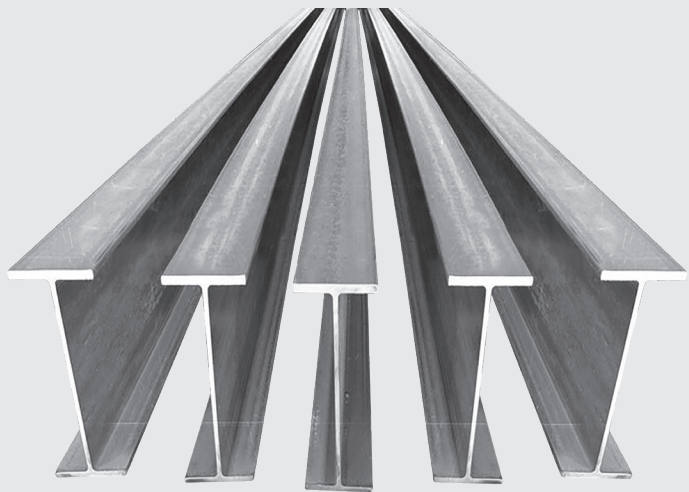


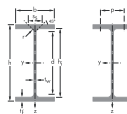
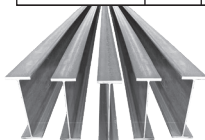
UNIVERSAL BEAMS



UNIVERSAL BEAMS - DIMENSIONS AND PROPERTIES

To BS 4 : Part 1993 : I

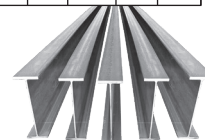
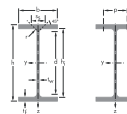
Designation	Mass per Metre kg/m	Depth of Section h mm	Width of Section b mm	Thickness Web s mm	Thickness Flange t mm	Root Radius r mm	Depth Between Fillets d mm	Ratios for Local Buckling	
								Flange b/2t	Web d/s
127 x 76 x 13	13.0	127.0	76.0	4.0	7.6	7.6	96.6	5.00	24.1
152 x 89 x 16	16.0	152.4	88.7	4.5	7.7	7.6	121.8	5.76	27.1
178 x 102 x 19	19.0	177.8	101.2	4.8	7.9	7.6	146.8	6.41	30.6
203 x 102 x 23	23.1	203.2	101.8	5.4	9.3	7.6	169.4	5.47	31.4
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 133 x 30	30.0	206.8	133.9	6.4	9.6	7.6	172.4	6.97	26.9
254 x 102 x 22	22.0	254.0	101.6	5.7	6.8	7.6	225.2	7.47	39.5
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 28	28.3	260.4	102.2	6.3	10.0	7.6	225.2	5.11	35.7
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 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 43	43.0	259.6	147.3	7.2	12.7	7.6	219.0	5.80	30.4
305 x 102 x 25	24.8	305.1	101.6	5.8	7.0	7.6	275.9	7.26	47.6
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 33	32.8	312.7	102.4	6.6	10.8	7.6	275.9	4.74	41.8
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 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 48	48.1	311.0	125.3	9.0	14.0	8.9	265.2	4.47	29.5
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 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 54	54.0	310.4	166.9	7.9	13.7	8.9	265.2	6.09	33.6
356 x 127 x 33	33.1	349.0	125.4	6.0	8.5	10.2	311.6	7.38	51.9
356 x 127 x 39	39.1	353.4	126.0	6.6	10.7	10.2	311.6	5.89	47.2



UNIVERSAL BEAMS - DIMENSIONS AND PROPERTIES

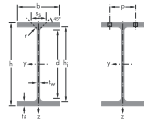
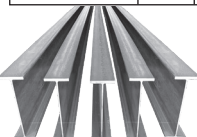
To BS 4 : Part I : 1993

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 dm ²
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					
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
834	89.8	6.41	2.10	109	20.2	123	31.2	0.890	19.6	0.00470	19.6	19.6
1356	137	7.48	2.37	153	27.0	171	41.6	0.888	22.6	0.00987	22.6	22.6
2105	164	8.46	2.36	207	32.2	234	49.8	0.888	22.5	0.0154	22.5	22.5
2340	308	8.56	3.10	230	46.2	258	70.9	0.877	25.6	0.0294	25.6	25.6
2896	385	8.71	3.17	280	57.5	314	88.2	0.881	21.5	0.0374	21.5	21.5
2841	119	10.1	2.06	224	23.5	259	37.3	0.856	36.4	0.0182	36.4	36.4
3415	149	10.3	2.15	266	29.2	306	46.0	0.866	31.5	0.0230	31.5	31.5
4005	179	10.5	2.22	308	34.9	353	54.8	0.874	27.5	0.0280	27.5	27.5
4413	448	10.5	3.36	351	61.3	393	94.1	0.880	29.6	0.0660	29.6	29.6
5537	571	10.8	3.48	433	78.0	483	119	0.890	24.3	0.0857	24.3	24.3
6544	677	10.9	3.52	504	92.0	566	141	0.891	21.2	0.103	21.2	21.2
4455	123	11.9	1.97	292	24.2	342	38.8	0.846	43.4	0.0273	43.4	43.4
5366	155	12.2	2.08	348	30.5	403	48.5	0.859	37.4	0.0349	37.4	37.4
6501	194	12.5	2.15	416	37.9	481	60.0	0.866	31.6	0.0442	31.6	31.6
7171	336	12.3	2.67	471	54.5	539	85.4	0.872	29.7	0.0725	29.7	29.7
8196	389	12.4	2.70	534	62.6	614	98.4	0.872	26.5	0.0846	26.5	26.5
9575	461	12.5	2.74	616	73.6	711	116	0.873	23.3	0.102	23.3	23.3
8503	764	12.9	3.86	560	92.6	623	142	0.889	31.0	0.164	31.0	31.0
9899	896	13.0	3.90	646	108	720	166	0.891	27.1	0.195	27.1	27.1
11700	1063	13.0	3.93	754	127	846	196	0.889	23.6	0.234	23.6	23.6
8249	280	14.0	2.58	473	44.7	543	70.3	0.863	42.2	0.0812	42.2	42.2
10170	358	14.3	2.68	576	56.8	659	89.1	0.871	35.2	0.105	35.2	35.2



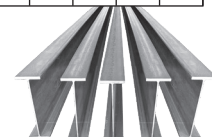
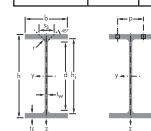
UNIVERSAL BEAMS - DIMENSIONS AND PROPERTIES To BS 4 : Part 1 : 1993

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
356 x 171 x 45	45.0	351.4	171.1	7.0	9.7	10.2	311.6	8.82	44.5
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 57	57.0	358.0	172.2	8.1	13.0	10.2	311.6	6.62	38.5
356 x 171 x 67	67.1	363.4	173.2	9.1	15.7	10.2	311.6	5.52	34.2
406 x 140 x 39	39.0	398.0	141.8	6.4	8.6	10.2	360.4	8.24	56.3
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 178 x 54	54.1	402.6	177.7	7.7	10.9	10.2	360.4	8.15	46.8
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 67	67.1	409.4	178.8	8.8	14.3	10.2	360.4	6.25	41.0
406 x 178 x 74	74.2	412.8	179.5	9.5	16.0	10.2	360.4	5.61	37.9
457 x 152 x 52	52.3	449.8	152.4	7.6	10.9	10.2	407.6	6.99	53.6
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 67	67.2	458.0	153.8	9.0	15.0	10.2	407.6	5.13	45.3
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 82	82.1	465.8	155.3	10.5	18.9	10.2	407.6	4.11	38.8
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 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 82	82.0	460	191.3	9.9	16.0	10.2	407.6	5.98	41.2
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 98	98.3	467.2	192.8	11.4	19.6	10.2	407.6	4.92	35.8
533 x 210 x 82	82.2	528.3	208.8	9.6	13.2	12.7	476.5	7.91	49.6
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 101	101.0	536.7	210.0	10.8	17.4	12.7	476.5	6.03	44.1
533 x 210 x 109	109.0	539.5	210.8	11.6	18.8	12.7	475.5	5.61	41.1
533 x 210 x 122	122.0	544.5	211.9	12.7	21.3	12.7	476.5	4.97	37.5
610 x 229 x 101	101.2	602.6	227.6	10.5	14.8	12.7	547.6	7.69	52.2
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 125	125.1	612.2	229.0	11.9	19.6	12.7	547.6	5.84	46.0
610 x 229 x 140	139.9	617.2	230.2	13.1	22.1	12.7	547.6	5.21	41.8



UNIVERSAL BEAMS - DIMENSIONS AND PROPERTIES To BS 4 : Part 1993 : I

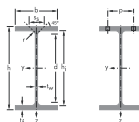
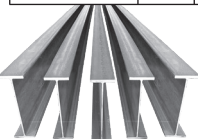
Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter U	Torsional Index x	Wrapping Constant H	Torsional Constant J	Area of Section
Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y					
cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³					
12070	811	14.5	3.76	687	94.8	775	147	0.874	36.8	0.237	15.8	0.237
14140	968	14.8	3.86	796	113	896	174	0.881	32.1	0.286	23.8	0.286
16040	1108	14.9	3.91	896	129	1010	199	0.882	28.8	0.330	33.4	0.330
19460	1362	15.1	3.99	1071	157	1211	243	0.886	24.4	0.412	55.7	0.412
12510	410	15.9	2.87	629	57.8	724	90.8	0.858	47.5	0.155	10.7	0.155
15690	538	16.4	3.03	778	75.7	888	118	0.871	38.9	0.207	19.0	0.207
18720	1021	16.5	3.85	930	115	1055	178	0.871	38.3	0.392	23.1	0.392
21600	1203	16.8	3.97	1063	135	1199	209	0.880	33.8	0.466	33.3	0.466
24330	1365	16.9	3.99	1189	153	1346	237	0.880	30.5	0.533	46.1	0.533
27310	1545	17.0	4.04	1323	172	1501	267	0.882	27.6	0.608	62.8	0.608
21370	645	17.9	3.11	950	84.6	1096	133	0.859	43.9	0.311	21.4	0.311
25500	795	18.3	3.23	1122	104	1287	163	0.868	37.5	0.387	33.8	0.387
28930	913	18.4	3.27	1263	119	1453	187	0.869	33.6	0.448	47.7	0.448
32670	1047	18.6	3.33	1414	136	1627	213	0.873	30.1	0.518	65.9	0.518
36590	1185	18.7	3.37	1571	153	1811	240	0.873	27.4	0.591	89.2	0.591
29380	1452	18.5	4.12	1296	153	1471	237	0.872	37.9	0.705	37.1	0.705
33320	1671	18.8	4.20	1458	176	1653	272	0.877	33.9	0.818	51.8	0.818
37050	1871	18.8	4.23	1611	196	1831	304	0.877	30.9	0.922	69.2	0.922
41020	2089	19.0	4.29	1770	218	2014	338	0.880	28.3	1.04	90.7	1.04
45730	2347	19.1	4.33	1957	243	2132	379	0.881	25.7	1.18	121	1.18
47540	2007	21.3	4.38	1800	192	2059	300	0.864	41.6	1.33	51.5	1.33
55230	2389	21.7	4.51	2072	228	2360	356	0.872	36.5	1.60	75.7	1.60
61520	2692	21.9	4.57	2292	256	2612	399	0.874	33.2	1.81	101	1.81
66820	2943	21.9	4.60	2477	279	2828	436	0.875	30.9	1.99	126	1.99
76040	3388	22.1	4.67	2793	320	3196	500	0.877	27.6	2.32	178	2.32
75780	2915	24.2	4.75	2515	256	2881	400	0.864	43.1	2.52	77	2.52
87320	3434	24.6	4.88	2874	301	3281	469	0.870	38.0	2.99	111	2.99
98610	3932	24.9	4.97	3221	343	3676	535	0.873	34.1	3.45	154	3.45
111800	4505	25.0	5.03	3622	391	4142	611	0.875	30.6	3.99	216	3.99



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
610 x 305 x 149	149.1	612.4	304.8	11.8	19.7	16.5	540.0	7.74	45.8
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 238	238.1	635.8	311.4	18.4	31.4	16.5	540.0	4.96	29.3
686 x 254 x 125	125.2	677.9	253.0	11.7	16.2	15.2	615.1	7.81	52.6
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 152	152.4	687.5	254.5	13.2	21.0	15.2	615.1	6.06	46.6
686 x 254 x 170	170.2	692.9	255.8	14.5	23.7	15.2	615.1	5.40	42.4
762 x 267 x 134	133.9	750.0	264.4	12.0	15.5	16.5	686.0	8.53	57.2
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 173	173.0	762.2	266.7	14.3	21.6	16.5	686.0	6.17	48.0
762 x 267 x 197	196.8	769.8	268.0	15.6	25.4	16.5	686.0	5.28	44.0
838 x 292 x 176	175.9	834.9	291.7	14.0	18.8	17.8	761.7	7.76	54.4
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 226	226.5	850.9	293.8	16.1	26.8	17.8	761.7	5.48	47.3
914 x 305 x 201	200.9	903.0	303.3	15.1	20.2	19.1	824.4	7.51	54.6
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 253	253.4	918.4	305.5	17.3	27.9	19.1	824.4	5.47	47.7
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 419 x 343	343.3	911.8	418.5	19.4	32.0	24.1	799.6	6.54	41.2
914 x 419 x 388	388.0	921.0	420.5	21.4	36.6	24.1	799.6	5.74	37.4
1016 x 305 x 222	222.0	970.3	300.0	16.0	21.1	30.0	867.8	7.11	54.4
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 272	272.0	990.1	300.0	16.5	31.0	30.0	868.0	4.84	52.7
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 349	349.0	1008.1	302.0	21.1	40.0	30.0	868.0	3.78	41.2
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 438	438.0	1025.9	305.4	26.9	49.0	30.0	868.0	3.12	32.3
1016 x 305 x 487	487.0	1036.1	308.5	30.0	54.1	30.0	867.8	2.85	29.0



UNIVERSAL BEAMS - DIMENSIONS AND PROPERTIES

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 ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³					
125900	9308	25.7	7.00	4111	611	4594	937	0.886	32.7	8.17	200	190
153000	11410	25.9	7.07	4935	743	5547	1144	0.886	27.7	10.2	340	228
209500	15840	26.3	7.23	6589	1017	7486	1574	0.886	21.3	14.5	875	303
118000	5383	27.2	5.24	3481	346	3994	542	0.862	43.9	4.80	116	159
136300	4183	27.6	5.39	3987	409	4558	638	0.868	38.7	5.72	169	178
150400	5784	27.8	5.46	4374	455	5000	710	0.871	35.5	6.42	220	194
170300	6630	28.0	5.53	4916	518	5631	811	0.872	31.8	7.42	308	217
150700	4788	29.7	5.30	4018	362	4644	570	0.854	49.8	6.46	119	171
168500	5455	30.0	5.40	4470	411	5156	647	0.858	45.2	7.40	159	187
205300	6850	30.5	5.58	5387	514	6198	807	0.864	38.1	9.39	267	220
240000	8175	30.9	5.71	6234	610	7176	959	0.869	33.2	11.3	404	251
246000	7799	33.1	5.90	5893	535	6808	842	0.856	46.5	13.0	221	224
279200	9066	33.6	6.06	6641	620	7640	974	0.862	41.6	15.2	306	247
339700	11360	34.3	6.27	7985	773	9155	1212	0.870	35.0	19.3	514	289
325300	9423	35.7	6.07	7204	621	8351	982	0.854	46.8	18.4	291	256
376400	11240	36.3	6.27	8269	739	9535	1163	0.861	41.3	22.1	422	286
436300	13300	36.8	6.42	9591	871	10940	1371	0.866	36.2	26.4	626	323
504200	15600	37.0	6.51	10880	1014	12570	1601	0.867	31.9	31.2	926	368
625800	39160	37.8	9.46	13730	1871	15480	2890	0.883	30.1	75.8	1193	437
719600	45440	38.2	9.59	15630	2161	17670	3341	0.885	26.7	88.9	1734	494
406900	9544	38.0	5.81	8387	636	9784	1019	0.849	46.0	21.5	384	282
480300	11750	39.0	6.09	9799	784	11330	1244	0.861	40.1	26.8	575	316
552900	14000	40.0	6.36	11170	934	12800	1469	0.872	35.1	32.2	826	346
643200	16230	40.1	6.37	12860	1082	14830	1712	0.871	30.8	37.7	1253	400
722100	18460	40.3	6.44	14330	1222	16570	1940	0.872	28.0	43.2	1706	445
806600	20490	40.2	6.40	15880	1353	18520	2167	0.868	25.6	48.4	2314	500
908900	23440	40.4	6.49	17720	1535	20740	2467	0.868	23.2	55.9	3166	556
1020400	26720	40.6	6.57	19700	1732	23180	2799	0.867	21.2	64.4	4276	619

