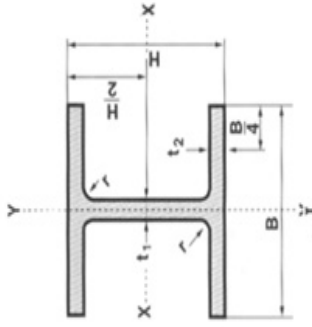


Steel Table

ตารางเหล็ก / เหล็กรูปพรรณ



ตารางที่ ก. 1

Wide Flange Shape

ASTM Standards, ASTM A6 : 1997



Moment of Inertia
Radius of Gyration
Modulus of Section

$$I = Ar^2$$

$$r = \sqrt{\frac{I}{A}}$$

$$Z = \frac{I}{C}$$

$$A = \text{Sectional Area}$$

Nominal Size	Weight kg/m	Sectional Dimension						Sectional Area (cm ²)	Moment of Inertia		Radius of Gyration		Modulus of Section	
		H mm	B mm	t1 mm	t2 mm	รูปร่าง r mm	Ix (cm ⁴)		Iy (cm ⁴)	rx cm	ry cm	Zx (cm ³)	Zy (cm ³)	
900 x 300	286	912	302	18	34	28	364	498,000	15,700	37	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	
800 x 300	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	6.62	7,290	782	
	191	792	300	14	22	28	243.4	254,000	9,930	32.3	6.39	6,410	662	
700 x 300	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	
600 x 300	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	1,745	103,000	7,670	24.3	6.63	3,530	511	
600 x 200	134	612	202	13	23	22	107.7	103,300	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	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	

ASTM Standards, ASTM A6 : 1997

Wide Flange Shape

ตารางที่ ก. 1 (ต่อ)

Nominal Size	Weight kg/m	Sectional Dimension						Sectional Area (cm ²)	Moment of Inertia		Radius of Gyration		Modulus of Section	
		H mm	B mm	t1 mm	t2 mm	r mm	Ix (cm ⁴)		Iy (cm ⁴)	rx cm	ry cm	Zx (cm ³)	Zy (cm ³)	
500 x 300	128	488	300	11	18	26	163.5	71,000	8,110	20.8	7.04	2,190	541	
	114	482	300	11	15	26	145.5	60,400	6,760	20.4	6.82	2,500	451	
500 x 200	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	
450 x 300	79.5	496	199	9	14	20	101.3	41,900	1,840	20.3	4.27	1,690	185	
	124	440	300	11	18	24	157.4	56,100	8,110	18.9	7.18	2,550	541	
450 x 200	106	434	299	10	15	24	135	46,800	6,690	18.6	7.04	2,160	448	
	76	450	200	9	14	18	96.76	33,500	1,870	18.6	4.4	1,490	187	
400 x 400	66.2	446	199	8	12	18	84.3	28,700	1,580	18.5	4.33	1,290	159	
	605	498	432	45	70	22	770.1	298,000	94,400	19.7	11.1	12,000	4,370	
400 x 300	415	458	417	30	50	22	528.6	187,000	60,500	18.8	10.7	8,170	2,900	
	283	428	407	20	35	22	360.7	119,000	39,400	18.2	10.4	5,570	1,930	
400 x 200	232	414	405	18	28	22	295.4	92,800	31,000	17.7	10.2	4,480	1,530	
	200	406	403	16	24	22	254.9	78,000	26,200	17.5	10.1	3,840	1,300	
400 x 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	10.1	3,330	1,120	
400 x 200	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	10.1	2,850	951	
400 x 300	140	388	402	15	15	22	178.5	49,000	16,300	16.6	9.54	2,520	809	
	107	390	300	10	16	22	136	38,700	7,210	16.9	7.28	1,980	481	
400 x 200	94.3	386	299	9	14	22	120.1	33,700	6,240	16.7	7.21	1,740	418	
	66	400	200	8	13	16	84.12	23,700	1,740	16.8	4.54	1,190	174	
400 x 200	56.6	396	199	7	11	16	72.16	20,000	1,450	16.7	4.48	1,010	145	

		Wide Flange Shape										ASTM Standards, ASTM A6 : 1997					
Nominal Size		Weight		Sectional Dimension						Sectional		Moment of Inertia		Radius of Gyration		Modulus of Section	
mm		H	B	t1	t2	flange r	Area	Ix	Iy	rx	ry	Zx	Zy				
mm		mm	mm	mm	mm	mm	(cm ²)	(cm ⁴)	(cm ⁴)	cm	cm	(cm ³)	(cm ³)				
350 x 350	159	356	352	14	22	20	202	47,600	16,000	15.3	8.9	2,670	909				
	156	350	357	19	19	20	198.4	42,800	14,400	14.7	8.53	2,450	809				
	137	350	350	12	19	20	173.9	40,300	13,600	15.2	8.84	2,300	776				
350 x 250	131	344	354	16	16	20	166.6	35,300	11,800	14.6	8.43	2,050	669				
	115	344	348	10	16	20	146	33,300	11,200	15.1	8.78	1,940	646				
	106	338	351	13	13	20	135.3	28,200	9,380	14.4	8.33	1,670	534				
350 x 175	79.7	340	250	9	14	20	101.5	21,700	3,650	14.6	6	1,280	292				
	69.2	336	249	8	12	20	88.15	18,500	3,090	14.5	5.92	1,100	248				
	49.6	350	175	7	11	14	63.14	13,600	984	14.7	3.95	775	112				
300 x 300	106	304	301	11	17	18	134.8	23,400	7,730	13.2	7.57	1,540	514				
	106	300	305	15	15	18	134.8	21,500	7,100	12.6	7.26	1,440	466				
	94	300	300	10	15	18	119.8	20,400	6,750	13.1	7.51	1,360	450				
300 x 200	87	298	299	9	14	18	110.8	18,800	6,240	13	7.51	1,270	417				
	84.5	294	302	12	12	18	107.7	16,900	5,520	12.5	7.16	1,150	365				
	65.4	298	201	9	14	18	83.36	13,300	1,900	12.6	4.77	893	189				
300 x 150	56.8	294	200	8	12	18	72.38	11,300	1,600	12.5	4.71	771	160				
	36.7	300	150	6.5	9	13	46.78	7,120	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				
250 x 175	64.4	244	252	11	11	16	82.06	8,790	2,940	10.3	5.98	720	233				
	44.1	244	175	7	11	16	56.24	6,120	984	10.4	4.18	502	113				

ตารางที่ ก. 1 (ต่อ)

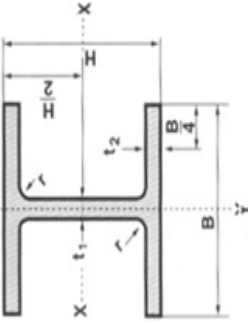
ตารางที่ ก. 1 (ต่อ) **Wide Flange Shape** **ASTM Standards, ASTM A6 : 1997**

Nominal Size	Weight kg/m	Sectional Dimension						Sectional Area (cm ²)	Moment of Inertia		Radius of Gyration		Modulus of Section	
		H mm	B mm	t1 mm	t2 mm	t mm	r mm		Ix (cm ⁴)	Iy (cm ⁴)	rx cm	ry cm	Zx (cm ³)	Zy (cm ³)
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	
200 x 150	49.9	200	200	8	12	13	63.53	4,720	1,600	8.62	5.02	472	160	
	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	
175 x 125	23.3	169	125	5.5	8	12	29.65	1,530	261	7.18	2.97	181	41.8	
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	

ตารางที่ ก. 2

H-Sections

(TIS 1227 : 1996 / JIS G3192 : 1990)



(Grade SM400, SM490, SM520, SS400, SS490 or SS540)

Moment of Inertia $I = Ar^2$

Radius of Gyration $r = \sqrt{\frac{I}{A}}$

Modulus of Section $Z = \frac{I}{C}$

$A =$ Sectional Area

Nominal Size	Weight kg/m	Sectional Dimension					Sectional Area (cm ²)	Moment of Inertia (cm ⁴)		Radius of Gyration (cm)		Modulus of Section (cm ³)	
		H mm	B mm	t1 mm	t2 mm	รูปร่าง r mm		Ix (cm ⁴)	Iy (cm ⁴)	rx (cm)	ry (cm)	Zx (cm ³)	Zy (cm ³)
100 x 50	9.3	100	50	5	7	8	11.85	187	14.8	3.98	1.12	37.5	5.91
100 x 100	17.2	100	100	6	8	10	21.9	383	134	4.2	2.47	77	27
125 x 60	13.2	125	60	6	8	9	16.84	413	29.2	4.95	1.32	66.1	9.73
125 x 125	23.8	125	125	6.5	9	10	30.31	847	293	5.3	3.11	136	47
150 x 100	21.1	148	100	6	9	11	26.84	1,020	151	6.2	2.37	138	30
150 x 75	14	150	75	5	7	8	17.85	666	49.5	6.11	1.66	88.8	13.2
150 x 150	31.5	150	150	7	10	11	40.14	1,640	563	6.4	3.75	219	75
175 x 90	18.1	175	90	5	8	9	23.04	1210	97.5	7.26	2.06	139	21.7
175 x 175	40.2	175	175	7.5	11	12	51.21	2,880	984	7.5	4.38	330	112
200 x 100	*18.2	198	99	4.5	7	11	23.18	1,580	114	8.3	2.21	160	23
200 x 150	21.3	200	100	5.5	8	11	27.16	1,840	134	8.2	2.22	184	27
200 x 200	30.6	194	150	6	9	13	39.01	2,690	507	8.3	3.61	277	68
250 x 125	29.6	250	125	6	9	12	37.66	4,050	294	10.4	2.79	324	47

ตารางที่ ก. 2 (ต่อ)

H-Sections

(TIS 1227 : 1996 / JIS G3192 : 1990)

Nominal Size	Weight kg/m	Sectional Dimension						Sectional Area (cm ²)	Moment of Inertia		Radius of Gyration			Modulus of Section	
		H mm	B mm	t1 mm	t2 mm	r mm	Ix (cm ⁴)		Iy (cm ⁴)	rx cm	ry cm	Zx (cm ³)	Zy (cm ³)		
250 x 175	44.1	244	175	7	11	16	6.24	6,120	984	10.4	4.18	502	113		
	*64.4	244	252	11	11	16	82.06	8,790	2,940	10.3	5.98	720	233		
250 x 250	*66.5	248	249	8	13	16	84.07	9,930	3,350	10.8	6.29	801	269		
	72.4	250	250	9	14	16	92.18	10,800	3,650	10.8	6.29	867	292		
300 x 150	*82.2	250	255	14	14	16	104.7	11,500	3,880	10.5	6.09	919	304		
	*32.0	298	149	5.5	8	13	40.8	6,320	442	12.4	3.29	424	59		
300 x 200	36.7	300	150	6.5	9	13	46.78	7,210	508	12.4	3.29	481	68		
	56.8	294	200	8	12	18	72.38	11,300	1,600	12.5	4.71	771	160		
300 x 300	*65.4	298	201	9	14	18	83.36	13,300	1,900	12.6	4.77	893	189		
	*84.5	294	302	12	12	18	107.7	16,900	5,520	12.5	7.16	1,150	365		
350 x 175	*87.0	298	299	9	14	18	110.8	18,800	6,240	13	7.51	1,270	417		
	94	300	300	10	15	18	119.8	20,400	6,750	13.1	7.51	1,360	450		
350 x 250	*106.0	300	305	15	15	18	134.8	21,500	7,100	12.6	7.26	1,440	466		
	*106.0	304	301	11	17	18	134.8	23,400	7,730	13.2	7.57	1,540	514		
350 x 350	*41.4	346	174	6	9	14	52.68	11,100	792	14.5	3.88	641	91		
	49.6	350	175	7	11	14	53.14	13,600	984	14.7	3.95	775	112		
350 x 350	*57.8	354	176	8	13	14	73.68	16,100	1,180	14.8	4.01	909	134		
	*69.2	336	249	8	12	20	88.15	18,500	3,090	14.5	5.92	1,100	248		
350 x 350	79.7	340	250	9	14	20	101.5	21,700	3,650	14.6	6	1,280	292		
	*106.0	338	351	13	20	135.3	28,200	9,380	14.4	8.33	1,670	534			
350 x 350	*115.0	344	348	16	20	146	33,300	11,200	15.1	8.78	1,940	646			
	*131.0	344	354	16	20	166.6	35,300	11,800	14.6	8.43	2,050	669			
350 x 350	137	350	350	19	20	173.9	40,300	13,600	15.2	8.84	2,300	776			
	*156.0	350	357	19	20	198.4	42,800	14,400	14.7	8.53	2,450	809			

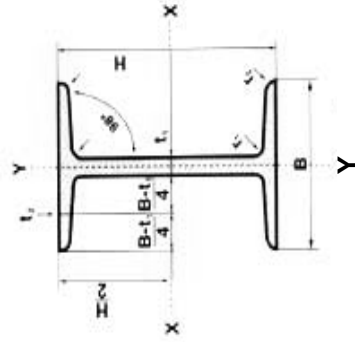
Nominal Size		Weight kg/m	Sectional Dimension						H-Sections			(TIS 1227 : 1996 / JIS G3192 : 1990)		
			H	B	t1	t2	รูปร่าง	Area (cm ²)	Ix (cm ⁴)	Iy (cm ⁴)	Radius of Gyration rx cm	ry cm	Zx (cm ³)	Zy (cm ³)
400 x 200	mm	*56.6	396	199	7	11	16	72.16	20,000	1,450	16.7	4.48	1,010	145
		66	400	200	8	13	16	84.12	23,700	1,740	16.8	4.54	1,190	174
		*75.5	404	201	9	15	16	96.16	27,500	2,030	16.9	4.6	1,360	202
400 x 300	mm	*94.3	386	299	9	14	22	120.1	33,700	6,240	16.7	7.21	1,740	418
		107	390	300	10	16	22	136	38,700	7,210	16.9	7.28	1,980	481
		*140.0	388	402	15	15	22	178.5	49,000	16,300	16.6	9.54	2,520	809
400 x 400	mm	*147.0	394	398	11	18	22	186.8	56,100	18,900	17.3	10.1	2,850	951
		*168.0	394	405	18	18	22	214.4	59,700	20,000	16.7	9.65	3,030	985
		172	400	400	13	21	22	218.7	66,600	22,400	17.5	10.1	3,330	1,120
450 x 200	mm	*197.0	400	408	21	21	22	250.7	70,900	23,800	16.8	9.75	3,540	1,170
		*232.0	414	405	18	28	22	295.4	92,800	31,000	17.7	10.2	4,480	1,530
		*66.2	446	199	8	12	18	84.3	28,700	1,580	18.5	4.33	1,290	159
450 x 300	mm	76	450	200	9	14	18	96.76	33,500	1,870	18.6	4.4	1,490	187
		*88.9	456	201	10	17	18	113.3	40,400	2,310	18.9	4.51	1,770	230
		*106.0	434	299	10	15	24	135	46,800	6,690	18.6	7.04	2,160	448
500 x 200	mm	124	440	300	11	18	24	157.4	56,100	8,110	18.9	7.18	2,550	541
		*145.0	446	302	13	21	24	184.3	66,400	9,660	19	7.24	2,980	639
		*79.5	496	199	9	14	20	101.3	41,900	1,840	20.3	4.27	1,690	185
500 x 300	mm	89.6	500	200	10	16	20	114.2	47,800	2,140	20.5	4.33	1,910	214
		*103.0	506	201	11	19	20	131.3	56,500	2,580	20.7	4.33	2,230	257
		*114.0	482	300	11	15	26	145.5	60,400	6,760	20.4	6.82	2,500	451
500 x 300	mm	128	488	300	11	18	26	163.5	71,000	8,110	20.8	7.04	2,910	541
		*150.0	494	302	13	21	26	191.4	83,800	9,660	20.9	7.1	3,390	640

ตารางที่ ก. 2 (ต่อ) **H-Sections** **(TIS 1227 : 1996 / JIS G3192 : 1990)**

Nominal Size	Weight kg/m	Sectional Dimension					Sectional Area (cm ²)	Moment of Inertia		Radius of Gyration		Modulus of Section	
		H mm	B mm	t1 mm	t2 mm	ร mm		Ix (cm ⁴)	Iy (cm ⁴)	rx cm	ry cm	Zx (cm ³)	Zy (cm ³)
600 x 200	*94.6	596	199	10	15	22	120.5	68,700	1,980	23.9	4.05	2,310	199
	106	600	200	11	17	22	134.4	77,600	2,280	24	4.12	2,590	228
	*120.0	606	201	12	20	22	152.5	90,400	2,720	24.3	4.22	2,980	271
600 x 300	*134.0	612	202	13	23	22	170.7	103,000	3,180	24.6	4.31	3,380	314
	*137.0	582	300	12	17	28	174.5	103,000	7,670	24.3	6.63	3,530	511
	151	588	300	12	20	28	192.5	118,000	9,020	24.8	6.85	4,020	601
700 x 300	*175.0	594	302	12	23	28	222.4	137,000	10,600	24.9	6.9	4,620	701
	*166.0	692	300	13	20	28	211.5	172,000	9,020	28.6	6.53	4,980	602
	185	700	300	13	24	28	235.5	201,000	10,800	29.3	6.78	5,760	722
800 x 300	*191.0	792	300	14	22	28	243.4	254,000	9,930	32.3	6.39	6,410	662
	210	800	300	14	26	28	267.4	292,000	11,700	33	6.62	7,290	782
900 x 300	243	900	300	16	28	28	309.8	411,000	12,600	36.4	6.39	9,140	843

ตารางที่ ก. 3

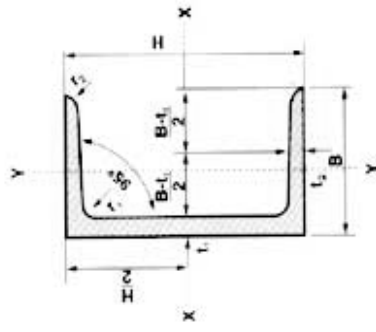
I-Sections (TIS 1227 : 1996 / JIS G3192 : 1990)



(Grade SM400, SM490, SM520, SS400, SS490 or SS540)

Moment of Inertia $I = Ar^2$
 Radius of Gyration $r = \sqrt{\frac{I}{A}}$
 Modulus of Section $Z = \frac{I}{C}$
 Sectional Area $A =$

Sectional Dimension		Sectional		Weight	Moment of Inertia		Radius of Gyration		Modulus of Section			
		Area	kg/m		Ix (cm ⁴)	Iy (cm ⁴)	rx cm	ry cm	Zx (cm ³)	Zy (cm ³)		
H x B	t1	t2	r1	r2	Area (cm ²)	kg/m	Ix (cm ⁴)	Iy (cm ⁴)	rx cm	ry cm	Zx (cm ³)	Zy (cm ³)
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
100 x 75	5	8	7	3.5	16.43	12.9	281	47.3	4.14	1.7	56.2	12.6
125 x 75	5.5	9.5	9	4.5	20.45	16.1	538	57.5	5.13	1.68	86	15.3
150 x 75	5.5	9.5	9	4.5	21.83	17.1	819	57.5	6.12	1.62	109	15.3
150 x 125	8.5	14	13	6.5	46.15	36.2	1760	385	6.18	2.89	235	61.6
180 x 100	6	10	10	5	30.06	23.6	1670	138	7.45	2.14	186	27.5
200 x 100	7	10	10	5	33.06	26	2,170	138	8.11	2.05	217	27.7
200 x 150	9	16	15	7.5	64.16	50.4	4,460	753	8.34	3.43	446	100
250 x 125	7.5	12.5	12	6	48.79	38.3	5,180	337	10.3	2.63	414	53.9
	10	19	21	10.5	70.73	55.5	7,310	538	10.2	2.76	585	86
300 x 150	8	13	12	6	61.58	48.3	9,480	588	12.4	3.09	632	78.4
	10	18.5	19	9.5	83.47	65.5	12,700	886	12.3	3.26	849	118
	11.5	22	23	11.5	97.88	76.8	14,700	1,080	12.2	3.32	978	143
350 x 150	9	15	13	6.5	74.58	58.5	15,200	702	14.3	3.07	870	93.5
	12	24	25	12.5	111.1	87.2	22,400	1,180	14.2	3.26	1,280	158
400 x 150	10	18	17	8.5	91.73	72	24,100	864	16.2	3.07	1,200	115
	12.5	25	27	13.5	122.1	95.8	31,700	1,240	16.1	3.18	1,580	165
450 x 175	11	20	19	9.5	116.8	91.7	39,200	1,510	18.3	3.6	1,740	173
	13	26	27	13.5	146.1	115	48,800	2,020	18.3	3.72	2,170	231
	13	25	25	12.5	169.4	133	98,400	2,460	24.10	3.81	3,280	259
600 x 190	16	35	38	19	224.5	176	130,000	3,540	24.1	3.97	4,330	373



ตารางที่ ก. 4

Channels

(TIS 1227 : 1996 / JIS G3192 : 1990)

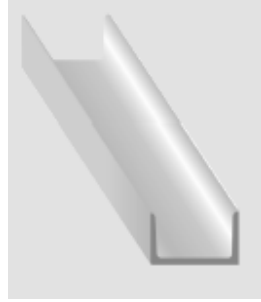
(Grade SM400, SM490, SM520, SS400, SS490 or SS540)

Moment of Inertia $I = Ar^2$

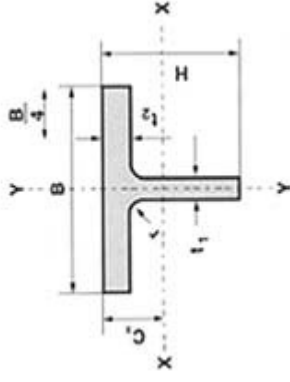
Radius of Gyration $r = \sqrt{\frac{I}{A}}$

Modulus of Section $Z = \frac{I}{C}$

$A =$ Sectional Area



H x B	Dimensions (mm)				Sectional Area (cm ²)	Weight (kg/m)	Moment of Inertia (cm ⁴)		Radius of Gyration (cm)		Modulus of Section (cm ³)	
	t1	t2	r1	r2			Ix	Iy	rx	ry	Zx	Zy
	50 x 25	5	6	6			3	4.92	3.86	16.8	2.49	1.85
75 x 40	5	7	8	4	8.818	6.92	75.3	12.2	2.92	1.17	20.1	4.47
100 x 50	5	7.5	8	4	11.92	9.36	188	26	3.97	1.48	37.6	7.52
125 x 65	6	8	8	4	17.11	13.4	424	61.8	4.98	1.9	67.8	13.4
150 x 75	6.5	10	10	5	23.71	18.6	861	117	6.03	2.22	115	22.4
150 x 75	9	12.5	15	7.5	30.59	24	1050	147	5.86	2.19	140	28.3
180 x 75	7	10.5	11	5.5	27.2	21.4	1380	131	7.12	2.19	153	24.3
200 x 80	7.5	11	12	6	31.33	24.6	1,950	168	7.88	2.32	195	29.1
200 x 90	8	13.5	14	7	38.65	30.3	2,490	277	8.02	2.68	249	44.2
250 x 90	9	13	14	7	44.07	34.6	4,180	294	9.74	2.58	334	44.5
	11	14.5	17	8.5	51.17	40.2	4,680	329	9.56	2.54	374	49.9
	9	13	14	7	48.57	38.1	6,440	309	11.5	2.52	429	45.7
300 x 90	10	15.5	19	9.5	55.74	43.8	7,410	360	11.5	2.54	494	54.1
	12	16	19	9.5	61.9	48.6	7,870	379	11.3	2.48	525	56.4
380 x 100	10.5	16	18	9	69.39	54.5	14,500	535	14.5	2.78	763	70.5
	13	20	24	12	85.71	67.3	17,600	655	14.3	2.76	926	87.8



รูปที่ ๑.๕

T-Section (Cut from H-Section)

(TIS 1227 : 1996 / JIS G3192 : 1990)

(Grade SM400, SM490, SM520, SS400, SS490 or SS540)

$I = Ar^2$ Moment of Inertia
 $r = \sqrt{\frac{I}{A}}$ Radius of Gyration
 $Z = \frac{I}{C}$ Modulus of Section
 A Sectional Area



Nominal Size	Weight kg/m	Sectional Dimension						Sectional Area (cm ²)	Moment of Inertia		Radius of Gyration		Modulus of Section		Center of Gravity Cx (cm)
		H mm	B mm	t1 mm	t2 mm	3r/8 mm	r mm		Ix (cm ⁴)	Iy (cm ⁴)	rx cm	ry cm	Zx (cm ³)	Zy (cm ³)	
50 x 100	8.6	50	100	6	8	10	10.95	16.1	66.9	1.21	2.47	4.03	13.4	1	
62.5 x 125	11.9	62.5	125	6.5	9	10	15.16	35	147	1.52	3.11	6.91	23.5	1.19	
75 x 100	10.5	74	100	6	9	11	13.42	51.7	75.3	1.96	2.37	8.84	15.1	11.55	
75 x 150	15.8	75	150	7	10	11	20.07	66.4	282	1.82	3.75	10.8	37.6	1.37	
87.5 x 175	20.1	87.5	175	7.5	11	12	25.61	115	492	2.12	4.38	15.9	56.2	1.55	
100 x 100	*9.1	99	99	4.5	7	11	11.59	93.8	56.8	2.84	2.21	12.1	11.5	2.14	
	10.7	100	100	5.5	8	11	13.58	114	67	2.9	2.22	4.8	13.4	2.29	
100 x 150	15.3	97	150	6	9	13	19.51	125	254	2.53	3.61	15.8	33.8	1.79	
	24.9	100	200	8	12	13	31.77	184	801	2.41	5.02	22.3	80.1	1.73	
100 x 200	*28.1	100	204	12	12	13	35.77	256	851	2.67	4.88	32.4	83.4	2.09	
	*32.8	104	202	10	16	13	41.85	251	1,100.00	2.45	5.13	29.5	109	1.91	
125 x 125	*12.8	124	124	5	8	12	16.34	208	127	3.57	2.79	21.3	20.5	2.68	
	14.8	125	125	6	9	12	18.83	248	147	3.36	2.79	25.6	23.5	2.78	
125 x 175	22.1	122	175	7	11	16	28.12	289	492	3.2	4.18	29.1	56.3	2.27	

ตารางที่ ก. 5 (ต่อ) (TIS 1227 : 1996 / JIS G3192 : 1990)

Nominal Size	Weight kg/m	Sectional Dimension						Sectional Area (cm ²)	Moment of Inertia		Radius of Gyration		Modulus of Section		Center of Gravity Cx
		H	B	t1	t2	รูปร่าง r	Ix		Iy	rx	ry	Zx	Zy		
		mm	mm	mm	mm	mm	(cm ⁴)		(cm ⁴)	cm	cm	(cm ³)	(cm ³)		
125 x 250	*32.2	122	252	11	11	16	41.03	445	1,470.00	3.29	5.98	45.3	117	2.39	
	*33.2	124	249	8	13	16	42.35	364	1,670.00	2.93	6.29	34.9	134	1.98	
	36.2	125	250	9	14	16	46.09	412	1,820.00	2.99	6.29	39.5	146	2.08	
	*41.1	125	255	14	14	16	52.34	589	1,940.00	3.36	6.09	59.4	152	2.58	
150 x 150	*16.0	149	149	5.5	8	13	20.4	393	221	4.39	3.29	33.8	29.7	3.26	
	18.4	150	150	6.5	9	13	23.39	464	254	4.45	3.29	40	33.8	3.41	
150 x 200	28.4	147	200	8	12	18	36.19	572	802	3.97	4.71	48.2	80.2	2.83	
	*32.7	149	201	9	14	18	41.68	662	949	3.99	4.77	55.2	94.9	2.91	
150 x 300	*42.3	147	302	12	12	18	53.83	858	2,760.00	3.99	7.16	72.3	183	3.84	
	*43.5	149	299	9	14	18	55.4	715	3,120.00	3.59	7.51	57	209	2.36	
	47	150	300	10	15	18	59.89	798	3,380.00	3.65	7.51	63.7	225	2.47	
	*52.9	150	305	15	15	18	67.39	1,110.00	3,550.00	4.05	7.26	92.5	233	2.03	
175 x 175	*52.9	152	301	11	17	18	67.41	903	3,870.00	3.66	7.57	71.4	257	2.55	
	*20.7	173	174	6	9	14	26.34	679	396	5.08	3.88	50	45.5	3.71	
175 x 250	24.8	175	175	7	11	14	31.57	815	492	5.08	3.95	59.3	56.2	3.75	
	*34.6	168	249	8	12	20	44.08	881	1,540.00	4.47	5.92	64	124	3.02	
175 x 350	39.8	170	250	9	14	20	50.76	1,020.00	1,830.00	4.48	6	73.1	146	3.09	
	*53.1	169	351	13	13	20	67.63	1,420.00	4,690.00	4.59	8.33	104	267	3.21	
	*57.3	172	348	10	16	20	73	1,230.00	5,620.00	4.11	8.78	84.7	323	2.67	
	*65.4	172	354	16	16	20	83.32	1,800.00	5,920.00	4.65	8.43	131	335	3.4	
200 x 200	68.2	175	350	12	19	20	86.94	1,520.00	6,790.00	4.18	8.84	104	388	2.86	
	*77.9	175	357	19	19	20	99.19	2,200.00	7,220.00	4.71	8.53	158	404	3.59	
200 x 200	*28.3	198	199	7	11	16	36.08	1,190.00	723	5.76	4.48	76.4	72.7	4.17	
	33	200	200	8	13	16	42.06	1,400.00	868	5.76	4.54	88.6	86.8	4.23	

ตารางที่ ก. 5 (ต่อ) **T-Section (Cut from H-Section)** **(TIS 1227 : 1996 / JIS G3192 : 1990)**

Nominal Size	Weight kg/m	Sectional Dimension						Sectional Area (cm ²)	Moment of Inertia (cm ⁴)		Radius of Gyration cm		Modulus of Section (cm ³)		Center of Gravity (cm ³)	
		H mm	B mm	t1 mm	t2 mm	r mm	Ix (cm ⁴)		Iy (cm ⁴)	rx cm	ry cm	Zx (cm ³)	Zy (cm ³)	Cx (cm ³)	Cy (cm ³)	
200 x 300	*47.1	193	299	9	14	22	60.05	1,530.00	3,120.00	5.04	7.21	95.5	209	3.33		
	53.4	195	300	10	16	22	67.98	1,730.00	3,600.00	5.05	7.28	108	240	3.41		
200 x 400	*70.0	194	402	15	15	22	89.23	2,480.00	8,130.00	5.27	9.54	158	404	3.7		
	*73.3	197	398	11	18	22	93.41	2,050.00	9,460.00	4.68	10.1	123	475	3.01		
	*84.1	197	405	18	18	22	107.2	3,050.00	9,980.00	5.34	9.65	193	493	3.89		
	85.8	200	400	13	21	22	109.3	2,480.00	11,200.00	4.76	10.1	147	560	3.21		
225 x 200	*98.4	200	408	21	21	22	125.3	3,650.00	11,900.00	5.4	9.75	229	584	4.07		
	*116.0	207	405	18	28	22	147.7	3,620.00	15,500.00	4.95	10.2	213	776	3.68		
255 x 200	*33.1	223	199	8	12	18	42.15	1,880.00	790	6.67	4.33	109	79.4	5.1		
	38	225	200	9	14	18	48.38	2,160.00	936	6.68	4.4	124	93.6	5.15		
255 x 300	*53.0	217	299	10	15	24	67.52	2,350.00	3,350.00	5.89	7.04	133	224	4.04		
	61.8	220	300	11	18	24	78.69	2,680.00	4,060.00	5.84	7.68	149	270	4.05		
250 x 200	*39.7	248	199	9	14	20	50.64	2,840.00	922	7.49	4.27	150	92.6	5.9		
	44.8	250	200	10	16	20	57.12	3,210.00	1,070.00	7.5	4.33	169	107	5.96		
250 x 300	*51.5	253	201	11	19	20	65.65	3,670.00	1,290.00	7.48	4.43	190	128	5.95		
	*57.1	241	300	11	15	26	72.76	3,420.00	3,380.00	6.85	6.82	178	225	4.92		
300 x 200	64.2	244	300	11	18	26	81.76	3,620.0	4,060	6.66	7.07	184	70	4.66		
	*47.3	298	199	10	15	22	60.23	5,190.00	989	9.29	4.05	236	99.4	7.79		
300 x 200	52.8	300	200	11	17	22	67.21	5,810.00	1,140.00	9.3	4.12	262	114	7.84		
	*59.8	303	201	12	20	22	76.24	6,570.00	1,360.00	9.28	4.22	292	135	7.79		
300 x 300	*67.0	306	202	13	23	22	85.33	7,340.00	1,590.00	9.27	4.31	322	157	7.79		
	*68.5	291	300	12	17	28	87.24	6,360.00	3,830.00	8.54	6.63	280	256	6.39		
300 x 300	75.6	294	300	12	20	28	96.24	6,710.00	4,510.00	8.35	6.85	288	301	6.08		
	*87.3	297	302	14	23	28	111.2	7,920.00	5,290.00	8.44	6.9	339	350	6.33		

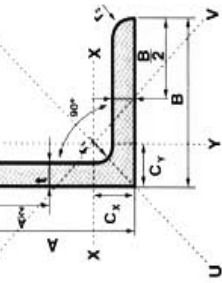
ตารางที่ ก. 5 (ต่อ) **T-Section (Cut from H-Section)** **(TIS 1227 : 1996 / JIS G3192 : 1990)**

Nominal Size	Weight	Sectional Dimension					Sectional Area	Moment of Inertia		Radius of Gyration		Modulus of Section		Center of Gravity
		H	B	t1	t2	รูปร่าง r		Ix	Iy	rx	ry	Zx	Zy	
350 x 300	kg/m	mm	mm	mm	mm	mm	cm ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³
	*83.0	346	300	13	20	28	105.7	11,300.00	4,510.00	10.3	6.53	425	301	7.99
400 x 300	kg/m	mm	mm	mm	mm	mm	cm ²	cm ⁴	cm ⁴	cm	cm	cm ³	cm ³	cm ³
	*95.6	396	300	14	22	28	121.7	17,100	4,960.00	12.1	6.38	593	331	9.66
	105	400	300	14	26	28	133.7	18,800	5,860.00	11.9	6.62	610	391	9.18

ตารางที่ 6

Equal Angle

(TIS 1227 : 1996 / JIS G3192 : 1990)



(Grade SM400, SM490, SM520, SS400, SS490 or SS540)

Moment of Inertia $I = Ar^2$
 Radius of Gyration $r = \sqrt{\frac{I}{A}}$
 Modulus of Section $Z = \frac{I}{C}$
 A = Sectional Area



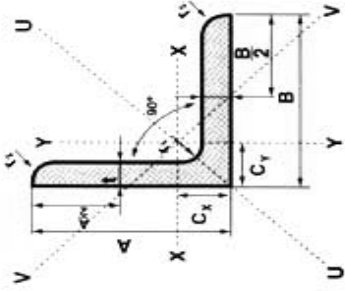
Dimensions (mm)			Sectional Area (cm ²)	Weight (kg/m)	Moment of Inertia (cm ⁴)				Radius of Gyration (cm)				Modulus of Section (cm ³)			Distance of Center of gravity (cm)	
A x B	t	r1			r2	Ix	Iy	Iu	Iv	rx	ry	ru	rv	Zx	Zy	Cx	Cy
25 x 25	3	4	2	1.427	0.797	0.797	1.26	0.332	0.747	0.747	0.94	0.433	0.448	0.448	0.719	0.719	
	5	3.5	2.4	2.26	1.2	1.2	1.89	0.52	0.73	0.73	0.91	0.43	0.45	0.45	0.8	0.8	
30 x 30	3	4	2	1.727	1.42	1.42	2.26	0.59	0.908	0.908	1.14	0.585	0.661	0.661	0.844	0.844	
	5	5	2.4	2.78	2.16	2.16	3.41	0.92	0.88	0.88	1.11	0.57	1.04	1.04	0.92	0.92	
40 x 40	3	4.5	2	2.336	3.53	3.53	5.6	1.46	1.23	1.23	1.55	0.79	1.21	1.21	1.09	1.09	
	4	6	2.4	3.08	4.47	4.47	7.09	1.85	1.21	1.21	1.52	0.78	1.55	1.55	1.12	1.12	
	5	4.5	3	3.755	5.42	5.42	8.59	2.25	1.2	1.2	1.51	0.774	1.91	1.91	1.17	1.17	
	6	6	2.4	4.48	6.31	6.31	9.98	2.65	1.19	1.19	1.49	0.77	2.26	2.26	1.2	1.2	
45 x 45	4	6.5	3	3.492	6.5	6.5	10.3	2.7	1.36	1.36	1.72	0.88	2	2	1.24	1.24	
	5	6.5	3	4.302	7.91	7.91	12.5	3.29	1.36	1.36	1.71	0.874	2.46	2.46	1.28	1.28	
50 x 50	3	7	2.4	2.96	6.86	6.86	10.8	2.88	1.52	1.52	1.91	0.99	1.86	1.86	2.33	1.31	
	4	6.5	3	3.892	9.06	9.06	14.4	3.76	1.53	1.53	1.92	0.983	2.49	2.49	1.37	1.37	
	5	6.5	3	4.802	11.1	11.1	17.5	4.58	1.52	1.52	1.91	0.976	3.08	3.08	1.41	1.41	
	6	6.5	4.5	5.644	12.6	12.6	20	5.23	1.5	1.5	1.88	0.963	3.55	3.55	1.44	1.44	
60 x 60	4	6.5	3	4.692	16	16	25.4	6.62	1.85	1.85	2.33	1.19	3.66	3.66	1.61	1.61	
	5	6.5	3	5.802	19.6	19.6	31.2	8.09	1.84	1.84	2.32	1.18	4.52	4.52	1.66	1.66	
65 x 65	5	8.5	3	6.367	25.3	25.3	41	10.5	1.99	1.99	2.51	1.28	5.35	5.35	1.77	1.77	
	6	8.5	4	7.527	29.4	29.4	46.6	12.2	1.98	1.98	2.49	1.27	6.26	6.26	1.81	1.81	
	8	8.5	6	9.761	36.8	36.8	58.3	15.3	1.94	1.94	2.44	1.25	7.96	7.96	1.88	1.88	

Dimensions (mm)				Sectional Area (cm ²)		Weight (kg/m)	Moment of Inertia (cm ⁴)				Equal Angle				(TIS 1227 : 1996 / JIS G3192 : 1990)			
A x B	t	r1	r2	Area		Ix	Iy	Iu	Iv	Radius of Gyration (cm)				Modulus of Section (cm ³)		Distance of Center of gravity (cm)		
				r1	r2					rx	ry	ru	rv	Zx	Zy	Cx	Cy	
70 x 70	6	8.5	4	8.127	6.38	37.1	37.1	58.9	15.3	2.14	2.14	2.69	1.37	7.33	7.33	1.93	1.93	
	6	8.5	4	8.727	6.85	46.1	46.1	73.2	19	2.3	2.3	2.9	1.48	8.74	8.74	2.06	2.06	
75 x 75	9	8.5	6	12.69	9.69	64.4	64.4	102	26.7	2.25	2.25	2.84	1.45	12.1	12.1	2.17	2.17	
	12	8.5	6	16.56	13	81.9	81.9	129	34.5	2.22	2.22	2.79	1.44	15.7	15.7	2.29	2.29	
80 x 80	6	8.5	4	9.327	7.32	56.4	56.4	89.6	23.2	2.46	2.46	3.1	1.58	9.7	9.7	2.18	2.18	
	6	10	5	10.55	8.28	80.7	80.7	128	33.4	2.77	2.77	3.48	1.78	12.3	12.3	2.42	2.42	
90 x 90	7	10	5	12.22	9.59	93	93	148	38.3	2.76	2.76	3.48	1.77	14.2	14.2	2.46	2.46	
	10	10	7	17	13.3	125	125	199	51.7	2.71	2.71	3.42	1.74	19.5	19.5	2.57	2.57	
100 x 100	12	11	4.8	20.3	15.9	148	148	234	61.7	2.7	2.7	3.4	1.75	23.3	23.3	2.66	2.66	
	13	10	7	31.71	17	156	156	248	65.3	2.68	2.68	3.38	1.73	24.8	24.8	2.69	2.69	
120 x 120	7	10	5	13.62	10.7	129	129	205	53.2	3.03	3.03	3.88	1.98	17.7	17.7	2.71	2.71	
	10	10	7	19	14.9	175	175	278	72	3.04	3.04	3.83	1.95	24.4	24.4	2.82	2.82	
130 x 130	12	12	4.8	22.7	17.8	207	207	328	85.7	3.02	3.02	3.8	1.94	29.1	29.1	2.9	2.9	
	13	10	7	24.31	19.1	220	220	348	91.1	3	3	3.78	12.94	31.1	31.1	2.94	2.94	
150 x 150	8	12	5	18.76	14.7	258	258	410	106	3.71	3.71	4.67	2.38	29.5	29.5	3.24	3.24	
	9	12	6	22.74	17.9	366	366	583	150	4.01	4.01	5.06	2.57	38.7	38.7	3.53	3.53	
175 x 175	12	12	8.5	29.76	23.4	467	467	743	192	3.96	3.96	5	2.54	49.9	49.9	3.64	3.64	
	15	12	8.5	36.75	28.8	568	568	902	234	3.93	3.93	4.95	2.53	61.5	61.5	3.76	3.76	
200 x 200	12	14	7	34.77	27.3	740	740	1,180	304	4.61	4.61	5.82	2.96	68.1	68.1	4.14	4.14	
	15	14	10	42.74	33.6	888	888	1,410	365	4.56	4.56	5.75	2.92	82.6	82.6	4.24	4.24	
250 x 250	19	14	10	53.38	41.9	1,090	1,090	1,370	451	4.52	4.52	6.69	2.91	103	103	4.4	4.4	
	12	15	11	40.52	31.8	1,170	1,170	1,860	480	5.38	5.38	6.78	3.44	91.8	91.8	4.73	4.73	
250 x 250	15	15	11	50.21	39.4	1,440	1,440	2,260	589	5.35	5.35	6.75	3.72	114	114	4.85	4.85	
	15	17	12	57.75	45.3	2,180	2,180	3,470	891	6.14	6.14	7.75	3.92	150	150	5.46	5.46	
250 x 250	20	17	12	76	59.7	2,820	2,820	4,490	1,160	6.09	6.09	7.68	3.9	197	197	5.67	5.67	
	25	17	12	93.75	73.6	3,420	3,420	5,420	1,420	6.04	6.04	7.61	3.88	242	242	5.86	5.86	
250 x 250	25	24	12	119.4	93.7	6,950	6,950	11,000	2,860	7.63	7.63	9.62	4.9	388	388	7.1	7.1	
	35	24	18	162.6	128	9,110	9,110	14,400	3,790	7.49	7.49	9.42	4.83	519	519	7.45	7.45	

ตารางที่ ๗

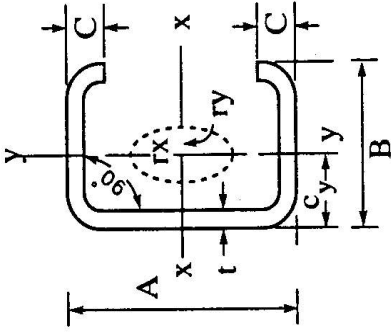
UnEqual Angle

(TIS 1227 : 1996 / JIS G3192 : 1990)



Moment of Inertia $I = Ar^2$
 Radius of Gyration $r = \sqrt{\frac{I}{A}}$
 Modulus of Section $Z = \frac{I}{C}$
 Sectional Area $A =$ Sectional Area

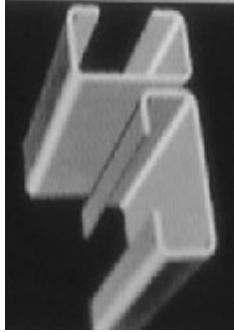
Dimensions (mm)		Sectional Area (cm ²)	Weight (kg/m)	tan	Moment of Inertia (cm ⁴)			Radius of Gyration (cm)			Modulus of Section (cm ³)		Distance of Center of gravity (cm)			
A x B	t				r1	r2	Ix	Iy	Iu	Iv	rx	ry	ru	rv	Zx	Zy
90 x 75	9	14.04	11	0.676	109	63.1	143	34.1	2.78	2.2	3.19	1.56	17.4	12.4	2.75	2
100 x 75	7	11.87	9.32	0.548	118	56.9	144	30.8	3.15	2.19	3.49	1.61	17	10	3.06	1.83
100 x 75	10	16.5	13	0.543	159	76.1	194	41.3	3.11	2.15	3.43	1.58	23.3	13.7	3.17	1.94
125 x 75	7	13.62	10.7	0.362	219	60.4	243	36.4	4.01	2.11	4.23	1.64	26.1	10.3	4.1	1.64
125 x 75	10	19	14.9	0.357	299	80.8	330	49	3.96	2.06	4.17	1.61	36.1	14.1	4.22	1.75
125 x 75	13	24.31	19.1	0.352	376	101	415	61.9	3.93	2.04	4.13	1.6	46.1	17.9	4.35	1.87
125 x 90	10	20.5	16.1	0.505	318	138	380	76.2	3.94	2.59	4.3	1.93	37.2	20.3	3.95	2.22
125 x 90	13	26.26	20.6	0.501	401	173	477	96.3	3.91	2.57	4.26	1.91	47.5	25.9	4.07	2.34
150 x 90	9	20.94	16.4	0.361	485	133	537	80.4	4.81	2.52	5.06	1.96	48.2	19	4.95	1.99
150 x 90	12	27.36	21.5	0.357	619	167	685	102	4.76	2.47	5	1.93	62.3	24.3	5.07	2.1
150 x 100	9	21.84	17.1	0.439	502	181	579	104	4.79	2.88	5.15	2.18	49.1	23.5	4.76	2.3
150 x 100	12	28.56	22.4	0.435	642	223	733	132	4.74	2.83	5.09	2.15	63.4	30.1	4.88	2.41
150 x 100	15	32.25	27.7	0.431	782	276	897	161	4.71	2.8	5.04	2.14	78.2	37	5	2.53



ပုံ ၈ နံပါတ် ၁၂၅၅၅၅

Light Lip Channel

(TIS 1228 : 2006 / JIS G3192 : 1990)

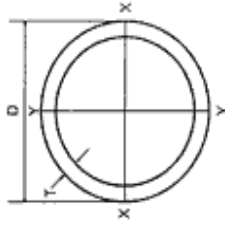
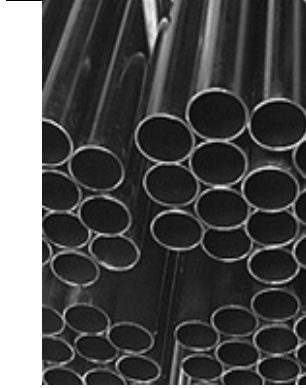


I = Moment of Inertia
 r = Radius of Gyration
 Z = Modulus of Section
 A = Sectional Area
 I = $A r^2$
 r = $\sqrt{\frac{I}{A}}$
 Z = $\frac{I}{C}$

Sectional Dimensional (mm)	Sectional Area (cm ²)	Weight (kg/m)	Distance from C.G. (cm)		Moment of Inertia (cm ⁴)		Radius of Gyration (cm)		Modulus of Section (cm ³)			Shear Distance (cm)	
			Cx	Cy	Ix	Iy	rx	ry	Zx	Zy	Sx	Sy	
A x B x C 60 x 30 x 10	2.872	2.25	0	1.06	15.6	3.32	2.33	1.07	5.2	1.71	2.5	0	0
75 x 35 x 15	3.677	2.89	0	1.29	31	6.58	2.91	1.34	8.28	2.98	3.1	0	0
75 x 45 x 15	4.137	3.25	0	1.72	37.1	11.8	3	1.69	9.9	4.24	4	0	0
90 x 48 x 20	6.367	5	0	1.72	76.9	13.3	3.48	1.69	17.1	6.57	4.1	0	0
	4.712	3.7	0	1.73	58.6	14.2	3.53	1.74	13	5.11	4.1	0	0
	9.469	7.43	0	1.86	139	30.9	3.82	1.81	27.7	9.82	4.3	0	0
100 x 50 x 20	8.548	6.71	0	1.86	127	28.7	3.85	1.83	25.4	9.13	4.3	0	0
	7.007	15.5	0	1.86	107	24.5	3.9	1.87	21.3	7.81	4.4	0	0
	5.172	4.06	0	1.86	80.7	19	3.95	1.92	16.1	6.06	4.4	0	0
120 x 40 x 20	7.007	5.5	0	1.32	144	15.3	4.53	1.48	24	5.71	3.4	0	0
120 x 60 x 20	8.287	6.51	0	2.12	186	40.9	4.74	2.22	31	10.5	4.9	0	0
120 x 60 x 25	11.72	9.2	0	2.25	252	58	4.63	2.22	41.9	15.5	5.3	0	0

Sectional Dimensional (mm)			Sectional Area (cm ²)	Weight (kg/m)	Distance from C.G. (cm)		Moment of Inertia (cm ⁴)		Radius of Gyration (cm)		Modulus of Section (cm ³)			Shear Distance (cm)		
H	A	C			C x	C y	I x	I y	r x	r y	Z x	Z y	S x	S y		
		t														
		4.5	10.59	8.32	0	1.68	238	33.5	4.74	1.78	33	4	10	4	0	0
		4	9.548	7.5	0	1.68	217	33.1	4.77	1.81	34.7	4	9.38	4	0	0
		3.2	7.807	6.13	0	1.68	181	26.6	4.82	1.85	29	4	8.02	4	0	0
		4.5	11.72	9.2	0	1.54	368	35.7	5.6	1.75	49	3.7	10.5	3.7	0	0
		3.2	8.607	6.76	0	1.54	280	28.3	5.71	1.81	37.4	3.8	8.19	3.8	0	0
		4	11.75	9.22	0	2.11	401	63.7	5.84	2.33	53.5	5	14.5	5	0	0
		3.2	9.567	7.51	0	2.11	332	53.8	5.89	2.37	44.3	5.1	12.2	5.1	0	0
		4.5	13.97	11	0	2.5	489	99.2	5.92	2.66	65.2	6	19.8	6	0	0
		4	12.55	9.85	0	2.51	445	91	5.95	2.69	59.3	5.8	18.2	5.8	0	0
		3.2	10.21	8.01	0	2.51	366	76.4	5.99	2.74	48.9	5.1	15.3	5.1	0	0
		4.5	14.42	11.3	0	2.65	501	109	5.9	2.75	66.9	6.3	22.5	6.3	0	0
		4	12.95	10.2	0	2.65	455	99.8	5.93	2.78	60.6	6.3	20.6	6.3	0	0
		3.2	10.53	8.27	0	2.66	375	83.6	5.97	2.82	50	6.4	17.3	6.4	0	0
		4.5	16.22	12.7	0	2.19	963	109	7.71	2.6	96.3	5.3	20.6	5.3	0	0
		4	14.55	11.4	0	2.19	871	100	7.74	2.62	87.1	5.3	18.9	5.3	0	0
		3.2	11.81	9.27	0	2.19	716	84.1	7.79	2.67	71.6	5.4	15.8	5.4	0	0
		4.5	16.67	13.1	0	2.32	990	121	7.61	2.69	99	5.6	23.3	5.6	0	0
		4	14.95	11.7	0	2.32	895	110	7.74	2.72	89.5	5.7	21.3	5.7	0	0
		3.2	12.13	9.52	0	2.33	736	92.3	7.7	2.76	73.6	5.7	17.8	5.7	0	0
		4.5	18.92	14.9	0	2.07	1690	129	9.44	2.62	135	5.1	23.8	5.1	0	0

ตารางที่ ก. 9
(TIS 1228 : 2006 / JIS G3192 : 1990)

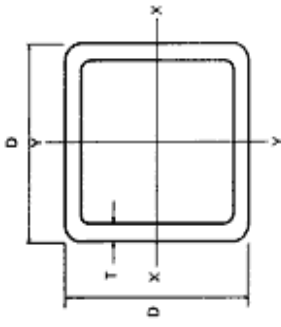


Moment of Inertia $I = \frac{Ar^2}{4}$
 Radius of Gyration $r = \sqrt{\frac{I}{A}}$
 Modulus of Section $Z = \frac{I}{C}$
 Sectional Area $A =$

Carbon Steel Pipe

Nominal dimension	Outside Diameter	Thickness	Calculate Weight	Cross Sectional Area	Geometrical Moment of Inertia	Modulus of Section	Radius of Gyration
DN	D	T	W	A	I	Z	r
in (mm)	mm	mm	kg./m	cm ²	cm ⁴	cm ³	cm
1/2 (15)	21.7	2	0.97	1.24	0.61	0.56	0.7
3/4 (20)	27.2	2	1.24	1.58	1.26	0.93	0.89
		2.3	1.41	1.8	1.41	1.03	0.88
1 (25)	34	2.3	1.8	2.29	2.89	1.7	1.12
		2.3	2.29	2.92	5.97	2.8	1.43
1 1/4 (32)	42.7	2.5	2.48	3.16	6.4	3	1.42
		2.3	2.63	3.35	8.99	3.7	1.64
		2.5	2.84	3.62	9.65	3.97	1.63
1 1/2 (40)	48.6	2.8	3.16	4.03	10.6	4.36	1.62
		3.2	3.58	4.56	11.8	4.86	1.61
		2.3	3.3	4.21	17.8	5.9	2.06
2(50)	60.5	3.2	4.52	5.76	23.7	7.84	2.03
		4	5.57	7.1	28.5	9.41	2
		2.8	5.08	6.47	43.7	11.5	2.6
2 1/2 (65)	76.3	3.2	5.77	7.35	49.2	12.9	2.59
		4	7.13	9.09	59.5	15.6	2.58

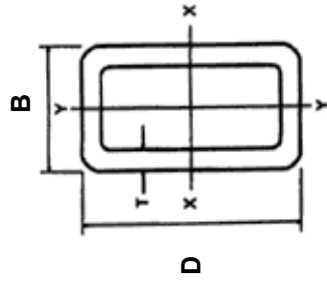
Carbon Steel Pipe							
ตารางที่ ก. 9 (ต่อ)							
(TIS 1228 : 2006 / JIS G3192 : 1990)							
Nominal dimension	Outside Diameter	Thickness	Calculate Weight	Cross Sectional Area	Geometrical Moment of Inertia	Modulus of Section	Radius of Gyration
DN	D	T	W	A	I	Z	r
in (mm)	mm	mm	kg/m	cm ²	cm ⁴	cm ³	cm
3 (80)	89.1	2.8	5.96	7.59	70.7	15.9	3.05
		3.2	6.78	8.64	79.8	17.9	3.04
3 1/2 (90)	101.6	3.2	7.76	9.89	120	23.6	3.48
		4	9.63	12.26	146	28.8	3.45
4 (100)	114.3	3.2	8.77	11.17	172	30.2	3.93
		3.5	9.58	12.18	187	32.7	3.92
		4.5	12.2	15.52	234	41	3.89
5 (125)	139.8	3.6	12.1	15.4	357	51.1	4.82
		4	13.4	17.07	394	56.3	4.8
		4.5	15	19.13	438	62.7	4.79
		6	19.8	25.22	566	80.2	4.74
6 (150)	165.2	4.5	17.8	22.72	734	88.9	5.68
		5	19.8	25.16	808	97.8	5.67
		6	23.6	30.01	952	115	5.63
		7.1	27.7	35.26	1,100.00	134	5.6
8 (200)	216.3	4.5	23.5	29.94	1,680.00	155	7.49
		5.8	30.1	38.36	2,130.00	197	7.45
		7	36.1	46.03	2,520.00	233	7.4
		8.2	42.1	53.61	2,910.00	269	7.36



ตารางที่ ก. 10		Square Tube			
(TIS 1228 : 2006 / JIS G3192 : 1990)					
Side Length	Thickness	Calculate Weight	Geometrical Moment of Inertia	Modulus of Section	Radius of Gyration
D x D	T	W	I _x = I _y	Z _x = Z _y	r _x = r _y
in	mm	kg./m	cm ⁴	cm ³	cm
1 x 1	2	1.36	1.48	1.19	0.92
	2.3	1.53	1.61	1.29	0.9
	2.6	1.65	1.63	1.31	0.88
	3.2	1.91	1.75	1.4	0.85
1 1/4 x 1 1/4	2.3	2.04	3.71	2.32	1.2
	3.2	2.69	4.54	2.84	1.15
1 1/2 x 1 1/2	2.3	2.47	6.54	3.44	1.44
	3.2	3.29	8.18	4.3	1.4
	1.6	2.38	11.7	4.68	1.96
2 x 2	2	2.91	13.9	5.57	1.94
	2.3	3.34	15.9	6.34	1.93
	3.2	4.5	20.4	8.16	1.89
	3.6	4.9	21.4	8.58	1.85
	4	5.35	22.9	9.15	1.83
	5	6.39	25.7	10.3	1.78

Moment of Inertia $I = Ar^2$
 Radius of Gyration $r = \sqrt{\frac{I}{A}}$
 Modulus of Section $Z = \frac{I}{C}$
 Sectional Area $A =$

Side Length		Thickness	Calculate Weight	Cross Sectional Area	Moment of Inertia	Modulus of Section	Radius of Gyration	ตารางที่ ก. 10 (ต่อ)	
								(TIS 1228 : 2006 / JIS G3192 : 1990)	
D x D		T	W	A	I _x = I _y	Z _x = Z _y	r _x = r _y		
in	mm	mm	kg/m	cm ²	cm ⁴	cm ³	cm		
3 x 3	75 x 75	2.3	5.14	6.55	57.1	15.2	2.95		
		3.2	7.01	8.93	75.5	20.1	2.91		
		4	8.59	10.95	90.2	24.1	2.87		
		4.5	9.55	12.17	98.6	26.3	2.85		
4 x 4	100 x 100	2.3	6.95	8.85	140	27.9	3.97		
		3.2	9.52	12.13	187	37.5	3.93		
		4	11.7	14.95	226	45.3	3.89		
		4.5	13.1	16.67	249	49.9	3.87		
5 x 5	125 x 125	6	17	21.63	311	62.3	3.79		
		3.2	12	15.33	376	60.1	4.95		
		4.5	16.6	21.17	506	80.9	4.89		
		5	18.3	23.36	553	88.4	4.86		
6 x 6	150 x 150	6	21.7	27.63	641	103	4.82		
		4.5	20.1	25.67	896	120	5.91		
		5	22.3	28.36	982	131	5.89		
		6	26.4	33.63	1,150.00	153	5.84		
		6.3	27.4	34.8	1,174.00	156	5.8		



ตารางที่ ก. 11 **Rectangular Tube**
(TIS 1228 : 2006 / JIS G3192 : 1990)

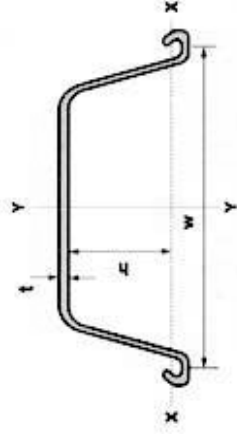
Moment of Inertia $I = Ar^2$
 Radius of Gyration $r = \sqrt{\frac{I}{A}}$
 Modulus of Section $Z = \frac{I}{C}$
 Sectional Area $A =$

Side Length		Thickness	Calculate Weight	Cross Sectional Area	Moment of Inertia		Modulus of Section		Radius of Gyration	
D x B	T	W	A	Ix	Iy	Zx	Zy	rx	ry	
in	mm	kg/m	cm ²	cm ⁴	cm ⁴	cm ³	cm ³	cm	cm	
2 x 1	2	2.12	2.7	8.17	2.76	3.27	2.2	1.74	1.01	
	2.3	2.44	3.1	9.31	3.1	3.72	2.48	1.68	0.96	
	3.2	3.24	4.13	11.6	3.8	4.65	3.04	1.68	0.96	
	3.6	3.48	4.44	11.7	3.86	4.7	3.09	1.63	0.93	
3 x 1 $\frac{1}{4}$	2.3	3.81	4.85	34.6	12	9.23	6.3	2.67	1.57	
	3.2	5.15	5.15	45	15.4	12	8.09	2.62	1.53	
3 x 1 $\frac{3}{4}$	1.6	2.88	3.67	28.4	12.9	7.56	5.75	2.78	1.88	
	2.3	4.06	5.17	38.9	17.6	10.4	7.82	2.74	1.84	
	3.2	5.5	7.01	50.8	22.8	13.5	10.1	2.69	1.8	
4 x 2	2	4.48	5.7	74.1	25.5	14.8	10.2	3.61	2.11	
	2.3	5.14	6.55	84.8	29	17	11.6	3.6	2.1	
	3.2	7.01	8.93	112	38	22.5	15.2	3.55	2.06	
	3.6	7.72	9.84	121	40.9	24.1	16.3	3.5	2.04	
	4	8.59	10.95	142	46.7	28.4	18.7	3.55	2.03	
	4.5	9.55	12.17	147	48.9	29.3	19.5	3.47	2	

ตารางที่ ก. 11 (ต่อ)
Rectangular Tube
(TIS 1228 : 2006 / JIS G3192 : 1990)

Side Length		Thickness	Calculate Weight	Cross Sectional Area	Moment of Inertia		Modulus of Section		Radius of Gyration	
D x B	T	W	A	Ix	Iy	Zx	Zy	rx	ry	
in	mm	kg/m	cm ²	cm ⁴	cm ⁴	cm ³	cm ³	cm	cm	
5 x 3	2.3	6.95	8.85	192	87.5	30.6	23.3	4.65	3.14	
	3.2	9.52	12.13	257	117	41.1	31.1	4.6	3.1	
	4	11.7	14.95	311	141	49.7	37.5	4.56	3.07	
6 x 2	4.5	13.1	16.67	342	155	54.8	41.2	4.53	3.04	
	6	17	21.63	428	192	68.5	51.1	4.45	2.98	
	3.2	9.63	12.13	314.92	55.71	42.61	22.61	5.16	2.17	
8 x 4	4.5	13.5	17.03	423.93	75.75	53.35	29.82	5.05	2.11	
	6.3	18.77	22.84	536.98	93.65	72.76	36.87	4.93	2.03	
	4.5	20.1	25.67	1,330.00	455	133	90.9	7.2	4.21	
200 x 100	6	26.4	33.63	1,700.00	577	170	115	7.12	4.14	
	6.3	27.4	34.8	1,739.00	591	174	118	7.06	4.12	

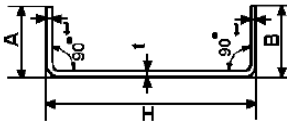
ตารางที่ ก. 12
Sheet Piles
(TIS 1390 : 1996 / JIS A5228 : 1988)
Hot Rolled Steel Sheet Pile
(Grade SY295 or SY390)



Section	Dimensions			Sectional Area	Weight		Moment of Inertia		Section Modulus	
	w	h	t		per pile	per wall width	per pile	per wall width	per pile	per wall width
SP - III	mm	mm	mm	(cm ²)	kg/m	kg/m	(cm ⁴)	(cm ⁴ /m)	(cm ³)	(cm ³ /m)
	400	125	13	76.42	60	150	2,220.00	16,800	223	1,340.00
SP - IV	in	in	in	in ²	lbs/ft	lbs/ft	in ⁴	in ⁴ /ft	in ³	in ³ /ft
	15.7	4.92	0.152	11.85	40.3	30.7	53.3	123	13.6	24.9
SP - IV	400	170	15.5	96.99	76.1	190	4,670.00	38,600	362	2,270.00
	15.7	6.69	0.61	15.03	51.1	38.9	112	283	22.1	42.2

ตารางที่ ก. 13

Light Channels (TIS 1228 : 2006 / JIS G3192 : 1990)



เหล็กทรงพับ (Light Channels) เป็นเหล็กโครงสร้างรูปพรรณขึ้นรูปเย็น

เหมาะสำหรับงานโครงสร้างขนาดเล็ก

$$I = \frac{Ar^2}{2}$$

$$r = \sqrt{\frac{I}{A}}$$

$$Z = \frac{I}{C}$$

$$A = \text{Sectional Area}$$



Dimensios (mm)	Thickn (mm)	Sectional		Weight (kg/m)	Distance from CG. (cm)		Moment of Inertia (cm ⁴)		Radius of Gyration (cm)		Modulus of Section (cm ³)		Shear Distance (cm)	
		Area (cm ²)	A		C x	C y	I x	I y	r x	r y	Z x	Z y	S x	S y
60	30	1.836	1.836	1.44	0	0.82	10.30	1.64	2.37	0.95	3.45	0.75	1.80	0
	30	2.586	2.586	2.03	0	0.86	14.20	2.27	2.34	0.94	4.72	1.06	1.80	0
80	40	3.506	3.506	2.75	0	1.11	34.90	5.56	3.16	1.26	8.73	1.92	2.40	0
	40	3.966	3.966	3.11	0	0.99	58.90	5.96	3.85	1.23	11.80	1.98	2.20	0
100	40	5.423	5.423	4.26	0	1.03	78.60	7.99	3.81	1.21	15.70	2.69	2.20	0
	50	4.426	4.426	3.47	0	1.36	69.90	11.10	3.97	1.58	14.00	3.04	3.10	0
120	50	6.063	6.063	4.76	0	1.40	93.60	14.90	3.93	1.57	18.70	4.15	3.10	0
	40	6.063	6.063	4.76	0	0.94	122.00	8.43	4.48	1.18	20.30	2.75	2.10	0
150	50	5.576	5.576	4.36	0	1.10	181.00	12.50	5.69	1.50	24.10	3.20	2.60	0
	50	7.663	7.663	6.02	0	1.14	244.00	16.90	5.64	1.48	32.50	4.37	2.60	0
150	50	10.58	10.58	8.31	0	1.20	329.00	22.60	5.58	1.47	43.90	5.99	2.60	0
	75	11.47	11.47	9.00	0	2.06	404.00	64.20	5.93	2.36	53.90	11.80	4.60	0
150	75	12.83	12.83	10.10	0	2.08	448.00	71.40	5.91	2.36	59.80	13.20	4.60	0
	75	16.82	16.82	13.20	0	2.15	573.00	91.90	5.84	2.34	76.40	17.20	4.60	0

Dimensions		Thickn	Sectional		Weight	Distance from CG.		Moment of Inertia		Radius of Gyration		Modulus of Section		Shear Distance	
(mm)		(mm)	Area	(cm ²)		(kg/m)	C x	C y	I x	I y	r x	r y	Z x	Z y	S x
200	H	A	B	t	A	0	0	490	18.2	7.28	1.40	49.00	4.51	2.30	0
		50	50	3.2	9.263	0	0.97	490	18.2	7.28	1.40	49.00	4.51	2.30	0
		50	50	4.0	11.47	0	1.00	600	22.2	7.23	1.39	60.00	5.55	2.20	0
		50	50	4.5	12.83	0	1.03	666	24.6	7.20	1.38	66.60	6.19	2.20	0
250	H	A	B	t	A	0	0	1130	101.0	7.56	2.25	113.00	17.90	4.10	0
		75	75	6.0	19.82	0	1.87	1130	101.0	7.56	2.25	113.00	17.90	4.10	0
		50	50	4.0	13.47	0	0.88	1050	23.3	8.81	1.32	83.70	5.66	2.00	0
		50	50	4.5	15.08	0	0.91	1160	25.9	8.78	1.31	93.00	6.31	2.00	0
	75	75	6.0	22.82	17.90	0	1.66	1940	107.0	9.23	2.17	155.00	18.40	3.70	0

ตารางที่ น. 13 (ต่อ) (TIS 1228 : 2006 / JIS G3192 : 1990)