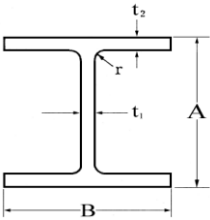


Wide Flange Shapes (Inch Series)

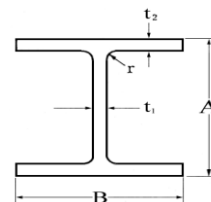


Series Designation and Nominal Depth	Weight		Area of Section		Depth of Section (A)		Flange				Web Thickness (t ₁)	
							Width (B)		Thickness (t ₂)			
in	lbs/ft	kg/m	in ²	cm ²	in	mm	in	mm	in	mm	in	mm
W36 36 X 16½	300	446,4	88,3	569,7	36,74	933,2	16,655	423,0	1,680	42,67	0,945	24,00
	280	416,7	82,4	531,6	36,52	927,6	16,595	421,5	1,570	39,88	0,885	22,48
	260	386,9	76,5	493,5	36,26	921,0	16,550	420,4	1,440	36,58	0,840	21,34
	245	364,6	72,1	465,2	36,08	916,4	16,510	419,4	1,350	34,29	0,800	20,32
	230	342,3	67,6	436,1	35,90	911,9	16,470	418,3	1,260	32,00	0,760	19,30
W36 36 X 12	210	312,5	61,8	398,7	36,69	931,9	12,180	309,4	1,360	34,54	0,830	21,08
	194	288,7	57,0	367,7	36,49	926,8	12,115	307,7	1,260	32,00	0,765	19,43
	182	270,8	53,6	345,8	36,33	922,8	12,075	306,7	1,180	29,97	0,725	18,42
	170	253,0	50,0	322,6	36,17	918,7	12,030	305,6	1,100	27,94	0,680	17,27
	160	238,1	47,0	303,2	36,01	914,7	12,000	304,8	1,020	25,91	0,650	16,51
	150	223,2	44,2	285,2	35,85	910,6	11,975	304,2	0,940	23,88	0,625	15,88
	135	200,9	39,7	256,1	35,55	903,0	11,950	303,5	0,790	20,07	0,600	15,24
W33 33 X 15¾	241	358,6	70,9	457,4	34,18	868,2	15,860	402,8	1,400	35,56	0,830	21,08
	221	328,9	65,0	419,4	33,93	861,8	15,805	401,4	1,275	32,38	0,775	19,68
	201	299,1	59,1	381,3	33,68	855,5	15,745	399,9	1,150	29,21	0,715	18,16
W33 33 X 11½	152	226,2	44,7	288,4	33,49	850,6	11,565	293,8	1,055	26,80	0,635	16,13
	141	209,8	41,6	268,4	33,30	845,8	11,535	293,0	0,960	24,38	0,605	15,37
	130	193,5	38,3	247,1	33,09	840,5	11,510	292,4	0,855	21,72	0,580	14,73
	118	175,6	34,7	223,9	32,86	834,6	11,480	291,6	0,740	18,80	0,550	13,97
W30 30 X 15	211	314,0	62,0	400,0	30,94	785,9	15,105	383,7	1,315	33,40	0,775	19,68
	191	284,2	56,1	361,9	30,68	779,2	15,040	382,0	1,185	30,10	0,710	18,03
	173	257,5	50,8	327,7	30,44	773,2	14,985	380,6	1,065	27,05	0,655	16,64
W30 30 X 10½	132	196,4	38,9	251,0	30,31	769,9	10,545	267,8	1,000	25,40	0,615	15,62
	124	184,5	36,5	235,5	30,17	766,3	10,515	267,1	0,930	23,62	0,585	14,86
	116	172,6	34,2	220,6	30,01	762,3	10,495	266,6	0,850	21,59	0,565	14,35
	108	160,7	31,7	204,5	29,83	757,7	10,475	266,1	0,760	19,30	0,545	13,84
	99	147,3	29,1	187,7	29,65	753,1	10,450	265,4	0,670	17,02	0,520	13,21
W27 27 X 14	178	264,9	52,3	337,4	27,81	706,4	14,085	357,8	1,190	30,23	0,725	18,42
	161	239,6	47,4	505,8	27,59	700,8	14,020	356,1	1,080	27,43	0,660	16,76
	146	217,3	42,9	276,8	27,38	695,5	13,965	354,7	0,975	24,76	0,605	15,37
W27 27 X 10	114	169,7	33,5	216,1	27,29	693,2	10,070	255,8	0,930	23,62	0,570	14,48
	102	151,8	30,0	193,5	27,09	688,1	10,015	254,4	0,830	21,08	0,515	13,08
	94	139,9	27,7	178,7	26,92	683,8	9,990	253,7	0,745	18,92	0,490	12,45
	84	125,0	24,8	160,0	26,71	678,4	9,960	253,0	0,640	16,26	0,460	11,68
W24 24 X 12¾	162	241,1	47,7	307,7	25,00	635,0	12,955	329,1	1,220	30,99	0,705	17,91
	146	217,3	43,0	277,4	24,74	628,4	12,900	327,7	1,090	27,69	0,650	16,51
	131	194,9	38,5	248,4	24,48	621,8	12,855	326,5	0,960	24,38	0,605	15,37
	117	174,1	34,4	221,9	24,26	616,2	12,800	325,1	0,850	21,59	0,550	13,97
	104	154,8	30,6	197,4	24,06	611,1	12,750	323,8	0,750	19,05	0,500	12,70

Corner Radius (r)		Moment of Inertia				Radius of Gyration				Modulus of Section			
		Jx		Jy		ix		iy		Zx		Zy	
in	mm	in ⁴	cm ⁴	in ⁴	cm ⁴	in	cm	in	cm	in ³	cm ³	in ³	cm ³
0,95	24,1	20.300	845.000	1.300	54.100	15,2	38,6	3,83	9,73	1.110	18.200	156,0	2.560
		18.900	787.000	1.200	49.900	15,1	38,4	3,81	9,68	1.030	16.900	144,0	2.360
		17.300	720.000	1.090	45.400	15,0	38,1	3,78	9,60	953	15.600	132,0	2.160
		16.100	670.000	1.010	42.000	15,0	38,1	3,75	9,52	895	14.700	123,0	2.020
		15.000	624.000	940	39.100	14,9	37,8	3,73	9,47	837	13.700	114,0	1.870
0,75	19,0	13.200	549.000	411	17.100	14,6	37,1	2,58	6,55	719	11.800	67,5	1.110
		12.100	504.000	375	15.600	14,6	37,1	2,56	6,50	664	10.900	61,9	1.010
		11.300	470.000	347	14.400	14,5	36,8	2,55	6,48	623	10.200	57,6	944
		10.500	437.000	320	13.300	14,5	36,8	2,53	6,43	580	9.500	53,2	872
		9.750	406.000	295	12.300	14,4	36,6	2,5	6,35	542	8.880	49,1	805
		9.040	376.000	270	11.200	14,3	36,3	2,47	6,27	504	8.260	45,1	739
		7.800	325.000	225	9.370	14,0	35,6	2,38	6,05	439	7.190	37,7	618
0,7	17,8	14.200	591.000	932	38.800	14,1	35,8	3,63	9,22	829	13.600	118,0	1.930
		12.800	533.000	840	35.000	14,1	35,8	3,59	9,12	757	12.400	106,0	1.740
		11.500	479.000	749	31.200	14,0	35,6	3,56	9,04	684	11.200	95,2	1.560
0,7	17,8	8.160	340.000	273	11.400	13,5	34,3	2,47	6,27	487	7.980	47,2	773
		7.450	310.000	246	10.200	13,4	34,0	2,43	6,17	448	7.340	42,7	700
		6.710	279.000	218	9.070	13,2	33,5	2,39	6,07	406	6.650	37,9	621
		5.900	246.000	187	7.780	13,0	33,0	2,32	5,89	359	5.580	32,6	534
0,65	16,5	10.300	429.000	757	31.500	12,9	32,8	3,49	8,86	663	10.900	100,0	1.640
		9.170	382.000	673	28.000	12,8	32,5	3,46	8,79	598	9.800	89,5	1.470
		8.200	341.000	598	24.900	12,7	32,3	3,43	8,71	539	8.830	79,8	1.310
0,65	16,5	5.770	240.000	196	8.160	12,2	31,0	2,25	5,72	380	6.230	37,2	610
		5.360	223.000	181	7.530	12,1	30,7	2,23	5,66	355	5.820	34,4	564
		4.930	205.000	164	6.830	12,0	30,5	2,19	5,56	329	5.390	31,3	513
		4.470	186.000	146	6.080	11,9	30,2	2,15	5,46	299	4.900	27,9	457
		3.990	166.000	128	5.330	11,7	29,7	2,1	5,33	269	4.410	24,5	401
0,6	15,2	6.990	291.000	555	23.100	11,6	29,5	3,26	8,28	502	8.230	78,8	1.290
		6.280	261.000	497	20.700	11,5	29,2	3,24	8,23	455	7.460	70,9	1.160
		5.630	234.000	443	18.400	11,4	29,0	3,21	8,15	411	6.740	63,5	1.040
0,6	15,2	4.090	170.000	159	6.620	11,0	27,9	2,18	5,54	299	4.900	31,5	516
		3.620	151.000	139	5.790	11,0	27,9	2,15	5,46	267	4.380	27,8	456
		3.270	136.000	124	5.160	10,9	27,7	2,12	5,38	243	3.980	24,8	406
		2.850	119.000	106	4.410	10,7	27,2	2,07	5,26	213	3.490	21,2	347
0,5	12,7	5.170	215.000	443	18.400	10,4	26,4	3,05	7,75	414	6.780	68,4	1.120
		4.580	191.000	391	16.300	10,3	26,2	3,01	7,65	371	6.080	60,5	991
		4.020	167.000	340	14.200	10,2	25,9	2,97	7,54	329	5.390	53,0	869
		3.540	147.000	297	12.400	10,1	25,7	2,94	7,47	291	4.770	46,5	762
		3.100	129.000	259	10.800	10,1	25,7	2,91	7,39	258	4.230	40,7	667

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Wide Flange Shapes (Inch Series)



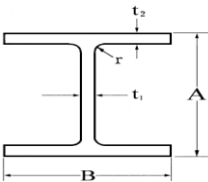
Series Designation and Nominal Depth	Weight		Area of Section		Depth of Section (A)		Flange				Web Thickness (t ₁)	
							Width (B)		Thickness (t ₂)			
in	lbs/ft	kg/m	in ²	cm ²	in	mm	in	mm	in	mm	in	mm
W24 24 X 9	94	139,90	27,7	178,70	24,31	617,5	9,065	230,3	0,875	22,22	0,515	13,08
	84	125,00	24,7	159,40	24,10	612,1	9,020	229,1	0,770	19,56	0,470	11,94
	76	113,10	22,4	144,50	23,92	607,6	8,990	228,3	0,680	17,27	0,440	11,18
	68	101,20	20,1	129,70	23,73	602,7	8,965	227,7	0,585	14,86	0,415	10,54
W24 X 7	62	92,27	18,2	117,40	23,74	603,0	7,040	178,8	0,590	14,99	0,430	10,92
	55	81,85	16,2	104,50	23,57	598,7	7,005	177,9	0,505	12,83	0,395	10,03
W21 21 X 12¼	147	218,80	43,2	278,70	22,06	560,3	12,510	317,8	1,150	29,21	0,720	18,29
	132	196,40	38,8	250,30	21,83	554,5	12,440	316,0	1,035	26,29	0,650	16,51
	122	181,60	35,9	231,60	21,68	550,7	12,390	314,7	0,960	24,38	0,600	15,24
	111	165,20	32,7	211,00	21,51	546,4	12,340	313,4	0,875	22,22	0,550	13,97
	101	150,30	29,8	192,30	21,36	542,5	12,290	312,2	0,800	20,32	0,500	12,70
W21 21 X 8¾	93	138,40	27,3	176,10	21,62	549,1	8,420	213,9	0,930	23,62	0,580	14,73
	83	123,50	24,3	156,80	21,43	544,3	8,355	212,2	0,835	21,21	0,515	13,08
	73	108,60	21,5	138,70	21,24	539,5	8,295	210,7	0,740	18,80	0,455	11,56
	68	101,20	20,0	129,00	21,13	536,7	8,270	210,1	0,685	17,40	0,430	10,92
	62	92,27	18,3	118,10	20,99	533,1	8,240	209,3	0,615	15,62	0,400	10,16
W21 X 6½	57	84,83	16,7	107,70	21,06	534,9	6,555	166,5	0,650	16,51	0,405	10,29
	50	74,41	14,7	94,84	20,83	529,1	6,530	165,9	0,535	13,59	0,380	9,65
	44	65,48	13,0	83,87	20,66	524,8	6,500	165,1	0,450	11,43	0,350	8,89
W18 18 X11	119	177,10	35,1	226,50	18,97	481,8	11,265	286,1	1,060	26,92	0,655	16,64
	106	157,70	31,1	200,60	18,73	475,7	11,200	284,5	0,940	23,88	0,590	14,99
	97	144,40	28,5	183,90	18,59	472,2	11,145	283,1	0,870	22,10	0,535	13,59
	86	128,00	25,3	163,20	18,39	467,1	11,090	281,7	0,770	19,56	0,480	12,19
	76	113,10	22,3	143,90	18,21	462,5	11,035	280,3	0,680	17,27	0,425	10,80
W18 18 X7½	71	105,70	20,8	134,20	18,47	469,1	7,635	193,9	0,810	20,57	0,495	12,57
	65	96,73	19,1	123,20	18,35	466,1	7,590	192,8	0,750	19,05	0,450	11,43
	60	89,29	17,6	113,50	18,24	463,3	7,555	191,9	0,695	17,65	0,415	10,54
	55	81,85	16,2	104,50	18,11	460,0	7,530	191,3	0,630	16,00	0,390	9,91
	50	74,41	14,7	94,84	17,99	456,9	7,495	190,4	0,570	14,48	0,355	9,02
W18 X 6	46	68,46	13,5	87,10	18,06	458,7	6,060	153,9	0,605	15,37	0,360	9,14
	40	59,53	11,8	78,13	17,90	454,7	6,015	152,8	0,525	13,34	0,315	8,00
	35	52,09	10,3	66,45	17,70	449,6	6,000	152,4	0,425	10,80	0,300	7,62
W16 16 X 10¼	100	148,80	29,4	189,70	16,97	431,0	10,425	264,8	0,985	25,02	0,585	14,86
	89	132,40	26,2	169,00	16,75	425,4	10,365	263,3	0,875	22,22	0,525	13,33
	77	114,60	22,6	145,80	16,52	419,6	10,295	261,5	0,760	19,30	0,455	11,56
	67	99,71	19,7	127,10	16,33	414,8	10,235	260,0	0,665	16,89	0,395	10,03
W16 16 X7	57	84,83	16,8	108,40	16,43	417,3	7,120	180,8	0,715	18,16	0,430	10,92
	50	74,41	14,7	94,84	16,26	413,0	7,070	179,6	0,630	16,00	0,380	9,65
	45	66,97	13,3	85,81	16,13	409,7	7,035	178,7	0,565	14,35	0,345	8,76
	40	59,53	11,8	76,13	16,01	406,7	6,995	177,7	0,505	12,83	0,305	7,75
	36	53,57	10,6	68,39	15,86	402,8	6,985	177,4	0,430	10,92	0,295	7,49

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Corner Radius (r)		Moment of Inertia				Radius of Gyration				Modulus of Section			
		Jx		Jy		ix		iy		Zx		Zy	
in	mm	in ⁴	cm ⁴	in ⁴	cm ⁴	in	cm	in	cm	in ³	cm ³	in ³	cm ³
0,50	12,7	2.700	112.000	109,0	4.540	9,87	25,1	1,98	5,03	222,0	3.640	24,00	393
		2.370	98.600	94,4	3.930	9,79	24,9	1,95	4,95	196,0	3.210	20,90	342
		2.100	87.400	82,5	2.430	9,69	24,6	1,92	4,88	176,0	2.880	18,40	302
		1.830	76.200	70,4	2.930	9,55	24,3	1,87	4,75	154,0	2.520	15,70	257
0,50	12,7	1.550	64.500	34,5	1.440	9,23	23,4	1,38	3,51	131,0	2.150	9,80	161
		1.350	56.200	29,1	1.210	9,11	23,1	1,34	3,40	114,0	1.870	8,30	136
0,50	12,7	3.630	151.000	376,0	15.700	9,17	23,3	2,95	7,49	329,0	5.390	60,10	985
		3.220	134.000	333,0	13.900	9,12	23,2	2,93	7,44	295,0	4.830	53,50	877
		2.960	123.000	305,0	12.700	9,09	23,1	2,92	7,42	273,0	4.470	49,20	806
		2.670	111.000	274,0	11.400	9,05	23,0	2,90	7,37	249,0	4.080	44,50	729
		2.420	101.000	248,0	10.300	9,02	22,9	2,89	7,34	227,0	3.720	40,30	660
0,50	12,7	2.070	86.200	92,9	3.870	8,70	22,1	1,84	4,67	192,0	3.150	22,10	362
		1.830	76.200	81,4	3.390	8,67	22,0	1,83	4,65	171,0	2.800	19,50	320
		1.600	66.600	70,6	2.940	8,64	21,9	1,81	4,60	151,0	2.470	17,00	279
		1.480	61.600	64,7	2.690	8,60	21,8	1,80	4,57	140,0	2.290	15,70	257
		1.330	55.400	57,5	2.390	8,54	21,7	1,77	4,50	127,0	2.080	13,90	228
0,50	12,7	1.170	48.700	30,6	1.270	8,36	21,2	1,35	3,43	111,0	1.820	9,35	153
		984	41.000	24,9	1.040	8,18	20,8	1,30	3,30	94,5	1.550	7,64	125
		843	35.100	20,7	862	8,06	20,5	1,26	3,20	81,6	1.340	6,36	104
0,40	10,2	2.190	91.200	253,0	10.500	7,90	20,1	2,69	6,83	231,0	3.790	44,90	736
		1.910	79.500	220,0	9.160	7,84	19,9	2,66	6,76	204,0	3.340	39,40	646
		1.750	72.800	201,0	8.370	7,82	19,9	2,65	6,73	188,0	3.080	36,10	592
		1.530	63.700	175,0	7.280	7,77	19,7	2,63	6,68	166,0	2.720	31,60	518
		1.330	55.400	152,0	6.330	7,73	19,6	2,61	6,63	146,0	2.390	27,60	452
0,40	10,2	1.170	48.700	60,3	2.510	7,50	19,0	1,70	4,32	127,0	2.080	15,80	259
		1.070	44.500	54,8	2.280	7,49	19,0	1,69	4,29	117,0	1.920	14,40	236
		984	41.000	50,1	2.090	7,47	19,0	1,69	4,29	108,0	1.770	13,30	218
		890	37.000	44,9	1.870	7,41	18,8	1,67	4,24	98,3	1.610	11,90	195
		800	33.300	40,1	1.670	7,38	18,7	1,65	4,19	88,9	1.460	10,70	175
0,40	10,2	712	29.600	22,5	937	7,25	18,4	1,29	3,28	78,8	1.290	7,43	122
		612	25.500	19,1	795	7,21	18,3	1,27	3,23	68,4	1.120	6,35	104
		510	21.200	15,3	637	7,04	17,9	1,22	3,10	57,6	944	5,12	84
0,40	10,2	1.490	62.000	186,0	7.740	7,10	18,0	2,52	6,40	175,0	2.870	35,70	585
		1.300	54.100	163,0	6.780	7,05	17,9	2,49	6,32	155,0	2.540	31,40	515
		1.110	46.200	138,0	5.740	7,00	17,8	2,47	6,27	134,0	2.200	26,90	441
		954	39.700	119,0	4.950	6,96	17,7	2,46	6,25	117,0	1.920	23,20	380
0,40	10,2	758	31.600	43,1	1.790	6,72	17,1	1,60	4,06	92,2	1.510	12,10	198
		659	27.400	37,2	1.550	6,68	17,0	1,59	4,04	81,0	1.330	10,50	172
		586	24.400	32,8	1.370	6,65	16,9	1,57	3,99	72,7	1.190	9,34	153
		518	21.600	28,9	1.200	6,63	16,8	1,57	3,99	64,7	1.060	8,25	135
		448	18.600	24,5	1.020	6,51	16,5	1,52	3,86	56,5	926	7,00	115

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Wide Flange Shapes (Inch Series)

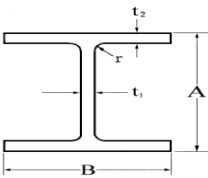


Series Designation and Nominal Depth	Weight		Area of Section		Depth of Section (A)		Flange				Web Thickness (t ₁)	
							Width (B)		Thickness (t ₂)			
in	lbs/ft	kg/m	in ²	cm ²	in	mm	in	mm	in	mm	in	mm
W16 X 5½	31	46,13	9,12	58,84	15,88	403,4	5,525	140,3	0,440	11,18	0,275	6,98
	26	38,69	7,68	49,55	15,69	398,5	5,500	139,7	0,345	8,76	0,250	6,35
W14 14 X 16	730	1086,00	215,00	1387,00	22,42	569,5	17,890	454,4	4,910	124,71	3,070	77,98
	665	989,60	196,00	1265,00	21,64	549,7	17,650	448,3	4,520	114,81	2,830	71,88
	605	900,30	178,00	1148,00	20,92	531,4	17,415	442,3	4,160	105,66	2,595	65,91
	550	818,50	162,00	1045,00	20,24	514,1	17,200	436,9	3,820	97,03	2,380	60,45
	500	744,10	147,00	948,40	19,60	497,8	17,010	432,1	3,500	88,90	2,190	55,63
	455	677,10	134,00	864,50	19,02	483,1	16,835	427,6	3,210	81,53	2,015	51,18
	426	634,00	125,00	806,40	18,67	474,2	16,695	424,1	3,035	77,09	1,875	47,62
	398	592,30	117,00	754,80	18,29	464,6	16,590	421,4	2,845	72,26	1,770	44,96
	370	550,60	109,00	703,20	17,92	455,2	16,475	418,5	2,660	67,56	1,655	42,04
	342	509,00	101,00	651,60	17,54	445,5	16,360	415,5	2,470	62,74	1,540	39,12
	311	462,80	91,40	589,70	17,12	434,8	16,230	412,2	2,260	57,40	1,410	35,81
	283	421,10	83,30	537,40	16,74	425,2	16,110	409,2	2,070	52,58	1,290	32,77
	257	382,50	75,60	487,70	16,38	416,1	15,995	406,3	1,890	48,01	1,175	29,84
	233	346,70	68,50	441,90	16,04	407,4	15,890	403,3	1,720	43,69	1,070	27,18
	211	314,00	62,00	400,00	15,72	399,3	15,800	401,3	1,560	39,62	0,980	24,89
	193	287,20	56,80	366,50	15,48	393,2	15,710	399,0	1,440	36,58	0,890	22,61
	176	261,90	51,80	334,20	15,22	386,6	15,650	397,5	1,310	33,27	0,830	21,08
	159	236,60	46,70	301,30	14,98	380,5	15,565	395,4	1,190	30,23	0,745	18,92
	145	215,80	42,70	275,50	14,78	375,4	15,500	393,7	1,090	27,69	0,680	17,27
W14 14 X 14½	132	196,40	38,80	250,30	14,66	372,4	14,725	374,0	1,030	26,16	0,645	16,38
	120	178,60	35,30	227,70	14,48	367,8	14,670	372,6	0,940	23,88	0,590	14,99
	109	162,20	32,00	206,50	14,32	363,7	14,605	371,0	0,860	21,84	0,525	13,34
	99	147,30	29,10	187,70	14,16	359,7	14,565	370,0	0,780	19,81	0,485	12,32
	90	133,90	26,50	171,00	14,02	356,1	14,520	368,8	0,710	18,03	0,440	11,18
W14 14 X 10	82	122,00	24,10	155,50	14,31	363,5	10,130	257,3	0,855	21,72	0,510	12,95
	74	110,10	21,80	140,60	14,17	359,9	10,070	255,8	0,785	19,94	0,450	11,43
	68	101,20	20,00	129,00	14,04	356,6	10,035	254,9	0,720	18,29	0,415	10,54
	61	90,78	17,90	115,50	13,89	352,8	9,995	253,9	0,645	16,38	0,375	9,52
W14 14 X 8	53	78,87	15,60	100,60	13,92	353,6	8,060	204,7	0,660	16,76	0,370	9,40
	48	71,43	14,10	90,97	13,79	350,3	8,030	204,0	0,595	15,11	0,340	8,64
	43	63,99	12,60	81,29	13,66	347,0	7,995	203,1	0,530	13,46	0,305	7,75
W14 14 X 6¾	38	56,55	11,20	72,26	14,10	358,1	6,770	172,0	0,515	13,08	0,310	7,87
	34	50,60	10,00	64,52	13,98	355,1	6,745	171,3	0,455	11,56	0,285	7,24
	30	44,64	8,85	57,10	13,84	351,5	6,730	170,9	0,385	9,78	0,270	6,86
W14 X 5	26	38,69	7,69	49,61	13,91	353,3	5,025	127,6	0,420	10,67	0,255	6,48
	22	32,74	6,49	41,87	13,74	349,0	5,000	127,0	0,335	8,51	0,230	5,84

Corner Radius (r)		Moment of Inertia				Radius of Gyration				Modulus of Section			
		Jx		Jy		ix		iy		Zx		Zy	
in	mm	in ⁴	cm ⁴	in ⁴	cm ⁴	in	cm	in	cm	in ³	cm ³	in ³	cm ³
0,4	10,2	375 301	15600 12500	12,40 9,59	516 399	6,41 6,26	16,3 15,9	1,17 1,12	2,97 2,84	47,2 38,4	773 629	4,49 3,49	73,6 57,2
0,6	15,2	14.300	595.000	4.720	196.000	8,17	20,8	4,69	11,90	1.280	21.000	527	8.640
		12.400	516.000	4.170	174.000	7,98	20,3	4,62	11,70	1.150	18.800	472	7.730
		10.800	450.000	3.680	153.000	7,80	19,8	4,55	11,60	1.040	17.000	423	6.930
		9.430	393.000	3.250	135.000	7,63	19,4	4,49	11,40	931	15.300	378	6.190
		8.210	342.000	2.880	120.000	7,48	19,0	4,43	11,30	838	13.700	339	5.560
		7.190	299.000	2.560	107.000	7,33	18,6	4,38	11,10	756	12.400	304	4.980
		6.600	275.000	2.360	98.200	7,26	18,4	4,34	11,00	707	11.600	283	4.640
		6.000	250.000	2.170	90.300	7,16	18,2	4,31	10,90	656	10.700	262	4.290
		5.440	226.000	1.990	82.800	7,07	18,0	4,27	10,80	607	9.950	241	3.950
		4.900	204.000	1.810	75.300	6,98	17,7	4,24	10,80	559	9.160	221	3.620
		4.330	180.000	1.610	67.000	6,88	17,5	4,20	10,70	506	8.290	199	3.260
		3.840	160.000	1.440	59.900	6,79	17,2	4,17	10,60	459	7.520	179	2.930
		3.400	142.000	1.290	53.700	6,71	17,0	4,13	10,50	415	6.800	161	2.640
		3.010	125.000	1.150	47.900	6,63	16,8	4,10	10,40	375	6.150	145	2.380
		2.660	111.000	1.030	42.900	6,55	16,6	4,07	10,30	338	5.540	130	2.130
		2.400	99.900	931	38.800	6,50	16,5	4,05	10,30	310	5.080	119	1.950
		2.140	89.100	838	34.900	6,43	16,3	4,02	10,20	281	4.600	107	1.750
		1.900	79.100	748	31.100	6,38	16,2	4,00	10,20	254	4.160	96,20	1.580
		1.710	71.200	677	28.200	6,33	16,1	3,98	10,10	232	3.800	87,30	1.430
0,6	15,2	1.530	63.700	548	22.800	6,28	16,0	3,76	9,55	209	3.420	74,50	1.220
		1.380	57.400	495	20.600	6,24	15,8	3,74	9,50	190	3.110	67,50	1.110
		1.240	51.600	447	18.600	6,22	15,8	3,73	9,47	173	2.830	61,20	1.000
		1.110	46.200	402	16.700	6,17	15,7	3,71	9,42	157	2.570	55,20	905
		999	41.600	362	15.100	6,14	15,6	3,70	9,40	143	2.340	49,90	818
0,6	15,2	882	36.700	148	6.160	6,05	15,4	2,48	6,30	123	2.020	29,30	480
		796	33.100	134	5.580	6,04	15,3	2,48	6,30	112	1.840	26,60	436
		723	30.100	121	5.040	6,01	15,3	2,46	6,25	103	1.690	24,20	397
		640	26.600	107	4.450	5,98	15,2	2,45	6,22	92,2	1.510	21,50	352
0,6	15,2	541	22.500	57,70	2.400	5,89	15,0	1,92	4,88	77,8	1.270	14,30	234
		485	20.200	51,40	2.140	5,85	14,9	1,91	4,85	70,3	1.150	12,80	210
		428	17.800	45,20	1.880	5,82	14,8	1,89	4,80	62,7	1.030	11,30	185
0,4	10,2	385	16.000	26,70	1.110	5,88	14,9	1,55	3,94	54,6	895	7,88	129
		340	14.200	23,30	970	5,83	14,8	1,53	3,89	48,6	796	6,91	113
		291	12.100	19,60	816	5,73	14,6	1,49	3,78	42,0	688	5,82	95,4
0,4	10,2	245	10.200	8,91	371	5,65	14,4	1,08	2,74	35,3	578	3,54	58,0
		199	8.280	7,00	291	5,54	14,1	1,04	2,64	29,0	475	2,80	45,9

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Wide Flange Shapes (Inch Series)

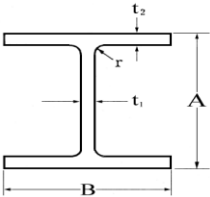


Series Designation and Nominal Depth	Weight		Area of Section		Depth of Section (A)		Flange				Web Thickness (t ₁)	
							Width (B)		Thickness (t ₂)			
in	lbs/ft	kg/m	in ²	cm ²	in	mm	in	mm	in	mm	in	mm
W12 12X12	336	500,00	98,80	637,40	16,82	427,2	13,385	340,0	2,955	75,06	1,775	45,08
	305	453,90	89,60	578,10	16,32	414,5	13,235	336,2	2,705	68,71	1,625	41,28
	279	415,20	81,90	528,40	15,85	402,6	13,140	333,8	2,470	62,74	1,530	38,86
	252	375,00	74,10	478,10	15,41	391,4	13,005	330,3	2,250	57,15	1,395	35,43
	230	342,30	67,70	436,80	15,05	382,3	12,895	327,5	2,070	52,58	1,285	32,64
	210	312,50	61,80	398,70	14,71	373,6	12,790	324,9	1,900	48,26	1,180	29,97
	190	282,80	55,80	360,00	14,38	365,3	12,670	321,8	1,735	44,07	1,060	26,92
	170	253,00	50,00	322,60	14,03	356,4	12,570	319,3	1,560	39,62	0,960	24,38
	152	226,20	44,70	288,40	13,71	348,2	12,480	317,0	1,400	35,56	0,870	22,10
	136	202,40	39,90	257,40	13,41	340,6	12,400	315,0	1,250	31,75	0,790	20,07
	120	178,60	35,30	227,70	13,12	333,2	12,320	312,9	1,105	28,07	0,710	18,03
	106	157,70	31,20	201,30	12,89	327,4	12,220	310,4	0,990	25,15	0,610	15,49
	96	142,90	28,20	181,90	12,71	322,8	12,160	308,9	0,900	22,86	0,550	13,97
	87	129,50	25,60	165,20	12,53	318,3	12,125	308,0	0,810	20,57	0,515	13,08
	79	117,60	23,20	149,70	12,38	314,5	12,080	306,8	0,735	18,67	0,470	11,94
	72	107,10	21,10	136,10	12,25	311,2	12,040	305,8	0,670	17,02	0,430	10,92
	65	96,73	19,10	123,20	12,12	307,8	12,000	304,8	0,605	15,37	0,390	9,91
W12 12X10	58	86,31	17,00	109,70	12,19	309,6	10,010	254,3	0,640	16,26	0,360	9,14
	53	78,87	15,60	100,60	12,06	306,3	9,995	253-9	0,575	14,60	0,345	8,76
W12 12X8	50	74,41	14,70	94,84	12,19	309,6	8,080	205,2	0,640	16,26	0,370	9,40
	45	66,97	13,20	85,16	12,06	306,3	8,045	204,3	0,575	14,60	0,335	8,51
	40	59,53	11,80	76,13	11,94	303,3	8,005	203,3	0,515	13,08	0,295	7,49
W12 12X6½	35	52,09	10,30	66,45	12,50	317,5	6,560	166,6	0,520	13,21	0,300	7,62
	30	44,64	8,79	56,71	12,34	313,4	6,520	165,6	0,440	11,18	0,260	6,60
	26	38,69	7,65	49,35	12,22	310,4	6,490	164,8	0,380	9,65	0,230	5,84
W12x4	22	32,74	6,48	41,81	12,31	312,7	4,030	102,4	0,425	10,80	0,260	6,60
	19	28,28	5,57	35,94	12,16	308,9	4,005	101,7	0,350	8,89	0,235	5,97
	16	23,81	4,71	30,39	11,99	304,5	3,900	101,3	0,265	6,73	0,220	5,59
W12x4	14	20,83	4,16	26,84	11,91	302,5	3,970	100,8	0,225	5,72	0,200	5,08
W10 10x10	112	166,70	32,90	212,30	11,36	288,5	10,415	264,5	1,250	31,75	0,755	19,18
	100	148,80	29,40	189,70	11,10	281,9	10,340	262,6	1,120	28,45	0,680	17,27
	88	131,00	25,90	167,10	10,84	275,3	10,265	260,7	0,990	25,15	0,605	15,37
	77	114,60	22,60	145,80	10,60	269,2	10,190	258,8	0,870	22,10	0,530	13,46
	68	101,20	20,00	129,00	10,40	264,2	10,130	257,3	0,770	19,56	0,470	11,94
	60	89,29	17,60	113,50	10,22	259,6	10,080	256,0	0,680	17,27	0,420	10,67
	54	80,36	15,80	101,90	10,09	256,3	10,030	254,8	0,615	15,62	0,370	9,40
	49	72,92	14,40	92,90	9,98	253,5	10,000	254,0	0,560	14,22	0,340	8,64
W10 10X8	45	66,97	13,30	85,81	10,10	256,5	8,020	203,7	0,620	15,75	0,350	8,89
	39	58,04	11,50	74,19	9,92	252,0	7,985	202,8	0,530	13,46	0,315	8,00
	33	49,11	9,71	62,64	9,73	247,1	7,960	202,2	0,435	11,05	0,290	7,37

Corner Radius (r)		Moment of Inertia				Radius of Gyration				Modulus of Section			
		Jx		Jy		ix		iy		Zx		Zy	
in	mm	in ⁴	cm ⁴	in ⁴	cm ⁴	in	cm	in	cm	in ³	cm ³	in ³	cm ³
0.60	15.2	4,060	169,000	1,190	49,500	6.41	16.3	3.470	8.81	483	7,910	177	2,900
		3,550	148,000	1,050	43,700	6.29	16.0	3.420	8.69	435	7,130	159	2,610
		3,110	129,000	938	39,000	6.16	15.6	3.380	8.59	393	6,440	143	2,340
		2,720	113,000	828	34,500	6.06	15.4	3.340	8.48	353	5,780	127	2,080
		2,440	101,000	742	30,900	5.97	15.2	3.310	8.41	32	5,260	115	1,880
		2,140	89,100	664	27,600	5.89	15.0	3.280	8.33	292	4,790	104	1,700
		1,890	78,700	589	24,500	5.82	14.8	3.250	8.26	263	4,310	93.00	1,520
		1,650	68,700	517	21,500	5.74	14.6	3.220	8.18	235	3,850	82.30	1,350
		1,430	59,500	454	18,900	5.66	14.4	3.190	8.10	209	3,420	72.80	1,190
		1,240	51,600	398	16,600	5.58	14.2	3.160	8.03	186	3,050	64.20	1,050
		1,070	44,500	345	14,400	5.51	14.0	3.130	7.95	163	2,670	56.00	918
		933	38,800	301	12,500	5.47	13.9	3.110	7.90	145	2,380	49.30	808
		833	34,700	270	11,200	5.44	13.8	3.090	7.85	131	2,150	44.40	728
		740	30,800	241	10,000	5.38	13.7	3.070	7.80	118	1,930	39.70	651
		662	27,600	216	8,990	5.34	13.6	3.050	7.75	107	1,750	35.80	587
		597	24,800	195	8,120	5.31	13.5	3.040	7.72	97.4	1,600	32.40	531
		533	22,200	174	7,240	5.28	13.4	3.020	7.67	87.9	1,440	29.10	477
0.60	15.2	475	19,800	107	4,450	5.28	13.4	2.510	6.38	78.0	1,280	21.40	351
		425	17,700	95.80	3,990	5.23	13.3	2.480	6.30	70.6	1,160	19.20	315
0.60	15.2	394	16,400	56.30	2,340	5.18	13.2	1.960	4.98	64.7	1,060	13.90	228
		350	14,600	50.00	2,080	5.15	13.1	1.940	4.93	58.1	952	12.40	203
		310	12,900	44.10	1,840	5.13	13.0	1.930	4.90	51.9	850	11.00	180
0.30	7.6	285	11,900	24.50	1,020	5.25	13.3	1.540	3.91	45.6	747	7.47	122
		238	9,910	20.30	845	5.21	13.2	1.520	3.86	38.6	633	6.24	102
		204	8,400	17.30	720	5.17	13.1	1.510	3.84	33.4	547	5.34	87.5
0.30	7.6	156	6,490	4.66	194	4.91	12.5	0.848	2.15	25.4	416	2.31	37.9
		130	5,410	3.76	157	4.82	12.2	0.822	2.09	21.3	349	1.88	30.8
		103	4,290	2.82	117	4.67	11.9	0.773	1.96	17.1	280	1.41	23.1
0.30	7.6	88.6	3,690	2.36	98.2	4.62	11.7	0.753	1.91	14.9	244	1.19	19.5
0.50	12.7	716	29,800	236	9,820	4.66	11.8	2.680	6.81	126	2,060	45.30	742
		623	25,900	207	8,620	4.60	11.7	2.650	6.73	112	1,840	40.00	655
		534	22,200	179	7,450	4.54	11.5	2.630	6.68	98.5	1,610	34.80	570
		455	18,900	154	6,410	4.49	11.4	2.600	6.60	85.9	1,410	30.10	493
		394	16,400	134	5,580	4.44	11.3	2.590	6.58	75.7	1,240	26.40	433
		341	14,200	116	4,830	4.39	11.2	2.570	6.53	66.7	1,090	23.00	377
		303	12,600	103	4,290	4.37	11.1	2.560	6.50	60.0	983	20.60	338
0.50	12.7	272	11,300	93.40	3,890	4.35	11.0	2.540	6.45	54.6	895	18.70	306
		248	10,300	53.40	2,220	4.33	11.0	2.010	5.11	49.1	805	13.30	218
		209	8,700	45.00	1,870	4.27	10.8	1.980	5.03	42.1	690	11.30	185
		170	7,080	36.60	1,520	4.19	10.6	1.940	4.93	35.0	574	9.20	151

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Wide Flange Shapes (Inch Series)



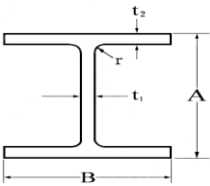
Series Designation and Nominal Depth	Weight		Area of Section		Depth of Section (A)		Flange				Web Thickness (t ₁)	
							Width (B)		Thickness (t ₂)			
in	lbs/ft	kg/m	in ²	cm ²	in	mm	in	mm	in	mm	in	mm
W10 10X5¾	30	44,64	8,84	57,03	10,47	265,9	5,810	147,6	0,510	12,95	0,300	7,62
	26	38,69	7,61	49,10	10,33	262,4	5,770	146,6	0,440	11,18	0,260	6,60
	22	32,74	6,49	41,87	10,17	258,3	5,750	146,0	0,360	9,14	0,240	6,10
W10X4	19	28,28	5,62	36,26	10,24	260,1	4,020	102,1	0,395	10,03	0,250	6,35
	17	25,30	4,99	32,19	10,11	256,8	4,010	101,9	0,330	8,38	0,240	6,10
	15	22,32	4,41	28,45	9,99	253,7	4,000	101,6	0,270	6,86	0,230	5,84
W10X4	12	17,86	3,54	22,84	9,87	250,7	3,960	100,6	0,210	5,33	0,190	4,83
W8 8X8	67	99,71	19,70	127,10	9,00	228,6	8,280	210,3	0,935	23,75	0,570	14,48
	58	86,31	17,10	110,30	8,75	222,2	8,220	208,8	0,810	20,57	0,510	12,95
	48	71,43	14,10	90,97	8,50	215,9	8,110	206,0	0,685	17,40	0,400	10,16
	40	59,53	11,70	75,48	8,25	209,6	8,070	205,0	0,560	14,22	0,360	9,14
	35	52,09	10,30	66,45	8,12	206,2	8,020	203,7	0,495	12,57	0,310	7,87
	31	46,13	9,13	58,90	8,00	203,2	7,995	203,1	0,435	11,05	0,285	7,24
W8 8X6½	28	41,67	8,25	53,23	8,06	204,7	6,535	166,0	0,465	11,81	0,285	7,24
	24	35,72	7,08	45,68	7,93	201,4	6,495	165,0	0,400	10,16	0,245	6,22
W8 8X5¼	21	31,25	6,16	39,74	8,28	210,3	5,270	133,9	0,400	10,16	0,250	6,35
	18	26,79	5,26	33,94	8,14	206,8	5,250	133,4	0,330	8,38	0,230	5,84
W8X4	15	22,32	4,45	28,65	8,11	206,0	4,015	102,0	0,315	8,00	0,245	6,22
	13	19,35	3,84	24,77	7,99	202,9	4,000	101,6	0,255	6,48	0,230	5,84
W8X4	10	14,88	2,96	19,10	7,89	200,4	3,940	100,1	0,205	5,21	0,170	4,32
W6 6X6	25	37,20	7,34	47,35	6,38	162,1	6,080	154,4	0,455	11,56	0,320	8,13
	20	29,76	5,87	38,87	6,20	157,5	6,020	152,9	0,365	9,27	0,260	6,60
	15	22,32	4,43	28,58	5,99	152,1	5,990	152,1	0,260	6,60	0,230	5,81
W6X4	16	23,81	4,74	30,58	6,28	159,5	4,030	102,4	0,405	10,29	0,260	6,60
	12	17,86	3,55	22,90	6,03	153,2	4,000	101,6	0,280	7,11	0,230	5,84
W6X4	9	13,39	2,68	17,29	5,90	149,9	3,940	100,1	0,215	5,46	0,170	4,32
W5X5	19	28,28	5,56	35,87	5,15	130,8	5,030	127,8	0,430	10,92	0,270	6,86
	16	23,81	4,71	30,39	5,01	127,3	5,000	127,0	0,360	9,14	0,240	6,10
W4X4	13	19,35	3,83	24,71	4,16	105,7	4,060	103,1	0,345	8,76	0,280	7,11

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Corner Radius (r)		Moment of Inertia				Radius of Gyration				Modulus of Section			
		Jx		Jy		ix		iy		Zx		Zy	
in	mm	in ⁴	cm ⁴	in ⁴	cm ⁴	in	cm	in	cm	in ³	cm ³	in ³	cm ³
0,3	7,6	170	7.080	16,70	695	4,38	11,10	1,37	3,48	32,40	531	5,75	94,2
		144	5.990	14,10	587	4,35	11,00	1,36	3,45	27,90	457	4,89	80,1
		118	4.910	11,40	475	4,27	10,80	1,33	3,38	23,20	380	3,97	65,1
0,3	7,6	96,3	4.010	4,29	179	4,14	10,50	0,874	2,22	18,80	308	2,14	35,1
		81,9	3.410	3,56	148	4,05	10,30	0,845	2,15	16,20	265	1,78	29,2
		68,9	2.870	2,89	120	3,95	10,00	0,810	2,06	13,80	226	1,45	23,8
0,3	7,6	53,8	2.240	2,18	90,7	3,90	9,91	0,785	1,99	10,90	179	1,10	18,0
0,4	10,2	272	11.300	88,60	3.690	3,72	9,45	2,12	5,38	60,40	990	21,40	351
		228	9.490	75,10	3.130	3,65	9,27	2,10	5,33	52,00	852	18,30	300
		184	7.660	60,90	2.530	3,61	9,17	2,08	5,28	43,30	710	15,00	246
		146	6.080	49,10	2.040	3,53	8,97	2,04	5,18	35,50	582	12,20	200
		127	5.290	42,60	1.770	3,51	8,92	2,03	5,16	31,20	511	10,60	174
		110	4.580	37,10	1.540	3,47	8,81	2,02	5,13	27,50	451	9,27	152
0,4	10,2	98,0	4.080	21,70	903	3,45	8,76	1,62	4,11	24,30	398	6,63	109
		82,8	3.450	18,30	762	3,42	8,69	1,61	4,09	20,90	342	5,63	92,3
0,3	7,6	75,3	3.130	9,77	407	3,49	8,86	1,26	3,20	18,20	298	3,71	60,8
		61,9	2.580	7,97	332	3,43	8,71	1,23	3,12	15,20	249	3,04	49,8
0,3	7,6	48,0	2.000	3,41	142	3,29	8,36	0,876	2,23	11,80	193	1,70	27,9
		39,6	1.650	2,73	114	3,21	8,15	0,843	2,14	9,91	162	1,37	22,5
0,3	7,6	30,8	1.280	2,09	87,0	3,22	8,18	0,841	2,14	7,81	128	1,06	17,4
0,25	6,4	53,4	2.220	17,10	712	2,70	6,86	1,52	3,86	16,70	274	5,61	91,9
		41,4	1.720	13,30	554	2,66	6,76	1,50	3,81	13,40	220	4,41	72,3
		29,1	1.210	9,32	388	2,56	6,50	1,45	3,68	9,72	159	3,11	51,0
0,25	6,4	32,1	1.340	4,43	184	2,60	6,60	0,967	2,46	10,20	167	2,20	36,1
		22,1	900	2,99	124	2,49	6,32	0,918	2,33	7,31	120	1,50	24,6
0,25	6,4	16,4	683	2,20	91,6	2,47	6,27	0,905	2,30	5,56	91,1	1,11	18,2
0,3	7,6	26,3	1.090	9,13	380	2,17	5,51	1,28	3,25	10,20	167	3,63	59,5
		21,4	891	7,51	313	2,13	5,41	1,26	3,20	8,55	140	3,30	49,2
0,25	6,4	11,3	470	3,86	161	1,72	4,37	1,00	2,54	5,46	89,5	1,90	31,1

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H - Bearing Piles (Inch Series)

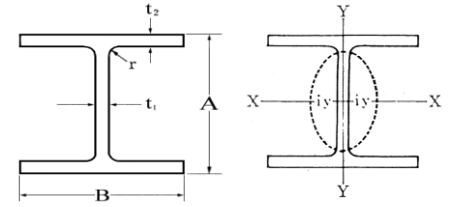


Series Designation and Nominal Depth	Weight		Area of Section		Depth of Section (A)		Flange				Web Thickness (t ₁)	
							Width (B)		Thickness (t ₂)			
in	lbs/ft	kg/m	in ²	cm ²	in	mm	in	mm	in	mm	in	mm
HP14 14X14½	117	174,10	34,4	221,90	14,21	360,9	14,885	378,1	0,805	20,45	0,805	20,45
	102	151,80	30,0	193,50	14,01	355,9	14,785	375,5	0,705	17,91	0,705	17,91
	89	132,40	26,1	168,40	13,83	351,3	14,695	373,3	0,615	15,62	0,615	15,62
	73	108,60	21,4	138,10	13,61	345,7	14,585	370,5	0,505	12,83	0,505	12,83
HP13 13X13	100	148,80	29,4	189,70	13,15	334,0	13,205	335,4	0,765	19,43	0,765	19,43
	87	129,50	25,5	164,50	12,95	328,9	13,105	332,9	0,665	16,89	0,665	16,89
	73	108,60	21,6	139,40	12,75	323,8	13,005	330,3	0,565	14,35	0,565	14,35
	60	89,29	17,5	112,90	12,54	318,5	12,900	327,7	0,460	11,68	0,460	11,68
HP12 12X12	84	125,00	24,6	158,70	12,28	311,9	12,295	312,3	0,685	17,40	0,685	17,40
	74	110,10	21,8	140,60	12,13	308,1	12,215	310,3	0,610	15,49	0,605	15,37
	63	93,75	18,4	118,70	11,94	303,3	12,125	308,0	0,515	13,08	0,515	13,08
	53	78,87	15,5	100,00	11,78	299,2	12,045	305,9	0,435	11,05	0,435	11,05
HP10 10X10	57	84,83	16,8	108,40	9,99	253,7	10,225	259,7	0,565	14,35	0,565	14,35
	42	62,50	12,4	80,00	9,70	246,4	10,075	255,9	0,420	10,67	0,415	10,45
HP8 X 8	36	53,57	10,6	68,39	8,02	203,7	8,155	207,1	0,445	11,30	0,445	11,30

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Corner Radius (r)		Moment of Inertia				Radius of Gyration				Modulus of Section			
		Jx		Jy		ix		iy		Zx		Zy	
in	mm	in ⁴	cm ⁴	in ⁴	cm ⁴	in	cm	in	cm	in ³	cm ³	in ³	cm ³
0,6	15,2	1.220	50.800	443	18.400	5,96	15,1	3,59	9,12	172	2.820	59,5	975
		1.050	43.700	380	15.800	5,92	15,0	3,56	9,04	150	2.460	51,4	842
		904	37.600	326	13.600	5,88	14,9	3,53	8,97	131	2.150	44,3	726
		729	30.300	261	10.900	5,84	14,8	3,49	8,86	107	1.750	35,8	587
0,6	15,2	886	36.900	294	12.200	5,49	13,9	3,16	8,03	135	2.210	44,5	729
		755	31.400	250	10.400	5,45	13,8	3,13	7,95	117	1.920	38,1	624
		630	26.200	207	8.620	5,40	13,7	3,10	7,87	98,8	1.620	31,9	523
		503	20.900	165	6.870	5,36	13,6	3,07	7,80	80,3	1.320	25,5	418
0,6	15,2	650	27.100	213	8.870	5,14	13,1	2,94	7,47	105,8	1.730	34,6	567
		569	23.700	186	7.740	5,11	13,0	2,92	7,42	93,8	1.540	30,4	498
		472	19.600	153	6.370	5,06	12,9	2,88	7,32	79,1	1.300	25,3	415
		393	16.400	127	5.290	5,03	12,8	2,86	7,26	66,8	1.090	21,1	346
0,5	12,7	294	12.200	101	4.200	4,18	10,6	2,45	6,22	58,8	964	19,7	323
		210	8.740	71,7	2.980	4,13	10,5	2,41	6,12	43,4	711	14,2	233
0,4	10,2	119	4.950	40,3	1.680	3,36	8,53	1,95	4,95	29,8	488	9,88	162

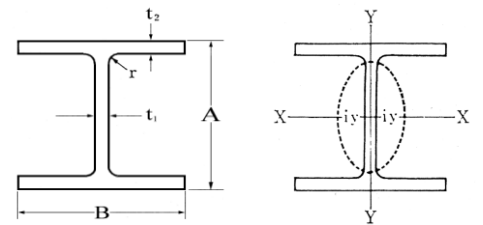
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Wide Flange Shapes (Metric Series)

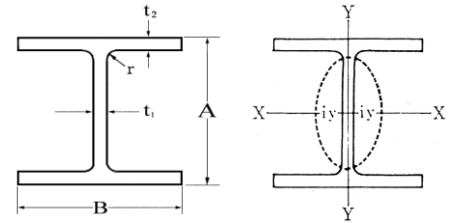
Section Index	Weight	Depth of Section (A)	Flange Width (B)	Thickness		Corner Radius (r)	Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section	
				Web (t ₁)	Flange (t ₂)			J _x	J _y	i _x	i _y	Z _x	Z _y
mm	kg/m	mm	mm	mm	mm	mm	cm ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³
900X300	286	912	302	18	34	28	364,0	498.000	15.700	37,0	6,56	10.900	1.040
	243	900	300	16	28	28	309,8	411.000	12.600	36,4	6,39	9.140	843
	213	890	299	15	23	28	270,9	345.000	10.300	35,7	6,16	7.760	688
800X300	241	808	302	16	30	28	307,6	339.000	13.800	33,2	6,7	8.400	915
	210	800	300	14	26	28	267,4	292.000	11.700	33,0	6,62	7.290	782
	191	792	300	14	22	28	243,4	254.000	9.930	32,3	6,39	6.410	662
700X300	215	708	302	15	28	28	273,6	237.000	12.900	29,4	6,86	6.700	853
	185	700	300	13	24	28	235,5	201.000	10.800	29,3	6,78	5.760	722
	166	692	300	13	20	28	211,5	172.000	9.020	28,6	6,53	4.980	602
600X300	175	594	302	14	23	28	222,4	137.000	10.600	24,9	6,9	4.620	701
	151	588	300	12	20	28	192,5	118.000	9.020	24,8	6,85	4.020	601
	137	582	300	12	17	28	174,5	103.000	7.670	24,3	6,63	3.530	511
600X200	134	612	202	13	23	22	107,7	103.000	3.180	24,6	4,31	3.380	314
	120	606	201	12	20	22	152,5	90.400	2.720	24,3	4,22	2.980	271
	106	600	200	11	17	22	134,4	77.600	2.280	24,0	4,12	2.590	228
	94,6	596	199	10	15	22	120,5	68.700	1.980	23,9	4,05	2.310	199
500X300	128	488	300	11	18	26	163,5	71.000	8,11	20,8	7,04	2.910	541
	114	482	300	11	15	26	145,5	60.400	6.760	20,4	6,82	2.500	451
500X200	103	506	201	11	19	20	131,3	56.500	2.580	20,7	4,43	2.230	257
	89,6	500	200	10	16	20	114,2	47.800	2.140	20,5	4,33	1.910	214
	79,5	496	199	9	14	20	101,3	41.900	1.840	20,3	4,27	1.690	185
450X300	124	440	300	11	18	24	157,4	56.100	8.110	18,9	7,18	2.550	541
	106	434	299	10	15	24	135,0	46.800	6.690	18,6	7,04	2.160	448
450X200	76 0	450	200	9	14	18	96,8	33.500	1.870	18,6	4,4	1.490	187
	66,2	446	199	8	12	18	84,3	28.700	1.580	18,5	4,33	1.290	159
400X400	605	498	432	45	70	22	770,1	298.000	94.400	19,7	11,1	12.000	4.370
	415	458	417	30	50	22	528,6	187.000	60.500	18,8	10,70	8.170	2.900
	283	428	407	20	35	22	360,7	119.000	39.400	18,2	10,40	5.570	1.930
	232	414	405	18	28	22	295,4	92.800	31.000	17,7	10,20	4.480	1.530
	200	406	403	16	24	22	254,9	78.000	26.200	17,5	10,10	3.840	1.300
	197	400	408	21	21	22	250,7	70.900	23.800	16,8	9,75	3.540	1.170
	172	400	400	13	21	22	218,7	66.600	22.400	17,5	10,10	3.330	1.120
	168	394	405	18	18	22	214,4	59.700	20.000	16,7	9,65	3.030	985
	147	394	398	11	18	22	186,8	56.100	18.900	17,3	10,10	2.850	951
	140	388	402	15	15	22	178,5	49.000	16.300	16,6	9,54	2.520	809
400X300	107	390	300	10	16	22	136,0	38.700	7.210	16,9	7,28	1.980	481
	94,3	386	299	9	14	22	120,1	33.700	6.540	16,7	7,81	1.740	418

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Section Index	Weight	Depth of Section (A)	Flange Width (B)	Thickness		Corner Radius (r)	Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section	
				Web (t1)	Flange (t2)			Jx	Jy	ix	iy	Zx	Zy
mm	kg/m	mm	mm	mm	mm	mm	cm ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³
400 x 200	66	400	200	8	13	16	84,12	23.700	1.740	16,8	4,54	1190	174
	56,6	396	199	7	11	16	72,16	20.000	1.450	16,7	4,48	1010	145
350 x 350	159	356	352	14	22	20	202	47.600	16.000	15,3	8,9	2670	909
	156	350	357	19	19	20	198,4	42.800	14.400	14,7	8,53	2450	809
	137	350	350	12	19	20	173,9	40.300	13.600	15,2	8,84	2300	776
	131	344	354	16	16	20	166,6	35.300	11.800	14,6	8,43	2050	669
	115	344	348	10	16	20	146	33.300	11.200	15,1	8,78	1940	646
	106	338	351	13	13	20	135,3	28.200	9.380	14,4	8,33	1670	534
350 x 250	79,7	340	250	9	14	20	101,5	21.700	3.650	14,6	6	1280	292
	69,2	336	249	8	12	20	88,15	18.500	3.090	14,5	5,92	1100	248
350 X 175	49,6	350	175	7	11	14	63,14	13.600	984	14,7	3,95	775	112
	41,4	346	174	6	9	14	52,68	11.100	792	14,5	3,88	641	91
300 X 300	106	304	301	11	17	18	134,8	23.400	7.730	13,2	7,57	1540	514
	106	300	305	15	15	18	134,8	21.500	7.100	12,6	7,26	1440	466
	94	300	300	10	15	18	119,8	20.400	6.750	13,1	7,51	1360	450
	87	298	299	9	14	18	110,8	18.800	6.240	13	7,51	1270	417
	84,5	294	302	12	12	18	107,7	16.900	5.520	12,5	7,16	1150	365
300 X 200	65,4	298	201	9	14	18	82,36	13.300	1.900	12,6	4,77	893	189
	56,8	294	200	8	12	18	72,38	11.300	1.600	12,5	4,71	771	160
300 X 150	36,7	300	150	6,5	9	13	46,38	7.210	508	12,4	3,29	481	67,7
	32	298	149	5,5	8	13	40,8	6.320	442	12,4	3,29	424	59,3
250 x 250	82,2	250	255	14	14	16	104,7	11.500	3.880	10,5	6,09	919	304
	72,4	250	250	9	14	16	92,18	10.800	3.650	10,8	6,29	867	292
	66,5	248	249	8	13	16	84,7	9.930	3.350	10,8	6,29	801	269
	64,4	244	252	11	11	16	82,06	8.790	2.940	10,3	5,98	720	233
250 X 175	44,1	244	175	7	11	16	56,24	6.120	984	10,4	4,18	502	113
250 X 125	29,6	250	125	6	9	12	37,66	4.050	294	10,4	2,79	324	47
	25,7	248	124	5	8	12	32,68	3.540	255	10,4	2,79	285	41,1
200 X 200	65,7	208	202	10	16	13	83,69	6.530	2.200	8,83	5,13	628	218
	56,2	200	204	12	12	13	71,53	4.980	1.700	8,35	4,88	498	167
	49,9	200	200	8	12	13	63,53	4.720	1.600	8,62	5,02	472	160
200 X 150	30,6	194	150	6	9	13	39,01	2.690	507	8,3	3,61	277	67,6
200 X 100	21,3	200	100	5,5	8	11	27,16	1.840	134	8,24	2,22	184	26,8
	18,2	198	99	4,5	7	11	23,18	1.580	114	8,26	2,21	160	23
175 X 175	40,2	175	175	7,5	11	12	51,21	2.880	984	7,5	4,38	330	112

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Wide Flange Shapes (Metric Series)

Section Index	Weight	Depth of Section (A)	Flange Width (B)	Thickness		Corner Radius (r)	Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section	
				Web (t ₁)	Flange (t ₂)			J _x	J _y	i _x	i _y	Z _x	Z _y
mm	kg/m	mm	mm	mm	mm	mm	cm ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³
175 x 90	18,1	175	90	5	8	9	23,04	1.210	97,5	7,26	2,06	139	21,7
150 x 150	31,5	150	150	7	10	11	40,14	1.640	563	6,39	3,75	219	75,1
150 x 100	21,1	148	100	6	9	11	26,84	1.020	151	6,17	2,37	138	30,1
150 x 75	14	150	75	5	7	8	17,85	666	49,5	6,11	1,66	88,8	13,2
125 x 125	23,8	125	125	6,5	9	10	30,31	847	293	5,29	3,11	136	47
125 x 60	13,2	125	60	6	8	9	16,84	413	29,2	4,95	1,32	66,1	9,73
100 x 100	17,2	100	100	6	8	10	21,9	383	134	4,18	2,47	76,5	26,7
100 x 50	9,3	100	50	5	7	8	11,85	187	14,8	3,98	1,12	37,5	5,91

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STEEL SHEET PILING



MATERIAL QUALITIES

CHEMICAL COMPOSITION (%)

Classification	Designation	C	Mn.	Si	P	S	Cu	Ni	Nb + V
Class 2	SY30	-	-	-	0.040 max	0.040 max	0.25 min	-	
Class 3	SY40	-	-	-	0.040 max	0.040 max	0.25 min	-	0.15 max
SY 30-MOD6		-	-	-	0.040 max	0.040 max	0.25 min	-	
MARINER		0.22 max	0.60 -0.90	0.10 max	0.08 -0.15	0.040 max	0.50 min	0.40 -0.65	-

MECHANICAL PROPERTIES

Classification	Designation	Tensile Strength, min. kg/mm ² min. N/mm ²	Yield Point, min. kg/mm ² min. N/mm ²	Elongation min. %	Remarks
Class 2	SY30	50 490	30 294	18	JISNo. 1 test specimens
Class 3	SY40	55 539	40 392	16	
SY30-MODS		50 490	36 353	18	
MARINER		50 490	36 353	18	

NOTE : chemical composition and mechanical properties of Class 2 and Class 3 are specified in JIS A5528 (1967).

MARINER STEEL

Mariner is a semi-killed steel having superior resistance to sea water due mainly to such added elements as nickel, copper and phosphorus.

Mariner steel was developed by United States Steel Corporation of the U.S.A. after years of research and testing, and was made public in 1964. Nippon Steel manufactures Mariner steel under a technical agreement with US Steel.

SUPERIOR CORROSION RESISTANCE TO SEA WATER

When used in splash zones, Mariner steel provides two to three times higher corrosion resistance than that of structural carbon steel.

HIGH YIELD POINT

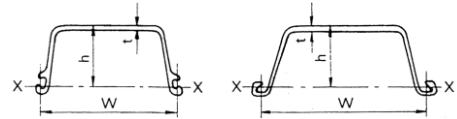
Mariner steel sheet piling has a minimum yield point of 36 kg/mm², about 20 per cent higher than that of Class 2 steel sheet piles. Consequently, it allows a higher allowable stress design, with considerable reduction in structural weight and resultant saving in material costs.

GOOD WORKABILITY

Mariner steel can be sheared, punched or gas cut without any special pretreatment.

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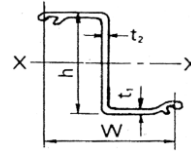
SECTION PROPERTIES



U-TYPE SECTION

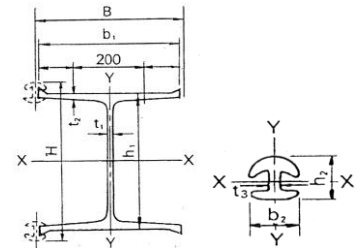
Section	Dimensions			Sectional Area	Weight		Moment of Inertia		Section Modulus	
	w	h	t	per pile	per pile	per wall width	per pile	per wall width	per pile	per wall width
	mm in	mm in	mm in	cm ² in ²	kg/m lbs/ft	kg/m ² lbs/ft ²	cm ⁴ in ⁴	cm ⁴ /m in ⁴ /ft	cm ³ in ³	cm ³ /m in ³ /ft
YSPI	400	75	8.0	46.49	36.5	91.2	429	3,82	66.4	509
	15.7	2.95	0.315	7.206	24.5	18.7	10.3	28.0	4.05	9.47
YSP U-5	400	80	7.6	45.21	35.5	88.8	454	4,22	64.7	527
	15.7	3.15	0.299	7,008	23.9	18.2	10.9	30.9	3.95	9.80
FSPIA	400	85	8.0	45.21	35.5	88.8	598	4,5	88.0	529
	15.7	3.35	0.315	7,008	23.9	18.2	14.4	33.0	5.37	9.84
YSP II	400	100	10.5	61.18	48.0	120	986	8,69	121	869
	15.7	3.94	0.413	9,483	32.3	24.6	23.7	63.6	7.38	16.2
FSP II	400	100	10.5	61.18	48.0	120	1,24	8,74	152	874
	15.7	3.94	0.413	9,483	32.3	24.6	29.8	64.0	9.28	16.3
YSP U-9	400	110	9.3	55.01	43.2	108	1,070	9,680	120	880
	15.7	4.33	0.366	8,527	29.0	22.1	25.7	70.9	7.32	18.4
FSP II A	400	120	9.2	55.01	43.2	108	1,46	10,6	160	880
	15.7	4.72	0.362	8,527	29.0	22.1	35.1	77.6	9.76	16.4
YSP III	400	125	13.0	76.42	60.0	150	1,92	16,4	196	1,31
	15.7	4.92	0.512	11.85	40.3	30.7	46.1	120	12.0	24.4
FSP III	400	125	13.0	76.42	60.0	150	2,22	16,8	223	1,34
	15.7	4.92	0.512	11.85	40.3	30.7	53.3	123	13.6	24.9
YSPU-15	400	150	12.2	74.40	58.4	146	2,7	22,8	238	1,52
	15.7	5.91	0.480	11.53	39.2	29.9	64.9	167	14.5	28.3
FSP III A	400	150	13.1	74.40	58.4	146	2,79	22,8	250	1,52
	15.7	5.91	0.516	11.53	39.2	29.9	67.0	167	15.3	28.3
YSP IV	400	155	15.5	96.99	76. f	190	3,69	31,9	311	2,06
	15.7	6.10	0.610	15.03	51.1	38.9	88.7	234	19.0	38.3
FSP IV	400	170	15.5	96.99	76.1	190	4,67	38,6	362	2,27
	15.7	6.69	0.610	15.03	51.1	38.9	112	283	22.1	42.2
YSP U-23	400	175	14.7	94.21	74.0	185	4,38	39,4	330	2,25
	15.7	6.89	0.579	14.60	49.7	37.9	105	289	20.1	41.9
FSP IV A	400	185	16.1	94.21	74.0	185	5,3	41,6	400	2,25
	15.7	7.28	0.634	14.60	49.7	37.9	127	305	24.4	41.9
YSPV	420	175	22.0	134.0	105	250	5,95	55,2	433	3,15
	16.5	6.89	0.866	20.77	70.6	51.2	143	404	26.4	58.6
FSPVL	500	200	24.3	133.8	105	210	7,96	63	520	3,15
	19.7	7.87	0.957	20.74	70.6	43.0	191	461	31.7	58.6
FSP VI L	500	225	27.6	153.0	120	240	11,4	86	680	3,82
	19.7	8.86	1.09	23.72	80.6	49.2	274	630	41.5	71.1

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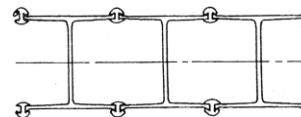
Z-TYPE SECTIONS

Section	Dimensions				Sectional Area	Weight		Moment of Inertia		Section Modulus	
	w	h	t1	t2	per pile	per pile	per wall width	per pile	per wall width	per pile	per wall width
	mm in	mm in	mm in	mm in	cm ² in ²	kg/m lbs/ft	kg/m ² lbs/ft ²	cm ⁴ in ⁴	cm ⁴ /m in ⁴ /ft	cm ³ in ³	cm ³ /m in ³ /ft
FSPZ-25	400	305	13.0	9.6	94.32	74.0	185	15,300	38,300	1,000	2,510
	15.7	12.0	0.512	0.378	14.62	49.7	37.9	368	280	61.0	46.7
FSPZ-32	400	344	14.2	10.4	107.7	84.5	211	22,000	55,000	1,280	3,200
	15.7	13.5	0.559	0.409	16.69	56.8	43.2	529	403	78.1	59.5
FSPZ-38	400	364	17.2	11.4	122.3	96.0	240	27,700	69,200	1,520	3,800
	15.7	14.3	0.677	0.449	18.96	64.5	49.2	665	507	92.8	70.7
FSPZ-45	400	367	21.9	13.2	148.2	116	290	33,400	83,500	1,820	4,550
	15.7	14.4	0.862	0.520	22.97	77.9	59.4	802	611	111	84.6



H-TYPE SECTIONS

Pile (without Joints)	Dimensions						Sectional Area	Weight	Joint	Dimensions			Sectional Area	Weight
	H	B	b1	h1	t1	*2				b2	h ₂	*3		
	mm in	mm in	mm in	mm in	mm in	mm in	cm ² in ²	kg/m lbs/ft		mm in	mm in	mm in	cm ² in ²	kg/m lbs/ft
	486	420	403	410	10	13.5	165.0	130		67	64	14	22.99	18.0
	19.1	16.5	15.9	16.1	0.394	0.531	25.58	87.4		2.64	2.52	0.551	3.563	12.1



BOTH-SIDE JOINED TYPE

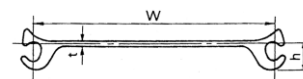
Section	Dimensions				Sectional Area	Weight		Moment of Inertia		Section Modulus	
	H	B	t1	t2	per pile	per pile	per wall width	per pile	per wall width	per pile	per wall width
	mm in	mm in	mm in	mm in	cm ² in ²	kg/m lbs/ft	kg/m ² lbs/ft ²	cm ⁴ in ⁴	cm ⁴ /m in ⁴ /ft	cm ³ in ³	cm ³ /m in ³ /ft
Both-side joined	486	420	10	13.5	211.0	166	394	75,700	180,000	3,120	7,420
	19.1	16.5	0.394	0.531	32.71	112.0	80.7	1,820	1,320	190	138

NOTE 1 : Weight represents that of the pile and its joints combined, on the assumption that joints are equal to the pile in length.

NOTE 2 : Weight per linear meter (foot) of wall is rounded off using the JIS Z 8401-specified formula :

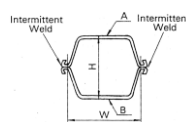
$$\text{Weight per section} \times \frac{1,000}{W (\text{effective Width})}$$

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STRAIGHT WEB-TYPE SECTIONS

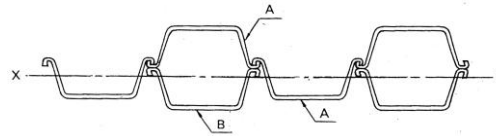
Section	Dimensions			Sectional Area	Weight		Moment of Inertia	Section Modulus	Interlock Strength
	w	h	t	per pile	per pile	per wall width	per pile	per pile	
	mm in	mm in	mm in	cm ² in ²	kg/m lbs/ft	kg/m ² lbs/ft ²	cm ⁴ in ⁴	cm ³ in ³	
YSPF	400	44.5	9.5	69.07	54.2	136	190	47.8	400
	15.7	1.75	0.374	10.71	36.4	27.9	4.56	2.92	268 780
YSPFA	400	44.5	12.7	77.50	60.8	152	196	48.3	400
	15.7	1.75	0.500	12.01	40.9	31.1	4.71	2.95	268 780
YSPFX	400	47.0	12.7	85.66	67.2	168	224	56.1	600
	15.7	1.85	0.500	13.28	45.2	34.4	5.38	3.42	403 170



BOX-TYPE SECTIONS [MEMBER SECTIONS]

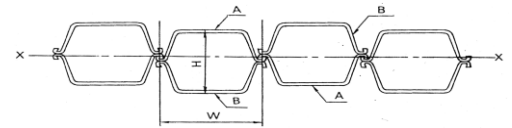
Section		Dimensions		Sectional Area	Moment of Inertia	Section Modulus	* Statical Moment
		H	W				
A	B	mm in	mm in	cm ² in ²	cm ⁴ in ⁴	cm ³ in ³	cm ³ in ³
FSP I A	FSP I A	205 8.07	400 15.7	90.42 14.02	5,360 129	523 31.9	307 18.7
FSP II A	FSP II A	241 9.49	400 15.7	100.2 15.53	8,210 197	678 41.4	391 23.9
FSP II A	FSP II A	277 10.9	400 15.7	110.0 17.05	11,800 283	852 52.0	493 30.1
FSP III A	FSP III A	309 12.2	400 15.7	129.4 20.06	17,100 411	1,040 63.5	639 39.0
FSP III A	FSP III A	340 13.4	400 15.7	148.8 23.06	24,300 584	1,430 87.3	836 51.0
FSP IV A	FSP III A	377 14.8	400 15.7	168.6 26.13	32,900 790	1,690 103	1,010 61.6
FSP IV A	FSP IV A	414 16.3	400 15.7	188.4 29.20	43,300 1,040	2,090 128	1,240 75.7
FSP V L	FSPVL	445 17.5	500 19.7	267.6 41.48	80,500 1,930	3,620 221	2,050 125
FSP VI L	FSP VI L	471 18.5	500 19.7	286.8 44.45	92,500 2,220	3,850 235	2,320 142
FSP VI L	FSP VI L	497 19.6	500 19.7	306.0 47.43	108,000 2,590	4,350 265	2,560 156
FSP II	FSP II	244 9.61	400 15.7	122.4 18.94	10,600 255	869 53.0	499 30.5
FSP III	FSP III	271 10.7	400 15.7	137.6 21.33	14,200 341	1,020 62.2	609 37.2
FSP III	FSP III	297 11.7	400 15.7	152.8 23.68	19,600 471	1,320 80.6	761 46.4
FSP IV	FSP IV	342 13.5	400 15.7	173.4 26.88	28,500 685	1,610 98.2	962 58.7
FSP IV	FSP IV	387 15.2	400 15.7	194.0 30.07	41,600 999	2,150 131	1,250 76.3

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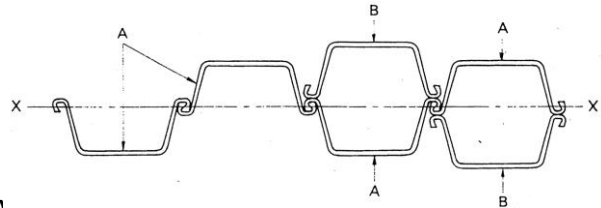
BOX-TYPE SECTIONS [ALTERNATE-BOX TYPE]

Section		Sectional Area	Moment of Inertia	Section Modulus	Weight Kg/m^2 lbs/ft^2					
					Ratio of B-Pile Length to A-Pile Length					
A	B	cm^2/m in^2/ft	cm^4/m in^4/ft	cm^3/m in^3/ft	100%	90%	80%	70%	60%	50%
FSP V L	FSP V L	401.4	99.000	3.810	315	305	294	284	273	263
		19.0	725	70.9	64.5	62.4	60.2	58.1	55.9	53.8
FSP V L	FSP VI L	420.6	110.000	4.110	330	318	306	294	282	260
		19.9	805	76.4	67.6	65.1	62.7	60.2	57.8	53.3
FSP VI L	FSP VI L	459.0	134.000	4.640	360	348	336	324	312	300
		21.7	981	86.3	73.7	71.3	68.8	66.4	63.9	61.4



BOX-TYPE SECTION (ALL-BOX TYPE)

Section		Dimensions		Sectional Area	Moment of Inertia	Section Modulus	* Statical Moment	Weight Kg/m^2 lbs/ft^2					
		H	W					Ratio of Box Pile Wall Length to Total Pile Wall Length					
A	B	mm in	mm in	cm^2/m in^2/ft	cm^4/m in^4/ft	cm^3/m in^3/ft	cm^3/m in^3/ft	100%	90%	80%	70%	60%	50%
FSP I A	FSP I A	205	400	226.0	13,4	1,31	768	178	169	160	151	142	133
		8.07	15.7	10.7	98.1	24.4	14.3	36.4	34.6	32.7	30.9	29.1	27.3
FSP II A	FSP I A	241	400	250.5	20,5	1,7	978	197	188	179	170	161	152
		9.49	15.7	11.8	150	31.6	18.2	40.3	38.5	36.7	34.9	33.0	31.2
FSP II A	FSP II A	277	400	275.0	29,5	2,13	1,23	216	205	194	184	173	162
		10.9	15.7	13.0	216	39.6	22.9	44.2	42.0	39.8	37.6	35.4	33.2
FSP III A	FSP II A	309	400	323.5	42,8	2,6	1,6	254	243	232	222	211	200
		12.1	15.7	15.3	313	48.4	29.8	52.0	49.8	47.6	45.4	43.4	41.0
FSP III A	FSP III A	340	400	372.0	60,75	3580	2,09	292	277	263	248	234	219
		13.4	15.7	17.6	445	66.6	38.9	59.8	56.8	53.8	50.8	47.8	44.9
FSP IVA	FSP III A	377	400	421.5	82,2	4,22	2,52	331	316	302	287	273	258
		14.8	15.7	19.9	602	78.5	46.9	67.8	64.8	61.8	58.8	55.8	52.8
FSP IVA	FSP IV A	414	400	471.0	108	5,22	3,1	370	352	333	314	296	278
		16.3	15.7	22.3	791	97.1	57.7	75.8	72.0	68.2	64.4	60.6	56.8
FSP V L	FSP V L	445	500	535.2	161	7,24	4,1	420	399	378	357	336	315
		17.5	19.7	25.3	1,18	135	76.3	86.0	81.7	77.4	73.1	68.8	64.5
FSP VI L	FSP V L	471	500	573.6	185	7,7	4,64	450	429	408	387	366	345
		18.5	19.7	27.1	1,35	143	86.3	92.2	87.9	83.6	79.3	75.0	70.7
FSP VI L	FSP VI L	497	500	612.0	216	8700	5,12	480	456	432	408	384	360
		19.6	19.7	28.9	1,58	162	95.2	98.3	93.4	88.5	83.6	78.7	73.7
FSP II	FSP II	244	400	306.0	26.500	2.170	1.250	240	228	216	204	192	180
		9.61	15.7	14.5	194	40.4	23.2	49.2	46.7	44.2	41.8	39.3	36.9
FSP III	FSP II	271	400	344.0	35,5	2,55	1,52	270	258	246	234	222	210
		10.6	15.7	16.3	260	47.4	28.3	55.3	52.8	50.4	47.9	45.5	43.0
FSP III	FSP III	297	400	382.0	49	3.300	1,9	300	285	270	255	240	225
		11.7	15.7	18.0	359	61.4	35.3	61.4	58.4	55.3	52.2	49.2	46.1
FSP IV	FSP III	342	400	433.5	71.200	4.020	2.400	340	325	310	295	280	265
		13.5	15.7	20.5	521	74.8	44.6	69.6	66.6	63.5	60.4	57.3	54.3
FSP IV	FSP IV	387	400	485.0	104.000	5.380	3.120	380	361	342	323	304	285
		15.2	15.7	22.9	762	100	58.0	77.8	73.9	70.0	66.2	62.3	58.4



BOX-TYPE SECTIONS (ALTERNATE-DOUBLE-BOX TYPE)

Section	Sectional Area	Moment of Inertia	Section Modulus	Weight Kg/m^2 lbs/ft^2					
				Ratio of B-Pile Length to A-Pile Length					
A, B	cm^2/m in^2/ft	cm^4/m in^4/ft	cm^3/m in^3/ft	100%	90%	80%	70%	60%	50%
FSP I A	169.5	8950	920	133	129	124	120	115	111
	8.01	65.5	17.1	27.2	26.4	25.4	24.6	23.6	22.7
FSP II	229.5	17600	1,520	180	174	168	162	156	150
	10.8	129	28.3	36.9	35.6	34.4	33.2	32.0	30.7
FSP II A	206.2	20000	1,510	162	156	151	146	140	135
	9.74	146	28.1	33.2	32.0	30.9	29.9	28.7	27.7
FSP III	286.5	32900	2,310	225	217	210	202	195	187
	13.5	241	43.0	46.1	44.4	43.0	41.4	39.9	38.3
FSP III A	279.0	41800	2,550	219	212	204	197	190	182
	13.2	306	47.4	44.9	43.4	41.8	40.3	38.9	37.3
FSP IV	363.7	71300	3,830	285	276	266	257	257	238
	17.2	522	71.2	58.4	56.5	54.5	52.6	50.6	48.7
FSP IV A	353.3	74800	3,740	277	268	259	250	240	231
	16.7	548	69.6	56.7	54.9	53.0	51.2	49.2	47.3
FSP VL	401.4	112000	5,200	315	305	294	284	273	263
	19.0	820	96.7	64.5	62.5	60.2	58.2	55.9	53.9
FSP VI L	459.0	151000	6,260	360	348	336	324	312	300
	21.7	1,11	116	73.7	71.3	68,8	66.4	63.9	61.4

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MILD STEEL PLATES
JIS 3101 1970 STEEL Plates for General Structures

Designation	Chemical Composition % *1						Tensile Test *2					
	C max.	Si	Mn max.	P max.	S max.	Cu	Yield Point min.				Tensile Strength	
							Thickness		kg/mm ²	psi	kg/mm ²	psi
							mm	in.				
SS34	—	—	—	0.050	0.050	—	16 and under	0.6299 and under	21	30.000	34—44	48000— 63.000
							16—40, incl.	0.6299-1.5748, incl.	20	28.000		
							Over 40	Over 1.5748	18	26.000		
SS41	—	—	—	0.050	0.050	—	16 and under	0.6299 and under	25	36.000	41—52	58000— 74.000
							16—40, incl.	0.6299-1.5748, incl.	24	34.000		
							Over 40	Over 1.5748	22	31.000		
SS50	—	—	—	0.050	0.050	—	16 and under	0.6299 and under	29	41.000	50—62	71000- 88.000
							16—40, incl.	0.6299-1.5748, incl.	28	40.000		
							Over 40	Over 1.5748	26	37.000		
SS55	0.30	—	1.60	0.040	0.040	—	16 and under	0.6299 and under	41	58.000	55 min.	79000 min.
							16—40, incl.	0.6299—1.5748, incl.	40	57.000		
							Over 40	Over 1.5748	—	—		

JIS G3106-1970 Steel Plates for Welded Structures

Designation		Chemical Composition % *1							Tensile Test					
		C			Si max.	- Mn	P max.	S max.	Yield Point min.				Tensile Strength	
		Thickness		max.					Thickness		kg/ mm ²	psi	kg/mm ²	psi
		mm	in.						mm	in.				
Class 1	SM41A	50 and under	1.9685 and under	0.23	—	2.5xc min.	0.040	0.040	16 and under	0.6299 and under	25	36.000	41 — 52	58000- 74.000
		50—100 incl	19.685 3.9370, incl.	0.25										
	SM41B	50 and under	19.685 and under	0.20	0.35	0.60— 1.20	0.040	0.040	16—40, incl.	0.6299— 1.5748, incl.	24	34.000		
		50—100 incl	19.685 3.9370, incl	0.22										
	SM41C	50 and under	1.9685 and under	0.18	0.35	1.40 max.	0.040	0.040	Over 40	Over 1.5748	22	31.000		
Class 1	SM50A	50 and under	1.9685 and under	0.20	0.55	1.50 max.	0.040	0.040	16 and under	0.6299 and under	33	46.900	50—62	71000- 88.000
		50—100 incl	1.9685— 3.9370, incl.	0.22										
	SM50B	50 and under	19.685 and under	0.18	0.55	1.50 max.	0.040	0.040	16—40, incl.	0.6299— 1.5748, incl.	32	45.500		
		50—100 incl	1.9685- 3.9370, incl.	0.20										
	SM50C	50 and under	1.9685 and under	0.20	0.55	1.50 max.	0.040	0.040	Over 40	Over 1.5748	30	42.600		
Class 3	SM50YA	50 and under	1.9685 and under	0.20	0.55	1.50 max.	0.040	0.040	16 and under	0.6299 and under	37	52.600	50—62	71000- 88.000
	SM50YB	50 and under	1.9685 and under	0.20	0.55	1.50 max.	0.040	0.040	16—40, incl. Over 40	1.5748, incl Over 1.5748	36 34	51.200 48.300		
Class 4	SM53B	50 and under	1.9685 and under	0.20	0.55	1.50 max.	0.040	0.040	16 and under	0.6299 and under	37	52.600	58-73	75300— 92.000
	SM53C	50 and under	1.9685 and under	0.20	0.55	1.50 max.	0.040	0.040	16—40, incl.- Over 40	1.5748, incl Over 1.5748	36 34	51.200 48.300		
Class 5	*2 SM58	6—50, incl.	0.6298— 1.9685 incl.	0.18	0.55	1.50 max	0.040	0.040	16 and under	0.6299 and under	47	66.800	58-73	82000— 104.000
									16—40, incl.-	0.6299— 1.5748, incl	44	65.400		
									Over 40	Over 1.5748	44	62.500		

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Elongation				Bend Test	
Thickness		Test Specimen JIS	% min.	Angle of Bend	Inside Radius
mm	in.				
5 and under	0.1968 and under	No. 5	26	180°	0.5t
5 — 16, incl.	0.1968—0.6299, incl.	No. 1A	21		
Over 16 to 50 and under	Over 0.6299	No. 1A	26		
Over 40	Over 1.5748	No. 4	28		
5 and under	0.1968 and under	No. 5	21	180°	1.5t
5 — 16, incl.	0.1968—0.6299, incl.	No. 1A	17		
Over 16 to 50 and under	Over 0.6299	No. 1A	21		
Over 40	Over 1.5748	No. 4	23		
5 and under	0.1968 and under	No. 5	19	180°	2.0t
5 — 16, incl.	0.1968—0.6299, incl.	No. 1A	15		
Over 16 to 50 and under	Over 0.6299	No. 1A	19		
Over 40	Over 1.5748	No. 4	21		
5 and under	0.1968 and under	No. 5	16	180°	2.0t
5-16, incl.	0.1968-0.6299, incl.	No. 1A	13		
Over 16	Over 0.6299	No. 1A	17		

Note :

*1 In case of SS55, other alloy elements may be added, if necessary.

*2 (a) The yield point for plates thicker than 100mm is 17kg/mm² for SS34, 21kg/mm² SS41, and 25 kg/mm² for SS50, respectively.

(b) For obtaining the elongation percentage of Test Specimen JIS No.4 for steel plates thicker than 90mm, a deduction shall be made in the elongation percentage shown in the Table, at the rate of 1% for each increase in the thickness of 25.0mm or fraction thereof in excess of 90mm. This deduction shall not exceed 3%.

Elongation				Bend Test		Impact Test *3					
Thickness		Test Specimen JIS	% min.	Angle of Bend	Inside Radius	Thickness		Test Temperature		Charpy Impact Energy, min.	
mm	in.					mm	in.	°C	°F	kg-m	1 ft-lb
5 and under	0.1968 and under	No. 5	23	180°	1.0t	--	--	--	--	--	--
5 — 16, incl.	0.1968 — 0.6299, incl.	No. 1A	18			Over 12	Over 0.4724	0	32	2.8	19
Over 16 to 50 and under	Over 0.6299	No. 1A	22			Over 12	Over 0.4724	0	32	4.8	33
Over 40	Over 1.5748	No. 4	24			Over 12	Over 0.4724	0	32	4.8	33
5 and under	0.1968 and under	No. 5	22	180°	1.5t	--	--	--	--	--	--
5 — 16, incl.	0.1968-0.6299, incl.	No. 1A	17			Over 12	Over 0.4724	0	32	2.8	19
Over 16 to 50 and under	Over 0.6299	No. 1A	21			Over 12	Over 0.4724	0	32	4.8	33
Over 40	Over 1.5748	No. 4	23			Over 12	Over 0.4724	0	32	4.8	33
5 and under	0.1968 and under	No. 5	19	180°	1.5t	--	--	--	--	--	--
5 — 16, incl.	0.1968 — 0.6299, incl.	No. 1A	15			Over 12	Over 0.4724	0	32	2.8	19
Over 16 to 50 and under	Over 0.6299	No. 1A	19			Over 12	Over 0.4724	0	32	4.8	33
Over 40	Over 1.5748	No. 4	21			Over 12	Over 0.4724	0	32	4.8	33
5 and under	0.1968 and under	No. 5	19	180°	1.5t	Over 12	Over 0.4724	0	32	2.8	19
5 — 16, incl.	0.1968-0.6299, incl.	No. 1A	15			Over 12	Over 0.4724	0	32	4.8	33
Over 16 to 50 and under	Over 0.6299	No. 1A	19			Over 12	Over 0.4724	0	32	4.8	33
Over 40	Over 1.5748	No. 4	21			Over 12	Over 0.4724	0	32	4.8	33
6 — 16, incl.	0.2362-0.6299, incl.	No. 5	19	180°	1.5t	Over 12	Over 0.4724	— 5	23	4.8	33
Over 16	Over 0.6299	No. 5	26			Over 12	Over 0.4724	— 5	23	4.8	33
Over 20	Over 0.7874	No. 4	20			Over 12	Over 0.4724	— 5	23	4.8	33

Note :

*1 Alloying elements not shown may be added if necessary.

*2 Ceq must be under 0.44%.

$$Ceq = C + \frac{Mn}{6} + \frac{Si}{24} + \frac{Ni}{40} + \frac{Cr}{5} + \frac{Mo}{4} + \frac{V}{14} \cdot (\%)$$

In case Ceq exceeds 0.44%, either of the following two conditions must be satisfied :

(1) Maximum hardness of weld part, tested on plates thicker than 12mm, must be HV350 (10kg load).

(2) Angle of bead bend which initiates a crack in HAZ (about 2mm from end of weld part), as tested on plates thicker than 19mm, must be over prescribed value.

*3 Impact test is applied only to plates exceeding 12mm in thickness.

Remarks :

SM58 is to be suffixed with symbol Q for quenched material and with symbol N for normalized material.

Note :

*1 Alloying elements not shown may be added if necessary.

*2 Ceq must be under 0.44%.

$$Ceq = C + \frac{Mn}{6} + \frac{Si}{24} + \frac{Ni}{40} + \frac{Cr}{5} + \frac{Mo}{4} + \frac{V}{14} (\%)$$

In case Ceq exceeds 0.44%, either of the following two conditions must be satisfied :

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(2) Angle of bead bend which initiates a crack in HAZ (about 2mm from end of weld part), as tested on plates thicker than 19mm, must be over prescribed value.

*3 Impact test is applied only to plates exceeding 12mm in thickness.

Remarks :

SM58 is to be suffixed with symbol Q for quenched material and with symbol N for normalized material.

BS 4360-1968 Weldable Structural Steel Plates

Grade	Chemical Composition. %						Ceq.*1 % max.	Tensile Strength ton/in ² (kg/mm ²)	Yield Point ton/in ² (kg/mm), min.			
	C max.	Si	Mn max.	P max.	S max.	Nb *4 max.			Under $\frac{5}{16}$ "	Over $\frac{5}{16}$ " up to 1½"	Over 1½" up to 2½"	Over 2½" up to 4"
40A *2	0.22	—	—	0.050	0.050	—	—	26-31 (41-48.8)	— ^{*8}	—	—	—
40B *2	0.20	—	1.5	//	//	—	—	//	15.0 (23.6)	14.5 (22.8)	14.25 (22.4)	13.5 (21.3)
40C	0.18	—	//	//	//	—	0.41	//	//	// ^{*9}	//	//
40D	0.16	—	//	//	//	0.10	//	//	17.0 (26.8)	16.0 (25.2)	15.5 (24.4)	14.5 (22.8)
40E	//	0.10-0.5C	//	0.040	0.040	—	0.39	//	//	//	//	//
43A *2	0.25	—	—	0.050	0.050	—	—	28-33 (44.1-52.0)	— ^{*8}	— ^{*10}	—	—
43A *2	//	—	—	//	//	—	—	//	16.0 (25.2)	15.5 (24.4)	15.0 (23.6)	14.0 (22.0)
43B *2	0.22	—	1.5	//	//	—	—	//	//	*10 y	//	//
43C	0.18	—	//	//	//	—	0.41	//	//	*10 //	15.25 (24.0)	14.5 (22.8)
43D	0.16	—	//	0.040	0.040	0.10	//	//	18.0 (28.3)	17.5 (27.6)	16.5 (26.0)	15.5 (24.4)
43E	//	0.10-0.5C	//	//	//	—	0.39	//	//	//	//	//
50A *2	0.23	—	1.6	0.050	0.050	—	—	32-40 ^{*6}	— ^{*8}	—	—	—
50B *2	0.20 ^{*3}	0.50	1.5	//	//	0.10	—	(5.04-63.0) ^{*6}	23.0 (36.2)	22.5 (35.4)	22.7 (54.6)	21.0 (33.1)
50C *2	// ^{*3}	//	//	//	//	//	0.45	//	//	//	//	//
50D	0.18	0.10-0.50	//	0.040	0.040	//	0.43	//	//	//	//	By Agreement
55C *2	0.22	0.60	1.6 ^{*5}	0.040	0.040	0.10	0.51	36-45 (56.9-71.0)	29.0 (45.7)	Over $\frac{5}{16}$ " up to 1" 28.0 (44.1)	Over 1" up to 2½" 27.0 (42.5)	Over 1½" up to 2½"
55E *2	//	//	// ^{*5}	//	//	//	//	//	//	//	//	26.0 (41.0)

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Elongation %, min.		Radius of Bend	Charpy V-Notch Impact Test			Thickness in max.
01=8" *11 mm.	01 = 5 . 65 So mm.		Temp. °C	Energy ft-lb min.		
22%	25%	1.25t *12	—	—		
"	"	"	R. T. *13	20	2	
"	"	"	0	"	"	
"	"	"	(-10	(30	3	
"	"	"	(-20	(20		
"	"	"	(-20	(45		
"	"	"	(-30	(35	-	
"	"	"	(-50	(20		
20%	22%	1.5t	—	—	—	
"	"	"	—	—	-	
"	"	"	R. T. *13	20	2	
"	"	"	0	"	-	
"	"	"	(-10	(30	3	
"	"	"	(-20	(20		
"	"	"	(-20	(45		
"	"	"	(-30	(35	"	
"	"	"	(-50	(20		
18%	20%	1.5t	—	—	-	
"	"	1t *12	—	—	-	
"	"	" *12	(- 5	(10	3	
"	"	"	(-15	(10		
"	"	1.5t	(-20	(30	"	
"	"	"	(-30	(20		
17%	19%	2t	0	20	¾ *14	
"	"	1.5t	(-20	(45	2½	
"	"	"	(-30	(35		
"	"	"	(-50	(20		

Note: *1 The carbon equivalent value shall be calculated using the formula :

$$Ceq=C+\frac{Mn}{6}+\frac{Cr+Mo+V}{5}+\frac{Ni+Cu}{15}$$

For plates of Grade 50C over ¾" thick, the maximum Ceq shall be 0.47%. For plates of Grade 50D up to 1½" (38mm) thick, a maximum carbon equivalent value may be set at 0.41%, in which case the grade shall be designated as 50D1.

*2 Grades 40A, 40B, 43A1, 43B, 50C, 55E may also be supplied containing either 0.20~0.35% or 0.35~0.50% Copper, if specified on the order.

*3 For plates of Grades 50B and 50C over ¾" thick a maximum carbon content of 0.22% is permitted.

*4 If micro-elements other than Niobium are to be used the manufacturer shall inform the purchase at the time of the enquiry or order.

*5 If used as an alloying element, Mn in Grades 55C and 55E includes Chromium.

*6 Regarding plates of Grades 50B and 50C over 2½" thick, minimum tensile strength shall be 31 ton/in².

*7 Minimum yield stress values for material over 4" thick to be agreed between the manufacturer and the purchaser.

*8 Only bend testes are required for plates of Grades 40A, 43A1 and 50A under ¼" thick.

*9 For Grade 40C up to ¾" thick, the minimum yield stress shall be 15.0 ton/in².

*10 For Grades 43A, 43B and 43C up to ¾" thick, the minimum yield stress shall be 16.0 ton/in².

*11 For material under ¾" thick, the minnum elongation value for GL=8" shall be 16% for Grades 40 and 43, aud 15% for grades 50 and 55.

*12 The maximum bend radius for plates of Grades 40A, 40B and 50B required for cold flanging shall be 1T. The maximum bend radius for Grade 50C over 1" thick shall be 1.5T.

*13 Impact value for Grades 40B and 43B shall apply only if specified on the order.

*14 The impact value for Grade 55C up to ¾" thick shall also be applicable to plates over ¾" np to 1½" thick by agreement between the manufacturer and the purchaser.

Note: *1 The carbon equivalent value shall be calculated using the formula:

$$C_{eq} = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Ni + Cu}{15}$$

For plates of Grade 50C over 3/8" thick, the maximum Ceq shall be 0.47%. For plates of Grade 50D up to 1 1/2" (38mm) thick, a maximum carbon equivalent value may be set at 0.41%, in which case the grade shall be designated as 50D1.

*2 Grades 40A, 40B, 43A1, 43B, 50C, 55E may also be supplied containing either 0.20~0.35% or 0.35~0.50% Copper, if specified on the order.

*3 For plates of Grades 50B and 50C over 3/8" thick a maximum carbon content of 0.22% is permitted.

*4 If micro-elements other than Niobium are to be used the manufacturer shall inform the purchaser at the time of the enquiry or order.

*5 If used as an alloying element, Mn in Grades 55C and 55E includes Chromium.

*6 Regarding plates of Grades 50B and 50C over 2 1/2" thick, minimum tensile strength shall be 31 ton/in².

*7 Minimum yield stress values for material over 4" thick to be agreed between the manufacturer and the purchaser.

*8 Only bend testes are required for plates of Grades 40A, 43A1 and 50A under 1/4" thick.

*9 For Grade 40C up to 3/4" thick, the minimum yield stress shall be 15.0 ton/in².

*10 For Grades 43A, 43B and 43C up to 3/4" thick, the minimum yield stress shall be 16.0 ton/in².

*11 For material under 3/8" thick, the minimum elongation value for GL=8" shall be 16% for Grades 40 and 43, and 15% for grades 50 and 55.

*12 The maximum bend radius for plates of Grades 40A, 40B and 50B required for cold flanging shall be 1T. The maximum bend radius for Grade 50C over 1" thick shall be 1.5T.

*13 Impact value for Grades 40B and 43B shall apply only if specified on the order.

*14 The impact value for Grade 55C up to 3/4" thick shall also be applicable to plates over 3/4" up to 1 1/2" thick by agreement between the manufacturer and the purchaser.

AB(1970) Higher Strength Hull Structural Steel Plates

Designation		Thickness mm (in.)	Chemical Composition %					Deoxidation	Tensile Test			
			C max.	Si	Mn	P max.	S max.		Tensile Strength		Yield Point	
									kg/mm ²	psi	kg/mm ²	psi
Ordinary :	Grade A	12.7(0.500) and under	—	—	—	0,05	0,05	Any method	For all grades : 41-50 58,000- 71.000		-	-
	Grade B	25.5(1.00) and under	0,21	*2	*1 0,8 -1.10*5	0,05	0,05	Semi-killed or killed				
	Grade C	51.0(2.00) and under	*3 0,23	0,1 -0,35	*1 0,6 -0,9	0,05	0,05	Fully killed, fine grain practice				
	Grade CS	51.0(2.00) and under	0,18	0,1 -0,35	1,00 -1,35	0,05	0,05	Fully killed, fine grain practice	For Flanging Quality : 39-46 58,000- 71/000			
	Grade D	35.0(1.378) and under	*4 0,21	0,35 max.	*4 0,6 -1,40	0,05	0,05	Semi-killed or killed				
	Grade E	51.0(2.00) and under	*4 0,18	0,1 -0,35	*4 0,7 -1,5	0,05	0,05	Fully killed, fine grain practice				
	Grade R	51.0(2.00) and under	—		2.5xC mm.	0,05	0,05	Semi-killed or killed				

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	Bend Test		Imooct Tast			Heat Treatment	Note :		
Elongation	Thickness	Ratio of Bend Daimeter	(Charpy Standard V-Notch)						
Test Specimen %, min.	mm (in.)	to Specimen Thickness	Temperature °C(°F)	km-m	ft-lb				
For all grades : GL=200 mm (8 in.) 21 GL=50 mm (2 in.) 24 GL=5.65i/A 22 CA eauls area of test specimen.) For Flanging Quality: GL = 200 mm (8 in.) 2,3	For all grades : 3		—	—	—	Normalized Over 35 0 mm (1.375in.) thick Normalized	*1 Upper limit of manganese may be exceeded provided carbon content plus 1/8 manganese content does not ex- ceed 0.40 per cent.		
							*4 Carbon content plus 1/8 manganese content shall not exceed 0.40 per cent.		
							*5 Where the use of cold flanging quality has been specially approved the man- ganese content may be reduced to 0.60~0.90%.		

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ASTM A515-70 Carbon Steel Plates for Pressure Vessels for Intermediate and Higher Temperature Service

Designation	Chemical Composition %						Tensile Test	
	Thickness in.	C max.	Si	Mn max.	P max.	S max.	Tensile Strength psi (kg/mm ²)	Yield Point psi (kg/mm ²) "
A515-55	1 and under	0,20	0.15-0.30	0,90	0,035	0,04	55,000-65,000 (38.7-45.7)	30,000 (21.1)
	1—2, incl.	0,22						
	2-4, incl.	0,24						
	4—8, incl.	0,26						
	8-12, incl.	0,28						
A515-60	1 and under	0,24	0.15-0.30	0,90	0,035	0,04	60,000-72,000 (42.2-50.6)	32,000 (22.5)
	1— 2, incl.	0,27						
	2—4, incl.	0,29						
	4—8, incl.	0,31						
	8—12, incl.	—						
A515-65	1 and under	0,28	0.15-0.30	0,90	0,035	0,04	65,000-77,000 (45.7-54.1)	35,000 (24.6)
	1-2, incl.	0,31						
	2 — 4, incl.	0,33						
	4—8, incl.	0,33						
	8-12, incl.	—						
A515-70	1 and under	0,31	0.15-0.30	0,90	0,035	0,04	70,000-85,000 (49.2-59.8)	38,000 (24.7)
	1 — 2, incl.	0,33						
	2 — 4, incl.	0,35						
	4 — 8, incl.	0,35						
	8-12, incl.	—						

ASTM A516-70a Carbon Steel Plates for Pressure Vessels for Moderate and Lower Temperature Service

Designation	Chemical Composition ½						Tensile Test *	
	Thickness in.	C max.	Si	Mn max.	P max.	S max.	Tensile Strength psi (kg/mm ²)	Yield Point psi (kg/mm ²)
A516-55	½ and under	0,18	0.15-0.30	0.60—0.90	0,035	0,04	55,000-65,000 (38.7-45.7)	30,000 (21.1)
	½-2, incl.	0,20		0.60-1.20				
	2-4, incl.	0,22						
	4—8, incl.	0,24						
	8-12, incl.	0,26						
A516-60	½ and under	0,21	0.15-0.50	0.60-0.90	0,035	0,04	60. 000-72,000 (42.2-50.6)	32,000 (22.5)
	½-2, incl.	0,23		0.85-1.20				
	2-4, incl.	0,25						
	4-8, incl.	0,27						
	8 — 12, incl.	—						
A516-65	½ and under	0,24	0.15-0.30	0.85-1.20	0,035	0,04	65,000-77,000 (45.7-54.1)	35,000 (2-4.6)
	½-2, incl.	0,26						
	2—4, incl.	0,28						
	4-8, incl.	0,29						
	8 — 12, incl.	—						
A516-70	½ and under	0,27	0.15-0.30	0.85-1.20	0,035	0,04	70,000-85,000 (49.2-59.8)	38,000 (26.7)
	½-2, incl.	0,28						
	2—4, incl.	0,30						
	4— 8, incl.	0,31						
	8 — 12, incl.	—						

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Tensile Test		Bend Test		
Elongation* % min.		Thickness in.	Angle of Bend	Diameter
GL = 8" min.	GL = 2" min.			
23	27	1 and under 1—2, incl. 2—4, incl. 4—8, incl. 8—12, incl.	180°	$\frac{1}{2}t$ 1.0t $1\frac{1}{2}t$ 2.0t $2\frac{1}{2}t$
21	25	1 and under 1—2, incl. 2—4, incl. 4—8, incl. 8—12, incl.	180°	1.0t $1\frac{1}{2}t$ 2.0t $2\frac{1}{2}t$ —
19	23	1 and under 1—2, incl. 2—4, incl. 4—8, incl. 8—12, incl.	180°	$1\frac{1}{2}t$ 2.0t 2.0t $2\frac{1}{2}t$ —
17	21	1 and under 1—2, incl. 2—4, incl. 4—8, incl. 8—12, incl.	180°	2.0t 2.0t $2\frac{1}{2}t$ 3.0t —

Note* (a) For material under $\frac{5}{16}$ " thick, a deduction of 1.25% from elongation % in GL=8" shall be made for each decrease of $\frac{1}{32}$ " of specified thickness under $\frac{5}{16}$ ".
(b) For material over $\frac{3}{4}$ " thick, a deduction of 0.5% from elongation % in GL=8" shall be made for each increase of $\frac{1}{8}$ " of specified thickness above $\frac{3}{4}$ ". This deduction shall not exceed 3%.
(c) For material over $3\frac{1}{2}$ " thick, a deduction of 0.5% from elongation % in GL=2" shall be made for each increase of $\frac{1}{2}$ " of specified thickness above $3\frac{1}{2}$ ". This deduction shall not exceed 3%.

Tensile Test *		Bend Test		
Elongation %		Thickness in.	Angle of Bend	Diameter
GL = 8"	GL = 2"			
23	27	1 and under	180°	½t
		1—2, incl.		1.0t
		2—4, incl.		1½t
		4—8, incl.		2.0t
		8—12, incl.		2½t
21	25	1 and under	180°	1.0t
		1—2, incl.		½t
		2—4, incl.		2.0t
		4—8, incl.		2½t
		8—12, incl.		—
19	23	1 and under	180°	1½t
		1—2, incl.		2.0t
		2—4, incl.		2.0t
		4—8, incl.		2½t
		8—12, incl.		—
17	21	1 and under	180°	2.0t
		1—2, incl.		2.0t
		2—4, incl.		2½t
		4—8, incl.		3.0t
		8—12, incl.		—

Note* (a) For material under 5/16" thick, a deduction of 1.25% from elongation % in GL=8" shall be made for each decrease of 1/32" of specified thickness under 5/16".
(b) For material over 3/4" thick, a deduction of 0.5% from elongation % in GL=8" shall be made for each increase of 1/8" of specified thickness above 3/4". This deduction shall not exceed 3%.
(c) For material over 3½" thick, a deduction of 0.5% from elongation % in GL=2" shall be made for each increase of ½" of specified thickness above 3½". This deduction shall not exceed 3%.
(d) For material under ½" thick.

MILD STEEL PLATE REFERENTIAL DATA

7.85 kg/m² - 0.7293 kg/mm ft²

Thickness (mm) Width & Length (ft)

Thickness (mm)	Unit Weight (kg)	3x6	4x8	4 x 10	4x 16	4x 20	5x 10	5x 20	5x30	5x40	6x30	6x 40
		18	32	40	64	80	50	100	150	200	180	240
1,2	8752	15,8	28,0	35,0	56,0	70,0	43,8	87,5	131	175	158	210
1,6	1,167	21,0	37,3	46,7	74,7	93,4	58,4	117	175	233	210	280
1,9	1,386	24,9	44,4	55,4	88,7	111	69,3	139	208	277	249	333
2,3	1,677	30,2	53,7	67,1	107	134	83,9	168	252	335	302	402
2,6	1,896	34,1	60,7	75,8	121	152	94,8	190	284	379	341	455
3,0	2,188	39,4	70,0	87,5	140	175	109	219	328	438	394	525
3,2	2,334	42,0	74,7	93,4	148	187	117	233	350	467	420	560
4,5	3,282	59,1	105	131	210	263	164	328	492	656	591	788
5	3,646	65,6	117	146	233	292	182	365	547	729	656	875
6	4,376	78,8	140	175	280	350	219	438	656	875	788	1.050
7	5,105	91,9	163	204	327	408	255	510	766	1.021	919	1.225
8	5,834	105	187	233	373	467	292	583	875	1.167	1.050	1.400
9	6,564	118	210	263	420	525	328	656	985	1.313	1.182	1.575
10	7,293	131	233	292	467	583	365	729	1.094	1.459	1.313	1.750
11	8,022	144	257	321	513	642	401	802	1.203	1.604	1.444	1.925
12	8,752	158	280	350	560	700	438	875	1.313	1.750	1.575	2.100
12,7	9,262	167	296	370	593	741	463	926	1.389	1.852	1.667	2.223
13	9,481	171	303	379	607	758	474	948	1.422	1.896	1.707	2.275
14	10,21	184	327	408	653	817	510	1.021	1.532	2.042	1.838	2.450
15	10,94	197	350	438	700	875	547	1.094	1.641	2.188	1.969	2.626
16	11,67	210	373	467	747	934	584	1.167	1.750	2.334	2.101	2.801
17	12,40	223	397	496	794	992	620	1.240	1.860	2.480	2.232	2.976
18	13,13	236	420	525	840	1.050	656	1.313	1.970	2.625	2.363	3.151
19	13,86	249	444	554	887	1.109	693	1.386	2.079	2.772	2.495	3.326
20	14,59	263	467	584	934	1.167	730	1.459	2.188	2.918	2.626	3.502
21	15,32	276	490	613	980	1.226	766	1.532	2.298	3.064	2.758	3.677
22	16,04	289	513	642	1.027	1.283	802	1.604	2.406	3.208	2.887	3.850
23	16,77	302	537	671	1.073	1.342	838	1.677	2.516	3.354	3.019	4.025
24	17,50	315	560	700	1.120	1.400	875	1.750	2.625	3.500	3.150	4.200
25	18,23	328	583	729	1.167	1.458	912	1.823	2.734	3.646	3.281	4.375
25,4	18,52	333	593	741	1.185	1.482	926	1.852	2.778	3.704	3.334	4.445
26	18,96	341	607	758	1.213	1.517	948	1.896	2.844	3.792	3.413	4.550
27	19,69	354	630	788	1.260	1.575	984	1.969	2.954	3.938	3.544	4.726
28	20,42	368	653	817	1.307	1.634	1.021	2.042	3.063	4.084	3.676	4.901
29	21,15	381	677	846	1.354	1.692	1.058	2.115	3.172	4.230	3.807	5.076
30	21,88	394	700	875	1.400	1.750	1.094	2.188	3.282	4.376	3.938	5.251
32	23,34	420	747	934	1.494	1.867	1.167	2.334	3.501	4.668	4.201	5.602
34	24,80	446	794	992	1.587	1.984	1.240	2.480	3.720	4.960	4.464	5.952
36	26,25	472	840	1050	1.680	2.100	1.312	2.625	3.938	5.250	4.752	6.300
38	27,71	499	887	1.108	1.773	2.217	1.386	2.771	4.156	5.542	4.988	6.650
40	29,17	525	933	1.167	1.867	2.334	1.458	2.917	4.376	5.834	5.251	7.001
45	32,82	591	1.050	1.313	2.100	2.626	1.641	3.282	4.923	6.564	5.908	7.877
50	36,46	656	1.167	1.458	2.334	2.917	1.823	3.646	5.469	7.292	6.563	8.750
55	40,11	722	1.284	1.604	2.567	3.209	2.006	4.011	6.016	8.022	7.220	9.626
60	43,76	788	1.400	1.750	2.801	3.501	2.188	4.376	6.564	8.752	7.877	10.502
65	47,40	853	1.517	1.896	3.035	3.792	2.370	4.740	7.110	9.480	8.532	11.376
70	51,05	919	1.634	2.042	3.267	4.084	2.552	5.105	7.658	10.210	9.189	12.252
80	58,34	1.050	1.867	2.334	3.734	4.667	2.917	5.834	8.751	11.670	10.500	14.002
90	65,64	1.182	2.100	2.626	4.201	5.251	3.282	6.564	9.846	13.128	11.815	15.754
100	72,93	1.313	2.334	2.917	4.668	5.834	3.647	7.293	10.940	14.586	13.127	17.503
110	80,22	1.444	2.567	3.209	5.134	6.418	4.011	8.022	12.033	16.044	14.440	19.253
120	87,52	1.575	2.801	3.501	5.601	7.002	4.376	8.752	13.128	17.504	15.754	21.005
130	94,81	1.707	3.034	3.792	6.080	7.585	4.741	9.481	14.222	18.962	17.066	22.754
140	102,1	1.838	3.267	4.084	6.534	8.168	5.105	10.210	15.315	20.420	18.378	24.504
150	109,4	1.969	3.501	4.376	7.002	8.752	5.470	10.940	16.410	21.880	19.692	25.256



MILD STEEL PLATES

ASTM (180505 kg/in ft²)

Thickness in. mm		Width x Length ft	4x8	5x10	5x20	5x30	6x20	6x24	6x30	8x30
		Unit Weight kg/ft²	32	50	100	150	120	144	180	240
$\frac{1}{16}$	1.59	1.157	37.0	37.9	116	174	139	167	208	278
$\frac{1}{8}$	3.18	2.313	74.0	139	231	347	278	333	416	555
$\frac{1}{16}$	4.76	3.470	111	174	347	520	416	500	625	833
$\frac{1}{4}$	6.39	4.626	148	231	463	694	555	666	833	1.110
$\frac{5}{16}$	7.94	5.783	185	289	578	867	694	833	1.041	1.388
$\frac{3}{8}$	9.53	6.939	222	347	694	1.041	833	999	1.249	1.665
$\frac{7}{16}$	11.11	8.096	259	405	810	1.214	972	1.166	1.457	1.943
$\frac{1}{2}$	12.70	9.252	296	463	925	1.388	1.110	1.332	1.665	1.220
$\frac{9}{16}$	14.29	10.41	333	520	1.041	1.504	1.249	1.499	1.874	2.498
$\frac{5}{8}$	15.88	11.57	370	578	1.157	1.736	1.388	1.666	2.083	2.777
$\frac{11}{16}$	17.46	12.72	407	636	1.272	1.908	1.526	1.832	2.290	3.053
$\frac{3}{4}$	19.05	13.88	444	694	1.388	2.082	1.666	1.999	2.498	3.331
$\frac{13}{16}$	20.64	15.04	481	752	1.504	2.256	1.805	2.166	2.707	3.610
$\frac{7}{8}$	22.23	16.19	518	810	1.619	2.428	1.943	2.331	2.914	3.886
$\frac{15}{16}$	23.81	17.35	555	868	1.735	2.602	2.082	2.498	3.123	4.164
1	25.40	18.50	592	925	1.850	2.775	2.220	2.664	3.330	4.440
$1\frac{1}{8}$	28.58	20.82	666	1.041	2.082	3.123	2.498	2.889	3.748	4.997
$1\frac{1}{4}$	31.75	23.13	740	1.156	2.313	3.470	2.776	3.331	4.163	5.551
$1\frac{3}{8}$	34.93	25.44	814	1.272	2.544	3.816	3.053	3.663	4.579	6.106
$1\frac{1}{2}$	38.10	27.76	888	1.388	3.776	4.164	3.331	3.997	4.997	6.662
$1\frac{5}{8}$	41.28	30.07	926	1.504	3.007	4.510	3.608	4.330	5.413	7.217
$1\frac{3}{4}$	44.45	32.38	1.036	1.619	3.238	4.856	3.886	4.663	5.828	7.771
$1\frac{7}{8}$	47.63	34.70	1.110	1.735	2.470	5.205	4.164	4.997	6.246	8.328
2	50.80	37.01	1.184	1.850	3.701	5.552	4.441	5.329	6.662	8.882
$2\frac{1}{2}$	63.50	46.26	1.480	2.313	4.626	6.939	5.551	6.661	8.327	11.102
3	76.20	55.52	1.777	2.776	7.552	8.238	6.162	7.995	9.994	13.325
4	101.6	74.02	2.369	3.701	7.402	11.103	8.882	10.659	13.324	17.765
5	127.0	92.52	2.960	4.626	9.252	13.878	11.102	13.323	16.654	22.205
6	152.4	111.02	3.553	5.551	11.102	13.658	13.322	15.987	19.984	26.645

BS (18.507 kg/in ft²)

Thickness in. mm		Width x Length ft	4x8	5x10	5x20	5x30	6x20	6x24	6x30	8x30
		Unit Weight kg/ft²	32	50	100	150	120	144	180	240
$\frac{1}{16}$	1.59	1.157	37.0	57.9	116	174	139	167	208	278
$\frac{1}{8}$	3.18	2.313	74.0	116	231	347	278	333	416	555
$\frac{3}{16}$	4.76	3.470	111	174	347	520	416	500	625	833
$\frac{1}{4}$	6.39	4.626	148	231	463	694	555	666	833	1.110
$\frac{5}{16}$	7.94	5.783	185	289	578	876	694	833	1.041	1.388
$\frac{3}{8}$	9.53	6.940	222	347	694	1.041	833	999	1.249	1.666
$\frac{7}{16}$	11.11	8.096	259	405	810	1.215	972	1.166	1.457	1.943
$\frac{1}{2}$	12.70	9.252	296	463	925	1.388	1.110	1.333	1.665	2.221
$\frac{9}{16}$	14.29	10.41	333	520	1.041	1.562	1.249	1.499	1.874	2.498
$\frac{5}{8}$	15.88	11.57	370	578	1.157	1.736	1.388	1.666	2.083	2.777
$\frac{11}{16}$	17.46	12.72	407	636	1.272	1.908	1.526	1.832	2.290	3.053
$\frac{3}{4}$	19.05	13.88	444	694	1.388	2.082	1.666	1.999	2.498	3.331
$\frac{13}{16}$	20.64	15.04	481	752	1.504	2.256	1.805	2.166	2.707	3.610
$\frac{7}{8}$	22.23	16.19	518	810	1.619	2.428	1.943	2.331	2.914	3.886
$\frac{15}{16}$	23.81	17.35	555	868	1.735	2.602	2.082	2.498	3.123	4.164
1	25.40	18.51	592	926	1.851	2.775	2.221	2.665	3.332	4.447
$1\frac{1}{8}$	28.58	20.82	666	1.041	2.082	3.123	2.498	2.998	3.748	4.997
$1\frac{1}{4}$	31.75	23.13	740	1.156	2.313	3.470	2.776	3.331	4.163	5.551
$1\frac{3}{8}$	34.93	25.44	814	1.388	2.776	4.164	3.054	3.665	4.581	6.108
$1\frac{1}{2}$	38.10	27.76	888	1.388	2.776	4.164	3.331	3.997	4.997	6.662
$1\frac{5}{8}$	41.28	30.07	926	1.504	3.007	4.510	3.608	4.330	5.413	7.217
$1\frac{3}{4}$	44.45	32.38	1.036	1.620	3.239	4.858	3.887	4.664	5.830	7.774
$1\frac{7}{8}$	47.63	34.70	1.110	1.735	3.470	5.205	4.164	4.997	6.246	8.238
2	50.80	37.01	1.184	1.850	3.701	5.552	4.441	5.329	6.662	8.882
$2\frac{1}{2}$	63.50	46.26	1.481	2.314	4.672	6.940	5.552	6.663	8.329	11.105
3	76.20	55.52	2.776	2.776	5.552	8.238	6.662	7.995	9.994	13.325
4	101.6	74.02	2.369	3.701	7.502	11.103	8.882	10.659	13.324	17.765
5	127.0	92.52	2.960	4.626	9.252	13.878	11.102	13.323	16.654	22.205
6	152.4	111.02	3.553	5.551	11.102	16.653	13.322	15.987	19.984	26.645

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MILD STEEL PLATES

JIS (18,524 kg/in ft²)

Thickness in. mm		Width x Length ft	4x8	5x10	5x20	5x30	6x20	6x24	6x30	8x30
		Unit Weight kg/ft ²	32	50	100	150	120	144	180	240
$\frac{1}{16}$	1.59	1.158	37.1	57.9	116	174	139	167	208	278
$\frac{1}{8}$	3.18	2.316	74.1	116	232	347	278	334	417	556
$\frac{3}{16}$	4.76	3.473	111	174	347	521	417	500	625	834
$\frac{1}{4}$	6.35	4.631	148	232	463	695	556	667	834	1,111
$\frac{5}{16}$	7.94	5.789	185	289	579	868	695	834	1,042	1,389
$\frac{3}{8}$	9.53	6.946	222	347	695	1,042	834	1,000	1,250	1,667
$\frac{7}{16}$	11.11	8.104	259	405	810	1,256	972	1,167	1,459	1,945
$\frac{1}{2}$	12.70	9.262	296	463	926	1,389	1,111	1,334	1,667	2,223
$\frac{9}{16}$	14.24	10.42	333	521	1,042	1,563	1,250	1,500	1,876	2,501
$\frac{5}{8}$	15.88	11.58	371	579	1,158	1,737	1,390	1,668	2,084	2,779
$\frac{11}{16}$	17.46	12.74	408	637	1,274	1,911	1,529	1,835	2,293	3,058
$\frac{3}{4}$	19.05	13.89	444	694	1,389	2,084	1,667	2,000	2,500	3,334
$\frac{13}{16}$	20.64	15.05	482	752	1,505	2,254	1,806	2,167	2,709	3,612
$\frac{7}{8}$	22.23	16.21	519	810	1,621	2,432	1,945	2,334	2,918	3,890
$\frac{15}{16}$	23.81	17.37	556	868	1,737	2,606	2,084	2,501	3,127	4,169
1	25.40	18.52	593	926	1,852	2,778	2,222	2,667	3,334	4,445
$1\frac{1}{8}$	28.58	20.84	667	1,042	2,084	3,126	2,501	3,001	3,751	5,002
$1\frac{1}{4}$	31.75	23.16	741	1,158	2,316	3,474	2,779	3,335	4,169	5,558
$1\frac{3}{8}$	34.93	25.47	815	1,274	2,547	3,820	3,056	3,668	4,585	6,113
$1\frac{1}{2}$	38.10	27.79	889	1,390	2,779	4,168	3,335	4,002	5,002	6,670
$1\frac{5}{8}$	41.28	30.10	963	1,505	3,010	4,515	3,612	4,334	5,418	7,224
$1\frac{3}{4}$	44.45	32.42	1,037	1,621	3,242	4,863	3,890	4,668	5,836	7,781
$1\frac{7}{8}$	47.63	34.73	1,111	1,736	3,473	5,210	4,168	5,001	6,251	8,335
2	50.80	37.05	1,186	3,705	5,705	5,558	4,446	5,335	6,669	8,892
$2\frac{1}{2}$	63.50	46.31	1,482	4,631	4,631	6,946	5,557	6,669	8,336	11,114
3	76.20	55.57	1,778	2,778	5,557	8,336	6,668	8,002	10,003	13,337
4	101.6	74.10	2,371	3,705	4,446	7,410	8,892	10,670	13,338	17,784
5	127.0	92.62	2,964	4,631	9,262	11,114	qq.114	13,337	16,672	22,229
6	152.4	111.1	3,555	5,555	11,110	16,665	13,332	15,998	19,998	26,664

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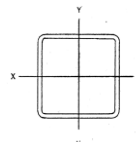


CHEQUERED PLATE

WEIGHT TABLE, kg(lb)

Thickness	Unit Weight,	Width and Length, mm							
		(Figures in the lower row — e.g., 3x6 — are nominal sizes in feet)							
mm	kg/m ²	914 x 1,829	914 x 3,658	914 x 2,438	1,219 x 3,048	1,219 x 4,877	1,219 x 6,096	1,524 x 3,048	1,524 x 6,096
(in)	(lb/ft ²)	(3x 6)	(3x 12)	(4x8)	(4x 10)	(4 x 16)	(4 x 20)	(5x 10)	(5 x 20)
2.3 (0.091)	19.73 (4.04)	33.0 (72.75)	66.0 (145.5)	58.6 (129.2)	73.3 (161.6)	117 (257.9)	147 (324.1)	91.6 (201.9)	183 (403.4)
3.2 (0.126)	26.79 (5.49)	44.8 (98.77)	89.6 (197.5)	79.6 (175.5)	99.6 (219.6)	159 (350.5)	199 (438.7)	124 (273.4)	249 (549.0)
4.5 (0.177)	36.99 (7.58)	61.8 (136.2)	124 (273.4)	110 (242.5)	137 (302.0)	220 (485.0)	275 (606.3)	172 (379.2)	344 (758.4)
6.0 (0.236)	48.77 (9.99)	81.5 (179.7)	163 (359.4)	145 (319.7)	181 (399.0)	290 (639.3)	362 (798.1)	227 (500.4)	453 (998.7)
8.0 (0.315)	64.47 (13.2)	108 (238.1)	216 (476.2)	192 (423.3)	240 (529.1)	383 (844.4)	0,479 (1,056)	299 (659.2)	599 (1,321)
9.0 (0.354)	72.32 (14.8)	121 (266.8)	242 (533.5)	215 (474.0)	269 (593.9)	430 (948.0)	537 (1,184)	336 (740.8)	672 (1,482)
10.0 (0.394)	80.17 (16.4)	134 (295.4)	268 (590.8)	238 (524.7)	298 (657.0)	477 (1,052)	596 (1,314)	372 (820.1)	745 (1,642)
12.0 (0.472)	95.87 (19.6)	167 (368.2)	320 (705.5)	285 (628.3)	356 (748.8)	570 (1,257)	712 (1,570)	445 (981.1)	891 (1,964)

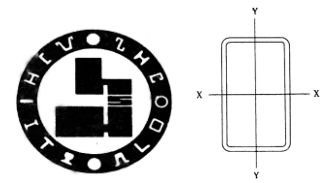
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SQUARE HOLLOW SECTIONS

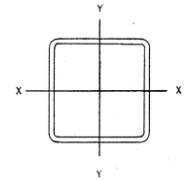
Sizes		Wall Thickness		Unit Weight					Area of Metal	Moment of Inertia I	Section Modulus Z	Radius of Gyration r
inches	mm	inches	mm	lbs/ft	lbs/20ft	kg/ft	kg/m	kg/6m	in ²	in ⁴	in ⁴	in
1/2 x 1/2	12.7 x 12.7	0.047	1.2	0.272	5.440	0.123	0.404	2.424	0.082	0.002	0.010	0.180
		0.063	1.6	0.364	7.200	0.165	0.541	3.246	0.102	0.003	0.012	0.173
5/8 x 5/8	15.9 x 15.9	0.047	1.2	0.353	7.060	0.160	0.525	3.150	0.106	0.005	0.018	0.231
		0.063	1.6	0.472	9.440	0.214	0.702	4.212	0.134	0.006	0.021	0.223
3/4 x 3/4	19.1 x 19.1	0.047	1.2	0.434	8.680	0.197	0.646	3.876	0.140	0.011	0.030	0.288
		0.063	1.6	0.580	11.600	0.263	0.863	5.178	0.186	0.014	0.037	0.282
		0.095	2.4	0.817	16.340	0.371	1.230	7.380	0.240	0.017	0.046	0.270
1 x 1	25.4 x 25.4	0.047	1.2	0.593	11.860	0.269	0.883	5.296	0.173	0.026	0.051	0.385
		0.063	1.6	0.770	15.400	0.350	1.150	6.900	0.226	0.032	0.064	0.376
		0.091	2.3	1.050	21.000	0.470	1.540	9.240	0.308	—	—	—
		0.095	2.4	1.100	22.000	0.500	1.640	9.840	0.321	0.041	0.082	0.358
		0.120	3.0	1.296	25.920	0.588	1.929	11.574	0.385	0.047	0.094	0.350
1.1/4 x 1.1/4	31.8 x 31.8	0.047	1.2	0.754	15.080	0.342	1.122	6.733	0.220	0.052	0.084	0.487
		0.063	1.6	0.983	19.660	0.446	1.463	8.778	0.290	0.066	0.106	0.479
		0.091	2.3	1.357	27.140	0.616	2.020	12.120	—	—	—	—
		0.095	2.4	1.420	28.400	0.642	2.110	12.660	0.416	0.089	0.142	0.461
		0.120	3.0	1.698	33.960	0.770	2.527	15.162	0.505	0.103	0.165	0.452
1.1/2 x 1.1/2	38.1 x 38.1	0.047	1.2	0.915	18.300	0.415	1.362	8.172	0.288	0.093	0.124	0.590
		0.063	1.6	1.200	24.000	0.544	1.785	10.710	0.384	0.120	0.159	0.581
		0.091	2.3	1.666	33.320	0.756	2.480	14.880	—	—	—	—
		0.095	2.4	1.740	34.800	0.790	2.592	15.552	0.526	0.163	0.220	0.564
		0.120	3.0	2.100	42.000	0.953	3.125	18.750	0.626	0.192	0.260	0.554
2 x 2	50.8 x 80.8	0.063	1.6	1.626	32.524	0.738	2.424	14.544	0.480	0.300	0.300	0.786
		0.091	2.3	2.282	45.637	1.035	3.396	20.377	—	—	—	—
		0.095	2.4	2.380	47.600	1.080	3.542	21.252	0.700	0.415	0.415	0.770
		0.120	3.0	2.904	58.080	1.317	4.322	25.932	0.870	0.494	0.494	0.756
		0.125	3.2	3.060	61.200	1.390	4.560	24.360	0.893	0.508	0.508	0.756
2.1/2 x 2.1/2	63.5 x 63.5	0.156	4.0	3.700	74.000	1.680	5.510	33.060	1.088	0.589	0.589	0.740
		0.091	2.3	2.898	57.965	1.315	4.313	25.878	—	—	—	—
		0.095	2.4	3.030	60.600	1.374	4.509	24.056	0.900	0.850	0.680	0.980
		0.120	3.0	3.708	74.160	1.682	5.518	33.111	1.110	1.020	0.820	0.961
		0.125	3.2	3.910	78.200	1.770	5.810	34.860	1.150	1.053	0.840	0.958
3 x 3	76.2 x 76.2	0.156	4.0	4.760	95.200	2.160	7.090	42.540	1.400	1.241	0.993	0.942
		0.091	2.3	3.515	70.290	1.594	5.231	31.387	—	—	—	—
		0.095	2.4	3.670	73.400	1.670	5.480	32.880	1.080	1.503	1.002	1.180
		0.120	3.0	4.511	90.226	2.046	6.714	40.281	1.346	1.830	1.220	1.170
		0.125	3.2	4.790	95.798	2.173	7.129	42.772	1.400	1.890	1.260	1.163
3.1/2 x 3.1/2	88.9 x 88.9	0.156	4.0	5.820	116.400	2.640	8.660	51.960	1.711	2.251	1.500	1.147
		0.125	3.2	5.647	112.940	2.561	8.404	50.424	1.651	3.100	1.760	1.367
		0.156	4.0	6.880	137.600	3.120	10.240	61.420	2.024	3.712	2.121	1.354
		0.177	4.5	7.739	154.775	3.510	11.518	69.105	—	—	—	—
		0.180	4.6	7.850	157.000	3.560	11.680	70.080	2.310	4.000	2.264	1.330
4 x 4	101.6 x 101.6	0.236	6.0	10.006	200.125	4.539	14.891	89.348	—	—	—	—
		0.250	6.4	10.400	208.000	4.760	15.618	93.705	3.100	5.300	3.020	1.310
		0.125	3.2	6.505	130.100	2.951	9.681	58.086	1.902	4.700	2.344	1.572
		0.156	4.0	7.950	159.000	3.600	11.810	70.900	2.340	5.660	2.830	1.556
		0.177	4.5	8.945	178.892	4.057	13.312	79.874	—	—	—	—
5 x 5	127.0 x 177.0	0.180	4.6	9.070	181.400	4.120	13.520	81.120	2.670	6.130	3.064	1.532
		0.236	6.0	11.614	232.281	5.268	17.285	103.708	—	—	—	—
		0.250	6.4	12.000	240.000	5.450	17.881	107.286	3.540	8.000	4.000	1.503
		0.156	4.0	10.100	202.000	4.570	15.000	90.000	2.961	11.430	4.571	1.965
		0.177	4.5	11.356	275.126	5.151	16.901	101.403	—	—	—	—
6 x 6	152.4 x 152.4	0.180	4.6	11.500	230.000	5.216	17.113	102.680	3.390	12.560	5.025	1.942
		0.236	6.0	14.830	296.593	6.727	22.070	132.424	—	—	—	—
		0.250	6.4	15.400	308.000	6.990	22.930	137.580	4.540	16.600	6.640	1.920
		0.156	4.0	12.200	244.000	5.530	18.140	108.840	3.583	20.200	6.730	2.400
		0.177	4.5	13.768	275.361	6.245	20.940	122.940	—	—	—	—
8 x 8	203.2 x 203.2	0.180	4.6	13.900	278.000	6.330	20.770	124.620	4.103	22.400	7.470	2.350
		0.236	6.0	18.045	360.000	8.185	26.856	161.130	—	—	—	—
		0.250	6.4	18.800	376.000	8.540	28.020	168.120	5.535	29.850	9.950	2.320
		0.1857	4.8	19.400	388.000	8.800	28.900	193.400	5.710	57.240	14.310	3.167
		0.250	6.4	25.400	508.000	11.500	37.730	226.400	7.500	73.400	18.350	3.132
10 x 10	254.0 x 254.0	0.250	6.4	33.000	660.000	15.000	49.220	295.320	9.720	154.000	31.000	4.000
		0.375	9.5	48.800	976.000	22.130	72.610	435.660	14.400	222.000	44.300	3.930

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RECTANGULAR HOLLOW SECTIONS

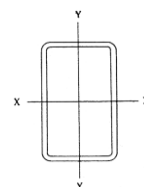
Sizes		Wall Thickness		Unit Weight					Area of Metal	Moment of Inertia in ⁴		Section Modulus in ³		Radius of Gyration in	
inches	mm	inches	mm	lbs/ft	lb/20ft	kg/ft	kg/m	kg/6m	in ²	I _{xx}	I _{yy}	Z _{xx}	Z _{yy}	r _{xx}	r _{yy}
1 x 1/2	25.4 x 12.7	0.047	1.2	0.448	8.960	0.203	0.670	4.020	0.131	0.015	0.005	0.031	0.020	0.344	0.198
		0.063	1.6	0.580	11.600	0.263	0.863	5.178	0.167	0.018	0.006	0.037	0.024	0.335	0.191
1.1/2 x 1	38.1 x 25.4	0.047	1.2	0.767	15.340	0.348	1.140	6.840	0.229	0.070	0.037	0.094	0.075	0.555	0.405
		0.063	1.6	1.010	20.200	0.457	1.500	9.000	0.297	0.088	0.047	0.118	0.094	0.546	0.398
2 x 1	50.8 x 25.4	0.047	1.2	0.915	18.295	0.415	1.362	8.172	0.288	0.144	0.049	0.144	0.971	0.726	0.422
		0.0598	1.5	1.128	22.560	0.513	1.683	10.090	0.365	0.179	0.060	0.179	0.120	0.721	0.416
		0.063	1.6	1.200	24.000	0.544	1.785	10.710	0.384	0.187	0.062	0.187	0.125	0.720	0.415
		0.091	2.3	1.666	33.320	0.756	2.480	14.880	—	—	—	—	—	—	—
		0.095	2.4	1.740	34.800	0.790	2.592	15.550	0.526	0.260	0.085	0.260	0.170	0.702	0.401
		0.120	3.0	2.100	42.000	0.953	3.125	18.752	0.626	0.285	0.093	0.285	0.187	0.680	0.390
2.1/2 x 1.1/2	63.5 x 38.1	0.063	1.6	1.626	32.524	0.738	2.424	14.544	0.480	0.416	0.189	0.333	0.252	0.920	0.620
		0.091	2.3	2.282	45.637	1.035	3.396	20.377	—	—	—	—	—	—	—
		0.095	2.4	2.380	47.600	1.080	3.542	21.252	0.700	0.572	0.257	0.457	0.343	0.903	0.606
		0.120	3.0	2.904	58.080	1.317	4.322	25.932	0.870	0.685	0.306	0.548	0.409	0.889	0.595
3 x 1.1/2	76.2 x 38.1	0.075	1.9	2.166	43.319	0.982	3.224	19.341	—	—	—	—	—	—	—
		0.091	2.3	2.590	51.801	1.175	3.855	23.127	—	—	—	—	—	—	—
		0.095	2.4	2.700	54.000	1.225	4.018	24.110	0.795	0.901	0.304	0.601	0.406	1.064	0.619
		0.120	3.0	3.306	66.109	1.500	4.920	29.521	0.985	1.086	0.364	0.724	0.485	1.050	0.607
3 x 2	76.2 x 50.8	0.075	1.9	2.421	48.410	1.098	3.603	21.618	—	—	—	—	—	—	—
		0.091	2.3	2.898	57.964	1.315	4.313	25.878	—	—	—	—	—	—	—
		0.095	2.4	3.030	60.600	1.374	4.509	27.056	0.900	1.102	0.589	0.734	0.589	1.112	0.813
		0.120	3.0	3.708	74.160	1.682	5.518	33.111	1.110	1.330	0.707	0.886	0.707	1.097	0.800
		0.125	3.2	3.910	78.200	1.770	5.810	34.860	1.150	1.372	0.730	0.915	0.730	1.094	0.797
		0.156	4.0	4.760	95.200	2.160	7.090	42.540	1.400	1.620	0.860	1.080	0.860	1.080	0.782
4 x 2	101.6 x 50.8	0.075	1.9	2.930	58.593	1.329	4.361	26.163	—	—	—	—	—	—	—
		0.091	2.3	3.515	70.290	1.594	5.231	31.387	—	—	—	—	—	—	—
		0.095	2.4	3.670	73.400	1.670	5.480	32.880	1.080	2.233	0.761	1.116	0.761	1.440	0.840
		0.120	3.0	4.511	90.226	2.046	6.714	40.281	1.346	2.720	0.920	1.360	0.919	1.421	0.830
		0.125	3.2	4.790	95.789	2.173	7.129	42.772	1.400	2.810	0.950	1.405	0.950	1.420	0.824
		0.156	4.0	5.820	116.400	2.640	8.660	51.960	1.711	3.350	1.121	1.674	1.121	1.400	0.809
5 x 2	127.0 x 50.8	0.125	3.2	5.647	112.940	2.561	8.404	50.424	1.651	4.960	1.174	1.983	1.174	1.735	0.844
		0.156	4.0	6.880	137.600	3.120	10.240	61.420	2.024	5.960	1.400	2.383	1.400	1.7160	0.830
		0.177	4.5	7.739	154.775	3.510	11.518	69.105	—	—	—	—	—	—	—
		0.180	4.6	7.850	157.000	3.560	11.680	70.080	2.310	6.320	1.500	2.530	1.500	1.675	0.814
		0.236	6.0	10.006	200.125	4.539	14.891	89.348	—	—	—	—	—	—	—
		0.250	6.4	10.400	208.000	4.760	15.618	93.705	3.100	7.790	1.813	3.116	1.813	1.616	0.780
4 x 3	101.6 x 76.2	0.125	3.2	5.647	112.940	2.561	8.404	50.424	1.651	3.750	2.406	1.874	1.604	1.508	1.209
		0.156	4.0	6.880	137.600	3.120	10.240	61.420	2.024	4.520	2.900	2.260	1.930	1.500	1.196
		0.177	4.5	7.739	154.775	3.510	11.518	69.105	—	—	—	—	—	—	—
		0.180	4.6	7.850	157.000	3.560	11.680	70.080	2.310	4.813	3.092	2.407	2.061	1.462	1.172
		0.236	6.0	10.006	200.125	4.539	14.891	89.348	—	—	—	—	—	—	—
		0.250	6.4	10.400	208.000	4.760	15.618	93.705	3.100	6.450	4.100	3.225	2.733	1.445	1.152
5 x 3	127.0 x 76.2	0.125	3.2	6.505	130.100	2.951	9.781	58.086	1.902	6.431	2.923	2.572	1.950	1.841	1.241
		0.156	4.0	7.950	159.000	3.600	11.810	70.900	2.340	7.765	3.514	3.106	2.342	1.823	1.226
		0.177	4.5	8.945	178.892	4.057	13.312	79.874	—	—	—	—	—	—	—
		0.180	4.6	9.070	181.400	4.120	13.520	81.120	2.670	8.400	3.809	3.351	2.540	1.791	1.210
		0.236	6.0	11.614	232.281	5.268	17.285	103.708	—	—	—	—	—	—	—
		0.250	6.4	12.000	240.000	5.450	17.881	107.286	3.540	10.950	4.920	4.380	3.280	1.760	1.180
6 x 2	152.4 x 50.8	0.125	3.2	6.505	130.100	2.951	9.681	58.086	1.902	7.920	1.394	2.640	1.394	2.043	0.857
		0.156	4.0	7.950	159.000	3.600	11.810	70.900	2.340	9.561	1.661	3.190	1.662	2.023	0.834
		0.177	4.5	8.945	178.892	4.057	13.312	79.874	—	—	—	—	—	—	—
		0.180	4.6	9.070	181.400	4.120	13.520	81.120	2.670	10.240	1.800	3.413	1.800	1.980	0.823
		0.236	6.0	11.614	232.281	5.268	17.285	103.708	—	—	—	—	—	—	—
		0.250	6.4	12.000	240.000	5.450	17.881	107.286	3.540	12.815	2.200	4.272	2.200	1.918	0.795
6 x 3	152.4 x 76.2	0.125	3.2	7.320	146.400	3.320	10.893	65.357	2.130	10.060	3.440	3.354	2.300	2.165	1.266
		0.156	4.0	9.020	180.400	4.090	13.424	80.544	2.652	12.200	4.145	4.070	2.763	2.146	1.251
		0.177	4.5	10.150	203.009	4.604	15.106	90.634	—	—	—	—	—	—	—
		0.180	4.6	10.300	206.000	4.670	15.322	91.934	3.030	13.250	4.525	4.415	3.017	2.111	1.234
		0.236	6.0	13.222	264.737	5.997	19.678	118.066	—	—	—	—	—	—	—
		0.250	6.4	13.700	274.000	6.220	20.408	122.447	4.035	17.440	4.870	5.813	3.912	2.080	1.206
6 x 4	152.4 x 101.6	0.156	4.0	10.100	202.000	4.570	15.000	90.000	2.961	14.860	7.962	4.960	3.981	2.241	1.640
		0.177	4.5	11.356	227.126	5.151	16.901	101.403	—	—	—	—	—	—	—
		0.180	4.6	11.500	230.000	5.216	17.113	102.680	3.390	16.295	8.760	5.432	4.380	2.212	1.621
		0.236	6.0	14.830	296.593	6.727	22.070	132.424	—	—	—	—	—	—	—
		0.250	6.4	15.400	308.000	6.990	22.930	137.580	4.540	21.600	11.510	7.200	5.754	2.131	1.600
8 x 4	203.2 x 101.6	0.156	4.0	12.200	244.000	5.530	18.140	108.840	3.583	30.000	10.270	7.500	5.700	2.900	1.700
		0.177	4.5	13.768	275.361	6.245	20.490	122.940	—	—	—	—	—	—	—
		0.180	4.6	13.900	278.000	6.330	20.770	124.620	4.103	33.125	11.390	8.300	7.515	2.860	1.680
		0.236	6.0	18.045	360.905	8.185	26.856	161.130	—	—	—	—	—	—	—
		0.250	6.4	18.800	376.000	8.540	28.020	168.120	5.535	44.230	15.030	1.060	7.515	2.830	1.650
7 x 5	177.8 x 127.0	0.156	4.0	12.200	244.000	5.530	18.140	108.840	3.583	—	—	—	—	—	—
		0.177	4.5	13.768	275.361	6.245	20.490	122.940	—	—	—	—	—	—	—
		0.180	4.6	13.900	278.000	6.330	20.770	124.620	4.103	28.020	16.800	8.010	6.712	2.630	2.035
		0.236	6.0	18.045	360.905	8.185	26.856	161.130	—	—	—	—	—	—	—
		0.250	6.4	18.800	376.000	8.540	28.020	168.120	5.535	36.700	21.900	10.500	8.762	2.600	2.0



SQUARE HOLLOW SECTIONS (mm-size)

Nominal size mm	Wall Thickness mm	Weight kg/m	Area cm ²	Moment of Inertia		Section Modulus		Radius of Gyration	
				I _x cm ⁴	I _y cm ⁴	Z _x cm ³	Z _y cm ³	i _x cm	i _y cm
50 x 50	1.6	2.38	3.032	11.7	11.7	4.68	4.68	1.96	1.96
	2.3	3.34	4.252	15.9	15.9	6.34	6.34	1.93	1.93
	3.2	4.50	5.727	20.4	20.4	8.16	8.16	1.89	1.89
60 x 60	1.6	2.88	3.672	20.7	20.7	6.89	6.89	2.37	2.37
	2.3	4.06	5.172	28.3	28.3	9.44	9.44	2.34	2.34
	3.2	5.50	7.007	36.9	36.9	12.3	12.3	2.30	2.30
75 x 75	2.3	5.14	6.552	57.1	57.1	15.2	15.2	2.95	2.95
	3.2	7.01	8.927	75.5	75.5	20.1	20.1	2.91	2.91
100 x 100	2.3	6.95	8.852	140	140	27.9	27.9	3.97	3.97
	3.2	9.52	12.13	187	187	37.5	37.5	3.93	3.93
	4.5	13.1	16.67	249	249	49.9	49.9	3.87	3.87
	6.0	17.0	21.63	311	311	62.3	62.3	3.79	3.79
125 x 125	3.2	12.0	15.33	376	376	60.1	60.1	4.95	4.95
	4.5	16.6	21.17	506	506	80.9	80.9	4.89	4.89
	6.0	21.7	27.63	641	641	103	103	4.82	4.82
150 x 150	4.5	20.1	25.67	896	896	120	120	5.91	5.91
	6.0	26.4	33.63	1150	1150	153	153	5.84	5.84
175 x 175	6.0	31.1	39.63	1860	1860	213	213	6.86	6.86
200 x 200	6.0	35.8	45.63	2830	2830	283	283	7.88	7.88
	8.0	46.9	59.79	3620	3620	362	362	7.78	7.78
	9.0	52.3	66.67	3990	3990	399	399	7.73	7.73
	12.0	67.9	86.53	4980	4980	498	498	7.59	7.59
250 x 250	6.0	45.2	57.63	5670	5670	454	454	9.92	9.92
	9.0	66.5	84.67	8090	8090	647	647	9.78	9.78
	12.0	86.8	110.5	10300	10300	820	820	9.63	9.63
300 x 300	6.0	54.7	69.63	9960	9960	664	664	12.0	12.0
	9.0	80.6	102.7	14300	14300	956	956	11.8	11.8
	12.0	106	134.5	18300	18300	1220	1220	11.7	11.7
350 x 350	9.0	94.7	120.7	23200	23200	1320	1320	13.9	13.9
	12.0	124	158.5	29800	29800	1700	1700	13.7	13.7

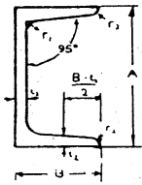
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RECTANGULAR HOLLOW SECTIONS (mm-size)

Nominal size mm	Wall Thickness mm	Weight kg/m	Area cm ²	Moment of Inertia		Section Modulus		Radius of Gyration	
				I _x cm ⁴	I _y cm ⁴	Z _x cm ³	Z _y cm ³	i _x cm	i _y cm
60x30	1.6	2.13	2.712	12.5	4.25	4.16	2.83	2.15	1.25
	2.3	2.98	3.792	16.8	5.65	5.61	3.76	2.11	1.22
	3.2	3.99	5.087	21.4	7.08	7.15	4.72	2.05	1.18
75x45	2.3	4.06	5.172	38.9	17.6	10.4	7.82	2.74	1.84
	3.2	5.50	7.007	50.8	22.8	13.5	10.1	2.69	1.80
100 x 50	2.3	5.14	6.552	84.8	29.0	17.0	11.6	3.60	2.10
	3.2	7.01	8.927	112	38.0	22.5	15.2	3.55	2.06
125 x 75	2.3	6.95	8.852	192	87.5	30.6	23.3	4.65	3.14
	3.2	9.52	12.13	257	117	41.1	31.1	4.60	3.10
150 x 100	3.2	12.0	15.33	488	262	65.1	52.5	5.64	4.14
	4.5	16.6	21.17	658	352	87.7	70.4	5.58	4.08
	6.0	21.7	27.63	835	444	111	88.8	5.50	4.01
200 x 100	4.5	20.1	25.67	1330	455	133	90.9	7.20	4.21
	6.0	26.4	33.63	1700	577	170	115	7.12	4.14
200 x 150*	6.0	31.1	39.63	2270	1460	227	194	7.56	6.06
250 x 150*	6.0	35.8	45.63	3890	1770	311	236	9.23	6.23
	9.0	52.3	66.67	5480	2470	438	330	9.06	6.09
	12.0	67.9	86.53	6850	3070	548	409	8.90	5.95
350 x 150*	6.0	45.2	57.63	8910	2390	509	319	12.4	6.44
	9.0	66.5	84.67	12700	3370	726	449	12.3	6.31
	12.0	86.8	110.5	16100	4210	921	562	12.1	6.17
300 x 200*	6.0	45.2	57.63	7370	3960	491	396	11.3	8.29
	9.0	66.5	84.67	10500	5630	702	563	11.2	8.16
	12.0	86.8	110.5	13400	7110	890	711	11	8.02
400 x 200*	6.0	54.7	69.63	14800	5090	739	509	14.6	8.55
	9.0	80.6	102.7	21300	7270	1070	727	14.4	8.42
	12.0	106	134.5	27300	9230	1360	923	14.2	8.28

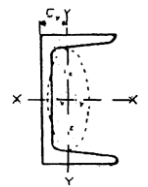
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MILD STEEL CHANNELS

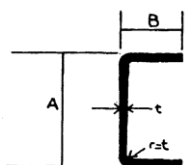
Size	Depth (A)		Flange Width (B)		FJange Thickness		Web Thickness		Comer Radius				Sectional Area	
					t1		t ₂		r1		r ₂			
A x B x t1	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	in²	cm²
75 x 40 x 5	75	2.953	40	1.575	5	.197	7	.276	8	.315	4	.157	8.818	1.367
100 x 50 x 5	100	3.937	50	1.969	5	.197	7.5	.295	8	.315	4	.157	11.92	1.848
125 x 65 x 6	125	4.921	65	2.559	6	.236	8	.315	8	.315	4	.157	17.11	2.652
150 x 75 x 6.5	150	5.906	75	2.953	6.5	.256	10	.394	10	.394	5	.197	23.71	3.675
150 x 75 x 9	150	5.906	75	2.953	9	.354	12.5	.492	15	.591	7.5	.295	30.49	4.741
180 x 75 x 7	180	7.087	75	2.953	7	.276	10.5	.413	11	.433	5.5	.217	27.20	4.316
180 x 90 x 7.5	180	7.087	90	3.543	7.5	.295	12.5	.492	13	.512	6.5	.256	34.57	5.358
200 x 80 x 7.5	200	7.874	80	3.150	7.5	.295	11	.433	12	.472	6	.236	31.33	4.856
200 x 90 x 8	200	7.874	90	3.543	8	.315	13.5	.531	14	.551	7	.276	38.65	5.991
230 x 80 x 8	230	9.055	80	3.150	8	.315	12	.472	13	.512	6.5	.256	36.12	5.499
230 x 90 x 8.5	230	9.055	90	3.543	8.5	.335	13.5	.531	15	.591	7.5	.295	42.14	6.531
250 x 80 x 8	250	9.843	80	3.150	8	.315	12.5	.492	14	.551	7	.276	38.51	5.969
250 x 90 x 9	250	9.843	90	3.543	9	.354	13	.512	14	.551	7	.276	44.07	6.831
250 x 90 x 1 1	250	9.843	90	3.543	11	.433	14.5	.571	17	.669	8.5	.335	51.17	7.931
280 x 100 x 9	280	11.024	100	3.937	9	.354	13	.512	14	.551	7	.276	49.37	7.652
280 x 100 x 11.5	280	11.024	100	3.937	11.5	.453	16	.630	18	.709	9	.354	61.37	9.512
300 x 90 x 9	300	11.811	90	3.543	9	.354	12	.512	14	.551	7	.276	48.57	7.531
300 x 90 x 10	300	11.811	90	3.543	10	.394	15.5	.611	19	.748	9.5	.374	55.74	8.640
380 x 100 x 10.5	380	14.961	100	3.937	10.5	.413	16	.630	18	.709	9	.354	69.38	10.76
380 x 100 x 13	380	14.961	100	3.937	13	.512	6.5	.650	18	.709	9	.354	78.96	12.54

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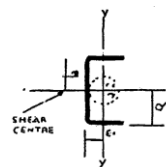


Weight			Centre of Gravity		Moment of Inertia				Radius of Gyration				Modulus of Section				Size
			Cy		Jx		Jy		ix		iy		Zx		Zy		
kg/m	kg/ft	lb/ft	cm	in	cm ⁴	in ⁴	cm ⁴	in ⁴	cm	in	cm	in	cm ³	in ³	cm ³	in ³	
6.92	2.11	4.650	1.27	.500	75.9	1.823	12.4	.298	2.93	1.154	1.19	.469	20.2	1.233	4.54	.277	75 x 40 x 5
9.36	2.85	6.290	1.55	.610	189	4.541	26.9	646	3.98	1.567	1.50	.591	37.8	2.307	7.82	.477	100 x 50 x 5
13.4	4.09	9.004	1.94	.764	425	10.21	65.5	1.571	4.99	1.965	1.96	.772	68.0	4.150	14.4	.879	125 x 65 x 6
18.6	5.67	12.50	2.31	.909	864	20.76	122	2.931	6.04	2.378	2.27	.894	115	7.018	23.6	1.440	150 x 75 x 6.5
24.0	7.32	16.13	2.31	.009	1060	25.47	151	3.628	5.87	2.311	2.22	.874	141	8.604	29.1	1.776	150 x 75 x 9
21.4	6.51	14.35	2.15	.846	1380	33.15	137	3.291	7.13	2.807	2.24	.882	154	9.398	25.5	1.556	180 x 75 x 7
27.1	8.27	18.21	2.18	1.122	1840	44.21	258	6.198	7.29	2.870	2.73	1.075	204	12.45	42.0	2.563	180 x 80 x 7.5
24.6	7.50	16.53	2.24	.882	1950	46.85	177	4.252	7.89	3.106	2.38	.937	195	11.90	30.8	1.880	180 x 80 x 7.5
30.3	9.25	20.40	2.77	1.091	2490	59.82	286	6.871	8.03	3.161	2.72	1.071	249	15.19	45.9	2.801	200 x 90 x 8
28.4	8.64	19.08	2.15	.846	2900	69.67	200	4.805	8.96	3.528	2.35	.925	252	15.38	34.2	2.087	230 x 80 x 8
33.1	10.1	22.24	2.58	1.016	3490	83.85	303	7.280	9.10	3.583	2.68	1.055	304	18.55	47.3	2.886	230 x 90 x 8.5
30.2	9.22	20.29	2.11	.831	3630	87.21	210	5.045	9.71	3.823	2.33	.921	291	17.76	35.7	2.179	250 x 80 x 8
34.6	10.5	23.15	2.42	.953	4180	100.4	306	7.352	9.74	3.835	2.64	1.039	335	20.44	46.5	2.838	250 x 90 x 9
40.2	12.2	26.90	2.39	.941	4690	112.7	342	8.217	9.47	3.768	2.58	1.016	375	22.88	51.7	3.155	250 x 90 x 11
38.8	11.8	26.07	2.64	1.040	5930	142.5	428	10.28	11.0	4.331	2.95	1.161	423	25.81	58.2	3.552	280 x 100 x 9
48.2	14.7	32.39	2.68	1.055	7150	171.8	515	12.37	10.8	4.252	2.90	1.142	510	31.12	70.4	4.296	280 x 100 x 11.5
38.1	11.6	25.57	2.23	.878	6440	154.7	325	7.808	11.5	4.528	2.59	1.020	429	26.18	48.0	2.929	300 x 90 x 9
43.8	13.3	29.32	2.33	.917	7400	177.8	373	8.961	11.5	4.528	2.59	1.020	494	30.15	56.0	3.417	300 x 90 x 10
54.5	16.6	36.60	2.41	.949	14500	348.4	557	13.38	14.5	5.709	2.83	1.114	762	46.50	73.3	4.473	380 x 100 x 10.5
62.0	18.9	41.66	2.29	.902	15600	374.8	584	14.03	14.1	5.551	2.72	1.071	822	50.16	75.8	4.625	380 x 100 x 13

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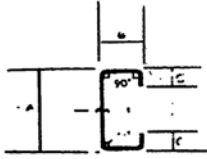


LIGHT GAUGE PLAIN CHANNELS

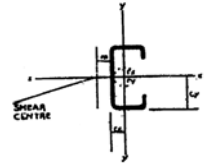


Dimensions		Area	Weight	Position of Centroid		Moment of Inertia		Radius of Gyration		Sectional Modulus		Moment Capacity	Shear Centre	Column Factor
AxB mm	t mm	Ar cm ²	W kg/m	Cx cm	Cy cm	Ix m	Iy cm ⁴	Rx cm	Ry cm	Zx cm ³	Zy cm ³	Mx kg/m	M cm	0
60 x 30	1.6	1.83	1.44	0.82	3.00	10.33	1.63	2.37	0.94	3.44	0.75	46.08	1.12	0.77
	2.3	2.58	2.03	0.85	3.00	15.13	2.25	2.33	0.93	4.71	1.05	76.97	1.12	0.96
75 x 45	1.6	2.55	2.00	1.30	3.75	23.86	5.38	3.05	1.45	6.36	1.68	53.04	1.76	0.46
	2.3	3.62	2.84	1.33	3.75	33.08	7.51	3.02	1.44	8.82	2.37	114.32	1.76	0.76
	3.0	4.75	3.65	1.37	3.75	41.58	9.51	2.98	1.42	11.08	3.04	169.91	1.76	0.90
100 x 50	1.6	3.11	2.44	1.32	5.00	50.00	7.88	4.00	1.59	10.00	2.14	66.48	1.87	0.33
	2.3	4.42	3.47	1.35	5.00	69.83	11.05	3.97	1.58	13.96	3.03	165.23	1.87	0.66
	3.0	5.70	4.47	1.38	5.00	88.45	14.05	3.93	1.56	17.69	3.89	255.77	1.87	0.85
125 x 50	2.3	5.00	3.92	1.21	6.25	117.36	11.84	4.84	1.53	18.77	3.12	222.17	1.76	0.61
	3.0	6.45	5.06	1.24	6.25	149.25	15.07	4.80	1.52	23.88	5.01	345.27	1.75	0.81
	4.5	9.45	7.42	1.31	6.25	211.76	31.43	4.73	1.50	33.88	5.81	571.75	1.75	1.00
150 x 65	3.2	6.26	4.91	1.61	7.50	218.16	25.86	5.90	2.03	29.08	5.29	239.92	2.34	0.40
	3.0	8.10	6.36	1.64	7.50	278.84	33.12	5.86	2.02	37.17	6.82	441.26	2.34	0.63
	4.5	11.93	9.36	1.71	7.50	400.15	47.69	5.79	1.99	53.35	9.96	832.81	2.34	0.91
175 x 75	2.3	7.30	5.73	1.83	8.75	346.87	40.19	6.89	2.34	39.64	7.09	240.68	2.69	0.28
	3.0	9.45	7.42	1.86	8.75	444.65	51.59	6.85	2.33	50.81	9.15	515.38	2.69	0.51
	4.5	13.95	10.95	1.93	8.76	642.23	74.74	6.78	2.31	73.39	13.42	1061.21	2.69	0.82
200 x 75	2.3	7.87	6.18	1.70	10.00	473.31	41.76	7.75	2.30	47.33	7.21	287.35	2.48	0.26
	3.0	10.20	8.01	1.73	10.00	607.58	53.63	7.71	2.29	60.75	9.31	616.21	2.58	0.48
	4.5	15.08	11.84	1.80	10.00	880.30	77.78	7.63	2.27	88.03	13.65	1272.76	2.58	0.79
225 x 75	2.3	8.45	6.63	1.59	11.25	624.36	43.12	8.59	2.25	55.49	7.30	336.94	2.49	0.24
	3.0	10.95	8.59	1.63	11.25	802.40	55.40	8.55	2.24	71.32	9.43	723.37	2.48	0.45
	4.5	16.20	12.72	1.69	11.25	1145.51	80.39	8.47	2.22	103.60	13.85	1497.89	2.48	0.76
250 x 75	2.3	9.02	7.08	1.50	12.50	801.81	44.31	9.42	2.21	64.14	7.39	389.44	2.39	0.23
	3.0	11.70	9.18	1.53	12.50	1031.46	56.94	9.38	2.20	82.51	9.54	836.88	2.39	0.43
	4.5	17.33	13.60	1.60	12.50	1501.38	82.67	9.30	2.18	120.11	14.01	1736.58	2.39	0.72

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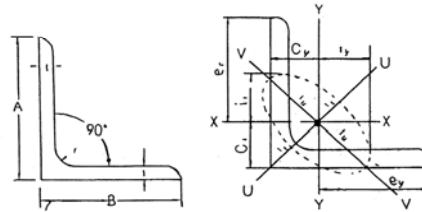
LIGHT GAUGE PLAIN CHANNELS



Dimensions		Area	Weight	Position of Centroid		Moment of Inertia		Radius of Gyration		Sectional Modulus		Reduced Modulus	Moment Capacity	Shear Centre	Column Factor
AxBxC mm	t mm	Ar cm ²	W kg/m	Cx cm	Cy cm	Ix m	Iy cm ⁴	Rx cm	Ry cm	Zx cm ³	Zy cm ³	Zx1 cm	Mx kg/m	M cm	Q
60 x 30 x 10	1.6	2.07	1.62	1.06	3.00	11.6	2.54	2.36	1.10	3.87	1.31	3.87	65.4	1.54	0.97
	2.3	2.87	2.25	1.05	3.00	15.5	3.28	2.32	1.07	5.18	1.69	5.13	87.5	1.53	1.00
75 x 45 x 15	1.6	2.95	2.31	1.72	3.75	27.1	8.69	3.03	1.71	7.23	3.13	7.23	122.0	2.43	0.94
	2.3	4.13	3.24	1.71	3.75	37.0	11.67	2.99	1.67	9.88	4.19	9.88	166.8	2.42	0.99
	3.0	5.25	4.12	1.71	3.75	45.9	14.16	2.95	1.64	12.24	5.07	12.24	206.5	2.42	1.00
100 x 50 x 20	1.6	3.67	2.88	1.86	5.00	58.3	13.97	3.98	1.95	11.67	4.46	11.66	196.8	2.73	0.85
	2.3	5.17	4.06	1.86	5.00	80.6	18.96	3.94	1.91	16.12	6.04	16.12	272.1	2.72	0.95
	3.0	6.60	5.18	1.85	5.00	100.9	23.30	3.90	1.87	20.18	7.42	20.18	340.6	2.71	0.99
125 x 50 x 20	2.3	5.74	4.51	1.68	6.25	136.4	20.54	4.87	1.89	21.82	6.20	21.82	368.2	2.55	0.89
	3.0	7.35	5.77	1.63	6.25	171.5	25.27	4.82	1.85	27.44	7.62	27.44	463.1	2.54	0.95
	4.5	10.59	8.31	1.67	6.25	237.1	33.21	4.73	1.77	37.94	10.00	37.94	640.2	2.51	1.00
150 x 65 x 20	2.3	7.01	5.50	2.11	7.50	247.7	40.99	5.94	2.41	33.03	9.35	33.03	557.4	3.16	0.84
	3.0	9.00	7.07	2.11	7.50	313.7	50.99	5.90	2.37	41.83	11.62	41.83	705.8	3.15	0.91
	4.5	13.06	10.25	2.10	7.50	440.7	68.79	5.80	2.29	58.77	15.64	58.77	991.7	3.12	0.99
175 x 75 x 20	2.3	8.04	6.31	2.34	8.75	389.3	60.97	6.95	2.75	44.49	11.83	44.31	747.7	3.52	0.80
	3.0	10.35	8.13	2.34	8.75	494.9	76.25	6.91	2.71	56.66	14.78	56.56	954.5	3.50	0.87
	4.5	15.09	11.84	2.33	8.75	701.6	104.12	6.81	2.62	80.18	20.14	80.18	1353.1	3.47	0.96
200 x 75 x 20	2.3	8.62	6.76	2.19	10.00		63.65	7.84	2.71	53.10	12.00	52.89	892.5	3.38	0.75
	3.0	11.10	8.71	2.19	10.00	676.1	79.62	7.80	2.67	67.61	15.00	67.61	1140.9	3.36	0.82
	4.5	16.12	12.73	2.18	10.00	962.0	108.77	7.70	2.58	96.20	20.46	96.20	1623.3	3.33	0.94
250 x 75 x 25	2.3	10.00	7.85	2.07	12.50	921.11	74.68	9.59	2.73	73.68	13.77	73.43	1239.14	3.34	0.68
	3.0	12.90	10.13	2.07	12.50	1176.57	93.68	9.54	2.69	94.12	17.27	94.12	1588.31	3.32	0.74
	4.5	18.91	14.85	2.07	12.50	1685.70	128.83	9.43	2.60	134.85	23.74	134.85	2275.61	3.27	0.86

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MILD STEEL ANGLES



EQUEL ANGLES

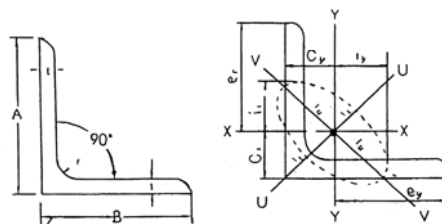
Metric Series

Section Number and Size A x B(mm)	Thickness (mm)	Reduce of Fillet (mm)	Area of Section (cm ²)	Weight (kg/m)	A X I S				Zx = Zy (cm ³)
					Cx = Cy (cm)	Ix = Iy (cm ⁴)	ix = iy (cm)	iv (cm)	
20 x 20	3	4	1.127	0.885	0.6	0.61	0.59	0.38	0.28
25 x 25	3	4	1.427	1.12	0.719	0.797	0.747	0.483	0.448
30 x 30	3	4	1.727	1.36	0.844	1.42	0.908	0.585	0.661
40 x 40	3	4.5	2.336	1.83	1.09	3.53	1.23	0.790	1.21
	4	6.0	3.079	2.42	1.12	4.48	1.21	0.78	1.56
	5	4.5	3.755	2.95	1.17	5.42	1.20	0.774	1.91
	6	6.0	4.48	3.52	1.20	6.33	1.19	0.77	2.26
45 x 45	4	6.5	3.492	2.74	1.24	6.50	1.36	0.880	2.00
	5	6.5	4.302	3.38	1.28	7.91	1.36	0.874	2.46
50 x 50	3	7	2.96	2.33	1.31	6.86	1.52	0.99	1.86
	4	6.5	3.892	3.06	1.37	9.06	1.53	0.983	2.49
	5	6.5	4.802	3.77	1.41	11.1	1.52	0.976	3.08
	6	6.5	5.644	4.43	1.44	12.6	1.50	0.963	3.55
	8	6.5	7.364	5.78	1.52	16.1	1.48	0.96	4.62
60 x 60	5	6.5	5.802	4.55	1.66	19.6	1.84	1.18	4.52
	6	8	6.91	5.42	1.69	22.8	1.82	1.17	5.29
65 x 65	5	8.5	6.367	5.00	1.77	25.3	1.99	1.28	5.35
	6	8.5	7.527	5.91	1.81	29.4	1.98	1.27	6.26
	8	8.5	9.761	7.66	1.88	36.8	1.94	1.25	7.96
1.70 x 70	6	8.5	8.127	6.38	1.93	37.1	2.14	1.37	7.33
	7	9	9.40	7.38	1.97	42.4	2.12	1.37	8.43

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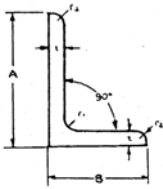


EQUEL ANGLES **Metric Series**



Section Number and Size A x B(mm)	Thickness (mm)	Reduce of Fillet (mm)	Area of Section (cm ²)	Weight (kg/m)	A X I S				
					Cx = Cy (cm)	Ix = Iy (cm ⁴)	ix = iy (cm)	iv (cm)	Zx = Zy (cm ³)
75 x 75	6	8.5	8.727	6.85	2.06	46.1	2.30	1.48	8.47
	8	10	11.5	9.03	2.13	58.9	2.26	1.46	11
	9	8.5	12.69	9.96	2.17	64.4	2.25	1.45	12.1
	12	8.5	16.56	13.0	2.29	81.9	2.22	1.44	15.7
80 x 80	6	8.5	9.327	7.32	2.18	56.4	2.46	1.58	9.70
	7	10	10.8	8.49	2.21	64.2	2.44	1.57	11.1
	8	10	12.3	19.66	2.26	72.3	2.42	1.55	12.6
90 x 90	6	10	10.55	8.28	2.42	80.7	2.77	1.78	12.3
	7	10	12.22	9.59	2.46	93.0	2.76	1.77	14.2
	8	11	13.9	10.9	2.50	104	2.74	1.76	16.1
	9	11	15.5	12.2	2.54	116	2.74	1.76	18.0
100 x 100	10	10	17.00	13.3	2.57	125	2.71	1.74	19.5
	13	10	21.71	17.0	2.69	156	2.68	1.73	24.8
	6	8.5	11.67	9.2	2.67	111.3	3.09	1.95	15.2
	7	10	13.62	10.7	2.71	129	3.08	1.98	17.7
	8	12	15.5	12.2	2.74	145	3.06	1.96	19.9
130 x 130	10	10	19.00	14.9	2.82	175	3.04	1.95	24.4
	13	10	24.31	19.1	2.94	220	3.00	1.94	31.1
	9	12	22.74	17.9	3.53	366	4.01	2.57	38.7
	12	12	29.76	23.4	3.64	467	3.96	2.54	49.9
	15	12	36.75	28.8	3.76	568	3.93	2.53	61.5
150 x 150	12	14	34.77	27.3	4.14	740	4.61	2.96	68.1
	15	14	42.74	33.6	4.24	888	4.56	2.92	82.6
175 x 175	12	15	40.52	31.8	4.73	1170	5.37	3.44	91.6
	15	15	50.21	39.4	4.85	1440	5.35	3.42	114
200 x 200	15	17	57.75	45.3	5.47	2180	6.14	3.93	150
	20	17	76	59.7	5.67	2820	6.09	3.90	197
	25	17	93.75	73.6	5.87	3420	6.04	3.88	242
250x250	25	24	119.4	93.7	7.10	6950	7.63	4.8	388
	35	24	162.6	128	7.45	9110	7.48	4.83	519

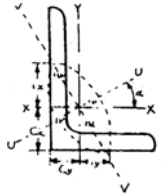
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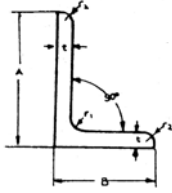
UNEQUAL ANGLES

Size	Leg Length				Thickness		Corner Radius				Sectional		Weight			Centre of Gravity			
	A		B		t		r ₁		r ₂		Area		Kg/m	Kg/ft	lb/ft	Cx		Cy	
Ax B x t	mm	in	mm	in	mm	in	mm	in	mm	in	cm ²	in ²				cm	in	cm	in
40 x 20 x 3	40	1.575	20	.787	3	.118	5	.197	2	.0787	1.747	.271	1.37	.418	.921	1.41	.555	.44	.173
40 x 20 x 5	40	1.575	20	.787	5	.197	5	.197	3.5	.138	2.751	.426	2.16	.658	1.451	1.50	.591	.51	.201
50 x 35 x 4	50	1.969	35	1.378	4	.157	6.5	.256	3	.118	3.292	.510	2.58	.788	1.734	1.58	.622	.85	.335
50 x 35 x 6	50	1.969	35	1.378	6	.236	6.5	.256	4.5	.177	4.744	.735	3.72	1.14	2.500	1.66	.654	.92	.362
60 x 50 x 5	60	2.362	50	1.969	5	.197	6.5	.256	3	.118	5.302	.822	4.16	1.27	2.795	1.79	.705	1.30	.512
60 x 50 x 7	60	2.362	50	1.969	7	.276	6.5	.256	4.5	.177	7.214	1.118	5.66	1.73	3.803	1.87	.736	1.37	.539
65 x 50 x 5	65	2.559	50	1.969	5	.197	6.5	.256	3	.118	5.552	.861	4.36	1.33	2.930	1.99	.783	1.25	.492
65 x 50 x 7	65	2.559	50	1.969	7	.276	6.5	.256	4.5	.177	7.564	1.172	5.94	1.81	3.992	2.07	.815	1.33	0.52
65 x 50 x 9	65	2.559	50	1.969	9	.354	6.5	.256	4.5	.177	9.544	1.479	7.49	2.28	5.033	2.14	.843	1.40	.551
70 x 60 x 6	70	2.756	60	2.362	6	.236	8.5	.335	4	.157	7.527	1.167	5.91	1.80	3.971	2.07	.815	1.58	.622
70 x 60 x 8	70	2.756	60	2.362	8	.315	8.5	.335	6	.236	9.761	1.513	7.66	2.34	5.147	2.14	.843	1.65	.661
70 x 60 x 10	70	2.756	60	2.362	10	.394	8.5	.335	6	.236	12.00	1.860	9.42	2.82	6.330	2.24	.874	1.73	0.68
75 x 50 x 6	75	2.953	50	1.969	6	.236	8.5	.335	4	.157	7.227	1.120	5.67	1.73	3.810	2.43	.957	1.20	0.47
75 x 50 x 8	75	2.953	50	1.969	8	.315	8.5	.335	6	.236	9.261	1.451	7.35	2.24	4.939	2.50	.984	1.27	.500
75 x 50 x 10	75	2.953	50	1.969	10	.394	8.5	.335	6	.236	11.50	1.782	9.03	2.75	6.068	2.58	1.016	1.35	.531
75 x 65 x 6	75	2.953	65	2.559	6	.236	8.5	.335	4	.157	8.127	1.260	6.38	1.94	4.287	2.19	.862	1.70	.669
75 x 65 x 8	75	2.953	65	2.559	8	.315	8.5	.335	6	.236	10.56	1.637	8.29	2.53	5.571	2.26	.890	1.77	0.7
75 x 65 x 10	75	2.953	65	2.559	10	.394	8.5	.335	6	.236	13.00	2.015	10.2	3.11	6.854	2.34	.921	1.85	.728
80 x 60 x 6	80	3.150	60	2.362	6	.236	8.5	.335	4	.157	8.127	1.260	6.38	1.94	4.287	2.46	.969	1.48	0.58
80 x 60 x 8	80	3.150	60	2.362	8	.315	8.5	.335	6	.236	10.56	1.637	8.29	2.53	5.571	2.54	1.000	1.55	0.61
80 x 60 x 10	80	3.150	60	2.362	10	.394	8.5	.335	6	.236	13.00	2.015	10.2	3.11	6.854	2.62	1.031	1.63	.642
80 x 70 x 6	80	3.150	70	2.756	6	.236	8.5	.335	4	.157	8.727	1.353	6.85	2.09	4.603	2.32	.913	1.83	0.72
80 x 70 x 9	80	3.150	70	2.756	9	.354	8.5	.335	6	.236	12.69	1.967	9.96	3.04	6.693	2.43	.957	1.93	0.76
80 x 70 x 12	80	3.150	70	2.756	12	.472	8.5	.335	6	.236	16.56	2.567	13.0	3.96	8.736	2.54	1.000	2.05	.807
90 x 60 x 6	90	3.543	60	2.362	6	.236	8.5	.335	4	.157	8.727	1.353	6.85	2.09	4.603	2.88	1.134	1.40	.551
90 x 60 x 9	90	3.543	60	2.362	9	.354	8.5	.335	6	.236	12.69	1.967	9.96	3.04	6.693	2.99	1.177	1.51	.594
90 x 60 x 12	90	3.543	60	2.362	12	.472	8.5	.335	6	.236	16.56	2.567	13.0	3.96	8.736	3.11	1.244	1.63	.642
90 x 75 x 6	90	3.543	75	2.953	6	.236	8.5	.335	4	.157	9.626	1.492	7.56	2.30	5.080	2.64	1.039	1.90	.748
90 x 75 x 9	90	3.543	75	2.953	9	.354	8.5	.335	6	.236	14.04	2.176	11.0	3.36	7.392	2.75	1.083	2.01	.791
90 x 75 x 12	90	3.543	75	2.953	12	.472	8.5	.335	6	.236	18.36	2.846	14.4	4.39	9.676	2.87	1.130	2.12	0.84

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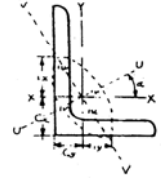
Moment of Inertia								Radius of Gyration								tan	Modulus of Section				Size
Jx		Jy		Max Ju		Min Jv		ix		iy		Max i _u		Min i _v			Zx		Zy		
cm ⁴	in ⁴	cm ⁴	in ⁴	cm ⁴	in ⁴	cm ⁴	in ⁴	cm	in	cm	in	cm	in	cm	in		cm ³	in ³	cm ³	in ³	A x B x t
2.81	.068	.47	.011	2.98	.072	.31	.007	1.27	.500	.52	.205	1.31	.516	.42	.165	.257	1.09	.067	.30	.018	40 x 20 x 3
4.21	.110	.68	.016	4.43	.106	.41	.010	1.24	.488	.50	.197	1.27	.500	.41	.161	.243	1.68	.103	.46	.208	40 x 20 x 5
8.08	.194	3.25	.078	9.49	.228	1.84	.044	1.57	.618	.99	.390	1.70	.669	.75	.295	.475	2.36	.144	1.23	.075	50 x 35 x 4
12.2	.269	4.43	.106	13.1	.315	2.55	.061	1.54	.606	.97	.382	1.66	.654	.73	.287	.466	3.35	.204	1.72	.105	50 x 35 x 6
18.5	.445	11.7	.281	24.4	.586	5.82	.140	1.87	.736	1.48	.583	2.14	.843	1.05	.413	.679	4.40	.269	3.16	.193	60 x 50 x 5
24.4	.586	15.2	.365	31.9	.766	7.68	.185	1.84	.724	1.45	.571	2.10	.827	1.03	.406	.673	5.89	.359	4.20	.256	60 x 50 x 7
23.2	.557	11.9	.286	28.8	.692	6.33	.152	2.04	.803	1.47	.579	2.28	.898	1.07	.421	.577	5.14	.314	3.19	.195	65 x 50 x 5
30.6	.735	15.6	.375	37.9	.911	8.35	.201	2.01	.791	1.44	.567	2.24	.882	1.05	.413	.571	6.90	.421	4.25	.259	65 x 50 x 7
37.8	.908	19.2	.461	46.6	1.120	10.4	.250	1.99	.783	1.42	.559	2.21	.870	1.05	.413	.565	8.69	.530	5.33	.325	65 x 50 x 9
35.3	.848	23.9	.574	47.6	1.144	11.7	.281	2.17	.854	1.78	.701	2.15	.988	1.24	.488	.719	7.17	.438	5.40	.330	70 x 60 x 6
44.4	1.067	29.8	.716	59.5	1.429	14.7	.353	2.13	.839	1.75	.689	2.47	.872	1.23	.484	.714	9.13	.457	6.85	.418	70 x 60 x 8
53.6	1.288	36.0	.865	71.7	1.723	17.9	.430	2.11	.831	1.73	.681	2.44	.961	1.22	.480	.711	11.2	.683	8.41	.513	70 x 60 x 10
40.4	.971	14.4	.346	46.4	1.115	8.33	.200	2.36	.929	1.41	.555	2.53	.996	1.07	.421	.434	7.97	.486	3.78	.231	75 x 50 x 6
50.8	1.221	17.8	.428	58.1	1.396	10.4	.250	2.33	.917	1.38	.543	2.49	.980	1.05	.413	.427	10.2	.622	4.77	.291	75 x 50 x 8
61.4	1.475	21.4	.514	70.0	1.682	12.7	.257	2.31	.909	1.36	.535	2.47	.972	1.05	.413	.421	12.5	.763	5.85	.357	75 x 50 x 10
44.1	1.060	30.7	.738	49.9	1.439	14.8	.356	2.33	.917	1.94	.764	2.72	1.071	1.35	.531	.737	8.30	.506	6.39	.523	75 x 65 x 6
55.5	1.333	38.4	.923	75.3	1.809	18.6	.447	2.29	902	1.91	.752	2.67	1.051	1.33	.524	.733	10.6	.647	8.13	.496	75 x 65 x 8
67.3	1.617	46.5	1.117	91.0	2.186	22.8	.548	2.27	.894	1.89	.744	2.65	1.043	1.32	.520	.730	13.0	.793	9.99	.610	75 x 65 x 10
51.5	1.237	24.8	.596	62.9	1.511	13.4	.322	2.52	.992	1.75	.689	2.78	1.094	1.28	.504	.548	9.30	.568	5.50	.336	80 x 60 x 6
65.0	1.562	31.0	.745	79.1	1.900	16.9	.406	2.48	.976	1.71	.673	2.74	1.079	1.26	.496	.542	11.9	.726	6.97	.425	80 x 60 x 8
78.7	1.891	37.4	.899	95.6	2.297	20.5	.493	2.46	.969	1.70	.669	2.52	.992	1.26	.496	.538	14.6	.891	8.55	.522	80 x 60 x 10
54.1	1.300	38.6	.927	75.3	1.785	18.4	.442	2.49	.980	2.10	.827	2.92	1.150	1.45	.571	.752	9.52	.581	7.46	.455	80 x 70 x 6
75.8	1.821	53.8	1.293	104	2.499	25.9	.622	2.44	.961	2.06	.811	2.86	1.126	1.43	.563	.748	13.6	.830	10.6	.647	80 x 70 x 9
96.6	1.321	68.3	1.641	131	3.147	33.4	.802	2.41	.949	2.03	.799	2.82	1.110	1.42	.559	.744	17.7	1.080	13.8	.842	80 x 70 x 12
71.5	1.718	23.6	.615	82.3	1.977	14.8	356'	2.86	1.126	1.71	.674	3.07	1.209	1.30	.512	.437	11.7	.714	5.47	.340	90 x 60 x 6
101	2.427	35.4	.850	115	2.763	20.7	.497	2.82	1.110	1.67	.657	3.01	1.185	1.28	.504	.430	16.7	1.091	7.90	.482	90 x 60 x 9
128	3.075	44.8	1.076	146	2.508	26.7	.641	2.78	1.094	1.65	.650	2.97	1.169	1.27	.500	.423	21.8	1.330	10.2	.622	90 x 60 x 12
76.9	1.848	48.6	1.168	101	2.427	24.2	.581	2.83	1.114	2.25	.886	3.25	1.280	1.58	.622	.681	12.1	.738	8.68	.530	90 x 75 x 6
109	2.619	68.1	1.636	143	3.436	34.1	.819	2.78	1.094	2.20	.866	3.19	1.257	1.56	.614	.676	17.4	1.062	12.4	.757	90 x 75 x 9
139	3.340	86.8	2.085	182	4.373	44.0	1.057	2.75	1.083	2.17	.854	3.14	1.236	1.55	.610	.672	22.6	1.379	16.1	.982	90 x 75 x 12



UNEQUAL ANGLES

Size	Leg Length				Thickness		Corner Radius				Sectional		Weight			Centre of Gravity			
	A		B		t		r1		r2		Area		Weight			C _x		C _y	
A x B x t	mm	in	mm	in	mm	in	mm	in	mm	in	cm ²	in ²	kg/m	kg/ft	lb/ft	cm	in	cm	in
90 x 80 x 7	90	3.543	80	3.150	7	.276	10	.394	5	.197	11.52	1.786	9.04	2.76	6.075	2.59	1.020	2.10	.827
90 x 80 x 10	90	3.543	80	3.150	10	.394	10	.394	7	.276	16.00	2.480	12.6	3.83	8.467	2.71	1.067	2.21	.870
90 x 80 x 13	90	3.543	80	3.150	13	.512	10	.394	7	.276	20.41	3.164	16.0	4.88	10.75	2.82	1.110	2.33	.917
100 x 65 x 7	100	3.937	65	2.559	7	.276	10	.394	5	.197	11.17	1.731	8.77	2.67	5.893	3.23	1.272	1.52	.598
100 x 65 x 9	100	3.937	65	2.559	9	.354	10	.394	7	.276	14.04	2.176	11.0	3.36	7.392	3.31	1.303	1.59	.626
100 x 65 x 12	100	3.937	65	2.559	12	.472	10	.394	7	.276	18.36	2.846	14.4	4.39	9.676	3.43	1.350	1.70	.669
100 x 75 x 7	100	3.937	75	2.953	7	.276	10	.394	5	.197	11.87	1.840	9.32	2.84	6.263	3.06	1.205	1.84	.724
100 x 75 x 10	100	3.937	75	2.953	10	.394	10	.394	7	.276	16.50	2.557	13.0	3.95	8.736	3.18	1.252	1.95	.764
100 x 75 x 13	100	3.937	75	2.953	13	.512	10	.394	7	.276	21.06	3.264	16.5	5.04	11.087	3.30	1.300	2.06	.811
100 x 80 x 7	100	3.937	80	3.150	7	.276	10	.394	5	.196	12.22	1.894	9.59	2.92	6.444	2.98	1.173	2.00	.787
100 x 80 x 10	100	3.937	80	3.150	10	.394	10	.394	7	.276	17.00	2.635	13.3	4.07	8.937	3.10	1.220	2.11	.831
100 x 80 x 13	100	3.937	80	3.150	13	.512	10	.394	7	.276	21.71	3.365	17.0	5.20	11.423	3.22	1.268	2.23	.878
100 x 90 x 7	100	3.937	90	3.543	7	.276	10	.394	5	.197	12.92	2.003	10.1	3.09	6.787	2.84	1.118	2.35	.925
100 x 90 x 10	100	3.973	90	3.543	10	.394	10	.394		.276	18.00	2.790	14.1	4.31	9.475	2.96	1.165	2.46	1.016
100 x 90 x 13	100	3.937	90	3.543	13	.512	10	.395	7	.276	23.01	3.567	18.1	5.51	12.162	3.07	1.209	2.58	1.016
125 x 75 x 7	125	4.921	75	2.953	7	.276	10	.394	5	.197	13.62	2.111	10.7	3.26	7.190	4.10	1.615	1.64	.646
125 x 75 x 10	125	4.921	75	2.953	10	.394	10	.394	7	.276	19.00	2.945	14.9	4.55	10.01	4.23	1.665	1.75	.689
125 x 75 x 13	125	4.921	75	2.953	13	.512	10	.394	7	.276	24.31	3.768	19.1	5.82	12.835	4.35	1.713	1.87	.736
125 x 90 x 7	125	4.921	90	3.543	7	.276	10	.394	5	.197	14.67	2.274	11.5	3.51	7.728	3.84	1.512	2.11	.831
125 x 90 x 10	125	4.921	90	3.543	10	.394	10	.394	7	.276	20.50	3.177	16.1	4.91	10.819	3.95	1.555	2.22	.874
125 x 90 x 13	125	4.921	90	3.543	13	.512	10	.394	7	.276	26.26	4.070	20.6	6.28	13.843	4.08	1.606	2.34	.921
150 x 75 x 7	150	5.906	75	2.953	7	.276	12	.472	5	.197	15.46	2.396	12.1	3.70	8.131	5.17	2.035	1.50	.591
150 x 75 x 9	150	5.906	75	2.953	9	.354	12	.472	8.5	.335	19.44	3.013	15.3	4.65	10.281	5.25	2.067	1.56	.614
150 x 75 x 12	150	5.906	75	2.953	12	.472	12	.472	8.5	.335	25.56	3.962	20.1	6.12	13.507	5.39	2.122	1.68	.661
150 x 90 x 9	150	5.906	90	3.543	9	.354	12	.472	6	.236	20.94	3.246	16.4	5.01	11.020	4.96	1.953	2.00	.787
150 x 90 x 12	150	5.906	90	3.543	12	.472	12	.472	8.5	.335	27.36	4.241	21.5	6.55	14.447	5.07	1.996	2.10	.828
150 x 90 x 15	150	5.906	90	3.543	15	.591	12	.472	8.5	.335	33.75	5.231	26.5	8.08	17.807	5.20	2.047	2.22	.874
150 x 100 x 9	150	5.906	100	3.937	9	.354	12	.472	6	.236	21.84	3.385	17.1	5.23	11.490	4.77	1.878	2.32	.913
150 x 100 x 12	150	5.906	100	3.937	12	.472	12	.472	8.5	.336	28.56	4.427	22.4	6.83	15.052	4.88	1.921	2.41	.949
150 x 100 x 15	150	5.906	100	3.937	15	.591	12	.472	8.5	.335	35.25	5.464	27.7	8.44	18.614	5.10	1.972	2.53	.996
75 x 90 x 9	175	6.89	90	3.543	9	.354	12	.472	6	.236	23.19	3.594	18.2	5.55	12.230	6.04	2.373	1.85	.728
175 x 90 x 12	175	6.890	90	3.543	12	.472	12	.472	8.5	.335	30.36	4.706	23.8	7.27	15.993	6.16	2.425	1.96	.772
175 x 90 x 15	175	6.890	90	3.543	15	.591	12	.472	8.5	.335	37.50	5.812	29.4	8.97	19.756	6.29	2.476	2.08	.819

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Moment of Inertia								Radius of Gyration								tan	Modulus of Section				Size
Jx		Jy		Max Ju		Min Jv		iz		iy		Max i _u		Min i _v			Zx		Zy		
cm ⁴	in ⁴	cm ⁴	in ⁴	cm ⁴	in ⁴	cm ⁴	in ⁴	cm	in	cm	in	cm	in	cm	in		cm ³	in ³	cm ³	in ³	
89.6	2.153	66.5	1.598	125	3.003	31.3	.752	2.79	1.098	2.40	.945	3.29	1.295	1.65	.650	.777	14.0	.854	11.3	.690	90 x 80 x 7
121	2.907	89.1	1.660	167	4.018	42.1	1.011	2.74	1.078	2.36	.929	3.24	1.276	1.62	.638	.774	19.1	1.166	15.4	.940	90 x 80 x 10
151	3.628	111	2.668	208	4.997	53.3	1.281	2.72	1.071	2.33	.917	3.19	1.256	1.72	.638	.770	24.4	1.489	19.6	1.196	90 x 80 x 13
112	2.091	37.6	.903	128	3.075	22.0	.529	3.17	1.248	1.84	.724	3.39	1.335	1.40	.551	.415	16.6	1.013	7.55	.461	100 x 65 x 7
138	3.315	45.6	1.096	157	3.772	26.8	.644	3.14	1.236	1.80	.709	3.34	1.335	1.38	.553	.411	20.6	1.257	9.28	.566	100 x 65 x 9
177	4.252	58.1	1.396	200	4.882	34.7	.834	3.11	1.224	1.78	.701	3.30	1.300	1.37	.539	.405	27.0	1.648	12.1	.738	100 x 65 x 12
118	2.835	57.0	1.369	144	3.460	30.7	.738	3.15	1.240	2.19	.862	3.49	1.374	1.61	.634	.548	17.0	1.037	10.1	.616	100 x 75 x 10
159	3.820	76.1	1.828	194	4.661	41.3	.992	311	1.224	2.15	.846	3.43	1.350	1.58	.622	.543	23.3	23.33	13.7	.836	100* 75 x 10
199	4.781	94.8	2.278	242	5.814	52.2	1.254	3.08	1.213	2.12	.835	3.39	1.335	1.57	.618	.538	29.7	1.812	17.4	1.062	100 x 75 x 13
120	2.883	68.6	1.643	154	3.700	35.3	.848	3.14	1.236	2.37	.933	3.55	1.398	1.70	.669	.625	17.2	1.050	11.4	.696	100 x 80 x 7
163	3.916	91.9	2.208	207	4.973	47.6	1.144	3.09	1.217	2.33	.917	3.49	1.374	1.67	.659	.621	23.6	1.440	15.6	.952	100 x 80 x 20
204	4.901	115	2.763	258	6.198	60.1	1.444	3.06	1.205	2.30	.096	3.45	1.358	1.66	.654	.616	30.1	1.837	19.9	1.215	100 x 80 x 13
125	3.003	959	2.304	177	4.252	44.5	1.069	3.11	1.224	2.73	1.075	3.70	1.457	1.85	.728	.799	17.5	1.068	14.5	.879	100 x 90 x 7
169	4.060	129	3.099	238	5.718	60.1	1.444	3.07	1.209	2.68	1.055	3.64	1.433	1.83	.720	.797	24.0	1.465	19.8	1.208	100 x 90 x 10
212	5.093	162	3.892	298	7.159	76.0	1.826	3.06	1.205	2.65	1.043	3.60	1.417	1.82	.717	.794	30.6	1.867	25.2	1.538	100 x 90 x 13
219	5.261	60.4	1.451	243	5.138	36.4	.875	5.01	1.579	2.11	.831	4.23	1.665	1.63	.642	.362	26.1	1.593	10.3	.629	125 x 75 x 7
298	7.159	80.9	1.944	330	7.928	49.0	1.177	3.86	1.559	2.06	.811	4.17	1.642	1.61	.634	.357	36.1	2.203	14.1	.860	125 x 75 x 10
376	9.033	101	2.427	414	9.946	61.9	1.487	3.92	1.547	2.04	.803	4.13	1.626	1.60	.630	.352	46.1	2.813	17.9	1.092	125 x 75 x 13
233	5.598	102	2.451	279	6.703	56.2	1.350	3.99	1.571	2.64	1.039	4.36	1.717	1.96	.772	.510	26.9	1.642	14.8	.903	125 x 90 x 7
318	7.640	138	3.315	380	9.129	76.1	1.828	3.94	1.551	2.59	1.029	4.30	1.693	1.93	.760	.506	37.2	2.270	20.4	1.245	125 x 90 x 10
401	9.634	165	3.964	479	11.51	87.2	2.095	3.91	1.539	2.51	.938	4.27	1.681	1.82	.717	.499	47.5	2.899	24.8	1.513	125 x 90 x 13
364	8.745	63.1	1.516	386	9.274	40.5	.973	4.85	1.909	2.02	.795	5.00	1.969	1.62	.738	.265	37.0	2.258	10.5	.641	150 x 75 x 7
446	7.151	75.6	1.816	473	11.36	48.5	1.170	4.79	1.886	1.97	.776	4.93	1.941	1.58	.622	.260	45.8	2.795	12.7	.775	150 x 75 x 9
580	13.93	97.4	2.340	614	14.75	63.3	1.521	4.76	1.874	1.95	.768	4.90	1.929	1.57	.618	.257	60.3	3.680	16.7	1.019	150 x 75 x 12
484	16.63	133	3.195	537	12.90	80.2	1.927	4.81	1.894	2.52	.992	5.06	1.992	1.96	.772	.362	48.2	2.941	19.0	1.159	150 x 90 x 9
619	14.87	168	4.036	684	16.43	102	2.451	4.75	1.870	2.47	.972	5.00	1.969	1.93	.760	.357	62.3	3.802	24.3	1.483	150 x 90 x 12
753	18.09	202	4.853	831	19.96	124	2.979	4.72	1.858	2.45	.965	5.96	1.965	1.92	.756	.353	76.8	4.687	29.9	1.825	150 x 90 x 15
502	12.06	179	4.300	580	13.93	101	2.427	4.79	1.886	2.86	1.126	5.15	2.028	2.15	.846	.441	49.0	2.990	23.3	1.422	150 x 100 x 9
642	15.42	229	5.502	738	17.73	133	3.195	4.74	1.866	2.83	1.114	5.08	2.000	2.15	.846	.435	63.4	3.869	30.2	1.843	150 x 100x 12
781	18.76	276	6.631	896	21.55	161	3.868	4.71	1.854	2.80	1.102	5.04	1.984	2.14	.843	.432	78.2	4.772	37.0	2.258	150 x 100 x 15
741	17.80	138	3.315	790	18.93	78.4	1.884	5.65	2.224	2.44	.961	5.84	2.299	1.84	.724	.277	64.6	3.942	19.3	1.178	175 x 90 x 9
950	22.82	174	4.180	1010	24.37	111	2.667	5.60	2.205	2.39	.941	5.78	2.276	1.91	.752	.274	83.8	5.114	24.7	1.507	175 x 90 x 12
1160	27.87	210	5.045	1230	29.55	136	3.267	5.56	2.189	2.37	.933	5.74	2.260	1.90	.748	.270	103	6.285	30.4	1.855	175 x 90 x 15

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MILD STEEL FLAT BARS

Standard Sectional dimension		Sectional area cm ²	Unit Weight kg/m	Standard Sectional dimension		Sectional area cm ²	Unit Weight kg/m
Thickness mm	Width mm			Thickness mm	Width mm		
3	12	0.3600	0.283	9	25	2.250	1.77
3	16	0.4800	0.377	9	32	2.880	2.26
3	19	0.5700	0.447	9	38	3.420	2.68
3	25	0.7500	0.589	9	44	3.960	3.11
3	32	0.9600	0.754	9	50	4.500	3.53
3	38	0.1400	0.895	9	65	5.850	4.59
3	50	1.500	1.18	9	75	6.750	5.30
4.5	25	1.125	0.88	9	90	8.100	6.36
4.5	32	1.440	1.13	9	100	9.999	7.06
4.5	38	1.710	1.34	9	125	11.25	8.83
4.5	44	1.980	1.55	9	150	13.50	10.6
4.5	50	2.250	1.77	9	180	16.20	12.7
6	25	1.500	1.13	9	200	18.00	14.1
6	32	1.920	1.51	9	130	20.70	16.2
6	38	2.280	1.79	9	250	22.50	17.7
6	44	2.640	2.07	12	25	3.000	2.36
6	50	3.000	2.36	12	32	3.840	3.58
6	65	3.900	3.06	12	38	4.560	4.14
6	75	4.500	3.53	12	44	5.280	4.14
6	90	5.400	4.24	12	50	6.000	4.71
6	100	6.000	4.71	12	65	7.800	6.12
6	125	7.500	5.89	12	75	9.000	7.06
8	25	2.000	1.57	12	90	10.80	8.48
8	32	2.560	2.01	13	100	12.00	9.42
8	38	3.040	2.39	12	125	15.00	11.8
8	44	3.520	2.76	12	150	18.00	14.1
8	50	4.000	3.14	12	180	21.6	17.0
8	65	5.200	5.65	12	200	24.00	18.8
8	75	6.000	4.71	12	130	27.60	21.7
8	90	7.200	5.65	12	250	30.00	23.6
8	100	8.000	6.28	12	280	33.60	26.4
8	125	10.00	7.85	12	300	36.00	28.3

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MILD STEEL FLAT BARS

Standard Sectional dimension		Sectional area cm ²	Unit Weight kg/m	Standard Sectional dimension		Sectional area cm ²	Unit Weight kg/m
Thickness mm	Width mm			Thickness mm	Width mm		
16	32	5.120	4.02	22	280	61.00	48.4
16	38	6.080	4.77	22	300	66.00	51.8
16	44	7.040	5.53	25	50	12.50	9.81
16	50	8.000	6.28	25	65	16.25	12.8
16	65	10.40	8.16	25	75	18.75	14.7
16	75	12.00	9.42	25	90	22.50	17.7
16	90	14.40	11.3	25	100	25.00	19.6
16	100	16.00	12.6	25	125	31.25	24.5
16	125	20.00	15.7	25	150	37.50	29.4
16	150	24.00	18.8	25	180	45.00	35.3
16	180	28.00	22.6	25	200	50.00	39.2
16	200	32.00	25.1	25	230	57.50	45.1
16	230	36.80	28.9	25	250	62.50	49.1
16	250	50.00	31.4	25	280	70.00	55.0
16	280	44.80	35.2	25	300	75.00	58.9
16	300	48.00	37.7	28	100	28.00	22.0
19	38	7.220	5.67	28	125	35.00	27.5
19	44	8.360	6.56	28	150	42.00	33.0
19	50	9.500	7.46	28	180	50.40	39.6
19	65	12.35	9.69	28	200	56.00	44.0
19	75	14.25	11.2	28	230	64.40	50.6
19	90	17.10	13.4	28	250	70.00	55.0
19	100	19.00	14.9	28	280	78.40	61.5
19	125	23.75	18.6	28	300	84.00	65.9
19	150	28.50	22.4	32	100	32.00	25.1
19	180	34.20	26.8	32	125	40.00	31.4
19	200	38.00	29.8	32	150	48.00	37.7
19	230	43.70	34.3	32	180	57.60	45.2
19	250	47.50	37.3	32	200	64.00	50.2
19	280	53.20	41.8	32	230	73.60	57.8
19	300	57.00	44.7	32	250	80.00	62.8
22	50	11.00	8.64	32	280	89.60	70.3
22	65	14.30	11.2	32	300	96.00	75.4
22	75	16.50	13.0	36	100	36.00	28.3
22	90	19.80	15.5	36	125	45.00	35.3
22	100	22.00	17.3	36	150	54.00	42.4
22	125	27.50	21.6	36	180	64.80	50.9
22	150	33.00	25.9	36	200	72.00	56.5
22	180	39.60	31.1	36	230	82.80	65.0
22	200	44.00	34.5	36	250	90.00	70.6
22	230	50.60	39.7	36	280	100.8	79.1
22	250	55.00	43.2	36	300	108.0	84.8

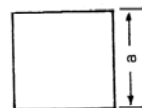
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MILD STEEL SQUARE BARS

Size	Side Length a		Weight			Sectional Area		Moment of Inertia	Radius of Gyratation	Modulus of Section
	mm	in	kg/m	kg/ft	lb/ft	cm ²	in ²	in ⁴	in	in ³
16	16	.630	2.01	6.13	1.351	2.560	.3968	.0132	.181	.0415
17	17	.669	2.27	.692	1.525	2.890	.4480	.0168	.193	.0500
18	18	.709	2.54	.775	1.707	3.240	.5022	.0209	.205	.0592
19	19	.748	2.83	.864	1.902	3.610	.5596	.0262	.217	.0696
22	22	.866	3.80	1.16	2.553	4.840	.7502	.0468	.252	.108
23	23	.906	4.15	1.27	2.789	5.290	.8200	.0560	.260	.124
24	24	.945	4.52	1.38	3.037	5.760	.8928	.0663	.272	.140
25	25	.984	4.91	1.50	3.299	6.250	.9688	.0783	.283	.159
26	26	1.024	5.31	1.62	3.568	6.760	1.048	.0915	.295	.179
28	28	1.102	6.15	1.88	4.133	7.840	1.215	.123	.319	.223
30	30	1.181	7.07	2.15	4.751	9.000	1.395	.162	.343	.275
32	32	1.260	8.04	2.45	5.403	10.24	1.587	.210	.362	.333
34	34	1.339	9.07	2.77	6.095	11.56	1.792	.267	.386	.400
35	35	1.378	9.62	2.93	6.464	12.25	1.899	.300	.398	.436
36	36	1.417	10.2	3.10	6.854	12.96	2.009	.336	.409	.475
38	38	1.496	11.3	3.46	7.593	14.44	2.238	.418	.433	.558

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MILD STEEL SQUARE BARS

Size	Side Length a		Weight			Sectional Area		Moment of Inertia	Radius of Gyration	Modulus of Section
	mm	in	kg/m	kg/ft	lb/ft	cm ²	in ²	in ⁴	in	in ³
50	50	1.969	19.6	5.98	13.17	25.00	3.875	1.252	.567	1.269
55	55	2.165	23.7	7.24	15.93	30.25	4.689	1.833	.626	1.690
60	60	2.362	28.3	8.61	19.02	36.00	5.580	2.595	.681	2.197
65	65	2.559	33.2	10.1	22.31	42.25	6.549	3.580	.740	2.795
70	70	2.756	38.5	11.7	25.87	49.00	7.595	4.805	.795	3.491
75	75	2.953	44.2	13.5	29.70	56.25	8.719	6.342	.854	4.290
80	80	3.150	50.2	15.3	33.73	64.00	9.920	8.192	.909	5.205
85	85	3.346	56.7	17.3	38.10	72.25	11.20	10.450	.965	6.224
90	90	3.543	63.6	19.4	42.74	81.00	12.56	13.141	1.024	7.384
95	95	3.740	70.8	21.6	47.58	90.25	13.99	16.312	1.079	8.726
100	100	3.937	78.5	23.9	52.75	100.0	15.50	20.012	1.138	10.191
110	110	4.331	95	29.0	63.84	121.0	18.76	29.309	1.252	13.547
120	120	4.724	113	34.5	75.93	144.0	22.32	41.562	1.362	17.575
130	130	5.118	133	40.4	89.37	169.0	26.20	57.177	1.476	22.334
140	140	5.512	154	46.9	103.5	196.0	30.38	76.877	1.591	27.888
150	150	5.906	177	53.8	118.9	225.0	34.88	101.381	1.705	34.295
160	160	6.299	201	61.3	135.1	256.0	39.68	131.195	1.819	41.679

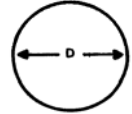
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MILD STEEL ROUND BARS

Size	Diameter		Weight			Sectional Area		Moment of Inertia I in ⁴	Radius of Gyration i in	Modulus of Section S in ³
	mm	in	kg/m	kg/ft	lb/ft	cm ²	in ²			
6	6	.236	.222	.0677	.149	.2827	.04382	.0002	.0591	.0012
7	7	.276	.302	.0921	.203	.3848	.05964	.0002	.0709	.0018
8	8	.315	.395	.120	.265	.5027	.07792	.0005	.0787	.0031
9	9	.354	.499	.152	.335	.6362	.09861	.0007	.0906	.0043
10	10	.394	.617	.188	.415	.7854	.1217	.0012	.0984	.0061
11	11	.433	.746	.227	.501	.9503	.1473	.0017	.110	.0079
12	12	.472	.888	.271	.597	1.131	.1753	.0024	.118	.0104
13	13	.512	1.04	.318	.699	1.327	.2057	.0034	.130	.0134
14	14	.551	1.21	.368	.813	1.539	.2385	.0046	.138	.0165
15	15	.591	1.39	.423	.934	1.767	.2739	.0060	.150	.0201
16	16	.630	1.58	.481	1.062	2.011	.3117	.0077	.157	.0244
17	17	.669	1.78	.543	1.196	2.270	.3519	.0099	.169	.0293
18	18	.709	2.00	.609	1.344	2.545	.3945	.0125	.177	.0348
19	19	.748	2.23	.678	1.498	2.835	.4394	.0154	.189	.0409
20	20	.787	2.47	.752	1.660	3.142	.4870	.0190	.197	.0482
21	21	.827	2.72	.829	1.828	3.464	.5369	.0228	.209	.0555
22	22	.866	2.98	.910	2.002	3.801	.5892	.0276	.217	.0641
23	23	.906	3.26	.994	2.191	4.155	.6440	.0329	.228	.0726
24	24	.945	3.55	1.08	2.385	4.524	.7012	.0392	.236	.0830
25	25	.984	3.85	1.17	2.587	4.909	.7609	.0461	.248	.0934
26	26	1.024	4.17	1.27	2.802	5.309	.8229	.0538	.256	.106
27	27	1.063	4.49	1.37	3.017	5.726	.8875	.0627	.268	.118
28	28	1.102	4.83	1.47	3.246	6.158	.9545	.0726	.276	.132
29	29	1.142	5.18	1.58	3.481	6.605	1.024	.0834	.287	.146
30	30	1.181	5.55	1.69	3.729	7.069	1.096	.0956	.295	.162
31	31	1.220	5.93	1.81	3.985	7.548	1.170	.109	.307	.179
32	32	1.260	6.31	1.92	4.240	8.042	1.247	.124	.315	.196
34	34	1.339	7.13	2.17	4.791	9.079	1.407	.158	.335	.236
35	35	1.378	7.55	2.30	5.073	9.621	1.491	.177	.346	.257
36	36	1.417	7.99	2.44	5.369	10.18	1.578	.198	.354	.279
38	38	1.496	8.90	2.71	5.981	11.34	1.758	.245	.374	.329
40	40	1.575	9.87	3.01	6.632	12.57	1.948	.303	.394	.383
42	42	1.654	10.9	3.31	7.324	13.85	2.147	.368	.413	.444
44	44	1.732	11.9	3.64	7.996	15.21	2.358	.442	.433	.510
46	46	1.811	13.0	3.98	8.736	16.62	2.576	.529	.453	.583
46	48	1.890	14.2	4.33	9.542	18.10	2.805	.627	.472	.665
50	50	1.969	15.4	4.70	10.35	19.63	3.043	.738	.492	.751

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MILD STEEL ROUND BARS

Size	Diameter		Weight			Sectional Area		Moment of Inertia I in ⁴	Radius of Gyration i in	Modulus of Section S in ³
	mm	in	kg/m	kg/ft	lb/ft	cm ²	in ²			
55	55	2.165	18.7	5.69	12.57	23.76	3.683	1.079	.543	.995
60	60	2.362	22.2	6.77	14.92	28.27	4.382	1.528	.591	1.294
65	65	2.559	26.0	7.94	17.47	33.18	5.143	2.105	.642	1.648
70	70	2.756	30.2	9.21	20.29	38.48	5.964	2.835	.689	2.056
75	75	2.953	34.7	10.6	23.32	44.18	6.848	3.724	.740	2.526
80	80	3.150	39.5	12.0	26.54	50.27	7.792	4.829	.787	3.069
85	85	3.346	44.5	13.6	29.90	56.75	8.796	6.150	.839	3.680
90	90	3.543	49.9	15.2	33.53	63.62	9.861	7.736	.886	4.369
95	95	3.740	55.6	17.0	37.36	70.88	10.99	9.610	.937	5.138
100	100	3.937	61.7	18.8	41.46	78.54	12.17	11.795	.984	5.992
105	105	4.134	68.0	20.7	45.69	86.59	13.42	14.342	1.035	-6.957
110	110	4.331	74.6	22.7	50.13	95.03	14.73	17.273	1.083	7.994
115	115	4.528	81.6	24.9	54.83	103.9	16.10	20.637	1.134	9.092
120	120	4.724	88.8	27.1	59.67	113.1	17.53	24.504	1.181	10.374
125	125	4.921	96.3	29.4	64.71	122.7	19.02	28.829	1.232	11.716
130	130	5.118	104	31.8	69.89	132.7	20.57	33.634	1.280	13.181
135	135	5.315	112	34.2	75.26	143.1	22.18	39.159	1.331	14.768
140	140	5.512	121	36.8	81.31	153.9	23.85	45.405	1.378	16.415
145	145	5.709	130	39.5	87.36	165.1	25.59	52.132	1.429	18.246
150	150	5.906	139	42.3	93.40	176.7	27.39	59.820	1.476	20.199
160	160	6.299	158	48.1	106.2	201.1	31.17	77.357	1.575	24.531
170	170	6.693	178	54.3	119.6	227.0	35.19	98.498	1.673	29.431
180	180	7.087	200	60.9	134.4	254.5	39.45	123.72	1.772	34.966
190	190	7.480	223	67.8	149.9	283.5	43.94	153.75	1.870	41.068
200	200	7.874	247	75.2	166.0	314.2	48.70	188.59	1.969	47.903

Inch Sizes

3/8 in	9.525	.375	.559	.171	.3748	.7126	.1104	.0010	.0933	.0051
1/2 in	12.700	.500	.995	.303	.6680	1.267	.1964	.0031	.125	.0123
5/8 in	15.875	.625	1.55	.474	1.045	1.979	.3068	.0075	.156	.0240
3/4 in	19.050	.750	2.24	.682	1.504	2.850	.4418	.0155	.187	.0414
7/8 in	22.225	.875	3.05	.928	2.046	3.879	.6013	.0288	.220	.0658
1 in	25.400	1.000	3.98	1.21	2.668	5.067	.7854	.0491	.250	.0982
1 1/8 in	28.575	1.125	5.03	1.53	3.373	6.413	.9940	.0786	.281	.1400
1 1/4 in	31.750	1.250	6.21	1.89	4.167	7.917	1.227	.1200	.313	.1918
1 3/8 in	34.925	1.375	7.52	2.29	5.049	9.580	1.485	.1755	.344	.2553

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**MILD STEEL ROUND BARS AND
HIGH TENSILE DEFORMED BARS**

		WEIGHT TABLES			
Nominal Diameter	Cross-Sectional Area	Mass Per Unit Length	Mass Per 12m Run	No. of Bars Per Bundle*	Mass Per Bundle*
mm	mm ²	kg/m	kg	12m lengths	Metric Ton
6	28.3	0.222	2.664	376	1.002
9	63.6	0.499	5.988	170	1.018
10	78.5	0.616	7.392	137	1.013
12	113.1	0.888	10.656	94	1.002
13	132.7	1.042	12.504	81	1.013
14	153.9	1.208	14.496	70	1.015
16	201.1	1.579	18.948	54	1.023
18	254.5	1.998	23.976	43	1.031
20	314.2	2.466	29.592	35	1.036
22	380.1	2.984	35.808	28	1.003
25	490.9	3.854	46.248	23	1.064
28	615.8	4.834	58.008	18	1.044
32	804.2	6.313	75.756	14	1.061
35	962.1	7.553	90.636	12	1.088
38	1134.1	8.903	106.836	10	1.068
40	1256.6	9.864	118.368	9	1.065

- 1) Mild Steel Plain Round Bar for concrete reinforcement
Specification: SS 2 1970, BS 4449: 1969
- 2) High Tensile Deformed Bar "SINGACON" for concrete reinforcement
Specification: SS 2 1970 (High Yield), BS 4449: 1969 (High Yield) ASTM A 615, Grade 60.

Note:- Standard packing for domestic market.

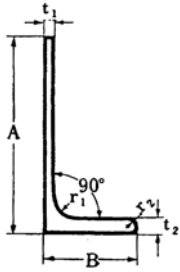
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API Line Pipes/GENERAL DATA (Per American Standard designation, 1970)

SEAMLESS AND WELDED STEEL PIPES

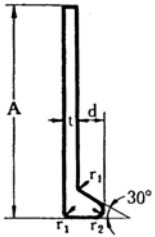
Nom. Size	O.D.	Schedule 10		Schedule 20		Schedule 30		Standard (P.E.)		Schedule 40		Schedule 60		Extra Strong		Schedule 80		Schedule 100		Schedule 120		Schedule 140		Schedule 160		XX Strong	
		Wall	Lbs/ft	Wall	Lbs/Ft	Wall	Lbs/ft	Wall	Lbs/Rt	Wall	Lbs/Ft	Wall	Lbs/Ft	Wall	Lbs/Ft	Wall	Lbs/Ft	Wall	Lbs/Ft	Wall	Lbs/Ft	Wall	Lbs/Ft	Wall	Lbs/Ft	Wall	Lbs/Ft
1/8	0.405							.068	.24	.068	.24			.095	.31	.095	.31										
1/4	0.540							.088	.42	.068	.42			.119	.54	.119	.54										
3/8	0.657							.091	.57	.091	.57			.126	.74	.126	.74										
1/2	0.840							.109	.85	.109	.85			.147	1.09	.147	1.09							.188	1.31	.294	1.71
3/4	1.050							.113	1.13	.113	1.13			.154	1.47	.154	1.47							.219	1.94	.308	2.44
1	1.315							.133	1.68	.133	1.68			.179	2.17	.179	2.17							.250	2.84	.358	3.66
1 1/4	1.660							.140	2.27	.140	2.27			.191	3.00	.191	3.00							.250	3.76	.382	5.21
1 1/2	1.900							.145	2.72	.145	2.72			.200	3.63	.200	3.63							.281	4.86	.400	6.41
2	2.375							.154	3.65	.154	3.65			.218	5.02	.218	5.02							.344	7.46	.436	9.03
2 1/2	2.875							.203	5.79	.203	5.79			.276	7.66	.276	7.66							.375	10.01	.552	13.69
3	3.500							.216	7.58	.216	7.58			.300	10.25	.300	10.25							.438	14.32	.600	18.58
3 1/2	4.000							.226	9.11	.226	9.11			.318	12.50	.318	12.50								.636	22.85	
4	4.500							.937	10.79	.237	10.79			.337	14.98	.337	14.98			.438	19.00			.531	22.51	.674	27.54
5	5.563							.258	14.62	.258	14.62			.375	20.78	.375	20.78			.500	27.04			.625	32.96	.750	38.55
6	6.625							.280	18.97	.280	18.97			.432	28.57	.432	28.57			.562	36.39			.719	45.35	.864	53.16
8	8.625			.250	22.36	.277	24.70	.322	28.55	.322	28.55	.406	35.64	.500	43.39	.500	43.39	.594	50.95	.719	60.71	.812	67.76	.906	74.69	.875	72.42
10	10.750			.250	28.04	.307	34.24	.365	40.48	.365	40.48	.500	54.74	.500	54.74	.594	64.43	.719	77.03	.844	89.29	1.000	104.13	1.125	115.64	1.000	104.13
12	12.750			.250	33.38	.330	43.77	.375	49.56	.406	53.52	.562	73.15	.500	65.42	.688	88.63	.844	107.32	1.000	125.49	1.125	139.67	1.312	160.27	1.000	125.49
14	14.000	.250	36.71	.312	45.61	.375	54.57	.375	54.57	.438	63.44	.594	85.05	.500	72.09	.750	106.13	.938	130.85	1.094	150.79	1.250	170.21	1.406	189.11		
16	16.000	.250	42.05	.312	52.27	.375	62.58	.375	62.58	.500	82.77	.656	107.50	.500	82.77	.844	136.61	1.031	164.82	1.219	192.43	1.438	223.64	1.594	245.25		
18	18.000	.250	47.39	.312	58.94	.438	82.15	.375	70.59	.562	104.67	.750	138.17	.500	93.45	.938	170.92	1.156	207.96	1.375	244.14	1.562	274.22	1.781	308.55		
20	20.000	.250	52.73	.375	78.60	.500	104.13	.375	78.60	.594	123.11	.812	166.40	.500	104.13	1.031	208.87	1.281	256.19	1.500	296.37	1.750	341.10	1.969	379.14		
22	22.000	.250	58.07	.375	86.61	.500	114.81	.375	86.61			.875	197.41	.500	114.81	1.125	250.81	1.375	302.88	1.625	353.61	1.875	403.01	2.125	451.07		
24	24.000	.250	63.41	.375	94.62	.562	140.68	.375	94.62	.688	171.29	.969	238.35	.500	125.49	1.219	296.53	1.1531	367.45	1.812	429.50	2.062	483.24	2.344	542.09		
26	26.000	.312	85.60	.500	136.17			.375	102.63					.500	136.17												
28	28.000	.312	92.41	.500	146.85	.625	182.73	.375	110.64					.500	146.83												
30	30.000	.312	98.93	.500	157.53	.625	196.08	.375	118.65					.500	157.53												
32	32.000	.312	105.59	.500	168.21	.625	209.45	.375	126.66	.688	229.92			.500	168.21												
34	34.000	.312	112.25	.500	178.89	.625	222.73	.375	134.67	.688	244.77			.500	178.89												
36	36.000	.312	118.92	.500	189.57	.625	236.13	.375	142.68	.750	282.35			.500	189.57												

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UNEQUAL LEGS, UNEQUAL THICKNESS, ANGLES

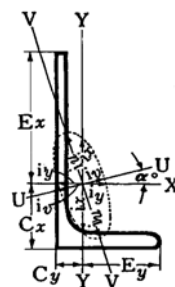
Size	Leg Length				Thickness				Corner Radius				Sectional Area		Weight			Centre of Gravity			
	A		B		t1		t2		r1		r2		cm ²	in ²	kg/m	kg/ft	lb/ft	Cx		Cy	
	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in						cm	in	cm	in
200 x 90	200	7.874	90	3.543	9	.354	14	.551	14	.551	7	.276	29.66	4.597	23.3	7.10	15.657	6.36	2.504	2.15	.846
250 x 90	250	9.843	90	3.543	10	.394	15	.591	17	.669	85	.335	37.47	5.808	29.4	8.96	19.756	8.61	3.390	1.92	.756
250 x 90	250	9.843	90	3.543	12	.472	16	.630	17	.669	8.5	.335	42.95	6.657	33.7	10.27	22.645	8.99	3.539	1.89	.744
300 x 90	300	11.811	90	3.543	11	.433	16	.630	19	.748	9.5	.374	46.22	7.164	36.3	11.06	24.393	11.0	4.331	1.76	.693
300 x 90	300	11.811	90	3.543	13	.512	17	.669	19	.748	9.5	.374	52.67	8.164	41.3	12.59	27.752	11.3	4.449	1.75	.689
400 x 100	.400	15.748	100	3.937	13	.512	18	.709	24	.945	12	.472	68.59	10.631	53.8	16.40	35.152	15.4	6.063	1.77	.697



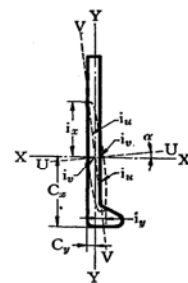
BULB PLATES

Size	Width		Thickness		Bulb Height		Corner Radius				Sectional Area		Weight			Centre of Gravity			
	A		t		d		r1		r2		Area		kg/m	kg/ft	lb/ft	Cx		Cy	
A x d x t	mm	in	mm	in	mm	in	mm	in	mm	in	cm ²	in ²				cm	in	cm	in
180x23 x.9.5	180	7.087	9.5	.374	23	.906	7	.276	2	.079	21.06	3.264	16.5	5.04	11.088	7.49	2.949	0.75	.295
200x26.5 x10	200	7.874	10	.394	26.5	1.043	8	.315	2	.079	25.23	3.911	19.8	6.04	13.305	8.15	3.209	0.84	.331
230x30 x11	230	9.055	11	.433	30	1.181	9	.354	2	.079	31.98	4.957	25.1	7.65	16.866	9.35	3.673	0.93	.366
250x33 x12	250	9.843	12	.472	33	1.299	10	.394	2	.079	38.13	5.910	29.9	9.12	20.092	10.1	3.984	1.03	.406

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Moment of Inertia								Radius of Gyration								tan	Modulus of Section				Size
Jx		Jy		Max Ju		Min Jv		ix		iy		Max i _u		Min i _u			Zx		Zy		
cm ⁴	in ⁴	cm ⁴	in ⁴	cm ⁴	in ⁴	cm ⁴	in ⁴	cm	in	cm	in	cm	in	cm	in		cm ³	in ³	cm ³	in ³	A x B
1210	29.07	200	4.805	1290	30.99	125	3.003	6.39	2.516	2.60	1.024	6.59	2.594	2.05	.807	.263	88.7	5.412	29.2	1.782	200 x 90
2440	58.62	223	5.358	2520	60.54	147	3.532	8.07	3.177	2.44	.961	8.20	3.228	1.98	.780	.182	149	9.092	31.5	1.922	250 x 90
2790	67.03	238	5.718	2870	68.95	160	3.844	8.06	3.173	2.35	.925	8.17	3.217	1.93	.760	.173	174	10.62	33.5	2.044	250 x 90
4470	107.4	245	5.886	4540	109.1	169	4.060	9.83	3.870	2.30	.906	9.91	3.902	1.91	.752	.132	235	14.34	33.8	2.062	300 x 90
4940	118.7	259	6.222	5020	120.6	181	4.348	9.68	3.811	2.22	.874	9.76	3.843	1.85	.728	.128	264	16.11	35.7	2.178	300 x 90
11500	276.3	388	9.322	11600	278.7	277	6.655	12.9	5.079	2.38	.937	13.0	5.118	2.01	.791	.0994	467	28.50	47.1	2.874	400 x100



Moment of Inertia								Radius of Gyration								tan	Modulus of Section				Size	
Jx		Jy		Max Ju		Min Jv		ix		iy		Max i _u		Min i _u			Zx		Zy			
cm ⁴	in ⁴	cm ⁴	in ⁴	cm ⁴	in ⁴	cm ⁴	in ⁴	cm	in	cm	in	cm	in	cm	in		cm ³	in ³	cm ³	in ³	A x t x d	
673	16.17	9.62	.023	678	16.29	5.04	.121	5.65	2.224	.68	.268	5.67	2.232	.49	.193	.0814	64.0	3.905	3.85	.235	180x23 x9.5	
1000	24.05	15.4	.037	1010	24.22	7.93	.191	6.30	2.472	.73	.307	6.32	2.488	.56	.220	.0839	84.5	5.156	5.46	.333	200x26.5x10	
1680	40.39	24.6	.052	1690	40.67	12.7	.306	7.25	2.854	.88	.346	7.28	2.866	.63	.276	.0819	123	7.518	7.76	.474	230x30 x11	
2370	56.91	35.8	.086	2390	57.32	18.5	.445	7.88	3.102	.97	.382	7.91	3.114	.70	.348	.0833	159	9.715	10.3	.629	250x33 x12	

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British Standard (BS 1387-1967)
Welded Steel Pipes - Class Light

NOMINAL SIZE		OUTSIDE DIAMETER				WALL THICKNESS			CALCULATED WEIGHT						NUMBER OF THREADS PER INCH	SOCKET				TEST PRESSURE	
		MAXIMUM		MINIMUM					PLAIN ENDS			THREADS AND COUPLING				OUTER DIA		MIN. LENGTH			
mm	in	mm	in	mm	in	mm	in	swg	kg/m	kg/ft	lb/ft	kg/m	kg/ft	lb/ft		mm	in	mm	in	kg/cm ²	psi
15	½	21.4	0.841	21.0	0.82b	2.0	0.080	14	0.952	0.290	0.640	0.961	0.293	0.646	14	27.8	1.094	38.1	1.500	49.2	700
20	¾	26.9	1.059	26.4	1.041	2.35	0.092	13	1.405	0.428	0.944	1.420	0.433	0.954	14	34.1	1.343	41.3	1.626	49.2	700
25	1	33.8	1.328	33.2	1.309	2.6b	0.104	12	2.009	0.612	1.35	2.024	0.617	1.36	11	42.1	1.657	47.6	1.874	49.2	700
32	1¼	42.5	1.670	41.9	1.650	2.6b	0.104	12	2.574	0.785	1.73	2.604	0.794	1.75	11	51.6	2.031	54.0	2.126	49.2	700
40	1½	48.4	1.903	47.8	1.882	2.9	0.116	11	3.259	0.993	2.19	3.304	1.007	2.22	11	57.9	2.280	57.2	2.252	49.2	700
50	2	60.2	2.370	59.6	2.347	2.9	0.116	11	4.107	1.252	2.76	4.182	1.274	2.81	11	70.6	2.780	63.5	2.500	49.2	700
65	2½	76.0	2.991	75.2	2.960	3.25	0.128	10	5.804	1.769	3.90	5.923	1.805	3.98	11	87.3	3.437	69.9	2.752	49.2	700
80	3	88.7	3.491	87.9	3.430	3.25	0.128	10	6.816	2.077	4.58	6.979	2.127	4.69	11	101.6	4.000	76.2	3.000	49.2	700
90	3½	101.1	3.981	100.3	3.950	3.65	0.144	9	8.750	2.667	5.88	8.929	2.722	6.00	11	114.3	4.500	82.6	3.252	49.2	700
100	4	113.9	4.481	113.0	4.450	3.65	0.144	9	9.881	3.012	6.64	10.179	3.102	6.84	11	128.6	5.063	88.9	3.500	49.2	700

Class Medium

NOMINAL SIZE		OUTSIDE DIAMETER				WALL THICKNESS			CALCULATED WEIGHT						NUMBER OF THREADS PER INCH	SOCKET				TEST PRESSURE	
		MAXIMUM		MINIMUM					PLAIN ENDS			THREADS AND COUPLING				OUTER DIA		MIN. LENGTH			
mm	in	mm	in	mm	in	mm	in	swg	kg/m	kg/ft	lb/ft	kg/m	kg/ft	lb/ft		mm	in	mm	in	kg/cm ²	psi
15	½	21.4	0.841	21.0	0.82b	2.0	0.080	14	0.952	0.290	0.640	0.961	0.293	0.646		14	27.8	1.094	38.1	1.500	49.2
20	¾	26.9	1.059	26.4	1.041	2.35	0.092	13	1.405	0.428	0.944	1.420	0.433	0.954	14	34.1	1.343	41.3	1.626	49.2	700
25	1	33.8	1.328	33.2	1.309	2.6b	0.104	12	2.009	0.612	1.35	2.024	0.617	1.36	11	42.1	1.657	47.6	1.874	49.2	700
32	1¼	42.5	1.670	41.9	1.650	2.6b	0.104	12	2.574	0.785	1.73	2.604	0.794	1.75	11	51.6	2.031	54.0	2.126	49.2	700
40	1½	48.4	1.903	47.8	1.882	2.9	0.116	11	3.259	0.993	2.19	3.304	1.007	2.22	11	57.9	2.280	57.2	2.252	49.2	700
50	2	60.2	2.370	59.6	2.347	2.9	0.116	11	4.107	1.252	2.76	4.182	1.274	2.81	11	70.6	2.780	63.5	2.500	49.2	700
65	2½	76.0	2.991	75.2	2.960	3.25	0.128	10	5.804	1.769	3.90	5.923	1.805	3.98	11	87.3	3.437	69.9	2.752	49.2	700
80	3	88.7	3.491	87.9	3.430	3.25	0.128	10	6.816	2.077	4.58	6.979	2.127	4.69	11	101.6	4.000	76.2	3.000	49.2	700
90	3½	101.1	3.981	100.3	3.950	3.65	0.144	9	8.750	2.667	5.88	8.929	2.722	6.00	11	114.3	4.500	82.6	3.252	49.2	700
100	4	113.9	4.481	113.0	4.450	3.65	0.144	9	9.881	3.012	6.64	10.179	3.102	6.84	11	128.6	5.063	88.9	3.500	49.2	700

Class Heavy

NOMINAL SIZE		OUTSIDE DIAMETER				WALL THICKNESS			CALCULATED WEIGHT						NUMBER OF THREADS PER INCH	SOCKET				TEST PRESSURE	
		MAXIMUM		MINIMUM					PLAIN ENDS			THREADS AND COUPLING				OUTER DIA		MIN. LENGTH			
mm	in	mm	in	mm	in	mm	in	swg	kg/m	kg/ft	lb/ft	kg/m	kg/ft	lb/ft		mm	in	mm	in	kg/cm ²	psi
15	½	21.4	0.841	21.0	0.82b	2.0	0.080	14	0.952	0.290	0.640	0.961	0.293	0.646	14	27.8	1.094	38.1	1.500	49.2	700
20	¾	26.9	1.059	26.4	1.041	2.35	0.092	13	1.405	0.428	0.944	1.420	0.433	0.954	14	34.1	1.343	41.3	1.626	49.2	700
25	1	33.8	1.328	33.2	1.309	2.6b	0.104	12	2.009	0.612	1.35	2.024	0.617	1.36	11	42.1	1.657	47.6	1.874	49.2	700
32	1¼	42.5	1.670	41.9	1.650	2.6b	0.104	12	2.574	0.785	1.73	2.604	0.794	1.75	11	51.6	2.031	54.0	2.126	49.2	700
40	1½	48.4	1.903	47.8	1.882	2.9	0.116	11	3.259	0.993	2.19	3.304	1.007	2.22	11	57.9	2.280	57.2	2.252	49.2	700
50	2	60.2	2.370	59.6	2.347	2.9	0.116	11	4.107	1.252	2.76	4.182	1.274	2.81	11	70.6	2.780	63.5	2,500	49.2	700
65	2½	76.0	2.991	75.2	2.960	3.25	0.128	10	5.804	1.769	3.90	5.923	1.805	3.98	11	87.3	3.437	69.9	2.752	49.2	700
80	3	88.7	3.491	87.9	3.430	3.25	0.128	10	6.816	2.077	4.58	6.979	2.127	4.69	11	101.6	4.000	76.2	3.000	49.2	700
90	3½	101.1	3.981	100.3	3.950	3.65	0.144	9	8.750	2.667	5.88	8.929	2.722	6.00	11	114.3	4.500	82.6	3.252	49.2	700
100	4	113.9	4.481	113.0	4.450	3.65	0.144	9	9.881	3.012	6.64	10.179	3.102	6.84	11	128.6	5.063	88.9	3.500	49.2	700