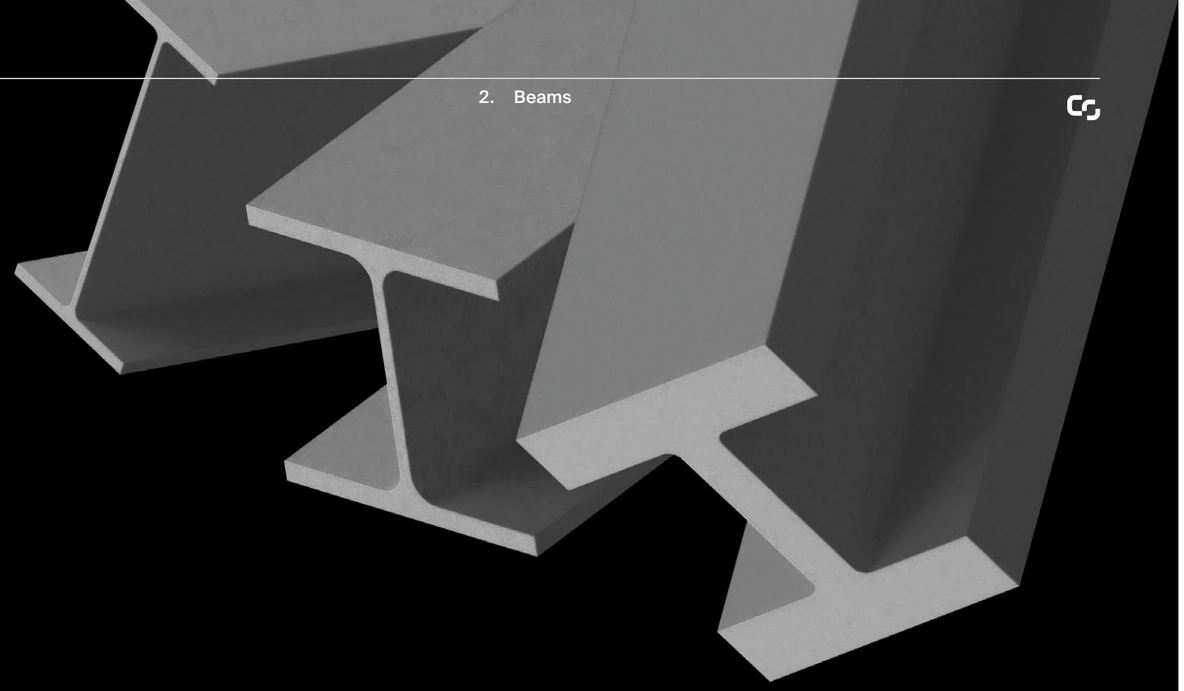


2. Beams

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.

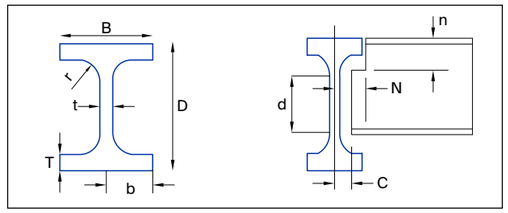
2.1 Parallel Flange I Sections (IPE)
2.2 Wide Flange Beams (HE)
2.3 Universal Beams (UB)
2.4 Universal Columns (UB)
2.5 Metric Beams (MB)
2.6 Metric Columns (MC)

Universal Beams and Columns
Standard specifications

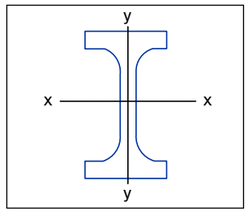
The standard specifications used for production of universal beams and columns in this region are listed in this table.

Material	Yield strength N/mm²			Tensile strength N/mm²	Min. Elongation $L_0=5.65\sqrt{S_0}$	Min. Charpy V-notch.	Dimensions & Tolerances
AS 3679.1	**≤11mm**	**>11 - <40mm**	**≥40mm**				*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	

2.4 Metric Beams & Columns (MB & MC)



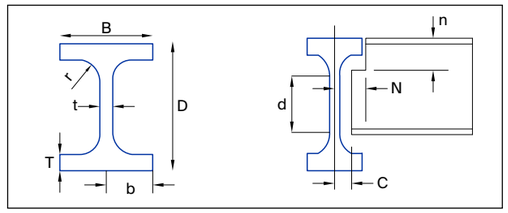
Dimensions	JIS G 3192
Specification	EN10025/ ASTM A36/ ASTM A572/ JIS G 3101
Size Range	MB: 100mm x 50mm to 900mm x 300mm MC: 100mm x 100mm to 400mm x 400mm



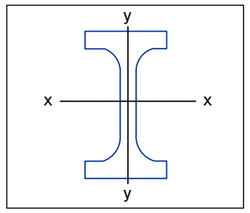
Metric Units

Designation		Depth of Section	Width of Section	Thickness		Root Radius	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing			Surface Area per Metre	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
Size	Mass per Metre			Flange	Web				Flange	Web	End clearance	Notch		Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y				
		D	B	T	t	r	d	A	b/T	d/t	C	N	n										u	x	H	J
in (mm)	kg/m	mm	mm	mm	mm	mm	mm	cm²			mm	mm	mm	m²	cm⁴	cm⁴	cm	cm	cm³	cm³	cm³	cm³			dm⁶	cm⁴
100x50	9.30	100	50	7	5	8	70	11.8	3.57	14.0	5	33	15	0.376	188	14.8	3.98	1.12	37.5	5.93	44.1	9.5	0.876	12.7	0.000	2.03
100x100	14.8	100	100	7	5	10	66	19.2	7.14	13.2	5	58	17	0.570	344	117.0	4.20	2.47	69.0	23.0	78.0	36.0	0.843	12.3	0.003	3.53
	16.9	100	100	8	6	8	68	21.6	6.25	11.3	5	57	16	0.574	378	134	4.18	2.49	75.6	26.7	86.4	41.0	0.836	11.1	0.003	4.73
	17.2	100	100	8	6	10	64	21.9	6.25	10.7	5	57	18	0.571	383	134	4.18	2.47	76.5	26.8	87.6	41.2	0.837	10.7	0.003	5.17
125x60	13.2	125	60	8	6	9	91	16.8	3.75	15.2	5	37	17	0.463	413	29.2	4.95	1.32	66.1	9.75	77.6	15.7	0.872	14.0	0.001	3.75
125x125	23.6	125	125	9	6.5	8	91	30.0	6.94	14.0	5	69	17	0.723	840	293	5.29	3.13	134	46.9	152	71.7	0.839	12.8	0.010	7.91
	23.8	125	125	9	6.5	10	87	30.3	6.94	13.4	5	69	19	0.720	847	294	5.29	3.11	136	47.0	154	71.9	0.840	12.5	0.010	8.43
150x75	14.0	150	75	7	5	8	120	17.8	5.36	24.0	5	45	15	0.576	666	49.5	6.11	1.67	88.8	13.2	102	20.8	0.876	20.4	0.003	2.81
150x100	20.7	148	100	9	6	8	114	26.3	5.56	19.0	5	57	17	0.670	1003	150	6.17	2.39	135	30.1	154	46.4	0.880	15.8	0.007	6.56
	21.1	148	100	9	6	11	108	26.8	5.56	18.0	5	57	20	0.665	1021	151	6.17	2.37	138	30.1	157	46.7	0.881	15.0	0.007	7.37
150x150	31.1	150	150	10	7	8	114	39.6	7.50	16.3	6	82	18	0.872	1623	563	6.40	3.77	216	75.1	243	114	0.841	14.1	0.028	12.5
	31.5	150	150	10	7	11	108	40.1	7.50	15.4	6	82	21	0.867	1641	563	6.39	3.75	219	75.1	246	115	0.842	13.7	0.028	13.5
	37.4	154	151	12	8	11	108	47.7	6.29	13.5	6	82	23	0.877	2018	690	6.51	3.80	262	91.4	298	140	0.845	11.8	0.035	22.2
175x90	18.0	175	90	8	5	8	143	22.9	5.63	28.6	5	53	16	0.686	1205	97.5	7.26	2.06	138	21.7	156	33.6	0.885	21.8	0.007	4.31
	18.1	175	90	8	5	9	141	23.0	5.63	28.2	5	53	17	0.685	1214	97.6	7.26	2.06	139	21.7	157	33.7	0.885	21.4	0.007	4.50
175x125	23.3	169	125	8	5.5	12	129	29.7	7.81	23.5	5	70	20	0.806	1529	261	7.18	2.97	181	41.8	202	64.3	0.879	19.1	0.017	6.76
175x175	32.8	171	174	9	6	12	129	41.7	9.67	21.5	5	94	21	1.01	2304	791	7.43	4.35	269	90.9	298	138	0.845	17.5	0.052	11.5
	40.2	175	175	11	7.5	12	129	51.2	7.95	17.2	6	94	23	1.01	2884	984	7.50	4.38	330	112	369	171	0.844	14.7	0.066	20.4
	40.4	175	175	11	7.5	13	127	51.4	7.95	16.9	6	94	24	1.01	2895	984	7.50	4.37	331	112	370	172	0.845	14.5	0.066	21.0
200x100	17.8	198	99	7	4.5	8	168	22.7	7.07	37.3	4	57	15	0.769	1543	113	8.25	2.24	156	22.9	175	35.5	0.883	28.4	0.010	3.30
	18.2	198	99	7	4.5	11	162	23.2	7.07	36.0	4	57	18	0.764	1582	114	8.26	2.22	160	23.0	180	35.7	0.884	26.5	0.010	3.86
	20.9	200	100	8	5.5	8	168	26.7	6.25	30.5	5	57	16	0.775	1806	134	8.23	2.24	181	26.7	205	41.6	0.878	24.9	0.012	5.08
	21.3	200	100	8	5.5	11	162	27.2	6.25	29.5	5	57	19	0.770	1844	134	8.24	2.22	184	26.8	209	41.9	0.880	23.6	0.012	5.77
200x150	29.9	194	150	9	6	8	160	38.1	8.33	26.7	5	82	17	0.962	2625	507	8.30	3.65	271	67.6	301	103	0.876	21.2	0.043	9.32
	30.6	194	150	9	6	13	150	39.0	8.33	25.0	5	82	22	0.954	2690	507	8.30	3.61	277	67.7	309	104	0.878	19.8	0.043	10.9
	36.9	198	151	11	7	13	150	47.0	6.86	21.4	6	82	24	0.964	3331	633	8.42	3.67	336	83.8	377	128	0.879	16.9	0.055	18.5
200x200	41.4	196	199	10	6.5	13	150	52.7	9.95	23.1	5	106	23	1.15	3846	1315	8.54	5.00	392	132	433	201	0.847	18.2	0.114	17.6
	49.9	200	200	12	8	13	150	63.5	8.33	18.8	6	106	25	1.16	4716	1602	8.62	5.02	472	160	525	244	0.846	15.5	0.142	29.8
	57.8	204	201	14	9	13	150	73.6	7.18	16.7	7	106	27	1.17	5603	1897	8.73	5.08	549	189	617	287	0.847	13.6	0.171	45.8
	65.7	208	202	16	10	13	150	83.7	6.31	15.0	7	106	29	1.18	6531	2201	8.83	5.13	628	218	710	332	0.848	12.2	0.203	66.7

2.4
Metric Beams & Columns (MB & MC)



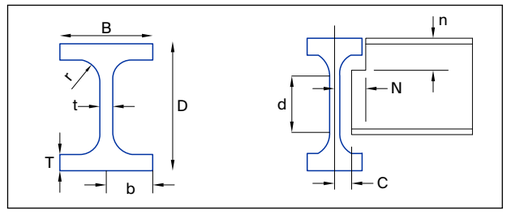
Dimensions	JIS G 3192
Specification	EN10025/ ASTM A36/ ASTM A572/ JIS G 3101
Size Range	MB: 100mm x 50mm to 900mm x 300mm MC: 100mm x 100mm to 400mm x 400mm



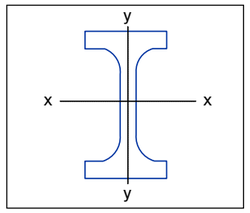
Metric Units

Designation		Depth of Section	Width of Section	Thickness		Root Radius	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing			Surface Area per Metre	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
Size	Mass per Metre			Flange	Web				Flange	Web	End clearance	Notch		Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y				
		D	B	T	t	r	d	A	b/T	d/t	C	N	n										u	x	H	J
in (mm)	kg/m	mm	mm	mm	mm	mm	mm	cm²			mm	mm	mm	m²	cm⁴	cm⁴	cm	cm	cm³	cm³	cm³	cm³			dm⁶	cm⁴
250x125	25.1	248	124	8	5	8	216	32.0	7.75	43.2	5	70	16	0.968	3450	255	10.4	2.82	278	41.1	312	63.2	0.884	32.0	0.037	5.78
	25.7	248	124	8	5	12	208	32.7	7.75	41.6	5	70	20	0.961	3537	255	10.4	2.79	285	41.1	319	63.6	0.886	29.9	0.037	6.74
	29.0	250	125	9	6	8	216	37.0	6.94	36.0	5	70	17	0.974	3965	294	10.4	2.82	317	47.0	358	72.7	0.880	28.4	0.043	8.51
	29.6	250	125	9	6	12	208	37.7	6.94	34.7	5	70	21	0.967	4052	294	10.4	2.79	324	47.0	366	73.1	0.881	26.9	0.043	9.68
250x175	43.6	244	175	11	7	13	196	55.5	7.95	28.0	6	94	24	1.15	6037	984	10.4	4.21	495	112	550	172	0.883	21.3	0.134	21.2
	44.1	244	175	11	7	16	190	56.2	7.95	27.1	6	94	27	1.15	6122	985	10.4	4.19	502	113	558	173	0.884	20.5	0.134	23.2
	51.6	248	176	13	8	16	190	65.7	6.77	23.8	6	94	29	1.16	7308	1184	10.5	4.24	589	135	660	207	0.884	18.0	0.163	36.1
	59.1	252	177	15	9	16	190	75.3	5.90	21.1	7	94	31	1.17	8541	1390	10.7	4.30	678	157	764	241	0.885	16.0	0.195	53.2
250x250	66.5	248	249	13	8	16	190	84.7	9.58	23.8	6	131	29	1.45	9931	3348	10.8	6.29	801	269	883	408	0.850	17.9	0.462	46.7
	71.8	250	250	14	9	13	196	91.4	8.93	21.8	7	131	27	1.46	10750	3648	10.8	6.32	860	292	953	443	0.847	17.1	0.508	55.8
	72.4	250	250	14	9	16	190	92.2	8.93	21.1	7	131	30	1.45	10830	3649	10.8	6.29	867	292	960	444	0.848	16.7	0.508	58.7
	81.6	250	255	14	14	13	196	104	9.11	14.0	9	131	27	1.47	11400	3876	10.5	6.11	912	304	1031	467	0.826	15.7	0.540	75.4
	98.1	260	253	19	12	16	190	125	6.66	15.8	8	131	35	1.48	15340	5134	11.1	6.41	1180	406	1330	618	0.849	12.8	0.745	141
300x150	25.0	294	148	6	4.5	16	250	32.6	12.3	55.6	4	82	22	1.14	4940	326	12.3	3.16	336	44.0	375	68.4	0.878	39.7	0.068	5.51
	32.0	298	149	8	5.5	13	256	40.8	9.31	46.5	5	82	21	1.16	6318	442	12.4	3.29	424	59.4	475	91.8	0.880	35.6	0.093	8.65
	36.7	300	150	9	6.5	13	256	46.8	8.33	39.4	5	82	22	1.16	7210	508	12.4	3.29	481	67.7	542	105	0.876	32.0	0.107	12.4
	41.4	304	150	11	6.5	13	256	52.8	6.82	39.4	5	82	24	1.17	8578	620	12.7	3.43	564	82.7	633	128	0.888	27.8	0.133	18.8
	46.2	306	151	12	7.5	13	256	58.8	6.29	34.1	6	82	25	1.18	9514	691	12.7	3.43	622	91.5	702	142	0.884	25.6	0.149	24.9
	69.0	318	154	18	11	13	256	87.9	4.28	23.3	8	82	31	1.21	14820	1100	13.0	3.54	932	143	1070	223	0.884	17.9	0.248	79.0
300x200	48.3	290	199	10	7	18	234	61.5	9.95	33.4	6	106	28	1.33	9431	1317	12.4	4.63	650	132	721	203	0.882	26.0	0.258	22.8
	55.8	294	200	12	8	13	244	71.1	8.33	30.5	6	106	25	1.35	11110	1602	12.5	4.75	756	160	842	245	0.882	24.0	0.319	31.4
	56.8	294	200	12	8	18	234	72.4	8.33	29.3	6	106	30	1.34	11340	1604	12.5	4.71	771	160	859	247	0.883	22.7	0.319	35.8
	65.4	298	201	14	9	18	234	83.4	7.18	26.0	7	106	32	1.35	13310	1900	12.6	4.77	893	189	1000	291	0.884	20.1	0.383	53.4
	77.3	304	202	17	10	18	234	98.5	5.94	23.4	7	106	35	1.37	16280	2341	12.9	4.88	1071	232	1204	356	0.888	17.2	0.482	87.8
300x300	87.0	298	299	14	9	18	234	111	10.7	26.0	7	155	32	1.74	18850	6242	13.0	7.51	1265	418	1389	634	0.850	20.0	1.26	71.3
	93.0	300	300	15	10	13	244	118	10.0	24.4	7	155	28	1.76	20190	6753	13.1	7.55	1346	450	1484	683	0.847	19.4	1.37	82.1
	94.0	300	300	15	10	18	234	120	10.0	23.4	7	155	33	1.75	20410	6756	13.1	7.51	1361	450	1501	684	0.848	18.8	1.37	88.1
	105	300	305	15	15	13	244	133	10.2	16.3	10	155	28	1.77	21310	7103	12.6	7.30	1421	466	1596	714	0.828	17.9	1.44	109
	106	304	301	17	11	18	234	135	8.85	21.3	8	155	35	1.76	23380	7733	13.2	7.57	1538	514	1705	781	0.849	16.9	1.59	125
	125	310	303	20	13	18	234	159	7.58	18.0	9	155	38	1.78	28130	9282	13.3	7.64	1815	613	2031	932	0.849	14.6	1.95	200
	130	310	305	20	15	18	234	165	7.63	15.6	10	155	38	1.78	28630	9470	13.2	7.57	1847	621	2079	949	0.842	14.4	1.99	215
	147	312	310	21	20	18	234	187	7.38	11.7	12	155	39	1.79	31370	10450	13.0	7.48	2011	674	2295	1040	0.830	13.0	2.21	298

2.4
Metric Beams & Columns (MB & MC)



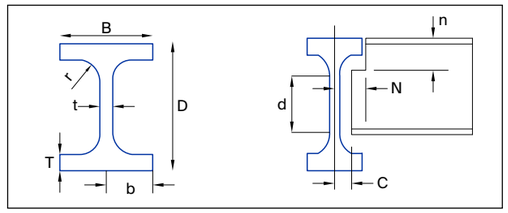
Dimensions	JIS G 3192
Specification	EN10025/ ASTM A36/ ASTM A572/ JIS G 3101
Size Range	MB: 100mm x 50mm to 900mm x 300mm MC: 100mm x 100mm to 400mm x 400mm



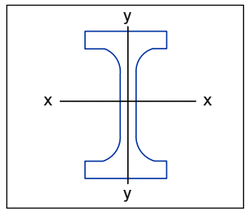
Metric Units

Designation		Depth of Section	Width of Section	Thickness		Root Radius	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing			Surface Area per Metre	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
Size	Mass per Metre			Flange	Web				Flange	Web	End clearance	Notch		Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y				
		D	B	T	t	r	d	A	b/T	d/t	C	N	n										u	x	H	J
in (mm)	kg/m	mm	mm	mm	mm	mm	mm	cm²			mm	mm	mm	m²	cm⁴	cm⁴	cm	cm	cm³	cm³	cm³	cm³			dm⁶	cm⁴
350x175	41.2	346	174	9	6	13	302	52.5	9.67	50.3	5	94	22	1.35	11040	792	14.5	3.88	638	91.0	712	140	0.881	38.1	0.225	13.2
	41.4	346	174	9	6	14	300	52.7	9.67	50.0	5	94	23	1.35	11100	792	14.5	3.88	641	91.0	716	140	0.882	37.5	0.225	13.6
	49.4	350	175	11	7	13	302	62.9	7.95	43.1	6	94	24	1.36	13500	984	14.6	3.96	771	113	864	173	0.883	32.2	0.283	22.4
	49.6	350	175	11	7	14	300	63.1	7.95	42.9	6	94	25	1.36	13560	985	14.7	3.95	775	113	868	174	0.884	31.8	0.283	23.0
	57.8	354	176	13	8	14	300	73.7	6.77	37.5	6	94	27	1.37	16100	1184	14.8	4.01	909	135	1022	208	0.885	27.6	0.344	36.1
	66.2	358	177	15	9	14	300	84.3	5.90	33.3	7	94	29	1.38	18710	1390	14.9	4.06	1045	157	1180	243	0.886	24.4	0.409	53.6
	71.8	360	178	16	10	14	300	91.4	5.56	30.0	7	94	30	1.39	20240	1508	14.9	4.06	1124	169	1276	263	0.883	22.9	0.446	66.3
	79.7	364	177	18	11	14	300	101	4.92	27.3	8	93	32	1.39	22760	1669	15.0	4.06	1250	189	1425	293	0.884	20.6	0.499	91.3
350x250	69.2	336	249	12	8	20	272	88.2	10.4	34.0	6	131	32	1.62	18510	3093	14.5	5.92	1102	248	1215	380	0.881	25.8	0.812	44.6
	78.1	340	250	14	9	13	286	100	8.93	31.8	7	131	27	1.64	21230	3649	14.6	6.05	1249	292	1382	445	0.881	24.2	0.969	58.0
	79.7	340	250	14	9	20	272	102	8.93	30.2	7	131	34	1.63	21680	3652	14.6	6.00	1275	292	1412	447	0.882	22.8	0.970	66.3
	94.2	346	251	17	10	20	272	120	7.38	27.2	7	131	37	1.64	26440	4488	14.8	6.12	1528	358	1699	547	0.886	19.5	1.21	109
	108	350	253	19	12	20	272	137	6.66	22.7	8	131	39	1.65	30190	5138	14.8	6.12	1725	406	1935	623	0.882	17.6	1.41	155
350x350	113	344	348	16	10	13	286	144	10.9	28.6	7	179	29	2.04	32850	11240	15.1	8.84	1910	646	2092	978	0.848	21.1	3.02	111
	115	344	354	16	10	20	272	148	11.1	27.2	7	182	36	2.05	33810	11840	15.1	8.95	1966	669	2153	1014	0.846	20.4	3.18	123
	135	350	350	19	12	13	286	172	9.21	23.8	8	179	32	2.05	39847	13583	15.2	8.89	2277	776	2515	1176	0.847	18.0	3.72	186
	137	350	350	19	12	20	272	174	9.21	22.7	8	179	39	2.04	40300	13590	15.2	8.84	2303	776	2545	1179	0.849	17.5	3.72	199
	159	356	352	22	14	20	272	202	8.00	19.4	9	179	42	2.06	47590	16000	15.3	8.90	2674	909	2979	1382	0.848	15.4	4.46	305
	181	362	354	25	16	20	272	230	7.08	17.0	10	179	45	2.07	55190	18500	15.5	8.96	3049	1045	3424	1591	0.848	13.7	5.25	445
400x200	56.1	396	199	11	7	13	348	71.4	9.05	49.7	6	106	24	1.55	19770	1447	16.6	4.50	999	145	1114	223	0.883	36.8	0.536	25.0
	56.6	396	199	11	7	16	342	72.2	9.05	48.9	6	106	27	1.55	20020	1448	16.7	4.48	1011	145	1128	224	0.884	35.6	0.536	27.1
	65.4	400	200	13	8	13	348	83.4	7.69	43.5	6	106	26	1.56	23460	1736	16.8	4.56	1173	174	1313	267	0.885	31.8	0.650	39.6
	66.0	400	200	13	8	16	342	84.1	7.69	42.8	6	106	29	1.56	23710	1737	16.8	4.54	1185	174	1326	268	0.886	30.9	0.650	42.2
	75.5	404	201	15	9	16	342	96.2	6.70	38.0	7	106	31	1.57	27490	2035	16.9	4.60	1361	202	1528	312	0.887	27.4	0.770	62.3
	88.2	410	202	18	10	16	342	112	5.61	34.2	7	106	34	1.58	33060	2478	17.2	4.70	1612	245	1815	378	0.891	23.4	0.952	101
	140	430	208	28	16	16	342	179	3.71	21.4	10	106	44	1.63	54850	4216	17.5	4.86	2551	405	2941	632	0.887	15.7	1.70	373
	187	446	214	36	22	16	342	239	2.97	15.5	13	106	52	1.68	75250	5919	17.8	4.98	3374	553	3968	873	0.883	12.5	2.49	825
400x300	94.3	386	299	14	9	22	314	120	10.7	34.9	7	155	36	1.91	33680	6246	16.7	7.21	1745	418	1918	637	0.880	25.8	2.16	79.9
	105	390	300	16	10	13	332	133	9.38	33.2	7	155	29	1.94	37860	7204	16.9	7.35	1942	480	2141	730	0.879	24.5	2.52	100
	107	390	300	16	10	22	314	136	9.38	31.4	7	155	38	1.92	38680	7210	16.9	7.28	1983	481	2188	733	0.881	23.2	2.52	114
	127	396	302	19	12	22	314	162	7.95	26.2	8	155	41	1.94	46660	8735	17.0	7.35	2357	578	2620	884	0.880	20.0	3.10	185
	144	402	303	22	13	22	314	184	6.89	24.2	9	155	44	1.95	54420	10220	17.2	7.45	2707	674	3022	1030	0.883	17.7	3.69	272

2.4
Metric Beams & Columns (MB & MC)



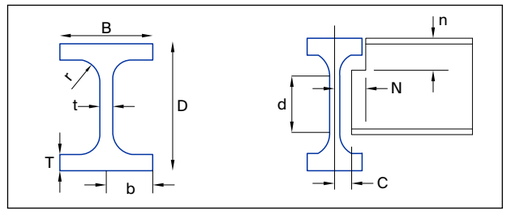
Dimensions	JIS G 3192
Specification	EN10025/ ASTM A36/ ASTM A572/ JIS G 3101
Size Range	MB: 100mm x 50mm to 900mm x 300mm MC: 100mm x 100mm to 400mm x 400mm



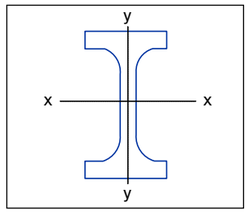
Metric Units

Designation		Depth of Section	Width of Section	Thickness		Root Radius	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing			Surface Area per Metre	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
Size	Mass per Metre			Flange	Web				Flange	Web	End clearance	Notch		Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y				
		D	B	T	t	r	d	A	b/T	d/t	C	N	n										u	x	H	J
in (mm)	kg/m	mm	mm	mm	mm	mm	mm	cm²			mm	mm	mm	m²	cm⁴	cm⁴	cm	cm	cm³	cm³	cm³	cm³			dm⁶	cm⁴
400x400	140	388	402	15	15	22	314	178	13.4	20.9	10	204	37	2.32	48970	16260	16.6	9.55	2524	809	2802	1237	0.830	22.5	5.66	156
	147	394	398	18	11	22	314	187	11.1	28.5	8	204	40	2.32	56150	18930	17.3	10.1	2850	951	3118	1441	0.850	20.9	6.69	194
	172	400	400	21	13	22	314	219	9.52	24.2	9	204	43	2.34	66620	22420	17.5	10.1	3331	1121	3672	1700	0.850	18.2	8.05	303
	197	400	408	21	21	22	314	251	9.71	15.0	13	204	43	2.35	70890	23810	16.8	9.75	3545	1167	3992	1794	0.828	16.7	8.55	415
	200	406	403	24	16	22	314	255	8.40	19.6	10	204	46	2.35	78040	26200	17.5	10.1	3844	1300	4280	1977	0.846	16.1	9.56	462
	232	414	405	28	18	22	314	295	7.23	17.4	11	204	50	2.37	92770	31030	17.7	10.2	4482	1532	5026	2331	0.848	14.1	11.6	714
	235	408	412	25	25	22	314	300	8.24	12.6	15	204	47	2.38	86470	29200	17.0	9.87	4239	1418	4818	2185	0.827	14.2	10.7	694
	283	428	407	35	20	22	314	361	5.81	15.7	12	204	57	2.41	119200	39360	18.2	10.4	5570	1934	6311	2941	0.854	11.6	15.2	1317
	415	458	417	50	30	22	314	529	4.17	10.5	17	204	72	2.49	187100	60530	18.8	10.7	8172	2903	9540	4436	0.853	8.5	25.2	3885
	605	498	432	70	45	22	314	770	3.09	7.0	25	204	92	2.60	297900	94360	19.7	11.1	11960	4369	14460	6724	0.852	6.4	43.2	11060
450x200	65.1	446	199	12	8	13	396	83.0	8.29	49.5	6	106	25	1.65	28130	1579	18.4	4.36	1262	159	1423	245	0.876	38.4	0.744	33.9
	66.2	446	199	12	8	18	386	84.3	8.29	48.3	6	106	30	1.64	28700	1581	18.5	4.33	1287	159	1450	247	0.878	36.5	0.744	38.3
	74.9	450	200	14	9	13	396	95.4	7.14	44.0	7	106	27	1.66	32890	1870	18.6	4.43	1462	187	1652	290	0.878	33.6	0.889	51.6
	76.0	450	200	14	9	18	386	96.8	7.14	42.9	7	106	32	1.65	33450	1872	18.6	4.40	1487	187	1679	291	0.879	32.2	0.890	56.9
	88.9	456	201	17	10	18	386	113	5.91	38.6	7	106	35	1.67	40400	2308	18.9	4.51	1772	230	2003	356	0.884	27.5	1.11	92.5
	98.9	460	202	19	11	18	386	126	5.32	35.1	8	106	37	1.68	45430	2619	19.0	4.56	1975	259	2240	403	0.885	25.0	1.27	126
	110	460	205	19	14	18	386	140	5.39	27.6	9	106	37	1.68	47860	2742	18.5	4.43	2081	268	2399	423	0.869	23.9	1.33	152
450x300	106	434	299	15	10	24	356	135	9.97	35.6	7	155	39	2.00	46800	6695	18.6	7.04	2157	448	2384	686	0.883	27.0	2.94	104
	121	440	300	18	11	13	378	154	8.33	34.4	8	155	31	2.04	54730	8106	18.9	7.26	2488	540	2757	823	0.885	24.9	3.61	141
	124	440	300	18	11	24	356	157	8.33	32.4	8	155	42	2.02	56070	8114	18.9	7.18	2549	541	2825	828	0.887	23.4	3.61	163
	145	446	302	21	13	24	356	184	7.19	27.4	9	155	45	2.03	66380	9658	19.0	7.24	2977	640	3323	981	0.886	20.5	4.36	253
500x200	77.9	496	199	14	9	13	442	99	7.11	49.1	7	105	27	1.75	40840	1843	20.3	4.31	1647	185	1869	288	0.874	37.5	1.07	52.5
	79.5	496	199	14	9	20	428	101	7.11	47.6	7	105	34	1.74	41870	1846	20.3	4.27	1688	186	1914	290	0.876	35.2	1.07	60.8
	88.2	500	200	16	10	13	442	112	6.25	44.2	7	105	29	1.76	46810	2138	20.4	4.36	1872	214	2130	333	0.875	33.3	1.25	75.9
	89.6	500	200	16	10	20	428	114	6.25	42.8	7	105	36	1.75	47850	2142	20.5	4.33	1914	214	2175	335	0.877	31.6	1.25	85.9
	102	506	201	19	11	13	442	129	5.29	40.2	8	105	32	1.77	55480	2578	20.7	4.47	2193	257	2496	399	0.880	28.7	1.53	119
	103	506	201	19	11	20	428	131	5.29	38.9	8	105	39	1.76	56520	2582	20.7	4.43	2234	257	2541	401	0.881	27.5	1.53	132
	117	512	202	22	12	20	428	148	4.59	35.7	8	105	42	1.77	65450	3035	21.0	4.52	2557	300	2913	469	0.884	24.3	1.82	193
500x300	111	482	300	15	11	13	426	141	10.0	38.7	8	155	28	2.12	58270	6756	20.3	6.92	2418	450	2696	690	0.877	32.4	3.68	93.9
	114	482	300	15	11	26	400	146	10.0	36.4	8	155	41	2.10	60370	6768	20.4	6.82	2505	451	2791	695	0.880	29.4	3.69	118
	125	488	300	18	11	13	426	159	8.33	38.7	8	155	31	2.13	68860	8106	20.8	7.14	2822	540	3132	825	0.887	28.0	4.48	143
	128	488	300	18	11	26	400	164	8.33	36.4	8	155	44	2.11	70960	8118	20.8	7.05	2908	541	3228	830	0.889	25.9	4.48	172
	150	494	302	21	13	26	400	191	7.19	30.8	9	155	47	2.13	83810	9663	20.9	7.11	3393	640	3792	984	0.888	22.8	5.40	265

2.4
Metric Beams & Columns (MB & MC)



Dimensions	JIS G 3192
Specification	EN10025/ ASTM A36/ ASTM A572/ JIS G 3101
Size Range	MB: 100mm x 50mm to 900mm x 300mm MC: 100mm x 100mm to 400mm x 400mm



Metric Units

Designation		Depth of Section	Width of Section	Thickness		Root Radius	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing			Surface Area per Metre	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
Size	Mass per Metre			Flange	Web				Flange	Web	End clearance	Notch		Per metre	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y				
		D	B	T	t	r	d	A	b/T	d/t	C	N	n										u	x	H	J
in (mm)	kg/m	mm	mm	mm	mm	mm	mm	cm²			mm	mm	mm	m²	cm⁴	cm⁴	cm	cm	cm³	cm³	cm³	cm³			dm⁶	cm⁴
600x200	79.0	592	197	13	8	22	522	101	7.58	65.3	6	105	35	1.92	58240	1665	24.1	4.07	1968	169	2239	265	0.870	45.2	1.40	53.0
	92.5	596	199	15	10	13	540	118	6.63	54.0	7	105	28	1.95	66640	1976	23.8	4.10	2236	199	2576	312	0.861	42.9	1.67	69.2
	94.6	596	199	15	10	22	522	120	6.63	52.2	7	105	37	1.93	68720	1982	23.9	4.06	2306	199	2651	315	0.864	39.7	1.67	82.4
	103	600	200	17	11	13	540	132	5.88	49.1	8	105	30	1.96	75560	2274	24.0	4.16	2519	227	2904	358	0.863	38.4	1.93	97.3
	106	600	200	17	11	22	522	134	5.88	47.5	8	105	39	1.94	77630	2280	24.0	4.12	2588	228	2979	361	0.865	36.0	1.94	113
	118	606	201	20	12	13	540	150	5.03	45.0	8	105	33	1.97	88320	2716	24.3	4.26	2915	270	3357	426	0.868	33.4	2.33	147
	120	606	201	20	12	22	522	152	5.03	43.5	8	105	42	1.95	90400	2723	24.3	4.23	2983	271	3432	429	0.870	31.7	2.34	167
	134	612	202	23	13	22	522	171	4.39	40.2	9	105	45	1.97	103500	3178	24.6	4.32	3382	315	3893	498	0.873	28.3	2.76	237
600x300	133	582	300	17	12	13	522	169	8.82	43.5	8	154	30	2.32	98950	7659	24.2	6.73	3400	511	3822	786	0.876	35.5	6.11	137
	137	582	300	17	12	28	492	174	8.82	41.0	8	154	45	2.29	102700	7675	24.3	6.63	3530	512	3963	793	0.879	32.1	6.13	173
	147	588	300	20	12	13	522	187	7.50	43.5	8	154	33	2.33	114400	9009	24.7	6.94	3889	601	4348	921	0.886	31.2	7.27	199
	151	588	300	20	12	28	492	192	7.50	41.0	8	154	48	2.30	118100	9025	24.8	6.85	4018	602	4489	928	0.888	28.8	7.28	241
	170	594	302	23	14	13	522	217	6.57	37.3	9	154	36	2.35	133600	10570	24.8	6.98	4497	700	5057	1077	0.885	27.3	8.62	304
	175	594	302	23	14	28	492	222	6.57	35.1	9	154	51	2.32	137300	10590	24.9	6.90	4624	701	5197	1085	0.887	25.5	8.63	356
	203	602	304	27	16	28	492	259	5.63	30.8	10	154	55	2.34	162600	12680	25.1	7.00	5401	834	6101	1292	0.888	22.3	10.5	551
	217	608	304	30	16	28	492	277	5.07	30.8	10	154	58	2.35	179300	14090	25.4	7.13	5896	927	6653	1431	0.893	20.5	11.8	702
700x300	166	692	300	20	13	28	596	211	7.50	45.8	9	154	48	2.51	172400	9030	28.6	6.53	4984	602	5629	936	0.878	34.3	10.2	260
	182	700	300	24	13	18	616	232	6.25	47.4	9	154	42	2.54	197500	10820	29.2	6.83	5643	721	6338	1110	0.887	31.4	12.4	343
	185	700	300	24	13	28	596	235	6.25	45.8	9	154	52	2.53	201500	10830	29.3	6.78	5757	722	6464	1116	0.889	30.0	12.4	383
	215	708	302	28	15	28	596	274	5.39	39.7	10	154	56	2.55	237100	12890	29.4	6.86	6699	854	7559	1323	0.889	26.3	14.9	588
800x300	191	792	300	22	14	28	692	243	6.82	49.4	9	153	50	2.71	253600	9936	32.3	6.39	6405	662	7288	1036	0.873	36.8	14.7	341
	207	800	300	26	14	18	712	264	5.77	50.9	9	153	44	2.74	286400	11720	33.0	6.67	7159	781	8098	1210	0.882	33.9	17.6	440
	210	800	300	26	14	28	692	267	5.77	49.4	9	153	54	2.72	291700	11740	33.0	6.62	7292	782	8243	1216	0.883	32.5	17.6	486
	241	808	302	30	16	28	692	308	5.03	43.3	10	153	58	2.74	339200	13820	33.2	6.70	8397	915	9534	1426	0.883	28.7	20.9	726
	267	816	303	34	17	28	692	340	4.46	40.7	11	153	62	2.76	383600	15820	33.6	6.82	9402	1044	10680	1625	0.887	25.8	24.2	1003
900x300	210	890	299	23	15	18	808	267	6.50	53.9	10	152	41	2.92	338500	10280	35.6	6.20	7608	687	8750	1079	0.863	42.2	19.3	361
	213	890	299	23	15	28	788	271	6.50	52.5	10	152	51	2.90	345300	10290	35.7	6.16	7760	688	8913	1085	0.865	40.2	19.3	403
	240	900	300	28	16	18	808	306	5.36	50.5	10	152	46	2.94	404500	12630	36.4	6.43	8989	842	10290	1317	0.872	35.9	24.0	580
	243	900	300	28	16	28	788	310	5.36	49.3	10	152	56	2.92	411300	12650	36.4	6.39	9139	843	10450	1324	0.873	34.5	24.0	633
	283	912	302	34	18	18	808	360	4.44	44.9	11	152	52	2.97	491000	15660	36.9	6.59	10770	1037	12340	1622	0.876	30.1	30.2	979
	286	912	302	34	18	28	788	364	4.44	43.8	11	152	62	2.95	497800	15670	37.0	6.56	10920	1038	12500	1629	0.877	29.3	30.2	1050
	304	918	303	37	19	18	808	387	4.09	42.5	12	152	55	2.98	535400	17210	37.2	6.67	11660	1136	13380	1778	0.878	27.9	33.4	1234
	307	918	303	37	19	28	788	391	4.09	41.5	12	152	65	2.96	542200	17230	37.2	6.63	11810	1137	13540	1785	0.879	27.2	33.4	1316