

Construction & Infrastructure

Perfiles estructurales Structural sections

de acuerdo con las especificaciones europeas
in accordance with European Specifications



Indicaciones de acuerdo con ENV 1993-1-1

A	=	Área de la sección
b	=	Ancho del perfil
d	=	Profundidad de la parte recta del alma
G	=	Peso por metro
h	=	Profundidad del perfil
h_i	=	Profundidad interior entre alas
I	=	Momento de inercia
i	=	Radio de giro
I_T	=	Constante de torsión
I_w	=	Factor de curvatura respecto al centro del cizallado
I_{yz}	=	Momento centrífugo
r, r_1	=	Radio de la base del alma
r_2	=	Radio de la base del ala
t	=	Espesor
t_f	=	Espesor del ala
t_w	=	Espesor del alma
W	=	Módulo de sección elástica
W_{pl}	=	Módulo de sección plástica
Y_s	=	Distancia del centro de gravedad a lo largo del eje y
Z_s	=	Distancia del centro de gravedad a lo largo del eje z
ϕ	=	Coefficiente de esbeltez equivalente

Los diseñadores deberían comprobar que los coeficientes de esbeltez del alma y el ala del perfil elegido y el grado del acero cumplen los códigos de diseño empleados.

Calidades de acero, tolerancias y presentación

Calidades de acero

Calidades de acero estructural de acuerdo con las normas nacionales e internacionales: Grados EN10025 S235JR, S275JR, S275J0, S275J2, S355JR, S355J0, S355J2, ASTM A36, A572 y JIS.

Tolerancias de laminación

Sobre las dimensiones, el perfil, el peso y la longitud, según Euronorm, BS EN10034: 1993 y BS EN10056-2: 1993.

Longitud

De 6m hasta 24m. Para determinadas medidas, se pueden proporcionar longitudes de hasta 27m, previo acuerdo.

Acabados

Normalmente, los perfiles se suministran en estado bruto de laminación pero, previo acuerdo, se podrán suministrar granallados e imprimados/pintados.

Marcado

Todos los perfiles se identificarán utilizando las etiquetas de códigos de barras estándar de Corus.

Notations according to ENV 1993-1-1

A	=	Sectional area
b	=	Width of section
d	=	Depth of straight portion of web
G	=	Weight per metre
h	=	Depth of section
h_i	=	Inner depth between flanges
I	=	Moment of inertia
i	=	Radius of gyration
I_T	=	Torsional constant
I_w	=	Warping constant referred to the shear centre
I_{yz}	=	Centrifugal moment
r, r_1	=	Radius of root fillet
r_2	=	Toe radius
t	=	Thickness
t_f	=	Flange thickness
t_w	=	Web thickness
W	=	Elastic section modulus
W_{pl}	=	Plastic section modulus
Y_s	=	Distance of centre of gravity along y-axis
Z_s	=	Distance of centre of gravity along z-axis
ϕ	=	Equivalent slenderness coefficient

Designers should verify that the slenderness ratios of web and flange of the chosen section and grade comply with the design codes used.

Steel grades, tolerances and presentation

Steel grades

Structural steel grades in accordance with national and international standards: EN10025 S235JR, S275JR, S275J0, S275J2, S355JR, S355J0, S355J2, ASTM A36, A572 and JIS.

Rolling tolerances

On dimensions, profile, weight and length to Euronorm, BS EN10034: 1993 and BS EN10056-2: 1993.

Lengths

From 6m up to 24m. For certain sizes lengths up to 27m may be supplied by arrangement.

Finishes

Sections are normally supplied in the as-rolled condition but arrangements can be made for material to be shotblasted and primed/painted.

Marking

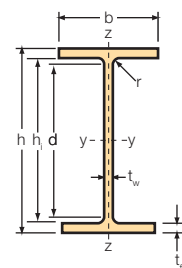
All sections will be identified using the standard Corus bar coded label.

Perfiles Europeos

con alas paralelas de acuerdo con la Euronorma 19-57

European specification beams

with parallel flanges in accordance with Euronorm 19-57



Página de explicación 3					Explanation page 3				
Perfil Section	G kg/m	h mm	b mm	tw mm	tr mm	r mm	A cm ²	h1 mm	d mm
IPE 140	12.9	140	73	4.7	6.9	7	16.4	126.2	112.2
IPE 140 R	14.4	142	72	5.3	7.8	7	18.4	126.4	112.4
IPE 160	15.8	160	82	5	7.4	9	20.1	145.2	127.2
IPE 160 R	17.7	162	81	5.6	8.5	9	22.6	145	127
IPE 180	18.8	180	91	5.3	8	9	23.9	164	146
IPE 180 O	21.3	182	92	6	9	9	27.1	164	146
IPE 180 R	22.1	183	89	6.4	9.5	9	28.1	164	146
IPE 200	22.4	200	100	5.6	8.5	12	28.5	183	159
IPE 200 O	25.1	202	102	6.2	9.5	12	32.0	183	159
IPE 200 R	26.6	204	98	6.6	10.5	12	33.9	183	159
IPE 220	26.2	220	110	5.9	9.2	12	33.4	201.6	177.6
IPE 220 O	29.4	222	112	6.6	10.2	12	37.4	201.6	177.6
IPE 220 R	31.6	225	108	6.7	11.8	12	40.2	201.4	177.4
IPE 240	30.7	240	120	6.2	9.8	15	39.1	220.4	190.4
IPE 240 O	34.3	242	122	7	10.8	15	43.7	220.4	190.4
IPE 240 R	37.3	245	118	7.5	12.3	15	47.5	220.4	190.4
IPE 270	36.1	270	135	6.6	10.2	15	45.9	249.6	219.6
IPE 270 O	42.3	274	136	7.5	12.2	15	53.8	249.6	219.6
IPE 270 R	44	276	133	7.7	13.1	15	56.0	249.8	219.8
IPE 300	42.2	300	150	7.1	10.7	15	53.8	278.6	248.6
IPE 300 O	49.3	304	152	8	12.7	15	62.8	278.6	248.6
IPE 300 R	51.7	306	147	8.5	13.7	15	65.9	278.6	248.6
IPE 330	49.1	330	160	7.5	11.5	18	62.6	307	271
IPE 330 O	57	334	162	8.5	13.5	18	72.6	307	271
IPE 330 R	60.3	336	158	9.2	14.5	18	76.8	307	271
IPE 360	57.1	360	170	8	12.7	18	72.7	334.6	298.6
IPE 360 O	66	364	172	9.2	14.7	18	84.1	334.6	298.6
IPE 360 R	70.3	366	168	9.9	16	18	89.6	334	298

Medida no estándar. Consulten al Departamento Comercial de Corus la disponibilidad de laminaciones

Non-standard Section Size. Please enquire for availability.

Página de explicación 3

Explanation page 3

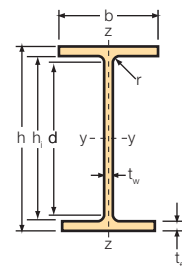
I_y cm ⁴	I_z cm ⁴	i_y cm	i_z cm	W_y cm ³	W_z cm ³	W_{ply} cm ³	W_{plz} cm ³	I_{io} dm ⁶	I_T cm ⁴	G kg/m	Perfil Section
541	44.9	5.74	1.65	77.3	12.3	88.4	19.2	0.0020	2.40	12.9	IPE 140
611	48.8	5.77	1.63	86.1	13.5	99.1	21.3	0.0022	3.36	14.4	IPE 140 R
869	68.3	6.58	1.84	109	16.7	124	26.1	0.0040	3.54	15.8	IPE 160
989	75.7	6.62	1.83	122	18.7	140	29.3	0.0045	5.05	17.7	IPE 160 R
1317	101	7.42	2.05	146	22.2	166	34.6	0.0075	4.73	18.8	IPE 180
1505	117	7.45	2.08	165	25.5	189	39.9	0.0088	6.65	21.3	IPE 180 O
1554	112	7.44	2.00	170	25.2	195	39.6	0.0084	7.63	22.1	IPE 180 R
1943	142	8.26	2.24	194	28.5	221	44.5	0.0131	6.92	22.4	IPE 200
2211	169	8.32	2.30	219	33.1	249	51.8	0.0156	9.36	25.1	IPE 200 O
2363	166	8.35	2.21	232	33.8	265	53.1	0.0155	11.7	26.6	IPE 200 R
2772	205	9.11	2.48	252	37.3	285	58.0	0.0228	9.03	26.2	IPE 220
3134	240	9.16	2.53	282	42.8	321	66.8	0.0269	12.2	29.4	IPE 220 O
3474	249	9.29	2.49	309	46.1	352	71.8	0.0283	16.4	31.6	IPE 220 R
3892	284	9.97	2.69	324	47.3	367	73.8	0.0376	13.0	30.7	IPE 240
4369	329	10.0	2.74	361	53.9	410	84.3	0.0439	17.1	34.3	IPE 240 O
4823	339	10.1	2.67	394	57.4	450	90.0	0.0459	22.8	37.3	IPE 240 R
5790	420	11.2	3.02	429	62.2	484	96.8	0.0708	15.9	36.1	IPE 270
6947	513	11.4	3.09	507	75.5	575	118	0.0880	25.0	42.3	IPE 270 O
7312	516	11.4	3.03	530	77.6	602	121	0.0891	29.1	44.0	IPE 270 R
8356	604	12.5	3.35	557	80.5	628	125	0.126	19.9	42.2	IPE 300
9994	746	12.6	3.45	658	98.1	744	152	0.158	31.0	49.3	IPE 300 O
10500	728	12.6	3.32	686	99.0	780	154	0.155	37.0	51.7	IPE 300 R
11770	788	13.7	3.55	713	98.5	805	153	0.200	28.1	49.1	IPE 330
13910	960	13.8	3.64	833	119	943	185	0.247	42.2	57.0	IPE 330 O
14690	958	13.8	3.53	874	121	995	190	0.247	50.6	60.3	IPE 330 R
16270	1043	15.0	3.79	904	123	1019	191	0.315	37.4	57.1	IPE 360
19050	1251	15.0	3.86	1047	145	1186	227	0.382	55.7	66.0	IPE 360 O
20290	1270	15.0	3.76	1109	151	1262	236	0.389	68.7	70.3	IPE 360 R

Perfiles Europeos

con alas paralelas de acuerdo con la Euronorma 19-57

European specification beams

with parallel flanges in accordance with Euronorm 19-57



Página de explicación 3					Explanation page 3				
Perfil Section	G kg/m	h mm	b mm	t_w mm	t_f mm	r mm	A cm ²	h_1 mm	d mm
IPE 400	66.3	400	180	8.6	13.5	21	84.5	373	331
IPE 400 O	75.7	404	182	9.7	15.5	21	96.4	373	331
IPE 400 R	81.5	407	178	10.6	17	21	104	373	331
IPE 400 V	84	408	182	10.6	17.5	21	107	373	331
IPE 450	77.6	450	190	9.4	14.6	21	98.8	420.8	378.8
IPE 450 O	92.4	456	192	11	17.6	21	118	420.8	378.8
IPE 450 R	95.2	458	188	11.3	18.6	21	121	420.8	378.8
IPE 450 V	104	460	194	12.4	19.6	21	132	420.8	378.8
IPE 500	90.7	500	200	10.2	16	21	116	468	426
IPE 500 O	107	506	202	12	19	21	137	468	426
IPE 500 R	111	508	198	12.6	20	21	142	468	426
IPE 500 V	129	514	204	14.2	23	21	164	468	426
IPE 550	106	550	210	11.1	17.2	24	134	515.6	467.6
IPE 550 O	123	556	212	12.7	20.2	24	156	515.6	467.6
IPE 550 R	134	560	210	14	22.2	24	170	515.6	467.6
IPE 550 V	159	566	216	17.1	25.2	24	202	515.6	467.6
IPE 600	122	600	220	12	19	24	156	562	514
IPE 600 O	154	610	224	15	24	24	197	562	514
IPE 600 R	144	608	218	14	23	24	184	562	514
IPE 600 V	184	618	228	18	28	24	234	562	514
IPE 750 x 137	137	753	263	11.5	17	17	175	719	685
IPE 750 x 147	147	753	265	13.2	17	17	187	719	685
IPE 750 x 161	160	758	266	13.8	19.3	17	204	719.4	685.4
IPE 750 x 173	173	762	267	14.4	21.6	17	221	718.8	684.8
IPE 750 x 185	185	766	267	14.9	23.6	17	236	718.8	684.8
IPE 750 x 196	196	770	268	15.6	25.4	17	251	719.2	685.2
IPE 750 x 210	210	775	268	16	28	17	268	719	685
IPE 750 x 222	222	778	269	17	29.5	17	283	719	685

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Non-standard Section Size. Please enquire for availability.

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Explanation page 3

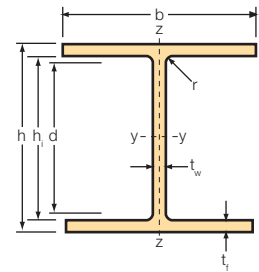
I_y cm ⁴	I_z cm ⁴	i_y cm	i_z cm	W_y cm ³	W_z cm ³	W_{ply} cm ³	W_{plz} cm ³	I_{ω} dm ⁶	I_T cm ⁴	G kg/m	Perfil Section
23130	1318	16.5	3.95	1156	146	1308	229	0.492	51.3	66.3	IPE 400
26750	1564	16.7	4.03	1324	172	1503	269	0.590	73.3	75.7	IPE 400 O
28860	1606	16.7	3.93	1418	180	1618	283	0.611	92.5	81.5	IPE 400 R
30140	1766	16.8	4.06	1477	194	1682	304	0.673	99.6	84.0	IPE 400 V
33740	1676	18.5	4.12	1500	176	1702	276	0.794	66.7	77.6	IPE 450
40920	2085	18.6	4.21	1795	217	2047	341	1.00	109	92.4	IPE 450 O
42400	2070	18.7	4.13	1851	220	2115	346	0.999	123	95.2	IPE 450 R
46200	2397	18.7	4.26	2009	247	2302	389	1.16	149	104	IPE 450 V
48200	2142	20.4	4.31	1928	214	2195	335	1.25	89.1	90.7	IPE 500
57780	2622	20.6	4.38	2284	260	2613	408	1.55	143	107	IPE 500 O
59930	2600	20.5	4.28	2360	263	2710	414	1.55	162	111	IPE 500 R
70720	3271	20.8	4.47	2752	321	3169	506	1.97	242	129	IPE 500 V
67120	2668	22.3	4.45	2441	254	2788	400	1.89	123	106	IPE 550
79160	3224	22.5	4.55	2847	304	3264	480	2.31	187	123	IPE 550 O
86600	3447	22.5	4.50	3093	328	3563	520	2.49	242	134	IPE 550 R
102300	4265	22.5	4.60	3616	395	4206	632	3.12	372	159	IPE 550 V
92080	3387	24.3	4.66	3069	308	3513	485	2.86	165	122	IPE 600
118300	4521	24.5	4.79	3879	404	4472	639	3.88	316	154	IPE 600 O
110300	3993	24.5	4.66	3629	366	4176	580	3.42	271	144	IPE 600 R
141600	5570	24.6	4.88	4582	489	5325	780	4.85	506	184	IPE 600 V
159900	5166	30.3	5.44	4246	393	4865	614	7.00	135	137	IPE 750 x 137
166100	5289	29.8	5.31	4411	399	5110	631	7.16	157	147	IPE 750 x 147
186100	6073	30.2	5.45	4909	457	5666	719	8.28	208	160	IPE 750 x 161
205800	6873	30.5	5.57	5402	515	6218	810	9.42	270	174	IPE 750 x 173
223000	7510	30.8	5.65	5821	563	6691	884	10.3	334	185	IPE 750 x 185
240300	8175	31.0	5.71	6241	610	7174	959	11.3	406	197	IPE 750 x 196
262200	9011	31.3	5.80	6765	672	7762	1054	12.6	512	210	IPE 750 x 210
278200	9604	31.3	5.82	7152	714	8225	1122	13.5	601	222	IPE 750 x 222

Perfiles Europeos de ala ancha

de acuerdo con la Euronorma 53-62

European wide flange beams

in accordance with Euronorm 53-62



Página de explicación 3

Explanation page 3

Perfil Section	G kg/m	h mm	b mm	t _w mm	t _r mm	r mm	A cm ²	h ₁ mm	d mm
HE 100 A	16.7	96	100	5	8	12	21.2	80.0	56.0
HE 100 B	20.4	100	100	6	10	12	26.0	80.0	56.0
HE 120 A	19.9	114	120	5	8	12	25.3	98.0	74.0
HE 120 B	26.7	120	120	6.5	11	12	34.0	98.0	74.0
HE 140 A	24.7	133	140	5.5	8.5	12	31.4	116.0	92.0
HE 140 B	33.7	140	140	7	12	12	43.0	116.0	92.0
HE 160 A	30.4	152	160	6	9	15	38.8	134.0	104.0
HE 160 B	42.6	160	160	8	13	15	54.3	134.0	104.0
HE 160 M	76.2	180	166	14	23	15	97.1	134.0	104.0
HE 180 A	35.5	171	180	6	9.5	15	45.3	152.0	122.0
HE 180 B	51.2	180	180	8.5	14	15	65.3	152.0	122.0
HE 180 M	88.9	200	186	14.5	24	15	113	152.0	122.0
HE 200 A	42.3	190	200	6.5	10	18	53.8	170.0	134.0
HE 200 B	61.3	200	200	9	15	18	78.1	170.0	134.0
HE 200 M	103	220	206	15	25	18	131	170.0	134.0
HE 220 A	50.5	210	220	7	11	18	64.3	188.0	152.0
HE 220 B	71.5	220	220	9.5	16	18	91.0	188.0	152.0
HE 220 M	117	240	226	15.5	26	18	149	188.0	152.0
HE 240 A	60.3	230	240	7.5	12	21	76.8	206.0	164.0
HE 240 B	83.2	240	240	10	17	21	106	206.0	164.0
HE 240 M	157	270	248	18	32	21	200	206.0	164.0
HE 260 A	68.2	250	260	7.5	12.5	24	86.8	225.0	177.0
HE 260 B	93	260	260	10	17.5	24	118	225.0	177.0
HE 260 M	172	290	268	18	32.5	24	220	225.0	177.0
HE 280 A	76.4	270	280	8	13	24	97.3	244.0	196.0
HE 280 B	103	280	280	10.5	18	24	131	244.0	196.0
HE 280 M	189	310	288	18.5	33	24	240	244.0	196.0
HE 300 A	88.3	290	300	8.5	14	27	113	262.0	208.0
HE 300 B	117	300	300	11	19	27	149	262.0	208.0
HE 300 M	238	340	310	21	39	27	303	262.0	208.0
HE 320 A	97.6	310	300	9	15.5	27	124	279.0	225.0
HE 320 B	127	320	300	11.5	20.5	27	161	279.0	225.0
HE 320 M	245	359	309	21	40	27	312	279.0	225.0
HE 340 A	105	330	300	9.5	16.5	27	133	297.0	243.0
HE 340 B	134	340	300	12	21.5	27	171	297.0	243.0
HE 340 M	248	377	309	21	40	27	316	297.0	243.0
HE 360 A	112	350	300	10	17.5	27	143	315.0	261.0
HE 360 B	142	360	300	12.5	22.5	27	181	315.0	261.0
HE 360 M	250	395	308	21	40	27	319	315.0	261.0

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Explanation page 3

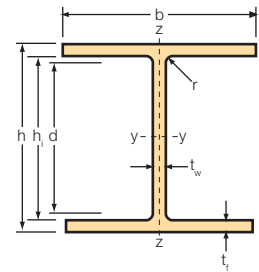
I_y cm ⁴	I_z cm ⁴	i_y cm	i_z cm	W_y cm ³	W_z cm ³	W_{ply} cm ³	W_{plz} cm ³	I_{ω} dm ⁶	I_T cm ⁴	G kg/m	Perfil Section
349	134	4.06	2.51	72.8	26.8	83.1	41.1	0.0026	5.28	16.7	HE 100 A
450	167	4.16	2.53	89.9	33.5	104	51.3	0.0034	9.33	20.4	HE 100 B
606	231	4.89	3.02	106	38.5	120	58.8	0.0065	6.04	19.9	HE 120 A
864	318	5.04	3.06	144	52.9	165	80.9	0.0094	13.9	26.7	HE 120 B
1033	389	5.73	3.52	155	55.6	174	84.8	0.0151	8.10	24.7	HE 140 A
1509	550	5.93	3.58	216	78.5	245	120	0.0225	20.2	33.7	HE 140 B
1673	616	6.57	3.98	220	76.9	245	117	0.0315	12.1	30.4	HE 160 A
2492	889	6.78	4.05	312	111	354	170	0.0480	31.3	42.6	HE 160 B
5098	1759	7.25	4.26	566	212	675	325	0.108	161	76.2	HE 160 M
2510	925	7.45	4.52	294	103	325	156	0.0603	14.9	35.5	HE 180 A
3831	1363	7.66	4.57	426	151	482	231	0.0939	42.2	51.2	HE 180 B
7483	2580	8.13	4.77	748	277	884	425	0.200	201	88.9	HE 180 M
3692	1336	8.28	4.98	389	134	430	204	0.108	21.0	42.3	HE 200 A
5696	2003	8.54	5.07	570	200	643	306	0.171	59.7	61.3	HE 200 B
10640	3651	9.00	5.27	967	354	1135	543	0.347	258	103	HE 200 M
5410	1955	9.17	5.51	515	178	569	270	0.194	28.6	50.5	HE 220 A
8091	2843	9.43	5.59	736	258	827	394	0.296	77.0	71.5	HE 220 B
14600	5012	9.89	5.79	1217	444	1420	678	0.574	313	117	HE 220 M
7763	2769	10.1	6.00	675	231	745	351	0.329	42.1	60.3	HE 240 A
11260	3923	10.3	6.08	938	327	1054	498	0.488	104	83.2	HE 240 B
24290	8153	11.0	6.39	1799	657	2117	1006	1.15	626	157	HE 240 M
10450	3668	11.0	6.50	836	282	920	430	0.517	54.2	68.2	HE 260 A
14920	5135	11.2	6.58	1148	395	1283	602	0.755	127	93.0	HE 260 B
31310	10450	11.9	6.90	2159	780	2524	1192	1.73	720	172	HE 260 M
13670	4763	11.9	7.00	1013	340	1113	518	0.786	63.5	76.4	HE 280 A
19270	6595	12.1	7.09	1376	471	1535	717	1.13	146	103	HE 280 B
39550	13160	12.8	7.40	2551	914	2966	1396	2.52	807	189	HE 280 M
18260	6310	12.7	7.49	1260	421	1384	640	1.20	87.8	88.3	HE 300 A
25170	8563	13.0	7.58	1678	571	1870	869	1.69	189	117	HE 300 B
59200	19400	14.0	8.00	3482	1252	4079	1912	4.39	1411	238	HE 300 M
22930	6985	13.6	7.49	1479	466	1629	709	1.51	112	97.6	HE 320 A
30820	9239	13.8	7.57	1926	616	2150	938	2.07	230	127	HE 320 B
68130	19710	14.8	7.95	3796	1276	4436	1950	5.01	1506	245	HE 320 M
27690	7436	14.4	7.46	1678	496	1851	755	1.83	131	105	HE 340 A
36660	9690	14.6	7.53	2156	646	2409	985	2.46	263	134	HE 340 B
76370	19710	15.6	7.90	4052	1276	4718	1952	5.60	1512	248	HE 340 M
33090	7887	15.2	7.43	1891	526	2089	801	2.18	153	112	HE 360 A
43190	10140	15.5	7.49	2400	676	2684	1032	2.89	298	142	HE 360 B
84870	19520	16.3	7.83	4297	1268	4990	1942	6.15	1513	250	HE 360 M

Perfiles Europeos de ala ancha

de acuerdo con la Euronorma 53-62

European wide flange beams

in accordance with Euronorm 53-62



Página de explicación 3

Explanation page 3

Perfil Section	G kg/m	h mm	b mm	t _w mm	t _f mm	r mm	A cm ²	h ₁ mm	d mm
HE 400 x 107	107	384	297	10	16	27	136	352.0	298.0
HE 400 A	125	390	300	11	19	27	159	352.0	298.0
HE 400 B	155	400	300	13.5	24	27	198	352.0	298.0
HE 400 M	256	432	307	21	40	27	326	352.0	298.0
HE 450 x 123	123	435	300	10.2	18.5	27	158	398.0	344.0
HE 450 A	140	440	300	11.5	21	27	178	398.0	344.0
HE 450 B	171	450	300	14	26	27	218	398.0	344.0
HE 450 M	263	478	307	21	40	27	335	398.0	344.0
HE 500 A	155	490	300	12	23	27	198	444.0	390.0
HE 500 B	187	500	300	14.5	28	27	239	444.0	390.0
HE 500 M	270	524	306	21	40	27	344	444.0	390.0
HE 550 A	166	540	300	12.5	24	27	212	492.0	438.0
HE 550 B	199	550	300	15	29	27	254	492.0	438.0
HE 550 M	278	572	306	21	40	27	354	492.0	438.0
HE 600 x 137	137	575	300	11.8	17.5	27	175	540.0	486.0
HE 600 x 151	151	582	300	11.6	20.6	27	193	540.8	486.8
HE 600 x 174	174	588	300	13.6	23.9	27	223	540.2	486.2
HE 600 A	178	590	300	13	25	27	226	540.0	486.0
HE 600 B	212	600	300	15.5	30	27	270	540.0	486.0
HE 600 M	285	620	305	21	40	27	364	540.0	486.0
HE 650 A	190	640	300	13.5	26	27	242	588.0	534.0
HE 650 B	225	650	300	16	31	27	286	588.0	534.0
HE 650 M	293	668	305	21	40	27	374	588.0	534.0
HE 700 x 166	166	678	300	12.5	21	27	212	636.0	582.0
HE 700 A	204	690	300	14.5	27	27	260	636.0	582.0
HE 700 B	241	700	300	17	32	27	306	636.0	582.0
HE 700 M	301	716	304	21	40	27	383	636.0	582.0
HE 800 A	224	790	300	15	28	30	286	734.0	674.0
HE 800 B	262	800	300	17.5	33	30	334	734.0	674.0
HE 800 M	317	814	303	21	40	30	404	734.0	674.0
HE 900 A	252	890	300	16	30	30	321	830.0	770.0
HE 900 B	291	900	300	18.5	35	30	371	830.0	770.0
HE 900 M	333	910	302	21	40	30	424	830.0	770.0
HE 1000 A	272	990	300	16.5	31	30	347	928.0	868.0
HE 1000 B	314	1000	300	19	36	30	400	928.0	868.0
HE 1000 M	349	1008	302	21	40	30	444	928.0	868.0

Medida no estándar. Consulten al Departamento Comercial de Corus la disponibilidad de laminaciones

Non-standard Section Size. Please enquire for availability.

Página de explicación 3

Explanation page 3

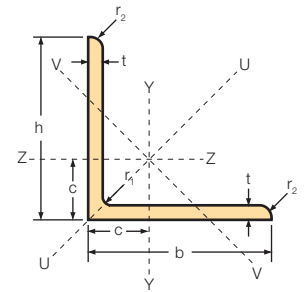
I_y cm ⁴	I_z cm ⁴	i_y cm	i_z cm	W_y cm ³	W_z cm ³	W_{ply} cm ³	W_{plz} cm ³	I_{io} dm ⁶	I_T cm ⁴	G kg/m	Perfil Section
37640	6998	16.6	7.16	1960	471	2166	721	2.37	126	107	HE 400 x 107
45070	8564	16.8	7.34	2311	571	2563	872	2.95	193	125	HE 400 A
57680	10820	17.1	7.40	2884	721	3233	1103	3.82	361	155	HE 400 B
104100	19340	17.9	7.70	4820	1260	5571	1933	7.43	1520	256	HE 400 M
55860	8338	18.8	7.27	2568	556	2837	849	3.62	178	124	HE 450 x 123
63720	9465	18.9	7.29	2896	631	3217	965	4.15	250	140	HE 450 A
79890	11720	19.1	7.33	3551	781	3983	1197	5.27	448	171	HE 450 B
131500	19340	19.8	7.59	5501	1260	6332	1938	9.28	1534	263	HE 450 M
86970	10370	21.0	7.24	3550	691	3950	1058	5.65	318	155	HE 500 A
107200	12620	21.2	7.27	4287	842	4815	1291	7.03	548	187	HE 500 B
161900	19150	21.7	7.46	6180	1252	7095	1931	11.2	1544	270	HE 500 M
111900	10820	23.0	7.15	4146	721	4623	1106	7.20	360	166	HE 550 A
136700	13080	23.2	7.17	4971	872	5591	1340	8.87	610	199	HE 550 B
198000	19160	23.6	7.35	6923	1252	7934	1936	13.6	1559	278	HE 550 M
101500	7893	24.1	6.72	3529	526	3953	813	6.13	177	137	HE 600 x 137
117100	9287	24.7	6.94	4024	619	4484	952	7.32	247	151	HE 600 x 151
136400	10780	24.7	6.95	4639	719	5203	1108	8.57	374	175	HE 600 x 174
141200	11270	25.0	7.05	4787	751	5351	1155	9.00	407	178	HE 600 A
171000	13530	25.2	7.08	5701	902	6426	1390	11.0	677	212	HE 600 B
237400	18980	25.6	7.22	7660	1244	8773	1930	16.0	1570	285	HE 600 M
175200	11720	26.9	6.97	5474	782	6137	1204	11.0	458	190	HE 650 A
210600	13980	27.1	6.99	6480	932	7321	1441	13.4	749	225	HE 650 B
281700	18980	27.5	7.13	8433	1245	9658	1935	18.7	1584	293	HE 650 M
168900	9471	28.2	6.69	4982	631	5599	977	10.2	274	166	HE 700 x 166
215300	12180	28.8	6.84	6241	812	7033	1256	13.4	522	204	HE 700 A
256900	14440	29.0	6.87	7340	963	8328	1494	16.1	839	241	HE 700 B
329300	18800	29.3	7.01	9198	1237	10540	1928	21.5	1595	301	HE 700 M
303400	12640	32.6	6.65	7682	843	8701	1311	18.3	609	224	HE 800 A
359100	14900	32.8	6.68	8977	994	10230	1552	21.9	959	262	HE 800 B
442600	18630	33.1	6.79	10870	1230	12490	1929	27.9	1657	317	HE 800 M
422100	13550	36.3	6.50	9485	903	10810	1413	25.0	749	252	HE 900 A
494100	15820	36.5	6.53	10980	1054	12590	1657	29.6	1150	291	HE 900 B
570400	18450	36.7	6.60	12540	1222	14440	1928	34.9	1683	333	HE 900 M
553800	14000	40.0	6.35	11190	934	12830	1469	32.2	835	272	HE 1000 A
644700	16280	40.1	6.38	12890	1085	14860	1715	37.8	1267	314	HE 1000 B
722300	18460	40.3	6.45	14330	1222	16570	1939	43.2	1713	349	HE 1000 M

Perfiles angulares de lados iguales

de acuerdo con BS EN 10056 – 1: 1993

Equal angles

according to BS EN 10056 - 1: 1993



Página de explicación 3

Explanation page 3

Perfil Section	G kg/m	h mm	b mm	t mm	r ₁ mm	r ₂ mm	A cm ²	C cm
L 90 x 90 x 6	8.3	90	90	6	11	5.5	10.6	2.41
L 90 x 90 x 8	10.9	90	90	8	11	5.5	13.9	2.50
L 90 x 90 x 10	13.4	90	90	10	11	5.5	17.1	2.58
L 90 x 90 x 12	15.9	90	90	12	11	5.5	20.3	2.66
L 100 x 100 x 8	12.2	100	100	8	12	6	15.5	2.74
L 100 x 100 x 10	15.0	100	100	10	12	6	19.2	2.82
L 100 x 100 x 12	17.8	100	100	12	12	6	22.7	2.90
L 100 x 100 x 15	21.9	100	100	15	12	6	27.9	3.02
L 120 x 120 x 8	14.7	120	120	8	13	6.5	18.7	3.23
L 120 x 120 x 10	18.2	120	120	10	13	6.5	23.2	3.31
L 120 x 120 x 12	21.6	120	120	12	13	6.5	27.5	3.40
L 120 x 120 x 15	26.6	120	120	15	13	6.5	33.9	3.51
L 150 x 150 x 10	23.0	150	150	10	16	8	29.3	4.03
L 150 x 150 x 12	27.3	150	150	12	16	8	34.8	4.12
L 150 x 150 x 15	33.8	150	150	15	16	8	43.0	4.25
L 150 x 150 x 18	40.1	150	150	18	16	8	51.0	4.37
L 160 x 160 x 12	29.3	160	160	12	17	8.5	37.3	4.36
L 160 x 160 x 15	36.2	160	160	15	17	8.5	46.1	4.49
L 160 x 160 x 18	42.9	160	160	18	17	8.5	54.7	4.61
L 160 x 160 x 20	47.3	160	160	20	17	8.5	60.3	4.69
L 180 x 180 x 12	33.1	180	180	12	18	9	42.1	4.85
L 180 x 180 x 15	40.9	180	180	15	18	9	52.1	4.98
L 180 x 180 x 18	48.6	180	180	18	18	9	61.9	5.10
L 180 x 180 x 20	53.7	180	180	20	18	9	68.3	5.18
L 200 x 200 x 16	48.5	200	200	16	18	9	61.8	5.52
L 200 x 200 x 18	54.2	200	200	18	18	9	69.1	5.60
L 200 x 200 x 20	59.9	200	200	20	18	9	76.3	5.68
L 200 x 200 x 24	71.1	200	200	24	18	9	90.6	5.84

Medida no estándar. Consulten al Departamento Comercial de Corus la disponibilidad de laminaciones

Non-standard Section Size. Please enquire for availability.

Página de explicación 3

Explanation page 3

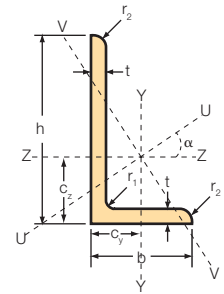
$I_y = I_z$ cm ⁴	I_u cm ⁴	I_v cm ⁴	I_{yz} cm ⁴	$i_z = i_y$ cm	i_u cm	i_v cm	$W_z = W_y$ cm ³	I_T cm ⁴	ϕ_a	Perfil Section
80.4	127	33	-47	2.76	3.47	1.77	12.2	1.45	4.38	L 90 x 90 x 6
104	165	43	-61	2.74	3.45	1.75	16.1	3.28	3.31	L 90 x 90 x 8
127	201	53	-74	2.72	3.43	1.75	19.8	6.20	2.64	L 90 x 90 x 10
148	234	62	-86	2.70	3.40	1.74	23.4	10.5	2.16	L 90 x 90 x 12
145	230	60	-85	3.06	3.85	1.97	20.0	3.68	3.70	L 100 x 100 x 8
177	281	73	-104	3.04	3.82	1.95	24.6	6.97	2.95	L 100 x 100 x 10
207	328	86	-121	3.02	3.80	1.95	29.1	11.8	2.43	L 100 x 100 x 12
249	393	105	-144	2.98	3.75	1.94	35.6	22.3	1.91	L 100 x 100 x 15
256	405	106	-150	3.69	4.66	2.38	29.1	4.44	4.51	L 120 x 120 x 8
313	497	129	-184	3.67	4.63	2.36	36.0	8.41	3.61	L 120 x 120 x 10
368	584	152	-216	3.65	4.61	2.35	42.7	14.2	3.00	L 120 x 120 x 12
445	705	185	-260	3.62	4.56	2.33	52.4	27.0	2.36	L 120 x 120 x 15
624	990	258	-366	4.62	5.81	2.96	56.9	10.8	4.52	L 150 x 150 x 10
737	1170	304	-433	4.60	5.80	2.95	67.8	18.2	3.77	L 150 x 150 x 12
898	1426	370	-528	4.57	5.76	2.93	83.5	34.6	3.00	L 150 x 150 x 15
1050	1665	435	-615	4.54	5.71	2.92	98.8	58.6	2.47	L 150 x 150 x 18
900	1429	371	-529	4.92	6.19	3.15	77.4	19.6	4.02	L 160 x 160 x 12
1099	1745	453	-646	4.89	6.15	3.13	95.5	37.2	3.21	L 160 x 160 x 15
1287	2042	532	-755	4.85	6.11	3.12	113	62.9	2.65	L 160 x 160 x 18
1407	2230	584	-823	4.83	6.08	3.11	124	85.3	2.36	L 160 x 160 x 20
1298	2061	534	-763	5.55	7.00	3.56	98.7	22.1	4.57	L 180 x 180 x 12
1589	2524	654	-935	5.52	6.96	3.54	122	42.0	3.65	L 180 x 180 x 15
1866	2963	769	-1097	5.49	6.92	3.52	145	71.2	3.02	L 180 x 180 x 18
2043	3242	844	-1199	5.47	6.89	3.51	159	96.5	2.70	L 180 x 180 x 20
2342	3723	960	-1381	6.16	7.76	3.94	162	56.1	3.85	L 200 x 200 x 16
2600	4133	1067	-1533	6.13	7.73	3.93	181	78.9	3.41	L 200 x 200 x 18
2851	4529	1173	-1678	6.11	7.70	3.92	199	107	3.05	L 200 x 200 x 20
3331	5284	1378	-1953	6.06	7.64	3.90	235	182	2.50	L 200 x 200 x 24

Perfiles angulares de lados desiguales

de acuerdo con BS EN 10056 – 1: 1993

Unequal angles

according to BS EN 10056 - 1: 1993



Página de explicación 3

Explanation page 3

Perfil Section	G kg/m	h mm	b mm	t mm	r ₁ mm	r ₂ mm	A cm ²	C _z cm	C _y cm
L 100 x 65 x 7	8.77	100	65	7	10	5	11.2	3.23	1.51
L 100 x 65 x 8	9.94	100	65	8	10	5	12.7	3.27	1.55
L 100 x 65 x 10	12.3	100	65	10	10	5	15.6	3.36	1.63
L 100 x 75 x 8	10.6	100	75	8	10	5	13.5	3.10	1.87
L 100 x 75 x 10	13	100	75	10	10	5	16.6	3.19	1.95
L 100 x 75 x 12	15.4	100	75	12	10	5	19.7	3.27	2.03
L 120 x 80 x 8	12.2	120	80	8	11	5.5	15.5	3.83	1.87
L 120 x 80 x 10	15	120	80	10	11	5.5	19.1	3.92	1.95
L 120 x 80 x 12	17.8	120	80	12	11	5.5	22.7	4.00	2.03
L 125 x 75 x 8	12.2	125	75	8	11	5.5	15.5	4.14	1.68
L 125 x 75 x 10	15	125	75	10	11	5.5	19.1	4.23	1.76
L 125 x 75 x 12	17.8	125	75	12	11	5.5	22.7	4.31	1.84
L 150 x 75 x 10	17	150	75	10	12	6	21.7	5.31	1.61
L 150 x 75 x 12	20.2	150	75	12	12	6	25.7	5.40	1.69
L 150 x 75 x 15	24.8	150	75	15	12	6	31.7	5.52	1.81
L 150 x 90 x 10	18.2	150	90	10	12	6	23.2	5.00	2.04
L 150 x 90 x 12	21.6	150	90	12	12	6	27.5	5.08	2.12
L 150 x 90 x 15	26.6	150	90	15	12	6	33.9	5.21	2.23
L 150 x 100 x 10	19	150	100	10	12	6	24.2	4.81	2.34
L 150 x 100 x 12	22.5	150	100	12	12	6	28.7	4.90	2.42
L 150 x 100 x 14	26.1	150	100	14	12	6	33.2	4.98	2.50
L 200 x 100 x 10	23	200	100	10	15	7.5	29.2	6.93	2.01
L 200 x 100 x 12	27.3	200	100	12	15	7.5	34.8	7.03	2.10
L 200 x 100 x 15	33.7	200	100	15	15	7.5	43.0	7.16	2.22
L 200 x 150 x 12	32	200	150	12	15	7.5	40.8	6.08	3.61
L 200 x 150 x 15	39.6	200	150	15	15	7.5	50.5	6.21	3.73
L 200 x 150 x 18	47.1	200	150	18	15	7.5	60.0	6.33	3.85

Medida no estándar. Consulten al Departamento Comercial de Corus la disponibilidad de laminaciones

Non-standard Section Size. Please enquire for availability.

Página de explicación 3

Explanation page 3

I_z cm ⁴	I_y cm ⁴	I_u cm ⁴	I_v cm ⁴	I_{yz} cm ⁴	i_z cm	i_y cm	i_u cm	i_v cm	W_z cm ³	W_y cm ³	α deg	Perfil Section
113	37.6	128	22.1	-37.5	3.17	1.83	3.39	1.41	16.6	7.53	22.42	L 100 x 65 x 7
127	42.2	144	24.8	-42.2	3.16	1.83	3.37	1.40	18.9	8.54	22.42	L 100 x 65 x 8
154	51.0	175	30.2	-50.8	3.14	1.81	3.35	1.39	23.2	10.5	22.30	L 100 x 65 x 10
133	64.1	162	34.7	-53.8	3.14	2.18	3.47	1.60	19.3	11.4	28.69	L 100 x 75 x 8
162	77.6	197	42.2	-65.1	3.12	2.16	3.45	1.59	23.8	14.0	28.52	L 100 x 75 x 10
189	90.2	230	49.5	-75.3	3.10	2.14	3.41	1.59	28.1	16.5	28.37	L 100 x 75 x 12
226	80.8	260	46.7	-78.2	3.82	2.28	4.10	1.74	27.6	13.2	23.56	L 120 x 80 x 8
276	98.1	317	56.9	-95.0	3.80	2.26	4.08	1.73	34.1	16.2	23.45	L 120 x 80 x 10
323	114	371	66	-110.5	3.77	2.24	4.04	1.71	40.4	19.1	23.30	L 120 x 80 x 12
247	67.6	274	40.9	-74.2	4.00	2.09	4.20	1.62	29.6	11.6	19.80	L 125 x 75 x 8
302	82.1	334	49.9	-90.1	3.97	2.07	4.18	1.62	36.5	14.3	19.67	L 125 x 75 x 10
354	95.5	391	58.5	-104.6	3.95	2.05	4.15	1.60	43.2	16.9	19.49	L 125 x 75 x 12
501	85.4	531	55.2	-116.0	4.81	1.99	4.95	1.59	51.7	14.5	14.59	L 150 x 75 x 10
589	99.6	624	65	-135.1	4.78	1.97	4.93	1.59	61.3	17.1	14.45	L 150 x 75 x 12
713	119	754	78	-160.5	4.75	1.94	4.88	1.57	75.2	21.0	14.20	L 150 x 75 x 15
533	146	591	88	-160.3	4.80	2.51	5.05	1.95	53.3	21.0	19.82	L 150 x 90 x 10
627	171	694	104	-187.5	4.78	2.49	5.02	1.94	63.3	24.8	19.72	L 150 x 90 x 12
761	205	840	126	-224.7	4.74	2.46	4.98	1.92	77.7	30.4	19.47	L 150 x 90 x 10
553	198	637	114	-192.2	4.78	2.87	5.13	2.17	54.2	25.9	23.64	L 150 x 100 x 10
651	233	749	135	-225.3	4.76	2.85	5.11	2.17	64.4	30.7	23.58	L 150 x 100 x 12
745	265	856	154	-256.2	4.74	2.82	5.08	2.15	74.3	35.3	23.44	L 150 x 100 x 14
1219	210	1294	135	-285.3	6.46	2.68	6.66	2.15	93.3	26.3	14.74	L 200 x 100 x 10
1441	247	1529	159	-335.8	6.43	2.67	6.63	2.14	111	31.3	14.68	L 200 x 100 x 12
1759	299	1864	194	-406.0	6.40	2.64	6.58	2.12	137	38.4	14.54	L 200 x 100 x 15
1653	803	2026	430	-675.0	6.36	4.44	7.05	3.25	119	70.5	28.90	L 200 x 150 x 12
2023	979	2476	526	-824.1	6.33	4.40	7.00	3.23	147	86.9	28.82	L 200 x 150 x 15
2376	1146	2904	618	-963.5	6.29	4.37	6.96	3.21	174	103	28.72	L 200 x 150 x 18

Tolerancias de laminación - BS EN 10034: 1993

La norma europea especifica las tolerancias dimensionales, del perfil y de la masa de los perfiles universales de acero estructural. Estos requisitos no son de aplicación en los perfiles de alas inclinadas.

Altura del perfil (*h*)

La desviación con respecto a la altura nominal del perfil medida en la línea central del espesor del alma deberá estar dentro de las tolerancias que se indican en la Tabla 1(a).

Tabla 1 (a) Tolerancia sobre la altura y la sección transversal.

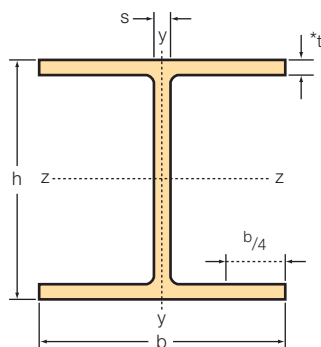
Altura de la sección <i>h</i> mm	Tolerancia mm
Hasta 180, inclusive	+3,0 -2,0
Más de 180 y hasta 400, inclusive	+4,0 -2,0
Más de 400 y hasta 700, inclusive	+5,0 -3,0
Más de 700	±5,0

Ancho del ala (*b*)

La desviación con respecto al ancho nominal del ala deberá estar dentro de las tolerancias que se indican en la Tabla 1(b).

Tabla 1 (b) Tolerancia sobre el ancho del ala.

Ancho del ala <i>b</i> mm	Tolerancia mm
Hasta 110, inclusive	+4,0 -1,0
Más de 110 y hasta 210, inclusive	+4,0 -2,0
Más de 210 y hasta 325, inclusive	±4,0
Más de 325	+6,0 -5,0



*t se mide en $b/4$

Espesor del alma (*s*)

La desviación con respecto al espesor nominal del alma medida en el punto medio de la dimensión (*h*) deberá estar dentro de las tolerancias que se indican en la Tabla 1(c).

Tabla 1 (c) Tolerancias sobre el espesor del alma.

Espesor del alma <i>s</i> mm	Tolerancia mm
Menos de 7	±0,7
7 y hasta 10, no inclusive	±1,0
10 y hasta 20, no inclusive	±1,5
20 y hasta 40, no inclusive	±2,0
40 y hasta 60, no inclusive	±2,5
60 o más	±3,0

Espesor del ala (*t*)

La desviación con respecto al espesor nominal del ala medida en el punto a un cuarto del ancho del ala deberá estar dentro de las tolerancias que se indican en la Tabla 1(d).

Tabla 1 (d) Tolerancias sobre el espesor del ala.

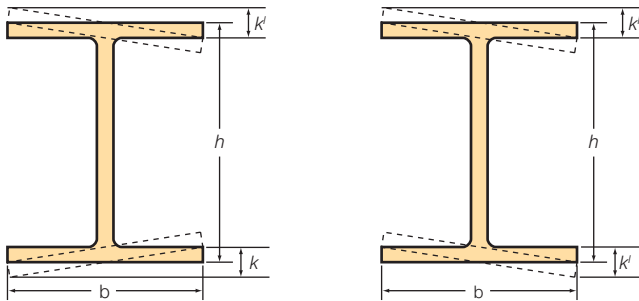
Grosor del ala <i>t</i> mm	Tolerancia mm
Menos de 6,5	+1,5 -0,5
6,5 y hasta 10, no inclusive	+2,0 -1,0
10 y hasta 20, no inclusive	+2,5 -1,5
20 y hasta 30, no inclusive	+2,5 -2,0
30 y hasta 40, no inclusive	±2,5
40 y hasta 60, no inclusive	±3,0
60 o más	±4,0

Descuadre ($k + k'$)

El descuadre de la sección no debe superar el máximo indicado en la Tabla 2(a).

Tabla 2 (a) Tolerancias sobre el descuadre de los perfiles universales.

Ancho del ala b mm	Descuadre de las alas $k + k'$ mm
Hasta 110, inclusive	1,5
Más de 110	2% de b (máximo 6,5mm)

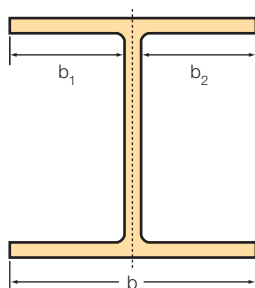


Descentrado del alma (e)

El espesor en el punto medio del alma no podrá desviarse con respecto a la posición del ancho medio del ala en más de la distancia (e) indicada en la Tabla 2(b).

Tabla 2 (b) Tolerancias sobre el descentrado de los perfiles universales.

Ancho del ala b mm	Descentramiento del alma donde $e = \frac{b_1 - b_2}{2}$ mm	
$t < 40$	Hasta 110, inclusive	2,5
	Más de 110 y hasta 325, inclusive	3,5
	Más de 325	5,0
$t \geq 40$	Más de 110 y hasta 325, inclusive	5,0
	Más de 325	8,0

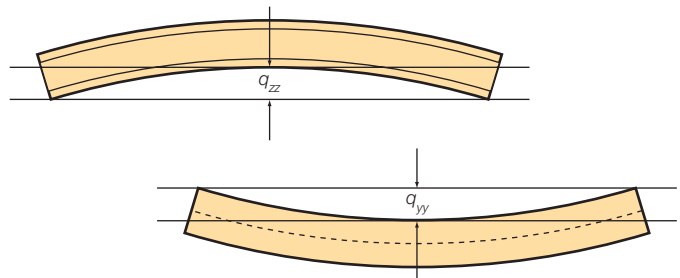


Rectitud (q_{zz} o q_{yy})

La rectitud deberá cumplir los requisitos que se indican en la Tabla 3.

Tabla 3 Tolerancia sobre la rectitud de los perfiles universales.

Altura de la sección h mm	Tolerancia q_{zz} y q_{yy} sobre el largo L %
Más de 80 y hasta 180, inclusive	0,30 L
Más de 180 y hasta 360, inclusive	0,15 L
Más de 360	0,1 L



Tolerancia sobre la masa

La desviación con respecto a la masa nominal de un lote o una pieza no debe superar el $\pm 4,0\%$.

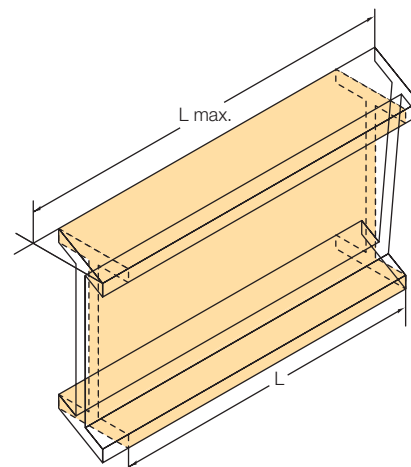
La desviación de masa es la diferencia entre la masa real del lote o pieza y la masa calculada. La masa calculada se determinará utilizando una densidad de 7850kg/m^3 .

Tolerancia sobre la longitud

Los perfiles se cortarán a la longitud pedida de acuerdo con unas tolerancias de:

- $\pm 50\text{mm}$; o
- 0, +100mm cuando se soliciten longitudes mínimas.

L representa la mayor longitud del perfil utilizable, asumiendo que los extremos del perfil se han cortado a escuadra.



Tolerancias de laminación - BS EN 10056-2: 1993

La norma europea especifica las tolerancias dimensionales, del perfil y de la masa de los perfiles angulares de lados iguales y desiguales de acero estructural laminado en caliente.

Tolerancias del perfil y dimensiones longitud del ala (*a* o *b*)

La desviación con respecto al nominal de la longitud del ala deberá estar dentro de las tolerancias que se indican en la Tabla 1(a). Para los perfiles angulares de lados desiguales, el ala más larga (*a*) se utilizará para determinar la banda de tolerancia.

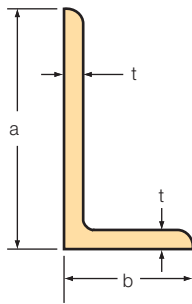


Tabla 1 (a) Tolerancias dimensionales.

Longitud del ala <i>a</i> mm	Tolerancia mm
Hasta 50, inclusive	±1,0
Más de 50 y hasta 100, inclusive	±2,0
Más de 100 y hasta 150, inclusive	±3,0
Más de 150 y hasta 200, inclusive	±4,0
Más de 200	+6,0 -4,0

Espesor del perfil (*t*)

La desviación con respecto al espesor nominal deberá estar dentro de las tolerancias que se indican en la Tabla 1(b).

Tabla 1 (b) Tolerancias de espesor.

Espesor de la sección <i>t</i> mm	Tolerancia mm
Hasta 5, inclusive	±0,50
Más de 5 y hasta 10, inclusive	±0,75
Más de 10 y hasta 15, inclusive	±1,00
Más de 15	±1,20

Descuadre (*k*)

El descuadre del perfil no debe superar el máximo indicado en la Tabla 1(c). Para los perfiles angulares de lados desiguales, el ala más larga (*a*) se utilizará para determinar la banda de tolerancia.

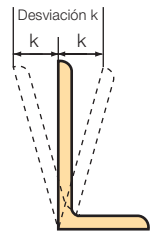


Tabla 1 (c) Tolerancias sobre el descuadre.

Descuadre – longitud del ala mm	Tolerancia mm
Hasta 100, inclusive	1,0
Más de 100 y hasta 150, inclusive	1,5
Más de 150 y hasta 200, inclusive	2,0
Más de 200	3,0

Rectitud (*q*)

La desviación con respecto a la rectitud no debe superar las tolerancias que se indican en la Tabla 1(d). Para los perfiles angulares de lados desiguales, el ala más larga (*a*) se utilizará para determinar la banda de tolerancia.

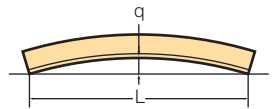


Tabla 1 (d) Tolerancias sobre la rectitud.

Largo del ala <i>a</i> mm	Tolerancia sobre toda la longitud	Tolerancia sobre cualquier parte de la longitud	
	Desviación <i>q</i> mm	Longitud considerada mm	Desviación <i>q</i> mm
Hasta 150, inclusive	0,4% L	1,500	6,0
Más de 150 y hasta 200, inclusive	0,2% L	2,000	3,0
Más de 200	0,1% L	3,000	3,0

Tolerancia sobre la masa

La desviación con respecto a la masa nominal de cualquier pieza individual no debe superar:

- a) ±6% del grosor para $t \leq 4$ mm, o
- b) ±4% del grosor para $t > 4$ mm.

La desviación con respecto a la masa nominal es la diferencia entre la masa real de la pieza y la masa calculada. La masa calculada se determinará utilizando una densidad de 7850kg/m³.

Tolerancia de longitud

La tolerancia sobre la longitud pedida será:

- a) ±50mm; o
- b) -0, +100mm cuando se necesiten largos mínimos.

Rolling tolerances - BS EN 10034: 1993

The European Standard specifies tolerances on shape dimensions and mass of structural steel universal beams and columns. These requirements do not apply to taper flange sections.

Section height (*h*)

The deviation from nominal on section height measured at the centre line of web thickness shall be within the tolerance given in Table 1(a).

Section height <i>h</i> mm	Tolerance mm
Up to and including 180	+3.0 -2.0
Greater than 180 up to and including 400	+4.0 -2.0
Greater than 400 up to and including 700	+5.0 -3.0
Greater than 700	±5.0

Web thickness (*s*)

The deviation from nominal on web thickness measured at the mid-point of dimension (*h*) shall be within the tolerance given in Table 1(c).

Web thickness <i>s</i> mm	Tolerance mm
Less than 7	±0.7
7 up to but excluding 10	±1.0
10 up to but excluding 20	±1.5
20 up to but excluding 40	±2.0
40 up to but excluding 60	±2.5
60 and over	±3.0

Flange width (*b*)

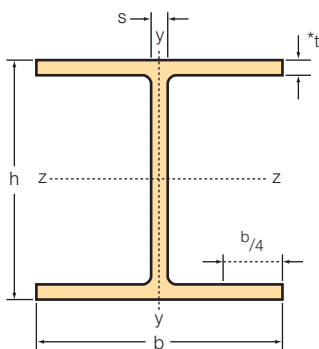
The deviation from nominal on flange width shall be within the tolerance given in Table 1(b).

Flange width <i>b</i> mm	Tolerance mm
Up to and including 110	+4.0 -1.0
Greater than 110 up to and including 210	+4.0 -2.0
Greater than 210 up to and including 325	±4.0
Greater than 325	+6.0 -5.0

Flange thickness (*t*)

The deviation from nominal on flange thickness measured at the quarter flange width point shall be within the tolerance given in Table 1(d).

Flange thickness <i>t</i> mm	Tolerance mm
Less than 6.5	+1.5 -0.5
6.5 up to but excluding 10	+2.0 -1.0
10 up to but excluding 20	+2.5 -1.5
20 up to but excluding 30	+2.5 -2.0
30 up to but excluding 40	±2.5
40 up to but excluding 60	±3.0
60 and over	±4.0



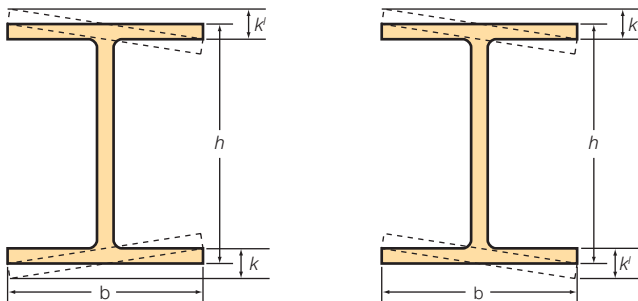
**t* is measured at *b/4*

Out-of-squareness ($k + k'$)

The out-of-squareness of the section shall not exceed the maximum given in Table 2(a).

Table 2 (a) Tolerance on out-of-squareness of universal beams and columns

Flange width b mm	Out-of-squareness of flanges $k + k'$ mm
Up to and including 110	1.5
Greater than 110	2% of b (maximum 6.5mm)

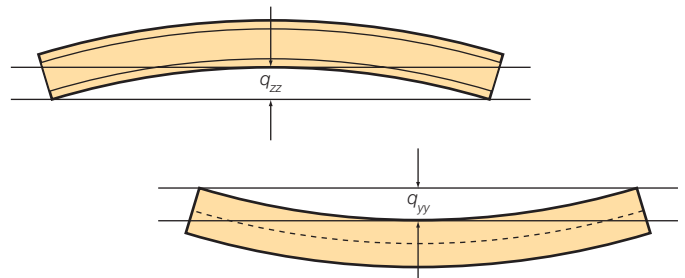


Straightness (q_{zz} or q_{yy})

The straightness shall comply with the requirements given in Table 3.

Table 3 Tolerance on straightness of universal beams and columns

Section height h mm	Tolerance q_{zz} and q_{yy} on length L %
Greater than 80 up to and including 180	0.30 L
Greater than 180 up to and including 360	0.15 L
Greater than 360	0.1 L

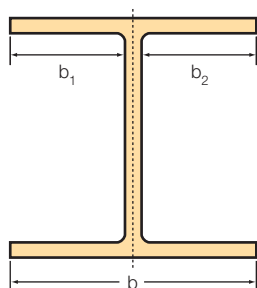


Web off-centre (e)

The mid-thickness of the web shall not deviate from the mid-width position on the flange by more than the distance (e) given in Table 2(b).

Table 2 (b) Tolerance on web off-centre of universal beams and columns

Flange thickness t mm	Flange width b mm	Web off-centre where $e = \frac{b_1 - b_2}{2}$ mm
$t < 40$	Up to and including 110	2.5
	Greater than 110 up to and including 325	3.5
	Greater than 325	5.0
$t \geq 40$	Greater than 110 up to and including 325	5.0
	Greater than 325	8.0



Tolerance on mass

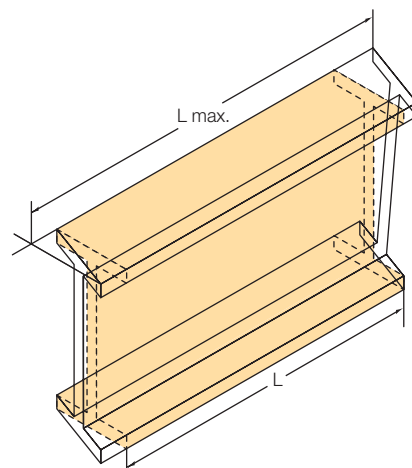
The deviation from the nominal mass of a batch or a piece shall not exceed $\pm 4.0\%$.

The mass deviation is the difference between the actual mass of the batch or piece and the calculated mass. The calculated mass shall be determined using a density of 7850 kg/m^3 .

Tolerance on length

The sections shall be cut to ordered lengths to tolerances of:
 a) $\pm 50 \text{ mm}$; or
 b) $-0, +100 \text{ mm}$ where minimum lengths are requested.

L represents the longest useable length of the section assuming that the ends of the section have been cut square.



Rolling tolerances – BS EN 10056-2: 1993

This European Standard specifies tolerances on shape, dimensions and mass of hot-rolled structural steel equal and unequal leg angles.

Tolerances on shapes and dimensions Leg length (*a* or *b*)

The deviation from nominal on leg length shall be within the tolerance given in Table 1(a). For unequal leg angles the longer leg length (*a*) shall be used to determine the tolerance band.

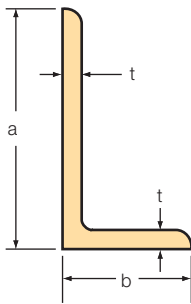


Table 1 (a) Dimensional tolerances	
Leg length <i>a</i> mm	Tolerance mm
Up to and including 50	±1.0
Greater than 50 up to and including 100	±2.0
Greater than 100 up to and including 150	±3.0
Greater than 150 up to and including 200	±4.0
Greater than 200	+6.0 -4.0

Section thickness (*t*)

The deviation from nominal on thickness shall be within the tolerances given in Table 1(b).

Table 1 (b) Thickness tolerances	
Section thickness <i>t</i> mm	Tolerance mm
Up to and including 5	±0.50
Greater than 5 up to and including 10	±0.75
Greater than 10 up to and including 15	±1.00
Greater than 15	±1.20

Out-of-square (*k*)

Out-of-squareness of the section shall not exceed the maximum given in Table 1(c). For unequal leg angles, the longer leg length (*a*) shall be used to determine the tolerance band.

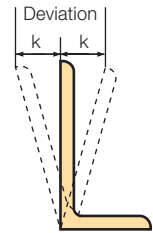


Table 1 (c) Squareness tolerances

Out of square – Leg length mm	Tolerance mm
Up to and including 100	1.0
Greater than 100 up to and including 150	1.5
Greater than 150 up to and including 200	2.0
Greater than 200	3.0

Straightness (*q*)

The deviation from straightness shall not exceed the tolerances given in Table 1(d). For unequal leg angles, the longer leg length (*a*) shall be used to determine the tolerance band.

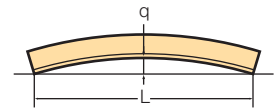


Table 1 (d) Straightness tolerances

Leg length <i>a</i> mm	Tolerance over full bar length Deviation <i>q</i> mm	Tolerance over any part bar length	
		Length considered mm	Deviation <i>q</i> mm
Up to and including 150	0.4% L	1,500	6.0
Greater than 150 up to and including 200	0.2% L	2,000	3.0
Greater than 200	0.1% L	3,000	3.0

Tolerance on mass

The deviation from the nominal mass of any individual piece shall not exceed:

- a) ±6% for thickness for $t \leq 4$ mm or
- b) ±4% for thickness for $t > 4$ mm.

The deviation from the nominal mass is the difference between the actual mass of the piece and the calculated mass. The calculated mass shall be determined using a density of 7850kg/m³.

Tolerance on length

The tolerance on ordered length shall be either:

- a) ±50mm; or
- b) -0, +100mm where minimum lengths are required.

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