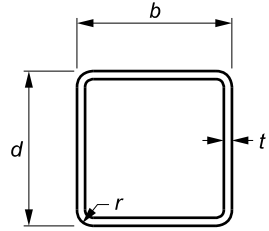


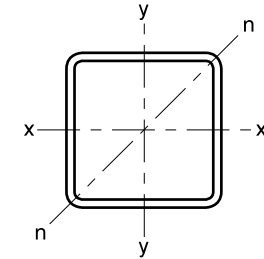
TABLE 3.1(a)



DIMENSIONS AND PROPERTIES

TUBELINE® SQUARE HOLLOW SECTIONS

GRADE C350L0 (AS 1163)



DIMENSION AND RATIOS					PROPERTIES								PROPERTIES FOR DESIGN TO AS 4100					
Designation			Mass per m	External Surface Area		$\frac{b-2t}{t}$	Gross Section Area A_g	About x-, y- and n-axis					Torsion Constant J	Torsion Modulus C	Form Factor k_f	About x- and y-axis		
<i>d</i>	<i>b</i>	<i>t</i>		per m	per t			I_x	Z_x	Z_n	S_x	r_x				λ_e	Compactness ⁽³⁾	Z_e
mm	mm	mm	kg/m	m ² /m	m ² /t	mm ²	10 ⁶ mm ⁴	10 ³ mm ³	10 ³ mm ³	10 ³ mm ³	mm	10 ⁶ mm ⁴	10 ³ mm ³		(C,N,S)	10 ³ mm ³		
250x250x9.0 SHS			65.9	0.961	14.6	25.8	8400	79.8	639	477	750	97.5	129	972	1.00	30.5	N	744
6.0 SHS			45.0	0.974	21.7	39.7	5730	56.2	450	330	521	99.0	88.7	681	0.853	46.9	S	409
200x200x9.0 SHS			51.8	0.761	14.7	20.2	6600	39.2	392	297	465	77.1	64.5	599	1.00	23.9	C	465
6.0 SHS			35.6	0.774	21.8	31.3	4530	28.0	280	207	327	78.6	44.8	425	1.00	37.1	N	294
5.0 SHS			29.9	0.779	26.0	38.0	3810	23.9	239	175	277	79.1	37.8	362	0.890	45.0	S	223
150x150x9.0 SHS			37.7	0.561	14.9	14.7	4800	15.4	205	159	248	56.6	26.1	316	1.00	17.4	C	248
6.0 SHS			26.2	0.574	22.0	23.0	3330	11.3	150	113	178	58.2	18.4	229	1.00	27.2	C	178
5.0 SHS			22.1	0.579	26.2	28.0	2810	9.70	129	96.1	151	58.7	15.6	197	1.00	33.1	N	144
125x125x9.0 SHS			30.6	0.461	15.1	11.9	3900	8.38	134	106	165	46.4	14.5	208	1.00	14.1	C	165
6.0 SHS			21.4	0.474	22.1	18.8	2730	6.29	101	76.5	120	48.0	10.4	154	1.00	22.3	C	120
5.0 SHS			18.2	0.479	26.3	23.0	2310	5.44	87.1	65.4	103	48.5	8.87	133	1.00	27.2	C	103
4.0 SHS			14.8	0.483	32.7	29.3	1880	4.52	72.3	53.6	84.5	49.0	7.25	110	1.00	34.6	N	78.9
100x100x9.0 SHS			23.5	0.361	15.4	9.11	3000	3.91	78.1	63.6	98.6	36.1	7.00	123	1.00	10.8	C	98.6
6.0 SHS			16.7	0.374	22.4	14.7	2130	3.04	60.7	47.1	73.5	37.7	5.15	93.6	1.00	17.4	C	73.5
5.0 SHS			14.2	0.379	26.6	18.0	1810	2.66	53.1	40.5	63.5	38.3	4.42	81.4	1.00	21.3	C	63.5
4.0 SHS			11.6	0.383	32.9	23.0	1480	2.23	44.6	33.5	52.6	38.8	3.63	68.0	1.00	27.2	C	52.6
3.0 SHS			8.96	0.390	43.5	31.3	1140	1.77	35.4	26.0	41.2	39.4	2.79	53.2	1.00	37.1	N	37.1
2.5 SHS			7.53	0.391	52.0	38.0	959	1.51	30.1	21.9	34.9	39.6	2.35	45.2	0.891	45.0	S	28.1
2.0 SHS			6.07	0.393	64.7	48.0	774	1.23	24.6	17.8	28.3	39.9	1.91	36.9	0.706	56.8	S	20.2

- NOTES:
1. This table is calculated in accordance with AS 4100 using design yield stress $f_y = 350$ MPa and design tensile strength $f_u = 430$ MPa as per AS 4100 table 2.1 for AS 1163 grade C350L0.
 2. Grade C350L0 is cold formed and therefore is allocated the CF residual stresses classification in AS 4100.
 3. C = Compact Section; N = Non-compact Section; S = Slender Section; as defined in AS 4100.
 4. For Square and Rectangular Hollow Sections the outside corner radius r used in calculating the section properties is equal to $2t$ for sections with thickness $t \leq 3.0$ mm and $2.5t$ for sections with $t > 3.0$ mm.
 5. Sizes shown in *Italics*: These sizes may not be stocked in all states or minimum order quantities may apply

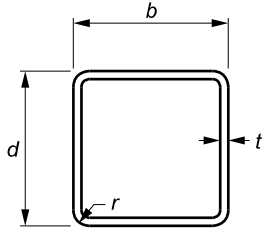
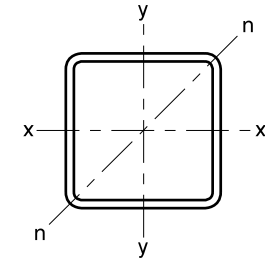


TABLE 3.1(b)

DIMENSIONS AND PROPERTIES
TUBELINE® SQUARE HOLLOW SECTIONS
GRADE C350L0 (AS 1163)



DIMENSION AND RATIOS					PROPERTIES								PROPERTIES FOR DESIGN TO AS 4100					
Designation			Mass per m	External Surface Area		$\frac{b-2t}{t}$	Gross Section Area A_g	About x-, y- and n-axis					Torsion Constant J	Torsion Modulus C	Form Factor k_f	About x- and y-axis		
d	b	t		per m	per t			I_x	Z_x	Z_n	S_x	r_x				λ_e	Compactness ⁽³⁾	Z_e
mm	mm	mm	kg/m	m ² /m	m ² /t	mm ²	10 ⁶ mm ⁴	10 ³ mm ³	10 ³ mm ³	10 ³ mm ³	mm	10 ⁶ mm ⁴	10 ³ mm ³	(C,N,S) 10 ³ mm ³				
89 x 89 x6.0 SHS			14.6	0.330	22.5	12.8	1870	2.06	46.2	36.3	56.6	33.2	3.54	71.6	1.00	15.2	C	56.6
5.0 SHS			12.5	0.334	26.7	15.8	1590	1.81	40.7	31.4	49.1	33.7	3.05	62.7	1.00	18.7	C	49.1
3.5 SHS			9.06	0.341	37.6	23.4	1150	1.37	30.9	23.2	36.5	34.5	2.24	47.1	1.00	27.7	C	36.5
75 x 75 x6.0 SHS			12.0	0.274	22.8	10.5	1530	1.16	30.9	24.7	38.4	27.5	2.04	48.2	1.00	12.4	C	38.4
5.0 SHS			10.3	0.279	27.0	13.0	1310	1.03	27.5	21.6	33.6	28.0	1.77	42.6	1.00	15.4	C	33.6
4.0 SHS			8.49	0.283	33.3	16.8	1080	0.882	23.5	18.0	28.2	28.6	1.48	36.1	1.00	19.8	C	28.2
3.5 SHS			7.53	0.285	37.9	19.4	959	0.797	21.3	16.1	25.3	28.8	1.32	32.5	1.00	23.0	C	25.3
3.0 SHS			6.60	0.290	43.9	23.0	841	0.716	19.1	14.2	22.5	29.2	1.15	28.7	1.00	27.2	C	22.5
2.5 SHS			5.56	0.291	52.4	28.0	709	0.614	16.4	12.0	19.1	29.4	0.971	24.6	1.00	33.1	N	18.3
2.0 SHS			4.50	0.293	65.1	35.5	574	0.505	13.5	9.83	15.6	29.7	0.790	20.2	0.953	42.0	S	13.1
65 x 65 x6.0 SHS			10.1	0.234	23.1	8.83	1290	0.706	21.7	17.8	27.5	23.4	1.27	34.2	1.00	10.5	C	27.5
5.0 SHS			8.75	0.239	27.3	11.0	1110	0.638	19.6	15.6	24.3	23.9	1.12	30.6	1.00	13.0	C	24.3
4.0 SHS			7.23	0.243	33.6	14.3	921	0.552	17.0	13.2	20.6	24.5	0.939	26.2	1.00	16.9	C	20.6
3.0 SHS			5.66	0.250	44.1	19.7	721	0.454	14.0	10.4	16.6	25.1	0.733	21.0	1.00	23.3	C	16.6
2.5 SHS			4.78	0.251	52.6	24.0	609	0.391	12.0	8.91	14.1	25.3	0.624	18.1	1.00	28.4	C	14.1
2.0 SHS			3.88	0.253	65.3	30.5	494	0.323	9.94	7.29	11.6	25.6	0.509	14.9	1.00	36.1	N	10.6
1.6 SHS			3.13	0.255	81.2	38.6	399	0.265	8.16	5.94	9.44	25.8	0.414	12.2	0.876	45.7	S	7.54
50 x 50 x5.0 SHS			6.39	0.179	27.9	8.00	814	0.257	10.3	8.51	13.2	17.8	0.469	16.3	1.00	9.47	C	13.2
4.0 SHS			5.35	0.183	34.2	10.5	681	0.229	9.15	7.33	11.4	18.3	0.403	14.3	1.00	12.4	C	11.4
3.0 SHS			4.25	0.190	44.7	14.7	541	0.195	7.79	5.92	9.39	19.0	0.321	11.8	1.00	17.4	C	9.39
2.5 SHS			3.60	0.191	53.1	18.0	459	0.169	6.78	5.09	8.07	19.2	0.275	10.2	1.00	21.3	C	8.07
2.0 SHS			2.93	0.193	65.8	23.0	374	0.141	5.66	4.20	6.66	19.5	0.226	8.51	1.00	27.2	C	6.66
1.6 SHS			2.38	0.195	81.7	29.3	303	0.117	4.68	3.44	5.46	19.6	0.185	7.03	1.00	34.6	N	5.10

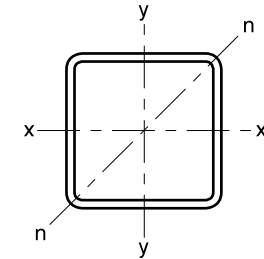
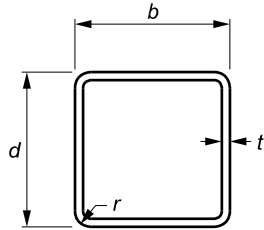
- NOTES: 1. This table is calculated in accordance with AS 4100 using design yield stress $f_y = 350$ MPa and design tensile strength $f_u = 430$ MPa as per AS 4100 table 2.1 for AS 1163 grade C350L0.
2. Grade C350L0 is cold formed and therefore is allocated the CF residual stresses classification in AS 4100.
3. C = Compact Section; N = Non-compact Section; S = Slender Section; as defined in AS 4100.
4. For Square and Rectangular Hollow Sections the outside corner radius r used in calculating the section properties is equal to $2t$ for sections with thickness $t \leq 3.0$ mm and $2.5t$ for sections with $t > 3.0$ mm.

TABLE 3.1(c)

DIMENSIONS AND PROPERTIES

TUBELINE® SQUARE HOLLOW SECTIONS

GRADE C350L0 (AS 1163)



DIMENSION AND RATIOS					PROPERTIES								PROPERTIES FOR DESIGN TO AS 4100					
Designation			Mass per m	External Surface Area		$\frac{b-2t}{t}$	Gross Section Area A_g	About x-, y- and n-axis					Torsion Constant J	Torsion Modulus C	Form Factor k_f	About x- and y-axis		
d	b	t		per m	per t			I_x	Z_x	Z_n	S_x	r_x				λ_e	Compactness ⁽³⁾	Z_e
mm	mm	mm	kg/m	m ² /m	m ² /t	mm ²	10 ⁶ mm ⁴	10 ³ mm ³	10 ³ mm ³	10 ³ mm ³	mm	10 ⁶ mm ⁴	10 ³ mm ³	(C,N,S) 10 ³ mm ³				
40 x 40	x4.0	SHS	4.09	0.143	34.9	8.00	521	0.105	5.26	4.36	6.74	14.2	0.192	8.33	1.00	9.47	C	6.74
		3.0 SHS	3.30	0.150	45.3	11.3	421	0.0932	4.66	3.61	5.72	14.9	0.158	7.07	1.00	13.4	C	5.72
		2.5 SHS	2.82	0.151	53.7	14.0	359	0.0822	4.11	3.13	4.97	15.1	0.136	6.21	1.00	16.6	C	4.97
		2.0 SHS	2.31	0.153	66.4	18.0	294	0.0694	3.47	2.61	4.13	15.4	0.113	5.23	1.00	21.3	C	4.13
		1.6 SHS	1.88	0.155	82.3	23.0	239	0.0579	2.90	2.15	3.41	15.6	0.0927	4.36	1.00	27.2	C	3.41
35 x 35	x3.0	SHS	2.83	0.130	45.8	9.67	361	0.0595	3.40	2.67	4.23	12.8	0.102	5.18	1.00	11.4	C	4.23
		2.5 SHS	2.42	0.131	54.2	12.0	309	0.0529	3.02	2.33	3.69	13.1	0.0889	4.58	1.00	14.2	C	3.69
		2.0 SHS	1.99	0.133	66.8	15.5	254	0.0451	2.58	1.95	3.09	13.3	0.0741	3.89	1.00	18.3	C	3.09
		1.6 SHS	1.63	0.135	82.7	19.9	207	0.0379	2.16	1.62	2.57	13.5	0.0611	3.26	1.00	23.5	C	2.57
30 x 30	x2.0	SHS	1.68	0.113	67.4	13.0	214	0.0272	1.81	1.39	2.21	11.3	0.0454	2.75	1.00	15.4	C	2.21
		1.6 SHS	1.38	0.115	83.3	16.8	175	0.0231	1.54	1.16	1.84	11.5	0.0377	2.32	1.00	19.8	C	1.84
25 x 25	x3.0	SHS	1.89	0.0897	47.4	6.33	241	0.0184	1.47	1.21	1.91	8.74	0.0333	2.27	1.00	7.49	C	1.91
		2.5 SHS	1.64	0.0914	55.7	8.00	209	0.0169	1.35	1.08	1.71	8.99	0.0297	2.07	1.00	9.47	C	1.71
		2.0 SHS	1.36	0.0931	68.3	10.5	174	0.0148	1.19	0.926	1.47	9.24	0.0253	1.80	1.00	12.4	C	1.47
		1.6 SHS	1.12	0.0945	84.1	13.6	143	0.0128	1.02	0.780	1.24	9.44	0.0212	1.54	1.00	16.1	C	1.24
20 x 20	x1.6	SHS	0.873	0.0745	85.4	10.5	111	0.00608	0.608	0.474	0.751	7.39	0.0103	0.924	1.00	12.4	C	0.751

- NOTES:
1. This table is calculated in accordance with AS 4100 using design yield stress $f_y = 350$ MPa and design tensile strength $f_u = 430$ MPa as per AS 4100 table 2.1 for AS 1163 grade C350L0.
 2. Grade C350L0 is cold formed and therefore is allocated the CF residual stresses classification in AS 4100.
 3. C = Compact Section; N = Non-compact Section; S = Slender Section; as defined in AS 4100.
 4. For Square and Rectangular Hollow Sections the outside corner radius r used in calculating the section properties is equal to $2t$ for sections with thickness $t \leq 3.0$ mm and $2.5t$ for sections with $t > 3.0$ mm.

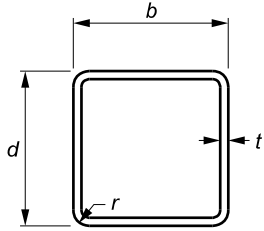
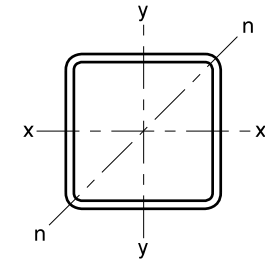


TABLE 3.2

DIMENSIONS AND PROPERTIES

TUBELINE® SQUARE HOLLOW SECTIONS

GRADE C350L0 (TUBELINE 350L0 - TYPE 2)



DIMENSION AND RATIOS					PROPERTIES								PROPERTIES FOR DESIGN TO AS 4100					
Designation			Mass per m	External Surface Area		$\frac{b-2t}{t}$	Gross Section Area A_g	About x-, y- and n-axis					Torsion Constant J	Torsion Modulus C	Form Factor k_f	About x- and y-axis		
d	b	t		per m	per t			I_x	Z_x	Z_n	S_x	r_x				λ_e	Compactness ⁽⁴⁾	Z_e
mm	mm	mm	kg/m	m ² /m	m ² /t	mm ²	10 ⁶ mm ⁴	10 ³ mm ³	10 ³ mm ³	10 ³ mm ³	mm	10 ⁶ mm ⁴	10 ³ mm ³		(C,N,S)	10 ³ mm ³		
15 x 15	15	1.8	0.681	0.0538	79.1	6.33	86.7	0.00239	0.318	0.262	0.414	5.25	0.00431	0.491	1.00	7.49	C	0.414
13 x 13	13	1.8	0.568	0.0458	80.7	5.22	72.3	0.00142	0.218	0.184	0.290	4.42	0.00262	0.339	1.00	6.18	C	0.290

- NOTES:
- In this table, the properties of these products are calculated in accordance with AS 4100 using design yield stress $f_y = 350$ MPa and design tensile strength $f_u = 380$.
 - Type 2 products are not made strictly in accordance with AS 1163. Care should be used when designing structures using these products.
 - Grade C350L0 is cold formed and therefore is allocated the CF residual stresses classification in AS 4100.
 - C = Compact Section; N = Non-compact Section; S = Slender Section; as defined in AS 4100.
 - For Square and Rectangular Hollow Sections the outside corner radius r used in calculating the section properties is equal to $2t$ for sections with thickness $t \leq 3.0$ mm and $2.5t$ for sections with $t > 3.0$ mm.