

Tubo de Usos Gerais

Norma DIN 2394 REDONDO

Diâmetro exterior	Kg / m		
	1.25*	1.50	2.00
10 mm	0.308	0.353	0.455
12 mm	0.383	0.447	0.581
13 mm	0.402	0.471	0.612
14 mm	0.422	0.495	0.644
16 mm	0.481	0.565	0.738
18 mm	0.550	0.648	0.848
19 mm	0.579	0.683	0.895
20 mm	0.608	0.718	0.942
22 mm	0.677	0.801	1.052
25 mm	0.775	0.918	1.209
28 mm	0.873	1.060	1.382
30 mm	0.922	1.095	1.444
32 mm	0.971	1.154	1.523
33 mm		1.213	
34 mm		1.220	1.633
35 mm	1.070	1.272	1.680
38 mm	1.168	1.413	1.853
40 mm	1.260	1.472	1.947
41 mm	1.266	1.507	1.994
42 mm	1.276	1.519	2.010
45 mm	1.364	1.649	2.167
48 mm	1.462	1.743	2.308
50 mm	1.580	1.884	2.481
55 mm		2.025	2.683
57 mm		2.120	2.795
60 mm		2.214	2.936
65 mm		2.379	3.156
70 mm		2.567	3.407
75 mm		2.802	3.721
80 mm		2.944	3.909
89 mm			4.380
100 mm			5.008

Norma DIN 2395 QUADRADO

Diâmetro exterior	Kg / m		
	1.25*	1.50	2.00
10 X 10 mm	0.383	0.447	
12 X 12 mm	0.481	0.565	
14 X 14 mm		0.636	
16 X 16 mm	0.628	0.742	0.973
18 X 18 mm		0.824	
20 X 20 mm	0.795	0.942	1.225
22 X 22 mm	0.893	1.060	1.382
25 X 25 mm	0.991	1.178	1.539
28 X 28 mm		1.272	1.711
30 X 30 mm	1.187	1.413	1.853
32 X 32 mm		1.507	1.994
35 X 35 mm	1.107	1.649	2.167
38 X 38 mm		1.743	2.339
40 X 40 mm		1.884	2.481
45 X 45 mm		2.120	2.795
50 X 50 mm		2.331	3.093
60 X 60 mm		2.802	3.721
70 X 70 mm			4.349
80 X 80 mm			4.977
100 X 100 mm			6.233

* Materia Prima: Chapa laminada a frio na qualidade ST 12.03
Materia Prima: Chapa laminada a quente na qualidade S235 JRG2,
S275 JR ou sob pedido S355 JOH
Tipo de Fabrico: Tubo laminado a frio

Tubo de Usos Gerais

Norma DIN 2395
RECTANGULAR

Diâmetro exterior		Kg / m		
		1.25*	1.50	2.00
15 mm	10 mm	0.481	0.565	
20 mm	10 mm		0.683	
20 mm	15 mm		0.801	
25 mm	10 mm		0.801	
25 mm	15 mm		0.942	1.225
30 mm	10 mm		0.942	
30 mm	15 mm	0.893	1.060	
30 mm	20 mm	0.991	1.178	1.539
30 mm	25 mm		1.272	
32 mm	13 mm		1.060	
35 mm	10 mm		1.060	
35 mm	15 mm		1.178	
35 mm	20 mm	1.070	1.272	1.680
35 mm	25 mm		1.413	
40 mm	10 mm		1.178	
40 mm	15 mm		1.272	
40 mm	20 mm	1.187	1.413	1.853
40 mm	25 mm		1.507	1.994
40 mm	30 mm		1.649	2.167
45 mm	20 mm		1.507	
45 mm	25 mm		1.649	2.167
50 mm	10 mm		1.413	
50 mm	14 mm		1.507	1.994
50 mm	20 mm	1.384	1.649	2.167
50 mm	25 mm		1.743	2.308
50 mm	30 mm	1.580	1.884	2.481
50 mm	35 mm		1.978	
50 mm	40 mm		2.120	2.795
55 mm	25 mm		1.884	2.481
55 mm	35 mm		2.120	2.795
60 mm	10 mm		1.649	
60 mm	15 mm		1.743	

RECTANGULAR

Diâmetro exterior		Kg / m		
		1.25*	1.50	2.00
60 mm	20 mm		1.884	
60 mm	25 mm		1.978	
60 mm	30 mm		2.120	2.795
60 mm	40 mm		2.331	3.093
70 mm	20 mm		2.120	2.795
70 mm	30 mm		2.331	3.093
70 mm	40 mm		2.567	3.407
80 mm	20 mm		2.331	
80 mm	30 mm		2.567	
80 mm	40 mm		2.802	3.721
100 mm	40 mm			4.349
100 mm	50 mm			4.663
100 mm	60 mm			4.977

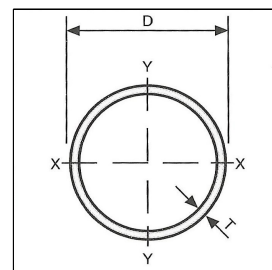
* Materia Prima: Chapa laminada a frio na qualidade ST 12.03
Materia Prima: Chapa laminada a quente na qualidade S235 JRG2,
S275 JR ou sob pedido S355 JOH
Tipo de Fabrico: Tubo laminado a frio

Tubo Estrutural

Método de fabrico: Laminado a frio segundo a norma **EN 10219**

Matéria-prima: Chapa laminada a quente nas qualidades **S275** e **S355**

Redondo



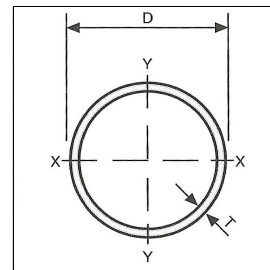
Diâmetro d (mm)	Espessura t (mm)	Peso kg/m	Movimento de Inércia I (cm ⁴)	Raio de giração i (cm)	Módulo		Área pintura A _s (m ² /m)
					Elástico W _{el} (cm ³)	Elástico W _{pl} (cm ³)	
38	3	2.590	5.090	1.240	2.680	3.680	0.119
40	3	2.740	6.010	1.310	3.000	4.120	0.126
42.4	3	2.910	7.250	1.400	3.420	4.670	0.133
48.3	3	3.350	11.000	1.610	4.550	6.170	0.152
	4	4.370	13.770	1.570	5.700	7.870	0.152
50	3	3.480	12.280	1.670	4.910	6.640	0.157
	4	4.540	15.410	1.630	6.160	8.490	0.157
55	3	3.850	16.620	1.840	6.040	8.120	0.173
	4	5.030	20.960	1.810	7.620	10.430	0.173
57	3	4.000	18.610	1.910	6.530	8.760	0.179
	4	5.230	23.520	1.880	8.250	11.260	0.179
60.3	3	4.240	22.220	2.030	7.370	9.860	0.189
	4	5.550	28.170	2.000	9.340	12.700	0.189
63	3	4.440	25.510	2.120	8.100	10.810	0.198
	4	5.820	32.410	2.090	10.290	13.950	0.198
70	3	4.960	35.500	2.370	10.140	13.480	0.220
	4	6.510	45.330	2.340	12.950	17.450	0.220
76.1	3	5.410	46.100	2.590	12.110	16.040	0.239
	4	7.110	59.060	2.550	15.520	20.810	0.239
	5	8.770	70.920	2.520	18.640	25.320	0.239
	6	10.370	81.760	2.490	21.490	29.560	0.239
80	3	5.700	53.870	2.720	13.470	17.800	0.251
	4	7.500	69.150	2.690	17.290	23.130	0.251
	5	9.250	83.200	2.660	20.800	28.170	0.251
	6	10.950	96.110	2.620	24.030	32.930	0.251
83	3	5.920	60.400	2.830	14.560	19.210	0.261
	4	7.790	77.640	2.800	18.710	24.990	0.261
88.9	3	6.360	74.760	3.040	16.820	22.150	0.279
	4	8.380	96.340	3.000	21.670	28.850	0.279
	5	10.350	116.370	2.970	26.180	35.240	0.279
	6	12.270	134.940	2.940	30.360	41.310	0.279
90	3	6.440	77.670	3.080	17.260	22.720	0.283
	4	8.480	100.130	3.040	22.250	29.610	0.283
95	3	6.810	91.830	3.250	19.330	25.400	0.298
	4	8.980	118.600	3.220	24.970	33.150	0.298
100	3	7.180	107.620	3.430	21.520	28.240	0.314
	4	9.470	139.220	3.400	27.840	36.890	0.314
	5	11.710	168.810	3.360	33.760	45.170	0.314
	6	13.910	196.500	3.330	39.300	53.090	0.314
	8	18.150	246.480	3.260	49.300	67.880	0.314
101.6	3	7.290	113.040	3.490	22.250	29.170	0.319
	4	9.630	146.280	3.450	28.800	38.120	0.319
	5	11.910	177.470	3.420	34.930	46.700	0.319
	6	14.150	206.680	3.390	40.680	54.910	0.319
	8	18.470	259.500	3.320	51.080	70.260	0.319

Tubo Estrutural

Método de fabrico: Laminado a frio segundo a norma **EN 10219**

Matéria-prima: Chapa laminada a quente nas qualidades **S275** e **S355**

Redondo



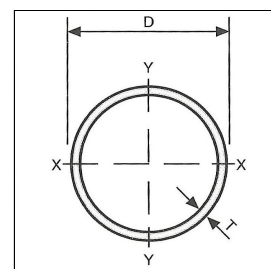
Diâmetro d (mm)	Espessura t (mm)	Peso kg/m	Movimento de Inércia I (cm ⁴)	Raio de giração i (cm)	Módulo		Área pintura A _s (m ² /m)
					Elástico W _{el} (cm ³)	Elástico W _{pl} (cm ³)	
108	3	7.770	136.490	3.710	25.280	33.080	0.339
	4	10.260	176.950	3.680	32.770	43.290	0.339
110	3	7.920	144.440	3.780	26.260	34.360	0.346
	4	10.460	187.350	3.750	34.060	44.970	0.346
113	3	8.140	156.920	3.890	27.770	36.310	0.355
	4	10.750	203.700	3.860	36.050	47.550	0.355
	5	13.320	247.870	3.820	43.870	58.360	0.355
	6	15.830	289.550	3.790	51.250	68.770	0.355
114.3	3	8.230	162.550	3.940	28.440	37.170	0.359
	4	10.880	211.070	3.900	36.930	48.690	0.359
	5	13.480	256.920	3.870	44.960	59.770	0.359
	6	16.030	300.210	3.830	52.530	70.450	0.359
	8	20.970	379.490	3.770	66.400	90.570	0.359
120	3	8.660	188.810	4.140	31.470	41.080	0.377
	4	11.440	245.480	4.100	40.910	53.850	0.377
125	3	9.030	214.050	4.310	34.250	44.660	0.393
	4	11.940	278.580	4.280	44.570	58.590	0.393
	5	14.800	339.880	4.250	54.380	72.040	0.393
	6	17.610	398.070	4.210	63.690	85.040	0.393
	8	23.080	505.510	4.150	80.880	109.680	0.393
	10	28.360	601.760	4.080	96.280	132.580	0.393
127	3	9.170	224.750	4.390	35.390	46.140	0.399
	4	12.130	292.610	4.350	46.080	60.540	0.399
133	3	9.620	258.970	4.600	38.940	50.710	0.418
	4	12.730	337.530	4.560	50.760	66.590	0.418
139.7	3	10.110	301.090	4.830	43.110	56.070	0.439
	4	13.390	392.860	4.800	56.240	73.680	0.439
	5	16.610	480.540	4.770	68.800	90.760	0.439
	6	19.780	564.260	4.730	80.780	107.330	0.439
	8	25.980	720.290	4.660	103.120	138.930	0.439
	10	31.990	861.890	4.600	123.390	168.550	0.439
152	3	11.020	389.870	5.270	51.300	66.610	0.478
	4	14.600	509.590	5.230	67.050	87.640	0.478
159	3	11.540	447.420	5.520	56.280	73.020	0.500
	4	15.290	585.330	5.480	73.630	96.120	0.500
	5	18.990	717.880	5.450	90.300	118.620	0.500
	6	22.640	845.190	5.410	106.310	140.530	0.500
	8	29.790	1084.670	5.350	136.440	182.580	0.500
164	3	11.910	491.820	5.690	59.980	77.770	0.515
	4	15.780	643.800	5.660	78.510	102.420	0.515

Tubo Estrutural

Método de fabrico: Laminado a frio segundo a norma **EN 10219**

Matéria-prima: Chapa laminada a quente nas qualidades **S275** e **S355**

Redondo



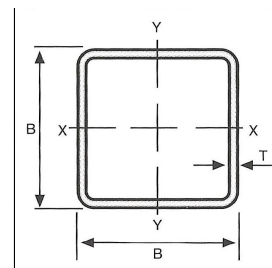
Diâmetro d (mm)	Espessura t (mm)	Peso kg/m	Movimento de Inércia I (cm ⁴)	Raio de giração i (cm)	Módulo		Área pintura A _s (m ² /m)
					Elástico W _{el} (cm ³)	Elástico W _{pl} (cm ³)	
168.3	3	12.230	532.280	5.850	63.250	81.980	0.529
	4	16.210	697.090	5.810	82.840	108.000	0.529
	5	20.140	855.850	5.780	101.700	133.380	0.529
	6	24.020	1008.690	5.740	119.870	158.120	0.529
	8	31.630	1297.270	5.670	154.160	205.740	0.529
	10	39.040	1563.980	5.610	185.860	250.920	0.529
	12	46.260	1809.970	5.540	215.090	293.730	0.529
177.8	3	12.930	629.410	6.180	70.800	91.670	0.559
	4	17.140	825.090	6.150	92.810	120.850	0.559
	5	21.310	1013.970	6.110	114.060	149.340	0.559
	6	25.420	1196.220	6.080	134.560	177.160	0.559
	8	33.500	1541.440	6.010	173.390	230.830	0.559
193.7	3	14.110	817.220	6.740	84.380	109.110	0.609
	4	18.710	1072.790	6.710	110.770	143.970	0.609
	5	23.270	1320.230	6.670	136.320	178.080	0.609
	6	27.770	1559.720	6.640	161.050	211.460	0.609
	8	36.640	2015.540	6.570	208.110	276.050	0.609
	10	45.300	2441.590	6.500	252.100	337.790	0.609
	12	53.770	2839.200	6.440	293.150	396.750	0.609
200	3	14.570	900.910	6.970	90.090	116.440	0.628
	4	19.330	1183.230	6.930	118.320	153.690	0.628
	5	24.040	1456.860	6.900	145.690	190.170	0.628
	6	28.710	1721.990	6.860	172.200	225.890	0.628
	8	37.880	2227.440	6.790	222.740	295.080	0.628
219.1	3	15.990	1189.130	7.640	108.550	140.110	0.688
	4	21.220	1563.840	7.610	142.750	185.090	0.688
	5	26.400	1928.040	7.570	176.000	229.240	0.688
	6	31.530	2281.950	7.540	208.300	272.540	0.688
	8	41.650	2959.630	7.470	270.160	356.680	0.688
	10	51.570	3598.440	7.400	328.470	437.560	0.688
	12	61.290	4199.880	7.330	383.380	515.260	0.688

Tubo Estrutural

Método de fabrico: Laminado a frio segundo a norma **EN 10219**

Matéria-prima: Chapa laminada a quente nas qualidades **S275** e **S355**

Quadrado



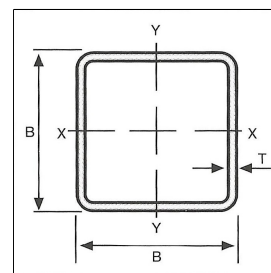
Diâmetro b (mm)	Espessura t (mm)	Peso kg/m	Movimento de Inércia I (cm ⁴)	Raio de giração i (cm)	Módulo		Área pintura A _s (m ² /m)
					Elástico W _{el} (cm ³)	Elástico W _{pl} (cm ³)	
30	3	2.360	3.500	1.080	2.340	2.960	0.110
35	3	2.830	5.940	1.270	3.400	4.230	0.130
40	3	3.300	9.320	1.490	4.660	5.720	0.150
	4	4.200	11.100	1.440	5.540	7.010	0.150
45	3	3.770	13.770	1.690	6.110	7.440	0.170
50	3	4.250	19.050	1.900	7.790	9.390	0.190
	4	5.450	23.700	1.850	9.490	11.070	0.190
	5	6.560	27.000	1.800	10.800	13.700	0.180
60	6	7.560	29.450	1.750	11.770	15.310	0.180
	3	5.190	35.100	2.310	11.700	14.000	0.230
	4	6.710	43.600	2.260	14.500	17.600	0.230
	5	8.130	50.500	2.210	16.800	20.900	0.220
70	6	9.450	56.100	2.160	18.700	23.700	0.220
	3	6.130	57.500	2.710	16.400	19.400	0.270
	4	7.970	72.100	2.670	20.600	24.800	0.270
	5	9.700	84.600	2.620	24.200	29.600	0.260
80	6	11.330	95.200	2.570	27.200	33.800	0.260
	3	7.070	87.800	3.120	22.000	25.800	0.310
	4	9.220	111.000	3.070	27.800	33.100	0.310
	5	11.270	131.000	3.030	32.900	39.700	0.300
	6	13.210	149.000	2.980	37.300	45.800	0.300
90	8	16.360	168.000	2.840	42.100	53.900	0.290
	3	8.010	127.000	3.530	28.300	33.000	0.350
	4	10.480	162.000	3.480	36.000	42.600	0.350
	5	12.840	193.000	3.430	42.900	51.400	0.340
	6	15.100	220.000	3.390	49.000	59.500	0.340
	8	18.870	255.000	3.250	56.600	71.300	0.330
100	3	8.960	177.000	3.940	35.400	41.200	0.390
	4	11.730	226.000	3.890	45.300	53.300	0.390
	5	14.410	271.000	3.840	54.200	64.600	0.380
	10	25.560	411.000	3.550	82.200	105.000	0.360
	12	28.310	408.000	3.360	81.060	110.000	0.340
120	3	10.840	312.000	4.760	52.100	60.200	0.470
	4	14.250	402.000	4.710	67.000	78.300	0.470
	5	17.550	485.000	4.660	80.900	95.400	0.460
	6	20.750	562.000	4.610	93.070	112.000	0.460
	8	26.410	677.000	4.490	113.000	138.000	0.450
	10	31.840	777.000	4.380	129.000	162.000	0.440
	12	35.840	806.000	4.200	134.000	174.000	0.420

Tubo Estrutural

Método de fabrico: Laminado a frio segundo a norma **EN 10219**

Matéria-prima: Chapa laminada a quente nas qualidades **S275** e **S355**

Quadrado



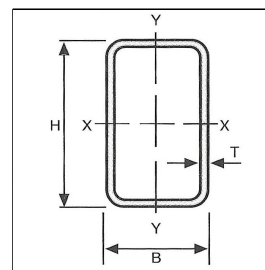
Diâmetro b (mm)	Espessura t (mm)	Peso kg/m	Movimento de Inércia I (cm ⁴)	Raio de giração i (cm)	Módulo		Área pintura A _s (m ² /m)
					Elástico W _{el} (cm ³)	Elástico W _{pl} (cm ³)	
130	3	11.780	400.270	5.150	61.580	71.090	0.510
	4	15.500	516.960	5.110	79.520	92.630	0.510
	5	19.120	625.670	5.070	96.260	113.120	0.500
	6	22.630	726.640	5.010	111.790	132.570	0.500
	8	28.920	882.840	4.900	135.820	164.780	0.490
	10	34.980	1021.090	4.780	157.080	194.600	0.480
140	12	39.610	1075.230	4.610	165.410	211.670	0.460
	3	12.720	503.330	5.570	71.910	82.860	0.550
	4	16.760	652.000	5.520	93.100	108.000	0.550
	5	20.690	791.000	5.480	113.000	132.000	0.540
	6	24.520	920.000	5.430	131.000	155.000	0.540
	8	31.430	1127.000	5.300	161.000	194.000	0.530
150	10	38.120	1312.000	5.200	187.000	230.000	0.520
	12	43.380	1398.000	5.030	200.000	253.000	0.500
	4	18.010	808.000	5.930	108.000	125.000	0.590
	5	22.260	982.000	5.890	131.000	153.000	0.580
	6	26.400	1146.000	5.840	153.000	180.000	0.580
	8	33.950	1412.000	5.710	188.000	226.000	0.570
160	10	41.260	1653.000	5.610	220.000	269.000	0.560
	12	47.150	1780.000	5.440	237.000	298.000	0.540
	4	19.270	987.000	6.340	123.000	143.000	0.630
	5	23.830	1202.000	6.290	150.000	175.000	0.620
	6	28.290	1405.000	6.250	176.000	206.000	0.620
	8	36.460	1741.000	6.120	218.000	260.000	0.610
175	10	44.400	2048.000	6.020	256.000	311.000	0.600
	12	50.910	2224.000	5.860	278.000	346.000	0.580
	4	21.150	1303.000	6.940	149.000	172.000	0.690
	5	26.180	1590.000	6.900	182.000	211.000	0.680
	6	31.110	1864.000	6.860	213.000	249.000	0.680
	8	40.230	2325.000	6.730	265.000	316.000	0.670
175	10	49.110	2751.000	6.630	314.000	379.000	0.660
	12	56.570	3020.000	6.470	345.000	425.000	0.640

Tubo Estrutural

Método de fabrico: Laminado a frio segundo a norma **EN 10219**

Matéria-prima: Chapa laminada a quente nas qualidades **S275** e **S355**

Rectangular



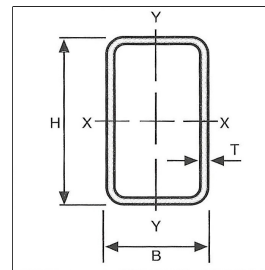
Diâmetro h x b (mm)	Espessura t (mm)	Peso kg/m	Movimento de Inércia		Raio de giração		Módulo				Área pintura A _s (m²/m)
							Elástico		Plástico		
			I _{xx} cm ⁴	I _{yy} cm ⁴	i _{xx} cm	i _{yy} cm	W _{el xx} cm ³	W _{el yy} cm ³	W _{pl xx} cm ³	W _{pl yy} cm ³	
50 x 30	3	4.210	12.830	5.700	1.750	1.160	5.130	3.800	6.570	4.580	0.150
	4	5.350	15.250	6.690	1.690	1.120	6.100	4.460	8.050	5.580	0.150
60 x 30	3	4.810	20.500	6.800	2.060	1.190	6.830	4.530	8.820	5.390	0.170
60 x 40	3	5.410	25.380	13.440	2.170	1.580	8.460	6.720	10.530	7.940	0.190
	4	6.950	30.990	16.280	2.110	1.530	10.330	8.140	13.160	9.890	0.190
	5	8.360	35.330	18.430	2.060	1.480	11.780	9.210	15.380	11.520	0.180
	6	9.630	38.500	19.950	2.000	1.440	12.830	9.970	17.200	12.840	0.180
70 x 40	3	6.010	37.310	15.500	2.490	1.610	10.660	7.750	13.390	9.050	0.210
	4	7.750	45.950	18.880	2.440	1.560	13.130	9.440	16.840	11.330	0.210
	5	9.360	52.880	21.510	2.380	1.520	15.110	10.750	19.810	13.270	0.200
	6	10.830	58.200	23.450	2.320	1.470	16.630	11.730	22.310	14.880	0.200
80 x 40	3	6.610	52.250	17.560	2.810	1.630	13.060	8.780	16.540	10.160	0.230
	4	8.550	64.790	21.490	2.750	1.590	16.200	10.740	20.910	12.770	0.230
	5	10.360	75.110	24.590	2.690	1.540	18.780	12.300	24.740	15.020	0.220
	6	12.030	83.320	26.960	2.630	1.500	20.830	13.480	28.030	16.920	0.220
	8	14.440	85.090	27.660	2.430	1.380	21.270	13.830	30.850	18.600	0.210
80 x 50	3	7.210	61.150	29.420	2.910	2.020	15.290	11.770	18.850	13.620	0.250
	4	9.350	76.360	36.460	2.860	1.980	19.090	14.590	23.950	17.250	0.250
	5	11.360	89.190	42.290	2.800	1.930	22.300	16.920	28.490	20.450	0.240
	6	13.230	99.780	46.990	2.750	1.880	24.950	18.790	32.470	23.240	0.240
	8	16.040	105.910	50.010	2.570	1.770	26.480	20.000	36.610	26.220	0.230
90 x 50	3	7.810	81.850	32.740	3.240	2.050	18.190	13.100	22.600	15.030	0.270
	4	10.150	102.710	40.710	3.180	2.000	22.820	16.280	28.820	19.090	0.270
	5	12.360	120.600	47.370	3.120	1.960	26.800	18.950	34.410	22.700	0.260
	6	14.430	135.660	52.830	3.070	1.910	30.150	21.130	39.380	25.880	0.260
	8	17.640	146.660	57.150	2.880	1.800	32.590	22.860	45.030	29.580	0.250
100 x 50	3	8.410	106.460	36.060	3.560	2.070	21.290	14.420	26.660	16.440	0.290
	4	10.950	134.140	44.950	3.500	2.030	26.830	17.980	34.100	20.930	0.290
	5	13.360	158.190	52.450	3.440	1.980	31.640	20.980	40.840	24.950	0.280
	6	15.630	178.750	58.670	3.380	1.940	35.750	23.470	46.900	28.520	0.280
	8	19.240	196.240	64.290	3.190	1.830	39.250	25.720	54.250	32.940	0.270
100 x 60	3	9.010	120.570	54.650	3.660	2.460	24.110	18.220	29.570	20.790	0.310
	4	11.750	152.580	68.680	3.600	2.420	30.520	22.890	37.940	26.600	0.310
	5	14.360	180.770	80.830	3.550	2.370	36.150	26.940	45.590	31.880	0.300
	6	16.830	205.300	91.200	3.490	2.330	41.060	30.400	52.540	36.640	0.300
	8	20.840	230.180	102.180	3.320	2.210	46.040	34.060	61.610	42.970	0.290
	10	24.570	248.410	109.680	3.180	2.110	49.680	36.560	69.250	48.120	0.280
100 x 80	3	10.210	148.810	105.640	3.820	3.220	29.760	26.410	35.390	30.400	0.350
	4	13.350	189.470	134.170	3.770	3.170	37.890	33.540	45.620	39.150	0.350
	5	16.360	225.940	159.610	3.720	3.120	45.190	39.900	55.090	47.240	0.340
	6	19.230	258.390	182.100	3.670	3.080	51.680	45.530	63.820	54.670	0.340
	8	24.040	298.060	210.020	3.520	2.960	59.610	52.500	76.330	65.410	0.330
	10	28.570	329.740	231.810	3.400	2.850	65.950	57.950	87.250	74.680	0.320

Tubo Estrutural

Método de fabrico: Laminado a frio segundo a norma **EN 10219**

Matéria-prima: Chapa laminada a quente nas qualidades **S275** e **S355**

Rectangular



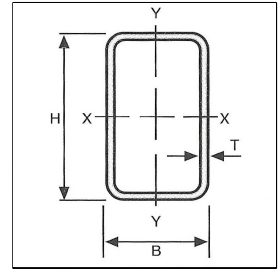
Diâmetro h x b (mm)	Espessura t (mm)	Peso kg/m	Movimento de Inércia		Raio de giração		Módulo				Área pintura A _s (m²/m)
			I _{xx} cm ⁴	I _{yy} cm ⁴	i _{xx} cm	i _{yy} cm	Elástico		Plástico		
							W _{el xx} cm ³	W _{el yy} cm ³	W _{pl xx} cm ³	W _{pl yy} cm ³	
120 x 60	3	10.210	189.120	64.400	4.300	2.510	31.520	21.470	39.180	24.210	0.350
	4	13.350	240.740	81.250	4.250	2.470	40.120	27.080	50.490	31.080	0.350
	5	16.360	286.970	95.990	4.190	2.420	47.830	32.000	60.950	37.380	0.340
	6	19.230	328.010	108.770	4.130	2.380	54.670	36.260	70.570	43.120	0.340
	8	24.040	375.310	123.980	3.950	2.270	62.550	41.330	84.050	51.290	0.330
	10	28.570	412.810	135.010	3.800	2.170	68.800	45.000	95.820	58.120	0.320
120 x 80	3	11.410	230.200	123.430	4.490	3.290	38.370	30.860	46.200	35.020	0.390
	4	14.950	294.590	157.290	4.440	3.240	49.100	39.320	59.770	45.230	0.390
	5	18.360	353.140	187.780	4.390	3.200	58.860	46.940	72.450	54.740	0.380
	6	21.630	406.060	215.030	4.330	3.150	67.680	53.760	84.250	63.550	0.380
	8	27.240	475.830	251.660	4.180	3.040	79.310	62.920	101.970	76.930	0.370
	10	32.570	534.140	281.140	4.050	2.940	89.020	70.290	117.820	88.680	0.360
	12	36.060	524.610	279.160	3.810	2.780	87.430	69.790	122.250	92.380	0.340
120 x 100	3	12.610	271.270	205.280	4.640	4.040	45.210	41.060	53.220	47.030	0.430
	4	16.550	348.430	263.240	4.590	3.990	58.070	52.650	69.050	60.980	0.430
	5	20.360	419.310	316.270	4.540	3.940	69.880	63.250	83.950	74.090	0.420
	6	24.030	484.110	364.560	4.490	3.890	80.680	72.910	97.930	86.380	0.420
	8	30.440	576.350	433.830	4.350	3.780	96.060	86.770	119.890	105.770	0.410
	10	36.570	655.470	492.410	4.230	3.670	109.250	98.480	139.820	123.250	0.400
140 x 60	3	11.410	278.080	74.160	4.940	2.550	39.730	24.720	49.980	27.630	0.390
	4	14.950	355.590	93.810	4.880	2.510	50.800	31.270	64.630	35.560	0.390
	5	18.360	425.890	111.160	4.820	2.460	60.840	37.050	78.300	42.880	0.380
	6	21.630	489.190	126.340	4.760	2.420	69.880	42.110	91.010	49.600	0.380
140 x 80	3	9.900	334.400	141.230	5.150	3.350	47.770	35.310	58.200	39.640	0.430
	4	12.960	429.600	180.420	5.100	3.300	61.370	45.100	75.510	51.310	0.430
	5	16.000	517.060	215.940	5.040	3.260	73.870	53.990	91.800	62.240	0.420
	6	18.870	597.000	247.960	4.980	3.210	85.290	61.990	107.090	72.430	0.420
	8	23.900	708.090	293.310	4.820	3.100	101.160	73.330	130.820	88.450	0.410
	10	28.700	803.670	330.480	4.690	3.010	114.810	82.620	152.380	102.680	0.400
140 x 100	3	10.840	390.710	233.520	5.320	4.110	55.820	46.700	66.420	52.850	0.470
	4	14.250	503.610	300.120	5.270	4.070	71.940	60.020	86.390	68.660	0.470
	5	17.550	608.230	361.440	5.220	4.020	86.890	72.290	105.300	83.590	0.460
	6	20.750	704.810	417.650	5.160	3.970	100.690	83.530	123.170	97.660	0.460
	8	26.410	847.650	501.710	5.020	3.860	121.090	100.340	151.940	120.490	0.450
	10	31.840	973.010	573.740	4.900	3.760	139.000	114.750	178.380	141.250	0.440
	12	35.840	1003.960	595.070	4.690	3.610	143.420	119.010	191.430	151.960	0.420
150 x 50	3	8.960	298.550	52.650	5.120	2.150	39.810	21.060	51.430	23.490	0.390
	4	11.730	381.390	66.160	5.050	2.100	50.850	26.470	66.470	30.130	0.390
	5	14.410	456.290	77.870	4.990	2.060	60.840	31.150	80.480	36.200	0.380
	6	16.980	523.470	87.890	4.920	2.020	69.800	35.160	93.480	41.720	0.380
	8	21.390	604.420	100.000	4.710	1.920	80.590	40.000	112.360	49.740	0.370

Tubo Estrutural

Método de fabrico: Laminado a frio segundo a norma **EN 10219**

Matéria-prima: Chapa laminada a quente nas qualidades **S275 e S355**

Rectangular



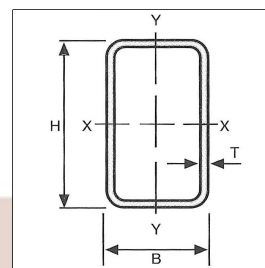
Diâmetro h x b (mm)	Espessura t (mm)	Peso kg/m	Movimento de Inércia		Raio de giração		Módulo				Área pintura A _s (m²/m)
							Elástico		Plástico		
			I _{xx} cm⁴	I _{yy} cm⁴	i _{xx} cm	i _{yy} cm	W _{el xx} cm³	W _{el yy} cm³	W _{pl xx} cm³	W _{pl yy} cm³	
150 x 100	3	11.310	460.640	247.640	5.650	4.150	61.420	49.530	73.480	55.760	0.490
	4	14.870	594.600	318.570	5.600	4.100	79.280	63.710	95.670	72.500	0.490
	5	18.330	719.200	384.020	5.550	4.050	95.890	76.800	116.730	88.340	0.480
	6	21.690	834.690	444.190	5.500	4.010	111.290	88.840	136.680	103.300	0.480
	8	27.670	1008.130	535.650	5.350	3.900	134.420	107.130	169.160	127.850	0.470
	10	33.410	1161.700	614.410	5.220	3.800	154.890	122.880	199.170	150.250	0.460
	12	37.730	1207.010	641.820	5.010	3.650	160.930	128.360	214.860	162.520	0.440
160 x 80	4	14.250	597.710	203.540	5.740	3.350	74.710	50.890	92.860	57.390	0.470
	5	17.550	721.690	244.110	5.680	3.300	90.210	61.030	113.160	69.740	0.460
	6	20.750	836.010	280.890	5.620	3.260	104.500	70.220	132.320	81.310	0.460
	8	26.410	1001.220	334.950	5.460	3.160	125.150	83.740	162.860	99.970	0.450
180 x 80	4	15.500	802.120	226.670	6.370	3.390	89.120	56.670	111.810	63.470	0.510
	5	19.120	971.030	272.280	6.310	3.340	107.890	68.070	136.520	77.240	0.500
	6	22.630	1127.880	313.820	6.250	3.300	125.320	78.450	159.950	90.190	0.500
	8	28.920	1361.650	376.590	6.080	3.200	151.290	94.150	198.100	111.490	0.490
	10	34.980	1570.130	429.140	5.940	3.100	174.460	107.290	233.510	130.680	0.480
	12	39.610	1625.870	447.350	5.680	2.980	180.650	111.840	252.030	141.340	0.460
180 x 100	4	16.760	926.040	373.890	6.590	4.180	102.890	74.780	125.890	84.020	0.550
	5	20.690	1124.200	451.770	6.530	4.140	124.910	90.350	154.020	102.590	0.540
	6	24.520	1309.610	523.830	6.480	4.100	145.510	104.770	180.830	120.220	0.540
	8	31.430	1598.490	637.470	6.320	3.990	177.610	127.490	225.620	149.930	0.530
	10	38.120	1859.470	736.410	6.190	3.890	206.610	147.280	267.510	177.250	0.520
200 x 100	4	18.010	1199.710	410.780	7.230	4.230	119.970	82.160	148.040	91.700	0.590
	5	22.260	1459.250	496.940	7.170	4.190	145.930	99.390	181.370	112.090	0.580
	6	26.400	1703.310	576.910	7.120	4.140	170.330	115.380	213.270	131.500	0.580
	8	33.950	2090.840	705.360	6.950	4.040	209.080	141.070	267.260	164.650	0.570
	10	41.260	2444.400	817.740	6.820	3.940	244.440	163.550	318.080	195.250	0.560
	12	47.150	2606.700	875.580	6.590	3.820	260.670	175.120	350.010	215.320	0.540
200 x 120	4	19.270	1353.390	617.660	7.430	5.020	135.340	102.940	163.720	115.450	0.630
	5	23.830	1649.420	750.140	7.370	4.970	164.940	125.020	200.870	141.450	0.620
	6	28.290	1929.200	874.350	7.320	4.930	192.920	145.720	236.550	166.330	0.620
	8	36.460	2385.920	1078.970	7.170	4.820	238.590	179.830	297.980	209.490	0.610
	10	44.400	2805.730	1262.140	7.040	4.720	280.570	210.360	356.080	249.820	0.600
	12	50.910	3031.410	1367.870	6.840	4.590	303.140	227.980	395.130	277.770	0.580
200 x 150	4	21.150	1583.920	1021.030	7.670	6.160	158.390	136.140	187.240	154.070	0.690
	5	26.180	1934.670	1245.040	7.620	6.110	193.470	166.000	230.120	189.230	0.680
	6	31.110	2268.030	1457.130	7.560	6.060	226.800	194.280	271.470	223.080	0.680
	8	40.230	2828.550	1815.540	7.430	5.950	282.850	242.070	344.060	282.760	0.670
	10	49.110	3347.730	2143.360	7.310	5.850	334.770	285.780	413.080	339.170	0.660
	12	56.570	3668.460	2352.530	7.140	5.710	366.850	313.670	462.810	380.460	0.640

Tubo Estrutural

Método de fabrico: Laminado a frio segundo a norma **EN 10219**

Matéria-prima: Chapa laminada a quente nas qualidades **S275** e **S355**

Rectangular



Diâmetro h x b (mm)	Espessura t (mm)	Peso kg/m	Movimento de Inércia		Raio de giração		Módulo				Área pintura A _s (m²/m)
							Elástico		Plástico		
			I _{xx} cm ⁴	I _{yy} cm ⁴	i _{xx} cm	i _{yy} cm	W _{el xx} cm ³	W _{el yy} cm ³	W _{pl xx} cm ³	W _{pl yy} cm ³	
220 x 80	4	18.010	1332.620	272.920	7.620	3.450	121.150	68.230	154.510	75.630	0.590
	5	22.260	1619.860	328.610	7.560	3.400	147.260	82.150	189.230	92.240	0.580
	6	26.400	1889.420	379.670	7.500	3.360	171.770	94.920	222.420	107.950	0.580
	8	33.950	2309.950	459.880	7.310	3.260	210.000	114.970	278.180	134.530	0.570
	10	41.260	2693.120	527.810	7.160	3.170	244.830	131.950	330.650	158.680	0.560
250 x 50	5	22.260	1803.340	128.700	7.970	2.130	144.270	51.480	197.260	58.700	0.580
	6	26.400	2099.120	146.330	7.900	2.090	167.930	58.530	231.650	68.120	0.580
	8	33.950	2542.380	171.410	7.670	1.990	203.390	68.560	288.570	83.340	0.570
250 x 100	4	21.150	2091.660	502.990	8.810	4.320	167.330	100.600	210.410	110.900	0.690
	5	26.180	2553.760	609.850	8.750	4.280	204.300	121.970	258.510	135.840	0.680
	6	31.110	2992.340	709.630	8.690	4.230	239.390	141.930	304.850	159.700	0.680
	8	40.230	3714.080	875.060	8.510	4.130	297.130	175.010	385.370	201.450	0.670
	10	49.110	4384.170	1021.080	8.370	4.040	350.730	204.220	462.000	240.250	0.660
	12	56.570	4757.140	1109.340	8.130	3.920	380.570	221.870	515.160	268.120	0.640