

# 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)

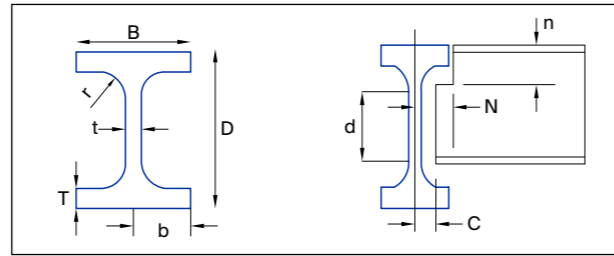
## Universal Beams and Columns Standard specifications

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 <sup>2</sup>	Min. Elongation L <sub>0</sub> =5.65√S <sub>0</sub>	Min. Charpy V-notch.	Dimensions & Tolerances
	≤11mm	>11 - <40mm	≥40mm				
<b>AS 3679.1</b>							<b>AS 3679.1</b>
Grade 300	320	300	280	min. 440	22%	27J @ 0°C	
Grade 350	360	340	330	min. 480	20%	27J @ 0°C	
<b>ASTM A36 (1996)</b>		min. 250		400-550	20-21 %	-	<b>ASTM A6</b>
<b>ASTM A572</b>							
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 %	-	
<b>ASTM A992</b>		345 - 450		min. 450	18-21 %	-	
<b>EN 10025</b>	≤16mm	>16 - ≤40mm	>40 - ≤150mm	3-100mm			<b>EN 10034</b>
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	
<b>ETA - 10/0156</b>	≤100mm	>100 - ≤140mm					<b>EN 10034</b>
HISTAR460	460	450		540-720	17%	40J @ -20°C	
<b>JIS 3101</b>	≤16mm	>16 - ≤40mm	>40 - ≤100mm	t<100mm			<b>JIS 3192</b>
SS400	245	235	215	400-510	17-23 %	-	
SS490	285	275	255	490-610	15-21 %	-	
SS540	400	390	-	min. 540	13-17 %	-	
<b>JIS 3106</b>	≤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	

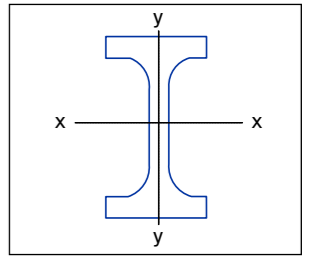


## 2.2 Wide Flange Beams (HE)



Section designation	Dimensions												
	Mass per Metre	Depth of Section	Width of Section	Thickness		Root	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing		
				Flange	Web				Flange	Web	End clearance	Notch	
	kg/m	D mm	B mm	T mm	t mm	r mm	d mm	A cm <sup>2</sup>	b/T	d/t		C mm	N mm
HE 100 AA	12.2	91.0	100.0	5.5	4.2	12.0	56.0	15.6	13.3	6.53	4	58	18
HE 100 A	16.7	96.0	100.0	8.0	5.0	12.0	56.0	21.2	11.2	4.44	5	58	20
HE 100 B	20.4	100.0	100.0	10.0	6.0	12.0	56.0	26.0	9.33	3.50	5	58	22
HE 100 C	30.9	110.0	103.0	15.0	9.0	12.0	56.0	39.3	6.22	2.33	7	58	28
HE 100 M	41.8	120.0	106.0	20.0	12.0	12.0	56.0	53.2	4.67	1.75	8	58	32
HE 120 AA	14.6	109.0	120.0	5.5	4.2	12.0	74.0	18.6	17.6	8.35	4	68	18
HE 120 A	19.9	114.0	120.0	8.0	5.0	12.0	74.0	25.3	14.8	5.69	5	68	20
HE 120 B	26.7	120.0	120.0	11.0	6.5	12.0	74.0	34.0	11.4	4.07	5	68	24
HE 120 C	39.2	130.0	123.0	16.0	9.5	12.0	74.0	49.9	7.79	2.80	7	68	28
HE 120 M	52.1	140.0	126.0	21.0	12.5	12.0	74.0	66.4	5.92	2.13	8	68	34
HE 140 AA	18.1	128.0	140.0	6.0	4.3	12.0	92.0	23.0	21.4	9.31	4	78	18
HE 140 A	24.7	133.0	140.0	8.5	5.5	12.0	92.0	31.4	16.7	6.50	5	78	22
HE 140 B	33.7	140.0	140.0	12.0	7.0	12.0	92.0	43.0	13.1	4.54	6	78	24
HE 140 C	48.2	150.0	143.0	17.0	10.0	12.0	92.0	61.5	9.20	3.21	7	78	30
HE 140 M	63.2	160.0	146.0	22.0	13.0	12.0	92.0	80.6	7.08	2.48	9	78	34
HE 160 AA	23.8	148.0	160.0	7.0	4.5	15.0	104.0	30.4	23.1	8.96	4	88	22
HE 160 A	30.4	152.0	160.0	9.0	6.0	15.0	104.0	38.8	17.3	6.89	5	88	24
HE 160 B	42.6	160.0	160.0	13.0	8.0	15.0	104.0	54.3	13.0	4.69	6	86	28
HE 160 C	59.2	170.0	163.0	18.0	11.0	15.0	104.0	75.4	9.45	3.39	8	86	34
HE 160 M	76.2	180.0	166.0	23.0	14.0	15.0	104.0	97.1	7.43	2.65	9	86	38
HE 180 AA	28.7	167.0	180.0	7.5	5.0	15.0	122.0	36.5	24.4	9.67	5	98	24
HE 180 A	35.5	171.0	180.0	9.5	6.0	15.0	122.0	45.3	20.3	7.58	5	98	26
HE 180 B	51.2	180.0	180.0	14.0	8.5	15.0	122.0	65.3	14.4	5.05	6	96	30
HE 180 C	69.8	190.0	183.0	19.0	11.5	15.0	122.0	89.0	10.6	3.72	8	96	34
HE 180 M	88.9	200.0	186.0	24.0	14.5	15.0	122.0	113	8.41	2.95	9	96	40
HE 200 AA	34.6	186.0	200.0	8.0	5.5	18.0	134.0	44.1	24.4	9.91	5	108	26

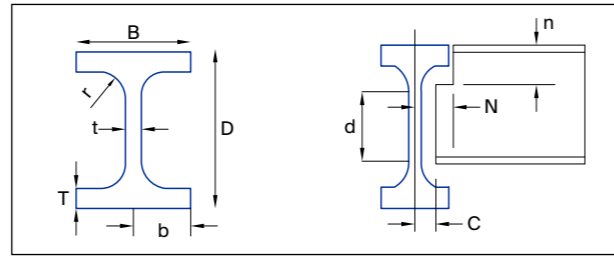
Dimensions EN10365  
 Specification EN10025  
 Size Range HE 100 AA to HE 1000 x 584



Surface Area	Properties											
	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	u	x	H dm <sup>3</sup>	J cm <sup>4</sup>
m <sup>2</sup>	cm <sup>4</sup>	cm <sup>4</sup>	cm	cm	cm <sup>3</sup>	cm <sup>3</sup>	cm <sup>3</sup>	cm <sup>3</sup>				
0.553	236	92.1	3.89	2.43	52.0	18	58.4	28.4	4.271	12.5	0.00168	2.33
0.561	349	134	4.06	2.51	72.8	27	83.0	41.1	4.363	9.95	0.00258	5.28
0.567	450	167	4.16	2.53	89.9	33	104	51.4	4.401	8.49	0.00338	9.33
0.593	759	274	4.39	2.64	138	53	166	82.1	4.502	6.23	0.00616	29.1
0.619	1,140	399	4.63	2.74	190	75	236	116	4.597	5.02	0.00993	67.2
0.669	413	159	4.72	2.93	75.8	27	84.1	40.6	4.690	15.7	0.00424	2.59
0.677	606	231	4.89	3.02	106	39	120	58.8	4.789	12.3	0.00647	6.04
0.686	864	318	5.04	3.06	144	53	165	81.0	4.840	9.62	0.00941	13.9
0.712	1,390	498	5.27	3.16	214	81	253	124	4.930	7.13	0.0161	40.7
0.738	2,020	703	5.51	3.25	288	112	351	172	5.016	5.75	0.0248	90.5
0.787	720	275	5.59	3.45	112	39	124	59.9	5.114	17.8	0.0102	3.43
0.794	1,030	389	5.73	3.52	155	56	174	84.8	5.175	13.9	0.0151	8.10
0.805	1,510	550	5.93	3.58	216	79	245	120	5.241	10.6	0.0225	20.2
0.831	2,330	830	6.16	3.68	311	116	364	178	5.323	7.92	0.0366	55.4
0.857	3,290	1,140	6.39	3.77	411	157	494	240	5.401	6.42	0.0543	119
0.901	1,280	479	6.50	3.97	173	60	190	91.4	5.504	17.3	0.0238	6.43
0.906	1,670	616	6.57	3.98	220	77	245	118	5.519	14.5	0.0314	12.1
0.918	2,490	889	6.78	4.05	312	111	354	170	5.589	10.9	0.0479	31.3
0.944	3,700	1,300	7.01	4.16	436	160	508	245	5.669	8.41	0.0750	78.7
0.970	5,100	1,760	7.25	4.26	566	212	675	326	5.747	6.89	0.108	161
1.02	1,970	730	7.34	4.47	236	81	258	124	5.846	18.9	0.0464	8.31
1.02	2,510	925	7.45	4.52	294	103	325	156	5.882	15.9	0.0602	14.9
1.04	3,830	1,360	7.66	4.57	426	151	481	231	5.941	11.7	0.0938	42.2
1.06	5,540	1,940	7.89	4.68	584	212	675	325	6.016	9.05	0.142	101
1.09	7,480	2,580	8.13	4.77	748	277	883	425	6.088	7.46	0.199	201
1.13	2,940	1,070	8.17	4.92	317	107	347	163	6.152	18.9	0.0845	12.5

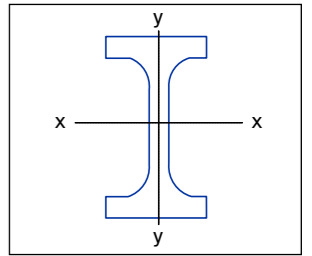


## 2.2 Wide Flange Beams (HE)



Section designation	Dimensions												
	Mass per Metre	Depth of Section	Width of Section	Thickness		Root	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing		
				Flange	Web				Flange	Web	End clearance	Notch	
	kg/m	D mm	B mm	T mm	t mm	r mm	d mm	A cm <sup>2</sup>	b/T	d/t		C mm	N mm
HE 200 A	42.3	190.0	200.0	10.0	6.5	18.0	134.0	53.8	20.6	7.88	5	108	28
HE 200 B	61.3	200.0	200.0	15.0	9.0	18.0	134.0	78.1	14.9	5.17	7	106	34
HE 200 C	81.9	210.0	203.0	20.0	12.0	18.0	134.0	104	11.2	3.88	8	106	38
HE 200 M	103	220.0	206.0	25.0	15.0	18.0	134.0	131	8.93	3.10	10	106	44
HE 220 AA	40.4	205.0	220.0	8.5	6.0	18.0	152.0	51.5	25.3	10.47	5	118	28
HE 220 A	50.5	210.0	220.0	11.0	7.0	18.0	152.0	64.3	21.7	8.05	6	118	30
HE 220 B	71.5	220.0	220.0	16.0	9.5	18.0	152.0	91.0	16.0	5.45	7	116	34
HE 220 C	94.1	230.0	223.0	21.0	12.5	18.0	152.0	120	12.2	4.15	8	116	40
HE 220 M	117	240.0	226.0	26.0	15.5	18.0	152.0	149	9.81	3.36	10	116	44
HE 240 AA	47.4	224.0	240.0	9.0	6.5	21.0	164.0	60.4	25.2	10.64	5	128	30
HE 240 A	60.3	230.0	240.0	12.0	7.5	21.0	164.0	76.8	21.9	7.94	6	128	34
HE 240 B	83.2	240.0	240.0	17.0	10.0	21.0	164.0	106	16.4	5.53	7	126	38
HE 240 C	119	255.0	244.0	24.5	14.0	21.0	164.0	152	11.7	3.84	9	126	46
HE 240 M	157	270.0	248.0	32.0	18.0	21.0	164.0	200	9.11	2.94	11	126	54
HE 260 AA	54.1	244.0	260.0	9.5	6.5	24.0	177.0	69.0	27.2	10.82	5	138	34
HE 260 A	68.2	250.0	260.0	12.5	7.5	24.0	177.0	86.8	23.6	8.18	6	138	38
HE 260 B	93.0	260.0	260.0	17.5	10.0	24.0	177.0	118	17.7	5.77	7	136	42
HE 260 C	132	275.0	264.0	25.0	14.0	24.0	177.0	168	12.6	4.04	9	136	50
HE 260 M	172	290.0	268.0	32.5	18.0	24.0	177.0	220	9.83	3.11	11	136	58
HE 280 AA	61.2	264.0	280.0	10.0	7.0	24.0	196.0	78.0	28.0	11.25	6	148	34
HE 280 A	76.4	270.0	280.0	13.0	8.0	24.0	196.0	97.3	24.5	8.62	6	146	38
HE 280 B	103	280.0	280.0	18.0	10.5	24.0	196.0	131	18.7	6.15	7	146	42
HE 280 C	145	295.0	284.0	25.5	14.5	24.0	196.0	185	13.5	4.34	9	146	50
HE 280 M	189	310.0	288.0	33.0	18.5	24.0	196.0	240	10.6	3.36	11	146	58
HE 300 AA	69.8	283.0	300.0	10.5	7.5	27.0	208.0	88.9	27.7	11.36	6	158	38
HE 300 A	88.3	290.0	300.0	14.0	8.5	27.0	208.0	112	24.5	8.48	6	156	42

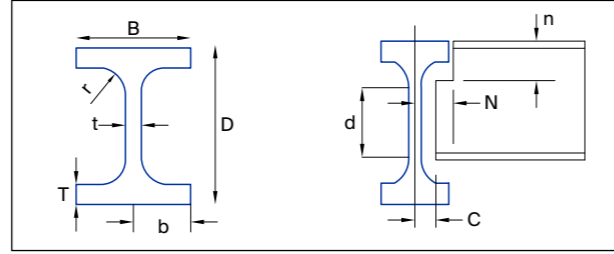
Dimensions EN10365  
 Specification EN10025  
 Size Range HE 100 AA to HE 1000 x 584



Surface Area	Properties											
	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	u	x	H dm <sup>3</sup>	J cm <sup>4</sup>
	m <sup>2</sup>	cm <sup>4</sup>	cm <sup>4</sup>	cm	cm	cm <sup>3</sup>	cm <sup>3</sup>	cm <sup>3</sup>	cm <sup>3</sup>			
1.14	3,690	1,340	8.28	4.98	389	134	430	204	6.194	16.3	0.108	21.0
1.15	5,700	2,000	8.54	5.07	570	200	642	306	6.267	12.0	0.171	59.7
1.18	8,030	2,790	8.77	5.17	765	275	881	421	6.339	9.45	0.252	135
1.20	10,600	3,650	9.00	5.27	967	354	1,140	543	6.406	7.87	0.346	258
1.25	4,170	1,510	9.00	5.42	407	137	446	209	6.448	20.2	0.146	15.5
1.26	5,410	1,960	9.17	5.51	515	178	568	271	6.517	16.9	0.193	28.6
1.27	8,090	2,840	9.43	5.59	736	258	827	394	6.587	12.5	0.295	77.0
1.30	11,200	3,890	9.65	5.69	972	349	1,110	532	6.652	9.98	0.424	168
1.32	14,600	5,010	9.89	5.79	1,220	444	1,420	679	6.715	8.35	0.573	313
1.36	5,840	2,080	9.83	5.87	521	173	571	264	6.726	20.1	0.240	22.1
1.37	7,760	2,770	10.1	6.00	675	231	745	352	6.815	16.6	0.328	42.1
1.38	11,300	3,920	10.3	6.08	938	327	1,050	498	6.880	12.7	0.487	104
1.42	17,300	5,940	10.7	6.25	1,360	487	1,560	744	6.984	9.45	0.788	289
1.46	24,300	8,150	11.0	6.39	1,800	658	2,120	1,010	7.077	7.59	1.15	626
1.47	7,980	2,790	10.8	6.36	654	214	714	328	7.026	20.1	0.383	30.1
1.48	10,400	3,670	11.0	6.50	836	282	920	430	7.112	17.0	0.516	54.2
1.50	14,900	5,140	11.2	6.58	1,150	395	1,280	602	7.175	13.2	0.754	127
1.54	22,600	7,680	11.6	6.75	1,640	582	1,880	888	7.272	9.95	1.20	340
1.57	31,300	10,400	11.9	6.90	2,160	780	2,520	1,190	7.362	8.03	1.73	720
1.59	10,600	3,660	11.6	6.85	800	262	873	399	7.299	21.3	0.590	35.5
1.60	13,700	4,760	11.9	7.00	1,010	340	1,110	518	7.379	18.0	0.785	63.5
1.62	19,300	6,600	12.1	7.09	1,380	471	1,530	718	7.442	14.0	1.13	146
1.66	28,800	9,750	12.5	7.26	1,950	687	2,220	1,050	7.540	10.6	1.77	385
1.69	39,600	13,200	12.8	7.40	2,550	914	2,970	1,400	7.628	8.54	2.52	807
1.70	13,800	4,730	12.5	7.30	976	316	1,060	482	7.541	21.0	0.877	478
1.72	18,300	6,310	12.7	7.49	1,260	421	1,380	641	7.646	17.7	1.20	878

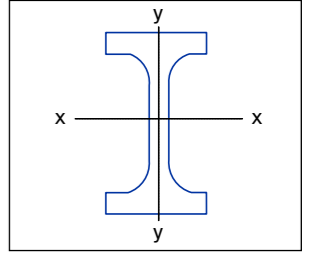


## 2.2 Wide Flange Beams (HE)



Section designation	Dimensions												
	Mass per Metre	Depth of Section	Width of Section	Thickness		Root	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing		
				Flange	Web				Flange	Web	End clearance	Notch	
	kg/m	D mm	B mm	T mm	t mm	r mm	d mm	A cm <sup>2</sup>	b/T	d/t		C mm	N mm
HE 300 B	117	300.0	300.0	19.0	11.0	27.0	208.0	149	18.9	6.18	8	156	46
HE 300 C	177	320.0	305.0	29.0	16.0	27.0	208.0	225	13.0	4.05	10	156	56
HE 300 M	238	340.0	310.0	39.0	21.0	27.0	208.0	303	9.90	3.01	13	156	66
HE 320 AA	74.2	301.0	300.0	11.0	8.0	27.0	225.0	94.6	28.1	10.82	6	156	38
HE 320 A	97.6	310.0	300.0	15.5	9.0	27.0	225.0	124	25.0	7.65	7	156	44
HE 320 B	127	320.0	300.0	20.5	11.5	27.0	225.0	161	19.6	5.72	8	156	48
HE 320 C	186	340.0	305.0	30.5	16.0	27.0	225.0	237	14.1	3.85	10	156	58
HE 320 M	245	359.0	309.0	40.0	21.0	27.0	225.0	312	10.7	2.93	13	154	68
HE 340 AA	78.9	320.0	300.0	11.5	8.5	27.0	243.0	100	28.6	10.33	6	156	40
HE 340 A	105	330.0	300.0	16.5	9.5	27.0	243.0	134	25.6	7.17	7	156	44
HE 340 B	134	340.0	300.0	21.5	12.0	27.0	243.0	171	20.3	5.44	8	154	50
HE 340 M	248	377.0	309.0	40.0	21.0	27.0	243.0	316	11.6	2.93	13	154	68
HE 360 AA	83.7	339.0	300.0	12.0	9.0	27.0	261.0	107	29.0	9.88	7	156	40
HE 360 A	112	350.0	300.0	17.5	10.0	27.0	261.0	143	26.1	6.74	7	156	46
HE 360 B	142	360.0	300.0	22.5	12.5	27.0	261.0	181	20.9	5.19	8	154	50
HE 360 M	250	395.0	308.0	40.0	21.0	27.0	261.0	319	12.4	2.91	13	154	68
HE 400 AA	92.4	378.0	300.0	13.0	9.5	27.0	298.0	118	31.4	9.10	7	156	40
HE 400 A	125	390.0	300.0	19.0	11.0	27.0	298.0	159	27.1	6.18	8	156	46
HE 400 B	155	400.0	300.0	24.0	13.5	27.0	298.0	198	22.1	4.84	9	154	52
HE 400 M	256	432.0	307.0	40.0	21.0	27.0	298.0	326	14.2	2.90	13	154	68
HE 450 AA	99.7	425.0	300.0	13.5	10.0	27.0	344.0	127	34.4	8.74	7	156	42
HE 450 A	140	440.0	300.0	21.0	11.5	27.0	344.0	178	29.9	5.58	8	156	48
HE 450 B	171	450.0	300.0	26.0	14.0	27.0	344.0	218	24.6	4.46	9	154	54
HE 450 M	263	478.0	307.0	40.0	21.0	27.0	344.0	335	16.4	2.90	13	154	68
HE 500 AA	107	472.0	300.0	14.0	10.5	27.0	390.0	137	37.1	8.41	7	156	42
HE 500 A	155	490.0	300.0	23.0	12.0	27.0	390.0	198	32.5	5.09	8	154	50

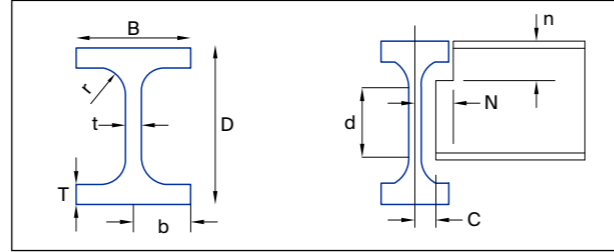
Dimensions EN10365  
 Specification EN10025  
 Size Range HE 100 AA to HE 1000 x 584



Surface Area	Properties											
	Second Moment of Area		Radius of Gyration		Elastic Modulus		Plastic Modulus		Buckling Parameter	Torsional Index	Warping Constant	Torsional Constant
	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	Axis x-x	Axis y-y	u	x	H dm <sup>3</sup>	J cm <sup>4</sup>
	m <sup>2</sup>	cm <sup>4</sup>	cm <sup>4</sup>	cm	cm	cm <sup>3</sup>	cm <sup>3</sup>	cm <sup>3</sup>	cm <sup>3</sup>			
1.73	25,200	8,560	13.0	7.58	1,680	571	1,870	870	7.706	14.1	1.69	189
1.78	41,000	13,700	13.5	7.81	2,560	901	2,930	1,370	7.835	10.0	2.90	604
1.83	59,200	19,400	14.0	8.00	3,480	1,250	4,080	1,910	7.947	7.88	4.39	1,410
1.74	16,400	4,960	13.2	7.24	1,090	331	1,200	506	7.617	21.8	1.04	53.6
1.76	22,900	6,980	13.6	7.49	1,480	466	1,630	710	7.761	17.5	1.51	112
1.77	30,800	9,240	13.8	7.57	1,930	616	2,150	939	7.813	14.2	2.07	230
1.82	48,700	14,400	14.3	7.81	2,860	947	3,270	1,440	7.945	10.3	3.45	688
1.87	68,100	19,700	14.8	7.95	3,800	1,280	4,440	1,950	8.028	8.20	5.00	1,510
1.78	19,600	5,180	14.0	7.18	1,220	346	1,340	529	7.675	22.6	1.23	60.0
1.79	27,700	7,440	14.4	7.46	1,680	496	1,850	756	7.837	17.9	1.82	131
1.81	36,700	9,690	14.7	7.53	2,160	646	2,410	986	7.882	14.5	2.45	263
1.90	76,400	19,700	15.6	7.90	4,050	1,280	4,720	1,950	8.085	8.70	5.58	1,510
1.81	23,000	5,410	14.7	7.12	1,360	361	1,500	553	7.710	23.3	1.44	67.1
1.83	33,100	7,890	15.2	7.43	1,890	526	2,090	802	7.893	18.1	2.18	153
1.85	43,200	10,100	15.5	7.49	2,400	676	2,680	1,030	7.935	14.8	2.88	298
1.93	84,900	19,500	16.3	7.83	4,300	1,270	4,990	1,940	8.115	9.21	6.14	1,510
1.89	31,200	5,860	16.3	7.06	1,650	391	1,820	600	7.778	24.8	1.95	81.3
1.91	45,100	8,560	16.8	7.34	2,310	571	2,560	873	7.951	19.0	2.94	193
1.93	57,700	10,800	17.1	7.40	2,880	721	3,230	1,100	7.987	15.7	3.82	361
2.00	104,000	19,300	17.9	7.70	4,820	1,260	5,570	1,930	8.155	10.3	7.41	1,520
1.98	41,900	6,090	18.2	6.92	1,970	406	2,180	624	7.780	27.4	2.57	91.4
2.01	63,700	9,460	18.9	7.29	2,900	631	3,220	966	8.016	20.0	4.15	250
2.03	79,900	11,700	19.1	7.33	3,550	781	3,980	1,200	8.039	16.7	5.26	448
2.10	132,000	19,300	19.8	7.59	5,500	1,260	6,330	1,940	8.176	11.6	9.25	1,530
2.08	54,600	6,310	20.0	6.79	2,320	421	2,580	649	7.756	29.9	3.30	103
2.11	87,000	10,400	21.0	7.24	3,550	691	3,950	1,060	8.050	20.8	5.64	318

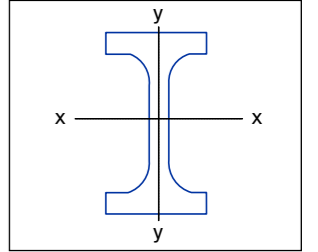


## 2.2 Wide Flange Beams (HE)



Section designation	Dimensions												
	Mass per Metre	Depth of Section	Width of Section	Thickness		Root	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing		
				Flange	Web				Flange	Web	End clearance	Notch	
	kg/m	D mm	B mm	T mm	t mm	r mm	d mm	A cm <sup>2</sup>	b/T	d/t		C mm	N mm
HE 500 B	187	500.0	300.0	28.0	14.5	27.0	390.0	239	26.9	4.13	9	154	56
HE 500 M	270	524.0	306.0	40.0	21.0	27.0	390.0	344	18.6	2.89	13	154	68
HE 550 AA	120	522.0	300.0	15.0	11.5	27.0	438.0	153	38.1	7.82	8	156	42
HE 550 A	166	540.0	300.0	24.0	12.5	27.0	438.0	212	35.0	4.86	8	154	52
HE 550 B	199	550.0	300.0	29.0	15.0	27.0	438.0	254	29.2	3.98	10	154	56
HE 550 M	278	572.0	306.0	40.0	21.0	27.0	438.0	354	20.9	2.89	13	154	68
HE 600 AA	129	571.0	300.0	15.5	12.0	27.0	486.0	164	40.5	7.55	8	154	44
HE 600 A	178	590.0	300.0	25.0	13.0	27.0	486.0	226	37.4	4.66	9	154	52
HE 600 B	212	600.0	300.0	30.0	15.5	27.0	486.0	270	31.4	3.84	10	154	58
HE 600 M	285	620.0	305.0	40.0	21.0	27.0	486.0	364	23.1	2.88	13	152	68
HE 600 x 337	337	632.0	310.0	46.0	25.5	27.0	486.0	429	19.1	2.51	15	154	74
HE 600 x 399	399	648.0	315.0	54.0	30.0	27.0	486.0	508	16.2	2.14	17	154	82
HE 650 AA	138	620.0	300.0	16.0	12.5	27.0	534.0	176	42.7	7.30	8	154	44
HE 650 A	190	640.0	300.0	26.0	13.5	27.0	534.0	242	39.6	4.47	9	154	54
HE 650 B	225	650.0	300.0	31.0	16.0	27.0	534.0	286	33.4	3.71	10	152	58
HE 650 M	293	668.0	305.0	40.0	21.0	27.0	534.0	374	25.4	2.88	13	152	68
HE 650 x 343	343	680.0	309.0	46.0	25.0	27.0	534.0	438	21.4	2.50	15	152	74
HE 650 x 407	407	696.0	314.0	54.0	29.5	27.0	534.0	519	18.1	2.13	17	154	82
HE 700 AA	150	670.0	300.0	17.0	13.0	27.0	582.0	191	44.8	6.85	9	154	44
HE 700 A	204	690.0	300.0	27.0	14.5	27.0	582.0	260	40.1	4.29	9	154	54
HE 700 B	241	700.0	300.0	32.0	17.0	27.0	582.0	306	34.2	3.58	11	152	60
HE 700 M	301	716.0	304.0	40.0	21.0	27.0	582.0	383	27.7	2.86	13	152	68
HE 700 x 352	352	728.0	308.0	46.0	25.0	27.0	582.0	449	23.3	2.49	15	152	74
HE 700 x 418	418	744.0	313.0	54.0	29.5	27.0	582.0	532	19.7	2.13	17	152	82
HE 800 AA	172	770.0	300.0	18.0	14.0	30.0	674.0	218	48.1	6.28	9	154	48

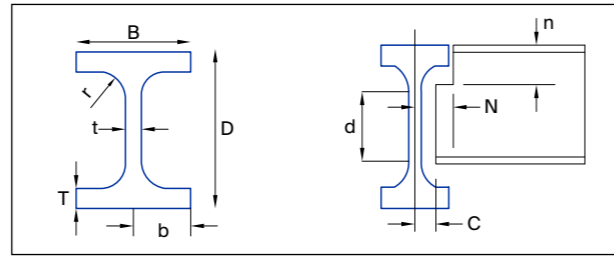
Dimensions EN10365  
 Specification EN10025  
 Size Range HE 100 AA to HE 1000 x 584



Surface Area	Properties											
	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	Axis y-y	u	x	H dm <sup>3</sup>
m <sup>2</sup>	cm <sup>4</sup>	cm <sup>4</sup>	cm	cm	cm <sup>3</sup>	cm <sup>3</sup>	cm <sup>3</sup>	cm <sup>3</sup>				
2.12	107,000	12,600	21.2	7.27	4,290	842	4,820	1,290	8.065	17.6	7.02	548
2.18	162,000	19,200	21.7	7.46	6,180	1,250	7,090	1,930	8.157	12.9	11.2	1,540
2.17	72,900	6,770	21.8	6.65	2,790	451	3,130	699	7.708	31.5	4.34	127
2.21	112,000	10,800	23.0	7.15	4,150	721	4,620	1,110	8.031	22.4	7.19	360
2.22	137,000	13,100	23.2	7.17	4,970	872	5,590	1,340	8.045	19.0	8.86	610
2.28	198,000	19,200	23.6	7.35	6,920	1,250	7,930	1,940	8.135	14.3	13.5	1,560
2.27	91,900	6,990	23.7	6.53	3,220	466	3,620	724	7.651	33.8	5.38	142
2.31	141,000	11,300	25.0	7.05	4,790	751	5,350	1,160	8.001	23.8	8.98	407
2.32	171,000	13,500	25.2	7.08	5,700	902	6,420	1,390	8.015	20.3	11.0	677
2.37	237,000	19,000	25.6	7.22	7,660	1,240	8,770	1,930	8.088	15.8	15.9	1,570
2.41	283,000	22,900	25.7	7.31	8,960	1,480	10,400	2,310	8.123	13.9	19.6	2,440
2.45	345,000	28,300	26.0	7.46	10,600	1,800	12,500	2,810	8.201	12.0	24.8	3,930
2.37	114,000	7,220	25.5	6.41	3,680	481	4,160	751	7.594	35.9	6.57	158
2.41	175,000	11,700	26.9	6.97	5,470	782	6,140	1,200	7.966	25.2	11.0	458
2.42	211,000	14,000	27.1	6.99	6,480	932	7,320	1,440	7.978	21.6	13.4	749
2.47	282,000	19,000	27.5	7.13	8,430	1,240	9,660	1,940	8.048	17.2	18.6	1,580
2.50	334,000	22,700	27.6	7.21	9,820	1,470	11,400	2,300	8.084	15.2	22.7	2,440
2.54	405,000	28,000	28.0	7.35	11,600	1,780	13,600	2,800	8.160	13.2	28.7	3,930
2.47	143,000	7,670	27.3	6.34	4,260	512	4,840	800	7.562	37.3	8.16	186
2.50	215,000	12,200	28.8	6.84	6,240	812	7,030	1,260	7.897	26.5	13.4	522
2.52	257,000	14,400	29.0	6.87	7,340	963	8,330	1,500	7.912	22.8	16.1	839
2.56	329,000	18,800	29.3	7.01	9,200	1,240	10,500	1,930	7.991	18.7	21.4	1,600
2.59	390,000	22,500	29.5	7.08	10,700	1,460	12,400	2,290	8.027	16.5	26.0	2,450
2.63	472,000	27,800	29.8	7.22	12,700	1,770	14,800	2,800	8.100	14.3	32.8	3,960
2.66	209,000	8,130	30.9	6.10	5,430	542	6,220	857	7.424	40.2	11.4	243

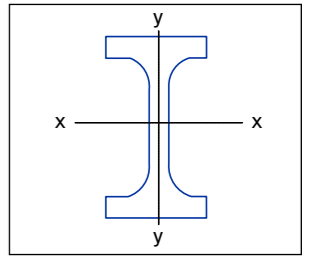


## 2.2 Wide Flange Beams (HE)



Section designation	Dimensions												
	Mass per Metre	Depth of Section	Width of Section	Thickness		Root	Depth between Fillets	Area of Section	Ratios for Local Buckling		Dimensions for Detailing		
				Flange	Web				Flange	Web	End clearance	Notch	
kg/m	D mm	B mm	T mm	t mm	r mm	d mm	A cm <sup>2</sup>	b/T	d/t	C mm	N mm	n mm	
HE 800 A	224	790.0	300.0	28.0	15.0	30.0	674.0	286	44.9	4.02	10	154	58
HE 800 B	262	800.0	300.0	33.0	17.5	30.0	674.0	334	38.5	3.37	11	152	64
HE 800 M	317	814.0	303.0	40.0	21.0	30.0	674.0	404	32.1	2.78	13	152	70
HE 800 x 373	373	826.0	308.0	46.0	25.0	30.0	674.0	475	27.0	2.42	15	152	76
HE 800 x 444	444	842.0	313.0	54.0	30.0	30.0	674.0	566	22.5	2.06	17	152	84
HE 900 AA	198	870.0	300.0	20.0	15.0	30.0	770.0	252	51.3	5.63	10	154	50
HE 900 A	252	890.0	300.0	30.0	16.0	30.0	770.0	320	48.1	3.73	10	152	60
HE 900 B	291	900.0	300.0	35.0	18.5	30.0	770.0	371	41.6	3.16	11	152	66
HE 900 M	333	910.0	302.0	40.0	21.0	30.0	770.0	424	36.7	2.76	13	152	70
HE 900 x 391	391	922.0	307.0	46.0	25.0	30.0	770.0	498	30.8	2.41	15	152	76
HE 900 x 466	466	938.0	312.0	54.0	30.0	30.0	770.0	594	25.7	2.06	17	152	84
HE 1000 AA	222	970.0	300.0	21.0	16.0	30.0	868.0	282	54.3	5.33	10	152	52
HE 1000 x 249	249	980.0	300.0	26.0	16.5	30.0	868.0	317	52.6	4.30	10	152	56
HE 1000 A	272	990.0	300.0	31.0	16.5	30.0	868.0	347	52.6	3.60	10	152	62
HE 1000 B	314	1,000.0	300.0	36.0	19.0	30.0	868.0	400	45.7	3.07	12	152	66
HE 1000 M	349	1,008.0	302.0	40.0	21.0	30.0	868.0	444	41.3	2.76	13	152	70
HE 1000 x 393	393	1,016.0	303.0	43.9	24.4	30.0	868.0	500	35.6	2.49	14	150	74
HE 1000 x 415	415	1,020.0	304.0	46.0	26.0	30.0	868.0	529	33.4	2.37	15	150	76
HE 1000 x 438	438	1,026.0	305.0	49.0	26.9	30.0	868.0	556	32.3	2.23	15	150	80
HE 1000 x 494	494	1,036.0	309.0	54.0	31.0	30.0	868.0	629	28.0	2.02	18	150	84
HE 1000 x 584	584	1,056.0	314.0	64.0	36.0	30.0	868.0	744	24.1	1.70	20	150	94

Dimensions EN10365  
 Specification EN10025  
 Size Range HE 100 AA to HE 1000 x 584



Surface Area	Properties											
	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	Axis y-y	u	x	H dm <sup>3</sup>
m <sup>2</sup>	cm <sup>4</sup>	cm <sup>4</sup>	cm	cm	cm <sup>3</sup>	cm <sup>3</sup>	cm <sup>3</sup>	cm <sup>3</sup>				
2.70	303,000	12,600	32.6	6.65	7,680	843	8,700	1,310	7.799	29.5	18.3	609
2.71	359,000	14,900	32.8	6.68	8,980	994	10,200	1,550	7.813	25.6	21.8	959
2.75	443,000	18,600	33.1	6.79	10,900	1,230	12,500	1,930	7.876	21.6	27.8	1,660
2.78	524,000	22,500	33.2	6.89	12,700	1,460	14,700	2,310	7.927	19.0	34.1	2,550
2.82	634,000	27,800	33.5	7.01	15,100	1,780	17,600	2,830	7.987	16.4	42.8	4,160
2.86	301,000	9,040	34.6	5.99	6,920	603	8,000	958	7.357	42.5	16.3	322
2.90	422,000	13,600	36.3	6.50	9,480	903	10,800	1,410	7.711	31.8	25.0	749
2.91	494,000	15,800	36.5	6.53	11,000	1,050	12,600	1,660	7.723	27.7	29.5	1,150
2.93	570,000	18,400	36.7	6.60	12,500	1,220	14,400	1,930	7.766	24.6	34.8	1,680
2.97	674,000	22,300	36.8	6.70	14,600	1,450	17,000	2,310	7.815	21.6	42.6	2,600
3.01	815,000	27,600	37.1	6.81	17,400	1,770	20,400	2,830	7.877	18.7	53.4	4,230
3.06	406,000	9,500	38.0	5.80	8,380	633	9,780	1,020	7.235	45.7	21.3	387
3.08	481,000	11,800	39.0	6.09	9,820	784	11,400	1,240	7.437	39.7	26.6	582
3.10	554,000	14,000	40.0	6.35	11,200	934	12,800	1,470	7.618	34.9	32.1	835
3.11	645,000	16,300	40.2	6.38	12,900	1,080	14,900	1,720	7.634	30.6	37.6	1,270
3.13	722,000	18,500	40.3	6.45	14,300	1,220	16,600	1,940	7.673	27.8	43.0	1,710
3.14	808,000	20,500	40.2	6.40	15,900	1,350	18,500	2,170	7.635	25.4	48.1	2,330
3.15	853,000	21,700	40.2	6.41	16,700	1,430	19,600	2,300	7.635	24.3	51.1	2,700
3.17	909,000	23,400	40.4	6.48	17,700	1,530	20,800	2,460	7.684	23.0	55.3	3,180
3.19	1,028,000	26,800	40.4	6.53	19,800	1,740	23,400	2,820	7.702	20.9	64.0	4,400
3.24	1,246,000	33,400	40.9	6.70	23,600	2,130	28,000	3,480	7.805	18.0	81.2	7,150