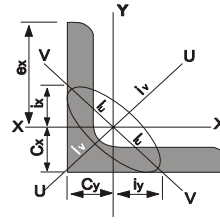
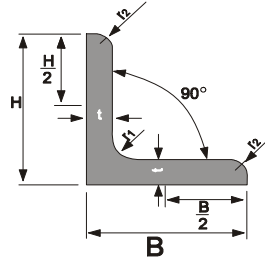
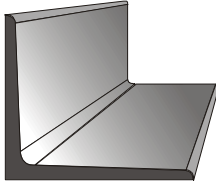


Angle Shape

Product Specifications

Hot Rolled



JIS 3192

Metric Size

Standard Sectional Dimensions				Section Area A cm ²	Unit Weight Kg/m	Center of Gravity Cx = Cy cm	Informative Reference						
H x B mm x mm	t mm	r ¹ mm	r ² mm				Geometrical Moment of Inertia			Radius of Gyration of Area			Modulus of Section Zx = Zy cm ³
				I _x = I _y cm ⁴	Max I _u cm ⁴	Min I _v cm ⁴	I _x = I _y cm	Max I _u cm	Min I _v cm				
25 x 25	3	4	2	1.427	1.12	0.719	0.797	1.26	0.332	0.747	0.94	0.48	0.448
30 x 30	3	4	2	1.727	1.36	0.844	1.42	2.26	0.59	0.908	1.14	0.58	0.661
40 x 40	3	4.5	2	2.336	1.83	1.09	3.53	5.6	1.46	1.23	1.55	0.79	1.21
40 x 40	4	4.5	2	2.336	1.83	1.09	3.53	5.6	1.46	1.23	1.55	0.79	1.21
40 x 40	5	4.5	3	3.755	2.95	1.17	5.42	8.59	2.25	1.2	1.51	0.77	1.91
45 x 45	5	6.5	3	4.302	3.38	1.28	7.91	12.5	3.29	1.36	1.71	0.87	2.46
45 x 45	4	6.5	3	3.492	2.74	1.24	6.5	10.3	2.7	1.36	1.72	0.88	2
50 x 50	4	6.5	3	3.892	3.06	1.37	9.06	14.4	3.76	1.53	1.92	0.98	2.49
50 x 50	5	6.5	3	4.802	3.77	1.41	11.1	17.5	4.58	1.52	1.91	0.98	3.08
50 x 50	6	6.5	4.5	5.644	4.43	1.44	12.6	20	5.23	1.5	1.88	0.96	3.55
60 x 60	4	6.5	3	4.692	3.68	1.61	16	25.4	6.62	1.85	2.33	1.19	3.66
60 x 60	5	6.5	3	5.802	4.55	1.66	19.6	31.2	8.09	1.84	2.32	1.18	4.52
60 x 60	6	8	4	6.91	5.4	1.7	22.79	36.16	9.42	1.82	2.29	1.17	5.28
65 x 65	5	8.5	3	6.367	5	1.77	25.3	40.1	10.5	1.99	2.51	1.28	5.35
65 x 65	6	8.5	4	7.527	5.91	1.81	29.4	46.6	12.2	1.98	2.49	1.27	6.26
65 x 65	8	8.5	6	9.761	7.66	1.88	36.8	58.3	15.3	1.94	2.44	1.25	7.96
70 x 70	6	8.5	4	8.127	6.38	1.93	37.1	58.9	15.3	2.14	2.69	1.37	7.33
75 x 75	6	8.5	4	8.727	6.85	2.06	46.1	73.2	19	2.3	2.9	1.48	8.47
75 x 75	9	8.5	6	12.69	9.96	2.17	64.4	102	26.7	2.25	2.84	1.45	21.1
75 x 75	12	8.5	6	16.56	13	2.29	81.9	129	34.5	2.22	2.79	1.44	15.7
80 x 80	6	8.5	4	9.23	7.32	2.18	56.4	89.6	23.2	2.46	3.1	1.58	9.7
90 x 90	6	10	5	10.55	8.28	2.42	80.7	128	33.4	2.77	3.48	1.78	12.3
90 x 90	7	10	5	12.22	9.59	2.46	93	148	38.3	2.76	3.48	1.77	14.2
90 x 90	10	10	7	17	13.3	2.57	125	199	51.7	2.71	3.42	1.74	19.5
90 x 90	13	10	7	21.71	17	2.69	156	248	65.3	2.68	3.38	1.73	24.8
100 x 100	7	10	5	13.62	10.7	2.71	129	205	53.2	3.08	3.88	1.98	17.7
100 x 100	13	10	7	24.31	19.1	2.94	220	348	91.1	3	3.78	1.94	31.1
100 x 100	10	10	7	19	14.9	2.82	175	278	72	3.04	3.83	1.95	24.4
120 x 120	8	12	5	18.76	14.7	3.24	258	410	106	3.71	4.67	2.38	29.5
120 x 120	11	13	6.5	25.37	19.9	3.3	340	541	140	3.66	4.62	2.35	39.36
120 x 120	12	13	6.5	27.54	21.6	3.4	367	583	151	3.65	4.6	2.35	42.68
130 x 130	9	12	6	22.74	17.9	3.53	366	583	150	4.01	5.06	2.57	38.7
130 x 130	12	12	8.5	29.76	23.4	3.64	467	743	192	3.96	5	2.54	49.9
130 x 130	15	12	8.5	36.75	28.8	3.76	568	902	234	3.93	4.95	2.53	41.6
150 x 150	12	14	7	34.77	27.3	4.14	740	1180	304	4.61	5.82	2.96	68.1
150 x 150	15	14	10	42.74	33.6	4.24	888	1410	365	4.56	5.75	2.92	82.6
150 x 150	19	14	10	53.38	41.9	4.4	1090	1730	451	4.52	5.69	2.91	103
175 x 175	12	15	11	40.52	31.8	4.73	1170	1860	480	5.38	6.78	3.44	91.8
175 x 175	15	15	11	50.21	39.4	4.85	1440	2290	589	5.35	6.75	3.48	114
200 x 200	15	17	12	57.75	45.3	5.46	2180	3470	891	6.14	7.75	3.93	150
200 x 200	20	17	12	76	59.7	5.67	2820	4490	1160	6.09	7.68	3.9	197
200 x 200	25	17	12	93.75	73.6	5.86	3420	5420	1410	6.04	7.61	3.88	242
250 x 250	25	24	12	119.4	93.7	7.1	6950	11000	2860	7.63	9.62	4.89	388
250 x 250	35	24	18	162.6	128	7.45	9110	14400	3790	7.49	9.42	4.83	519

Angle Shape

Chemical Composition

According JIS G 3101, G 3106

Symbol Of Grade	Chemical Composition					
		C	Si	Mn	P	S
SS 400, 490		-	-	-	0.050 max	0.050 max
SS 540		0.3 max	-	1.60 max	0.040 max	0.040 max
SM 400 A	50mm or under in thickness	0.23 max	-	2.5 x c min (1)	0.035 max	0.035 max
	Over 50 mm, up to and incl. 200mm in thickness	0.25 max				
SM 400 B	50mm or under in thickness	0.20 max	0.35 max	0.6 - 1.40	0.035 max	0.035 max
	Over 50 mm, up to and incl. 200mm in thickness	0.22 max				
SM 400 C	100mm or under in thickness	0.18 max	0.35 max	1.40 max	0.035 max	0.035 max
SM 490 A	50mm or under in thickness	0.20 max	0.55 max	1.60 max	0.035 max	0.035 max
	Over 50 mm, up to and incl. 200mm in thickness	0.22 max				
SM 490 B	50mm or under in thickness	0.18 max	0.55 max	1.60 max	0.035 max	0.035 max
	Over 50 mm, up to and incl. 200mm in thickness	0.20 max				
SM 490 C	100mm or under in thickness	0.18 max	0.55 max	1.60 max	0.035 max	0.035 max
SM 490 YA SM 490 YB	100mm or under in thickness	0.20 max	0.55 max	1.60 max	0.035 max	0.035 max
SM 520 B SM 520 C	100mm or under in thickness	0.20 max	0.55 max	1.60 max	0.035 max	0.035 max
SM 570	100mm or under in thickness	0.18 max	0.55 max	1.60 max	0.035 max	0.035 max

Angle Shape

Corresponding Specification

Metric Size

Type of Material	Classified By Tensile Strength		Specifications			
	Tensile Strength Class (N/mm ²)	Special Specification	JIS	ASTM	BS 4360	DIN
General Structure	400	-	G 3101 SS 400	A 36	Gr. 43 A	St 33
	490	-	G 3101 SS 490	-	Gr. 50 A	St 50-2
Welded Structure	400	-	G 3106 SM 400 A	A 572 Gr. 42	Gr. 43 B	-
		Charpy impact test	G 3106 SM 400 B, C	-	Gr. 43 C	St 37-2 RSt 37-2
		Charpy impact test for low temperature	-	-	Gr. 43 D	-
	490	-	G 3106 SM 490 A	-	Gr. 43 DD	-
		Charpy impact test	G 3106 SM 490 B, C	-	-	-
	490 (High Yield Point)	-	G 3106 SM 490 YA	A 572 Gr. 42	Gr. 50 B	-
		Charpy impact test	G 3106 SM 490 B, C SM 520 B, C	-	Gr. 50 C	St 52-3
		Charpy impact test for low temperature	-	-	Gr. 50 D	-

Angle Shape

Mechanical Properties

Metric Size

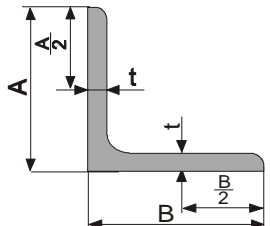
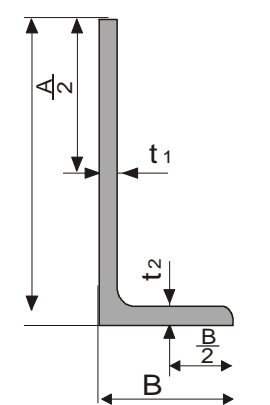

Classification	Yield Point N/mm ²		Tensile Strength N/mm ²	Elongation, %		
	Thickness (mm)			Thickness (mm)		
	16 or under	over 16		5 or under	5 to 16	over 16
JIS G 3101 SS400	245	235	400 - 510	21	17	21
JIS G 3101 SS540	400	390	min 540	16	13	17
JIS G 3101 SS490	285	275	490 - 610	19	15	19
JIS G 3106 SM400 A, B, C	245	235	400 - 510	23	18	22
JIS G 3106 SM490 A, B, C	325	315	490 - 610	22	17	21
JIS G 3106 SM490 YA, YB	365	355	490 - 610	19	15	19
JIS G 3106 SM520 B, C	365	355	520 - 640	19	15	19
JIS G 3106 SM570	460	450	570 - 720	19	19	26

Angle Shape

Dimensional Tolerance

JIS G3192/ TIS 1227-194

Metric Size

Dimensional		Tolerance	Remark	
Leg Length (A or B)	Under 50 in depth	± 1.5	 	
	50 or over to and excl. 100	± 2.0		
	100 or over to and excl. 200	± 3.0		
	200 or over	± 4.0		
Thickness t_1, t_2	For Leg Length A (B for T Section) or under 130 in depth	Under 6.3		± 0.6
		6.3 or over to and excl.10		± 0.7
		10 or over to and excl.16		± 0.8
		16 or over		± 1.0
	For Leg Length A (B for T Section) or under 130 or over in depth	Under 6.3		± 0.7
		6.3 or over to and excl.10		± 0.8
		10 or over to and excl.16	± 1.0	
		16 or over to and excl.25	± 1.2	
Length	7m or under	$+ 40$ $- 0$		
	Over 7m	Add 5mm to the plus side tolerance given in the above column for every 1m. Increase in length or its fraction		
Out of Square (T)	I Section	2.0 % or under of width B		
	Sections excluding I and T sections	2.5 % or under of width of flange B (or leg length)		
Bend	I and T Sections	0.20% or under of length	To be applied to bend such as sweep and camber	
	Sections excluding I and T sections	0.30% or under of length		

Angle Shape

Table Weight

SIZE	Weight		
	Kg/m	Kg/6m	Kg/12m

Equal Angle (Hot Rolled)

L 45 x 45 x 4	2.74	16.5	33
L 50 x 50 x 4	3.06	18.5	37
L 50 x 50 x 5	3.77	22.62	45.24
L 60 x 60 x 5	4.55	27.5	55
L 60 x 60 x 6	5.42	32.5	65
L 65 x 65 x 5	5	30	60
L 65 x 65 x 6	5.91	35.5	71
L 70 x 70 x 6	6.38	38.5	77
L 70 x 70 x 7	7.38	44.5	89
L 75 x 75 x 6	6.85	41	82
L 90 x 90 x 6	8.28	49.5	99
L 90 x 90 x 7	9.6	58	115
L 90 x 90 x 8	10.8	65	130
L 90 x 90 x 9	12.2	73	146
L 90 x 90 x 10	13.3	80	160
L 90 x 90 x 13	17	102	204
L 100 x 100 x 7	10.7	64	128
L 100 x 100 x 8	12.1	73	146
L 100 x 100 x 9	13.5	81	162
L 100 x 100 x 10	14.9	89.5	179
L 100 x 100 x 12	17.8	107	214
L 100 x 100 x 13	19.1	114.6	229
L 120 x 120 x 8	14.7	88	176
L 120 x 120 x 10	18.2	109	218
L 120 x 120 x 11	19.9	119.5	239
L 120 x 120 x 12	21.6	130	260
L 130 x 130 x 9	17.9	107.5	215
L 130 x 130 x 10	19.7	118	236
L 130 x 130 x 12	23.4	140.5	281
L 150 x 150 x 10	23	138	276
L 150 x 150 x 12	27.3	164	328
L 150 x 150 x 15	33.6	202	404
L 175 x 175 x 12	31.8	191	382
L 175 x 175 x 15	39.4	236.5	473
L 180 x 180 x 14	38	228	456
L 200 x 200 x 15	45.3	272	544
L 200 x 200 x 20	59.7	358	716
L 200 x 200 x 25	73.6	442	884
L 250 x 250 x 25	93.7	562	1124
L 250 x 250 x 35	128	768	1536

Unequal Angle (Hot Rolled)

L 125 x 75 x 8	12.2	73	146
L 125 x 75 x 9	13.49	81	162
L 125 x 75 x 10	14.9	89	178
L 150 x 90 x 9	16.4	98.5	197
L 150 x 90 x 10	18.1	109	218
L 150 x 90 x 12	21.6	129.5	259