

OpenCourseWare

## **Teoría de Estructuras y Construcciones Industriales**

Carlos Santiuste Romero, Sara Garzón Hernández, Liu Jiao Wang,  
Manuel Cuadrado Sanguino, Luis Jiménez Girón, Daniel Herrero Adán

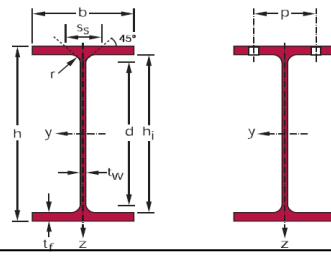
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### **Entender un prontuario de perfiles**

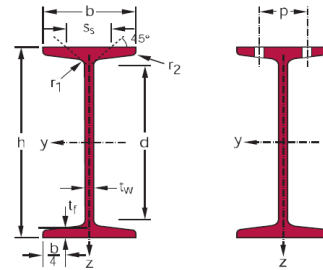




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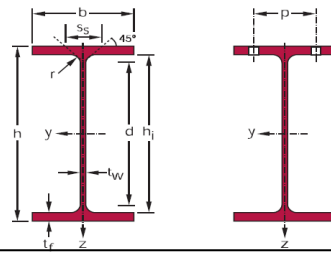


# IPN

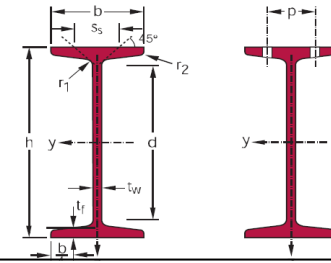


Denominación	Dimensiones								Dimensiones de construcción				Superficie		Denominación	Propiedades del perfil														Classification ENV 1993-1-1			
	G	h	b	l <sub>w</sub>	l <sub>f</sub>	r <sub>1</sub>	r <sub>2</sub>	A	d	Ø	P <sub>min</sub>	P <sub>max</sub>	A <sub>L</sub>	A <sub>G</sub>		G	I <sub>y</sub>	W <sub>el,y</sub>	W <sub>pl,y</sub> *	I <sub>y</sub>	A <sub>vz</sub>	I <sub>z</sub>	W <sub>el,z</sub>	W <sub>pl,z</sub> *	I <sub>z</sub>	S <sub>s</sub>	I <sub>T</sub>	I <sub>w</sub>	Pure bending		Pure compression		
	kg/m	mm	mm	mm	mm	mm	mm	mm <sup>2</sup> x10 <sup>2</sup>	mm	mm	mm	mm	m <sup>2</sup> /m	m <sup>2</sup> /t	kg/m	mm <sup>4</sup> x10 <sup>8</sup>	mm <sup>3</sup> x10 <sup>3</sup>	mm <sup>3</sup> x10 <sup>3</sup>	mm <sup>4</sup> x10 <sup>2</sup>	mm <sup>2</sup>	mm <sup>4</sup> x10 <sup>8</sup>	mm <sup>3</sup> x10 <sup>3</sup>	mm <sup>3</sup> x10 <sup>3</sup>	mm <sup>4</sup> x10 <sup>8</sup>	mm	mm <sup>4</sup> x10 <sup>6</sup>	mm <sup>4</sup> x10 <sup>6</sup>	S235	S355	S235	S355		
IPN 80*	5.9	80	42	3.9	5.9	3.9	2.3	7.58	59	-	-	-	0.304	51.09	IPN 80	5.9	77.8	19.5	22.8	3.20	3.41	6.29	3.00	5.00	0.91	21.6	0.87	0.09	4	4	4	4	
IPN 100*	8.3	100	50	4.5	6.8	4.5	2.7	10.6	75.7	-	-	-	0.370	44.47	IPN 100	8.3	171	34.2	39.8	4.01	4.85	12.2	4.88	8.10	1.07	25.0	1.60	0.27	1	1	1	1	
IPN 120*	11.1	120	58	5.1	7.7	5.1	3.1	14.2	92.4	-	-	-	0.439	39.38	IPN 120	11.1	328	54.7	63.6	4.81	6.63	21.5	7.41	12.4	1.23	28.4	2.71	0.69	1	1	1	1	
IPN 140*	14.3	140	66	5.7	8.6	5.7	3.4	18.3	109.1	-	-	-	0.502	34.94	IPN 140	14.3	573	81.9	95.4	5.61	8.65	35.2	10.7	17.9	1.40	31.8	4.32	1.54	1	1	1	1	
IPN 160*	17.9	160	74	6.3	9.5	6.3	3.8	22.8	125.8	-	-	-	0.575	32.13	IPN 160	17.9	935	117	136	6.40	10.83	54.7	14.8	24.9	1.55	35.2	6.57	3.14	1	1	1	1	
IPN 180*	21.9	180	82	6.9	10.4	6.9	4.1	27.9	142.4	-	-	-	0.640	29.22	IPN 180	21.9	1450	161	187	7.20	13.35	81.3	19.8	33.2	1.71	38.6	9.58	5.92	1	1	1	1	
IPN 200*	26.2	200	90	7.5	11.3	7.5	4.5	33.4	159.1	-	-	-	0.709	27.04	IPN 200	26.2	2140	214	250	8.00	16.03	117	26.0	43.5	1.87	42.0	13.5	10.5	1	1	1	1	
IPN 220*	31.1	220	98	8.1	12.2	8.1	4.9	39.5	175.8	M 10	50	56	0.775	24.99	IPN 220	31.1	3060	278	324	8.80	19.06	162	33.1	55.7	2.02	45.4	18.6	17.8	1	1	1	1	
IPN 240*	36.2	240	106	8.7	13.1	8.7	5.2	46.1	192.5	M 10	54	60	0.844	23.32	IPN 240	36.2	4250	354	412	9.59	22.33	221	41.7	70.0	2.20	48.9	25.0	28.7	1	1	1	1	
IPN 260*	41.9	260	113	9.4	14.1	9.4	5.6	53.3	208.9	M 12	62	62	0.906	21.65	IPN 260	41.9	5740	442	514	10.40	26.08	288	51.0	85.9	2.32	52.6	33.5	44.1	1	1	1	1	
IPN 280*	47.9	280	119	10.1	15.2	10.1	6.1	61.0	225.1	M 12	68	68	0.966	20.17	IPN 280	47.9	7590	542	632	11.10	30.18	364	61.2	103	2.45	56.4	44.2	64.6	1	1	1	1	
IPN 300*	54.2	300	125	10.8	16.2	10.8	6.5	69.0	241.6	M 12	70	74	1.03	19.02	IPN 300	54.2	9800	653	762	11.90	34.58	451	72.2	121	2.56	60.1	56.8	91.8	1	1	1	1	
IPN 320*	61.0	320	131	11.5	17.3	11.5	6.9	77.7	257.9	M 12	70	80	1.09	17.87	IPN 320	61.0	12510	782	914	12.70	39.26	555	84.7	143	2.67	63.9	72.5	129	1	1	1	1	
IPN 340*	68.0	340	137	12.2	18.3	12.2	7.3	86.7	274.3	M 12	78	86	1.15	16.90	IPN 340	68.0	15700	923	1080	13.50	44.27	674	98.4	166	2.80	67.6	90.4	176	1	1	1	1	
IPN 360*	76.1	360	143	13	19.5	13	7.8	97.0	290.2	M 12	78	92	1.21	15.89	IPN 360	76.1	19610	1090	1276	14.20	49.95	818	114	194	2.90	71.8	115	240	1	1	1	1	
IPN 380*	84.0	380	149	13.7	20.5	13.7	8.2	107	306.7	M 16	84	86	1.27	15.12	IPN 380	84.0	24010	1260	1482	15.00	55.55	975	131	221	3.02	75.4	141	319	1	1	1	1	
IPN 400*	92.4	400	155	14.4	21.6	14.4	8.6	118	322.9	M 16	86	92	1.33	14.36	IPN 400	92.4	29210	1460	1714	15.70	61.69	1160	149	253	3.13	79.3	170	420	1	1	1	1	
IPN 450*	115	450	170	16.2	24.3	16.2	9.7	147	363.6	M 16	92	106	1.48	12.83	IPN 450	115	45850	2040	2400	17.70	77.79	1730	203	345	3.43	88.9	267	791	1	1	1	1	
IPN 500*	141	500	185	18	27	18	10.8	179	404.3	M 20	102	110	1.63	11.60	IPN 500	141	68740	2750	3240	19.60	95.60	2480	268	456	3.72	98.5	402	1400	1	1	1	1	
IPN 550*	166	550	200	19	30	19	11.9	212	445.6	M 22	112	118	1.80	10.80	IPN 550	166	99180	3610	4240	21.60	111.3	3490	349	592	4.02	107.3	544	2390	1	1	1	1	
IPN 600*	199	600	215	21.6	32.4	21.6	13	254	485.8	M 24	126	128	1.97	9.89	IPN 600	199	138800	4627	5452	23.39	138.0	4674	435	752	4.29	117.6	787	3814	1	1	1	1	

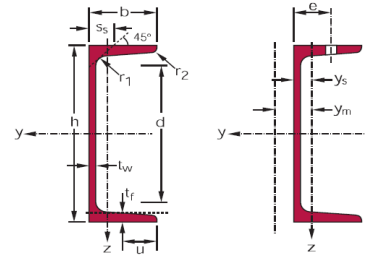
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# IPN



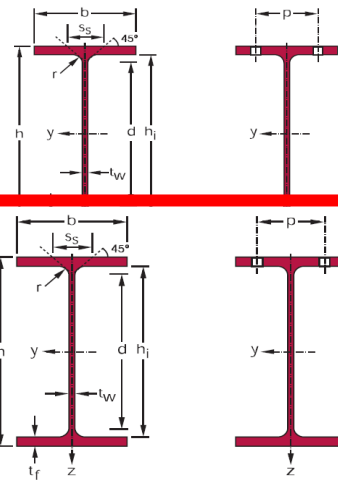
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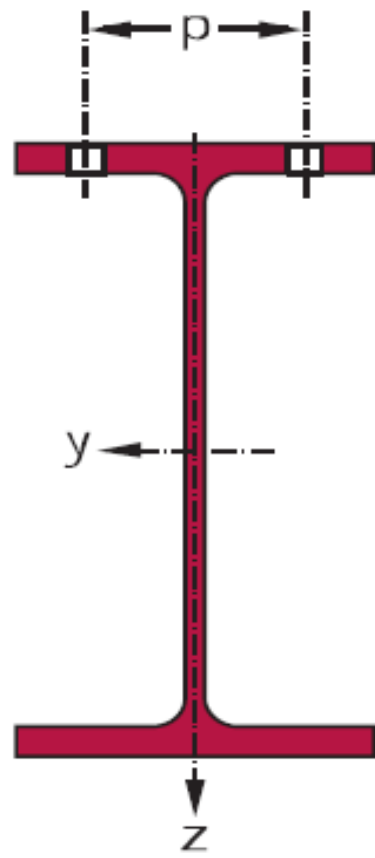
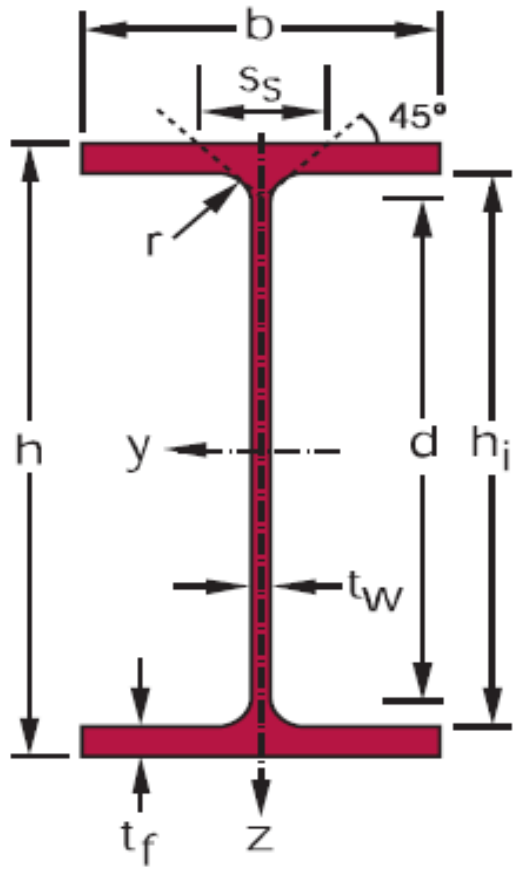
Denominación	Dimensiones						A mm <sup>2</sup> x10 <sup>3</sup>	Dimensiones de construcción					Superficie		Denominación	Propiedades del perfil														Classification ENV 1993-1-1				
	G kg/m	h mm	b mm	l <sub>w</sub> mm	t <sub>f</sub> mm	r mm		h <sub>j</sub> mm	d mm	Ø mm	p <sub>min</sub> mm	p <sub>max</sub> mm	A <sub>L</sub> m <sup>2</sup> /m	A <sub>G</sub> m <sup>2</sup> /t		G kg/m	I <sub>y</sub> mm <sup>4</sup> x10 <sup>8</sup>	W <sub>el,y</sub> mm <sup>3</sup> x10 <sup>3</sup>	W <sub>pl,y</sub> * mm <sup>3</sup> x10 <sup>3</sup>	I <sub>y</sub> mm <sup>4</sup> x10 <sup>8</sup>	A <sub>Vz</sub> mm <sup>2</sup> x10 <sup>2</sup>	I <sub>z</sub> mm <sup>4</sup> x10 <sup>8</sup>	W <sub>el,z</sub> mm <sup>3</sup> x10 <sup>3</sup>	W <sub>pl,z</sub> * mm <sup>3</sup> x10 <sup>3</sup>	I <sub>z</sub> mm <sup>4</sup> x10 <sup>8</sup>	S <sub>s</sub> mm	I <sub>T</sub> mm <sup>4</sup> x10 <sup>8</sup>	I <sub>w</sub> mm <sup>5</sup> x10 <sup>9</sup>	Y <sub>s</sub> mm	Y <sub>m</sub> mm	Pure bending	Pure compression		
UPN 80*	8.65	80	45	6	8	4	11.02	-	-	-	-	0.321	37.10	UPN 80	8.65	106	26.6	32.3	3.10	4.90	19.4	6.38	11.9	1.33	19.4	2.20	0.18	1.42	2.65	1	1	1	1	
UPN 100*	10.6	100	50	6	8.5	4.5	13.50	-	-	-	-	0.372	35.10	UPN 100	10.6	206	41.2	49.0	3.91	6.46	29.3	8.49	16.2	1.47	20.3	2.81	0.41	1.55	2.93	1	1	1	1	
UPN 120	13.4	120	55	7	9	4.5	17.00	-	-	-	-	0.434	32.52	UPN 120	13.4	364	60.7	72.6	4.62	8.80	43.2	11.1	21.2	1.59	22.2	4.15	0.90	1.60	3.03	1	1	1	1	
UPN 140	16.0	140	60	7	10	5	20.40	-	-	M 12	33	37	0.489	30.54	UPN 140	16.0	605	86.4	103	5.45	10.41	62.7	14.8	28.3	1.75	23.9	5.68	1.80	1.75	3.37	1	1	1	1
UPN 160	18.8	160	65	7.5	10.5	5.5	24.00	-	-	M 12	34	42	0.546	28.98	UPN 160	18.8	925	116	138	6.21	12.60	85.3	18.3	35.2	1.89	25.3	7.39	3.26	1.84	3.56	1	1	1	1
UPN 180	22.0	180	70	8	11	5.5	28.00	-	-	M 16	38	41	0.611	27.80	UPN 180	22.0	1350	150	179	6.95	15.09	114	22.4	42.9	2.02	26.7	9.55	5.57	1.92	3.75	1	1	1	1
UPN 200	25.3	200	75	8.5	11.5	6	32.20	-	-	M 16	39	46	0.661	26.15	UPN 200	25.3	1910	191	228	7.70	17.71	148	27.0	51.8	2.14	28.1	11.9	9.07	2.01	3.94	1	1	1	1
UPN 220	29.4	220	80	9	12.5	6.5	37.40	-	-	M 16	40	51	0.718	24.46	UPN 220	29.4	2690	245	292	8.48	20.62	197	33.6	64.1	2.30	30.3	16.0	14.6	2.14	4.20	1	1	1	1
UPN 240	33.2	240	85	9.5	13	6.5	42.30	-	-	M 20	46	50	0.775	23.34	UPN 240	33.2	3600	300	358	9.22	23.71	248	39.6	75.7	2.42	31.7	19.7	22.1	2.23	4.39	1	1	1	1
UPN 260	37.9	260	90	10	14	7	48.30	-	-	M 22	50	52	0.834	22.00	UPN 260	37.9	4820	371	442	9.99	27.12	317	47.7	91.6	2.56	33.9	25.5	33.3	2.36	4.66	1	1	1	1
UPN 280	41.8	280	95	10	15	7.5	53.30	-	-	M 22	52	57	0.890	21.27	UPN 280	41.8	6280	448	532	10.9	29.28	399	57.2	109	2.74	35.6	31.0	48.5	2.53	5.02	1	1	1	1
UPN 300	46.2	300	100	10	16	8	58.80	-	-	M 24	55	59	0.950	20.58	UPN 300	46.2	8030	535	632	11.7	31.77	495	67.8	130	2.90	37.3	37.4	69.1	2.70	5.41	1	1	1	1
UPN 320*	59.5	320	100	14	17.5	8.75	75.80	-	-	M 22	58	62	0.982	16.50	UPN 320	59.5	10870	679	826	12.1	47.11	597	80.6	152	2.81	43.0	66.7	96.1	2.60	4.82	1	1	1	1
UPN 350	60.6	350	100	14	16	8	77.30	-	-	M 22	56	62	1.047	17.25	UPN 350	60.6	12840	734	918	12.9	50.84	570	75.0	143	2.72	40.7	61.2	114	2.40	4.45	1	1	1	1
UPN 380*	63.1	380	102	13.5	16	8	80.40	-	-	M 24	59	60	1.110	17.59	UPN 380	63.1	15760	829	1014	14.0	53.23	615	78.7	148	2.77	40.3	59.1	146	2.38	4.58	1	1	1	1
UPN 400*	71.8	400	110	14	18	9	91.50	-	-	M 27	61	62	1.182	16.46	UPN 400	71.8	20350	1020	1240	14.9	58.55	846	102	190	3.04	44.0	81.6	221	2.65	5.11	1	1	1	1

# HE

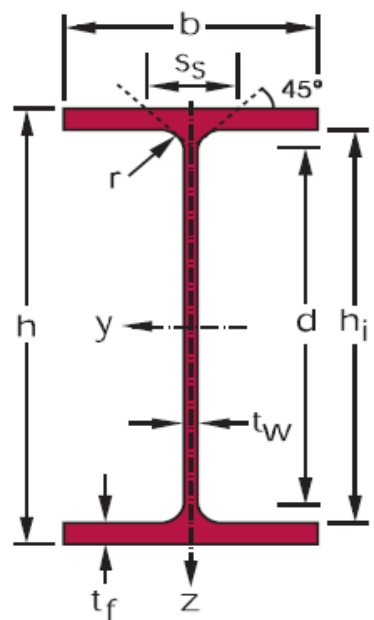
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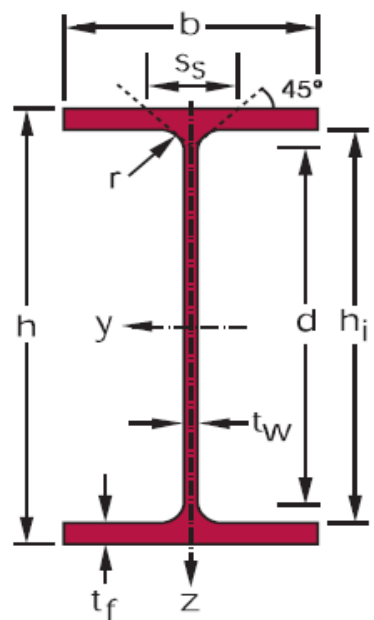
Denominación	Dimensiones						Dimensiones de construcción						Superficie		Denominación	Propiedades del perfil														Classification ENV 1993-1-1					
	G	h	b	l <sub>w</sub>	t <sub>f</sub>	r	A	h <sub>i</sub>	d	Ø	p <sub>min</sub>	p <sub>max</sub>	A <sub>t</sub>	A <sub>G</sub>		G	I <sub>y</sub>	W <sub>el,y</sub>	W <sub>pl,y</sub> *	I <sub>y</sub>	A <sub>vz</sub>	I <sub>z</sub>	W <sub>el,z</sub>	W <sub>pl,z</sub> *	I <sub>z</sub>	s <sub>s</sub>	I <sub>t</sub>	I <sub>w</sub>	Pure bending y-y	Pure compression					
kg/m	mm	mm	mm	mm	mm	mm <sup>2</sup>	mm	mm	mm	mm	mm	m <sup>2</sup> /m	m <sup>2</sup> /t	kg/m	mm <sup>4</sup>	mm <sup>3</sup>	mm <sup>3</sup>	mm	mm <sup>2</sup>	mm <sup>4</sup>	mm <sup>3</sup>	mm <sup>3</sup>	mm	mm	mm	mm <sup>4</sup>	mm <sup>5</sup>	S235	S355	S460	S235	S355	S460		
IPE 80	6.0	80	46	3.8	5.2	7.64	69.6	59.6	-	-	-	0.328	54.64	IPE 80	6.0	80.14	20.03	23.22	3.24	3.58	8.49	3.69	5.82	1.05	20.10	0.70	0.12	1	1	-	1	1	-		
IPE 100	8.1	100	55	4.1	5.7	7	10.3	88.6	74.6	-	-	0.400	49.33	IPE 100	8.1	171.0	34.20	39.41	4.07	5.08	15.92	5.79	9.15	1.24	23.70	1.20	0.35	1	1	-	1	1	-		
IPE 120	10.4	120	64	4.4	6.3	7	13.2	107.4	93.4	-	-	0.475	45.82	IPE 120	10.4	317.8	52.96	60.73	4.90	6.31	27.67	8.65	13.58	1.45	25.20	1.74	0.89	1	1	-	1	1	-		
IPE 140	12.9	140	73	4.7	6.9	7	16.4	126.2	112.2	-	-	0.551	42.70	IPE 140	12.9	541.2	77.32	88.34	5.74	7.64	44.92	12.31	19.25	1.65	26.70	2.45	1.98	1	1	-	1	1	-		
IPE 160	15.8	160	82	5	7.4	9	20.1	145.2	127.2	-	-	0.623	39.47	IPE 160	15.8	869.3	108.7	123.9	6.58	9.66	68.31	16.66	26.10	1.84	30.34	3.60	3.96	1	1	-	1	1	-		
IPE 180	18.8	180	91	5.3	8	9	23.9	164	146	M 10	48	48	0.698	37.13	IPE 180	18.8	1317	146.3	166.4	7.42	11.25	100.9	22.16	34.60	2.05	31.84	4.79	7.43	1	1	-	1	2	-	
IPE 200	22.4	200	100	5.6	8.5	12	28.5	183	159	M 10	54	58	0.768	34.36	IPE 200	22.4	1943	194.3	220.6	8.26	14.00	142.4	28.47	44.61	2.24	36.66	6.98	12.99	1	1	-	1	2	-	
IPE 220	26.2	220	110	5.9	9.2	12	33.4	201.6	177.6	M 12	60	62	0.848	32.36	IPE 220	26.2	2772	252.0	285.4	9.11	15.88	204.9	37.25	58.11	2.48	38.36	9.07	22.67	1	1	-	1	2	-	
IPE 240	30.7	240	120	6.2	9.8	15	39.1	220.4	190.4	M 12	66	68	0.922	30.02	IPE 240	30.7	3892	324.3	366.6	9.97	19.14	283.6	47.27	73.92	2.69	43.37	12.88	37.39	1	1	-	1	2	-	
IPE 270	36.1	270	135	6.6	10.2	15	45.9	249.6	219.6	M 16	72	72	1.041	28.86	IPE 270	36.1	5790	428.9	484.0	11.23	22.14	419.9	62.20	96.95	3.02	44.57	15.94	70.58	1	1	-	2	3	-	
IPE 300	42.2	300	150	7.1	10.7	15	53.8	278.6	248.6	M 16	72	86	1.160	27.46	IPE 300	42.2	8356	557.1	628.4	12.46	25.68	603.8	80.50	125.2	3.35	46.07	20.12	125.9	1	1	-	2	4	-	
IPE 330	49.1	330	160	7.5	11.5	18	62.6	307	271	M 16	78	96	1.254	25.52	IPE 330	49.1	11770	713.1	804.3	13.71	30.81	788.1	98.52	153.7	3.55	51.59	28.15	199.1	1	1	-	2	4	-	
IPE 360	57.1	360	170	8	12.7	18	72.7	334.6	298.6	M 22	88	88	1.353	23.70	IPE 360	57.1	16270	903.6	1019	14.95	35.14	1043	122.8	191.1	3.79	54.49	37.32	313.6	1	1	-	2	4	-	
IPE 400	66.3	400	180	8.6	13.5	21	84.5	373	331	M 22	96	98	1.467	22.12	IPE 400	66.3	23130	1156	1307	16.55	42.69	1318	146.4	229.0	3.95	60.20	51.08	490.0	1	1	-	3	4	-	
IPE 450	77.6	450	190	9.4	14.6	21	98.8	420.8	378.8	M 24	100	102	1.605	20.69	IPE 450	77.6	33740	1500	1702	18.48	50.85	1676	176.4	276.4	4.12	63.20	66.87	791.0	1	1	1	3	4	4	
IPE 500	90.7	500	200	10.2	16	21	116	468	426	M 24	102	112	1.744	19.23	IPE 500	90.7	48200	1928	2194	20.43	59.87	2142	214.2	335.9	4.31	66.80	89.29	1249	1	1	1	3	4	4	
IPE 550	106	550	210	11.1	17.2	24	134	515.6	467.6	M 24	110	122	1.877	17.78	IPE 550	106	67120	2441	2787	22.35	72.34	2668	254.1	400.5	4.45	73.62	123.2	1884	1	1	1	4	4	4	
IPE 600	122	600	220	12	19	24	156	562	514	M 27	116	118	2.015	16.45	IPE 600	122	92080	3069	3512	24.30	83.78	3387	307.9	485.6	4.66	78.12	165.4	2846	1	1	1	4	4	4	
IPE 750	147	753	265	13.2	17	17	188	719	685	M 27	104	164	2.51	17.06	IPE 750	147	166100	4411	5110	29.76	105.4	5289	399.2	630.8	5.31	67.12	161.5	7141	1	1	2	4	4	4	
UPN 180	22.0	180	70	8	11	5.5	28.00	-	-	M 16	38	41	0.611	27.80	UPN 180	22.0	1350	150	179	6.95	15.09	114	22.4	42.9	2.02	26.7	9.55	5.57	1.92	3.75	1	1	1	1	1
UPN 200	25.3	200	75	8.5	11.5	6	32.20	-	-	M 16	39	46	0.661	26.15	UPN 200	25.3	1910	191	228	7.70	17.71	148	27.0	51.8	2.14	28.1	11.9	9.07	2.01	3.94	1	1	1	1	1
UPN 220	29.4	220	80	9	12.5	6.5	37.40	-	-	M 16	40	51	0.718	24.46	UPN 220	29.4	2690	245	292	8.48	20.62	197	33.6	64.1	2.30	30.3	16.0	14.6	2.14	4.20	1	1	1	1	1
UPN 240	33.2	240	85	9.5	13	6.5	42.30	-	-	M 20	46	50	0.775	23.04	UPN 240	33.2	3600	300	358	9.22	23.71	248	39.6	75.7	2.42	31.7	19.7	22.1	2.23	4.39	1	1	1	1	1
UPN 260	37.9	260	90	10	14	7	48.30	-	-	M 22	50	52	0.834	22.00	UPN 260	37.9	4820	371	442	9.99	27.12	317	47.7	91.6	2.56	33.9	25.5	33.3	2.36	4.66	1	1	1	1	1
UPN 280	41.8	280	95	10	15	7.5	53.30	-	-	M 22	52	57	0.890	21.27	UPN 280	41.8	6280	448	532	10.9	29.28	399	57.2	109	2.74	35.6	31.0	48.5	2.53	5.02	1	1	1	1	1
UPN 300	46.2	300	100	10	16	8	58.80	-	-	M 24	55	59	0.950	20.58	UPN 300	46.2	8030	535	632	11.7	31.77	495	67.8	130	2.90	37.3	37.4	69.1	2.70	5.41	1	1	1	1	1
UPN 320*	59.5	320	100	14	17.5	8.75	75.80	-	-	M 22	58	62	0.982	18.56	UPN 320	59.5	10870	679	826	12.1	47.11	597	80.6	152	2.81	43.0	66.7	96.1	2.60	4.82	1	1	1	1	1
UPN 350	60.6	350	100	14	16	8	77.30	-	-	M 22	56	62	1.047	17.25	UPN 350	60.6	12840	734	918	12.9	50.84	570	75.0	143	2.72	40.7	61.2	114	2.40	4.45	1	1	1	1	1
UPN 380*	63.1	380	102	13.5	16	8	80.40	-	-	M 24	59	60	1.110	17.59	UPN 380	63.1	15760	829	1014	14.0	53.23	615	78.7	148	2.77	40.3	59.1	146	2.38	4.58	1	1	1	1	1
UPN 400*	71.8	400	110	14	18	9	91.50	-	-	M 27	61	62	1.182	16.46	UPN 400	71.8	20350	1020	1240	14.9	58.55	846	102	190	3.04	44.0	81.6	221	2.65	5.11	1	1	1	1	1



<b>Denominación</b>		<b>Dimensiones</b>					
	G kg/m	h mm	b mm	$t_w$ mm	$t_f$ mm	r mm	A mm <sup>2</sup> x10 <sup>2</sup>
<b>IPE 80</b>	6.0	80	46	3.8	5.2	5	7.64
<b>IPE 100</b>	8.1	100	55	4.1	5.7	7	10.3
<b>IPE 120</b>	10.4	120	64	4.4	6.3	7	13.2
<b>IPE 140</b>	12.9	140	73	4.7	6.9	7	16.4
<b>IPE 160</b>	15.8	160	82	5	7.4	9	20.1
<b>IPE 180</b>	18.8	180	91	5.3	8	9	23.9
<b>IPE 200</b>	22.4	200	100	5.6	8.5	12	28.5

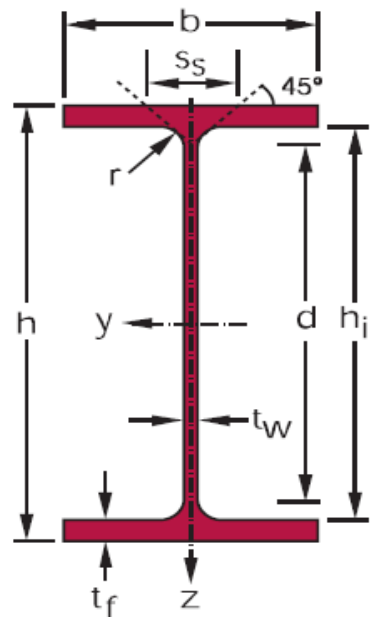


<b>Denominación</b>		<b>Dimensiones</b>					
	G kg/m	h mm	b mm	$t_w$ mm	$t_f$ mm	r mm	A mm <sup>2</sup> x10 <sup>2</sup>
<b>IPE 80</b>	6.0	80	46	3.8	5.2	5	7.64
<b>IPE 100</b>	8.1	100	55	4.1	5.7	7	10.3
<b>IPE 120</b>	10.4	120	64	4.4	6.3	7	13.2
<b>IPE 140</b>	12.9	140	73	4.7	6.9	7	16.4
<b>IPE 160</b>	15.8	160	82	5	7.4	9	20.1
<b>IPE 180</b>	18.8	180	91	5.3	8	9	23.9
<b>IPE 200</b>	22.4	200	100	5.6	8.5	12	28.5

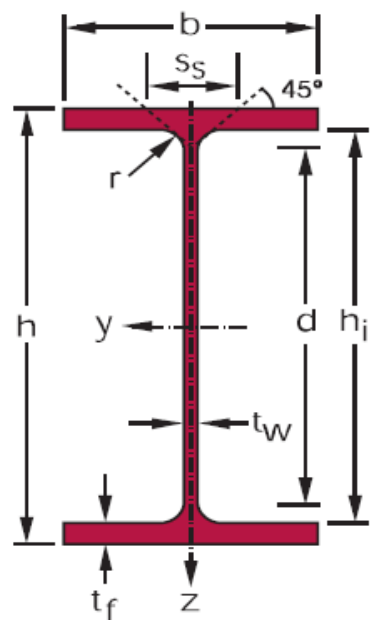




<b>Denominación</b>		<b>Prop</b>				
		<b>eje fuerte y-y</b>				
	G kg/m	$I_y$ mm <sup>4</sup> x10 <sup>4</sup>	$W_{el,y}$ mm <sup>3</sup> x10 <sup>3</sup>	$W_{pl,y} \blacklozenge$ mm <sup>3</sup> x10 <sup>3</sup>	$i_y$ mm x10	$A_{vz}$ mm <sup>2</sup> x10 <sup>2</sup>
<b>IPE 80</b>	6.0	80.14	20.03	23.22	3.24	3.58
<b>IPE 100</b>	8.1	171.0	34.20	39.41	4.07	5.08
<b>IPE 120</b>	10.4	317.8	52.96	60.73	4.90	6.31
<b>IPE 140</b>	12.9	541.2	77.32	88.34	5.74	7.64
<b>IPE 160</b>	15.8	869.3	108.7	123.9	6.58	9.66
<b>IPE 180</b>	18.8	1317	146.3	166.4	7.42	11.25
<b>IPE 200</b>	22.4	1943	194.3	220.6	8.26	14.00



Denominación		Propiedades del perfil			
		eje débil z-z			
	G kg/m	$I_z$ mm <sup>4</sup> x10 <sup>4</sup>	$W_{el.z}$ mm <sup>3</sup> x10 <sup>3</sup>	$W_{pl.z} \blacktriangleright$ mm <sup>3</sup> x10 <sup>3</sup>	$i_z$ mm x10
<b>IPE 80</b>	6.0	8.49	3.69	5.82	1.05
<b>IPE 100</b>	8.1	15.92	5.79	9.15	1.24
<b>IPE 120</b>	10.4	27.67	8.65	13.58	1.45
<b>IPE 140</b>	12.9	44.92	12.31	19.25	1.65
<b>IPE 160</b>	15.8	68.31	16.66	26.10	1.84
<b>IPE 180</b>	18.8	100.9	22.16	34.60	2.05
<b>IPE 200</b>	22.4	142.4	28.47	44.61	2.24



<b>Denominación</b>		<b>Classification ENV 1993-1-1</b>					
	G kg/m	Pure bending y-y			Pure compression		
		S235	S355	S460	S235	S355	S460
<b>IPE 80</b>	6.0	1	1	-	1	1	-
<b>IPE 100</b>	8.1	1	1	-	1	1	-
<b>IPE 120</b>	10.4	1	1	-	1	1	-
<b>IPE 140</b>	12.9	1	1	-	1	1	-
<b>IPE 160</b>	15.8	1	1	-	1	1	-
<b>IPE 180</b>	18.8	1	1	-	1	2	-
<b>IPE 200</b>	22.4	1	1	-	1	2	-
<b>IPE 220</b>	26.2	1	1	-	1	2	-
<b>IPE 240</b>	30.7	1	1	-	1	2	-
<b>IPE 270</b>	36.1	1	1	-	2	3	-
<b>IPE 300</b>	42.2	1	1	-	2	4	-
<b>IPE 330</b>	49.1	1	1	-	2	4	-
<b>IPE 360</b>	57.1	1	1	-	2	4	-
<b>IPE 400</b>	66.3	1	1	-	3	4	-
<b>IPE 450</b>	77.6	1	1	1	3	4	4
<b>IPE 500</b>	90.7	1	1	1	3	4	4
<b>IPE 550</b>	106	1	1	1	4	4	4
<b>IPE 600</b>	122	1	1	1	4	4	4
<b>IPE 750</b>	147	1	1	2	4	4	4

# Apto 6.2. Resistencia secciones. DB SE-A p.29-33

6.2.3. Resistencia de las secciones a tracción. p. 30

6.2.4. Resistencia de las secciones a corte. p. 30

6.2.5. Resistencia de las secciones a compresión. p. 31

6.2.6. Resistencia de las secciones a flexión. p. 31

6.2.7. Resistencia de las secciones a torsión. p. 32

6.2.8. Interacción de esfuerzos. p. 32-33

- Flexión compuesta
- Flexión más cortante
- Flexión, axil y cortante
- Cortante y torsión
- Flexión y torsión

# Apto 6.3. Resistencia barras. DB SE-A p.33-51

6.3.2. Compresión

6.3.4.2. Flexocompresión

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## **Teoría de Estructuras y Construcciones Industriales**

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### **Entender un prontuario de perfiles**

