TATA STEEL

TATA

Celsius® 355 NH technical guide

Structural hollow sections

Contents

CELSIUS® 355 NH

Celsius® 355 hot finished hollow section is manufactured exclusively from normalised, fine grain steel for outstanding performance. Where failure is not an option, you can trust **Celsius® 355** to deliver.

Celsius® 355 key features:

- Normalised fine grain steel, so free of internal stresses and with a minimum strength of 355 MPa – allowing the highest fabrication factors and enabling material cost savings and lighter structures
- Available in a wide range of circular, square, rectangular and elliptical hollow sections
- Tight corner radii, exceeding the standard - enhancing the product's aesthetic appeal whilst avoiding the risk of brittle fracture which occurs in some cold formed products
- Dimensional consistency, high levels of formability and, because the steel is fully-killed, excellent weldability
- Certified as suitable for all structural applications, fully compliant with design codes and overcomes design risks associated with other forms of hollow sectons
- Certified as suitable for mechanical applications, especially those involving cyclical loading
- Suitable for low temperature applications (40J @ -20°C)
- Batch-tested to give the properties of the specific delivered material; full test certification supplied
- Clearly marked as **Celsius® 355**, with the reassurance of batch traceability
- Full technical support available
- Excellent supply availability through approved stockholders
- All **Celsius® 355** material is CE marked and is fully compliant with the Construction Products Regulation
- Suitable for galvanising

TECHNICAL DATA

High strength hot finished hollow sections suitable for all construction and mechanical applications. **Celsius® 355** is suitable for all internal and external applications to BS5950-1:2000, EN1993 and BS5400.

Celsius® 355 hollow sections are supplied with a minimum yield strength of 355 N/mm^2 and comply fully with the European Standard for hot finished structural hollow sections, EN10210: S355NH.

Mechanical properties

Yield strength R_{eH} min N/mm^2	**Tensile strength R_m N/mm^2**	**Elongation % min $L_0 = 5{,}65\sqrt{S_0}$ specimen**	**Impact strength 10mm x 10mm**		**Carbon equivalent (CEV) max**
T ≤ 16mm	3mm < T ≤ 100mm	T	°C	J	
355	470-630	22	-20	40	0.43

Chemical composition % by mass

C max	**Si max**	**Mn**	**P max**	**S max**	**Nb max**	**V ma**	**Al total min**	**Ti max**	**Cr max**	**Ni max**	**Mo max**	**Cu max**	**N max**
0.20	0.50	0.90 1.65	0.035	0.030	0.050	0.12	0.020	0.03	0.30	0.50	0.10	0.35	0.020

Celsius® 355 is produced from fully-killed steel – critical to formability and weldability.

Inspection and testing

Celsius® 355 hollow sections EN10210: S355NH are subject to specific inspection and testing and are supplied with an inspection certificate type 3.1 to EN10204.

Designation

Celsius® 355 hollow sections are designated by their product name, outside dimensions and thickness in millimetres.

CE marking

All **Celsius® 355** material is CE marked and is fully compliant with the Construction Products Regulation.

Examples

Circular hollow section:
Celsius® 355 114.3 x 6.3
or **114.3 x 6.3 CHS EN10210: Part 1: S355NH**

Rectangular hollow section:
Celsius® 355 100 x 50 x 5.0
or **100 x 50 x 5.0 RHS EN10210: Part 1: S355NH**

Elliptical hollow section:
Celsius® 355 elliptical 400 x 200 x 8.0
or **400 x 200 x 8.0 EHS EN10210: Part 1: S355NH**
or simply
Celsius® 355 EHS 400 x 200 x 8.0

Dimensional tolerances EN10210: Part 2

	Circular/Ellipticals	Square/Rectangular
Outside dimension (D B and H)	Circular ±1% with a min of ±0.5mm and maximum of ±10mm Ellipticals ±1% with a min of ±0.5mm (The permitted tolerance is twice the value for H < 250)	±1% with a min of ±0.5mm
Thickness (T)	-10% Note: Positive deviation limited by mass tolerance	-10% Note: Positive deviation limited by mass tolerance
Squareness of side	–	90 degrees ±1 degree
External corner profile	–	2T max at each corner* (EN10210 has 3T max)
Concavity/convexity (x)	–	±1% of the side, measured independently of the tolerance on the outside dimension
Twist (V)	Ellipticals: 2mm plus 0.5mm/m max (The permitted tolerance is twice the value for H < 250)	2mm plus 0.5mm/m max Section is placed on a flat surface with one end held flat. At the other end the height difference of the two lower corners is taken
Mass (M)	±6% on individual lengths	±6% on individual lengths
Straightness	Maximum 0.2% of the total length & 3mm over every 1m length Ellipticals: The permitted tolerance is twice the value for H < 250	Maximum 0.2% of total length & 3mm over every 1m length
Length	+150mm/-0mm	+150mm/-0mm
Out-of-roundness (O)	Circular 2% for hollow sections having a diameter to thickness ratio not exceeding 100	–

* Unless shown otherwise

Celsius® 355 Square Hollow Sections – length and tolerances

Size	Thickness	Standard mill lengths	Special mill lengths	Tolerance
mm	mm	m	m**	mm
40 x 40 uti 100 x 100	All	6.0, 6.4, 7.5, 10.0 & 12.0	5.4 - 14.6	+ 150-0
120 x 120 uti 150 x 150 x 12.5	All	6.0, 6.4, 7.5, 10.0 & 12.0	6.0 - 14.5	+ 150-0
150 x 150 x 16.0	All	Check availability	6.0 - 13.5	+ 150-0
160 x 160 uti 400 x 400 x 16.0	All	10.0 & 12.0	6.0 - 15.3	+ 150-0
400 x 400 x 20.0	All	12.0 - 12.7 subject to availability	–	–

(uti – up to and including)

Celsius® 355 Rectangular Hollow Sections – length and tolerances

Size	Thickness	Standard mill lengths	Special mill lengths	Tolerance
mm	mm	m	m**	mm
50 x 30 uti 120 x 80	All	6.0, 6.4, 7.5, 10.0 & 12.0	5.4 - 14.6	+ 150-0
150 x 100 uti 200 x 100 x 12.5	All	6.0, 6.4, 7.5, 10.0 & 12.0	6.0 - 14.5	+ 150-0
200 x 100 x 16.0	All	Check availability	6.0 - 13.5	+ 150-0
200 x 120 uti 500 x 300 x 16.0	All	10.0 & 12.0	6.0 - 15.3	+ 150-0
500 x 300 x 20.0	All	12.0 - 12.7 subject to availability	–	–

(uti - up to and including)

Celsius® 355 Circular Hollow Sections – length and tolerances

Outside diameter	Thickness	Standard mill lengths	Special mill lengths	Tolerance
mm	mm	m	m**	mm
21.3 - 33.7	All	6.0, 6.4 & 7.5	5.4 - 7.0	+ 150-0
*42.4	All	6.0, 6.4, 7.5, 10.0 & 12.0	5.4 - 12.0	+ 150-0
*48.3 - 114.3	All	6.0, 6.4, 7.5, 10.0 & 12.0	5.4 - 14.6	+ 150-0
139.7	All	6.0, 7.5, 10.0 & 12.0	6.0 - 14.5	+ 150-0
168.3	All	6.0, 7.5, 10.0 & 12.0	6.0 - 14.6	+ 150-0
193.7	All	6.0, 7.5, 10.0 & 12.0	6.0 - 14.6	+ 150-0
219.1 - 508.0	All	10.0 & 12.0	6.0 - 14.6	+ 150-0

Celsius® 355 Elliptical Hollow Sections – length and tolerances

Size	Thickness	Standard mill lengths	Special mill lengths	Tolerance
mm	mm	m	m**	mm
150 x 75	All	7.5, 10.0 & 12.0	6.0 - 14.5	+ 150-0
200 x 100	All	7.5, 10.0 & 12.0	6.0 - 14.5	+ 150-0
250 x 125	All	7.5, 10.0 & 12.0	6.0 - 14.5	+ 150-0
300 x 150	All	10.0 & 12.0	9.0 - 14.5	+ 150-0
400 x 200	All	10.0 & 12.0	9.0 - 14.5	+ 150-0
500 x 250	All	10.0 & 12.0	9.0 - 14.5	+ 150-0

* For thinner gauge material, check standard lengths

** Lengths available in 100mm increments

SIZE RANGE CHARTS

Celsius® 355 Circular Hollow Sections

Outside Diameter (mm)	Thickness (mm)												
	2.6	2.9	3.2	3.6	4.0	4.5	5.0	5.6	6.3	8.0	10.0	12.5	14.2	16.0
21.3	■	■	■											
26.9	■	■	■	■										
33.7	■	■	■	■	■	■	■							
42.4	■	■	■	■	■	■	■							
48.3	■	■	■	■	■	■	■	■	■					
60.3	■	■	■	■	■	■	■	■	■	■				
76.1		■	■	■	■	■	■	■	■	■				
88.9		■	■	■	■	■	■	■	■	■	■			
101.6			■	■	■	■	■	■	■	■	■			
114.3			■	■	■	■	■	■	■	■	■			
139.7			■	■	■	■	■	■	■	■	■	■		
168.3							■	■	■	■	■	■		
193.7							■	■	■	■	■	■		■
219.1						■	■	■	■	■	■	■	■	■
244.5							■	■	■	■	■	■	■	■
273.0							■	■	■	■	■	■	■	■
323.9							■	■	■	■	■	■	■	■
355.6									■	■	■	■	■	■
406.4									■	■	■	■	■	■
457.0									■	■	■	■	■	■
508.0									■	■	■	■	■	■

- The above table shows our normal capability, reference should be made to the sectional properties table to identify sizes that are readily available and should be given preference.
- Minimum order quantities may apply to some sizes.
- Other sizes can be manufactured – please contact your account manager.

Celsius® 355 Elliptical Hollow Sections

Size (mm)	Thickness (mm)							
	4.0	5.0	6.3	8.0	10.0	12.5	14.2	16.0
150 x 75								
200 x 100								
250 x 125								
300 x 150								
400 x 200								
500 x 250								

Celsius® 355 Square Hollow Sections

Size (mm)	Thickness (mm)													
	3.0	3.2	3.6	4.0	5.0	6.3	7.1	8.0	8.8	10.0	12.5	14.2	16.0	20.0
40 x 40														
50 x 50														
60 x 60														
70 x 70														
80 x 80														
90 x 90														
100 x 100														
120 x 120														
140 x 140														
150 x 150														
160 x 160														
180 x 180														
200 x 200														
250 x 250														
260 x 260														
300 x 300														
350 x 350														
400 x 400														

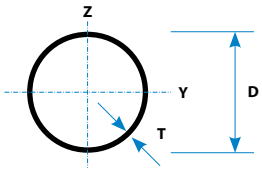
- For sizes shown please contact your account manager.

Celsius® 355 Rectangular Hollow Sections

Size (mm)	Thickness (mm)													
	3.0	3.2	3.6	4.0	5.0	6.3	7.1	8.0	8.8	10.0	12.5	14.2	16.0	20.0
50 x 30														
60 x 40														
80 x 40														
90 x 50														
100 x 50														
100 x 60														
120 x 60														
120 x 80														
150 x 100														
160 x 80														
180 x 60														
180 x 100														
200 x 100														
200 x 120														
200 x 150														
220 x 120														
250 x 100														
250 x 150														
250 x 200														
260 x 140														
260 x 180														
300 x 100														
300 x 150														
300 x 200														
300 x 250														
340 x 100														
350 x 150														
350 x 250														
400 x 120														
400 x 150														
400 x 200														
400 x 300														
450 x 250														
500 x 200														
500 x 300														

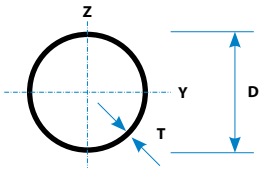
- The above table shows our normal capability, reference should be made to the sectional properties table to identify sizes that are readily available and should be given preference.
- Minimum order quantities may apply to some sizes.
- Other sizes can be manufactured – please contact your account manager.
- For sizes shown please contact your account manager.

CELSIUS® 355 CIRCULAR



Celsius® 355 EN10210: S355NH Hot finished circular hollow section

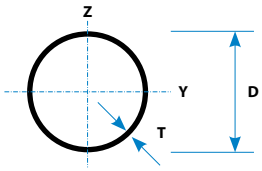
Outside Diameter D mm	Thickness T mm	Mass M kg/m	Sectional area A cm^2	Moment of inertia I cm^4	Radius of gyration i cm	Elastic modulus W_{el} cm^3	Plastic modulus W_{pl} cm^3	Torsional constants I_t cm^4	Torsional constants C_t cm^3	Superficial area/m A_s m^2/m	Approx. length /tonne m/t
21.3	2.6	1.20	1.53	0.681	0.668	0.639	0.915	1.36	1.28	0.067	834
	2.9	1.32	1.68	0.727	0.659	0.683	0.990	1.45	1.37	0.067	760
	3.2	1.43	1.82	0.768	0.650	0.722	1.06	1.54	1.44	0.067	700
26.9	2.6	1.56	1.98	1.48	0.864	1.10	1.54	2.96	2.20	0.085	642
	2.9	1.72	2.19	1.60	0.855	1.19	1.68	3.19	2.38	0.085	583
	3.2	1.87	2.38	1.70	0.846	1.27	1.81	3.41	2.53	0.085	535
	3.6	2.07	2.64	1.83	0.834	1.36	1.97	3.66	2.72	0.085	483
33.7	2.6	1.99	2.54	3.09	1.10	1.84	2.52	6.19	3.67	0.106	501
	2.9	2.20	2.81	3.36	1.09	1.99	2.76	6.71	3.98	0.106	454
	3.2	2.41	3.07	3.60	1.08	2.14	2.99	7.21	4.28	0.106	415
	3.6	2.67	3.40	3.91	1.07	2.32	3.28	7.82	4.64	0.106	374
	4.0	2.93	3.73	4.19	1.06	2.49	3.55	8.38	4.97	0.106	341
	4.5	3.24	4.13	4.50	1.04	2.67	3.87	9.01	5.35	0.106	309
	5.0	3.54	4.51	4.78	1.03	2.84	4.16	9.57	5.68	0.106	283
42.4	2.6	2.55	3.25	6.46	1.41	3.05	4.12	12.9	6.10	0.133	392
	2.9	2.82	3.60	7.06	1.40	3.33	4.53	14.1	6.66	0.133	354
	3.2	3.09	3.94	7.62	1.39	3.59	4.93	15.2	7.19	0.133	323
	3.6	3.44	4.39	8.33	1.38	3.93	5.44	16.7	7.86	0.133	290
	4.0	3.79	4.83	8.99	1.36	4.24	5.92	18.0	8.48	0.133	264
	4.5	4.21	5.36	9.76	1.35	4.60	6.49	19.5	9.20	0.133	238
	5.0	4.61	5.87	10.5	1.33	4.93	7.04	20.9	9.86	0.133	217



Celsius® 355 EN10210: S355NH Hot finished circular hollow section (continued)

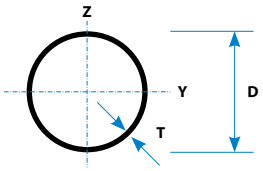
Outside Diameter D mm	Thickness T mm	Mass M kg/m	Sectional area A cm^2	Moment of inertia I cm^4	Radius of gyration i cm	Elastic modulus W_{el} cm^3	Plastic modulus W_{pl} cm^3	Torsional constants I_t cm^4	Torsional constants C_t cm^3	Superficial area/m A_s m^2/m	Approx. length /tonne m/t
48.3	2.6	2.93	3.73	9.78	1.62	4.05	5.44	19.6	8.10	0.152	341
	2.9	3.25	4.14	10.7	1.61	4.43	5.99	21.4	8.86	0.152	308
	3.2	3.56	4.53	11.6	1.60	4.80	6.52	23.2	9.59	0.152	281
	3.6	3.97	5.06	12.7	1.59	5.26	7.21	25.4	10.5	0.152	252
	4.0	4.37	5.57	13.8	1.57	5.70	7.87	27.5	11.4	0.152	229
	4.5	4.86	6.19	15.0	1.56	6.21	8.66	30.0	12.4	0.152	206
	5.0	5.34	6.80	16.2	1.54	6.69	9.42	32.3	13.4	0.152	187
	5.6	5.90	7.51	17.4	1.52	7.21	10.3	34.8	14.4	0.152	170
	6.3	6.53	8.31	18.7	1.50	7.76	11.2	37.5	15.5	0.152	153
60.3	2.6	3.70	4.71	19.7	2.04	6.52	8.66	39.3	13.0	0.189	270
	2.9	4.11	5.23	21.6	2.03	7.16	9.56	43.2	14.3	0.189	244
	3.2	4.51	5.74	23.5	2.02	7.78	10.4	46.9	15.6	0.189	222
	3.6	5.03	6.41	25.9	2.01	8.58	11.6	51.7	17.2	0.189	199
	4.0	5.55	7.07	28.2	2.00	9.34	12.7	56.3	18.7	0.189	180
	4.5	6.19	7.89	30.9	1.98	10.2	14.0	61.8	20.5	0.189	161
	5.0	6.82	8.69	33.5	1.96	11.1	15.3	67.0	22.2	0.189	147
	5.6	7.55	9.62	36.4	1.94	12.1	16.8	72.7	24.1	0.189	132
	6.3	8.39	10.7	39.5	1.92	13.1	18.5	79.0	26.2	0.189	119
	8.0	10.3	13.1	46.0	1.87	15.3	22.1	92.0	30.5	0.189	96.9
76.1	2.9	5.24	6.67	44.7	2.59	11.8	15.5	89.5	23.5	0.239	191
	3.2	5.75	7.33	48.8	2.58	12.8	17.0	97.6	25.6	0.239	174
	3.6	6.44	8.20	54.0	2.57	14.2	18.9	108	28.4	0.239	155
	4.0	7.11	9.06	59.1	2.55	15.5	20.8	118	31.0	0.239	141
	4.5	7.95	10.1	65.1	2.54	17.1	23.1	130	34.2	0.239	126
	5.0	8.77	11.2	70.9	2.52	18.6	25.3	142	37.3	0.239	114
	5.6	9.74	12.4	77.5	2.50	20.4	27.9	155	40.8	0.239	103
	6.3	10.8	13.8	84.8	2.48	22.3	30.8	170	44.6	0.239	92.2
	8.0	13.4	17.1	101	2.42	26.4	37.3	201	52.9	0.239	74.4
88.9	2.9	6.15	7.84	72.5	3.04	16.3	21.5	145	32.6	0.279	163
	3.2	6.76	8.62	79.2	3.03	17.8	23.5	158	35.6	0.279	148
	3.6	7.57	9.65	87.9	3.02	19.8	26.2	176	39.5	0.279	132
	4.0	8.38	10.7	96.3	3.00	21.7	28.9	193	43.3	0.279	119
	4.5	9.37	11.9	107	2.99	24.0	32.1	213	47.9	0.279	107
	5.0	10.3	13.2	116	2.97	26.2	35.2	233	52.4	0.279	96.7
	5.6	11.5	14.7	128	2.95	28.7	38.9	255	57.5	0.279	86.9
	6.3	12.8	16.3	140	2.93	31.5	43.1	280	63.1	0.279	77.9
	8.0	16.0	20.3	168	2.87	37.8	52.5	336	75.6	0.279	62.7
	10.0	19.5	24.8	196	2.81	44.1	62.6	392	88.2	0.279	51.4

The dimensions shown in blue are standard sizes and should be given preference
All other sizes are non-standard and therefore minimum order quantities may apply



Celsius® 355 EN10210: S355NH Hot finished circular hollow section (continued)

Outside Diameter D	Thickness T	Mass M	Sectional area A	Moment of inertia I	Radius of gyration i	Elastic modulus W_{el}	Plastic modulus W_{pl}	Torsional constants I_t	Torsional constants C_t	Superficial area/m A_s	Approx. length /tonne
mm	mm	kg/m	cm^2	cm^4	cm	cm^3	cm^3	cm^4	cm^3	m^2/m	m/t
101.6	3.2	7.77	9.89	120	3.48	23.6	31.0	240	47.2	0.319	129
	3.6	8.70	11.1	133	3.47	26.2	34.6	266	52.5	0.319	115
	4.0	9.63	12.3	146	3.45	28.8	38.1	293	57.6	0.319	104
	4.5	10.8	13.7	162	3.44	31.9	42.5	324	63.8	0.319	92.8
	5.0	11.9	15.2	177	3.42	34.9	46.7	355	69.9	0.319	84.0
	5.6	13.3	16.9	195	3.40	38.4	51.7	390	76.9	0.319	75.4
	6.3	14.8	18.9	215	3.38	42.3	57.3	430	84.7	0.319	67.5
	8.0	18.5	23.5	260	3.32	51.1	70.3	519	102	0.319	54.2
	10.0	22.6	28.8	305	3.26	60.1	84.2	611	120	0.319	44.3
114.3	3.2	8.77	11.2	172	3.93	30.2	39.5	345	60.4	0.359	114
	3.6	9.83	12.5	192	3.92	33.6	44.1	384	67.2	0.359	102
	4.0	10.9	13.9	211	3.90	36.9	48.7	422	73.9	0.359	91.9
	4.5	12.2	15.5	234	3.89	41.0	54.3	469	82.0	0.359	82.1
	5.0	13.5	17.2	257	3.87	45.0	59.8	514	89.9	0.359	74.2
	5.6	15.0	19.1	283	3.85	49.6	66.2	566	99.1	0.359	66.6
	6.3	16.8	21.4	313	3.82	54.7	73.6	625	109	0.359	59.6
	8.0	21.0	26.7	379	3.77	66.4	90.6	759	133	0.359	47.7
	10.0	25.7	32.8	450	3.70	78.7	109	899	157	0.359	38.9
139.7	3.2	10.8	13.7	320	4.83	45.8	59.6	640	91.6	0.439	92.8
	3.6	12.1	15.4	357	4.81	51.1	66.7	713	102	0.439	82.8
	4.0	13.4	17.1	393	4.80	56.2	73.7	786	112	0.439	74.7
	4.5	15.0	19.1	437	4.78	62.6	82.3	874	125	0.439	66.6
	5.0	16.6	21.2	481	4.77	68.8	90.8	961	138	0.439	60.2
	5.6	18.5	23.6	531	4.75	76.1	101	1062	152	0.439	54.0
	6.3	20.7	26.4	589	4.72	84.3	112	1177	169	0.439	48.2
	8.0	26.0	33.1	720	4.66	103	139	1441	206	0.439	38.5
	10.0	32.0	40.7	862	4.60	123	169	1724	247	0.439	31.3
	12.5	39.2	50.0	1020	4.52	146	203	2040	292	0.439	25.5
168.3	5.0	20.1	25.7	856	5.78	102	133	1712	203	0.529	49.7
	5.6	22.5	28.6	948	5.76	113	148	1897	225	0.529	44.5
	6.3	25.2	32.1	1053	5.73	125	165	2107	250	0.529	39.7
	8.0	31.6	40.3	1297	5.67	154	206	2595	308	0.529	31.6
	10.0	39.0	49.7	1564	5.61	186	251	3128	372	0.529	25.6
	12.5	48.0	61.2	1868	5.53	222	304	3737	444	0.529	20.8
193.7	5.0	23.3	29.6	1320	6.67	136	178	2640	273	0.609	43.0
	5.6	26.0	33.1	1465	6.65	151	198	2930	303	0.609	38.5
	6.3	29.1	37.1	1630	6.63	168	221	3260	337	0.609	34.3
	8.0	36.6	46.7	2016	6.57	208	276	4031	416	0.609	27.3
	10.0	45.3	57.7	2442	6.50	252	338	4883	504	0.609	22.1
	12.5	55.9	71.2	2934	6.42	303	411	5869	606	0.609	17.9
	16.0	70.1	89.3	3554	6.31	367	507	7109	734	0.609	14.3
219.1	4.5	23.8	30.3	1747	7.59	159	207	3494	319	0.688	42.0
	5.0	26.4	33.6	1928	7.57	176	229	3856	352	0.688	37.9
	5.6	29.5	37.6	2142	7.55	195	255	4283	391	0.688	33.9
	6.3	33.1	42.1	2386	7.53	218	285	4772	436	0.688	30.2
	8.0	41.6	53.1	2960	7.47	270	357	5919	540	0.688	24.0
	10.0	51.6	65.7	3598	7.40	328	438	7197	657	0.688	19.4
	12.5	63.7	81.1	4345	7.32	397	534	8689	793	0.688	15.7
	14.2	71.8	91.4	4820	7.26	440	597	9640	880	0.688	13.9
	16.0	80.1	102	5297	7.20	483	661	10593	967	0.688	12.5

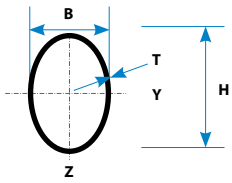


Celsius® 355 EN10210: S355NH Hot finished circular hollow section (continued)

Outside Diameter D mm	Thickness T mm	Mass M kg/m	Sectional area A cm^2	Moment of inertia I cm^4	Radius of gyration i cm	Elastic modulus W_{el} cm^3	Plastic modulus W_{pl} cm^3	Torsional constants I_t cm^4	Torsional constants C_t cm^3	Superficial area/m A_s m^2/m	Approx. length /tonne m/t
244.5	5.0	29.5	37.6	2699	8.47	221	287	5397	441	0.768	33.9
	5.6	33.0	42.0	3000	8.45	245	320	6000	491	0.768	30.3
	6.3	37.0	47.1	3346	8.42	274	358	6692	547	0.768	27.0
	8.0	46.7	59.4	4160	8.37	340	448	8321	681	0.768	21.4
	10.0	57.8	73.7	5073	8.30	415	550	10146	830	0.768	17.3
	12.5	71.5	91.1	6147	8.21	503	673	12295	1006	0.768	14.0
	14.2	80.6	103	6837	8.16	559	754	13674	1119	0.768	12.4
	16.0	90.2	115	7533	8.10	616	837	15066	1232	0.768	11.1
273.0	5.0	33.0	42.1	3781	9.48	277	359	7562	554	0.858	30.3
	5.6	36.9	47.0	4207	9.46	308	400	8413	616	0.858	27.1
	6.3	41.4	52.8	4696	9.43	344	448	9392	688	0.858	24.1
	8.0	52.3	66.6	5852	9.37	429	562	11703	857	0.858	19.1
	10.0	64.9	82.6	7154	9.31	524	692	14308	1048	0.858	15.4
	12.5	80.3	102	8697	9.22	637	849	17395	1274	0.858	12.5
	14.2	90.6	115	9695	9.16	710	952	19390	1421	0.858	11.0
	16.0	101	129	10707	9.10	784	1058	21414	1569	0.858	9.86
323.9	5.0	39.3	50.1	6369	11.3	393	509	12739	787	1.02	25.4
	5.6	44.0	56.0	7094	11.3	438	567	14188	876	1.02	22.7
	6.3	49.3	62.9	7929	11.2	490	636	15858	979	1.02	20.3
	8.0	62.3	79.4	9910	11.2	612	799	19820	1224	1.02	16.0
	10.0	77.4	98.6	12158	11.1	751	986	24317	1501	1.02	12.9
	12.5	96.0	122	14847	11.0	917	1213	29693	1833	1.02	10.4
	14.2	108	138	16599	11.0	1025	1363	33198	2050	1.02	9.22
	16.0	121	155	18390	10.9	1136	1518	36780	2271	1.02	8.23
355.6	6.3	54.3	69.1	10547	12.4	593	769	21094	1186	1.12	18.4
	8.0	68.6	87.4	13201	12.3	742	967	26403	1485	1.12	14.6
	10.0	85.2	109	16223	12.2	912	1195	32447	1825	1.12	11.7
	12.5	106	135	19852	12.1	1117	1472	39704	2233	1.12	9.45
	14.2	120	152	22227	12.1	1250	1656	44455	2500	1.12	8.36
	16.0	134	171	24663	12.0	1387	1847	49326	2774	1.12	7.46
406.4	6.3	62.2	79.2	15849	14.1	780	1009	31699	1560	1.28	16.1
	8.0	78.6	100	19874	14.1	978	1270	39748	1956	1.28	12.7
	10.0	97.8	125	24476	14.0	1205	1572	48952	2409	1.28	10.2
	12.5	121	155	30031	13.9	1478	1940	60061	2956	1.28	8.24
	14.2	137	175	33685	13.9	1658	2185	67371	3315	1.28	7.28
	16.0	154	196	37449	13.8	1843	2440	74898	3686	1.28	6.49
457.0	6.3	70.0	89.2	22654	15.9	991	1280	45308	1983	1.44	14.3
	8.0	88.6	113	28446	15.9	1245	1613	56893	2490	1.44	11.3
	10.0	110	140	35091	15.8	1536	1998	70183	3071	1.44	9.07
	12.5	137	175	43145	15.7	1888	2470	86290	3776	1.44	7.30
	14.2	155	198	48464	15.7	2121	2785	96928	4242	1.44	6.45
	16.0	174	222	53959	15.6	2361	3113	107919	4723	1.44	5.75
508.0	6.3	77.9	99.3	31246	17.7	1230	1586	62493	2460	1.60	12.8
	8.0	98.6	126	39280	17.7	1546	2000	78560	3093	1.60	10.1
	10.0	123	156	48520	17.6	1910	2480	97040	3820	1.60	8.14
	12.5	153	195	59755	17.5	2353	3070	119511	4705	1.60	6.55
	14.2	173	220	67199	17.5	2646	3463	134397	5291	1.60	5.78
	16.0	194	247	74909	17.4	2949	3874	149818	5898	1.60	5.15

The dimensions shown in blue are standard sizes and should be given preference
All other sizes are non-standard and therefore minimum order quantities may apply

CELSIUS® 355 ELLIPTICAL

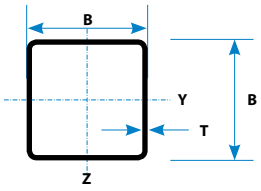


Celsius® 355 EN10210: S355NH Hot finished elliptical hollow section

Size	Thickness	Mass	Sectional area	Moment of inertia		Radius of gyration		Elastic modulus		Plastic modulus		Torsional constants		Superficial area/m	Approx length /tonne
H x B	T	M	A	I_{yy}	I_{zz}	i_{yy}	i_{zz}	$W_{el,yy}$	$W_{el,zz}$	$W_{pl,yy}$	$W_{pl,zz}$	I_t	C_t	A_s	
mm	mm	kg/m	cm^2	cm^4	cm^4	cm	cm	cm^3	cm^3	cm^3	cm^3	cm^4	cm^3	m^2/m	m/t
150 x 75	4.0	10.7	13.6	301	101	4.70	2.72	40.1	26.9	56.1	34.4	303	60.1	0.363	93.4
	5.0	13.3	16.9	367	122	4.66	2.69	48.9	32.5	68.9	42.0	367	72.2	0.363	75.4
	6.3	16.5	21.0	448	147	4.62	2.64	59.7	39.1	84.9	51.5	443	86.3	0.363	60.6
200 x 100	5.0	17.9	22.8	897	302	6.27	3.64	89.7	60.4	125	76.8	905	135	0.484	55.9
	6.3	22.3	28.4	1103	368	6.23	3.60	110	73.5	155	94.7	1105	163	0.484	44.8
	8.0	28.0	35.7	1358	446	6.17	3.54	136	89.3	193	117	1347	197	0.484	35.7
	10.0	34.5	44.0	1637	529	6.10	3.47	164	106	235	141	1605	232	0.484	29.0
	12.5	42.4	54.0	1954	619	6.02	3.39	195	124	284	169	1889	269	0.484	23.6
250 x 125	6.3	28.2	35.9	2205	742	7.84	4.55	176	119	246	151	2224	265	0.605	35.5
	8.0	35.4	45.1	2732	909	7.78	4.49	219	145	307	188	2734	323	0.605	28.2
	10.0	43.8	55.8	3316	1090	7.71	4.42	265	174	376	228	3288	385	0.605	22.8
	12.5	53.9	68.7	3996	1292	7.63	4.34	320	207	458	276	3918	453	0.605	18.5
300 x 150	8.0	42.8	54.5	4813	1616	9.39	5.44	321	215	449	275	4846	481	0.726	23.4
	10.0	53.0	67.5	5872	1950	9.32	5.37	391	260	551	336	5867	577	0.726	18.9
	12.5	65.5	83.4	7120	2334	9.24	5.29	475	311	674	409	7047	686	0.726	15.3
	14.2	73.8	94.0	7921	2573	9.18	5.23	528	343	755	456	7790	753	0.726	13.5
	16.0	82.5	105	8731	2809	9.12	5.17	582	374	837	503	8529	818	0.726	12.1
400 x 200	8.0	57.6	73.4	11689	3966	12.6	7.35	584	397	811	500	11858	890	0.969	17.4
	10.0	71.5	91.1	14348	4829	12.5	7.28	717	483	1001	615	14473	1079	0.969	14.0
	12.5	88.6	113	17531	5843	12.5	7.19	877	584	1232	753	17558	1299	0.969	11.3
	14.2	100	127	19609	6491	12.4	7.14	980	649	1384	843	19544	1438	0.969	9.99
	16.0	112	143	21734	7143	12.3	7.07	1087	714	1541	936	21551	1577	0.969	8.92
500 x 250	10.0	90.0	115	28539	9682	15.8	9.19	1142	775	1585	976	28950	1739	1.21	11.1
	12.5	112	142	35030	11791	15.7	9.10	1401	943	1956	1201	35333	2108	1.21	8.95
	14.2	126	161	39305	13158	15.6	9.04	1572	1053	2202	1349	39491	2346	1.21	7.91
	16.0	142	180	43709	14549	15.6	8.98	1748	1164	2459	1501	43737	2586	1.21	7.06

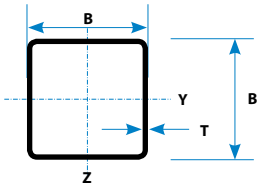
All above sizes are non-standard and therefore minimum order quantities may apply.

CELSIUS® 355 SQUARE



Celsius® 355 EN10210: S355NH Hot finished square hollow section

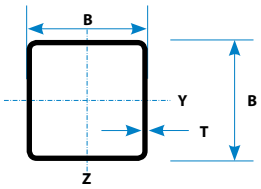
Size	Thickness	Mass	Sectional area	Moment of inertia	Radius of gyration	Elastic modulus	Plastic modulus	Torsional constants		Superficial area/m	Approx. length
B x B	T	M	A	I	i	W_{el}	W_{pl}	I_t	C_t	A_s	/tonne
mm	mm	kg/m	cm^2	cm^4	cm	cm^3	cm^3	cm^4	cm^3	m^2/m	m/t
40 x 40	3.0	3.41	4.34	9.78	1.50	4.89	5.97	15.7	7.10	0.152	293
	3.2	3.61	4.60	10.2	1.49	5.11	6.28	16.5	7.42	0.152	277
	3.6	4.01	5.10	11.1	1.47	5.54	6.88	18.1	8.01	0.151	250
	4.0	4.39	5.59	11.8	1.45	5.91	7.44	19.5	8.54	0.150	228
	5.0	5.28	6.73	13.4	1.41	6.68	8.66	22.5	9.60	0.147	189
50 x 50	3.0	4.35	5.54	20.2	1.91	8.08	9.70	32.1	11.8	0.192	230
	3.2	4.62	5.88	21.2	1.90	8.49	10.2	33.8	12.4	0.192	217
	3.6	5.14	6.54	23.2	1.88	9.27	11.3	37.2	13.5	0.191	195
	4.0	5.64	7.19	25.0	1.86	9.99	12.3	40.4	14.5	0.190	177
	5.0	6.85	8.73	28.9	1.82	11.6	14.5	47.6	16.7	0.187	146
	6.3	8.31	10.6	32.8	1.76	13.1	17.0	55.2	18.8	0.184	120
	7.1	9.14	11.6	34.5	1.72	13.8	18.3	58.9	19.8	0.182	109
	8.0	10.0	12.8	36.0	1.68	14.4	19.5	62.3	20.6	0.179	99.9
60 x 60	3.0	5.29	6.74	36.2	2.32	12.1	14.3	56.9	17.7	0.232	189
	3.2	5.62	7.16	38.2	2.31	12.7	15.2	60.2	18.6	0.232	178
	3.6	6.27	7.98	41.9	2.29	14.0	16.8	66.5	20.4	0.231	160
	4.0	6.90	8.79	45.4	2.27	15.1	18.3	72.5	22.0	0.230	145
	5.0	8.42	10.7	53.3	2.23	17.8	21.9	86.4	25.7	0.227	119
	6.3	10.3	13.1	61.6	2.17	20.5	26.0	102	29.6	0.224	97.2
	7.1	11.4	14.5	65.8	2.13	21.9	28.2	110	31.6	0.222	88.0
	8.0	12.5	16.0	69.7	2.09	23.2	30.4	118	33.4	0.219	79.9
70 x 70	3.0	6.24	7.94	59.0	2.73	16.9	19.9	92.2	24.8	0.272	160
	3.2	6.63	8.44	62.3	2.72	17.8	21.0	97.6	26.1	0.272	151
	3.6	7.40	9.42	68.6	2.70	19.6	23.3	108	28.7	0.271	135
	4.0	8.15	10.4	74.7	2.68	21.3	25.5	118	31.2	0.270	123
	5.0	9.99	12.7	88.5	2.64	25.3	30.8	142	36.8	0.267	100
	6.3	12.3	15.6	104	2.58	29.7	36.9	169	42.9	0.264	81.5
	7.1	13.6	17.3	112	2.54	32.0	40.3	185	46.1	0.262	73.5
	8.0	15.0	19.2	120	2.50	34.2	43.8	200	49.2	0.259	66.5
	8.8	16.3	20.7	126	2.46	35.9	46.6	212	51.6	0.257	61.5
80 x 80	3.0	7.18	9.14	89.8	3.13	22.5	26.3	140	33.0	0.312	139
	3.2	7.63	9.72	95.0	3.13	23.7	27.9	148	34.9	0.312	131
	3.6	8.53	10.9	105	3.11	26.2	31.0	164	38.5	0.311	117
	4.0	9.41	12.0	114	3.09	28.6	34.0	180	41.9	0.310	106
	5.0	11.6	14.7	137	3.05	34.2	41.1	217	49.8	0.307	86.5
	6.3	14.2	18.1	162	2.99	40.5	49.7	262	58.7	0.304	70.2
	7.1	15.8	20.2	176	2.95	43.9	54.5	286	63.5	0.302	63.2
	8.0	17.5	22.4	189	2.91	47.3	59.5	312	68.3	0.299	57.0
	8.8	19.0	24.2	200	2.87	50.0	63.7	332	72.0	0.297	52.6
90 x 90	3.6	9.66	12.3	152	3.52	33.8	39.7	237	49.7	0.351	104
	4.0	10.7	13.6	166	3.50	37.0	43.6	260	54.2	0.350	93.7
	5.0	13.1	16.7	200	3.45	44.4	53.0	316	64.8	0.347	76.1
	6.3	16.2	20.7	238	3.40	53.0	64.3	382	77.0	0.344	61.6
	7.1	18.1	23.0	260	3.36	57.7	70.8	419	83.7	0.342	55.4
	8.0	20.1	25.6	281	3.32	62.6	77.6	459	90.5	0.339	49.9
	8.8	21.8	27.8	299	3.28	66.5	83.4	492	96.0	0.337	45.9



Celsius® 355 EN10210: S355NH Hot finished square hollow section (continued)

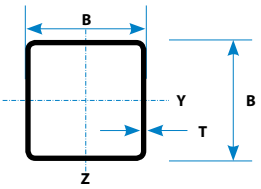
Size	Thickness	Mass	Sectional area	Moment of inertia	Radius of gyration	Elastic modulus	Plastic modulus	Torsional constants		Superficial area/m	Approx. length /tonne
B x B	T	M	A	I	i	W_{el}	W_{pl}	I_t	C_t	A_s	
mm	mm	kg/m	cm^2	cm^4	cm	cm^3	cm^3	cm^4	cm^3	m^2/m	m/t
100 x 100	3.6	10.8	13.7	212	3.92	42.3	49.5	328	62.3	0.391	92.7
	4.0	11.9	15.2	232	3.91	46.4	54.4	361	68.2	0.390	83.9
	5.0	14.7	18.7	279	3.86	55.9	66.4	439	81.8	0.387	68.0
	6.3	18.2	23.2	336	3.80	67.1	80.9	534	97.8	0.384	54.9
	7.1	20.3	25.8	367	3.77	73.4	89.2	589	107	0.382	49.3
	8.0	22.6	28.8	400	3.73	79.9	98.2	646	116	0.379	44.3
	8.8	24.5	31.3	426	3.69	85.2	106	694	123	0.377	40.7
	10.0	27.4	34.9	462	3.64	92.4	116	761	133	0.374	36.5
120 x 120	4.0	14.4	18.4	410	4.72	68.4	79.7	635	101	0.470	69.3
	5.0	17.8	22.7	498	4.68	83.0	97.6	777	122	0.467	56.0
	6.3	22.2	28.2	603	4.62	100	120	950	147	0.464	45.1
	7.1	24.7	31.5	663	4.59	110	133	1051	161	0.462	40.4
	8.0	27.6	35.2	726	4.55	121	146	1160	176	0.459	36.2
	8.8	30.1	38.3	779	4.51	130	158	1252	189	0.457	33.3
	10.0	33.7	42.9	852	4.46	142	175	1382	206	0.454	29.7
	12.5	40.9	52.1	982	4.34	164	207	1623	236	0.448	24.5
140 x 140	5.0	21.0	26.7	807	5.50	115	135	1253	170	0.547	47.7
	6.3	26.1	33.3	984	5.44	141	166	1540	206	0.544	38.3
	7.1	29.2	37.2	1086	5.40	155	184	1709	227	0.542	34.2
	8.0	32.6	41.6	1195	5.36	171	204	1892	249	0.539	30.7
	8.8	35.6	45.4	1287	5.33	184	221	2048	268	0.537	28.1
	10.0	40.0	50.9	1416	5.27	202	246	2272	294	0.534	25.0
	12.5	48.7	62.1	1653	5.16	236	293	2696	342	0.528	20.5
150 x 150	5.0	22.6	28.7	1002	5.90	134	156	1550	197	0.587	44.3
	6.3	28.1	35.8	1223	5.85	163	192	1909	240	0.584	35.6
	7.1	31.4	40.0	1352	5.81	180	213	2121	264	0.582	31.8
	8.0	35.1	44.8	1491	5.77	199	237	2351	291	0.579	28.5
	8.8	38.4	48.9	1608	5.74	214	257	2549	313	0.577	26.1
	10.0	43.1	54.9	1773	5.68	236	286	2832	344	0.574	23.2
	12.5	52.7	67.1	2080	5.57	277	342	3375	402	0.568	19.0
	14.2	58.9	75.0	2262	5.49	302	377	3707	436	0.563	17.0

The dimensions shown in blue are standard sizes and should be given preference
All other sizes are non-standard and therefore minimum order quantities may apply



Celsius® 355 EN10210: S355NH Hot finished square hollow section (continued)

Size	Thickness	Mass	Sectional area	Moment of inertia	Radius of gyration	Elastic modulus	Plastic modulus	Torsional constants		Superficial area/m	Approx. length
B x B	T	M	A	I	i	W_{el}	W_{pl}	I_t	C_t	A_s	/tonne
mm	mm	kg/m	cm^2	cm^4	cm	cm^3	cm^3	cm^4	cm^3	m^2/m	m/t
160 x 160	5.0	24.1	30.7	1225	6.31	153	178	1892	226	0.627	41.5
	6.3	30.1	38.3	1499	6.26	187	220	2333	275	0.624	33.3
	7.1	33.7	42.9	1659	6.22	207	245	2595	304	0.622	29.7
	8.0	37.6	48.0	1831	6.18	229	272	2880	335	0.619	26.6
	8.8	41.1	52.4	1978	6.14	247	295	3125	361	0.617	24.3
	10.0	46.3	58.9	2186	6.09	273	329	3478	398	0.614	21.6
	12.5	56.6	72.1	2576	5.98	322	395	4158	467	0.608	17.7
	14.2	63.3	80.7	2809	5.90	351	436	4579	508	0.603	15.8
	16.0	70.2	89.4	3028	5.82	379	476	4988	546	0.599	14.2
180 x 180	5.0	27.3	34.7	1765	7.13	196	227	2718	290	0.707	36.7
	6.3	34.0	43.3	2168	7.07	241	281	3361	355	0.704	29.4
	7.1	38.1	48.6	2404	7.04	267	314	3744	393	0.702	26.2
	8.0	42.7	54.4	2661	7.00	296	349	4162	434	0.699	23.4
	8.8	46.7	59.4	2880	6.96	320	379	4524	469	0.697	21.4
	10.0	52.5	66.9	3193	6.91	355	424	5048	518	0.694	19.0
	12.5	64.4	82.1	3790	6.80	421	511	6070	613	0.688	15.5
	14.2	72.2	92.0	4154	6.72	462	566	6711	670	0.683	13.8
	16.0	80.2	102	4504	6.64	500	621	7343	724	0.679	12.5
200 x 200	5.0	30.4	38.7	2445	7.95	245	283	3756	362	0.787	32.9
	6.3	38.0	48.4	3011	7.89	301	350	4653	444	0.784	26.3
	7.1	42.6	54.2	3345	7.85	335	391	5189	493	0.782	23.5
	8.0	47.7	60.8	3709	7.81	371	436	5778	545	0.779	21.0
	8.8	52.2	66.5	4021	7.78	402	474	6288	590	0.777	19.2
	10.0	58.8	74.9	4471	7.72	447	531	7031	655	0.774	17.0
	12.5	72.3	92.1	5336	7.61	534	643	8491	778	0.768	13.8
	14.2	81.1	103	5872	7.54	587	714	9417	854	0.763	12.3
	16.0	90.3	115	6394	7.46	639	785	10340	927	0.759	11.1
250 x 250	5.0	38.3	48.7	4861	9.99	389	447	7430	577	0.987	26.1
	6.3	47.9	61.0	6014	9.93	481	556	9238	712	0.984	20.9
	7.1	53.7	68.4	6701	9.90	536	622	10325	792	0.982	18.6
	8.0	60.3	76.8	7455	9.86	596	694	11525	880	0.979	16.6
	8.8	66.0	84.1	8107	9.82	649	758	12572	955	0.977	15.2
	10.0	74.5	94.9	9055	9.77	724	851	14106	1065	0.974	13.4
	12.5	91.9	117	10915	9.66	873	1037	17164	1279	0.968	10.9
	14.2	103	132	12094	9.58	967	1158	19139	1413	0.963	9.67
	16.0	115	147	13267	9.50	1061	1280	21138	1546	0.959	8.67



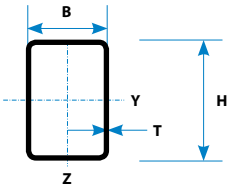
Celsius® 355 EN10210: S355NH Hot finished square hollow section (continued)

Size	Thickness	Mass	Sectional area	Moment of inertia	Radius of gyration	Elastic modulus	Plastic modulus	Torsional constants		Superficial area/m	Approx. length /tonne
B x B	T	M	A	I	i	W_{el}	W_{pl}	I_t	C_t	A_s	
mm	mm	kg/m	cm^2	cm^4	cm	cm^3	cm^3	cm^4	cm^3	m^2/m	m/t
300 x 300	6.3	57.8	73.6	10547	12.0	703	809	16136	1043	1.18	17.3
	7.1	64.9	82.6	11775	11.9	785	906	18061	1163	1.18	15.4
	8.0	72.8	92.8	13128	11.9	875	1013	20194	1294	1.18	13.7
	8.8	79.8	102	14305	11.9	954	1107	22060	1409	1.18	12.5
	10.0	90.2	115	16026	11.8	1068	1246	24807	1575	1.17	11.1
	12.5	112	142	19442	11.7	1296	1525	30333	1904	1.17	8.97
	14.2	126	160	21637	11.6	1442	1708	33938	2114	1.16	7.95
	16.0	141	179	23850	11.5	1590	1895	37622	2325	1.16	7.12
350 x 350	8.0	85.4	109	21129	13.9	1207	1392	32384	1789	1.38	11.7
	8.8	93.6	119	23055	13.9	1317	1522	35413	1950	1.38	10.7
	10.0	106	135	25884	13.9	1479	1715	39886	2185	1.37	9.44
	12.5	131	167	31541	13.7	1802	2107	48934	2654	1.37	7.62
	14.2	148	189	35211	13.7	2012	2364	54879	2957	1.36	6.76
	16.0	166	211	38942	13.6	2225	2630	60990	3264	1.36	6.04
400 x 400	8.0	97.9	125	31857	16.0	1593	1830	48695	2363	1.58	10.2
	8.8	107	137	34798	15.9	1740	2004	53290	2579	1.58	9.31
	10.0	122	155	39128	15.9	1956	2260	60092	2895	1.57	8.22
	12.5	151	192	47839	15.8	2392	2782	73906	3530	1.57	6.63
	14.2	170	217	53526	15.7	2676	3127	83026	3942	1.56	5.87
	16.0	191	243	59344	15.6	2967	3484	92442	4362	1.56	5.24
	20.0 #	235	300	71535	15.4	3577	4247	112489	5237	1.55	4.25

The dimensions shown in blue are standard sizes and should be given preference
All other sizes are non-standard and therefore minimum order quantities may apply

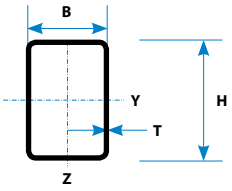
SAW Process (single longitudinal seam weld, slightly proud)

CELSIUS® 355 RECTANGULAR



Celsius® 355 EN10210: S355NH Hot finished rectangular hollow section

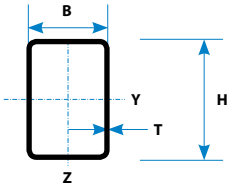
Size	Thickness	Mass	Sectional area	Moment of inertia		Radius of gyration		Elastic modulus		Plastic modulus		Torsional constants		Superficial area/m	Approx length /tonne
H x B	T	M	A	I_{yy}	I_{zz}	i_{yy}	i_{zz}	$W_{el,yy}$	$W_{el,zz}$	$W_{pl,yy}$	$W_{pl,zz}$	I_t	C_t	A_s	
mm	mm	kg/m	cm^2	cm^4	cm^4	cm	cm	cm^3	cm^3	cm^3	cm^3	cm^4	cm^3	m^2/m	m/t
50 x 30	3.0	3.41	4.34	13.6	5.94	1.77	1.17	5.43	3.96	6.88	4.76	13.5	6.51	0.152	293
	3.2	3.61	4.60	14.2	6.20	1.76	1.16	5.68	4.13	7.25	5.00	14.2	6.80	0.152	277
	3.6	4.01	5.10	15.4	6.67	1.74	1.14	6.16	4.45	7.94	5.46	15.4	7.31	0.151	250
	4.0	4.39	5.59	16.5	7.08	1.72	1.13	6.60	4.72	8.59	5.88	16.6	7.77	0.150	228
	5.0	5.28	6.73	18.7	7.89	1.67	1.08	7.49	5.26	10.0	6.80	19.0	8.67	0.147	189
60 x 40	3.0	4.35	5.54	26.5	13.9	2.18	1.58	8.82	6.95	10.9	8.19	29.2	11.2	0.192	230
	3.2	4.62	5.88	27.8	14.6	2.18	1.57	9.27	7.29	11.5	8.64	30.8	11.7	0.192	217
	3.6	5.14	6.54	30.4	15.9	2.16	1.56	10.1	7.93	12.7	9.50	33.8	12.8	0.191	195
	4.0	5.64	7.19	32.8	17.0	2.14	1.54	10.9	8.52	13.8	10.3	36.7	13.7	0.190	177
	5.0	6.85	8.73	38.1	19.5	2.09	1.50	12.7	9.77	16.4	12.2	43.0	15.7	0.187	146
	6.3	8.31	10.6	43.4	21.9	2.02	1.44	14.5	11.0	19.2	14.2	49.5	17.6	0.184	120
80 x 40	3.0	5.29	6.74	54.2	18.0	2.84	1.63	13.6	9.00	17.1	10.4	43.8	15.3	0.232	189
	3.2	5.62	7.16	57.2	18.9	2.83	1.63	14.3	9.46	18.0	11.0	46.2	16.1	0.232	178
	3.6	6.27	7.98	62.8	20.6	2.81	1.61	15.7	10.3	20.0	12.1	50.8	17.5	0.231	160
	4.0	6.90	8.79	68.2	22.2	2.79	1.59	17.1	11.1	21.8	13.2	55.2	18.9	0.230	145
	5.0	8.42	10.7	80.3	25.7	2.74	1.55	20.1	12.9	26.1	15.7	65.1	21.9	0.227	119
	6.3	10.3	13.1	93.3	29.2	2.67	1.49	23.3	14.6	31.1	18.4	75.6	24.8	0.224	97.2
	7.1	11.4	14.5	99.8	30.7	2.63	1.46	25.0	15.4	33.8	19.8	80.9	26.2	0.222	88.0
	8.0	12.5	16.0	106	32.1	2.58	1.42	26.5	16.1	36.5	21.2	85.8	27.4	0.219	79.9
90 x 50	3.0	6.24	7.94	84.4	33.5	3.26	2.05	18.8	13.4	23.2	15.3	76.5	22.4	0.272	160
	3.2	6.63	8.44	89.1	35.3	3.25	2.04	19.8	14.1	24.6	16.2	80.9	23.6	0.272	151
	3.6	7.40	9.42	98.3	38.7	3.23	2.03	21.8	15.5	27.2	18.0	89.4	25.9	0.271	135
	4.0	8.15	10.4	107	41.9	3.21	2.01	23.8	16.8	29.8	19.6	97.5	28.0	0.270	123
	5.0	9.99	12.7	127	49.2	3.16	1.97	28.3	19.7	36.0	23.5	116	32.9	0.267	100
	6.3	12.3	15.6	150	57.0	3.10	1.91	33.3	22.8	43.2	28.0	138	38.1	0.264	81.5
	7.1	13.6	17.3	162	60.9	3.06	1.88	36.0	24.4	47.2	30.5	149	40.7	0.262	73.5
	8.0	15.0	19.2	174	64.6	3.01	1.84	38.6	25.8	51.4	32.9	160	43.2	0.259	66.5
100 x 50	3.0	6.71	8.54	110	36.8	3.58	2.08	21.9	14.7	27.3	16.8	88.4	25.0	0.292	149
	3.2	7.13	9.08	116	38.8	3.57	2.07	23.2	15.5	28.9	17.7	93.4	26.4	0.292	140
	3.6	7.96	10.1	128	42.6	3.55	2.05	25.6	17.0	32.1	19.6	103	29.0	0.291	126
	4.0	8.78	11.2	140	46.2	3.53	2.03	27.9	18.5	35.2	21.5	113	31.4	0.290	114
	5.0	10.8	13.7	167	54.3	3.48	1.99	33.3	21.7	42.6	25.8	135	36.9	0.287	92.8
	6.3	13.3	16.9	197	63.0	3.42	1.93	39.4	25.2	51.3	30.8	160	42.9	0.284	75.4
	7.1	14.7	18.7	214	67.5	3.38	1.90	42.7	27.0	56.3	33.5	173	46.0	0.282	68.0
	8.0	16.3	20.8	230	71.7	3.33	1.86	46.0	28.7	61.4	36.3	186	48.9	0.279	61.4
	8.8	17.6	22.5	243	74.8	3.29	1.82	48.5	29.9	65.6	38.5	197	51.1	0.277	56.7
	10.0	19.6	24.9	259	78.4	3.22	1.77	51.8	31.4	71.2	41.4	209	53.6	0.274	51.1
100 x 60	3.0	7.18	9.14	124	55.7	3.68	2.47	24.7	18.6	30.2	21.2	121	30.7	0.312	139
	3.2	7.63	9.72	131	58.8	3.67	2.46	26.2	19.6	32.0	22.4	129	32.4	0.312	131
	3.6	8.53	10.9	145	64.8	3.65	2.44	28.9	21.6	35.6	24.9	142	35.6	0.311	117
	4.0	9.41	12.0	158	70.5	3.63	2.43	31.6	23.5	39.1	27.3	156	38.7	0.310	106
	5.0	11.6	14.7	189	83.6	3.58	2.38	37.8	27.9	47.4	32.9	188	45.9	0.307	86.5
	6.3	14.2	18.1	225	98.1	3.52	2.33	45.0	32.7	57.3	39.5	224	53.8	0.304	70.2
	7.1	15.8	20.2	244	106	3.48	2.29	48.8	35.3	62.9	43.2	245	58.0	0.302	63.2
	8.0	17.5	22.4	264	113	3.44	2.25	52.8	37.8	68.7	47.1	265	62.2	0.299	57.0
	8.8	19.0	24.2	279	119	3.40	2.22	55.9	39.7	73.6	50.2	282	65.4	0.297	52.6



Celsius® 355 EN10210: S355NH Hot finished rectangular hollow section (continued)

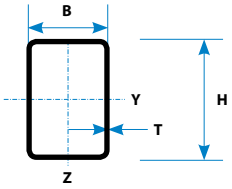
Size	Thickness	Mass	Sectional area	Moment of inertia		Radius of gyration		Elastic modulus		Plastic modulus		Torsional constants		Superficial area/m	Approx length /tonne
H x B	T	M	A	I_{yy}	I_{zz}	i_{yy}	i_{zz}	$W_{el,yy}$	$W_{el,zz}$	$W_{pl,yy}$	$W_{pl,zz}$	I_t	C_t	A_s	
mm	mm	kg/m	cm^2	cm^4	cm^4	cm	cm	cm^3	cm^3	cm^3	cm^3	cm^4	cm^3	m^2/m	m/t
120 x 60	3.0	8.12	10.3	194	65.5	4.33	2.52	32.3	21.8	40.0	24.6	156	37.2	0.352	123
	3.2	8.64	11.0	205	69.2	4.32	2.51	34.2	23.1	42.4	26.1	165	39.2	0.352	116
	3.6	9.66	12.3	227	76.3	4.30	2.49	37.9	25.4	47.2	28.9	183	43.3	0.351	104
	4.0	10.7	13.6	249	83.1	4.28	2.47	41.5	27.7	51.9	31.7	201	47.1	0.350	93.7
	5.0	13.1	16.7	299	98.8	4.23	2.43	49.9	32.9	63.1	38.4	242	56.0	0.347	76.1
	6.3	16.2	20.7	358	116	4.16	2.37	59.7	38.8	76.7	46.3	290	65.9	0.344	61.6
	7.1	18.1	23.0	391	126	4.12	2.34	65.2	41.9	84.4	50.8	317	71.3	0.342	55.4
	8.0	20.1	25.6	425	135	4.08	2.30	70.8	45.0	92.7	55.4	344	76.6	0.339	49.9
	8.8	21.8	27.8	452	142	4.04	2.27	75.3	47.5	99.6	59.2	366	80.8	0.337	45.9
120 x 80	3.6	10.8	13.7	276	147	4.48	3.27	46.0	36.7	55.6	42.0	301	59.5	0.391	92.7
	4.0	11.9	15.2	303	161	4.46	3.25	50.4	40.2	61.2	46.1	330	65.0	0.390	83.9
	5.0	14.7	18.7	365	193	4.42	3.21	60.9	48.2	74.6	56.1	401	77.9	0.387	68.0
	6.3	18.2	23.2	440	230	4.36	3.15	73.3	57.6	91.0	68.2	487	92.9	0.384	54.9
	7.1	20.3	25.8	482	251	4.32	3.12	80.3	62.8	100	75.2	535	101	0.382	49.3
	8.0	22.6	28.8	525	273	4.27	3.08	87.5	68.1	111	82.6	587	110	0.379	44.3
	8.8	24.5	31.3	561	290	4.24	3.04	93.5	72.4	119	88.7	629	117	0.377	40.7
	10.0	27.4	34.9	609	313	4.18	2.99	102	78.1	131	97.3	688	126	0.374	36.5
150 x 100	4.0	15.1	19.2	607	324	5.63	4.11	81.0	64.8	97.4	73.6	660	105	0.490	66.4
	5.0	18.6	23.7	739	392	5.58	4.07	98.5	78.5	119	90.1	807	127	0.487	53.7
	6.3	23.1	29.5	898	474	5.52	4.01	120	94.8	147	110	986	153	0.484	43.2
	7.1	25.9	32.9	990	520	5.48	3.97	132	104	163	122	1091	168	0.482	38.7
	8.0	28.9	36.8	1087	569	5.44	3.94	145	114	180	135	1203	183	0.479	34.7
	8.8	31.5	40.1	1168	610	5.40	3.90	156	122	195	146	1298	196	0.477	31.8
	10.0	35.3	44.9	1282	665	5.34	3.85	171	133	216	161	1432	214	0.474	28.4
	12.5	42.8	54.6	1488	763	5.22	3.74	198	153	256	190	1679	246	0.468	23.3
160 x 80	4.0	14.4	18.4	612	207	5.77	3.35	76.5	51.7	94.7	58.3	493	88.1	0.470	69.3
	5.0	17.8	22.7	744	249	5.72	3.31	93.0	62.3	116	71.1	600	106	0.467	56.0
	6.3	22.2	28.2	903	299	5.66	3.26	113	74.8	142	86.8	730	127	0.464	45.1
	7.1	24.7	31.5	994	327	5.62	3.22	124	81.7	158	95.9	804	139	0.462	40.4
	8.0	27.6	35.2	1091	356	5.57	3.18	136	89.0	175	106	883	151	0.459	36.2
	8.8	30.1	38.3	1172	379	5.53	3.15	147	94.9	189	114	949	161	0.457	33.3
	10.0	33.7	42.9	1284	411	5.47	3.10	161	103	209	125	1041	175	0.454	29.7
	12.5	40.9	52.1	1485	465	5.34	2.99	186	116	247	146	1204	198	0.448	24.5
180 x 60	4.0	14.4	18.4	697	121	6.16	2.56	77.4	40.3	99.8	45.2	341	72.2	0.470	69.3
	5.0	17.8	22.7	846	144	6.10	2.52	94.0	48.1	122	54.9	411	86.3	0.467	56.0
	6.3	22.2	28.2	1027	171	6.03	2.46	114	57.0	150	66.6	495	102	0.464	45.1
	7.1	24.7	31.5	1130	186	5.99	2.43	126	61.9	166	73.3	542	111	0.462	40.4
	8.0	27.6	35.2	1240	201	5.94	2.39	138	66.9	184	80.4	590	120	0.459	36.2
	8.8	30.1	38.3	1331	212	5.89	2.35	148	70.8	199	86.2	630	127	0.457	33.3
	10.0	33.7	42.9	1457	228	5.83	2.30	162	75.8	220	94.4	683	137	0.454	29.7
	12.5	40.9	52.1	1682	251	5.68	2.20	187	83.7	260	109	770	151	0.448	24.5

The dimensions shown in blue are standard sizes and should be given preference
All other sizes are non-standard and therefore minimum order quantities may apply



Celsius® 355 EN10210: S355NH Hot finished rectangular hollow section (continued)

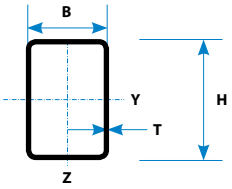
Size	Thickness	Mass	Sectional area	Moment of inertia		Radius of gyration		Elastic modulus		Plastic modulus		Torsional constants		Superficial area/m	Approx length /tonne
H x B	T	M	A	I_{yy}	I_{zz}	i_{yy}	i_{zz}	$W_{el,yy}$	$W_{el,zz}$	$W_{pl,yy}$	$W_{pl,zz}$	I_t	C_t	A_s	
mm	mm	kg/m	cm^2	cm^4	cm^4	cm	cm	cm^3	cm^3	cm^3	cm^3	cm^4	cm^3	m^2/m	m/t
180 x 100	4.0	16.9	21.6	945	379	6.61	4.19	105	75.9	128	85.2	852	127	0.550	59.0
	5.0	21.0	26.7	1153	460	6.57	4.15	128	92.0	157	104	1042	154	0.547	47.7
	6.3	26.1	33.3	1407	557	6.50	4.09	156	111	194	128	1277	186	0.544	38.3
	7.1	29.2	37.2	1555	613	6.47	4.06	173	123	215	142	1413	205	0.542	34.2
	8.0	32.6	41.6	1713	671	6.42	4.02	190	134	239	157	1560	224	0.539	30.7
	8.8	35.6	45.4	1847	720	6.38	3.98	205	144	259	170	1685	240	0.537	28.1
	10.0	40.0	50.9	2036	787	6.32	3.93	226	157	288	188	1862	263	0.534	25.0
	12.5	48.7	62.1	2385	908	6.20	3.82	265	182	344	223	2191	303	0.528	20.5
200 x 100	4.0	18.2	23.2	1223	416	7.26	4.24	122	83.2	150	92.8	983	142	0.590	54.9
	5.0	22.6	28.7	1495	505	7.21	4.19	149	101	185	114	1204	172	0.587	44.3
	6.3	28.1	35.8	1829	613	7.15	4.14	183	123	228	140	1475	208	0.584	35.6
	7.1	31.4	40.0	2024	674	7.11	4.10	202	135	254	155	1634	229	0.582	31.8
	8.0	35.1	44.8	2234	739	7.06	4.06	223	148	282	172	1804	251	0.579	28.5
	8.8	38.4	48.9	2412	793	7.02	4.03	241	159	306	186	1950	270	0.577	26.1
	10.0	43.1	54.9	2664	869	6.96	3.98	266	174	341	206	2156	295	0.574	23.2
	12.5	52.7	67.1	3136	1004	6.84	3.87	314	201	408	245	2541	341	0.568	19.0
	14.2	58.9	75.0	3416	1080	6.75	3.80	342	216	450	268	2770	368	0.563	17.0
200 x 120	5.0	24.1	30.7	1685	762	7.40	4.98	168	127	205	144	1648	210	0.627	41.5
	6.3	30.1	38.3	2065	929	7.34	4.92	207	155	253	177	2028	255	0.624	33.3
	7.1	33.7	42.9	2288	1025	7.30	4.89	229	171	281	197	2252	282	0.622	29.7
	8.0	37.6	48.0	2529	1128	7.26	4.85	253	188	313	218	2495	310	0.619	26.6
	8.8	41.1	52.4	2734	1215	7.22	4.82	273	203	340	237	2703	334	0.617	24.3
	10.0	46.3	58.9	3026	1337	7.17	4.76	303	223	379	263	3001	367	0.614	21.6
	12.5	56.6	72.1	3576	1562	7.04	4.66	358	260	455	314	3569	428	0.608	17.7
	14.2	63.3	80.7	3907	1693	6.96	4.58	391	282	503	346	3915	464	0.603	15.8
	16.0	70.2	89.4	4221	1813	6.87	4.50	422	302	550	377	4247	497	0.599	14.2
200 x 150	5.0	26.5	33.7	1970	1265	7.64	6.12	197	169	234	192	2386	267	0.687	37.8
	6.3	33.0	42.1	2420	1549	7.58	6.07	242	207	289	237	2947	326	0.684	30.3
	7.1	37.0	47.1	2685	1715	7.55	6.03	268	229	322	264	3280	361	0.682	27.0
	8.0	41.4	52.8	2971	1894	7.50	5.99	297	253	359	294	3643	398	0.679	24.1
	8.8	45.3	57.7	3217	2047	7.47	5.96	322	273	390	319	3956	430	0.677	22.1
	10.0	51.0	64.9	3568	2264	7.41	5.91	357	302	436	356	4409	475	0.674	19.6
	12.5	62.5	79.6	4236	2673	7.30	5.80	424	356	525	428	5287	559	0.668	16.0
	14.2	70.0	89.2	4644	2919	7.22	5.72	464	389	582	473	5834	610	0.663	14.3
	16.0	77.7	99.0	5036	3152	7.13	5.64	504	420	638	518	6370	658	0.659	12.9
220 x 120	5.0	25.7	32.7	2125	829	8.06	5.03	193	138	236	155	1881	232	0.667	38.9
	6.3	32.0	40.8	2610	1010	8.00	4.98	237	168	292	191	2315	283	0.664	31.2
	7.1	35.9	45.7	2895	1116	7.96	4.94	263	186	326	213	2572	312	0.662	27.9
	8.0	40.2	51.2	3203	1229	7.91	4.90	291	205	362	236	2850	343	0.659	24.9
	8.8	43.9	55.9	3467	1324	7.87	4.87	315	221	394	256	3089	370	0.657	22.8
	10.0	49.4	62.9	3844	1459	7.82	4.81	349	243	440	285	3431	407	0.654	20.2
	12.5	60.5	77.1	4560	1707	7.69	4.71	415	285	530	341	4087	476	0.648	16.5
	14.2	67.8	86.3	4996	1853	7.61	4.63	454	309	586	376	4488	517	0.643	14.8
	16.0	75.2	95.8	5413	1988	7.52	4.55	492	331	643	410	4873	555	0.639	13.3



Celsius® 355 EN10210: S355NH Hot finished rectangular hollow section (continued)

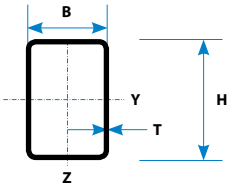
Size	Thickness	Mass	Sectional area	Moment of inertia		Radius of gyration		Elastic modulus		Plastic modulus		Torsional constants		Superficial area/m	Approx length /tonne
H x B	T	M	A	I_{yy}	I_{zz}	i_{yy}	i_{zz}	$W_{el,yy}$	$W_{el,zz}$	$W_{pl,yy}$	$W_{pl,zz}$	I_t	C_t	A_s	
mm	mm	kg/m	cm^2	cm^4	cm^4	cm	cm	cm^3	cm^3	cm^3	cm^3	cm^4	cm^3	m^2/m	m/t
250 x 100	5.0	26.5	33.7	2610	618	8.80	4.28	209	124	263	138	1617	217	0.687	37.8
	6.3	33.0	42.1	3207	751	8.73	4.22	257	150	326	169	1983	264	0.684	30.3
	7.1	37.0	47.1	3559	827	8.69	4.19	285	165	363	188	2198	291	0.682	27.0
	8.0	41.4	52.8	3940	909	8.64	4.15	315	182	404	209	2430	319	0.679	24.1
	8.8	45.3	57.7	4266	977	8.60	4.12	341	195	439	226	2627	343	0.677	22.1
	10.0	51.0	64.9	4733	1072	8.54	4.06	379	214	491	251	2908	376	0.674	19.6
	12.5	62.5	79.6	5622	1245	8.41	3.96	450	249	592	299	3436	438	0.668	16.0
	14.2	70.0	89.2	6165	1344	8.31	3.88	493	269	655	329	3752	473	0.663	14.3
	16.0	77.7	99.0	6686	1433	8.22	3.80	535	287	719	358	4050	505	0.659	12.9
250 x 150	5.0	30.4	38.7	3360	1527	9.31	6.28	269	204	324	228	3278	337	0.787	32.9
	6.3	38.0	48.4	4143	1874	9.25	6.22	331	250	402	283	4054	413	0.784	26.3
	7.1	42.6	54.2	4606	2078	9.22	6.19	368	277	449	315	4515	457	0.782	23.5
	8.0	47.7	60.8	5111	2298	9.17	6.15	409	306	501	350	5021	506	0.779	21.0
	8.8	52.2	66.5	5546	2486	9.13	6.12	444	331	545	381	5457	547	0.777	19.2
	10.0	58.8	74.9	6174	2755	9.08	6.06	494	367	611	426	6090	605	0.774	17.0
	12.5	72.3	92.1	7387	3265	8.96	5.96	591	435	740	514	7326	717	0.768	13.8
	14.2	81.1	103	8141	3576	8.87	5.88	651	477	823	570	8102	784	0.763	12.3
	16.0	90.3	115	8879	3873	8.79	5.80	710	516	906	625	8868	849	0.759	11.1
260 x 140	5.0	30.4	38.7	3532	1354	9.55	5.91	272	193	331	216	3078	326	0.787	32.9
	6.3	38.0	48.4	4355	1660	9.49	5.86	335	237	411	267	3803	399	0.784	26.3
	7.1	42.6	54.2	4842	1839	9.45	5.82	372	263	459	298	4234	442	0.782	23.5
	8.0	47.7	60.8	5373	2032	9.40	5.78	413	290	511	331	4704	488	0.779	21.0
	8.8	52.2	66.5	5831	2197	9.37	5.75	449	314	557	360	5110	527	0.777	19.2
	10.0	58.8	74.9	6490	2432	9.31	5.70	499	347	624	402	5698	584	0.774	17.0
	12.5	72.3	92.1	7767	2876	9.18	5.59	597	411	756	485	6841	690	0.768	13.8
	14.2	81.1	103	8560	3144	9.10	5.52	658	449	840	537	7555	754	0.763	12.3
	16.0	90.3	115	9337	3400	9.01	5.44	718	486	925	588	8257	815	0.759	11.1

The dimensions shown in blue are standard sizes and should be given preference
All other sizes are non-standard and therefore minimum order quantities may apply



Celsius® 355 EN10210: S355NH Hot finished rectangular hollow section (continued)

Size	Thickness	Mass	Sectional area	Moment of inertia		Radius of gyration		Elastic modulus		Plastic modulus		Torsional constants		Superficial area/m	Approx length /tonne
H x B	T	M	A	I_{yy}	I_{zz}	i_{yy}	i_{zz}	$W_{el,yy}$	$W_{el,zz}$	$W_{pl,yy}$	$W_{pl,zz}$	I_t	C_t	A_s	
mm	mm	kg/m	cm^2	cm^4	cm^4	cm	cm	cm^3	cm^3	cm^3	cm^3	cm^4	cm^3	m^2/m	m/t
300 x 100	5.0	30.4	38.7	4146	731	10.3	4.34	276	146	354	161	2040	262	0.787	32.9
	6.3	38.0	48.4	5111	890	10.3	4.29	341	178	439	199	2504	319	0.784	26.3
	7.1	42.6	54.2	5683	981	10.2	4.25	379	196	490	221	2775	352	0.782	23.5
	8.0	47.7	60.8	6305	1078	10.2	4.21	420	216	546	245	3069	387	0.779	21.0
	8.8	52.2	66.5	6841	1160	10.1	4.18	456	232	594	266	3319	416	0.777	19.2
	10.0	58.8	74.9	7613	1275	10.1	4.13	508	255	666	296	3676	458	0.774	17.0
	12.5	72.3	92.1	9103	1486	9.94	4.02	607	297	806	354	4350	534	0.768	13.8
	14.2	81.1	103	10028	1607	9.85	3.94	669	321	896	390	4755	578	0.763	12.3
	16.0	90.3	115	10931	1719	9.75	3.87	729	344	986	425	5138	619	0.759	11.1
300 x 200	5.0	38.3	48.7	6322	3396	11.4	8.35	421	340	501	380	6824	552	0.987	26.1
	6.3	47.9	61.0	7829	4193	11.3	8.29	522	419	624	472	8476	681	0.984	20.9
	7.1	53.7	68.4	8729	4667	11.3	8.26	582	467	698	528	9469	757	0.982	18.6
	8.0	60.3	76.8	9717	5184	11.3	8.22	648	518	779	589	10562	840	0.979	16.6
	8.8	66.0	84.1	10573	5631	11.2	8.18	705	563	851	643	11514	912	0.977	15.2
	10.0	74.5	94.9	11819	6278	11.2	8.13	788	628	956	721	12908	1015	0.974	13.4
	12.5	91.9	117	14273	7537	11.0	8.02	952	754	1165	877	15677	1217	0.968	10.9
	14.2	103	132	15832	8328	11.0	7.95	1055	833	1302	978	17457	1343	0.963	9.67
	16.0	115	147	17390	9109	10.9	7.87	1159	911	1441	1080	19252	1468	0.959	8.67
300 x 250	5.0	42.2	53.7	7410	5611	11.7	10.2	494	449	575	508	9766	697	1.09	23.7
	6.3	52.8	67.3	9188	6950	11.7	10.2	613	556	716	633	12155	862	1.08	18.9
	7.1	59.3	75.5	10252	7749	11.6	10.1	683	620	802	708	13595	960	1.08	16.9
	8.0	66.5	84.8	11422	8627	11.6	10.1	761	690	896	791	15187	1067	1.08	15.0
	8.8	72.9	92.9	12439	9388	11.6	10.1	829	751	979	864	16578	1160	1.08	13.7
	10.0	82.4	105	13923	10496	11.5	10.0	928	840	1101	971	18620	1295	1.07	12.1
	12.5	102	130	16857	12680	11.4	9.89	1124	1014	1345	1185	22711	1560	1.07	9.83
	14.2	115	146	18734	14070	11.3	9.82	1249	1126	1505	1325	25365	1728	1.06	8.73
	16.0	128	163	20620	15460	11.2	9.74	1375	1237	1668	1467	28064	1896	1.06	7.81
340 x 100	10.0	65.1	82.9	10585	1438	11.3	4.16	623	288	823	332	4299	523	0.854	15.4
350 x 150	5.0	38.3	48.7	7655	2053	12.5	6.49	437	274	543	301	5161	477	0.987	26.1
	6.3	47.9	61.0	9481	2525	12.5	6.43	542	337	676	373	6389	586	0.984	20.9
	7.1	53.7	68.4	10572	2803	12.4	6.40	604	374	756	416	7122	651	0.982	18.6
	8.0	60.3	76.8	11770	3105	12.4	6.36	673	414	844	464	7926	721	0.979	16.6
	8.8	66.0	84.1	12808	3364	12.3	6.33	732	449	922	506	8622	781	0.977	15.2
	10.0	74.5	94.9	14320	3737	12.3	6.27	818	498	1035	566	9633	867	0.974	13.4
	12.5	91.9	117	17297	4450	12.2	6.17	988	593	1263	686	11619	1032	0.968	10.9
	14.2	103	132	19189	4890	12.1	6.09	1097	652	1411	763	12875	1134	0.963	9.67
	16.0	115	147	21079	5317	12.0	6.01	1205	709	1561	840	14124	1233	0.959	8.67
350 x 250	6.3	57.8	73.6	13203	7885	13.4	10.4	754	631	892	709	15215	1011	1.18	17.3
	7.1	64.9	82.6	14747	8796	13.4	10.3	843	704	999	794	17024	1127	1.18	15.4
	8.0	72.8	92.8	16449	9798	13.3	10.3	940	784	1118	888	19027	1254	1.18	13.7
	8.8	79.8	102	17932	10668	13.3	10.2	1025	853	1222	970	20778	1365	1.18	12.5
	10.0	90.2	115	20102	11937	13.2	10.2	1149	955	1375	1091	23354	1525	1.17	11.1
	12.5	112	142	24419	14444	13.1	10.1	1395	1156	1685	1334	28526	1842	1.17	8.97
	14.2	126	160	27200	16046	13.0	10.0	1554	1284	1887	1492	31892	2044	1.16	7.95
	16.0	141	179	30011	17654	12.9	9.93	1715	1412	2095	1655	35325	2246	1.16	7.12



Celsius® 355 EN10210: S355NH Hot finished rectangular hollow section (continued)

Size	Thickness	Mass	Sectional area	Moment of inertia		Radius of gyration		Elastic modulus		Plastic modulus		Torsional constants		Superficial area/m	Approx length /tonne
H x B	T	M	A	I_{yy}	I_{zz}	i_{yy}	i_{zz}	$W_{el,yy}$	$W_{el,zz}$	$W_{pl,yy}$	$W_{pl,zz}$	I_t	C_t	A_s	
mm	mm	kg/m	cm^2	cm^4	cm^4	cm	cm	cm^3	cm^3	cm^3	cm^3	cm^4	cm^3	m^2/m	m/t
400 x 150	6.3	52.8	67.3	13255	2851	14.0	6.51	663	380	836	418	7595	673	1.08	18.9
	7.1	59.3	75.5	14794	3166	14.0	6.47	740	422	936	467	8467	748	1.08	16.9
	8.0	66.5	84.8	16488	3509	13.9	6.43	824	468	1046	521	9424	828	1.08	15.0
	8.8	72.9	92.9	17961	3804	13.9	6.40	898	507	1143	568	10254	898	1.08	13.7
	10.0	82.4	105	20111	4227	13.8	6.35	1006	564	1285	636	11460	998	1.07	12.1
	12.5	102	130	24369	5043	13.7	6.24	1218	672	1571	772	13831	1190	1.07	9.83
	14.2	115	146	27095	5547	13.6	6.16	1355	740	1758	859	15333	1309	1.06	8.73
	16.0	128	163	29836	6038	13.5	6.09	1492	805	1948	947	16829	1426	1.06	7.81
400 x 200	6.3	57.8	73.6	15696	5376	14.6	8.55	785	538	960	594	12612	917	1.18	17.3
	7.1	64.9	82.6	17535	5989	14.6	8.51	877	599	1075	665	14096	1021	1.18	15.4
	8.0	72.8	92.8	19562	6660	14.5	8.47	978	666	1203	743	15735	1135	1.18	13.7
	8.8	79.8	102	21328	7241	14.5	8.44	1066	724	1315	811	17164	1233	1.18	12.5
	10.0	90.2	115	23914	8084	14.4	8.39	1196	808	1480	911	19259	1376	1.17	11.1
	12.5	112	142	29063	9738	14.3	8.28	1453	974	1813	1111	23438	1656	1.17	8.97
	14.2	126	160	32381	10784	14.2	8.21	1619	1078	2032	1242	26137	1834	1.16	7.95
	16.0	141	179	35738	11824	14.1	8.13	1787	1182	2256	1374	28871	2010	1.16	7.12
400 x 300	8.0	85.4	109	25709	16540	15.4	12.3	1285	1103	1517	1247	31014	1749	1.38	11.7
	8.8	93.6	119	28063	18037	15.3	12.3	1403	1202	1659	1363	33908	1906	1.38	10.7
	10.0	106	135	31521	20233	15.3	12.2	1576	1349	1870	1536	38180	2135	1.37	9.44
	12.5	131	167	38451	24611	15.2	12.1	1923	1641	2298	1884	46810	2592	1.37	7.62
	14.2	148	189	42954	27441	15.1	12.1	2148	1829	2579	2113	52472	2887	1.36	6.76
	16.0	166	211	47541	30309	15.0	12.0	2377	2021	2870	2349	58286	3184	1.36	6.04
450 x 250	8.0	85.4	109	30082	12142	16.6	10.6	1337	971	1622	1081	27083	1629	1.38	11.7
	8.8	93.6	119	32840	13229	16.6	10.5	1460	1058	1774	1182	29590	1774	1.38	10.7
	10.0	106	135	36895	14819	16.5	10.5	1640	1185	2000	1331	33284	1986	1.37	9.44
	12.5	131	167	45026	17973	16.4	10.4	2001	1438	2458	1631	40719	2406	1.37	7.62
	14.2	148	189	50315	19999	16.3	10.3	2236	1600	2759	1827	45577	2675	1.36	6.76
	16.0	166	211	55705	22041	16.2	10.2	2476	1763	3070	2029	50545	2947	1.36	6.04
500 x 200	8.0	85.4	109	34045	8135	17.7	8.65	1362	814	1707	896	21124	1430	1.38	11.7
	8.8	93.6	119	37167	8850	17.7	8.61	1487	885	1867	979	23048	1555	1.38	10.7
	10.0	106	135	41755	9891	17.6	8.56	1670	989	2105	1101	25872	1737	1.37	9.44
	12.5	131	167	50956	11938	17.5	8.45	2038	1194	2586	1346	31514	2096	1.37	7.62
	14.2	148	189	56939	13239	17.4	8.38	2278	1324	2904	1505	35166	2324	1.36	6.76
	16.0	166	211	63036	14539	17.3	8.30	2521	1454	3231	1669	38872	2552	1.36	6.04
500 x 300	8.0	97.9	125	43728	19951	18.7	12.6	1749	1330	2100	1480	42563	2203	1.58	10.2
	8.8	107	137	47784	21770	18.7	12.6	1911	1451	2300	1619	46554	2403	1.58	9.31
	10.0	122	155	53762	24439	18.6	12.6	2150	1629	2595	1826	52450	2696	1.57	8.22
	12.5	151	192	65813	29780	18.5	12.5	2633	1985	3196	2244	64389	3281	1.57	6.63
	14.2	170	217	73700	33245	18.4	12.4	2948	2216	3593	2519	72244	3660	1.56	5.87
	16.0	191	243	81783	36768	18.3	12.3	3271	2451	4005	2804	80329	4044	1.56	5.24
	20.0 #	235	300	98777	44078	18.2	12.1	3951	2939	4885	3408	97447	4842	1.55	4.25

SAW Process (single longitudinal seam weld, slightly proud)

The dimensions shown in blue are standard sizes and should be given preference
All other sizes are non-standard and therefore minimum order quantities may apply

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