

CIRCULAR HOLLOW SECTIONS

ASTM A - 500

Designation		Weight	Cross Sectional Area	Second Moment of Area	Radius of Gyraton	Elastic Modulus	Plastic Modulus	Torsional inertia contant	Torsional modulus contant	Superficial Area per metre length	Nominal Length per tonne	Ratio for Local Buckling
Size	Thickness											
OD	T	M	A	I	r	Z	S	J	C	As	L	B/T
mm	mm	Kg/m	cm ²	cm ⁴	cm	cm ³	cm ³	cm ⁴	cm ³	m ² /m	m	
21.3	2.0	0.952	1.21	0.57	0.69	0.54	0.75	1.14	1.07	0.07	1050.56	10.65
21.3	2.5	1.159	1.48	0.66	0.67	0.62	0.89	1.33	1.25	0.07	862.80	8.52
21.3	3.0	1.354	1.72	0.74	0.66	0.70	1.01	1.48	1.39	0.07	738.64	7.10
26.9	2.0	1.228	1.56	1.22	0.88	0.91	1.24	2.44	1.81	0.08	814.29	13.45
26.9	2.5	1.504	1.92	1.44	0.87	1.07	1.49	2.88	2.14	0.08	664.78	10.76
26.9	3.0	1.768	2.25	1.63	0.85	1.21	1.72	3.27	2.43	0.08	565.57	8.97
33.7	2.0	1.564	1.99	2.51	1.12	1.49	2.01	5.02	2.98	0.11	639.26	16.85
33.7	2.5	1.924	2.45	3.00	1.11	1.78	2.44	6.00	3.56	0.11	519.75	13.48
33.7	3.0	2.271	2.89	3.44	1.09	2.04	2.84	6.88	4.08	0.11	440.30	11.23
42.4	2.0	1.993	2.54	5.19	1.43	2.45	3.27	10.38	4.90	0.13	501.88	21.20
42.4	2.5	2.460	3.13	6.26	1.41	2.95	3.99	12.52	5.91	0.13	406.53	16.96
42.4	3.0	2.915	3.71	7.25	1.40	3.42	4.67	14.49	6.84	0.13	343.08	14.13
42.4	4.0	3.788	4.83	8.99	1.36	4.24	5.92	17.98	8.48	0.13	264.01	10.60
48.3	2.0	2.284	2.91	7.81	1.64	3.23	4.29	15.62	6.47	0.15	437.92	24.15
48.3	2.5	2.824	3.60	9.46	1.62	3.92	5.25	18.92	7.83	0.15	354.16	19.32
48.3	3.0	3.351	4.27	11.00	1.61	4.55	6.17	22.00	9.11	0.15	298.39	16.10
48.3	4.0	4.370	5.57	13.77	1.57	5.70	7.87	27.54	11.40	0.15	228.85	12.08
48.3	5.0	5.339	6.80	16.15	1.54	6.69	9.42	32.31	13.38	0.15	187.30	9.66
60.3	2.0	2.876	3.66	15.58	2.06	5.17	6.80	31.16	10.34	0.19	347.71	30.15
60.3	2.5	3.564	4.54	18.99	2.05	6.30	8.36	37.99	12.60	0.19	280.58	24.12
60.3	3.0	4.239	5.40	22.22	2.03	7.37	9.86	44.45	14.74	0.19	235.90	20.10
60.3	4.0	5.554	7.07	28.17	2.00	9.34	12.70	56.35	18.69	0.19	180.05	15.08
60.3	5.0	6.819	8.69	33.48	1.96	11.10	15.33	66.95	22.21	0.19	146.65	12.06
76.1	2.0	3.655	4.66	31.98	2.62	8.40	10.98	63.96	16.81	0.24	273.63	38.05
76.1	2.5	4.538	5.78	39.19	2.60	10.30	13.55	78.37	20.60	0.24	220.36	30.44
76.1	3.0	5.408	6.89	46.10	2.59	12.11	16.04	92.19	24.23	0.24	184.91	25.37
76.1	4.0	7.112	9.06	59.06	2.55	15.52	20.81	118.11	31.04	0.24	140.61	19.03
76.1	5.0	8.767	11.17	70.92	2.52	18.64	25.32	141.84	37.28	0.24	114.07	15.22
76.1	6.0	10.373	13.21	81.76	2.49	21.49	29.56	163.52	42.97	0.24	96.40	12.68
76.1	6.3	10.845	13.81	84.82	2.48	22.29	30.78	169.64	44.58	0.24	92.21	12.08
88.9	2.0	4.286	5.46	51.57	3.07	11.60	15.11	103.14	23.20	0.28	233.32	44.45
88.9	2.5	5.327	6.79	63.37	3.06	14.26	18.67	126.75	28.51	0.28	187.74	35.56
88.9	3.0	6.355	8.10	74.76	3.04	16.82	22.15	149.53	33.64	0.28	157.36	29.63
88.9	4.0	8.375	10.67	96.34	3.00	21.67	28.85	192.68	43.35	0.28	119.41	22.23
88.9	5.0	10.346	13.18	116.37	2.97	26.18	35.24	232.75	52.36	0.28	96.66	17.78
88.9	6.0	12.267	15.63	134.94	2.94	30.36	41.31	269.88	60.72	0.28	81.52	14.82
88.9	6.3	12.833	16.35	140.24	2.93	31.55	43.07	280.47	63.10	0.28	77.93	14.11
101.6	2.0	4.913	6.26	77.63	3.52	15.28	19.84	155.26	30.56	0.32	203.54	50.80
101.6	2.5	6.110	7.78	95.61	3.50	18.82	24.56	191.22	37.64	0.32	163.68	40.64
101.6	3.0	7.295	9.29	113.04	3.49	22.25	29.17	226.07	44.50	0.32	137.08	33.87
101.6	4.0	9.628	12.26	146.28	3.45	28.80	38.12	292.57	57.59	0.32	103.86	25.40
101.6	5.0	11.912	15.17	177.47	3.42	34.93	46.70	354.94	69.87	0.32	83.95	20.32
101.6	6.0	14.146	18.02	206.68	3.39	40.68	54.91	413.35	81.37	0.32	70.69	16.93
101.6	6.3	14.807	18.86	215.07	3.38	42.34	57.30	430.13	84.67	0.32	67.54	16.13
114.3	2.5	6.893	8.78	137.26	3.95	24.02	31.25	274.52	48.03	0.36	145.07	45.72
114.3	3.0	8.234	10.49	162.55	3.94	28.44	37.17	325.10	56.88	0.36	121.45	38.10
114.3	4.0	10.881	13.86	211.07	3.90	36.93	48.69	422.13	73.86	0.36	91.90	28.58
114.3	5.0	13.478	17.17	256.92	3.87	44.96	59.77	513.84	89.91	0.36	74.19	22.86
114.3	6.0	16.025	20.41	300.21	3.83	52.53	70.45	600.42	105.06	0.36	62.40	19.05
114.3	6.3	16.780	21.38	312.71	3.82	54.72	73.57	625.43	109.44	0.36	59.59	18.14
114.3	8.0	20.972	26.72	379.49	3.77	66.40	90.57	758.98	132.81	0.36	47.68	14.29
139.7	3.0	10.114	12.88	301.09	4.83	43.11	56.07	602.18	86.21	0.44	98.87	46.57
139.7	4.0	13.386	17.05	392.86	4.80	56.24	73.68	785.72	112.49	0.44	74.70	34.93
139.7	5.0	16.610	21.16	480.54	4.77	68.80	90.76	961.08	137.59	0.44	60.20	27.94
139.7	6.0	19.783	25.20	564.26	4.73	80.78	107.33	1128.52	161.56	0.44	50.55	23.28
139.7	6.3	20.726	26.40	588.62	4.72	84.27	112.20	1177.24	168.54	0.44	48.25	22.17
139.7	8.0	25.983	33.10	720.29	4.66	103.12	138.93	1440.58	206.24	0.44	38.49	17.46

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mm	mm	Kg/m	cm ²	cm ⁴	cm	cm ³	cm ³	cm ⁴	cm ³	m ² /m	m	
168.3	3.0	12.230	15.58	532.28	5.85	63.25	81.98	1064.57	126.51	0.53	81.77	56.10
168.3	4.0	16.208	20.65	697.09	5.81	82.84	108.00	1394.18	165.68	0.53	61.70	42.08
168.3	5.0	20.136	25.65	855.85	5.78	101.70	133.38	1711.69	203.41	0.53	49.66	33.66
168.3	6.0	24.015	30.59	1008.69	5.74	119.87	158.12	2017.39	239.74	0.53	41.64	28.05
168.3	6.3	25.170	32.06	1053.42	5.73	125.18	165.42	2106.84	250.37	0.53	39.73	26.71
168.3	8.0	31.626	40.29	1297.27	5.67	154.16	205.74	2594.54	308.32	0.53	31.62	21.04
168.3	10.0	39.039	49.73	1563.98	5.61	185.86	250.92	3127.97	371.71	0.53	25.62	16.83
177.8	4.0	17.145	21.84	825.09	6.15	92.81	120.85	1650.17	185.62	0.56	58.33	44.45
177.8	5.0	21.308	27.14	1013.97	6.11	114.06	149.34	2027.94	228.11	0.56	46.93	35.56
177.8	6.0	25.421	32.38	1196.22	6.08	134.56	177.16	2392.43	269.12	0.56	39.34	29.63
177.8	6.3	26.646	33.94	1249.62	6.07	140.56	185.38	2499.24	281.13	0.56	37.53	28.22
177.8	8.0	33.500	42.68	1541.44	6.01	173.39	230.83	3082.87	346.78	0.56	29.85	22.23
177.8	10.0	41.382	52.72	1861.98	5.94	209.45	281.90	3723.96	418.89	0.56	24.17	17.78
177.8	12.0	49.067	62.51	2159.06	5.88	242.86	330.45	4318.11	485.73	0.56	20.38	14.82
177.8	12.5	50.957	64.91	2229.79	5.86	250.82	342.20	4459.59	501.64	0.56	19.62	14.22
193.7	4.0	18.713	23.84	1072.79	6.71	110.77	143.97	2145.58	221.54	0.61	53.44	48.43
193.7	5.0	23.268	29.64	1320.23	6.67	136.32	178.08	2640.46	272.63	0.61	42.98	38.74
193.7	6.0	27.774	35.38	1559.72	6.64	161.05	211.46	3119.45	322.09	0.61	36.00	32.28
193.7	6.3	29.116	37.09	1630.05	6.63	168.31	221.33	3260.09	336.61	0.61	34.35	30.75
193.7	8.0	36.637	46.67	2015.54	6.57	208.11	276.05	4031.07	416.22	0.61	27.29	24.21
193.7	10.0	45.303	57.71	2441.59	6.50	252.10	337.79	4883.18	504.20	0.61	22.07	19.37
193.7	12.0	53.772	68.50	2839.20	6.44	293.15	396.75	5678.40	586.31	0.61	18.60	16.14
193.7	12.5	55.858	71.16	2934.31	6.42	302.97	411.07	5868.62	605.95	0.61	17.90	15.50
219.1	4.0	21.219	27.03	1563.84	7.61	142.75	185.09	3127.67	285.50	0.69	47.13	54.78
219.1	5.0	26.400	33.63	1928.04	7.57	176.00	229.24	3856.09	351.99	0.69	37.88	43.82
219.1	6.0	21.530	40.17	2281.95	7.54	208.30	272.54	4563.89	416.60	0.69	46.45	36.52
219.1	6.3	33.062	42.12	2386.14	7.53	217.81	285.37	4772.28	435.63	0.69	30.25	34.78
219.1	8.0	41.648	53.06	2959.63	7.47	270.16	356.68	5919.27	540.33	0.69	24.01	27.39
219.1	10.0	51.567	65.69	3598.44	7.40	328.47	437.56	7196.88	656.95	0.69	19.39	21.91
219.1	12.0	61.289	78.07	4199.88	7.33	383.38	515.26	8399.76	766.75	0.69	16.32	18.26
219.1	12.5	63.688	81.13	4344.58	7.32	396.58	534.20	8689.16	793.17	0.69	15.70	17.53
244.5	5.0	29.532	37.62	2698.58	8.47	220.74	286.84	5397.16	441.49	0.77	33.86	48.90
244.5	6.0	35.291	44.96	3198.53	8.43	261.64	341.37	6397.07	523.28	0.77	28.34	40.75
244.5	6.3	37.009	47.14	3346.03	8.42	273.70	357.54	6692.05	547.41	0.77	27.02	38.81
244.5	8.0	46.660	59.44	4160.45	8.37	340.32	447.63	8320.89	680.65	0.77	21.43	30.56
244.5	10.0	57.831	73.67	5073.15	8.30	414.98	550.24	10146.29	829.96	0.77	17.29	24.45
244.5	12.0	68.806	87.65	5938.34	8.23	485.75	649.25	11876.69	971.51	0.77	14.53	20.38
244.5	12.5	71.518	91.11	6147.42	8.21	502.86	673.45	12294.84	1005.71	0.77	13.98	19.56
273	5.0	33.046	42.10	3780.81	9.48	276.98	359.16	7561.63	553.97	0.86	30.26	54.60
273	6.0	39.508	50.33	4487.08	9.44	328.72	427.81	8974.17	657.45	0.86	25.31	45.50
273	6.3	41.437	52.79	4695.82	9.43	344.02	448.20	9391.65	688.03	0.86	24.13	43.33
273	8.0	52.282	66.60	5851.71	9.37	428.70	561.97	11703.43	857.39	0.86	19.13	34.13
273	10.0	64.860	82.62	7154.09	9.31	524.11	692.02	14308.19	1048.22	0.86	15.42	27.30
273	12.0	77.240	98.39	8396.14	9.24	615.10	818.03	16792.28	1230.20	0.86	12.95	22.75
273	12.5	80.304	102.30	8697.45	9.22	637.18	848.90	17394.90	1274.35	0.86	12.45	21.84
323.9	5.0	39.323	50.09	6369.42	11.28	393.30	508.53	12738.85	786.59	1.02	25.43	64.78
323.9	6.0	47.039	59.92	7572.47	11.24	467.58	606.43	15144.93	935.16	1.02	21.26	53.98
323.9	6.3	49.345	62.86	7928.90	11.23	489.59	635.56	15857.79	979.18	1.02	20.27	51.41
323.9	8.0	62.325	79.39	9910.08	11.17	611.92	798.51	19820.16	1223.84	1.02	16.04	40.49
323.9	10.0	77.412	98.61	12158.34	11.10	750.75	985.67	24316.68	1501.49	1.02	12.92	32.39
323.9	12.0	92.303	117.58	14319.56	11.04	884.20	1167.96	28639.12	1768.39	1.02	10.83	26.99
323.9	12.5	95.995	122.29	14846.53	11.02	916.74	1212.78	29693.06	1833.47	1.02	10.42	25.91
355.6	5.0	43.232	55.07	8463.58	12.40	476.02	614.64	16927.15	952.03	1.12	23.13	71.12
355.6	6.0	51.730	65.90	10070.55	12.36	566.40	733.39	20141.11	1132.80	1.12	19.33	59.27
355.6	6.3	54.270	69.13	10547.21	12.35	593.21	768.75	21094.41	1186.41	1.12	18.43	56.44
355.6	8.0	68.579	87.36	13201.37	12.29	742.48	966.78	26402.75	1484.97	1.12	14.58	44.45
355.6	10.0	85.230	108.57	16223.50	12.22	912.46	1194.73	32447.00	1824.92	1.12	11.73	35.56
355.6	12.0	101.684	129.53	19139.47	12.16	1076.46	1417.31	38278.95	2152.92	1.12	9.83	29.63
355.6	12.5	105.767	134.74	19852.18	12.14	1116.55	1472.12	39704.35	2233.09	1.12	9.45	28.45
355.6	16.0	134.001	170.70	24663.00	12.02	1387.12	1846.62	49326.00	2774.24	1.12	7.46	22.23

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mm	mm	Kg/m	cm ²	cm ⁴	cm	cm ³	cm ³	cm ⁴	cm ³	m ² /m	m	
406.4	6.0	59.247	75.47	15128.33	14.16	744.50	961.99	30256.65	1489.01	1.28	16.88	67.73
406.4	6.3	62.163	79.19	15849.43	14.15	779.99	1008.59	31698.87	1559.98	1.28	16.09	64.51
406.4	8.0	78.601	100.13	19873.89	14.09	978.05	1269.95	39747.79	1956.09	1.28	12.72	50.80
406.4	10.0	97.758	124.53	24475.81	14.02	1204.52	1571.66	48951.63	2409.04	1.28	10.23	40.64
406.4	12.0	116.718	148.69	28937.01	13.95	1424.07	1867.19	57874.03	2848.13	1.28	8.57	33.87
406.4	12.5	121.427	154.68	30030.67	13.93	1477.89	1940.12	60061.33	2955.77	1.28	8.24	32.51
406.4	16.0	154.046	196.24	37448.82	13.81	1842.95	2439.96	74897.64	3685.91	1.28	6.49	25.40
457	6.0	66.734	85.01	21618.10	15.95	946.09	1220.48	43236.21	1892.18	1.44	14.98	76.17
457	6.3	70.024	89.20	22654.16	15.94	991.43	1279.81	45308.32	1982.86	1.44	14.28	72.54
457	8.0	88.584	112.85	28446.36	15.88	1244.92	1612.98	56892.73	2489.83	1.44	11.29	57.13
457	10.0	110.237	140.43	35091.32	15.81	1535.73	1998.42	70182.65	3071.45	1.44	9.07	45.70
457	12.0	131.692	167.76	41556.30	15.74	1818.66	2376.88	83112.60	3637.31	1.44	7.59	38.08
457	12.5	137.025	174.55	43144.80	15.72	1888.18	2470.40	86289.61	3776.35	1.44	7.30	36.56
457	16.0	174.012	221.67	53959.38	15.60	2361.46	3113.06	107918.76	4722.92	1.44	5.75	28.56