

Second edition

**2023**

# MANUAL OF GEOMETRIC PROPERTIES OF EXTRUDED ALUMINIUM SECTIONS



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## **ALUQUÉBEC**

AluQuébec gather aluminium producers, processors, equipment and specialized suppliers, R&D centres as well as educational institutions associated with the industry.

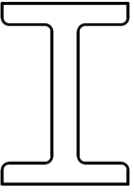
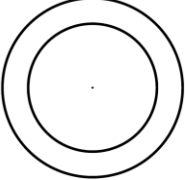
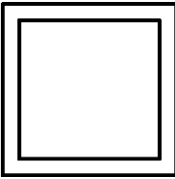
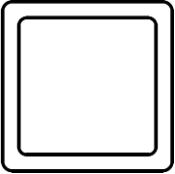
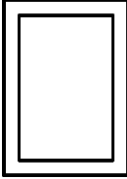
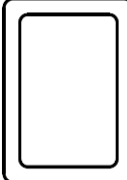



As a federative instance of the ecosystem, AluQuébec stimulates the growth and appreciation of the industry's value chain around concrete solutions to develop its full potential and increase the use of the material.

AluQuébec's role is to act as a lever for Québec's aluminium industry by ensuring the consistency and convergence of stakeholders to facilitate and encourage global and promising actions that cater to the industry's needs with beneficial repercussions in Québec all while ensuring a worldwide outreach.

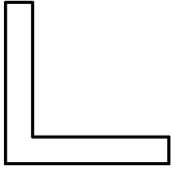
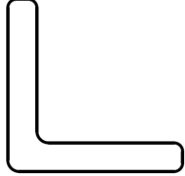
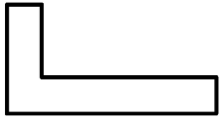
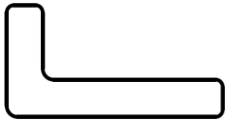
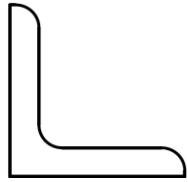
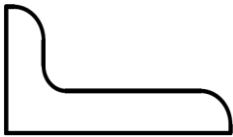
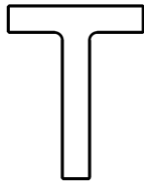
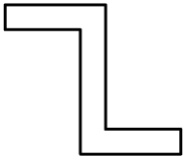
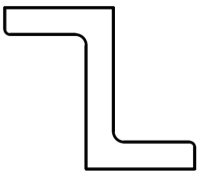
Concretely, AluQuébec collaborates with members of the industry within working groups to establish stowed projects that cater to businesses' needs. More so, AluQuébec promotes the use of aluminium and its integration into profitable sectors such as building, sustainable construction, infrastructure, bridges and footbridges, and transportation, notably by offering full technical support and training to support innovation and R&D via its Centre d'expertise et d'innovation sur l'aluminium (CeIAI).

The CeIAI's team accompanies businesses, professionals and scholars to facilitate a better use of aluminium. The CeIAI is a reference in Québec when it comes to information, training on standards, alloys, constraints, etc. The CeIAI is also a partner in the development of design and concepts that carry out innovative projects involving aluminium.

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## Definition of symbols:

$I_x$  : moment of inertia along the X-X axis

$I_y$  : moment of inertia along the Y-Y axis

$S_x$  : elastic section modulus along the X-X axis

$S_y$  : elastic section modulus along the Y-Y axis

$Z_x$  : plastic section modulus along the X-X axis

$Z_y$  : plastic section modulus along the Y-Y axis

$r_x$  : radius of gyration of a single-angled element around its geometric axis parallel to the connected branch

$r_y$  : radius of gyration around the weak axis

$x_0, y_0$  : coordinates of the shear center of the section with respect to the principal axes (angle shapes)

$x_s, y_s$  : coordinates of the shear center of the section with respect to the geometrical axes (angle shapes)

$J$  : Saint-Venant torsion constant

$C_w$  : warping torsional constant

$r_0$  : Polar radius of gyration about the shear center

$\Omega$  : cross-section property used for the calculation of the torsional-flexural buckling resistance of a single-symmetry cross-section

$\alpha$  : angle between the principal and geometrical axes of a section

$\theta$  : slope angle of structural channels sections

$\beta_w$  : section property for unequal leg angles, positive for short legs in compression and negative for long legs in compression.

If the long leg is in compression anywhere along the unbraced length of the member, the negative values of  $\beta_w$  shall be used.

## Calculation formulas :

$$r_0^2 = x_0^2 + y_0^2 + r_x^2 + r_y^2$$

$$\Omega = \frac{r_x^2 + r_y^2}{r_0^2}$$

$$\beta_w = \frac{1}{I_w} \int_A z(w^2 + z^2) dA - 2z_0$$

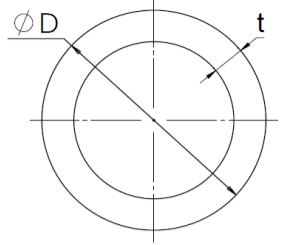
$$\text{Dead load in kN/m} : \frac{\text{masse} \cdot 9.81}{1000}$$

Remarks :

- The shapes presented in the tables below are listed in descending order relative to the extruder.
- Aluminum profiles are not standardized. Thus a standard profile can have certain differences depending on the extruder that produces it.
- For the sake of classification, the differences specific to each extruder are sometimes omitted in order to be able to list each type of profile in the same table.
- Properties were determined assuming that the material is 6061 T6 aluminum.

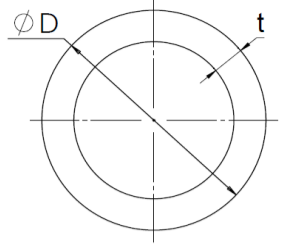


# ROUND TUBES



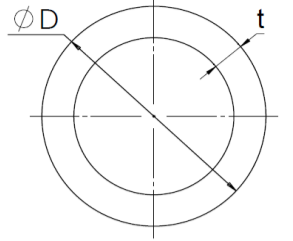
Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS D x t	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 305</b>														
x19	305	19.1	46.3	4.54E-01	17083	1.75E+02	1148	101	1555	349910	0.958	Nanshan	Lafayette	1594
x13	305	12.7	31.6	3.10E-01	11642	1.24E+02	816	103	1083	248530	0.958	Taber	Russelville	TM-07648
x9.5	305	9.53	23.9	2.34E-01	8826	9.62E+01	631	104	829	192370	0.958	Tri City Extrusion	Bristol	HD12-375
x7.9	305	7.92	20	1.96E-01	7383	8.13E+01	534	105	698	162610	0.958	Tri City Extrusion	Bristol	HD12-312
x6.4	305	6.35	16.1	1.58E-01	5948	6.62E+01	434	105	565	132340	0.958	Nanshan Tri City Extrusion	Lafayette Bristol	1257 HD12-250
<b>HSS 273</b>														
x9.5	273	9.53	21.4	2.10E-01	7877	6.84E+01	501	93.2	661	136790	0.858	Taber	Russelville	TM-13267
x5.1	273	5.08	11.6	1.14E-01	4272	3.83E+01	281	94.7	364	76629	0.858	Extrudex	Toronto	H-20787
<b>HSS 267</b>														
x19	267	19.1	40.2	3.94E-01	14806	1.14E+02	856	87.8	1169	228110	0.838	Taber	Russelville	TM-13264
x16	267	15.9	33.9	3.32E-01	12496	9.86E+01	739	88.8	999	197120	0.838	Taber	Russelville	TM-13252
x13	267	12.7	27.5	2.70E-01	10123	8.18E+01	613	89.9	819	163510	0.838	Taber	Russelville	TM-13253
x11	267	11.1	24.2	2.37E-01	8913	7.28E+01	546	90.4	725	145680	0.838	Taber	Russelville	TM-13263
x9.5	267	9.53	20.8	2.04E-01	7688	6.36E+01	477	90.9	629	127150	0.838	Taber	Russelville	TM-13254
<b>HSS 254</b>														
x13	254	12.7	26.1	2.56E-01	9617	7.01E+01	552	85.4	739	140230	0.798	Taber	Russelville	TM-07761
x9.5	254	9.53	19.8	1.94E-01	7308	5.46E+01	430	86.5	569	109240	0.798	Tri City Extrusion	Bristol	HD10-375
x7.9	254	7.92	16.6	1.63E-01	6120	4.63E+01	365	87.0	479	92638	0.798	Tri City Extrusion	Bristol	HD10-312
x6.4	254	6.35	13.4	1.31E-01	4935	3.78E+01	298	87.5	389	75632	0.798	Tri City Extrusion	Bristol	HD10-250
x5.6	254	5.56	11.8	1.16E-01	4337	3.34E+01	263	87.8	343	66876	0.798	Tri City Extrusion	Bristol	HD10-219
x4.8	254	4.78	10.1	9.90E-02	3735	2.90E+01	228	88.1	296	57948	0.798	Nanshan Tri City Extrusion	Lafayette Bristol	1598 HD10-188
x4.2	254	4.19	8.91	8.74E-02	3286	2.56E+01	202	88.3	261	51212	0.798	Tri City Extrusion	Bristol	HD10-165
x4.0	254	3.96	8.43	8.27E-02	3109	2.43E+01	191	88.4	247	48550	0.798	Tri City Extrusion	Bristol	HD10-156
<b>HSS 229</b>														
x25	229	25.4	43.9	4.31E-01	16198	8.48E+01	742	72.4	1053	169630	0.718	Nanshan	Lafayette	1465
x13	229	12.7	23.3	2.28E-01	8605	5.03E+01	440	76.4	592	100520	0.718	Nanshan	Lafayette	1635
x9.5	229	9.53	17.8	1.75E-01	6549	3.93E+01	344	77.5	457	78637	0.718	Tri City Extrusion	Bristol	HD9-375
x6.4	229	6.35	12	1.18E-01	4429	2.73E+01	239	78.6	313	54676	0.718	Tri City Extrusion	Bristol	HD9-250
x5.6	229	5.56	10.6	1.04E-01	3894	2.42E+01	212	78.8	276	48396	0.718	Tri City Extrusion	Bristol	HD9-219
x4.8	229	4.78	9.1	8.92E-02	3354	2.10E+01	184	79.1	239	41979	0.718	Tri City Extrusion	Bristol	HD9-188
x4.0	229	3.96	7.58	7.43E-02	2793	1.76E+01	154	79.4	200	35209	0.718	Tri City Extrusion	Bristol	HD9-156
<b>HSS 219</b>														
x8.2	219	8.18	14.7	1.44E-01	5570	3.28E+01	291	76.7	385	65584	0.688	Extrudex	Toronto	H-17180
x8.1	219	8.13	14.6	1.43E-01	5384	3.00E+01	274	74.6	362	59991	0.688	Taber	Russelville	TM-12799
x3.8	219	3.76	6.89	6.76E-02	2540	1.47E+01	134	76.1	174	29415	0.688	Tri City Extrusion	Bristol	2242
<b>HSS 216</b>														
x13	216	12.7	22	2.16E-01	8099	4.19E+01	388	71.9	524	83838	0.678	Nanshan	Lafayette	1631
<b>HSS 203</b>														
x19	203	19.1	29.9	2.93E-01	11009	4.71E+01	464	65.4	647	94234	0.638	Nanshan	Lafayette	1360
x13	203	12.7	20.6	2.02E-01	7593	3.46E+01	340	67.5	461	69118	0.638	Service Center Metals	Prince George	HT2020
x12	203	11.5	18.9	1.85E-01	6922	3.19E+01	314	67.9	423	63751	0.638	Extrudex	Toronto	H-16450
x9.5	203	9.53	15.7	1.54E-01	5789	2.72E+01	268	68.5	357	54362	0.638	Tri City Extrusion	Bristol	HD8-375
x7.9	203	7.92	13.2	1.29E-01	4857	2.32E+01	228	69.1	302	46324	0.638	Tri City Extrusion	Bristol	HD8-312
x7.9	203	7.87	13.1	1.28E-01	4827	2.30E+01	227	69.1	300	46062	0.638	Taber	Russelville	TM-11645
x7.1	203	7.14	12	1.18E-01	4392	2.11E+01	208	69.3	274	42214	0.638	Extrudex	Toronto	H-14304
x6.4	203	6.35	10.6	1.04E-01	3923	1.90E+01	187	69.6	246	38000	0.638	Hydro Tri City Extrusion Service Center Metals	Montreal Bristol Prince George	AH-40797 HD8-250 HT1523
x5.6	203	5.56	9.36	9.18E-02	3450	1.68E+01	166	69.9	217	33680	0.638	Extrudex Tri City Extrusion	Toronto Bristol	H-25529 HD8-219
x4.8	203	4.78	8.06	7.90E-02	2974	1.46E+01	144	70.1	188	29252	0.638	Hydro Tri City Extrusion	Montreal Bristol	AH-39439 HD8-188
x4.0	203	3.96	6.72	6.59E-02	2478	1.23E+01	121	70.4	157	24568	0.638	Tri City Extrusion	Bristol	HD8-156
x4.0	203	3.96	6.73	6.60E-02	2478	1.23E+01	121	70.4	157	24568	0.638	Hydro	Montreal	AH-40650
x3.2	203	3.18	5.41	5.31E-02	1993	9.96E+00	98	70.7	127	19916	0.638	Tower Extrusion Nanshan	Olney Lafayette	13566 1365
<b>HSS 191</b>														
x19	191	19.1	27.8	2.73E-01	10250	3.81E+01	400	61.0	561	76175	0.598	Nanshan	Lafayette	1295
x13	191	13.0	19.7	1.93E-01	7265	2.89E+01	303	63.1	412	57793	0.600	Service Center Metals Taber	Prince George Russelville	HT1759 TM-13835
x13	191	12.7	19.2	1.89E-01	7086	2.81E+01	295	63.0	402	56232	0.598	Nanshan	Lafayette	1643
<b>HSS 178</b>														
x25	178	25.4	32.9	3.23E-01	12148	3.62E+01	407	54.6	594	72421	0.559	Nanshan	Lafayette	1746
x19	178	19.1	25.7	2.52E-01	9491	3.03E+01	341	56.5	482	60593	0.559	Taber	Russelville	TM-11723
x13	178	12.7	17.8	1.75E-01	6580	2.25E+01	253	58.5	346	45059	0.559	Nanshan	Lafayette	1630
x6.4	178	6.35	9.27	9.09E-02	3417	1.26E+01	141	60.6	186	25115	0.559	Tri City Extrusion Hydro	Bristol Montreal	HD7-250 AH-60554
x5.6	178	5.56	8.15	7.99E-02	3007	1.12E+01	125	60.9	165	22298	0.559	Tri City Extrusion Hydro	Bristol Montreal	HD7-219 AH-59663
x4.8	178	4.78	7.03	6.89E-02	2593	9.70E+00	109	61.2	143	19399	0.559	Tri City Extrusion Hydro	Bristol Montreal	HD7-188 AH-56370
x4.0	178	3.96	5.86	5.75E-02	2162	8.16E+00	91.82	61.4	120	16321	0.559	Tri City Extrusion Hydro	Bristol Montreal	HD7-156 AH-40433
x3.2	178	3.18	4.72	4.63E-02	1740	6.63E+00	74.57	61.7	96.7	13253	0.559	Tri City Extrusion	Bristol	HD7-125
<b>HSS 169</b>														
x8.2	169	8.20	11.2	1.10E-01	4135	1.34E+01	158	56.8	211	26706	0.530	Nanshan	Lafayette	1207

# ROUND TUBES



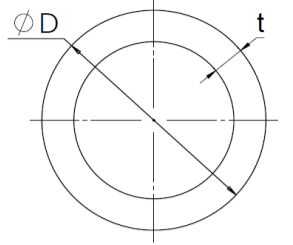
Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS D x t										J				
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 168</b>														
x11	168	11.0	14.7	1.44E-01	5417	1.68E+01	200	55.7	272	33636	0.529	Hydro Nanshan Extrudex	Montreal Lafayette	AH-47714 1217 H-21962
x7.1	168	7.11	9.76	9.57E-02	3597	1.17E+01	139	57.0	185	23377	0.529	Tri City Extrusion Hydro	Toronto, Ohio	AH-41758 2193 H-9036
x6.4	168	6.35	8.75	8.58E-02	3227	1.06E+01	126	57.3	166	21161	0.529	Tri City Extrusion	Bristol	2217
x3.4	168	3.40	4.8	4.71E-02	1761	5.98E+00	71.1	58.3	92.4	11959	0.529	Extrudex	Toronto	H-6399
x2.6	168	2.64	3.74	3.67E-02	1373	4.71E+00	55.9	58.5	72.4	9409	0.529	Extrudex	Ohio	H-5063
<b>HSS 166</b>														
x11	166	11.4	15.1	1.48E-01	5558	1.68E+01	201	54.9	274	33502	0.523	Tri City Extrusion	Bristol	2301
x3.4	166	3.40	4.81	4.72E-02	1734	5.71E+00	68.9	57.4	89.6	11415	0.521	Hydro	Montreal	AH-60053
<b>HSS 165</b>														
x13	165	12.7	16.5	1.62E-01	6074	1.77E+01	215	54.0	295	35476	0.519	Western Extrusions	Dallas	H 19123
<b>HSS 164</b>														
x4.8	164	4.78	6.46	6.34E-02	2384	7.54E+00	92	56.2	121	15072	0.515	Nanshan	Lafayette	1048
<b>HSS 153</b>														
x3.2	153	3.18	4.04	3.96E-02	1491	4.17E+00	54.6	52.9	71.0	8335	0.480	Tri City Extrusion	Bristol	2177
<b>HSS 152</b>														
x25	152	25.4	27.5	2.70E-01	10123	2.12E+01	278	45.8	414	42408	0.479	Service Center Metals Nanshan	Prince George Lafayette	HT1964 1735
x19	152	19.1	21.6	2.12E-01	7972	1.81E+01	237	47.6	341	36126	0.479	Service Center Metals	Prince George	HT1950
x13	152	12.7	15.1	1.48E-01	5568	1.37E+01	180	49.6	248	27362	0.479	Service Center Metals Nanshan	Prince George Lafayette	HT1949 1290
x8.0	152	7.95	9.77	9.58E-02	3604	9.42E+00	124	51.1	166	18837	0.479	Tri City Extrusion Hydro	Bristol	2300
x6.4	152	6.35	7.89	7.74E-02	2911	7.77E+00	102	51.7	135	15533	0.479	Tri City Extrusion Western Extrusions	Montreal Bristol Dallas	AH-07227 HD6-250 H 19118
x5.0	152	4.95	6.22	6.10E-02	2292	6.23E+00	81.8	52.1	108	12457	0.479	Service Center Metals Extrudex	Prince George Toronto, Ohio	HT1948 H-17229
x4.8	152	4.78	6	5.88E-02	2212	6.03E+00	79.1	52.2	104	12052	0.479	Tri City Extrusion Hydro	Bristol	HD6-195
x4.7	152	4.75	5.95	5.83E-02	2201	6.00E+00	78.7	52.2	103	11994	0.479	Tri City Extrusion Extrudex	Montreal Toronto, Ohio	AH-41576 HD6-188 H-23194
x4.0	152	3.96	5.01	4.91E-02	1846	5.08E+00	66.7	52.5	87.2	10163	0.479	Tri City Extrusion Tower Extrusion Hydro	Montreal Laval	MH-17235 96881
x3.4	152	3.40	4.32	4.24E-02	1592	4.41E+00	57.9	52.7	75.5	8827	0.479	Tri City Extrusion	Bristol	HD6-156 14512
x3.2	152	3.18	4.03	3.95E-02	1487	4.14E+00	54.3	52.7	70.6	8272	0.479	Tri City Extrusion Hydro	Olney Montreal	MH-16971
x3.0	152	3.05	3.87	3.80E-02	1429	3.98E+00	52.3	52.8	67.9	7961	0.479	Tri City Extrusion	Bristol	HD6-134
x2.4	152	2.36	3.02	2.96E-02	1112	3.13E+00	41	53.0	53.1	6254	0.479	Tri City Extrusion	Bristol	HD6-125
x2.1	152	2.11	2.7	2.65E-02	994	2.81E+00	36.8	53.1	47.5	5609	0.479	Tri City Extrusion	Bristol	MH-41271
x2.0	152	1.98	2.54	2.49E-02	935	2.64E+00	34.7	53.2	44.8	5285	0.479	Tri City Extrusion	Bristol	HD6-120
<b>HSS 141</b>														
x9.5	141	9.53	10.7	1.05E-01	3939	8.59E+00	122	46.7	165	17171	0.444	Metra Extruded Aluminum Corporation Hydro	Laval Belding Montreal	96543 19569 AH-49870
x6.6	141	6.55	7.49	7.35E-02	2771	6.30E+00	89.2	47.7	119	12595	0.444	Extrudex	Toronto, Ohio	H-20331
x4.7	141	4.75	5.52	5.41E-02	2035	4.74E+00	67.2	48.3	88.5	9489	0.444	Metra Hydro	Laval Montreal	96640 AH-45781
x3.4	141	3.40	4	3.92E-02	1473	3.50E+00	49.5	48.7	64.6	6998	0.444	Extrudex	Toronto, Ohio	H-17417
												Tower Extrusion Hydro	Olney Montreal	9522 AH-07185
<b>HSS 140</b>														
x19	140	19.1	19.6	1.92E-01	7213	1.34E+01	192	43.2	279	26875	0.439	Service Center Metals Nanshan	Prince George Lafayette	HT2127 1745
x13	140	12.70	13.7	1.34E-01	5062	1.03E+01	147	45.1	205	20593	0.439	Service Center Metals	Prince George	HT1947
x9.5	140	9.53	10.6	1.04E-01	3891	8.28E+00	119	46.1	161	16555	0.439	Nanshan	Lafayette	1093
x6.4	140	6.35	7.21	7.07E-02	2657	5.91E+00	82.7	47.2	113	11828	0.439	Western Extrusions	Dallas	H 19119
x4.8	140	4.78	5.6	5.49E-02	2022	4.60E+00	65.9	47.7	86.8	9204	0.439	Hydro	Montreal	MH-18292
x2.0	140	1.98	2.32	2.28E-02	856	2.03E+00	29	48.7	37.5	4056	0.439	Tri City Extrusion	Bristol	HD5.5-078
x1.6	140	1.57	1.85	1.81E-02	683	1.63E+00	23.3	48.8	30.0	3252	0.439	Tower Extrusion	Olney	7952

# ROUND TUBES



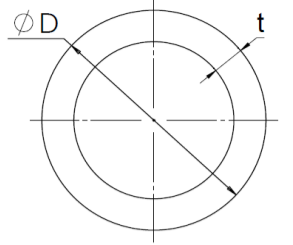
Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS D x t										J				
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 127</b>														
x13	127	12.7	12.4	1.22E-01	4556	7.52E+00	118	40.6	166	15047	0.399	Service Center Metals	Prince George	HT1946
x11	127	11.10	11	1.08E-01	4037	6.83E+00	108	41.1	149	13668	0.399	Extrudex	Ohio	H-24621
x8.0	127	7.95	8.04	7.88E-02	2966	5.27E+00	83.1	42.2	113	10547	0.399	Western Extrusions	Dallas	H 19124
x6.4	127	6.35	6.52	6.39E-02	2404	4.38E+00	69	42.7	92.4	8765	0.399	Service Center Metals	Prince George	HT1945
x6.3	127	6.27	6.45	6.33E-02	2377	4.34E+00	68.3	42.7	91.4	8675	0.399	Tri City Extrusion	Bristol	HD5-250
x6.2	127	6.22	6.43	6.31E-02	2359	4.31E+00	67.9	42.7	90.7	8615	0.399	Hydro	Montreal	AH-58721
x4.8	127	4.78	4.97	4.87E-02	1832	3.42E+00	53.9	43.2	71.3	6844	0.399	Hydro	Montreal	AH-07080
x4.7	127	4.76	4.96	4.86E-02	1832	3.42E+00	53.9	43.2	71.3	6844	0.399	Hydro	Montreal	MH-16676
x4.7	127	4.75	4.92	4.82E-02	1822	3.41E+00	53.6	43.2	70.9	6811	0.399	Extrudex	Toronto, Ohio	H-20332
x4.2	127	4.22	4.41	4.32E-02	1625	3.06E+00	48.2	43.4	63.5	6124	0.399	Taber	Russelville	OH-05304
x4.0	127	3.96	4.15	4.07E-02	1530	2.90E+00	45.6	43.5	59.9	5790	0.399	Tower Extrusion	Wylie-M	275.0
x3.2	127	3.18	3.35	3.29E-02	1234	2.36E+00	37.2	43.8	48.6	4727	0.399	Tri City Extrusion	Bristol	HD5-188
x3.0	127	3.05	3.22	3.16E-02	1186	2.28E+00	35.8	43.8	46.8	4552	0.399	Service Center Metals	Prince George	HT2122
x2.1	127	2.11	2.24	2.20E-02	826	1.61E+00	25.4	44.1	32.8	3219	0.399	Extrudex	Toronto	H-23250
<b>HSS 121</b>														
x13	121	12.7	11.7	1.15E-01	4303	6.35E+00	105	38.4	148	12694	0.379	Hydro	Montreal	AH-07083
x6.4	121	6.35	6.18	6.06E-02	2278	3.73E+00	61.8	40.5	82.9	7455	0.379	Hydro	Montreal	MH-16601
<b>HSS 119</b>														
x5.7	119	5.72	5.53	5.42E-02	2039	3.30E+00	55.2	40.2	73.8	6594	0.375	Hydro	Montreal	MH-62791
<b>HSS 115</b>														
x2.0	115	1.98	1.91	1.87E-02	703	1.12E+00	19.5	39.9	25.3	2241	0.361	Metra	Laval	96879
<b>HSS 114</b>														
x13	114	13.5	11.6	1.14E-01	4267	5.51E+00	96.5	35.9	138	11024	0.359	Tri City Extrusion	Bristol	HD5-166
x13	114	12.70	11	1.08E-01	4049	5.30E+00	92.8	36.2	132	10602	0.359	Hydro	Montreal	AH-7342
x8.6	114	8.56	7.7	7.55E-02	2841	3.99E+00	69.9	37.5	95.8	7984	0.359	Tri City Extrusion	Bristol	HD5-156
x6.4	114	6.35	5.83	5.72E-02	2151	3.14E+00	55	38.2	74.0	6282	0.359	Extrudex	Toronto	H-23595
x6.0	114	6.02	5.55	5.44E-02	2046	3.00E+00	52.6	38.3	70.5	6008	0.359	Hydro	Montreal	MH-16923
x5.9	114	5.89	5.44	5.33E-02	2005	2.95E+00	51.6	38.4	69.2	5901	0.359	Hydro	Montreal	AH-07082
x4.8	114	4.78	4.45	4.36E-02	1641	2.46E+00	43.1	38.7	57.2	4926	0.359	Nanshan	Lafayette	1047
x4.0	114	3.96	3.8	3.73E-02	1372	2.09E+00	36.6	39.0	48.2	4177	0.359	Tower Extrusion	Olney	2010
x3.2	114	3.18	3	2.94E-02	1107	1.71E+00	29.9	39.3	39.2	3417	0.359	Tri City Extrusion	Bristol	HD5-125
x3.0	114	3.05	2.89	2.83E-02	1064	1.65E+00	28.8	39.3	37.7	3292	0.359	Hydro	Montreal	AH-42248
x2.3	114	2.29	2.18	2.14E-02	804	1.26E+00	22	39.6	28.6	2519	0.359	Extrudex	Toronto	H-23550
x2.2	114	2.16	2.06	2.02E-02	760	1.19E+00	20.9	39.6	27.1	2387	0.359	Extrudex	Québec	V-15405
x2.1	114	2.11	2.01	1.97E-02	742	1.17E+00	20.4	39.7	26.5	2334	0.359	Extruded Aluminum Corporation	Belding	20616
x3.2	114	3.18	3.07	3.01E-02	1107	1.71E+00	29.9	39.3	39.2	3417	0.359	Tri City Extrusion	Bristol	1174
<b>HSS 108</b>														
x13	108	12.7	10.3	1.01E-01	3796	4.38E+00	81.1	34.0	116	8754	0.339	Bonnell	M	AE1750
x6.4	108	6.35	5.49	5.38E-02	2025	2.62E+00	48.6	36.0	65.5	5240	0.339	Extrudex	Ohio	H-20780
<b>HSS 105</b>														
x23	105	23.2	16.2	1.59E-01	5938	5.31E+00	102	29.9	158	10628	0.329	Hydro	Montreal	MH-18570
x9.5	105	9.53	7.76	7.61E-02	2847	3.26E+00	62.2	33.8	86.6	6516	0.329	Extrudex	Ohio	H-23171

# ROUND TUBES



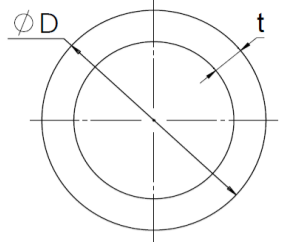
Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS D x t	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 102</b>														
x25	102	25.4	16.5	1.62E-01	6074	4.89E+00	96.3	28.4	153	9787	0.319	Service Center Metals	Prince George	HT2016
x19	102	19.1	13.4	1.31E-01	4935	4.42E+00	87.1	29.9	132	8846	0.319	Nanshan	Lafayette	1095
x13	102	12.7	9.61	9.42E-02	3543	3.57E+00	70.2	31.7	101	7136	0.319	Service Center Metals	Prince George	HT2343
x9.7	102	9.65	7.55	7.40E-02	2785	2.97E+00	58.5	32.7	81.8	5945	0.319	Service Center Metals	Prince George	HT1943
x9.5	102	9.53	7.46	7.32E-02	2752	2.94E+00	58	32.7	80.9	5890	0.319	International Extrusions	Garden City	KE10492
x8.1	102	8.08	6.41	6.29E-02	2371	2.61E+00	51.4	33.2	70.7	5217	0.319	Extrudex	Ohio	H-21379
x7.9	102	7.92	6.32	6.20E-02	2330	2.57E+00	50.6	33.2	69.6	2142	0.319	Taber	Russelville	OH-08618
x6.4	102	6.35	5.15	5.05E-02	1898	2.16E+00	42.5	33.7	57.6	4320	0.319	Service Center Metals	Prince George	HT1389
x5.7	102	5.74	4.68	4.59E-02	1727	1.99E+00	39.2	33.9	52.7	3977	0.319	Nanshan	Lafayette	1744
x5.4	102	5.41	4.43	4.34E-02	1633	1.89E+00	37.3	34.0	30.0	3786	0.319	Extrudex	Ohio	H-26324
x4.8	102	4.78	3.94	3.86E-02	1451	1.70E+00	33.5	34.3	44.7	3405	0.319	Metra	Laval	96612
x4.7	102	4.75	3.91	3.83E-02	1444	1.70E+00	33.4	34.3	44.5	3390	0.319	Hydro	Montreal	AH-07134
x4.0	102	3.96	3.29	3.23E-02	1214	1.45E+00	28.5	34.5	37.7	2895	0.319	Extrudex	Toronto, Ohio	H-11496
x3.9	102	3.94	3.36	3.30E-02	1207	1.44E+00	28.3	34.5	37.5	2879	0.319	Hydro	Montreal	H-8383
x3.8	102	3.76	3.12	3.06E-02	1154	1.38E+00	27.2	34.6	35.9	2764	0.319	Tower Extrusion	Olney	OH-05837
x3.2	102	3.18	2.66	2.61E-02	981	1.19E+00	23.4	34.8	30.7	2375	0.319	Taber	Russelville	OH-05837
x3.0	102	3.05	2.56	2.51E-02	943	1.14E+00	22.5	34.8	29.6	2289	0.319	Tri City Extrusion	Bristol	2149
x2.1	102	2.13	1.81	1.78E-02	666	8.23E-01	16.2	35.2	21.1	1646	0.319	Tri City Extrusion	Lafayette	1288
x2.1	102	2.11	1.78	1.75E-02	658	8.14E-01	16	35.2	20.8	1628	0.319	Nannex Aluminum	Leetonia	5342-H
x1.8	102	1.83	1.55	1.52E-02	573	7.12E-01	14	35.3	18.2	1424	0.319	Service Center Metals	Prince George	HT1454
x1.7	102	1.70	1.45	1.42E-02	534	6.65E-01	13.1	35.3	17.0	1330	0.319	Extrudex	Dallas	H 19611
x1.7	102	1.65	1.4	1.37E-02	518	6.46E-01	12.7	35.3	16.5	1292	0.319	Western Extrusions	Laval	96727
x1.6	102	1.60	1.36	1.33E-02	502	6.27E-01	12.3	35.3	16.0	1254	0.319	Hydro	Montreal	AH-07078
x1.3	102	1.35	1.15	1.13E-02	424	5.32E-01	10.5	35.4	13.5	1063	0.319	Metra	Laval	96650
x1.3	102	1.27	1.08	1.06E-02	400	5.03E-01	9.9	35.5	12.8	1005	0.319	Tri City Extrusion	Bristol	1185
<b>HSS 99</b>														
x1.5	98.6	1.52	1.26	1.24E-02	464	5.46E-01	11.1	34.3	14.3	1091	0.310	Extruded Aluminum Corporation	Belding	19452
<b>HSS 95</b>														
x19	95.3	19.1	12.4	1.22E-01	4556	3.51E+00	73.7	27.8	112.7	7019	0.299	Service Center Metals	Prince George	HT1167
x13	95.3	12.7	8.92	8.75E-02	3290	2.87E+00	60.2	29.5	87.1	5732	0.299	Service Center Metals	Prince George	HT1287
x8.7	95.3	8.74	6.46	6.34E-02	2372	2.24E+00	47	30.7	65.5	4479	0.299	Nanshan	Lafayette	1193
<b>HSS 94</b>														
x9.3	94.0	9.27	6.68	6.55E-02	2465	2.23E+00	47.6	30.1	66.7	4470	0.295	Extrudex	Ohio	H-891
<b>HSS 92</b>														
x17	91.9	16.9	10.8	1.06E-01	3979	2.94E+00	64	27.2	96.6	5881	0.289	Extrudex	Toronto	H-3135
<b>HSS 90</b>														
x5.0	90.0	5.00	3.63	3.56E-02	1335	1.21E+00	26.8	30.1	36.1	2416	0.283	Extrudex	Toronto	H-5299

# ROUND TUBES



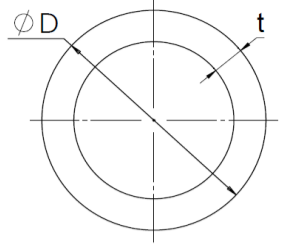
Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS D x t	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 89</b>														
x19	88.9	19.1	11.3	1.11E-01	4176	2.73E+00	61.5	25.6	95.1	5467	0.279	Service Center Metals Nanshan Extrudex	Prince George Lafayette Ohio	HT1347 1568 H-21470
x13	88.9	12.7	8.24	8.08E-02	3037	2.26E+00	20.9	27.3	74.3	4526	0.279	Service Center Metals	Prince George	HT2220
x10	88.9	10.2	6.81	6.68E-02	2511	1.98E+00	44.5	28.1	63.2	3952	0.279	Tower Extrusion	Olney	13583
x9.5	88.9	9.53	6.46	6.34E-02	2373	1.89E+00	42.6	28.3	60.2	3787	0.279	Extrudex	Ohio	H-21356
x7.6	88.9	7.62	5.25	5.15E-02	1944	1.62E+00	36.4	28.8	50.4	3235	0.279	Metra Hydro Extrudex Extrudex	Laval Montreal Toronto, Ohio Québec	96524 AH-07010 H-6857 V-14644
x6.4	88.9	6.35	4.56	4.47E-02	1645	1.41E+00	31.7	29.3	43.3	2816	0.279	Hydro	Montreal	AH-59185
x5.6	88.9	5.59	3.96	3.88E-02	1461	1.27E+00	28.6	29.5	38.8	2544	0.279	Crown Extrusions	Chaska	12586
x5.5	88.9	5.49	3.88	3.80E-02	1436	1.25E+00	28.2	29.5	38.2	2506	0.279	Metra Hydro Extrudex Hydro Extrudex	Laval Montreal Toronto, Ohio Montreal Québec	96547 AH-07076 H-2210 MH-14029 V-15307
x4.8	88.9	4.78	3.42	3.35E-02	1261	1.12E+00	25.1	29.8	33.8	2235	0.279	Taber Tri City Extrusion Western Extrusions Metra	Russelville Bristol Dallas Laval	OH-05089 2151 H 19126 999349
x4.7	88.9	4.75	3.67	3.60E-02	1254	1.11E+00	25	29.8	33.6	2225	0.279	Hydro Hydro	Montreal Montreal	AH-07022 MH-17805
x4.0	88.9	3.96	2.86	2.80E-02	1056	9.54E-01	21.5	30.0	28.6	1907	0.279	Western Extrusions Tower Extrusion	Dallas Olney	H 19041 4162
x3.9	88.9	3.91	2.89	2.83E-02	1043	9.43E-01	21.2	30.1	28.2	1886	0.279	Hydro	Montreal	MH-18794
x3.8	88.9	3.76	2.73	2.68E-02	1015	9.20E-01	20.7	30.1	27.5	1839	0.279	Extrudex	Québec	V-01815
x3.2	88.9	3.18	2.32	2.28E-02	854	7.85E-01	17.7	30.3	23.3	1570	0.279	Taber Tri City Extrusion Tower Extrusion Crown Extrusions Pennex Aluminum Bonnell Western Extrusions Metra Hydro Hydro Hydro	Russelville Bristol Olney Chaska Chaska Leetonia M Dallas Laval Montreal Montreal Montreal	OH-02999 1190 6492 13243 5779-H AE0430 H 19127 96836 AH-60676 MH-16675 AH-07075
x3.0	88.9	3.05	2.23	2.19E-02	821	7.57E-01	17	30.4	22.4	1514	0.279	Tri City Extrusion Tower Extrusion Extrudex Extrudex	Bristol Olney Toronto, Ohio Québec	1129 18675 H-16298 V-18642
x2.1	88.9	2.13	1.58	1.55E-02	581	5.46E-01	12.3	30.7	16.0	1093	0.279	Tri City Extrusion	Bristol	1130
x2.1	88.9	2.11	1.55	1.52E-02	574	5.40E-01	12.2	30.7	15.9	1081	0.279	Metra Extrudex	Laval Toronto	97047 H-8495
x1.7	88.9	1.70	1.26	1.24E-02	466	4.42E-01	9.95	30.8	12.9	885	0.279	Tri City Extrusion	Bristol	1161
<b>HSS 87</b>														
x3.9	87.2	3.91	2.77	2.72E-02	1022	8.88E-01	20.4	29.5	27.1	1775	0.274	Tri City Extrusion	Bristol	2224
<b>HSS 86</b>														
x2.3	85.7	2.29	1.62	1.59E-02	599	5.21E-01	12.2	29.5	15.9	1042	0.269	International Extrusions	Garden City	KE6942
x2.3	85.6	2.29	1.62	1.59E-02	598	5.18E-01	12.1	29.5	15.8	1037	0.269	International Extrusions	Garden City	KE11150
<b>HSS 83</b>														
x13	82.6	12.7	7.55	7.40E-02	2784	1.75E+00	42.5	25.1	62.5	3504	0.259	Service Center Metals Extrudex	Prince George Ohio	HT1318 H-26338
x11	82.6	10.7	8.5	8.34E-02	2407	1.59E+00	38.5	25.7	55.4	3174	0.259	Hydro	Montreal	AH-07002
x9.5	82.6	9.53	5.95	5.83E-02	2183	1.48E+00	35.8	26.0	51.0	2957	0.259	Extrudex	Ohio	H-26323
x6.4	82.6	6.35	4.12	4.04E-02	1519	1.11E+00	26.9	27.0	36.9	2217	0.259	Taber Nanshan Service Center Metals Extrudex Extrudex	Russelville Lafayette Prince George Toronto, Ohio Québec	OH-05691 1602 HT1386 H-20283 V-20035
x3.2	82.6	3.18	2.14	2.10E-02	791	6.23E-01	15.1	28.1	20.0	1246	0.259	Pennex Aluminum	Leetonia	5719-H
x2.5	82.6	2.54	1.73	1.70E-02	638	5.10E-01	12.4	28.3	16.2	1021	0.259	Bonnell	M	AE0174
x1.8	82.6	1.83	1.26	1.24E-02	463	3.77E-01	9.14	28.5	11.9	754	0.259	International Extrusions	Garden City	KE8372
x1.7	83.0	1.65	1.14	1.12E-02	421	3.48E-01	8.39	28.8	10.9	697	0.261	Extrudex	Québec	V-01132
x1.6	82.6	1.57	1.09	1.07E-02	400	3.28E-01	7.94	28.6	10.3	655	0.259	Extruded Aluminum Corporation	Belding	5872
x1.4	82.8	1.40	0.967	9.48E-03	357	2.95E-01	7.14	28.8	9.2	591	0.260	Metra	Laval	996567
<b>HSS 80</b>														
x4.0	80.0	3.99	2.6	2.55E-02	951	6.88E-01	17.2	26.9	23.0	1377	0.251	Extrudex	Toronto	H-5298
x2.4	80.1	2.41	1.6	1.57E-02	589	4.44E-01	11.1	27.5	14.6	889	0.252	Tower Extrusion	Olney	9841
<b>HSS 79</b>														
x3.9	79.4	3.91	2.51	2.46E-02	926	6.61E-01	16.6	26.7	22.3	1321	0.249	Tri City Extrusion	Bristol	2222
x2.8	79.4	2.77	1.81	1.78E-02	666	4.88E-01	12.3	27.1	16.2	977	0.249	Western Extrusions	Dallas	H 19132
<b>HSS 78</b>														
x7.1	77.8	7.14	4.31	4.23E-02	1582	9.96E-01	25.6	25.1	35.7	1992	0.244	Extrudex	Toronto	H-3136
<b>HSS 77</b>														
x1.6	76.9	1.57	1.01	9.90E-03	372	2.64E-01	6.87	26.6	8.93	528	0.242	Extruded Aluminum Corporation	Belding	18391

# ROUND TUBES



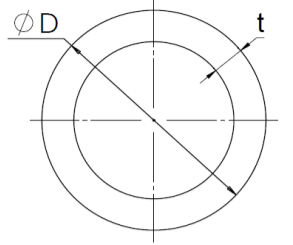
Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS D x t										J				
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 76</b>														
x19	76.2	19.1	9.27	9.09E-02	3417	1.55E+00	40.6	21.3	64.4	3097	0.239	Service Center Metals Extrudex	Prince George Ohio	HT2099 H-20159
x13	76.2	13.1	7.07	6.93E-02	2595	1.35E+00	35.3	22.8	52.8	2691	0.239	Extrudex	Ohio	H-20281
x13	76.2	12.7	6.86	6.73E-02	2531	1.33E+00	34.8	22.9	51.8	2651	0.239	Service Center Metals Nanshan Pennex Aluminum Extrudex	Prince George Lafayette Leetonia Ohio	HT1232 1135 50431 H-29334
x9.5	76.2	9.53	5.41	5.31E-02	1993	1.13E+00	29.6	23.8	42.6	2258	0.239	Service Center Metals Tower Extrusion Nanshan	Prince George Wylie-M Lafayette	HT1286 2809 1155
x8.1	76.2	8.10	4.7	4.61E-02	1732	1.02E+00	26.7	24.2	37.7	2034	0.239	Tower Extrusion	Olney	15317
x6.4	76.2	6.35	3.78	3.71E-02	1392	8.55E-01	22.4	24.8	31.0	1710	0.239	Taber Nanshan Crown Extrusions Tower Extrusion Western Extrusions Pennex Aluminum Service Center Metals Hydro Extrudex Hydro Extrudex Hydro	Russelville Lafayette Chaska Olney Dallas Leetonia Prince George Montreal Toronto, Ohio Montreal Québec Montreal	OH-05690 1462 12585 6713 H 19897 5665-H HT1186 AH-7334 H-19620 MH-58632 V-18669 MH-54992
x4.8	76.2	4.78	2.9	2.84E-02	1070	6.85E-01	18	25.3	24.4	1370	0.239	Pennex Aluminum Tri City Extrusion Western Extrusions Service Center Metals Extrudex Hydro Extrudex	Leetonia Bristol Dallas Prince George Québec Montreal Ohio	5734-H 2185 H 19128 HT1285 V-18334 AH-07003 H-19266
x4.7	76.2	4.75	2.92	2.86E-02	1065	6.82E-01	17.9	25.3	24.2	1364	0.239	Metra Hydro Extrudex	Laval Montreal Québec	97095 MH-19141 SA-05066
x3.8	76.2	3.76	2.31	2.27E-02	855	5.62E-01	14.7	25.6	19.7	1123	0.239	Taber Bonnell Tower Extrusion Wylie-M Garden City International Extrusions Pennex Aluminum Tri City Extrusion Western Extrusions Service Center Metals Metra Extrudex Hydro Extrudex	Russelville CN Wylie-M Wylie-M Leetonia Bristol Dallas Prince George Laval Toronto Montreal Québec	OH-05097 A-1922 291 8492 KE10894 5207-H 1189 H 19544 HT1276 96876 H-3842 MH-16677 V-18406
x3.0	76.2	3.05	1.9	1.86E-02	700	4.68E-01	12.3	25.9	16.3	937	0.239	Hydro	Montreal	AH-07021
x3.0	76.2	3.05	1.9	1.86E-02	700	4.68E-01	12.3	25.9	16.3	937	0.239	Tri City Extrusion	Bristol	1102
x2.8	76.2	2.82	1.76	1.73E-02	649	4.37E-01	11.5	25.9	15.2	874	0.239	Tri City Extrusion	Bristol	2161
x2.4	76.2	2.41	1.52	1.49E-02	559	3.80E-01	9.98	26.1	13.1	761	0.239	Tri City Extrusion Extrudex	Bristol Québec	2147 SA-05064
x2.3	76.2	2.29	1.44	1.41E-02	530	3.62E-01	9.51	26.1	12.5	724	0.239	Extruded Aluminum Corporation	Belding	20659
x2.1	76.2	2.13	1.34	1.31E-02	496	3.40E-01	8.93	26.2	11.7	680	0.239	Tri City Extrusion	Bristol	1101
x1.7	76.2	1.70	1.08	1.06E-02	398	2.76E-01	7.24	26.3	9.43	552	0.239	Tri City Extrusion	Bristol	1096
x1.7	76.2	1.65	1.05	1.03E-02	386	2.68E-01	7.04	26.4	9.16	536	0.239	Extrudex Bonnell Hydro	Toronto M Montreal	H-2577 AE1805 MH-43579
x1.6	76.2	1.57	1	9.81E-03	369	2.57E-01	6.74	26.4	8.76	513	0.239	Bonnell	CN	A-1267
x1.4	76.2	1.40	0.885	8.68E-03	328	2.29E-01	6.02	26.4	7.81	458	0.239	Bonnell Metra	CN Laval	A-1356 997558
x1.3	76.2	1.27	0.808	7.92E-03	299	2.09E-01	5.5	26.5	7.12	419	0.239	Metra Extrudex Hydro	Laval Toronto Montreal	97098 H-5503 MH-10841
<b>HSS 75</b>														
x3.2	74.9	3.18	1.94	1.90E-02	715	4.61E-01	12.3	25.4	16.3	921	0.235	Gateway Extrusions	Woodbridge	CES141
x1.8	74.9	1.83	1.14	1.12E-02	420	2.80E-01	7.48	25.8	9.76	560	0.235	Gateway Extrusions	Woodbridge	CES140
x1.3	74.9	1.27	0.796	7.81E-03	294	1.99E-01	5.31	26.0	6.88	398	0.235	Bonnell Gateway Extrusions	M Woodbridge	AE0852 CES139
<b>HSS 73</b>														
x5.2	73.0	5.16	2.98	2.92E-02	1098	6.35E-01	17.4	24.1	23.8	1271	0.229	Tower Extrusion Crown Extrusions	Olney Chaska	13512 1673
x2.7	73.0	2.67	1.6	1.57E-02	589	3.65E-01	9.99	24.9	13.2	729	0.229	Tower Extrusion	Olney	14573
x2.2	72.7	2.18	2.98	2.92E-02	1098	6.29E-01	17.3	23.9	23.6	1257	0.228	Extruded Aluminum Corporation	Belding	19936
x2.1	73.0	2.13	1.29	1.27E-02	475	2.98E-01	8.17	25.1	10.7	596	0.229	Tri City Extrusion	Bristol	1188
x2.0	72.5	1.98	1.19	1.17E-02	439	2.73E-01	7.52	24.9	9.84	545	0.228	Western Extrusions	Dallas	H 19334
<b>HSS 72</b>														
x1.3	72.4	1.27	0.769	7.54E-03	283	1.79E-01	4.95	25.1	6.41	358	0.227	Tower Extrusion	Olney	9840
<b>HSS 70</b>														
x4.5	70.5	4.52	2.54	2.49E-02	936	5.11E-01	14.5	23.4	19.7	1022	0.221	Tri City Extrusion	Bristol	2137
x9.5	69.9	9.53	4.89	4.80E-02	1803	8.40E-01	24.1	21.6	34.9	1680	0.219	Nanshan	Lafayette	1185
x4.8	69.9	4.78	2.64	2.59E-02	975	5.18E-01	14.8	23.1	20.2	1037	0.219	Tower Extrusion	Wylie-M	12004
x3.2	69.9	3.18	1.8	1.77E-02	664	3.70E-01	10.6	23.6	14.1	739	0.219	Pennex Aluminum Extruded Aluminum Corporation	Leetonia Belding	5208-H 21001
x2.1	69.9	2.11	1.22	1.20E-02	448	2.57E-01	7.36	23.9	9.66	514	0.219	Tower Extrusion Pennex Aluminum	Wylie-M Leetonia	1082 5691-H

# ROUND TUBES



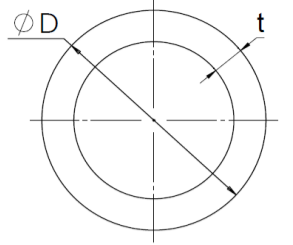
Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
										J				
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
HSS 67 x6.4	66.7	6.35	3.26	3.20E-02	1202	5.52E-01	16.6	21.4	23.2	1105	0.209	Tower Extrusion	Olney	3588
HSS 65 x1.9	64.8	1.91	1.02	1.00E-02	376	1.86E-01	5.73	22.2	7.52	371	0.203	Bonnell	M	AE5500
HSS 64 x13	63.5	12.70	5.49	5.38E-02	2025	6.93E-01	21.8	18.5	33.4	1386	0.199	Service Center Metals	Prince George	HT1259
												Service Center Metals	Prince George	HT1058
												Extruded Aluminum Corporation	Belding	1245
												Extruded Aluminum Corporation	Belding	5920
												Tower Extrusion	Olney	1660
												Pennex Aluminum	Leetonia	4971-H
												Western Extrusions	Dallas	H 19129
												Bonnell	CN	A-1921
												Western Extrusions	Dallas	H 19732
												Extruded Aluminum Corporation	Belding	5924
												Pennex Aluminum	Leetonia	5221-H
												Service Center Metals	Prince George	HT1321
												Taber	Russelville	OH-05687
												Tri City Extrusion	Bristol	1104
												Tower Extrusion	Olney	5429
												Tri City Extrusion	Bristol	1105
												Tri City Extrusion	Bristol	2146
												Crown Extrusions	Chaska	13383
												International Extrusions	Garden City	KE8373
												Tri City Extrusion	Bristol	1089
												Extruded Aluminum Corporation	Belding	21000
HSS 63 x1.5	63.0	1.50	0.784	7.69E-03	289	1.37E-01	4.34	21.7	5.66	273	0.198	Bonnell	M	AE3466
HSS 62 x9.5	61.9	9.53	4.25	4.17E-02	1566	5.55E-01	17.9	18.8	26.4	1110	0.195	Tower Extrusion	Olney	14003
												Bonnell	M	AE4837
HSS 61 x2.8	61.0	2.84	1.41	1.38E-02	519	2.19E-01	7.2	20.6	9.60	439	0.192	Tower Extrusion	Olney	15235
HSS 60 x5.5	60.3	5.54	2.58	2.53E-02	952	3.61E-01	12	19.5	16.7	721	0.190	Crown Extrusions	Chaska	1674
												Western Extrusions	Dallas	H 19086
												Western Extrusions	Dallas	H 19183
												Crown Extrusions	Chaska	1355
												Bonnell	M	AE5784
												International Extrusions	Garden City	KE8410
												Gateway Extrusions	Woodbridge	CES221
												Bonnell	C	A-1431
												Bonnell	M	AE5906
												Extruded Aluminum Corporation	Belding	3560
												Crown Extrusions	Chaska	12299
												Tower Extrusion	Olney	15322
												Western Extrusions	Dallas	H 19952
												Tri City Extrusion	Bristol	1187
HSS 59 x3.9	58.6	3.91	1.82	1.78E-02	672	2.52E-01	8.61	19.4	11.7	505	0.184	Tower Extrusion	Wylie-M	1016
HSS 58 x5.6	58.4	5.64	2.53	2.48E-02	934	3.29E-01	11.3	18.8	15.7	657	0.184	International Extrusions	Garden City	KE11695
HSS 57 x7.9	57.2	7.92	3.32	3.26E-02	1226	3.80E-01	13.3	17.6	19.4	761	0.180	Service Center Metals	Prince George	HT1394
												Tower Extrusion	Olney	8380
												Tower Extrusion	Wylie-M	2808
												International Extrusions	Garden City	KE9051
												Extruded Aluminum Corporation	Belding	5883
												Service Center Metals	Prince George	HT1450
												Bonnell	M	AE5862
												Tower Extrusion	Olney	12159
												Extruded Aluminum Corporation	Belding	20999
												Crown Extrusions	Chaska	13217
												Tri City Extrusion	Bristol	1180T
												Tri City Extrusion	Bristol	1156
												Extruded Aluminum Corporation	Belding	19453
												Bonnell	CN	A-1488
												Tri City Extrusion	Bristol	1123
												Pennex Aluminum	Leetonia	5540-H
												Tower Extrusion	Olney	4944
												Tri City Extrusion	Bristol	2145
HSS 55 x3.2	54.6	3.18	1.39	1.36E-02	513	1.70E-01	6.23	18.2	8.40	340	0.172	Western Extrusions	Dallas	H 19457
HSS 54 x9.5	54.0	9.53	3.6	3.53E-02	1329	3.43E-01	12.7	16.1	19.1	686	0.170	International Extrusions	Garden City	KE6420
												Tri City Extrusion	Bristol	2223
												Tri City Extrusion	Bristol	1122
												Bonnell	M	AE4501
												Bonnell	M	AE4910
HSS 52 x4.4	52.2	4.45	1.81	1.78E-02	667	1.92E-01	7.35	17.0	10.2	384	0.164	Extruded Aluminum Corporation	Belding	17553

# ROUND TUBES



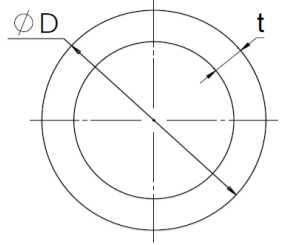
Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS D x t										J				
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 51</b>														
x13	50.8	12.7	4.12	4.04E-02	1519	3.06E-01	12	14.2	19.1	612	0.160	Service Center Metals	Prince George	HT1322
x9.5	50.8	9.53	3.35	3.29E-02	1234	2.76E-01	10.9	15.0	16.5	553	0.160	Service Center Metals	Prince George	HT1284
												International Extrusions	Garden City	KE11591
												Western Extrusions	Dallas	H 19048
x6.4	50.8	6.35	2.4	2.35E-02	886	2.23E-01	8.78	15.9	12.6	446	0.160	Pries Enterprises	Independence	4992
												Tower Extrusion	Olney	1629
												Extruded Aluminum Corporation	Belding	2693
												Nanshan	Lafayette	1286
												Pennex Aluminum	Leetonia	5303-H
												Service Center Metals	Prince George	HT1122
												Taber	Russelville	OH-05685
x5.0	50.8	4.95	1.93	1.89E-02	713	1.89E-01	7.45	16.3	10.4	378	0.160	Tower Extrusion	Olney	11004
												Western Extrusions	Dallas	H 19105
												Tower Extrusion	Olney	11620
												Tower Extrusion	Wylie-M	122
												Tower Extrusion	Wylie-M	9429
												Extruded Aluminum Corporation	Belding	23748
												Service Center Metals	Prince George	HT1330
												Bonnell	C	A-1286
												Pries Enterprises	Independence	4150
												Bonnell	CN	A-1489
												Bonnell	M	AE1158
												Crown Extrusions	Chaska	1210
												International Extrusions	Garden City	KE3974
												Extruded Aluminum Corporation	Belding	5908
												Tower Extrusion	Olney	11619
												Tower Extrusion	Wylie-M	106
												Tower Extrusion	Wylie-M	7090
												Nanshan	Lafayette	1501
												Pennex Aluminum	Leetonia	5131-H
												Service Center Metals	Prince George	HT1283
												Western Extrusions	Dallas	H 19560
												Taber	Russelville	OH-05683
x3.0	50.8	3.05	1.24	1.22E-02	457	1.31E-01	5.14	16.9	6.95	261	0.160	Tri City Extrusion	Bristol	1117
x2.8	50.8	2.77	1.13	1.11E-02	417	1.21E-01	4.75	17.0	6.38	241	0.160	Pries Enterprises	Independence	3031
x2.4	50.8	2.39	0.984	9.65E-03	363	1.06E-01	4.19	17.1	5.59	213	0.160	Extruded Aluminum Corporation	Belding	5919
												Pennex Aluminum	Leetonia	5407-H
x2.3	50.8	2.29	0.944	9.26E-03	348	1.03E-01	4.04	17.2	5.38	205	0.160	Taber	Russelville	OH-03959
x2.2	50.8	2.24	0.924	9.06E-03	341	1.01E-01	3.96	17.2	5.27	201	0.160	International Extrusions	Garden City	KE5706
												Extruded Aluminum Corporation	Belding	20511
x2.1	50.8	2.13	0.884	8.67E-03	326	9.66E-02	3.8	17.2	5.05	193	0.160	Tri City Extrusion	Bristol	1097
x2.0	50.8	2.03	0.843	8.27E-03	311	9.25E-02	3.64	17.2	4.83	185	0.160	Bonnell	C	A-1284
x2.0	50.8	1.96	0.813	7.97E-03	300	8.95E-02	3.52	17.3	4.66	179	0.160	Pennex Aluminum	Leetonia	5725-H
x1.8	50.8	1.78	0.742	7.28E-03	274	8.22E-02	3.24	17.3	4.27	164	0.160	Bonnell	M	AE3257
x1.7	50.8	1.70	0.711	6.97E-03	262	7.90E-02	3.11	17.4	4.10	158	0.160	Tri City Extrusion	Bristol	1084
x1.7	50.9	1.65	0.692	6.79E-03	255	7.75E-02	3.04	17.4	4.00	155	0.160	International Extrusions	Garden City	KE8828
												Bonnell	M	AE0584
												Crown Extrusions	Chaska	12059
												Pennex Aluminum	Leetonia	5638-H
												Western Extrusions	Dallas	H 19942
												Bonnell	N	A-1270
												Bonnell	M	AE5946
x1.6	51.4	1.57	0.668	6.55E-03	270	9.14E-02	3.4	18.4	4.47	183	0.162	Tower Extrusion	Olney	616
x1.6	50.8	1.60	0.67	6.57E-03	247	7.48E-02	2.94	17.4	3.87	150	0.160	Tri City Extrusion	Bristol	2034
x1.6	50.8	1.57	0.66	6.47E-03	243	7.37E-02	2.9	17.4	3.81	147	0.160	Bonnell	N	AE1623
x1.3	50.8	1.27	0.535	5.25E-03	197	6.05E-02	2.38	17.5	3.11	121	0.160			
<b>HSS 49</b>														
x5.3	49.3	5.26	1.97	1.93E-02	726	1.78E-01	7.24	15.7	10.2	356	0.155	Crown Extrusions	Chaska	1366
x3.4	49.2	3.43	1.34	1.31E-02	493	1.30E-01	5.27	16.2	7.19	260	0.155	Extruded Aluminum Corporation	Belding	5850
x3.3	48.6	3.25	1.26	1.24E-02	463	1.20E-01	4.92	16.1	6.70	240	0.153	Tower Extrusion	Olney	20361
x2.2	49.2	2.16	0.864	8.47E-03	319	8.83E-02	3.59	16.6	4.77	177	0.155	International Extrusions	Garden City	KE5141
x1.5	49.0	1.52	0.616	6.04E-03	227	6.42E-02	2.62	16.8	3.44	128	0.154	Extruded Aluminum Corporation	Belding	19482
<b>HSS 48</b>														
x5.1	48.3	5.08	1.87	1.83E-02	688	1.62E-01	6.74	15.4	9.50	325	0.152	International Extrusions	Garden City	KE9526
x4.8	48.3	4.83	1.78	1.75E-02	658	1.57E-01	6.5	15.4	9.13	314	0.152	Pries Enterprises	Independence	7627
x4.8	47.6	4.78	1.74	1.71E-02	642	1.49E-01	6.26	15.2	8.79	298	0.150	Tower Extrusion	Olney	2396
x4.3	48.3	4.32	1.61	1.58E-02	595	1.45E-01	6.01	15.6	8.35	290	0.152	Tower Extrusion	Olney	172
												Extruded Aluminum Corporation	Belding	3260
x3.7	48.3	3.68	1.4	1.37E-02	515	1.29E-01	5.34	15.8	7.32	257	0.152	International Extrusions	Garden City	KE8548
												Crown Extrusions	Chaska	1295
x3.5	48.3	3.51	1.34	1.31E-02	492	1.24E-01	5.14	15.9	7.02	247	0.152	Pries Enterprises	Independence	7322
x3.4	48.0	3.40	1.29	1.27E-02	476	1.19E-01	4.96	15.8	6.77	238	0.151	Western Extrusions	Dallas	H 19573
x3.2	47.6	3.18	1.2	1.18E-02	443	1.10E-01	4.61	15.7	6.27	220	0.150	Gateway Extrusions	Woodbridge	CDT-89
x2.8	48.3	2.77	1.07	1.05E-02	395	1.03E-01	4.25	16.1	5.73	205	0.152	Tower Extrusion	Olney	1740
												Tri City Extrusion	Bristol	1186
												Extruded Aluminum Corporation	Belding	18730
												Pries Enterprises	Independence	5123
x2.2	48.3	2.16	0.847	8.31E-03	312	8.31E-02	3.44	16.3	4.58	166	0.152	International Extrusions	Garden City	KE3424
x1.5	48.3	1.52	0.606	5.94E-03	224	6.10E-02	2.53	16.5	3.32	122	0.152			
x1.5	48.0	1.52	0.603	5.91E-03	222	6.00E-02	2.5	16.4	3.29	120	0.151	Bonnell	CN	A-1387

# ROUND TUBES



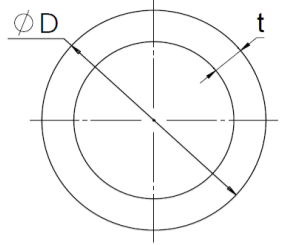
Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS D x t										J				
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 47</b>														
x5.3	46.7	5.28	1.86	1.82E-02	687	1.50E-01	6.41	14.8	9.11	300	0.147	Tower Extrusion	Olney	12049
x3.2	47.5	3.18	1.2	1.18E-02	442	1.09E-01	4.59	15.7	6.24	218	0.149	Bonnell	M	AE1624
x3.0	46.6	3.05	1.13	1.11E-02	416	9.89E-02	4.25	15.4	5.77	198	0.146	Tower Extrusion	Olney	9572
x2.0	46.8	2.03	0.774	7.59E-03	286	7.17E-02	3.06	15.8	4.07	143	0.147	Extruded Aluminum Corporation	Belding	20020
<b>HSS 46</b>														
x10	46.0	10.0	3.06	3.00E-02	1130	1.97E-01	8.55	13.2	13.3	393	0.144	Extruded Aluminum Corporation	Belding	19729
x4.9	46.2	4.93	1.73	1.70E-02	637	1.38E-01	5.96	14.7	8.41	275	0.145	Western Extrusions	Dallas	H 19264
x4.0	45.6	3.96	1.4	1.37E-02	518	1.13E-01	4.96	14.8	6.88	226	0.143	Tower Extrusion	Olney	7515
x3.9	45.9	3.91	1.4	1.37E-02	516	1.15E-01	4.99	14.9	6.91	229	0.144	Bonnell	M	AE5623
x3.6	45.7	3.56	1.28	1.26E-02	471	1.05E-01	4.6	15.0	6.33	210	0.144	International Extrusions	Garden City	KE8636
<b>HSS 45</b>														
x5.7	45.3	5.66	1.91	1.87E-02	705	1.41E-01	6.23	14.2	8.95	282	0.142	Bonnell	M	AE4860
<b>HSS 44</b>														
x13	44.5	13.5	3.55	3.48E-02	1311	1.87E-01	8.4	11.9	13.7	373	0.140	Tri City Extrusion	Bristol	1088
x8.0	44.5	7.95	2.47	2.42E-02	911	1.59E-01	7.14	13.2	10.7	317	0.140	Tri City Extrusion	Bristol	1198
x6.4	44.5	6.35	2.06	2.02E-02	759	1.41E-01	6.37	13.6	9.29	283	0.140	Tower Extrusion	Olney	8379
x4.9	43.7	4.90	1.62	1.59E-02	597	1.14E-01	5.21	13.8	7.40	228	0.137	International Extrusions	Garden City	KE9052
x3.2	44.5	3.18	1.12	1.10E-02	411	8.80E-02	3.96	14.6	5.41	176	0.140	Service Center Metals	Prince George	HT1357
x2.5	44.5	2.54	0.906	8.88E-03	334	7.35E-02	3.31	14.8	4.46	147	0.140	Bonnell	M	AE4047
x2.4	44.5	2.36	0.846	8.30E-03	312	6.92E-02	3.12	14.9	4.18	138	0.140	Pries Enterprises	Independence	582
x2.1	44.5	2.13	0.768	7.53E-03	283	6.35E-02	2.86	15.0	3.82	127	0.140	Tri City Extrusion	Bristol	1151
x2.1	44.5	2.11	0.76	7.45E-03	280	6.29E-02	2.83	15.0	3.78	126	0.140	Pennex Aluminum	Leetonia	5406-H
x2.0	44.5	2.03	0.734	7.20E-03	271	6.09E-02	2.74	15.0	3.65	122	0.140	Tower Extrusion	Olney	807
x1.7	44.5	1.70	0.619	6.07E-03	228	5.22E-02	2.35	15.1	3.11	104	0.140	Tri City Extrusion	Bristol	1120
x1.5	44.5	1.52	0.557	5.46E-03	205	4.73E-02	2.13	15.2	2.80	95	0.140	Bonnell	N	A-1015
<b>HSS 43</b>														
x5.9	42.9	5.92	1.86	1.82E-02	687	1.21E-01	5.62	13.2	8.16	241	0.135	Tower Extrusion	Olney	11714
x1.7	43.2	1.65	0.584	5.73E-03	215	4.64E-02	2.15	14.7	2.84	92.82	0.136	Bonnell	M	AE4909
<b>HSS 42</b>														
x4.9	42.2	4.85	1.54	1.51E-02	568	1.00E-01	4.76	13.3	6.78	201	0.132	Extruded Aluminum Corporation	Belding	5844
x3.6	42.2	3.56	1.17	1.15E-02	431	8.09E-02	3.84	13.7	5.31	162	0.132	International Extrusions	Garden City	KE3982
x3.4	42.2	3.36	1.17	1.15E-02	431	8.09E-02	3.84	13.7	5.31	162	0.132	Gateway Extrusions	Woodbridge	CES143
x3.4	42.2	3.35	1.11	1.09E-02	408	7.74E-02	3.67	13.8	5.05	155	0.132	Crown Extrusions	Chaska	1294
x3.3	42.0	3.33	1.09	1.07E-02	404	7.59E-02	3.62	13.7	4.98	152	0.132	Bonnell	M	AE5860
x2.3	42.2	2.29	0.776	7.61E-03	286	6.00E-02	2.7	14.1	3.63	114	0.132	Extruded Aluminum Corporation	Belding	3612
												Tower Extrusion	Olney	13296
<b>HSS 41</b>														
x6.4	41.3	6.35	1.89	1.85E-02	696	1.10E-01	5.31	12.5	7.82	219	0.130	Pennex Aluminum	Leetonia	5384-H
x3.3	41.3	3.30	1.07	1.05E-02	394	7.14E-02	3.46	13.5	4.77	143	0.130	Tower Extrusion	Olney	20362
												Tower Extrusion	Olney	7544
x3.2	41.3	3.18	1.03	1.01E-02	380	6.93E-02	3.36	13.5	4.61	139	0.130	Extruded Aluminum Corporation	Belding	1243
												Tower Extrusion	Olney	11272
x1.9	41.3	1.91	0.638	6.26E-03	235	4.57E-02	2.21	13.9	2.95	91.3	0.130	Tower Extrusion	Olney	18385
<b>HSS 40</b>														
x2.3	40.1	2.29	0.736	7.22E-03	272	4.87E-02	2.43	13.4	3.27	97.5	0.126	Crown Extrusions	Chaska	12320
<b>HSS 39</b>														
x6.0	39.1	6.05	1.7	1.67E-02	628	8.87E-02	4.54	11.9	6.68	177	0.123	Tower Extrusion	Olney	8775
x5.1	39.2	5.08	1.47	1.44E-02	544	8.08E-02	4.12	12.2	5.95	162	0.123	Extruded Aluminum Corporation	Belding	20743
x1.6	38.9	1.57	0.5	4.90E-03	184	3.21E-02	1.65	13.2	2.19	64.2	0.122	Gateway Extrusions	Woodbridge	CES015

# ROUND TUBES



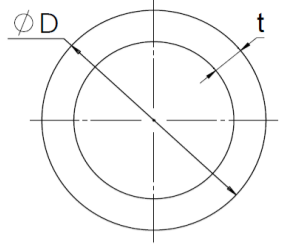
Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS D x t										J				
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 38</b>														
x6.4	38.1	6.35	1.72	1.69E-02	633	8.28E-02	4.35	11.4	6.48	166	0.120	Service Center Metals Tower Extrusion Pennex Aluminum Western Extrusions	Prince George Olney Leetonia Dallas	HT1305 1659 5701-H H 19602
x4.8	38.1	4.78	1.35	1.32E-02	499	7.07E-02	3.71	11.9	5.33	141	0.120	Tower Extrusion Pennex Aluminum Western Extrusions	Wylie-M Leetonia	2810 5167-H
x4.0	38.1	3.96	1.15	1.13E-02	425	6.26E-02	3.29	12.1	4.63	125	0.120	Tower Extrusion	Olney	5063
x3.8	38.1	3.81	1.11	1.09E-02	410	6.09E-02	3.2	12.2	4.49	122	0.120	Tower Extrusion	Olney	10994
x3.2	38.1	3.18	0.944	9.26E-03	348	5.34E-02	2.81	12.4	3.88	107	0.120	Bonnell Bonnell Extruded Aluminum Corporation Tower Extrusion Tower Extrusion Tower Extrusion International Extrusions Crown Extrusions Nanshan Pennex Aluminum Service Center Metals Western Extrusions Taber	CN M Belding Olney Wylie-M Wylie-M Garden City Chaska Lafayette Leetonia Prince George Dallas Russelville	A-1487 AE1880 20707 5833 126 8490 KE8463 1379 1637 5204-H HT1371 H 19782 OH-01033
x3.0	38.1	3.05	0.909	8.91E-03	335	5.18E-02	2.72	12.4	3.75	104	0.120	Tri City Extrusion Crown Extrusions	Bristol Chaska	2072 1680
x2.9	38.1	2.92	0.875	8.58E-03	322	5.02E-02	2.63	12.5	3.62	100	0.120	International Extrusions Bonnell	Garden City M	KE8885 AE0817
x2.9	38.1	2.87	0.861	8.44E-03	317	4.95E-02	2.6	12.5	3.56	99.0	0.120	International Extrusions	Garden City	KE10800
x2.8	38.1	2.79	0.84	8.24E-03	310	4.85E-02	2.55	12.5	3.48	97.0	0.120	Extruded Aluminum Corporation	Belding	5933
x2.8	37.8	2.84	0.847	8.31E-03	312	4.81E-02	2.54	12.4	3.49	96.2	0.119	Bonnell	M	AE3299
x2.3	38.1	2.29	0.697	6.84E-03	257	4.13E-02	2.17	12.7	2.93	82.6	0.120	Crown Extrusions Pennex Aluminum International Extrusions International Extrusions Extruded Aluminum Corporation Bonnell	Chaska Leetonia Garden City Garden City Belding M	12363 5345-H KE10493 KE5705 20192 AE3275
x2.1	38.1	2.11	0.646	6.34E-03	238	3.87E-02	2.03	12.7	2.73	77.3	0.120	Tri City Extrusion Taber	Bristol Russelville	2116 OH-07558
x2.0	38.1	2.03	0.624	6.12E-03	230	3.75E-02	1.97	12.8	2.64	75.0	0.120	Bonnell	M	AE1862
x1.8	38.1	1.83	0.565	5.54E-03	208	3.43E-02	1.8	12.8	2.40	68.6	0.120	Crown Extrusions	Chaska	1389
x1.8	38.1	1.78	0.55	5.39E-03	203	3.35E-02	1.76	12.9	2.34	66.9	0.120	Tri City Extrusion	Bristol	1121
x1.7	38.1	1.70	0.527	5.17E-03	194	3.22E-02	1.69	12.9	2.25	64.5	0.120	Tower Extrusion	Wylie-M	937
x1.7	38.1	1.65	0.512	5.02E-03	189	3.14E-02	1.65	12.9	2.19	62.8	0.120	International Extrusions Pennex Aluminum Tower Extrusion	Garden City Leetonia Olney	KE5727 5271-H 5832
x1.6	38.1	1.57	0.49	4.81E-03	181	3.01E-02	1.58	12.9	2.10	60.3	0.120	Gateway Extrusions Extruded Aluminum Corporation Bonnell	Woodbridge Belding CN	CES220 20193 A-1456
x1.3	38.3	1.35	0.423	4.15E-03	156	2.66E-02	1.39	13.1	1.84	53.3	0.120	Bonnell	M	AE5942
x1.3	38.1	1.27	0.398	3.90E-03	147	2.49E-02	1.31	13.0	1.72	49.8	0.120	International Extrusions	Garden City	KE6934
x1.2	38.1	1.24	0.39	3.82E-03	144	2.44E-02	1.28	13.0	1.69	48.9	0.120	Tri City Extrusion	Bristol	2258
<b>HSS 37</b>														
x3.2	37.5	3.18	0.927	9.09E-03	342	5.36E-02	2.7	12.2	3.74	101	0.118	Extruded Aluminum Corporation	Belding	20410
<b>HSS 36</b>														
x3.5	36.5	3.53	0.991	9.72E-03	365	5.02E-02	2.75	11.7	3.85	100	0.115	International Extrusions	Garden City	KE2862
x2.9	35.6	2.92	0.811	7.95E-03	299	4.01E-02	2.26	11.6	3.12	80.2	0.112	Tower Extrusion	Olney	10805
<b>HSS 35</b>														
x9.7	35.4	9.65	2.12	2.08E-02	781	7.39E-02	4.17	9.73	6.70	148	0.111	Tower Extrusion	Olney	386
x6.7	35.4	6.73	1.64	1.61E-02	606	6.58E-02	3.71	10.4	5.64	132	0.111	Crown Extrusions	Chaska	1604
x6.4	34.9	6.35	1.54	1.51E-02	569	6.09E-02	3.49	10.3	5.26	122	0.110	Service Center Metals	Prince George	HT1282
x4.8	34.9	4.83	1.24	1.22E-02	456	5.29E-02	3.03	10.8	4.40	106	0.110	Tri City Extrusion	Bristol	2044
x3.6	34.7	3.56	0.942	9.24E-03	347	4.25E-02	2.45	11.1	3.45	85.1	0.109	Crown Extrusions	Chaska	12528
x3.2	34.9	3.18	0.868	8.51E-03	316	4.02E-02	2.3	11.3	3.21	80.4	0.110	Pennex Aluminum	Leetonia	5380-H
x3.2	34.9	3.18	0.858	8.41E-03	316	4.02E-02	2.3	11.3	3.21	80.4	0.110	Service Center Metals	Prince George	HT1159
x1.6	34.9	1.57	0.447	4.38E-03	165	2.29E-02	1.31	11.8	1.75	45.9	0.110	Tower Extrusion	Olney	7352
x1.6	34.5	1.57	0.442	4.33E-03	163	2.22E-02	1.28	11.7	1.71	44.3	0.109	Crown Extrusions	Chaska	1312
x1.5	34.9	1.52	0.433	4.25E-03	160	2.23E-02	1.28	11.8	1.70	44.6	0.110	Taber	Russelville	OH-13437
x1.3	34.9	1.27	0.364	3.57E-03	134	1.90E-02	1.09	11.9	1.44	38.0	0.110	Crown Extrusions	Chaska	12350
x1.2	34.9	1.24	0.357	3.50E-03	132	1.87E-02	1.07	11.9	1.41	37.3	0.110	Bonnell	N	A-1467
												Bonnell	M	AE0585
<b>HSS 34</b>														
x4.1	34.4	4.06	1.05	1.03E-02	387	4.53E-02	2.63	10.8	3.76	90.7	0.108	Tower Extrusion	Olney	20429
x4.1	34.3	4.06	1.05	1.03E-02	386	4.49E-02	2.62	10.8	3.74	89.8	0.108	Nanshan	Lafayette	1121
<b>HSS 33</b>														
x9.9	32.0	9.91	1.86	1.82E-02	687	5.03E-02	3.14	8.56	5.15	101	0.101	Bonnell	M	AE3990
x7.9	33.3	7.92	1.71	1.68E-02	632	5.58E-02	3.35	9.40	5.27	112	0.105	Tri City Extrusion	Bristol	1199
x3.9	33.4	3.86	0.971	9.52E-03	358	3.97E-02	2.38	10.5	3.38	79.3	0.105	Pennex Aluminum	Leetonia	5248-H
x3.4	33.4	3.38	0.863	8.46E-03	318	3.63E-02	2.17	10.7	3.05	72.6	0.105	Gateway Extrusions International Extrusions Extruded Aluminum Corporation	Woodbridge Garden City Belding	CES142 KE4236 5909
x3.3	33.4	3.30	0.846	8.30E-03	312	3.57E-02	2.14	10.7	3.00	71.4	0.105	Bonnell	M	AE5785
x1.6	33.3	1.57	0.426	4.18E-03	157	1.98E-02	1.19	11.2	1.59	39.6	0.105	Gateway Extrusions	Woodbridge	CES014

# ROUND TUBES



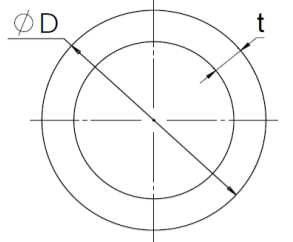
Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
										J				
HSS D x t	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 32</b>														
x6.4	31.8	6.35	1.37	1.34E-02	506	4.33E-02	2.73	9.25	4.18	86.7	0.100	Service Center Metals	Prince George	HT1355
x4.8	31.8	4.78	1.1	1.08E-02	404	3.79E-02	2.39	9.68	3.51	75.8	0.100	Pennex Aluminum Nanshan	Leetonia Lafayette	9352-H 1575
x4.6	31.8	4.57	1.06	1.04E-02	390	3.70E-02	2.33	9.74	3.40	74.0	0.100	Extruded Aluminum Corporation	Belding	19636
x3.3	31.8	3.25	0.789	7.74E-03	291	2.99E-02	1.88	10.14	2.65	59.7	0.100	Extruded Aluminum Corporation	Belding	17198
x3.2	31.8	3.18	0.772	7.57E-03	285	2.94E-02	1.85	10.16	2.60	58.8	0.100	Taber Nanshan Gateway Extrusions Extruded Aluminum Corporation Crown Extrusions Pennex Aluminum Western Extrusions Bonnell	Russelville Lafayette Woodbridge Belding Chaska Leetonia Dallas M	OH-10064 1391 CES188 20298 1883 5355-H H 19851 AE5082
x3.0	31.8	3.05	0.745	7.31E-03	275	2.86E-02	1.8	10.20	2.52	57.1	0.100	Tri City Extrusion Tower Extrusion	Bristol Olney	2142 8929
x2.9	31.8	2.92	0.717	7.03E-03	264	2.77E-02	1.75	10.24	2.43	55.4	0.100	International Extrusions	Garden City	KE8883
x2.8	31.8	2.77	0.683	6.70E-03	252	2.67E-02	1.68	10.29	2.33	53.3	0.100	Tower Extrusion	Olney	4865
x2.4	31.8	2.39	0.597	5.85E-03	220	2.38E-02	1.5	10.41	2.06	47.7	0.100	Extruded Aluminum Corporation	Belding	5698
x2.4	31.8	2.36	0.591	5.80E-03	218	2.36E-02	1.49	10.42	2.04	47.3	0.100	Bonnell	N	A-1019
x2.3	31.8	2.29	0.573	5.62E-03	211	2.31E-02	1.45	10.44	1.99	46.1	0.100	Crown Extrusions	Chaska	12255
x2.2	31.8	2.16	0.544	5.33E-03	201	2.20E-02	1.39	10.48	1.89	44.1	0.100	International Extrusions	Garden City	KE8565
x2.1	31.8	2.11	0.532	5.22E-03	196	2.16E-02	1.36	10.50	1.85	43.3	0.100	Pennex Aluminum Bonnell	Leetonia M	5679-H AE4932
x2.0	31.8	2.03	0.514	5.04E-03	190	2.10E-02	1.32	10.53	1.79	42.0	0.100	Extruded Aluminum Corporation	Belding	5882
x1.8	31.8	1.75	0.447	4.38E-03	165	1.86E-02	0.117	10.62	1.58	37.2	0.100	Taber Bonnell	Russelville M	OH-08292 AE3498
x1.7	31.8	1.65	0.423	4.15E-03	156	1.77E-02	1.11	10.65	1.49	35.4	0.100	Pennex Aluminum Tower Extrusion Bonnell	Leetonia Wylie-M CN	9803-H 1207 A-1458
x1.6	31.8	1.60	0.411	4.03E-03	151	1.72E-02	1.09	10.67	1.45	34.5	0.100	Pennex Aluminum Gateway Extrusions Tri City Extrusion	Leetonia Woodbridge Bristol	8875-H CES158 2060
x1.6	31.8	1.57	0.404	3.96E-03	149	1.70E-02	1.07	10.68	1.43	34.0	0.100	Pries Enterprises Crown Extrusions Tower Extrusion	Independence Chaska Wylie-M	290 12254 3571
x1.3	31.8	1.27	0.329	3.23E-03	121	1.41E-02	0.889	10.78	1.18	28.2	0.100	International Extrusions	Garden City	KE10833
x1.3	31.8	1.27	0.329	3.23E-03	121	1.41E-02	0.889	10.78	1.18	28.2	0.100	Tower Extrusion	Wylie-M	4901
x1.2	32.0	1.19	0.313	3.07E-03	115	1.37E-02	0.856	10.90	1.13	27.4	0.101	International Extrusions	Garden City	KE10833
x1.2	31.8	1.24	0.323	3.17E-03	119	1.39E-02	0.874	10.79	1.16	27.7	0.100	Bonnell	M CN	AE5152 A-1016
<b>HSS 31</b>														
x3.8	31.1	3.81	0.885	8.68E-03	326	3.10E-02	1.99	9.74	2.85	62.0	0.098	Tower Extrusion	Olney	15441
x2.9	31.1	2.87	0.69	6.77E-03	254	2.56E-02	1.65	10.03	2.29	51.2	0.098	Tower Extrusion	Olney	9668
<b>HSS 30</b>														
x4.9	30.1	4.93	1.06	1.04E-02	390	3.22E-02	2.13	9.08	3.17	64.3	0.095	International Extrusions	Garden City	KE6580
x4.2	30.5	4.24	0.947	9.29E-03	349	3.08E-02	2.02	9.39	2.94	61.6	0.096	Tower Extrusion	Olney	7491
x2.4	30.5	2.41	0.576	5.65E-03	213	2.11E-02	1.38	9.95	1.90	42.1	0.096	Tower Extrusion	Wylie-M	4901
x1.6	29.9	1.57	0.38	3.73E-03	140	1.41E-02	0.944	10.04	1.27	28.3	0.094	Gateway Extrusions	Woodbridge	CES013
x1.5	29.6	1.52	0.364	3.57E-03	134	1.32E-02	0.895	9.93	1.20	26.5	0.093	Crown Extrusions	Chaska	1597
<b>HSS 29</b>														
x6.6	28.6	6.58	1.23	1.21E-02	454	2.89E-02	2.09	8.11	3.27	59.8	0.090	Bonnell	M	AE0272
x5.6	28.6	5.64	1.1	1.08E-02	406	2.83E-02	1.98	8.35	3.02	56.5	0.090	Bonnell	N	A-1010
x3.2	28.6	3.18	0.686	6.73E-03	253	2.07E-02	1.45	9.05	2.06	41.4	0.090	Extruded Aluminum Corporation Western Extrusions	Belding Dallas	5921 H 19176
x2.4	28.6	2.39	0.532	5.22E-03	196	1.69E-02	1.19	9.29	1.64	33.9	0.090	Extruded Aluminum Corporation	Belding	20795
x2.1	28.6	2.11	0.475	4.66E-03	175	1.54E-02	1.08	9.38	1.48	30.8	0.090	International Extrusions	Garden City	KE5372
x1.4	29.2	1.40	0.331	3.25E-03	122	1.18E-02	0.809	9.84	1.08	23.6	0.092	Tower Extrusion	Olney	2504
<b>HSS 27</b>														
x6.4	27.0	6.38	1.12	1.10E-02	413	2.40E-02	1.78	7.63	2.79	48.0	0.085	Bonnell	M	AE3999
x5.0	27.0	4.98	0.932	9.14E-03	344	2.18E-02	1.62	7.97	2.45	43.7	0.085	International Extrusions	Garden City	KE6927
x3.1	26.7	3.12	0.626	6.14E-03	231	1.63E-02	1.22	8.39	1.74	32.5	0.084	Bonnell	M	AE5783
x2.9	26.7	2.87	0.581	5.70E-03	214	1.54E-02	1.15	8.47	1.63	30.8	0.084	International Extrusions	Garden City	KE8838
x2.7	26.7	2.72	0.554	5.43E-03	204	1.48E-02	1.11	8.52	1.56	29.6	0.084	Extruded Aluminum Corporation	Belding	1197
x2.5	26.7	2.46	0.508	4.98E-03	187	1.38E-02	1.04	8.60	1.45	27.7	0.084	Bonnell	M	AE5905
<b>HSS 26</b>														
x7.2	25.5	7.19	1.12	1.10E-02	414	2.00E-02	1.57	6.96	2.54	40.1	0.080	International Extrusions	Garden City	KE7700
x3.3	25.8	3.30	0.632	6.20E-03	233	1.50E-02	1.16	8.03	1.68	30.0	0.081	Tri City Extrusion	Bristol	1029R

# ROUND TUBES



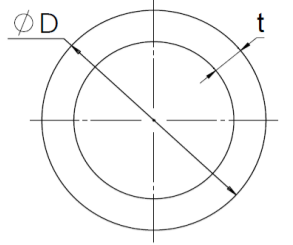
Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS D x t										J				
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 25</b>														
x9.4	25.4	9.40	1.28	1.26E-02	472	2.03E-02	1.6	6.56	2.68	40.6	0.080	Bonnell	M	AE4657
x8.6	25.4	8.61	1.23	1.21E-02	454	2.02E-02	1.59	6.67	2.64	40.3	0.080	Gateway Extrusions	Woodbridge	CES219
												Service Center Metals	Prince George	HT1281
												International Extrusions	Garden City	KE6455
x6.4	25.4	6.35	1.03	1.01E-02	380	1.91E-02	1.51	7.10	2.39	38.2	0.080	Pennex Aluminum	Leetonia	5702-H
												Taber	Russelville	OH-10058
x6.0	25.4	5.97	0.987	9.68E-03	364	1.88E-02	1.48	7.18	2.32	37.6	0.080	Tri City Extrusion	Bristol	1196
x4.8	25.4	4.78	0.838	8.22E-03	309	1.73E-02	1.36	7.48	2.06	34.6	0.080	Pennex Aluminum	Leetonia	5609-H
x4.7	25.4	4.75	0.835	8.19E-03	308	1.73E-02	1.36	7.49	2.06	34.5	0.080	Tower Extrusion	Olney	7493
												Tower Extrusion	Olney	10701
												Bonnell	M	AE1502
												Pennex Aluminum	Leetonia	5265-H
												Crown Extrusions	Chaska	1833
												International Extrusions	Garden City	KE1457
												Extruded Aluminum Corporation	Belding	5842
												Tower Extrusion	Olney	11621
x3.2	25.4	3.18	0.601	5.89E-03	221	1.39E-02	1.1	7.93	1.58	27.9	0.080	Tower Extrusion	Wylie-M	121
												Tower Extrusion	Wylie-M	9430
												Tri City Extrusion	Bristol	10291
												Bonnell	CN	A-1484
												Service Center Metals	Prince George	HT1280
												Western Extrusions	Dallas	H 19765
												Taber	Russelville	OH-07700
x3.0	25.4	3.05	0.58	5.69E-03	214	1.36E-02	1.07	7.97	1.53	27.2	0.080	Pries Enterprises	Independence	2060
x2.9	25.4	2.92	0.559	5.48E-03	206	1.32E-02	1.04	8.01	1.48	26.4	0.080	Gateway Extrusions	Woodbridge	CES156
x2.5	25.4	2.54	0.494	4.84E-03	182	1.20E-02	0.948	8.13	1.33	24.1	0.080	International Extrusions	Garden City	KE8884
x2.4	25.4	2.36	0.463	4.54E-03	171	1.14E-02	0.901	8.18	1.26	22.9	0.080	International Extrusions	Garden City	KE0354
x2.3	25.4	2.29	0.45	4.41E-03	166	1.12E-02	0.88	8.21	1.22	22.3	0.080	Extruded Aluminum Corporation	Belding	5776
x2.2	25.4	2.16	0.427	4.19E-03	157	1.07E-02	0.844	8.25	1.17	21.4	0.080	Pennex Aluminum	Leetonia	5456-H
x2.1	25.4	2.11	0.418	4.10E-03	154	1.05E-02	0.829	8.26	1.15	21.0	0.080	Bonnell	CN	A-1265
												Pennex Aluminum	Leetonia	5256-H
x2.0	25.4	2.03	0.404	3.96E-03	149	1.02E-02	0.806	8.29	1.11	20.5	0.080	Tri City Extrusion	Bristol	2108
												International Extrusions	Garden City	KE9687
												Taber	Russelville	OH-01173
x1.9	25.4	1.91	0.381	3.74E-03	140	9.75E-03	0.768	9.33	1.05	19.5	0.080	Crown Extrusions	Chaska	1257
x1.9	25.4	1.85	0.372	3.65E-03	137	9.54E-03	0.752	9.35	1.03	19.1	0.080	Bonnell	M	AE3851
x1.8	25.4	1.83	0.367	3.60E-03	135	9.44E-03	0.744	9.35	1.02	18.9	0.080	Gateway Extrusions	Woodbridge	US146
x1.8	25.4	1.78	0.357	3.50E-03	132	9.24E-03	0.727	9.37	0.992	18.5	0.080	Bonnell	M	AE1853
												Bonnell	CN	A-1464
x1.7	25.4	1.65	0.334	3.28E-03	123	8.71E-03	0.686	8.41	0.931	17.4	0.080	Extruded Aluminum Corporation	Belding	5857
												Crown Extrusions	Chaska	12428
												Pennex Aluminum	Leetonia	5211-H
												Pries Enterprises	Independence	1445
x1.7	25.3	1.65	0.332	3.26E-03	122	8.57E-03	0.678	8.37	0.921	17.1	0.079	Tower Extrusion	Olney	9669
x1.6	25.4	1.60	0.324	3.18E-03	120	8.49E-03	0.669	8.43	0.906	17.0	0.080	Tri City Extrusion	Bristol	1095
x1.6	25.4	1.57	0.319	3.13E-03	118	8.38E-03	0.66	8.44	0.894	16.8	0.080	Bonnell	N	WLB-186
												Tower Extrusion	Olney	2280
												Tower Extrusion	Wylie-M	1483
x1.5	25.4	1.52	0.31	3.04E-03	114	8.16E-03	0.643	8.45	0.869	16.3	0.080	Pennex Aluminum	Leetonia	9767-H
x1.5	25.4	1.52	0.31	3.04E-03	114	8.16E-03	0.643	8.45	0.869	16.3	0.080	Taber	Russelville	OH-01015
x1.5	25.4	1.47	0.3	2.94E-03	111	7.94E-03	0.625	8.47	0.843	15.9	0.080	Crown Extrusions	Chaska	1358
x1.4	25.4	1.45	0.295	2.89E-03	109	7.82E-03	0.616	8.48	0.830	15.7	0.080	Bonnell	M	AE3319
x1.4	25.4	1.40	0.285	2.79E-03	105	7.60E-03	0.598	8.50	0.805	15.2	0.080	International Extrusions	Garden City	KE12320
												Pennex Aluminum	Leetonia	4209-H
x1.3	25.4	1.27	0.261	2.56E-03	96.2	7.01E-03	0.552	8.54	0.739	14.0	0.080	Extruded Aluminum Corporation	Belding	5617
												Bonnell	CN	A-1463
x1.3	25.2	1.27	0.259	2.54E-03	95.4	6.84E-03	0.543	8.47	0.727	13.7	0.079	International Extrusions	Garden City	KE4828
<b>HSS 24</b>														
x5.6	24.0	5.61	0.879	8.62E-03	324	1.50E-02	1.25	6.79	1.95	29.9	0.075	Bonnell	M	AE4000
x2.7	23.9	2.67	0.481	4.72E-03	178	1.01E-02	0.849	7.55	1.20	20.3	0.075	Tri City Extrusion	Bristol	1179
x2.7	23.6	2.67	0.476	4.67E-03	175	9.77E-03	0.828	7.46	1.18	19.5	0.074	Bonnell	M	AE0722
x2.4	23.8	2.41	0.439	4.31E-03	162	9.37E-03	0.787	7.61	1.11	18.7	0.075	Tri City Extrusion	Bristol	1119
x2.1	23.8	2.11	0.39	3.82E-03	144	8.54E-03	0.717	7.71	0.996	17.1	0.075	International Extrusions	Garden City	KE12310
x2.0	23.8	2.03	0.377	3.70E-03	139	8.31E-03	0.698	7.73	0.966	16.6	0.075	Gateway Extrusions	Woodbridge	US193
x1.7	23.8	1.65	0.311	3.05E-03	115	7.07E-03	0.594	7.85	0.810	14.1	0.075	Extruded Aluminum Corporation	Belding	18082
<b>HSS 23</b>														
x3.6	23.2	3.61	0.602	5.90E-03	222	1.10E-02	0.949	7.05	1.40	22.0	0.073	Bonnell	M	AE5969
x4.9	22.9	4.90	0.749	7.35E-03	276	1.20E-02	1.05	6.58	1.62	23.9	0.072	International Extrusions	Garden City	KE7662

# ROUND TUBES



Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
										J				
HSS D x t	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 22</b>														
x9.1	22.2	9.14	1.02	1.00E-02	375	1.19E-02	1.07	5.64	1.82	23.9	0.070	Bonnell	M	AE0982
x3.6	22.1	3.63	0.571	5.60E-03	210	9.31E-03	0.843	6.65	1.25	18.6	0.069	International Extrusions	Garden City	KE6796
x3.4	22.2	3.40	0.545	5.34E-03	201	9.18E-03	0.827	6.76	1.22	18.4	0.070	Gateway Extrusions	Woodbridge	CES150
												Western Extrusions	Dallas	H 19708
x3.2	22.2	3.18	0.515	5.05E-03	190	8.84E-03	0.796	6.82	1.16	17.7	0.070	International Extrusions	Garden City	KE8460
												Tri City Extrusion	Bristol	1009
												Bonnell	M	AE1948
x2.5	21.6	2.54	0.412	4.04E-03	152	7.00E-03	0.649	6.79	0.926	14.0	0.068	Western Extrusions	Dallas	H 19452
x2.4	22.2	2.41	0.407	3.99E-03	150	7.46E-03	0.672	7.05	0.950	14.9	0.070	Western Extrusions	Dallas	H 19463
x2.1	22.2	2.11	0.361	3.54E-03	133	6.80E-03	0.612	7.15	0.855	13.6	0.070	Bonnell	M	AE3047
												Crown Extrusions	Chaska	13044
x2.0	22.2	2.03	0.349	3.42E-03	129	6.62E-03	0.596	7.17	0.830	13.2	0.070	Gateway Extrusions	Woodbridge	CES149
x1.8	22.2	1.78	0.309	3.03E-03	114	6.00E-03	0.54	7.25	0.744	12.0	0.070	Bonnell	M	AE2298
												Bonnell	CN	A-1352
x1.7	22.2	1.65	0.289	2.83E-03	107	5.67E-03	0.51	7.29	0.699	11.3	0.070	Pries Enterprises	Independence	2092
												Pries Enterprises	Independence	5808
x1.7	22.1	1.65	0.287	2.81E-03	106	5.57E-03	0.504	7.25	0.691	11.1	0.069	Tower Extrusion	Olney	5787
x1.7	22.0	1.65	0.286	2.80E-03	105	5.48E-03	0.499	7.21	0.684	11.0	0.069	International Extrusions	Garden City	KE11733
x1.6	22.2	1.60	0.281	2.76E-03	104	5.53E-03	0.498	7.31	0.681	11.1	0.070	Western Extrusions	Dallas	H 19545
x1.6	22.2	1.57	0.277	2.72E-03	102	5.47E-03	0.492	7.32	0.672	10.9	0.070	Tower Extrusion	Olney	1310
x1.5	22.2	1.47	0.26	2.55E-03	95.9	5.19E-03	0.467	7.35	0.634	10.4	0.070	Extruded Aluminum Corporation	Belding	20135
x1.5	22.2	1.47	0.26	2.55E-03	95.8	5.17E-03	0.466	7.34	0.633	10.3	0.070	Bonnell	N	BCN-400
x1.3	22.2	1.27	0.227	2.23E-03	83.5	4.60E-03	0.414	7.42	0.557	9.19	0.070	Crown Extrusions	Chaska	1364
x1.2	22.2	1.24	0.222	2.18E-03	81.9	4.52E-03	0.407	7.43	0.548	9.00	0.070	Bonnell	CN	A-1462
<b>HSS 21</b>														
x3.8	21.4	3.76	0.564	5.53E-03	208	8.44E-03	0.789	6.37	1.18	16.9	0.067	Tower Extrusion	Olney	11900
x4.7	20.6	4.75	0.642	6.30E-03	237	8.11E-03	0.787	5.86	1.23	16.2	0.065	Extruded Aluminum Corporation	Belding	20344
x4.0	21.3	3.96	0.586	5.75E-03	216	8.57E-03	0.803	6.30	1.21	17.1	0.067	Tri City Extrusion	Bristol	2283
x2.8	21.3	2.77	0.438	4.30E-03	161	7.10E-03	0.666	6.63	0.960	14.2	0.067	Extruded Aluminum Corporation	Belding	5754
x1.7	20.6	1.65	0.267	2.62E-03	98.3	4.45E-03	0.432	6.73	0.595	8.91	0.065	Extruded Aluminum Corporation	Belding	18081
<b>HSS 20</b>														
x3.6	20.2	3.61	0.51	5.00E-03	188	6.78E-03	0.671	6.01	1.01	13.6	0.064	Bonnell	M	AE5968
x2.4	19.6	2.41	0.352	3.45E-03	130	4.86E-03	0.497	6.12	0.713	9.72	0.061	Bonnell	M	AE0563
x1.0	20.0	0.99	0.16	1.57E-03	59	2.67E-03	0.267	6.72	0.357	5.34	0.063	Bonnell	M	AE5151
<b>HSS 19</b>														
x6.1	19.1	6.15	0.675	6.62E-03	249	6.35E-03	0.667	5.05	1.10	12.7	0.060	Gateway Extrusions	Woodbridge	CES218
x5.3	19.1	5.28	0.619	6.07E-03	228	6.20E-03	0.651	5.21	1.05	12.4	0.060	Tower Extrusion	Olney	6355
												Tri City Extrusion	Bristol	1153
x4.8	19.1	4.78	0.58	5.69E-03	214	6.05E-03	0.636	5.32	1.01	12.1	0.060	Bonnell	N	A-1378
x4.5	19.1	4.46	0.563	5.52E-03	208	5.98E-03	0.628	5.37	0.989	12.0	0.060	Crown Extrusions	Chaska	1578
x4.4	19.1	4.45	0.553	5.42E-03	204	5.93E-03	0.623	5.39	0.976	11.9	0.060	Bonnell	M	AE0574
x3.8	19.1	3.81	0.494	4.84E-03	182	5.62E-03	0.59	5.55	0.902	11.2	0.060	Extruded Aluminum Corporation	Belding	20094
												Western Extrusions	Dallas	H 19719
x3.2	19.1	3.18	0.429	4.21E-03	158	5.18E-03	0.544	5.72	0.810	10.4	0.060	Crown Extrusions	Chaska	12458
												Pennex Aluminum	Leetonia	5752-H
												Bonnell	M	AE3397
x3.0	19.1	3.05	0.415	4.07E-03	153	5.07E-03	0.533	5.76	0.789	10.1	0.060	Tower Extrusion	Olney	12790
x2.9	19.1	2.92	0.401	3.93E-03	148	4.96E-03	0.521	5.79	0.767	9.92	0.060	International Extrusions	Garden City	KE7456
												Extruded Aluminum Corporation	Belding	21008
x2.8	19.1	2.84	0.392	3.84E-03	145	4.89E-03	0.514	5.81	0.754	9.78	0.060	Bonnell	N	A-1281
x2.8	19.1	2.79	0.387	3.80E-03	143	4.84E-03	0.508	5.83	0.744	9.68	0.060	Extruded Aluminum Corporation	Belding	20117
x2.2	19.1	2.18	0.314	3.08E-03	114	4.14E-03	0.435	6.02	0.618	8.35	0.060	Bonnell	M	AE4315
x2.2	19.1	2.16	0.31	3.04E-03	114	4.14E-03	0.435	6.02	0.618	8.29	0.060	Extruded Aluminum Corporation	Belding	17352
												Bonnell	N	A-1457
x2.1	19.1	2.11	0.304	2.98E-03	112	4.08E-03	0.428	6.03	0.607	8.16	0.060	Pennex Aluminum	Leetonia	5349-H
x1.9	19.1	1.91	0.278	2.73E-03	103	3.81E-03	0.4	6.10	0.561	7.62	0.060	Pennex Aluminum	Leetonia	5731-H
												Bonnell	CN	A-1465
												Bonnell	M	AE1492
x1.7	19.1	1.65	0.245	2.40E-03	90.1	3.44E-03	0.361	6.18	0.501	6.88	0.060	Crown Extrusions	Chaska	1442
												Pennex Aluminum	Leetonia	5232-H
												Western Extrusions	Dallas	H 19577
x1.7	18.7	1.70	0.246	2.41E-03	90.8	3.31E-03	0.354	6.03	0.492	6.61	0.059	International Extrusions	Garden City	KE10272
x1.6	19.1	1.57	0.234	2.29E-03	86.4	3.32E-03	0.349	6.20	0.481	6.64	0.060	Pries Enterprises	Independence	1372
												Tri City Extrusion	Bristol	1103
												Pries Enterprises	Independence	5807
x1.6	19.1	1.57	0.22	2.16E-03	81.3	3.16E-03	0.332	6.23	0.455	6.31	0.060	Tower Extrusion	Olney	4154
x1.6	19.0	1.60	0.237	2.32E-03	87.2	3.16E-03	0.35	6.17	0.484	6.63	0.060	International Extrusions	Garden City	KE11031
x1.5	19.1	1.52	0.227	2.23E-03	83.8	3.24E-03	0.34	6.22	0.469	6.48	0.060	Tower Extrusion	Wylie-M	196
												Tri City Extrusion	Bristol	2141
x1.4	19.1	1.40	0.21	2.06E-03	77.4	3.03E-03	0.318	6.26	0.436	6.06	0.060	Extruded Aluminum Corporation	Belding	5851
												International Extrusions	Garden City	KE5308
x1.3	19.1	1.27	0.192	1.88E-03	70.9	2.81E-03	0.295	6.30	0.402	5.62	0.060	International Extrusions	Garden City	KE11275
												Bonnell	CN	A-1461
x0.81	19.1	0.81	0.127	1.25E-03	46.6	1.95E-03	0.204	6.47	0.272	3.90	0.060	Bonnell	M	AE0586
<b>HSS 18</b>														
x4.6	18.2	4.62	0.536	5.26E-03	198	5.10E-03	0.559	5.08	0.888	10.20	0.057	Extruded Aluminum Corporation	Belding	21005
x1.9	18.2	1.91	0.264	2.59E-03	97.2	3.25E-03	0.358	5.78	0.505	6.50	0.057	Western Extrusions	Dallas	H 19561
<b>HSS 17</b>														
x4.6	17.1	4.62	0.493	4.83E-03	182	4.04E-03	0.472	4.72	0.757	8.04	0.054	Pries Enterprises	Independence	1671
x2.3	16.9	2.31	0.287	2.81E-03	106	2.88E-03	0.341	5.22	0.495	5.76	0.053	Bonnell	N	A-1429

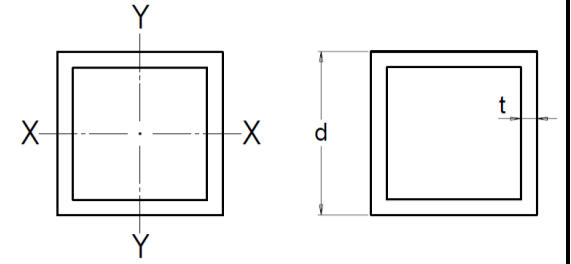
# ROUND TUBES



Designation	Dimension (D)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS D x t										J				
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 16</b>														
x3.9	15.9	3.91	0.398	3.90E-03	147	2.91E-03	0.366	4.45	0.579	5.81	0.050	Extruded Aluminum Corporation	Belding	21007
x3.7	15.9	3.68	0.382	3.75E-03	141	2.85E-03	0.36	4.50	0.563	5.71	0.050	Crown Extrusions	Chaska	1262
x3.2	15.9	3.18	0.343	3.36E-03	127	2.71E-03	0.341	4.63	0.522	5.42	0.050	Tower Extrusion	Olney	7494
x2.5	15.9	2.54	0.288	2.82E-03	106	2.45E-03	0.308	4.80	0.456	4.89	0.050	Gateway Extrusions	Woodbridge	CES157
x2.1	15.9	2.11	0.247	2.42E-03	91.1	2.21E-03	0.278	4.92	0.402	4.41	0.050	Pennex Aluminum	Leetonia	5291-H
x1.7	15.9	1.65	0.2	1.96E-03	73.7	1.89E-03	0.238	5.06	0.335	3.77	0.050	Bonnell	CN	A-1466
x1.5	15.9	1.47	0.181	1.78E-03	66.6	1.74E-03	0.22	5.12	0.306	3.49	0.050	Tower Extrusion	Olney	4153
x1.0	15.9	1.02	0.128	1.26E-03	47.4	1.31E-03	0.165	5.26	0.224	2.62	0.050	Tower Extrusion	Olney	10477
<b>HSS 14</b>														
x2.7	14.3	2.74	0.27	2.65E-03	99.5	1.75E-03	0.245	4.20	0.373	3.51	0.045	Bonnell	M	AE5099
x2.2	13.7	2.24	0.218	2.14E-03	80.5	1.38E-03	0.201	4.13	0.298	2.75	0.043	Gateway Extrusions	Woodbridge	CES148
<b>HSS 13</b>														
x3.0	12.7	2.97	0.246	2.41E-03	90.7	1.17E-03	0.185	3.59	0.290	2.34	0.040	Tower Extrusion Pries Enterprises	Olney Independance	13482 3317
x2.4	12.7	2.44	0.213	2.09E-03	78.5	1.09E-03	0.172	3.73	0.261	2.18	0.040	Extruded Aluminum Corporation	Belding	21006
x1.7	12.7	1.65	0.155	1.52E-03	57.2	8.92E-04	0.141	3.95	0.203	1.78	0.040	Pries Enterprises	Independance	2726
<b>HSS 11</b>														
x2.1	11.1	2.11	0.162	1.59E-03	59.7	6.39E-04	0.115	3.27	0.174	1.28	0.035	Tri City Extrusion	Bristol	2225

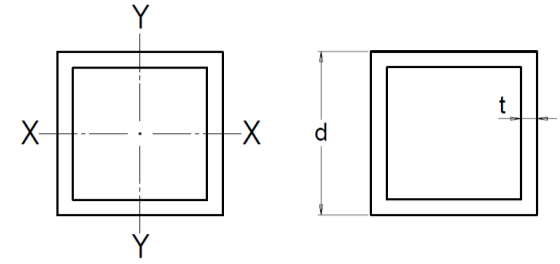


# SQUARE TUBES (SHARP CORNERS)



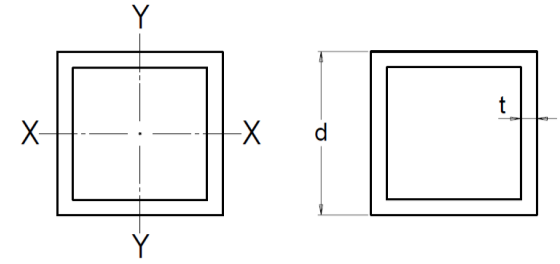
Designation	Dimension (d)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS d x t										J				
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
HSS 92 x6.4	92.1	6.35	5.97	5.85E-02	2177	2.68	58.25	35.1	70.1	4158	0.368	Hydro	Montreal	MH-54929
HSS 89 x6.4	88.9	6.35	5.69	5.58E-02	2097	2.4	53.89	33.8	65	3719	0.356	Service Center Metals	Prince George	HSQ1368
HSS 89 x3.2	88.9	3.18	2.94	2.88E-02	1089	1.34	30.04	35.0	35	2039	0.356	Nanshan Metra	Lafayette Laval	1577 95933
HSS 76 x13	76.2	12.7	8.75	8.58E-02	3226	2.25	59.18	26.4	77.8	3639	0.305	Nanshan	Lafayette	1576
HSS 76 x9.5	76.2	9.52	6.89	6.76E-02	2540	1.92	50.41	27.5	63.9	3050	0.305	Service Center Metals Nanshan Extrudex	Prince George Lafayette Québec	HSQ1003 1258 SA-05274
HSS 76 x6.4	76.2	6.35	4.81	4.72E-02	1774	1.45	38.18	28.6	46.6	2270	0.305	Hydro Service Center Metals Pennex Aluminum Crown Extrusions Nanshan Western Extrusions Taber Bonnell Extrudex Hydro Extrudex	Montreal Prince George Leetonia Chaska Lafayette Dallas Russelville C Toronto, Ohio Montreal Québec	AH-07211 HSQ0408 5334-H 12109 1131 H 19303 OH-08890 A-7027 H-6856 MH-39952 SA-05278
HSS 76 x5.6	76.2	5.56	4.26	4.18E-02	1572	1.32	34.52	28.9	41.7	2043	0.305	Bonnell Hydro	Montreal CN	A-7036 AH-07210
HSS 76 x4.8	76.2	4.78	3.7	3.63E-02	1364	1.17	30.58	29.2	36.6	1802	0.305	Service Center Metals Pennex Aluminum Taber Extrudex Hydro	Montreal Prince George Leetonia Russelville Toronto, Ohio Montreal	HSQ1165 5333-H OH-06022 H-24939 MH-16355
HSS 76 x4.8	76.2	4.75	3.68	3.61E-02	1358	1.16	30.45	29.2	36.4	1793	0.305	Bonnell Extrudex	N Québec	A-1414 V-14322
HSS 76 x4.0	76.2	3.96	3.11	3.05E-02	1145	0.999	26.21	29.5	31	1537	0.305	Service Center Metals Taber	Prince George Russelville	HSQ1103 OH-01180
HSS 76 x3.2	76.2	3.18	2.52	2.47E-02	927	0.826	21.68	29.8	25.4	1265	0.305	Pennex Aluminum Crown Extrusions Nanshan Service Center Metals Western Extrusions Bonnell Extrudex Metra Hydro Extrudex	Leetonia Chaska Lafayette Prince George Dallas CN Toronto, Ohio Laval Montreal Québec	5329-H 1354 1224 HSQ0326 H 19280 A-7033 H-5200 94192 MH-15194 SA-05273
HSS 76 x2.4	76.2	2.39	1.91	1.87E-02	705	0.641	16.82	30.2	19.5	977	0.305	Hydro	Montreal	MH-10699
HSS 76 x2.3	76.2	2.29	1.83	1.79E-02	676	0.616	16.17	30.2	18.7	938	0.305	Pennex Aluminum	Leetonia	5581-H
HSS 76 x2.0	76.2	1.98	1.6	1.57E-02	588	0.54	14.18	30.3	16.4	822	0.305	Bonnell	CN	A-1496
HSS 67 x3.2	66.675	3.18	2.19	2.15E-02	808	0.544	16.32	25.9	19.2	834	0.267	Extrudex	St-Nicolas	H-9847
HSS 64 x6.4	63.5	6.35	3.94	3.86E-02	1452	0.8	25.20	23.5	31.2	1257	0.254	Extrudex Service Center Metals Nanshan Pennex Aluminum Bonnell	St-Nicolas Prince George Lafayette Leetonia C	H-24875 HSQ1114 1130 5773-H A-1920
HSS 64 x4.8	63.5	4.78	3.04	2.98E-02	1122	0.649	20.44	24.1	24.8	1009	0.254	Extrudex Bonnell Nanshan Pennex Aluminum	St-Nicolas C Lafayette Leetonia	H-27087 A-7059 1129 5268-H
HSS 64 x3.2	63.5	3.18	2.08	2.04E-02	766	0.466	14.68	24.7	17.3	716	0.254	Extrudex Bonnell Crown Extrusions Nanshan Pennex Aluminum Service Center Metals	St-Nicolas CN Chaska Lafayette Leetonia Prince George	H-7218 A-7015 1353 1237 4720-H HSQ0444
HSS 64 x1.9	63.5	1.9	1.23	1.21E-02	468	0.296	9.32	25.1	10.8	453	0.254	Extrudex	St-Nicolas	H-20640
HSS 61 x6.4	61.2	6.35	3.78	3.71E-02	1393	0.708	23.13	22.5	28.8	1114	0.245	Extruded Aluminum Corporation	Belding	19506
HSS 57 x4.8	57.2	4.78	2.71	2.66E-02	1000	0.461	16.14	21.5	19.7	720	0.229	Pennex Aluminum	Leetonia	5666-H
HSS 57 x3.1	57.2	3.05	1.79	1.76E-02	660	0.323	11.30	22.1	13.4	497	0.229	Pennex Aluminum	Leetonia	5247-H
HSS 55 x1.6	55.372	1.57	0.922	9.04E-03	338	0.163	5.89	22.0	6.84	249	0.221	Extrudex	St-Nicolas	H-8730
HSS 54 x3.2	54.0	3.18	1.75	1.72E-02	646	0.279	10.32	20.8	12.3	430	0.216	Pennex Aluminum	Leetonia	13784-H

# SQUARE TUBES (SHARP CORNERS)



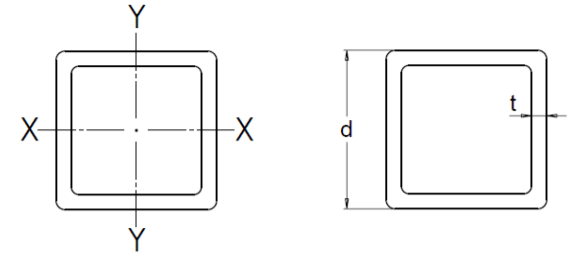
Designation	Dimension (d)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS d x t	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	J	m <sup>2</sup>			
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 51</b>														
x6.4	50.8	6.35	3.06	3.00E-02	1129	0.379	14.94	18.3	18.9	603	0.203	Bonnell Pennex Aluminum Crown Extrusions Nanshan Service Center Metals Western Extrusions Taber Extrudex	C Leetonia Chaska Lafayette Prince George Dallas Russelville St-Nicolas	A-7028 5565-H 12475 1109 HSQ0422 H 19326 OH-13262 H-17072
x4.8	50.8	4.78	2.38	2.33E-02	879	0.314	12.35	18.9	15.2	492	0.203	Taber Nanshan Pennex Aluminum Service Center Metals Extrudex	Russelville Lafayette Leetonia Prince George St-Nicolas	OH-15046 1366 5359-H HSQ0622 H-18426
x3.2	50.8	3.18	1.64	1.61E-02	605	0.23	9.04	19.5	10.8	355	0.203	Bonnell Pennex Aluminum Extruded Aluminum Corporation Crown Extrusions Nanshan Service Center Metals Western Extrusions Taber Extrudex	CN Leetonia Belding Chaska Lafayette Prince George Dallas Russelville St-Nicolas	A-7024 5152-H 5878 1352 1222 HSQ0325 H 19598 OH-01453 H-22327
x3.2	50.5	3.18	1.63	1.60E-02	602	0.226	8.94	19.4	10.7	350	0.202	Pries Enterprises	Independance	812
x3.1	50.8	3.05	1.58	1.55E-02	583	0.222	8.74	19.5	10.4	343	0.203	Extrudex	St-Nicolas	H-2270
x2.7	50.8	2.67	1.39	1.36E-02	513	0.199	7.83	19.7	9.28	306	0.203	Bonnell	N	A-1934
x2.4	50.8	2.41	1.27	1.25E-02	466	0.183	7.20	19.8	8.48	281	0.203	Extrudex	St-Nicolas	H-7217
x2.4	50.8	2.39	1.25	1.23E-02	462	0.181	7.13	19.8	8.40	278	0.203	Pennex Aluminum	Leetonia	5501-H
x2.4	50.8	2.36	1.24	1.22E-02	458	0.179	7.06	19.8	8.32	275	0.203	Extrudex Bonnell	St-Nicolas CN	H-23646 A-1480
x2.3	50.8	2.29	1.2	1.18E-02	444	0.174	6.87	19.8	8.08	267	0.203	Western Extrusions	Dallas	H 19301
x1.7	50.8	1.65	0.88	8.63E-03	325	0.131	5.15	20.1	5.98	200	0.203	Western Extrusions	Dallas	H 19550
x1.6	50.8	1.57	0.841	8.25E-03	310	0.125	4.94	20.1	5.73	191	0.203	Taber	Russelville	OH-15026
x1.5	50.8	1.52	0.817	8.01E-03	300	0.121	4.76	20.1	5.55	185	0.203	Extrudex	St-Nicolas	H-20641
<b>HSS 45</b>														
x2.2	45.085	2.16	1.01	9.90E-03	371	0.114	5.06	17.5	5.97	175	0.180	Extrudex	St-Nicolas	H-3154
<b>HSS 44</b>														
x3.2	44.5	3.18	1.42	1.39E-02	524	0.15	6.74	16.9	8.13	232	0.178	Western Extrusions Crown Extrusions Pennex Aluminum Service Center Metals	Dallas Chaska Leetonia Prince George	H 19302 1291 5139-H HSQ0324
x3.1	44.45	3.05	1.37	1.34E-02	505	0.145	6.52	16.9	7.85	225	0.178	Bonnell Extrudex	CN St-Nicolas	A-7034 H-2585
x2.4	44.5	2.39	1.09	1.07E-02	402	0.119	5.35	17.2	6.34	183	0.178	Extrudex Bonnell	St-Nicolas CN	H-7216 A-7039
x2.4	44.45	2.36	1.08	1.06E-02	397	0.118	5.31	17.2	6.28	181	0.178	Extrudex	St-Nicolas	H-25661
x1.6	44.5	1.57	0.732	7.18E-03	270	8.29E-02	3.73	17.5	4.34	127	0.178	Extrudex Bonnell	St-Nicolas CN	H-17559 A-1931
<b>HSS 41</b>														
x2.5	41.275	2.54	1.07	1.05E-02	394	9.88E-02	4.79	15.8	5.72	153	0.165	Extrudex	St-Nicolas	H-20639
<b>HSS 38</b>														
x6.4	38.1	6.35	2.19	2.15E-02	806	0.141	7.40	13.2	9.73	227	0.152	Pennex Aluminum Service Center Metals Extrudex	Leetonia Prince George St-Nicolas	5751-H HSQ1317 H-25464
x4.8	38.1	4.78	1.73	1.70E-02	637	0.12	6.30	13.7	8.01	191	0.152	Extrudex	St-Nicolas	H-22212
x3.2	38.1	3.18	1.2	1.18E-02	444	9.09E-02	4.77	14.3	5.83	142	0.152	Pries Enterprises Pennex Aluminum Extruded Aluminum Corporation Nanshan Service Center Metals Bonnell Taber	Independance Leetonia Belding Lafayette Prince George CN	1293 5056-H 5879 1128 HSQ0323 A-1438
x3.1	38.1	3.05	1.16	1.14E-02	428	8.82E-02	4.63	14.4	5.63	137	0.152	Extrudex Crown Extrusions	Russelville St-Nicolas Chaska	OH-02792 H-2179 1683
x2.4	38.1	2.41	0.938	9.20E-03	344	7.34E-02	3.85	14.6	4.62	114	0.152	Extrudex Pennex Aluminum	St-Nicolas Leetonia	H-7215 5676-H
x2.4	38.1	2.36	0.919	9.01E-03	337	7.21E-02	3.78	14.6	4.53	112	0.152	Extrudex Western Extrusions	St-Nicolas Dallas	H-23648 H 19148
x1.9	38.1	1.9	0.75	7.35E-03	275	6.03E-02	3.17	14.8	3.75	93	0.152	Extrudex	St-Nicolas	H-9367
x1.8	38.1	1.78	0.703	6.89E-03	259	5.70E-02	2.99	14.8	3.52	87	0.152	Extrudex	St-Nicolas	H-18396
x1.7	38.1	1.65	0.653	6.40E-03	241	5.34E-02	2.80	14.9	3.29	82	0.152	Taber	Russelville	OH-03893
x1.6	38.1	1.6	0.634	6.22E-03	234	5.20E-02	2.73	14.9	3.20	80	0.152	Pennex Aluminum	Leetonia	421-H
x1.6	38.1	1.57	0.624	6.12E-03	230	5.13E-02	2.69	14.9	3.15	78	0.152	Western Extrusions Extrudex	Dallas St-Nicolas	H 19623 H-23647
x1.3	38.1	1.27	0.507	4.97E-03	187	4.23E-02	2.22	15.0	2.59	65	0.152	Extrudex Bonnell Pennex Aluminum	St-Nicolas CN Leetonia	H-2322 A-1402 5151-H

# SQUARE TUBES (SHARP CORNERS)



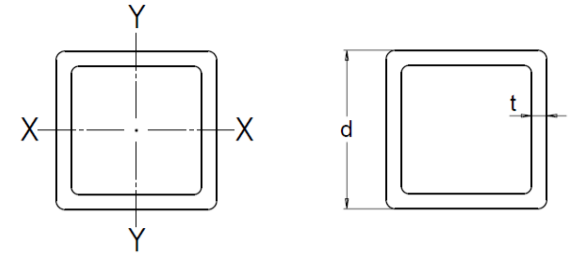
Designation	Dimension (d)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS d x t	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	J	m <sup>2</sup>			
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 32</b>														
x6.4	31.8	6.35	1.75	1.72E-02	645	7.37E-02	4.64	10.7	6.27	120	0.127	Pennex Aluminum	Leetonia	5772-H
												Pries Enterprises	Independence	3675
												Pennex Aluminum	Leetonia	5164-H
												Extruded Aluminum Corporation	Belding	5899
x3.2	31.8	3.18	0.984	9.65E-03	363	5.00E-02	3.15	11.7	3.90	79	0.127	Crown Extrusions	Chaska	1218
												Nanshan	Lafayette	1344
												Service Center Metals	Prince George	HSQ0322
												Western Extrusions	Dallas	H 19607
												Bonnell	CN	A-1481
												Taber	Russelville	OH-02977
												Extrudex	St-Nicolas	H-8195
x3.2	31.75	3.18	0.987	9.68E-03	363	5.01E-02	3.16	11.7	2.59	65	0.127	Extrudex	St-Nicolas	H-6868
x3.1	31.75	3.05	0.952	9.34E-03	350	4.86E-02	3.06	11.8	3.78	76	0.127	Extrudex	St-Nicolas	H-3325
x2.4	31.8	2.36	0.753	7.38E-03	278	4.02E-02	2.53	12.0	3.07	63	0.127	Western Extrusions	Dallas	H 19149
x2.0	31.8	1.98	0.64	6.28E-03	236	3.50E-02	2.20	12.2	2.64	54	0.127	Pennex Aluminum	Leetonia	5146-H
x1.7	31.8	1.65	0.539	5.29E-03	199	3.01E-02	1.90	12.3	2.25	46	0.127	Extruded Aluminum Corporation	Belding	20480
x1.6	31.8	1.6	0.523	5.13E-03	193	2.93E-02	1.85	12.3	2.18	45	0.127	Pennex Aluminum	Leetonia	1961-H
<b>HSS 29</b>														
x3.2	28.6	3.18	0.875	8.58E-03	323	3.52E-02	2.47	10.5	3.09	56	0.114	Extruded Aluminum Corporation	Belding	5934
<b>HSS 25</b>														
x3.2	25.4	3.18	0.766	7.51E-03	282	2.37E-02	1.87	9.2	2.37	38	0.102	Pries Enterprises	Independence	1190
												Service Center Metals	Prince George	HSQ0321
												Extruded Aluminum Corporation	Belding	5903
												Crown Extrusions	Chaska	1212
												Nanshan	Lafayette	1122
												Pennex Aluminum	Leetonia	5096-H
												Western Extrusions	Dallas	H 19620
												Bonnell	CN	A-1474
												Taber	Russelville	OH-02791
x3.2	25.273	3.18	0.764	7.49E-03	281	2.33E-02	1.84	9.1	2.34	37	0.101	Extrudex	St-Nicolas	H-6869
x3.1	25.4	3.05	0.741	7.27E-03	273	2.31E-02	1.82	9.2	2.30	37	0.102	Extrudex	St-Nicolas	H-4237
												Crown Extrusions	Chaska	1922
x2.4	25.4	2.41	0.604	5.92E-03	222	1.97E-02	1.55	9.4	1.92	31	0.102	Extrudex	St-Nicolas	H-2439
x2.4	25.4	2.36	0.59	5.79E-03	218	1.95E-02	1.53	9.5	1.89	30	0.102	Bonnell	C	A-1940
x2.3	25.4	2.29	0.576	5.65E-03	212	1.90E-02	1.50	9.5	1.84	30	0.102	Extrudex	St-Nicolas	H-9376
												Taber	Russelville	OH-13979
x2.0	25.4	2.03	0.515	5.05E-03	190	1.74E-02	1.37	9.6	1.67	27	0.102	Pennex Aluminum	Leetonia	5310-H
x1.8	25.4	1.78	0.456	4.47E-03	168	1.57E-02	1.24	9.7	1.49	24	0.102	Extruded Aluminum Corporation	Belding	5900
x1.7	25.4	1.65	0.425	4.17E-03	157	1.48E-02	1.17	9.7	1.40	23	0.102	Taber	Russelville	OH-12383
x1.6	25.4	1.6	0.413	4.05E-03	152	1.44E-02	1.14	9.7	1.36	22	0.102	Crown Extrusions	Chaska	1216
												Pennex Aluminum	Leetonia	4289-H
x1.6	25.4	1.57	0.407	3.99E-03	150	1.43E-02	1.12	9.7	1.34	22	0.102	Extrudex	St-Nicolas	H-18984
												Bonnell	CN	A-1473
												Pries Enterprises	Independence	849
x1.3	25.4	1.27	0.332	3.26E-03	123	1.19E-02	0.94	9.9	1.11	18	0.102	Western Extrusions	Dallas	H 19549
												Bonnell	CN	A-1403
x1.0	25.4	1.02	0.269	2.64E-03	99.1	9.84E-03	0.77	10.0	0.907	15	0.102	Bonnell	C	A-1522
<b>HSS 22</b>														
x2.4	22.2	2.39	0.514	5.04E-03	189	1.26E-02	1.13	8.2	1.42	20	0.089	Bonnell	N	A-1482
<b>HSS 19</b>														
x3.2	19.1	3.18	0.547	5.36E-03	202	8.81E-03	0.92	6.6	1.22	14	0.076	Bonnell	CN	A-1498
												Pennex Aluminum	Leetonia	5123-H
												Service Center Metals	Prince George	HSQ1202
												Taber	Russelville	OH-02790
												Extrudex	St-Nicolas	H-26849
												Extrudex	St-Nicolas	H-6859
x3.1	19.05	3.05	0.299	2.93E-03	195	8.63E-03	0.91	6.7	1.18	14	0.076	Extrudex	St-Nicolas	H-17510
x1.6	19.1	1.6	0.303	2.97E-03	112	5.72E-03	0.60	7.2	0.733	9	0.076	Pennex Aluminum	Leetonia	5219-H
												Extrudex	St-Nicolas	H-5140
												Pries Enterprises	Independence	2208
x1.6	19.1	1.57	0.299	2.93E-03	110	5.65E-03	0.59	7.2	0.723	9	0.076	Extruded Aluminum Corporation	Belding	5691
												Western Extrusions	Dallas	H 19521
												Bonnell	CN	A-1475
												Taber	Russelville	OH-12506
x1.5	19.1	1.52	0.29	2.84E-03	107	5.51E-03	0.58	7.2	0.704	9	0.076	Crown Extrusions	Chaska	1229
<b>HSS 16</b>														
x1.6	15.9	1.6	0.248	2.43E-03	91.4	3.14E-03	0.40	5.9	0.491	5	0.064	Pennex Aluminum	Leetonia	5145-H
x1.6	15.9	1.57	0.244	2.39E-03	90.1	3.11E-03	0.39	5.9	0.485	5	0.064	Bonnell	N	A-1468
x1.3	15.875	1.27	0.202	1.98E-03	74.2	2.66E-03	0.34	6.0	0.407	4	0.064	Crown Extrusions	Chaska	12244
												Extrudex	St-Nicolas	H-22243
<b>HSS 13</b>														
x1.6	12.7	1.6	0.193	1.89E-03	71	1.49E-03	0.23	4.6	0.298	2	0.051	Pennex Aluminum	Leetonia	5040-H
x1.6	12.7	1.57	0.19	1.86E-03	70.1	1.49E-03	0.23	4.6	0.294	2	0.051	Bonnell	CN	A-1478
x1.3	12.7	1.27	0.157	1.54E-03	58.1	1.28E-03	0.20	4.7	0.250	2	0.051	Crown Extrusions	Chaska	1350
												Bonnell	CN	A-1470

# SQUARE TUBES (ROUNDED CORNERS)



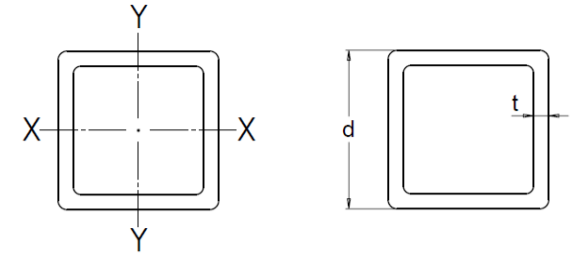
Designation HSS d x t	Dimension (d)	Thickness (t)	Mass kg/m	Dead Load kN/m	Area mm <sup>2</sup>	I 10 <sup>8</sup> mm <sup>4</sup>	S 10 <sup>3</sup> mm <sup>3</sup>	r mm	Z 10 <sup>3</sup> mm <sup>3</sup>	Torsional Constant	Surface Area per meter of length m <sup>2</sup>	Extruder	Location	Manufacturer Identification Number
										J 10 <sup>3</sup> mm <sup>4</sup>				
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 254</b>														
x9.5	254	9.52	25.3	2.48E-01	9315	92.7	730	99.8	854	144160	1.000	Western Extrusions	Dallas	H 19035
x6.4	254	6.35	17	1.67E-01	6282	64.2	506	101	583	97760	1.011	Bonnell	C	WLB-573
<b>HSS 203</b>														
x13	203	12.7	26.3	2.58E-01	9684	58.8	579	77.9	693	91151	0.810	Taber	Russelville	TM-12766
x13	203	12.7	25.5	2.50E-01	9400	56.1	552	77.2	665	90725	0.780	Western Extrusions	Dallas	H 19039
x9.5	203	9.52	20	1.96E-01	7388	46.3	456	79.2	537	71259	0.811	Taber	Russelville	TM-12726
x5.6	203	5.59	12	1.18E-01	4408	28.7	282	80.7	327	43768	0.807	Bonnell	C	WLB-546
x4.8	203	4.78	10.3	1.01E-01	3790	24.9	245	80	282	37988	0.807	Western Extrusions	Dallas	H 19100
<b>HSS 171</b>														
x4.8	171	4.78	8.63	8.46E-02	3184	14.8	172	68.1	199	22439	0.685	Tri City Extrusion	Bristol	2325
<b>HSS 168</b>														
x6.4	168	6.35	5.14	5.04E-02	1895	7.04	92.3	60.9	106	10670	0.609	Tri City Extrusion	Bristol	2292
<b>HSS 152</b>														
x13	152	12.7	1.92	1.88E-02	7097	23.2	305	57.2	372	36741	0.599	Western Extrusions	Dallas	H 19038
x6.4	152	6.35	10.1	9.90E-02	3710	13.2	173	59.7	203	20220	0.609	Tri City Extrusion	Bristol	2028
x6.4	152	6.35	10.1	9.90E-02	3710	13.1	172	59.4	202	21014	0.588	Tri City Extrusion	Bristol	2117
x6.4	152	6.35	10.3	1.01E-01	3571	12.5	164	59.1	193	19796	0.588	Hydro	Montreal	AH-56068
x4.8	152	4.78	7.81	7.66E-02	2681	9.5	125	59.5	146	14895	0.588	Hydro	Montreal	AH-56067
x4.8	152	4.78	7.65	7.50E-02	2820	10.3	135	60.3	156	15618	0.609	Tri City Extrusion	Bristol	2323
x4.8	152	4.78	7.65	7.50E-02	2820	10.2	133	60	155	16275	0.588	Tri City Extrusion	Bristol	2118
x4.8	152	4.78	7.65	7.50E-02	2820	10.2	134	60.3	156	15737	0.604	Western Extrusions	Dallas	H 19098
x4.8	152	4.78	7.67	7.52E-02	2826	10.3	135	60.3	157	15741	0.607	Bonnell	C	A-7062
x4.6	152	4.57	7.31	7.17E-02	2695	9.81	129	60.3	149	5006	0.604	Bonnell	C	WLB-593
x4.6	152	4.57	7.33	7.19E-02	2704	9.83	129	60.3	150	15295	0.599	Bonnell	C	WLB-590
x3.8	152	3.81	6.12	6.00E-02	2256	8.29	109	60.6	126	12666	0.604	Bonnell	C	WLB-605
x3.2	152	3.18	5.14	5.04E-02	1895	7.04	92.3	60.9	106	10681	0.608	Gateway Extrusions	Woodbridge	EA117
x3.2	152	3.18	5.14	5.04E-02	1895	7.04	92.3	60.9	106	10670	0.609	Tri City Extrusion	Bristol	2292
<b>HSS 127</b>														
x7.9	127	7.92	10.3	1.01E-01	3783	8.98	142	48.7	169	13943	0.507	Extrudex	Ohio	H-20777
x6.4	127	6.35	8.27	8.11E-02	3030	7.32	115	49.2	137	11435	0.497	Hydro	Montreal	AH-60928
x6.4	127	6.35	8.31	8.15E-02	3065	7.35	116	49	138	11966	0.486	Tri City Extrusion	Bristol	2119
x6.4	127	6.35	8.06	7.90E-02	2960	7.05	111	48.8	132	11496	0.486	Extrudex	Ohio	H-27671
x4.8	127	4.78	6.33	6.21E-02	2335	5.82	91.7	49.9	107	8895	0.507	Tri City Extrusion	Bristol	2265
x4.8	127	4.78	6.33	6.21E-02	2335	5.74	90.5	49.6	106	9323	0.486	Tri City Extrusion	Bristol	2120
x4.8	127	4.75	6.16	6.04E-02	2264	5.56	87.6	49.6	103	8890	0.492	Extrudex	Ohio	H-26322
<b>HSS 126</b>														
x3.2	126	3.18	4.21	4.13E-02	1553	3.9	61.9	50.1	71.4	5973	0.499	International Extrusions	Garden City	KE8444
<b>HSS 114</b>														
x4.8	114	4.78	5.53	5.42E-02	2034	4.01	70.1	44.4	82.7	6443	0.441	Extrudex	Toronto	H-15425
x3.2	114	3.18	3.83	3.76E-02	1411	2.91	50.9	45.4	58.8	4425	0.456	Bonnell	M	AE3352
<b>HSS 108</b>														
x3.1	108	3.05	3.47	3.40E-02	1279	2.35	43.4	42.8	50.3	3617	0.426	International Extrusions	Garden City	KE7788
<b>HSS 102</b>														
x11	102	11.1	10.9	1.07E-01	4018	5.55	109	37.2	137	8885	0.398	Extrudex	Ohio	H-13937
x9.5	102	9.52	9.51	9.33E-02	3508	4.98	98	37.7	121	8001	0.396	Western Extrusions	Dallas	H 19034
x6.4	102	6.35	6.25	6.13E-02	2315	3.42	67.3	38.4	81.4	5686	0.385	Metra	Laval	98210
x6.4	102	6.35	6.63	6.50E-02	2445	3.72	73.2	39	87.6	5826	0.401	Western Extrusions	Dallas	H 19838
x6.4	102	6.35	6.56	6.43E-02	2419	3.6	70.8	38.6	85.7	5968	0.385	Tri City Extrusion	Bristol	2121
x6.4	102	6.35	6.56	6.43E-02	2419	3.67	72.3	39	86.5	5678	0.406	Tri City Extrusion	Bristol	2294
x6.4	102	6.35	6.49	6.36E-02	2393	3.61	71	38.8	85.2	5719	0.396	International Extrusions	Garden City	KE12475
x6.4	102	6.35	6.56	6.43E-02	2419	3.67	72.3	39	86.5	5684	0.405	International Extrusions	Garden City	KE7447
x6.4	102	6.35	6.28	6.16E-02	2315	3.42	67.3	38.4	81.4	5686	0.385	Taber	Russelville	OH-12110
x6.4	102	6.35	6.56	6.43E-02	2419	3.67	72.3	39	86.5	5684	0.405	Bonnell	M	AE2971
x6.4	102	6.35	6.56	6.43E-02	2280	3.35	66	38.4	79.9	5473	0.385	Hydro	Montreal	AH-07325
x6.4	102	6.35	6.3	6.18E-02	2315	3.42	67.3	38.4	81.4	5686	0.385	Extrudex	Toronto, Ohio	H-11781
x6.4	102	6.35	6.59	6.46E-02	2385	3.59	70.7	38.8	84.8	5663	0.395	Hydro	Montreal	MH-17278
x4.8	102	4.78	4.96	4.86E-02	1830	2.85	56.1	39.5	66.2	4437	0.398	Hydro	Montreal	AH-42559
x4.8	102	4.78	5.02	4.92E-02	1849	2.9	57	39.6	67.2	4463	0.404	Tri City Extrusion	Bristol	2211
x4.8	102	4.78	5.07	4.97E-02	1869	2.94	57.8	39.6	68.1	4536	0.406	Extruded Aluminum Corporation	Belding	17305
x4.8	102	4.78	4.99	4.89E-02	1841	2.88	56.6	39.5	66.8	4449	0.401	International Extrusions	Garden City	KE8104
x4.8	102	4.78	5.02	4.92E-02	1849	2.9	57	39.6	67.2	4451	0.405	Crown Extrusions	Chaska	13716
x4.8	102	4.78	4.93	4.83E-02	1817	2.82	55.4	39.4	65.6	4439	0.396	Bonnell	N	A-7116
x4.8	102	4.78	5.02	4.92E-02	1849	2.9	57	39.6	67.2	4445	0.406	Tri City Extrusion	Bristol	2321
x4.8	102	4.78	5.03	4.93E-02	1849	2.88	56.6	39.4	67	4582	0.394	Extrudex	Toronto, Ohio	H-10075
x4.8	102	4.78	4.99	4.89E-02	1849	2.88	56.6	39.4	67	4582	0.394	Extrudex	Québec	V-18401
x4.8	102	4.75	4.86	4.77E-02	1795	2.77	54.6	39.3	64.6	4431	0.393	Metra	Laval	997486
x3.8	102	3.81	4.04	3.96E-02	1490	2.38	46.8	39.9	54.6	3679	0.401	Bonnell	C	A-7017
x3.2	102	3.18	3.44	3.37E-02	1270	2.06	40.5	40.2	47	3194	0.398	Taber	Russelville	OH-10793
x3.2	102	3.18	3.39	3.32E-02	1250	2.02	39.8	40.2	46.2	3079	0.406	Tri City Extrusion	Bristol	2033
x3.2	102	3.18	3.39	3.32E-02	1250	2.02	39.8	40.2	46.2	3084	0.405	Gateway Extrusions	Woodbridge	CES127
x3.2	102	3.18	3.39	3.32E-02	1250	2.02	39.8	40.2	46.2	3083	0.405	International Extrusions	Garden City	KE2260
x3.2	102	3.18	3.39	3.32E-02	1250	2.01	39.6	40.1	46	3173	0.396	Crown Extrusions	Chaska	12408
x3.2	102	3.18	3.46	3.39E-02	1276	2.07	40.8	40.3	47.3	3189	0.401	Western Extrusions	Dallas	H 19365
x3.2	102	3.18	3.32	3.26E-02	1224	1.95	38.5	40	44.8	3091	0.396	Pennex Aluminum	Leetonia	5753-H
x3.2	102	3.18	3.39	3.32E-02	1250	2.02	39.8	40.2	46.2	3081	0.406	Bonnell	M	AE3353
x3.2	102	3.18	3.39	3.32E-02	1250	2.02	39.7	40.2	46.1	3118	0.401	Bonnell	C	WLB-582
x3.2	102	3.18	3.3	3.24E-02	1224	1.95	38.5	40	44.8	3091	0.395	Metra	Laval	998758
x3.1	102	3.05	3.08	3.02E-02	1795	2.77	54.6	39.3	64.6	4431	0.393	Metra	Laval	998907

# SQUARE TUBES (ROUNDED CORNERS)



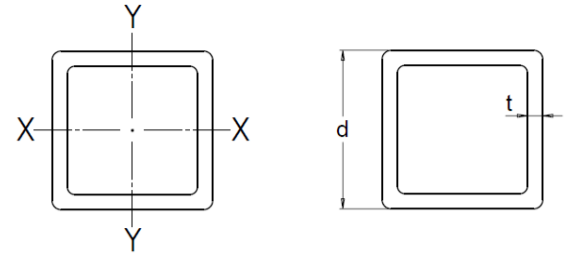
Designation	Dimension (d)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS d x t	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	J	m <sup>2</sup>			
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 86</b> x13	85.7	12.7	10.1	9.90E-02	3710	3.39	79.1	30.2	102	5479	0.337	Extrudex	Toronto	H-3134
<b>HSS 79</b> x6.4	79.4	6.35	5.01	4.91E-02	1847	1.65	41.5	29.9	50.6	2589	0.312	International Extrusions	Garden City	KE7455
x6.4	79.4	6.35	4.98	4.88E-02	1836	1.63	41.1	29.8	50.2	2582	0.309	Bonnell	M	AE3095
x9.5	78.7	9.52	7.15	7.01E-02	2638	2.15	54.5	28.5	68.9	3402	0.314	Western Extrusions	Dallas	H 19262
<b>HSS 76</b> x9.5	76.2	9.52	6.53	6.40E-02	2323	1.66	43.6	26.7	56.4	2881	0.278	Hydro	Montreal	MH-44928
x9.5	76.2	9.52	6.98	6.85E-02	2573	1.94	51	27.5	64.8	3125	0.302	Extruded Aluminum Corporation	Belding	17073
x9.5	76.2	9.52	6.61	6.48E-02	2436	1.77	46.5	27	60	3056	0.283	Bonnell	N	A-1936
x6.4	76.2	6.35	4.55	4.46E-02	1739	1.41	37	28.4	45.3	2259	0.294	Hydro	Montreal	AH-07264
x6.4	76.2	6.35	4.76	4.67E-02	1755	1.43	37.5	28.5	45.9	2267	0.297	Western Extrusions	Dallas	H 19323
x6.4	76.2	6.35	4.81	4.72E-02	1774	1.45	38.2	28.6	46.6	2269	0.304	Gateway Extrusions	Woodbridge	CES159
x6.4	76.2	6.35	4.74	4.65E-02	1748	1.42	37.2	28.5	45.6	2287	0.294	Gateway Extrusions	Woodbridge	BT003
x6.4	76.2	6.35	4.81	4.72E-02	1774	1.44	37.8	28.5	46.4	2336	0.294	Crown Extrusions	Chaska	1826
x6.4	76.2	6.35	4.69	4.60E-02	1731	1.39	36.4	28.3	44.8	2311	0.288	Taber	Russelville	OH-08917
x6.4	76.2	6.35	4.81	4.72E-02	1774	1.44	37.8	28.5	46.4	2336	0.294	Tri City Extrusion	Bristol	2025
x6.4	76.2	6.35	4.81	4.72E-02	1774	1.45	38.2	28.6	46.6	2269	0.304	Tri City Extrusion	Bristol	2293
x6.4	76.2	6.35	4.78	4.69E-02	1757	1.43	37.5	28.5	45.9	2275	0.297	Extrudex	Toronto, Ohio	H-13783
x6.4	76.2	6.35	4.59	4.50E-02	1687	1.34	35.1	28.2	43.4	2258	0.286	Extrudex	Toronto, Ohio	H-22173
x6.4	76.2	6.35	4.55	4.46E-02	1670	1.31	34.5	28	42.8	2256	0.283	Extrudex	Toronto	H-22283
x6.4	76.2	6.35	4.86	4.77E-02	1755	1.43	37.5	28.5	45.9	2265	0.297	Hydro	Montreal	MH-55880
x5.3	76.2	5.33	4.1	4.02E-02	1512	1.27	33.3	29	40.2	2000	0.299	International Extrusions	Garden City	KE6404
x5.1	76.2	5.08	3.97	3.89E-02	1462	1.24	32.6	29.1	39.2	1940	0.305	Extruded Aluminum Corporation	Belding	20097
x5.1	76.2	5.08	3.75	3.68E-02	1384	1.14	29.9	28.7	36.3	1896	0.288	Extruded Aluminum Corporation	Belding	18477
x4.8	76.2	4.83	3.74	3.67E-02	1378	1.17	30.7	29.1	36.8	1861	0.297	Pries Enterprises	Independence	4467
x4.8	76.2	4.78	3.58	3.51E-02	1332	1.12	29.4	29	35.4	1798	0.294	Metra	Laval	998012
x4.8	76.2	4.78	3.7	3.63E-02	1364	1.16	30.4	29.1	36.5	1844	0.297	Crown Extrusions	Chaska	13278
x4.8	76.2	4.78	3.68	3.61E-02	1356	1.15	30.3	29.2	36.3	1802	0.299	International Extrusions	Garden City	KE6153
x4.8	76.2	4.78	3.7	3.63E-02	1364	1.16	30.6	29.2	36.6	1803	0.303	International Extrusions	Garden City	KE3986
x4.8	76.2	4.78	3.7	3.63E-02	1364	1.17	30.6	29.2	36.6	1802	0.304	Tri City Extrusion	Bristol	2440
x4.8	76.2	4.78	3.54	3.47E-02	1304	1.08	28.4	28.8	34.4	1802	0.288	Taber	Russelville	OH-10763
x4.8	76.2	4.78	3.67	3.60E-02	1347	1.14	29.9	29.1	35.9	1805	0.297	Extrudex	Toronto	H-23747
x4.8	76.2	4.75	3.67	3.60E-02	1349	1.15	30.1	29.2	36.1	1795	0.299	Extrudex	Ohio	H-13387
x4.8	76.2	4.75	3.68	3.61E-02	1358	1.16	30.4	29.2	36.4	1795	0.303	Western Extrusions	Dallas	H 19867
x4.1	76.2	4.06	3.1	3.04E-02	1137	0.971	25.5	29.2	30.4	1572	0.293	Extrudex	Toronto	H-14181
x4.1	76.2	4.06	3.19	3.13E-02	1171	1.02	26.7	29.5	31.7	1570	0.302	Extrudex	Toronto	H-6826
x3.2	76.2	3.18	2.52	2.47E-02	927	0.826	21.7	29.8	25.4	1265	0.304	Bonnell	M	AE3048
x3.2	76.2	3.18	2.52	2.47E-02	927	0.824	21.6	29.8	25.4	1286	0.299	Bonnell	M	AE4165
x3.2	76.2	3.18	2.52	2.47E-02	927	0.826	21.7	29.8	25.4	1265	0.304	Tri City Extrusion	Bristol	2220
x3.2	76.2	3.18	2.44	2.39E-02	901	0.789	20.7	29.6	24.4	1269	0.294	International Extrusions	Garden City	KE12159
x3.2	76.2	3.18	2.52	2.47E-02	927	0.826	21.7	29.8	25.4	1267	0.303	International Extrusions	Garden City	KE3975
x3.2	76.2	3.18	2.52	2.47E-02	927	0.826	21.7	29.8	25.4	1267	0.303	International Extrusions	Garden City	KE1042
x3.2	76.2	3.18	2.49	2.44E-02	919	0.814	21.4	29.8	25.1	1265	0.299	International Extrusions	Garden City	KE6200
x3.2	76.2	3.18	2.48	2.43E-02	910	0.802	21	29.7	24.8	1265	0.297	Extrudex	Toronto	H-23746
x3.2	76.2	3.18	2.45	2.40E-02	901	0.789	20.7	29.6	24.4	1269	0.294	Extrudex	Ohio	H-30389
x3.2	76.2	3.18	2.46	2.41E-02	910	0.802	21	29.7	24.8	1265	0.297	Extrudex	Québec	V-18636
x3.1	76.2	3.05	2.34	2.29E-02	838	0.722	18.9	29.4	22.5	1214	0.287	Hydro	Montreal	MH-42811
x2.5	76.2	2.54	2.02	1.98E-02	747	0.675	17.7	30.1	20.6	1035	0.302	Gateway Extrusions	Woodbridge	CES136
x2.5	76.2	2.54	2.02	1.98E-02	743	0.67	17.6	30	20.5	1032	0.300	Extrudex	Toronto	H-13792
x2.4	76.2	2.36	1.89	1.85E-02	698	0.635	16.7	30.2	19.3	969	0.304	International Extrusions	Garden City	KE9660
x2.4	76.2	2.36	1.89	1.85E-02	697	0.634	16.6	30.2	19.3	968	0.304	Gateway Extrusions	Woodbridge	CES138
x2.3	76.2	2.29	1.83	1.79E-02	676	0.615	16.1	30.2	18.7	956	0.299	Bonnell	C	WLB-571
x2.0	76.2	2.01	1.58	1.55E-02	586	0.534	14	30.2	16.2	829	0.299	Extrudex	Québec	V-12342
<b>HSS 75</b> x5.1	74.9	5.08	3.85	3.78E-02	1419	1.16	31	28.6	37.2	1799	0.298	International Extrusions	Garden City	KE1009
<b>HSS 67</b> x4.8	67.5	4.78	3.24	3.18E-02	1193	0.784	23.2	25.6	28.1	1228	0.265	International Extrusions	Garden City	KE8228
<b>HSS 64</b> x6.4	64.3	6.35	3.83	3.76E-02	1412	0.774	24.1	23.4	30.2	1312	0.241	International Extrusions	Garden City	KE10464
x6.4	63.5	6.35	3.94	3.86E-02	1452	0.8	25.2	23.5	31.2	1258	0.253	International Extrusions	Garden City	KE8741
x6.4	63.5	6.35	3.83	3.76E-02	1412	0.763	24	23.2	30	1257	0.242	Taber	Russelville	OH-13278
x4.8	63.5	4.78	3.04	2.98E-02	1122	0.649	20.4	24.1	24.8	1010	0.253	International Extrusions	Garden City	KE7959
x4.8	63.5	4.78	3.04	2.98E-02	1122	0.647	20.4	24	24.7	1025	0.249	Crown Extrusions	Chaska	12326
x3.8	63.5	3.81	2.41	2.36E-02	889	0.523	16.5	24.2	19.7	835	0.245	Extruded Aluminum Corporation	Belding	18484
x3.2	63.5	3.18	2.08	2.04E-02	766	0.466	14.7	24.7	17.3	717	0.253	Bonnell	M	AE1090
x3.2	63.5	3.18	2.06	2.02E-02	758	0.458	14.4	24.6	17.1	716	0.249	International Extrusions	Garden City	KE6737
x3.2	63.5	3.18	2.08	2.04E-02	766	0.466	14.7	24.7	17.3	718	0.253	International Extrusions	Garden City	KE11179
x3.2	63.5	3.18	2.08	2.04E-02	766	0.466	14.7	24.7	17.3	718	0.253	International Extrusions	Garden City	KE0956
x3.2	63.5	3.18	2.08	2.04E-02	766	0.466	14.7	24.7	17.3	718	0.253	International Extrusions	Garden City	KE9869
x3.2	63.5	3.18	2.08	2.04E-02	766	0.464	14.6	24.6	17.3	730	0.249	Crown Extrusions	Chaska	12327
x3.2	63.5	3.18	2.09	2.05E-02	770	0.469	14.8	24.7	17.5	726	0.253	Western Extrusions	Dallas	H 19917
x2.5	63.5	2.54	1.68	1.65E-02	619	0.384	12.1	24.9	14.2	589	0.253	International Extrusions	Garden City	KE2800
x2.4	63.5	2.36	1.55	1.52E-02	571	0.354	11.1	24.9	13	554	0.249	Pennex Aluminum	Leetonia	5778-H
x2.0	63.5	2.03	1.36	1.33E-02	500	0.315	9.92	25.1	11.5	482	0.253	Crown Extrusions	Chaska	12230
x1.9	63.5	1.9	1.27	1.25E-02	469	0.297	9.35	25.2	10.8	454	0.253	International Extrusions	Garden City	KE8342
x1.9	63.5	1.9	1.27	1.25E-02	469	0.297	9.35	25.2	10.8	454	0.253	International Extrusions	Garden City	KE11180
x1.9	63.5	1.9	1.27	1.25E-02	469	0.297	9.35	25.2	10.8	452	0.253	Bonnell	N	BCE-276
<b>HSS 60</b> x3.2	60.3	3.18	1.94	1.90E-02	715	0.386	12.8	23.2	15.2	619	0.233	International Extrusions	Garden City	KE6746
x3.2	60.3	3.18	1.92	1.88E-02	708	0.381	12.6							

# SQUARE TUBES (ROUNDED CORNERS)



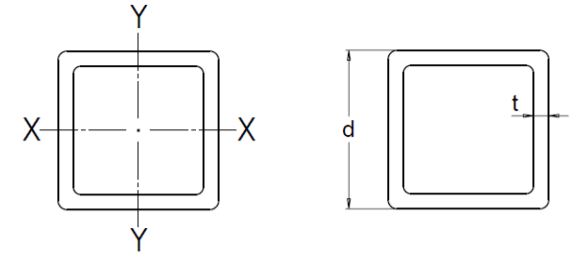
Designation	Dimension (d)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS d x t	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	J	m <sup>2</sup>			
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 52</b>														
x4.4	52.5	4.44	2.31	2.27E-02	854	0.331	12.6	19.7	15.4	517	0.209	Extruded Aluminum Corporation	Belding	19298
x3.2	52.4	3.18	1.65	1.62E-02	608	0.242	9.25	20	11.1	391	0.201	Extruded Aluminum Corporation	Belding	20836
<b>HSS 51</b>														
x6.4	50.8	6.35	3.06	3.00E-02	1129	0.379	14.9	18.3	18.9	606	0.201	Pries Enterprises	Independance	7513
x6.4	50.8	6.35	2.87	2.81E-02	1060	0.34	13.4	17.9	17.3	591	0.187	Nanshan	Lafayette	1504
x6.4	50.8	6.35	3.06	3.00E-02	1129	0.379	14.9	18.3	18.9	603	0.202	Crown Extrusions	Chaska	13718
x6.4	50.8	6.35	3.06	3.00E-02	1129	0.379	14.9	18.3	18.9	603	0.202	International Extrusions	Garden City	KE5537
x6.4	50.8	6.35	3.06	3.00E-02	1129	0.379	14.9	18.3	18.9	602	0.203	Tri City Extrusion	Bristol	2078
x6.4	50.8	6.35	3.06	3.00E-02	1129	0.379	14.9	18.3	18.9	602	0.203	Tri City Extrusion	Bristol	2085
x6.4	50.8	6.35	2.97	2.91E-02	1094	0.359	14.1	18.1	18.1	596	0.192	Western Extrusions	Dallas	H 19707
x6.4	50.8	6.35	2.99	2.93E-02	1103	0.362	14.3	18.1	18.3	607	0.192	Western Extrusions	Dallas	H 19299
x6.4	50.8	6.35	2.97	2.91E-02	1094	0.359	14.1	18.1	18.1	596	0.192	Taber	Russelville	OH-12685
x4.8	50.8	4.78	2.38	2.33E-02	879	0.298	11.7	18.4	14.9	520	0.187	Pries Enterprises	Independance	2248
x4.8	50.8	4.78	2.38	2.33E-02	879	0.314	12.3	18.9	15.2	492	0.203	Tri City Extrusion	Bristol	2089
x4.8	50.8	4.78	2.38	2.33E-02	879	0.314	12.3	18.9	15.2	493	0.202	International Extrusions	Garden City	KE5338
x4.8	50.8	4.78	2.38	2.33E-02	879	0.311	12.2	18.8	15.2	504	0.196	Crown Extrusions	Chaska	1704
x4.8	50.8	4.78	2.34	2.29E-02	862	0.303	11.9	18.8	14.8	490	0.195	Nanshan	Lafayette	1108
x4.8	50.8	4.78	2.23	2.19E-02	822	0.277	10.9	18.4	13.8	491	0.186	Western Extrusions	Dallas	H 19143
x4.8	50.8	4.78	2.38	2.33E-02	879	0.314	12.3	18.9	15.2	493	0.202	Western Extrusions	Dallas	H 19702
x4.8	50.8	4.78	2.28	2.24E-02	840	0.291	11.4	18.6	14.3	488	0.191	Taber	Russelville	OH-09338
x4.8	50.8	4.75	2.23	2.19E-02	821	0.278	10.9	18.4	13.8	490	0.186	International Extrusions	Garden City	KE12082
x3.2	50.8	3.18	1.64	1.61E-02	605	0.219	8.62	19	10.6	379	0.187	Pries Enterprises	Independance	1194
x3.2	50.8	3.18	1.62	1.59E-02	597	0.225	8.84	19.4	10.6	355	0.198	Western Extrusions	Dallas	H 19314
x3.2	50.8	3.18	1.64	1.61E-02	603	0.228	9	19.5	10.8	356	0.201	Gateway Extrusions	Woodbridge	CES118
x3.2	50.8	3.18	1.59	1.56E-02	588	0.219	8.63	19.3	10.4	354	0.195	International Extrusions	Garden City	KE6491
x3.2	50.8	3.18	1.62	1.59E-02	597	0.225	8.84	19.4	10.6	355	0.198	International Extrusions	Garden City	KE7996
x3.2	50.8	3.18	1.64	1.61E-02	605	0.23	9.04	19.5	10.8	356	0.202	International Extrusions	Garden City	KE6576
x3.2	50.8	3.18	1.64	1.61E-02	605	0.229	9.03	19.5	10.8	358	0.201	International Extrusions	Garden City	KE1679
x3.2	50.8	3.18	1.64	1.61E-02	605	0.23	9.04	19.5	10.8	356	0.202	International Extrusions	Garden City	KE11181
x3.2	50.8	3.18	1.59	1.56E-02	587	0.219	8.62	19.3	10.4	354	0.195	Extruded Aluminum Corporation	Belding	5858
x3.2	50.8	3.18	1.64	1.61E-02	605	0.228	8.99	19.4	10.8	363	0.198	Crown Extrusions	Chaska	12192
x3.2	50.8	3.18	1.64	1.61E-02	605	0.227	8.93	19.4	10.8	369	0.195	Crown Extrusions	Chaska	12078
x3.2	50.8	3.18	1.64	1.61E-02	605	0.225	8.85	19.3	10.7	373	0.192	Crown Extrusions	Chaska	13239
x3.2	50.8	3.18	1.64	1.61E-02	605	0.23	9.04	19.5	10.8	355	0.203	Tri City Extrusion	Bristol	2026
x3.2	50.8	3.18	1.64	1.61E-02	605	0.225	8.85	19.3	10.7	373	0.192	Tri City Extrusion	Bristol	2036
x3.2	50.8	3.18	1.57	1.54E-02	579	0.214	8.41	19.2	10.2	355	0.192	Pennex Aluminum	Leetonia	5328-H
x3.2	50.8	3.18	1.6	1.57E-02	589	0.22	8.65	19.3	10.4	356	0.195	Western Extrusions	Dallas	H 19207
x3.2	50.8	3.18	1.64	1.61E-02	605	0.228	8.99	19.4	10.8	363	0.198	Western Extrusions	Dallas	H 19966
x3.2	50.8	3.18	1.57	1.54E-02	579	0.214	8.41	19.2	10.2	355	0.192	Western Extrusions	Dallas	H 19346
x3.2	50.8	3.18	1.64	1.61E-02	605	0.23	9.04	19.5	10.8	355	0.203	Bonnell	M	AE0569
x3.2	50.8	3.18	1.61	1.58E-02	594	0.223	8.78	19.4	10.6	354	0.197	Taber	Russelville	OH-13189
x3.1	50.8	3.1	1.6	1.57E-02	591	0.224	8.82	19.5	10.6	356	0.198	Bonnell	M	AE5410
x3.1	50.8	3.05	1.46	1.43E-02	540	0.195	7.69	19	9.38	343	0.187	International Extrusions	Garden City	KE9465
x3.1	50.8	3.05	1.49	1.46E-02	549	0.199	7.84	19	9.56	349	0.187	International Extrusions	Garden City	KE12608
x3.1	50.8	3.05	1.57	1.54E-02	581	0.221	8.71	19.5	10.4	344	0.201	International Extrusions	Garden City	KE6918
x2.4	50.8	2.41	1.24	1.22E-02	459	0.178	6.99	19.7	8.28	280	0.198	International Extrusions	Garden City	KE8103
x2.4	50.8	2.36	1.24	1.22E-02	456	0.178	7.02	19.8	8.27	276	0.201	Gateway Extrusions	Woodbridge	CES012
x2.4	50.8	2.36	1.24	1.22E-02	458	0.179	7.06	19.8	8.32	276	0.202	Bonnell	M	AE6126
x2.3	50.8	2.29	1.11	1.09E-02	411	0.153	6.01	19.3	7.23	269	0.187	International Extrusions	Garden City	KE12607
x2.0	50.8	2.03	1.08	1.06E-02	396	0.157	6.19	19.9	7.25	242	0.202	International Extrusions	Garden City	KE5806
x2.0	50.8	2.03	1.07	1.05E-02	395	0.156	6.15	19.9	7.21	241	0.201	Gateway Extrusions	Woodbridge	CES117
x1.6	50.8	1.57	0.836	8.20E-03	308	0.124	4.89	20.1	5.68	191	0.201	Gateway Extrusions	Woodbridge	CES011
x1.5	50.8	1.52	0.816	8.00E-03	301	0.122	4.8	20.1	5.56	186	0.203	International Extrusions	Garden City	KE12095
<b>HSS 50</b>														
x6.4	50.3	6.35	2.93	2.87E-02	1082	0.347	13.8	17.9	17.7	577	0.190	International Extrusions	Garden City	KE12158
<b>HSS 48</b>														
x3.2	47.6	3.18	1.53	1.50E-02	564	0.187	7.84	18.2	9.42	289	0.190	Extruded Aluminum Corporation	Belding	21093
<b>HSS 44</b>														
x4.8	44.5	4.78	2.03	1.50E-02	750	0.198	8.9	16.2	11.2	318	0.172	International Extrusions	Garden City	KE6736
x3.2	44.5	3.18	1.42	1.39E-02	524	0.145	6.55	16.7	8.02	245	0.167	Pries Enterprises	Independance	6069
x3.2	44.5	3.18	1.39	1.36E-02	511	0.144	6.47	16.8	7.85	231	0.171	International Extrusions	Garden City	KE12221
x3.2	44.5	3.18	1.4	1.37E-02	516	0.146	6.56	16.8	7.95	232	0.172	International Extrusions	Garden City	KE6263
x3.2	44.5	3.18	1.37	1.34E-02	507	0.142	6.37	16.7	7.75	232	0.170	Western Extrusions	Dallas	H 19931
x3.2	44.5	3.18	1.42	1.39E-02	524	0.15	6.74	16.9	8.13	233	0.177	Bonnell	M	AE1543
x2.5	44.5	2.54	1.06	1.04E-02	390	0.107	4.82	16.6	5.89	192	0.161	Tri City Extrusion	Bristol	2197
x1.5	44.5	1.52	0.71	6.96E-03	262	0.0804	3.62	17.5	4.21	123	0.176	International Extrusions	Garden City	KE8341
x1.9	44.3	1.9	0.857	8.40E-03	316	0.0937	4.23	17.2	4.99	149	0.172	Extruded Aluminum Corporation	Belding	18797
x2.5	44.1	2.51	1.12	1.10E-02	413	0.119	5.38	17	6.43	187	0.172	International Extrusions	Garden City	NE1994
x3.2	43.9	3.18	1.38	1.35E-02	509	0.140	6.39	16.6	7.75	224	0.170	Gateway Extrusions	Woodbridge	CES132
<b>HSS 42</b>														
x3.2	42.1	3.18	1.34	1.31E-02	494	0.123	5.83	15.8	7.15	204	0.159	Pries Enterprises	Independance	2716
<b>HSS 40</b>														
x4.8	39.7	4.75	1.75	1.72E-02	646	0.131	6.6	14.2	8.41	218	0.151	International Extrusions	Garden City	KE6876

# SQUARE TUBES (ROUNDED CORNERS)



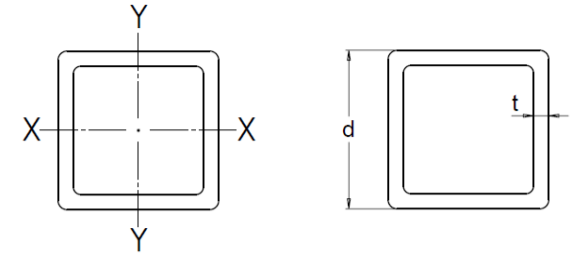
Designation	Dimension (d)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS d x t	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	J	m <sup>2</sup>			
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
<b>HSS 38</b>														
x6.4	38.1	6.35	2.19	2.15E-02	806	0.141	7.39	13.2	9.73	228	0.151	International Extrusions	Garden City	KE5322
x5.1	38.1	5.08	1.82	1.78E-02	671	0.125	6.55	13.6	8.37	199	0.151	Pries Enterprises	Independance	4752
x3.2	38.1	3.18	1.2	1.18E-02	444	9.00E-02	4.72	14.2	5.8	146	0.147	Pries Enterprises	Independance	4753
x3.2	38.1	3.18	1.2	1.18E-02	442	9.02E-02	4.73	14.3	5.79	142	0.150	Gateway Extrusions	Woodbridge	US176
x3.2	38.1	3.18	1.2	1.18E-02	444	9.09E-02	4.77	14.3	5.82	142	0.152	Tri City Extrusion	Bristol	2218
x3.2	38.1	3.18	1.2	1.18E-02	444	9.07E-02	4.76	14.3	5.82	144	0.150	Tri City Extrusion	Bristol	2179
x3.2	38.1	3.18	1.18	1.16E-02	435	8.80E-02	4.62	14.2	5.67	141	0.147	Tri City Extrusion	Bristol	1162
x3.2	38.1	3.18	1.19	1.17E-02	437	8.85E-02	4.65	14.2	5.7	143	0.147	Pennex Aluminum	Leetonia	5633-H
x3.2	38.1	3.18	1.13	1.11E-02	417	8.21E-02	4.31	14	5.34	141	0.142	Pennex Aluminum	Leetonia	5604-H
x3.2	38.1	3.18	1.2	1.18E-02	444	9.09E-02	4.77	14.3	5.82	142	0.151	International Extrusions	Garden City	KE3970
x3.2	38.1	3.18	1.2	1.18E-02	443	9.09E-02	4.77	14.3	5.82	142	0.151	International Extrusions	Garden City	KE6492
x3.2	38.1	3.18	1.19	1.17E-02	437	8.85E-02	4.65	14.2	5.7	143	0.147	International Extrusions	Garden City	KE8848
x3.2	38.1	3.18	1.11	1.09E-02	410	7.91E-02	4.15	13.9	5.19	141	0.139	International Extrusions	Garden City	KE12669
x3.2	38.1	3.18	1.19	1.17E-02	439	8.92E-02	4.68	14.3	5.73	142	0.148	Extruded Aluminum Corporation	Belding	5860
x3.2	38.1	3.18	1.2	1.18E-02	444	9.00E-02	4.72	14.2	5.8	146	0.147	Crown Extrusions	Chaska	12162
x3.2	38.1	3.18	1.21	1.19E-02	448	9.18E-02	4.82	14.3	5.88	145	0.151	Western Extrusions	Dallas	H 19923
x3.2	38.1	3.18	1.2	1.18E-02	444	8.99E-02	4.72	14.2	5.8	146	0.147	Bonnell	M	AE4163
x3.2	38.1	3.18	1.2	1.18E-02	444	8.99E-02	4.77	14.3	5.82	142	0.152	Bonnell	M	AE1669
x3.2	38.1	3.18	1.2	1.18E-02	444	8.99E-02	4.77	14.3	5.82	142	0.152	Bonnell	CN	A-1439
x3.2	38.1	3.18	1.2	1.18E-02	444	8.74E-02	4.59	14	5.71	150	0.142	Taber	Russelville	OH-14045
x3.1	38.1	3.1	1.08	1.06E-02	400	7.75E-02	4.07	13.9	5.07	138	0.139	International Extrusions	Garden City	KE11606
x3.1	38.1	3.05	1.13	1.11E-02	416	8.43E-02	4.43	14.2	5.43	138	0.146	Gateway Extrusions	Woodbridge	CES180
x3.0	38.1	2.97	1.11	1.09E-02	409	8.36E-02	4.39	14.3	5.35	134	0.147	Bonnell	C	A-1942
x2.5	38.1	2.46	0.939	9.21E-03	346	7.29E-02	3.83	14.5	4.61	116	0.148	International Extrusions	Garden City	KE10008
x2.4	38.1	2.41	0.934	9.16E-03	344	7.34E-02	3.85	14.6	4.62	114	0.152	Bonnell	M	AE3139
x2.4	38.1	2.39	0.912	8.94E-03	336	7.12E-02	3.74	14.5	4.49	112	0.148	Pennex Aluminum	Leetonia	5667-H
x2.3	38.1	2.29	0.849	8.33E-03	313	6.53E-02	3.43	14.4	4.14	109	0.144	Western Extrusions	Dallas	H 19465
x2.3	38.1	2.29	0.888	8.71E-03	327	7.03E-02	3.69	14.6	4.4	109	0.151	International Extrusions	Garden City	KE2837
x2.3	38.1	2.29	0.888	8.71E-03	327	6.96E-02	3.65	14.6	4.38	112	0.147	Crown Extrusions	Chaska	1433
x2	38.1	2.03	0.744	7.30E-03	274	5.71E-02	3	14.4	3.61	98.5	0.142	Tri City Extrusion	Bristol	2198
x2.0	38.1	2.03	0.795	7.80E-03	293	6.32E-02	3.32	14.7	3.95	102	0.147	Crown Extrusions	Chaska	12308
x1.9	38.1	1.9	0.748	7.34E-03	276	6.04E-02	3.17	14.8	3.75	93.3	0.151	International Extrusions	Garden City	KE9840
x1.8	38.1	1.78	0.701	6.87E-03	258	5.69E-02	2.99	14.8	3.52	87.5	0.152	Bonnell	M	AE3003
x1.7	38.1	1.65	0.633	6.21E-03	233	5.08E-02	2.67	14.8	3.15	81.9	0.147	Bonnell	M	AE1863
x1.6	38.1	1.6	0.634	6.22E-03	234	5.20E-02	2.73	14.9	3.2	79.8	0.152	Gateway Extrusions	Woodbridge	CES186
x1.6	38.1	1.6	0.619	6.07E-03	228	5.01E-02	2.63	14.8	3.1	79.8	0.148	Gateway Extrusions	Woodbridge	CES222
x1.6	38.1	1.57	0.624	6.12E-03	230	5.12E-02	2.69	14.9	3.15	78.5	0.152	Extruded Aluminum Corporation	Belding	5915
x1.6	38.1	1.57	0.606	5.94E-03	224	4.90E-02	2.57	14.8	3.03	78.8	0.147	International Extrusions	Garden City	KE11296
x1.6	38.1	1.57	0.622	6.10E-03	229	5.10E-02	2.68	14.9	3.14	78.9	0.150	International Extrusions	Garden City	KE4291
x1.6	38.1	1.57	0.624	6.12E-03	230	5.12E-02	2.69	14.9	3.15	78.9	0.151	International Extrusions	Garden City	KE8266
x1.6	38.1	1.57	0.623	6.11E-03	230	5.11E-02	2.68	14.9	3.14	78.5	0.151	Bonnell	CN	A-1495
x1.6	38.1	1.55	0.585	5.74E-03	216	4.67E-02	2.45	14.7	2.9	78	0.144	International Extrusions	Garden City	KE11484
x1.5	38.1	1.52	0.605	5.93E-03	223	4.97E-02	2.61	14.9	3.06	77.5	0.150	Bonnell	M	AE3378
x1.5	38.1	1.52	0.606	5.94E-03	223	4.99E-02	2.62	14.9	3.07	76.7	0.152	Tri City Extrusion	Bristol	1077
x1.4	38.1	1.4	0.556	5.45E-03	205	4.61E-02	2.42	15	2.82	70.6	0.152	Gateway Extrusions	Woodbridge	US179
x1.3	38.1	1.27	0.508	4.98E-03	187	4.25E-02	2.23	15	2.59	65	0.152	International Extrusions	Garden City	KE11295
x1.3	38.1	1.27	0.507	4.97E-03	187	4.23E-02	2.22	15	2.58	65	0.151	International Extrusions	Garden City	KE0013
x1.2	38.1	1.17	0.468	4.59E-03	173	3.93E-02	2.06	15.1	2.39	60.3	0.151	International Extrusions	Garden City	KE10753
<b>HSS 36</b>														
x3.2	36.1	3.18	1.12	1.10E-02	413	7.46E-02	4.14	13.4	5.09	119	0.140	International Extrusions	Garden City	KE4316
x1.6	35.7	1.57	0.569	5.58E-03	210	4.03E-02	2.26	13.9	2.67	64.1	0.138	International Extrusions	Garden City	NE1991
<b>HSS 35</b>														
x2.0	35.0	2.01	0.671	6.58E-03	248	4.30E-02	2.46	13.2	2.98	74.5	0.130	International Extrusions	Garden City	KE11596
x4.0	34.9	3.96	1.32	1.29E-02	486	7.74E-02	4.43	12.6	5.62	129	0.133	Western Extrusions	Dallas	H 19141
x1.8	34.9	1.78	0.639	6.27E-03	236	4.33E-02	2.48	13.6	2.93	66.7	0.139	Crown Extrusions	Chaska	12418
x1.6	34.9	1.57	0.558	5.47E-03	206	3.78E-02	2.16	13.5	2.56	59.8	0.136	Gateway Extrusions	Woodbridge	CES120
<b>HSS 33</b>														
x1.7	33.4	1.65	0.553	5.42E-03	204	3.37E-02	2.02	12.9	2.4	54.2	0.129	Bonnell	M	AE1866
x3.2	33.0	3.18	1.03	1.01E-02	379	5.61E-02	3.4	12.2	4.23	92.1	0.127	Tri City Extrusion	Bristol	2056
<b>HSS 32</b>														
x5.1	31.8	5.08	1.47	1.44E-02	542	6.66E-02	4.19	11.1	5.48	107	0.126	Gateway Extrusions	Woodbridge	1004
x4.8	31.8	4.78	1.4	1.37E-02	515	6.44E-02	4.06	11.2	5.26	104	0.126	International Extrusions	Garden City	KE8862
x3.2	31.8	3.18	0.961	9.42E-03	354	4.80E-02	3.02	11.6	3.77	78	0.122	Western Extrusions	Dallas	H 19312
x3.2	31.8	3.18	0.984	9.65E-03	363	5.00E-02	3.15	11.7	3.9	78.6	0.126	Tri City Extrusion	Bristol	2037
x3.2	31.8	3.18	0.961	9.42E-03	342	4.66E-02	2.9	11.1	3.77	78.1	0.122	Gateway Extrusions	Woodbridge	CES179
x3.2	31.8	3.18	0.962	9.43E-03	355	4.81E-02	3.03	11.6	3.78	78.4	0.122	International Extrusions	Garden City	KE6198
x3.2	31.8	3.18	0.967	9.48E-03	356	4.83E-02	3.04	11.6	3.8	79.2	0.122	International Extrusions	Garden City	KE12220
x3.2	31.8	3.18	0.984	9.65E-03	363	5.00E-02	3.15	11.7	3.9	78.6	0.126	Bonnell	M	AE2070
x3.2	31.8	3.18	0.968	9.49E-03	357	4.84E-02	3.05	11.6	3.8	79.4	0.122	Bonnell	M	AE4196
x3.2	31.8	3.18	0.972	9.53E-03	358	4.86E-02	3.06	11.6	3.82	79.9	0.122	Bonnell	M	AE2336
x3.2	31.8	3.18	0.962	9.43E-03	355	4.81E-02	3.03	11.6	3.78	78.4	0.122	Taber	Russelville	OH-01518
x2.8	31.8	2.77	0.848	8.32E-03	313	4.34E-02	2.74	11.8	3.37	70.6	0.122	International Extrusions	Garden City	KE8265
x2.5	31.8	2.54	0.805	7.89E-03	297	4.25E-02	2.68	12	3.26	66.3	0.126	Bonnell	M	AE4941
x2.5	31.8	2.54	0.805	7.89E-03	297	4.19E-02	2.64	11.9	3.24	68.7	0.122	Crown Extrusions	Chaska	12630
x2.5	31.8	2.46	0.769	7.54E-03	284	4.03E-02	2.54	11.9	3.1	64.7	0.123	International Extrusions	Garden City	KE10007
x2.4	31.8	2.41	0.768	7.53E-03	283	4.09E-02	2.57	12	3.12	63.9	0.126	Bonnell	M	AE3143
x2.4	31.8	2.36	0.742	7.28E-03	274	3.93E-02	2.47	12	3.01	62.7	0.123	Western Extrusions	Dallas	H 19962
x2.3	31.8	2.29	0.731	7.17E-03	269	3.92E-02	2.47	12.1	2.98	61.3	0.126	Crown Extrusions	Chaska	1276
x2.3	31.8	2.29	0.708	6.94E-03	261	3.73E-02	2.35	12	2.86	60.5	0.122	International Extrusions	Garden City	KE9770
x2.3	31.8	2.29	0.709	6.95E-03	261	3.73E-02	2.35	12	2.86	60.6	0.122	Bonnell	M	AE1765
x2.0	31.8	2.03	0.655	6.42E-03	242	3.46E-02	2.18	12	2.66	58.5	0.119	Crown Extrusions	Chaska	1667
x1.8	31.8	1.83	0.574	5.63E-03	212	3.11E-02	1.96	12.1	2.35	50.6	0.122	Western Extrusions	Dallas	H 19748
x1.8	31.8	1.83	0.574	5.63E-03	212	3.10E-02	1.96	12.1	2.35	50.5	0.122	Bonnell	M	AE1141
x1.7	31													

# SQUARE TUBES (ROUNDED CORNERS)



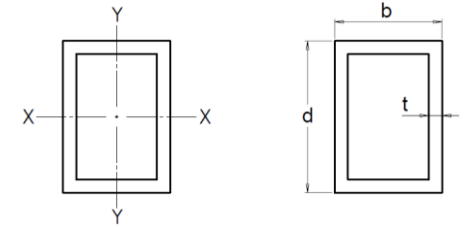
Designation	Dimension (d)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS d x t										J				
mm x mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	m <sup>2</sup>			
HSS 31 x2.8	31.2	2.84	0.859	8.42E-03	317	4.23E-02	2.71	11.6	3.35	69.2	0.120	Bonnell	M	AE5225
HSS 29 x3.2	28.6	3.18	0.853	8.37E-03	314	3.37E-02	2.36	10.4	2.98	55.5	0.109	International Extrusions	Garden City	KE6493
HSS 29 x3.2	28.6	3.18	0.867	8.50E-03	320	3.46E-02	2.42	10.4	3.05	55.8	0.111	Bonnell	M	AE1864
HSS 29 x1.9	28.6	1.88	0.526	5.16E-03	194	2.26E-02	1.58	10.8	1.92	37.2	0.109	Western Extrusions	Dallas	H 19462
HSS 29 x1.8	28.6	1.78	0.501	4.91E-03	185	2.18E-02	1.53	10.9	1.84	35.4	0.110	Bonnell	M	AE1393
HSS 29 x1.7	28.6	1.65	0.482	4.73E-03	178	2.14E-02	1.5	11	1.79	34.4	0.110	Pries Enterprises	Independance	4849
HSS 29 x1.6	28.6	1.6	0.444	4.35E-03	164	1.92E-02	1.35	10.8	1.62	32.5	0.107	Bonnell	M	AE5472
HSS 28 x1.6	28.4	1.57	0.434	4.26E-03	160	1.86E-02	1.31	10.8	1.58	31.4	0.107	International Extrusions	Garden City	KE5371
HSS 27 x2.5	27.0	2.54	0.632	6.20E-03	233	2.25E-02	1.66	9.82	2.09	38.9	0.100	Bonnell	M	AE1221
HSS 25 x3.2	25.4	3.18	0.766	7.51E-03	282	2.37E-02	1.87	9.16	2.37	37.7	0.101	Bonnell	M	AE0570
HSS 25 x3.2	25.4	3.18	0.742	7.28E-03	274	2.25E-02	1.77	9.06	2.27	37.3	0.096	Tri City Extrusion	Bristol	1021
HSS 25 x3.2	25.4	3.18	0.766	7.51E-03	282	2.37E-02	1.87	9.16	2.37	37.7	0.101	Tri City Extrusion	Bristol	2079
HSS 25 x3.2	25.4	3.18	0.801	7.86E-03	295	2.46E-02	1.94	9.14	2.48	39.8	0.100	Extruded Aluminum Corporation	Belding	15309
HSS 25 x3.2	25.4	3.18	0.766	7.51E-03	282	2.37E-02	1.87	9.16	2.37	37.7	0.101	Gateway Extrusions	Woodbridge	US107
HSS 25 x3.2	25.4	3.18	0.766	7.51E-03	282	2.31E-02	1.82	9.05	2.34	39	0.096	Crown Extrusions	Chaska	12160
HSS 25 x3.2	25.4	3.18	0.766	7.51E-03	282	2.31E-02	1.82	9.05	2.34	39	0.096	Pennex Aluminum	Leetonia	5593-H
HSS 25 x3.2	25.4	3.18	0.695	6.82E-03	256	1.99E-02	1.57	8.82	2.05	36.3	0.091	Pennex Aluminum	Leetonia	5635-H
HSS 25 x3.2	25.4	3.18	0.743	7.29E-03	274	2.25E-02	1.77	9.06	2.27	37.5	0.096	International Extrusions	Garden City	KE3934
HSS 25 x3.2	25.4	3.18	0.766	7.51E-03	282	2.37E-02	1.86	9.16	2.37	37.8	0.100	International Extrusions	Garden City	KE6495
HSS 25 x3.2	25.4	3.18	0.77	7.55E-03	284	2.38E-02	1.87	9.16	2.38	38.3	0.100	International Extrusions	Garden City	KE7428
HSS 25 x3.2	25.4	3.18	0.77	7.55E-03	284	2.38E-02	1.87	9.16	2.38	38.3	0.100	International Extrusions	Garden City	KE2830
HSS 25 x3.2	25.4	3.18	0.76	7.45E-03	280	2.34E-02	1.84	9.14	2.34	37.6	0.099	Western Extrusions	Dallas	H 19818
HSS 25 x3.2	25.4	3.18	0.741	7.27E-03	273	2.22E-02	1.75	9.01	2.25	38	0.095	Western Extrusions	Dallas	H 19396
HSS 25 x3.2	25.4	3.18	0.748	7.34E-03	276	2.26E-02	1.78	9.06	2.28	37.9	0.096	Western Extrusions	Dallas	H 19221
HSS 25 x3.2	25.4	3.18	0.736	7.22E-03	271	2.21E-02	1.74	9.04	2.24	37.1	0.096	Western Extrusions	Dallas	H 19206
HSS 25 x3.2	25.4	3.18	0.764	7.49E-03	282	2.36E-02	1.86	9.16	2.36	37.7	0.100	Bonnell	M	AE2983
HSS 25 x3.2	24.8	3.18	0.72	7.06E-03	266	2.03E-02	1.64	8.75	2.12	35	0.092	International Extrusions	Garden City	KE12155
HSS 25 x3.1	25.4	3.05	0.716	7.02E-03	264	2.19E-02	1.72	9.1	2.19	36.2	0.096	Bonnell	M	AE0177
HSS 25 x2.5	25.4	2.54	0.629	6.17E-03	232	2.04E-02	1.61	9.38	1.99	32.2	0.100	Gateway Extrusions	Woodbridge	CES177
HSS 25 x2.5	25.4	2.54	0.616	6.04E-03	227	1.97E-02	1.55	9.31	1.94	32.2	0.097	International Extrusions	Garden City	KE10006
HSS 25 x2.5	25.4	2.54	0.634	6.22E-03	234	2.06E-02	1.62	9.39	2.01	32.7	0.101	Tri City Extrusion	Bristol	2096
HSS 25 x2.5	25.4	2.54	0.598	5.86E-03	220	1.88E-02	1.48	9.22	1.86	31.9	0.095	Tri City Extrusion	Bristol	2095
HSS 25 x2.4	25.4	2.39	0.595	5.83E-03	219	1.95E-02	1.54	9.44	1.9	30.7	0.100	Western Extrusions	Dallas	H 19556
HSS 25 x2.4	25.4	2.36	0.568	5.57E-03	210	1.83E-02	1.44	9.34	1.79	30.3	0.096	Pennex Aluminum	Leetonia	5774-H
HSS 25 x2.3	25.4	2.34	0.585	5.74E-03	216	1.93E-02	1.52	9.46	1.87	30.3	0.101	Bonnell	M	AE4307
HSS 25 x2.3	25.4	2.29	0.552	5.41E-03	203	1.78E-02	1.4	9.36	1.74	29.5	0.096	Bonnell	M	AE3283
HSS 25 x2.3	25.4	2.29	0.555	5.44E-03	205	1.80E-02	1.41	9.37	1.76	29.9	0.096	Extruded Aluminum Corporation	Belding	19646
HSS 25 x2.3	25.4	2.29	0.573	5.62E-03	211	1.87E-02	1.47	9.4	1.82	30.9	0.097	Crown Extrusions	Chaska	1864
HSS 25 x2.3	25.4	2.29	0.55	5.39E-03	203	1.78E-02	1.4	9.36	1.74	29.3	0.096	Tri City Extrusion	Bristol	2221
HSS 25 x2.3	25.4	2.29	0.551	5.40E-03	203	1.78E-02	1.4	9.36	1.74	29.5	0.096	Bonnell	M	AE1762
HSS 25 x2.3	25.4	2.29	0.056	5.46E-04	205	1.81E-02	1.42	9.39	1.76	29.6	0.097	International Extrusions	Garden City	KE8481
HSS 25 x2.3	25.4	2.29	0.555	5.44E-03	205	1.80E-02	1.41	9.37	1.76	29.9	0.096	International Extrusions	Garden City	KE8135
HSS 25 x2.2	25.4	2.24	0.55	5.39E-03	203	1.80E-02	1.42	9.43	1.75	29.3	0.098	Western Extrusions	Dallas	H 19583
HSS 25 x2.0	25.4	2.03	0.507	4.97E-03	187	1.69E-02	1.33	9.52	1.63	27.1	0.098	Bonnell	M	AE1138
HSS 25 x1.9	25.4	1.9	0.486	4.77E-03	179	1.66E-02	1.3	9.62	1.58	25.8	0.101	Tri City Extrusion	Bristol	2098
HSS 25 x1.8	25.4	1.78	0.456	4.47E-03	168	1.54E-02	1.21	9.66	1.48	25.6	0.096	Crown Extrusions	Chaska	1427
HSS 25 x1.8	25.4	1.78	0.456	4.47E-03	168	1.57E-02	1.24	9.66	1.49	24.6	0.101	Crown Extrusions	Chaska	1275
HSS 25 x1.7	25.4	1.7	0.438	4.30E-03	161	1.47E-02	1.16	9.54	1.41	24.9	0.095	Western Extrusions	Dallas	H 19397
HSS 25 x1.7	25.4	1.65	0.407	3.99E-03	150	1.38E-02	1.09	9.58	1.32	22.9	0.096	International Extrusions	Garden City	KE6494
HSS 25 x1.7	25.4	1.65	0.408	4.00E-03	150	1.38E-02	1.09	9.59	1.32	23	0.096	Bonnell	M	AE3540
HSS 25 x1.6	25.4	1.6	0.417	4.09E-03	154	1.46E-02	1.15	9.74	1.38	22.9	0.100	Extruded Aluminum Corporation	Belding	20989
HSS 25 x1.6	25.4	1.6	0.396	3.88E-03	146	1.35E-02	1.06	9.6	1.28	22.4	0.096	Pennex Aluminum	Leetonia	5210-H
HSS 25 x1.6	25.4	1.59	0.41	4.02E-03	151	1.43E-02	1.13	9.74	1.35	22.2	0.101	Tri City Extrusion	Bristol	2097
HSS 25 x1.6	25.4	1.57	0.39	3.82E-03	144	1.33E-02	1.05	9.61	1.27	22.2	0.096	Bonnell	M	AE0898
HSS 25 x1.6	25.4	1.57	0.389	3.81E-03	144	1.33E-02	1.04	9.61	1.26	22.1	0.096	Extruded Aluminum Corporation	Belding	18565
HSS 25 x1.6	25.4	1.57	0.407	3.99E-03	150	1.43E-02	1.12	9.75	1.34	22.1	0.101	Gateway Extrusions	Woodbridge	US365
HSS 25 x1.6	25.4	1.57	0.389	3.81E-03	144	1.33E-02	1.04	9.61	1.26	22	0.096	Tri City Extrusion	Bristol	1022
HSS 25 x1.6	25.4	1.57	0.395	3.87E-03	146	1.36E-02	1.07	9.66	1.29	22	0.098	Western Extrusions	Dallas	H 19588
HSS 25 x1.6	25.4	1.57	0.392	3.84E-03	145	1.34E-02	1.06	9.64	1.28	22	0.097	Bonnell	M	AE4190
HSS 25 x1.6	25.4	1.57	0.381	3.74E-03	140	1.28E-02	1.01	9.54	1.22	21.9	0.095	Taber	Russelville	OH-01105
HSS 25 x1.6	24.6	1.57	0.37	3.63E-03	136	1.16E-02	0.943	9.22	1.15	19.9	0.092	International Extrusions	Garden City	KE12121
HSS 25 x1.5	25.4	1.52	0.395	3.87E-03	146	1.36E-02	1.07	9.66	1.29	22.5	0.096	International Extrusions	Garden City	KE3933
HSS 25 x1.5	25.4	1.52	0.378	3.71E-03	139	1.29E-02	1.02	9.63	1.23	21.5	0.096	International Extrusions	Garden City	KE10423
HSS 25 x1.5	25.4	1.52	0.39	3.82E-03	144	1.36E-02	1.07	9.73	1.28	21.6	0.099	International Extrusions	Garden City	KE8943
HSS 25 x1.5	25.4	1.52	0.395	3.87E-03	146	1.39E-02	1.09	9.76	1.3	21.6	0.100	International Extrusions	Garden City	KE2987
HSS 25 x1.5	25.4	1.52	0.395	3.87E-03	146	1.36E-02	1.07	9.66	1.29	22.5	0.096	Crown Extrusions	Chaska	12608
HSS 25 x1.5	25.4	1.45	0.36	3.53E-03	133	1.24E-02	0.974	9.66	1.17	20.6	0.096	Bonnell	M	AE0129
HSS 25 x1.4	25.4	1.4	0.346	3.39E-03	127	1.19E-02	0.938	9.67	1.13	19.8	0.096	International Extrusions	Garden City	KE12015
HSS 25 x1.3	25.4	1.27	0.331	3.25E-03	122	1.19E-02	0.934	9.85	1.11	18.4	0.100	International Extrusions	Garden City	KE0012
HSS 25 x1.3	25.4	1.27	0.324	3.18E-03	120	1.15E-02	0.904	9.79	1.07	18.3	0.098	Pennex Aluminum	Leetonia	5606-H
HSS 25 x1.3	24.6	1.27	0.332	3.26E-03	122	1.11E-02	0.9	9.51	1.07	17.8	0.094	Gateway Extrusions		

# SQUARE TUBES (ROUNDED CORNERS)



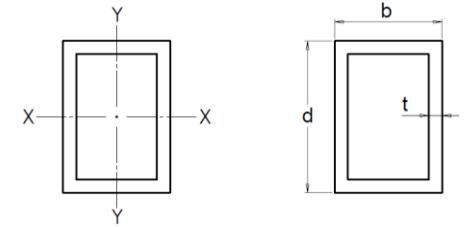
Designation	Dimension (d)	Thickness (t)	Mass	Dead Load	Area	I	S	r	Z	Torsional Constant	Surface Area per meter of length	Extruder	Location	Manufacturer Identification Number
HSS d x t	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	J	m <sup>2</sup>			
<b>HSS 19</b>														
x3.2	19.1	3.18	0.534	5.24E-03	197	8.42E-03	0.884	6.54	1.17	14.1	0.072	Western Extrusions	Dallas	H 19285
x3.2	19.1	3.18	0.542	5.32E-03	200	8.65E-03	0.908	6.58	1.2	14.3	0.074	International Extrusions	Garden City	KE11124
x3.2	19.1	3.18	0.546	5.35E-03	201	8.77E-03	0.92	6.6	1.21	14.2	0.075	Tri City Extrusion	Bristol	1167
x3.2	19.1	3.18	0.54	5.30E-03	199	8.55E-03	0.898	6.56	1.19	14.3	0.073	Bonnell	M	AE2273
x3.1	19.1	3.05	0.46	4.51E-03	170	6.61E-03	0.694	6.24	0.957	12.7	0.065	International Extrusions	Garden City	KE7601
x3.1	19.1	3.05	0.529	5.19E-03	195	8.62E-03	0.905	6.65	1.18	13.9	0.076	Extruded Aluminum Corporation	Belding	5692
x2.3	19.1	2.29	0.416	4.08E-03	153	7.24E-03	0.76	6.87	0.965	11.9	0.074	International Extrusions	Garden City	KE7914
x1.7	19.1	1.73	0.319	3.13E-03	118	5.87E-03	0.616	7.06	0.76	9.42	0.074	Bonnell	N	A-1448
x1.7	19.1	1.65	0.312	3.06E-03	115	5.85E-03	0.614	7.13	0.752	9.17	0.076	Bonnell	M	AE1994
x1.6	19.1	1.57	0.299	2.93E-03	110	5.64E-03	0.593	7.16	0.723	8.84	0.076	Tri City Extrusion	Bristol	1108
x1.6	19.1	1.57	0.281	2.76E-03	104	5.09E-03	0.535	7.01	0.663	8.75	0.071	Tri City Extrusion	Bristol	1034
x1.6	19.1	1.57	0.299	2.93E-03	110	5.64E-03	0.592	7.15	0.723	8.91	0.075	International Extrusions	Garden City	KE9817
x1.6	19.1	1.57	0.299	2.93E-03	110	5.65E-03	0.593	7.16	0.723	8.84	0.076	Gateway Extrusions	Woodbridge	CES185
x1.6	19.1	1.57	0.287	2.81E-03	106	5.29E-03	0.555	7.07	0.684	8.76	0.072	Western Extrusions	Dallas	H 19393
x1.5	19.1	1.47	0.263	2.58E-03	97.1	4.82E-03	0.506	7.05	0.625	8.29	0.071	Pennex Aluminum	Leetonia	5536-H
x1.4	19.1	1.4	0.268	2.63E-03	98.6	5.15E-03	0.541	7.23	0.654	8.08	0.076	Bonnell	M	AE0862
x1.4	18.9	1.4	0.265	2.60E-03	98	5.01E-03	0.53	7.16	0.642	7.9	0.074	International Extrusions	Garden City	KE3328
x1.4	19.1	1.35	0.259	2.54E-03	95.3	5.00E-03	0.525	7.24	0.633	7.87	0.075	International Extrusions	Garden City	KE10573
x1.3	19.1	1.27	0.242	2.37E-03	89.3	4.69E-03	0.493	7.25	0.594	7.42	0.074	Pennex Aluminum	Leetonia	5754-H
x1.1	19.1	1.14	0.212	2.08E-03	78.1	4.07E-03	0.428	7.22	0.516	6.77	0.072	Western Extrusions	Dallas	H 19300
<b>HSS 18</b>														
x3.2	18.3	3.18	0.526	5.16E-03	194	7.69E-03	0.841	6.3	1.11	12.6	0.073	International Extrusions	Garden City	KE12222
x2.0	18.3	2.03	0.364	3.57E-03	134	6.00E-03	0.656	6.69	0.823	9.6	0.073	International Extrusions	Garden City	KE12172
x1.1	18.3	1.14	0.218	2.14E-03	80.4	3.97E-03	0.434	7.03	0.52	6.2	0.073	International Extrusions	Garden City	KE12111
<b>HSS 16</b>														
x3.2	15.9	3.18	0.437	4.29E-03	161	4.60E-03	0.58	5.34	0.784	7.54	0.063	Tri City Extrusion	Bristol	2111
x1.6	15.9	1.57	0.239	2.34E-03	87.9	2.98E-03	0.376	5.83	0.469	4.85	0.061	Bonnell	N	A-1447
x1.3	15.9	1.27	0.201	1.97E-03	74.2	2.65E-03	0.334	5.97	0.407	4.2	0.062	International Extrusions	Garden City	KE8996
x1.1	15.9	1.14	0.184	1.80E-03	67.7	2.47E-03	0.311	6.03	0.375	3.87	0.063	International Extrusions	Garden City	KE11195
x1.1	15.9	1.14	0.181	1.78E-03	66.7	2.41E-03	0.303	6.01	0.368	3.86	0.062	International Extrusions	Garden City	KE11297
x1.1	15.6	1.14	0.18	1.77E-03	66.2	2.32E-03	0.297	5.92	0.359	3.68	0.061	International Extrusions	Garden City	KE8340
<b>HSS 15</b>														
x1.3	15.2	1.27	0.193	1.89E-03	71.3	2.34E-03	0.307	5.73	0.375	3.69	0.060	International Extrusions	Garden City	KE7816
x1.3	15.0	1.27	0.179	1.76E-03	66.1	2.02E-03	0.269	5.52	0.333	3.42	0.056	International Extrusions	Garden City	KE12174
x1.1	15.4	1.14	0.176	1.73E-03	65	2.20E-03	0.287	5.82	0.347	3.47	0.060	Gateway Extrusions	Woodbridge	CES008
x1.1	15.2	1.14	0.175	1.72E-03	64.4	2.14E-03	0.28	5.76	0.34	3.39	0.060	International Extrusions	Garden City	KE9488
x1.1	15.2	1.14	0.175	1.72E-03	64.5	2.14E-03	0.281	5.76	0.34	3.39	0.060	International Extrusions	Garden City	KE2228
x1.1	15.2	1.09	0.167	1.64E-03	61.4	2.05E-03	0.268	5.77	0.325	3.27	0.059	International Extrusions	Garden City	KE10535
x1.0	15.0	1.02	0.154	1.51E-03	56.9	1.86E-03	0.248	5.72	0.298	2.95	0.059	International Extrusions	Garden City	KE12210
<b>HSS 13</b>														
x1.7	12.7	1.65	0.199	1.95E-03	73.3	1.52E-03	0.24	4.56	0.306	2.45	0.050	International Extrusions	Garden City	KE7718
x1.6	12.7	1.57	0.19	1.86E-03	70.1	1.47E-03	0.232	4.58	0.294	2.35	0.050	Extruded Aluminum Corporation	Belding	20319

# RECTANGULAR TUBES (SHARP CORNERS)



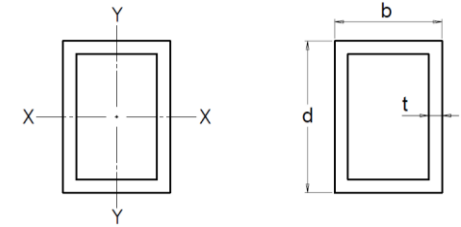
Designation	Dimensions		Thickness (t)	Mass	Dead Load	Area	Surface Area per meter of length	Axis X-X				Axis Y-Y				Torsional Constant	Extruder	Location	Manufacturer Identification Number
	HSS d x b x t	Height (d)						Width (b)	$I_x$	$S_x$	$r_x$	$Z_x$	$I_y$	$S_y$	$r_y$				
mm x mm x mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	m <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>			
HSS 305 x51x4.8	305	50.8	4.76	8.94	8.77E-02	3296	0.711	31.3	206	97.5	280	1.6	63	22	70.9	5348	Bonnell	C	WLB-619
HSS 203 x152x6.4	203	152	6.35	11.9	1.17E-01	4355	0.710	26.1	257	77.4	306	16.7	219	61.8	250	31212	Extrudex	Toronto	H-21471
x127x9.5	203	127	9.52	16.1	1.58E-01	5927	0.660	32.6	321	74.2	396	15.4	242	50.9	283	32732	Service Center Metals	Prince George	HR1635
x102x12.7	203	102	12.7	19.2	1.88E-01	7097	0.610	35.3	348	70.6	447	11.2	221	39.7	266	27412	Crown Extrusions	Chaska	12604
x102x9.5	203	102	9.52	14.8	1.45E-01	5444	0.610	28.1	276	71.8	349	9.13	180	40.9	211	21972	Service Center Metals	Prince George	HR1636
x102x6.4	203	102	6.35	10.1	9.90E-02	3710	0.610	19.8	195	73.1	242	6.61	130	42.2	148	15643	Crown Extrusions	Chaska	13720
x102x4.8	203	102	4.78	7.65	7.50E-02	2820	0.610	15.3	151	73.7	186	5.17	102	42.8	114	12151	Service Center Metals	Prince George	HR2147
x76x6.4	203	76.2	6.35	9.19	9.01E-02	3387	0.559	16.7	164	70.2	210	3.43	90	31.8	103	9241	Service Center Metals	Prince George	HR0876
x51x6.4	203	50.8	6.35	8.31	8.15E-02	3065	0.508	13.6	134	66.5	179	1.34	52.8	20.9	62	4161	Extrudex	Lafayette	1466
x51x3.2	203	50.8	3.18	4.26	4.18E-02	1573	0.508	7.26	71.5	68	93.8	0.779	30.7	22.3	33.9	2362	Nanshan	Ohio	H-25679
HSS 178 x76x3.2	178	76.2	3.18	4.26	4.18E-02	1573	0.508	6.36	71.5	63.6	88.9	1.69	44.3	32.7	45	4229	Extrudex	Ohio	1147
x51x3.2	178	50.8	3.18	3.83	3.76E-02	1411	0.457	5.13	57.7	60.3	74.8	0.688	27.1	22.1	30	2009	Service Center Metals	Prince George	HR2226
HSS 159 x89x6.4	159	88.9	6.35	8.12	7.96E-02	2984	0.495	9.86	124	57.5	154	3.91	88	36.2	102	8803	Extrudex	Ohio	H-19567
HSS 152 x102x13	152	102	12.7	15.7	1.54E-01	5806	0.509	17	223	54	283	8.64	170	38.6	209	18196	Service Center Metals	Prince George	HR2365
x102x9.5	152	102	9.52	12.1	1.19E-01	4476	0.509	13.7	179	55.2	223	7.07	139	39.7	166	14642	Bonnell	C	A-7081
x102x6.4	152	102	6.35	8.31	8.15E-02	3065	0.509	9.77	128	56.5	156	5.14	101	41	117	10471	Extrudex	Chaska	12603
x102x4.8	152	102	4.78	6.35	6.23E-02	2335	0.509	7.61	99.8	57.1	120	4.03	79.4	41.6	90.7	8148	Service Center Metals	Prince George	HR0791
x102x3.2	152	102	3.18	4.26	4.18E-02	1573	0.509	5.24	68.8	57.7	82	2.8	55.2	42.2	62	5608	Service Center Metals	Prince George	HR1624
x76x13	152	76.2	12.7	14	1.37E-01	5161	0.457	13.8	181	51.7	238	4.23	111	28.6	139	10567	Extrudex	Chaska	1132
x76x6.4	152	76.2	6.35	7.44	7.30E-02	2742	0.457	8.05	106	54.2	133	2.64	69.2	31	80.4	6318	Service Center Metals	Prince George	HR0790
x76x4.8	152	76.2	4.78	5.67	5.56E-02	2092	0.457	6.29	82.5	54.8	102	2.09	55	31.6	62.6	4961	Extrudex	Chaska	OH-13998
x76x4.8	152	76.2	4.75	5.67	5.56E-02	2081	0.457	6.26	82.1	54.8	102	2.09	54.7	31.7	62.3	4938	Extrudex	Chaska	H-13661
x76x3.2	152	76.2	3.18	3.83	3.76E-02	1411	0.457	4.34	57	55.5	70	1.47	38.6	32.3	43.1	3445	Service Center Metals	Prince George	HR1316
x64x3.2	152	63.5	3.18	3.61	3.54E-02	1331	0.432	3.89	51.1	54.1	63.9	0.98	30.9	27.1	34.4	2496	Service Center Metals	Prince George	HR0335
x51x6.4	152	50.8	6.35	6.56	6.43E-02	2419	0.406	6.33	83	51.1	109	1.02	40.2	20.5	47.6	2920	Extrudex	Ohio	H-1317
x51x4.8	152	50.8	4.78	5.12	5.02E-02	1849	0.406	4.96	65.1	51.8	84.5	0.829	32.7	21.2	37.6	2341	Service Center Metals	Prince George	HR1212
x51x3.2	152	50.8	3.18	3.39	3.32E-02	1250	0.406	3.44	45.2	52.5	57.9	0.596	23.5	21.8	26.2	1658	Extrudex	Ohio	H-13662
x51x3.1	152	50.8	3.05	3.27	3.21E-02	1202	0.406	3.32	43.5	52.6	55.7	0.576	22.7	21.9	25.2	1600	Bonnell	C	A-7066
x51x2.3	152	50.8	2.29	2.46	2.41E-02	908	0.406	2.54	33.3	52.9	42.4	0.448	17.6	22.2	19.3	1237	Extruded Aluminum Corporation	Belding	13641
x44x3.2	152	44.4	3.18	3.28	3.22E-02	1210	0.394	3.22	42.3	51.6	54.9	0.442	19.9	19.1	22.3	1289	Service Center Metals	Prince George	HR1316
x44x2.5	152	44.4	2.54	2.63	2.58E-02	974	0.394	2.62	34.4	51.9	44.5	0.366	16.5	19.4	18.2	1061	Extrudex	Chaska	12476
x44x2.3	152	44.4	2.34	1.89	1.85E-02	898	0.394	2.43	31.8	52	41.1	0.341	15.3	19.5	16.8	985	Extrudex	Chaska	5237-H
x38x3.2	152	38.1	3.18	3.17	3.11E-02	1169	0.381	3	39.3	50.6	51.9	0.313	16.4	16.4	18.5	956	Service Center Metals	Prince George	HR1213
x25x3.2	152	25.4	3.18	2.95	2.89E-02	1089	0.356	2.55	33.4	48.4	45.9	0.124	9.76	10.7	11.3	418	Extrudex	Chaska	5233-H
HSS 140 x64x3.2	140	63.5	3.18	3.17	3.11E-02	1169	0.406	2.48	39	46	48.1	0.833	26.2	26.7	29.5	1960	Extrudex	Chaska	5233-H
HSS 127 x102x3.2	127	102	3.18	3.84	3.77E-02	1411	0.458	3.4	53.6	49.1	63.1	2.41	47.5	41.3	54.1	4309	Bonnell	C	A-7053
x76x6.4	127	76.2	6.35	6.56	6.43E-02	2419	0.406	5.11	80.4	45.9	99.9	2.24	58.9	30.5	69.1	4904	Extrudex	Toronto	H-6636
x76x4.8	127	76.2	4.78	5.02	4.92E-02	1849	0.406	4.01	63.1	46.6	77.4	1.78	46.8	31.1	53.9	3858	Extrudex	Toronto	H-9550
x76x3.2	127	76.2	3.18	3.39	3.32E-02	1250	0.406	2.78	43.8	47.2	53.1	1.26	33	31.7	37.2	2683	Hydro	Montreal	AH-07233
x76x2.4	127	76	2.36	2.55	2.50E-02	937	0.406	2.11	33.3	47.5	40	0.956	25.2	31.9	28.1	2033	Hydro	Montreal	MH-16356
x64x4.8	127	63.5	4.78	4.7	4.61E-02	1728	0.381	3.56	56	45.4	70	1.17	36.9	26.1	42.6	2797	Bonnell	C	A-7065
x64x4.8	127	63.5	4.75	4.68	4.59E-02	1719	0.381	3.54	55.7	45.4	69.7	1.17	36.8	26.1	42.4	2784	Extrudex	Chaska	1406
x64x3.2	127	63.5	3.18	3.18	3.12E-02	1174	0.381	2.49	39.3	46.1	48.4	0.837	26.4	26.7	29.6	1978	Extrudex	Chaska	1406
x51x6.4	127	50.8	6.35	5.66	5.55E-02	2097	0.356	3.93	61.9	43.3	80.4	0.861	33.9	20.3	40.5	2309	Extrudex	Chaska	1406
x51x4.8	127	50.8	4.78	4.36	4.28E-02	1607	0.356	3.1	48.9	43.9	62.6	0.7	27.6	20.9	32	1853	Extrudex	Chaska	1406
x51x4.8	127	50.8	4.75	4.32	4.24E-02	1602	0.356	3.09	48.7	43.9	62.4	0.699	27.5	20.9	31.9	1847	Extrudex	Chaska	1406
x51x2.5	127	50.8	2.54	2.37	2.32E-02	877	0.356	1.77	27.8	44.9	34.9	0.416	16.4	21.8	18.2	1078	Extruded Aluminum Corporation	Belding	5859
x51x2.4	127	50.8	2.39	2.24	2.20E-02	826	0.356	1.67	26.3	44.9	32.9	0.394	15.5	21.8	17.2	1020	Extrudex	Chaska	1406
x51x2.4	127	50.8	2.36	2.22	2.18E-02	818	0.356	1.65	26	44.9	32.6	0.391	15.4	21.9	17	1010	Extrudex	Chaska	1406
x44x4.8	127	44.4	4.78	4.19	4.11E-02	1546	0.343	2.88	45.3	43.1	58.9	0.513	23.1	18.2	27	1434	Extruded Aluminum Corporation	Belding	5859
x44x3.2	127	44.4	3.18	2.84	2.79E-02	1048	0.343	2.01	31.7	43.8	40.6	0.373	16.8	18.9	18.9	1026	Extruded Aluminum Corporation	Belding	5859
x44x3.1	127	44.4	3.05	2.72	2.67E-02	1008	0.343	1.94	30.5	43.9	39.1	0.361	16.2	18.9	18.3	991	Extruded Aluminum Corporation	Belding	5859
x38x3.2	127	38.1	3.18	2.72	2.67E-02	1008	0.330	1.86	29.2	42.9	38.1	0.264	13.8	16.2	15.7	765	Extruded Aluminum Corporation	Belding	5859
x25x3.2	127	25.4	3.18	2.52	2.47E-02	927	0.305	1.55	24.4	40.9	33.1	0.104	8.18	10.6	9.54	339	Extruded Aluminum Corporation	Belding	5859

# RECTANGULAR TUBES (SHARP CORNERS)



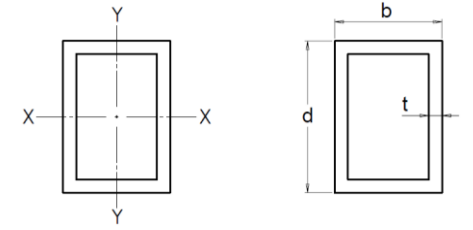
Designation	Dimensions		Thickness (t)	Mass	Dead Load	Area	Surface Area per meter of length	Axis X-X				Axis Y-Y				Torsional Constant	Extruder	Location	Manufacturer Identification Number	
	HSS d x b x t	Height (d)						Width (b)	$I_x$	$S_x$	$r_x$	$Z_x$	$I_y$	$S_y$	$r_y$					$Z_y$
mm x mm x mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	m <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>				
<b>HSS 114</b>																				
x51x3.2	114	50.8	3.18	2.73	2.68E-02	1008	0.330	1.66	29.1	40.6	36.4	0.459	18.1	21.3	20.4	1145	Bonnell	C	A-7049	
x51x2.4	114	50.8	2.39	2.08	2.04E-02	766	0.330	1.28	22.4	40.9	27.9	0.359	14.1	21.7	15.7	889	Bonnell	C	A-7054	
x44x3.2	114	44.4	3.18	2.62	2.57E-02	968	0.317	1.54	26.9	39.9	34.2	0.339	15.3	18.7	17.3	897	Bonnell	CN	A-7020	
x44x2.9	114	44.4	2.92	2.42	2.37E-02	893	0.317	1.43	25	40	31.6	0.316	14.2	18.8	16	835	Crown Extrusions	Chaska	12013	
x44x2.8	114	44.4	2.79	2.31	2.27E-02	856	0.317	1.37	24	40	30.4	0.305	13.7	18.9	15.4	803	Pennex Aluminum	Leetonia	5582-H	
x44x2.4	114	44.4	2.39	1.99	1.95E-02	735	0.317	1.19	20.8	40.2	26.2	0.267	12	19	13.4	699	Service Center Metals	Prince George	HR1111	
x44x2.3	114	44.4	2.29	1.92	1.88E-02	705	0.317	1.14	20	40.2	25.1	0.257	11.5	19.1	12.8	672	Extrudex	Québec	V-12282	
x32x5.4	114	31.8	5.38	3.95	3.87E-02	1457	0.292	2.01	35.2	37.2	47.5	0.225	14.2	12.4	17.4	691	Western Extrusions	Dallas	H 19834	
<b>HSS 108</b>																				
x32x6.4	108	31.8	6.35	4.37	4.29E-02	1613	0.280	1.96	36.2	34.8	49.3	0.233	14.7	12	18.6	712	Taber	Russelville	OH-12539	
<b>HSS 102</b>																				
x76x6.4	102	76.2	6.35	5.69	5.58E-02	2097	0.356	2.94	57.9	37.5	71.2	1.85	48.5	29.7	57.9	3545	Nanshan	Lafayette	1094	
x76x4.8	102	76.2	4.78	4.37	4.29E-02	1607	0.356	2.33	45.8	38.1	55.5	1.48	38.7	30.3	45.3	2796	Crown Extrusions	Chaska	12110	
x76x3.2	102	76.2	3.18	2.95	2.89E-02	1089	0.356	1.63	32.1	38.7	38.2	1.04	27.3	30.9	31.3	1951	Extrudex	Toronto, Ohio	H-1070	
x51x9.5	102	50.8	9.52	6.85	6.72E-02	2540	0.305	2.95	58.1	34.1	77	0.89	35	18.7	44.7	2244	Bonnell	C	A-1415	
x51x6.4	102	50.8	6.35	4.81	4.72E-02	1774	0.305	2.21	43.5	35.3	55.8	0.7	27.6	19.9	33.3	1713	Crown Extrusions	Chaska	1296	
x51x4.8	102	50.8	4.78	3.7	3.63E-02	1364	0.305	1.76	34.6	35.9	43.7	0.572	22.5	20.5	26.4	1376	Pennex Aluminum	Leetonia	5737-H	
x51x4.8	102	50.8	4.75	3.66	3.59E-02	1358	0.305	1.75	34.5	35.9	43.5	0.569	22.4	20.5	26.3	1370	Nanshan	Lafayette	1138	
x51x3.2	102	50.8	3.18	2.52	2.47E-02	927	0.305	1.24	24.4	36.5	30.3	0.413	16.3	21.1	18.5	978	Hydro	Laval	MH-13744	
x51x3.1	102	50.8	3.05	2.41	2.36E-02	892	0.305	1.19	23.5	36.6	29.2	0.399	15.7	21.2	17.8	943	Extrudex	Toronto, Ohio	H-12575	
x44x6.4	102	44.4	6.35	4.59	4.50E-02	1694	0.292	2.03	39.9	34.6	52	0.506	22.8	17.3	27.8	1324	Service Center Metals	Prince George	HR1019	
x44x4.8	102	44.4	4.83	3.58	3.51E-02	1317	0.292	1.63	32.1	35.2	41.2	0.421	18.9	17.9	22.4	1082	Western Extrusions	Dallas	5685-H	
x44x3.2	102	44.4	3.18	2.41	2.36E-02	887	0.292	1.14	22.5	35.9	28.3	0.305	13.7	18.5	15.6	769	Taber	Russelville	OH-16405	
x44x2.9	102	44.4	2.92	2.22	2.18E-02	819	0.292	1.06	20.9	36	26.2	0.284	12.8	18.6	14.5	716	Extrudex	Toronto, Ohio	H-2249	
x44x2.8	102	44.4	2.79	2.14	2.10E-02	785	0.292	1.02	20	36	25.1	0.274	12.3	18.7	13.9	689	Bonnell	CN	A-7055	
x44x2.5	102	44.4	2.54	1.94	1.90E-02	716	0.292	0.935	18.4	36.1	23	0.253	11.4	18.8	12.8	633	Pennex Aluminum	Leetonia	5236-H	
x44x2.3	102	44.4	2.29	1.75	1.72E-02	647	0.292	0.849	16.7	36.2	20.9	0.231	10.4	18.9	11.6	577	Crown Extrusions	Chaska	12009	
x44x1.6	102	44.4	1.57	1.22	1.20E-02	450	0.292	0.601	11.8	36.5	14.6	0.166	7.45	19.2	8.2	410	Service Center Metals	Prince George	HR0445	
x38x6.4	102	38.1	6.35	4.39	4.31E-02	1613	0.279	1.84	36.3	33.8	48.1	0.347	18.2	14.7	22.5	971	Western Extrusions	Dallas	H 19450	
x38x4.6	102	38.1	4.57	3.24	3.18E-02	1194	0.279	1.42	28	34.5	36.4	0.281	14.8	15.3	17.5	771	Taber	Russelville	OH-05578	
x38x3.2	102	38.1	3.18	2.3	2.26E-02	847	0.279	1.04	20.5	35.1	26.3	0.214	11.2	15.9	12.9	578	Metra	Laval	94153	
x38x3.1	102	38.1	3.05	2.2	2.16E-02	814	0.279	1.01	19.8	35.2	25.3	0.207	10.9	16	12.4	558	Hydro	Montreal	AH-7321	
x38x2.4	102	38.1	2.39	1.75	1.72E-02	644	0.279	0.809	15.9	35.4	20.2	0.17	8.91	16.2	9.99	453	Extrudex	Québec	V-00762	
x25x3.2	102	25.4	3.18	2.08	2.04E-02	766	0.254	0.848	16.7	33.3	22.3	0.084	6.6	10.5	7.75	260	Pennex Aluminum	Leetonia	5567-H	
x25x3.1	102	25.4	3.05	2.04	2.00E-02	737	0.254	0.819	16.1	33.3	21.5	0.082	6.42	10.5	7.49	252	Taber	Russelville	OH-12347	
x25x2.3	102	25.4	2.29	1.52	1.49E-02	560	0.254	0.534	12.5	33.7	16.5	0.066	5.17	10.8	5.86	201	Nanshan	Lafayette	1645	
<b>HSS 89</b>																				
x44x3.2	88.9	44.4	3.18	2.19	2.15E-02	806	0.267	0.816	18.4	31.8	22.9	0.27	12.2	18.3	14	643	Service Center Metals	Prince George	HR1110	
<b>HSS 87</b>																				
x61x4.8	86.7	61	4.75	3.57	3.50E-02	1312	0.295	1.34	30.8	31.9	37.9	0.76	24.9	24.1	29.4	1512	Bonnell	C	A-1919	
<b>HSS 86</b>																				
x48x3.2	85.7	47.6	3.18	2.2	2.16E-02	806	0.267	0.78	18.2	31.1	22.5	0.307	12.9	19.5	14.8	691	Hydro	Montreal	AH-07120	
<b>HSS 83</b>																				
x32x5.1	82.6	31.8	5.08	2.88	2.82E-02	1058	0.229	0.806	19.5	27.6	25.8	0.159	10	12.3	12.4	441	Extrudex	Ohio	H-26321	
<b>HSS 79</b>																				
x41x1.6	79.4	41.3	1.57	1	9.81E-03	370	0.241	0.313	7.89	29.1	9.63	0.113</								

# RECTANGULAR TUBES (SHARP CORNERS)



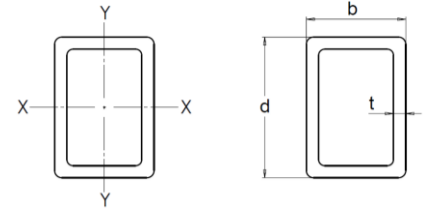
Designation	Dimensions		Thickness (t)	Mass	Dead Load	Area	Surface Area per meter of length	Axis X-X				Axis Y-Y				Torsional Constant	Extruder	Location	Manufacturer Identification Number
	HSS d x b x t	Height (d)						Width (b)	$I_x$	$S_x$	$r_x$	$Z_x$	$I_y$	$S_y$	$r_y$				
mm x mm x mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	m <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>			
<b>HSS 76</b> x64x2.5	76.2	63.5	2.54	1.85	1.81E-02	684	0.279	0.59	15.5	29.4	18.3	0.444	14	25.5	16.1	776	Bonnell Metra Service Center Metals	C Laval Prince George	A-7063 94213 HR1043
x51x6.4	76.2	50.8	6.35	3.94	3.86E-02	1452	0.254	1.06	27.8	27	35.3	0.54	21.3	19.3	26.1	1137	Pennex Aluminum Crown Extrusions Nanshan Taber Hydro Extrudex Extrudex	Leetonia Chaska Lafayette Russelville Montreal Québec Toronto, Ohio	5343-H 12479 1536 OH-10693 MH-16582 V-18335 H-24170
x51x4.8	76.2	50.8	4.78	3.05	2.99E-02	1122	0.254	0.855	22.4	27.6	27.9	0.443	17.4	19.9	20.8	917	Extrudex	Toronto, Ohio	H-18513
x51x4.8	76.2	50.8	4.76	3.03	2.97E-02	1119	0.254	0.854	22.4	27.6	27.9	0.442	17.4	19.9	20.8	915	Crown Extrusions	Chaska	12477
x51x4.8	76.2	50.8	4.75	3.03	2.97E-02	1116	0.254	0.852	22.4	27.6	27.8	0.441	17.4	19.9	20.7	913	Extrudex	Québec	V-00164
x51x3.2	76.2	50.8	3.18	2.08	2.04E-02	766	0.254	0.611	16	28.2	19.5	0.321	12.6	20.5	14.7	654	Hydro Pennex Aluminum Extruded Aluminum Corporation Crown Extrusions Nanshan Western Extrusions	Montreal Leetonia Belding Chaska Lafayette Dallas CN	AH-7327 5121-H 5791 1470 1152 H 19599
x51x3.1	76.2	50.8	3.05	1.99	1.95E-02	737	0.254	0.59	15.5	28.3	18.8	0.311	12.2	20.5	14.1	632	Bonnell Taber Metra Hydro Extrudex Extrudex	Montreal Québec Toronto, Ohio	MH-13613 SA-05466 H-5261
x51x2.6	76.2	50.8	2.59	1.71	1.68E-02	631	0.254	0.511	13.4	28.5	16.2	0.271	10.7	20.7	12.2	548	Bonnell Metra	CN Laval	A-7030 998558
x44x3.2	76.2	44.4	3.18	1.97	1.93E-02	726	0.241	0.557	14.6	27.7	18.1	0.236	10.6	18	12.3	520	Service Center Metals Nanshan Pennex Aluminum	Prince George Lafayette Leetonia CN	HR0331 1522 5004-H A-7040
x44x2.4	76.2	44.4	2.39	1.5	1.47E-02	553	0.241	0.434	11.4	28	13.9	0.186	8.37	18.3	9.53	406	Taber Bonnell Extrudex	Russelville C Ohio	OH-01823 A-1933 H-21882
x44x1.6	76.2	44.4	1.57	1	9.81E-03	370	0.241	0.297	7.8	28.3	9.43	0.129	5.8	18.7	6.49	287	Bonnell Metra Pennex Aluminum	C Laval Leetonia	A-7124 998154 5678-H
x38x4.8	76.2	38.1	4.78	2.71	2.66E-02	1000	0.229	0.7	18.4	26.5	23.6	0.222	11.7	14.9	14.1	543	Service Center Metals Taber Hydro Extrudex	Prince George Russelville Montreal Toronto, Ohio	HR1367 OH-10694 MH-15692 H-16550
x38x3.2	76.2	38.1	3.18	1.86	1.82E-02	685	0.229	0.503	13.2	27.1	16.6	0.165	8.66	15.5	10	395	Metra Pennex Aluminum Crown Extrusions Nanshan Bonnell Taber Extrudex	Laval Leetonia Chaska Lafayette CN Russelville Toronto, Ohio	997698 5517-H 1607 1481 A-1497 OH-10040 H-13665
x38x3.1	76.2	38.1	3.05	1.78	1.75E-02	660	0.229	0.486	12.8	27.1	16	0.16	8.38	15.6	9.7	382	Metra Hydro Hydro Extrudex	Laval Montreal Montreal Québec	94190 AH-07150 MH-41535 SA-05465
x32x3.2	76.2	31.8	3.18	1.75	1.72E-02	645	0.216	0.449	11.8	26.4	15.1	0.108	6.79	12.9	7.94	282	Pennex Aluminum Taber Pennex Aluminum	Leetonia Russelville	5041-H OH-07896
x25x3.2	76.2	25.4	3.18	1.64	1.61E-02	605	0.203	0.396	10.4	25.6	13.6	6.38E-02	5.02	10.3	5.95	183	Extruded Aluminum Corporation Crown Extrusions Nanshan Bonnell Extrudex	Leetonia Belding Chaska Lafayette CN Ohio	5544-H 20092 12014 1519 A-1915 H-22330
x25x3.1	76.2	25.4	3.05	1.57	1.54E-02	582	0.203	0.382	10	25.6	13.2	6.20E-02	4.88	10.3	5.76	177	Metra Hydro Extrudex Extrudex	Laval Montreal Québec Toronto	94196 MH-07995 V-14770 H-22492
x25x2.4	76.2	25.4	2.39	1.25	1.23E-02	462	0.203	0.31	8.14	25.9	10.6	5.18E-02	4.08	10.6	4.69	146	Bonnell	C	A-1927
x19x2.0	76.2	19	2.03	1.01	9.90E-03	371	0.190	0.234	6.13	25.1	8.16	2.37E-02	2.48	7.99	2.86	72.9	Extrudex	Toronto	H-11036
<b>HSS 70</b> x51x2.4	69.9	50.8	2.39	1.5	1.47E-02	553	0.241	0.386	11	26.4	13.2	2.34E-01	9.23	20.6	10.6	449	Pennex Aluminum	Leetonia	5554-H
<b>HSS 64</b> x51x3.2	63.5	50.8	3.18	1.86	1.82E-02	685	0.229	0.393	12.4	23.9	14.9	2.75E-01	10.8	20	12.7	501	Service Center Metals Service Center Metals	Prince George Prince George	HR1421 HR0448
x38x3.2	63.5	38.1	3.18	1.64	1.61E-02	605	0.203	0.319	10	23	12.5	1.40E-01	7.36	15.2	8.64	306	Pennex Aluminum Nanshan Bonnell	Leetonia Lafayette C	5214-H 1470 A-7014
x38x1.8	63.5	38.1	1.83	0.972	9.53E-03	358	0.203	0.198	6.23	23.5	7.57	8.89E-02	4.67	15.8	5.3	191	Crown Extrusions Service Center Metals	Chaska Prince George	12093 HR1088
x32x3.2	63.5	31.8	3.18	1.53	1.50E-02	565	0.191	0.282	8.89	22.4	11.3	9.13E-02	5.75	12.7	6.79	221	Crown Extrusions Pennex Aluminum Western Extrusions	Chaska Leetonia Dallas	1284 5163-H H 19619
x32x1.4	63.5	31.8	1.42	0.713	6.99E-03	263	0.191	0.14	4.41	23.1	5.42	4.73E-02	2.98	13.4	3.33	111	Bonnell	N	A-1928
x25x1.6	63.5	25.4	1.6	0.744	7.30E-03	274	0.178	0.136	4.29	22.3	5.43	3.17E-02	2.5	10.8	2.81	82.7	Bonnell	C	A-1536
<b>HSS 57</b> x44x3.2	57.2	44.4	3.18	1.64	1.61E-02	605	0.203	0.275	9.63	21.3	11.7	0.184	8.28	17.4	9.79	343	Bonnell Western Extrusions Taber	C Dallas Russelville	A-1930 H 19192 OH-07485
x25x1.6	57.2	25.4	1.57	0.678	6.65E-03	250	0.165	0.103	3.61	20.3	4.52	2.85E-02	2.24	10.7	2.53	71	Bonnell	N	A-1913
x13x3.2	57.2	12.7	3.18	1.09	1.07E-02	403	0.140	0.128	4.49	17.8	6.27	8.67E-03	1.37	4.64	1.79	28.7	Crown Extrusions	Chaska	13114
<b>HSS 51</b> x44x3.2	50.8	44.4	3.18	1.53	1.50E-02	565	0.190	0.207	8.14	19.1	9.86	0.167	7.51	17.2	8.96	284	Bonnell Taber Crown Extrusions	C Russelville Chaska	A-7029 OH-02797 12043
x38x3.2	50.8	38.1	3.18	1.42	1.39E-02	524	0.178	0.184	7.24	18.7	8.9	0.116	6.07	14.8	7.23	222	Pennex Aluminum Nanshan Service Center Metals	Leetonia Lafayette Prince George	5213-H 1287 HR0330
x25x4.8	50.8	25.4	4.78	1.73	1.70E-02	637	0.152	0.185	7.28	17	9.64	5.57E-02	4.38	9.35	5.6	140	Bonnell Service Center Metals	CN Prince George	A-1408 HR1156
x25x3.2	50.8	25.4	3.18	1.2	1.18E-02	444	0.152	0.138	5.44	17.6	6.98	4.38E-02	3.45	9.93	4.16	107	Bonnell Pennex Aluminum Crown Extrusions Nanshan Service Center Metals Western Extrusions Taber Pries Enterprises	Leetonia Chaska Belding Lafayette Prince George Dallas Russelville Independence	5071-H 1378 5790 1239 HR0329 H 19510 OH-02796 1162
x25x2.4	50.8	25.4	2.36	0.916	8.98E-03	338	0.152	0.109	4.29	18	4.51	3.54E-02	2.79	10.2	3.27	85.3	Bonnell	N	A-1519
x25x2.0	50.8	25.4	1.98	0.776	7.61E-03	286	0.152	9.39E-02	3.7	18.1	4.63	3.09E-02	2.43	10.4	2.81	73.8	Bonnell	CN	A-1476
x25x1.6	50.8	25.4	1.57	0.624	6.12E-03	230	0.152	7.69E-02	3.03	18.3	3.76	2.56E-02	2.02	10.6	2.3	60.7	Bonnell	CN	A-1911
x19x4.8	50.8	19	4.78	1.56	1.53E-02	576	0.140	0.153	6.01	16.3	8.25	2.63E-02	2.76	6.76	3.68	76.1	Crown Extrusions	Chaska	12564
<b>HSS 44</b> x25x2.4	44.5	25.4	2.39	0.843	8.27E-03	311	0.140	7.86E-02	3.53	15.9	4.43	3.17E-02	2.5	10.1	2.95	71.5	Bonnell	CN	A-1405
x25x1.6	44.5	25.4	1.57	0.57	5.59E-03	210	0.140	5.53E-02	2.49	16.2	3.06	2.28E-02	1.79	10.4	2.06	50.5	Bonnell	C	A-7042
x19x1.9	44.5	19	1.9	0.617	6.05E-03	227	0.127	5.42E-02	2.44	15.4	3.12	1.36E-02	1.43	7.74	1.67	35.2	Pennex Aluminum	Leetonia	4256-H

# RECTANGULAR TUBES (SHARP CORNERS)



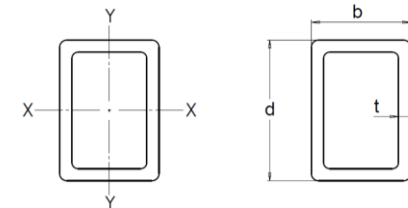
Designation	Dimensions		Thickness (t)	Mass	Dead Load	Area	Surface Area per meter of length	Axis X-X				Axis Y-Y				Torsional Constant	Extruder	Location	Manufacturer Identification Number
	HSS d x b x t	Height (d)						Width (b)	$I_x$	$S_x$	$r_x$	$Z_x$	$I_y$	$S_y$	$r_y$				
mm x mm x mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	m <sup>2</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>			
<b>HSS 38</b> x32x4.8	38.1	31.8	4.78	1.56	1.53E-02	576	0.140	0.103	5.42	13.4	7	7.56E-02	4.76	11.5	6.08	140	Service Center Metals Taber Pennex Aluminum Extruded Aluminum Corporation Nanshan Service Center Metals Bonnell Bonnell Service Center Metals Crown Extrusions Pennex Aluminum Bonnell Bonnell Western Extrusions Bonnell	Prince George Russelville Leetonia Belding Lafayette Prince George CN CN Prince George Chaska Leetonia CN N Dallas C	HR0451 OH-02795 5212-H 20525 1285 HR1084 A-7035 A-1479 HR1211 1238 5142-H A-1348 A-1926 H 19821 A-1442
x25x3.2	38.1	25.4	3.18	0.984	9.65E-03	363	0.127	6.63E-02	3.48	13.5	4.42	3.37E-02	2.66	9.64	3.25	71.1			
x25x1.6	38.1	25.4	1.57	0.516	5.06E-03	190	0.127	3.79E-02	1.99	14.1	2.42	1.99E-02	1.57	10.2	1.82	40.6			
x19x3.2	38.1	19	3.18	0.875	8.58E-03	323	0.114	5.39E-02	2.83	12.9	3.71	1.65E-02	1.74	7.16	2.18	41.3			
x19x2.4	38.1	19	2.36	0.672	6.59E-03	248	0.114	4.34E-02	2.28	13.2	2.92	1.38E-02	1.45	7.46	1.74	33.7			
x19x1.6	38.1	19	1.57	0.461	4.52E-03	170	0.114	3.12E-02	1.64	13.6	2.06	1.02E-02	1.08	7.76	1.25	24.5			
x19x1.3	38.1	19	1.27	0.376	3.69E-03	139	0.114	2.59E-02	1.36	13.7	1.69	8.61E-03	0.904	7.88	1.03	20.4			
<b>HSS 32</b> x25x3.2	31.8	25.4	3.18	0.875	8.58E-03	323	0.114	4.17E-02	2.63	11.4	3.33	2.87E-02	2.26	9.44	2.82	53.9	Crown Extrusions	Chaska	1412
<b>HSS 27</b> x19x1.3	27.0	19	1.27	0.3	2.94E-03	111	0.092	1.11E-02	0.823	10	1	6.38E-03	0.67	7.6	0.783	12.6	Pennex Aluminum	Leetonia	5184-H
<b>HSS 25</b> x19x3.2	25.4	19	3.18	0.656	6.43E-03	242	0.089	1.87E-02	1.47	8.79	1.92	1.14E-02	1.19	6.86	1.54	22.8	Crown Extrusions Bonnell Service Center Metals Bonnell Bonnell	Chaska CN Prince George C C	1571 A-1440 HR1215 A-7025 A-1500
x13x3.2	25.4	12.7	3.18	0.547	5.36E-03	202	0.076	1.37E-02	1.08	8.24	1.47	3.93E-03	0.619	4.41	0.832	10.2			
x13x1.6	25.4	12.7	1.57	0.299	2.93E-03	110	0.076	8.58E-03	0.675	8.83	0.866	2.72E-03	0.428	4.97	0.517	6.65			
<b>HSS 22</b> x19x1.6	22.2	19	1.57	0.326	3.20E-03	120	0.082	8.23E-03	0.741	8.28	0.906	6.41E-03	0.673	7.31	0.811	11.2	Extruded Aluminum Corporation	Belding	20017
<b>HSS 19</b> x11x1.3	19.1	11.1	1.27	0.19	1.86E-03	70	0.060	3.19E-03	0.335	6.74	0.424	1.32E-03	0.236	4.33	0.285	2.97	Pennex Aluminum	Leetonia	5203-H

# RECTANGULAR TUBES (ROUNDED CORNERS)



Designation	Dimensions		Thickness (t)	Mass	Dead Load	Area	Surface Area per meter of length	Axis X-X				Axis Y-Y				Torsional Constant	Extruder	Location	Manufacturer Identification Number
	HSS d x b x t	Height (d)						Width (b)	$I_x$	$S_x$	$r_x$	$Z_x$	$I_y$	$S_y$	$r_y$				
mm x mm x mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	m <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>			
HSS 394 x89x6.4	394	88.9	6.35	16.7	1.64E-01	6141	0.943	106	541	132	711	9.12	205	38.5	230	29305	Taber	Russelville	TM-12234
HSS 305 x152x6.4	305	152	6.35	15.3	1.50E-01	5637	0.909	69.3	455	111	558	23.5	308	64.6	344	55105	Bonnell	C	WLB-589
x76x6.4	305	76.2	6.35	12.7	1.25E-01	4677	0.761	47.9	314	101	415	5	131	32.7	148	15283	Taber	Russelville	TM-11868
x51x4.8	305	50.8	4.83	9.06	8.88E-02	3339	0.710	31.7	208	97.4	284	1.62	63.6	22	71.7	5398	Western Extrusions	Dallas	H 19062
HSS 304 x102x7.9	304	102	7.87	16.8	1.65E-01	6178	0.811	67.4	443	104	570	11.4	225	43	255	32206	Taber	Russelville	TM-12764
HSS 263 x85x4.6	263	85.3	4.57	8.22	8.06E-02	3021	0.675	24.1	183	89.4	238	4.12	96.5	36.9	107	12005	Extrudex	Toronto	H-20789
HSS 254 x203x6.0	254	203	5.99	14.5	1.42E-01	5329	0.909	51.5	405	98.3	477	36.5	359	82.8	409	65346	Bonnell	C	WLB-547
x152x5.6	254	152	5.59	12	1.18E-01	4415	0.810	39.6	312	94.7	376	17.9	235	63.7	264	38182	Bonnell	C	WLB-554
x127x12.7	254	127	12.7	24.5	2.40E-01	9032	0.761	72.3	569	89.5	721	23.4	368	50.9	434	56445	Tower	Olney	15019
x76x3.8	254	76.2	3.81	6.67	6.54E-02	2458	0.660	18.6	146	87	188	2.74	72	33.4	79	7849	Tower	Olney	16011
x64x4.0	254	63.5	3.99	6.7	6.57E-02	2469	0.634	17.8	140	84.9	184	1.91	60.2	27.8	66.4	5784	Tower	Olney	14725
x51x3.6	254	50.8	3.56	5.74	5.63E-02	2117	0.609	14.6	115	83	154	1.06	41.7	22.4	46.1	3388	Bonnell	C	WLB-620
x51x3.2	254	50.8	3.18	5.14	5.04E-02	1895	0.608	13.1	103	83.2	138	0.962	37.9	22.5	41.5	3083	Western Extrusions	Dallas	H 19061
HSS 248 x181x6.4	248	181	6.35	14.3	1.40E-01	5277	0.852	47.1	380	94.5	452	29	320	74.2	364	55194	Taber	Russelville	TM-11453
HSS 229 x76x6.4	229	76.2	6.35	10.1	9.90E-02	3710	0.608	22.6	198	78.1	256	3.82	100	32.1	114	10738	Tower	Olney	17975
HSS 203 x152x12.7	203	152	12.7	22.7	2.23E-01	8387	0.700	47	462	74.8	569	29.5	387	59.3	462	57300	Western Extrusions	Dallas	H 19054
x152x7.6	203	152	7.62	14.1	1.38E-01	5184	0.707	30.6	301	76.9	361	19.5	256	61.3	296	36793	Taber	Russelville	TM-13538
x152x4.8	203	152	4.78	8.94	8.77E-02	3296	0.706	20	197	77.9	233	12.8	169	62.4	191	24027	Bonnell	C	WLB-537
x152x4.8	203	152	4.78	8.96	8.79E-02	3303	0.709	20.1	198	78	234	12.9	169	62.5	192	24033	Bonnell	C	WLB-545
x127x9.5	203	127	9.52	16	1.57E-01	5893	0.650	32.3	318	74	392	15.2	240	50.9	281	32685	Taber	Russelville	TM-12160
x102x9.5	203	102	9.52	14.8	1.45E-01	5439	0.604	28	276	71.8	348	9.11	179	40.9	210	22027	Crown Extrusions	Chaska	12382
x102x6.4	203	102	6.35	10	9.81E-02	3701	0.604	19.7	194	73	241	6.58	130	42.2	148	15640	Bonnell	C	WLB-613
x102x6.4	203	102	6.35	10.1	9.90E-02	3718	0.610	19.9	196	73.2	243	6.62	130	42.2	148	15740	Western Extrusions	Dallas	H 19329
x102x6.4	203	102	6.35	10.1	9.90E-02	3710	0.604	19.8	195	73.1	242	6.6	130	42.2	148	15736	Western Extrusions	Dallas	H 19330
x102x6.4	203	102	6.35	10	9.81E-02	3709	0.608	19.8	195	73.1	242	6.6	130	42.2	148	15632	Extrudex	Toronto	H-20817
x102x4.8	203	102	4.78	7.45	7.31E-02	2735	0.588	14.5	142	72.7	177	4.96	97.6	42.6	110	12232	Extrudex	Ohio	H-27076
x102x3.8	203	102	3.81	6.12	6.00E-02	2256	0.604	12.4	122	74	149	4.21	82.9	43.2	92.1	9879	Bonnell	C	WLB-650
x76x9.5	203	76.2	9.52	13.5	1.32E-01	4960	0.548	23.5	231	68.8	302	4.61	121	30.5	144	12889	Tri City Extrusion	Bristol	2054
x64x6.4	203	63.5	6.35	8.73	8.56E-02	3209	0.525	15	147	68.3	193	2.24	70.5	26.4	81.4	6517	Extrudex	Ohio	H-15316
x51x6.4	203	50.8	6.35	8.29	8.13E-02	3047	0.500	13.4	132	66.3	177	1.33	52.4	20.9	61.5	4165	Extrudex	Ohio	H-1080
x51x3.2	203	50.8	3.18	4.22	4.14E-02	1556	0.500	7.1	69.9	67.5	92.1	0.769	30.3	22.2	33.5	2361	Crown Extrusions	Chaska	12419
x51x3.2	203	50.8	3.18	4.26	4.18E-02	1573	0.042	7.26	71.5	68	93.8	0.779	30.7	22.3	33.9	2364	Gateway Extrusions	Woodbridge	EA116
x51x3.2	203	50.8	3.18	4.27	4.19E-02	1571	0.505	7.24	71.3	67.9	93.6	0.778	30.6	22.3	33.8	2360	Extrudex	Toronto, Ohio	H-20790
HSS 178 x51x3.2	178	50.8	3.18	3.83	3.76E-02	1411	0.457	5.13	57.7	60.3	74.8	0.688	27.1	22.1	30	2008	Bonnell	M	AE4310
HSS 162 x44x3.2	162	44.4	3.18	3.44	3.37E-02	1270	0.412	3.77	46.6	54.5	60.8	0.468	21.1	19.2	23.5	1387	Bonnell	M	AE4308
HSS 152 x102x6.4	152	102	6.35	8.31	8.15E-02	3065	0.507	9.77	128	56.5	156	5.14	101	41	117	10470	Western Extrusions	Dallas	H 19291
x102x6.4	152	102	6.35	8.31	8.15E-02	3065	0.507	9.77	128	56.5	156	5.14	101	41	117	10464	Tri City Extrusion	Bristol	2467
x102x6.4	152	102	6.35	8.15	7.99E-02	2995	0.492	9.38	123	56	151	4.97	97.9	40.7	114	10462	Extrudex	Ohio	H-16426
x102x4.8	152	102	4.78	6.33	6.21E-02	2335	0.507	7.61	99.8	57.1	120	4.03	79.4	41.6	90.7	8144	Tri City Extrusion	Bristol	2027
x102x3.8	152	102	3.81	5.07	4.97E-02	1871	0.503	6.16	80.9	57.4	96.9	3.29	64.7	41.9	73.3	6655	Western Extrusions	Dallas	H 19366
x102x3.8	152	102	3.81	5.07	4.97E-02	1871	0.503	6.16	80.9	57.4	96.9	3.29	64.7	41.9	73.3	6655	Bonnell	C	A-7005
x102x3.2	152	102	3.18	4.26	4.18E-02	1573	0.500	5.23	68.7	57.7	81.9	2.8	55	42.2	62	5705	Tri City Extrusion	Bristol	2192
x76x9.5	152	76.2	9.52	10.8	1.06E-01	4001	0.457	11.2	147	147	189	3.55	93.2	93.2	113	8726	Crown Extrusions	Chaska	1556
x76x9.5	152	76.2	9.52	10.8	1.06E-01	3992	0.456	11.2	147	52.9	188	3.54	93	29.8	112	8673	Taber	Russelville	TM-13239
x76x6.4	152	76.2	6.35	7.44	7.30E-02	2742	0.446	8.02	105	54.1	132	2.62	68.9	30.9	80.2	6447	Tri City Extrusion	Bristol	2052
x76x6.4	152	76.2	6.35	7.52	7.37E-02	2775	0.454	8.2	108	54.4	135	2.67	70	31	81.4	6459	Crown Extrusions	Chaska	13641
x76x6.4	152	76.2	6.35	7.25	7.11E-02	2672	0.441	7.66	101	53.5	127	2.55	66.8	30.9	77.9	6306	Taber	Russelville	OH-13793
x76x3.2	152	76.2	3.18	3.83	3.76E-02	1411	0.452	4.34	56.9	55.4	69.9	1.47	38.6	32.3	43.1	3484	Western Extrusions	Dallas	H 19929
x76x3.2	152	76.2	3.18	3.83	3.76E-02	1411	0.452	4.34	56.9	55.4	69.9	1.47	38.6	32.3	43.1	3484	Bonnell	C	A-7016
x51x6.4	152	50.8	6.35	6.49	6.36E-02	2385	0.393	6.12	80.3	50.7	106	0.997	39.2	20.4	46.7	2947	Extrudex	Toronto	H-21485
x51x6.4	152	50.8	6.35	6.69	6.56E-02	2417	0.404	6.31	82.9	51.1	109	1.02	40.1	20.5	47.6	2920	Hydro	Montreal	MH-55881
x51x4.8	152	50.8	4.78	4.98	4.88E-02	1830	0.398	4.85	63.7	51.5	83.1	0.818	32.2	21.1	37.1	2334	Extrudex	Toronto, Ohio	H-23748
x51x4.8	152	50.8	4.78	5	4.90E-02	1843	0.401	4.93	64.6	51.7	84	0.825	32.5	21.2	37.4	2347	Crown Extrusions	Chaska	12239
x51x4.8	152	50.8	4.78	2.02	1.98E-02	1849	0.406	4.96	65.1	51.8	84.5	0.829	32.7	21.2	37.6	2340	Tri City Extrusion	Bristol	2176
x51x3.8	152	50.8	3.81	4.04	3.96E-02	1490	0.401	4.06	53.3	52.2	68.7	0.692	27.2	21.5	30.8	1962	Extruded Aluminum Corporation	Belding	21133
x51x3.2	152	50.8	3.18	3.39	3.32E-02	1250	0.396	3.43	45	52.4	57.8								

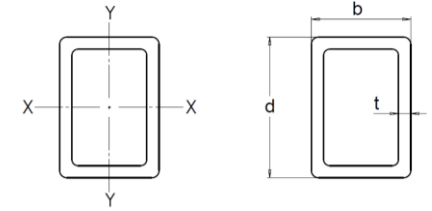
# RECTANGULAR TUBES (ROUNDED CORNERS)



Designation	Dimensions		Thickness (t)	Mass	Dead Load	Area	Surface Area per meter of length	Axis X-X				Axis Y-Y				Torsional Constant	Extruder	Location	Manufacturer Identification Number	
	HSS d x b x t	Height (d)						Width (b)	I <sub>x</sub>	S <sub>x</sub>	r <sub>x</sub>	Z <sub>x</sub>	I <sub>y</sub>	S <sub>y</sub>	r <sub>y</sub>					Z <sub>y</sub>
mm x mm x mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	m <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>				
<b>HSS 114</b>																				
x102x3.2	114	102	3.18	3.61	3.54E-02	1331	0.430	2.66	46.5	44.7	54.3	2.22	43.6	40.8	50.1	3688	Bonnell	M	AE4864	
x89x4.6	114	89	4.57	4.66	4.57E-02	1717	0.390	3.15	55.2	42.9	66.7	2.14	48.1	35.3	56.1	4151	Gateway Extrusions	Woodbridge	CES227	
x64x4.8	114	63.5	4.78	4.36	4.28E-02	1607	0.353	2.73	47.8	41.2	59.4	1.07	33.6	25.8	39	2429	Bonnell	M	AE2225	
x52x7.1	114	52.4	7.14	5.85	5.74E-02	2156	0.325	3.28	57.4	39	74.7	0.895	34.2	20.4	41.6	2317	Extruded Aluminum Corporation	Belding	5863	
x51x4.8	114	50.8	4.78	3.98	3.90E-02	1466	0.322	2.31	40.4	39.7	51.7	0.624	24.6	20.6	28.7	1608	Extruded Aluminum Corporation	Belding	5862	
x51x4.8	114	50.8	4.78	4.01	3.93E-02	1477	0.325	2.34	41	39.8	52.3	0.631	24.8	20.7	29	1612	Crown Extrusions	Chaska	12227	
x51x3.2	114	50.8	3.18	2.73	2.68E-02	1008	0.330	1.66	29.1	40.6	36.4	0.459	18.1	21.3	20.4	1145	Bonnell	M	AE0165	
x44x3.2	114	44.4	3.18	2.63	2.58E-02	946	0.308	1.47	25.7	39.4	33	0.329	14.8	18.6	16.8	898	Extrudex	Québec	V-01415	
x44x3.2	114	44.4	3.18	2.62	2.57E-02	968	0.317	1.54	26.9	39.9	34.2	0.339	15.3	18.7	17.3	897	Bonnell	M	AE0166	
x35x3.1	114	34.8	3.05	2.36	2.31E-02	872	0.297	1.3	22.8	38.6	29.6	0.189	10.8	14.7	12.3	546	Tri City Extrusion	Bristol	1079	
x32x3.2	114	31.8	3.18	2.41	2.36E-02	887	0.291	1.29	22.5	38.1	29.7	0.157	9.92	13.3	11.4	471	Bonnell	M	AE4195	
x25x3.2	114	25.4	3.18	2.3	2.26E-02	847	0.279	1.16	20.4	37.1	27.5	0.094	7.39	10.5	8.64	299	Bonnell	M	AE2515	
x25x3.2	114	25.4	3.18	2.3	2.26E-02	847	0.279	1.16	20.4	37.1	27.5	0.094	7.39	10.5	8.64	300	Bonnell	M	AE3345	
x19x3.2	114	19	3.18	2.19	2.15E-02	806	0.266	1.04	18.2	35.9	25.2	0.047	4.98	7.67	6.02	162	Bonnell	M	AE2603	
x16x3.1	114	15.9	3.05	2.05	2.01E-02	756	0.260	0.943	16.5	35.3	23.2	0.03	3.74	6.26	4.61	104	Bonnell	M	AE1953	
<b>HSS 102</b>																				
x76x6.4	102	76.2	6.35	5.57	5.46E-02	2053	0.339	2.82	55.5	37.1	68.9	1.78	46.7	29.4	56.1	3607	Metra	Laval	997916	
x76x6.4	102	76.2	6.35	5.62	5.51E-02	2071	0.345	2.87	56.6	37.3	69.8	1.81	47.5	29.6	56.9	3570	Tri City Extrusion	Bristol	2024	
x76x6.4	102	76.2	6.35	5.67	5.56E-02	2092	0.349	2.93	57.6	37.4	70.9	1.84	48.3	29.6	57.6	3580	Taber	Russelville	OH-12259	
x76x6.4	102	76.2	6.35	5.69	5.58E-02	2062	0.345	2.86	56.2	37.2	69.5	1.8	47.3	29.6	56.6	3531	Hydro	Montreal	MH-57813	
x76x4.8	102	76.2	4.78	4.36	4.28E-02	1608	0.354	2.33	45.9	38.1	55.5	1.48	38.7	30.3	45.3	2808	Pries	Independence	4727	
x76x4.8	102	76.2	4.78	4.36	4.28E-02	1607	0.354	2.33	45.8	38.1	55.4	1.47	38.7	30.3	45.2	2795	Bonnell	M	AE5133	
x76x4.8	102	76.2	4.75	4.33	4.25E-02	1597	0.353	2.31	45.5	38.1	55.1	1.47	38.5	30.3	45	2783	Extruded Aluminum Corporation	Belding	5889	
x76x4.8	102	76.2	4.75	4.26	4.18E-02	1590	0.350	2.3	45.2	38	54.8	1.46	38.2	30.3	44.7	2782	Hydro	Montreal	AH-07145	
x76x3.2	102	76.2	3.18	2.95	2.89E-02	1089	0.350	1.63	32	38.7	38.2	1.04	27.3	30.9	31.3	1979	Western Extrusions	Dallas	H 19530	
x76x3.2	102	76.2	3.18	2.93	2.87E-02	1082	0.350	1.61	31.7	38.6	37.9	1.03	27.1	30.9	31.1	1959	Bonnell	C	A-1411	
x64x4.8	102	63.5	4.75	3.7	3.63E-02	1371	0.303	1.75	34.5	35.8	43.8	0.851	26.8	24.9	31.8	2036	Extrudex	Québec	V-17955	
x53x4.4	102	52.5	4.44	3.5	3.43E-02	1291	0.307	1.69	33.3	36.2	41.8	0.583	22.2	21.3	25.9	1378	Extruded Aluminum Corporation	Belding	19297	
x51x6.4	102	50.8	6.35	4.83	4.74E-02	1774	0.297	2.2	43.3	35.2	55.7	0.695	27.4	19.8	33.2	1746	Extrudex	Ohio	H-20861	
x51x6.4	102	50.8	6.35	4.81	4.72E-02	1774	0.304	2.21	43.5	35.3	55.8	0.7	27.6	19.9	33.3	1713	Tri City Extrusion	Bristol	2174	
x51x6.4	102	50.8	6.35	4.81	4.72E-02	1774	0.294	2.19	43.1	35.1	55.6	0.691	27.2	19.7	33.1	1759	Gateway Extrusions	Woodbridge	BT002	
x51x6.4	102	50.8	6.35	4.79	4.70E-02	1766	0.299	2.19	43.1	35.2	55.4	0.697	27.4	19.8	33.1	1712	Extruded Aluminum Corporation	Belding	19730	
x51x6.4	102	50.8	6.35	4.81	4.72E-02	1774	0.304	2.21	43.5	35.3	55.8	0.7	27.6	19.9	33.3	1713	Extruded Aluminum Corporation	Belding	5911	
x51x6.4	102	50.8	6.35	4.72	4.63E-02	1742	0.294	2.13	41.9	35	54.2	0.681	26.8	19.8	32.5	1711	Western Extrusions	Dallas	H 19160	
x51x6.4	102	50.8	6.35	4.76	4.67E-02	1748	0.294	2.14	42.1	35	54.5	0.683	26.9	19.8	32.6	1725	Extrudex	Toronto	H-27490	
x51x6.4	102	50.8	6.35	4.72	4.63E-02	1748	0.294	2.14	42.1	35	54.5	0.683	26.9	19.8	32.6	1725	Extrudex	Québec	V-16900	
x51x4.9	102	50.8	4.85	3.92	3.84E-02	1445	0.297	1.89	37.1	36.1	46.8	0.594	23.4	20.3	27.7	1481	Taber	Russelville	OH-14034	
x51x4.8	102	50.8	4.78	3.71	3.64E-02	1364	0.294	1.74	34.3	35.7	43.6	0.564	22.2	20.3	26.2	1419	Extrudex	Toronto	H-23267	
x51x4.8	102	50.8	4.78	3.7	3.63E-02	1364	0.303	1.76	34.6	35.9	43.7	0.571	22.5	20.5	26.4	1376	Crown Extrusions	Chaska	13719	
x51x4.8	102	50.8	4.78	3.68	3.61E-02	1358	0.299	1.74	34.3	35.8	43.4	0.567	22.3	20.4	26.2	1382	Tri City Extrusion	Bristol	2043	
x51x4.8	102	50.8	4.78	3.72	3.65E-02	1373	0.305	1.78	35	36	44.1	0.575	22.6	20.5	26.6	1396	Western Extrusions	Dallas	H 19518	
x51x4.8	102	50.8	4.78	3.68	3.61E-02	1364	0.294	1.74	34.3	35.7	43.6	0.564	22.2	20.3	26.2	1419	Extrudex	Québec	V-18295	
x51x4.1	102	50.8	4.06	3.18	3.12E-02	1173	0.304	1.54	30.2	36.2	37.9	0.505	19.9	20.7	23	1207	Pries	Independence	2600	
x51x3.6	102	50.8	3.56	2.71	2.66E-02	999	0.294	1.28	25.3	35.9	31.9	0.433	17.1	20.8	19.6	1058	Tri City Extrusion	Bristol	2057	
x51x3.2	102	50.8	3.2	2.53	2.48E-02	935	0.304	1.25	24.6	36.5	30.5	0.416	16.4	21.1	18.6	985	Bonnell	M	AE0830	
x51x3.2	102	50.8	3.18	2.41	2.36E-02	893	0.291	1.15	22.6	35.9	28.5	0.391	15.4	20.9	17.6	983	Metra	Laval	998772	
x51x3.2	102	50.8	3.18	2.46	2.41E-02	910	0.297	1.2	23.5	36.2	29.4	0.402	15.8	21	18.1	977	Metra	Laval	998859	
x51x3.2	102	50.8	3.18	2.52	2.47E-02	927	0.304	1.24	24.4	36.5	30.3	0.413	16.3	21.1	18.5	978	Tri City Extrusion	Bristol	2039	
x51x3.2	102	50.8	3.18	2.52	2.47E-02	927	0.288	1.22	23.9	36.2	30	0.402	15.8	20.8	18.3	1029	Pries	Independence	1442	
x51x3.2	102	50.8	3.18	2.52	2.47E-02	927	0.303	1.24	24.4	36.5	30.3	0.413	16.2	21.1	18.5	980	Gateway Extrusions	Woodbridge	CES129	
x51x3.2	102	50.8	3.18	2.51	2.46E-02	925	0.302	1.23	24.3	36.5	30.2	0.411	16.2	21.1	18.4	977	Extruded Aluminum Corporation	Belding	5888	
x51x3.2	102	50.8	3.18	2.49	2.44E-02	919	0.299	1.22	24	36.4	29.8	0.408	16	21.1	18.3	976	Crown Extrusions	Chaska	12226	
x51x3.2	102	50.8	3.18	2.47	2.42E-02	912	0.297	1.2	23.6	36.3	29.5	0.403	15.9	21	18.1	982	Western Extrusions	Dallas	H 19253	
x51x3.2	102	50.8	3.18	2.44	2.39E-02	901	0.294	1.17	23.1	36.1	29	0.397	15.6	21	17.9	980	Western Extrusions	Dallas	H 19212	
x51x3.2	102	50.8	3.18	2.52	2.47E-02	927	0.304	1.24	24.4	36.5	30.3	0.413	16.3	21.1	18.5	978	Bonnell	M	AE2999	
x51x3.2	102	50.8	3.18	2.5	2.45E-02	919	0.299	1.22	24</											

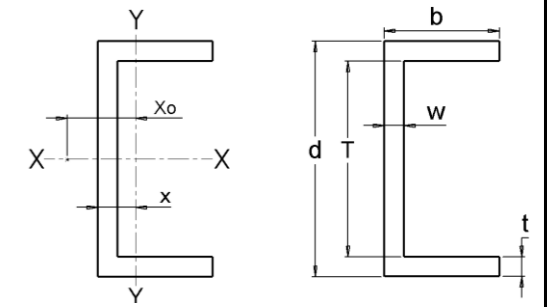


# RECTANGULAR TUBES (ROUNDED CORNERS)



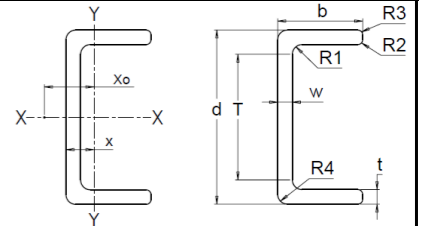
Designation	Dimensions		Thickness (t)	Mass	Dead Load	Area	Surface Area per meter of length	Axis X-X				Axis Y-Y				Torsional Constant	Extruder	Location	Manufacturer Identification Number	
	HSS d x b x t	Height (d)						Width (b)	$I_x$	$S_x$	$r_x$	$Z_x$	$I_y$	$S_y$	$r_y$					$Z_y$
mm x mm x mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	m <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>				
<b>HSS 40</b>																				
x28x2.0	40	28	2.03	0.699	6.85E-03	258	0.133	5.60E-02	2.8	14.7	3.43	0.032	2.27	11.1	2.67	64	Tri City Extrusion	Bristol	1059	
x20x1.7	40	20	1.65	0.503	4.93E-03	185	0.117	3.72E-02	1.86	14.2	2.34	0.012	1.23	8.14	1.42	29.8	Tri City Extrusion	Bristol	1057	
x30x3.2	39.8	29.7	3.18	1.09	1.07E-02	404	0.136	8.35E-02	4.2	14.4	5.26	0.052	3.47	11.3	4.24	102	Extruded Aluminum Corporation	Belding	18755	
<b>HSS 38</b>																				
x24x5.0	38.3	23.7	5	1.41	1.38E-02	520	0.122	8.50E-02	4.44	12.8	5.95	0.037	3.08	8.38	4.06	84	Gateway Extrusions	Woodbridge	CES119	
x38x3.2	38.1	38.1	3.18	1.2	1.18E-02	444	0.142	8.74E-02	4.59	14	5.71	0.087	4.59	14	5.71	150	Taber	Russelville	OH-14045	
x25x3.2	38.1	25.4	3.18	0.984	9.65E-03	363	0.126	6.62E-02	3.48	13.5	4.42	0.034	2.66	9.64	3.26	71.2	Tri City Extrusion	Bristol	2444	
x25x2.6	38.1	25.4	2.59	0.812	7.96E-03	300	0.124	5.60E-02	2.94	13.7	3.69	0.029	2.28	9.83	2.75	61.5	Bonnell	M	AE3622	
x25x2.3	38.1	25.4	2.29	0.709	6.95E-03	261	0.122	4.89E-02	2.57	13.7	3.22	0.026	2.02	9.9	2.41	55.2	Bonnell	M	AE5755	
x25x1.6	38.1	25.4	1.57	0.515	5.05E-03	190	0.126	3.79E-02	1.99	14.1	2.42	0.02	1.57	10.2	1.82	40.6	Western Extrusions	Dallas	H 19195	
x25x1.6	38.1	25.4	1.57	0.503	4.93E-03	186	0.123	3.64E-02	1.91	14	2.34	0.019	1.52	10.2	1.76	40.3	Crown Extrusions	Chaska	1506	
x25x1.6	38.1	25.4	1.57	0.516	5.06E-03	190	0.124	3.78E-02	1.98	14.1	2.42	0.02	1.56	10.2	1.82	41.4	Western Extrusions	Dallas	H 19152	
x25x1.5	38.1	25.4	1.52	0.483	4.74E-03	178	0.122	3.47E-02	1.82	14	2.24	0.019	1.46	10.2	1.69	39.6	Bonnell	M	AE3078	
x25x1.4	38.1	25.4	1.4	0.446	4.37E-03	164	0.122	3.22E-02	1.69	14	2.07	0.017	1.35	10.2	1.57	37	Tri City Extrusion	Bristol	1075	
x25x1.3	38.1	25.4	1.27	0.399	3.91E-03	147	0.120	2.86E-02	1.5	14	1.84	0.015	1.21	10.2	1.4	33.8	Bonnell	M	AE2228	
x24x1.0	38.1	23.8	1.04	0.333	3.27E-03	123	0.121	2.45E-02	1.28	14.1	1.56	0.012	0.992	9.81	1.13	25.2	Tri City Extrusion	Bristol	1003	
x19x3.2	38.1	19	3.18	0.875	8.58E-03	323	0.114	5.39E-02	2.83	12.9	3.71	0.017	1.73	7.16	2.18	41.3	Tri City Extrusion	Bristol	2227	
x36x2.5	38	36	2.49	0.931	9.13E-03	343	0.147	7.14E-02	3.76	14.4	4.53	0.065	3.64	13.8	4.36	106	Gateway Extrusions	Woodbridge	CES100	
<b>HSS 32</b>																				
x25x3.2	31.8	25.4	3.18	0.853	8.37E-03	314	0.109	3.98E-02	2.51	11.3	3.2	0.028	2.17	9.36	2.72	53.8	Bonnell	M	AE6080	
x25x1.5	31.8	25.4	1.52	0.43	4.22E-03	159	0.109	2.22E-02	1.4	11.8	1.7	0.016	1.23	9.94	1.46	30.3	Bonnell	M	AE6081	
x19x1.6	31.8	19	1.57	0.407	3.99E-03	150	0.101	1.98E-02	1.25	11.5	1.55	8.71E-03	0.914	76.2	1.07	19.1	Bonnell	M	AE5181	
x16x2.0	31.8	15.9	1.98	0.442	4.33E-03	163	0.088	1.86E-02	1.17	10.7	1.54	6.09E-03	0.768	6.12	0.938	16.1	Pennex Aluminum	Leetonia	5242-H	
<b>HSS 27</b>																				
x16x2.0	26.6	15.7	2.01	0.416	4.08E-03	153	0.083	1.33E-02	1	9.32	1.28	5.54E-03	0.706	6.01	8.64	12.6	Gateway Extrusions	Woodbridge	CES147	
<b>HSS 25</b>																				
x13x3.2	25.4	12.7	3.18	0.547	5.36E-03	202	0.076	1.37E-02	1.08	8.24	1.47	3.93E-03	0.618	9.34	0.832	10.2	Bonnell	M	AE3065	
x10x1.5	25.4	10.3	1.47	0.244	2.39E-03	90.1	0.066	6.14E-03	0.484	8.26	0.655	1.42E-03	0.276	3.98	0.339	4.15	Pennex Aluminum	Leetonia	5535-H	
<b>HSS 24</b>																				
x19x1.5	23.8	18.5	1.5	0.315	3.09E-03	116	0.082	8.91E-03	0.748	8.76	0.921	5.95E-03	0.643	7.16	0.77	11.4	Tri City Extrusion	Bristol	1173	
<b>HSS 21</b>																				
x15x3.0	21.2	15.1	3	0.493	4.83E-03	182	0.072	9.34E-03	0.881	7.17	1.17	5.16E-03	0.681	5.32	0.897	10.8	Bonnell	M	AE3322	

# CHANNELS (SHARP CORNERS)



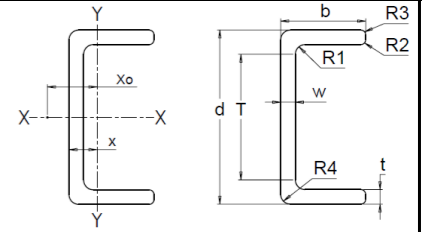
Designation	Depth (d)	Web Dimensions		Flange Dimensions		Mass (w)	Dead Load	Area	Surface Area per meter of length		Axis X-X			Axis Y-Y			Shear Center	Torsional Constant	Warping Constant	Extruder	Location	Manufacturer Identification Number	
		Height (T)	Thickness (w)	Width (b)	Thickness (t)				Total	Minus Top of Top Flange	$I_x$	$S_x$	$r_x$	$I_y$	$S_y$	$r_y$							x
mm x (kg/m)	mm	mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	m <sup>2</sup>	m <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	mm	mm	10 <sup>3</sup> mm <sup>4</sup>	10 <sup>9</sup> mm <sup>6</sup>			
<b>C 166</b> x5.5	166	153	6.35	83.6	6.35	5.52	5.41E-02	2034	0.653	0.570	8.66	104	65.2	1.38	22.9	26.0	23.3	50.1	28.0	6.15	Tri City Extrusion Inc.	Bristol	675
<b>C 127</b> x2.8	127	117	4.78	50.8	4.78	2.84	2.78E-02	1046	0.448	0.397	2.46	38.7	48.5	2.43E-02	6.44	15.2	13.1	27.6	8.25	0.642	Tri City Extrusion Inc.	Bristol	873
	127	121	3.18	25.4	3.18	1.48	1.45E-02	544	0.349	0.324	1.08	17.1	44.6	2.30E-02	1.12	6.50	1.12	9.61	1.88	6.62E-02	Tri City Extrusion Inc.	Bristol	848
<b>C 108</b> x1.1	108	103	2.54	25.4	2.54	1.06	1.04E-02	390	0.313	0.287	0.59	10.9	38.8	1.84E-02	0.903	6.86	5.05	10.7	0.86	3.76E-02	Tri City Extrusion Inc.	Bristol	947
<b>C 53</b> x1.6	53.37	43.8	4.78	38.1	4.78	1.55	1.52E-02	573	0.250	0.211	0.25	9.33	20.8	8.13E-02	3.23	11.9	13.0	24.7	4.36	3.45E-02	Tri City Extrusion Inc.	Bristol	50087
<b>C 51</b> x0.82	50.8	44.5	3.18	25.4	3.18	0.820	8.05E-03	302	0.197	0.171	0.11	4.52	19.5	1.81E-02	1.01	7.73	7.51	14.7	1.03	7.24E-03	Tri City Extrusion Inc.	Bristol	50010
<b>C 44</b> x0.77	44.5	38.1	3.18	25.4	3.18	0.766	7.51E-03	282	0.184	0.159	8.35E-02	3.76	17.2	1.73E-02	0.991	7.83	7.94	15.4	0.961	5.22E-03	Tri City Extrusion Inc.	Bristol	941
<b>C 38</b> x1.04	38.1	31.8	3.18	44.5	3.18	1.04	1.02E-02	383	0.248	0.203	9.48E-02	4.98	15.7	7.82E-02	2.83	14.3	16.8	33.8	1.31	1.78E-02	Tri City Extrusion Inc.	Bristol	50092
	38.1	31.8	3.18	25.4	3.18	0.711	6.97E-03	262	0.171	0.146	5.78E-02	3.03	14.8	1.64E-02	0.967	7.91	8.43	16.2	0.889	3.58E-03	Tri City Extrusion Inc.	Bristol	50124
<b>C 25</b> x0.82	25.4	19.1	3.18	38.1	3.18	0.820	8.05E-03	302	0.197	0.159	3.19E-02	2.51	10.3	4.41E-02	1.96	12.1	15.6	30.0	1.03	4.37E-03	Tri City Extrusion Inc.	Bristol	50091
	25.4	19.1	3.18	25.4	3.18	0.601	5.90E-03	222	0.146	0.121	2.19E-02	1.72	9.93	1.42E-02	0.900	7.99	9.67	18.0	0.749	1.33E-03	Tri City Extrusion Inc.	Bristol	684
	25.4	19.1	3.18	12.7	3.18	0.383	3.75E-03	141	0.095	0.083	1.19E-02	0.934	9.17	1.92E-03	0.229	3.69	4.31	6.55	0.473	1.71E-04	Tri City Extrusion Inc.	Bristol	50011

# CHANNELS (ROUNDED CORNERS)



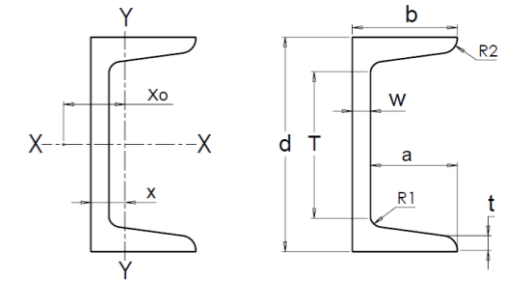
Designation	Depth (d)	Web Dimensions		Flange Dimensions		Radii				Mass (w)	Dead Load	Area	Surface Area per meter of length		Axis X-X			Axis Y-Y				Shear Center	Torsional Constant	Warping Constant	Extruder	Location	Manufacturer Identification Number
		Height (T)	Thickness (w)	Width (b)	Thickness (t)	R1	R2	R3	R4				Total	Minus Top of Top Flange	I <sub>x</sub>	S <sub>x</sub>	r <sub>x</sub>	I <sub>y</sub>	S <sub>y</sub>	r <sub>y</sub>	X						
mm x (kg/m)	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	m <sup>2</sup>	m <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	mm	mm	10 <sup>3</sup> mm <sup>4</sup>	10 <sup>9</sup> mm <sup>6</sup>			
C 267 x6.1	267	251	6.35	50.8	6.35	1.57	0.38	0.38	0.38	6.13	6.01E-02	2259	0.724	0.674	19.6	147	93.2	0.372	9.01	12.8	20.2	18.7	31.4	4.75	Tower Extrusions	Oney	12376
C 254 x9.1	254	215	6.35	88.9	10.4	8.89	-	-	-	9.13	8.96E-02	3366	0.851	0.762	34.6	273	101	2.64	41.9	28	25.9	55.2	98.9	27.5	Taber Extrusions	Russellville	OC-11037
C 229 x7.4	229	193	5.84	82.6	8.89	8.89	-	-	-	7.41	7.27E-02	2733	0.777	0.694	22.6	198	91	1.83	31	25.9	23.6	50.4	55.8	15.5	Taber Extrusions	Russellville	OC-7656
C 219 x5.1	219	206	6.35	44.4	6.35	0.25	0.25	0.25	0.25	5.09	4.99E-02	1875	0.603	0.558	11	101	76.7	0.241	6.77	11.3	8.98	16.7	26.4	2.04	Tower Extrusions	Oney	5102
C 219 x4.7	219	206	6.35	31.8	6.35	0.25	0.25	0.25	0.25	4.65	4.56E-02	1714	0.552	0.521	9.21	84.1	73.3	0.088	3.44	7.16	11.3	9.23	23	0.765	Tower Extrusions	Oney	5104
C 217 x5.1	217	204	6.35	44.4	6.35	0.25	0.25	0.25	0.25	5.06	4.96E-02	1865	0.599	0.554	10.8	99.6	76.2	0.24	6.76	11.3	8.98	16.8	25	2	Tower Extrusions	Oney	5838
C 203 x8.6	203	164	6.35	95.2	10.4	8.89	-	-	-	8.61	8.45E-02	3176	0.774	0.679	21.9	216	83.1	2.97	46.2	30.6	31	64.7	90.1	19.6	Taber Extrusions	Russellville	OC-7655
C 203 x8.6	203	164	6.35	95.2	10.4	8.89	0.79	0.79	0.79	8.61	8.45E-02	3175	0.774	0.679	21.9	216	83.1	2.96	46.1	30.6	31	64.7	90.1	19.6	Western Extrusions Corp.	Dallas	19096
C 203 x6.2	203	170	4.83	76.2	8.89	7.62	0	0	0	6.17	6.05E-02	2275	0.701	0.625	15.6	153	82.7	1.35	25.7	24.4	23.7	50.3	43.7	9.01	Western Extrusions Corp.	Dallas	19289
C 203 x6.2	203	170	4.83	76.2	8.89	7.62	-	-	-	6.17	6.05E-02	2275	0.701	0.625	15.6	153	82.7	1.35	25.7	24.4	23.6	50.3	43.7	9.01	Taber Extrusions	Russellville	OC-7654
C 178 x7.0	178	143	5.33	88.9	9.65	7.62	-	-	-	7.01	6.88E-02	2587	0.701	0.612	14.1	158	73.7	2.13	36.5	28.7	30.5	63.4	62.3	10.8	Taber Extrusions	Russellville	OC-7653
C 178 x4.8	178	148	4.32	69.8	7.37	7.62	0	0	0	4.77	4.68E-02	1758	0.627	0.557	9.2	103	72.3	0.874	18	22.3	21.4	45.6	24.3	4.49	Western Extrusions Corp.	Dallas	19293
C 178 x4.8	178	148	4.32	69.8	7.37	7.62	-	-	-	4.77	4.68E-02	1758	0.627	0.557	9.2	103	72.3	0.874	18	22.3	21.3	45.6	24.3	4.49	Taber Extrusions	Russellville	OC-7652
C 157 x5.3	157	128	5.33	82.6	7.11	7.62	0.79	0.79	0.79	5.32	5.22E-02	1961	0.634	0.551	8.03	102	64	1.36	24.1	26.4	25.8	54.6	29	5.44	Tower Extrusions	Oney	11848
C 157 x7.3	152	119	8.89	82.6	8.89	7.62	0.51	-	-	7.29	7.15E-02	2689	0.617	0.534	9.48	124	59.4	1.74	30	25.4	24.6	49	75.7	6.3	Pries Enterprises Inc.	Independence	4751
C 157 x6.0	152	119	5.33	82.6	8.89	7.62	0	0	0	6.0	5.89E-02	2211	0.624	0.541	8.76	11.5	62.9	1.57	28.9	26.6	28.4	58.5	46.8	5.8	Western Extrusions Corp.	Dallas	19200
C 157 x6.0	152	119	5.33	82.6	8.89	7.62	-	-	-	6.0	5.89E-02	2211	0.624	0.541	8.76	11.5	62.9	1.57	28.9	26.6	28.4	58.5	46.8	5.8	Taber Extrusions	Russellville	OC-7651
C 157 x4.2	152	122	4.32	63.5	7.37	7.62	0	0	0	4.22	4.14E-02	1555	0.549	0.486	5.98	78.4	62	0.639	14.7	20.3	20	41.9	21.8	2.38	Western Extrusions Corp.	Dallas	19364
C 157 x4.2	152	122	4.32	63.5	7.37	7.62	-	-	-	4.22	4.14E-02	1555	0.549	0.486	5.98	78.4	62	0.639	14.7	20.3	20.1	41.9	21.7	2.38	Taber Extrusions	Russellville	OC-7650
C 148 x3.9	148	128	4.78	71.4	5.33	4.75	0.38	0.38	0.38	3.87	3.80E-02	1429	0.572	0.501	4.97	67.1	59	0.719	14	22.4	20.2	43.7	12.3	2.58	Tower Extrusions	Oney	10754
C 141 x3.8	141	128	6.35	44.4	6.35	0.25	0.25	0.25	0.25	3.75	3.68E-02	1381	0.447	0.402	3.7	52.3	51.7	0.217	6.47	12.5	11	20.9	18.9	0.708	Tower Extrusions	Oney	3930
C 127 x4.6	127	95.5	4.83	69.8	8.13	7.62	0	0	0	4.6	4.51E-02	1695	0.524	0.454	4.64	73	52.3	0.855	18.7	22.5	24.2	49.5	30.3	2.18	Western Extrusions Corp.	Dallas	19292
C 127 x4.6	127	95.5	4.83	69.8	8.13	7.62	-	-	-	4.6	4.51E-02	1695	0.524	0.454	4.64	73	52.3	0.855	18.7	22.5	24.1	49.5	30.3	2.18	Taber Extrusions	Russellville	OC-7649
C 127 x4.5	127	107	9.53	34.9	9.53	0.51	4.78	4.78	4.78	4.53	4.44E-02	1669	0.375	0.34	3.21	50.5	43.8	0.131	5.16	8.85	9.58	13.2	50.7	0.32	Western Extrusions Corp.	Dallas	19053
C 127 x3.3	127	98.6	3.81	57.2	6.6	7.62	0	0	0	3.29	3.23E-02	1213	0.475	0.418	3.28	51.7	52	0.406	10.5	18.3	18.6	38.5	14.1	1.05	Western Extrusions Corp.	Dallas	19378
C 127 x3.3	127	98.5	3.81	57.2	6.6	7.67	-	-	-	3.29	3.23E-02	1213	0.475	0.418	3.28	51.7	52	0.406	10.5	18.3	18.5	38.5	14.1	1.05	Taber Extrusions	Russellville	OC-7648
C 127 x2.8	127	116	4.78	50.8	4.78	0.79	0.79	0.79	0.79	2.84	2.79E-02	1045	0.448	0.397	2.46	38.7	48.5	0.242	6.42	15.2	13	27.5	8.25	0.64	Western Extrusions Corp.	Dallas	19037
C 109 x5.3	109	64.5	9.53	44.4	12.7	9.53	0.79	0.79	0.79	5.32	5.22E-02	1961	0.377	0.332	3.14	57.7	40	0.334	11.3	13.1	14.8	23.5	89.4	0.538	Tower Extrusions	Oney	14799
C 108 x3.8	108	88.2	6.35	44.4	9.53	0.38	0.38	0.38	0.38	3.83	3.76E-02	1411	0.381	0.336	2.43	45	41.5	0.264	8.85	13.7	14.6	27.2	31.1	0.457	Tower Extrusions	Oney	12751
C 103 x3.2	103	88.7	6.35	47.6	6.35	0.79	0.79	0.79	0.79	3.2	3.14E-02	1179	0.384	0.336	1.81	35.1	39.2	0.241	7.12	14.3	13.8	26.5	16.1	0.399	Tower Extrusions	Oney	13129
C 103 x10.6	103	76.8	12.7	114	12.7	0.38	0.38	0.38	0.38	10.6	1.04E-01	3891	0.637	0.523	6.48	126	40.8	5.08	72.5	36.1	44.3	83.5	211	8	Tower Extrusions	Oney	13478
C 102 x9.6	102	67.5	12.7	102	12.7	4.57	4.57	4.67	4.57	9.57	9.39E-02	3530	0.587	0.485	5.56	109	39.7	3.55	56.1	31.7	38.4	71	195	5.29	Tower Extrusions	Oney	14802
C 102 x5.4	102	82.2	9.53	63.5	9.53	0.38	0.38	0.38	0.38	5.41	5.31E-02	1996	0.439	0.375	3.02	59.4	38.9	0.759	17.9	19.5	21.2	38.8	60.7	1.15	Tower Extrusions	Oney	10264
C 102 x3.5	102	74.6	4.83	57.2	7.37	6.35	0	0	0	3.47	3.40E-02	1279	0.423	0.366	2.17	42.7	41.2	0.425	11.3	18.2	19.7	39.3	19.2	0.679	Western Extrusions Corp.	Dallas	19362
C 102 x3.5	102	74.6	4.83	57.2	7.37	6.35	-	-	-	3.47	3.40E-02	1279	0.423	0.366	2.17	42.7	41.2	0.425	11.3	18.2	19.8	39.3	19.2	0.679	Taber Extrusions	Russellville	OC-7647
C 102 x3.3	102	76.6	6.35	50.8	6.35	6.35	6.35	-	-	3.3	3.24E-02	1217	0.394	0.344	1.85	36.4	39	0.278	7.69	15.1	14.7	28.1	17.8	0.439	Pries Enterprises Inc.	Independence	1197
C 102 x3.3	102	88.5	6.35	50.8	6.35	0.38	0.38	0.38	0.38	3.28	3.22E-02	1210	0.394	0.344	1.84	36.2	39	0.289	8.08	15.5	15.1	29.4	16.4	0.463	Tower Extrusions	Oney	12857
C 102 x2.8	102	73.5	4.78	46	6.35	7.92	0.79	0.79	1.57	2.81	2.76E-02	1035	0.378	0.332	1.65	32.5	40	0.209	6.57	14.2	14.1	27.8	12.6	0.333	Tower Extrusions	Oney	11310
C 102 x2.6	102	77.6	3.81	50.8	5.84	6.35	0	0	0	2.59	2.54E-02	954	0.4	0.349	1.63	32	41.3	0.25	7.32	16.2	16.6	34	9.04	0.409	Western Extrusions Corp.	Dallas	19363
C 102 x2.6	102	77.6	3.81	50.8	5.84	6.35	-	-	-	2.59	2.54E-02	954	0.4	0.349	1.63	32	41.3	0.25	7.32	16.2	16.5	34	9.04	0.409	Taber Extrusions	Russellville	OC-7646
C 102 x2.6	102	95.1	3.18	102	3.18	0.25	0.25	0.25	0.25	2.57	2.52E-02	948	0.606	0.504	1.79	35.3	43.5	1.05	15.8	33.3	35.1	76.4	3.33	1.83	Tower Extrusions	Oney	3222
C 102 x2.0	102	79.9	3.81	38.1	4.7	6.35	0	0	0	1.97	1.93E-02	727	0.349	0.311	1.12	22.1	39.3	0.096	3.48	11.5	10.4	21.1	5	0.159	Western Extrusions Corp.	Dallas	19178

# CHANNELS (ROUNDED CORNERS)



Designation	Depth (d)	Web Dimensions		Flange Dimensions		Radii				Mass (w)	Dead Load	Area	Surface Area per meter of length		Axis X-X			Axis Y-Y				Shear Center	Torsional Constant	Warping Constant	Extruder	Location	Manufacturer Identification Number
		Height (T)	Thickness (w)	Width (b)	Thickness (t)	R1	R2	R3	R4				Total	Minus Top of Top Flange	I <sub>x</sub>	S <sub>x</sub>	r <sub>x</sub>	I <sub>y</sub>	S <sub>y</sub>	r <sub>y</sub>	X						
mm x (kg/m)	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	m <sup>2</sup>	m <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	mm	mm	10 <sup>3</sup> mm <sup>4</sup>	10 <sup>9</sup> mm <sup>6</sup>			
<b>C 89</b> x6.3	88.9	62.7	6.35	76.2	12.7	0.38	0.38	0.38	0.38	6.34	6.22E-02	2339	0.47	0.394	2.97	66.8	35.6	1.34	30.5	24	32.1	60.9	101	1.64	Tower Extrusions	Oney	15837
<b>C 76</b> x2.4	76.2	57.1	6.35	38.1	6.35	3.18	3.18	-	-	2.41	2.36E-02	887	0.292	0.254	0.727	19.1	28.6	0.113	426	11.3	11.7	20.8	12.4	0.096	Pries Enterprises Inc.	Independence	4369
x2.4	76.2	50.3	4.32	44.4	6.6	6.35	0	0	0	2.38	2.33E-02	876	0.321	0.277	0.819	21.5	30.6	0.174	6.04	14.1	15.7	30.3	10.8	0.152	Western Extrusions Corp.	Dallas	19298
x2.4	76.2	50.3	4.32	44.4	6.6	6.35	-	-	-	2.38	2.33E-02	876	0.321	0.277	0.819	21.5	30.6	0.174	6.04	14.1	15.8	30.3	10.8	0.152	Taber Extrusions	Russellville	OC-7645
x1.7	76.2	53.3	3.3	38.1	5.08	6.35	0	0	0	1.69	1.66E-02	623	0.298	0.26	0.587	15.4	30.7	0.09	3.54	12	12.6	25	4.6	0.081	Western Extrusions Corp.	Dallas	19286
x1.7	76.2	53.3	3.3	38.1	5.08	6.35	-	-	-	1.69	1.66E-02	623	0.298	0.26	0.587	15.4	30.7	0.09	3.54	12	12.4	25	4.6	0.081	Taber Extrusions	Russellville	OC-7644
<b>C 70</b> x3.1	69.9	50.8	6.35	63.5	6.35	3.18	0	0	6.35	3.14	3.08E-02	1156	0.381	0.318	0.898	25.7	27.9	0.47	11.6	20.2	23.1	45.3	15.9	0.337	Western Extrusions Corp.	Dallas	19204

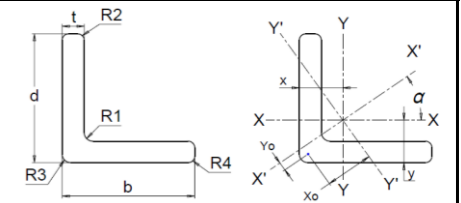
# STRUCTURAL CHANNELS



Designation	Depth (d)	Web Dimensions		Flange Dimensions		Distance	Radii		Mass (w)	Dead Load	Area	Surface Area per meter of length		Axis X-X			Axis Y-Y				Shear Center	Torsional Constant	Warping Constant	Extruder	Location	Manufacturer Identification Number
		Height (T)	Thickness (w)	Width (b)	Thickness (t)		a	R1				R2	Total	Minus Top of Top Flange	I <sub>x</sub>	S <sub>x</sub>	r <sub>x</sub>	I <sub>y</sub>	S <sub>y</sub>	r <sub>y</sub>						
mm x (kg/m)	mm	mm	mm	mm	mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	m <sup>2</sup>	m <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	mm	mm	10 <sup>9</sup> mm <sup>4</sup>	10 <sup>9</sup> mm <sup>6</sup>			
<b>C 394</b>																										
x13	394	328	6.35	89.7	6.35	83.4	12.7	-	13	1.28E-01	4785	1.13	1.04	114	580	154	2.85	41.4	24.4	20.8	43.3	217	71.3	Taber Extrusions	Russellville	TM-12075
x11	394	330	5.59	82.6	5.59	77.0	13.46	-	11.2	1.10E-01	4119	1.11	1.02	97.6	496	154	2.04	31.8	22.2	18.5	38.8	150	51.6	Taber Extrusions	Russellville	TM-12595
<b>C 381</b>																										
x26	381	310	18.3	94.5	10.2	76.2	12.7	6.1	25.9	2.54E-01	9565	1.1	1.01	170	892	133	4.84	63.4	22.5	20.6	32	1149	113	Taber Extrusions	Russellville	TM-10984
<b>C 305</b>																										
x11	305	249	7.62	75.2	7.11	67.6	9.65	4.32	11	1.08E-01	4040	0.896	0.82	54.4	357	116	1.66	28.2	20.3	17.5	34.5	162	24.3	Taber Extrusions	Russellville	TM-12267
x9.4	305	248	7.62	75.2	7.62	67.6	9.65	4.32	9.37	9.19E-02	3454	0.896	0.82	42.6	280	111	1.04	16.8	17.3	13.5	26.3	91.5	16.2	Western Extrusion Corp.	Dallas	19187
<b>C 254</b>																										
x12	254	190	13.4	73.3	13.4	59.9	8.64	3.56	12	1.18E-01	4408	0.774	0.701	33.4	263	87.1	1.05	17.7	15.5	13.7	20.6	244	11.4	Western Extrusion Corp.	Dallas	19278
x8.0	254	205	6.1	66	6.1	59.9	8.64	3.56	7.97	7.82E-02	2938	0.76	0.694	28.6	225	98.7	0.977	19.7	18.2	16.4	32.7	95.5	9.78	Western Extrusion Corp.	Dallas	19287
x7.9	254	205	6.1	66	6.1	59.9	8.64	3.56	7.92	7.77E-02	2919	0.76	0.694	28.4	223	98.6	0.992	19.4	18.4	16.5	32.7	92.3	9.97	Taber Extrusions	Russellville	OC-11879
<b>C 229</b>																										
x10	229	182	11.4	67.3	5.84	55.9	8.38	3.56	10.3	1.01E-01	3782	0.704	0.637	25.3	221	81.7	1.01	18.9	16.4	14.7	24.6	178	8.32	Taber Extrusions	Russellville	OC-09711
<b>C 203</b>																										
x11	203	134	9.65	76.2	9.65	66.6	13.97	5.59	10.9	1.07E-01	4032	0.692	0.615	24.9	245	78.5	1.93	34.3	21.9	22.1	40.2	263	11.2	Taber Extrusions	Russellville	OC-04454
x9.8	203	145	12.4	64.2	12.4	51.8	8.13	3.33	9.78	9.59E-02	3607	0.638	0.574	18.7	184	72	0.859	17.3	15.4	14.7	22.9	191	5.46	Western Extrusion Corp.	Dallas	19288
x9.6	203	158	12.4	64.2	5.59	51.8	8.13	3.3	9.63	9.45E-02	3552	0.638	0.574	18.3	180	71.7	0.834	16.4	15.3	14.5	22.3	183	5.36	Taber Extrusions	Russellville	OC-03596
x8.4	203	158	10.0	61.8	5.59	51.8	8.13	3.3	8.38	8.22E-02	3088	0.633	0.571	16.7	165	73.6	0.749	15.3	15.6	14.2	24.2	121	4.78	Taber Extrusions	Russellville	OC-08180
x7.0	203	158	7.62	59.5	5.59	51.9	8.13	3.3	6.99	6.86E-02	2579	0.629	0.569	14.9	146	76	0.636	13.7	15.7	14	26	76	4.04	Taber Extrusions	Russellville	OC-08337
x6.5	203	157	6.35	58.2	6.35	51.9	8.13	3.3	6.46	6.34E-02	2381	0.626	0.568	14.5	143	78	0.601	13.8	15.9	14.6	28	68.8	3.77	Western Extrusion Corp.	Dallas	19353
x6.4	203	158	6.35	58.2	5.59	51.9	8.13	3.3	6.36	6.24E-02	2346	0.626	0.568	14.2	140	77.8	0.603	13.4	16	14.5	28	63.9	3.81	Taber Extrusions	Russellville	OC-03538
<b>C 178</b>																										
x7.6	178	136	10.6	58.4	5.33	47.8	7.87	3.3	7.58	7.44E-02	2796	0.568	0.51	11.3	128	63.7	0.582	12.7	14.4	13.5	21.9	112	2.81	Taber Extrusions	Russellville	OC-07886
x6.3	178	136	7.98	55.7	5.33	47.7	7.87	3.3	6.3	6.18E-02	2322	0.563	0.507	10.1	114	65.9	0.497	11.5	14.6	13.5	24	67.8	2.38	Taber Extrusions	Russellville	OC-07523
x5.3	178	136	5.84	53.6	5.33	47.8	7.87	3.3	5.27	5.17E-02	1943	0.559	0.505	9.1	102	68.4	0.428	10.5	14.8	13.7	26.2	46.1	2.05	Taber Extrusions	Russellville	OC-03537
<b>C 152</b>																										
x11	152	92	12.7	76.2	9.65	63.5	9.65	6.35	10.6	1.04E-01	3903	0.583	0.507	13	170	57.6	1.86	34	21.8	23.6	39.9	303	5.66	Taber Extrusions	Russellville	OC-08371
x6.7	152	112	11.1	54.8	5.08	43.7	7.62	3.05	6.74	6.61E-02	2486	0.501	0.446	7.33	96.2	54.3	0.462	10.8	13.6	13.2	20.5	102	1.6	Taber Extrusions	Russellville	OC-03536
x5.5	152	106	7.98	51.7	7.98	43.7	7.62	3.05	5.52	5.42E-02	2035	0.495	0.443	6.51	85.4	56.5	3.76	9.72	13.7	13	22.6	59.5	1.28	Western Extrusion Corp.	Dallas	19295
x5.4	152	112	7.98	51.7	5.08	43.7	7.62	3.05	5.43	5.33E-02	2003	0.495	0.443	6.38	83.7	56.4	0.375	9.39	13.7	13	22.5	55.7	1.3	Taber Extrusions	Russellville	OC-02564
x4.5	152	112	5.72	49.4	5.08	43.7	7.62	3.05	4.5	4.41E-02	1659	0.49	0.441	5.71	74.9	58.7	0.318	8.47	13.8	13	24.7	36.4	1.1	Taber Extrusions	Russellville	OC-02563
x4.2	152	112	5.08	48.8	5.08	43.7	7.62	3.05	4.24	4.16E-02	1562	0.489	0.44	5.52	72.5	59.5	0.301	8.2	13.9	13.2	25.4	32.6	1.04	Taber Extrusions	Russellville	OC-02562
x4.2	152	112	5.08	49.4	5.08	44.3	7.62	3.05	4.18	4.10E-02	1542	0.491	0.442	5.43	71.2	59.3	0.291	8	13.7	13	25.1	30.9	1.01	Western Extrusion Corp.	Dallas	19661
x4.1	152	112	5.08	48.8	5.08	43.7	7.62	3.05	4.14	4.06E-02	1528	0.489	0.44	5.36	70.3	59.2	0.28	7.77	13.5	12.8	24.5	30.5	0.971	Western Extrusion Corp.	Dallas	19294
<b>C 76</b>																										
x3.4	76.2	33.5	9.53	50.8	9.65	41.3	4.83	9.65	3.35	3.29E-02	1236	0.337	0.286	0.964	25.3	27.9	0.202	5.41	12.8	13.5	21	33.2	0.153	Taber Extrusions	Russellville	OC-07588

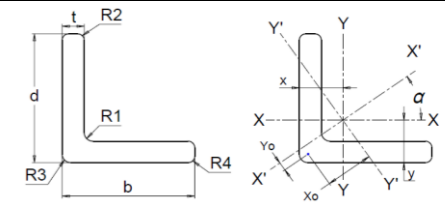


# ANGLES, EQUAL LEGS (ROUNDED CORNERS)



Designation	Dimensions		Thickness (t)	Radii				Mass	Dead Load	Area	Axis X-X					Axis Y-Y					Torsional Constant	Warping Constant	Axis X'-X'		Axis Y'-Y'		r <sub>0</sub>	Ω	tan α	Extruder	Location	Manufacturer Identification Number		
	L b x d x t	Length (b)		Height (d)	R1	R2	R3				R4	I <sub>x</sub>	S <sub>x</sub>	r <sub>x</sub>	Z <sub>x</sub>	y	I <sub>y</sub>	S <sub>y</sub>	r <sub>y</sub>	Z <sub>y</sub>			x	r' <sub>x</sub>	y <sub>0</sub>	r' <sub>y</sub>							x <sub>0</sub>	
mm x mm x mm	mm	mm	mm	mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
L 152x152	x9.5	152	152	9.53	9.53	0	0	7.68	7.53E-02	2832	6.42	57.9	47.6	104	41.5	6.42	57.9	47.6	104	41.5	90.1	1.53E-01	60.1	0	30.4	51.3	84.6	0.633	1	Western Extrusions Corp.	Dallas	19224		
	x3.2	152	152	3.18	0.76	0.25	-	2.6	2.55E-02	958	2.27	20.1	48.7	36.1	39.2	2.27	20.1	48.7	36.1	39.2	3.37	6.09E-03	61.6	0	30.8	53.3	87	0.625	1				Tower Extrusions	Olney
L 127x127	x13	127	127	12.7	6.35	0.76	-	8.33	8.17E-02	3073	4.69	51.7	39	93.2	36.4	4.69	51.7	39	93.2	36.4	167	1.95E-01	49.2	0	25	41.7	69.2	0.637	1	Tower Extrusions	Olney	11513		
L 106x106	x3.2	106	106	3.18	0.25	0.25	-	1.79	1.76E-02	661	0.746	9.55	33.6	17.2	27.7	0.746	9.55	33.6	17.2	27.7	2.27	2.00E-03	42.5	0	21.3	36.7	60.1	0.626	1	Tower Extrusions	Olney	8882		
L 102x102	x13	102	102	12.7	6.35	0.76	-	6.58	6.45E-02	2428	2.32	32.4	30.9	58.3	30.2	2.32	32.4	30.9	58.3	30.2	131	9.48E-02	38.9	0	19.9	32.5	54.4	0.644	1	Tower Extrusions	Olney	13460		
	x9.5	102	102	9.53	11.1	0.25	-	5.08	4.98E-02	1871	1.82	25	31.2	45	29.0	1.82	25	31.2	45	29.0	60.6	4.27E-02	39.3	0	20.1	32.8	55	0.644	1	Tower Extrusions	Olney	9541		
	x6.4	102	102	6.35	0.25	0.25	-	3.39	3.33E-02	1250	1.26	17.1	31.8	30.8	27.9	1.26	17.1	31.8	30.8	27.9	16.9	1.35E-02	40.2	0	20.2	34.6	56.8	0.628	1	Tower Extrusions	Olney	3036		
	x4.8	102	102	4.78	0.38	0.38	-	2.57	2.52E-02	947	0.973	13.1	32	23.5	27.3	0.973	13.1	32	23.5	27.3	7.37	5.88E-03	40.5	0	20.3	35	57.2	0.627	1	Tower Extrusions	Olney	10988		
L 76x76	x13	76.2	76.2	12.7	0.25	0.25	-	4.81	4.72E-02	1774	0.922	17.6	22.8	31.7	23.7	0.922	17.6	22.8	31.7	23.7	92.5	3.66E-02	28.6	0	14.8	23.6	39.9	0.652	1	Tower Extrusions	Olney	9424		
	x9.5	76.2	76.2	9.53	0.25	0.25	-	3.69	3.62E-02	1361	0.732	13.6	23.2	24.6	22.5	0.732	13.6	23.2	24.6	22.5	40.4	1.70E-02	29.2	0	14.9	24.6	41	0.640	1	Tower Extrusions	Olney	9908		
	x6.4	76.2	76.2	6.35	0.25	0.25	-	2.52	2.47E-02	927	0.518	9.45	23.6	17	21.4	0.518	9.45	23.6	17	21.4	12.4	5.46E-03	29.8	0	15	25.5	42.1	0.631	1	Tower Extrusions	Olney	3102		
	x4.8	76.2	76.2	4.78	0.38	0.38	-	1.91	1.87E-02	705	0.401	7.24	23.9	13	20.8	0.401	7.24	23.9	13	20.8	5.41	2.41E-03	30.1	0	15.1	25.9	42.6	0.629	1	Tower Extrusions	Olney	9591		
	x3.2	76.2	76.2	3.18	0.38	0.38	-	1.28	1.26E-02	474	0.275	4.91	24.1	8.85	20.2	0.275	4.91	24.1	8.85	20.2	1.62	7.35E-04	30.5	0	15.3	26.3	43	0.627	1	Tower Extrusions	Olney	13575		
	x3.2	76.2	76.2	3.18	0.25	0.25	-	1.28	1.26E-02	474	0.275	4.91	24.1	8.85	20.2	0.275	4.91	24.1	8.85	20.2	1.64	7.36E-04	30.5	0	15.3	26.3	43	0.627	1	Tower Extrusions	Wylie-H	3694		
L 64x64	x9.5	63.5	63.5	9.53	0.41	0.41	-	3.03	2.97E-02	1119	0.409	9.27	19.1	16.7	19.4	0.409	9.27	19.1	16.7	19.4	33	9.28E-03	24.1	0	12.4	20	33.6	0.647	1	Tower Extrusions	Wylie-M	418		
	x4.8	63.5	63.5	4.78	0.38	0.38	-	1.58	1.55E-02	584	0.228	4.97	19.8	8.95	17.6	0.228	4.97	19.8	8.95	17.6	4.45	1.36E-03	25	0	12.6	21.4	35.2	0.630	1	Tower Extrusions	Wylie-H	3561		
	x3.2	63.5	63.5	3.18	0.38	0.38	-	1.07	1.05E-02	393	0.157	3.38	20	6.09	17.1	0.157	3.38	20	6.09	17.1	1.34	4.19E-04	25.3	0	12.7	21.8	35.7	0.627	1	Tower Extrusions	Olney	14914		
L 57x57	x6.4	57.2	57.2	6.35	0.25	0.25	-	1.86	1.82E-02	685	0.21	5.18	17.5	9.34	16.6	0.21	5.18	17.5	9.34	16.6	9.09	2.18E-03	22.1	0	11.2	18.7	31	0.636	1	Tower Extrusions	Olney	9442		
L 56x56	x4.8	55.6	55.6	4.78	4.83	1.52	-	1.39	1.36E-02	512	0.15	3.75	17.1	6.77	15.7	0.15	3.75	17.1	6.77	15.7	4.1	8.82E-04	21.6	0	11	18.2	30.3	0.640	1	Pries Enterprises Inc.	Independence	4483		
L 51x51	x6.4	50.8	50.8	6.35	0.25	0.25	-	1.64	1.61E-02	605	0.145	4.04	15.5	7.29	15.0	0.145	4.04	15.5	7.29	15.0	7.95	1.49E-03	19.5	0	9.93	16.4	27.3	0.640	1	Tower Extrusions	Olney	667		
	x6.4	50.8	50.8	6.35	2.36	0.81	-	1.64	1.61E-02	606	0.145	4.04	15.4	7.28	15.0	0.145	4.04	15.4	7.28	15.0	8.12	1.48E-03	19.5	0	9.93	16.3	27.3	0.643	1	Tower Extrusions	Olney	13068		
	x6.4	50.8	50.8	6.35	0.41	0.41	-	1.64	1.61E-02	605	0.145	4.04	15.5	7.29	15.0	0.145	4.04	15.5	7.29	15.0	8	1.49E-03	19.5	0	9.93	16.4	27.3	0.640	1	Tower Extrusions	Wylie-M	787		
	x6.4	50.8	50.8	6.35	0.41	0.41	-	1.64	1.61E-02	605	0.145	4.04	15.5	7.29	15.0	0.145	4.04	15.5	7.29	15.0	8	1.49E-03	19.5	0	9.93	16.4	27.3	0.640	1	Tower Extrusions	Wylie-H	8445		
	x6.4	50.8	50.8	6.35	0.79	0.79	-	1.64	1.61E-02	605	0.145	4.04	15.5	7.28	15.0	0.145	4.04	15.5	7.28	15.0	7.99	1.48E-03	19.5	0	9.93	16.4	27.3	0.640	1	Pries Enterprises Inc.	Independence	459		
	x6.4	50.8	50.8	6.35	6.35	3.18	-	1.65	1.62E-02	609	0.142	3.96	15.3	7.21	15.0	0.142	3.96	15.3	7.21	15.0	8.73	1.41E-03	19.2	0	9.85	16.6	26.7	0.656	1	Pries Enterprises Inc.	Independence	2204		
	x4.8	50.8	50.8	4.78	0.25	0.25	-	1.25	1.23E-02	462	0.114	3.13	15.7	5.63	14.5	0.114	3.13	15.7	5.63	14.5	3.49	6.74E-04	19.8	0	10	15.9	27.9	0.633	1	Tower Extrusions	Olney	1185		
	x4.8	50.8	50.8	4.78	0.41	0.41	-	1.25	1.23E-02	462	0.114	3.13	15.7	5.63	14.5	0.114	3.13	15.7	5.63	14.5	3.5	6.74E-04	19.8	0	9	16.9	27.9	0.633	1	Tower Extrusions	Wylie-M	147		
	x4.8	50.8	50.8	4.78	0.41	0.41	-	1.25	1.23E-02	462	0.114	3.13	15.7	5.63	14.5	0.114	3.13	15.7	5.63	14.5	3.5	6.74E-04	19.8	0	9	16.9	27.9	0.633	1	Tower Extrusions	Wylie-H	8400		
	x3.2	50.8	50.8	3.18	0.25	0.25	-	0.847	8.31E-03	312	7.90E-02	2.14	15.9	3.86	13.9	7.90E-02	2.14	15.9	3.86	13.9	1.06	2.10E-04	20.1	0	10.1	17.3	28.4	0.629	1	Tower Extrusions	Olney	2449		
	x3.2	50.8	50.8	3.18	0.64	1.57	-	0.845	8.29E-03	312	7.83E-02	2.12	15.9	3.83	13.9	7.83E-02	2.12	15.9	3.83	13.9	1.06	2.06E-04	20	0	10.1	17.2	28.3	0.629	1	Tower Extrusions	Olney	20829		
	x3.2	50.8	50.8	3.18	0.41	0.41	-	0.847	8.31E-03	312	7.90E-02	2.14	15.9	3.85	13.9	7.90E-02	2.14	15.9	3.85	13.9	1.06	2.10E-04	20.1	0	10.1	17.3	28.4	0.629	1	Tower Extrusions	Wylie-M	127		
	x3.2	50.8	50.8	3.18	0.25	0.25	-	0.847	8.31E-03	312	7.90E-02	2.14	15.9	3.86	13.9	7.90E-02	2.14	15.9	3.86	13.9	1.06	2.10E-04	20.1	0	10.1	17.3	28.4	0.629	1	Tower Extrusions	Wylie-H	501		
L 44x44	x4.8	44.4	44.4	4.78	0.38	0.38	0.38	1.09	1.07E-02	402	7.46E-02	2.36	13.6	4.26	12.9	7.46E-02	2.36	13.6	4.26	12.9	3.03	4.39E-04	17.2	0	87.2	14.6	24.2	0.636	1	Western Extrusions Corp.	Dallas	19084		
	x4.8	44.4	44.4	4.78	0.38	0.38	-	1.09	1.07E-02	402	7.47E-02	2.36	13.6	4.26	12.9	7.47E-02	2.36	13.6	4.26	12.9	3.01	4.40E-04	17.2	0	8.72	14.6	24.2	0.636	1	Tower Extrusions	Olney	11886		
	x4.8	44.4	44.4	4.78	4.75	3.18	-	1.09	1.07E-02	402	7.27E-02	2.29	13.4	4.18	12.9	7.27E-02	2.29	13.4	4.18	12.9	3.24	4.11E-04	16.9	0										

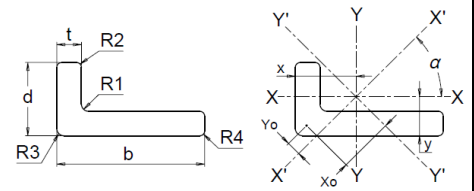
# ANGLES, EQUAL LEGS (ROUNDED CORNERS)



Designation	Dimensions		Thickness (t)	Radii				Mass	Dead Load	Area	Axis X-X					Axis Y-Y					Torsional Constant	Warping Constant	Axis X'-X'		Axis Y'-Y'		r <sub>0</sub>	Ω	tan α	Extruder	Location	Manufacturer Identification Number	
	L	b		d	x	t	R1				R2	R3	R4	I <sub>x</sub>	S <sub>x</sub>	r <sub>x</sub>	Z <sub>x</sub>	y	I <sub>y</sub>	S <sub>y</sub>			r <sub>y</sub>	Z <sub>y</sub>	x	J							C <sub>w</sub>
mm x mm x mm	mm	mm	mm	mm	mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	mm	mm	mm	mm	mm	mm	mm	mm	mm
<b>L 27x27</b> x6.4	27	27	6.35	0.38	0.38	-	-	0.82	8.04E-03	302	1.87E-02	1.04	7.87	1.88	9.03	1.87E-02	1.04	7.87	1.88	9.03	3.87	1.69E-04	9.8	0	5.27	7.59	13.5	0.683	1	Tower Extrusions	Olney	15846	
<b>L 25x25</b> x4.8	25.4	25.4	6.35	0.25	0.25	-	-	0.765	7.50E-03	282	1.53E-02	0.914	7.37	1.65	8.62	1.53E-02	0.914	7.37	1.65	8.62	3.59	1.35E-04	9.16	0	4.97	6.98	12.6	0.690	1	Tower Extrusions	Olney	7921	
x3.2	25.4	25.4	4.78	0.25	0.25	-	-	0.596	5.85E-03	220	1.25E-02	0.721	7.54	1.3	8.08	1.25E-02	0.721	7.54	1.3	8.08	1.61	6.83E-05	9.44	0	4.94	7.65	13.1	0.660	1	Tower Extrusions	Olney	1576	
x3.2	25.4	25.4	3.18	0	1.57	3.18	1.57	0.398	3.90E-03	147	8.57E-03	0.48	7.64	0.881	7.52	8.57E-03	0.48	7.64	0.881	7.52	0.481	2.15E-05	96.8	0	48	8.2	13.6	0.634	1	Western Extrusions Corp.	Dallas	19806	
x3.2	25.4	25.4	3.18	0.38	0.38	-	-	0.41	4.02E-03	151	9.03E-03	0.505	7.73	0.91	7.52	9.03E-03	0.505	7.73	0.91	7.52	0.499	2.32E-05	9.74	0	4.96	8.19	13.7	0.640	1	Tower Extrusions	Olney	179	
x3.2	25.4	25.4	3.18	0.41	0.41	-	-	0.41	4.02E-03	151	9.03E-03	0.505	7.73	0.91	7.52	9.03E-03	0.505	7.73	0.91	7.52	0.501	2.32E-05	9.74	0	4.96	8.19	13.7	0.640	1	Tower Extrusions	Wylie-M	102	
x3.2	25.4	25.4	3.18	0.25	0.25	-	-	0.41	4.02E-03	151	9.04E-03	0.505	7.73	0.911	7.52	9.04E-03	0.505	7.73	0.911	7.52	0.501	2.32E-05	9.74	0	4.97	8.2	13.7	0.640	1	Tower Extrusions	Wylie-H	1011	
<b>L 22x22</b> x3.2	22.2	22.2	3.18	0.25	0.25	-	-	0.355	3.48E-03	131	5.91E-03	0.381	6.71	0.687	6.71	5.91E-03	0.381	6.71	0.687	6.71	0.431	1.50E-05	8.45	0	4.33	7.05	11.8	0.645	1	Tower Extrusions	Olney	3693	
<b>L 19x19</b> x4.8	19	19	4.75	0.25	0.25	-	-	0.43	4.22E-03	158	4.85E-03	0.385	5.53	0.694	6.45	4.85E-03	0.385	5.53	0.694	6.45	1.13	2.39E-05	6.88	0	3.73	5.24	9.41	0.690	1	Tower Extrusions	Olney	3692	



**ANGLES, UNEQUAL LEGS (ROUNDED CORNERS)**

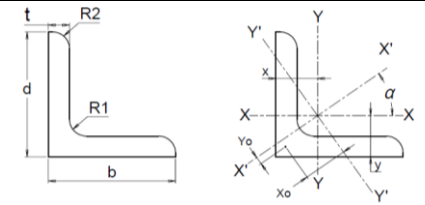


Designation L b x d x t mm x mm x mm	Dimensions		Thickness (t) mm	Radii				Mass kg/m	Dead Load kN/m	Area mm²	Axis X-X					Axis Y-Y					Torsional Constant J 10⁹ mm⁴	Warping Constant C <sub>w</sub> 10⁹ mm⁶	Axis X'-X'		Axis Y'-Y'		βw mm	r <sub>0</sub> mm	Ω	tan α	y <sub>s</sub> mm	x <sub>s</sub> mm	Extruder	Location	Manufacturer Identification Number
	Length (b) mm	Height (d) mm		R1 mm	R2 mm	R3 mm	R4 mm				I <sub>x</sub> 10⁸ mm⁴	S <sub>x</sub> 10³ mm³	r <sub>x</sub> mm	Z <sub>x</sub> 10³ mm³	y mm	I <sub>y</sub> 10⁸ mm⁴	S <sub>y</sub> 10³ mm³	r <sub>y</sub> mm	Z <sub>y</sub> 10³ mm³	x mm			r' <sub>x</sub> mm	y <sub>0</sub> mm	r' <sub>y</sub> mm	x <sub>0</sub> mm									
	mm	mm		mm	mm	mm	mm				mm	mm	mm	mm	mm	mm	mm	mm	mm	mm			mm	mm	mm	mm									
<b>L 203</b> x102x13 x76x8 x37x9.5	203 203 203	102 76.2 36.5	12.7 7.95 9.53	12.7 12.7 0.38	0.25 0.38 0.38	- - -	- - -	10.2 5.95 5.95	1.00E-01 5.84E-02 5.84E-02	3744 2193 2193	2.81 0.809 0.106	35.1 12.9 3.58	27.4 19.2 6.95	64.2 23.7 9.22	21.9 13.6 6.91	16.1 9.58 8.79	123 75.3 77.8	65.6 66.1 63.3	215 128 121	72.4 77.0 90.2	211 50 66.1	4.69E-01 1.13E-01 1.63E-01	22 16 6.31	31 20.9 6	67.6 67 63.4	56.9 66.9 68.5	139.2 157.8 177.3	96.2 98.2 93.7	0.546 0.491 0.462	-0.264 -0.167 -0.046	15.4 9.58 2.85	62.9 69.4 68.7	Tower Extrusions Tower Extrusions Tower Extrusions	Olney Olney Olney	9543 12745 15077
<b>L 178</b> x51x4.8 x38x3.2	178 178	50.8 38.1	4.78 3.18	6.35 0.38	2.3876 0.38	- -	0.381 -	2.92 1.83	2.86E-02 1.80E-02	1076 675	0.151 0.045	3.49 1.36	11.8 8.19	6.5 2.54	7.61 4.71	3.57 2.19	33.4 21.2	57.6 57	54.7 33.8	71.2 74.7	8.71 2.35	1.63E-02 4.85E-03	10.1 7.13	12.4 8.3	58 57.1	65.5 71.3	147.6 154.1	88.9 92	0.438 0.392	-0.109 -0.071	5.25 3.2	66.4 71.7	Tower Extrusions Tower Extrusions	Olney Olney	12440 12147
<b>L 152</b> x102x13 x102x9.5 x102x6.4 x76x13 x76x13 x76x6.4 x64x6.4 x64x6.4 x38x6.4	152 152 152 152 152 152 152 152 152	102 102 102 76.2 76.2 76.2 63.5 63.5 63.5	12.7 9.53 6.35 12.7 12.7 12.7 6.35 6.35 6.35	0.38 0.38 0.25 1.57 0.38 0.38 0.38 0.38 0.38	0.38 0.38 0.25 0.38 0.38 0.38 0.38 0.38 0.38	- - - - - - - - -	- - - - - - - - -	8.31 6.32 4.26 7.44 7.44 7.44 3.83 3.83 3.17	8.15E-02 6.20E-02 4.18E-02 7.30E-02 7.30E-02 7.30E-02 3.56E-02 3.56E-02 3.11E-02	3065 2329 1573 2742 2742 2742 1411 1339 1169	2.61 2.04 1.42 1.12 1.12 1.12 0.625 0.625 0.081	34.1 26.3 18 19.2 19.2 19.2 10.2 7.12 2.55	29.2 29.6 30.1 20.2 20.2 20.2 21 16.6 8.31	61.4 46.7 31.7 35.8 35.8 35.8 18.1 12.9 5.31	25.2 24.1 22.9 17.6 17.6 17.6 15.2 11.9 6.47	7.24 5.61 3.86 6.53 6.53 6.53 3.5 3.3 2.76	71 54.4 37 67.5 67.5 67.5 35.3 34.2 31.1	48.6 49.1 49.5 48.8 48.8 48.8 49.8 49.7 48.6	128 97.8 66.6 117 117 117 61.5 58.5 50	50.2 49.1 47.9 55.5 55.5 55.5 53.1 56.1 63.4	162 69.9 21.6 146 145 145 19.1 18.6 15.8	2.21E-01 9.78E-02 3.02E-02 1.89E-01 1.89E-01 2.61E-02 2.47E-02 2.28E-02	22.1 35.4 22.5 16.3 22.9 16.3 16.7 13.6 7.21	34.5 32.2 36.2 22.9 22.9 24.6 18.6 8.38	52.2 52.8 53.4 50.3 50.3 51.4 50.6 48.8	31.7 32.2 32.7 42.1 42.2 44.5 48.7 55.8	78.4 78.7 78.9 103.8 103.8 104.9 114.1 127.9	73.5 52.8 53.4 71.4 71.4 74.2 73.9 74.9	0.595 0.589 0.586 0.549 0.548 0.53 0.502 0.433	-0.44 -0.446 -0.451 -0.261 -0.261 -0.273 -0.2 -0.086	18.8 19.2 19.6 11.5 11.5 12.1 8.7 3.58	42.9 43.8 44.6 46.5 46.6 49.4 51.4 56.3	Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions	Olney Olney Olney Olney Olney Olney Olney Olney Olney	13476 20318 4120 4290 13477 18647 15381 11217
<b>L 140</b> x127x6.4	140	127	6.35	0.38	0.38	-	-	4.48	4.39E-02	1653	2.59	27.4	39.6	49	32.6	3.27	32.5	44.5	59	39.1	22.5	3.15E-02	26.5	45.3	53.3	8.89	22.8	75.4	0.624	-0.822	29.4	35.6	Tower Extrusions	Olney	13422
<b>L 127</b> x76x9.5 x76x6.4 x64x6.4 x51x4.8 x51x3.2 x41x3.2	127 127 127 127 127 127	76.2 76.2 63.5 50.8 50.8 41.3	9.53 6.35 6.35 4.78 3.18 3.18	0.41 0.38 0.38 1.6 0.41 0.38	0.41 0.38 0.38 1.6 0.41 0.381	- - - - - -	- - - 0.381 - 1.6	5 3.39 3.19 2.29 1.5 1.42	4.91E-02 3.33E-02 3.13E-02 2.22E-02 1.47E-02 1.39E-02	1845 1250 1178 834 554 524	0.849 0.598 0.354 0.143 0.1 0.055	14.6 10.1 7.01 3.43 2.36 1.56	21.5 21.9 17.3 13.1 13.4 10.2	26.3 17.8 12.6 6.21 4.11 2.79	17.9 16.7 13.0 9.15 8.52 6.36	3.07 2.13 2.01 1.43 0.963 0.895	36.6 25 24.3 17.9 12 11.5	40.8 41.2 41.3 44.8 46.6 41.4	65.1 44.6 42.5 30.4 20.4 19.1	43.3 16.9 44.8 16.4 46.6 49.2	55.3 55.3 55.3 55.3 55.3 55.3	5.14E-02 1.61E-02 1.48E-02 6.07E-03 1.85E-03 1.78E-03	16.6 16.8 13.8 10.8 11 8.53	25.2 26.1 19.9 14.5 15.3 11.2	43 43.5 42.6 42.1 42.4 41.7	30.6 31.3 36.3 41.3 42.5 45.9	75.7 76.0 87.6 61.7 62.9 102.7	60.8 62 61 61.7 62.9 63.6	0.574 0.568 0.539 0.496 0.484 0.449	-0.364 -0.371 -0.268 -0.186 -0.193 -0.138	13.2 13.6 9.83 6.73 6.97 4.82	37.4 38.4 40.2 43.3 44.7 47	Tri City Extrusion Inc. Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions	Bristol Olney Olney Olney Wylie-H Olney	747 13405 15382 12439 8405 21202
<b>L 118</b> x95x3.2	117	95.2	3.18	0.25	0.25	-	-	1.8	1.77E-02	665	0.578	7.95	29.5	14	22.5	0.964	11.5	38.1	20.9	33.4	2.31	2.11E-03	20.7	35	43.5	15.3	37.2	61.5	0.614	-0.657	20.9	32	Tower Extrusions	Olney	7615
<b>L 114</b> x58x3.2 x51x6.4 x51x4.8 x38x6.4	114 114 114 114	58.4 50.8 50.8 38.1	3.18 6.35 4.78 6.35	0.38 1.57 1.57 0.38	0.38 3.18 2.39 0.38	- 6.35 6.35 -	- 0 0 -	1.46 2.7 2.05 2.52	1.43E-02 2.65E-02 2.01E-02 2.47E-02	538 996 755 927	0.146 0.176 0.138 0.077	3.08 4.34 3.37 2.49	16.5 13.3 13.5 9.09	5.34 8.02 6.05 4.9	11.1 10.3 9.69 7.32	0.76 1.36 1.04 1.25	10.1 18.8 14.4 18.2	37.6 36.9 37.2 36.7	17.7 32.3 24.7 30	38.9 41.9 41.3 45.3	1.93 13.3 5.76 12.4	1.43E-03 1.01E-02 4.45E-03 9.63E-03	13 10.7 10.8 7.67	19.4 15.3 15.8 9.68	38.9 37.7 38 37	33.2 35.3 36 38.7	77.9 83.1 83.5 90.8	56.2 54.9 55.8 55	0.532 0.51 0.503 0.474	-0.286 -0.224 -0.229 -0.136	9.54 7.22 7.38 4.4	37.2 37.7 38.6 39.6	Tower Extrusions Western Extrusions Corp. Western Extrusions Corp. Tower Extrusions	Olney Dallas Dallas Olney	10208 19211 19211 13404
<b>L 102</b> x76x13 x76x9.5 x76x6.4 x64x6.4 x64x6.4 x64x6.4 x64x4.8 x51x6.4 x51x3.2 x38x4.8	102 102 102 102 102 102 102 102 102 102 102	76.2 76.2 76.2 63.5 63.5 63.5 63.5 50.8 50.8 50.8 38.1	12.7 9.53 6.35 6.35 6.35 6.35 4.78 6.35 3.18 3.18 4.78	0.25 9.53 0.25 0.25 0.38 0.38 0.38 0.38 0.38 0.41 0.41	0.25 0.25 0.25 0.38 0.38 0.38 0.25 0.38 0.38 0.25 0.25	- - - - - - - - - - -	- - - - - - - - - - -	5.69 4.4 2.95 2.76 2.73 2.09 2.52 1.28 1.76	5.58E-02 4.32E-02 2.89E-02 2.71E-02 2.68E-02 2.05E-02 2.47E-02 1.26E-02 1.73E-02	2097 1622 1089 1017 1006 770 927 474 649	1.01 0.801 0.564 0.335 0.33 0.261 0.175 0.095 0.059	18.3 14.2 9.81 6.85 6.73 5.27 4.39 2.32 1.91	21.9 22.2 22.8 18.2 12.1 14.6 13.7 14.2 9.54	33.2 25.6 17.4 12.2 14.6 12.2 8 4.04 3.56	21.0 19.8 18.7 16 10.7 15.8 12.4 9.67 7.08	2.1 1.66 1.15 1.09 1.07 0.838 1.0 0.527 0.704	30.9 23.9 32.5 32.7 28.3 33 32.9 33.3 32.9	31.7 32 32.5 32.7 33.8 33 32.9 33.3 32.9	55.8 43.3 29.8 26.6 28.3 21.9 26.7 13.8 18.8	33.9 32.7 31.6 14.3 13.7 33.2 36.5 35.3 39.0	110 51.9 14.6 16 16 6.16 12.4 1.62 5.17	6.55E-02 2.96E-02 9.45E-03 8.18E-03 8.02E-03 3.60E-03 7.38E-03 9.89E-04 3.00E-03	16.2 16.4 16.5 14 14 14.1 11 11.2 7.93	25.2 25.5 27.1 21.3 21.4 21.8 15.9 16.7 10.4	34.9 35.3 36.1 34.7 34.7 35 29 34.4 33.4	15.9 16 16.8 23.3 23.5 23.7 29 29.9 33.4	42.3 42.4 42.6 58.5 58.5 58.6 48.6 49.8 79.2	48.7 49.2 50.9 48.9 49 49.6 70.3 70.9 49	0.625 0.626 0.608 0.585 0.581 0.579 0.537 0.528 0.49	-0.542 -0.547 -0.558 -0.392 -0.394 -0.397 -0.267 -0.275 -0.166	14.6 14.7 15.5 11.3 11.3 11.5 7.85 8.13 4.78	26 26.3 27.9 29.4 29.7 30 32.1 33.3 34.7	Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions Tri City Extrusion Inc. Tower Extrusions Tower Extrusions	Olney Olney Olney Olney Olney Olney Bristol Wylie-M Olney	9195 9540 2146 15383 7293 4969 946 17431 4964
<b>L 95</b> x32x3.2	95.2	31.8	3.18	0.38	0.38	-	-	1.07	1.05E-02	393	0.024	0.905	7.81	1.66	5.27	0.377	6.46	30.9	10.7	37.0	1.34	7.43E-04	6.53	8.56	31.2	33.8	76.4	47.3	0.456	-0.142	3.74	34.6	Tower Extrusions	Olney	10790
<b>L 86</b> x35x9.5 x35x9.5	85.7 85.7	34.9 34.9	9.53 9.53	0.41 0.51	4.78 4.78	- 4.78	- 4.78	2.84 2.8	2.79E-02 2.75E-02	1049 1034	0.073 0.069	2.78 2.63	8.34 8.19	5.85 5.67	8.75 8.75	0.757 0.734	14.6 14.2	26.9 26.6	24.8 24.3	34.2 34.2	30.9 30.5	1.14E-02 1.10E-02	7.06 6.92	8.35 8.37	27.2 27	23.3 23.3	63.4 63.4	37.5 37.3	0.563 0.559	-0.172 -0.17	4.29 4.35	24.4 24.4	Tower Extrusions Western Extrusions Corp.	Wylie-M Dallas	2087 19052
<b>L 83</b> x57x6.4	82.6	57.2	6.35	6.35	6.35	-	-	2.28	2.24E-02	841	0.219	5.03	16.1	9.31	14.1	0.569	10.1	26	18.6	26.8	11.8	4.24E-03	12.1	18.6	28.1	15.9	40.5	39.2	0.61	-0.462	10.2	22.3	Pries Enterprises Inc.	Independence	4796
<b>L 76</b> x64x7.9 x51x6.4 x51x4.8 x51x4.8 x51x4.8 x51x4.8 x51x3.2 x51x3.2 x38x6.4 x38x3.2 x29x4.8 x25x6.4	76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2	63.5 50.8 50.8 50.8 50.8 50.8 50.8 50.8 38.1 38.1 28.6 25.4	7.92 6.35 4.78 4.78 4.78 4.78 3.18 3.18 6.35 3.18 4.78 6.35	0.25 0.38 0.25 0.25 0.41 0.41 0.41 0.41 0.38 0.38 0.38 0.25	0.25 0.38 0.25 0.25 0.38 0.38 0.38 0.38 0.38 0.38 0.38 0.25	- - - - - - - - - - - -	- - - - - - - - - - - -	2.83 2.08 1.58 1.58 1.58 1.58 1.07 1.07 1.86 0.957 1.3 1.64	2.78E-02 2.04E-02 1.55E-02 1.55E-02 1.55E-02 1.55E-02 1.05E-02 1.05E-02 1.82E-02 9.39E-03 1.28E-02 1.61E-02	1044 766 584 584 584 584 393 393 685 353 477 605	0.373 0.163 0.128 0.128 0.128 0.128 8.88E-02 8.88E-02 7.02E-02 3.90E-02 2.37E-02 2.09E-02	8.09 4.26 3.29 3.29 3.29 3.29 2.25 2.25 2.39 1.28 1.04 1.06	18.9																						



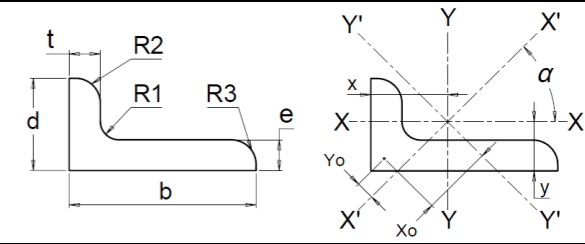


# STRUCTURAL ANGLES, EQUAL LEGS



Designation	Dimensions		Thickness (t)	Radii			Mass	Dead Load	Area	Axis X-X					Axis Y-Y					Torsional Constant	Warping Constant	Axis X'-X'		Axis Y'-Y'		r <sub>0</sub>	Ω	tan α	Extruder	Location	Manufacturer Identification Number
	L b x d x t	Length (b)		Height (d)	R1	R2				R3	I <sub>x</sub>	S <sub>x</sub>	r <sub>x</sub>	Z <sub>x</sub>	y	I <sub>y</sub>	S <sub>y</sub>	r <sub>y</sub>	Z <sub>y</sub>			x	J	C <sub>W</sub>	r' <sub>x</sub>						
mm x mm x mm	mm	mm	mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>8</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>2</sup> mm <sup>4</sup>	10 <sup>6</sup> mm <sup>6</sup>	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
<b>L 51X51</b>																															
x9.5	50.8	50.8	9.53	6.35	3.18	3.18	2.39	2.34E-02	881	0.197	5.67	15	10.3	16.2	0.197	5.67	15	10.3	16.2	27.4	4.12E-03	18.7	0	9.8	14.6	25.7	0.679	1	Western Extrusions Corp.	Dallas	19662
x9.5	50.8	50.8	9.53	6.35	3.18	3.18	2.39	2.34E-02	881	0.197	5.67	15	10.3	16.2	0.197	5.67	15	10.3	16.2	27.4	4.12E-03	18.7	0	9.8	14.6	25.7	0.679	1	Tower Extrusions	Olney	15530
x9.5	50.8	50.8	9.53	6.35	6.35	6.35	2.36	2.32E-02	868	0.189	5.42	14.8	10	16.2	0.189	5.42	14.8	10	16.2	27	3.78E-03	18.5	0	9.63	14.1	25.2	0.686	1	Tower Extrusions	Wylie-M	376
x9.5	50.8	50.8	9.53	6.35	6.35	6.35	2.36	2.32E-02	868	0.189	5.42	14.8	10	16.2	0.189	5.42	14.8	10	16.2	27	3.78E-03	18.5	0	9.63	14.1	25.2	0.686	1	Tower Extrusions	Wylie-H	11441
x9.5	50.8	50.8	9.53	-	-	-	2.38	2.33E-02	877	0.199	5.75	15.1	10.4	16.2	0.199	5.75	15.1	10.4	16.2	25.6	4.35E-03	18.9	0	9.89	15.3	26.3	0.66	1	Service Center Metals	Prince George	SA0208
x7.9	50.8	50.8	7.92	-	-	-	2.01	1.97E-02	742	0.173	4.91	15.3	8.86	15.6	0.173	4.91	15.3	8.86	15.6	15.1	2.70E-03	19.2	0	9.9	15.9	26.8	0.648	1	Service Center Metals	Prince George	SA0566
x6.4	50.8	50.8	6.35	6.35	3.18	3.18	1.65	1.62E-02	609	0.142	3.96	15.3	7.21	15.0	0.142	3.96	15.3	7.21	15.0	8.73	1.41E-03	19.2	0	9.85	15.6	26.7	0.656	1	Western Extrusions Corp.	Dallas	19855
x6.4	50.8	50.8	6.35	6.35	3.18	3.18	1.65	1.62E-02	609	0.142	3.96	15.3	7.21	15.0	0.142	3.96	15.3	7.21	15.0	8.73	1.41E-03	19.2	0	9.85	15.6	26.7	0.656	1	Tower Extrusions	Olney	4797
x6.4	50.8	50.8	6.35	6.35	3.18	3.18	1.65	1.62E-02	609	0.142	3.96	15.3	7.21	15.0	0.142	3.96	15.3	7.21	15.0	8.73	1.41E-03	19.2	0	9.85	15.6	26.7	0.656	1	Tower Extrusions	Wylie-M	1172
x6.4	50.8	50.8	6.35	-	-	-	1.64	1.61E-02	605	0.145	4.04	15.5	7.29	15.0	0.145	4.04	15.5	7.29	15.0	8	1.49E-03	19.5	0	9.93	16.4	27.3	0.64	1	Service Center Metals	Prince George	SA0207
x4.8	50.8	50.8	4.78	6.35	3.18	3.18	1.27	1.25E-02	467	0.111	3.04	15.4	5.55	14.5	0.111	3.04	15.4	5.55	14.5	3.88	6.37E-04	19.4	0	9.93	16.1	27.1	0.649	1	Western Extrusions Corp.	Dallas	19677
x4.8	50.8	50.8	4.78	4.78	3.18	3.18	1.26	1.24E-02	463	0.111	3.04	15.5	5.54	14.5	0.111	3.04	15.5	5.54	14.5	3.68	6.38E-04	19.5	0	9.92	16.3	27.3	0.644	1	Tower Extrusions	Olney	15617
x4.8	50.8	50.8	4.78	-	-	-	1.25	1.23E-02	462	0.114	3.13	15.7	5.63	14.5	0.114	3.13	15.7	5.63	14.5	3.5	6.75E-04	19.8	0	10	16.9	27.9	0.633	1	Service Center Metals	Prince George	SA0206
x4.8	50.8	50.8	4.75	6.35	3.18	3.18	1.26	1.24E-02	464	0.111	3.02	15.4	5.52	14.5	0.111	3.02	15.4	5.52	14.5	3.83	6.27E-04	19.4	0	9.93	16.1	27.1	0.649	1	Tower Extrusions	Olney	353
x3.2	50.8	50.8	3.18	6.35	3.18	3.18	0.863	8.47E-03	318	7.74E-02	2.07	15.6	3.79	13.9	7.74E-02	2.07	15.6	3.79	13.9	1.23	2.02E-04	10.1	0	19.7	16.4	27.5	0.643	1	Western Extrusions Corp.	Dallas	19990
x3.2	50.8	50.8	3.18	6.35	3.18	3.18	0.859	8.43E-03	317	7.66E-02	2.05	15.6	3.77	13.9	7.66E-02	2.05	15.6	3.77	13.9	1.23	1.98E-04	19.6	0	10	16.3	27.4	0.645	1	Tower Extrusions	Olney	13301
x3.2	50.8	50.8	3.18	-	-	-	0.848	8.32E-03	313	7.91E-02	2.14	15.9	3.86	13.9	7.91E-02	2.14	15.9	3.86	13.9	1.06	2.10E-04	20.1	0	10.1	17.3	28.4	0.628	1	Service Center Metals	Prince George	SA0205
<b>L 44X44</b>																															
x6.4	44.4	44.4	6.35	-	-	-	1.42	1.39E-02	524	9.46E-02	3.05	13.4	5.5	13.4	9.46E-02	3.05	13.4	5.5	13.4	6.88	9.60E-04	16.9	0	8.67	14.1	23.7	0.644	1	Service Center Metals	Prince George	SA0204
x4.8	44.4	44.4	4.78	4.78	3.18	3.18	1.09	1.07E-02	402	7.27E-02	2.29	13.4	4.18	12.9	7.27E-02	2.29	13.4	4.18	12.9	3.24	4.11E-04	16.9	0	8.63	14	23.6	0.65	1	Tower Extrusions	Olney	4796
x4.8	44.4	44.4	4.78	-	-	-	1.09	1.07E-02	402	7.47E-02	2.37	13.6	4.26	12.9	7.47E-02	2.37	13.6	4.26	12.9	3.02	4.40E-04	17.2	0	8.72	14.6	24.2	0.636	1	Service Center Metals	Prince George	SA0380
x3.2	44.4	44.4	3.18	4.78	3.18	3.18	0.74	7.26E-03	273	5.02E-02	1.55	13.6	2.84	12.3	5.02E-02	1.55	13.6	2.84	12.3	1.02	1.29E-04	17.1	0	8.71	14.3	23.9	0.643	1	Tower Extrusions	Olney	13300
x3.2	44.4	44.4	3.18	-	-	-	0.738	7.24E-03	272	5.23E-02	1.63	13.9	2.93	12.3	5.23E-02	1.63	13.9	2.93	12.3	0.927	1.39E-04	17.5	0	8.81	15	24.7	0.63	1	Service Center Metals	Prince George	SA0464
<b>L 38X38</b>																															
x6.4	38.1	38.1	6.35	4.78	3.18	3.18	1.2	1.18E-02	444	5.62E-02	2.13	11.3	3.9	11.8	5.62E-02	2.13	11.3	3.9	11.8	6.2	5.28E-04	14.1	0	7.31	11.1	19.4	0.672	1	Tower Extrusions	Olney	4798
x6.4	38.1	38.1	6.35	4.78	3.18	3.18	1.2	1.18E-02	444	5.62E-02	2.13	11.3	3.9	11.8	5.62E-02	2.13	11.3	3.9	11.8	6.2	5.28E-04	14.1	0	7.31	11.1	19.4	0.672	1	Tower Extrusions	Wylie-M	788
x6.4	38.1	38.1	6.35	-	-	-	1.2	1.18E-02	444	5.77E-02	2.2	11.4	3.96	11.8	5.77E-02	2.2	11.4	3.96	11.8	5.79	5.72E-04	14.3	0	7.42	11.8	20	0.652	1	Service Center Metals	Prince George	SA0203
x4.8	38.1	38.1	4.78	4.78	3.18	3.18	0.927	9.09E-03	342	4.44E-02	1.64	11.4	3.02	11.3	4.44E-02	1.64	11.4	3.02	11.3	2.75	2.46E-04	14.4	0	7.34	11.6	19.9	0.658	1	Tower Extrusions	Olney	15613
x4.8	38.1	38.1	4.78	4.78	3.18	3.18	0.927	9.09E-03	342	4.44E-02	1.64	11.4	3.02	11.3	4.44E-02	1.64	11.4	3.02	11.3	2.75	2.46E-04	14.4	0	7.34	11.6	19.9	0.658	1	Tower Extrusions	Wylie-M	763
x4.8	38.1	38.1	4.78	-	-	-	0.925	9.07E-03	341	4.59E-02	1.71	11.6	3.08	11.3	4.59E-02	1.71	11.6	3.08	11.3	2.54	2.67E-04	14.6	0	7.45	12.3	20.5	0.64	1	Service Center Metals	Prince George	SA0202
x4.8	38.1	38.1	4.75	4.75	3.18	3.18	0.922	9.04E-03	340	4.42E-02	1.64	11.4	3	11.3	4.42E-02	1.64	11.4	3	11.3	2.72	2.42E-04	14.4	0	7.34	11.6	19.9	0.658	1	Western Extrusions Corp.	Dallas	19995
x4.8	38.1	38.1	4.75	3.18	4.75	4.75	0.9	8.83E-03	332	4.22E-02	1.56	11.3	2.91	11.3	4.22E-02	1.56	11.3	2.91	11.3	2.55	2.27E-04	14.2	0	7.22	11.6	19.7	0.655	1	Tower Extrusions	Olney	7889
x4.8	38.1	38.1	4.75	4.75	4.75	4.75	0.907	8.90E-03	335	4.23E-02	1.56	11.2	2.91	11.3	4.23E-02	1.56	11.2	2.91	11.3	2.67	2.28E-04	14.2	0	7.22	11.4	19.5	0.662	1	Tower Extrusions	Olney	4786
x3.2	38.1	38.1	3.18	4.78	3.18	3.18	0.63	6.18E-03	232	3.09E-02	1.11	11.5	2.06	10.7	3.09E-02	1.11	11.5	2.06	10.7	0.853	7.79E-05	14.5	0	7.41	12	20.2	0.649	1	Western Extrusions Corp.	Dallas	19671
x3.2	38.1	38.1	3.18	4.78	3.18	3.18	0.63	6.18E-03	232	3.09E-02	1.11	11.5	2.06	10.7	3.09E-02	1.11	11.5	2.06	10.7	0.853	7.79E-05	14.5	0	7.41	12	20.2	0.649	1	Tower Extrusions	Olney	13299
x3.2	38.1	38.1	3.18	-	-	-	0.629	6.17E-03	232	3.24E-02	1.18	11.8	2.13	10.7	3.24E-02	1.18	11.8	2.13	10.7	0.783	8.54E-05	14.9	0	7.52	12.8	21	0.631	1	Service Center Metals	Prince George	SA0201
<b>L 32X32</b>																															
x6.4	31.8	31.8	6.35	-	-	-	0.984	9.65E-03	363	3.19E-02	1.48	9.38	2.68	10.2	3.19E-02	1.48															

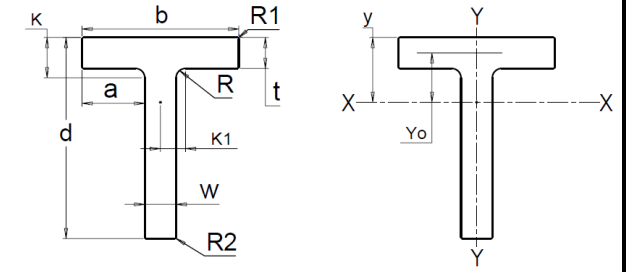
# STRUCTURAL ANGLES, UNEQUAL LEGS



Designation	Dimensions		Thickness (e)	Thickness (t)	Radii			Mass	Dead Load	Area	Axis X-X					Axis Y-Y					Torsional Constant	Warping Constant	Axis X'-X'		Axis Y'-Y'		$\beta_w$	$r_0$	$\Omega$	$\tan \alpha$	$y_s$	$x_s$	Extruder	Location	Manufacturer Identification Number
	L b x d x t	Length (b)			Height (d)	R1	R2				R3	$I_x$	$S_x$	$r_x$	$Z_x$	y	$I_y$	$S_y$	$r_y$	$Z_y$			x	J	$C_w$	$r'_x$									
mm x mm x mm	mm	mm	mm	mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>4</sup>	10 <sup>9</sup> mm <sup>6</sup>	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
<b>L 254</b> x83x7.9	254	82.6	7.92	9.52	12.7	0.254	0.254	7.48	7.34E-02	2758	1.24	18.2	21.2	33	13.3	18.9	118	82.8	201	99.0	70.2	2.21E-01	17.6	23.2	83.6	84.2	-	122	0.489	-0.15	10.8	86.7	Tower Extrusions	Olney	10205
<b>L 203</b> x102x11.1 x76x8	203 203	102 76.2	11.1 7.95	12.7 7.95	6.35 12.7	6.35 0.38	0.8128 0.38	9.25 5.95	9.07E-02 5.84E-02	3410 2193	2.72 0.809	34.4 12.9	28.3 19.2	62.3 23.7	21.3 13.6	14.7 9.58	110 75.3	65.7 66.1	195 128	71.8 77.0	158 50	3.33E-01 1.13E-01	22.3 16	32.9 20.9	67.9 67	54.5 66.9	-	95.7 98.2	0.558 0.491	-0.28 -0.17	17 9.58	61.3 69.4	Tower Extrusions Tower Extrusions	Olney Olney	11676 12745
<b>L 152</b> x203x19 x203x12.7 x89x9.5	152 152 152	203 203 88.9	19 12.7 9.53	19 12.7 9.53	- - 3.18	- - 7.14	- - 7.14	17.4 11.8 5.93	1.71E-01 1.16E-01 5.82E-02	6411 4355 2188	26.4 18.4 1.34	191 131 19.3	64.2 65.1 24.7	346 238 35.2	65.1 62.8 20.0	12.8 9.02 5.23	113 78.5 51.8	44.7 45.5 48.9	204 140 92.8	39.6 37.3 51.6	767 232 66.5	1.91E+00 6.05E-01 8.60E-02	71 72.2 19.2	61.9 63.8 29	32.7 33.1 51.3	0.284 -0.097 38.1	84.0 84.2 93.1	99.7 102 72.7	0.614 0.607 0.567	0.549 0.559 -0.35	54.1 55.8 14.9	30.1 31	Service Center Metals Service Center Metals Tower Extrusions	Prince George Prince George Olney	SUA0771 SUA0854 7770
<b>L 127</b> x89x9.5 x89x7.9 x76x9.5 x76x9.5 x76x7.9 x76x4.8	127 127 127 127 127 127	88.9 88.9 76.2 76.2 76.2 76.2	9.53 7.92 9.53 9.53 7.92 4.75	9.53 7.92 9.53 9.53 7.92 4.75	11.13 11.13 9.53 9.53 6.35 4.75	7.92 7.92 7.95 9.53 6.35 4.75	7.92 7.92 7.95 9.53 6.35 4.75	5.33 4.47 4.98 4.93 4.17 2.54	5.23E-02 4.39E-02 4.89E-02 4.84E-02 4.09E-02 2.49E-02	1965 1648 1837 1819 1539 938	1.27 1.07 0.804 0.785 0.697 0.444	18.8 15.7 13.7 13.3 11.8 7.34	25.4 25.5 20.9 20.8 21.3 21.7	34.4 28.7 25.4 25 17.3 13.1	21.9 21.3 17.9 17.9 17.3 16.1	3.15 2.65 2.98 2.93 2.54 1.59	36.2 30.3 35.3 34.6 30 18.5	40 40.1 40.3 40.1 40.6 41.1	66.5 55.9 63.9 63.1 54.1 33.3	40.9 40.3 43.3 43.3 42.7 41.5	63.3 37.3 58.2 56.7 33.1 7.5	5.32E-02 3.13E-02 4.77E-02 4.68E-02 2.89E-02 6.64E-03	19 19.1 16.3 16.1 16.5 16.8	29.3 29.5 23.9 22.8 24.8 25.8	43.4 43.5 42.4 42.2 42.8 31.3	23.7 23.9 29.7 29.8 30.5 31.3	61.0 61.1 59.3 59.1 60.4 61.7	60.5 60.9 0.586 0.584 0.576 0.569	-0.48 -0.48 -0.36 -0.36 -0.36 -0.37	16.2 16.4 12.5 12.4 12.9 13.4	34 34.3 36 36.1 37.1 38.2	Western Extrusions Corp. Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions	Dallas Olney Wylie-H Olney Olney Wylie-M	19230 3359 8522 20087 13916 2444	
<b>L 102</b> x152x12.7 x152x9.5 x76x9.5 x76x6.4 x64x6.4 x64x6.4	102 102 102 102 102 102	152 152 76.2 76.2 63.5 63.5	12.7 9.53 9.53 6.35 6.35 6.35	12.7 9.53 9.53 6.35 6.35 6.35	- - 9.53 9.53 9.53 3.18	- - 6.35 6.35 6.35 3.18	8.31 6.32 4.35 2.91 2.74 2.73	8.15E-02 6.20E-02 4.27E-02 2.85E-02 2.69E-02 2.68E-02	3065 2329 1605 1074 1010 1006	7.24 5.61 0.773 0.537 0.315 0.33	71 54.4 13.6 9.28 6.39 6.73	48.6 49.1 21.9 22.4 17.7 18.1	128 97.8 25 16.9 11.8 12.1	50.2 49.1 19.8 18.7 14.6 14.6	2.61 2.04 1.61 1.11 1.05 1.07	34.1 26.3 23.2 15.7 15.3 15.8	29.2 29.6 31.7 32.1 32.2 32.7	61.4 46.7 42.5 29 27.9 28.3	25.2 24.1 32.7 31.6 33.8 33.8	164 69.8 51.3 14.5 14.9 13.7	2.21E-01 9.78E-02 2.79E-02 8.85E-03 7.59E-03 8.02E-03	52.2 52.8 16.1 16.3 13.6 13.9	46.8 47.9 25 26.4 20.2 21.4	22.1 22.3 35 35.6 34.1 34.7	-0.096 -0.339 15.9 16.7 22.7 23.5	78.4 78.7 42.4 42.6 58.5 58.5	73.5 74.7 48.6 50.1 47.7 49	0.595 0.589 0.629 0.61 0.594 0.581	0.441 0.445 -0.54 -0.55 -0.38 -0.39	42.9 43.8 14.3 15.1 10.7 11.3	18.8 19.2 25.9 27.4 28.5 29.7	Service Center Metals Service Center Metals Western Extrusions Corp. Western Extrusions Corp. Tower Extrusions Tower Extrusions	Prince George Prince George Dallas Dallas Wylie-M Olney	SUA0238 SUA0237 19231 19771 2595 7293	
<b>L 89</b> x152x12.7 x127x12.7	88.9 88.9	152 127	12.7 12.7	12.7 12.7	- -	- -	7.87 7	7.72E-02 6.87E-02	2903 2581	6.91 4.16	69.4 48.9	48.8 40.1	123 88.1	52.7 42.1	1.77 1.68	26.1 25.6	24.7 25.6	47.6 46.3	21.2 23.0	154 137	2.03E-01 1.28E-01	51.1 43.5	47.2 38.3	19.3 19.2	-0.365 0.183	92.7 60.8	72.2 61	0.573 0.607	0.344 0.479	44.8 34.4	15 16.7	Service Center Metals Service Center Metals	Prince George Prince George	SUA0546 SUA1734	
<b>L 76</b> x152x9.5 x152x6.4 x127x12.7 x127x9.5 x127x6.4 x102x12.7 x102x9.5 x102x6.4 x51x9.5 x51x6.4 x51x6.4 x51x6.4 x51x6.4 x51x4.8 x51x4.8 x51x4.8	76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2 76.2	152 152 127 127 127 102 102 102 50.8 50.8 50.8 50.8 50.8 50.8 50.8 50.8	9.53 6.35 12.7 9.53 6.35 9.53 9.53 6.35 6.35 9.53 6.35 6.35 6.35 6.35 4.78 4.78 4.78	9.53 6.35 12.7 9.53 6.35 9.53 9.53 6.35 6.35 9.53 6.35 6.35 6.35 6.35 4.78 4.78 4.78	- - - - - - - - - 7.92 4.78 4.78 4.78 4.78 4.78 4.78	- - - - - - - - - 4.78 0.38 0.38 0.38 0.38 0.38 0.38	5.66 3.83 6.56 5 3.39 5.69 4.35 2.95 3.04 2.09 2.09 2.09 2.09 2.09 1.57 1.57 1.59	5.55E-02 3.76E-02 6.44E-02 4.91E-02 3.33E-02 5.58E-02 4.27E-02 2.89E-02 2.98E-02 2.05E-02 2.05E-02 2.05E-02 2.05E-02 2.05E-02 1.55E-02 1.54E-02 1.56E-02	2087 1411 2419 1845 1250 2097 1603 1089 1123 771 770 770 770 770 581 580 584	5.07 3.5 3.93 3.07 2.13 2.1 1.65 1.15 0.219 0.163 0.156 0.156 0.156 0.156 0.122 0.122 0.12	51.8 35.3 47.7 36.6 25 30.9 23.9 16.4 5.89 4.26 4.06 4.06 4.06 4.06 3.11 3.11 3.07	49.3 49.8 40.3 40.8 41.2 31.7 32.1 32.5 14 14.5 14.2 14.2 14.2 14.2 14.5 14.5 14.4	90.1 61.5 84.5 65.1 44.6 55.8 43.2 29.8 11 7.69 7.49 7.49 7.49 7.49 5.67 5.67 5.64	54.3 53.1 44.5 43.3 42.1 33.9 32.7 31.6 13.7 12.5 12.5 12.5 12.5 12.5 12.0 12.0 11.9	0.888 0.625 1.07 0.849 0.598 1.01 0.799 0.564 0.627 0.454 0.442 0.442 0.442 0.442 0.34 0.339 0.339	14.8 10.2 18.8 14.6 10.1 18.3 14.2 9.81 12.5 8.89 8.59 8.59 8.59 8.59 6.53 6.53 6.5	20.6 21 21.1 21.5 21.9 21.9 22.3 22.8 23.6 24.3 24 24 24 24 24.2 24.2 24.1	27 18.1 34.6 26.3 17.8 33.2 25.5 17.4 22.6 16 15.7 15.7 15.7 15.7 12 12 12	16.4 15.2 19.1 17.9 16.7 21.0 19.8 18.7 26.4 25.2 25.2 25.2 25.2 24.7 24.7 24.6	62.9 19.2 128 55.4 16.9 110 47.9 14.6 35.6 11.2 11.2 11.3 11.3 11.3 4.69 4.64 4.91	8.41E-02 2.61E-02 1.14E-01 5.14E-02 1.61E-02 6.55E-02 2.98E-02 9.45E-03 9.78E-03 3.43E-03 3.21E-03 3.21E-03 3.21E-03 3.21E-03 1.44E-03 1.44E-03 1.40E-03	50.8 51.4 42.4 43 43.6 34.9 35.5 36.1 10.8 11 10.9 10.9 10.9 10.9 11 11 10.9	49.6 50.8 38.3 39.7 40.7 29.8 29.8 31.9 15.3 16.9 16.2 16.2 16.2 16.2 16.9 16.9 16.4	16.5 16.7 16.5 16.6 16.8 16.2 16.4 16.5 16.5 14.4 15.6 15.2 15.2 15.2 15.8 15.8 15.5	-1.04 -1.37 0.005 -0.373 -0.646 0.404 0.142 -0.048 25.3 26 25.7 25.7 25.7 25.7 26 26 25.8	104.4 104.9 75.3 75.7 76.0 42.3 42.4 42.6 42.6 76.0 48.7 49.9 49.9 49.9 48.7 48.7 39.8	72.9 74.2 59.5 60.8 62 48.7 49.9 50.9 34.6 36.5 35.6 35.6 35.6 35.6 36.4 36.5 36	0.537 0.53 0.585 0.574 0.568 0.625 0.614 0.608 0.632 0.601 0.613 0.612 0.612 0.612 0.598 0.597 0.607	0.268 0.273 0.356 0.364 0.372 0.543 0.549 0.559 -0.42 -0.44 -0.43 -0.43 -0.43 -0.44 -0.44 -0.43	48.2 49.4 36.1 37.4 38.4 26 27.1 27.9 8.45 9.25 8.81 8.81 8.81 8.81 9.13 9.15 8.94	11.8 12.1 12.9 13.2 13.6 14.6 15.1 15.5 19.2 21.1 20.3 20.4 20.4 20.4 21.2 21.3 20.7	Service Center Metals Service Center Metals Service Center Metals Service Center Metals Service Center Metals Service Center Metals Service Center Metals Service Center Metals Western Extrusions Corp. Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions Western Extrusions Corp. Western Extrusions Corp. Tower Extrusions	Prince George Prince George Prince George Prince George Prince George Prince George Prince George Prince George Dallas Olney Wylie-M Dallas Wylie-H Dallas Dallas Olney	SUA0511 SUA2121 SUA0505 SUA0236 SUA1304 SUA0462 SUA0235 SUA0234 19476 16396 1129 19236 1007 19201 19395 3712	

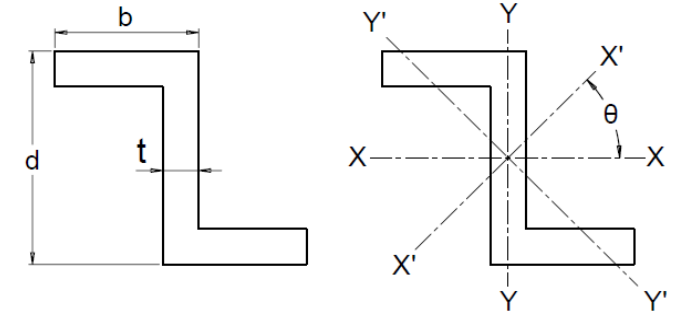


# TEE SHAPE



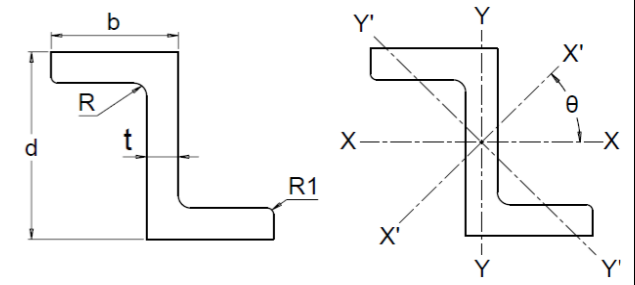
Designation	Dimensions		Thickness		Distances			Radii			Mass ( $\omega$ )	Dead Load	Area	Axis X-X				Axis Y-Y			Torsional Constant	Warping Constant	$r_0$	$y_0$	$\Omega$	Extruder	Location	Manufacturer Identification Number
	T d x b x $\omega$	Section Height (d)	Flange Width (b)	Web (w)	Flange (t)	a	k	k1	R	R1				R2	$I_x$	$S_x$	$r_x$	y	$I_y$	$S_y$								
mm x mm x (kg/m)	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg/m	kN/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	mm	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>4</sup>	10 <sup>9</sup> mm <sup>6</sup>	mm	mm				
<b>T 191</b> x127x10	191	127	9.53	15.9	58.7	27.8	16.7	11.9	-	0.38	10.1	9.95E-02	3741	12.6	90	58	50.5	2.73	42.9	27	244	1.96E-01	76.0	40.9	0.710	Tower Extrusions	Olney	14424
<b>T 173</b> x152x7.6	173	152	7.95	9.53	72.2	19.1	13.5	9.53	0.38	0.38	7.57	7.42E-02	2791	8.09	63.2	53.8	45.1	2.82	37	31.8	80.6	8.65E-02	74.0	39.5	0.714	Tower Extrusions	Olney	17057
<b>T 152</b> x127x7.0 x51x3.4	152 152	127 50.8	9.53 6.35	9.53 6.35	58.7 22.2	15.9 6.7	11.1 3.6	6.35 0.38	0.25 0.38	0.25 0.38	7.02 3.39	6.89E-02 3.33E-02	2588 1250	6.06 3.04	56.4 32.8	48.4 49.3	44.9 59.8	1.64 0.072	25.8 2.85	25.1 7.61	83 17.1	8.76E-02 2.29E-02	67.1 72.8	39.0 53.0	0.662 0.470	Tower Extrusions Tower Extrusions	Olney Olney	2412 17401
<b>T 146</b> x70x3.2	146	69.9	5.33	6.35	32.3	9.5	5.8	3.18	0.25	0.25	3.24	3.17E-02	1193	2.7	27.8	47.6	48.9	0.182	5.21	12.4	13.7	1.27E-02	66.4	44.6	0.549	Tower Extrusions	Olney	9972
<b>T 127</b> x178x7.6 x83x5.2 x51x4.3 x51x3.0	127 127 127 127	178 82.6 50.8 50.8	9.53 9.53 9.53 6.35	9.53 9.53 9.53 6.35	84.1 36.5 20.6 22.2	9.9 9.9 9.9	5.1 5.1 5.1	0.38 0.38 0.38 0.38	0.38 0.38 0.38 0.38	0.38 0.38 0.38	7.63 5.17 4.35 2.95	7.48E-02 5.07E-02 4.26E-02 2.90E-02	2812 1905 1603 1089	4.02 3.15 2.65 1.85	41.4 37.1 34 23.3	37.8 40.7 40.7 41.2	30 42.2 49 47.9	4.47 0.455 0.112 0.072	50.3 11 4.43 2.83	39.9 15.4 8.38 8.12	86.4 58.2 48.8 14.9	7.65E-02 4.56E-02 4.09E-02 1.32E-02	60.3 56.3 56.9 59.4	24.9 35.7 38.9 42.1	0.829 0.598 0.532 0.498	Tower Extrusions Tower Extrusions Tower Extrusions Tower Extrusions	Olney Olney Olney Olney	15078 15082 17623 16893
<b>T 102</b> x102x5.4 x102x5.0 x51x2.5	102 102 102	101.6 101.6 50.8	10.3 9.53 6.35	10.3 9.53 6.35	45.6 46.0 22.2	16.7 - 6.7	11.5 - 3.6	6.35 - 0.38	0.38 - 0.38	0.38 - 0.38	5.44 5.00 2.51	5.34E-02 4.91E-02 2.47E-02	2006 1845 927	1.95 1.81 1	26.8 25 15.3	31.2 31.4 32.9	29.1 28.9 36.2	0.91 0.839 0.071	17.9 16.5 2.81	21.3 21.3 8.77	76.7 56.4 12.6	3.37E-02 2.72E-02 6.75E-03	44.0 44.6 46.3	22.6 23.4 31.4	0.737 0.724 0.540	Tower Extrusions Service Center Metals Tower Extrusions	Olney Prince George Olney	2136 T0568 16892
<b>T 76</b> x127x3.4 x102x4.3	76.2 76.2	127 101.6	6.35 9.53	6.35 9.53	60.3 46.0	- -	- -	- -	- -	- -	3.39 4.35	3.33E-02 4.26E-02	1250 1603	0.598 0.799	10.1 14.2	21.9 22.3	16.6 20	1.09 0.837	17.1 16.5	29.5 22.9	17.1 49	6.33E-03 1.45E-02	39.1 35.1	13.3 14.5	0.883 0.829	Service Center Metals Service Center Metals	Prince George Prince George	T1091 T1077

# ZEE SHAPE (SHARP CORNERS)



Designation	Dimensions			Mass	Area	Axis X-X				Axis Y-Y				Torsional Constant	Warping Constant	Axe X'-X'		Axe Y'-Y'		$\theta$	Extruder	Location	Manufacturer Identification Number
	Z d x b x t	Height (d)	Flange Width (b)			Thickness (t)	$I_x$	$S_x$	$r_x$	$Z_x$	$I_y$	$S_y$	$r_y$			$Z_y$	J	$C_W$	$I_{x'}$				
mm x mm x mm	mm	mm	mm	kg/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>3</sup> mm <sup>4</sup>	10 <sup>9</sup> mm <sup>6</sup>	10 <sup>6</sup> mm <sup>4</sup>	mm	10 <sup>6</sup> mm <sup>4</sup>	mm				
<b>Z 191</b> x51x4.8	191	50.8	4.78	3.7	1349	6.54	68.7	69.6	84.1	0.363	75.0	16.4	12.3	10.8	2.32	6.76	70.7	0.194	12.0	9.27	Western Extrusions Corp.	Dallas	19083
<b>Z 105</b> x81x9.5	105	81.0	9.53	6.4	2359	4.01	76.6	41.2	91.0	2.82	37.0	34.6	57.5	71.3	3.44	6.11	50.9	0.723	17.5	38.6	Service Center Metals	Prince George	Z1197
<b>Z 102</b> x78x6.4	102	77.8	6.35	4.2	1552	2.62	51.5	41.0	59.6	1.76	23.6	33.7	36.3	21.2	2.16	3.92	50.3	0.454	17.1	37.9	Service Center Metals	Prince George	Z0581
<b>Z 76</b> x68x9.5	76.2	68.3	9.53	5.0	1845	1.60	42.1	29.5	51.1	1.63	25.7	29.7	39.9	56.0	0.925	2.89	39.6	0.344	13.7	44.7	Service Center Metals	Prince George	Z1014
x70x6.4	76.2	69.9	6.35	3.5	1290	1.22	32.0	30.8	37.4	1.26	18.8	31.2	28.9	17.6	0.779	2.22	41.5	0.255	14.1	44.5	Service Center Metals	Prince George	Z1105
x68x6.4	76.2	68.3	6.35	3.4	1270	1.20	31.4	30.7	36.7	1.17	18.0	30.3	27.6	17.3	0.731	2.12	40.9	0.245	13.9	44.6	Service Center Metals	Prince George	Z0543

# ZEE SHAPE (ROUNDED CORNERS)



Designation	Dimensions					Mass	Area	Axis X-X				Axis Y-Y				Torsional Constant	Warping Constant	Axe X'-X'		Axe Y'-Y'		θ	Extruder	Location	Manufacturer Identification Number
	Z d x b x t	Height (d)	Flange Width (b)	Thickness (t)	Internal Radius (R)			External Radius (R1)	I <sub>x</sub>	S <sub>x</sub>	r <sub>x</sub>	Z <sub>x</sub>	I <sub>y</sub>	S <sub>y</sub>	r <sub>y</sub>			Z <sub>y</sub>	J	C <sub>W</sub>	I <sub>x'</sub>				
mm x mm x mm	mm	mm	mm	mm	mm	kg/m	mm <sup>2</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>6</sup> mm <sup>4</sup>	10 <sup>3</sup> mm <sup>3</sup>	mm	10 <sup>3</sup> mm <sup>3</sup>	10 <sup>9</sup> mm <sup>6</sup>	10 <sup>6</sup> mm <sup>4</sup>	mm	10 <sup>6</sup> mm <sup>4</sup>	mm					
<b>Z 191</b> x44x4.8	191	44.5	4.78	4.78	4.78	3.49	1289	6.01	63.1	68.3	78.5	0.239	5.67	13.6	9.53	10.6	1.55	6.16	69.0	0.128	9.94	7.62	Tower Extrusions	Olney	12966
<b>Z 127</b> x83x7.9	127	82.6	7.92	7.92	6.35	6.45	2377	5.76	90.7	49.2	108	2.40	30.8	31.7	49.5	65.2	5.09	7.26	57.5	0.785	18.9	29.4	Western Extrusions Corp.	Dallas	19171
<b>Z 102</b> x78x6.4	102	77.8	6.35	7.92	6.35	4.33	1562	2.63	51.7	41.0	59.9	1.67	22.3	32.7	35.2	23.2	2.03	3.87	49.7	0.453	17.0	36.8	Western Extrusions Corp.	Dallas	19102
<b>Z 76</b> x68x9.5	76.2	68.3	9.53	7.92	6.35	5.03	1854	1.61	42.2	29.4	51.3	1.56	24.6	29.0	39.0	61.1	0.859	2.84	39.1	0.341	13.5	44.5	Western Extrusions Corp.	Dallas	19155
x68x9.5	76.2	68.3	9.53	9.53	9.53	5.00	1845	1.58	41.5	29.3	50.7	1.63	25.7	29.7	40.1	61.3	0.868	2.75	38.6	0.332	13.4	44.4	Tower Extrusions	Olney	1825
x68x6.4	76.2	68.3	6.35	7.92	6.35	3.47	1280	1.20	31.5	30.6	36.9	1.10	16.9	29.3	26.6	19.4	0.677	2.06	40.1	0.244	13.8	43.4	Western Extrusions Corp.	Dallas	19345
x68x6.4	76.2	68.3	6.35	7.95	6.35	3.41	1257	1.17	31.4	30.6	36.1	1.12	17.1	29.8	26.8	17.9	0.685	2.06	40.1	0.244	13.8	44.1	Tower Extrusions	Olney	17127
x68x6.4	76.2	68.3	6.35	7.92	6.35	3.41	1257	1.17	30.2	30.6	36.1	1.11	17.1	29.8	26.8	17.9	0.685	2.06	40.1	0.244	13.8	44.1	Tower Extrusions	Olney	6207

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