

ตารางเหล็ก

สำหรับผู้รับเหมาก่อสร้างและวิศวกร



KitKit
HI

ตารางหลัก

สำหรับผู้รับเหมาก่อสร้างและวิศวกร

ตัวอย่าง

ตารางหลัก

สำหรับผู้รับเหมาก่อสร้างและวิศวกร

สงวนลิขสิทธิ์ตามกฎหมาย

ตัวอย่าง

คำนำ

(สำหรับการพิมพ์ครั้งที่หนึ่ง)

ในวงการก่อสร้างงานเหล็กทั่วไป ผู้รับเหมาก่อสร้างและวิศวกรมักประสบปัญหา ในการคำนวณหาน้ำหนักเหล็ก และข้อมูลคุณสมบัติต่างๆ ซึ่งแยกอยู่ในหลายเล่ม ไม่สะดวกแก่การปฏิบัติงานให้ได้ผลและทันต่อเหตุการณ์

ผู้เรียบเรียงมีประสบการณ์ในงานก่อสร้างมาเป็นเวลาหลายสิบปี ได้สะสมรวบรวมตารางเหล็กต่างๆ ที่จำเป็นต้องใช้ตามมาตรฐาน Japanese Industrial Standard (JIS), British Standard (BS), American Petroleum Institute (API), American Society for Testing and Material (ASTM) และวัสดุเหล็กที่ผลิตขึ้นในประเทศ จัดเรียงเรียงและพิมพ์ขึ้นไว้ใช้เป็นคู่มือในการคิหาน้ำหนักเหล็ก คิตราคา และคำนวณออกแบบสำหรับบริษัทผู้รับเหมาก่อสร้างและบริษัทที่ปรึกษาออกแบบ

ผู้เรียบเรียงมั่นใจว่าตารางเหล็กเล่มนี้จะเป็นคู่มือที่เพิ่มความคล่องตัวในการปฏิบัติงานไม่มากนักน้อย

ผู้เรียบเรียง
Tee Group of Engineers

คำนำ

(สำหรับการพิมพ์ครั้งที่สอง)

หนังสือตารางเหล็กเล่มนี้ได้รับความสนใจจากวงการก่อสร้าง วิศวกร อาจารย์ และนิสิตนักศึกษา อย่างกว้างขวาง ผู้เรียบเรียงได้รับการสั่งซื้อและขยหมดภายในเวลาที่เร็วเกินความคาดหมาย ดังนั้นในการพิมพ์ครั้งที่ 2 นี้ ผู้เรียบเรียงจึงพยายามปรับปรุงแก้ไขเพิ่มเติม ตรวจสอบ ตัวเลข และออกแบบรูปเล่มใหม่ให้ดีขึ้น เพื่อให้ผู้อ่านได้รับประโยชน์จากหนังสือเล่มนี้มากที่สุด

จากประสบการณ์ในการพิมพ์หนังสือตารางเหล็กเล่มนี้ ผู้เรียบเรียงจึงมั่นใจว่า หนังสือประเภทที่ใช้เป็นคู่มือในการปฏิบัติงานเปิดออกเลือกใช้ได้ทันทีโดยไม่ต้องคิดคำนวณตามสูตรที่ยุ่งยากซับซ้อนและเสียเวลาเป็นหนังสือที่มีประโยชน์จริง และเป็นที่ต้องการในวงการก่อสร้างอย่างมาก ดังนั้น ผู้เรียบเรียงจึงกำลังจัดพิมพ์หนังสือตารางท่อและตารางก่อสร้าง เพื่อจัดทำจำหน่ายต่อไป

ผู้เรียบเรียง
Tee Group of Engineers

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PLATE

Metric Size

PLATE

Kilograms of Standard Sizes (JIS - 0.7293 Kg/mm, ft²)

Thickness	UNIT WEIGHT	WIDTH x LENGTH, ft ²										
		AREA, ft ²										
		3x6	4x8	4x10	4x16	4x20	5x10	5x20	5x30	5x40	6x30	6x40
mm.	Kg / ft ²	18	32	40	64	80	50	100	150	200	180	240
3.2	2.334	42.0	74.7	93.4	149	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	183	204	327	408	255	510	766	1,021	919	1,225
8	5.384	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	2,626	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	928	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	5,254
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	1,050	1,680	2,100	1,312	2,625	3,938	5,250	4,725	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	2,333	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	2,008	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	3,034	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	5,104	7,658	10,210	9,189	12,252

PLATE

Inch Size

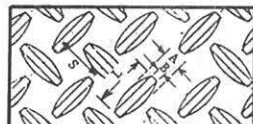
PLATE

Kilograms of Standard Sizes (JIS - 0.7293 Kg/mm, ft²)

Thickness		Unit Weight	WIDTH x LENGTH, ft ²										
			AREA, ft ²										
			3x6	4x8	4x10	4x16	4x20	5x10	5x20	5x30	5x40	6x30	6x40
in	mm.	Kg/ft ²	18	32	40	64	80	50	100	150	200	180	240
1/8	3.175	2.316	41.7	74.1	92.6	148	185	116	232	347	463	417	556
5/32	3.696	2.894	52.1	92.6	116	185	232	145	290	434	579	521	694
3/16	4.763	3.473	62.5	111	139	222	278	174	384	521	695	625	834
7/32	5.556	4.052	72.9	130	162	259	324	203	406	608	810	729	972
1/4	6.350	4.631	83.3	148	185	296	370	232	464	695	926	834	1111
9/32	7.144	5.210	93.8	167	208	333	417	260	521	782	1042	938	1250
5/16	7.938	5.789	104	185	232	370	463	289	579	868	1158	1042	1389
11/32	8.731	6.368	115	204	255	408	509	318	637	955	1274	1146	1528
3/8	9.525	6.946	125	222	278	444	556	347	695	1042	1389	1250	1667
13/32	10.391	7.525	135	241	301	482	602	376	752	1129	1505	1354	1806
7/16	11.113	8.104	146	259	324	519	648	405	810	1216	1621	1459	1945
15/32	11.906	8.683	156	278	347	556	695	434	868	1302	1737	1563	2084
1/2	12.700	9.262	167	298	370	593	741	463	926	1389	1852	1667	2223
17/32	13.494	9.841	177	315	394	630	787	492	984	1476	1968	1771	2362
9/16	14.228	10.42	188	333	417	667	834	521	1042	1563	2084	1876	2501
19/32	15.081	11.00	198	352	440	704	880	550	1100	1650	2200	1980	2640
5/8	15.875	11.58	208	371	463	741	926	579	1158	1737	2316	2084	2779
21/32	16.669	12.16	219	389	486	778	973	608	1216	1824	2432	2189	2918
11/16	17.463	12.74	229	408	510	815	1019	637	1274	1915	2548	2293	3058
23/32	18.256	13.31	240	426	532	852	1065	666	1331	1996	2662	2396	3194
3/4	19.050	13.89	250	444	556	889	1111	694	1389	2084	2778	2500	3334
25/32	19.844	14.47	260	463	579	926	1158	724	1447	2170	2894	2605	3473
13/16	20.638	15.05	271	482	602	963	1204	752	1505	2258	3010	2709	3612
27/32	21.431	15.63	281	500	625	1000	1250	782	1563	2344	3126	2813	3751
7/8	22.225	16.21	292	519	648	1037	1297	810	1621	2432	3242	2918	3890
29/32	23.019	16.79	302	537	672	1074	1343	840	1679	2518	3358	3022	4030
15/16	23.813	17.37	313	556	695	1112	1390	868	1737	2606	3474	3127	4169
31/32	24.606	17.95	323	574	718	1149	1436	898	1795	2692	3590	3231	4308
1	25.400	18.52	333	593	741	1185	1482	926	1852	2778	3704	3334	4445
1 1/16	26.988	19.68	354	630	787	1260	1574	984	1968	2952	3936	3542	4723
1 1/8	28.570	20.84	375	667	834	1334	1667	1042	2084	3126	4168	3751	5002
1 3/16	30.163	22.00	396	704	880	1408	1760	1100	2200	3300	4400	3960	5280
1 1/4	31.750	23.16	417	741	926	1482	1853	1158	2316	3474	4632	4169	5558
1 5/16	33.338	24.31	438	778	972	1556	1945	1216	2431	3646	4862	4376	5834
1 3/8	34.925	25.47	458	815	1019	1630	2038	1274	2547	3820	5094	4585	6113
1 7/16	36.513	26.63	479	852	1065	1704	2130	1332	2663	3994	5326	4793	6391
1 1/2	38.100	27.79	500	889	1112	1778	2223	1390	2779	4168	5558	5002	6670
1 9/16	39.688	28.94	521	926	1158	1852	2315	1447	2894	4341	5788	5209	6946
1 5/8	41.275	30.10	542	963	1204	1926	2408	1505	3010	4515	6020	5418	7224
1 11/16	42.863	31.16	561	997	1246	1994	2493	1558	3116	4674	6232	5609	7478
1 3/4	44.450	32.42	584	1037	1297	2075	2594	1621	3242	4863	6484	5836	7781
1 13/16	46.034	33.57	604	1074	1343	2148	2686	1678	3357	5036	6714	6043	8057
1 7/8	47.625	34.73	625	1111	1389	2223	2778	1738	3473	5210	6946	6251	8335
2	50.800	37.05	667	1189	1482	2371	2964	1852	3705	5558	7410	6669	8892

CHECKERED PLATES

Standard Sizes of Floor Plates



Style	A	B	L	S
M	5.1	2.5	25.5	20.2
H	6.0	3.2	25.5	28.3

Metric Size

Dimension									
Thickness		Width x Length							
		3ft x 6ft		4ftx 8ft		5ft x 10ft		5ft x 20ft	
		Weight of One Plate							
mm.	in	kg	lb	kg	lb	kg	lb	kg	lb
M 2.3	0.0906	33.0	72.7	66.1	146				
M 3.2	0.1260	44.8	98.7	89.7	198				
M 4.5	0.1772	61.9	136	123	271				
H 3.2	0.1260	45.1	99.4	80.2	177	125	276	251	553
H 4.5	0.1772	62.2	137	111	245	173	381	345	760
H 6	0.2362	81.9	181	146	322	227	500	455	1003
H 8	0.3150	108	238	192	423	300	661	601	1325
H 9	0.3543	121	267	216	476	337	743	674	1485
H 10	0.3937	134	295	239	527	373	822	747	1646
H 12	0.4724	161	355	286	563	446	983	892	1966

Inch Size

Dimension										
Thickness			Width x Length							
			3ft x 6ft		4ftx 8ft		5ft x 10ft		5ft x 20ft	
			Weight of One Plate							
in	in	mm.	kg	lb	kg	lb	kg	lb	kg	lb
3/32	0.0938	2.381	34.1	75.2	60.0	134				
1/8	0.1250	3.175	44.5	98.1	79.2	175				
3/16	0.1875	4.763	65.4	144	116	256				
1/8	0.1250	3.175	44.8	98.7	79.7	176	124	237	249	549
3/16	0.1875	4.763	65.6	145	117	258	182	401	365	804
1/4	0.2500	6.350	86.5	191	154	339	240	529	480	1058
5/16	0.1325	7.938	107	236	191	421	298	657	596	1314
3/8	0.3750	9.525	128	282	228	503	356	785	712	1569
7/16	0.4375	11.112	149	328	265	584	414	912	828	1825
1/2	0.5000	12.700	170	375	302	666	472	1040	944	2081

STEEL SHEETS

Metric Size

SHEET

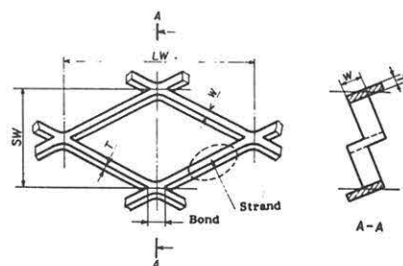
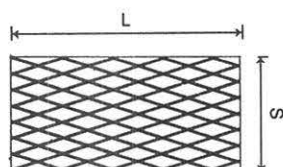
Thickness	Width Length	Width x Length, ft ²										
		Width x Length, mm ²										
		2.5 x 8	2.5 x 10	3 x 6	3 x 8	4 x 8	4 x 10	5 x 10	5 x 12	6 x 8	6 x 10	6 x 12
		762 x	762 x	914 x	914 x	1219 x	1219 x	1524 x	1524 x	1829 x	1829 x	1829 x
mm.	Kg / ft ²	2438	3048	1829	2438	2438	3048	3048	3658	2438	3048	3658
0.15	1.178	2.19	2.74	1.97	2.62	3.50	4.38	5.47	6.57	5.25	6.57	7.88
0.152	1.193	2.22	2.77	1.99	2.66	3.55	4.43	5.54	6.65	5.32	6.65	7.98
0.169	1.327	2.47	3.08	2.22	2.96	3.94	4.93	6.16	7.40	5.92	7.40	8.88
0.179	1.405	2.61	3.26	2.35	3.13	4.18	5.22	6.53	7.83	6.26	7.83	9.40
0.19	1.492	2.77	3.47	2.49	3.32	4.43	5.54	6.93	8.32	6.65	8.32	9.98
0.198	1.554	2.89	3.61	2.60	3.46	4.62	5.77	7.22	8.66	6.93	8.66	10.4
0.20	1.570	2.92	3.65	2.63	3.50	4.67	5.83	7.29	8.75	7.00	8.75	10.5
0.22	1.727	3.21	4.01	2.89	3.85	5.13	6.42	8.02	9.63	7.70	9.63	11.6
0.23	1.806	3.36	4.20	3.02	4.02	5.37	6.71	8.39	10.1	8.05	10.1	12.1
0.24	1.884	3.50	4.38	3.15	4.20	5.60	7.00	8.75	10.5	8.40	10.5	12.6
0.25	1.962	3.65	4.56	3.28	4.37	5.83	7.29	9.11	10.9	8.75	10.9	13.1
0.26	2.041	3.79	4.74	3.41	4.55	6.07	7.58	9.48	11.4	9.10	11.4	13.7
0.27	2.120	3.94	4.92	3.54	4.72	6.30	7.88	9.85	11.8	9.45	11.8	14.2
0.28	2.198	4.08	5.11	3.68	4.90	6.53	8.17	10.2	12.3	9.80	12.3	14.7
0.29	2.276	4.23	5.29	3.81	5.07	6.76	8.46	10.6	12.7	10.1	12.7	15.2
0.30	2.355	4.38	5.47	3.94	5.25	7.00	8.75	10.9	13.1	10.5	13.1	15.8
0.32	2.512	4.67	5.84	4.20	5.60	7.47	9.33	11.7	14.0	11.2	14.0	16.8
0.35	2.748	5.11	6.38	4.59	6.12	8.17	10.2	12.8	15.3	12.3	15.3	18.4
0.40	3.140	5.83	7.29	5.25	7.00	9.30	11.7	14.6	17.5	14.0	17.5	21.0
0.45	3.532	6.56	8.20	5.91	7.87	10.5	13.1	16.4	19.7	15.7	19.7	23.6
0.50	3.925	7.29	9.12	6.56	8.74	11.7	14.6	18.2	21.9	17.5	21.9	26.3
0.55	4.318	8.02	10.0	7.22	9.62	12.8	16.0	20.1	24.1	19.3	24.1	28.9
0.60	4.710	8.75	10.9	7.88	10.5	14.0	17.5	21.9	26.3	21.0	26.3	31.5
0.65	5.102	9.48	11.9	8.53	11.4	15.2	19.0	23.7	28.4	22.8	28.4	34.1
0.70	5.495	10.2	12.8	9.19	12.2	16.3	20.4	25.5	30.6	24.5	30.6	36.8
0.75	5.888	10.9	13.7	9.84	13.1	17.5	21.9	27.3	32.8	26.3	32.8	39.4
0.80	6.280	11.7	14.6	10.5	14.0	18.7	23.3	29.2	35.0	28.0	35.0	42.0
0.85	6.672	12.4	15.5	11.2	14.9	19.8	24.8	31.0	37.2	29.8	37.2	44.6
0.90	7.065	13.1	16.4	11.8	15.7	21.0	26.3	32.8	39.4	31.5	39.4	47.3
0.95	7.458	13.9	17.3	12.5	16.6	22.2	27.7	34.6	41.6	33.3	41.6	49.9
1.0	7.850	14.6	18.2	13.1	17.5	23.3	29.2	36.5	43.8	35.0	43.8	52.5
1.2	9.420	17.5	21.9	15.8	21.0	28.0	35.0	43.8	52.5	42.0	52.5	63.0
1.4	10.99	20.4	25.5	18.4	24.5	32.7	40.8	51.0	61.3	49.0	61.3	73.5
1.6	12.56	23.3	29.2	21.0	28.0	37.3	46.7	58.3	70.0	56.0	70.0	84.0
1.8	14.13	26.3	32.8	23.6	31.5	42.0	52.5	65.5	78.8	63.0	78.8	94.5
2.0	15.70	29.2	36.5	26.3	35.0	46.7	58.3	72.9	87.5	70.0	87.5	105
2.3	18.06	33.6	42.0	30.2	40.2	53.7	67.1	83.9	101	80.5	101	121
2.5	19.62	36.5	45.6	32.8	43.7	58.3	73.8	91.1	109	87.5	109	131
2.6	20.41	37.9	47.4	34.1	45.5	60.9	75.8	94.8	114	91.0	114	137
2.8	21.98	40.8	51.1	36.8	49.0	65.3	81.7	102	123	98.0	123	147
2.9	22.76	42.3	52.9	38.1	50.7	67.6	84.6	106	127	101	127	152
3.0	23.55	43.8	54.7	39.4	52.5	70.0	87.5	109	131	105	131	158
3.2	25.12	46.7	58.4	42.0	56.0	74.7	93.3	117	140	112	140	168

GALVANIZED SHEETS

JIS G3312

GAL SHEET

Zinc coating g/m ² (oz/ft ²)	Standard thickness (Base sheet) mm.	Width mm															
		762						914						1000	1219		
		Length mm															
		1829	2134	2438	2743	3048	3658	1829	2134	2438	2743	3048	3658	2000	2438	3048	3658
183 (0.60)	0.20	2.44	2.85	3.26	3.66	4.07	4.89	2.93	3.42	3.91	4.39	4.88	5.86	3.51	5.21	6.51	7.82
	0.25	2.99	3.49	3.99	4.48	4.98	5.98	3.59	4.18	4.78	5.38	5.98	7.17	4.29	6.37	7.97	9.56
	0.27	3.21	3.74	4.28	4.81	5.35	6.42	3.85	4.49	5.13	5.77	6.42	7.70	4.61	6.84	8.56	10.3
	0.30	3.54	4.13	4.72	5.30	5.90	7.07	4.24	4.95	5.65	6.36	7.07	8.48	5.08	7.54	9.43	11.3
244 (0.80)	0.20	2.53	2.95	3.37	3.79	4.21	5.06	3.03	3.54	4.04	4.55	5.05	6.06	3.63	5.39	6.74	8.09
	0.25	3.08	3.59	4.10	4.61	5.12	6.15	3.69	4.30	4.91	5.53	6.15	7.37	4.41	6.56	8.20	8.84
	0.27	3.30	3.84	4.39	4.94	5.49	6.59	3.95	4.61	5.27	5.93	6.59	7.90	4.73	7.03	8.78	10.5
	0.30	3.62	4.23	4.83	5.43	6.04	7.24	4.35	5.07	5.79	6.52	7.24	8.69	5.20	7.72	9.66	11.6
	0.35	4.17	4.86	5.56	6.25	6.95	8.34	5.00	5.83	6.67	7.50	8.34	10.0	5.98	8.89	11.1	13.3
	0.40	4.72	5.50	6.29	7.07	7.86	9.43	5.66	6.60	7.54	8.48	9.43	11.3	6.77	10.1	12.6	15.1
	0.50	5.81	6.78	7.75	8.71	9.68	11.6	6.97	8.13	9.29	10.5	11.6	13.9	8.34	12.4	15.5	18.6
305 (1.00)	0.60	6.99	8.15	9.32	11.5	11.6	14.0	8.39	9.78	11.2	12.6	14.0	16.8	10.0	14.9	18.6	22.4
	0.80	9.18	10.7	12.2	13.8	15.3	18.4	11.0	12.8	14.7	16.5	18.3	22.0	13.2	19.6	24.5	29.4
	1.10	11.4	13.3	15.2	17.0	18.9	22.7	13.6	15.9	18.2	20.4	22.7	27.3	16.3	24.2	30.3	36.4
381 (1.25)	0.27	3.49	4.07	4.65	5.23	5.81	6.97	4.18	4.88	5.57	6.27	6.97	8.36	5.00	7.43	9.29	11.2
	0.30	3.81	4.45	5.08	5.72	6.36	7.63	4.57	5.34	6.10	6.86	7.62	9.15	5.47	8.13	10.2	12.2
	0.35	4.36	5.09	5.81	6.54	7.27	8.72	5.23	6.10	6.97	7.84	8.72	10.5	6.26	9.30	11.6	14.0
	0.40	4.91	5.73	6.54	7.36	8.18	9.81	5.89	6.87	7.84	8.83	9.81	11.8	7.04	10.5	13.1	15.7
	0.50	6.00	7.00	8.00	9.00	10.0	12.0	7.20	8.40	9.59	10.8	12.0	14.4	8.61	12.8	16.0	19.2
	0.60	7.10	8.28	9.46	10.6	11.8	14.2	8.51	9.93	11.3	12.8	14.2	17.0	10.2	15.1	18.9	22.7
	0.80	9.29	10.8	12.4	13.9	15.5	18.6	11.1	13.0	14.8	16.7	18.6	22.3	13.3	19.8	24.8	29.7
	1.0	11.5	13.4	15.3	17.2	19.1	22.9	13.8	16.1	18.3	20.6	22.9	27.5	16.5	24.5	30.6	36.7
	1.2	13.7	15.9	18.2	20.5	22.8	27.3	16.4	19.1	21.8	24.6	27.3	32.8	19.6	29.1	36.4	43.7
	1.4	15.8	18.5	21.1	23.8	26.4	31.7	19.0	22.2	25.3	28.5	31.7	38.0	22.7	33.8	42.3	50.7
	1.6	18.0	21.0	24.0	27.0	30.1	36.1	21.6	25.2	28.8	32.4	36.1	43.3	25.9	38.5	48.1	57.7



EXPANDED METALS

JIS G3351

Standard Finish Dimensions

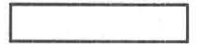
Dimensions and Weight

S mm	L mm	Area m ²
1829	914	1.672
2438	914	2.228
1829	1219	2.230
2438	1219	2.972
2438	1524	3.716
3048	1524	4.645
914	1829	1.672
1219	1829	2.230
2438	1829	4.459
914	2438	2.228
1219	2438	2.972
1829	2438	4.459
1524	3046	4.645

Symbol	Product number	Dimensions of mesh mm		Dimensions of strand mm		Rate of expansion	Unit Weight kg/m ²	Length of bond mm
		SW	LW	T	W			
XG	11	34	135.4	4.5	7.0	2.43	14.5	30 min
	12	34	135.4	6.0	7.0	2.43	19.4	30 min
	13	34	135.4	6.0	9.0	1.89	24.9	30 min
	14	34	135.4	8.0	9.0	1.89	33.2	30 min
	21	36	101.6	4.5	7.0	2.57	13.7	10 min
	22	36	101.6	6.0	7.0	2.57	18.3	10 min
	23	36	101.6	6.0	9.0	2.00	23.6	10 min
	24	36	101.6	8.0	9.0	2.00	31.4	10 min
	31	12	30.5	1.2	1.5	4.00	2.36	-
	32	12	30.5	1.6	2.0	3.00	4.19	
	33	12	30.5	2.3	3.0	2.00	9.03	
	41	22	50.8	1.6	2.0	5.50	2.28	-
	42	22	50.8	2.3	2.5	4.40	4.10	
	43	22	50.8	3.2	3.5	3.14	8.00	
	51	25	61.0	1.6	2.5	5.00	2.51	
	52	25	61.0	2.3	3.0	4.17	4.33	
	53	25	61.0	3.2	4.0	3.12	8.05	
XS	61	34	76.2	2.3	3.0	5.67	3.19	-
	62	34	76.2	3.2	4.0	4.25	5.91	
	63	34	76.2	4.5	5.0	3.40	10.4	
	71	50	152.4	2.3	3.5	7.14	2.53	-
	72	50	152.4	3.2	4.0	6.25	4.02	
	73	50	152.4	4.5	5.0	5.00	7.06	
	81	75	203.2	3.2	4.0	9.38	2.68	-
	82	75	203.2	4.5	5.0	7.50	4.71	
	83	75	203.2	6.0	6.0	6.25	7.54	
	91	115	304.8	3.2	5.0	11.5	2.18	-
	92	115	304.8	4.5	6.0	9.58	3.69	
	93	115	304.8	6.0	7.0	8.21	5.74	

FLAT BARS

Metric Size

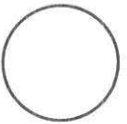


Standard Sectional Dimension		Sectional Area cm ²	Unit Weight kg/m	Standard Sectional Dimension		Sectional Area cm ²	Unit Weight kg/m	Standard Sectional Dimension		Sectional Area cm ²	Unit Weight kg/m	Standard Sectional Dimension		Sectional Area cm ²	Unit Weight kg/m
Thick-ness mm	Width mm			Thick-ness mm	Width mm			Thick-ness mm	Width mm			Thick-ness mm	Width mm		
4.5	25	1.125	0.88	9	180	16.20	12.7	16	300	48.00	37.7	25	180	45.00	35.3
4.5	32	1.440	1.13	9	200	18.00	14.1	19	38	7.22	5.67	25	200	50.00	39.2
4.5	38	1.710	1.34	9	230	20.70	16.2	19	44	8.360	6.56	25	230	57.50	45.1
4.5	44	1.980	1.55	9	250	22.50	17.7	19	50	9.500	7.46	25	250	62.50	49.1
4.5	50	2.250	1.77	12	25	3.000	2.36	19	65	12.35	9.69	25	280	70.00	55.0
6	25	1.500	1.18	12	32	3.810	3.01	19	75	14.25	11.2	25	300	75.00	58.9
6	32	1.920	1.51	12	38	4.560	3.58	19	90	17.10	13.4	28	100	28.00	22.0
6	38	2.280	1.79	12	44	5.280	4.14	19	100	19.00	14.9	28	125	35.00	27.5
6	44	2.640	2.07	12	50	6.000	4.71	19	125	23.75	18.6	28	150	42.00	33.0
6	50	3.000	2.36	12	65	7.800	6.12	19	150	28.50	22.4	28	180	50.40	39.6
6	65	3.900	3.06	12	75	9.000	7.06	19	180	34.20	26.8	28	200	56.00	44.0
6	75	4.500	3.53	12	90	10.80	8.48	19	200	38.00	29.8	28	230	64.40	50.6
6	90	5.400	4.24	12	100	12.00	9.42	19	230	43.70	34.3	28	250	70.00	55.0
6	100	6.000	4.71	12	125	15.00	11.8	19	250	47.50	37.3	28	280	78.40	61.5
6	125	7.500	5.89	12	150	18.00	14.1	19	280	53.20	41.8	28	300	84.00	65.9
8	25	2.000	1.57	12	180	21.60	17.0	19	300	57.00	44.7	32	100	32.00	25.1
8	32	2.560	2.01	12	200	24.00	18.8	22	50	11.00	8.64	32	125	40.00	31.4
8	38	3.040	2.39	12	230	27.60	21.7	22	65	14.30	11.2	32	150	48.00	37.7
8	44	3.520	2.76	12	250	30.00	23.6	22	75	16.50	13.0	32	180	57.60	45.2
8	50	4.000	3.14	12	280	33.60	26.4	22	90	19.80	15.5	32	200	64.00	50.2
8	65	5.200	4.08	12	300	36.00	28.3	22	100	22.00	17.3	32	230	73.60	57.8
8	75	6.000	4.71	16	32	5.120	4.02	22	125	27.50	21.6	32	250	80.00	62.8
8	90	7.200	5.65	16	38	6.080	4.77	22	150	33.00	25.9	32	280	89.60	70.3
8	100	8.000	6.28	16	44	7.040	5.53	22	180	39.60	31.1	32	300	96.00	75.4
8	125	10.00	7.85	16	50	8.000	6.28	22	200	44.00	34.5	36	100	36.00	28.3
9	25	2.250	1.77	16	65	10.40	8.16	22	230	50.60	39.7	36	125	45.00	35.3
9	32	2.880	2.26	16	75	12.00	9.42	22	250	55.00	43.2	36	150	54.00	42.4
9	38	3.420	2.68	16	90	14.40	11.3	22	280	61.60	48.4	36	180	64.80	50.9
9	44	3.960	3.11	16	100	16.00	12.6	22	300	66.00	51.8	36	200	72.00	56.5
9	50	4.500	3.53	16	125	20.00	15.7	25	50	12.50	9.81	36	230	82.80	65.0
9	65	5.850	4.59	16	150	24.00	18.8	25	65	16.25	12.8	36	250	90.00	70.6
9	75	6.750	5.30	16	180	28.80	22.6	25	75	18.75	14.7	36	280	100.8	79.1
9	90	8.100	6.36	16	200	32.00	25.1	25	90	22.50	17.7	36	300	108.0	84.8
9	100	9.000	7.06	16	230	36.80	28.9	25	100	25.00	19.6				
9	125	11.25	8.83	16	250	40.00	31.4	25	125	31.25	24.5				
9	150	13.50	10.6	16	280	44.80	35.2	25	150	37.50	29.4				

SQUARE BARS

Size in	lb/ft	kg/m	Size in	lb/ft	kg/m	Size in	lb/ft	kg/m
3/16	.1195	.178	1- 3/32	4.067	6.052	2-13/16	26.895	40.024
13/64	.1403	.209	1- 1/8	4.303	6.404	2-27/32	27.496	40.918
7/32	.1627	.242	1- 5/32	4.546	6.785	2- 7/8	28.103	41.822
15/64	.1868	.278	1- 3/16	4.795	7.136	2-29/32	28.717	42.736
1/4	.2125	.316	1- 7/32	5.050	7.515	2-15/16	29.338	43.661
17/64	.2399	.357	1- 1/4	5.313	7.907	2-31/32	29.966	44.595
9/32	.2689	.400	1- 9/32	5.581	8.306	3	30.600	45.538
19/64	.2997	.446	1- 5/16	5.857	8.716	3- 1/32	31.241	47.455
5/16	.3320	.494	1- 11/32	6.139	9.136	3- 1/16	31.888	47.455
21/64	.3661	.545	1- 3/8	6.428	9.566	3- 3/32	32.542	48.428
11/32	.4018	.596	1- 13/32	6.724	10.007	3- 1/8	33.203	49.421
23/64	.4391	.653	1- 7/16	7.026	10.456	3- 5/32	33.871	50.406
3/8	.4718	.711	1- 15/32	7.335	10.916	3- 3/16	34.545	51.409
25/64	.5188	.772	1- 1/2	7.650	11.385	3- 7/32	35.225	52.421
13/32	.5611	.835	1- 17/32	7.972	11.864	3- 1/4	35.913	53.444
27/64	.6051	.900	1- 9/16	8.301	12.352	3- 9/32	36.606	54.476
7/16	.6508	.969	1- 19/32	8.636	12.852	3- 5/16	37.307	55.519
29/64	.6981	1.039	1- 5/8	8.978	13.361	3-11/32	38.014	56.571
15/32	.7471	1.112	1- 21/32	9.327	13.880	3- 3/8	38.728	57.633
31/64	.7977	1.187	1- 11/16	9.682	14.409	3-13/32	39.449	58.706
1/2	.8500	1.265	1- 23/32	10.044	14.947	3- 7/16	40.176	59.789
33/64	.9040	1.345	1- 3/4	10.413	15.497	3-15/32	40.910	60.881
17/32	.9596	1.428	1- 25/32	10.788	16.055	3- 1/2	41.650	61.982
35/64	1.0168	1.513	1- 13/16	11.170	16.623	3- 9/16	43.151	64.261
9/16	1.0758	1.601	1- 27/32	11.558	17.200	3- 5/8	44.678	66.489
37/64	1.1364	1.691	1- 7/8	11.953	17.788	3-11/16	46.232	68.801
19/32	1.1986	1.784	1- 29/32	12.355	18.386	3- 3/4	47.813	71.153
39/64	1.2625	1.879	1- 15/16	12.763	18.993	3-13/16	49.420	73.545
5/8	1.3281	1.977	1- 31/32	13.178	19.622	3- 7/8	51.053	75.976
41/64	1.3954	2.077	2	13.600	20.239	3-15/16	52.713	78.466
21/32	1.4643	2.179	2- 1/32	14.028	20.877	4	54.400	80.958
43/64	1.5348	2.284	2- 1/16	14.463	21.524	4- 1/16	56.113	83.506
11/16	1.6070	2.392	2- 3/32	14.905	22.181	4- 1/8	57.853	86.096
45/64	1.6809	2.501	2- 1/8	15.353	22.848	4- 3/16	59.620	88.762
23/32	1.7564	2.614	2- 5/32	15.808	23.525	4- 1/4	61.413	91.394
47/64	1.8336	2.729	2- 3/16	16.270	24.212	4- 5/16	63.232	94.101
3/4	1.9125	2.848	3- 7/32	16.738	24.909	4- 3/8	65.078	96.848
49/64	1.9930	2.968	2- 1/4	17.213	25.616	4- 7/16	66.951	99.635
25/32	2.0752	3.088	2- 9/32	17.694	26.332	4- 1/2	68.850	102.461
51/64	2.1590	3.213	2- 5/16	18.182	27.058	4- 9/16	70.776	105.327
13/16	2.2445	3.340	2- 11/32	18.677	27.795	4- 5/8	72.728	108.231
53/64	2.3317	3.470	2- 3/8	19.178	28.541	4-11/16	74.707	111.177
27/32	2.4205	3.602	2- 13/32	19.606	29.297	4- 3/4	76.713	114.162
55/64	2.5110	3.737	2- 7/16	20.201	30.063	4-13/16	78.745	117.186
7/8	2.6031	3.874	2- 15/32	20.722	30.838	4- 7/8	80.803	120.249
57/64	2.6969	4.031	2- 1/2	21.250	31.624	4-15/16	82.888	123.351
29/32	2.7924	4.156	2- 17/32	21.785	32.420	5	85.000	126.494
59/64	2.8895	4.300	2- 9/16	22.326	33.225	5- 1/16	87.138	129.676
15/16	2.9883	4.447	2- 19/32	22.874	34.041	5- 1/8	89.303	132.899
61/64	3.0887	4.597	2- 5/8	23.428	34.866	5- 3/16	91.495	136.161
31/32	3.1908	4.748	2- 21/32	23.989	35.701	5- 1/4	93.713	139.462
63/64	3.2946	4.903	2- 11/16	24.557	36.546	5- 5/16	95.957	142.801
1	3.4000	5.060	2- 23/32	25.131	37.400	5- 3/8	98.228	146.180
1- 1/32	3.616	5.381	2- 3/4	25.713	38.255	5- 7/16	100.526	149.600
1- 1/16	3.838	5.712	2- 25/32	26.300	39.139	5- 1/2	102.850	150.059

REFERENCE: UNITED STATES STEEL EXPORT COMPANY



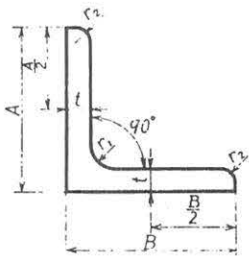
ROUND BARS

Metric Size

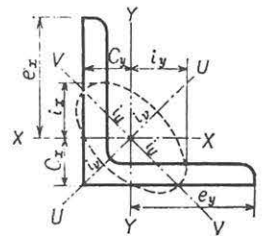
Diameter		Unit Weight			Diameter		Unit Weight		
mm	in	kg/m.	kg/ft	lb/ft	mm	in	kg/m.	kg/ft	lb/ft
6	0.236	0.222	0.0677	0.149	40	1.579	9.87	3.01	6.032
7	0.276	0.302	0.0921	0.203	42	1.654	10.9	3.31	7.324
8	0.315	0.395	0.120	0.265	44	1.732	11.9	3.64	7.996
9	0.354	0.499	0.152	0.335	46	1.811	13.0	3.93	8.736
10	0.394	0.617	0.183	0.415	48	1.890	14.2	4.33	9.542
11	0.433	0.746	0.227	0.501	50	1.969	15.4	4.70	10.35
12	0.472	0.896	0.271	0.597	55	2.165	18.7	5.69	12.57
13	0.512	1.04	0.316	0.699	60	2.362	22.2	6.77	14.92
14	0.561	1.21	0.368	0.813	65	2.559	26.0	7.94	17.47
15	0.591	1.39	0.423	0.934	70	2.759	30.2	9.21	20.29
16	0.630	1.58	0.481	1.062	75	2.935	34.7	10.6	23.32
17	0.669	1.78	0.543	1.196	80	3.150	39.5	12.0	26.54
18	0.709	2.00	0.609	1.344	85	3.346	44.5	13.6	29.90
19	0.748	2.23	0.678	1.498	90	3.543	49.9	15.2	33.53
20	0.787	2.47	0.752	1.660	95	3.740	55.5	17.0	37.36
21	0.827	2.72	0.829	1.826	100	3.937	61.7	18.8	41.46
22	0.866	2.98	0.910	2.002	105	4.134	68.0	20.7	45.69
23	0.908	3.26	0.994	2.191	110	4.331	74.6	22.7	50.13
24	0.945	3.55	1.09	2.402	115	4.528	81.5	24.9	54.83
25	0.984	3.85	1.17	2.587	120	4.724	88.6	27.1	59.67
26	1.024	4.17	1.27	2.802	125	4.921	96.3	29.4	64.71
28	1.102	4.83	1.47	3.246	130	5.118	104	31.8	69.88
30	1.181	5.51	1.69	3.729	135	5.315	112	34.2	75.26
32	1.260	6.31	1.92	4.240	140	5.512	121	36.8	81.31
34	1.335	7.13	2.17	4.791	145	5.709	130	39.5	87.36
36	1.417	7.99	2.44	5.369	150	5.906	139	42.3	93.40
38	1.496	8.90	2.71	5.981	200	7.874	217	75.3	165.97

Inch Size

Diameter			Unit Weight			Diameter			Unit Weight		
in	in	mm	kg/m	kg/ft	lb/ft	in	in	mm	kg/m	kg/ft	lb/ft
3/16	0.1875	4.763	0.140	0.0426	0.09392	7/8	0.8750	22.225	3.05	0.9325	2.046
1/4	0.2500	6.350	0.249	0.0750	0.1671	15/16	0.9375	23.813	3.50	1.07	2.356
5/16	0.3125	7.930	0.388	0.118	0.2601	1	1.0000	25.400	3.98	1.21	2.668
3/8	0.3750	9.525	0.559	0.170	0.3748	1 1/8	1.1250	28.575	5.03	1.53	3.373
7/16	0.4375	11.113	0.761	0.232	0.5113	1 1/4	1.2500	31.750	6.21	1.89	4.167
1/2	0.5000	12.700	0.995	0.303	0.6680	1 3/8	1.3750	34.925	7.52	2.20	5.049
9/16	0.5625	14.288	1.26	0.384	0.8470	1 1/2	1.5000	38.100	8.95	2.73	6.091
5/8	0.6250	15.875	1.55	0.474	1.045	1 5/8	1.6250	41.275	10.5	3.20	7.055
11/16	0.6875	17.463	1.88	0.573	1.263	1 3/4	1.7500	44.450	12.2	3.71	8.179
3/4	0.7500	19.050	2.24	0.682	1.504	1 7/8	1.8750	47.625	14.0	4.29	9.392
13/16	0.8125	20.638	2.63	0.801	1.766	2	2.000	50.800	15.9	4.85	10.68

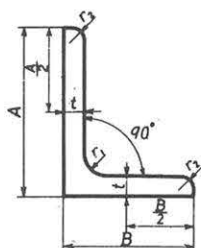


Geometrical moment of inertia $I = a^2$
 Radius of gyration of area $i = \sqrt{I/a}$
 Modulus of section $Z = I/e$
 (a : sectional area)

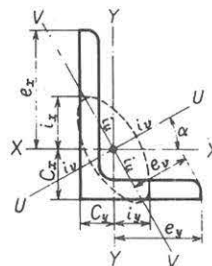


EQUAL ANGLE JIS G 3192

Standard sectional dimension mm				Sectional Area cm ²	Unit Weight kg/m	Reference											
A x B	t	r ₁	r ₂			Position of Center of Gravity cm		Geometrical moment of inertia cm ⁴				Radius of Gyration of Area cm				Modulus of Section cm ³	
						Cx	Cy	Ix	Iy	Max ix	Min iy	i _x	i _y	Max ix	Min iy	Z _x	Z _y
25 X 25	3	4	2	1.427	1.12	0.719	0.719	0.797	0.797	1.26	0.332	0.747	0.747	0.940	0.483	0.448	0.448
30 X 30	3	4	2	1.727	1.36	0.844	0.844	1.42	1.42	2.26	0.590	0.908	0.908	1.14	0.585	0.661	0.661
40 X 40	3	4.5	2	2.336	1.83	1.09	1.09	3.53	3.53	5.60	1.46	1.23	1.23	1.55	0.790	1.21	1.21
40 X 40	5	4.5	3	3.755	2.95	1.17	1.17	5.42	5.42	8.59	2.25	1.20	1.20	1.51	0.774	1.91	1.91
45 X 45	4	6.5	3	3.492	2.74	1.27	1.24	6.50	6.50	10.3	2.70	1.36	1.36	1.72	0.880	2.00	2.00
45 X 45	5	6.5	3	4.302	3.38	1.28	1.28	7.91	7.91	12.5	3.29	1.36	1.36	1.71	0.874	2.46	2.46
50 X 50	4	6.5	3	3.892	3.06	1.37	1.37	9.06	9.06	14.4	3.76	1.53	1.53	1.92	0.983	2.49	2.49
50 X 50	5	6.5	3	4.802	3.77	1.41	1.41	11.1	11.1	17.5	4.58	1.52	1.52	1.91	0.976	3.08	3.08
50 X 50	6	6.5	4.5	5.644	4.43	1.44	1.44	12.6	12.6	20.0	5.23	1.50	1.50	1.88	0.963	3.55	3.55
60 X 60	4	6.5	3	4.692	3.68	1.61	1.61	16.0	16.0	25.4	6.62	1.85	1.85	2.33	1.19	3.66	3.66
60 X 60	5	6.5	3	5.802	4.55	1.66	1.66	19.6	19.6	31.2	8.09	1.84	1.84	2.32	1.18	4.52	4.52
65 X 65	5	8.5	3	6.367	5.00	1.77	1.77	25.3	25.3	40.1	10.5	1.99	1.99	2.51	1.28	5.35	5.35
65 X 65	6	8.5	4	7.527	5.91	1.81	1.81	29.4	29.4	46.6	12.2	1.98	1.98	2.49	1.27	6.26	6.26
65 X 65	8	8.5	6	9.761	7.86	1.88	1.88	36.8	36.8	58.3	15.3	1.94	1.94	2.44	1.25	7.96	7.96
70 X 70	6	8.5	4	8.127	6.38	1.93	1.93	37.1	37.1	58.9	15.3	2.14	2.14	2.69	1.37	7.33	7.33
75 X 75	6	8.5	4	8.727	6.85	2.06	2.06	46.1	46.1	73.2	19.0	2.30	2.30	2.90	1.48	8.47	8.47
75 X 75	9	8.5	6	12.69	9.96	2.17	2.17	64.4	64.4	102	26.7	2.25	2.25	2.84	1.45	12.1	12.1
75 X 75	12	8.5	6	16.56	13.0	2.29	2.29	81.9	81.9	129	34.5	2.22	2.22	2.79	1.44	15.7	15.7
80 X 80	6	8.5	4	9.327	7.32	2.18	2.18	56.4	56.4	89.6	23.2	2.46	2.46	3.10	1.58	9.70	9.70
90 X 90	6	10	5	10.55	8.28	2.42	2.42	80.7	80.7	128	33.4	2.77	2.77	3.48	1.78	12.3	12.3
90 X 90	7	10	5	12.22	9.59	2.46	2.46	93.0	93.0	148	38.3	2.76	2.76	3.48	1.77	14.2	14.2
90 X 90	10	10	7	17.00	13.3	2.57	2.57	125	125	199	51.7	2.71	2.71	3.42	1.74	19.5	19.5
90 X 90	13	10	7	21.71	17.0	2.69	2.69	156	156	248	65.3	2.68	2.68	3.38	1.73	24.8	24.8
100 X 100	7	10	5	13.62	10.7	2.71	2.71	129	129	205	53.2	3.08	3.08	3.88	1.98	17.7	17.7
100 X 100	10	10	7	19.00	14.9	2.82	2.82	175	175	278	72.0	3.04	3.04	3.83	1.95	24.4	24.4
100 X 100	13	10	7	24.31	19.1	2.94	2.94	220	220	348	91.1	3.00	3.00	3.78	1.94	31.1	31.1
120 X 120	8	12	5	18.76	14.7	3.24	3.24	258	258	410	106	3.71	3.71	4.67	2.38	29.5	29.5
130 X 130	9	12	6	22.74	17.9	3.53	3.53	366	366	583	150	4.01	4.01	5.06	2.57	38.7	38.7
130 X 130	12	12	8.5	29.76	23.4	3.64	3.64	467	467	743	192	3.96	3.96	5.00	2.54	49.9	49.9
130 X 130	15	12	8.5	36.75	28.8	3.76	3.76	568	568	902	234	3.93	3.93	4.95	2.53	21.5	21.5
150 X 150	12	14	7	34.77	27.3	4.14	4.14	740	740	1180	304	4.61	4.61	5.82	2.96	68.1	68.1
150 X 150	15	14	10	42.74	33.6	4.24	4.24	888	888	1410	365	4.56	4.56	5.75	2.92	82.6	82.6
150 X 150	19	14	10	53.38	41.9	4.40	4.40	1090	1090	1730	451	4.52	4.52	5.69	2.91	103	103
175 X 175	12	15	11	40.52	31.8	4.73	4.73	1170	1170	1860	480	5.38	5.38	6.78	3.44	91.8	91.8
175 X 175	15	15	11	50.21	39.4	4.85	4.85	1440	1440	2290	589	5.35	5.35	6.75	3.42	114	114
200 X 200	15	17	12	57.75	45.3	5.46	5.46	2180	2180	3470	891	6.14	6.14	7.75	3.93	150	150
200 X 200	20	17	12	76.00	59.7	5.67	5.67	2820	2820	4490	1160	6.09	6.09	7.68	3.90	197	197
200 X 200	25	17	12	93.75	73.6	5.86	5.86	3420	3420	5420	1410	6.04	6.04	7.61	3.88	242	242
250 X 250	25	24	12	119.4	93.7	7.10	7.10	6950	6950	11000	2860	7.63	7.63	9.62	4.90	388	388
250 X 250	35	24	18	162.6	128	7.45	7.45	9110	9110	14400	3790	7.49	7.49	9.42	4.83	519	519

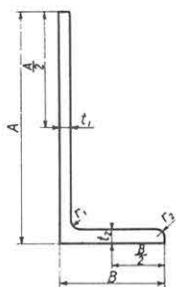


Geometrical moment of inertia $I = a^2$
 Radius of gyration of area $i = \sqrt{I/a}$
 Modulus of section $Z = I/e$
 (a : sectional area)

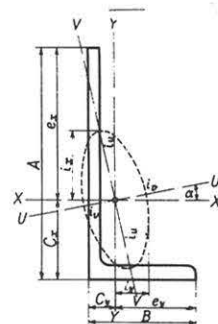


UNEQUAL ANGLE JIs G 3192

Standard sectional dimension mm				Sectional Area cm ³	Unit Weight kg/m	Reference													
A x B	t	r ₁	r ₂			Position of Center of Gravity cm		Geometrical moment of inertia cm ⁴				Radius of Gyration of Area cm				tan α	Modulus of Section cm ³		
						Cx	Cy	Ix	Iy	Max Iu	Max Iv	ix	iy	Max Iu	Min Iv		Zx	Zy	
90 x 75	9	8.5	6	14.04	11.0	2.75	2.00	109	68.1	143	34.1	2.78	2.20	3.19	1.56	0.676	17.4	12.4	
100 x 75	7	10	5	11.87	9.32	3.06	1.83	118	56.9	144	30.8	3.15	2.19	3.49	1.61	0.548	17.0	10.0	
100 x 75	10	10	7	16.50	13.0	3.17	1.94	159	76.1	194	41.3	3.11	2.15	3.43	1.58	0.543	23.3	13.7	
125 x 75	7	10	5	13.62	10.7	4.10	1.64	219	60.4	243	36.4	4.01	2.11	4.23	1.64	0.362	26.1	10.3	
125 x 75	10	10	7	19.00	14.9	4.22	1.75	299	80.8	330	49.0	3.96	2.06	4.17	1.61	0.357	36.1	14.1	
125 x 75	13	10	7	24.31	19.1	4.35	1.87	376	101	415	61.9	3.93	2.04	4.13	1.60	0.352	46.1	17.9	
125 x 90	10	10	7	20.50	16.1	3.95	2.22	318	138	380	76.2	3.94	2.59	4.30	1.93	0.505	37.2	20.3	
125 x 90	13	10	7	26.26	20.6	4.07	2.34	401	173	477	96.3	3.91	2.57	4.26	1.91	0.501	47.5	25.9	
150 x 90	9	12	6	20.94	16.4	4.95	1.99	485	133	537	80.4	4.81	2.52	5.06	1.96	0.361	48.2	19.0	
150 x 90	12	12	8.5	27.36	21.5	5.07	2.10	619	167	685	102	4.76	2.47	5.00	1.93	0.357	62.3	24.3	
150 x100	9	12	6	21.84	17.1	4.76	2.30	502	181	579	104	4.79	2.88	5.15	2.18	0.439	49.1	23.5	
150 x100	12	12	8.5	28.56	22.4	4.88	2.41	612	223	738	132	4.74	2.83	5.09	2.15	0.435	63.4	30.1	
150 x100	15	12	8.5	35.25	27.7	5.00	2.53	782	276	897	161	4.71	2.80	5.04	2.14	0.431	78.2	37.0	

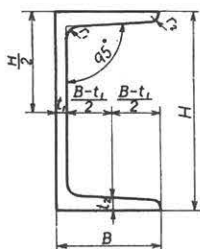


Geometrical moment of inertia $I = a^2$
 Radius of gyration of area $i = \sqrt{I/a}$
 Modulus of section $Z = I/e$
 (a : sectional area)

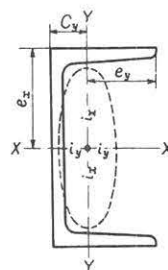


UNEQUAL ANGLE AND UNEQUAL THICKNESS JIS G 3192

Standard sectional dimension mm					Sectional Area cm ²	Unit Weight kg/m	Reference													
A x B	t ₁	t ₂	r ₁	r ₂			Position of Center of Gravity cm		Geometrical moment of inertia cm ⁴				Radius of Gyration of Area cm				tan α	Modulus of Section cm ³		
							Cx	Cv	Ix	Iv	Max Iu	Max Iv	ix	iv	Max Iu	Min iv		Zx	Zy	
200 x 90	9	14	14	7	29.66	23.3	6.36	2.15	1210	200	1290	125	6.39	2.60	6.58	2.05	0.263	88.7	29.2	
250 x 90	10	15	17	8.5	37.47	29.4	8.61	1.92	2440	223	2520	147	8.08	2.44	8.20	1.98	0.182	149	31.5	
250 x 90	12	16	17	8.5	42.95	33.7	8.99	1.89	2790	238	2870	160	8.07	2.35	8.18	1.93	0.173	174	33.5	
300 x 90	11	16	19	9.5	46.22	36.3	11.0	1.76	4370	245	4440	168	9.72	2.30	9.80	1.90	0.136	229	33.8	
300 x 90	13	17	19	9.5	52.67	41.3	11.3	1.75	4940	259	5020	181	9.63	2.22	9.76	1.85	0.128	265	35.8	
350 x 100	12	17	22	11	57.74	45.3	13.0	1.87	7440	362	7550	251	11.3	2.50	11.4	2.08	0.124	338	44.5	
400 x 100	13	18	24	12	68.59	53.8	15.4	1.77	11500	388	11600	277	12.9	2.38	13.0	2.01	0.0996	467	47.1	

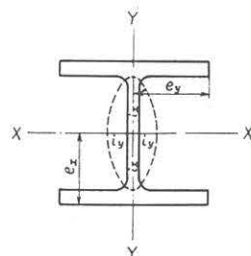
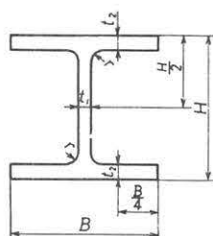


Geometrical moment of inertia $I = a r^2$
 Radius of gyration or area $i = \sqrt{I/a}$
 Modulus of section $Z = I/e$
 (a : sectional area)



CHANNEL JIS G 3192

Standard sectional dimension mm					Sectional Area cm ²	Unit Weight kg/m	Reference							
H x B	t ₁	t ₂	r ₁	r ₂			Position of Center of Gravity cm		Geometrical moment of inertia cm ⁴		Radius of Gyration of Area cm		Modulus of Section cm ³	
							Cx	Cy	I _x	I _y	I _y	I _x	Z _x	Z _y
75 x 40	5	7	8	4	8.818	6.92	0	1.28	75.3	12.2	2.92	1.17	20.1	4.47
100 x 50	5	7.5	8	4	11.92	9.36	0	1.54	188	26.0	3.97	1.48	37.6	7.52
125 x 65	6	8	8	4	17.11	13.4	0	1.90	424	61.8	4.98	1.90	67.8	13.4
150 x 75	6.5	10	10	5	23.71	18.6	0	2.28	861	117	6.03	2.22	115	22.4
150 x 75	9	12.5	15	7.5	30.59	24.0	0	2.31	1050	147	5.86	2.19	140	28.3
180 x 75	7	10.5	11	5.5	27.20	21.4	0	2.13	1380	131	7.12	2.19	153	24.3
200 x 80	7.5	11	12	6	31.33	24.6	0	2.21	1950	168	7.88	2.32	195	29.1
200 x 90	8	13.5	14	7	38.65	30.3	0	2.74	2490	277	8.02	2.68	249	44.2
250 x 90	9	13	14	7	44.07	34.6	0	2.40	4180	294	9.74	2.58	334	44.5
250 x 90	11	14.5	17	8.5	51.17	40.2	0	2.40	4680	329	9.56	2.54	374	49.9
300 x 90	9	13	14	7	48.57	38.1	0	2.22	6440	309	11.5	2.52	429	45.7
300 x 90	10	15.5	19	9.5	55.74	43.8	0	2.34	7410	360	11.5	2.54	494	54.1
300 x 90	12	16	19	9.5	61.90	48.6	0	2.28	7870	379	11.3	2.48	525	56.4
380 x100	10.5	16	18	9	69.39	54.5	0	2.41	14500	535	14.5	2.78	763	70.5
380 x100	13	16.5	18	9	78.96	62.0	0	2.33	15600	565	14.1	2.67	823	73.6
380 x100	13	20	24	12	85.71	67.3	0	2.54	17600	655	14.3	2.76	926	87.8



Geometrical moment of inertia $I = a^2$

Radius of gyration or area $i = \sqrt{I/a}$

Modulus of section $Z = I/e$

(a : sectional area)

H-BEAM JIS G 3192

Standard sectional dimension mm					Sectional Area cm ²	Unit Weight kg/m	Reference					
Nominal Dimension (Height x flage)	H x B	t ₁	t ₂	r			Geometrical moment of inertia cm ⁴		Radius of Gyration of Area cm		Modulus of Section cm ³	
							I _x	I _y	i _x	i _y	Z _x	Z _y
100 x 50	100 x 50	5	7	8	11.85	9.30	187	14.8	3.98	1.12	37.5	5.91
100 x 100	100 x100	6	8	10	21.90	17.2	383	134	4.18	2.47	76.5	26.7
125 x 60	125 x 60	6	8	9	16.84	13.2	413	29.2	4.95	1.32	66.1	9.73
125 x 125	125 x125	6.5	9	10	30.31	23.8	847	293	5.29	3.11	136	47.0
150 x 75	150 x 75	5	7	8	17.85	14.0	666	49.5	6.11	1.66	88.8	13.2
150 X 100	148 X100	6	9	11	26.84	21.1	1020	151	6.17	2.37	138	30.1
150 X 150	150 X150	7	10	11	40.14	31.5	1640	563	6.39	3.75	219	75.1
175 X 90	175 X 90	5	8	9	23.04	18.1	1210	97.5	7.26	2.06	139	21.7
175 X 175	175 X175	7.5	11	12	51.21	40.2	2880	984	7.50	4.38	330	112
200 X 100	198 X 99	4.5	7	11	23.18	18.2	1580	114	8.26	2.21	184	23.0
	200 X100	5.5	8	11	27.16	21.3	1840	134	8.24	2.22	184	26.8
200 X 150	194 X150	6	9	13	39.01	30.6	2690	507	8.30	3.61	277	67.6
200 X 200	200 X200	8	12	13	63.53	49.9	4720	1600	8.62	5.02	472	160
	200 X204	12	12	13	71.53	56.2	4980	1700	8.35	4.88	498	167
250 X 125	248 X124	5	8	12	32.68	25.7	3540	255	10.4	2.79	285	41.1
	250 X125	6	9	12	37.66	29.6	4050	294	10.4	2.79	324	47.0
250 X 175	244 X175	7	11	16	56.24	44.1	6120	984	10.4	4.18	502	113
250 X 250	250 X250	9	14	16	92.18	72.4	10800	3650	10.8	6.29	867	292
	250 X255	14	14	16	104.7	82.2	11500	3880	10.5	6.09	919	304
300 X 150	298 X149	5.5	8	13	40.80	32.0	6320	442	12.4	3.29	424	59.3
	300 X150	6.5	9	13	46.78	36.7	7210	508	12.4	3.29	481	67.7
300 X 200	294 X200	8	12	18	72.38	56.8	11300	1600	12.5	4.71	771	160
300 X 300	294 X302	12	12	18	107.7	84.5	16900	5520	12.5	7.16	1150	365
	300 X300	10	15	18	119.8	94.0	20400	6750	13.1	7.51	1360	450
	300 X305	15	15	18	134.8	106	21500	7100	12.6	7.26	1440	466
350 X 175	346 X174	6	9	14	52.68	41.4	11100	792	14.5	3.88	641	91.0
	350 X175	7	11	14	63.14	49.6	13600	948	14.7	3.95	775	112
350 X 250	340 X250	9	14	20	101.5	79.7	21700	3650	14.6	6.00	1280	292