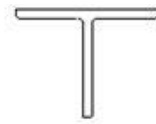
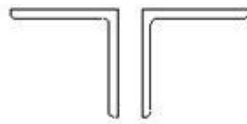




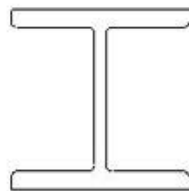
## *Metallic Structure*

# Table Of Steel Sections



Angles

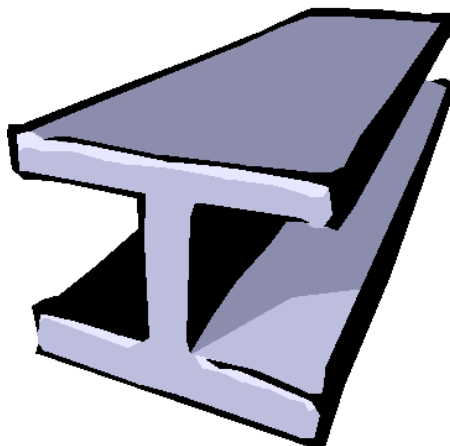
Tee



Channel

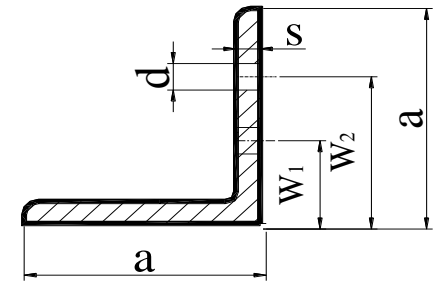
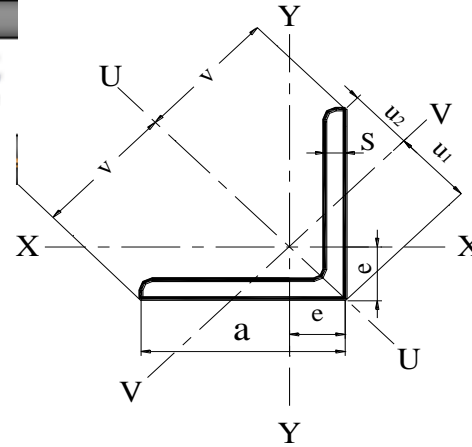
Column

Beam





# EQUAL ANGLES



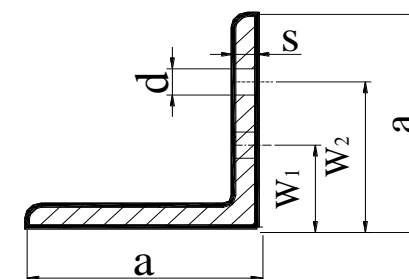
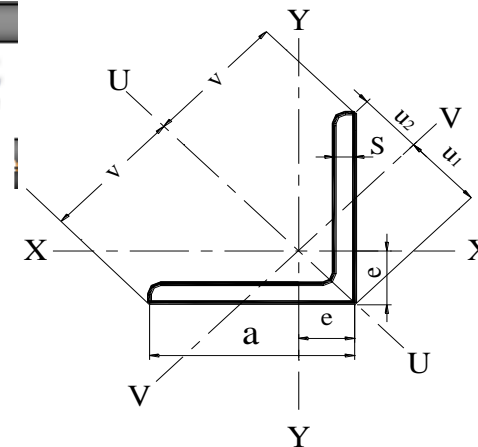
Size		Weight	Area	Dimensions				Axis X-X and Y-Y			Axis u-u		Axis v-v			Details			Surface Area	
a	s			e	v	u <sub>1</sub>	u <sub>2</sub>	I	S	r	I <sub>u</sub>	r <sub>u</sub>	I <sub>v</sub>	S <sub>v</sub>	r <sub>v</sub>	w <sub>1</sub>	w <sub>2</sub>	d <sub>max</sub>	U <sub>m</sub>	U <sub>t</sub>
mm	mm	kg/m	cm <sup>2</sup>	cm	cm	cm	cm	cm <sup>4</sup>	cm <sup>3</sup>	cm	cm <sup>4</sup>	cm	cm <sup>4</sup>	cm <sup>3</sup>	cm	mm	mm	mm	x10 <sup>-2</sup> m <sup>2</sup> /m	m <sup>2</sup> /t
30	3	1.36	1.74	0.84	2.12	1.18	1.04	1.41	0.65	0.90	2.24	1.14	0.57	0.48	0.57	N.A.			11.60	85.30
	4	1.78	2.27	0.89		1.24	1.05	1.81	0.86	0.89	2.85	1.12	0.76	0.61	0.58	N.A.			11.60	65.17
	5	2.18	2.78	0.92		1.30	1.07	2.16	1.04	0.88	3.41	1.11	0.91	0.70	0.57	N.A.			11.60	53.21
35	3	1.60	2.04	0.96	2.47	1.36	1.23	2.29	0.90	1.06	3.63	1.34	0.95	0.70	0.68	20	N.A.	M10	13.60	85.00
	4	2.10	2.67	1.00		1.41	1.24	2.96	1.18	1.05	4.68	1.33	1.24	0.88	0.68	20		M10	13.60	64.76
	5	2.57	3.28	1.04		1.47	1.25	3.56	1.45	1.04	5.63	1.31	1.49	1.10	0.67	20		M10	13.60	52.91
40	4	2.42	3.08	1.12	2.83	1.58	1.40	4.48	1.56	1.21	7.09	1.52	1.86	1.18	0.78	22	N.A.	M10	15.50	64.00
	5	2.97	3.79	1.16		1.64	1.42	5.43	1.91	1.20	8.64	1.51	2.22	1.35	0.77	22		M10	15.50	52.20
	6	3.52	4.48	1.20		1.70	1.43	6.33	2.26	1.19	9.98	1.49	2.67	1.57	0.77	22		M10	15.50	44.03
45	5	3.38	4.30	1.28	3.18	1.81	1.58	7.83	2.43	1.35	12.40	1.70	3.25	1.80	0.87	25	N.A.	M12	17.40	51.50
	6	4.00	5.09	1.32		1.87	1.59	9.16	2.88	1.34	14.50	1.69	3.85	2.05	0.87	25		M12	17.40	43.50
	7	4.60	5.86	1.36		1.92	1.61	10.40	3.31	1.33	16.40	1.67	4.39	2.29	0.87	25		M12	17.40	37.82
50	5	3.77	4.80	1.40	3.54	1.98	1.76	11.00	3.05	1.51	17.40	1.90	4.59	2.32	0.98	30	N.A.	M12	19.40	51.50
	6	4.47	5.69	1.45		2.04	1.77	12.80	3.51	1.50	20.40	1.89	5.24	2.57	0.96	30		M12	19.40	43.40
	7	5.15	6.56	1.49		2.11	1.78	14.60	4.15	1.49	23.10	1.88	6.02	2.85	0.96	30		M12	19.40	37.67
55	5	4.18	5.32	1.52	3.89	2.15	1.93	14.70	3.70	1.66	23.30	2.09	6.11	2.84	1.07	30	N.A.	M16	21.30	50.96
	6	4.95	6.31	1.56		2.21	1.94	17.80	4.40	1.66	27.40	2.08	7.24	3.26	1.07	30		M16	21.30	33.30
	8	6.46	8.23	1.64		2.32	1.97	22.10	5.72	1.64	34.80	2.06	9.35	4.03	1.07	30		M16	21.30	32.97
60	6	5.42	6.91	1.69	4.24	2.39	2.11	22.80	5.29	1.82	36.10	2.29	9.43	3.85	1.17	35	N.A.	M16	23.30	43.00
	8	7.09	9.03	1.77		2.50	2.14	29.10	6.88	1.80	46.10	2.26	12.10	4.84	1.16	35		M16	23.30	32.90
	10	8.69	11.10	1.85		2.62	2.17	34.90	8.41	1.78	55.10	2.23	14.60	5.57	1.15	35		M16	23.30	26.80
65	7	6.83	8.70	1.85	4.60	2.62	2.29	33.40	7.13	1.96	53.00	2.47	13.80	5.27	1.26	35	N.A.	M16	25.20	36.90
	8	7.73	9.85	1.89		2.67	2.31	37.50	8.13	1.95	59.40	2.46	15.60	5.84	1.26	35		M16	25.20	32.60
	9	8.62	11.00	1.93		2.73	2.32	41.30	9.04	1.94	65.40	2.44	17.20	6.30	1.25	35		M16	25.20	29.23

N.A.=not available for this angle size

Eng. Amr Ahmed



# EQUAL ANGLES



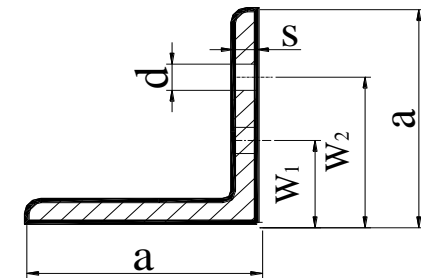
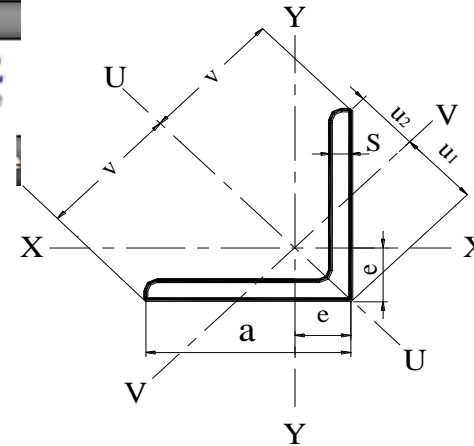
Size		Weight	Area	Dimensions				Axis X-X and Y-Y			Axis u-u		Axis v-v			Details			Surface Area	
a	s			e	v	u <sub>1</sub>	u <sub>2</sub>	I	S	r	I <sub>u</sub>	r <sub>u</sub>	I <sub>v</sub>	S <sub>v</sub>	r <sub>v</sub>	w <sub>1</sub>	w <sub>2</sub>	d <sub>max</sub>	U <sub>m</sub>	U <sub>t</sub>
mm	mm	kg/m	cm <sup>2</sup>	cm	cm	cm	cm	cm <sup>4</sup>	cm <sup>3</sup>	cm	cm <sup>4</sup>	cm	cm <sup>4</sup>	cm <sup>3</sup>	cm	mm	mm	mm	x10 <sup>-2</sup> m <sup>2</sup> /m	m <sup>2</sup> /ft
70	7	7.38	9.40	1.97	4.95	2.79	2.47	42.4	8.43	2.12	67.1	2.67	17.6	6.37	1.37	40	N.A.	M20	27.20	36.90
	9	9.34	11.90	2.05		2.90	2.50	52.6	10.6	2.10	83.1	2.64	22.0	7.59	1.36	40		M20	27.20	29.10
	11	11.20	14.30	2.13		3.01	2.53	61.8	12.7	2.09	97.6	2.61	26.0	8.61	1.35	40		M20	27.20	24.28
75	7	7.94	10.10	2.03	5.30	2.95	2.63	52.4	8.67	2.28	83.6	2.88	21.1	7.15	1.45	40	N.A.	M20	29.10	36.65
	8	9.03	11.50	2.13		3.01	2.65	58.9	11.0	2.26	93.3	2.85	24.4	8.11	1.46	40		M20	29.10	32.20
	10	11.10	14.10	2.21		3.18	2.68	71.4	13.5	2.25	113	2.83	28.8	9.55	1.45	40		M20	29.10	26.21
80	8	9.66	12.30	2.26	5.66	3.20	2.82	72.3	12.6	2.42	115	3.06	29.6	9.25	1.55	45	N.A.	M20	31.10	32.20
	10	11.90	15.10	2.34		3.31	2.85	87.5	15.5	2.41	139	3.03	35.9	10.9	1.54	45		M20	31.10	26.10
	12	14.10	17.90	2.41		3.41	2.89	102	18.2	2.39	161	3.00	43.0	12.6	1.53	45		M20	31.10	22.10
90	9	12.20	15.50	2.54	6.36	3.59	3.18	116	18.0	2.74	184	3.45	47.8	13.3	1.76	50	N.A.	M20	35.10	28.80
	11	14.70	18.70	2.62		3.70	3.21	138	21.6	2.72	218	3.41	57.1	15.4	1.75	50		M20	35.10	23.88
	13	17.10	21.80	2.70		3.81	3.24	158	25.1	2.69	250	3.39	65.9	17.3	1.74	50		M20	35.10	20.53
100	10	15.10	19.20	2.82	7.07	3.99	3.54	177	24.7	3.04	280	3.82	73.3	18.4	1.95	55	N.A.	M24	39.00	25.80
	12	17.80	22.70	2.90		4.10	3.57	207	29.2	3.02	328	3.80	86.2	21.0	1.95	55		M24	39.00	21.90
	14	20.60	26.20	2.98		4.21	3.60	235	33.5	3.00	372	3.77	98.3	23.4	1.94	55		M24	39.00	18.90
110	10	16.60	21.20	3.07	7.78	4.34	3.89	239	30.1	3.36	379	4.23	98.6	22.7	2.16	40	80	M20	43.00	25.90
	12	19.70	25.10	3.15		4.45	3.93	280	35.7	3.34	444	4.21	116	25.1	2.15	40	80	M20	43.00	21.83
	14	22.80	29.00	3.21		4.54	3.98	319	41.0	3.32	505	4.18	133	29.3	2.14	40	80	M20	43.00	18.86
120	12	21.60	27.50	3.40	8.49	4.80	4.26	368	42.7	3.65	584	4.60	152	31.6	2.35	45	85	M20	46.90	21.70
	13	23.30	29.90	3.44		4.86	4.27	394	46.0	3.64	625	4.59	162	33.3	2.34	45	85	M20	46.90	20.13
	15	26.60	33.90	3.51		4.96	4.31	446	52.5	3.63	705	4.56	186	37.5	2.34	45	85	M20	46.90	17.60

N.A.=not available for this angle size

Engr. Amr Ahmed



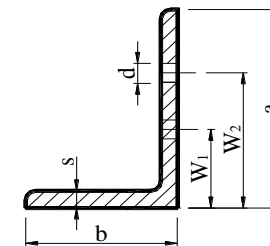
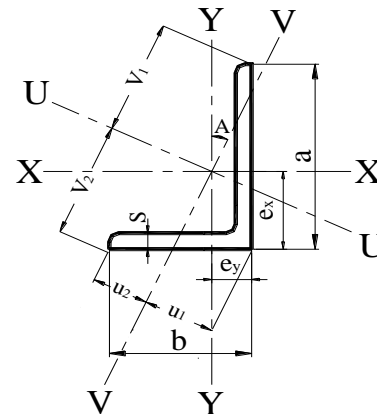
# EQUAL ANGLES



Size		Weight	Area	Dimensions				Axis X-X and Y-Y			Axis u-u		Axis v-v			Details			Surface Area	
a	s			e	v	u <sub>1</sub>	u <sub>2</sub>	I	S	r	I <sub>u</sub>	r <sub>u</sub>	I <sub>v</sub>	S <sub>v</sub>	r <sub>v</sub>	w <sub>1</sub>	w <sub>2</sub>	d <sub>max</sub>	U <sub>m</sub>	U <sub>t</sub>
mm	mm	kg/m	cm <sup>2</sup>	cm	cm	cm	cm <sup>4</sup>	cm <sup>3</sup>	cm	cm <sup>4</sup>	cm	cm <sup>4</sup>	cm <sup>3</sup>	cm	mm	mm	mm	x10 <sup>-2</sup> m <sup>2</sup> /m	m <sup>2</sup> /t	
130	12	23.60	30.00	3.64	9.19	5.15	4.60	472	50.4	3.97	750	5.00	194	37.7	2.54	50	90	M20	50.80	21.50
	14	27.20	34.70	3.72		5.26	4.63	540	55.2	3.94	857	4.97	223	42.4	2.53	50	90	M20	50.80	18.68
	16	30.90	39.30	3.80		5.37	4.66	605	65.8	3.92	959	4.94	251	46.7	2.52	50	90	M20	50.80	16.44
140	13	27.50	35.00	3.92	9.90	5.54	4.96	638	63.3	4.27	1010	5.38	262	47.3	2.74	55	105	M24	54.70	19.90
	15	31.40	40.00	4.00		5.66	4.99	723	72.3	4.25	1150	5.36	298	52.7	2.73	55	105	M24	54.70	17.40
150	14	31.60	40.30	4.21	10.60	5.95	5.31	845	78.2	4.58	1340	5.77	347	58.3	2.94	60	110	M24	58.60	18.50
	15	33.80	43.00	4.25		6.01	5.33	898	82.5	4.57	1430	5.76	370	61.6	2.93	60	110	M24	58.60	17.33
	16	35.90	45.70	4.29		6.07	5.34	949	88.7	4.56	1510	5.74	391	64.4	2.93	60	110	M24	58.60	16.30
	18	40.10	51.00	4.36		6.17	5.38	1050	99.3	4.54	1670	5.70	438	71.0	2.93	60	110	M24	58.60	14.61
	20	44.20	56.30	4.44		6.28	5.41	1150	109	4.51	1820	5.68	477	76.0	2.91	60	110	M24	58.60	13.25
160	15	36.20	46.10	4.49	11.30	6.35	5.67	1100	95.6	4.88	1750	6.15	453	71.3	3.14	60	120	M27	62.50	17.30
	17	40.70	51.80	4.57		6.46	5.70	1230	108	4.86	1950	6.13	506	78.3	3.13	60	120	M27	62.50	15.40
	19	45.10	57.50	4.65		6.58	5.73	1350	118	4.84	2140	6.10	558	84.8	3.12	60	120	M27	62.50	13.85
180	16	43.50	55.40	5.02	12.70	7.11	6.39	1680	130	5.51	2690	6.96	679	95.5	3.50	65	135	M27	70.50	16.20
	18	48.60	61.90	5.10		7.22	6.41	1870	145	5.49	2970	6.93	757	105	3.49	65	135	M27	70.50	14.50
	20	53.70	68.40	5.18		7.33	6.44	2040	160	5.47	3260	6.90	830	113	3.49	65	135	M27	70.50	13.12
	22	58.60	74.70	5.26		7.44	6.47	2210	174	5.44	3510	6.86	918	123	3.50	65	135	M27	70.50	12.03
200	16	48.50	61.80	5.52	14.10	7.80	7.09	2340	162	6.15	3740	7.78	943	121	3.91	65	150	M27	78.50	16.20
	18	54.30	69.10	5.60		7.92	7.12	2600	181	6.13	4150	7.75	1050	133	3.90	65	150	M27	78.50	14.50
	20	59.90	76.40	5.68		8.04	7.15	2850	199	6.11	4540	7.72	1160	144	3.89	65	150	M27	78.50	13.10
	24	71.10	90.60	5.84		8.26	7.21	3330	235	6.06	5280	7.64	1380	167	3.90	65	150	M27	78.50	11.04
	28	82.00	105.00	5.99		8.47	7.28	3780	270	6.02	5990	7.57	1580	186	3.89	65	150	M27	78.50	9.57



# UNEQUAL ANGLES



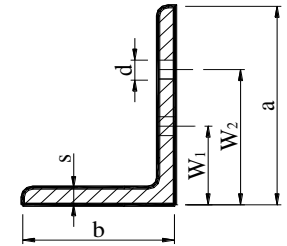
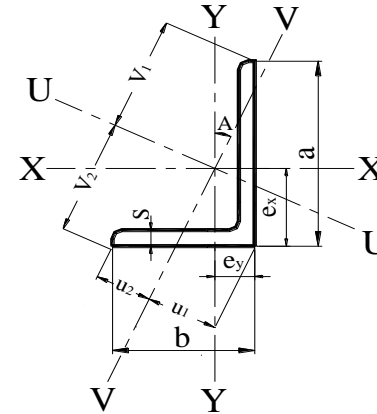
Size			Weight	Area	Dimensions						tan A	Axis X-X			Axis Y-Y			Axis u-u		Axis v-v		Details			Surface Area	
a	b	s			e <sub>x</sub>	e <sub>y</sub>	v <sub>1</sub>	v <sub>2</sub>	u <sub>1</sub>	u <sub>2</sub>		I <sub>x</sub>	S <sub>x</sub>	r <sub>x</sub>	I <sub>y</sub>	S <sub>y</sub>	r <sub>y</sub>	I <sub>u</sub>	r <sub>u</sub>	I <sub>v</sub>	r <sub>v</sub>	w <sub>1</sub>	w <sub>2</sub>	d <sub>max</sub>	U <sub>m</sub>	U <sub>t</sub>
mm	mm	mm	kg/m <sup>3</sup>	cm <sup>2</sup>	cm	cm	cm	cm	cm	cm <sup>4</sup>	cm <sup>3</sup>	cm	cm <sup>4</sup>	cm <sup>3</sup>	cm	cm <sup>4</sup>	cm	cm <sup>4</sup>	cm	mm	mm	mm	x10 <sup>-2</sup> m <sup>2</sup> /m <sup>1</sup>	m <sup>2</sup> /ft		
30	20	3	1.11	1.42	0.99	0.50	2.04	1.51	0.86	1.04	0.431	1.25	0.62	0.94	0.44	0.29	0.56	1.43	1.00	0.25	0.42	N.A.			9.68	87.20
		4	1.45	1.85	1.03	0.54	2.02	1.52	0.91	1.03	0.423	1.59	0.81	0.93	0.55	0.38	0.55	1.81	0.99	0.33	0.42	N.A.			9.68	66.70
40	20	3	1.35	1.72	1.43	0.44	2.61	1.77	0.79	1.19	0.259	2.79	1.08	1.27	0.47	0.30	0.52	2.96	1.31	0.30	0.42	22	N.A.	M10	11.68	86.50
		4	1.77	2.25	1.47	0.48	2.57	1.80	0.83	1.18	0.252	3.59	1.42	1.26	0.60	0.39	0.52	3.79	1.30	0.39	0.42	22		M10	11.68	66.00
45	30	3	1.72	2.19	1.43	0.70	3.09	2.23	1.21	1.59	0.436	4.47	1.46	1.43	1.60	0.70	0.86	5.15	1.53	0.93	0.65	25	N.A.	M12	14.64	85.00
		4	2.25	2.87	1.48	0.74	3.07	2.26	1.27	1.58	0.433	5.78	1.91	1.42	2.05	0.91	0.85	6.65	1.52	1.18	0.64	25		M12	14.64	65.06
		5	2.77	3.53	1.52	0.78	3.05	2.27	1.32	1.58	0.430	6.99	2.95	1.41	2.47	1.11	0.84	8.02	1.51	1.44	0.64	25		M12	14.64	52.80
60	30	5	3.37	4.29	2.15	0.68	3.90	2.67	1.20	1.77	0.256	15.6	4.04	1.90	2.60	1.12	0.78	16.5	1.96	1.69	0.63	35	N.A.	M16	17.50	51.90
		7	4.59	5.85	2.24	0.76	3.83	2.72	1.28	1.73	0.248	20.7	5.50	1.88	3.41	1.52	0.76	21.8	1.93	2.28	0.62	35		M16	17.50	38.10
60	40	5	3.76	4.79	1.96	0.97	4.08	3.01	1.68	2.09	0.437	17.2	4.25	1.89	6.11	2.02	1.13	19.8	2.03	3.50	0.86	35	N.A.	M16	19.50	51.80
		6	4.46	5.68	2.00	1.01	4.06	3.02	1.72	2.08	0.437	20.1	5.03	1.88	7.12	2.38	1.12	23.1	2.02	4.12	0.85	35		M16	19.50	37.90
		7	5.14	6.55	2.04	1.05	4.04	3.03	1.77	2.07	0.422	23.0	5.79	1.87	8.07	2.74	1.11	26.3	2.00	4.73	0.85	35		M16	19.50	37.93
75	50	5	4.74	6.04	2.40	1.17	5.14	3.73	2.03	2.64	0.437	34.4	6.74	2.39	12.3	3.21	1.43	39.6	2.56	7.10	1.08	40	N.A.	M20	24.44	51.50
		7	6.51	8.30	2.48	1.25	5.10	3.77	2.13	2.63	0.433	46.4	9.24	2.36	16.5	4.39	1.41	53.3	2.53	9.56	1.07	40		M20	24.44	37.54
		9	8.23	10.50	2.56	1.32	5.06	3.80	2.22	2.62	0.427	57.4	11.6	2.34	20.2	5.49	1.39	65.7	2.50	11.9	1.07	40		M20	24.44	29.70
80	40	6	5.41	6.89	2.85	0.88	5.21	3.53	1.55	2.42	0.259	44.9	8.7	2.55	7.6	2.44	1.05	47.6	2.63	4.90	0.84	45	N.A.	M22	23.40	43.20
		8	7.07	9.01	2.94	0.95	5.15	3.57	1.65	2.38	0.253	57.6	11.4	2.53	9.7	3.18	1.04	60.9	2.60	6.41	0.84	45		M22	23.40	33.10
90	60	6	6.82	8.69	2.89	1.41	6.14	4.50	2.46	3.16	0.442	71.7	11.7	2.87	25.8	5.61	1.72	82.8	3.09	14.6	1.30	50	N.A.	M24	29.40	43.10
		8	8.96	11.40	2.97	1.49	6.11	4.54	2.56	3.15	0.497	92.5	15.4	2.85	33.0	7.31	1.70	107	3.06	19.0	1.29	50		M24	29.40	32.80
100	50	6	6.85	8.73	3.49	1.04	6.50	4.39	1.91	2.98	0.263	89.7	13.8	3.20	15.3	3.86	1.32	95.2	3.30	9.78	1.06	55	N.A.	M24	29.20	42.60
		8	8.99	11.50	3.59	1.13	6.48	4.44	2.00	2.95	0.258	116	18.0	3.18	19.5	5.04	1.31	123	3.28	12.6	1.05	55		M24	29.20	32.80
		10	11.10	14.10	3.67	1.20	6.43	4.49	2.08	2.91	0.252	141	22.2	3.16	23.4	6.17	1.29	149	3.25	15.5	1.04	55		M24	29.20	26.30
100	65	7	8.77	11.20	3.23	1.51	6.83	4.91	2.66	3.48	0.419	113	16.6	3.17	37.6	7.54	1.84	128	3.39	21.6	1.39	55	N.A.	M24	32.10	36.60
		9	11.10	14.20	3.32	1.59	6.78	4.94	2.76	3.46	0.415	141	21.0	3.15	46.7	9.52	1.82	160	3.36	27.2	1.39	55		M24	32.10	28.90
		11	13.40	17.10	3.40	1.67	6.74	4.97	2.85	3.45	0.410	167	25.3	3.13	55.1	11.4	1.80	190	3.34	32.6	1.38	55		M24	32.10	24.00

N.A.=not available for this angle size

Eng. Amr Ahmed



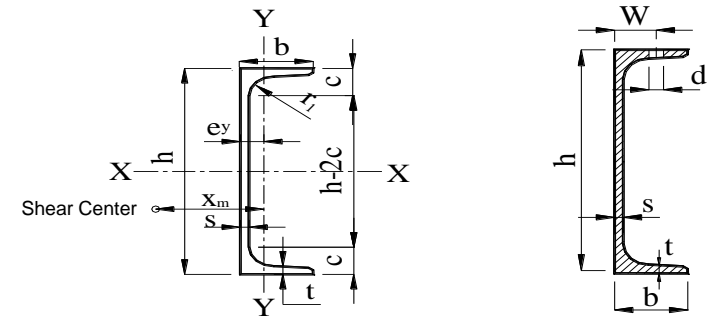
# UNEQUAL ANGLES



Size			Weight	Area	Dimensions						tan A	Axis X-X			Axis Y-Y			Axis u-u		Axis v-v		Details			Surface Area	
a	b	s			e <sub>x</sub>	e <sub>y</sub>	v <sub>1</sub>	v <sub>2</sub>	u <sub>1</sub>	u <sub>2</sub>		I <sub>x</sub>	S <sub>x</sub>	r <sub>x</sub>	I <sub>y</sub>	S <sub>y</sub>	r <sub>y</sub>	I <sub>u</sub>	r <sub>u</sub>	I <sub>v</sub>	r <sub>v</sub>	w <sub>1</sub>	w <sub>2</sub>	d <sub>max</sub>	U <sub>m</sub>	U <sub>t</sub>
mm	mm	mm	kg/m <sup>3</sup>	cm <sup>2</sup>	cm	cm	cm	cm	cm	cm	cm	cm <sup>4</sup>	cm <sup>3</sup>	cm	cm <sup>4</sup>	cm <sup>3</sup>	cm	cm <sup>4</sup>	cm	mm	mm	mm	x10 <sup>-2</sup> m <sup>2</sup> /m <sup>1</sup>	m <sup>2</sup> /ft		
120	80	8	12.20	15.50	3.83	1.87	8.23	5.99	3.27	4.20	0.441	226	27.6	3.82	80.8	13.2	2.29	261	4.10	45.8	1.72	45	85	M20	39.10	32.00
		10	15.00	19.10	3.92	1.95	8.18	6.03	3.37	4.19	0.438	276	34.1	3.80	98.1	16.2	2.27	318	4.07	56.1	1.71	45	85	M20	39.10	26.10
		12	17.80	22.70	4.00	2.03	8.14	6.06	3.46	4.18	0.433	323	40.4	3.77	114	19.1	2.25	371	4.04	66.1	1.71	45	85	M20	39.10	22.00
		14	20.50	26.20	4.08	2.10	8.10	6.08	3.55	4.17	0.429	368	46.4	3.75	130	22.0	2.23	421	4.01	75.8	1.70	45	85	M20	39.10	19.07
130	65	8	11.90	15.10	4.56	1.37	8.50	5.71	2.49	3.86	0.263	263	31.1	4.17	44.8	8.7	1.72	280	4.31	28.6	1.38	50	90	M20	38.10	32.00
		10	14.60	18.60	4.65	1.45	8.43	5.76	2.58	3.82	0.259	321	38.4	4.15	54.2	10.7	1.71	340	4.27	35.0	1.37	50	90	M20	38.10	26.10
		12	17.30	22.10	4.74	1.53	8.37	5.81	2.66	3.80	0.255	376	45.5	4.12	63.0	12.7	1.69	397	4.24	41.2	1.37	50	90	M20	38.10	22.00
130	90	10	16.60	21.20	4.15	2.18	8.92	6.69	3.75	4.62	0.472	358	40.5	4.11	141	20.6	2.58	420	4.46	78.5	1.93	50	90	M20	42.97	25.88
		12	19.70	25.10	4.84	2.26	8.88	6.72	3.85	4.60	0.463	420	48.0	4.09	165.0	24.4	2.56	492	4.43	92.6	1.92	50	90	M20	42.97	21.81
150	75	9	15.30	19.50	5.28	1.57	9.79	6.62	2.90	4.46	0.265	455	46.8	4.83	78.3	13.2	2.00	484	4.98	50.0	1.60	60	110	M24	44.10	28.80
		11	18.60	23.60	5.37	1.65	9.73	6.66	2.97	4.44	0.261	545	56.6	4.80	93.0	15.9	1.98	578	4.95	59.8	1.59	60	110	M24	44.10	23.00
150	100	10	19.00	24.20	4.80	2.34	10.30	7.50	4.10	5.25	0.442	552	54.1	4.78	198	25.8	2.86	637	5.13	112	2.15	60	110	M24	48.90	25.70
		12	22.60	28.70	4.89	2.42	10.20	7.53	4.19	5.24	0.439	650	64.2	4.76	232	30.6	2.84	749	5.10	133	2.15	60	110	M24	48.90	21.60
		14	26.10	33.20	4.97	2.50	10.20	7.56	4.28	5.23	0.435	744	74.1	4.73	264	35.2	2.82	856	5.07	152	2.14	60	110	M24	48.90	18.70
160	80	10	18.20	23.20	5.63	1.69	10.50	7.06	3.07	4.76	0.263	611	58.9	5.14	104	16.5	2.12	648	5.29	67.0	1.70	60	120	M27	46.90	25.70
		12	21.60	27.50	5.72	1.77	10.40	7.10	3.15	4.75	0.259	720	70.0	5.11	122	19.6	2.10	763	5.26	78.9	1.69	60	120	M27	46.90	21.70
		14	25.00	31.80	5.81	1.85	10.30	7.16	3.23	4.72	0.256	823	80.7	5.09	139	22.5	2.09	871	5.23	90.5	1.69	60	120	M27	46.90	18.70
180	90	10	20.60	26.20	6.28	1.85	11.80	7.89	3.38	5.42	0.262	880	75.1	5.80	151	21.1	2.40	934	5.97	97.4	1.93	65	135	M27	52.80	25.63
		12	24.50	31.20	6.37	1.93	11.70	7.95	3.48	5.38	0.261	1040	89.3	5.77	177	25.1	2.38	1100	5.94	114	1.92	65	135	M27	52.80	21.55
		14	28.30	36.10	6.46	2.01	11.70	8.01	3.57	5.34	0.259	1190	103	5.75	202	28.9	2.37	1260	5.92	131	1.91	65	135	M27	52.80	18.65
200	100	10	23.00	29.20	6.93	2.01	13.20	8.76	3.75	5.98	0.266	1220	93.2	6.46	210	26.3	2.68	1300	6.66	133	2.14	65	150	M27	58.70	25.50
		12	27.30	34.80	7.03	2.10	13.10	8.82	3.84	5.95	0.264	1440	111	6.43	247	31.3	2.67	1530	6.63	158	2.13	65	150	M27	58.70	21.50
		14	31.60	40.30	7.12	2.18	13.00	8.88	3.93	5.92	0.262	1650	128	6.41	282	36.1	2.65	1760	6.60	181	2.13	65	150	M27	58.70	18.60
		16	35.90	45.70	7.20	2.26	12.90	8.93	4.02	5.88	0.259	1860	145	6.38	316	40.8	2.63	1970	6.57	204	2.11	65	150	M27	58.70	16.35



# CHANNEL (U.P.N.)



Sec. No.	Weight kg/m	Area cm <sup>2</sup>	A <sub>web</sub> cm <sup>2</sup>	Dimensions								Axis X-X			Axis Y-Y			Details		Surface Area	
				h mm	b mm	s mm	t=r <sub>1</sub> mm	c mm	h-2c mm	e <sub>y</sub> cm	X <sub>m</sub> cm	I <sub>x</sub> cm <sup>4</sup>	S <sub>x</sub> cm <sup>3</sup>	r <sub>x</sub> cm	I <sub>y</sub> cm <sup>4</sup>	S <sub>y</sub> cm <sup>3</sup>	r <sub>y</sub> cm	W mm	d <sub>max</sub> mm	U <sub>m</sub> x10 <sup>-2</sup> m <sup>2</sup> /m	U <sub>t</sub> m <sup>2</sup> /t
30x15	1.74	2.21	0.84	30	15	4.0	4.5	9.0	12	0.52	0.74	2.53	1.69	1.07	0.38	0.39	0.42	N.A.	N.A.	7.14	41.00
30	4.27	5.44	0.80	30	33	5.0	7.0	14.5	1	1.31	2.22	6.39	4.26	1.08	5.33	2.68	0.99	N.A.	N.A.	17.40	40.74
40x20	2.87	3.66	1.45	40	20	5.0	5.5	11.0	18	0.67	1.01	7.58	3.79	1.44	1.14	0.86	0.56	N.A.	N.A.	13.71	47.77
40	4.87	6.21	1.30	40	35	5.0	7.0	14.5	11	1.33	2.32	14.1	7.05	1.50	6.68	3.08	1.04	N.A.	N.A.	19.47	40.00
50x25	3.86	4.92	1.90	50	25	5.0	6.0	12.5	25	0.81	1.34	16.6	6.73	1.85	2.49	1.48	0.71	N.A.	N.A.	17.52	45.40
50	5.59	7.12	1.80	50	38	5.0	7.0	15.0	20	1.37	2.47	26.4	10.6	1.92	9.12	3.75	1.13	N.A.	N.A.	22.40	40.06
60	5.07	6.46	2.88	60	30	6.0	6.0	12.5	35	0.91	1.50	31.6	10.5	2.21	4.51	2.16	0.84	N.A.	N.A.	21.32	42.06
65	7.09	9.03	2.75	65	42	5.5	7.5	16.0	33	1.42	2.60	57.5	17.7	2.52	14.1	5.07	1.25	22	M10	27.30	38.50
70	6.73	8.57	3.42	70	40	6.0	6.5	16.0	38	1.42	2.20	61.1	17.5	2.67	11.4	4.10	1.15	22	M10	26.67	39.64
80	8.64	11.00	3.84	80	45	6.0	8.0	17.0	47	1.45	2.67	106	26.5	3.10	19.4	6.36	1.33	25	M12	31.20	36.10
100	10.60	13.50	4.98	100	50	6.0	8.5	18.0	64	1.55	2.93	206	41.2	3.91	29.3	8.49	1.47	30	M12	37.20	35.10
120	13.40	17.00	7.14	120	55	7.0	9.0	19.0	82	1.60	3.03	364	60.7	4.62	43.2	11.1	1.59	30	M16	43.40	32.40
140	16.00	20.40	8.40	140	60	7.0	10.0	21.0	97	1.75	3.37	605	86.4	5.45	62.7	14.8	1.75	35	M16	48.90	30.60
160	18.80	24.00	10.43	160	65	7.5	10.5	22.5	116	1.84	3.56	925	116	6.21	85.3	18.3	1.89	35	M20	54.60	29.00
180	22.00	28.00	12.64	180	70	8.0	11.0	23.5	133	1.92	3.75	1350	150	6.95	114	22.4	2.02	40	M20	61.10	37.80
200	25.30	32.20	15.05	200	75	8.5	11.5	24.5	151	2.01	3.94	1910	191	7.70	148	27.0	2.14	40	M20	66.10	26.10
220	29.40	37.40	17.55	220	80	9.0	12.5	26.5	166	2.14	4.20	2690	245	8.48	197	33.6	2.30	45	M20	71.80	24.40
240	33.20	42.30	20.33	240	85	9.5	13.0	28.0	185	2.23	4.39	3600	300	9.22	248	39.6	2.42	45	M24	77.50	23.30
260	37.90	48.30	23.20	260	90	10.0	14.0	30.0	201	2.36	4.66	4820	371	9.99	317	47.7	2.56	50	M24	83.40	22.00
280	41.80	53.30	25.00	280	95	10.0	15.0	32.0	213	2.53	5.02	6280	448	10.90	399	57.2	2.74	50	M24	89.00	21.00
300	46.20	58.80	26.80	300	100	10.0	16.0	34.0	232	2.70	5.41	8030	535	11.70	495	67.8	2.90	55	M27	95.00	20.60
320	59.50	75.80	39.90	320	100	14.0	17.5	37.0	247	2.60	4.82	10870	679	12.10	597	80.6	2.81	58	M27	98.20	16.50
350	60.60	77.30	44.52	350	100	14.0	16.0	34.0	283	2.40	4.45	12840	734	12.90	570	75.0	2.72	58	M27	105.00	17.30
380	63.10	80.40	46.98	380	102	13.5	16.0	33.5	313	2.38	4.58	15760	829	14.00	615	78.7	2.77	60	M27	111.00	17.70
400	71.80	91.50	50.96	400	110	14.0	18.0	38.0	325	2.65	5.11	20350	1020	14.90	846	102	3.04	60	M27	118.00	16.50

N.A.=not available for this channel size

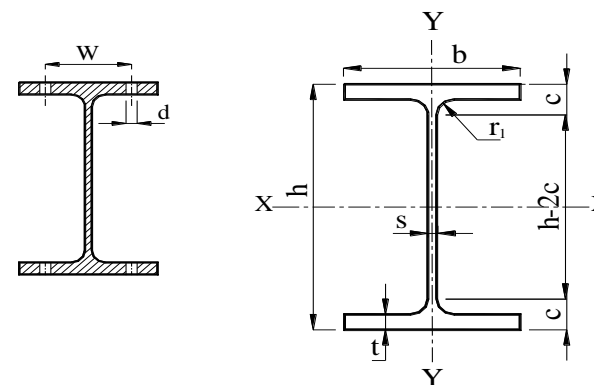


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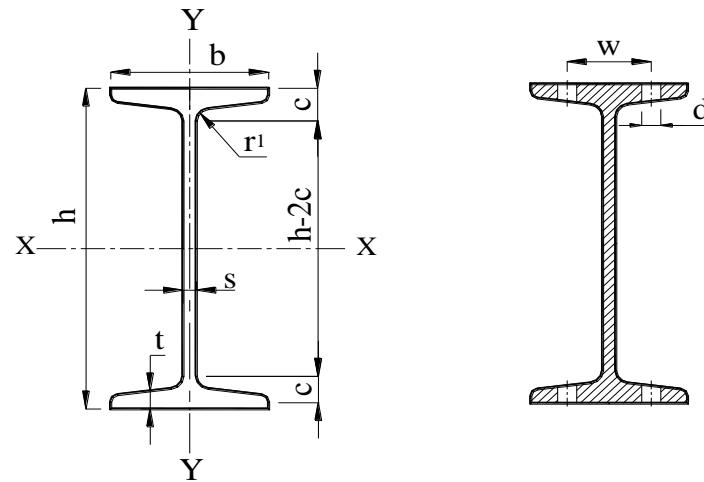


Sec. No.	Weight kg/m`	Area cm <sup>2</sup>	A <sub>web</sub> cm <sup>2</sup>	Dimensions							Axis X-X			Axis Y-Y			Details		Surface Area	
				h mm	b mm	s mm	t mm	r <sub>1</sub> mm	c mm	h-2c mm	I <sub>x</sub> cm <sup>4</sup>	S <sub>x</sub> cm <sup>3</sup>	r <sub>x</sub> cm	I <sub>y</sub> cm <sup>4</sup>	S <sub>y</sub> cm <sup>3</sup>	r <sub>y</sub> cm	w mm	d <sub>max</sub> mm	U <sub>m</sub> x10 <sup>-2</sup> m <sup>2</sup> /m <sup>1</sup>	U <sub>t</sub> m <sup>2</sup> /t
80	6.00	7.64	2.64	80	46	3.8	5.2	5	10.2	59.6	80.1	20.0	3.24	8.49	3.69	1.05	N.A.	N.A.	32.80	54.80
100	8.10	10.30	3.63	100	55	4.1	5.7	7	12.7	74.6	171	34.2	4.07	15.9	5.79	1.24	N.A.	N.A.	40.00	49.50
120	10.40	13.20	4.73	120	64	4.4	6.3	7	13.3	93.4	318	53.0	4.90	27.7	8.65	1.45	36	M10	47.50	45.60
140	12.90	16.40	5.93	140	73	4.7	6.9	7	13.9	112.2	541	77.3	5.74	44.9	12.3	1.65	38	M10	55.10	42.60
160	15.80	20.10	7.26	160	82	5.0	7.4	9	16.4	127.2	869	109	6.58	68.3	16.7	1.84	44	M12	62.30	39.40
180	18.80	23.90	8.69	180	91	5.3	8.0	9	17.0	146.0	1320	146	7.42	101	22.2	2.05	50	M12	69.80	37.10
200	22.40	28.50	10.25	200	100	5.6	8.5	12	20.5	159.0	1940	194	8.26	142	28.5	2.24	56	M12	76.80	34.30
220	26.20	33.40	11.89	220	110	5.9	9.2	12	21.2	177.6	2770	252	9.11	205	37.3	2.48	60	M16	84.80	32.40
240	30.70	39.10	13.66	240	120	6.2	9.8	15	24.8	190.4	3890	324	9.97	284	47.3	2.69	68	M16	92.20	30.00
270	36.10	45.90	16.47	270	135	6.6	10.2	15	25.2	219.6	5790	429	11.20	420	62.2	3.02	72	M20	104.00	28.80
300	42.20	53.80	19.78	300	150	7.1	10.7	15	25.7	248.6	8360	557	12.50	604	80.5	3.35	80	M20	116.00	27.50
330	49.10	62.60	23.03	330	160	7.5	11.5	18	29.5	271.0	11770	713	13.70	788	98.5	3.55	86	M24	125.00	25.50
360	57.10	72.70	26.77	360	170	8.0	12.7	18	30.7	298.6	16270	904	15.00	1040	123	3.79	90	M24	135.00	23.60
400	66.30	84.50	32.08	400	180	8.6	13.5	21	34.5	331.0	23130	1160	16.50	1320	146	3.95	96	M27	147.00	22.20
450	77.60	98.80	39.56	450	190	9.4	14.6	21	35.6	378.8	33740	1500	18.50	1680	176	4.12	106	M27	161.00	20.70
500	90.70	116.00	47.74	500	200	10.2	16.0	21	37.0	426.0	48200	1930	20.40	2140	214	4.31	110	M27	174.00	19.20
550	106.00	134.00	57.23	550	210	11.1	17.2	24	41.2	467.6	67120	2440	22.30	2670	254	4.45	120	M27	188.00	17.70
600	122.00	156.00	67.44	600	220	12.0	19.0	24	43.0	514.0	92080	3070	24.30	3390	308	4.66	120	M27	202.00	16.60

N.A.=not available for this IPE size

Eng. Amr Ahmed





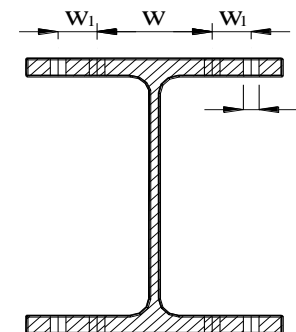
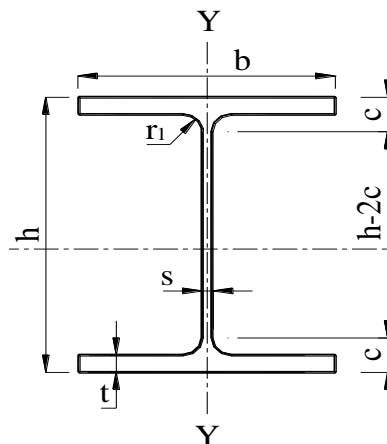
# STANDARD I-BEAMS ( I.P.N. )

Sec. No.	Weight kg/m <sup>1</sup>	Area cm <sup>2</sup>	A <sub>web</sub> cm <sup>2</sup>	Dimensions						Axis X-X			Axis Y-Y			Details		Surface Area	
				h mm	b mm	s=r <sub>1</sub> mm	t mm	c mm	h-2c mm	I <sub>x</sub> cm <sup>4</sup>	S <sub>x</sub> cm <sup>3</sup>	r <sub>x</sub> cm	I <sub>y</sub> cm <sup>4</sup>	S <sub>y</sub> cm <sup>3</sup>	r <sub>y</sub> cm	w mm	d <sub>max</sub> mm	U <sub>m</sub> x10 <sup>-2</sup> m <sup>2</sup> /m <sup>1</sup>	U <sub>t</sub> m <sup>2</sup> /t
80	5.94	7.57	2.66	80	42	3.9	5.9	10.5	59	77.8	19.5	3.20	6.29	3.00	0.91	N.A.		30.40	51.20
100	8.34	10.60	3.89	100	50	4.5	6.8	12.5	75	171	34.2	4.01	12.2	4.88	1.07	N.A.		37.00	44.40
120	11.10	14.20	5.33	120	58	5.1	7.7	14	92	328	54.7	4.81	21.5	7.41	1.23	N.A.		43.90	39.50
140	14.30	18.20	7.00	140	66	5.7	8.6	15.5	109	573	81.9	5.61	35.2	10.7	1.40	34	M10	50.20	35.10
160	17.90	22.80	8.88	160	74	6.3	9.5	17.5	125	935	117	6.40	54.7	14.8	1.55	40	M10	57.50	32.10
180	21.90	27.90	10.98	180	82	6.9	10.4	19	142	1450	161	7.20	81.3	19.8	1.71	44	M12	64.00	29.20
200	26.20	33.40	13.31	200	90	7.5	11.3	20.5	159	2140	214	8.00	117	26.0	1.87	48	M12	70.90	27.00
220	31.10	39.50	15.84	220	98	8.1	12.2	22	176	3060	278	8.80	162	33.1	2.02	52	M12	77.50	24.90
240	36.20	46.10	18.60	240	106	8.7	13.1	24	192	4250	354	9.59	221	41.7	2.20	56	M16	84.40	23.30
260	41.90	53.30	21.79	260	113	9.4	14.1	26	208	5740	442	10.40	288	51.0	2.32	60	M16	90.60	21.60
280	47.90	61.00	25.21	280	119	10.1	15.2	27.5	225	7590	542	11.10	364	61.2	2.45	60	M16	96.60	20.10
300	54.20	69.00	28.90	300	125	10.8	16.2	29.5	241	9800	653	11.90	451	72.2	2.56	64	M20	103.00	19.00
320	61.00	77.70	32.82	320	131	11.5	17.3	31	258	12510	782	12.70	555	84.7	2.67	70	M20	109.00	17.90
340	68.00	86.70	37.01	340	137	12.2	18.3	33	274	15700	923	13.50	674	98.4	2.80	74	M20	115.00	16.90
360	76.10	97.00	41.73	360	143	13	19.5	35	290	19610	1090	14.20	818	114	2.90	76	M20	121.00	15.90
380	84.00	107.00	46.44	380	149	13.7	20.5	37	306	24010	1260	15.00	975	131	3.02	82	M20	127.00	15.10
400	92.40	118.00	51.38	400	s	14.4	21.6	38.5	323	29210	1460	15.70	1160	149	3.13	86	M20	133.00	14.40
425	104.00	132.00	57.99	425	163	15.3	23	41	343	36970	1740	16.70	1440	176	3.30	88	M20	144.40	13.50
450	115.00	147.00	65.03	450	170	16.2	24.3	43.5	363	45850	2040	17.70	1730	203	3.43	94	M24	148.00	12.90
475	128.00	163.00	72.47	475	178	17.1	25.6	45.5	384	56480	2380	18.60	2090	235	3.60	100	M24	155.10	12.11
500	141.00	179.00	80.28	500	185	18	27	48	404	68740	2750	19.60	2480	268	3.72	100	M27	163.00	11.50
550	166.00	212.00	93.10	550	200	19	30	52.5	445	99180	3610	21.60	3490	349	4.02	110	M27	177.30	10.68
600	199.00	254.00	115.60	600	215	21.6	32.4	57.5	485	1E+05	4630	23.40	4670	434	4.30	120	M27	191.90	9.64

N.A.=not available for this IPN size



# BROAD FLANGE I - BEAMS ( H.E.A. )



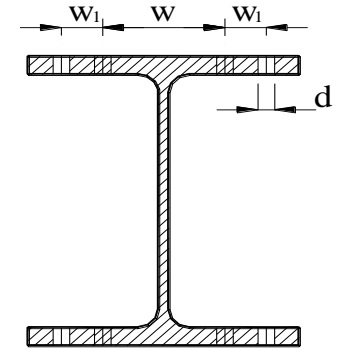
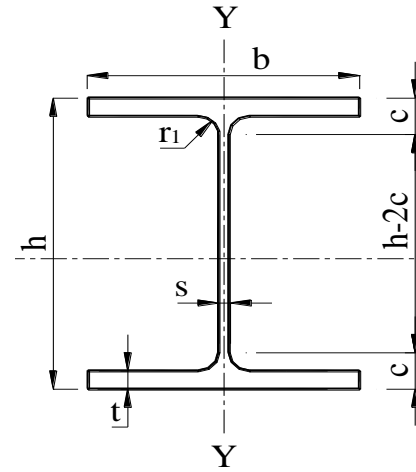
Sec. No.	Weight kg/m`	Area cm <sup>2</sup>	A <sub>web</sub> cm <sup>2</sup>	Dimensions							Axis X-X			Axis Y-Y			Details			Surface Area	
				h mm	b mm	s mm	t mm	r <sub>1</sub> mm	c mm	h-2c mm	I <sub>x</sub> cm <sup>4</sup>	S <sub>x</sub> cm <sup>3</sup>	r <sub>x</sub> cm	I <sub>y</sub> cm <sup>4</sup>	S <sub>y</sub> cm <sup>3</sup>	r <sub>y</sub> cm	w mm	w <sub>1</sub> mm	d <sub>max</sub> mm	U <sub>m</sub> x10 <sup>-2</sup> m <sup>2</sup> /m <sup>1</sup>	U <sub>t</sub> m <sup>2</sup> /t
100	16.7	21.2	4.00	96	100	5.0	8.0	12	20	56	349	73	4.06	134	26.8	2.51	56	N.A.	M12	56.10	33.60
120	19.9	25.3	4.90	114	120	5.0	8.0	12	20	74	606	106	4.89	231	38.5	3.02	66	N.A.	M16	67.70	34.00
140	24.7	31.4	6.38	133	140	5.5	8.5	12	21	91	1030	155	5.73	389	55.6	3.52	76	N.A.	M20	79.40	32.10
160	30.4	38.8	8.04	152	160	6.0	9.0	15	24	104	1670	220	6.57	616	76.9	3.98	86	N.A.	M20	90.60	29.80
180	35.5	45.3	9.12	171	180	6.0	9.5	15	25	121	2510	294	7.45	925	103	4.52	100	N.A.	M24	102.00	28.70
200	42.3	53.8	11.05	190	200	6.5	10.0	18	28	134	3690	389	8.28	1340	134	4.98	110	N.A.	M24	114.00	26.90
220	50.5	64.3	13.16	210	220	7.0	11.0	18	29	152	5410	515	9.17	1950	178	5.51	120	N.A.	M24	126.00	24.90
240	60.3	76.8	15.45	230	240	7.5	12.0	21	33	164	7760	675	10.10	2770	231	6.00	90	40	M24	137.00	22.70
260	68.2	86.8	16.88	250	260	7.5	12.5	24	37	176	10450	836	11.00	3670	282	6.50	95	40	M24	148.00	21.70
280	76.4	97.3	19.52	270	280	8.0	13.0	24	37	196	13670	1010	11.90	4760	340	7.00	110	40	M24	160.00	21.00
300	88.3	113	22.27	290	300	8.5	14.0	27	41	208	18260	1260	12.70	6310	421	7.49	120	50	M27	172.00	19.50
320	97.6	124	25.11	310	300	9.0	15.5	27	43	224	22930	1480	13.60	6990	466	7.49	120	50	M27	176.00	18.00
340	105	133	28.22	330	300	9.5	16.5	27	44	242	27690	1680	14.40	7440	496	7.46	120	50	M27	179.00	17.10
360	112	143	31.50	350	300	10.0	17.5	27	45	260	33090	1890	15.20	7890	526	7.43	120	50	M27	183.00	16.40
400	125	159	38.72	390	300	11.0	19.0	27	46	298	45070	2310	16.80	8560	571	7.34	120	50	M27	191.00	15.30
450	140	178	45.77	440	300	11.5	21.0	27	48	344	63720	2900	18.90	9470	631	7.29	120	50	M27	201.00	14.40
500	155	198	53.28	490	300	12.0	23.0	27	50	390	86970	3550	21.00	10370	691	7.24	120	50	M27	211.00	13.60
550	166	212	61.50	540	300	12.5	24.0	27	51	438	1E+05	4150	23.00	10820	721	7.15	120	50	M27	221.00	13.30
600	178	226	70.20	590	300	13.0	25.0	27	52	486	1E+05	4790	25.00	11270	751	7.05	120	50	M27	231.00	13.00
650	190	242	79.38	640	300	13.5	26.0	27	53	534	2E+05	5470	26.90	11720	782	6.97	120	50	M27	241.00	12.70
700	204	260	92.22	690	300	14.5	27.0	27	54	582	2E+05	6240	28.80	12180	812	6.84	120	50	M27	250.00	12.30
800	224	286	110.10	790	300	15.0	28.0	30	58	674	3E+05	7680	32.60	12640	843	6.65	120	50	M27	270.00	12.00
900	252	321	132.80	890	300	16.0	30.0	30	60	770	4E+05	9480	36.30	13550	903	6.50	120	50	M27	290.00	11.50
1000	272	347	153.12	990	300	16.5	31.0	30	61	868	6E+05	11190	40.00	14000	934	6.35	120	50	M27	310.00	11.40

N.A. =not available for this HEA size

Eng. Amr Ahmed



# BROAD FLANGE I - BEAMS ( H.E.B. )



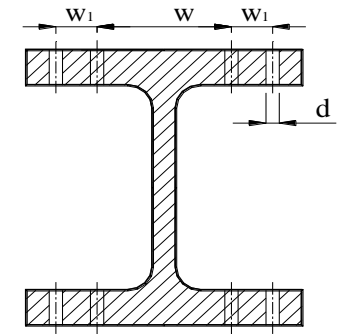
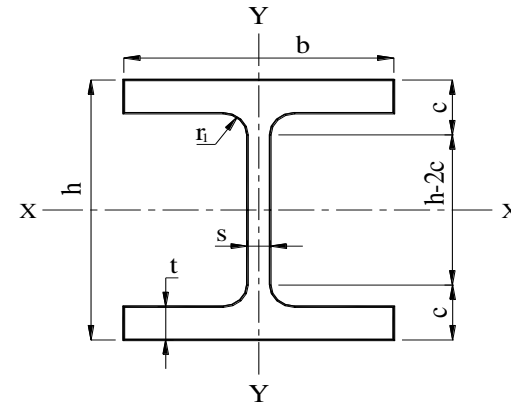
Sec. No.	Weight kg/m	Area cm <sup>2</sup>	A <sub>web</sub> cm <sup>2</sup>	Dimensions							Axis X-X			Axis Y-Y			Details			Surface Area	
				h mm	b mm	s mm	t mm	r <sub>1</sub> mm	c mm	h-2c mm	I <sub>x</sub> cm <sup>4</sup>	S <sub>x</sub> cm <sup>3</sup>	r <sub>x</sub> cm	I <sub>y</sub> cm <sup>4</sup>	S <sub>y</sub> cm <sup>3</sup>	r <sub>y</sub> cm	w mm	w <sub>1</sub> mm	d <sub>max</sub> mm	U <sub>m</sub> x10 <sup>-2</sup> m <sup>2</sup> /m	U <sub>t</sub> m <sup>2</sup> /t
100	20.4	26.0	4.80	100	100	6.0	10.0	12	22.0	56	450	89.9	4.16	167	33.5	2.53	56	N.A.	M12	56.70	27.80
120	26.7	34.0	6.37	120	120	6.5	11.0	12	23.0	74	864	144	5.04	318	52.9	3.06	66	N.A.	M16	68.60	25.70
140	33.7	43.0	8.12	140	140	7.0	12.0	12	24.0	92	1510	216	5.93	550	78.5	3.58	76	N.A.	M20	80.50	23.80
160	42.6	54.3	10.72	160	160	8.0	13.0	15	28.0	104	2490	311	6.78	889	111	4.05	86	N.A.	M20	91.80	21.50
180	51.2	65.3	12.92	180	180	8.5	14.0	15	29.0	122	3830	426	7.66	1360	151	4.57	100	N.A.	M24	104.00	20.30
200	61.3	78.1	15.30	200	200	9.0	15.0	18	33.0	134	5700	570	8.54	2000	200	5.07	110	N.A.	M24	115.00	18.80
220	71.5	91.0	17.86	220	220	9.5	16.0	18	34.0	152	8090	736	9.43	2840	258	5.59	120	N.A.	M24	127.00	17.80
240	83.2	106	20.60	240	240	10.0	17.0	21	38.0	164	11260	938	10.30	3920	327	6.08	90	40	M20	138.00	16.60
260	93.0	118	22.50	260	260	10.0	17.5	24	41.5	177	14920	1150	11.20	5130	395	6.58	95	40	M20	150.00	16.10
280	103	131	25.62	280	280	10.5	18.0	24	42.0	196	19270	1380	12.10	6590	471	7.09	110	40	M20	162.00	15.70
300	117	149	28.82	300	300	11.0	19.0	27	46.0	208	25170	1680	13.00	8560	571	7.58	120	50	M24	173.00	14.80
320	127	161	32.09	320	300	11.5	20.5	27	47.5	225	30820	1930	13.80	9240	616	7.57	120	50	M24	177.00	13.90
340	134	171	35.64	340	300	12.0	21.5	27	48.5	243	36660	2160	14.60	9690	646	7.53	120	50	M24	181.00	13.50
360	142	181	39.38	360	300	12.5	22.5	27	49.5	261	43190	2400	15.50	10140	676	7.49	120	50	M24	185.00	13.00
400	155	198	47.52	400	300	13.5	24.0	27	51.0	298	57680	2880	17.10	10820	721	7.40	120	50	M24	193.00	12.40
450	171	218	55.72	450	300	14.0	26.0	27	53.0	344	79890	3550	19.10	11720	781	7.33	120	50	M24	203.00	11.90
500	187	239	64.38	500	300	14.5	28.0	27	55.0	390	107200	4290	21.20	12620	842	7.27	120	50	M24	212.00	11.30
550	199	254	73.80	550	300	15.0	29.0	27	56.0	438	136700	4970	23.20	13080	872	7.17	120	50	M24	222.00	12.20
600	212	270	83.70	600	300	15.5	30.0	27	57.0	486	171000	5700	25.20	13530	902	7.08	120	50	M24	232.00	11.00
650	225	286	94.08	650	300	16.0	31.0	27	58.0	534	210600	6480	27.10	13980	932	6.99	120	50	M24	242.00	10.80
700	241	306	108.1	700	300	17.0	32.0	27	59.0	582	256900	7340	29.00	14440	963	6.87	120	50	M24	252.00	10.50
800	262	334	128.5	800	300	17.5	33.0	30	63.0	674	359100	9890	32.80	14900	994	6.68	120	50	M24	271.00	10.40
900	291	371	153.6	900	300	18.5	35.0	30	65.0	770	494100	10980	36.50	15820	1050	6.53	120	50	M24	291.00	10.00
1000	314	400	176.3	1000	300	19.0	36.0	30	66.0	868	644700	12890	40.10	16280	1090	6.38	120	50	M24	311.00	9.90

N.A.=not available for this HEB size

Eng. Amr Ahmed



# BROAD FLANGE I - BEAMS ( H.E.M. )



Sec. No.	Weight kg/m	Area cm <sup>2</sup>	A <sub>web</sub> cm <sup>2</sup>	Dimensions							Axis X-X			Axis Y-Y			Details			Surface Area	
				h mm	b mm	s mm	t mm	r <sub>1</sub> mm	c mm	h-2c mm	I <sub>x</sub> cm <sup>4</sup>	S <sub>x</sub> cm <sup>3</sup>	r <sub>x</sub> cm	I <sub>y</sub> cm <sup>4</sup>	S <sub>y</sub> cm <sup>3</sup>	r <sub>y</sub> cm	w mm	w <sub>1</sub> mm	d <sub>max</sub> mm	U <sub>m</sub> x10 <sup>-2</sup> m <sup>2</sup> /m	U <sub>t</sub> m <sup>2</sup> /ft
100	41.8	53.2	9.60	120	106	12	20	12	32	56	1140	190	4.63	400	75.3	2.74	60	N.A.	M12	61.90	14.80
120	52.1	66.4	12.25	140	126	12.5	21	12	33	74	2020	288	5.51	700	112	3.25	68	N.A.	M16	73.80	14.20
140	63.2	80.6	15.08	160	146	13	22	12	34	92	3290	411	6.39	1140	157	3.77	76	N.A.	M20	85.70	13.60
160	76.2	97.1	18.76	180	166	14	23	15	38	104	5100	566	7.25	1760	212	4.26	86	N.A.	M20	97.00	12.70
180	88.9	113	22.04	200	186	14.5	24	15	39	122	7480	748	8.13	2580	277	4.77	100	N.A.	M24	109.00	12.30
200	103	131	25.50	220	206	15	25	18	43	134	10640	967	9.00	3650	354	5.27	110	N.A.	M24	120.00	11.70
220	117	149	29.14	240	226	15.5	26	18	44	152	14600	1220	9.89	5010	444	5.79	120	N.A.	M24	132.00	11.30
240	157	200	37.08	270	248	18	32	21	53	164	24290	1800	11.00	8150	657	6.39	100	40	M20	146.00	9.30
260	172	220	40.50	290	268	18	32.5	24	57	176	31310	2160	11.90	10450	780	6.90	110	40	M20	157.00	9.13
280	189	240	22.76	310	288	18.5	33	24	66	196	39550	2550	12.80	13160	914	7.40	116	40	M20	169.00	8.94
300	238	303	55.02	340	310	21	39	27	67	208	59200	3480	14.00	19400	1250	8.00	120	50	M24	183.00	7.70
320	245	312	58.59	359	309	21	40	27	67	225	68130	3800	14.80	19710	1280	7.95	126	50	M24	187.00	7.63
340	248	316	62.37	377	309	21	40	27	67	243	76370	4050	15.60	19710	1280	7.90	126	50	M24	190.00	7.67
360	250	319	66.15	395	308	21	40	27	67	261	84870	4300	16.30	19520	1270	7.83	126	50	M24	193.00	7.77
400	256	326	73.92	432	307	21	40	27	67	298	104100	4820	17.90	19340	1260	7.70	126	50	M24	200.00	7.81
450	263	335	83.58	478	307	21	40	27	67	344	131500	5500	19.80	19340	1260	7.59	126	50	M24	210.00	7.97
500	270	344	93.24	524	306	21	40	27	67	390	161900	6180	21.70	19150	1250	7.46	130	50	M24	218.00	8.07
550	278	354	103.32	572	306	21	40	27	67	438	198000	6920	23.60	19150	1250	7.35	130	50	M24	228.00	8.20
600	285	364	113.40	620	305	21	40	27	67	486	237400	7660	25.60	18980	1240	7.22	130	50	M24	237.00	8.32
650	293	374	123.48	668	305	21	40	27	67	534	281700	8430	27.50	18980	1240	7.13	130	50	M24	247.00	8.42
700	301	383	133.56	716	304	21	40	27	67	582	329300	9200	29.30	18800	1240	7.01	130	50	M24	256.00	8.50
800	317	404	154.14	814	303	21	40	30	70	674	442600	10870	33.10	18630	1230	6.79	132	50	M24	275.00	8.66
900	333	424	174.30	910	302	21	40	30	70	770	570400	12540	36.70	18450	1220	6.60	132	50	M24	293.00	8.80
1000	349	444	194.88	1008	302	21	40	30	70	868	722300	14330	40.30	18450	1220	6.45	132	50	M24	313.00	8.97

N.A.=not available for this HEM size

Eng. Amr Ahmed