

2. Beams

Structural steel product having a profile of a specific cross section, like a H or I, usually used in construction and is designed to support heavy loads.

- 2.1 Parallel Flange I Sections (IPE)
- 2.2 Wide Flange Beams (HE)
- 2.3 Universal Beams (UB)
- 2.4 Universal Columns (UC)
- 2.5 Metric Beams (MB)
- 2.6 Metric Columns (MC)

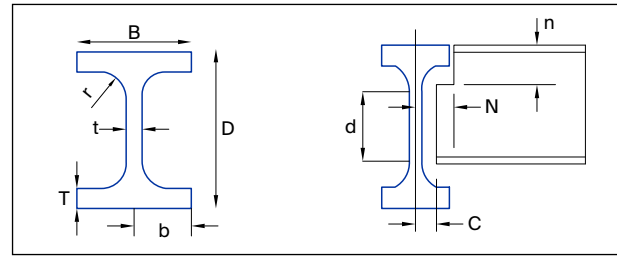
Universal Beams and Columns Standard specifications

The standard specifications used for production of universal beams and columns in this region are listed in this table.

Material	Yield strength			Tensile strength N/mm ²	Min. Elongation L ₀ =5.65√S ₀	Min. Charpy V-notch.	Dimensions & Tolerances
	≤11mm	>11 - <40mm	≥40mm				
AS 3679.1							AS 3679.1
Grade 300	320	300	280	min. 440	22%	27J @ 0°C	
Grade 350	360	340	330	min. 480	20%	27J @ 0°C	
ASTM A36 (1996)		min. 250		400-550	20-21 %	-	ASTM A6
ASTM A572							
Grade 42		min. 290		min. 415	20-24 %	-	
Grade 50		min. 345		min. 450	18-21 %	-	
Grade 60		min. 415		min. 520	16-18 %	-	
Grade 65		min. 450		min. 550	15-17 %	-	
ASTM A992		345 - 450		min. 450	18-21 %	-	
EN 10025	≤16mm	>16 - ≤40mm	>40 - ≤150mm	3-100mm			EN 10034
S275JR	275	265	255 - 225	410-560	18-23 %	27J @ 20°C	
S355JR	355	345	335 - 295	470-630	17-22 %	27J @ 20°C	
S355J0	355	345	335 - 295	470-630	17-22 %	27J @ 0°C	
S355J2	355	345	335 - 295	470-630	17-22 %	27J @ -20°C	
S460M	460	440	430 - 385	500-720	17%	40J @ -20°C	
ETA - 10/0156	≤100mm	>100 - ≤140mm					EN 10034
HISTAR460	460	450		540-720	17%	40J @ -20°C	
JIS 3101	≤16mm	>16 - ≤40mm	>40 - ≤100mm	t<100mm			JIS 3192
SS400	245	235	215	400-510	17-23 %	-	
SS490	285	275	255	490-610	15-21 %	-	
SS540	400	390	-	min. 540	13-17 %	-	
JIS 3106	≤16mm	>16 - ≤40mm	>40mm	t<100mm			
SM400A	245	235	215	400-510	18-24 %	-	
SM400B	245	235	215	400-510	18-24 %	27J @ 0°C	
SM400C	245	235	215	400-510	18-24 %	47J @ 0°C	
SM490A	325	315	295	490-610	17-23 %	-	
SM490B	325	315	295	490-610	17-23 %	27J @ 0°C	
SM490C	325	315	295	490-610	17-23 %	47J @ 0°C	
SM490YA	365	355	335	490-610	15-21 %	-	
SM490YB	365	355	335	490-610	15-21 %	27J @ 0°C	
SM520B	365	355	335	520-640	15-21%	27J @ 0°C	
SM520C	365	355	335	520-640	15-21 %	47J @ 0°C	



2.3 Universal Beams & Columns (UB & UC)



Imperial Units

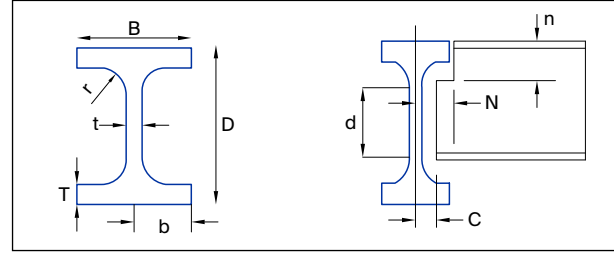
Designation	Depth of Section	Width of Section	Thickness		Root Radius	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing				
			Flange	Web				Flange	Web	End clearance	Notch			
Size	Mass per Metre		D	B	T	t	r	d	A	b/T	d/t	C	N	n
in (mm)	lb/ft	kg/m	mm	mm	mm	mm	mm	mm	cm ²			mm	mm	mm
W4-4x4 (102x102)	13	19.4	105.7	103.1	8.8	7.1	6.4	75.5	24.7	5.88	10.6	6	58	15
	13.8	21.0	102.0	102.0	9.4	8.0	6.0	71.2	26.1	5.43	8.90	6	57	15
	16.3	24.0	107.0	100.0	12.0	7.9	6.0	71.0	30.9	4.17	8.99	6	56	18
W5-5x3 (127x76)	9	13.0	127.0	76.0	7.6	4.0	7.6	96.6	16.5	5.00	24.2	4	46	15
W5-5x5 (127x127)	16	23.8	127.3	127.0	9.1	6.1	7.6	93.8	30.4	6.95	15.4	5	70	17
	19	28.3	130.8	127.8	10.9	6.9	7.6	93.8	35.8	5.86	13.7	5	70	19
W6-6x3 (152x76)	9	14.0	150.0	75.0	7.0	5.0	8.0	120.0	17.8	5.36	24.0	5	45	15
	12	18.0	155.0	75.0	8.5	6.0	8.0	122.0	21.6	4.41	20.3	5	45	17
W6-6x3 1/2 (152x89)	11	16.0	152.4	88.7	7.7	4.5	7.6	121.8	20.3	5.76	27.1	4	52	15
W6-6x4 (152x102)	9	13.4	149.9	100.1	5.5	4.3	6.4	126.3	17.3	9.17	29.2	4	58	12
	12	17.9	153.2	101.6	7.1	5.8	6.4	126.3	22.9	7.14	21.6	5	58	13
	16	23.8	159.5	102.4	10.2	6.6	6.4	126.4	30.4	5.02	19.2	5	58	17
W6-6x6 (152x152)	15	22.3	152.1	152.1	6.6	5.8	6.4	126.2	28.5	11.5	21.6	5	83	13
	15.7	23.0	152.4	152.2	6.8	5.8	7.6	123.6	29.2	11.2	21.3	5	83	14
	20	30.0	157.6	152.9	9.4	6.5	7.6	123.6	38.3	8.13	19.0	5	83	17
	25	37.0	161.8	154.4	11.5	8.0	7.6	123.6	47.1	6.71	15.5	6	83	19
W7-7x 3 1/2 (178x89)	11	16.1	173.0	90.0	7.0	4.5	8.9	141.2	20.4	6.43	31.4	4	53	16
	12	18.1	175.0	90.0	8.0	5.0	8.9	141.2	23.0	5.63	28.2	5	53	17
	15	22.2	179.0	90.0	10.0	6.0	8.9	141.2	28.2	4.50	23.5	5	52	19
W7-7x4 (178x102)	13	19.0	177.8	101.2	7.9	4.8	7.6	146.8	24.3	6.41	30.6	4	58	16
W8-8x4 (203x102)	10	14.9	200.4	100.1	5.2	4.3	7.6	174.7	19.1	9.61	40.4	4	58	13
	13	19.4	202.9	101.6	6.5	5.8	7.6	174.7	24.8	7.84	29.9	5	58	14
	15	22.3	206.0	102.0	8.0	6.2	7.6	174.8	28.6	6.38	28.1	5	58	16
	16	23.1	203.2	101.8	9.3	5.4	7.6	169.4	29.4	5.47	31.4	5	58	17
W8-8x5 1/4 (203x133)	15	22.3	202.0	133.0	7.0	5.0	8.9	170.2	28.7	9.50	34.0	5	74	16
	17	25.1	203.2	133.2	7.8	5.7	7.6	172.4	32.0	8.54	30.2	5	74	15
	18	26.8	206.8	133.3	8.4	5.8	7.6	174.8	33.9	7.95	29.9	5	74	16
	20	30.0	206.8	133.9	9.6	6.4	7.6	172.4	38.2	6.97	26.9	5	74	17
	21	31.3	210.3	133.9	10.1	6.4	7.6	174.9	39.6	6.63	27.5	5	74	18

Dimensions	EN10365 / ASTM A6	
Specification	EN10025 / ASTM A36 / ASTM A572	
Size Range	UB: 5"x3" (127mm x 76mm) to 44"x16" (1118mm x 406mm) UC: 4"x4" (102mm x 102mm) to 14"x16" (356mm x 406mm)	

Surface Area	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
	Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x				
m ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	u	x	H dm ⁶	J cm ⁴
0.599	472	160	4.38	2.55	89.4	31.1	103	47.8	0.836	10.9	0.004	6.29
0.586	456	167	4.18	2.53	89.4	32.7	104	50.4	0.827	9.61	0.004	7.78
0.588	587	200	4.36	2.55	110	40.1	129	61.5	0.844	8.13	0.005	13.5
0.537	473	55.8	5.35	1.84	74.6	14.7	84.2	22.6	0.895	16.3	0.002	2.85
0.737	892	312	5.42	3.21	140	49.2	158	75.0	0.842	13.0	0.011	8.00
0.746	1092	380	5.52	3.25	167	59.4	190	90.6	0.845	11.2	0.014	13.1
0.576	666	49.5	6.11	1.67	88.8	13.2	102	20.8	0.876	20.4	0.003	2.81
0.584	841	60.2	6.24	1.67	109	16.0	126	25.4	0.875	17.6	0.003	4.81
0.638	834	89.8	6.41	2.10	109	20.2	123	31.2	0.890	19.6	0.005	3.56
0.681	683	91.4	6.29	2.30	91.1	18.3	102	28.1	0.873	26.2	0.005	1.69
0.690	918	125	6.33	2.33	120	24.5	136	38.0	0.869	20.4	0.007	3.76
0.704	1330	183	6.61	2.45	167	35.7	190	55.2	0.882	15.4	0.010	9.12
0.890	1210	387	6.51	3.68	159	50.9	177	77.7	0.837	21.4	0.021	4.21
0.889	1250	400	6.54	3.70	164	52.6	182	80.2	0.840	20.7	0.021	4.63
0.901	1748	560	6.76	3.83	222	73.3	248	112	0.849	16.0	0.031	10.5
0.912	2210	706	6.85	3.87	273	91.5	309	140	0.848	13.3	0.040	19.2
0.682	1060	85.4	7.20	2.04	123	19.0	138	29.4	0.884	23.9	0.006	3.15
0.685	1213	97.6	7.26	2.06	139	21.7	157	33.7	0.885	21.4	0.007	4.48
0.691	1529	122	7.36	2.08	171	27.1	195	42.3	0.886	17.8	0.009	8.16
0.738	1356	137	7.48	2.37	153	27.0	171	41.6	0.888	22.6	0.010	4.41
0.779	1284	87.3	8.19	2.14	128	17.4	145	27.2	0.867	36.3	0.008	1.78
0.787	1647	114	8.16	2.14	162	22.4	187	35.3	0.861	29.0	0.011	3.63
0.794	1999	142	8.36	2.23	194	27.8	222	43.7	0.869	25.2	0.014	5.68
0.790	2105	164	8.46	2.36	207	32.2	234	49.8	0.888	22.5	0.015	7.02
0.911	2105	275	8.56	3.09	208	41.3	232	63.4	0.879	27.9	0.026	4.50
0.915	2340	308	8.56	3.10	230	46.2	258	70.9	0.877	25.6	0.029	5.96
0.922	2578	331	8.72	3.12	249	49.7	279	76.3	0.880	24.5	0.033	7.13
0.923	2896	385	8.71	3.17	280	57.5	314	88.2	0.881	21.5	0.037	10.3
0.930	3119	405	8.87	3.20	297	60.4	333	92.7	0.885	21.0	0.041	11.6



2.3 Universal Beams & Columns (UB & UC)



Imperial Units

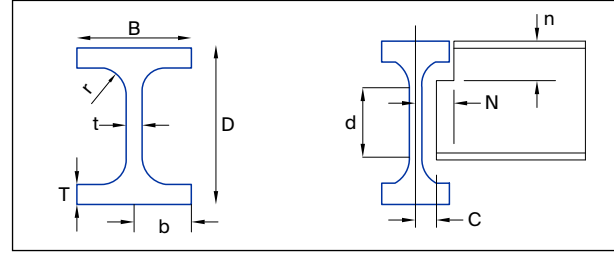
Designation			Depth of Section	Width of Section	Thickness		Root Radius	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing		
Size	Mass per Metre		D	B	Flange	Web	r	d	A	Flange	Web	End clearance C	Notch	
	lb/ft	kg/m			T	t				b/T	d/t		N	n
in (mm)			mm	mm	mm	mm	mm	mm	cm ²			mm	mm	mm
W8-8x6 1/2 (203x165)	24	35.7	201.4	165.0	10.1	6.2	10.2	160.8	45.5	8.17	25.9	5	89	20
	28	41.7	204.7	166.0	11.8	7.2	10.2	160.7	53.2	7.03	22.2	6	89	22
W8-8x8 (203x203)	31	46.1	203.2	203.6	11.0	7.2	10.2	160.8	58.7	9.25	22.3	6	108	21
	35	52.0	206.2	204.3	12.5	7.9	10.2	160.8	66.3	8.17	20.4	6	108	23
	40	60.0	209.6	205.8	14.2	9.4	10.2	160.8	76.4	7.25	17.1	7	108	24
	48	71.0	215.8	206.4	17.3	10.0	10.2	160.8	90.4	5.97	16.1	7	108	28
	58	86.1	222.2	209.1	20.5	12.7	10.2	160.8	110	5.10	12.7	8	108	31
	67	99.7	228.6	210.3	23.8	14.5	10.2	160.7	127	4.43	11.1	9	108	34
W10-10x4 (254x102)	12	17.9	250.7	100.6	5.3	4.8	7.6	224.8	22.8	9.44	46.5	4	58	13
	15	22.0	254.0	101.6	6.8	5.7	7.6	225.2	28.0	7.47	39.5	5	58	14
	17	25.2	257.2	101.9	8.4	6.0	7.6	225.2	32.0	6.07	37.5	5	58	16
	19	28.3	260.4	102.2	10.0	6.3	7.6	225.2	36.1	5.11	35.7	5	58	18
W10-10x5 3/4 (254x146)	21	31.1	251.4	146.1	8.6	6.0	7.6	219.0	39.7	8.49	36.5	5	80	16
	22	32.7	258.3	146.0	9.1	6.1	7.6	224.8	41.8	7.99	36.8	5	80	17
	25	37.0	256.0	146.4	10.9	6.3	7.6	219.0	47.2	6.72	34.8	5	80	19
	26	38.7	262.4	146.6	11.1	6.6	7.6	225.0	48.9	6.60	34.1	5	80	19
	29	43.0	259.6	147.3	12.7	7.2	7.6	219.0	54.8	5.80	30.4	6	80	20
	30	44.6	265.9	147.6	12.9	7.6	7.6	224.9	56.9	5.72	29.5	6	80	21
W10-10x8 (254x203)	33	49.1	247.1	202.2	11.0	7.4	12.7	199.7	62.5	9.19	27.1	6	107	24
	39	58.0	252.0	202.8	13.4	8.0	12.7	199.8	73.8	7.57	25.0	6	107	26
	42	62.5	249.4	207.0	12.2	12.2	12.7	199.6	79.3	8.49	16.4	8	107	25
	45	67.0	256.5	203.7	15.7	8.9	12.7	199.7	85.4	6.49	22.5	6	107	28
	57	84.8	258.1	211.3	16.5	16.5	12.7	199.7	108	6.40	12.1	10	107	29
W10-10x10 (254x254)	49	73.1	254.1	254.6	14.2	8.6	12.7	200.3	93.1	8.96	23.3	6	133	27
	54	80.4	256.3	254.8	15.6	9.4	12.7	199.7	102	8.17	21.2	7	133	28
	60	88.9	260.3	256.3	17.3	10.3	12.7	200.3	113	7.41	19.4	7	133	30
	68	101.2	264.2	257.3	19.6	11.9	12.7	199.7	129	6.58	16.7	8	133	32
	72	107.1	266.7	258.8	20.5	12.8	12.7	200.3	136	6.31	15.6	8	133	33
	77	114.6	269.2	258.8	22.1	13.5	12.7	199.6	146	5.86	14.8	9	133	35
	88	131	275.3	260.7	25.2	15.4	12.7	199.6	167	5.18	13.0	10	133	38
	89	132	276.3	261.3	25.3	15.3	12.7	200.3	168	5.16	13.1	10	133	38
	100	148.8	281.9	262.6	28.5	17.3	12.7	199.6	190	4.62	11.6	11	133	41
	112	167.1	289.1	265.2	31.7	19.2	12.7	200.3	213	4.18	10.4	12	133	44

Dimensions	EN10365 / ASTM A6	
Specification	EN10025 / ASTM A36 / ASTM A572	
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Surface Area	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
	Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x				
m ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	u	x	H dm ⁶	J cm ⁴
1.03	3430	757	8.68	4.08	341	91.7	378	140	0.875	19.3	0.069	14.3
1.04	4077	901	8.76	4.12	398	109	445	165	0.875	16.8	0.084	22.4
1.19	4568	1548	8.82	5.13	450	152	497	231	0.847	17.7	0.143	22.2
1.20	5259	1778	8.91	5.18	510	174	567	264	0.848	15.8	0.167	31.8
1.21	6125	2065	8.96	5.20	584	201	656	305	0.846	14.1	0.197	47.2
1.22	7618	2537	9.18	5.30	706	246	799	374	0.853	11.9	0.250	80.2
1.24	9449	3128	9.28	5.34	850	299	977	456	0.850	10.2	0.318	137
1.25	11310	3687	9.44	5.39	990	351	1150	536	0.852	9.0	0.387	211
0.881	2241	90.8	9.91	1.99	179	18.0	207	28.6	0.851	44.0	0.014	2.28
0.890	2841	119	10.1	2.06	224	23.5	259	37.3	0.856	36.4	0.018	4.15
0.897	3415	149	10.3	2.15	266	29.2	306	46.0	0.866	31.5	0.023	6.42
0.904	4005	179	10.5	2.22	308	34.9	353	54.8	0.874	27.5	0.028	9.57
1.06	4413	448	10.5	3.36	351	61.3	393	94.1	0.880	29.6	0.066	8.55
1.08	4917	475	10.8	3.37	381	65.0	426	100	0.882	28.9	0.074	9.96
1.07	5537	571	10.8	3.48	433	78.0	483	119	0.890	24.3	0.086	15.3
1.08	5974	584	11.1	3.45	455	79.6	510	122	0.888	24.5	0.092	16.5
1.08	6544	677	10.9	3.52	504	92.0	566	141	0.891	21.2	0.103	23.9
1.09	7048	692	11.1	3.49	530	93.8	597	144	0.888	21.3	0.111	25.6
1.27	7071	1517	10.6	4.93	572	150	634	229	0.873	21.5	0.211	24.0
1.28	8672	1865	10.8	5.03	688	184	765	280	0.878	18.3	0.265	40.2
1.25	8430	1807	10.3	4.77	676	175	768	271	0.851	17.9	0.254	44.5
1.29	10300	2214	11.0	5.09	803	217	898	331	0.880	15.9	0.321	62.3
1.31	11930	2606	10.5	4.91	925	247	1067	385	0.849	13.6	0.380	109
1.49	11410	3908	11.1	6.48	898	307	992	465	0.849	17.3	0.562	57.6
1.49	12590	4304	11.1	6.49	983	338	1091	512	0.849	15.8	0.623	75.6
1.50	14270	4858	11.2	6.55	1096	379	1224	575	0.850	14.5	0.717	102
1.51	16390	5558	11.3	6.57	1241	432	1398	657	0.849	12.9	0.832	148
1.52	17510	5928	11.3	6.59	1313	458	1484	697	0.848	12.4	0.898	172
1.52	18950	6391	11.4	6.61	1408	494	1599	752	0.849	11.6	0.976	213
1.54	22210	7436	11.5	6.67	1613	570	1850	869	0.850	10.3	1.16	314
1.55	22530	7531	11.6	6.69	1631	576	1869	878	0.850	10.3	1.19	319
1.56	25900	8598	11.7	6.73	1838	655	2127	999	0.851	9.3	1.38	452
1.58	30000	9870	11.9	6.81	2075	744	2424	1137	0.851	8.5	1.63	626



2.3 Universal Beams & Columns (UB & UC)



Imperial Units

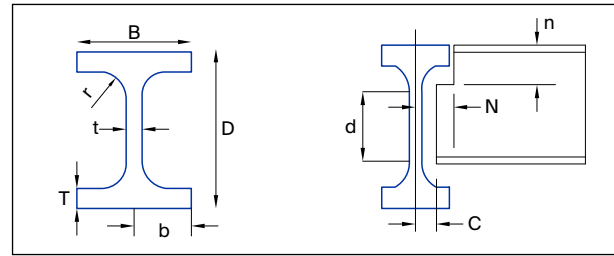
Designation			Depth of Section	Width of Section	Thickness		Root Radius	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing		
Size	Mass per Metre		D	B	Flange	Web	r	d	A	Flange	Web	End clearance	Notch	
	lb/ft	kg/m			T	t				b/T	d/t		N	n
in (mm)			mm	mm	mm	mm	mm	cm ²			mm	mm	mm	mm
W12-12x4 (305x102)	14	20.8	302.5	100.8	5.7	5.1	7.6	275.8	26.8	8.83	54.3	5	58	13
	16	23.8	304.5	101.3	6.7	5.6	7.6	275.8	30.4	7.53	49.3	5	58	14
	16.5	24.8	305.1	101.6	7.0	5.8	7.6	275.9	31.6	7.26	47.6	5	58	15
	19	28.2	308.7	101.8	8.8	6.0	7.6	275.9	35.9	5.78	46.0	5	58	16
	22	32.8	312.7	102.4	10.8	6.6	7.6	275.9	41.8	4.74	41.8	5	58	18
W12-12x5 (305x127)	25	37.0	304.4	123.3	10.7	7.1	8.9	265.2	47.2	5.76	37.4	6	68	20
	28	41.9	307.2	124.3	12.1	8.0	8.9	265.2	53.4	5.14	33.2	6	68	21
	32	48.1	311.0	125.3	14.0	9.0	8.9	265.2	61.2	4.48	29.5	7	68	23
W12-12x6 1/2 (305x165)	26	38.7	310.4	164.8	9.7	5.8	7.6	275.9	49.3	8.54	47.2	5	89	17
	27	40.3	303.4	165.0	10.2	6.0	8.9	265.2	51.3	8.09	44.2	5	90	19
	30	44.6	313.4	165.6	11.1	6.6	7.6	276.0	56.5	7.46	41.8	5	90	19
	31	46.1	306.6	165.7	11.8	6.7	8.9	265.2	58.7	7.02	39.6	5	90	21
	35	52.1	317.5	166.6	13.2	7.6	7.6	275.9	66.7	6.31	36.2	6	89	21
	36	54.0	310.4	166.9	13.7	7.9	8.9	265.2	68.8	6.09	33.6	6	90	23
W12-12x8 (305x203)	40	59.5	303.3	203.3	13.0	7.5	15.2	246.9	75.6	7.82	33.0	6	108	28
	45	67.0	306.3	204.3	14.6	8.5	15.2	246.7	85.2	7.00	29.0	6	108	30
	50	74.4	309.6	205.2	16.2	9.4	15.2	246.8	94.5	6.33	26.3	7	108	31
W12-12x10 (305x254)	53	78.9	306.3	253.9	14.6	8.8	15.2	246.7	100	8.70	28.2	6	133	30
	58	86.3	309.6	254.3	16.2	9.1	15.2	246.8	110	7.85	27.0	7	133	31
W12-12x12 (305x305)	65	96.9	307.9	305.3	15.4	9.9	15.2	246.7	123	9.91	24.9	7	158	31
	72	107.1	311.1	305.8	17.0	10.9	15.2	246.7	136	8.98	22.6	7	157	32
	79	117.9	314.5	307.4	18.7	12.0	15.2	246.7	150	8.22	20.6	8	158	34
	87	129.5	318.3	308.0	20.6	13.1	15.2	246.8	165	7.49	18.9	9	157	36
	92	136.9	320.5	309.2	21.7	13.8	15.2	246.7	174	7.12	17.9	9	158	37
	96	142.8	322.8	308.9	22.9	14.0	15.2	246.7	182	6.76	17.7	9	157	38
	106	158.1	327.1	311.2	25.0	15.8	15.2	246.7	201	6.22	15.6	10	158	40
	120	178.6	333.2	312.9	28.1	18.0	15.2	246.7	228	5.57	13.7	11	157	43
	133	198.1	339.9	314.5	31.4	19.1	15.2	246.7	252	5.01	12.9	12	158	47
	136	202.4	340.6	315.0	31.8	20.1	15.2	246.7	258	4.96	12.3	12	157	47
	152	226.2	348.2	317.0	35.6	22.1	15.2	246.7	289	4.46	11.2	13	157	51
	161	240	352.5	318.4	37.7	23.0	15.2	246.7	306	4.22	10.7	14	158	53
	170	253	356.4	319.3	39.6	24.4	15.2	246.8	323	4.03	10.1	14	157	55

Dimensions	EN10365 / ASTM A6	
Specification	EN10025 / ASTM A36 / ASTM A572	
Size Range	UB: 5"x3" (127mm x 76mm) to 44"x16" (1118mm x 406mm) UC: 4"x4" (102mm x 102mm) to 14"x16" (356mm x 406mm)	

Surface Area	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
	Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x				
m ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	u	x	H dm ⁶	J cm ⁴
0.985	3682	97.9	11.7	1.91	243	19.4	286	31.1	0.842	50.8	0.022	2.93
0.990	4274	117	11.9	1.96	281	23.1	329	37.0	0.846	45.0	0.026	4.27
0.992	4455	123	11.9	1.97	292	24.2	342	38.8	0.846	43.4	0.027	4.77
1.00	5366	155	12.2	2.08	348	30.5	403	48.5	0.859	37.4	0.035	7.40
1.01	6501	194	12.5	2.15	416	37.9	481	60.0	0.866	31.6	0.044	12.2
1.07	7166	335	12.3	2.67	471	54.4	539	85.3	0.872	29.7	0.072	14.8
1.08	8196	389	12.4	2.70	534	62.6	614	98.4	0.872	26.5	0.085	21.1
1.09	9575	461	12.5	2.74	616	73.6	711	116	0.873	23.3	0.102	31.8
1.26	8498	720	13.1	3.82	548	87.4	609	134	0.887	33.8	0.163	12.5
1.24	8503	764	12.9	3.86	560	92.7	623	142	0.889	31.0	0.164	14.7
1.26	9864	841	13.2	3.86	629	102	703	156	0.887	29.7	0.192	18.7
1.25	9899	896	13.0	3.90	646	108	720	166	0.891	27.1	0.195	22.2
1.27	11860	1019	13.3	3.91	747	122	838	188	0.889	25.3	0.236	30.8
1.26	11700	1063	13.0	3.93	754	127	846	196	0.889	23.6	0.234	34.8
1.38	12840	1823	13.0	4.91	847	179	938	274	0.890	22.9	0.384	39.1
1.39	14570	2078	13.1	4.94	952	203	1060	311	0.889	20.6	0.442	54.6
1.40	16350	2337	13.2	4.97	1056	228	1183	349	0.889	18.8	0.503	73.5
1.58	17700	3986	13.3	6.30	1156	314	1276	477	0.876	20.4	0.848	65.6
1.59	19740	4444	13.4	6.36	1275	349	1411	531	0.878	18.7	0.956	86.5
1.79	22250	7308	13.4	7.69	1445	479	1592	726	0.850	19.3	1.56	91.2
1.80	24830	8117	13.5	7.72	1596	531	1767	806	0.850	17.6	1.75	122
1.81	27670	9060	13.6	7.77	1760	589	1958	895	0.850	16.2	1.98	161
1.82	30810	10030	13.7	7.80	1936	651	2164	990	0.851	14.9	2.22	212
1.82	32820	10700	13.7	7.83	2048	692	2297	1053	0.851	14.2	2.39	249
1.83	34670	11240	13.8	7.86	2148	728	2413	1106	0.853	13.6	2.53	285
1.84	38750	12570	13.9	7.90	2369	808	2680	1230	0.851	12.5	2.87	378
1.86	44560	14350	14.0	7.94	2675	917	3053	1399	0.851	11.2	3.34	537
1.87	50900	16300	14.2	8.04	2995	1037	3440	1581	0.853	10.2	3.88	734
1.87	51790	16560	14.2	8.02	3041	1052	3501	1606	0.852	10.1	3.95	771
1.89	59610	18910	14.4	8.09	3424	1193	3975	1823	0.853	9.2	4.62	1074
1.91	64200	20320	14.5	8.15	3643	1276	4247	1951	0.854	8.7	5.03	1271
1.92	68490	21540	14.6	8.17	3844	1349	4502	2064	0.854	8.4	5.40	1480



2.3 Universal Beams & Columns (UB & UC)



Imperial Units

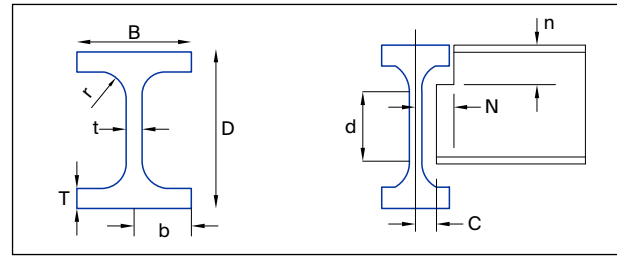
Designation	Depth of Section		Width of Section		Thickness		Root Radius	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing		
	D	B	T	t	r	d				A	b/T	d/t	End clearance	Notch
Size	Mass per Metre											N	n	
in (mm)	lb/ft	kg/m	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
W12-12x12 (305x305)	190	282.9	365.3	322.2	44.1	26.8	15.2	246.7	360	3.65	9.21	15	158	59
	210	312.5	373.6	324.9	48.3	30.0	15.2	246.7	399	3.37	8.23	17	157	63
	230	342	382.3	327.5	52.6	32.6	15.2	246.7	437	3.11	7.57	18	157	68
	252	375	391.4	330.3	57.2	35.4	15.2	246.6	478	2.89	6.97	20	157	72
	278	413.7	402.6	333.8	62.7	38.9	15.2	246.7	529	2.66	6.35	21	157	78
	279	415	402.6	333.8	62.7	38.9	15.2	246.8	528	2.66	6.34	21	157	78
	305	454	414.5	336.2	68.7	41.3	15.2	246.7	578	2.45	5.97	23	157	84
	336	500	427.2	340.0	75.1	45.1	15.2	246.6	638	2.26	5.47	25	157	90
W14-14x5 (356x127)	22	33.1	349.0	125.4	8.5	6.0	10.2	311.6	42.1	7.38	51.9	5	70	19
	26	39.1	353.4	126.0	10.7	6.6	10.2	311.6	49.8	5.89	47.2	5	70	21
W14-14x6 3/4 (356x171)	30	45.0	351.4	171.1	9.7	7.0	10.2	311.6	57.3	8.82	44.5	6	92	20
	34	51.0	355.0	171.5	11.5	7.4	10.2	311.6	64.9	7.46	42.1	6	92	22
	38	57.0	358.0	172.2	13.0	8.1	10.2	311.6	72.6	6.62	38.5	6	92	23
	45	67.1	363.4	173.2	15.7	9.1	10.2	311.6	85.5	5.52	34.2	7	92	26
W14-14x8 (356x203)	43	64.0	347.0	203.1	13.4	7.8	15.2	289.8	81.2	7.58	37.4	6	108	29
	48	71.4	350.3	204.0	15.1	8.6	15.2	289.7	91.2	6.75	33.5	6	108	30
	53	78.9	353.6	204.7	16.7	9.4	15.2	289.8	100	6.13	30.8	7	108	32
W14-14x10 (356x254)	61	90.8	352.8	253.9	16.3	9.5	15.2	289.8	115	7.79	30.4	7	132	32
	68	101.2	356.6	254.8	18.3	10.5	15.2	289.6	129	6.97	27.5	7	132	33
	74	110.1	359.9	255.8	19.9	11.4	15.2	289.6	141	6.41	25.3	8	132	35
	82	122	363.5	257.3	21.7	12.9	15.2	289.7	155	5.92	22.5	8	132	37
W14-14x14 1/2 (356x368)	87	129	355.6	368.6	17.5	10.4	15.2	290.2	164	10.5	27.9	7	189	33
	90	133.9	356.1	368.8	18.0	11.2	15.2	289.6	171	10.2	25.9	8	189	33
	99	147.3	359.7	370.0	19.8	12.3	15.2	289.7	188	9.34	23.5	8	189	35
	103	152.9	362.0	370.5	20.7	12.3	15.2	290.2	195	8.95	23.6	8	189	36
	109	162.2	363.7	371.0	21.8	13.3	15.2	289.6	207	8.49	21.7	9	189	37
	119	177	368.2	372.6	23.8	14.4	15.2	290.2	226	7.83	20.2	9	189	39
	120	178.6	367.8	372.6	23.9	15.0	15.2	289.6	228	7.80	19.3	9	189	39
	132	196.4	372.4	374.0	26.2	16.4	15.2	289.7	250	7.15	17.7	10	189	41
	136	201.9	374.6	374.7	27.0	16.5	15.2	290.2	257	6.94	17.6	10	189	42
	W14-14x16 (356x406)	118	175.6	360.0	396.0	20.0	20.0	15.0	290.0	224	9.90	14.5	12	198
145		215.8	375.4	393.7	27.7	17.3	15.2	289.6	275	7.11	16.8	11	198	43
158		235.1	381.0	394.8	30.2	18.4	15.2	290.2	299	6.54	15.8	11	198	45
159		236.6	380.5	395.4	30.2	18.9	15.2	289.6	302	6.54	15.3	11	198	45

Dimensions	EN10365 / ASTM A6	
Specification	EN10025 / ASTM A36 / ASTM A572	
Size Range	UB: 5"x3" (127mm x 76mm) to 44"x16" (1118mm x 406mm) UC: 4"x4" (102mm x 102mm) to 14"x16" (356mm x 406mm)	

Surface Area	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
	Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x				
m ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	u	x	H dm ⁶	J cm ⁴
1.94	78870	24640	14.8	8.27	4318	1529	5105	2342	0.855	7.7	6.35	2034
1.96	89270	27660	15.0	8.33	4779	1702	5703	2613	0.855	7.1	7.32	2693
1.98	100600	30880	15.2	8.41	5261	1886	6332	2898	0.856	6.6	8.39	3490
2.01	113200	34470	15.4	8.49	5783	2087	7020	3211	0.856	6.2	9.62	4495
2.04	129600	39040	15.7	8.59	6437	2339	7890	3604	0.857	5.7	11.3	5953
2.04	129500	39010	15.7	8.59	6435	2338	7888	3602	0.857	5.7	11.3	5946
2.07	147600	43690	16.0	8.69	7122	2599	8807	4006	0.860	5.4	13.1	7719
2.10	169000	49420	16.3	8.80	7913	2907	9882	4487	0.861	5.0	15.3	10110
1.17	8250	280	14.0	2.58	473	44.7	543	70.3	0.863	42.2	0.081	8.79
1.18	10170	358	14.3	2.68	576	56.8	659	89.1	0.871	35.2	0.105	15.1
1.36	12070	811	14.5	3.76	687	94.8	775	147	0.874	36.8	0.237	15.8
1.36	14140	968	14.8	3.86	796	113	896	174	0.881	32.1	0.286	23.8
1.37	16040	1108	14.9	3.91	896	129	1010	199	0.882	28.8	0.330	33.4
1.38	19460	1362	15.1	3.99	1071	157	1211	243	0.886	24.4	0.412	55.7
1.46	17760	1874	14.8	4.80	1024	185	1138	283	0.891	25.9	0.521	43.2
1.47	20170	2140	14.9	4.84	1151	210	1285	322	0.891	23.3	0.601	60.4
1.48	22480	2391	15.0	4.88	1271	234	1424	359	0.892	21.3	0.679	80.1
1.68	26540	4451	15.2	6.21	1505	351	1668	534	0.886	21.5	1.26	90.3
1.69	30060	5048	15.3	6.26	1686	396	1878	604	0.886	19.4	1.44	126
1.69	33120	5569	15.3	6.29	1840	435	2058	665	0.886	18.0	1.61	161
1.70	36680	6175	15.4	6.31	2018	480	2270	734	0.884	16.6	1.80	211
2.14	40250	14610	15.6	9.43	2264	793	2479	1199	0.844	19.9	4.18	153
2.14	41580	15080	15.6	9.40	2335	818	2565	1238	0.842	19.2	4.31	169
2.15	46240	16730	15.7	9.43	2571	904	2838	1370	0.842	17.7	4.83	223
2.16	48590	17550	15.8	9.49	2685	948	2965	1435	0.844	17.0	5.11	251
2.16	51540	18600	15.8	9.49	2834	1003	3142	1519	0.843	16.2	5.43	296
2.17	57120	20530	15.9	9.54	3103	1102	3455	1671	0.844	15.0	6.09	381
2.17	57290	20600	15.9	9.51	3115	1106	3475	1678	0.842	14.9	6.09	390
2.18	63720	22820	16.0	9.55	3422	1221	3838	1853	0.843	13.7	6.84	511
2.19	66260	23690	16.1	9.60	3538	1264	3972	1920	0.844	13.4	7.16	558
2.24	51770	20730	15.2	9.61	2876	1047	3235	1603	0.810	16.1	5.99	322
2.26	71240	28180	16.1	10.1	3796	1432	4264	2172	0.832	13.0	8.52	632
2.28	79090	30990	16.3	10.2	4151	1570	4687	2383	0.834	12.1	9.54	812
2.28	79160	31170	16.2	10.2	4161	1577	4702	2394	0.833	12.0	9.56	822



2.3 Universal Beams & Columns (UB & UC)



Imperial Units

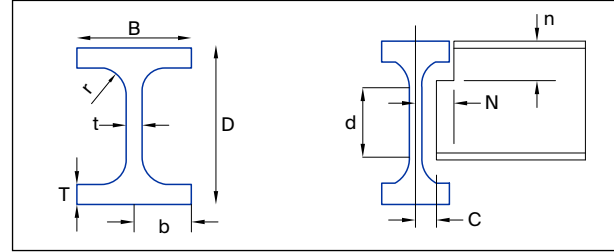
Table with 14 columns: Designation, Depth of Section, Width of Section, Thickness, Root Radius, Depth between Fillets, Area of Section, Ratios for Local Buckling, Dimensions for Detailing, Mass per Metre, and Size. Contains data for various beam sizes including W14-14x16, W16-16x5 1/2, W16-16x7, W16-16x10 1/4, and W18-18x6.

Technical information box containing Dimensions (EN10365 / ASTM A6), Specification (EN10025 / ASTM A36 / ASTM A572), Size Range (UB: 5"x3" to 44"x16"; UC: 4"x4" to 14"x16"), and a coordinate system diagram showing x and y axes.

Table with 13 columns: Surface Area, Second Moment of Area, Radius of Gyration, Elastic Modulus, Plastic Modulus, Buckling Parameter, Torsional Index, Warping Constant, and Torsional Constant. Contains detailed property data for various beam sizes.



2.3 Universal Beams & Columns (UB & UC)



Imperial Units

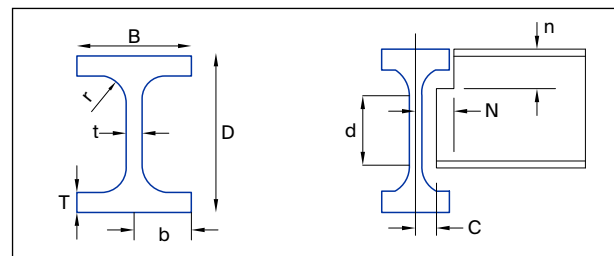
Designation			Depth of Section	Width of Section	Thickness		Root Radius	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing		
Size	Mass per Metre		D	B	Flange	Web	r	d	A	Flange	Web	End clearance	Notch	
	lb/ft	kg/m			T	t				b/T	d/t		N	n
in (mm)			mm	mm	mm	mm	mm	cm ²			mm	mm	mm	mm
W18-18x6 (457x152)	46	68.5	458.7	153.9	15.3	9.1	10.2	407.7	87.1	5.03	44.6	7	82	26
	50	74.2	462.0	154.4	17.0	9.6	10.2	407.6	94.5	4.54	42.5	7	82	27
	55	82.1	465.8	155.3	18.9	10.5	10.2	407.6	105	4.11	38.8	7	82	29
W18-18x7 1/2 (457x191)	45	67.1	453.4	189.9	12.7	8.5	10.2	407.6	85.5	7.48	48.0	6	101	23
	50	74.3	457.0	190.4	14.5	9.0	10.2	407.6	94.6	6.57	45.3	7	101	25
	55	82.0	460.0	191.3	16.0	9.9	10.2	407.6	104	5.98	41.2	7	101	26
	60	89.3	463.4	191.9	17.7	10.5	10.2	407.6	114	5.42	38.8	7	101	28
	65	96.7	466.1	192.8	19.1	11.4	10.2	407.6	123	5.06	35.7	8	101	29
	66	98.3	467.2	192.8	19.6	11.4	10.2	407.6	125	4.92	35.8	8	101	30
W18-18x11 (457x279)	71	105.7	469.1	193.9	20.6	12.6	10.2	407.6	134	4.71	32.4	8	101	31
	76	113.1	462.5	280.3	17.3	10.8	10.2	407.6	144	8.12	37.7	7	145	27
	86	128	467.1	281.7	19.6	12.1	10.2	407.6	163	7.20	33.7	8	145	30
	97	144.4	472.2	283.1	22.1	13.6	10.2	407.6	184	6.40	30.0	9	145	32
	106	157.7	475.7	284.5	23.9	15.0	10.2	407.5	201	5.96	27.2	9	145	34
	119	177.1	481.8	286.1	26.9	16.6	10.2	407.6	226	5.31	24.5	10	145	37
	130	193.5	489.0	283.5	30.5	17.0	10.2	407.6	247	4.65	24.0	11	143	41
W21-21x6 1/2 (533x165)	143	212.8	495.0	285.0	33.5	18.5	10.2	407.5	271	4.25	22.0	11	143	44
	44	65.5	524.8	165.1	11.4	8.9	12.7	476.6	84	7.24	53.6	6	88	24
	50	74.4	529.1	165.9	13.5	9.7	12.7	476.7	95	6.14	49.4	7	88	26
W21-21x8 1/4 (533x210)	57	84.8	534.9	166.5	16.5	10.3	12.7	476.5	108	5.04	46.3	7	88	29
	55	82.2	528.3	208.8	13.2	9.6	12.7	476.5	105	7.91	49.6	7	110	26
	62	92.1	533.1	209.3	15.6	10.1	12.7	476.5	117	6.71	47.2	7	110	28
	68	101	536.7	210.0	17.4	10.8	12.7	476.5	129	6.03	44.1	7	110	30
	73	109	539.5	210.8	18.8	11.6	12.7	476.5	139	5.61	41.1	8	110	32
	82	122	544.5	211.9	21.3	12.7	12.7	476.5	155	4.97	37.5	8	110	34
	83	123.5	544.3	212.2	21.2	13.1	12.7	476.5	157	5.00	36.4	9	110	34
W21-21x12 1/4 (533x312)	93	138.4	549.1	213.9	23.6	14.7	12.7	476.5	176	4.53	32.3	9	110	36
	101	150.3	542.5	312.2	20.3	12.7	12.7	476.5	192	7.68	37.5	8	160	33
	111	165.2	546.4	313.4	22.2	14.0	12.7	476.6	211	7.05	34.1	9	160	35
	122	181.6	550.7	314.7	24.4	15.2	12.7	476.5	231	6.45	31.3	10	160	37
	132	196.4	554.5	316.0	26.3	16.5	12.7	476.5	250	6.01	28.9	10	160	39
	147	218.8	560.3	317.8	29.2	18.3	12.7	476.5	279	5.44	26.1	11	160	42
	166	247	571.0	315.5	34.5	19.1	12.7	476.5	315	4.57	25.0	12	158	47
	182	270.8	577.1	317.8	37.6	21.1	12.7	476.5	346	4.23	22.6	13	158	50

Dimensions	EN10365 / ASTM A6	
Specification	EN10025 / ASTM A36 / ASTM A572	
Size Range	UB: 5"x3" (127mm x 76mm) to 44"x16" (1118mm x 406mm) UC: 4"x4" (102mm x 102mm) to 14"x16" (356mm x 406mm)	

Surface Area	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
	Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x				
m ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	u	x	H dm ⁶	J cm ⁴
1.50	29530	933	18.4	3.27	1288	121	1482	191	0.869	33.0	0.458	50.4
1.50	32670	1047	18.6	3.33	1414	136	1627	213	0.873	30.1	0.518	65.9
1.51	36590	1185	18.7	3.37	1571	153	1811	240	0.873	27.4	0.591	89.2
1.63	29380	1452	18.5	4.12	1296	153	1471	237	0.872	37.9	0.705	37.1
1.64	33320	1671	18.8	4.20	1458	176	1653	272	0.877	33.9	0.818	51.8
1.65	37050	1871	18.8	4.23	1611	196	1831	304	0.877	30.9	0.922	69.2
1.66	41020	2089	19.0	4.29	1770	218	2014	338	0.880	28.3	1.04	90.7
1.66	44590	2281	19.0	4.30	1913	237	2184	369	0.879	26.3	1.14	114
1.67	45730	2347	19.1	4.33	1957	243	2232	379	0.881	25.7	1.18	121
1.67	48760	2507	19.0	4.32	2079	259	2383	404	0.877	24.4	1.26	145
2.01	55460	6344	19.6	6.64	2398	453	2669	692	0.885	27.9	3.14	118
2.02	63520	7295	19.7	6.69	2720	518	3039	792	0.886	24.8	3.65	170
2.03	72710	8367	19.9	6.74	3079	591	3457	906	0.886	22.1	4.24	244
2.04	79600	9178	19.9	6.76	3347	645	3775	991	0.884	20.5	4.68	311
2.06	91040	10530	20.1	6.82	3779	736	4284	1132	0.885	18.4	5.44	442
2.06	102500	11590	20.4	6.86	4192	818	4761	1257	0.891	16.6	6.09	603
2.08	114400	12960	20.5	6.91	4624	910	5278	1400	0.891	15.2	6.90	800
1.67	35030	859	20.5	3.20	1335	104	1561	166	0.847	47.0	0.566	31.9
1.68	40810	1032	20.8	3.30	1543	124	1797	199	0.853	41.4	0.686	47.1
1.69	48640	1276	21.2	3.44	1819	153	2107	243	0.862	35.5	0.857	73.8
1.85	47540	2008	21.3	4.38	1800	192	2059	300	0.864	41.6	1.33	51.5
1.86	55230	2389	21.7	4.51	2072	228	2360	356	0.872	36.5	1.60	75.7
1.87	61520	2692	21.9	4.57	2292	256	2612	399	0.874	33.2	1.82	101
1.88	66820	2943	21.9	4.60	2477	279	2828	436	0.875	30.9	1.99	126
1.89	76040	3388	22.1	4.67	2793	320	3196	500	0.877	27.6	2.32	178
1.89	76240	3389	22.0	4.65	2801	319	3212	500	0.874	27.6	2.32	181
1.90	86170	3868	22.1	4.68	3139	362	3617	569	0.873	24.9	2.67	251
2.29	100800	10320	22.9	7.33	3715	661	4147	1012	0.885	27.8	7.03	217
2.30	111300	11410	23.0	7.36	4074	728	4565	1117	0.885	25.6	7.84	284
2.31	123300	12680	23.1	7.40	4476	806	5032	1238	0.885	23.4	8.78	373
2.32	134200	13850	23.2	7.44	4842	876	5462	1348	0.884	21.8	9.66	469
2.33	151200	15650	23.3	7.49	5396	985	6116	1519	0.884	19.8	11.0	643
2.34	178000	18110	23.8	7.58	6233	1148	7080	1766	0.891	17.2	13.0	983
2.36	197200	20150	23.9	7.63	6834	1268	7807	1956	0.890	15.9	14.7	1278



2.3 Universal Beams & Columns (UB & UC)



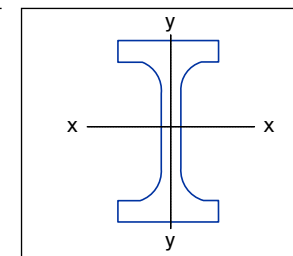
Imperial Units

Designation			Depth of Section	Width of Section	Thickness		Root Radius	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing		
Size	Mass per Metre		D	B	Flange	Web	r	d	A	Flange	Web	C	Notch	
	lb/ft	kg/m			T	t				b/T	d/t		N	n
in (mm)			mm	mm	mm	mm	mm	cm ²			mm	mm	mm	mm
W21-21x12 1/4 (533x312)	201	300	585.0	319.0	41.4	23.1	12.7	476.8	382	3.85	20.6	14	158	54
	223	331	593.0	322.0	45.5	25.4	12.7	476.6	422	3.54	18.8	15	158	58
	248	370	603.0	324.0	50.5	26.2	12.7	476.6	460	3.21	18.2	15	159	63
	275	409	613.0	327.0	55.6	31.0	12.7	476.4	521	2.94	15.4	18	158	68
W24-24x7 (610x178)	55	81.9	598.7	177.9	12.8	10.0	12.7	547.6	105	6.93	54.6	7	94	26
	61	91.0	602.5	178.4	15.0	10.6	12.7	547.1	116	5.95	51.6	7	94	28
	62	92.3	603.0	178.8	15.0	10.9	12.7	547.6	118	5.96	50.1	7	94	28
W24-24x9 (610x229)	68	101.2	602.6	227.6	14.8	10.5	12.7	547.6	129	7.69	52.2	7	119	28
	76	113	607.6	228.2	17.3	11.1	12.7	547.6	144	6.60	49.3	8	119	30
	84	125.1	612.2	229.0	19.3	11.9	12.7	548.2	158	5.93	46.1	8	119	32
	94	139.9	617.2	230.2	22.1	13.1	12.7	547.6	178	5.21	41.8	9	119	35
	103	153	623.1	228.6	24.9	14.0	12.7	547.9	195	4.59	39.1	9	117	38
	114	171	628.9	229.9	27.9	15.5	12.7	547.7	218	4.12	35.3	10	117	41
	128	191	635.0	231.5	30.9	17.0	12.7	547.8	242	3.75	32.2	11	117	44
	146	217	643.1	234.1	35.1	19.6	12.7	547.5	278	3.33	27.9	12	117	48
	163	243	651.0	235.9	39.1	21.6	12.7	547.4	310	3.02	25.3	13	117	52
	181	270	658.6	238.5	42.9	23.9	12.7	547.4	343	2.78	22.9	14	117	56
	198	295	667.0	240.5	47.0	25.9	12.7	547.6	376	2.56	21.1	15	117	60
	218	325	675.1	243.1	51.0	28.4	12.7	547.7	412	2.38	19.3	16	117	64
239	356	685.0	245.6	55.9	31.0	12.7	547.8	454	2.20	17.7	18	117	69	
W24-24x12 (610x305)	100	149.1	612.4	304.8	19.7	11.8	16.5	540.0	190	7.74	45.8	8	157	36
	120	179	620.2	307.1	23.6	14.1	16.5	540.0	228	6.51	38.3	9	157	40
	160	238.1	635.8	311.4	31.4	18.4	16.5	540.0	303	4.96	29.3	11	157	48
W24-24x12 3/4 (610x324)	104	154.8	611.1	323.8	19.1	12.7	12.7	547.6	198	8.50	43.1	8	166	32
	117	174.1	616.2	325.1	21.6	14.0	12.7	547.6	222	7.53	39.2	9	166	34
	131	194.9	621.8	326.5	24.4	15.4	12.7	547.6	249	6.70	35.6	10	166	37
	146	217.3	628.4	327.7	27.7	16.5	12.7	547.6	277	5.92	33.2	10	166	40
	162	241.1	635.0	329.1	31.0	17.9	12.7	547.6	308	5.31	30.6	11	166	44
	176	261.9	641.1	327.4	34.0	19.1	12.7	547.6	333	4.81	28.7	12	164	47
	192	285.7	646.9	328.9	37.1	20.6	12.7	547.3	363	4.44	26.6	12	164	50
	207	308	653.0	330.5	39.9	22.1	12.7	547.8	392	4.14	24.8	13	164	53
	229	341	661.0	333.0	43.9	24.4	16.5	540.2	435	3.79	22.1	14	164	60
	250	372	669.0	335.0	48.0	26.4	16.5	540.0	475	3.49	20.5	15	164	65
	279	415	679.0	338.0	53.1	29.5	16.5	539.8	530	3.18	18.3	17	164	70
	306	455	689.0	340.0	57.9	32.0	16.5	540.2	579	2.94	16.9	18	164	74

Dimensions EN10365 / ASTM A6

Specification EN10025 / ASTM A36 / ASTM A572

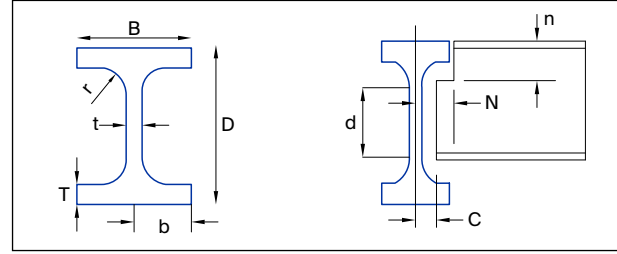
Size Range UB: 5"x3" (127mm x 76mm) to 44"x16" (1118mm x 406mm)
UC: 4"x4" (102mm x 102mm) to 14"x16" (356mm x 406mm)



Surface Area	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
	Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x				
m ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	u	x	H	J
2.38	220700	22450	24.1	7.67	7547	1408	8670	2175	0.890	14.6	16.6	1700
2.40	247700	25390	24.2	7.76	8355	1577	9656	2442	0.890	13.4	19.0	2263
2.43	278900	28710	24.6	7.90	9250	1772	10730	2739	0.894	12.3	21.9	2996
2.45	316900	32530	24.7	7.91	10340	1990	12120	3096	0.890	11.2	25.3	4131
1.87	56020	1210	23.2	3.40	1871	136	2200	219	0.843	48.3	1.04	49.2
1.88	63880	1426	23.5	3.51	2120	160	2480	256	0.850	43.2	1.23	68.6
1.88	64580	1436	23.4	3.49	2142	161	2512	258	0.848	42.8	1.24	71.0
2.07	75780	2915	24.2	4.76	2515	256	2881	400	0.864	43.1	2.52	77.0
2.08	87320	3434	24.6	4.88	2874	301	3281	469	0.870	38.0	2.99	111
2.09	97540	3872	24.8	4.95	3187	338	3639	528	0.872	34.5	3.40	149
2.11	111800	4505	25.0	5.03	3622	391	4142	611	0.875	30.6	3.99	216
2.11	125000	4972	25.3	5.04	4012	435	4595	680	0.878	27.6	4.45	295
2.12	141400	5670	25.4	5.09	4495	493	5167	773	0.878	24.8	5.12	411
2.14	158400	6415	25.6	5.15	4990	554	5757	871	0.879	22.6	5.85	554
2.16	183900	7544	25.7	5.21	5718	644	6643	1019	0.877	20.0	6.97	819
2.18	207900	8606	25.9	5.27	6386	730	7455	1157	0.878	18.2	8.06	1123
2.20	232800	9768	26.1	5.34	7069	819	8299	1304	0.877	16.7	9.26	1495
2.22	259400	10980	26.3	5.41	7778	913	9173	1458	0.878	15.4	10.6	1952
2.24	287700	12330	26.4	5.47	8522	1014	10110	1625	0.877	14.3	12.0	2517
2.27	322200	13950	26.6	5.55	9406	1136	11220	1826	0.877	13.2	13.8	3309
2.39	125900	9308	25.7	7.00	4111	611	4594	937	0.886	32.7	8.17	200
2.41	153000	11410	25.9	7.07	4935	743	5547	1144	0.886	27.7	10.2	340
2.45	209500	15840	26.3	7.23	6589	1017	7486	1574	0.886	21.3	14.5	785
2.47	129200	10790	25.6	7.39	4227	666	4734	1023	0.880	33.6	9.46	196
2.48	147200	12380	25.8	7.47	4776	762	5360	1170	0.882	30.0	10.9	280
2.50	167300	14160	25.9	7.55	5383	867	6057	1335	0.883	26.8	12.6	395
2.51	190800	16260	26.2	7.66	6074	993	6845	1527	0.886	23.9	14.7	559
2.53	215400	18440	26.4	7.74	6784	1121	7670	1726	0.888	21.6	16.8	770
2.53	236600	19950	26.6	7.73	7380	1218	8369	1878	0.890	19.9	18.4	995
2.55	260400	22030	26.8	7.79	8050	1340	9163	2068	0.890	18.4	20.5	1280
2.56	283900	24050	26.9	7.84	8695	1455	9936	2250	0.890	17.2	22.6	1593
2.58	319000	27090	27.1	7.90	9652	1627	11090	2523	0.890	15.7	25.8	2162
2.60	353900	30170	27.3	7.97	10580	1801	12220	2797	0.890	14.5	29.1	2809
2.62	400500	34310	27.5	8.04	11800	2030	13720	3162	0.889	13.2	33.6	3824
2.65	445200	38100	27.7	8.11	12920	2241	15120	3498	0.889	12.2	37.9	4940



2.3 Universal Beams & Columns (UB & UC)



Imperial Units

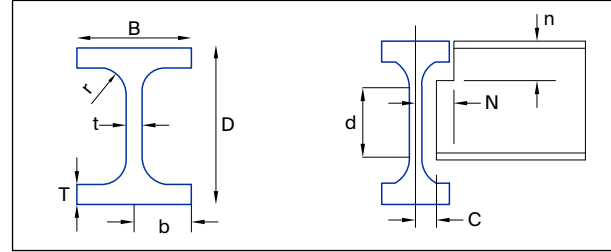
Designation			Depth of Section	Width of Section	Thickness		Root Radius	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing		
Size	Mass per Metre		D mm	B mm	Flange	Web	r mm	d mm	A cm ²	Flange	Web	End clearance C mm	Notch	
	lb/ft	kg/m			T mm	t mm				b/T	d/t		N mm	n mm
in (mm)														
W27-27x10 (686x254)	84	125.2	677.9	253.0	16.2	11.7	15.2	615.1	159	7.81	52.6	8	131	31
	94	140.1	683.5	253.7	19.0	12.4	15.2	615.1	178	6.68	49.6	8	131	34
	102	152.4	687.5	254.5	21.0	13.2	15.2	615.1	194	6.06	46.6	9	131	36
	114	170.2	692.9	255.8	23.7	14.5	15.2	615.1	217	5.40	42.4	9	131	39
	129	192	701.8	254.3	27.9	15.5	15.2	615.6	244	4.56	39.7	10	129	43
	143	213	707.9	255.8	31.0	17.0	15.2	615.5	270	4.13	36.2	11	129	46
	159	237	714.0	257.8	34.0	19.1	15.2	615.6	301	3.79	32.2	12	129	49
	182	271	723.9	260.2	39.1	21.6	15.2	615.3	345	3.33	28.5	13	129	54
	201	299	732.0	262.8	42.9	23.9	15.2	615.8	382	3.06	25.8	14	129	58
	221	329	739.9	264.8	47.0	25.9	15.2	615.5	418	2.82	23.8	15	129	62
	247	368	749.8	267.7	52.1	28.9	15.2	615.2	468	2.57	21.3	16	129	67
	271	404	760.0	270.3	56.9	31.5	15.2	615.8	513	2.38	19.5	18	129	72
	302	449	771.9	273.8	63.0	35.1	15.2	615.5	574	2.17	17.5	20	129	78
W27-27x14 (686x356)	146	217.3	695.5	354.7	24.8	15.4	15.2	615.6	277	7.16	40.1	10	180	40
	161	239.6	700.8	356.1	27.4	16.8	15.2	615.5	306	6.49	36.7	10	180	43
	178	264.9	706.4	357.8	30.2	18.4	15.2	615.5	337	5.92	33.4	11	180	45
	194	288.7	714.0	356.4	34.0	19.1	15.2	615.5	368	5.24	32.3	12	179	49
	217	322.9	722.1	358.5	38.1	21.1	15.2	615.5	411	4.70	29.2	13	179	53
	235	349.7	728.0	360.4	40.9	23.1	15.2	615.8	446	4.41	26.6	14	179	56
	258	383.9	736.1	362.5	45.0	24.9	15.2	615.8	489	4.03	24.7	14	179	60
	281	418.2	744.0	364.5	49.0	26.9	15.2	615.6	533	3.72	22.9	15	179	64
	307	456.9	752.1	366.9	53.1	29.5	15.2	615.5	582	3.46	20.9	17	179	68
	336	500	762.0	369.0	57.9	32.0	15.2	615.8	636	3.19	19.2	18	179	73
W30-30x10 1/2 (762x267)	90	133.9	750.0	264.4	15.5	12.0	16.5	686.0	171	8.53	57.2	8	136	32
	99	146.9	754.0	265.2	17.5	12.8	16.5	686.0	187	7.58	53.6	8	136	34
	108	160.7	757.7	266.1	19.3	13.8	16.5	686.1	205	6.89	49.6	9	136	36
	116	173	762.2	266.7	21.6	14.3	16.5	686.0	220	6.17	48.0	9	136	38
	124	184.5	766.3	267.1	23.6	14.9	16.5	686.1	235	5.65	46.2	9	136	40
	132	196.8	769.8	268.0	25.4	15.6	16.5	686.0	251	5.28	44.0	10	136	42
	148	220	779.0	266.2	30.0	16.5	16.5	686.0	281	4.44	41.6	10	135	47
	165	246	785.1	268.1	33.0	18.5	16.5	686.1	312	4.06	37.1	11	135	50
	185	275	793.0	270.1	37.1	20.6	16.5	685.8	351	3.64	33.3	12	135	54
	207	308	801.1	272.7	40.9	23.1	16.5	686.3	392	3.33	29.7	14	135	57
	226	337	809.0	274.6	44.9	24.9	16.5	686.2	428	3.06	27.6	14	135	61
	246	366	817.1	276.6	48.0	26.9	16.5	688.1	462	2.88	25.6	15	135	65

Dimensions	EN10365 / ASTM A6	
Specification	EN10025 / ASTM A36 / ASTM A572	
Size Range	UB: 5"x3" (127mm x 76mm) to 44"x16" (1118mm x 406mm) UC: 4"x4" (102mm x 102mm) to 14"x16" (356mm x 406mm)	

Surface Area	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
	Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x				
m ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	u	x	H	J
2.32	118000	4383	27.2	5.24	3481	347	3994	542	0.862	43.9	4.80	116
2.33	136300	5184	27.6	5.39	3987	409	4558	638	0.868	38.7	5.72	169
2.34	150400	5784	27.8	5.46	4374	455	5000	710	0.871	35.5	6.42	220
2.35	170300	6631	28.0	5.53	4916	518	5631	811	0.872	31.8	7.42	308
2.36	198000	7670	28.5	5.61	5644	603	6462	943	0.878	27.7	8.71	462
2.38	222000	8678	28.7	5.67	6272	678	7204	1063	0.878	25.2	9.94	627
2.39	247800	9750	28.7	5.69	6940	756	8016	1191	0.877	23.0	11.3	840
2.42	289300	11540	29.0	5.78	7993	887	9282	1402	0.878	20.3	13.5	1260
2.44	323800	13060	29.1	5.85	8847	994	10330	1577	0.877	18.6	15.5	1675
2.46	359400	14640	29.3	5.92	9715	1106	11390	1759	0.877	17.2	17.6	2186
2.49	406900	16800	29.5	5.99	10850	1255	12810	2005	0.877	15.6	20.4	2993
2.51	453800	18910	29.7	6.07	11940	1399	14170	2243	0.877	14.4	23.4	3897
2.54	515400	21790	30.0	6.16	13350	1592	15950	2565	0.876	13.2	27.4	5322
2.75	234200	18440	29.1	8.16	6735	1040	7558	1598	0.884	29.7	20.7	454
2.77	261200	20670	29.2	8.22	7455	1161	8389	1787	0.885	27.0	23.4	610
2.78	290800	23120	29.4	8.28	8233	1292	9297	1992	0.885	24.6	26.4	813
2.79	325500	25720	29.8	8.36	9118	1444	10300	2223	0.889	22.3	29.7	1100
2.81	369200	29310	30.0	8.44	10230	1635	11610	2523	0.890	20.1	34.3	1532
2.83	402300	31970	30.0	8.47	11050	1774	12600	2745	0.888	18.8	37.7	1914
2.85	447800	35780	30.3	8.56	12170	1974	13930	3057	0.889	17.2	42.7	2518
2.87	494700	39680	30.5	8.63	13300	2177	15290	3377	0.890	15.9	47.9	3250
2.89	545000	43850	30.6	8.68	14990	2390	16750	3717	0.889	14.8	53.6	4152
2.91	604800	48670	30.8	8.75	15870	2638	18450	4111	0.889	13.7	60.3	5373
2.51	150700	4788	29.7	5.30	4018	362	4644	570	0.854	49.8	6.46	119
2.51	168500	5456	30.0	5.40	4470	411	5156	647	0.858	45.2	7.40	159
2.52	185900	6080	30.1	5.45	4907	457	5665	720	0.859	41.5	8.29	208
2.53	205300	6850	30.5	5.58	5387	514	6198	807	0.864	38.1	9.39	267
2.54	223100	7525	30.8	5.65	5821	563	6689	885	0.867	35.4	10.4	333
2.55	240000	8175	30.9	5.71	6234	610	7167	959	0.869	33.2	11.3	404
2.56	278200	9463	31.5	5.81	7142	711	8197	1115	0.875	28.9	13.3	605
2.58	310700	10640	31.5	5.84	7914	794	9129	1251	0.874	26.4	15.0	815
2.60	353200	12240	31.7	5.91	8909	906	10320	1433	0.874	23.7	17.5	1147
2.62	397200	13900	31.8	5.96	9916	1020	11550	1620	0.873	21.6	20.1	1555
2.64	440500	15600	32.1	6.04	10890	1136	12720	1808	0.874	19.9	22.8	2029
2.66	480200	17050	32.2	6.08	11750	1233	13790	1971	0.873	18.7	25.2	2500



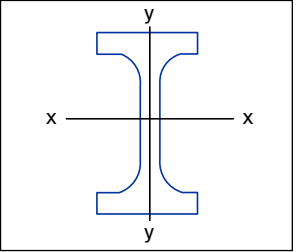
2.3 Universal Beams & Columns (UB & UC)



Imperial Units

Designation		Depth of Section		Width of Section		Thickness		Root Radius	Depth between Fillets		Area of Section	Ratios for Local Buckling		Dimensions for Detailing		
Size	Mass per Metre		D	B	Flange T	Web t	r	d	A	Flange b/T	Web d/t	End clearance C	Notch			
	lb/ft	kg/m											N	n		
in (mm)			mm	mm	mm	mm	mm	mm	cm ²			mm	mm	mm		
W30-30x10 1/2 (762x267)	269	401	825.0	279.1	53.1	29.5	16.5	685.8	511	2.63	23.2	17	135	70		
	295	439	835.2	281.7	57.9	32.0	16.5	686.4	559	2.43	21.5	18	135	74		
W30-30x15 (762x381)	173	257.5	773.2	380.6	27.1	16.6	16.5	686.1	328	7.04	41.2	10	192	44		
	191	284.2	779.3	382.0	30.1	18.0	16.5	686.1	362	6.35	38.1	11	192	47		
	211	314	785.9	383.7	33.4	19.7	16.5	686.1	400	5.74	34.9	12	192	50		
	235	349.7	795.0	382.4	38.1	21.1	16.5	685.8	445	5.02	32.5	13	191	55		
	261	388.4	802.9	384.9	41.9	23.6	16.5	686.1	495	4.59	29.0	14	191	58		
	292	434.5	813.1	387.5	47.0	25.9	16.5	686.1	553	4.12	26.5	15	191	63		
	326	485.1	823.0	390.4	52.1	29.0	16.5	685.9	617	3.75	23.7	16	191	69		
	357	531	833.0	393.0	56.9	31.5	20.0	679.2	677	3.45	21.6	18	191	77		
	W33-33x11 1/2 (838x292)	118	175.9	834.9	291.7	18.8	14.0	17.8	761.7	224	7.76	54.4	9	149	37	
		130	193.8	840.7	292.4	21.7	14.7	17.8	761.7	247	6.74	51.8	9	149	40	
141		209.8	845.8	293.0	24.4	15.4	17.8	761.4	268	6.01	49.5	10	149	42		
152		226.5	850.9	293.8	26.8	16.1	17.8	761.7	289	5.48	47.3	10	149	45		
169		252	859.0	292.1	31.0	17.0	17.8	761.4	319	4.71	44.8	11	148	49		
187		278	865.1	294.1	34.0	19.1	17.8	761.5	355	4.33	39.9	12	148	52		
204		304	871.2	295.7	37.1	20.6	17.8	761.4	386	3.99	37.0	12	148	55		
219		326	877.1	297.2	39.9	22.1	17.8	761.7	416	3.72	34.5	13	148	58		
243		362	885.2	299.7	43.9	24.4	17.8	761.8	460	3.41	31.2	14	148	62		
271		404	895.1	302.1	49.0	26.9	17.8	761.5	513	3.08	28.3	15	148	67		
301		449	905.0	305.2	54.1	30.0	17.8	761.2	572	2.82	25.4	17	148	72		
332		494	915.2	308.1	58.9	33.0	17.8	761.8	629	2.62	23.1	19	148	77		
361		537	925.1	310.6	64.0	35.6	17.8	761.5	684	2.43	21.4	20	148	82		
W33-33x15 3/4 (838x400)		201	299.1	855.5	399.9	29.2	18.2	17.8	761.5	381	6.85	41.9	11	201	47	
	221	328.9	861.8	401.4	32.4	19.7	17.8	761.4	420	6.20	38.7	12	201	50		
	241	358.6	868.2	402.8	35.6	21.1	17.8	761.5	457	5.66	36.1	13	201	53		
	263	391.4	877.1	401.4	39.9	22.1	17.8	761.7	499	5.03	34.5	13	200	58		
	291	433.1	884.9	404.0	43.9	24.4	17.8	761.4	552	4.60	31.2	14	200	62		
	318	473.2	893.1	406.0	48.0	26.4	17.8	761.5	603	4.23	28.8	15	200	66		
	354	526.8	903.0	408.9	53.1	29.5	17.8	761.2	672	3.85	25.8	17	200	71		
	387	575.9	913.1	411.5	57.9	32.0	17.8	761.7	734	3.55	23.8	18	200	76		
	424	631	923.0	414.0	63.0	35.1	20.0	757.0	805	3.29	21.6	20	199	83		
	468	697	935.0	418.0	69.1	38.6	20.0	756.8	889	3.02	19.6	21	200	89		

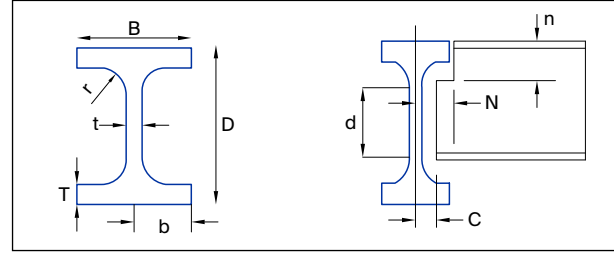
Dimensions	EN10365 / ASTM A6
Specification	EN10025 / ASTM A36 / ASTM A572
Size Range	UB: 5"x3" (127mm x 76mm) to 44"x16" (1118mm x 406mm) UC: 4"x4" (102mm x 102mm) to 14"x16" (356mm x 406mm)



Surface Area	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
	Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x				
m ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	u	x	H dm ⁶	J cm ⁴
2.68	536500	19400	32.4	6.16	13010	1390	15330	2229	0.874	17.0	28.9	3361
2.70	595900	21780	32.7	6.24	14270	1546	16900	2486	0.874	15.8	32.9	4345
3.01	341200	24890	32.3	8.71	8827	1308	9916	2012	0.883	30.3	34.6	635
3.02	381700	28000	32.5	8.80	9796	1466	11030	2258	0.885	27.5	39.3	859
3.04	427000	31500	32.7	8.87	10870	1642	12270	2531	0.886	25.0	44.6	1161
3.05	485900	35570	33.0	8.94	12220	1860	13830	2869	0.889	22.2	50.9	1651
3.07	543700	39920	33.1	8.98	13540	2074	15410	3208	0.888	20.3	57.8	2218
3.10	618300	45680	33.4	9.09	15210	2358	17380	3653	0.889	18.3	67.0	3090
3.12	697600	51790	33.6	9.16	16950	2653	19500	4123	0.888	16.7	77.0	4224
3.14	776600	57770	33.9	9.24	18650	2940	21550	4579	0.888	15.3	87.0	5563
2.78	246000	7800	33.1	5.90	5893	535	6808	842	0.856	46.5	13.0	221
2.79	279200	9067	33.6	6.06	6642	620	7640	974	0.862	41.6	15.2	306
2.80	310200	10250	34.0	6.18	7334	700	8416	1097	0.867	37.9	17.3	404
2.81	339700	11360	34.3	6.27	7985	773	9155	1212	0.870	35.0	19.3	514
2.82	386500	12920	34.8	6.36	8999	884	10310	1383	0.875	30.9	22.1	735
2.84	430400	14470	34.8	6.38	9950	984	11450	1547	0.874	28.3	25.0	983
2.85	473000	16050	35.0	6.45	10860	1086	12530	1710	0.874	26.1	27.9	1265
2.87	513500	17540	35.1	6.49	11710	1180	13550	1864	0.874	24.4	30.7	1569
2.89	573400	19800	35.3	6.56	12960	1321	15060	2095	0.874	22.3	35.0	2095
2.91	648200	22660	35.5	6.64	14480	1500	16910	2385	0.875	20.2	40.5	2884
2.94	729200	25820	35.7	6.72	16120	1692	18920	2704	0.874	18.4	46.7	3910
2.97	810000	28960	35.9	6.79	17700	1880	20890	3018	0.873	17.0	53.1	5088
2.99	892800	32280	36.1	6.87	19300	2078	22880	3346	0.873	15.8	59.8	6494
3.24	479800	31180	35.5	9.05	11220	1559	12640	2405	0.881	31.2	53.2	855
3.26	534700	34970	35.7	9.13	12410	1742	14020	2690	0.882	28.4	60.1	1146
3.27	590000	38800	35.9	9.21	13590	1927	15380	2977	0.884	26.1	67.3	1491
3.29	659000	43070	36.3	9.29	15030	2146	17020	3314	0.888	23.6	75.5	2008
3.31	735400	48390	36.5	9.36	16620	2396	18910	3709	0.887	21.6	85.6	2687
3.33	812500	53680	36.7	9.43	18200	2644	20780	4101	0.888	19.9	95.8	3488
3.35	913500	60680	36.9	9.50	20330	2968	23230	4616	0.887	18.1	110	4737
3.38	1012000	67480	37.1	9.59	22170	3280	25570	5113	0.887	16.7	123	6135
3.40	1120000	74810	37.3	9.64	24260	3614	28140	5652	0.886	15.5	138	7983
3.43	1253000	84520	37.6	9.75	26810	4044	31270	6342	0.886	14.2	158	10569



2.3 Universal Beams & Columns (UB & UC)



Imperial Units

Designation			Depth of section	Width of section	Thickness		Root radius	Depth between fillets	Area of section	Ratios for local buckling		Dimensions for detailing		
Size	Mass per metre		D	B	Flange	Web	r	d	A	Flange	Web	End clearance C	Notch	
	lb/ft	kg/m			T	t				b/T	d/t		N	n
in (mm)			mm	mm	mm	mm	mm	cm ²			mm	mm	mm	mm
W36-36x12 (914x305)	135	200.9	903.0	303.3	20.2	15.1	19.1	824.4	256	7.51	54.6	10	154	39
	150	224.2	910.4	304.1	23.9	15.9	19.1	824.4	286	6.36	51.8	10	154	43
	160	238.1	914.7	304.8	25.9	16.5	19.0	824.9	304	5.88	50.0	10	154	45
	170	253.4	918.4	305.5	27.9	17.3	19.1	824.4	323	5.47	47.7	11	154	47
	182	270.8	922.8	306.7	30.0	18.4	19.0	824.9	346	5.12	44.8	11	154	49
	194	289.1	926.6	307.7	32.0	19.5	19.1	824.4	368	4.81	42.3	12	154	51
	210	312.5	931.9	309.4	34.5	21.1	19.0	824.8	399	4.48	39.1	13	154	54
	232	345	942.9	307.8	39.9	22.1	19.1	824.9	440	3.86	37.3	13	153	59
	256	381	950.7	310.3	43.9	24.4	19.1	824.7	486	3.53	33.8	14	153	63
	286	426	960.9	312.8	48.0	26.9	19.1	826.7	536	3.26	30.7	15	153	67
	318	474	970.8	315.7	54.1	29.9	19.1	824.4	603	2.92	27.6	17	153	73
	350	521	980.7	318.8	58.9	33.0	19.1	824.7	663	2.71	25.0	19	153	78
	387	576	992.9	321.8	65.0	36.1	19.1	824.7	733	2.48	22.8	20	153	84
W36-36x16 1/2 (914x419)	230	343.3	911.8	418.5	32.0	19.4	24.1	799.6	437	6.54	41.2	12	210	56
	245	364.6	916.4	419.4	34.3	20.3	24.1	799.6	465	6.12	39.4	12	210	58
	260	388	921.0	420.5	36.6	21.4	24.1	799.6	494	5.74	37.4	13	210	61
	280	416.7	927.6	421.5	39.9	22.5	24.1	799.6	532	5.28	35.6	13	210	64
	300	446.4	933.2	423.0	42.7	24.0	24.1	799.7	569	4.96	33.3	14	210	67
	328	488.1	942.1	422.4	47.0	25.9	24.1	799.9	622	4.49	30.9	15	208	71
	359	534.2	950.0	424.9	51.1	28.5	24.1	799.7	680	4.16	28.1	16	208	75
	393	584.8	960.1	427.5	55.9	31.0	24.1	800.1	746	3.83	25.8	17	208	80
W40-40x12 (1016x305)	149	222	970.3	300.0	21.1	16.0	30.0	868.1	283	7.11	54.3	10	152	51
	167	249	980.2	300.0	26.0	16.5	30.0	868.2	317	5.77	52.6	10	152	56
	183	272	990.1	300.0	31.0	16.5	30.0	868.1	347	4.84	52.6	10	152	61
	211	314	1000.0	300.0	35.9	19.1	30.0	868.2	400	4.18	45.5	12	150	66
	235	349	1008.1	302.0	40.0	21.1	30.0	868.1	445	3.78	41.1	13	150	70
	264	393	1016.0	303.0	43.9	24.4	30.0	868.2	500	3.45	35.6	14	149	74
	294	438	1025.9	305.4	49.0	26.9	30.0	867.9	557	3.12	32.3	15	149	79
	327	487	1036.1	308.5	54.1	30.0	30.0	867.9	620	2.85	28.9	17	149	84
	359	535	1046.0	311.4	58.9	33.0	30.0	868.2	681	2.64	26.3	19	149	89

Dimensions	EN10365 / ASTM A6	
Specification	EN10025 / ASTM A36 / ASTM A572	
Size Range	UB: 5"x3" (127mm x 76mm) to 44"x16" (1118mm x 406mm) UC: 4"x4" (102mm x 102mm) to 14"x16" (356mm x 406mm)	

Surface area	Second moment of area		Radius of gyration		Elastic modulus		Plastic modulus		Buckling parameter	Torsional index	Warping constant	Torsional constant
	Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x				
m ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³	cm ³	u	x	H dm ⁶	J cm ⁴
2.96	325300	9424	35.7	6.07	7204	621	8351	982	0.854	46.8	18.4	291
2.97	376400	11240	36.3	6.27	8269	739	9535	1163	0.861	41.3	22.1	422
2.98	406100	12270	36.6	6.36	8879	805	10230	1266	0.864	38.6	24.2	515
2.99	436300	13300	36.8	6.42	9501	871	10940	1371	0.866	36.2	26.4	626
3.00	470700	14460	36.9	6.47	10200	943	11770	1487	0.866	33.9	28.8	767
3.01	504200	15600	37.0	6.51	10880	1014	12570	1601	0.867	31.9	31.2	926
3.03	549000	17130	37.1	6.55	11780	1107	13650	1754	0.866	29.7	34.5	1164
3.04	625200	19480	37.7	6.66	13260	1266	15340	2000	0.872	26.4	39.7	1648
3.06	696900	21980	37.9	6.72	14660	1416	17030	2247	0.872	24.1	45.2	2199
3.09	777000	24640	38.1	6.78	16170	1575	18870	2510	0.871	22.2	51.3	2891
3.11	884100	28580	38.3	6.89	18210	1810	21350	2895	0.872	19.9	60.0	4091
3.14	981300	32080	38.5	6.95	20010	2013	23590	3235	0.871	18.4	68.1	5337
3.17	110100	36460	38.8	7.05	22180	2266	26260	3654	0.871	16.8	78.5	7127
3.42	625800	39160	37.8	9.46	13730	1871	15480	2890	0.883	30.1	75.8	1193
3.43	671700	42240	38.0	9.53	14660	2014	16550	3111	0.884	28.3	82.2	1442
3.44	719600	45440	38.2	9.59	15630	2161	17670	3341	0.885	26.7	88.9	1734
3.45	785700	49870	38.4	9.68	16940	2366	19170	3658	0.887	24.8	98.3	2188
3.47	846900	53940	38.6	9.73	18150	2550	20600	3948	0.887	23.3	107	2671
3.48	936400	59170	38.8	9.76	19880	2801	22640	4344	0.887	21.4	119	3500
3.50	1031000	65450	38.9	9.81	21700	3081	24820	4790	0.886	19.8	132	4508
3.53	1144000	73000	39.2	9.89	23840	3415	27390	5320	0.887	18.2	149	5890
3.06	408000	9553	38.0	5.81	8409	637	9807	1020	0.850	45.7	21.5	390
3.08	481300	11760	39.0	6.09	9821	784	11350	1245	0.861	39.9	26.8	582
3.10	554000	14010	40.0	6.36	11190	934	12830	1470	0.873	35.0	32.2	835
3.11	644200	16240	40.1	6.37	12880	1083	14850	1713	0.872	30.7	37.7	1264
3.13	723100	18470	40.3	6.44	14350	1223	16590	1941	0.872	27.9	43.3	1718
3.14	807700	20500	40.2	6.40	15900	1353	18540	2168	0.868	25.5	48.4	2330
3.17	909900	23450	40.4	6.49	17740	1536	20760	2469	0.868	23.1	56.0	3185
3.19	1021000	26730	40.6	6.57	19720	1733	23200	2800	0.867	21.1	64.4	4299
3.22	1131000	29970	40.8	6.63	21620	1925	25570	3126	0.866	19.5	73.0	5576