

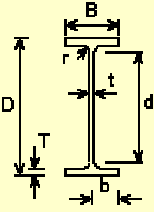
BS 5950-1: 2000

BS 4-1: 1993

# UNIVERSAL BEAMS

## DIMENSIONS

Section Designation	Mass per Metre kg/m	Depth of Section D mm	Width of Section B mm	Thickness		Root Radius r mm	Depth between Fillets d mm	Surface Area			Cross Sectional Area A cm <sup>2</sup>	4-Sided Section Factor Hp/A	3-Sided Section Factor Hp/A
				Web	Flange			4-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>	Per Tonne m <sup>2</sup>			
				t mm	T mm								
1016x305x487	486.6	1036.1	308.5	30	54.1	30	867.9	3.19	2.88	6.57	620	51	46
1016x305x437	436.9	1025.9	305.4	26.9	49	30	867.9	3.17	2.86	7.25	557	57	51
1016x305x393	392.7	1016	303	24.4	43.9	30	868.2	3.14	2.84	8.01	500	63	57
1016x305x349	349.4	1008.1	302	21.1	40	30	868.1	3.13	2.83	8.96	445	70	64
1016x305x314	314.3	1000	300	19.1	35.9	30	868.2	3.11	2.81	9.9	400	78	70
1016x305x272	272.3	990.1	300	16.5	31	30	868.1	3.1	2.80	11.4	347	89	81
1016x305x249	248.7	980.2	300	16.5	26	30	868.2	3.08	2.78	12.4	317	97	88
1016x305x222	222	970.3	300	16	21.1	30	868.1	3.06	2.76	13.8	283	108	98
914x419x388	388	921	420.5	21.4	36.6	24.1	799.6	3.44	3.02	8.87	494	70	61
914x419x343	343.3	911.8	418.5	19.4	32	24.1	799.6	3.42	3.00	9.95	437	78	69
914x305x289	289.1	926.6	307.7	19.5	32	19.1	824.4	3.01	2.70	10.4	368	82	73
914x305x253	253.4	918.4	305.5	17.3	27.9	19.1	824.4	2.99	2.68	11.8	323	93	83
914x305x224	224.2	910.4	304.1	15.9	23.9	19.1	824.4	2.97	2.67	13.3	286	104	93
914x305x201	200.9	903	303.3	15.1	20.2	19.1	824.4	2.96	2.66	14.7	256	116	104
838x292x226	226.5	850.9	293.8	16.1	26.8	17.8	761.7	2.81	2.52	12.4	289	97	87
838x292x194	193.8	840.7	292.4	14.7	21.7	17.8	761.7	2.79	2.50	14.4	247	113	101
838x292x176	175.9	834.9	291.7	14	18.8	17.8	761.7	2.78	2.49	15.8	224	124	111
762x267x197	196.8	769.8	268	15.6	25.4	16.5	686	2.55	2.28	13	251	102	91
762x267x173	173	762.2	266.7	14.3	21.6	16.5	686	2.53	2.26	14.6	220	115	103
762x267x147	146.9	754	265.2	12.8	17.5	16.5	686	2.51	2.24	17.1	187	134	120
762x267x134	133.9	750	264.4	12	15.5	16.5	686	2.51	2.25	18.7	171	147	131
686x254x170	170.2	692.9	255.8	14.5	23.7	15.2	615.1	2.35	2.09	13.8	217	108	97
686x254x152	152.4	687.5	254.5	13.2	21	15.2	615.1	2.34	2.09	15.4	194	121	108
686x254x140	140.1	683.5	253.7	12.4	19	15.2	615.1	2.33	2.08	16.6	178	131	117
686x254x125	125.2	677.9	253	11.7	16.2	15.2	615.1	2.32	2.07	18.5	159	146	130
610x305x238	238.1	635.8	311.4	18.4	31.4	16.5	540	2.45	2.14	10.3	303	81	71
610x305x179	179	620.2	307.1	14.1	23.6	16.5	540	2.41	2.10	13.5	228	106	92
610x305x149	149.2	612.4	304.8	11.8	19.7	16.5	540	2.39	2.09	16	190	126	110
610x229x140	139.9	617.2	230.2	13.1	22.1	12.7	547.6	2.11	1.88	15.1	178	119	106
610x229x125	125.1	612.2	229	11.9	19.6	12.7	547.6	2.09	1.86	16.7	159	131	117
610x229x113	113	607.6	228.2	11.1	17.3	12.7	547.6	2.08	1.85	18.4	144	144	129
610x229x101	101.2	602.6	227.6	10.5	14.8	12.7	547.6	2.07	1.84	20.5	129	160	143
533x210x122	122	544.5	211.9	12.7	21.3	12.7	476.5	1.89	1.68	15.5	155	122	108
533x210x109	109	539.5	210.8	11.6	18.8	12.7	476.5	1.88	1.67	17.2	139	135	120
533x210x101	101	536.7	210	10.8	17.4	12.7	476.5	1.87	1.66	18.5	129	145	129
533x210x92	92.1	533.1	209.3	10.1	15.6	12.7	476.5	1.86	1.65	20.2	117	159	141
533x210x82	82.2	528.3	208.8	9.6	13.2	12.7	476.5	1.85	1.64	22.5	105	176	156



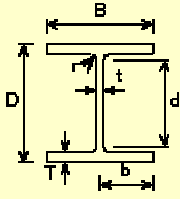
BS 5950-1: 2000

BS 4-1: 1993

# UNIVERSAL BEAMS

## DIMENSIONS

Section Designation	Mass per Metre kg/m	Depth of Section D mm	Width of Section B mm	Thickness		Root Radius r mm	Depth between Fillets d mm	Surface Area			Area of Section A cm <sup>2</sup>	4-Sided Section Factor Hp/A	3-Sided Section Factor Hp/A
				Web	Flange			4-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>	Per Tonne m <sup>2</sup>			
				t mm	T mm								
457x191x98	98.3	467.2	192.8	11.4	19.6	10.2	407.6	1.67	1.4772	16.9	125	134	118
457x191x89	89.3	463.4	191.9	10.5	17.7	10.2	407.6	1.66	1.4681	18.5	114	146	129
457x191x82	82	460	191.3	9.9	16	10.2	407.6	1.65	1.4587	20.1	104	159	140
457x191x74	74.3	457	190.4	9	14.5	10.2	407.6	1.64	1.4496	22.1	94.6	173	153
457x191x67	67.1	453.4	189.9	8.5	12.7	10.2	407.6	1.63	1.4401	24.3	85.5	191	168
457x152x82	82.1	465.8	155.3	10.5	18.9	10.2	407.6	1.51	1.3547	18.4	105	144	129
457x152x74	74.2	462	154.4	9.6	17	10.2	407.6	1.5	1.3456	20.3	94.5	159	142
457x152x67	67.2	458	153.8	9	15	10.2	407.6	1.5	1.3462	22.3	85.6	175	157
457x152x60	59.8	454.6	152.9	8.1	13.3	10.2	407.6	1.49	1.3371	24.9	76.2	196	175
457x152x52	52.3	449.8	152.4	7.6	10.9	10.2	407.6	1.48	1.3276	28.2	66.6	222	199
406x178x74	74.2	412.8	179.5	9.5	16	10.2	360.4	1.51	1.3305	20.3	94.5	160	141
406x178x67	67.1	409.4	178.8	8.8	14.3	10.2	360.4	1.5	1.3212	22.3	85.5	175	155
406x178x60	60.1	406.4	177.9	7.9	12.8	10.2	360.4	1.49	1.3121	24.8	76.5	195	172
406x178x54	54.1	402.6	177.7	7.7	10.9	10.2	360.4	1.48	1.3023	27.4	69	214	189
406x140x46	46	403.2	142.2	6.8	11.2	10.2	360.4	1.34	1.1978	29.2	58.6	229	204
406x140x39	39	398	141.8	6.4	8.6	10.2	360.4	1.33	1.1882	34.2	49.7	268	239
356x171x67	67.1	363.4	173.2	9.1	15.7	10.2	311.6	1.38	1.2068	20.6	85.5	161	141
356x171x57	57	358	172.2	8.1	13	10.2	311.6	1.37	1.1978	24.1	72.6	189	165
356x171x51	51	355	171.5	7.4	11.5	10.2	311.6	1.36	1.1885	26.7	64.9	210	183
356x171x45	45	351.4	171.1	7	9.7	10.2	311.6	1.36	1.1889	30.1	57.3	237	207
356x127x39	39.1	353.4	126	6.6	10.7	10.2	311.6	1.18	1.054	30.2	49.8	237	212
356x127x33	33.1	349	125.4	6	8.5	10.2	311.6	1.17	1.0446	35.4	42.1	278	248
305x165x54	54	310.4	166.9	7.9	13.7	8.9	265.2	1.26	1.0931	23.3	68.8	183	159
305x165x46	46.1	306.6	165.7	6.7	11.8	8.9	265.2	1.25	1.0843	27.1	58.7	213	185
305x165x40	40.3	303.4	165	6	10.2	8.9	265.2	1.24	1.075	30.8	51.3	242	210
305x127x48	48.1	311	125.3	9	14	8.9	265.2	1.09	0.9647	22.7	61.2	178	158
305x127x42	41.9	307.2	124.3	8	12.1	8.9	265.2	1.08	0.9557	25.8	53.4	202	179
305x127x37	37	304.4	123.4	7.1	10.7	8.9	265.2	1.07	0.9466	29	47.2	227	201
305x102x33	32.8	312.7	102.4	6.6	10.8	7.6	275.9	1.01	0.9076	30.8	41.8	242	217
305x102x28	28.2	308.7	101.8	6	8.8	7.6	275.9	1	0.8982	35.4	35.9	279	250
305x102x25	24.8	305.1	101.6	5.8	7	7.6	275.9	0.992	0.8904	40	31.6	314	282
254x146x43	43	259.6	147.3	7.2	12.7	7.6	219	1.08	0.9327	25.1	54.8	197	170
254x146x37	37	256	146.4	6.3	10.9	7.6	219	1.07	0.9236	29	47.2	227	196
254x146x31	31.1	251.4	146.1	6	8.6	7.6	219	1.06	0.9139	34.2	39.7	267	230
254x102x28	28.3	260.4	102.2	6.3	10	7.6	225.2	0.904	0.8018	31.9	36.1	250	222
254x102x25	25.2	257.2	101.9	6	8.4	7.6	225.2	0.897	0.7951	35.6	32	280	248
254x102x22	22	254	101.6	5.7	6.8	7.6	225.2	0.89	0.7884	40.5	28	318	282
203x133x30	30	206.8	133.9	6.4	9.6	7.6	172.4	0.923	0.7891	30.8	38.2	242	207
203x133x25	25.1	203.2	133.2	5.7	7.8	7.6	172.4	0.915	0.7818	36.4	32	286	244
203x102x23	23.1	203.2	101.8	5.4	9.3	7.6	169.4	0.79	0.6882	34.2	29.4	269	234
178x102x19	19	177.8	101.2	4.8	7.9	7.6	146.8	0.738	0.6368	38.8	24.3	304	262
152x89x16	16	152.4	88.7	4.5	7.7	7.6	121.8	0.638	0.5493	39.8	20.3	314	271
127x76x13	13	127	76	4	7.6	7.6	96.6	0.537	0.461	41.3	16.5	325	279





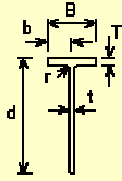
BS 5950-1: 2000

BS 4-1: 1993

# UNIVERSAL COLUMNS

## DIMENSIONS

Section Designation	Mass per Metre kg/m	Depth of Section D mm	Width of Section B mm	Thickness		Root Radius r mm	Depth between Fillets d mm	Surface Area			Cross Sectional Area A cm <sup>2</sup>	4-Sided	3-Sided
				Web t mm	Flange T mm			4-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>	Per Tonne m <sup>2</sup>		 Section Factor Hp/A	 Section Factor Hp/A
356x406x634	633.9	474.6	424	47.6	77	15.2	290.2	2.52	2.096	3.98	808	31	26
356x406x551	551	455.6	418.5	42.1	67.5	15.2	290.2	2.47	2.0515	4.49	702	35	29
356x406x467	467	436.6	412.2	35.8	58	15.2	290.2	2.42	2.0078	5.19	595	41	34
356x406x393	393	419	407	30.6	49.2	15.2	290.2	2.38	1.973	6.05	501	48	39
356x406x340	339.9	406.4	403	26.6	42.9	15.2	290.2	2.35	1.947	6.9	433	54	45
356x406x287	287.1	393.6	399	22.6	36.5	15.2	290.2	2.31	1.911	8.05	366	63	52
356x406x235	235.1	381	394.8	18.4	30.2	15.2	290.2	2.28	1.8852	9.69	299	76	63
356x368x202	201.9	374.6	374.7	16.5	27	15.2	290.2	2.19	1.8153	10.8	257	85	71
356x368x177	177	368.2	372.6	14.4	23.8	15.2	290.2	2.17	1.7974	12.3	226	96	80
356x368x153	152.9	362	370.5	12.3	20.7	15.2	290.2	2.16	1.7895	14.1	195	111	92
356x368x129	129	355.6	368.6	10.4	17.5	15.2	290.2	2.14	1.7714	16.6	164	130	108
305x305x283	282.9	365.3	322.2	26.8	44.1	15.2	246.7	1.94	1.6178	6.86	360	54	45
305x305x240	240	352.5	318.4	23	37.7	15.2	246.7	1.91	1.5916	7.94	306	62	52
305x305x198	198.1	339.9	314.5	19.1	31.4	15.2	246.7	1.87	1.5555	9.46	252	74	62
305x305x158	158.1	327.1	311.2	15.8	25	15.2	246.7	1.84	1.5288	11.6	201	92	76
305x305x137	136.9	320.5	309.2	13.8	21.7	15.2	246.7	1.82	1.5108	13.3	174	105	87
305x305x118	117.9	314.5	307.4	12	18.7	15.2	246.7	1.81	1.5026	15.3	150	121	100
305x305x97	96.9	307.9	305.3	9.9	15.4	15.2	246.7	1.79	1.4847	18.5	123	146	121
254x254x167	167.1	289.1	265.2	19.2	31.7	12.7	200.3	1.58	1.3148	9.45	213	74	62
254x254x132	132	276.3	261.3	15.3	25.3	12.7	200.3	1.55	1.2887	11.7	168	92	77
254x254x107	107.1	266.7	258.8	12.8	20.5	12.7	200.3	1.52	1.2612	14.2	136	112	93
254x254x89	88.9	260.3	256.3	10.3	17.3	12.7	200.3	1.5	1.2437	16.9	113	133	110
254x254x73	73.1	254.1	254.6	8.6	14.2	12.7	200.3	1.49	1.2354	20.4	93.1	160	133
203x203x86	86.1	222.2	209.1	12.7	20.5	10.2	160.8	1.24	1.0309	14.4	110	113	94
203x203x71	71	215.8	206.4	10	17.3	10.2	160.8	1.22	1.0136	17.2	90.4	135	112
203x203x60	60	209.6	205.8	9.4	14.2	10.2	160.8	1.21	1.0042	20.1	76.4	158	131
203x203x52	52	206.2	204.3	7.9	12.5	10.2	160.8	1.2	0.9957	23	66.3	181	150
203x203x46	46.1	203.2	203.6	7.2	11	10.2	160.8	1.19	0.9864	25.8	58.7	203	168
152x152x37	37	161.8	154.4	8	11.5	7.6	123.6	0.912	0.7576	24.7	47.1	194	161
152x152x30	30	157.6	152.9	6.5	9.4	7.6	123.6	0.901	0.7481	30	38.3	235	195
152x152x23	23	152.4	152.2	5.8	6.8	7.6	123.6	0.889	0.7368	38.7	29.2	304	252



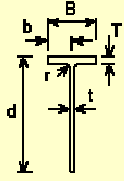
BS 5950-1: 2000

BS 4-1: 1993

## STRUCTURAL TEES CUT FROM UNIVERSAL BEAMS

### DIMENSIONS AND PROPERTIES

Section Designation	Cut from Universal Beam Section Designation	Mass per Metre kg/m	Width of Section B mm	Depth of Section d mm	Thickness		Root Radius r mm	Surface Area		Cross Sectional Area A cm <sup>2</sup>	4-Sided	3-Sided
					Web t mm	Flange T mm		4-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>		Section Factor Hp/A	Section Factor Hp/A
305x457x127	914x305x253	126.7	305.5	459.1	17.3	27.9	19.1	1.53	1.224	161	95	76
305x457x112	914x305x224	112.1	304.1	455.1	15.9	23.9	19.1	1.52	1.214	143	106	85
305x457x101	914x305x201	100.4	303.3	451.4	15.1	20.2	19.1	1.51	1.206	128	118	94
292x419x113	838x292x226	113.3	293.8	425.4	16.1	26.8	17.8	1.44	1.145	144	100	79
292x419x97	838x292x194	96.9	292.4	420.3	14.7	21.7	17.8	1.43	1.133	123	116	92
292x419x88	838x292x176	87.9	291.7	417.4	14	18.8	17.8	1.42	1.127	112	127	101
267x381x99	762x267x197	98.4	268	384.8	15.6	25.4	16.5	1.31	1.038	125	104	83
267x381x87	762x267x173	86.5	266.7	381	14.3	21.6	16.5	1.30	1.029	110	118	94
267x381x74	762x267x147	73.5	265.2	376.9	12.8	17.5	16.5	1.28	1.019	93.6	137	109
267x381x67	762x267x134	66.9	264.4	374.9	12	15.5	16.5	1.28	1.014	85.3	150	119
254x343x85	686x254x170	85.1	255.8	346.4	14.5	23.7	15.2	1.20	0.949	108	112	88
254x343x76	686x254x152	76.2	254.5	343.7	13.2	21	15.2	1.20	0.942	97	123	97
254x343x70	686x254x140	70	253.7	341.7	12.4	19	15.2	1.19	0.937	89.2	133	105
254x343x63	686x254x125	62.6	253	338.9	11.7	16.2	15.2	1.18	0.931	79.7	149	117
305x305x119	610x305x238	119	311.4	317.8	18.4	31.4	16.5	1.26	0.947	152	83	62
305x305x90	610x305x179	89.5	307.1	310	14.1	23.6	16.5	1.23	0.927	114	108	81
305x305x75	610x305x149	74.6	304.8	306.1	11.8	19.7	16.5	1.22	0.917	95	129	97
229x305x70	610x229x140	69.9	230.2	308.5	13.1	22.1	12.7	1.08	0.847	89.1	121	95
229x305x63	610x229x125	62.5	229	306	11.9	19.6	12.7	1.07	0.841	79.7	134	106
229x305x57	610x229x113	56.5	228.2	303.7	11.1	17.3	12.7	1.06	0.836	72	148	116
229x305x51	610x229x101	50.6	227.6	301.2	10.5	14.8	12.7	1.06	0.830	64.4	164	129
210x267x61	533x210x122	61	211.9	272.2	12.7	21.3	12.7	0.97	0.756	77.7	125	97
210x267x55	533x210x109	54.5	210.8	269.7	11.6	18.8	12.7	0.96	0.750	69.4	138	108
210x267x51	533x210x101	50.5	210	268.3	10.8	17.4	12.7	0.96	0.747	64.3	149	116
210x267x46	533x210x92	46.1	209.3	266.5	10.1	15.6	12.7	0.95	0.742	58.7	162	126
210x267x41	533x210x82	41.1	208.8	264.1	9.6	13.2	12.7	0.95	0.737	52.3	181	141
191x229x49	457x191x98	49.2	192.8	233.5	11.4	19.6	10.2	0.85	0.660	62.6	136	105
191x229x45	457x191x89	44.6	191.9	231.6	10.5	17.7	10.2	0.85	0.655	56.9	149	115
191x229x41	457x191x82	41	191.3	229.9	9.9	16	10.2	0.84	0.651	52.2	161	125
191x229x37	457x191x74	37.1	190.4	228.4	9	14.5	10.2	0.84	0.647	47.3	177	137
191x229x34	457x191x67	33.6	189.9	226.6	8.5	12.7	10.2	0.83	0.643	42.7	195	151
152x229x41	457x152x82	41	155.3	232.8	10.5	18.9	10.2	0.78	0.621	52.3	148	119
152x229x37	457x152x74	37.1	154.4	230.9	9.6	17	10.2	0.77	0.616	47.2	163	131
152x229x34	457x152x67	33.6	153.8	228.9	9	15	10.2	0.77	0.612	42.8	179	143
152x229x30	457x152x60	29.9	152.9	227.2	8.1	13.3	10.2	0.76	0.607	38.1	200	159
152x229x26	457x152x52	26.2	152.4	224.8	7.6	10.9	10.2	0.75	0.602	33.3	227	181





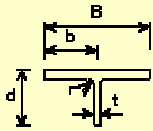
BS 5950-1: 2000

BS 4-1: 1993

## STRUCTURAL TEES CUT FROM UNIVERSAL BEAMS

### DIMENSIONS AND PROPERTIES

Section Designation	Cut from Universal Beam Section Designation	Mass per Metre kg/m	Width of Section B mm	Depth of Section d mm	Thickness		Root Radius r mm	Surface Area		Cross Sectional Area A cm <sup>2</sup>	4-Sided	3-Sided
					Web t mm	Flange T mm		4-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>		 Section Factor Hp/A	 Section Factor Hp/A
178x203x37	406x178x74	37.1	179.5	206.3	9.5	16	10.2	0.77	0.592	47.2	163	125
178x203x34	406x178x67	33.6	178.8	204.6	8.8	14.3	10.2	0.77	0.588	42.8	179	137
178x203x30	406x178x60	30	177.9	203.1	7.9	12.8	10.2	0.76	0.584	38.3	199	153
178x203x27	406x178x54	27.1	177.7	201.2	7.7	10.9	10.2	0.76	0.580	34.5	220	168
140x203x23	406x140x46	23	142.2	201.5	6.8	11.2	10.2	0.69	0.545	29.3	235	186
140x203x20	406x140x39	19.5	141.8	198.9	6.4	8.6	10.2	0.68	0.540	24.8	275	218
171x178x34	356x171x67	33.5	173.2	181.6	9.1	15.7	10.2	0.71	0.536	42.7	166	126
171x178x29	356x171x57	28.5	172.2	178.9	8.1	13	10.2	0.70	0.530	36.3	193	146
171x178x26	356x171x51	25.5	171.5	177.4	7.4	11.5	10.2	0.70	0.526	32.4	215	162
171x178x23	356x171x45	22.5	171.1	175.6	7	9.7	10.2	0.69	0.522	28.7	242	182
127x178x20	356x127x39	19.5	126	176.6	6.6	10.7	10.2	0.61	0.479	24.9	243	192
127x178x17	356x127x33	16.5	125.4	174.4	6	8.5	10.2	0.60	0.474	21.1	284	225
165x152x27	305x165x54	27	166.9	155.1	7.9	13.7	8.9	0.64	0.477	34.4	187	139
165x152x23	305x165x46	23.1	165.7	153.2	6.7	11.8	8.9	0.64	0.472	29.4	217	161
165x152x20	305x165x40	20.1	165	151.6	6	10.2	8.9	0.63	0.468	25.7	246	182
127x152x24	305x127x48	24	125.3	155.4	9	14	8.9	0.56	0.436	30.6	183	143
127x152x21	305x127x42	21	124.3	153.5	8	12.1	8.9	0.56	0.431	26.7	208	162
127x152x19	305x127x37	18.5	123.4	152.1	7.1	10.7	8.9	0.55	0.428	23.6	233	181
102x152x17	305x102x33	16.4	102.4	156.3	6.6	10.8	7.6	0.52	0.415	20.9	248	199
102x152x14	305x102x28	14.1	101.8	154.3	6	8.8	7.6	0.51	0.410	17.9	286	229
102x152x13	305x102x25	12.4	101.6	152.5	5.8	7	7.6	0.51	0.407	15.8	322	257
146x127x22	254x146x43	21.5	147.3	129.7	7.2	12.7	7.6	0.55	0.407	27.4	202	148
146x127x19	254x146x37	18.5	146.4	127.9	6.3	10.9	7.6	0.55	0.402	23.6	232	170
146x127x16	254x146x31	15.6	146.1	125.6	6	8.6	7.6	0.54	0.397	19.8	274	201
102x127x14	254x102x28	14.2	102.2	130.1	6.3	10	7.6	0.46	0.362	18	258	201
102x127x13	254x102x25	12.6	101.9	128.5	6	8.4	7.6	0.46	0.359	16	288	224
102x127x11	254x102x22	11	101.6	126.9	5.7	6.8	7.6	0.46	0.355	14	326	254
133x102x15	203x133x30	15	133.9	103.3	6.4	9.6	7.6	0.47	0.341	19.1	248	178
133x102x13	203x133x25	12.5	133.2	101.5	5.7	7.8	7.6	0.47	0.336	16	293	210





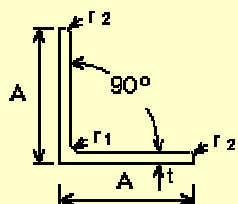
BS 5950-1: 2000

BS 4-1: 1993

## STRUCTURAL TEES CUT FROM UNIVERSAL COLUMNS

### DIMENSIONS



Section Designation	Cut from Universal Column Section Designation	Mass per Metre kg/m	Width of Section B mm	Depth of Section d mm	Thickness		Root Radius r mm	Surface Area		Cross Sectional Area A cm <sup>2</sup>	4-Sided	3-Sided
					Web t mm	Flange T mm		4-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>		 Section Factor Hp/A	 Section Factor Hp/A
406x178x118	356x406x235	117.5	394.8	190.4	18.4	30.2	15.2	1.1704	0.7756	150	78	52
368x178x101	356x368x202	100.9	374.7	187.2	16.5	27	15.2	1.1238	0.7491	129	87	58
368x178x89	356x368x177	88.5	372.6	184	14.4	23.8	15.2	1.1132	0.7406	113	99	66
368x178x77	356x368x153	76.5	370.5	180.9	12.3	20.7	15.2	1.1028	0.7323	97.4	113	75
368x178x65	356x368x129	64.5	368.6	177.7	10.4	17.5	15.2	1.0926	0.724	82.2	133	88
305x152x79	305x305x158	79	311.2	163.5	15.8	25	15.2	0.9494	0.6382	101	94	63
305x152x69	305x305x137	68.5	309.2	160.2	13.8	21.7	15.2	0.9388	0.6296	87.2	108	72
305x152x59	305x305x118	58.9	307.4	157.2	12	18.7	15.2	0.9292	0.6218	75.1	124	83
305x152x49	305x305x97	48.4	305.3	153.9	9.9	15.4	15.2	0.9184	0.6131	61.7	149	99
254x127x66	254x254x132	66	261.3	138.1	15.3	25.3	12.7	0.7988	0.5375	84.1	95	64
254x127x54	254x254x107	53.5	258.8	133.3	12.8	20.5	12.7	0.7842	0.5254	68.2	115	77
254x127x45	254x254x89	44.5	256.3	130.1	10.3	17.3	12.7	0.7728	0.5165	56.7	136	91
254x127x37	254x254x73	36.5	254.6	127	8.6	14.2	12.7	0.7632	0.5086	46.5	164	109
203x102x43	203x203x86	43	209.1	111	12.7	20.5	10.2	0.6402	0.4311	54.8	117	79
203x102x36	203x203x71	35.5	206.4	107.8	10	17.3	10.2	0.6284	0.422	45.2	139	93
203x102x30	203x203x60	30	205.8	104.7	9.4	14.2	10.2	0.621	0.4152	38.2	163	109
203x102x26	203x203x52	26	204.3	103	7.9	12.5	10.2	0.6146	0.4103	33.1	186	124
203x102x23	203x203x46	23	203.6	101.5	7.2	11	10.2	0.6102	0.4066	29.4	208	138
152x76x19	152x152x37	18.5	154.4	80.8	8	11.5	7.6	0.4704	0.316	23.5	200	134
152x76x15	152x152x30	15	152.9	78.7	6.5	9.4	7.6	0.4632	0.3103	19.1	243	162
152x76x12	152x152x23	11.5	152.2	76.1	5.8	6.8	7.6	0.4566	0.3044	14.6	313	208

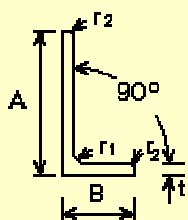


BS 5950-1: 2000  
BS EN 10056-1: 1999

## EQUAL ANGLES

### DIMENSIONS AND PROPERTIES




Section Designation		Mass per Metre kg/m	Surface Area		Cross Sectional Area cm <sup>2</sup>	4-Sided	3-Sided
Size A x A mm	Thickness t mm		4-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>			
						Section Factor Hp/A	Section Factor Hp/A
200x200	24	71.1	0.8	0.6	90.6	88	66
	20	59.9	0.8	0.6	76.3	105	79
	18	54.3	0.8	0.6	69.1	116	87
	16	48.5	0.8	0.6	61.8	129	97
150x150	18	40.1	0.6	0.45	51.2	117	88
	15	33.8	0.6	0.45	43	140	105
	12	27.3	0.6	0.45	34.8	172	129
	10	23	0.6	0.45	29.3	205	154
120x120	15	26.6	0.48	0.36	34	141	106
	12	21.6	0.48	0.36	27.5	175	131
	10	18.2	0.48	0.36	23.2	207	155
	8	14.7	0.48	0.36	18.8	255	191
100x100	15	21.9	0.4	0.3	28	143	107
	12	17.8	0.4	0.3	22.7	176	132
	10	15	0.4	0.3	19.2	208	156
	8	12.2	0.4	0.3	15.5	258	194
90x90	12	15.9	0.36	0.27	20.3	177	133
	10	13.4	0.36	0.27	17.1	211	158
	8	10.9	0.36	0.27	13.9	259	194
	7	9.61	0.36	0.27	12.2	295	221
80x80	10	11.9	0.32	0.24	15.1	212	159
	8	9.63	0.32	0.24	12.3	260	195
75x75	8	8.99	0.3	0.225	11.4	263	197
	6	6.85	0.3	0.225	8.73	344	258
70x70	7	7.38	0.28	0.21	9.4	298	223
	6	6.38	0.28	0.21	8.13	344	258
65x65	7	6.83	0.26	0.195	8.73	298	223
60x60	8	7.09	0.24	0.18	9.03	266	199
	6	5.42	0.24	0.18	6.91	347	260
	5	4.57	0.24	0.18	5.82	412	309

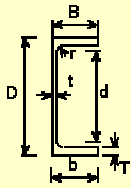


BS 5950-1: 2000  
BS EN 10056-1: 1999

# UNEQUAL ANGLES

## DIMENSIONS AND PROPERTIES

Section Designation			Mass per Metre kg/m	Surface Area			Cross Sectional Area cm <sup>2</sup>	4-Sided	3-Sided	3-Sided	
Size A mm	Size B mm	Thickness t mm		4-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>					
									Section Factor Hp/A	Section Factor Hp/A	Section Factor Hp/A
200	150	18	47.1	0.7	0.5	0.55	60.1	116	83	92	
200	150	15	39.6	0.7	0.5	0.55	50.5	139	99	109	
200	150	12	32	0.7	0.5	0.55	40.8	172	123	135	
200	100	15	33.8	0.6	0.4	0.5	43	140	93	116	
200	100	12	27.3	0.6	0.4	0.5	34.8	172	115	144	
200	100	10	23	0.6	0.4	0.5	29.2	205	137	171	
150	90	15	33.9	0.48	0.33	0.39	33.9	142	97	115	
150	90	12	21.6	0.48	0.33	0.39	27.5	175	120	142	
150	90	10	18.2	0.48	0.33	0.39	23.2	207	142	168	
150	75	15	24.8	0.45	0.3	0.375	31.7	142	95	118	
150	75	12	20.2	0.45	0.3	0.375	25.7	175	117	146	
150	75	10	17	0.45	0.3	0.375	21.7	207	138	173	
125	75	12	17.8	0.4	0.275	0.325	22.7	176	121	143	
125	75	10	15	0.4	0.275	0.325	19.1	209	144	170	
125	75	8	12.2	0.4	0.275	0.325	15.5	258	177	210	
100	75	12	15.4	0.35	0.25	0.275	19.7	178	127	140	
100	75	10	13	0.35	0.25	0.275	16.6	211	151	166	
100	75	8	10.6	0.35	0.25	0.275	13.5	259	185	204	
100	65	10	12.3	0.33	0.23	0.265	15.6	212	147	170	
100	65	8	9.94	0.33	0.23	0.265	12.7	260	181	209	
100	65	7	8.77	0.33	0.23	0.265	11.2	295	205	237	
100	50	8	8.97	0.3	0.2	0.25	11.4	263	175	219	
100	50	6	6.84	0.3	0.2	0.25	8.71	344	230	287	
80	60	7	7.36	0.28	0.2	0.22	9.38	299	213	235	

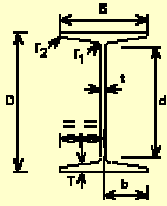


BS 5950-1: 2000  
BS 4-1: 1993

## PARALLEL FLANGE CHANNELS

### DIMENSIONS

Section Designation	Mass per Metre kg/m	Depth of Section D mm	Width of Section B mm	Thickness		Root Radius r mm	Depth between Fillets d mm	Surface Area				Cross Sectional Area A cm <sup>2</sup>	4-Sided Section Factor Hp/A	3-Sided Section Factor Hp/A	3-Sided Section Factor Hp/A
				Web t mm	Flange T mm			4-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>	Per Tonne m <sup>2</sup>				
430x100x64	64.4	430	100	11	19	15	362	1.23	1.13	0.8	19	82.1	150	138	97
380x100x54	54	380	100	9.5	17.5	15	315	1.13	1.03	0.75	20.9	68.7	164	150	109
300x100x46	45.5	300	100	9	16.5	15	237	0.969	0.869	0.669	21.3	58	167	150	115
300x90x41	41.4	300	90	9	15.5	12	245	0.932	0.842	0.632	22.5	52.7	177	160	120
260x90x35	34.8	260	90	8	14	12	208	0.854	0.764	0.594	24.5	44.4	192	172	134
260x75x28	27.6	260	75	7	12	12	212	0.796	0.721	0.536	28.8	35.1	227	205	153
230x90x32	32.2	230	90	7.5	14	12	178	0.795	0.705	0.565	24.7	41	194	172	138
230x75x26	25.7	230	75	6.5	12.5	12	181	0.737	0.662	0.507	28.7	32.7	225	202	155
200x90x30	29.7	200	90	7	14	12	148	0.736	0.646	0.536	24.8	37.9	194	170	141
200x75x23	23.4	200	75	6	12.5	12	151	0.678	0.603	0.478	28.9	29.9	227	202	160
180x90x26	26.1	180	90	6.5	12.5	12	131	0.697	0.607	0.517	26.7	33.2	210	183	156
180x75x20	20.3	180	75	6	10.5	12	135	0.638	0.563	0.458	31.4	25.9	246	217	177
150x90x24	23.9	150	90	6.5	12	12	102	0.637	0.547	0.487	26.7	30.4	210	180	160
150x75x18	17.9	150	75	5.5	10	12	106	0.579	0.504	0.429	32.4	22.8	254	221	188
125x65x15 #	14.8	125	65	5.5	9.5	12	82	0.489	0.424	0.364	33.1	18.8	260	226	194
100x50x10 #	10.2	100	50	5	8.5	9	65	0.382	0.332	0.282	37.5	13	294	255	217





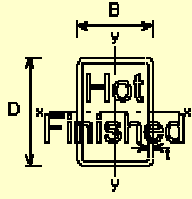
BS 5950-1: 2000

BS 4-1: 1993

# JOISTS

## DIMENSIONS




Section Designation	Mass per Metre kg/m	Depth of Section D mm	Width of Section B mm	Thickness		Radii		Depth between Fillets d mm	Surface Area			Cross Sectional Area A cm <sup>2</sup>	4-Sided	3-Sided
				Web t mm	Flange T mm	Root r <sub>1</sub> mm	Toe r <sub>2</sub> mm		4-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>	Per Tonne m <sup>2</sup>		 Section Factor Hp/A	 Section Factor Hp/A
254x203x82	82	254	203.2	10.2	19.9	19.6	9.7	166.6	1.21	1.0068	14.8	105	115	96
254x114x37	37.2	254	114.3	7.6	12.8	12.4	6.1	199.3	0.899	0.7847	24.2	47.3	190	166
203x152x52	52.3	203.2	152.4	8.9	16.5	15.5	7.6	133.2	0.932	0.7796	17.8	66.6	140	117
152x127x37	37.3	152.4	127	10.4	13.2	13.5	6.6	94.3	0.737	0.61	19.8	47.5	155	128
127x114x29	29.3	127	114.3	10.2	11.5	9.9	4.8	79.5	0.646	0.5317	22	37.4	173	142
127x114x27	26.9	127	114.3	7.4	11.4	9.9	5	79.5	0.65	0.5357	24.2	34.2	190	157
127x76x16	16.5	127	76.2	5.6	9.6	9.4	4.6	86.5	0.512	0.4358	31	21.1	243	207
114x114x27	27.1	114.3	114.3	9.5	10.7	14.2	3.2	60.8	0.618	0.5037	22.8	34.5	179	146
102x102x23	23	101.6	101.6	9.5	10.3	11.1	3.2	55.2	0.549	0.4474	23.9	29.3	187	153
102x44x7	7.5	101.6	44.5	4.3	6.1	6.9	3.3	74.6	0.35	0.3055	46.6	9.5	368	322
89x89x19	19.5	88.9	88.9	9.5	9.9	11.1	3.2	44.2	0.476	0.3871	24.4	24.9	191	155
76x76x15	15	76.2	80	8.9	8.4	9.4	4.6	38.1	0.419	0.339	27.9	19.1	219	177
76x76x13	12.8	76.2	76.2	5.1	8.4	9.4	4.6	38.1	0.411	0.3348	32.1	16.2	254	207

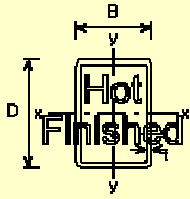


BS 5950-1: 2000  
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# HOT-FINISHED CELSIUS RECTANGULAR HOLLOW SECTIONS

## DIMENSIONS AND PROPERTIES




Section Designation			Mass per Metre kg/m	Surface Area				Cross Sectional Area A cm <sup>2</sup>	4-Sided	3-Sided	3-Sided
Size D mm	Size B mm	Thickness t mm		4-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>	Per Tonne m <sup>2</sup>		 Section Factor Hp/A	 Section Factor Hp/A	 Section Factor Hp/A
50	30	3.2	3.61	0.152	0.122	0.102	42.1	4.6	330	265	222
60	40	3	4.35	0.192	0.152	0.132	44.1	5.54	347	274	238
60	40	4	5.64	0.19	0.15	0.13	33.7	7.19	264	209	181
60	40	5	6.85	0.187	0.147	0.127	27.3	8.73	214	168	145
80	40	3.2	5.62	0.232	0.192	0.152	41.3	7.16	324	268	212
80	40	4	6.9	0.23	0.19	0.15	33.3	8.79	262	216	171
80	40	5	8.42	0.227	0.187	0.147	27	10.7	212	175	137
80	40	6.3	10.3	0.224	0.184	0.144	21.7	13.1	171	140	110
80	40	8	12.5	0.219	0.179	0.139	17.5	16	137	112	87
90	50	3.6	7.4	0.271	0.221	0.181	36.6	9.42	288	235	192
90	50	5	9.99	0.267	0.217	0.177	26.7	12.7	210	171	139
90	50	6.3	12.3	0.264	0.214	0.174	21.5	15.6	169	137	112
100	50	3	6.71	0.292	0.242	0.192	43.5	8.54	342	283	225
100	50	3.2	7.13	0.292	0.242	0.192	41	9.08	322	267	211
100	50	5	10.8	0.287	0.237	0.187	26.6	13.7	209	173	136
100	50	6.3	13.3	0.284	0.234	0.184	21.4	16.9	168	138	109
100	50	8	16.3	0.279	0.229	0.179	17.1	20.8	134	110	86
100	50	10	19.6	0.274	0.224	0.174	14	24.9	110	90	70
100	60	3.6	8.53	0.311	0.251	0.211	36.5	10.9	285	230	194
100	60	5	11.6	0.307	0.247	0.207	26.5	14.7	209	168	141
100	60	6.3	14.2	0.304	0.244	0.204	21.4	18.1	168	135	113
100	60	8	17.5	0.299	0.239	0.199	17.1	22.4	133	107	89
120	60	3.6	9.7	0.351	0.291	0.231	36.2	12.3	285	237	188
120	60	5	13.1	0.347	0.287	0.227	26.5	16.7	208	172	136
120	60	6.3	16.2	0.344	0.284	0.224	21.2	20.7	166	137	108
120	60	8	20.1	0.339	0.279	0.219	16.9	25.6	132	109	86
120	80	5	14.7	0.387	0.307	0.267	26.3	18.7	207	164	143
120	80	6.3	18.2	0.384	0.304	0.264	21.1	23.2	166	131	114
120	80	8	22.6	0.379	0.299	0.259	16.8	28.8	132	104	90
120	80	10	27.4	0.374	0.294	0.254	13.6	34.9	107	84	73
150	100	5	18.6	0.487	0.387	0.337	26.2	23.7	205	163	142
150	100	6.3	23.1	0.484	0.384	0.334	21	29.5	164	130	113
150	100	8	28.9	0.479	0.379	0.329	16.6	36.8	130	103	89
150	100	10	35.3	0.474	0.374	0.324	13.4	44.9	106	83	72
150	100	12.5	42.8	0.468	0.368	0.318	10.9	54.6	86	67	58
160	80	4	14.4	0.47	0.39	0.31	32.6	18.4	255	212	168
160	80	5	17.8	0.467	0.387	0.307	26.2	22.7	206	170	135
160	80	6.3	22.2	0.464	0.384	0.304	20.9	28.2	165	136	108
160	80	8	27.6	0.459	0.379	0.299	16.6	35.2	130	108	85
160	80	10	33.7	0.454	0.374	0.294	13.5	42.9	106	87	69

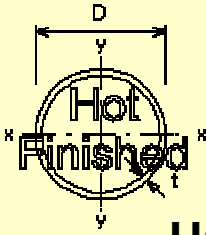


BS 5950-1: 2000  
BS EN 10210-2: 1997

# HOT-FINISHED CELSIUS RECTANGULAR HOLLOW SECTIONS

## DIMENSIONS AND PROPERTIES

Section Designation			Mass per Metre kg/m	Surface Area				Cross Sectional Area A cm <sup>2</sup>	4-Sided	3-Sided	3-Sided
Size D mm	Size B mm	Thickness t mm		4-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>	3-Sided Per Metre m <sup>2</sup>	Per Tonne m <sup>2</sup>		 Section Factor Hp/A	 Section Factor Hp/A	 Section Factor Hp/A
200	100	5	22.6	0.587	0.487	0.387	26	28.7	205	170	135
200	100	6.3	28.1	0.584	0.484	0.384	20.8	35.8	163	135	107
200	100	8	35.1	0.579	0.479	0.379	16.5	44.8	129	107	85
200	100	10	43.1	0.574	0.474	0.374	13.3	54.9	105	86	68
200	100	12.5	52.7	0.568	0.468	0.368	10.8	67.1	85	70	55
200	120	5	24.1	0.627	0.507	0.427	26	30.7	204	165	139
200	120	6.3	30.1	0.624	0.504	0.424	20.7	38.3	163	132	111
200	120	8	37.6	0.619	0.499	0.419	16.5	48	129	104	87
200	120	10	46.3	0.614	0.494	0.414	13.3	58.9	104	84	70
200	150	8	41.4	0.679	0.529	0.479	16.4	52.8	129	100	91
200	150	10	51	0.674	0.524	0.474	13.2	64.9	104	81	73
250	100	10	51	0.674	0.574	0.424	13.2	64.9	104	88	65
250	100	12.5	62.5	0.668	0.568	0.418	10.7	79.6	84	71	53
250	150	5	30.4	0.787	0.637	0.537	25.9	38.7	203	165	139
250	150	6.3	38	0.784	0.634	0.534	20.6	48.4	162	131	110
250	150	8	47.7	0.779	0.629	0.529	16.3	60.8	128	103	87
250	150	10	58.8	0.774	0.624	0.524	13.2	74.9	103	83	70
250	150	12.5	72.3	0.768	0.618	0.518	10.6	92.1	83	67	56
250	150	16	90.3	0.759	0.609	0.509	8.41	115	66	53	44
300	100	8	47.7	0.779	0.679	0.479	16.3	60.8	128	112	79
300	100	10	58.8	0.774	0.674	0.474	13.2	74.9	103	90	63
300	200	6.3	47.9	0.984	0.784	0.684	20.5	61	161	129	112
300	200	8	60.3	0.979	0.779	0.679	16.2	76.8	127	101	88
300	200	10	74.5	0.974	0.774	0.674	13.1	94.9	103	82	71
300	200	12.5	91.9	0.968	0.768	0.668	10.5	117	83	66	57
300	200	16	115	0.959	0.759	0.659	8.34	147	65	52	45
400	200	8	72.8	1.18	0.98	0.78	16.2	92.8	127	106	84
400	200	10	90.2	1.17	0.97	0.77	13	115	102	84	67
400	200	12.5	112	1.17	0.97	0.77	10.5	142	82	68	54
400	200	16	141	1.16	0.96	0.76	8.26	179	65	54	42
450	250	8	85.4	1.38	1.13	0.93	16.2	109	127	104	85
450	250	10	106	1.37	1.12	0.92	12.9	135	101	83	68
450	250	12.5	131	1.37	1.12	0.92	10.5	167	82	67	55
450	250	16	166	1.36	1.11	0.91	8.19	211	64	53	43
500	300	8	98	1.58	1.28	1.08	16.1	125	126	102	86
500	300	10	122	1.57	1.27	1.07	12.9	155	101	82	69
500	300	12.5	151	1.57	1.27	1.07	10.4	192	82	66	56
500	300	16	191	1.56	1.26	1.06	8.17	243	64	52	44
500	300	20	235	1.55	1.25	1.05	6.6	300	52	42	35

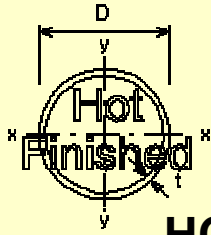


BS 5950-1: 2000  
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# HOT-FINISHED CELSIUS CIRCULAR HOLLOW SECTIONS

## DIMENSIONS AND PROPERTIES


Section Designation		Mass per Metre kg/m	Surface Area		Cross Sectional Area A cm <sup>2</sup>	Section Factor  Hp/A
Outside Diameter D mm	Thickness t mm		Per Metre m <sup>2</sup>	Per Tonne m <sup>2</sup>		
27	3.2	1.87	0.085	45.2	2.38	357
42	3.2	3.09	0.133	43	3.94	338
48	3.2	3.56	0.152	42.7	4.53	336
	4	4.37	0.152	34.8	5.57	273
	5	5.34	0.152	28.5	6.8	224
60	3.2	4.51	0.189	41.9	5.74	329
	5	6.82	0.189	27.7	8.69	217
76	2.9	5.24	0.239	45.6	6.67	358
	3.2	5.75	0.239	41.6	7.33	326
	4	7.11	0.239	33.6	9.06	264
	5	8.77	0.239	27.3	11.2	213
89	3.2	6.76	0.279	41.3	8.62	324
	4	8.38	0.279	33.3	10.7	261
	5	10.4	0.279	27	13.2	211
	6.3	12.8	0.279	21.7	16.3	171
114	3.2	8.77	0.359	40.9	11.2	321
	3.6	9.83	0.359	36.5	12.5	287
	5	13.5	0.359	26.6	17.2	209
	6.3	16.8	0.359	21.4	21.4	168
140	5	16.6	0.439	26.4	21.2	207
	6.3	20.7	0.439	21.2	26.4	166
	8	26	0.439	16.9	33.1	133
	10	32	0.439	13.7	40.7	108
168	5	20.1	0.529	26.3	25.7	206
	6.3	25.2	0.529	21	32.1	165
	8	31.6	0.529	16.7	40.3	131
	10	39	0.529	13.6	49.7	106
194	5	23.3	0.609	26.1	29.6	206
	6.3	29.1	0.609	20.9	37.1	164
	8	36.6	0.609	16.6	46.7	130
	10	45.3	0.609	13.4	57.7	106

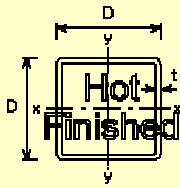


BS 5950-1: 2000  
BS EN 10210-2: 1997

# HOT-FINISHED CELSIUS CIRCULAR HOLLOW SECTIONS

## DIMENSIONS AND PROPERTIES



Section Designation		Mass per Metre kg/m	Surface Area		Area of Section A cm <sup>2</sup>	Section Factor  Hp/A
Outside Diameter D mm	Thickness t mm		Per Metre m <sup>2</sup>	Per Tonne m <sup>2</sup>		
219	5	26.4	0.688	26.1	33.6	205
	6	33.1	0.688	20.8	42.1	163
	8	41.6	0.688	16.5	53.1	130
	10	51.6	0.688	13.3	65.7	105
	13	63.7	0.688	10.8	81.1	85
245	12	68.8	0.768	11.2	87.7	88
273	5	33	0.858	26	42.1	204
	6	41.4	0.858	20.7	52.8	163
	8	52.3	0.858	16.4	66.6	129
	10	64.9	0.858	13.2	82.6	104
	13	80.3	0.858	10.7	102	84
324	6	101	0.858	8.46	129	67
	6	49.3	1.02	20.7	62.9	162
	8	62.3	1.02	16.4	79.4	128
	10	77.4	1.02	13.2	98.6	103
	13	96	1.02	10.6	122	84
406	16	122	1.02	8.4	155	66
	6	62.2	1.28	20.6	79.2	162
	8	78.6	1.28	16.3	100	128
	10	97.8	1.28	13.1	125	102
	13	121	1.28	10.5	155	83
457	16	154	1.28	8.31	196	65
	8	88.6	1.44	16.3	113	127
	10	110	1.44	13.1	140	103
	13	137	1.44	10.5	175	82
	16	174	1.44	8.28	222	65
508	8	98.6	1.6	16.2	126	127
	10	123	1.6	13	156	103
	13	153	1.6	10.5	195	82
	16	194	1.6	8.25	247	65
	20	241	1.6	6.64	307	52

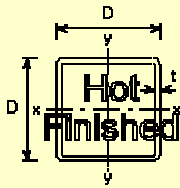


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## HOT-FINISHED CELSIUS SQUARE HOLLOW SECTIONS

### DIMENSIONS AND PROPERTIES

Section Designation		Mass per Metre kg/m	Ratio for Local Buckling $d/t^{(1)}$	Surface Area			Cross Sectional Area A $\text{cm}^2$	4-Sided	3-Sided
Size D x D mm	Thickness t mm			4-Sided Per Metre $\text{m}^2$	3-Sided Per Metre $\text{m}^2$	Per Tonne $\text{m}^2$			
							Section Factor $H_p/A$	Section Factor $H_p/A$	
40x40	3	3.41	10.3	0.152	0.112	44.6	4.34	350	258
	3.2	3.61	9.5	0.152	0.112	42.1	4.6	330	243
	4	4.39	7	0.15	0.11	34.2	5.59	268	197
	5	5.28	5	0.147	0.107	27.8	6.73	218	159
50x50	3	4.35	13.7	0.192	0.142	44.1	5.54	347	256
	3.2	4.62	12.6	0.192	0.142	41.6	5.88	327	241
	4	5.64	9.5	0.19	0.14	33.7	7.19	264	195
	5	6.85	7	0.187	0.137	27.3	8.73	214	157
	6.3	8.31	4.94	0.184	0.134	22.1	10.6	174	126
60x60	3	5.29	17	0.232	0.172	43.9	6.74	344	255
	3.2	5.62	15.8	0.232	0.172	41.3	7.16	324	240
	4	6.9	12	0.23	0.17	33.3	8.79	262	193
	5	8.42	9	0.227	0.167	27	10.7	212	156
	6.3	10.3	6.52	0.224	0.164	21.7	13.1	171	125
70x70	8	12.5	4.5	0.219	0.159	17.5	16	137	99
	3.6	7.4	16.4	0.271	0.201	36.6	9.42	288	213
	5	9.99	11	0.267	0.197	26.7	12.7	210	155
	6.3	12.3	8.11	0.264	0.194	21.5	15.6	169	124
80x80	8	15	5.75	0.259	0.189	17.3	19.2	135	98
	3.6	8.53	19.2	0.311	0.231	36.5	10.9	285	212
	4	9.41	17	0.31	0.23	32.9	12	258	192
	5	11.6	13	0.307	0.227	26.6	14.7	209	154
	6.3	14.2	9.7	0.304	0.224	21.4	18.1	168	124
90x90	8	17.5	7	0.299	0.219	17.1	22.4	133	98
	3.6	9.66	22	0.351	0.261	36.3	12.3	285	212
	4	10.7	19.5	0.35	0.26	32.7	13.6	257	191
	5	13.1	15	0.347	0.257	26.5	16.7	208	154
	6.3	16.2	11.3	0.344	0.254	21.2	20.7	166	123
100x100	8	20.1	8.25	0.339	0.249	16.9	25.6	132	97
	4	11.9	22	0.39	0.29	32.8	15.2	257	191
	5	14.7	17	0.387	0.287	26.3	18.7	207	153
	6.3	18.2	12.9	0.384	0.284	21.1	23.2	166	122
	8	22.6	9.5	0.379	0.279	16.8	28.8	132	97
120x120	10	27.4	7	0.374	0.274	13.6	34.9	107	79
	5	17.8	21	0.467	0.347	26.2	22.7	206	153
	6.3	22.2	16	0.464	0.344	20.9	28.2	165	122
	8	27.6	12	0.459	0.339	16.6	35.2	130	96
	10	33.7	9	0.454	0.334	13.5	42.9	106	78
120x120	12.5	40.9	6.6	0.448	0.328	11	52.1	86	63



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## HOT-FINISHED CELSIUS SQUARE HOLLOW SECTIONS

### DIMENSIONS AND PROPERTIES

Section Designation		Mass per Metre kg/m	Ratio for Local Buckling $d/t^{(1)}$	Surface Area			Area of Section A $\text{cm}^2$	4-Sided Section Factor $H_p/A$	3-Sided Section Factor $H_p/A$
Size D x D mm	Thickness t mm			4-Sided Per Metre $\text{m}^2$	3-Sided Per Metre $\text{m}^2$	Per Tonne $\text{m}^2$			
140x140	5	21	25	0.547	0.407	26	26.7	205	152
	6.3	26.1	19.2	0.544	0.404	20.8	33.3	163	121
	8	32.6	14.5	0.539	0.399	16.5	41.6	130	96
	10	40	11	0.534	0.394	13.4	50.9	105	77
	12.5	48.7	8.2	0.528	0.388	10.8	62.1	85	62
150x150	5	22.6	27	0.587	0.437	26	28.7	205	152
	6.3	28.1	20.8	0.584	0.434	20.8	35.8	163	121
	8	35.1	15.8	0.579	0.429	16.5	44.8	129	96
	10	43.1	12	0.574	0.424	13.3	54.9	105	77
	12.5	52.7	9	0.568	0.418	10.8	67.1	85	62
	16	65.2	6.38	0.559	0.409	8.57	83	67	49
160x160	5	24.1	29	0.627	0.467	26	30.7	204	152
	6.3	30.1	22.4	0.624	0.464	20.7	38.3	163	121
	8	37.6	17	0.619	0.459	16.5	48	129	96
	10	46.3	13	0.614	0.454	13.3	58.9	104	77
	12.5	56.6	9.8	0.608	0.448	10.7	72.1	84	62
180x180	6.3	34	25.6	0.704	0.524	20.7	43.3	163	121
	8	42.7	19.5	0.699	0.519	16.4	54.4	128	95
	10	52.5	15	0.694	0.514	13.2	66.9	104	77
	12.5	64.4	11.4	0.688	0.508	10.7	82.1	84	62
	16	80.2	8.25	0.679	0.499	8.47	102	67	49
200x200	5	30.4	37	0.787	0.587	25.9	38.7	203	152
	6.3	38	28.7	0.784	0.584	20.6	48.4	162	121
	8	47.7	22	0.779	0.579	16.3	60.8	128	95
	10	58.8	17	0.774	0.574	13.2	74.9	103	77
	12.5	72.3	13	0.768	0.568	10.6	92.1	83	62
	16	90.3	9.5	0.759	0.559	8.41	115	66	49
250x250	6.3	47.9	36.7	0.984	0.734	20.5	61	161	120
	8	60.3	28.3	0.979	0.729	16.2	76.8	127	95
	10	74.5	22	0.974	0.724	13.1	94.9	103	76
	12.5	91.9	17	0.968	0.718	10.5	117	83	61
	16	115	12.6	0.959	0.709	8.31	147	65	48
300x300	6.3	57.8	44.6	1.18	0.88	20.4	73.6	160	120
	8	72.8	34.5	1.18	0.88	16.2	92.8	127	95
	10	90.2	27	1.17	0.87	13	115	102	76
	12.5	112	21	1.17	0.87	10.5	142	82	61
	16	141	15.8	1.16	0.86	8.26	179	65	48
350x350	8	85.4	40.8	1.38	1.03	16.2	109	127	94
	10	106	32	1.37	1.02	12.9	135	101	76
	12.5	131	25	1.37	1.02	10.5	167	82	61
	16	166	18.9	1.36	1.01	8.19	211	64	48
400x400	10	122	37	1.57	1.17	12.9	155	101	75
	12.5	151	29	1.57	1.17	10.4	192	82	61
	16	191	22	1.56	1.16	8.17	243	64	48
	20	235	17	1.55	1.15	6.6	300	52	38