Simbologia

G	Peso do perfil em kg/m
h	Altura
B	Largura
t_w	Espessura da alma
t_f	Espessura do banzo
r	Raio de concordância
A	Área da secção transversal
h_i	Distância livre entre banzos
d	Altura da alma, com espessura constante
□	Diâmetro máximo dos parafusos
p_{min}	Distância mínima entre parafusos
p_{max}	Distância máxima entre parafusos
e_{min}	Distância mínima ao bordo
e_{max}	Distância máxima ao bordo
A_{net}	Área da secção transversal, com dedução das aberturas dos parafusos
A_L	Superficie de pintura em m^2/m
A_G	Superficie de pintura em m^2/ton
I	Momento de inércia
W_{el}	Módulo de flexão elástico
W_{pl}	Módulo de flexão plástico
i	Raio de giração
A_v	Área de corte
s_s	Largura de apoio rígido
I_t	Momento de inércia à torção
$I_{\square}$	Constante de empenamento (torção não uniforme)

Simbologia

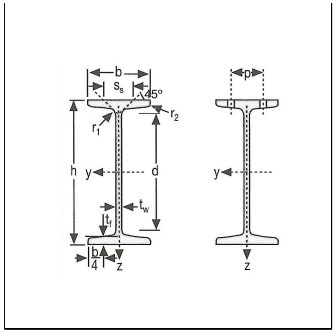
Classe 1 – Secções transversais com capacidade de atingir a sua resistência plástica sem risco de enfunamento local e com capacidade de rotação necessária para a formação de uma rótula plástica.

Classe 2 - Secções transversais com capacidade de atingir a sua resistência plástica sem risco de enfunamento local, mas com capacidade de rotação limitada.

Classe 3 - Secções transversais com capacidade de atingir a sua resistência elástica numa das fibras extremas, mas não a sua resistência plástica, com riscos de enfunamento localizado.

Classe 4 - Secções transversais sem capacidade de atingir a sua resistência elástica, com riscos de enfunamento localizado.

IPN



Norma Dimensional **DIN 1025-1 : 1963**

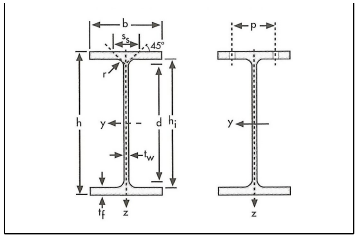
Norma Tolerâncias **EN 10024 : 1995**

Inclinação do Banzo **14%**

Perfil	Gkg/m	Dimensões						A	Dimensões de Construção				A_L	A_G	I_y	$W_{el,y}$	$W_{pl,y}$	i_y	A_{vz}	I_z	$W_{el,z}$	$W_{pl,z}$	i_z	s_s	I_t	$I_w x10^{-3}$	Classificação					
																											Flexão pura segundo yy			Compressão pura		
		h mm	b mm	t_w mm	t_f mm	r_1 mm	r_2 mm	cm^2	d mm	Ø	p_{min} mm	p_{max} mm	m^2/m	m^2/t	cm^4	cm^3	cm^3	cm	cm^2	cm^4	cm^3	cm^3	cm	mm	cm^4	cm^6	235	275	355	235	275	355
IPN 80	5.94	80	42	3.9	5.9	3.9	2.3	7.58	59	-	-	-	0.304	51.09	77.8	19.5	22.8	3.2	3.41	6.29	3	5	0.91	21.6	0.87	0.09	1	1	1	1	1	1
IPN 100	8.34	100	50	4.5	6.8	4.5	2.7	10.6	75.7	-	-	-	0.37	44.47	171	34.2	39.8	4.01	4.85	12.2	4.88	8.1	1.07	25	1.6	0.27	1	1	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	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	1	1
IPN 140	14.3	140	66	5.7	8.6	5.7	3.4	18.3	109.1	-	-	-	0.502	34.94	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	1	1
IPN 160	17.9	160	74	6.3	9.5	6.3	3.8	22.8	125.8	-	-	-	0.575	32.13	935	117	136	6.4	10.83	54.7	14.8	24.9	1.55	35.2	6.57	3.14	1	1	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	1450	161	187	7.2	13.35	81.3	19.8	33.2	1.71	38.6	9.58	5.92	1	1	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	2140	214	250	8.0	16.03	117	26.0	43.5	1.87	42.0	13.5	10.5	1	1	1	1	1	1
IPN 220	31.1	220	98	8.1	12.2	8.1	4.9	39.5	175.8	M10	50	56	0.775	24.99	3060	278	324	8.8	19.06	162	33.1	55.7	2.02	45.4	18.6	17.8	1	1	1	1	1	1
IPN 240	36.2	240	106	8.7	13.1	8.7	5.2	46.1	192.5	M10	54	60	0.844	23.32	4250	354	412	9.59	22.33	221	41.7	70.0	2.20	48.9	25.0	28.7	1	1	1	1	1	1
IPN 260	41.9	260	113	9.4	14.1	9.4	5.6	53.3	208.9	M12	62	62	0.906	21.65	5740	442	514	10.4	26.08	288	51.0	85.9	2.32	52.6	33.5	44.1	1	1	1	1	1	1
IPN 280	47.9	280	119	10.1	15.2	10.1	6.1	61	225.1	M12	68	68	0.97	20.17	7590	542	632	11.1	30.18	364	61.2	103	2.45	56.4	44	64.6	1	1	1	1	1	1
IPN 300	54.2	300	125	10.8	16.2	10.8	6.5	69.0	241.6	M12	70	74	1.03	19.02	9800	653	762	11.9	34.58	451	72.2	121	2.56	60.1	56.8	91.8	1	1	1	1	1	1
IPN 320	61.0	320	131	11.5	17.3	11.5	6.9	77.7	257.9	M12	70	80	1.09	17.87	12510	782	914	12.7	39.26	555	84.7	143	2.67	63.9	72.5	129	1	1	1	1	1	1
IPN 340	68.0	340	137	12.2	18.3	12.2	7.3	86.7	274.3	M12	78	86	1.15	16.90	15700	923	1080	13.5	44.27	674	98.4	166	2.80	67.6	90.4	176	1	1	1	1	1	1
IPN 360	76.1	360	143	13	19.5	13	7.8	97.0	290.2	M12	78	92	1.21	15.89	19610	1090	1276	14.2	49.95	818	114.0	194	2.90	71.8	115	240	1	1	1	1	1	1
IPN 380	84.0	380	149	13.7	20.5	13.7	8.2	107	306.7	M16	84	86	1.27	15.12	24010	1260	1482	15.0	55.55	975	131.0	221	3.02	75.4	141	319	1	1	1	1	1	1
IPN 400	92.4	400	155	14.4	21.6	14.4	8.6	118	322.9	M16	86	92	1.33	14.36	29210	1460	1714	15.7	61.69	1160	149	253	3.13	79.3	170	420	1	1	1	1	1	1
IPN 450	115	450	170	16.2	24.3	16.2	9.7	147	363.6	M16	92	106	1.48	12.83	45850	2040	2400	17.7	77.79	1730	203	345	3.43	88.9	267	791	1	1	1	1	1	1
IPN 500	141	500	185	18	27	18	10.8	179	404.3	M20	102	110	1.63	11.60	68740	2750	3240	19.6	95.6	2480	268	456	3.72	98.5	402	1400	1	1	1	1	1	1
IPN 550	166	550	200	19	30	19	11.9	212	445.6	M22	112	118	1.80	10.80	99180	3610	4240	21.6	111.30	3490	349	592	4.02	107.3	544	2390	1	1	1	1	1	1
IPN 600	199	600	215	21.6	32.4	21.6	13.0	253	485						139000	4630		23.4			434		4.3	112.0			1	1	1	1	1	1

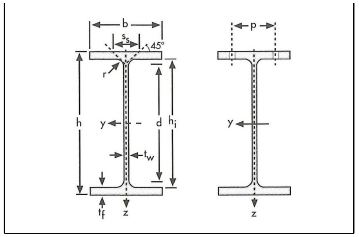
IPEA

IPE A 100 – 600



Perfil	Gkg/m	Dimensões						A	Dimensões de Construção				A_L	A_G	I_y	$W_{el.y}$	$W_{pl.y}$	i_y	A_{vz}	I_z	$W_{el.z}$	$W_{pl.z}$	i_z	s_s	I_t	$I_w x10^{-3}$	Classificação					
		h	b	t_w	t_f	r_1	r_2	cm^2	h_i	d	Ø	p_{min}	m^2/m	m^2/t	cm^4	cm^3	cm^3	cm	cm^2	cm^4	cm^3	cm^3	cm	mm	cm^4	cm^6	Flexão pura Segundo yy			Compressão Pura		
		mm	mm	mm	mm	mm	mm		mm	mm		mm															235	275	355	235	275	355
IPE A 80	5.0	78	46	3.3	4.2	5	6.38	69.9	59.6	-	-	-	0.325	64.9	64.38	16.51	18.98	3.18	3.07	6.85	2.98	4.69	1.04	17.6	0.42	0.09	1	1	1	1	1	1
IPE A 100	6.9	98	55	3.6	4.7	7	8.78	88.6	74.6	-	-	-	0.397	57.57	141.2	28.81	32.98	4.01	4.44	13.12	4.77	7.54	1.22	21.20	0.77	0.28	1	1	1	1	1	1
IPE A 120	8.7	117.6	64	3.8	5.1	7	11.03	107.4	93.4	-	-	-	0.472	54.47	257.4	43.77	49.87	4.83	5.41	22.39	7.00	10.98	1.42	22.20	1.04	0.71	1	1	1	1	1	1
IPE A 140	10.5	137.4	73	3.8	5.6	7	13.39	126.2	112.2	-	-	-	0.547	52.05	434.9	63.30	71.60	5.70	6.21	36.42	9.98	15.52	1.65	23.20	1.36	1.58	1	1	1	1	1	2
IPE A 160	12.7	157	82	4.0	5.9	9	16.18	145.2	127.2	-	-	-	0.619	48.70	689.3	87.81	99.09	6.53	7.80	54.43	13.27	20.70	1.83	26.34	1.96	3.09	1	1	1	1	2	3
IPE A 180	15.4	177	91	4.3	6.5	9	19.58	164.0	146.0	M10	48	48	0.694	45.15	1063	120.1	135.3	7.37	9.20	81.89	18.00	27.96	2.05	27.84	2.70	5.93	1	1	1	2	2	3
IPE A 200	18.4	197	100	4.5	7.0	12	23.47	183.0	159.0	M10	54	58	0.764	41.49	1591	161.6	181.7	8.23	11.47	117.2	23.43	36.54	2.23	32.56	4.11	10.53	1	1	1	2	3	4
IPE A 220	22.2	217	110	5.0	7.7	12	28.26	201.6	177.6	M12	60	62	0.843	38.02	2317	213.5	240.2	9.05	13.55	171.4	31.17	48.49	2.46	34.46	5.69	18.71	1	1	1	2	3	4
IPE A 240	26.2	237	120	5.2	8.3	15	33.31	220.4	190.4	M12	64	68	0.918	35.10	3290	277.7	311.6	9.94	16.31	240.1	40.02	62.40	2.68	39.37	8.35	31.26	1	1	1	2	3	4
IPE A 270	30.7	267	135	5.5	8.7	15	39.15	249.6	219.6	M16	70	72	1.037	33.75	4917	368.3	412.5	11.21	18.75	358.0	53.03	82.34	3.02	40.47	10.30	59.51	1	1	1	3	4	4
IPE A 300	36.5	297	150	6.1	9.2	15	46.53	278.6	248.6	M16	72	86	1.156	31.65	7173	483.1	541.8	12.42	22.25	519.0	69.20	107.3	3.34	42.07	13.43	107.2	1	1	1	3	4	4
IPE A 330	43.0	327	160	6.5	10.0	18	54.74	307.0	271.0	M16	78	96	1.250	29.09	10230	625.7	701.9	13.67	26.99	685.2	85.64	133.3	3.54	47.59	19.57	171.5	1	1	1	3	4	4
IPE A 360	50.2	357.6	170	6.6	11.5	18	63.96	334.6	298.6	M22	86	88	1.351	26.91	14520	811.8	906.8	15.06	29.76	944.3	111.1	171.9	3.84	50.69	26.51	282.0	1	1	1	4	4	4
IPE A 400	57.4	397	180	7.0	12.0	21	73.10	373.0	331.0	M22	94	98	1.464	25.51	20290	1022	1144	16.66	35.78	1171	130.1	202.1	4.00	55.60	34.79	432.2	1	1	1	4	4	4
IPE A 450	67.2	447	190	7.6	13.1	21	85.55	420.8	378.8	M24	100	102	1.603	23.87	29760	1331	1494	18.65	42.26	1502	158.1	245.7	4.19	58.40	45.67	704.9	1	1	1	4	4	4
IPE A 500	79.4	497	200	8.4	14.5	21	101.1	468.0	426.0	M24	100	112	1.741	21.94	42930	1728	1946	20.61	50.41	1939	193.9	301.6	4.38	62.00	62.78	1125	1	1	1	4	4	4
IPE A 550	92.1	547	210	9.0	15.7	24	117.3	515.6	467.6	M24	106	122	1.875	20.36	59980	2193	2475	22.61	60.30	2432	231.6	361.5	4.55	68.52	86.53	1710	1	1	1	4	4	4
IPE A 600	108	597	220	9.8	17.5	24	137.0	562.0	514.0	M27	114	118	2.013	18.72	82920	2778	3141	24.60	70.14	3116	283.3	442.1	4.77	72.92	118.8	2607	1	1	1	4	4	4

IPE



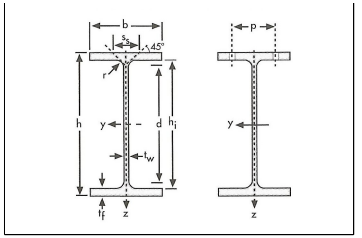
Norma Dimensional **EURONORMA 19-57**

Norma Tolerâncias **NP EN 10034 : 1998**

Perfil	Gkg/m	Dimensões					A	Dimensões de Construção					A_L	A_G	I_y	$W_{el,y}$	$W_{pl,y}$	i_y	A_{vz}	I_z	$W_{el,z}$	$W_{pl,z}$	i_z	s_s	I_t	$I_w x10^{-3}$	Classificação					
																											Flexão pura Segundo yy			Compressão Pura		
		h mm	b mm	t_w mm	t_f mm	r mm	cm^2	h_i mm	d mm	Ø	p_{min} mm	p_{max} mm	m^2/m	m^2/t	cm^4	cm^3	cm^3	cm	cm^2	cm^4	cm^3	cm^3	cm	mm	cm^4	cm^6	235	275	355	235	275	355
IPE 80	6.0	80	46	3.8	5.2	5	7.64	69.6	59.6	-	-	-	0.328	54.69	80.1	20.0	23.22	3.24	3.57	8.49	3.69	5.82	1.05	20.06	0.698	0.12	1	1	1	1	1	1
IPE 100	8.1	100	55	4.1	5.7	7	10.32	88.6	74.6	-	-	-	0.400	49.33	171.0	34.2	39.41	4.07	5.08	15.92	5.79	9.15	1.24	23.70	1.20	0.35	1	1	1	1	1	1
IPE 120	10.4	120	64	4.4	6.3	7	13.21	107.4	93.4	-	-	-	0.475	45.82	317.8	53.0	60.73	4.90	6.31	27.67	8.65	13.58	1.45	25.20	1.74	0.89	1	1	1	1	1	1
IPE 140	12.9	140	73	4.7	6.9	7	16.43	126.2	112.2	-	-	-	0.551	42.70	541.2	77.3	88.34	5.74	7.64	44.92	12.31	19.25	1.65	26.70	2.45	1.98	1	1	1	1	1	1
IPE 160	15.8	160	82	5.0	7.4	9	20.09	145.2	127.2	-	-	-	0.623	39.47	869.3	108.7	123.90	6.58	9.66	68.31	16.66	26.10	1.84	30.34	3.60	3.96	1	1	1	1	1	1
IPE 180	18.8	180	91	5.3	8.0	9	23.95	164.0	146.0	M10	48	48	0.698	37.13	1,317.0	146.3	166.40	7.42	11.25	100.90	22.16	34.60	2.05	31.84	4.79	7.43	1	1	1	1	1	2
IPE 200	22.4	200	100	5.6	8.5	12	28.48	183.0	159.0	M10	54	58	0.768	34.36	1,943.0	194.3	220.60	8.26	14.00	142.40	28.47	44.61	2.24	36.66	6.98	12.99	1	1	1	1	1	2
IPE 220	26.2	220	110	5.9	9.2	12	33.37	201.6	177.6	M12	60	62	0.848	32.36	2,772.0	252.0	285.40	9.11	15.88	204.90	37.25	58.11	2.48	38.36	9.07	22.67	1	1	1	1	1	2
IPE 240	30.7	240	120	6.2	9.8	15	39.12	220.4	190.4	M12	66	68	0.922	30.02	3,892.0	324.3	366.60	9.97	19.14	283.60	47.27	73.92	2.69	43.37	12.88	37.39	1	1	1	1	2	2
IPE 270	36.1	270	135	6.6	10.2	15	45.95	249.6	219.6	M16	72	72	1.041	28.86	5,790.0	428.9	484.00	11.23	22.14	419.90	62.20	96.95	3.02	44.57	15.94	70.58	1	1	1	2	2	3
IPE 300	42.2	300	150	7.1	10.7	15	53.81	278.6	248.6	M16	72	86	1.160	27.46	8,356.0	557.1	628.40	12.46	25.68	603.80	80.50	125.20	3.35	46.07	20.12	125.90	1	1	1	2	3	4
IPE 330	49.1	330	160	7.5	11.5	18	62.61	307.0	271.0	M16	78	96	1.254	25.52	11,770.0	713.1	804.30	13.71	30.81	788.10	98.52	153.70	3.55	51.59	28.15	199.10	1	1	1	2	3	4
IPE 360	57.1	360	170	8.0	12.7	18	72.73	334.6	298.6	M22	88	88	1.353	23.70	16,270.0	903.6	1,019.00	14.95	35.14	1,043.00	122.8	191.1	3.79	54.49	37.32	313.6	1	1	1	2	3	4
IPE 400	66.3	400	180	8.6	13.5	21	84.46	373.0	331.0	M22	96	98	1.467	22.12	23,130.0	1,156.0	1,307.00	16.55	42.69	1,318.00	146.4	229.0	3.95	60.20	51.08	490.0	1	1	1	3	3	4
IPE 450	77.6	450	190	9.4	14.6	21	98.82	420.8	378.8	M24	100	102	1.605	20.69	33,740.0	1,500.0	1,702.00	18.48	50.85	1,676.00	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	16.0	21	115.50	468.0	426.0	M24	102	112	1.744	19.23	48,200.0	1,928.0	2,194.00	20.43	59.87	2,142.00	214.2	335.9	4.31	66.80	89.29	1249	1	1	1	3	4	4
IPE 550	106.0	550	210	11.1	17.2	24	134.40	515.6	467.6	M24	110	122	1.877	17.78	67,120.0	2,441.0	2,787.00	22.35	72.34	2,668.00	254.1	400.5	4.45	73.62	123.2	1884	1	1	1	4	4	4
IPE 600	122.0	600	220	12.0	19.0	24	156.00	562.0	514.0	M27	116	118	2.015	16.45	92,080.0	3,069.0	3,512.00	24.30	83.78	3,387.00	307.9	485.6	4.66	78.12	165.4	2846	1	1	1	4	4	4

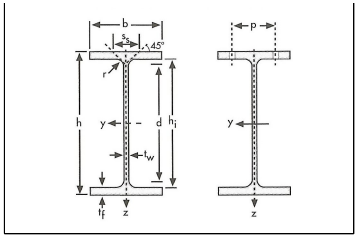
HEAA

HEAA 100 - 1000



Perfil	Gkg/m	Dimensões					A	Dimensões de Construção					A_L	A_G	I_y	$W_{el,y}$	$W_{pl,y}$	i_y	A_{vz}	I_z	$W_{el,z}$	$W_{pl,z}$	i_z	s_s	I_t	I_wx10^{-3}	Classificação					
																											Flexão pura Segundo yy			Compressão Pura		
		h	b	t_w	t_f	r	cm^2	h_i	d	Ø	p_{min}	p_{max}	m^2/m	m^2/t	cm^4	cm^3	cm^3	cm	cm^2	cm^4	cm^3	cm^3	cm	mm	cm^4	cm^6	235	275	355	235	275	355
HE 100 AA	12.2	91	100	4.2	5.5	12	15.60	80	56	M10	54	58	0.553	45.170	236.5	51.98	58.36	3.89	6.15	92.06	18.41	28.44	2.43	29.26	2.51	1.68	1	1	1	1	1	3
HE 120 AA	14.6	109	120	4.2	5.5	12	18.55	98	74	M12	58	68	0.669	45.940	413.4	75.85	84.12	4.72	6.90	158.8	26.47	40.62	2.93	29.26	2.78	4.24	1	2	3	1	2	3
HE 140 AA	18.1	128	140	4.3	6.0	12	23.02	116	92	M16	64	76	0.787	43.530	719.5	112.4	123.8	5.59	7.92	274.8	39.26	59.93	3.45	30.36	3.54	10.21	2	3	3	2	3	3
HE 160 AA	23.8	148	160	4.5	7.0	15	30.36	134	104	M20	76	84	0.901	37.810	1283.0	173.4	190.4	6.50	10.38	478.7	59.84	91.36	3.97	36.07	6.33	23.75	1	2	3	1	2	3
HE 180 AA	28.7	167	180	5.0	7.5	15	36.53	152	122	M24	84	92	1.018	35.510	1967.0	235.6	258.2	7.34	12.16	730.0	81.1	123.6	4.47	37.57	8.33	46.36	2	3	3	2	3	3
HE 200 AA	34.6	186	200	5.5	8.0	18	44.13	170	134	M27	96	100	1.130	32.620	2944.0	316.6	347.1	8.17	15.45	1068.0	106.8	163.2	4.92	42.59	12.69	84.49	2	3	3	2	3	4
HE 220 AA	40.4	205	220	6.0	8.5	18	51.46	188	152	M27	98	118	1.247	30.870	4170.0	406.9	445.5	9.00	17.63	1510.0	137.3	209.3	5.42	44.09	15.93	145.6	3	3	3	3	3	4
HE 240 AA	47.4	224	240	6.5	9.0	21	60.38	206	164	M27	104	138	1.359	28.670	5835.0	521.0	570.6	9.83	21.54	2077	173.1	264.4	5.87	49.10	22.98	239.6	3	3	3	3	3	4
HE 260 AA	54.1	244	260	6.5	9.5	24	68.97	225	177	M27	110	158	1.474	27.220	7981.0	654.1	714.5	10.76	24.75	2788	214.5	327.7	6.36	53.62	30.31	382.6	3	3	3	3	3	4
HE 280 AA	61.2	264	280	7.0	10.0	24	78.02	244	196	M27	110	178	1.593	26.010	10560.0	799.8	873.1	11.63	27.52	3664	261.7	399.4	6.85	55.12	36.22	590.1	3	3	3	3	3	4
HE 300 AA	69.8	283	300	7.5	10.5	27	88.91	262	208	M27	116	198	1.705	24.420	13800.0	976	1065	12.46	32.37	4734	315.6	482.3	7.30	60.13	49.35	877.2	3	3	4	3	3	4
HE 320 AA	74	301	300	8.0	11.0	27	94.58	279	225	M27	118	198	1.740	23.430	16450.0	1093	1196	13.19	35.40	4959	330.6	505.7	7.24	61.63	55.87	1041	3	3	3	3	3	4
HE 340 AA	78.9	320	300	8.5	11.5	27	100.50	297	243	M27	118	198	1.777	22.520	19550.0	1222	1341	13.95	38.69	5185	345.6	529.3	7.18	63.13	63.07	1231	3	3	3	3	3	4
HE 360 AA	84	339	300	9.0	12.0	27	106.60	315	261	M27	118	198	1.814	21.670	23040.0	1359	1495	14.70	42.17	5410	360.7	553.0	7.12	64.63	70.99	1444	2	3	3	2	3	4
HE 400 AA	92	378	300	9.5	13.0	27	117.70	352	298	M27	118	198	1.891	20.460	31250.0	1654	1824	16.30	47.95	5861	390.8	599.7	7.06	67.13	84.69	1948	2	2	3	2	2	3
HE 450 AA	100	425	300	10.0	13.5	27	127.10	398	344	M27	120	198	1.984	19.890	41890.0	1971	2183	18.16	54.70	6088	405.8	624.4	6.92	68.63	95.61	2572	1	2	3	2	2	4
HE 500 AA	107	472	300	10.5	14.0	27	136.90	444	390	M27	120	198	2.077	19.330	54640.0	2315	2576	19.98	61.91	6314	420.9	649.3	6.79	70.13	107.70	3304	1	2	3	2	3	4
HE 550 AA	120	522	300	11.5	15.0	27	152.80	492	438	M27	122	198	2.175	18.130	72870.0	2792	3128	21.84	72.66	6767	451.1	698.6	6.65	73.13	133.70	4338	1	1	2	3	3	4
HE 600 AA	129	571	300	12.0	15.5	27	164.10	540	486	M27	122	198	2.272	17.640	91900.0	3218	3623	23.66	81.29	6993	466.2	724.5	6.53	74.63	149.80	5381	1	1	2	3	4	4
HE 650 AA	138	620	300	12.5	16.0	27	175.80	588	534	M27	122	198	2.369	17.170	113900.0	3676	4160	25.46	90.40	7221	481.4	750.7	6.41	76.13	167.50	6567	1	1	2	4	4	4
HE 700 AA	150	670	300	13.0	17.0	27	190.90	636	582	M27	122	198	2.468	16.460	142700.0	4260	4840	27.34	100.30	7673	511.5	799.7	6.34	78.63	195.20	8155	1	1	1	4	4	4
HE 800 AA	172	770	300	14.0	18.0	30	218.50	734	674	M27	130	198	2.660	15.510	208900.0	5426	6225	30.92	123.80	8134	542.2	856.6	6.10	85.15	256.80	11450	1	1	1	4	4	4
HE 900 AA	198	870	300	15.0	20.0	30	252.20	830	770	M27	130	198	2.858	14.440	301100.0	6923	7999	34.55	147.20	9041	602.8	957.7	5.99	90.15	334.90	16260	1	1	1	4	4	4
HE 1000 AA	222	970	300	16.0	21.0	30	282.20	928	868	M27	132	198	3.056	13.800	406500.0	8380	9777	37.95	172.20	9501	633.4	1016.0	5.80	93.15	403.40	21280	1	1	1	4	4	4

HEA

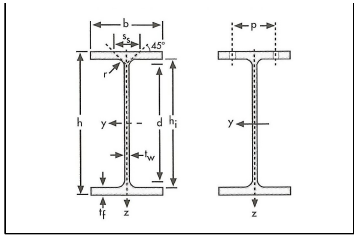


Norma Dimensional **EURONORMA 53-62**

Norma Tolerâncias **NP EN 10034 : 1998**

Perfil	Gkg/m	Dimensões					A	Dimensões de Construção					A_L	A_G	I_y	$W_{el.y}$	$W_{pl.y}$	i_y	A_{vz}	I_z	$W_{el.z}$	$W_{pl.z}$	i_z	s_s	I_t	I_wx10^{-3}	Classificação					
																											Flexão pura Segundo yy			Compressão Pura		
		h	b	t_w	t_f	r	cm^2	h_i	d	Ø	p_{min}	p_{max}	m^2/m	m^2/t	cm^4	cm^3	cm^3	cm	cm^2	cm^4	cm^3	cm^3	cm	mm	cm^4	cm^6	235	275	355	235	275	355
		mm	mm	mm	mm	mm		mm	mm		mm	mm																				
HE 100 A	16.7	96	100	5.0	8.0	12	21.24	80	56	M10	54	58	0.561	33.680	349.2	72.76	83.01	4.06	7.56	133.8	26.76	41.14	2.51	35.06	5.24	2.58	1	1	1	1	1	1
HE 120 A	19.9	114	120	5.0	8.0	12	25.34	98	74	M12	58	68	0.677	34.060	606.2	106.3	119.5	4.89	8.46	230.9	38.48	58.85	3.02	35.06	5.99	6.47	1	1	1	1	1	1
HE 140 A	24.7	133	140	5.5	8.5	12	31.42	116	92	M16	64	76	0.794	32.210	1033.0	155.4	173.5	5.73	10.12	389.3	55.62	84.85	3.52	36.56	8.13	15.06	1	1	1	1	1	1
HE 160 A	30.4	152	160	6.0	9.0	15	38.77	134	104	M20	78	84	0.906	29.780	1673.0	220.1	245.1	6.57	13.21	615.6	76.95	117.6	3.98	41.57	12.19	31.41	1	1	1	1	1	1
HE 180 A	35.5	171	180	6.0	9.5	15	45.25	152	122	M24	86	92	1.024	28.830	2510.0	293.6	324.9	7.45	14.47	924.6	102.7	156.5	4.52	42.57	14.80	60.21	1	1	2	1	1	2
HE 200 A	42.3	190	200	6.5	10.0	18	53.83	170	134	M27	98	100	1.136	26.890	3692.0	388.6	429.5	8.28	18.08	1336.0	133.6	203.8	4.98	47.59	20.98	108.0	1	1	2	1	1	2
HE 220 A	50.5	210	220	7.0	11.0	18	64.34	188	152	M27	98	118	1.255	24.850	5410.0	515.2	568.5	9.17	20.67	1955	177.7	270.6	5.51	50.09	28.46	193.3	1	1	2	1	1	2
HE 240 A	60.3	230	240	7.5	12.0	21	76.84	206	164	M27	104	138	1.369	22.700	7763.0	675.1	744.6	10.05	25.18	2769	230.7	351.7	6.00	56.10	41.55	328.5	1	1	2	1	1	2
HE 260 A	68.2	250	260	7.5	12.5	24	86.82	225	177	M27	110	158	1.484	21.770	10450.0	836.4	919.8	10.97	28.76	3668	282.1	430.2	6.50	60.62	52.37	516.4	1	1	3	1	1	3
HE 280 A	76.4	270	280	8.0	13.0	24	97.26	244	196	M27	112	178	1.603	20.990	13670.0	1013.0	1112	11.86	31.74	4763	340.2	518.1	7.00	62.12	62.10	785.4	1	2	3	1	2	3
HE 300 A	88	290	300	8.5	14.0	27	112.50	262	208	M27	118	198	1.717	19.430	18260.0	1260	1383	12.74	37.28	6310	420.6	641.2	7.49	68.13	85.17	1200	1	2	3	1	2	3
HE 320 A	97.6	310	300	9.0	15.5	27	124.40	279	225	M27	118	198	1.756	17.980	22930.0	1479.0	1628	13.58	41.13	6985	465.7	709.7	7.49	71.63	108.00	1512	1	1	2	1	1	2
HE 340 A	105.0	330	300	9.5	16.5	27	133.50	297	243	M27	118	198	1.795	17.130	27690.0	1678	1850	14.40	44.95	7436	495.7	755.9	7.46	74.13	127.20	1824	1	1	1	1	1	1
HE 360 A	112.0	350	300	10.0	17.5	27	142.80	315	261	M27	120	198	1.834	16.360	33090.0	1891	2088	15.22	48.96	7887	525.8	802.3	7.43	76.63	148.80	2177	1	1	1	1	1	1
HE 400 A	125	390	300	11.0	19.0	27	159.00	352	298	M27	120	198	1.912	15.320	45070.0	2311	2562	16.84	57.33	8564	570.9	872.9	7.34	80.63	189.00	2942	1	1	1	1	1	2
HE 450 A	140.0	440	300	11.5	21.0	27	178.00	398	344	M27	122	198	2.011	14.390	63720.0	2896	3216	18.92	65.78	9465	631.0	965.5	7.29	85.13	243.80	4148	1	1	1	1	1	2
HE 500 A	155	490	300	12.0	23.0	27	197.50	444	390	M27	122	198	2.110	13.600	86970.0	3550	3949	20.98	74.72	10370	691.1	1059.0	7.24	89.63	309.30	5643	1	1	1	1	2	3
HE 550 A	166	540	300	12.5	24.0	27	211.80	492	438	M27	122	198	2.209	13.290	111900.0	4146	4622	22.99	83.72	10820	721.3	1107.0	7.15	92.13	351.50	7189	1	1	1	2	3	4
HE 600 A	178	590	300	13.0	25.0	27	226.50	540	486	M27	122	198	2.308	12.980	141200.0	4787	5350	24.97	93.21	11270	751.4	1156.0	7.05	94.63	397.80	8978	1	1	1	2	3	4
HE 650 A	190	640	300	13.5	26.0	27	241.60	588	534	M27	124	198	2.407	12.690	175200.0	5474	6136	26.93	103.20	11720	781.6	1205.0	6.97	97.13	448.30	11030	1	1	1	3	4	4
HE 700 A	204	690	300	14.5	27.0	27	260.50	636	582	M27	124	198	2.505	12.250	215300.0	6241	7032	28.75	117.00	12180	811.9	1257.0	6.84	100.10	513.90	13350	1	1	1	3	4	4
HE 800 A	224	790	300	15.0	28.0	30	285.80	734	674	M27	130	198	2.698	12.030	303400.0	7682	8699	32.58	138.80	12640	842.6	1312.0	6.65	106.10	596.90	18290	1	1	1	4	4	4
HE 900 A	252	890	300	16.0	30.0	30	320.50	830	770	M27	132	198	2.896	11.510	422100.0	9485	10810	36.29	163.30	13550	903.2	1414.0	6.50	111.10	736.80	24960	1	1	1	4	4	4
HE 1000 A	272	990	300	16.5	31.0	30	346.80	928	868	M27	132	198	3.095	11.370	553800.0	11190	12820	39.96	184.60	14000	933.6	1470.0	6.35	113.60	822.40	32070	1	1	1	4	4	4

HEB

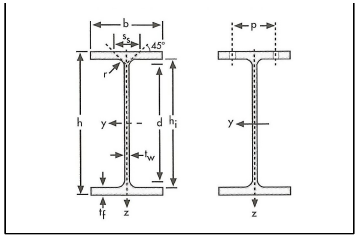


Norma Dimensional **EURONORMA 53-62**

Norma Tolerâncias **NP EN 10034 : 1998**

Perfil	Gkg/m	Dimensões					A	Dimensões de Construção					A_L	A_G	I_y	$W_{el.y}$	$W_{pl.y}$	i_y	A_{vz}	I_z	$W_{el.z}$	$W_{pl.z}$	i_z	s_s	I_t	I_wx10^{-3}	Classificação					
																											Flexão pura Segundo yy			Compressão Pura		
		h	b	t_w	t_f	r	cm^2	h_i	d	Ø	p_{min}	p_{max}	m^2/m	m^2/t	cm^4	cm^3	cm^3	cm	cm^2	cm^4	cm^3	cm^3	cm	mm	cm^4	cm^6	235	275	355	235	275	355
HE 100 B	20.4	100	100	6.0	10.0	12	26.04	80	56	M10	56	58	0.567	27.760	449.5	89.91	104.20	4.16	9.04	167.3	33.45	51.42	2.53	40.06	9.25	3.38	1	1	1	1	1	1
HE 120 B	26.7	120	120	6.5	11.0	12	34.01	98	74	M12	60	68	0.686	25.710	864.4	144.1	165.2	5.04	10.96	317.5	52.92	80.97	3.06	42.56	13.84	9.41	1	1	1	1	1	1
HE 140 B	33.7	140	140	7.0	12.0	12	42.96	116	92	M16	66	76	0.805	23.880	1509.0	215.6	245.4	5.93	13.08	549.7	78.52	119.80	3.58	45.06	20.06	22.48	1	1	1	1	1	1
HE 160 B	42.6	160	160	8.0	13.0	15	54.25	134	104	M20	80	84	0.918	21.560	2492.0	311.5	354.0	6.78	17.59	889.2	111.20	170.0	4.05	51.57	31.24	47.94	1	1	1	1	1	1
HE 180 B	51.2	180	180	8.5	14.0	15	65.25	152	122	M24	88	92	1.037	20.250	3831.0	425.7	481.4	7.66	20.24	1363.0	151.4	231.0	4.57	54.07	42.16	93.75	1	1	1	1	1	1
HE 200 B	61.3	200	200	9.0	15.0	18	78.08	170	134	M27	100	100	1.151	18.780	5696.0	569.6	642.5	8.54	24.83	2003.0	200.3	305.8	5.07	60.09	59.28	171.1	1	1	1	1	1	1
HE 220 B	71.5	220	220	9.5	16.0	18	91.04	188	152	M27	100	118	1.270	17.770	8091.0	735.5	827.0	9.43	27.92	2843	258.5	393.9	5.59	62.59	76.57	295.4	1	1	1	1	1	1
HE 240 B	83.2	240	240	10.0	17.0	21	106.00	206	164	M27	108	138	1.384	16.630	11260.0	938.3	1053.0	10.31	33.23	3923	326.9	498.4	6.08	68.60	102.70	486.9	1	1	1	1	1	1
HE 260 B	93.0	260	260	10.0	17.5	24	118.40	225	177	M27	114	158	1.499	16.120	14920.0	1148.0	1283.0	11.22	37.59	5135	395.0	602.2	6.58	73.12	123.80	753.7	1	1	1	1	1	1
HE 280 B	103.0	280	280	10.5	18.0	24	131.40	244	196	M27	114	178	1.618	15.690	19270.0	1376.0	1534	12.11	41.09	6595	471.0	717.6	7.09	74.62	143.70	1130.0	1	1	1	1	1	1
HE 300 B	117	300	300	11.0	19.0	27	149.10	262	208	M27	120	198	1.732	14.800	25170.0	1678	1869	12.99	47.43	8563	570.9	870.1	7.58	80.63	185.00	1688	1	1	1	1	1	1
HE 320 B	127.0	320	300	11.5	20.5	27	161.30	279	225	M27	122	198	1.771	13.980	30820.0	1926.0	2149	13.82	51.77	9239	615.9	939.1	7.57	84.13	225.10	2069	1	1	1	1	1	1
HE 340 B	134.0	340	300	12.0	21.5	27	170.90	297	243	M27	122	198	1.810	13.490	36660.0	2156	2408	14.65	56.09	9690	646.0	985.7	7.53	86.63	257.20	2454	1	1	1	1	1	1
HE 360 B	142.0	360	300	12.5	22.5	27	180.60	315	261	M27	122	198	1.849	13.040	43190.0	2400	2683	15.46	60.60	10140	676.1	1032.0	7.49	89.13	292.50	2883	1	1	1	1	1	1
HE 400 B	155	400	300	13.5	24.0	27	197.80	352	298	M27	124	198	1.927	12.410	57680.0	2884	3232	17.08	69.98	10820	721.3	1104.0	7.40	93.13	355.70	3817	1	1	1	1	1	1
HE 450 B	171.0	450	300	14.0	26.0	27	218.00	398	344	M27	124	198	2.026	11.840	79890.0	3551	3982	19.14	79.66	11720	781.4	1198.0	7.33	97.63	440.50	5258	1	1	1	1	1	1
HE 500 B	187	500	300	14.5	28.0	27	238.60	444	390	M27	124	198	2.125	11.340	107200.0	4287	4815	21.19	89.82	12620	841.6	1292.0	7.27	102.10	538.40	7018	1	1	1	1	1	2
HE 550 B	199	550	300	15.0	29.0	27	254.10	492	438	M27	124	198	2.224	11.150	136700.0	4971	5591	23.20	100.10	13080	871.8	1341.0	7.17	104.60	600.30	8856	1	1	1	1	1	2
HE 600 B	212	600	300	15.5	30.0	27	270.00	540	486	M27	126	198	2.323	10.960	171000.0	5701	6425	25.17	110.80	13530	902.0	1391.0	7.08	107.10	667.20	10970	1	1	1	1	2	3
HE 650 B	225	650	300	16.0	31.0	27	286.30	588	534	M27	126	198	2.422	10.770	210600.0	6480	7320	27.12	122.00	13980	932.3	1441.0	6.99	109.60	739.20	13360	1	1	1	2	2	3
HE 700 B	241	700	300	17.0	32.0	27	306.40	636	582	M27	126	198	2.520	10.480	256900.0	7340	8327	28.96	137.10	14440	962.7	1495.0	6.87	112.60	830.90	16060	1	1	1	2	2	4
HE 800 B	262	800	300	17.5	33.0	30	334.20	734	674	M27	134	198	2.713	10.340	359100.0	8977	10230	32.78	161.80	14900	993.6	1553.0	6.68	118.60	946.00	21840	1	1	1	3	3	4
HE 900 B	291	900	300	18.5	35.0	30	371.30	830	770	M27	134	198	2.911	9.990	494100.0	10980	12580	36.48	188.80	15820	1054.0	1658.0	6.53	123.60	1137.00	29460	1	1	1	3	4	4
HE 1000 B	314	1000	300	19.0	36.0	30	400.00	928	868	M27	134	198	3.110	9.905	644700.0	12890	14860	40.15	212.50	16280	1085.0	1716.0	6.38	126.10	1254.00	37640	1	1	1	4	4	4

HEM

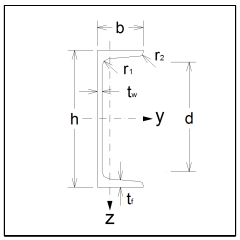


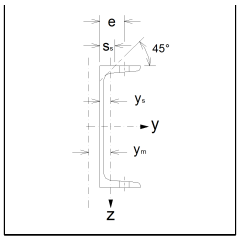
Norma Dimensional **EURONORMA 53-62**

Norma Tolerâncias **NP EN 10034 : 1998**

Perfil	Gkg/m	Dimensões					A	Dimensões de Construção					A_L	A_G	I_y	$W_{el.y}$	$W_{pl.y}$	i_y	A_{vz}	I_z	$W_{el.z}$	$W_{pl.z}$	i_z	s_s	I_t	$I_w x10^{-3}$	Classificação					
																											Flexão pura Segundo yy			Compressão Pura		
		h	b	t_w	t_f	r	cm^2	h_i	d	Ø	p_{min}	p_{max}	m^2/m	m^2/t	cm^4	cm^3	cm^3	cm	cm^2	cm^4	cm^3	cm^3	cm	mm	cm^4	cm^6	235	275	355	235	275	355
HE 100 M	41.8	120	106	12.0	20.0	12	53.24	80	56	M10	62	64	0.619	14.820	1143	190.4	235.80	4.63	18.04	399.2	75.31	116.30	2.74	66.06	68.21	9.93	1	1	1	1	1	1
HE 120 M	52.1	140	126	12.5	21.0	12	66.41	98	74	M12	66	74	0.738	14.160	2018	288.2	350.6	5.51	21.15	702.8	111.60	171.60	3.25	68.56	91.66	24.79	1	1	1	1	1	1
HE 140 M	63.2	160	146	13.0	22.0	12	80.56	116	92	M16	72	82	0.857	13.560	3291	411.4	493.8	6.39	24.46	1144.0	156.80	240.50	3.77	71.06	120.00	54.33	1	1	1	1	1	1
HE 160 M	76.2	180	166	14.0	23.0	15	97.05	134	104	M20	86	90	0.970	12.740	5098	566.5	674.6	7.25	30.81	1759.0	211.9	325.5	4.26	77.57	162.40	108.10	1	1	1	1	1	1
HE 180 M	88.9	200	186	14.5	24.0	15	113.30	152	122	M24	94	98	1.089	12.250	7483	748.3	883.4	8.13	34.65	2580	277.4	425.2	4.77	80.07	203.30	199.30	1	1	1	1	1	1
HE 200 M	103.0	220	206	15.0	25.0	18	131.30	170	134	M27	106	106	1.203	11.670	10640	967.4	1135.0	9.00	41.03	3651.0	354.5	543.2	5.27	86.09	259.40	346.3	1	1	1	1	1	1
HE 220 M	117.0	240	226	15.5	26.0	18	149.40	188	152	M27	108	124	1.322	11.270	14600	1217.0	1419.0	9.89	45.31	5012.0	443.5	678.6	5.79	88.59	315.30	572.7	1	1	1	1	1	1
HE 240 M	157.0	270	248	18.0	32.0	21	199.60	206	164	M27	116	146	1.460	9.318	24290	1799.0	2117.0	11.03	60.07	8153	657.5	1006.0	6.39	106.60	627.90	1152.0	1	1	1	1	1	1
HE 260 M	172	290	268	18.0	32.5	24	219.60	225	177	M27	122	166	1.575	9.133	31310	2159.0	2524.0	11.94	66.89	10450	779.7	1192.0	6.90	111.10	719.00	1728.0	1	1	1	1	1	1
HE 280 M	189.0	310	288	18.5	33.0	24	240.20	244	196	M27	122	186	1.694	8.984	39550	2551.0	2966.0	12.83	72.03	13160	914.1	1397.0	7.40	112.60	807.30	2520.0	1	1	1	1	1	1
HE 300 M	238.0	340	310	21.0	39.0	27	303.10	262	208	M27	132	208	1.832	7.699	59200	3482	4078	13.98	90.53	19400	1252.0	1913.0	8.00	130.60	1408.00	4386	1	1	1	1	1	1
HE 320 M	245	359	309	21.0	40.0	27	312.00	279	225	M27	132	204	1.866	7.616	68130	3796	4435	14.78	94.85	19710	1276.0	1951.0	7.95	132.60	1501.00	5004	1	1	1	1	1	1
HE 340 M	248	377	309	21.0	40.0	27	315.80	297	243	M27	132	204	1.902	7.670	76370	4052	4718	15.55	98.63	19710	1276.0	1953.0	7.90	132.60	1506.00	5584	1	1	1	1	1	1
HE 360 M	250	395	308	21.0	40.0	27	318.80	315	261	M27	132	204	1.934	7.730	84870	4297	4989	16.32	102.40	19520	1268.0	1942.0	7.83	132.60	1507.00	6137	1	1	1	1	1	1
HE 400 M	256	432	307	21.0	40.0	27	325.80	352	298	M27	132	202	2.004	7.835	104100	4820	5571	17.88	110.20	19340	1260.0	1934.0	7.70	132.60	1515.00	7410	1	1	1	1	1	1
HE 450 M	263	478	307	21.0	40.0	27	335.40	398	344	M27	132	202	2.096	7.959	131500	5501	6331	19.80	119.80	19340	1260.0	1939.0	7.59	132.60	1529.00	9251	1	1	1	1	1	1
HE 500 M	270	524	306	21.0	40.0	27	344.30	444	390	M27	132	202	2.184	8.079	161900	6180	7094	21.69	129.50	19150	1252.0	1932.0	7.46	132.60	1539.00	11190	1	1	1	1	1	1
HE 550 M	278	572	306	21.0	40.0	27	354.40	492	438	M27	132	202	2.280	8.195	198000	6923	7933	23.64	139.60	19160	1252.0	1937.0	7.35	132.60	1554.00	13520	1	1	1	1	1	1
HE 600 M	285	620	305	21.0	40.0	27	363.70	540	486	M27	132	200	2.372	8.308	237400	7660	8772	25.55	149.70	18980	1244.0	1930.0	7.22	132.60	1564.00	15910	1	1	1	1	1	1
HE 650 M	293	668	305	21.0	40.0	27	373.70	588	534	M27	132	200	2.468	8.411	281700	8433	9657	27.45	159.70	18980	1245.0	1936.0	7.13	132.60	1579.00	18650	1	1	1	1	1	1
HE 700 M	301	716	304	21.0	40.0	27	383.00	636	582	M27	132	200	2.560	8.513	329300	9198	10540	29.32	169.80	18800	1237.0	1929.0	7.01	132.60	1589.00	21400	1	1	1	1	1	2
HE 800 M	317	814	303	21.0	40.0	30	404.30	734	674	M27	138	198	2.746	8.655	442600	10870	12490	33.09	194.30	18630	1230.0	1930.0	6.79	136.10	1646.00	27780	1	1	1	1	2	3
HE 900 M	333	910	302	21.0	40.0	30	423.60	830	770	M27	138	198	2.934	8.824	570400	12540	14440	36.70	214.40	18450	1222.0	1929.0	6.60	136.10	1671.00	34750	1	1	1	2	3	4
HE 1000 M	349	1008	302	21.0	40.0	30	444.20	928	868	M27	138	198	3.130	8.978	722300	14330	16570	40.32	235.00	18460	1222.0	1940.0	6.45	136.10	1701.00	43020	1	1	1	3	4	4

UPN





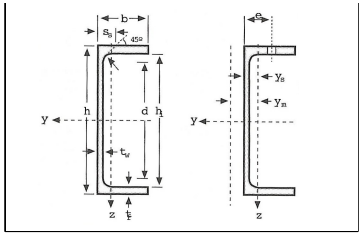
Norma Dimensional **DIN 1026-1 : 2000**

Norma Tolerâncias **NP EN 10279 : 2002**

Perfil	Gkg/m	Dimensões						A	Dimensões de Construção				A_L	A_G	I_y	$W_{el,y}$	$W_{pl,y}$	i_y	A_{vz}	I_z	$W_{el,z}$	$W_{pl,z}$	i_z	s_s	I_t	$I_w x10^{-3}$	y_s	Y_m	Classificação					
		h	b	t_w	t_f	r_1	r_2		d	Ø	e_{min}	e_{max}																	Flexão pura Segundo yy			Compressão Pura		
		mm	mm	mm	mm	mm	mm	cm^2	mm		mm	mm	m^2/m	m^2/t	cm^4	cm^3	cm^3	cm	cm^2	cm^4	cm^3	cm^3	cm	mm	cm^4	cm^6	cm	cm	235	275	355	235	275	355
UPN 80	8.64	80	45	6	8	8	4	11	46	-	-	-	0.312	36.1	106	26.5	29.4	3.1	5.08	19.4	6.36	12.1	1.33	18.69			1.45	2.67	1	1	1	1	1	1
UPN 100	10.6	100	50	6	8.5	8.5	4.5	13.5	64	-	-	-	0.372	35.1	206	41.2	49	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	1	1
UPN 120	13.4	120	55	7	9	9	4.5	17.0	82	-	-	-	0.434	32.52	364	60.7	72.6	4.62	8.8	43.2	11.1	21.2	1.59	22.2	4.15	0.9	1.6	3.03	1	1	1	1	1	1
UPN 140	16.0	140	60	7	10	10	5	20.4	98	M12	33	37	0.489	30.54	605	86.4	103	5.45	10.41	62.7	14.8	28.3	1.75	23.9	5.68	1.8	1.75	3.37	1	1	1	1	1	1
UPN 160	18.8	160	65	7.5	10.5	10.5	5.5	24.0	115	M12	34	42	0.546	28.98	925	116	138	6.21	12.6	85.3	18.3	35.2	1.89	25.3	7.39	3.26	1.84	3.56	1	1	1	1	1	1
UPN 180	22.0	180	70	8	11	11	5.5	28.0	133	M16	38	41	0.611	27.8	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	1
UPN 200	25.3	200	75	8.5	11.5	11.5	6	32.2	151	M16	39	46	0.661	26.15	1910	191	228	7.7	17.71	148	27	51.8	2.14	28.1	11.9	9.07	2.01	3.94	1	1	1	1	1	1
UPN 220	29.4	220	80	9	12.5	12.5	6.5	37.4	167	M16	40	51	0.718	24.46	2690	245	292	8.48	20.62	197	33.6	64.1	2.3	30.3	16	14.6	2.14	4.2	1	1	1	1	1	1
UPN 240	33.2	240	85	9.5	13	13	6.5	42.3	184	M20	46	50	0.775	23.34	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	1
UPN 260	37.9	260	90	10	14	14	7	48.3	200	M22	50	52	0.834	22	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	1
UPN 280	41.8	280	95	10	15	15	7.5	53.3	216	M22	52	57	0.89	21.27	6280	448	532	10.9	29.28	399	57.2	109	2.74	35.6	31	48.5	2.53	5.02	1	1	1	1	1	1
UPN 300	46.2	300	100	10	16	16	8	58.8	232	M24	55	59	0.95	20.58	8030	535	632	11.7	31.77	495	67.8	130	2.9	37.3	37.4	69.1	2.7	5.41	1	1	1	1	1	1
UPN 320	59.5	320	100	14	17.5	17.5	8.75	75.8	246	M22	58	62	0.982	16.5	10870	679	826	12.1	47.11	597	80.6	152	2.81	43	66.7	96.1	2.6	4.82	1	1	1	1	1	1
UPN 350	60.6	350	100	14	16	16	8	77.3	282	M22	56	62	1.047	17.25	12840	734	918	12.9	50.84	570	75	143	2.72	40.7	61.2	114	2.4	4.45	1	1	1	1	1	1
UPN 400	71.8	400	110	14	18	18	9	91.5	324	M27	61	62	1.182	16.46	20350	1020	1240	14.9	58.55	846	102	190	3.04	44	81.6	221	2.65	5.11	1	1	1	1	1	1

UPE

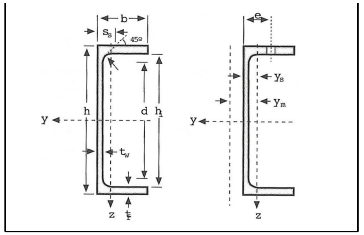
Norma Dimensional **DIN 1026**
Norma Tolerâncias **EN 10279**
Norma Material **NP EN 10025**



Perfil	Gkg/m	Dimensões					W_y cm^3	W_z cm^3	e_y cm	y_m cm
		h mm	b mm	t_w mm	t_f mm	r mm				
UPE 80	7.9	80	50	4	7	10	26.8	7.98	1.817	3.71
UPE 100	9.8	100	55	4.5	7.5	10	41.4	10.6	1.906	3.93
UPE 120	12.1	120	60	5	8	12	60.6	13.8	1.983	4.12
UPE 140	14.5	140	65	5	9	12	85.6	18.2	2.173	4.54
UPE 160	17	160	70	5.5	9.5	12	114.0	22.6	2.27	4.76
UPE 180	19.7	180	75	5.5	10.5	12	150.0	28.6	2.468	5.19
UPE 200	22.8	200	80	6	11	13	191	34.4	2.56	5.41
UPE 220	26.6	220	85	6.5	12	13	244	42.5	2.703	5.7
UPE 240	30.2	240	90	7	12.5	15	300	50.1	2.792	5.91
UPE 270	35.2	270	95	7.5	13.5	15	389	60.7	2.893	6.14
UPE 300	44.4	300	100	9.5	15	15	522	75.6	2.887	6.03
UPE 330	53.2	330	105	11	16	18	667	89.7	2.9	6
UPE 360	61.2	360	110	12	17	18	824	105	2.97	6.12
UPE 400	72.2	400	115	13.5	18	18	1049	123	2.977	6.06

UPE

Norma Dimensional **DIN 1026**
Norma Tolerâncias **EN 10279**
Norma Material **NP EN 10025**



REFERENCIA Wy

Perfil	W_y cm³	G kg/m	Perfil	W_y cm³	G kg/m	DIFERENÇA EM PESO %
UPE 80	26.8	7.9	**UPN 80**	26.5	8.64	**-8.6**
UPE 100	41.4	9.8	**UPN 100**	41.2	10.6	**-7.4**
UPE 120	60.6	12.1	**UPN 120**	60.7	13.4	**-9.0**
UPE 140	85.6	14.5	**UPN 140**	86.4	16.0	**-9.4**
UPE 160	114	17.0	**UPN 160**	116	18.8	**-9.6**
UPE 180	150	19.7	**UPN 180**	150	22.0	**-10.5**
UPE 200	191	22.8	**UPN 200**	191	25.3	**-9.9**
UPE 220	244	26.6	**UPN 220**	245	29.4	**-9.5**
UPE 240	300	30.2	**UPN 240**	300	33.2	**-9.0**
UPE 270	389	35.2	**UPN 260**	371	37.9	**-7.1**
			UPN 280	448	41.8	
UPE 300	522	44.4	**UPN 300**	535	46.2	**-3.9**
UPE 330	667	53.2	**UPN 330**	679	59.5	**-10.6**
			UPN 350	734	60.6	
UPE 360	824	61.2	**UPN 380**	829	63.1	**-3.0**
UPE 400	1049	72.2	**UPN 400**	1020	71.8	**0.6**

REFERENCIA Wz

Perfil	W_y cm³	G kg/m	Perfil	W_y cm³	G kg/m	DIFERENÇA EM PESO %
UPE 80	7.98	7.9	**UPN 100**	8.49	10.6	**-25.5**
UPE 100	10.6	9.8	**UPN 120**	11.1	13.4	**-26.2**
UPE 120	13.8	12.1	**UPN 140**	14.8	16.0	**-24.4**
UPE 140	18.2	14.5	**UPN 160**	18.3	18.8	**-22.9**
UPE 160	22.6	17.0	**UPN 180**	22.4	22.0	**-22.7**
UPE 180	28.6	19.7	**UPN 200**	27	25.3	**-22.1**
UPE 200	34.4	22.8	**UPN 220**	33.6	29.4	**-22.4**
UPE 220	42.5	26.6	**UPN 240**	39.6	33.2	**-19.9**
UPE 240	50.1	30.2	**UPN 260**	47.7	37.9	**-20.3**
UPE 270	60.7	35.2	**UPN 280**	57.2	41.8	**-15.9**
			UPN 300	67.8	46.2	
UPE 300	75.6	44.4	**UPN 320**	80.6	59.5	**-25.3**
UPE 300	75.6	44.4	**UPN 350**	75	60.6	**-26.7**
UPE 300	75.6	44.4	**UPN 380**	78.7	63.1	**-29.6**
UPE 330	89.7	53.2				
UPE 360	105.0	61.2	**UPN 400**	102	71.8	**-14.8**
UPE 400	123.0	72.2				