20	11	25	25.24	{ 2.57 }	10.0	255 { 26.0 }	11.3	284 { 29.0 }	12.5	314 { 32.0 }
30			30	21.04	{ 2.15 }	12.0		13.5		15.0	
35			35	18.03	{ 1.84 }	14.0		15.8		17.5	
40			40	15.78	{ 1.61 }	16.0		18.0		20.0	
45			45	14.02	{ 1.43 }	18.0		20.3		22.5	
50			50	12.62	{ 1.29 }	20.0		22.5		25.0	
55			55	11.47	{ 1.17 }	22.0		24.8		27.5	
60			60	10.52	{ 1.07 }	24.0		27.0		30.0	
65			65	9.71	{ 0.99 }	26.0		29.3		32.5	
70			70	9.02	{ 0.92 }	28.0		31.5		35.0	
75			75	8.41	{ 0.86 }	30.0		33.8		37.5	
80			80	7.89	{ 0.80 }	32.0		36.0		40.0	
90			90	7.01	{ 0.72 }	36.0		40.5		45.0	
100			100	6.31	{ 0.64 }	40.0		45.0		50.0	
125			125	5.05	{ 0.51 }	50.0		56.3		62.5	
150			150	4.21	{ 0.43 }	60.0		67.5		75.0	
TF 22 × 25	22	11	25	31.38	{ 3.20 }	10.0	314 { 32.0 }	11.3	353 { 36.0 }	12.5	392 { 40.0 }
30			30	26.15	{ 2.67 }	12.0		13.5		15.0	
35			35	22.41	{ 2.29 }	14.0		15.8		17.5	
40			40	19.61	{ 2.00 }	16.0		18.0		20.0	
45			45	17.43	{ 1.78 }	18.0		20.3		22.5	
50			50	15.69	{ 1.60 }	20.0		22.5		25.0	
55			55	14.26	{ 1.45 }	22.0		24.8		27.5	
60			60	13.07	{ 1.33 }	24.0		27.0		30.0	
65			65	12.07	{ 1.23 }	26.0		29.3		32.5	
70			70	11.21	{ 1.14 }	28.0		31.5		35.0	
75			75	10.46	{ 1.07 }	30.0		33.8		37.5	
80			80	9.81	{ 1.00 }	32.0		36.0		40.0	
90			90	8.72	{ 0.89 }	36.0		40.5		45.0	
100			100	7.84	{ 0.80 }	40.0		45.0		50.0	
125			125	6.28	{ 0.64 }	50.0		56.3		62.5	
150			150	5.23	{ 0.53 }	60.0		67.5		75.0	

TF

Carga Extra Leve

TF

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		40% do compr. total 1Milhão de ciclos		45% do compr. total 500mil ciclos		50% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TF 25 × 25	25	13.5	25	39.20	{ 4.00 }	10.0	392 { 40.0 }	11.3	441 { 45.0 }	12.5	490 { 50.0 }
30			30	32.67	{ 3.33 }	12.0		13.5		15.0	
35			35	28.00	{ 2.86 }	14.0		15.8		17.5	
40			40	24.50	{ 2.50 }	16.0		18.0		20.0	
45			45	21.78	{ 2.22 }	18.0		20.3		22.5	
50			50	19.60	{ 2.00 }	20.0		22.5		25.0	
55			55	17.82	{ 1.82 }	22.0		24.8		27.5	
60			60	16.33	{ 1.67 }	24.0		27.0		30.0	
65			65	15.08	{ 1.54 }	26.0		29.3		32.5	
70			70	14.00	{ 1.43 }	28.0		31.5		35.0	
75			75	13.07	{ 1.33 }	30.0		33.8		37.5	
80			80	12.25	{ 1.25 }	32.0		36.0		40.0	
90			90	10.89	{ 1.11 }	36.0		40.5		45.0	
100			100	9.80	{ 1.00 }	40.0		45.0		50.0	
125			125	7.84	{ 0.80 }	50.0		56.3		62.5	
150			150	6.53	{ 0.67 }	60.0		67.5		75.0	
175			175	5.60	{ 0.57 }	70.0		78.8		87.5	
200			200	4.90	{ 0.50 }	80.0		90.0		100.0	
TF 27 × 25	27	13.5	25	47.11	{ 4.80 }	10.0	471 { 48.0 }	11.3	530 { 54.0 }	12.5	588 { 60.0 }
30			30	39.26	{ 4.00 }	12.0		13.5		15.0	
35			35	33.65	{ 3.43 }	14.0		15.8		17.5	
40			40	29.44	{ 3.00 }	16.0		18.0		20.0	
45			45	26.17	{ 2.67 }	18.0		20.3		22.5	
50			50	23.56	{ 2.40 }	20.0		22.5		25.0	
55			55	21.41	{ 2.18 }	22.0		24.8		27.5	
60			60	19.63	{ 2.00 }	24.0		27.0		30.0	
65			65	18.12	{ 1.85 }	26.0		29.3		32.5	
70			70	16.83	{ 1.72 }	28.0		31.5		35.0	
75			75	15.70	{ 1.60 }	30.0		33.8		37.5	
80			80	14.72	{ 1.50 }	32.0		36.0		40.0	
90			90	13.09	{ 1.33 }	36.0		40.5		45.0	
100			100	11.78	{ 1.20 }	40.0		45.0		50.0	
125			125	9.42	{ 0.96 }	50.0		56.3		62.5	
150			150	7.85	{ 0.80 }	60.0		67.5		75.0	
175			175	6.73	{ 0.69 }	70.0		78.8		87.5	
200			200	5.89	{ 0.60 }	80.0		90.0		100.0	



Carga Extra Leve

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		40% do compr. total 1Milhão de ciclos		45% do compr. total 500mil ciclos		50% do compr. total 300mil ciclos	
				(N / mm)	(Kgf / mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TF 30 × 25	30	16	25	56.62	{ 5.77 }	10.0	569 { 58.0 }	11.3	637 { 65.0 }	12.5	706 { 72.0 }
30			30	47.19	{ 4.81 }	12.0		13.5		15.0	
35			35	40.44	{ 4.12 }	14.0		15.8		17.5	
40			40	35.39	{ 3.61 }	16.0		18.0		20.0	
45			45	31.46	{ 3.21 }	18.0		20.3		22.5	
50			50	28.31	{ 2.89 }	20.0		22.5		25.0	
55			55	25.74	{ 2.62 }	22.0		24.8		27.5	
60			60	23.59	{ 2.41 }	24.0		27.0		30.0	
65			65	21.78	{ 2.22 }	26.0		29.3		32.5	
70			70	20.22	{ 2.06 }	28.0		31.5		35.0	
75			75	18.87	{ 1.92 }	30.0		33.8		37.5	
80			80	17.69	{ 1.80 }	32.0		36.0		40.0	
90			90	15.73	{ 1.60 }	36.0		40.5		45.0	
100			100	14.16	{ 1.44 }	40.0		45.0		50.0	
125			125	11.32	{ 1.15 }	50.0		56.3		62.5	
150			150	9.44	{ 0.96 }	60.0		67.5		75.0	
175			175	8.09	{ 0.82 }	70.0		78.8		87.5	
200			200	7.08	{ 0.72 }	80.0		90.0		100.0	
TF 35 × 40	35	19	40	47.94	{ 4.89 }	16.0	765 { 78.0 }	18.0	863 { 88.0 }	20.0	961 { 98.0 }
45			45	42.62	{ 4.35 }	18.0		20.3		22.5	
50			50	38.36	{ 3.91 }	20.0		22.5		25.0	
55			55	34.87	{ 3.56 }	22.0		24.8		27.5	
60			60	31.96	{ 3.26 }	24.0		27.0		30.0	
65			65	29.50	{ 3.01 }	26.0		29.3		32.5	
70			70	27.40	{ 2.79 }	28.0		31.5		35.0	
75			75	25.57	{ 2.61 }	30.0		33.8		37.5	
80			80	23.97	{ 2.44 }	32.0		36.0		40.0	
90			90	21.31	{ 2.17 }	36.0		40.5		45.0	
100			100	19.18	{ 1.96 }	40.0		45.0		50.0	
125			125	15.34	{ 1.56 }	50.0		56.3		62.5	
150			150	12.79	{ 1.30 }	60.0		67.5		75.0	
175			175	10.96	{ 1.12 }	70.0		78.8		87.5	
200			200	9.59	{ 0.98 }	80.0		90.0		100.0	
TF 40 × 40	40	22	40	62.67	{ 6.39 }	16.0	1,000 { 102.0 }	18.0	1,128 { 115.0 }	20.0	1,255 { 128.0 }
45			45	55.70	{ 5.68 }	18.0		20.3		22.5	
50			50	50.13	{ 5.11 }	20.0		22.5		25.0	
55			55	45.58	{ 4.65 }	22.0		24.8		27.5	
60			60	41.78	{ 4.26 }	24.0		27.0		30.0	
65			65	38.56	{ 3.93 }	26.0		29.3		32.5	
70			70	35.81	{ 3.65 }	28.0		31.5		35.0	
75			75	33.42	{ 3.41 }	30.0		33.8		37.5	
80			80	31.33	{ 3.20 }	32.0		36.0		40.0	
90			90	27.85	{ 2.84 }	36.0		40.5		45.0	
100			100	25.07	{ 2.56 }	40.0		45.0		50.0	
125			125	20.05	{ 2.04 }	50.0		56.3		62.5	
150			150	16.71	{ 1.70 }	60.0		67.5		75.0	
175			175	14.32	{ 1.46 }	70.0		78.8		87.5	
200			200	12.53	{ 1.28 }	80.0		90.0		100.0	
225			225	11.14	{ 1.14 }	90.0		101.3		112.5	
250			250	10.03	{ 1.02 }	100.0		112.5		125.0	
275			275	9.12	{ 0.93 }	110.0		123.8		137.5	
300			300	8.36	{ 0.85 }	120.0		135.0		150.0	



Carga Extra Leve

TF

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		40% do compr. total 1Milhão de ciclos		45% do compr. total 500mil ciclos		50% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TF 50 × 50	50	27.5	50	78.44	8.00	20.0	1,569 {160.0}	22.5	1,765 {180.0}	25.0	1,961 {200.0}
55			55	71.31	7.27	22.0		24.8		27.5	
60			60	65.37	6.67	24.0		27.0		30.0	
65			65	60.34	6.15	26.0		29.3		32.5	
70			70	56.03	5.71	28.0		31.5		35.0	
75			75	52.30	5.33	30.0		33.8		37.5	
80			80	49.03	5.00	32.0		36.0		40.0	
90			90	43.58	4.44	36.0		40.5		45.0	
100			100	39.22	4.00	40.0		45.0		50.0	
125			125	31.38	3.20	50.0		56.3		62.5	
150			150	26.15	2.67	60.0		67.5		75.0	
175			175	22.41	2.29	70.0		78.8		87.5	
200			200	19.61	2.00	80.0		90.0		100.0	
225			225	17.43	1.78	90.0		101.3		112.5	
250			250	15.69	1.60	100.0		112.5		125.0	
275			275	14.26	1.45	110.0		123.8		137.5	
300			300	13.07	1.33	120.0		135.0		150.0	
350			350	11.21	1.14	140.0		157.5		175.0	
400			400	9.81	1.00	160.0		180.0		200.0	
450			450	8.72	0.89	180.0		202.5		225.0	
500			500	7.84	0.80	200.0		225.0		250.0	
TF 60 × 60	60	33	60	94.07	9.59	24.0	2,260 {230.5}	27.0	2,540 {259.0}	30.0	2,820 {287.6}
70			70	80.63	8.22	28.0		31.5		35.0	
80			80	70.56	7.19	32.0		36.0		40.0	
90			90	62.72	6.40	36.0		40.5		45.0	
100			100	56.44	5.76	40.0		45.0		50.0	
125			125	45.16	4.60	50.0		56.3		62.5	
150			150	37.63	3.84	60.0		67.5		75.0	
175			175	32.25	3.29	70.0		78.8		87.5	
200			200	28.22	2.88	80.0		90.0		100.0	
225			225	25.09	2.56	90.0		101.3		112.5	
250			250	22.58	2.30	100.0		112.5		125.0	
275			275	20.53	2.09	110.0		123.8		137.5	
300			300	18.81	1.92	120.0		135.0		150.0	
350			350	16.13	1.64	140.0		157.5		175.0	
400			400	14.11	1.44	160.0		180.0		200.0	
450			450	12.54	1.28	180.0		202.5		225.0	
500			500	11.29	1.15	200.0		225.0		250.0	
TF 70 × 70	70	38.5	70	114.29	11.65	28.0	3,200 {326.3}	31.5	3,600 {367.0}	35.0	4,000 {407.9}
80			80	100.00	10.20	32.0		36.0		40.0	
90			90	88.89	9.06	36.0		40.5		45.0	
100			100	80.00	8.16	40.0		45.0		50.0	
125			125	64.00	6.53	50.0		56.3		62.5	
150			150	53.33	5.44	60.0		67.5		75.0	
175			175	45.71	4.66	70.0		78.8		87.5	
200			200	40.00	4.08	80.0		90.0		100.0	
225			225	35.56	3.63	90.0		101.3		112.5	
250			250	32.00	3.26	100.0		112.5		125.0	
275			275	29.09	2.97	110.0		123.8		137.5	
300			300	26.67	2.72	120.0		135.0		150.0	
350			350	22.86	2.33	140.0		157.5		175.0	



Carga Leve

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		32% do compr. total 1Milhão de ciclos		36% do compr. total 500mil ciclos		40% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TL 8 x 10	8	4	10	24.53	{ 2.50 }	3.2	78.5 { 8.0 }	3.6	88.3 { 9.0 }	4.0	98.1 { 10.0 }
15			15	16.35	{ 1.67 }	4.8		5.4		6.0	
20			20	12.26	{ 1.25 }	6.4		7.2		8.0	
25			25	9.81	{ 1.00 }	8.0		9.0		10.0	
30			30	8.18	{ 0.83 }	9.6		10.8		12.0	
35			35	7.01	{ 0.71 }	11.2		12.6		14.0	
40			40	6.13	{ 0.63 }	12.8		14.4		16.0	
45			45	5.45	{ 0.56 }	14.4		16.2		18.0	
50			50	4.91	{ 0.50 }	16.0		18.0		20.0	
55			55	4.46	{ 0.45 }	17.6		19.8		22.0	
60			60	4.09	{ 0.42 }	19.2		21.6		24.0	
65			65	3.77	{ 0.38 }	20.8		23.4		26.0	
70			70	3.50	{ 0.36 }	22.4		25.2		28.0	
75			75	3.27	{ 0.33 }	24.0		27.0		30.0	
80			80	3.07	{ 0.31 }	25.6		28.8		32.0	
TL 10 x 20	10	5	20	17.71	{ 1.81 }	6.4	112.8 { 11.5 }	7.2	127.5 { 13.0 }	8.0	142.2 { 14.5 }
25			25	14.17	{ 1.44 }	8.0		9.0		10.0	
30			30	11.81	{ 1.20 }	9.6		10.8		12.0	
35			35	10.12	{ 1.03 }	11.2		12.6		14.0	
40			40	8.85	{ 0.90 }	12.8		14.4		16.0	
45			45	7.87	{ 0.80 }	14.4		16.2		18.0	
50			50	7.08	{ 0.72 }	16.0		18.0		20.0	
55			55	6.44	{ 0.66 }	17.6		19.8		22.0	
60			60	5.90	{ 0.60 }	19.2		21.6		24.0	
65			65	5.45	{ 0.56 }	20.8		23.4		26.0	
70			70	5.06	{ 0.52 }	22.4		25.2		28.0	
75			75	4.72	{ 0.48 }	24.0		27.0		30.0	
80			80	4.43	{ 0.45 }	25.6		28.8		32.0	
90			90	3.94	{ 0.40 }	28.8		32.4		36.0	





Carga Leve

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		32% do compr. total 1Milhão de ciclos		36% do compr. total 500mil ciclos		40% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TL 12 x 20	12	6	20	25.88	{ 2.64 }	6.4	166.7 { 17.0 }	7.2	186.3 { 19.0 }	8.0	206 { 21.0 }
25			25	20.70	{ 2.11 }	8.0		9.0		10.0	
30			30	17.25	{ 1.76 }	9.6		10.8		12.0	
35			35	14.79	{ 1.51 }	11.2		12.6		14.0	
40			40	12.94	{ 1.32 }	12.8		14.4		16.0	
45			45	11.50	{ 1.17 }	14.4		16.2		18.0	
50			50	10.35	{ 1.06 }	16.0		18.0		20.0	
55			55	9.41	{ 0.96 }	17.6		19.8		22.0	
60			60	8.63	{ 0.88 }	19.2		21.6		24.0	
65			65	7.96	{ 0.81 }	20.8		23.4		26.0	
70			70	7.39	{ 0.75 }	22.4		25.2		28.0	
75			75	6.90	{ 0.70 }	24.0		27.0		30.0	
80			80	6.47	{ 0.66 }	25.6		28.8		32.0	
90			90	5.75	{ 0.59 }	28.8		32.4		36.0	
TL 14 x 25	14	7	25	27.22	{ 2.78 }	8.0	216 { 22.0 }	9.0	245 { 25.0 }	10.0	275 { 28.0 }
30			30	22.69	{ 2.31 }	9.6		10.8		12.0	
35			35	19.44	{ 1.98 }	11.2		12.6		14.0	
40			40	17.01	{ 1.73 }	12.8		14.4		16.0	
45			45	15.12	{ 1.54 }	14.4		16.2		18.0	
50			50	13.61	{ 1.39 }	16.0		18.0		20.0	
55			55	12.37	{ 1.26 }	17.6		19.8		22.0	
60			60	11.34	{ 1.16 }	19.2		21.6		24.0	
65			65	10.47	{ 1.07 }	20.8		23.4		26.0	
70			70	9.72	{ 0.99 }	22.4		25.2		28.0	
75			75	9.07	{ 0.93 }	24.0		27.0		30.0	
80			80	8.51	{ 0.87 }	25.6		28.8		32.0	
90			90	7.56	{ 0.77 }	28.8		32.4		36.0	
100			100	6.81	{ 0.69 }	32.0		36.0		40.0	
TL 16 x 25	16	8	25	34.89	{ 3.56 }	8.0	275 { 28.0 }	9.0	314 { 32.0 }	10.0	343 { 35.0 }
30			30	29.07	{ 2.96 }	9.6		10.8		12.0	
35			35	24.92	{ 2.54 }	11.2		12.6		14.0	
40			40	21.81	{ 2.22 }	12.8		14.4		16.0	
45			45	19.38	{ 1.98 }	14.4		16.2		18.0	
50			50	17.44	{ 1.78 }	16.0		18.0		20.0	
55			55	15.86	{ 1.62 }	17.6		19.8		22.0	
60			60	14.54	{ 1.48 }	19.2		21.6		24.0	
65			65	13.42	{ 1.37 }	20.8		23.4		26.0	
70			70	12.46	{ 1.27 }	22.4		25.2		28.0	
75			75	11.63	{ 1.19 }	24.0		27.0		30.0	
80			80	10.90	{ 1.11 }	25.6		28.8		32.0	
90			90	9.69	{ 0.99 }	28.8		32.4		36.0	
100			100	8.72	{ 0.89 }	32.0		36.0		40.0	
125			125	6.98	{ 0.71 }	40.0		45.0		50.0	



Carga Leve

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		19.2% do compr. total 1Milhão de ciclos		21.6% do compr. total 500mil ciclos		24% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TL 18 × 25	18	9	25	42.44	{ 4.33 }	8.0	333 { 34.0 }	9.0	382 { 39.0 }	10.0	422 { 43.0 }
30			30	35.37	{ 3.61 }	9.6		10.8		12.0	
35			35	30.32	{ 3.09 }	11.2		12.6		14.0	
40			40	26.53	{ 2.71 }	12.8		14.4		16.0	
45			45	23.58	{ 2.40 }	14.4		16.2		18.0	
50			50	21.22	{ 2.16 }	16.0		18.0		20.0	
55			55	19.29	{ 1.97 }	17.6		19.8		22.0	
60			60	17.69	{ 1.80 }	19.2		21.6		24.0	
65			65	16.32	{ 1.66 }	20.8		23.4		26.0	
70			70	15.16	{ 1.55 }	22.4		25.2		28.0	
75			75	14.15	{ 1.44 }	24.0		27.0		30.0	
80			80	13.26	{ 1.35 }	25.6		28.8		32.0	
90			90	11.79	{ 1.20 }	28.8		32.4		36.0	
100			100	10.61	{ 1.08 }	32.0		36.0		40.0	
125			125	8.49	{ 0.87 }	40.0		45.0		50.0	
TL 20 × 25	20	10	25	53.44	{ 5.45 }	8.0	422 { 43.0 }	9.0	481 { 49.0 }	10.0	530 { 54.0 }
30			30	44.54	{ 4.54 }	9.6		10.8		12.0	
35			35	38.17	{ 3.89 }	11.2		12.6		14.0	
40			40	33.40	{ 3.41 }	12.8		14.4		16.0	
45			45	29.69	{ 3.03 }	14.4		16.2		18.0	
50			50	26.72	{ 2.72 }	16.0		18.0		20.0	
55			55	24.29	{ 2.48 }	17.6		19.8		22.0	
60			60	22.27	{ 2.27 }	19.2		21.6		24.0	
65			65	20.56	{ 2.10 }	20.8		23.4		26.0	
70			70	19.09	{ 1.95 }	22.4		25.2		28.0	
75			75	17.81	{ 1.82 }	24.0		27.0		30.0	
80			80	16.70	{ 1.70 }	25.6		28.8		32.0	
90			90	14.85	{ 1.51 }	28.8		32.4		36.0	
100			100	13.36	{ 1.36 }	32.0		36.0		40.0	
125			125	10.69	{ 1.09 }	40.0		45.0		50.0	
150			150	8.91	{ 0.91 }	48.0		54.0		60.0	
TL 22 × 25	22	11	25	65.33	{ 6.66 }	8.0	530 { 54.0 }	9.0	588 { 60.0 }	10.0	657 { 67.0 }
30			30	54.44	{ 5.55 }	9.6		10.8		12.0	
35			35	46.67	{ 4.76 }	11.2		12.6		14.0	
40			40	40.83	{ 4.16 }	12.8		14.4		16.0	
45			45	36.30	{ 3.70 }	14.4		16.2		18.0	
50			50	32.67	{ 3.33 }	16.0		18.0		20.0	
55			55	29.70	{ 3.03 }	17.6		19.8		22.0	
60			60	27.22	{ 2.78 }	19.2		21.6		24.0	
65			65	25.13	{ 2.56 }	20.8		23.4		26.0	
70			70	23.33	{ 2.38 }	22.4		25.2		28.0	
75			75	21.78	{ 2.22 }	24.0		27.0		30.0	
80			80	20.42	{ 2.08 }	25.6		28.8		32.0	
90			90	18.15	{ 1.85 }	28.8		32.4		36.0	
100			100	16.33	{ 1.67 }	32.0		36.0		40.0	
125			125	13.07	{ 1.33 }	40.0		45.0		50.0	
150			150	10.89	{ 1.11 }	48.0		54.0		60.0	



Carga Leve

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		32% do compr. total 1Milhão de ciclos		36% do compr. total 500mil ciclos		40% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TL 25 × 25	25	12.5	25	82.78	{ 8.44 }	8.0	657 { 67.0 }	9.0	745 { 76.0 }	10.0	824 { 84.0 }
30			30	68.98	{ 7.03 }	9.6		10.8		12.0	
35			35	59.13	{ 6.03 }	11.2		12.6		14.0	
40			40	51.74	{ 5.28 }	12.8		14.4		16.0	
45			45	45.99	{ 4.69 }	14.4		16.2		18.0	
50			50	41.39	{ 4.22 }	16.0		18.0		20.0	
55			55	37.63	{ 3.84 }	17.6		19.8		22.0	
60			60	34.49	{ 3.52 }	19.2		21.6		24.0	
65			65	31.84	{ 3.25 }	20.8		23.4		26.0	
70			70	29.56	{ 3.01 }	22.4		25.2		28.0	
75			75	27.59	{ 2.81 }	24.0		27.0		30.0	
80			80	25.87	{ 2.64 }	25.6		28.8		32.0	
90			90	22.99	{ 2.34 }	28.8		32.4		36.0	
100			100	20.69	{ 2.11 }	32.0		36.0		40.0	
125			125	16.56	{ 1.69 }	40.0		45.0		50.0	
150			150	13.80	{ 1.41 }	48.0		54.0		60.0	
175			175	11.83	{ 1.21 }	56.0		63.0		70.0	
200			200	10.35	{ 1.06 }	64.0		72.0		80.0	
TL 27 × 25	27	13.5	25	98.11	{ 10.00 }	8.0	785 { 80.0 }	9.0	883 { 90.0 }	10.0	981 { 100.0 }
30			30	81.76	{ 8.34 }	9.6		10.8		12.0	
35			35	70.08	{ 7.15 }	11.2		12.6		14.0	
40			40	61.32	{ 6.25 }	12.8		14.4		16.0	
45			45	54.51	{ 5.56 }	14.4		16.2		18.0	
50			50	49.06	{ 5.00 }	16.0		18.0		20.0	
55			55	44.60	{ 4.55 }	17.6		19.8		22.0	
60			60	40.88	{ 4.17 }	19.2		21.6		24.0	
65			65	37.74	{ 3.85 }	20.8		23.4		26.0	
70			70	35.04	{ 3.57 }	22.4		25.2		28.0	
75			75	32.70	{ 3.33 }	24.0		27.0		30.0	
80			80	30.66	{ 3.13 }	25.6		28.8		32.0	
90			90	27.25	{ 2.78 }	28.8		32.4		36.0	
100			100	24.53	{ 2.50 }	32.0		36.0		40.0	
125			125	19.62	{ 2.00 }	40.0		45.0		50.0	
150			150	16.35	{ 1.67 }	48.0		54.0		60.0	
175			175	14.02	{ 1.43 }	56.0		63.0		70.0	
200			200	12.26	{ 1.25 }	64.0		72.0		80.0	



Carga Leve

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		32% do compr. total 1Milhão de ciclos		36% do compr. total 500mil ciclos		40% do compr. total 300mil ciclos	
				(N / mm)	(Kg / mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TL 30 × 25	30	15	25	118.78	12.11	8.0	951 { 97.0 }	9.0	1,069 { 109.0 }	10.0	1,187 { 121.0 }
30			30	98.98	10.09	9.6		10.8		12.0	
35			35	84.84	8.65	11.2		12.6		14.0	
40			40	74.24	7.57	12.8		14.4		16.0	
45			45	65.99	6.73	14.4		16.2		18.0	
50			50	59.39	6.06	16.0		18.0		20.0	
55			55	53.99	5.51	17.6		19.8		22.0	
60			60	49.49	5.05	19.2		21.6		24.0	
65			65	45.68	4.66	20.8		23.4		26.0	
70			70	42.42	4.33	22.4		25.2		28.0	
75			75	39.59	4.04	24.0		27.0		30.0	
80			80	37.12	3.78	25.6		28.8		32.0	
90			90	32.99	3.36	28.8		32.4		36.0	
100			100	29.69	3.03	32.0		36.0		40.0	
125			125	23.76	2.42	40.0		45.0		50.0	
150			150	19.80	2.02	48.0		54.0		60.0	
175			175	16.97	1.73	56.0		63.0		70.0	
200			200	14.85	1.51	64.0		72.0		80.0	
TL 35 × 40	35	17.5	40	101.46	10.35	12.8	1,295 { 132.1 }	14.4	1,461 { 149.0 }	16.0	1,618 { 165.0 }
45			45	90.19	9.20	14.4		16.2		18.0	
50			50	81.17	8.28	16.0		18.0		20.0	
55			55	73.79	7.52	17.6		19.8		22.0	
60			60	67.64	6.90	19.2		21.6		24.0	
65			65	62.44	6.37	20.8		23.4		26.0	
70			70	57.98	5.91	22.4		25.2		28.0	
75			75	54.11	5.52	24.0		27.0		30.0	
80			80	50.73	5.17	25.6		28.8		32.0	
90			90	45.09	4.60	28.8		32.4		36.0	
100			100	40.58	4.14	32.0		36.0		40.0	
125			125	32.47	3.31	40.0		45.0		50.0	
150			150	27.06	2.76	48.0		54.0		60.0	
175			175	23.19	2.36	56.0		63.0		70.0	
200			200	20.29	2.07	64.0		72.0		80.0	
TL 40 × 40	40	20	40	132.15	13.48	12.8	1,697 { 173.0 }	14.4	1,903 { 194.1 }	16.0	2,120 { 216.2 }
45			45	117.47	11.98	14.4		16.2		18.0	
50			50	105.72	10.78	16.0		18.0		20.0	
55			55	96.11	9.80	17.6		19.8		22.0	
60			60	88.10	8.98	19.2		21.6		24.0	
65			65	81.32	8.29	20.8		23.4		26.0	
70			70	75.52	7.70	22.4		25.2		28.0	
75			75	70.48	7.19	24.0		27.0		30.0	
80			80	66.08	6.74	25.6		28.8		32.0	
90			90	58.73	5.99	28.8		32.4		36.0	
100			100	52.86	5.39	32.0		36.0		40.0	
125			125	42.29	4.31	40.0		45.0		50.0	
150			150	35.24	3.59	48.0		54.0		60.0	
175			175	30.21	3.08	56.0		63.0		70.0	
200			200	26.43	2.70	64.0		72.0		80.0	
225			225	23.49	2.40	72.0		81.0		90.0	
250			250	21.14	2.16	80.0		90.0		100.0	
275			275	19.22	1.96	88.0		99.0		110.0	
300			300	17.62	1.80	96.0		108.0		120.0	





Carga Leve

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		32% do compr. total 1Milhão de ciclos		36% do compr. total 500mil ciclos		40% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TL 50 × 50	50	25	50	165.56	16.88	16.0		18.0		20.0	
55			55	150.51	15.35	17.6		19.8		22.0	
60			60	137.96	14.07	19.2		21.6		24.0	
65			65	127.35	12.99	20.8		23.4		26.0	
70			70	118.25	12.06	22.4		25.2		28.0	
75			75	110.37	11.25	24.0		27.0		30.0	
80			80	103.47	10.55	25.6		28.8		32.0	
90			90	91.98	9.38	28.8		32.4		36.0	
100			100	82.78	8.44	32.0		36.0		40.0	
125			125	66.22	6.75	40.0		45.0		50.0	
150			150	55.19	5.63	48.0	2,650	54.0	2,980	60.0	3,310
175			175	47.30	4.82	56.0	{ 270.2 }	63.0	{ 303.9 }	70.0	{ 337.5 }
200			200	41.39	4.22	64.0		72.0		80.0	
225			225	36.79	3.75	72.0		81.0		90.0	
250			250	33.11	3.38	80.0		90.0		100.0	
275			275	30.10	3.07	88.0		99.0		110.0	
300			300	27.59	2.81	96.0		108.0		120.0	
350			350	23.65	2.41	112.0		126.0		140.0	
400			400	20.69	2.11	128.0		144.0		160.0	
450			450	18.40	1.88	144.0		162.0		180.0	
500			500	16.56	1.69	160.0		180.0		200.0	
TL 60 × 60	60	30	60	198.61	20.25	19.2		21.6		24.0	
70			70	170.24	17.36	22.4		25.2		28.0	
80			80	148.96	15.19	25.6		28.8		32.0	
90			90	132.41	13.50	28.8		32.4		36.0	
100			100	119.17	12.15	32.0		36.0		40.0	
125			125	95.33	9.72	40.0		45.0		50.0	
150			150	79.44	8.10	48.0		54.0		60.0	
175			175	68.10	6.94	56.0	3,810	63.0	4,290	70.0	4,770
200			200	59.58	6.08	64.0	{ 388.5 }	72.0	{ 437.5 }	80.0	{ 486.4 }
225			225	52.96	5.40	72.0		81.0		90.0	
250			250	47.67	4.86	80.0		90.0		100.0	
275			275	43.33	4.42	88.0		99.0		110.0	
300			300	39.72	4.05	96.0		108.0		120.0	
350			350	34.05	3.47	112.0		126.0		140.0	
400			400	29.79	3.04	128.0		144.0		160.0	
450			450	26.48	2.70	144.0		162.0		180.0	
500			500	23.83	2.43	160.0		180.0		200.0	
TL 70 × 70	70	38.5	70	217.86	22.22	22.4		25.2		28.0	
80			80	190.63	19.44	25.6		28.8		32.0	
90			90	169.44	17.28	28.8		32.4		36.0	
100			100	152.50	15.55	32.0		36.0		40.0	
125			125	122.00	12.44	40.0		45.0		50.0	
150			150	101.67	10.37	48.0	4,880	54.0	5,490	60.0	6,100
175			175	87.14	8.89	56.0	{ 497.6 }	63.0	{ 559.8 }	70.0	{ 622.0 }
200			200	76.25	7.78	64.0		72.0		80.0	
225			225	67.78	6.91	72.0		81.0		90.0	
250			250	61.00	6.22	80.0		90.0		100.0	
275			275	55.45	5.65	88.0		99.0		110.0	
300			300	50.83	5.18	96.0		108.0		120.0	
350			350	43.57	4.44	112.0		126.0		140.0	



Carga Média

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		25.6% do compr. total 1Milhão de ciclos		28.8 do compr. total 500mil ciclos		32% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TM 8 × 10	8	4	10	42.57	{ 4.34 }	2.6	107.9 { 11.0 }	2.9	122.6 { 12.5 }	3.2	137.3 { 14.0 }
15			15	28.38	{ 2.89 }	3.8		4.3		4.8	
20			20	21.28	{ 2.17 }	5.1		5.8		6.4	
25			25	17.03	{ 1.74 }	6.4		7.2		8.0	
30			30	14.19	{ 1.45 }	7.7		8.6		9.6	
35			35	12.16	{ 1.24 }	9.0		10.1		11.2	
40			40	10.64	{ 1.09 }	10.2		11.5		12.8	
45			45	9.46	{ 0.96 }	11.5		13.0		14.4	
50			50	8.51	{ 0.87 }	12.8		14.4		16.0	
55			55	7.74	{ 0.79 }	14.1		15.8		17.6	
60			60	7.09	{ 0.72 }	15.4		17.3		19.2	
65			65	6.55	{ 0.67 }	16.6		18.7		20.8	
70			70	6.08	{ 0.62 }	17.9		20.2		22.4	
75			75	5.68	{ 0.58 }	19.2		21.6		24.0	
80			80	5.32	{ 0.54 }	20.5		23.0		25.6	
TM 10 × 20	10	5	20	30.64	{ 3.12 }	5.1	156.9 { 16.0 }	5.8	176.5 { 18.0 }	6.4	196.1 { 20.0 }
25			25	24.51	{ 2.50 }	6.4		7.2		8.0	
30			30	20.43	{ 2.08 }	7.7		8.6		9.6	
35			35	17.51	{ 1.79 }	9.0		10.1		11.2	
40			40	15.32	{ 1.56 }	10.2		11.5		12.8	
45			45	13.62	{ 1.39 }	11.5		13.0		14.4	
50			50	12.26	{ 1.25 }	12.8		14.4		16.0	
55			55	11.14	{ 1.14 }	14.1		15.8		17.6	
60			60	10.21	{ 1.04 }	15.4		17.3		19.2	
65			65	9.43	{ 0.96 }	16.6		18.7		20.8	
70			70	8.75	{ 0.89 }	17.9		20.2		22.4	
75			75	8.17	{ 0.83 }	19.2		21.6		24.0	
80			80	7.66	{ 0.78 }	20.5		23.0		25.6	
90			90	6.81	{ 0.69 }	23.0		25.9		28.8	
TM 12 × 20	12	6	20	44.27	{ 4.51 }	5.1	226 { 23.0 }	5.8	255 { 26.0 }	6.4	284 { 29.0 }
25			25	35.42	{ 3.61 }	6.4		7.2		8.0	
30			30	29.51	{ 3.01 }	7.7		8.6		9.6	
35			35	25.30	{ 2.58 }	9.0		10.1		11.2	
40			40	22.14	{ 2.26 }	10.2		11.5		12.8	
45			45	19.68	{ 2.01 }	11.5		13.0		14.4	
50			50	17.71	{ 1.81 }	12.8		14.4		16.0	
55			55	16.10	{ 1.64 }	14.1		15.8		17.6	
60			60	14.76	{ 1.50 }	15.4		17.3		19.2	
65			65	13.62	{ 1.39 }	16.6		18.7		20.8	
70			70	12.65	{ 1.29 }	17.9		20.2		22.4	
75			75	11.81	{ 1.20 }	19.2		21.6		24.0	
80			80	11.07	{ 1.13 }	20.5		23.0		25.6	
90			90	9.84	{ 1.00 }	23.0		25.9		28.8	





Carga Média

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		25.6% do compr. total 1Milhão de ciclos		28.8 do compr. total 500mil ciclos		32% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TM 14 × 25	14	7	25	47.64	{ 4.86 }	6.4	304 { 31.0 }	7.2	343 { 35.0 }	8.0	383 { 39.1 }
30			30	39.70	{ 4.05 }	7.7		8.6		9.6	
35			35	34.03	{ 3.47 }	9.0		10.1		11.2	
40			40	29.77	{ 3.04 }	10.2		11.5		12.8	
45			45	26.47	{ 2.70 }	11.5		13.0		14.4	
50			50	23.82	{ 2.43 }	12.8		14.4		16.0	
55			55	21.65	{ 2.21 }	14.1		15.8		17.6	
60			60	19.85	{ 2.02 }	15.4		17.3		19.2	
65			65	18.32	{ 1.87 }	16.6		18.7		20.8	
70			70	17.01	{ 1.73 }	17.9		20.2		22.4	
75			75	15.88	{ 1.62 }	19.2		21.6		24.0	
80			80	14.89	{ 1.52 }	20.5		23.0		25.6	
90			90	13.23	{ 1.35 }	23.0		25.9		28.8	
100			100	11.91	{ 1.21 }	25.6		28.8		32.0	
TM 16 × 25	16	8	25	62.64	{ 6.39 }	6.4	402 { 41.0 }	7.2	451 { 46.0 }	8.0	500 { 51.0 }
30			30	52.20	{ 5.32 }	7.7		8.6		9.6	
35			35	44.74	{ 4.56 }	9.0		10.1		11.2	
40			40	39.15	{ 3.99 }	10.2		11.5		12.8	
45			45	34.80	{ 3.55 }	11.5		13.0		14.4	
50			50	31.32	{ 3.19 }	12.8		14.4		16.0	
55			55	28.47	{ 2.90 }	14.1		15.8		17.6	
60			60	26.10	{ 2.66 }	15.4		17.3		19.2	
65			65	24.09	{ 2.46 }	16.6		18.7		20.8	
70			70	22.37	{ 2.28 }	17.9		20.2		22.4	
75			75	20.88	{ 2.13 }	19.2		21.6		24.0	
80			80	19.57	{ 2.00 }	20.5		23.0		25.6	
90			90	17.40	{ 1.77 }	23.0		25.9		28.8	
100			100	15.66	{ 1.60 }	25.6		28.8		32.0	
125			125	12.53	{ 1.28 }	32.0		36.0		40.0	
TM 18 × 25	18	9	25	79.03	{ 8.06 }	6.4	510 { 52.0 }	7.2	569 { 58.0 }	8.0	637 { 65.0 }
30			30	65.86	{ 6.72 }	7.7		8.6		9.6	
35			35	56.45	{ 5.76 }	9.0		10.1		11.2	
40			40	49.39	{ 5.04 }	10.2		11.5		12.8	
45			45	43.90	{ 4.48 }	11.5		13.0		14.4	
50			50	39.51	{ 4.03 }	12.8		14.4		16.0	
55			55	35.92	{ 3.66 }	14.1		15.8		17.6	
60			60	32.93	{ 3.36 }	15.4		17.3		19.2	
65			65	30.40	{ 3.10 }	16.6		18.7		20.8	
70			70	28.22	{ 2.88 }	17.9		20.2		22.4	
75			75	26.34	{ 2.69 }	19.2		21.6		24.0	
80			80	24.70	{ 2.52 }	20.5		23.0		25.6	
90			90	21.95	{ 2.24 }	23.0		25.9		28.8	
100			100	19.76	{ 2.01 }	25.6		28.8		32.0	
125			125	15.81	{ 1.61 }	32.0		36.0		40.0	



Carga Média

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		25.6% do compr. total 1Milhão de ciclos		28.8 do compr. total 500mil ciclos		32% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TM 20 × 25	20	10	25	98.06	{10.00}	6.4	628 { 64.0 }	7.2	706 { 72.0 }	8.0	785 { 80.0 }
30			30	81.71	{ 8.33 }	7.7		8.6		9.6	
35			35	70.04	{ 7.14 }	9.0		10.1		11.2	
40			40	61.28	{ 6.25 }	10.2		11.5		12.8	
45			45	54.48	{ 5.55 }	11.5		13.0		14.4	
50			50	49.03	{ 5.00 }	12.8		14.4		16.0	
55			55	44.57	{ 4.54 }	14.1		15.8		17.6	
60			60	40.86	{ 4.17 }	15.4		17.3		19.2	
65			65	37.71	{ 3.85 }	16.6		18.7		20.8	
70			70	35.02	{ 3.57 }	17.9		20.2		22.4	
75			75	32.69	{ 3.33 }	19.2		21.6		24.0	
80			80	30.64	{ 3.12 }	20.5		23.0		25.6	
90			90	27.24	{ 2.78 }	23.0		25.9		28.8	
100			100	24.51	{ 2.50 }	25.6		28.8		32.0	
125			125	19.61	{ 2.00 }	32.0		36.0		40.0	
150			150	16.34	{ 1.67 }	38.4		43.2		48.0	
TM 22 × 25	22	11	25	118.47	{12.08}	6.4	765 { 78.0 }	7.2	853 { 87.0 }	8.0	951 { 97.0 }
30			30	98.73	{10.07}	7.7		8.6		9.6	
35			35	84.62	{ 8.63 }	9.0		10.1		11.2	
40			40	74.05	{ 7.55 }	10.2		11.5		12.8	
45			45	65.82	{ 6.71 }	11.5		13.0		14.4	
50			50	59.24	{ 6.04 }	12.8		14.4		16.0	
55			55	53.85	{ 5.49 }	14.1		15.8		17.6	
60			60	49.36	{ 5.03 }	15.4		17.3		19.2	
65			65	45.57	{ 4.65 }	16.6		18.7		20.8	
70			70	42.31	{ 4.31 }	17.9		20.2		22.4	
75			75	39.49	{ 4.03 }	19.2		21.6		24.0	
80			80	37.02	{ 3.78 }	20.5		23.0		25.6	
90			90	32.91	{ 3.36 }	23.0		25.9		28.8	
100			100	29.62	{ 3.02 }	25.6		28.8		32.0	
125			125	23.69	{ 2.42 }	32.0		36.0		40.0	
150			150	19.75	{ 2.01 }	38.4		43.2		48.0	
TM 25 × 25	25	12.5	25	152.50	{15.55}	6.4	981 { 100.0 }	7.2	1,098 { 112.0 }	8.0	1,226 { 125.0 }
30			30	127.08	{12.96}	7.7		8.6		9.6	
35			35	108.93	{11.11}	9.0		10.1		11.2	
40			40	95.31	{ 9.72 }	10.2		11.5		12.8	
45			45	84.72	{ 8.64 }	11.5		13.0		14.4	
50			50	76.25	{ 7.78 }	12.8		14.4		16.0	
55			55	69.32	{ 7.07 }	14.1		15.8		17.6	
60			60	63.54	{ 6.48 }	15.4		17.3		19.2	
65			65	58.65	{ 5.98 }	16.6		18.7		20.8	
70			70	54.46	{ 5.55 }	17.9		20.2		22.4	
75			75	50.83	{ 5.18 }	19.2		21.6		24.0	
80			80	47.66	{ 4.86 }	20.5		23.0		25.6	
90			90	42.36	{ 4.32 }	23.0		25.9		28.8	
100			100	38.13	{ 3.89 }	25.6		28.8		32.0	
125			125	30.50	{ 3.11 }	32.0		36.0		40.0	
150			150	25.42	{ 2.59 }	38.4		43.2		48.0	
175			175	21.79	{ 2.22 }	44.8		50.4		56.0	
200			200	19.06	{ 1.94 }	51.2		57.6		64.0	





Carga Média

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		25.6% do compr. total 1Milhão de ciclos		28.8 do compr. total 500mil ciclos		32% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TM 27 × 25	27	13.5	25	178.47	18.20	6.4	1,147 {117.0}	7.2	1,285 {131.0}	8.0	1,432 {146.0}
30			30	148.73	15.17	7.7		8.6		9.6	
35			35	127.48	13.00	9.0		10.1		11.2	
40			40	111.55	11.37	10.2		11.5		12.8	
45			45	99.15	10.11	11.5		13.0		14.4	
50			50	89.24	9.10	12.8		14.4		16.0	
55			55	81.12	8.27	14.1		15.8		17.6	
60			60	74.36	7.58	15.4		17.3		19.2	
65			65	68.64	7.00	16.6		18.7		20.8	
70			70	63.74	6.50	17.9		20.2		22.4	
75			75	59.49	6.07	19.2		21.6		24.0	
80			80	55.77	5.69	20.5		23.0		25.6	
90			90	49.58	5.06	23.0		25.9		28.8	
100			100	44.62	4.55	25.6		28.8		32.0	
125			125	35.69	3.64	32.0		36.0		40.0	
150			150	29.75	3.03	38.4		43.2		48.0	
175			175	25.50	2.60	44.8		50.4		56.0	
200			200	22.31	2.27	51.2		57.6		64.0	
TM 30 × 25	30	15	25	219.31	22.36	6.4	1,412 {144.0}	7.2	1,579 {161.0}	8.0	1,765 {180.0}
30			30	182.75	18.64	7.7		8.6		9.6	
35			35	156.65	15.97	9.0		10.1		11.2	
40			40	137.07	13.98	10.2		11.5		12.8	
45			45	121.84	12.42	11.5		13.0		14.4	
50			50	109.65	11.18	12.8		14.4		16.0	
55			55	99.68	10.16	14.1		15.8		17.6	
60			60	91.38	9.32	15.4		17.3		19.2	
65			65	84.35	8.60	16.6		18.7		20.8	
70			70	78.32	7.99	17.9		20.2		22.4	
75			75	73.10	7.45	19.2		21.6		24.0	
80			80	68.53	6.99	20.5		23.0		25.6	
90			90	60.92	6.21	23.0		25.9		28.8	
100			100	54.83	5.59	25.6		28.8		32.0	
125			125	43.86	4.47	32.0		36.0		40.0	
150			150	36.55	3.73	38.4		43.2		48.0	
175			175	31.33	3.19	44.8		50.4		56.0	
200			200	27.41	2.80	51.2		57.6		64.0	
TM 35 × 40	35	17.5	40	187.50	19.12	10.2	1,912 {195.0}	11.5	2,160 {220.3}	12.8	2,400 {244.7}
45			45	166.67	17.00	11.5		13.0		14.4	
50			50	150.00	15.30	12.8		14.4		16.0	
55			55	136.36	13.91	14.1		15.8		17.6	
60			60	125.00	12.75	15.4		17.3		19.2	
65			65	115.38	11.77	16.6		18.7		20.8	
70			70	107.14	10.93	17.9		20.2		22.4	
75			75	100.00	10.20	19.2		21.6		24.0	
80			80	93.75	9.56	20.5		23.0		25.6	
90			90	83.33	8.50	23.0		25.9		28.8	
100			100	75.00	7.65	25.6		28.8		32.0	
125			125	60.00	6.12	32.0		36.0		40.0	
150			150	50.00	5.10	38.4		43.2		48.0	
175			175	42.86	4.37	44.8		50.4		56.0	
200			200	37.50	3.82	51.2		57.6		64.0	



Carga Média

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		25.6% do compr. total 1Milhão de ciclos		28.8 do compr. total 500mil ciclos		32% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TM 40 × 40	40	20	40	244.79	24.96	10.2	2,510 {256.0}	11.5	2,820 {287.6}	12.8	3,140 {320.2}
45			45	217.59	22.19	11.5		13.0		14.4	
50			50	195.83	19.97	12.8		14.4		16.0	
55			55	178.03	18.15	14.1		15.8		17.6	
60			60	163.19	16.64	15.4		17.3		19.2	
65			65	150.64	15.36	16.6		18.7		20.8	
70			70	139.88	14.26	17.9		20.2		22.4	
75			75	130.56	13.31	19.2		21.6		24.0	
80			80	122.40	12.48	20.5		23.0		25.6	
90			90	108.80	11.09	23.0		25.9		28.8	
100			100	97.92	9.98	25.6		28.8		32.0	
125			125	78.33	7.99	32.0		36.0		40.0	
150			150	65.28	6.66	38.4		43.2		48.0	
175			175	55.95	5.71	44.8		50.4		56.0	
200			200	48.96	4.99	51.2		57.6		64.0	
225			225	43.52	4.44	57.6		64.8		72.0	
250			250	39.17	3.99	64.0		72.0		80.0	
275			275	35.61	3.63	70.4		79.2		88.0	
300			300	32.64	3.33	76.8		86.4		96.0	
TM 50 × 50	50	25	50	306.25	31.23	12.8	3,920 {399.7}	14.4	4,410 {449.7}	16.0	4,900 {499.7}
55			55	278.41	28.39	14.1		15.8		17.6	
60			60	255.21	26.02	15.4		17.3		19.2	
65			65	235.58	24.02	16.6		18.7		20.8	
70			70	218.75	22.31	17.9		20.2		22.4	
75			75	204.17	20.82	19.2		21.6		24.0	
80			80	191.41	19.52	20.5		23.0		25.6	
90			90	170.14	17.35	23.0		25.9		28.8	
100			100	153.13	15.61	25.6		28.8		32.0	
125			125	122.50	12.49	32.0		36.0		40.0	
150			150	102.08	10.41	38.4		43.2		48.0	
175			175	87.50	8.92	44.8		50.4		56.0	
200			200	76.56	7.81	51.2		57.6		64.0	
225			225	68.06	6.94	57.6		64.8		72.0	
250			250	61.25	6.25	64.0		72.0		80.0	
275			275	55.68	5.68	70.4		79.2		88.0	
300			300	51.04	5.20	76.8		86.4		96.0	
350			350	43.75	4.46	89.6		100.8		112.0	
TM 60 × 60	60	30	60	367.48	37.47	15.4	5,640 {575.1}	17.3	6,350 {647.5}	19.2	7,060 {719.9}
70			70	314.98	32.12	17.9		20.2		22.4	
80			80	275.61	28.10	20.5		23.0		25.6	
90			90	244.98	24.98	23.0		25.9		28.8	
100			100	220.49	22.48	25.6		28.8		32.0	
125			125	176.39	17.99	32.0		36.0		40.0	
150			150	146.99	14.99	38.4		43.2		48.0	
175			175	125.99	12.85	44.8		50.4		56.0	
200			200	110.24	11.24	51.2		57.6		64.0	
225			225	97.99	9.99	57.6		64.8		72.0	
250			250	88.19	8.99	64.0		72.0		80.0	
275			275	80.18	8.18	70.4		79.2		88.0	
300			300	73.50	7.49	76.8		86.4		96.0	
350			350	63.00	6.42	89.6		100.8		112.0	





Carga Média

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		25.6% do compr. total 1 Milhão de ciclos		28.8 do compr. total 500mil ciclos		32% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TM 70 × 70	70	38.5	70	379.46	38.69	17.9	6,800 {693.4}	20.2	7,650 {780.1}	22.4	8,500 {866.8}
80			80	332.03	33.86	20.5		23.0		25.6	
90			90	295.14	30.10	23.0		25.9		28.8	
100			100	265.63	27.09	25.6		28.8		32.0	
125			125	212.50	21.67	32.0		36.0		40.0	
150			150	177.08	18.06	38.4		43.2		48.0	
175			175	151.79	15.48	44.8		50.4		56.0	
200			200	132.81	13.54	51.2		57.6		64.0	
225			225	118.06	12.04	57.6		64.8		72.0	
250			250	106.25	10.83	64.0		72.0		80.0	
275			275	96.59	9.85	70.4		79.2		88.0	
300			300	88.54	9.03	76.8		86.4		96.0	
350			350	75.89	7.74	89.6		100.8		112.0	



Carga Pesada

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		19.2% do compr. total 1Milhão de ciclos		21.6% do compr. total 500mil ciclos		24% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TH 8 × 10	8	4	10	86.25	{ 8.80 }	1.9	166.7 { 17.0 }	2.2	186.3 { 19.0 }	2.4	206 { 21.0 }
15			15	57.50	{ 5.86 }	2.9		3.2		3.6	
20			20	43.13	{ 4.40 }	3.8		4.3		4.8	
25			25	34.50	{ 3.52 }	4.8		5.4		6.0	
30			30	28.75	{ 2.93 }	5.8		6.5		7.2	
35			35	24.64	{ 2.51 }	6.7		7.6		8.4	
40			40	21.56	{ 2.20 }	7.7		8.6		9.6	
45			45	19.17	{ 1.95 }	8.6		9.7		10.8	
50			50	17.25	{ 1.76 }	9.6		10.8		12.0	
55			55	15.68	{ 1.60 }	10.6		11.9		13.2	
60			60	14.38	{ 1.47 }	11.5		13.0		14.4	
65			65	13.27	{ 1.35 }	12.5		14.0		15.6	
70			70	12.32	{ 1.26 }	13.4		15.1		16.8	
75			75	11.50	{ 1.17 }	14.4		16.2		18.0	
80			80	10.78	{ 1.10 }	15.4		17.3		19.2	
TH 10 × 20	10	5	20	61.34	{ 6.26 }	3.8	235 { 24.0 }	4.3	265 { 27.0 }	4.8	294 { 30.0 }
25			25	49.07	{ 5.00 }	4.8		5.4		6.0	
30			30	40.90	{ 4.17 }	5.8		6.5		7.2	
35			35	35.05	{ 3.57 }	6.7		7.6		8.4	
40			40	30.67	{ 3.13 }	7.7		8.6		9.6	
45			45	27.26	{ 2.78 }	8.6		9.7		10.8	
50			50	24.54	{ 2.50 }	9.6		10.8		12.0	
55			55	22.31	{ 2.27 }	10.6		11.9		13.2	
60			60	20.45	{ 2.09 }	11.5		13.0		14.4	
65			65	18.87	{ 1.92 }	12.5		14.0		15.6	
70			70	17.53	{ 1.79 }	13.4		15.1		16.8	
75			75	16.36	{ 1.67 }	14.4		16.2		18.0	
80			80	15.34	{ 1.56 }	15.4		17.3		19.2	
90			90	13.63	{ 1.39 }	17.3		19.4		21.6	
TH 12 × 20	12	6	20	86.34	{ 8.80 }	3.8	333 { 34.0 }	4.3	373 { 38.0 }	4.8	422 { 43.0 }
25			25	69.07	{ 7.04 }	4.8		5.4		6.0	
30			30	57.56	{ 5.87 }	5.8		6.5		7.2	
35			35	49.34	{ 5.03 }	6.7		7.6		8.4	
40			40	43.17	{ 4.40 }	7.7		8.6		9.6	
45			45	38.37	{ 3.91 }	8.6		9.7		10.8	
50			50	34.54	{ 3.52 }	9.6		10.8		12.0	
55			55	31.40	{ 3.20 }	10.6		11.9		13.2	
60			60	28.78	{ 2.93 }	11.5		13.0		14.4	
65			65	26.57	{ 2.71 }	12.5		14.0		15.6	
70			70	24.67	{ 2.52 }	13.4		15.1		16.8	
75			75	23.02	{ 2.35 }	14.4		16.2		18.0	
80			80	21.59	{ 2.20 }	15.4		17.3		19.2	
90			90	19.19	{ 1.96 }	17.3		19.4		21.6	





Carga Pesada

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		19.2% do compr. total 1Milhão de ciclos		21.6% do compr. total 500mil ciclos		24% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TH 14 × 25	14	7	25	96.30	{ 9.82 }	4.8	461 { 47.0 }	5.4	520 { 53.0 }	6.0	579 { 59.0 }
30			30	80.25	{ 8.18 }	5.8		6.5		7.2	
35			35	68.78	{ 7.01 }	6.7		7.6		8.4	
40			40	60.19	{ 6.14 }	7.7		8.6		9.6	
45			45	53.50	{ 5.46 }	8.6		9.7		10.8	
50			50	48.15	{ 4.91 }	9.6		10.8		12.0	
55			55	43.77	{ 4.46 }	10.6		11.9		13.2	
60			60	40.12	{ 4.09 }	11.5		13.0		14.4	
65			65	37.04	{ 3.78 }	12.5		14.0		15.6	
70			70	34.39	{ 3.51 }	13.4		15.1		16.8	
75			75	32.10	{ 3.27 }	14.4		16.2		18.0	
80			80	30.09	{ 3.07 }	15.4		17.3		19.2	
90			90	26.75	{ 2.73 }	17.3		19.4		21.6	
100			100	24.07	{ 2.45 }	19.2		21.6		24.0	
TH 16 × 25	16	8	25	125.37	{ 12.78 }	4.8	608 { 62.0 }	5.4	677 { 69.0 }	6.0	755 { 77.0 }
30			30	104.48	{ 10.65 }	5.8		6.5		7.2	
35			35	89.55	{ 9.13 }	6.7		7.6		8.4	
40			40	78.36	{ 7.99 }	7.7		8.6		9.6	
45			45	69.65	{ 7.10 }	8.6		9.7		10.8	
50			50	62.69	{ 6.39 }	9.6		10.8		12.0	
55			55	56.99	{ 5.81 }	10.6		11.9		13.2	
60			60	52.24	{ 5.33 }	11.5		13.0		14.4	
65			65	48.22	{ 4.92 }	12.5		14.0		15.6	
70			70	44.78	{ 4.57 }	13.4		15.1		16.8	
75			75	41.79	{ 4.26 }	14.4		16.2		18.0	
80			80	39.18	{ 4.00 }	15.4		17.3		19.2	
90			90	34.83	{ 3.55 }	17.3		19.4		21.6	
100			100	31.34	{ 3.20 }	19.2		21.6		24.0	
125			125	25.07	{ 2.56 }	24.0		27.0		30.0	
TH 18 × 25	18	9	25	157.96	{ 16.11 }	4.8	765 { 78.0 }	5.4	853 { 87.0 }	6.0	951 { 97.0 }
30			30	131.64	{ 13.42 }	5.8		6.5		7.2	
35			35	112.83	{ 11.51 }	6.7		7.6		8.4	
40			40	98.73	{ 10.07 }	7.7		8.6		9.6	
45			45	87.76	{ 8.95 }	8.6		9.7		10.8	
50			50	78.98	{ 8.05 }	9.6		10.8		12.0	
55			55	71.80	{ 7.32 }	10.6		11.9		13.2	
60			60	65.82	{ 6.71 }	11.5		13.0		14.4	
65			65	60.75	{ 6.20 }	12.5		14.0		15.6	
70			70	56.42	{ 5.75 }	13.4		15.1		16.8	
75			75	52.65	{ 5.37 }	14.4		16.2		18.0	
80			80	49.36	{ 5.03 }	15.4		17.3		19.2	
90			90	43.88	{ 4.47 }	17.3		19.4		21.6	
100			100	39.49	{ 4.03 }	19.2		21.6		24.0	
125			125	31.59	{ 3.22 }	24.0		27.0		30.0	



Carga Pesada

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		19.2% do compr. total 1Milhão de ciclos		21.6% do compr. total 500mil ciclos		24% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TH 20 × 25	20	10	25	196.11	20.00	4.8	941 {96.0}	5.4	1,059 {108.0}	6.0	1,177 {120.0}
30			30	163.43	16.66	5.8		6.5		7.2	
35			35	140.08	14.28	6.7		7.6		8.4	
40			40	122.57	12.50	7.7		8.6		9.6	
45			45	108.95	11.11	8.6		9.7		10.8	
50			50	98.06	10.00	9.6		10.8		12.0	
55			55	89.14	9.09	10.6		11.9		13.2	
60			60	81.71	8.33	11.5		13.0		14.4	
65			65	75.43	7.69	12.5		14.0		15.6	
70			70	70.04	7.14	13.4		15.1		16.8	
75			75	65.37	6.67	14.4		16.2		18.0	
80			80	61.28	6.25	15.4		17.3		19.2	
90			90	54.48	5.55	17.3		19.4		21.6	
100			100	49.03	5.00	19.2		21.6		24.0	
125			125	39.22	4.00	24.0		27.0		30.0	
150			150	32.69	3.33	28.8		32.4		36.0	
TH 22 × 25	22	11	25	236.11	24.08	4.8	1,138 {116.0}	5.4	1,275 {130.0}	6.0	1,422 {145.0}
30			30	196.76	20.06	5.8		6.5		7.2	
35			35	168.65	17.20	6.7		7.6		8.4	
40			40	147.57	15.05	7.7		8.6		9.6	
45			45	131.17	13.38	8.6		9.7		10.8	
50			50	118.06	12.04	9.6		10.8		12.0	
55			55	107.32	10.94	10.6		11.9		13.2	
60			60	98.38	10.03	11.5		13.0		14.4	
65			65	90.81	9.26	12.5		14.0		15.6	
70			70	84.33	8.60	13.4		15.1		16.8	
75			75	78.70	8.03	14.4		16.2		18.0	
80			80	73.78	7.52	15.4		17.3		19.2	
90			90	65.59	6.69	17.3		19.4		21.6	
100			100	59.03	6.02	19.2		21.6		24.0	
125			125	47.22	4.82	24.0		27.0		30.0	
150			150	39.35	4.01	28.8		32.4		36.0	
TH 25 × 25	25	12.5	25	306.85	31.29	4.8	1,471 {150.0}	5.4	1,657 {169.0}	6.0	1,834 {187.0}
30			30	255.71	26.08	5.8		6.5		7.2	
35			35	219.18	22.35	6.7		7.6		8.4	
40			40	191.78	19.56	7.7		8.6		9.6	
45			45	170.47	17.38	8.6		9.7		10.8	
50			50	153.43	15.65	9.6		10.8		12.0	
55			55	139.48	14.22	10.6		11.9		13.2	
60			60	127.85	13.04	11.5		13.0		14.4	
65			65	118.02	12.03	12.5		14.0		15.6	
70			70	109.59	11.18	13.4		15.1		16.8	
75			75	102.28	10.43	14.4		16.2		18.0	
80			80	95.89	9.78	15.4		17.3		19.2	
90			90	85.24	8.69	17.3		19.4		21.6	
100			100	76.71	7.82	19.2		21.6		24.0	
125			125	61.37	6.26	24.0		27.0		30.0	
150			150	51.14	5.22	28.8		32.4		36.0	
175			175	43.84	4.47	33.6		37.8		42.0	
200			200	38.36	3.91	38.4		43.2		48.0	



Carga Pesada

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		19.2% do compr. total 1Milhão de ciclos		21.6% do compr. total 500mil ciclos		24% do compr. total 300mil ciclos	
				(N / mm)	(Kgf / mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TH 27 × 25	27	13.5	25	357.78	36.48	4.8	1,716 {175.0}	5.4	1,932 {197.0}	6.0	2,150 {219.2}
30			30	298.15	30.40	5.8		6.5		7.2	
35			35	255.56	26.06	6.7		7.6		8.4	
40			40	223.61	22.80	7.7		8.6		9.6	
45			45	198.77	20.27	8.6		9.7		10.8	
50			50	178.89	18.24	9.6		10.8		12.0	
55			55	162.63	16.58	10.6		11.9		13.2	
60			60	149.07	15.20	11.5		13.0		14.4	
65			65	137.61	14.03	12.5		14.0		15.6	
70			70	127.78	13.03	13.4		15.1		16.8	
75			75	119.26	12.16	14.4		16.2		18.0	
80			80	111.81	11.40	15.4		17.3		19.2	
90			90	99.38	10.13	17.3		19.4		21.6	
100			100	89.44	9.12	19.2		21.6		24.0	
125			125	71.56	7.30	24.0		27.0		30.0	
150			150	59.63	6.08	28.8		32.4		36.0	
175			175	51.11	5.21	33.6		37.8		42.0	
200			200	44.72	4.56	38.4		43.2		48.0	
TH 30 × 25	30	15	25	440.74	44.94	4.8	2,120 {216.2}	5.4	2,380 {242.7}	6.0	2,648 {270.0}
30			30	367.28	37.45	5.8		6.5		7.2	
35			35	314.81	32.10	6.7		7.6		8.4	
40			40	275.46	28.09	7.7		8.6		9.6	
45			45	244.86	24.97	8.6		9.7		10.8	
50			50	220.37	22.47	9.6		10.8		12.0	
55			55	200.34	20.43	10.6		11.9		13.2	
60			60	183.64	18.73	11.5		13.0		14.4	
65			65	169.52	17.29	12.5		14.0		15.6	
70			70	157.41	16.05	13.4		15.1		16.8	
75			75	146.91	14.98	14.4		16.2		18.0	
80			80	137.73	14.04	15.4		17.3		19.2	
90			90	122.43	12.48	17.3		19.4		21.6	
100			100	110.19	11.24	19.2		21.6		24.0	
125			125	88.15	8.99	24.0		27.0		30.0	
150			150	73.46	7.49	28.8		32.4		36.0	
175			175	62.96	6.42	33.6		37.8		42.0	
200			200	55.09	5.62	38.4		43.2		48.0	
TH 35 × 40	35	17.5	40	375.00	38.24	7.7	2,870 {292.7}	8.6	3,240 {330.4}	9.6	3,600 {367.1}
45			45	333.33	33.99	8.6		9.7		10.8	
50			50	300.00	30.59	9.6		10.8		12.0	
55			55	272.73	27.81	10.6		11.9		13.2	
60			60	250.00	25.49	11.5		13.0		14.4	
65			65	230.77	23.53	12.5		14.0		15.6	
70			70	214.29	21.85	13.4		15.1		16.8	
75			75	200.00	20.39	14.4		16.2		18.0	
80			80	187.50	19.12	15.4		17.3		19.2	
90			90	166.67	17.00	17.3		19.4		21.6	
100			100	150.00	15.30	19.2		21.6		24.0	
125			125	120.00	12.24	24.0		27.0		30.0	
150			150	100.00	10.20	28.8		32.4		36.0	
175			175	85.71	8.74	33.6		37.8		42.0	
200			200	75.00	7.65	38.4		43.2		48.0	



Carga Pesada

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		19.2% do compr. total 1Milhão de ciclos		21.6% do compr. total 500mil ciclos		24% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TH 40 × 40	40	20	40	490.74	50.04	7.7	3,770 {384.4}	8.6	4,240 {432.4}	9.6	4,710 {480.3}
45			45	436.21	44.48	8.6		9.7		10.8	
50			50	392.59	40.03	9.6		10.8		12.0	
55			55	356.90	36.39	10.6		11.9		13.2	
60			60	327.16	33.36	11.5		13.0		14.4	
65			65	301.99	30.79	12.5		14.0		15.6	
70			70	280.42	28.60	13.4		15.1		16.8	
75			75	261.73	26.69	14.4		16.2		18.0	
80			80	245.37	25.02	15.4		17.3		19.2	
90			90	218.11	22.24	17.3		19.4		21.6	
100			100	196.30	20.02	19.2		21.6		24.0	
125			125	157.04	16.01	24.0		27.0		30.0	
150			150	130.86	13.34	28.8		32.4		36.0	
175			175	112.17	11.44	33.6		37.8		42.0	
200			200	98.15	10.01	38.4		43.2		48.0	
225			225	87.24	8.90	43.2		48.6		54.0	
250			250	78.52	8.01	48.0		54.0		60.0	
275			275	71.38	7.28	52.8		59.4		66.0	
300			300	65.43	6.67	57.6		64.8		72.0	
TH 50 × 50	50	25	50	612.96	62.50	9.6	5,880 {599.6}	10.8	6,620 {675.1}	12.0	7,360 {750.5}
55			55	557.24	56.82	10.6		11.9		13.2	
60			60	510.80	52.09	11.5		13.0		14.4	
65			65	471.51	48.08	12.5		14.0		15.6	
70			70	437.83	44.65	13.4		15.1		16.8	
75			75	408.64	41.67	14.4		16.2		18.0	
80			80	383.10	39.07	15.4		17.3		19.2	
90			90	340.53	34.72	17.3		19.4		21.6	
100			100	306.48	31.25	19.2		21.6		24.0	
125			125	245.19	25.00	24.0		27.0		30.0	
150			150	204.32	20.83	28.8		32.4		36.0	
175			175	175.13	17.86	33.6		37.8		42.0	
200			200	153.24	15.63	38.4		43.2		48.0	
225			225	136.21	13.89	43.2		48.6		54.0	
250			250	122.59	12.50	48.0		54.0		60.0	
275			275	111.45	11.36	52.8		59.4		66.0	
300			300	102.16	10.42	57.6		64.8		72.0	
350			350	87.57	8.93	67.2		75.6		84.0	
TH 60 × 60	60	30	60	736.11	75.06	11.5	8,470 {863.7}	13.0	9,540 {972.8}	14.4	10,590 {1080}
70			70	630.95	64.34	13.4		15.1		16.8	
80			80	552.08	56.30	15.4		17.3		19.2	
90			90	490.74	50.04	17.3		19.4		21.6	
100			100	441.67	45.04	19.2		21.6		24.0	
125			125	353.33	36.03	24.0		27.0		30.0	
150			150	294.44	30.02	28.8		32.4		36.0	
175			175	252.38	25.74	33.6		37.8		42.0	
200			200	220.83	22.52	38.4		43.2		48.0	
225			225	196.30	20.02	43.2		48.6		54.0	
250			250	176.67	18.01	48.0		54.0		60.0	
275			275	160.61	16.38	52.8		59.4		66.0	
300			300	147.22	15.01	57.6		64.8		72.0	
350			350	126.19	12.87	67.2		75.6		84.0	



Carga Pesada

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		19.2% do compr. total 1Milhão de ciclos		21.6% do compr. total 500mil ciclos		24% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TH 70 x 70	70	38.5	70	773.81	78.91	13.4	10,400 { 1061 }	15.1	11,700 { 1193 }	16.8	13,000 { 1326 }
80			80	677.08	69.04	15.4		17.3		19.2	
90			90	601.85	61.37	17.3		19.4		21.6	
100			100	541.67	55.23	19.2		21.6		24.0	
125			125	433.33	44.19	24.0		27.0		30.0	
150			150	361.11	36.82	28.8		32.4		36.0	
175			175	309.52	31.56	33.6		37.8		42.0	
200			200	270.83	27.62	38.4		43.2		48.0	
225			225	240.74	24.55	43.2		48.6		54.0	
250			250	216.67	22.09	48.0		54.0		60.0	
275			275	196.97	20.09	52.8		59.4		66.0	
300			300	180.56	18.41	57.6		64.8		72.0	
350			350	154.76	15.78	67.2		75.6		84.0	



Carga Extra Pesada

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		16% do compr. total 1Milhão de ciclos		18% do compr. total 500mil ciclos		20% do compr. total 300mil ciclos	
				(N / mm)	(Kgf / mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TB 8 × 10	8	4	10	166.11	{ 16.94 }	1.6	255 { 26.0 }	1.8	299 { 30.5 }	2.0	343 { 35.0 }
15			15	110.74	{ 11.29 }	2.4		2.7		3.0	
20			20	83.06	{ 8.47 }	3.2		3.6		4.0	
25			25	66.44	{ 6.78 }	4.0		4.5		5.0	
30			30	55.37	{ 5.65 }	4.8		5.4		6.0	
35			35	47.46	{ 4.84 }	5.6		6.3		7.0	
40			40	41.53	{ 4.23 }	6.4		7.2		8.0	
45			45	36.91	{ 3.76 }	7.2		8.1		9.0	
50			50	33.22	{ 3.39 }	8.0		9.0		10.0	
55			55	30.20	{ 3.08 }	8.8		9.9		11.0	
60			60	27.69	{ 2.82 }	9.6		10.8		12.0	
65			65	25.56	{ 2.61 }	10.4		11.7		13.0	
70			70	23.73	{ 2.42 }	11.2		12.6		14.0	
75			75	22.15	{ 2.26 }	12.0		13.5		15.0	
80			80	20.76	{ 2.12 }	12.8		14.4		16.0	
TB 10 × 20	10	5	20	111.67	{ 11.39 }	3.2	353 { 36.0 }	3.6	402 { 41.0 }	4.0	441 { 45.0 }
25			25	89.33	{ 9.11 }	4.0		4.5		5.0	
30			30	74.44	{ 7.59 }	4.8		5.4		6.0	
35			35	63.81	{ 6.51 }	5.6		6.3		7.0	
40			40	55.83	{ 5.69 }	6.4		7.2		8.0	
45			45	49.63	{ 5.06 }	7.2		8.1		9.0	
50			50	44.67	{ 4.55 }	8.0		9.0		10.0	
55			55	40.61	{ 4.14 }	8.8		9.9		11.0	
60			60	37.22	{ 3.80 }	9.6		10.8		12.0	
65			65	34.36	{ 3.50 }	10.4		11.7		13.0	
70			70	31.90	{ 3.25 }	11.2		12.6		14.0	
75			75	29.78	{ 3.04 }	12.0		13.5		15.0	
80			80	27.92	{ 2.85 }	12.8		14.4		16.0	
90			90	24.81	{ 2.53 }	14.4		16.2		18.0	
TB 12 × 20	12	6	20	141.67	{ 14.45 }	3.2	451 { 46.0 }	3.6	510 { 52.0 }	4.0	569 { 58.0 }
25			25	113.33	{ 11.56 }	4.0		4.5		5.0	
30			30	94.44	{ 9.63 }	4.8		5.4		6.0	
35			35	80.95	{ 8.25 }	5.6		6.3		7.0	
40			40	70.83	{ 7.22 }	6.4		7.2		8.0	
45			45	62.96	{ 6.42 }	7.2		8.1		9.0	
50			50	56.67	{ 5.78 }	8.0		9.0		10.0	
55			55	51.52	{ 5.25 }	8.8		9.9		11.0	
60			60	47.22	{ 4.82 }	9.6		10.8		12.0	
65			65	43.59	{ 4.44 }	10.4		11.7		13.0	
70			70	40.48	{ 4.13 }	11.2		12.6		14.0	
75			75	37.78	{ 3.85 }	12.0		13.5		15.0	
80			80	35.42	{ 3.61 }	12.8		14.4		16.0	
90			90	31.48	{ 3.21 }	14.4		16.2		18.0	



Carga Extra Pesada

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		16% do compr. total 1Milhão de ciclos		18% do compr. total 500mil ciclos		20% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TB 14 x 25	14	7	25	148.22	{ 15.11 }	4.0	588 { 60.0 }	4.5	667 { 68.0 }	5.0	736 { 75.1 }
30			30	123.52	{ 12.60 }	4.8		5.4		6.0	
35			35	105.87	{ 10.80 }	5.6		6.3		7.0	
40			40	92.64	{ 9.45 }	6.4		7.2		8.0	
45			45	82.35	{ 8.40 }	7.2		8.1		9.0	
50			50	74.11	{ 7.56 }	8.0		9.0		10.0	
55			55	67.37	{ 6.87 }	8.8		9.9		11.0	
60			60	61.76	{ 6.30 }	9.6		10.8		12.0	
65			65	57.01	{ 5.81 }	10.4		11.7		13.0	
70			70	52.94	{ 5.40 }	11.2		12.6		14.0	
75			75	49.41	{ 5.04 }	12.0		13.5		15.0	
80			80	46.32	{ 4.72 }	12.8		14.4		16.0	
90			90	41.17	{ 4.20 }	14.4		16.2		18.0	
100			100	37.06	{ 3.78 }	16.0		18.0		20.0	
TB 16 x 25	16	8	25	196.22	{ 20.01 }	4.0	785 { 80.0 }	4.5	883 { 90.0 }	5.0	981 { 100.0 }
30			30	163.52	{ 16.67 }	4.8		5.4		6.0	
35			35	140.16	{ 14.29 }	5.6		6.3		7.0	
40			40	122.64	{ 12.51 }	6.4		7.2		8.0	
45			45	109.01	{ 11.12 }	7.2		8.1		9.0	
50			50	98.11	{ 10.00 }	8.0		9.0		10.0	
55			55	89.19	{ 9.10 }	8.8		9.9		11.0	
60			60	81.76	{ 8.34 }	9.6		10.8		12.0	
65			65	75.47	{ 7.70 }	10.4		11.7		13.0	
70			70	70.08	{ 7.15 }	11.2		12.6		14.0	
75			75	65.41	{ 6.67 }	12.0		13.5		15.0	
80			80	61.32	{ 6.25 }	12.8		14.4		16.0	
90			90	54.51	{ 5.56 }	14.4		16.2		18.0	
100			100	49.06	{ 5.00 }	16.0		18.0		20.0	
125			125	39.24	{ 4.00 }	20.0		22.5		25.0	
TB 18 x 25	18	9	25	246.22	{ 25.11 }	4.0	981 { 100.0 }	4.5	1,108 { 113.0 }	5.0	1,226 { 125.0 }
30			30	205.19	{ 20.92 }	4.8		5.4		6.0	
35			35	175.87	{ 17.93 }	5.6		6.3		7.0	
40			40	153.89	{ 15.69 }	6.4		7.2		8.0	
45			45	136.79	{ 13.95 }	7.2		8.1		9.0	
50			50	123.11	{ 12.55 }	8.0		9.0		10.0	
55			55	111.92	{ 11.41 }	8.8		9.9		11.0	
60			60	102.59	{ 10.46 }	9.6		10.8		12.0	
65			65	94.70	{ 9.66 }	10.4		11.7		13.0	
70			70	87.94	{ 8.97 }	11.2		12.6		14.0	
75			75	82.07	{ 8.37 }	12.0		13.5		15.0	
80			80	76.94	{ 7.85 }	12.8		14.4		16.0	
90			90	68.40	{ 6.97 }	14.4		16.2		18.0	
100			100	61.56	{ 6.28 }	16.0		18.0		20.0	
125			125	49.24	{ 5.02 }	20.0		22.5		25.0	



Carga Extra Pesada

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		16% do compr. total 1Milhão de ciclos		18% do compr. total 500mil ciclos		20% do compr. total 300mil ciclos	
				(N / mm)	(Kg / mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TB 20 × 25	20	10	25	313.78	32.00	4.0	1,255 {128.0}	4.5	1,412 {144.0}	5.0	1,569 {160.0}
30			30	261.48	26.66	4.8		5.4		6.0	
35			35	224.13	22.85	5.6		6.3		7.0	
40			40	196.11	20.00	6.4		7.2		8.0	
45			45	174.32	17.78	7.2		8.1		9.0	
50			50	156.89	16.00	8.0		9.0		10.0	
55			55	142.63	14.54	8.8		9.9		11.0	
60			60	130.74	13.33	9.6		10.8		12.0	
65			65	120.68	12.31	10.4		11.7		13.0	
70			70	112.06	11.43	11.2		12.6		14.0	
75			75	104.59	10.67	12.0		13.5		15.0	
80			80	98.06	10.00	12.8		14.4		16.0	
90			90	87.16	8.89	14.4		16.2		18.0	
100			100	78.44	8.00	16.0		18.0		20.0	
125			125	62.76	6.40	20.0		22.5		25.0	
150			150	52.30	5.33	24.0		27.0		30.0	
TB 22 × 25	22	11	25	383.56	39.11	4.0	1,530 {156.0}	4.5	1,726 {176.0}	5.0	1,912 {195.0}
30			30	319.63	32.59	4.8		5.4		6.0	
35			35	273.97	27.94	5.6		6.3		7.0	
40			40	239.72	24.44	6.4		7.2		8.0	
45			45	213.09	21.73	7.2		8.1		9.0	
50			50	191.78	19.56	8.0		9.0		10.0	
55			55	174.34	17.78	8.8		9.9		11.0	
60			60	159.81	16.30	9.6		10.8		12.0	
65			65	147.52	15.04	10.4		11.7		13.0	
70			70	136.98	13.97	11.2		12.6		14.0	
75			75	127.85	13.04	12.0		13.5		15.0	
80			80	119.86	12.22	12.8		14.4		16.0	
90			90	106.54	10.86	14.4		16.2		18.0	
100			100	95.89	9.78	16.0		18.0		20.0	
125			125	76.71	7.82	20.0		22.5		25.0	
150			150	63.93	6.52	24.0		27.0		30.0	
TB 25 × 25	25	12.5	25	482.22	49.17	4.0	1,922 {196.0}	4.5	2,170 {221.3}	5.0	2,400 {244.7}
30			30	401.85	40.98	4.8		5.4		6.0	
35			35	344.44	35.12	5.6		6.3		7.0	
40			40	301.39	30.73	6.4		7.2		8.0	
45			45	267.90	27.32	7.2		8.1		9.0	
50			50	241.11	24.59	8.0		9.0		10.0	
55			55	219.19	22.35	8.8		9.9		11.0	
60			60	200.93	20.49	9.6		10.8		12.0	
65			65	185.47	18.91	10.4		11.7		13.0	
70			70	172.22	17.56	11.2		12.6		14.0	
75			75	160.74	16.39	12.0		13.5		15.0	
80			80	150.69	15.37	12.8		14.4		16.0	
90			90	133.95	13.66	14.4		16.2		18.0	
100			100	120.56	12.29	16.0		18.0		20.0	
125			125	96.44	9.83	20.0		22.5		25.0	
150			150	80.37	8.20	24.0		27.0		30.0	
175			175	68.89	7.02	28.0		31.5		35.0	
200			200	60.28	6.15	32.0		36.0		40.0	



Carga Extra Pesada

TB

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		16% do compr. total 1Milhão de ciclos		18% do compr. total 500mil ciclos		20% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TB 27 × 25	27	13.5	25	568.89	58.01	4.0	2,280 {232.5}	4.5	2,560 {261.1}	5.0	2,840 {289.6}
30			30	474.07	48.34	4.8		5.4		6.0	
35			35	406.35	41.44	5.6		6.3		7.0	
40			40	355.56	36.26	6.4		7.2		8.0	
45			45	316.05	32.23	7.2		8.1		9.0	
50			50	284.44	29.01	8.0		9.0		10.0	
55			55	258.59	26.37	8.8		9.9		11.0	
60			60	237.04	24.17	9.6		10.8		12.0	
65			65	218.80	22.31	10.4		11.7		13.0	
70			70	203.17	20.72	11.2		12.6		14.0	
75			75	189.63	19.34	12.0		13.5		15.0	
80			80	177.78	18.13	12.8		14.4		16.0	
90			90	158.02	16.11	14.4		16.2		18.0	
100			100	142.22	14.50	16.0		18.0		20.0	
125			125	113.78	11.60	20.0		22.5		25.0	
150			150	94.81	9.67	24.0		27.0		30.0	
175			175	81.27	8.29	28.0		31.5		35.0	
200			200	71.11	7.25	32.0		36.0		40.0	
TB 30 × 25	30	15	25	706.67	72.06	4.0	2,820 {287.6}	4.5	3,180 {324.3}	5.0	3,530 {360.0}
30			30	588.89	60.05	4.8		5.4		6.0	
35			35	504.76	51.47	5.6		6.3		7.0	
40			40	441.67	45.04	6.4		7.2		8.0	
45			45	392.59	40.03	7.2		8.1		9.0	
50			50	353.33	36.03	8.0		9.0		10.0	
55			55	321.21	32.75	8.8		9.9		11.0	
60			60	294.44	30.02	9.6		10.8		12.0	
65			65	271.79	27.72	10.4		11.7		13.0	
70			70	252.38	25.74	11.2		12.6		14.0	
75			75	235.56	24.02	12.0		13.5		15.0	
80			80	220.83	22.52	12.8		14.4		16.0	
90			90	196.30	20.02	14.4		16.2		18.0	
100			100	176.67	18.01	16.0		18.0		20.0	
125			125	141.33	14.41	20.0		22.5		25.0	
150			150	117.78	12.01	24.0		27.0		30.0	
175			175	100.95	10.29	28.0		31.5		35.0	
200			200	88.33	9.01	32.0		36.0		40.0	
TB 35 × 40	35	17.5	40	600.00	61.18	6.4	3,840 {391.6}	7.2	4,320 {440.5}	8.0	4,810 {490.5}
45			45	533.33	54.38	7.2		8.1		9.0	
50			50	480.00	48.95	8.0		9.0		10.0	
55			55	436.36	44.50	8.8		9.9		11.0	
60			60	400.00	40.79	9.6		10.8		12.0	
65			65	369.23	37.65	10.4		11.7		13.0	
70			70	342.86	34.96	11.2		12.6		14.0	
75			75	320.00	32.63	12.0		13.5		15.0	
80			80	300.00	30.59	12.8		14.4		16.0	
90			90	266.67	27.19	14.4		16.2		18.0	
100			100	240.00	24.47	16.0		18.0		20.0	
125			125	192.00	19.58	20.0		22.5		25.0	
150			150	160.00	16.32	24.0		27.0		30.0	
175			175	137.14	13.98	28.0		31.5		35.0	
200			200	120.00	12.24	32.0		36.0		40.0	



Carga Extra Pesada

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		16% do compr. total 1 Milhão de ciclos		18% do compr. total 500mil ciclos		20% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TB 40 × 40	40	20	40	784.72	80.02	6.4	5,020 { 511.9 }	7.2	5,650 { 576.1 }	8.0	6,280 { 640.4 }
45			45	697.53	71.13	7.2		8.1		9.0	
50			50	627.78	64.02	8.0		9.0		10.0	
55			55	570.71	58.20	8.8		9.9		11.0	
60			60	523.15	53.35	9.6		10.8		12.0	
65			65	482.91	49.24	10.4		11.7		13.0	
70			70	448.41	45.73	11.2		12.6		14.0	
75			75	418.52	42.68	12.0		13.5		15.0	
80			80	392.36	40.01	12.8		14.4		16.0	
90			90	348.77	35.56	14.4		16.2		18.0	
100			100	313.89	32.01	16.0		18.0		20.0	
125			125	251.11	25.61	20.0		22.5		25.0	
150			150	209.26	21.34	24.0		27.0		30.0	
175			175	179.37	18.29	28.0		31.5		35.0	
200			200	156.94	16.00	32.0		36.0		40.0	
225			225	139.51	14.23	36.0		40.5		45.0	
250			250	125.56	12.80	40.0		45.0		50.0	
275			275	114.14	11.64	44.0		49.5		55.0	
300			300	104.63	10.67	48.0		54.0		60.0	
TB 50 × 50	50	25	50	981.11	100.0	8.0	7,850 { 800.5 }	9.0	8,830 { 900.4 }	10.0	9,810 { 1000 }
55			55	891.92	90.95	8.8		9.9		11.0	
60			60	817.59	83.37	9.6		10.8		12.0	
65			65	754.70	76.96	10.4		11.7		13.0	
70			70	700.79	71.46	11.2		12.6		14.0	
75			75	654.07	66.70	12.0		13.5		15.0	
80			80	613.19	62.53	12.8		14.4		16.0	
90			90	545.06	55.58	14.4		16.2		18.0	
100			100	490.56	50.02	16.0		18.0		20.0	
125			125	392.44	40.02	20.0		22.5		25.0	
150			150	327.04	33.35	24.0		27.0		30.0	
175			175	280.32	28.58	28.0		31.5		35.0	
200			200	245.28	25.01	32.0		36.0		40.0	
225			225	218.02	22.23	36.0		40.5		45.0	
250			250	196.22	20.01	40.0		45.0		50.0	
275			275	178.38	18.19	44.0		49.5		55.0	
300			300	163.52	16.67	48.0		54.0		60.0	
350			350	140.16	14.29	56.0		63.0		70.0	
TB 60 × 60	60	30	60	1176.85	120.0	9.6	11,300 { 1152 }	10.8	12,710 { 1296 }	12.0	14,120 { 1440 }
70			70	1008.73	102.9	11.2		12.6		14.0	
80			80	882.64	90.00	12.8		14.4		16.0	
90			90	784.57	80.00	14.4		16.2		18.0	
100			100	706.11	72.00	16.0		18.0		20.0	
125			125	564.89	57.60	20.0		22.5		25.0	
150			150	470.74	48.00	24.0		27.0		30.0	
175			175	403.49	41.14	28.0		31.5		35.0	
200			200	353.06	36.00	32.0		36.0		40.0	
225			225	313.83	32.00	36.0		40.5		45.0	
250			250	282.44	28.80	40.0		45.0		50.0	
275			275	256.77	26.18	44.0		49.5		55.0	
300			300	235.37	24.00	48.0		54.0		60.0	
350			350	201.75	20.57	56.0		63.0		70.0	



Carga Extra Pesada

Referência	Diam. Externo	Diam. Interno	Compr. Total (mm)	Constante Elástica		16% do compr. total 1Milhão de ciclos		18% do compr. total 500mil ciclos		20% do compr. total 300mil ciclos	
				(N / mm)	(Kgf /mm)	Deflexão	Carga	Deflexão	Carga	Deflexão	Carga
TB 70 x 70	70	38.5	70	1285.71	131.1	11.2	14,400 {1468}	12.6	16,200 {1652}	14.0	18,000 {1836}
80			80	1125.00	114.7	12.8		14.4		16.0	
90			90	1000.00	102.0	14.4		16.2		18.0	
100			100	900.00	91.77	16.0		18.0		20.0	
125			125	720.00	73.42	20.0		22.5		25.0	
150			150	600.00	61.18	24.0		27.0		30.0	
175			175	514.29	52.44	28.0		31.5		35.0	
200			200	450.00	45.89	32.0		36.0		40.0	
225			225	400.00	40.79	36.0		40.5		45.0	
250			250	360.00	36.71	40.0		45.0		50.0	
275			275	327.27	33.37	44.0		49.5		55.0	
300			300	300.00	30.59	48.0		54.0		60.0	
350			350	257.14	26.22	56.0		63.0		70.0	