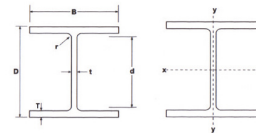


# Universal Columns

Dimensions and properties to BS 4: Part 1: 1993

152 x 152 x 23 - 356 x 406 x 634

\* These sections are in addition to the range of BS EN 10365 sections



Section Designation	Dimensions														Properties													
	Mass per metre kg/m	Depth of section h mm	Width of section b mm	Thickness		Root radius r mm	Depth between fillets d mm	Ratios for local buckling		Dimensions for detailing			Surface area		Second moment of area		Radius of gyration		Elastic modulus		Plastic modulus		Buckling parameter U	Torsional index X	Warping constant I <sub>w</sub> cm <sup>4</sup>	Torsional constant I <sub>T</sub> cm <sup>4</sup>	Area of section A cm <sup>2</sup>	
				Web t <sub>w</sub> mm	Flange t <sub>f</sub> mm			Web c <sub>w</sub> /t <sub>w</sub>	Flange c <sub>f</sub> /t <sub>f</sub>	End clearance C mm	Notch		Per metre m <sup>2</sup>	Per tonne m <sup>2</sup>	Axis y-y cm <sup>4</sup>	Axis z-z cm <sup>4</sup>	Axis y-y cm	Axis z-z cm	Axis y-y cm <sup>3</sup>	Axis z-z cm <sup>3</sup>	Axis y-y cm <sup>3</sup>	Axis z-z cm <sup>3</sup>						
											N mm	n mm																
<b>152 x 152</b>	<b>x 23</b>	23.0	152.4	152.2	5.8	6.8	7.6	123.6	21.3	9.65	5	84	16	0.889	38.7	1250	400	6.54	3.70	164	52.6	182	80.1	0.842	20.6	0.0210	4.63	29.2
	<b>x 30</b>	30.0	157.6	152.9	6.5	9.4	7.6	123.6	19.0	6.98	5	84	18	0.901	30.0	1750	560	6.76	3.83	222	73.3	248	112	0.847	16.1	0.0310	10.5	38.3
	<b>x 37</b>	37.0	161.8	154.4	8.0	11.5	7.6	123.6	15.5	5.70	6	84	20	0.912	24.6	2210	706	6.85	3.87	273	91.5	309	140	0.848	13.3	0.0400	19.2	47.1
	<b>x 44</b>	44.0	166.0	155.9	9.5	13.6	7.6	123.6	13.0	4.82	7	84	22	0.924	21.0	2700	860	6.94	3.92	326	110	372	169	0.847	11.5	0.0500	31.7	56.1
	<b>x 51</b>	51.2	170.2	157.4	11.0	15.7	7.6	123.6	11.2	4.18	8	84	24	0.935	18.3	3230	1020	7.04	3.96	379	130	438	199	0.848	10.1	0.0610	48.8	65.2
<b>203 x 203</b>	<b>x 46</b>	46.1	203.2	203.6	7.2	11.0	10.2	160.8	22.3	8.00	6	110	22	1.19	25.8	4570	1550	8.82	5.13	450	152	497	231	0.847	17.7	0.143	22.2	58.7
	<b>x 52</b>	52.0	206.2	204.3	7.9	12.5	10.2	160.8	20.4	7.04	6	110	24	1.20	23.1	5260	1780	8.91	5.18	510	174	567	264	0.847	15.8	0.167	31.8	66.3
	<b>x 60</b>	60.0	209.6	205.8	9.4	14.2	10.2	160.8	17.1	6.20	7	110	26	1.21	20.2	6120	2060	8.96	5.20	584	201	656	305	0.846	14.1	0.197	47.2	76.4
	<b>x 71</b>	71.0	215.8	206.4	10.0	17.3	10.2	160.8	16.1	5.09	7	110	28	1.22	17.2	7620	2540	9.18	5.30	706	246	799	374	0.853	11.9	0.250	80.2	90.4
	<b>x 86</b>	86.1	222.2	209.1	12.7	20.5	10.2	160.8	12.7	4.29	8	110	32	1.24	14.4	9450	3130	9.28	5.34	850	299	977	456	0.849	10.2	0.318	137	110
	<b>x 100</b>	99.6	228.6	210.3	14.5	23.7	10.2	160.8	11.1	3.70	9	108	34	1.25	12.6	11300	3680	9.44	5.39	988	350	1150	534	0.852	9.01	0.386	210	127
	<b>x 113</b>	113.5	235.0	212.1	16.3	26.9	10.2	160.8	9.87	3.26	10	108	38	1.27	11.2	13300	4290	9.59	5.45	1130	404	1330	618	0.852	8.11	0.464	305	145
<b>x 127</b>	127.5	241.4	213.9	18.1	30.1	10.2	160.8	8.88	2.91	11	108	42	1.28	10.0	15400	4920	9.75	5.50	1280	460	1520	704	0.856	7.36	0.549	427	162	
<b>254 x 254</b>	<b>x 73</b>	73.1	254.1	254.6	8.6	14.2	12.7	200.3	23.3	7.77	6	134	28	1.49	20.4	11400	3910	11.1	6.48	898	307	992	465	0.849	17.2	0.562	57.6	93.1
	<b>x 89</b>	88.9	260.3	256.3	10.3	17.3	12.7	200.3	19.4	6.38	7	134	30	1.50	16.9	14300	4860	11.2	6.55	1100	379	1220	575	0.850	14.5	0.717	102	113
	<b>x 107</b>	107.1	266.7	258.8	12.8	20.5	12.7	200.3	15.6	5.38	8	134	34	1.52	14.2	17500	5930	11.3	6.59	1310	458	1480	697	0.848	12.4	0.898	172	136
	<b>x 132</b>	132.0	276.3	261.3	15.3	25.3	12.7	200.3	13.1	4.36	10	134	38	1.55	11.7	22500	7530	11.6	6.69	1630	576	1870	878	0.850	10.3	1.19	319	168

	<b>x 167</b>	167.1	289.1	265.2	19.2	31.7	12.7	200.3	10.4	3.48	12	134	46	1.58	9.46	30000	9870	11.9	6.81	2080	744	2420	1140	0.851	8.48	1.63	626	213
<b>305 x 305</b>	<b>x 97</b>	96.9	307.9	305.3	9.9	15.4	15.2	246.7	24.9	8.60	7	158	32	1.79	18.5	22200	7310	13.4	7.69	1450	479	1590	726	0.851	19.2	1.56	91.2	123
	<b>x 118</b>	117.9	314.5	307.4	12.0	18.7	15.2	246.7	20.6	7.09	8	158	34	1.81	15.4	27700	9060	13.6	7.77	1760	589	1960	895	0.852	16.1	1.98	161	150
	<b>x 137</b>	136.9	320.5	309.2	13.8	21.7	15.2	246.7	17.9	6.11	9	158	38	1.82	13.3	32800	10700	13.7	7.83	2050	692	2300	1050	0.852	14.1	2.39	249	174
	<b>x 158</b>	158.1	327.1	311.2	15.8	25.0	15.2	246.7	15.6	5.30	10	158	42	1.84	11.6	38700	12600	13.9	7.90	2370	808	2680	1230	0.852	12.4	2.87	378	201
	<b>x 198</b>	198.1	339.9	314.5	19.1	31.4	15.2	246.7	12.9	4.22	12	158	48	1.87	9.44	50900	16300	14.2	8.04	3000	1040	3440	1580	0.854	10.2	3.88	734	252
	<b>x 240</b>	240.0	352.5	318.4	23.0	37.7	15.2	246.7	10.7	3.51	14	158	54	1.91	7.96	64200	20300	14.5	8.15	3640	1280	4250	1950	0.854	8.74	5.03	1270	306
	<b>x 283</b>	282.9	365.3	322.2	26.8	44.1	15.2	246.7	9.21	3.00	15	158	60	1.94	6.86	78900	24600	14.8	8.27	4320	1530	5110	2340	0.856	7.65	6.35	2030	360
<b>356 x 368</b>	<b>x 129</b>	129.0	355.6	368.6	10.4	17.5	15.2	290.2	27.9	9.37	7	190	34	2.14	16.6	40200	14600	15.6	9.43	2260	793	2480	1200	0.845	19.8	4.18	153	164
	<b>x 153</b>	152.9	362.0	370.5	12.3	20.7	15.2	290.2	23.6	7.92	8	190	36	2.16	14.1	48600	17600	15.8	9.49	2680	948	2960	1430	0.843	17.0	5.11	251	195
	<b>x 177</b>	177.0	368.2	372.6	14.4	23.8	15.2	290.2	20.2	6.89	9	190	40	2.17	12.3	57100	20500	15.9	9.54	3100	1100	3460	1670	0.843	15.0	6.09	381	226
	<b>x 202</b>	201.9	374.6	374.7	16.5	27.0	15.2	290.2	17.6	6.07	10	190	44	2.19	10.8	66300	23700	16.1	9.60	3540	1260	3970	1920	0.844	13.3	7.16	558	257
<b>356 x 406</b>	<b>x 235</b>	235.1	381.0	394.8	18.4	30.2	15.2	290.2	15.8	5.73	11	200	46	2.28	9.70	79100	31000	16.3	10.2	4150	1570	4690	2380	0.835	12.0	9.54	812	299
	<b>x 287</b>	287.1	393.6	399.0	22.6	36.5	15.2	290.2	12.8	4.74	13	200	52	2.31	8.05	99900	38700	16.5	10.3	5070	1940	5810	2950	0.835	10.2	12.3	1440	366
	<b>x 340</b>	339.9	406.4	403.0	26.6	42.9	15.2	290.2	10.9	4.03	15	200	60	2.35	6.91	123000	46900	16.8	10.4	6030	2330	7000	3540	0.836	8.85	15.5	2340	433
	<b>x 393</b>	393.0	419.0	407.0	30.6	49.2	15.2	290.2	9.48	3.52	17	200	66	2.38	6.06	147000	55400	17.1	10.5	7000	2720	8220	4150	0.837	7.85	18.9	3550	501
	<b>x 467</b>	467.0	436.6	412.2	35.8	58.0	15.2	290.2	8.11	2.98	20	200	74	2.42	5.18	183000	67800	17.5	10.7	8380	3290	10000	5030	0.839	6.85	24.3	5810	595
	<b>x 551</b>	551.0	455.6	418.5	42.1	67.5	15.2	290.2	6.89	2.56	23	200	84	2.48	4.49	227000	82700	18.0	10.9	9960	3950	12100	6060	0.842	6.05	31.1	9240	702
	<b>x 634</b>	633.9	474.6	424.0	47.6	77.0	15.2	290.2	6.10	2.25	26	200	94	2.52	3.98	275000	98100	18.4	11.0	11600	4630	14200	7110	0.842	5.46	38.8	13700	808