

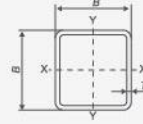
Technical Specification References

Classification	Specification	Designation of Grade	Mechanical Properties			Chemical Composition %					Bend Test		Flattening Test H
			Tensile Strength Min.	Yield Strength Min.	Elongation Min.	C	Si	Mn	P	S	Bending Angle	Bending Radius	
			N/mm ²	N/mm ²	%	Max	Max	Max	Max	Max			
Carbon Steel Tubes For Machine Structural Purposes	JIS G 3445	STKM11A	290min.	-	(N1) Test Piece No. 11 & 12 - 35min. (N1) Test Piece No. 5 - 30min.	0.12	0.60	0.035	0.04	0.04	180°	4D	1/2 D
Cold Rolled Square & Rectangular Hollow Section	APM S 001		270min.	170min.	Gauge Length Lo = 50mm - 20min.	0.20	-	1.20	0.045	0.045	-	-	-

NOTES : (N1) - Elongation values in Table above only applied to tubes over 40mm in outside diameter.
(N1) - When the tensile test is carried out on No. 12 or No. 5 test piece for the tube under 8mm in wall thickness, the minimum value elongation shall be determined by reducing 1.5% per 1mm of decrease in wall thickness from the values given in the Table above and rounding off the value obtained to integer in accordance with JIS Z 8401.

H - Distance between flat plates
D - Outside diameter of the tube
APM S 001 - Manufacturer Standard

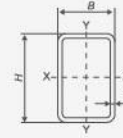
Cold Rolled Square Hollow Sections



APM S001

Nominal Size		t Wall Thickness	Calculated Weight		Sectional Area	Moment of Inertia		Section Modulus		Radius of Gyration		Plastic Modulus	
mm	in		kg/m	kg/6m		cm ²	I _x cm ⁴	I _y cm ⁴	Z _x cm ³	Z _y cm ³	i _x cm	i _y cm	S _x cm ³
12 x 12	1/2 x 1/2	0.8	0.277	1.662	0.353	0.073	0.073	0.1220	0.122	0.456	0.456	0.147	0.147
		1.0	0.339	2.034	0.431	0.087	0.087	0.144	0.144	0.448	0.448	0.177	0.177
		1.2	0.397	2.382	0.506	0.098	0.098	0.163	0.163	0.440	0.440	0.204	0.204
		1.6	0.505	3.030	0.644	0.116	0.116	0.193	0.193	0.424	0.424	0.249	0.249
16 x 16	5/8 x 5/8	0.8	0.378	2.265	0.481	0.184	0.184	0.2310	0.231	0.619	0.619	0.273	0.273
		1.0	0.464	2.784	0.591	0.221	0.221	0.276	0.276	0.611	0.611	0.331	0.331
		1.2	0.548	3.288	0.698	0.254	0.254	0.317	0.317	0.603	0.603	0.386	0.386
		1.6	0.706	4.236	0.900	0.310	0.310	0.387	0.387	0.587	0.587	0.483	0.483
19 x 19	3/4 x 3/4	0.8	0.453	2.718	0.5770	0.317	0.317	0.334	0.334	0.742	0.742	0.393	0.393
		1.0	0.559	3.354	0.711	0.383	0.383	0.403	0.403	0.733	0.733	0.479	0.479
		1.2	0.661	3.966	0.842	0.443	0.443	0.466	0.466	0.725	0.725	0.560	0.560
		1.6	0.857	5.142	1.092	0.548	0.548	0.577	0.577	0.709	0.709	0.709	0.709
20 x 20	-	1.2	0.679	4.074	0.865	0.498	0.498	0.498	0.498	0.759	0.759	0.601	0.601
		1.6	0.873	5.238	1.112	0.608	0.608	0.608	0.608	0.739	0.739	0.751	0.751
25 x 25	1 x 1	0.8	0.604	3.624	0.769	0.748	0.748	0.599	0.599	0.987	0.987	0.696	0.696
		1.0	0.747	4.482	0.951	0.910	0.910	0.728	0.728	0.978	0.978	0.854	0.854
		1.2	0.887	5.322	1.13	1.06	1.06	0.85	0.85	0.97	0.97	1.01	1.01
		1.6	1.160	6.960	1.48	1.34	1.34	1.07	1.07	0.95	0.95	1.29	1.29
30 x 30	-	1.0	0.904	5.423	1.15	1.61	1.61	1.07	1.07	1.18	1.18	1.25	1.25
		1.2	1.080	6.480	1.37	1.89	1.89	1.26	1.26	1.17	1.17	1.48	1.48
		1.6	1.410	8.460	1.80	2.40	2.40	1.60	1.60	1.16	1.16	1.91	1.91
32 x 32	1 1/4 x 1 1/4	1.0	0.967	5.800	1.23	1.97	1.97	1.23	1.23	1.26	1.26	1.43	1.43
		1.2	1.150	6.900	1.47	2.31	2.31	1.44	1.44	1.26	1.26	1.69	1.69
		1.6	1.510	9.060	1.92	2.95	2.95	1.84	1.84	1.24	1.24	2.19	2.19
35 x 35	-	1.0	1.047	6.282	1.33	2.55	2.55	1.45	1.45	1.38	1.38	1.69	1.69
		1.2	1.245	7.470	1.59	2.98	2.98	1.70	1.70	1.37	1.37	1.99	1.99
		1.6	1.626	9.756	2.07	3.79	3.79	2.17	2.17	1.35	1.35	2.57	2.57
38 x 38	1 1/2 x 1 1/2	1.0	1.155	6.930	1.47	3.35	3.35	1.76	1.76	1.51	1.51	2.04	2.04
		1.2	1.380	8.280	1.75	3.95	3.95	2.08	2.08	1.50	1.50	2.42	2.42
		1.6	1.810	10.860	2.31	5.08	5.08	2.67	2.67	1.48	1.48	3.14	3.14
40 x 40	-	1.2	1.430	8.580	1.83	4.54	4.54	2.27	2.27	1.54	1.54	2.72	2.72
		1.6	1.880	11.280	2.39	5.79	5.79	2.90	2.90	1.56	1.56	3.41	3.41
50 x 50	2 x 2	1.2	1.810	10.860	2.31	9.08	9.08	3.63	3.63	1.98	1.98	4.20	4.20
		1.6	2.410	14.460	3.08	12.0	12.0	4.79	4.79	1.97	1.97	5.57	5.57

Cold Rolled Rectangular Hollow Sections



APM S001

Nominal Size		t Wall Thickness	Calculated Weight		Sectional Area	Moment of Inertia		Section Modulus		Radius of Gyration		Plastic Modulus	
						I _x	I _y	Z _x	Z _y	i _x	i _y	S _x	S _y
mm	in	mm	kg/m	kg/6m	cm ²	cm ⁴	cm ⁴	cm ³	cm ³	cm	cm	cm ³	cm ³
25 x 12	1 x 1/2	0.8	0.440	2.409	0.561	0.444	0.139	0.355	0.231	0.889	0.497	0.445	0.264
		1.0	0.543	3.257	0.691	0.536	0.165	0.429	0.276	0.880	0.489	0.553	0.325
		1.2	0.642	3.853	0.818	0.621	0.189	0.496	0.316	0.871	0.481	0.649	0.379
		1.6	0.832	4.991	1.060	0.770	0.229	0.616	0.382	0.853	0.465	0.829	0.478
38 x 19	1 1/2 x 3/4	1.0	0.857	5.141	1.091	2.050	0.691	1.080	0.727	1.370	0.796	1.350	0.829
		1.2	1.020	6.114	1.298	2.400	0.804	1.260	0.847	1.360	0.787	1.600	0.977
		1.6	1.330	8.005	1.700	3.060	1.010	1.610	1.060	1.340	0.771	2.080	1.260
38 x 25	1 1/2 x 1	1.0	0.951	5.706	1.21	2.46	1.28	1.29	1.03	1.42	1.03	1.57	1.18
		1.2	1.130	6.792	1.44	2.89	1.50	1.52	1.20	1.42	1.02	1.86	1.39
		1.6	1.490	8.910	1.89	3.70	1.91	1.95	1.53	1.40	1.01	2.42	1.80
50 x 25	2 x 1	0.8	0.918	4.293	1.17	3.90	1.33	1.56	1.07	1.83	1.07	1.91	1.18
		1.0	1.140	6.836	1.45	4.79	1.63	1.92	1.30	1.82	1.06	2.38	1.46
		1.2	1.360	8.148	1.73	5.65	1.91	2.26	1.53	1.81	1.05	2.82	1.73
		1.6	1.790	10.718	2.28	7.29	2.44	2.91	1.95	1.79	1.03	3.69	2.25
65 x 35	2 1/2 x 1 3/8	1.2	1.810	8.148	2.31	13.07	5.04	4.02	2.88	2.38	1.48	4.91	3.21
		1.6	2.380	14.280	3.03	16.87	6.47	5.19	3.70	2.36	1.46	6.39	4.17
65 x 38	2 1/2 x 1 1/2	1.2	1.866	11.196	2.38	13.80	6.06	4.25	3.19	2.41	1.60	5.14	3.56
		1.6	2.490	14.938	3.17	18.30	7.94	5.63	4.18	2.40	1.58	6.91	4.75
75 x 25	3 x 1	1.2	1.810	6.836	2.31	15.31	2.73	4.08	2.18	2.58	1.09	5.24	2.40
		1.6	2.380	14.279	3.03	20.10	3.51	5.35	2.81	2.55	1.07	7.12	3.21
75 x 38	3 x 1 1/2	1.2	2.055	6.836	2.62	19.56	6.87	5.22	3.61	2.73	1.62	6.39	4.00
		1.6	2.710	16.239	3.45	25.30	8.85	6.76	4.66	2.71	1.60	8.59	5.34