

UNIVERSAL BEAMS - DIMENSIONS AND PROPERTIES

To BS 4 : Part 1 : 1993

Designation	Mass per Metre kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web s mm	Thickness Flange t mm	Root Radius r mm	Depth Between Fillets d mm	Ratios for Local Buckling	
								Flange b/2t	Web d/s
1016 x 305 x 487	487.0	1036.1	308.5	30.0	54.1	30.0	867.8	2.85	29.0
1016 x 305 x 438	438.0	1025.9	305.4	26.9	49.0	30.0	868.0	3.12	32.3
1016 x 305 x 393	393.0	1016.0	303.0	24.4	43.9	30.0	868.2	3.45	35.7
1016 x 305 x 349	349.0	1008.1	302.0	21.1	40.0	30.0	868.0	3.78	41.2
1016 x 305 x 314	314.0	1000.0	300.0	19.1	35.9	30.0	868.2	4.18	45.6
1016 x 305 x 272	272.0	990.1	300.0	16.5	31.0	30.0	868.0	4.84	52.7
1016 x 305 x 249	249.0	980.2	300.0	16.5	26.0	30.0	868.0	5.77	52.7
1016 x 305 x 222	222.0	970.3	300.0	16.0	21.1	30.0	867.8	7.11	54.4
914 x 419 x 388	388.0	921.0	420.5	21.4	36.6	24.1	799.6	5.74	37.4
914 x 419 x 343	343.3	911.8	418.5	19.4	32.0	24.1	799.6	6.54	41.2
914 x 305 x 289	289.1	926.6	307.7	19.5	32.0	19.1	824.4	4.81	42.3
914 x 305 x 253	253.4	918.4	305.5	17.3	27.9	19.1	824.4	5.47	47.7
914 x 305 x 224	224.2	910.4	304.1	15.9	23.9	19.1	824.4	6.36	51.8
914 x 305 x 201	200.9	903.0	303.3	15.1	20.2	19.1	824.4	7.51	54.6
838 x 292 x 226	226.5	850.9	293.8	16.1	26.8	17.8	761.7	5.48	47.3
838 x 292 x 194	193.8	840.7	292.4	14.7	21.7	17.8	761.7	6.74	51.8
838 x 292 x 176	175.9	834.9	291.7	14.0	18.8	17.8	761.7	7.76	54.4
762 x 267 x 197	196.8	769.8	268.0	15.6	25.4	16.5	686.0	5.28	44.0
762 x 267 x 173	173.0	762.2	266.7	14.3	21.6	16.5	686.0	6.17	48.0
762 x 267 x 147	146.9	754.0	265.2	12.8	17.5	16.5	686.0	7.58	53.6
762 x 267 x 134	133.9	750.0	264.4	12.0	15.5	16.5	686.0	8.53	57.2
686 x 254 x 170	170.2	692.9	255.8	14.5	23.7	15.2	615.1	5.40	42.4
686 x 254 x 152	152.4	687.5	254.5	13.2	21.0	15.2	615.1	6.06	46.6
686 x 254 x 140	140.1	683.5	253.7	12.4	19.0	15.2	615.1	6.68	49.6
686 x 254 x 125	125.2	677.9	253.0	11.7	16.2	15.2	615.1	7.81	52.6
610 x 305 x 238	238.1	635.8	311.4	18.4	31.4	16.5	540.0	4.96	29.3
610 x 305 x 179	179.0	620.2	307.1	14.1	23.6	16.5	540.0	6.51	38.3
610 x 305 x 149	149.1	612.4	304.8	11.8	19.7	16.5	540.0	7.74	45.8

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Second Moment of Area Axis x-x cm	Axis y-y cm	Radius of Gyration Axis x-x cm	Axis y-y cm	Elastic Modulus Axis x-x cm ³	Axis y-y cm ³	Plastic Modulus		Buckling Parameter U	Torsional Index x	Wrapping Constant H	Torsional Constant J	Area of Section dm ²
						Axis x-x cm ³	Axis y-y cm ³					
1020400	26720	40.6	6.57	19700	1732	23180	2799	0.867	21.2	644	4276	619
908900	23440	40.4	6.49	17720	1535	20740	2467	0.868	23.2	55.9	3166	556
806600	20490	40.2	6.40	15880	1353	18520	2167	0.868	25.6	48.4	2314	500
722100	18460	40.3	6.44	14330	1222	16570	1940	0.872	28.0	43.2	1706	445
643200	16230	40.1	6.37	12860	1082	14830	1712	0.871	30.8	37.7	1253	400
552900	14000	40.0	6.36	11170	934	12800	1469	0.872	35.1	32.2	826	346
480300	11750	39.0	6.09	9799	784	11330	1244	0.861	40.1	26.8	575	316
406900	9544	38.0	5.81	8387	636	9784	1019	0.849	46.0	21.5	384	282
719600	45440	38.2	9.59	15630	2161	17670	3034	0.885	26.7	88.9	1734	494
625800	39160	37.8	9.46	13730	1871	15480	2890	0.883	30.1	75.8	1193	437
504200	15600	37.0	6.51	10880	1014	12570	1601	0.867	31.9	31.2	926	368
436300	13300	36.8	6.42	9501	871	10940	1371	0.866	36.2	26.4	626	323
376400	11240	36.3	6.27	8269	739	9535	1163	0.861	41.3	22.1	422	286
325300	9423	35.7	6.07	7204	621	8351	982	0.854	46.8	18.4	291	256
339700	11360	34.3	6.27	7985	773	9155	1212	0.870	35.0	19.3	514	289
279200	9066	33.6	6.06	6641	620	7640	974	0.862	41.6	15.2	306	247
246000	7799	33.1	5.90	5893	535	6808	842	0.856	46.5	13.0	221	224
240000	8175	30.9	5.71	6234	610	7176	959	0.869	33.2	11.3	404	251
205300	6850	30.5	5.58	5387	514	6198	807	0.864	38.1	9.39	267	220
168500	5455	30.0	5.40	4470	411	5156	647	0.858	45.2	7.40	159	187
150700	4788	29.7	5.30	4018	362	4644	570	0.854	49.8	6.46	119	171
170300	6630	28.0	5.53	4916	518	5631	811	0.872	31.8	7.42	308	217
150400	5784	27.8	5.46	4374	455	5000	710	0.871	35.5	6.42	220	194
136300	5183	27.6	5.39	3987	409	4558	638	0.868	38.7	5.72	169	178
118000	4383	27.2	5.24	3481	346	3994	542	0.862	43.9	4.80	116	159
209500	15840	26.3	7.23	6589	1017	7486	1574	0.886	21.3	14.5	875	303
153000	11410	25.9	7.07	4935	743	5547	1144	0.886	27.7	10.2	340	228
125900	9308	25.7	7.00	4111	611	4594	937	0.886	32.0	8.17	200	190

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Designation	Mass per Metre kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web s mm	Thickness Flange t mm	Root Radius r mm	Depth Between Fillets d mm	Ratios for Local Buckling	
								Flange b/2t	Web d/s
610 x 229 x 140	139.9	617.2	230.2	13.1	22.1	12.7	547.6	5.21	41.8
610 x 229 x 125	125.1	612.2	229.0	11.9	19.6	12.7	547.6	5.84	46.0
610 x 229 x 113	113.0	607.6	228.2	11.1	17.3	12.7	547.6	6.60	49.3
610 x 229 x 101	101.2	602.6	227.6	10.5	14.8	12.7	547.6	7.69	52.2
533 x 210 x 122	122.0	544.5	211.9	12.7	21.3	12.7	476.5	4.97	37.5
533 x 210 x 109	109.0	539.5	210.8	11.6	18.8	12.7	4755	5.61	41.1
533 x 210 x 101	101.0	536.7	210.0	10.8	17.4	12.7	476.5	6.03	44.1
533 x 210 x 92	92.1	533.1	209.3	10.1	15.6	12.7	476.5	6.71	47.2
533 x 210 x 82	82.2	528.3	208.8	9.6	13.2	12.7	476.5	7.91	49.6
457 x 191 x 98	98.3	467.2	192.8	11.4	19.6	10.2	407.6	4.92	35.8
457 x 191 x 89	89.3	463.4	191.9	10.5	17.7	10.2	407.6	5.42	38.8
457 x 191 x 82	82.0	460	191.3	9.9	16.0	10.2	407.6	5.98	41.2
457 x 191 x 74	74.3	457.0	190.4	9.0	14.5	10.2	407.6	6.57	45.3
457 x 191 x 67	67.1	453.4	189.9	8.5	12.7	10.2	407.6	7.48	48.0
457 x 152 x 82	82.1	465.8	155.3	10.5	18.9	10.2	407.6	4.11	38.8
457 x 152 x 74	74.2	462.0	154.4	9.6	17.0	10.2	407.6	4.54	42.5
457 x 152 x 67	67.2	458.0	153.8	9.0	15.0	10.2	407.6	5.13	45.3
457 x 152 x 60	59.8	454.6	152.9	8.1	13.3	10.2	407.6	5.75	50.3
457 x 152 x 52	52.3	449.8	152.4	7.6	10.9	10.2	407.6	6.99	53.6
406 x 178 x 74	74.2	412.8	179.5	9.5	16.0	10.2	360.4	5.61	37.9
406 x 178 x 67	67.1	409.4	178.8	8.8	14.3	10.2	360.4	6.25	41.0
406 x 178 x 60	60.1	406.4	177.9	7.9	12.8	10.2	360.4	6.95	45.6
406 x 178 x 54	54.1	402.6	177.7	7.7	10.9	10.2	360.4	8.15	46.8
406 x 140 x 46	46.0	403.2	142.2	6.8	11.2	10.2	360.4	6.35	53.0
406 x 140 x 39	39.0	398.0	141.8	6.4	8.6	10.2	360.4	8.24	56.3
356 x 171 x 67	67.1	363.4	173.2	9.1	15.7	10.2	311.6	5.52	34.2
356 x 171 x 57	57.0	358.0	172.2	8.1	13.0	10.2	311.6	6.62	38.5
356 x 171 x 51	51.0	355.0	171.5	7.4	11.5	10.2	311.6	7.46	42.1
356 x 171 x 45	45.0	351.4	171.1	7.0	9.7	10.2	311.6	8.82	44.5

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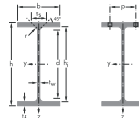
To BS 4 : Part 1 : 1993

Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter U	Torsional Index x	Wrapping Constant H	Torsional Constant J	Area of Section
Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y					
cm	cm	cm	cm	cm ⁴	cm ⁴	cm ³	cm ³			dm ⁴	dm ⁴	dm ²
111800	4505	25.0	5.03	3622	391	4142	611	0.875	30.6	3.99	216	3.99
98610	3932	24.9	4.97	3221	343	3676	535	0.873	34.1	3.45	154	3.45
87320	3434	24.6	4.88	2874	301	3281	469	0.870	38.0	2.99	111	2.99
75780	2915	24.2	4.75	2515	256	2881	400	0.864	43.1	2.52	77	2.52
76040	3388	22.1	4.67	2793	320	3196	500	0.877	27.6	2.32	178	2.32
66820	2943	21.9	4.60	2477	279	2828	436	0.875	30.9	1.99	126	1.99
61520	2692	21.9	4.57	2292	256	2612	399	0.874	33.2	1.81	101	1.81
55230	2389	21.7	4.51	2072	228	2360	356	0.872	36.5	1.60	75.7	1.60
47540	2007	21.3	4.38	1800	192	2059	300	0.864	41.6	1.33	51.5	1.33
45730	2347	19.1	4.33	1957	243	2232	379	0.881	25.7	1.18	121	1.18
41020	2089	19.0	4.29	1770	218	2014	338	0.880	28.3	1.04	90.7	1.04
37050	1871	18.8	4.23	1611	196	1831	304	0.877	30.9	0.922	69.2	0.922
33320	1671	18.8	4.20	1458	176	1653	272	0.877	33.9	0.818	51.8	0.818
29380	1452	18.5	4.12	1296	153	1471	237	0.872	37.9	0.705	37.1	0.705
36590	1185	18.7	3.37	1571	153	1811	240	0.873	27.4	0.591	89.2	0.591
32670	1047	18.6	3.33	1414	136	1627	213	0.873	30.1	0.518	65.9	0.518
28930	913	18.4	3.27	1263	119	1453	187	0.869	33.6	0.448	47.7	0.448
25500	795	18.3	3.23	1122	104	1287	163	0.868	37.5	0.387	33.8	0.387
21370	645	17.9	3.11	950	84.6	1096	133	0.859	43.9	0.311	21.4	0.311
27310	1545	17.0	4.04	1323	172	1501	267	0.882	27.6	0.608	62.8	0.608
24330	1365	16.9	3.99	1189	153	1346	237	0.880	30.5	0.533	46.1	0.533
21600	1203	16.8	3.97	1063	135	1199	209	0.880	33.8	0.466	33.3	0.466
18720	1021	16.5	3.85	930	115	1055	178	0.871	38.3	0.392	23.1	0.392
15690	538	16.4	3.03	778	75.7	888	118	0.871	38.9	0.207	19.0	0.207
12510	410	15.9	2.87	629	57.8	724	90.8	0.858	47.5	0.155	10.7	0.155
19460	1362	15.1	3.99	1071	157	1211	243	0.886	24.4	0.412	55.7	0.412
16040	1108	14.9	3.91	896	129	1010	199	0.882	28.8	0.330	33.4	0.330
14140	968	14.8	3.86	796	113	896	174	0.881	32.1	0.286	23.8	0.286
12070	811	14.5	3.76	687	94.8	775	147	0.874	36.8	0.237	15.8	0.237

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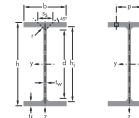
Designation	Mass per Metre	Depth of Section h	Width of Section b	Thickness Web s	Thickness Flange t	Root Radius r	Depth Between Fillets d	Ratios for Local Buckling	
								Flange b/t	Web d/s
356 x 127 x 39	39.1	353.4	126.0	6.6	10.7	10.2	311.6	5.89	47.2
356 x 127 x 33	33.1	349.0	125.4	6.0	8.5	10.2	311.6	7.38	51.9
305 x 165 x 54	54.0	310.4	166.9	7.9	13.7	8.9	265.2	6.09	33.6
305 x 165 x 46	46.1	306.6	165.7	6.7	11.8	8.9	265.2	7.02	39.6
305 x 165 x 40	40.3	303.4	165.0	6.0	10.2	8.9	265.2	8.09	44.2
305 x 127 x 48	48.1	311.0	125.3	9.0	14.0	8.9	265.2	4.47	29.5
305 x 127 x 42	41.9	307.2	124.3	8.0	12.1	8.9	265.2	5.14	33.2
305 x 127 x 37	37.0	304.4	123.3	7.1	10.7	8.9	265.2	5.77	37.4
305 x 102 x 33	32.8	312.7	102.4	6.6	10.8	7.6	275.9	4.74	41.8
305 x 102 x 28	28.2	308.7	101.8	6.0	8.8	7.6	275.9	5.78	46.0
305 x 102 x 25	24.8	305.1	101.6	5.8	7.0	7.6	275.9	7.26	47.6
254 x 146 x 43	43.0	259.6	147.3	7.2	12.7	7.6	219.0	5.80	30.4
254 x 146 x 37	37.0	256.0	146.4	6.3	10.9	7.6	219.0	6.72	34.8
254 x 146 x 31	31.1	251.4	146.1	6.0	8.6	7.6	219.0	8.49	36.5
254 x 102 x 28	28.3	260.4	102.2	6.3	10.0	7.6	225.2	5.11	35.7
254 x 102 x 25	25.2	257.2	101.9	6.0	8.4	7.6	225.2	6.07	37.5
254 x 102 x 22	22.0	254.0	101.6	5.7	6.8	7.6	225.2	7.47	39.5
203 x 133 x 30	30.0	206.8	133.9	6.4	9.6	7.6	172.4	6.97	26.9
203 x 133 x 25	25.1	203.2	133.2	5.7	7.8	7.6	172.4	8.54	30.2
203 x 102 x 23	23.1	203.2	101.8	5.4	9.3	7.6	169.4	5.47	31.4
178 x 102 x 19	19.0	177.8	101.2	4.8	7.9	7.6	146.8	6.41	30.6
152 x 89 x 16	16.0	152.4	88.7	4.5	7.7	7.6	121.8	5.76	27.1
127 x 76 x 13	13.0	127.0	76.0	4.0	7.6	7.6	96.6	5.00	24.1



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Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter U	Torsional Index x	Wrapping Constant H	Torsional Constant J	Area of Section
Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y					
cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³			dm ³	dm ³	dm ²
10170	358	14.3	2.68	576	56.8	659	891	0.871	35.2	0.105	35.2	35.2
8249	280	14.0	2.58	473	44.7	543	70.3	0.863	42.2	0.0812	42.2	42.2
11700	1063	13.0	3.93	754	127	846	196	0.889	23.6	0.234	23.6	23.6
9899	896	13.0	3.90	646	108	720	166	0.891	27.1	0.195	27.1	27.1
8503	764	12.9	3.86	560	92.6	623	142	0.889	31.0	0.164	31.0	31.0
9575	461	12.5	2.74	616	73.6	711	116	0.873	23.3	0.102	23.3	23.3
8196	389	12.4	2.70	534	62.6	614	98.4	0.872	26.5	0.0846	26.5	26.5
7171	336	12.3	2.67	471	54.5	539	85.4	0.872	29.7	0.0725	29.7	29.7
6501	194	12.5	2.15	416	37.9	481	60.0	0.866	31.6	0.0442	31.6	31.6
5366	155	12.2	2.08	348	30.5	403	48.5	0.859	37.4	0.0349	37.4	37.4
4455	123	11.9	1.97	292	24.2	342	38.8	0.846	43.4	0.0273	43.4	43.4
6544	677	10.9	3.52	504	92.0	566	141	0.891	21.2	0.103	21.2	21.2
5537	571	10.8	3.48	433	78.0	483	119	0.890	24.3	0.0857	24.3	24.3
4413	448	10.5	3.36	351	61.3	393	94.1	0.880	29.6	0.0660	29.6	29.6
4005	179	10.5	2.22	308	34.9	353	54.8	0.874	27.5	0.0280	27.5	27.5
3415	149	10.3	2.15	266	29.2	306	46.0	0.866	31.5	0.0230	31.5	31.5
2841	119	10.1	2.06	224	23.5	259	37.3	0.856	36.4	0.0182	36.4	36.4
2896	385	8.71	3.17	280	57.5	314	88.2	0.881	21.5	0.0374	21.5	21.5
2340	308	8.56	3.10	230	46.2	258	70.9	0.877	25.6	0.0294	25.6	25.6
2105	164	8.46	2.36	207	32.2	234	49.8	0.888	22.5	0.0154	22.5	22.5
1356	137	7.48	2.37	153	27.0	171	41.6	0.888	22.6	0.00987	22.6	22.6
834	89.8	6.41	2.10	109	20.2	123	31.2	0.890	19.6	0.00470	19.6	19.6
473	55.7	5.35	1.84	74.6	14.7	84.2	22.6	0.895	16.3	0.00199	16.3	16.3



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Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter U	Torsional Index x	Wrapping Constant H	Torsional Constant J	Area of Section
Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y					
cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³			dm ⁶	dm ⁴	dm ²
274800	98130	184	11.0	11580	4629	14240	7108	0.843	5.46	38.8	13720	808
226900	82670	18.0	10.9	9962	3951	12080	6058	0.841	6.05	31.1	9240	702
183000	67830	17.5	10.7	8383	3291	10000	5034	0.839	6.86	24.30	5809	595
146600	55370	17.1	10.5	6998	2721	8222	4154	0.837	7.86	18.90	3545	501
122500	46850	16.8	10.4	6031	2325	6999	3544	0.836	8.85	15.50	2343	433
99880	38680	16.5	10.3	5075	1939	5812	2949	0.835	10.2	12.30	1441	366
79080	30990	16.3	10.2	4151	1570	4687	2383	0.834	12.1	9.54	812	299
66260	23690	16.1	9.60	3538	1264	3972	1920	0.844	134	7.16	558	257
57120	20530	15.9	9.54	3103	1102	3455	1671	0.844	15.0	6.09	381	226
48590	17550	15.8	9.49	2684	948	2965	1435	0.844	17.0	5.11	251	195
40250	14610	15.6	9.43	2264	793	2479	1199	0.844	19.9	4.18	153	164
78870	24630	14.8	8.27	4318	1529	5105	2342	0.855	7.65	6.35	2034	360
64200	20310	14.5	8.15	3643	1276	4247	1951	0.854	8.74	5.03	1271	306
50900	16300	14.2	8.04	2995	1037	3440	1581	0.854	10.2	3.88	734	252
38750	12570	13.9	7.90	2369	808	2680	1230	0.851	12.5	2.87	378	201
32810	10700	13.7	7.83	2048	692	2297	1053	0.851	14.2	2.39	249	174
27670	9059	13.6	7.77	1760	589	1958	895	0.850	16.2	1.98	161	150
22250	7308	13.4	7.69	1445	479	1592	726	0.850	19.3	1.56	91.2	123
30000	9870	11.9	6.81	2075	744	2424	1137	0.851	8.49	1.63	626	213
22530	7531	11.6	6.69	1631	576	1869	878	0.850	10.3	1.19	319	168
17510	5928	11.3	6.59	1313	458	1484	697	0.848	12.4	0.898	172	136
14270	4857	11.2	6.55	1096	379	1224	575	0.850	14.5	0.717	102	113
11410	3908	11.1	6.48	898	307	992	465	0.849	17.3	0.562	57.6	93.1
9449	3127	9.28	5.34	850	299	977	456	0.850	10.2	0.318	137	110
7618	2537	9.18	5.30	706	246	799	374	0.853	11.9	0.250	80.2	904
6125	2065	8.96	5.20	584	201	656	305	0.846	14.1	0.197	47.2	76.4
5259	1778	8.91	5.18	510	174	567	264	0.848	15.8	0.167	31.8	66.3
4568	1548	8.82	5.13	450	152	497	231	0.847	17.7	0.143	22.2	58.7
2210	706	6.85	3.87	273	91.5	309	140	0.848	13.3	0.0399	19.2	47.1
1748	560	6.76	3.83	222	73.3	248	112	0.849	16.0	0.0308	10.5	38.3
1250	400	6.54	3.70	164	52.6	182	80.2	0.840	20.7	0.0212	4.63	29.2

