

MARYLAND METRICS P.O. Box 261 Owings Mills, MD 21117 USA

The one-stop source for all your METRIC METALS needs!

phones: (410)358-3130 (800)638-1830 faxes: (410)358-3142 (800)872-9329

web: <http://mdmetric.com> email: [sales@mdmetric.com](mailto:sales@mdmetric.com) RFQ form: <http://mdmetric.com/rfq.htm>

# ***METRIC SIZED METALS***

A WIDE RANGE OF METRIC SIZED METALS ARE AVAILABLE.  
PLEASE CALL, FAX, EMAIL OR WRITE FOR PRICE & AVAILABILITY

## ***SHAPES***



ROUND



ANGLE



HEXAGON



CHANNEL



THREADED



STRUCTURAL



FLAT



PLATE  
AND STRIP



SQUARE



PROFILE

## ***TUBING & PIPE***



ROUND



SQUARE



RECTANGULAR



HEXAGON

MATERIALS: CARBON STEEL, ALLOY STEEL, STAINLESS STEEL,  
TOOL STEEL, BRASS, BRONZE, ALUMINUM, PLASTIC + MANY OTHERS

ALSO AVAILABLE ARE:

KEYSTOCK, SHIM STOCK, HARDENED BEARING (60 case) SHAFTING,  
INDUCTION HARDENED HYDRAULIC CYLINDER SHAFTING, DRILL ROD

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Metric Cold Rolled Sheets

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Metric Galvanized Sheets  
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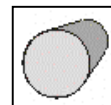
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Note that all of the listed metal materials are not available for each of the listed sizes. Please inquire for a specific size/material availability.

**Metric Cold Finished Rounds**



CARBON STEEL BS970, DIN 175, DIN 671, EN 10278, ISO h6, h7, h8, h9, h10, h11, 1018, 1018 TG&P, 1045, 1045 TG&P, 1045 IH

1060 IH, 1117, 1141, 1144 S.P., TG&P, 12L14, 12L14 TG&P, 1215, ASTM A-311 CLASS B, ASTM A-108, ASTM A-30

ALLOY STEEL 4140 H.T., TG&P, 4140 Annealed, 4 1L40, 4340 H.T., TG&P, A 193-B7, ASTM A-29

TOOL STEEL 0-1, A-2

COPPER (E-Cu57) 110 99.9%Cu (Multiply weights below by 1.1440)

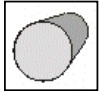
STAINLESS STEEL 303, 304, 304L, 316L, 416, 440C, 17-4PH - in G&P and TG&P, Nickel Alloys ASTM A-276, A-582, A-564

ALUMINUM 6060 T-6 (Extruded), EN573-3, EN755-3 (Multiply weights below by 0.3462)

BRASS CDA 360 (CuZn39Pb3), EN12165 (Mult. wgts. below by 1.084)

DIAMETER mm	DIAMETER Inches	EST. LBS. PER FT.	EST. kg/m	DIAMETER mm	DIAMETER Inches	EST. LBS. PER FT.	EST. kg/m	DIAMETER mm	DIAMETER Inches	EST. LBS. PER FT.	EST. kg/m
1	0.0394	0.004	0.006	26	1.0236	2.80	4.165	64	2.5197	16.96	25.235
1.5	0.0591	0.009	0.013	27	1.063	3.02	4.491	65	2.5591	17.49	26.031
2	0.0787	0.017	0.025	28	1.1024	3.25	4.831	70	2.7559	20.29	30.189
2.5	0.0984	0.026	0.039	29	1.1417	3.48	5.182	75	2.9528	23.29	34.656
3	0.1181	0.037	0.055	30	1.1811	3.73	5.545	80	3.1496	26.50	39.430
3.5	0.1378	0.051	0.076	31	1.2205	3.98	5.921	85	3.3465	29.91	44.514
4	0.1575	0.066	0.098	32	1.2598	4.24	6.308	90	3.5433	33.53	49.904
4.5	0.1772	0.084	0.125	33	1.2992	4.51	6.709	95	3.7402	37.36	55.604
5	0.1969	0.104	0.155	34	1.3386	4.79	7.122	100	3.937	41.40	61.610
5.5	0.2165	0.125	0.186	35	1.378	5.07	7.548	105	4.1339	45.64	67.926
6	0.2362	0.149	0.222	36	1.4173	5.37	7.984	110	4.3307	50.09	74.548
6.5	0.2559	0.175	0.260	37	1.4567	5.67	8.435	115	4.5276	54.75	81.480
7	0.2756	0.203	0.302	38	1.4961	5.98	8.896	120	4.7244	59.62	88.718
7.5	0.2953	0.233	0.347	39	1.5354	6.30	9.371	125	4.9213	64.69	96.266
8	0.315	0.265	0.394	40	1.5748	6.62	9.858	130	5.1181	69.97	104.121
8.5	0.3346	0.299	0.445	41	1.6142	6.96	10.356	135	5.315	75.45	112.285
9	0.3543	0.335	0.499	42	1.6535	7.30	10.868	140	5.5118	81.14	120.756
9.5	0.374	0.373	0.555	43	1.6929	7.66	11.392	145	5.7087	87.04	129.536
10	0.3937	0.414	0.616	44	1.7323	8.02	11.928	150	5.9055	93.15	138.622
11	0.4331	0.501	0.746	45	1.7717	8.38	12.477	155	6.1024	99.46	148.019
12	0.4724	0.596	0.887	46	1.811	8.76	13.036	160	6.2992	105.98	157.722
12.5	0.4921	0.647	0.963	47	1.8504	9.15	13.609	165	6.4961	112.71	167.734
13	0.5118	0.700	1.042	48	1.8898	9.54	14.196	170	6.6929	119.65	178.053
14	0.5512	0.811	1.207	49	1.9291	9.94	14.792	175	6.8898	126.79	188.681
15	0.5906	0.932	1.387	50	1.9685	10.35	15.402	180	7.0866	134.14	199.616
16	0.6299	1.06	1.577	51	2.0079	10.77	16.025	185	7.2835	141.69	210.861
17	0.6693	1.20	1.780	52	2.0472	11.20	16.660	190	7.4803	149.45	222.412
18	0.7087	1.34	1.996	53	2.0866	11.63	17.306	195	7.6772	157.42	234.273
19	0.748	1.50	2.225	54	2.126	12.07	17.965	200	7.874	165.60	246.440
20	0.7874	1.66	2.464	55	2.1654	12.52	18.638	220	8.6614	200.30	298.084
21	0.8268	1.83	2.717	56	2.2047	12.98	19.321	250	9.8425	258.75	385.062
22	0.8661	2.00	2.982	58	2.2835	13.93	20.726				
23	0.9055	2.19	3.259	60	2.3622	14.90	22.180				
24	0.9449	2.39	3.549	62	2.4409	15.91	23.683				
25	0.9843	2.59	3.851	63	2.4803	16.43	24.454				

(Note: Not all sizes are available for all of the listed materials)

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CARBON STEEL (Please see other pages for Induction Hardened Shafting specifications and other pages for Hard Chrome Plated Shafting Specifications.)

1045/1050 C.P., 1045/1050 IHCP, 1050/1060 IHCP, 1141 C.P., 1144 C.P., ASTM A-108, A-311, UNI C45/C50, EN 10278

ALLOY STEEL 4140 H.T., SR., Q.T., 42CrMo4, A-193 B7, ASTM A-29 (106,000 min. yield)

STAINLESS STEEL 303, 416, ASTM A-582, 304, A-276, 17-4PH, A-564

DIAMETER mm	DIAMETER Inches	EST. LBS. PER FT.	EST. kg/m	DIAMETER mm	DIAMETER Inches	EST. LBS. PER FT.	EST. kg/m	DIAMETER mm	DIAMETER Inches	EST. LBS. PER FT.	EST. kg/m
6	0.2362	0.149	0.222	36	1.4173	5.365	7.984	105	4.1339	45.644	67.926
8	0.315	0.265	0.394	38	1.4961	5.978	8.896	110	4.3307	50.094	74.548
10	0.3937	0.414	0.616	40	1.5748	6.624	9.858	115	4.5276	54.752	81.480
12	0.4724	0.596	0.887	45	1.7717	8.384	12.477	120	4.7244	59.616	88.718
14	0.5512	0.811	1.207	50	1.9685	10.35	15.402	125	4.9213	64.688	96.266
15	0.5906	0.932	1.387	55	2.1654	12.524	18.638	130	5.1181	69.966	104.121
16	0.6299	1.06	1.577	56	2.2047	12.983	19.321	140	5.5118	81.144	120.756
17	0.6693	1.196	1.780	60	2.3622	14.904	22.180	150	5.9055	93.15	138.622
18	0.7087	1.341	1.996	63	2.4803	16.432	24.454	160	6.2992	105.984	157.722
20	0.7874	1.656	2.464	65	2.5591	17.492	26.031	170	6.6929	119.646	178.053
22	0.8661	2.004	2.982	70	2.7559	20.286	30.189	180	7.0866	134.136	199.616
24	0.9449	2.385	3.549	75	2.9528	23.288	34.656	190	7.4803	149.454	222.412
25	0.9843	2.588	3.851	80	3.1496	26.496	39.430	200	7.874	165.6	246.440
28	1.1024	3.246	4.831	85	3.3465	29.912	44.514	220	8.6614	200.303	298.084
30	1.1811	3.726	5.545	90	3.5433	33.534	49.904	250	9.8425	258.75	385.062
32	1.2598	4.239	6.308	95	3.7402	37.364	55.604				
35	1.378	5.072	7.548	100	3.937	41.4	61.610				

(Note: Not all sizes are available for all of the listed materials)

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0.0003"=0.008mm 0.0005"=0.013mm 0.001"=0.025mm

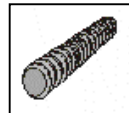
NOMINAL DIAMETER	mm	2	3	4	5	6	7	8	9	10
	inch	0.0787	0.1181	0.1575	0.1969	0.2362	0.2756	0.315	0.3543	0.3937
WEIGHT/FT	lbs	0.0166	0.0373	0.0662	0.1035	0.149	0.2029	0.265	0.3353	0.414

NOMINAL DIAMETER	mm	11	12	13	14	15	16	17	18	19	20
	inch	0.4331	0.4724	0.5118	0.5512	0.5906	0.6299	0.6693	0.7087	0.748	0.7874
WEIGHT/FT	lbs	0.5009	0.5962	0.6997	0.8114	0.9315	1.0598	1.1965	1.3414	1.4945	1.656

NOMINAL DIAMETER	mm	22	23	24	25	30	32	35	40	45	50
	inch	0.8661	0.9055	0.9449	0.9843	1.1811	1.2598	1.378	1.5748	1.7717	1.9685
WEIGHT/FT	lbs	2.0038	2.1901	2.3846	2.5875	3.726	4.2394	5.0715	6.624	8.3835	10.35

(Note: Not all sizes are available for all of the listed materials)

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CARBON STEEL DIN 975, Steel - Property Class 4.6, Low Carbon, Zinc Plated, Trapezoidal / Acme, Right Handed, Coarse Threads, Commercial Nut Fit. Left handed is available upon request.

ALLOY STEEL A 193-B7, 4140, ASTM A-29

STAINLESS STEEL 304, 316, 17-4PH, ASTM A-276, ASTM A-564

THREAD	mm	M4	M5	M6	M7	M8	M8	M10	M10	M12	M12
DIAMETER	inch	0.157	0.197	0.236	0.276	0.315	0.315	0.315	0.394	0.472	0.472
PITCH	mm	0.7	0.8	1	1	1	1.25	1.25	1.5	1.25	1.75

THREAD	mm	M14	M16	M16	M18	M20	M20	M22	M24	M27	M30
DIAMETER	inch	0.551	0.63	0.63	0.709	0.787	0.787	0.866	0.945	1.063	1.181
PITCH	mm	2	1.5	2	2.5	1.5	2.5	2.5	3	3	3.5

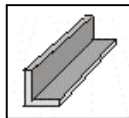
THREAD	mm	M33	M36	M39	M42	M45	M48	M52	M56	M60	M64
DIAMETER	inch	1.299	1.417	1.535	1.654	1.772	1.89	2.047	2.205	2.362	2.52
PITCH	mm	3.5	4	4	4.5	4.5	5	5	5.5	5.5	6

(Note: Not all sizes are available for all of the listed materials)

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web: <http://mdmetric.com> email: [sales@mdmetric.com](mailto:sales@mdmetric.com)**Metric Cold Drawn Equal Angles**

CARBON STEEL 1008/1018, S235JrG2C, St37-2 TO DIN 1652/17100.

Tolerances to DIN 59370, EN 10277, BS 971

STAINLESS STEEL 304, ASTM A-276, EN 10088-1

SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT
10 x 10 x 2	0.19	25 x 25 x 4	0.97	35 x 35 x 6	1.78	50 x 50 x 4	2.06
12 x 12 x 2	0.24	5	1.19	40 x 40 x 2	0.83	5	2.51
3	0.33	6	1.50	3	1.22	6	2.98
15 x 15 x 2	0.30	30 x 30 x 2	0.61	4	1.61	7	3.47
3	0.43	3	0.90	5	1.98	60 x 60 x 5	3.03
4	0.55	4	1.18	6	2.34	6	3.63
20 x 20 x 2	0.40	5	1.45	45 x 45 x 2	0.91	65 x 65 x 6	3.98
3	0.58	32 x 32 x 4	1.26	3	1.37	75 x 75 x 9	6.70
4	0.76	6	1.94	4	1.82	12	8.75
5	0.92	35 x 35 x 3	1.06	5	2.27	90 x 90 x 13	11.44
25 x 25 x 2	0.50	4	1.39	6	2.72	100 x 100 x 7	7.20
3	0.75	5	1.71	50 x 50 x 3	1.55	13	12.85

(Note: Not all sizes are available for all of the listed materials)

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**Metric Cold Drawn Flats & Key Stock**



CARBON STEEL 1008/1015, 1008/1018, 1015, 1018, 1040, 1045, 1045 Key Stock, 12L14, 1215, ASTM A-29, ASTM A-108, DIN 178 Squares, DIN 6880 Key Stock, BS970, EN 10279
ALLOY STEEL 4140, ASTM A-29
TOOL STEEL 0-1 (Ground Stock) ASTM A-681
STAINLESS STEEL 303, 304, 316, 316L, 316Ti, AMS 5640 TYPE 1, ASTM A582, ASTM A-276
ALUMINUM 6060 T-6 (Extruded), EN 754-5, EN 755-5 (Multiply Weights Below by 0.3462)
BRASS CDA 360, CuZn39Pb3, EN12165 (Multiply Weights Below by 1.084)

WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.
2	2	0.02	10	1.5	0.08	14	7	0.52	16	10	0.84	20	15	1.58
3	3	0.05	10	2	0.11	14	8	0.60	16	12	1.01	20	16	1.69
4	3	0.06	10	3	0.16	14	9	0.66	16	16	1.35	20	18	1.90
4	4	0.08	10	4	0.21	14	10	0.74	16	2	0.19	20	20	2.11
5	3	0.08	10	5	0.26	14	12	0.88	16	3	0.28	22	3	0.35
5	4	0.11	10	6	0.32	14	14	1.03	16	4	0.38	22	4	0.46
5	5	0.13	10	7	0.37	15	1	0.08	18	5	0.47	22	5	0.50
6	2	0.06	10	8	0.42	15	1.5	0.12	18	6	0.57	22	6	0.78
6	3	0.09	10	10	0.53	15	2	0.16	18	7	0.66	22	7	0.81
6	4	0.13	11	11	0.64	15	3	0.24	18	8	0.76	22	8	0.93
6	5	0.16	12	2	0.13	15	4	0.32	18	10	0.95	22	10	1.16
6	6	0.19	12	3	0.19	15	5	0.40	18	11	1.04	22	12	1.39
7	3	0.11	12	4	0.25	15	6	0.47	18	12	1.14	22	14	1.62
7	4	0.15	12	5	0.32	15	7	0.55	18	18	1.71	22	15	1.74
7	5	0.18	12	6	0.38	15	8	0.63	20	1	0.11	22	16	1.86
7	7	0.26	12	7	0.44	15	10	0.79	20	1.5	0.16	22	20	2.32
8	2	0.08	12	8	0.51	15	12	0.95	20	2	0.21	22	22	2.55
8	3	0.13	12	10	0.62	15	15	1.19	20	3	0.32	24	14	1.77
8	4	0.17	12	12	0.76	16	2	0.17	20	4	0.42	25	1	0.13
8	5	0.21	13	13	0.89	16	3	0.25	20	5	0.53	25	1.5	0.20
8	6	0.25	14	2	0.15	16	4	0.34	20	6	0.63	25	2	0.26
8	7	0.30	14	3	0.22	16	5	0.42	20	7	0.74	25	3	0.40
8	8	0.34	14	4	0.30	16	6	0.51	20	8	0.84	25	4	0.53
9	9	0.43	14	5	0.37	16	7	0.59	20	10	1.05	25	5	0.66
10	1	0.06	14	6	0.44	16	8	0.67	20	12	1.26	25	6	0.79

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WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.
25	7	0.92	35	3	0.56	45	7	1.66	55	15	4.35	65	30	10.28
25	8	1.05	35	4	0.74	45	8	1.90	55	16	4.64	65	35	11.99
25	10	1.32	35	5	0.92	45	10	2.37	55	20	5.80	65	40	13.70
25	12	1.58	35	6	1.11	45	12	2.85	55	25	7.25	65	50	17.13
25	14	1.84	35	7	1.29	45	15	3.56	55	30	8.70	65	65	22.27
25	15	1.98	35	8	1.48	45	16	3.79	55	35	10.15	70	2	0.74
25	16	2.11	35	10	1.84	45	20	4.74	55	40	11.59	70	3	1.11
25	18	2.37	35	12	2.22	45	25	5.93	55	55	15.94	70	4	1.48
25	20	2.64	35	15	2.77	45	30	7.11	56	32	9.46	70	5	1.84
25	25	3.29	35	16	2.95	45	35	8.30	60	3	0.95	70	6	2.21
26	16	2.19	35	18	3.32	45	40	9.49	60	4	1.26	70	7	2.58
26	20	2.74	35	20	3.69	45	45	10.67	60	5	1.58	70	8	2.96
28	16	2.36	35	25	4.61	50	2	0.52	60	6	1.90	70	10	3.69
30	2	0.32	35	30	5.53	50	3	0.79	60	7	2.21	70	12	4.43
30	3	0.47	35	35	6.46	50	4	1.05	60	8	2.53	70	15	5.53
30	4	0.63	36	1	0.19	50	5	1.32	60	10	3.16	70	16	5.90
30	5	0.79	36	2	0.38	50	6	1.58	60	12	3.79	70	20	7.38
30	6	0.95	36	20	3.79	50	7	1.84	60	15	4.74	70	25	9.22
30	7	1.11	40	2	0.42	50	8	2.11	60	16	5.06	70	30	11.07
30	8	1.26	40	3	0.63	50	10	2.64	60	18	5.69	70	35	12.91
30	10	1.58	40	4	0.85	50	12	3.16	60	20	6.32	70	36	13.36
30	12	1.90	40	5	1.05	50	15	3.95	60	22	6.96	70	40	14.76
30	15	2.37	40	6	1.26	50	16	4.22	60	25	7.91	70	50	18.45
30	16	2.53	40	7	1.48	50	18	4.74	60	30	9.49	70	60	22.13
30	18	2.85	40	8	1.69	50	20	5.27	60	35	11.07	70	70	25.82
30	20	3.16	40	10	2.11	50	25	6.59	60	40	12.65	75	5	1.98
30	25	3.95	40	12	2.53	50	28	7.38	60	50	15.81	75	6	2.37
30	30	4.74	40	15	3.16	50	30	7.91	60	60	18.97	75	8	3.16
32	3	0.51	40	16	3.37	50	35	9.22	63	32	10.68	75	10	3.95
32	4	0.67	40	20	4.22	50	40	10.54	65	3	1.03	75	12	4.74
32	5	0.84	40	22	4.64	50	50	13.18	65	4	1.37	75	15	5.93
32	6	1.01	40	25	5.27	55	2.5	0.73	65	5	1.71	75	16	6.32
32	8	1.35	40	30	6.32	55	3	0.87	65	6	2.06	75	20	7.91
32	10	1.69	40	35	7.38	55	4	1.16	65	8	2.74	75	25	9.88
32	12	2.02	40	40	8.43	55	5	1.45	65	10	3.43	75	30	11.86
32	15	2.53	45	2	0.48	55	6	1.74	65	12	4.11	75	35	13.83
32	16	2.70	45	3	0.71	55	7	2.03	65	15	5.14	75	40	15.81
32	18	3.04	45	4	0.95	55	8	2.32	65	16	5.48	75	50	19.76
32	20	3.37	45	5	1.19	55	10	2.90	65	20	6.85	75	75	29.64
32	25	4.22	45	6	1.42	55	12	3.48	65	25	8.56	80	3	1.26

- continued on next page -

WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.
80	4	1.69	100	20	10.54	125	25	16.47	160	10	8.43	250	50	65.88
80	5	2.11	100	25	13.16	125	30	19.76	160	12	10.12	250	60	79.05
80	6	2.53	100	30	15.81	125	40	26.35	160	15	12.65	300	10	15.81
80	7	2.95	100	35	18.45	125	50	32.94	160	16	13.49	300	12	18.97
80	8	3.37	100	40	21.08	130	6	4.11	160	20	16.86	300	15	23.72
80	10	4.22	100	50	26.35	130	8	5.48	160	25	21.08	300	20	31.62
80	12	5.06	100	60	31.62	130	10	6.85	160	30	25.30	300	25	39.53
80	15	6.32	100	65	34.26	130	12	8.22	160	40	33.73	300	30	47.43
80	16	6.75	100	75	39.53	130	15	10.28	160	45	37.94	300	40	63.24
80	20	8.43	110	5	2.90	130	16	10.96	160	50	42.16	350	10	18.45
80	25	10.54	110	6	3.48	130	20	13.70	160	60	50.59	350	12	22.13
80	30	12.65	110	8	4.64	130	25	17.13	180	8	7.59	350	15	27.67
80	35	14.76	110	10	5.80	130	30	20.55	180	10	9.49	350	20	36.89
80	40	16.86	110	12	6.96	130	40	27.40	180	12	11.38	350	25	46.11
80	50	21.08	110	15	8.69	130	50	34.26	180	15	14.23	350	30	55.34
80	60	25.30	110	16	9.28	130	60	41.11	180	16	15.18	350	40	73.78
80	80	33.73	110	20	11.59	140	6	4.43	180	20	18.97	350	50	92.23
85	10	4.48	110	25	14.49	140	10	7.38	180	25	23.72	350	60	110.67
85	20	8.96	110	30	17.39	140	12	8.85	180	30	28.46	400	8	16.86
90	5	2.37	110	40	23.19	140	15	11.07	180	40	37.94	400	10	21.08
90	6	2.85	110	50	28.99	140	20	14.76	180	50	47.43	400	12	25.30
90	8	3.79	110	60	34.78	140	25	18.45	180	60	56.92	400	15	31.62
90	10	4.74	120	5	3.16	140	30	22.13	180	75	71.15	400	20	42.16
90	12	5.69	120	6	3.79	140	40	29.51	200	7	7.38	400	50	105.40
90	15	7.12	120	8	5.06	140	50	36.89	200	8	8.43	400	60	126.48
90	16	7.59	120	10	6.32	14								

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**Metric Cold Drawn Hexagons**



CARBON STEEL 1018, 1035, 1040, 1045, 1117, 1137, 1140,1144, 1144 S.P., 12L14, 1215, ASTM A-311 Class B,  
 ASTM A-108, ASTM A-29, DIN 176, EN 10278, BS971  
 ALLOY STEEL 4140 Annealed, 8650 Annealed, ASTM A-29  
 STAINLESS STEEL 303, 304, 304L, 316, 316L, 316TI, 416, ASTM A-276, A-582  
 BRASS CDA360, CuZn39Pb3, EN12165 (Multiply Weights Below by 1.084)

DIAMETER mm	DIAMETER Inches	EST. LBS. PER FT.	EST. kg/m	DIAMETER mm	DIAMETER Inches	EST. LBS. PER FT.	EST. kg/m	DIAMETER mm	DIAMETER Inches	EST. LBS. PER FT.	EST. kg/m
2	0.0787	0.018	0.027	20	0.7874	1.828	2.720	42	1.6535	8.061	11.996
2.5	0.0984	0.029	0.043	21	0.8268	2.015	2.999	43	1.6929	8.45	12.575
3	0.1181	0.041	0.061	22	0.8661	2.212	3.292	44	1.7323	8.848	13.167
3.5	0.1378	0.056	0.083	23	0.9055	2.418	3.598	45	1.7717	9.254	13.771
4	0.1575	0.073	0.109	24	0.9449	2.632	3.917	46	1.811	9.67	14.391
4.5	0.1772	0.093	0.138	25	0.9843	2.856	4.250	47	1.8504	10.095	15.023
5	0.1969	0.114	0.170	26	1.0236	3.089	4.597	48	1.8898	10.529	15.669
5.5	0.2165	0.138	0.205	27	1.063	3.332	4.959	49	1.9291	10.973	16.330
6	0.2362	0.165	0.246	28	1.1024	3.583	5.332	50	1.9685	11.425	17.002
7	0.2756	0.224	0.333	29	1.1417	3.843	5.719	52	2.0472	12.357	18.389
8	0.315	0.292	0.435	30	1.1811	4.113	6.121	54	2.126	13.326	19.831
9	0.3543	0.37	0.551	31	1.2205	4.392	6.536	55	2.1654	13.824	20.572
10	0.3937	0.457	0.680	32	1.2598	4.68	6.965	56	2.2047	14.332	21.328
11	0.4331	0.553	0.823	33	1.2992	4.977	7.407	58	2.2835	15.373	22.878
12	0.4724	0.658	0.979	34	1.3386	5.283	7.862	60	2.3622	16.452	24.483
13	0.5118	0.772	1.149	35	1.378	5.598	8.331	65	2.5591	19.308	28.733
14	0.5512	0.896	1.333	36	1.4173	5.923	8.814	70	2.7559	22.393	33.324
15	0.5906	1.028	1.530	37	1.4567	6.256	9.310	75	2.9528	25.706	38.255
16	0.6299	1.17	1.741	38	1.4961	6.599	9.820	80	3.1496	29.248	43.526
17	0.6693	1.321	1.966	39	1.5354	6.951	10.344	85	3.3464	33.018	49.136
18	0.7087	1.481	2.204	40	1.5748	7.312	10.881	90	3.5433	37.02	55.092
19	0.748	1.65	2.455	41	1.6142	7.682	11.432	100	3.937	45.7	68.009

(Note: Not all sizes are available for all of the listed materials)

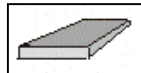
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**Metric Cold Drawn Shim Stock**



CARBON STEEL 1010, St37, ASTM A-109

STAINLESS STEEL 304, ASTM A-276

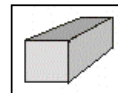
BRASS (Multiply Weights Below by 1.084)

WIDTH mm	THICKNESS mm	WEIGHT FT	WIDTH mm	THICKNESS mm	WEIGHT FT	WIDTH mm	THICKNESS mm	WEIGHT FT
0.05	150	0.03952	0.25	150	0.19762	0.65	150	0.51382
0.1	150	0.07905	0.3	150	0.23715	0.8	150	0.6324
0.15	150	0.11857	0.4	150	0.3162	1	36	0.18972
0.2	150	0.1581	0.5	150	0.39525	2	36	0.37944

(Note: Not all sizes are available for all of the listed materials)

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**Metric Cold Drawn Squares & Key Stock**



CARBON STEEL 1008/1015, 1008/1018, 1015, 1018, 1040, 1045, 1045 Key Stock, 12L14, 1215, ASTM A-29, ASTM A-108, DIN 178 Squares, DIN 6880 Key Stock, BS970, EN 10279  
 ALLOY STEEL 4140, 42CrMo, SCM440, ASTM A-29  
 TOOL STEEL 0-1 (Ground Stock) ASTM A-681  
 STAINLESS STEEL 303, 304, 316, 316L, 316Ti, AMS 5640 TYPE 1, ASTM A582, ASTM A-276 Free Machining Under 1/2" or 12MM  
 ALUMINUM 6060 T-6 (Extruded), EN 754-6 (Multiply Weights Below by 0.3462)  
 BRASS CDA 360, CuZn39Pb3, EN12165 (Multiply Weights Below by 1.084)

SIZE mm	SIZE Inches	EST. LBS. PER FT.	EST. kg/m	SIZE mm	SIZE Inches	EST. LBS. PER FT.	EST. kg/m	SIZE mm	SIZE Inches	EST. LBS. PER FT.	EST. kg/m
2	0.0787	0.021	0.031	21	0.8268	2.324	3.458	44	1.7323	10.203	15.184
2.5	0.0984	0.033	0.049	22	0.8661	2.551	3.796	45	1.7717	10.672	15.882
3	0.1181	0.047	0.070	23	0.9055	2.788	4.149	46	1.811	11.151	16.595
3.5	0.1378	0.065	0.097	24	0.9449	3.036	4.518	47	1.8504	11.641	17.324
4	0.1575	0.084	0.125	25	0.9843	3.294	4.902	48	1.8898	12.142	18.069
4.5	0.1772	0.107	0.159	26	1.0236	3.563	5.302	49	1.9291	12.653	18.830
5	0.1969	0.132	0.196	27	1.063	3.842	5.718	50	1.9685	13.175	19.607
5.5	0.2165	0.159	0.237	28	1.1024	4.132	6.149	52	2.0472	14.25	21.206
6	0.2362	0.19	0.283	29	1.1417	4.432	6.596	54	2.126	15.367	22.869
7	0.2756	0.258	0.384	30	1.1811	4.743	7.058	55	2.1654	15.942	23.724
8	0.315	0.337	0.502	31	1.2205	5.064	7.536	56	2.2047	16.527	24.595
9	0.3543	0.427	0.635	32	1.2598	5.396	8.030	58	2.2835	17.728	26.382
10	0.3937	0.527	0.784	33	1.2992	5.739	8.541	60	2.3622	18.972	28.233
11	0.4331	0.638	0.949	34	1.3386	6.092	9.066	65	2.5591	22.266	33.135
12	0.4724	0.759	1.130	35	1.378	6.456	9.608	70	2.7559	25.823	38.429
13	0.5118	0.891	1.326	36	1.4173	6.83	10.164	75	2.9528	29.644	44.115
14	0.5512	1.033	1.537	37	1.4567	7.215	10.737	80	3.1496	33.728	50.193
15	0.5906	1.186	1.765	38	1.4961	7.61	11.325	90	3.5433	42.69	63.530
16	0.6299	1.349	2.008	39	1.5354	8.016	11.929	100	3.937	52.7	78.426
17	0.6693	1.523	2.266	40	1.5748	8.432	12.548	110	4.3307	63.77	94.900
18	0.7087	1.707	2.540	41	1.6142	8.859	13.184	120	4.7244	75.89	112.937
19	0.748	1.902	2.830	42	1.6535	9.296	13.834				
20	0.7874	2.108	3.137	43	1.6929	9.744	14.501				

(Note: Not all sizes are available for all of the listed materials)

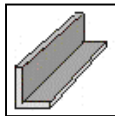
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## Metric Cold Drawn Unequal Angles



CARBON STEEL 1008/1018, S235JrG2C, St37-2 TO DIN 1652/17100.

Tolerances to DIN 59370, EN 10277, BS 970

STAINLESS STEEL 304, ASTM A-276, EN 10088-1

SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT
15 x 10 x 2	0.24	30 x 15 x 3	0.67	40 x 30 x 4	1.38	5	2.27
3	0.35	30 x 20 x 3	0.75	45 x 20 x 2	0.6	60 x 40 x 3	1.48
20 x 10 x 2	0.29	4	0.97	3	0.9	5	2.56
3	0.43	40 x 20 x 3	0.9	45 x 30 x 4	1.5	75 x 50 x 5	3.15
20 x 15 x 2	0.33	4	1.18	5	1.85	80 x 40 x 4	2.42
3	0.5	5	1.45	6	2.18	6	3.64
25 x 15 x 3	0.58	40 x 30 x 2	0.72	50 x 30 x 4	1.59	100 x 50 x 5	3.81
30 x 15 x 2	0.45	3	1.01	60 x 30 x 4	1.81	6	4.53

(Note: Not all sizes are available for all of the listed materials)

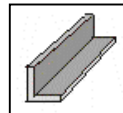
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## Metric Hot Rolled Equal Angles



CARBON STEEL 1008/1018, A-36 Modified, St37-2, St52-3, S235JrG2C, S355J2G3C, BS 4360, EN 10056-2, DIN 1028

STAINLESS STEEL 304, ASTM A-276, EN 10056

SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT
20 x 20 x 2	0.40	50 x 50 x 3	1.57	75 x 75 x 9	6.75	120 x 120 x 11	13.40
3	0.59	4	2.05	10	7.44	12	14.54
4	0.76	5	2.54	12	8.75	13	16.15
25 x 25 x 3	0.75	6	3.01	80 x 80 x 6	4.94	15	17.90
4	0.98	7	3.47	8	6.48	130 x 130 x 9	12.06
5	1.19	8	3.92	10	8.01	12	15.89
6	1.50	9	4.38	12	9.46	15	19.38
30 x 30 x 3	0.92	55 x 55 x 6	3.34	90 x 90 x 6	5.59	140 x 140 x 13	18.51
4	1.20	60 x 60 x 5	3.08	7	6.47	150 x 150 x 10	15.48
5	1.47	6	3.65	8	7.34	12	18.37
6	1.74	8	4.77	9	8.20	14	21.27
35 x 35 x 4	1.42	10	5.85	10	9.02	15	22.75
5	1.73	65 x 65 x 6	4.18	12	10.70	18	27.19
6	2.02	7	4.60	13	11.51	20	30.02
40 x 40 x 3	1.24	8	5.16	100 x 100 x 7	7.20	160 x 160 x 15	24.37
4	1.63	9	5.44	8	8.21	17	27.39
5	2.00	70 x 70 x 6	4.29	10	10.10	180 x 180 x 16	29.27
6	2.37	7	4.97	12	11.98	18	32.70
8	3.11	8	5.63	13	12.85	200 x 200 x 16	32.68
45 x 45 x 3	1.41	9	6.29	15	14.74	18	36.55
4	1.84	10	6.93	16	15.81	20	40.31
5	2.27	75 x 75 x 6	4.59	110 x 110 x 10	11.18	24	47.85
6	2.69	7	5.34	120 x 120 x 8	9.89		
8	3.11	8	6.08	10	12.25		
4	1.84	10	6.93	16	15.81	20	40.31
5	2.27	75 x 75 x 6	4.59	110 x 110 x 10	11.18	24	47.85
6	2.69	7	5.34	120 x 120 x 8	9.89		
8	3.11	8	6.08	10	12.25		

(Note: Not all sizes are available for all of the listed materials)

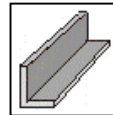
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**Metric Hot Rolled Unequal Angles**



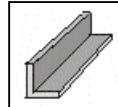
CARBON STEEL 1008/1018, A-36 Modified, St37-2, St52-3, S235JrG2C, S355J2G3C, BS 4360, EN 10056-2, DIN 1028

STAINLESS STEEL 304, ASTM A-276, EN 10056

SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT
20 x 10 x 3	0.43	65 x 65 x 9	5.06	100 x 65 x 10	8.28	150 x 75 x 11	12.52
25 x 15 x 3	0.75	70 x 50 x 6	3.63	11	9.02	12	13.59
30 x 20 x 3	0.75	7	4.38	100 x 75 x 7	6.28	150 x 90 x 9	11.04
4	0.98	75 x 50 x 6	3.74	8	7.13	10	12.25
40 x 20 x 3	0.91	7	4.38	9	7.95	12	14.54
4	1.20	8	4.97	10	8.75	15	17.90
40 x 25 x 4	1.29	9	5.54	11	9.63	150 x 100 x 9	11.86
45 x 30 x 3	1.16	10	5.99	12	10.36	10	12.79
4	1.52	75 x 55 x 5	3.33	120 x 80 x 8	8.21	12	15.21
5	1.87	7	4.58	10	10.10	14	17.57
50 x 30 x 4	1.63	9	5.78	12	11.98	160 x 80 x 10	12.25
5	2.00	80 x 40 x 6	3.64	125 x 75 x 7	7.20	12	14.54
50 x 40 x 4	1.83	8	4.76	8	8.21	180 x 90 x 10	13.86
5	2.27	80 x 60 x 6	4.29	10	10.10	12	16.48
6	2.69	7	4.96	12	11.98	200 x 100 x 10	15.48
60 x 30 x 5	2.27	8	5.61	130 x 65 x 8	8.01	12	18.37
6	2.69	80 x 65 x 8	5.82	10	9.83	14	21.30
60 x 40 x 5	2.53	10	7.20	11	10.74	15	22.68
6	3.00	90 x 60 x 6	4.59	12	11.65	200 x 150 x 12	21.54
7	3.46	8	6.03	130 x 90 x 10	11.44	16	24.17
60 x 50 x 9	5.14	100 x 50 x 6	4.61	12	13.26	250 x 90 x 10	17.92
65 x 30 x 5	2.27	8	6.06	137 x 102 x 6.4	7.89	12	21.50
65 x 50 x 5	2.93	10	7.47	7.9	9.76	14	25.08
6	3.47	100 x 65 x 7	5.90	150 x 75 x 8	9.22	16	28.66
7	4.02	8	6.69	9	10.30		
8	4.54	9	7.47	10	11.44		

(Note: Not all sizes are available for all of the listed materials)

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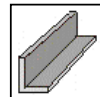
**MARYLAND METRICS P.O. Box 261 Owings Mills, MD 21117 USA***The one-stop source for all your METRIC METALS needs!*phones: (410)358-3130 (800)638-1830 faxes: (410)358-3142 (800)872-9329 web: <http://mdmetric.com> email: [sales@mdmetric.com](mailto:sales@mdmetric.com)**Metric Aluminum Equal Angles****ALUMINUM 6060 T-6; (Extruded), EN 573-3, EN 755-2, EN 755-1, EN 755-9, DIN 1725, DIN 1748, DIN 1771**

SIZE mm	EST. LBS./FT	EST. kg/m	SIZE mm	EST. LBS./FT	EST. kg/m	SIZE mm	EST. LBS./FT	EST. kg/m
10 x 10 x 2	0.10	0.07	40 x 40 x 3	0.64	0.43	60 x 60 x 8	2.46	1.66
15 x 15 x 2	0.15	0.10	4	0.84	0.56	10	3.03	2.04
3	0.22	0.15	5	1.03	0.69	70 x 70 x 2.5	0.95	0.64
20 x 20 x 1.5	0.16	0.11	45 x 45 x 2	0.48	0.33	5	1.86	1.25
2	0.21	0.14	4	0.95	0.64	6	2.21	1.49
3	0.31	0.21	5	1.17	0.79	7	2.56	1.72
4	0.40	0.27	50 x 50 x 2	0.54	0.36	80 x 80 x 3	1.30	0.87
25 x 25 x 2	0.26	0.18	3	0.80	0.54	4	1.72	1.16
3	0.39	0.26	4	1.06	0.71	5	2.13	1.43
4	0.51	0.34	5	1.31	0.88	6	2.54	1.71
30 x 30 x 2	0.32	0.22	6	1.55	1.04	8	3.34	2.25
3	0.47	0.32	8	2.02	1.36	10	4.13	2.78
4	0.62	0.42	10	2.48	1.67	100 x 100 x 4	2.16	1.45
5	0.76	0.51	60 x 60 x 2	0.65	0.44	6	3.20	2.15
35 x 35 x 2	0.37	0.25	2.5	0.81	0.54	8	4.22	2.84
3	0.55	0.37	3	0.97	0.65	10	5.23	3.52
4	0.73	0.49	4	1.28	0.86	120 x 120 x 8	5.10	3.44
5	0.89	0.60	5	1.58	1.06	10	6.33	4.26
40 x 40 x 2	0.43	0.29	6	1.88	1.27			

(Note: Not all sizes are available for all of the listed materials)

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**Metric Aluminum Unequal Angles**

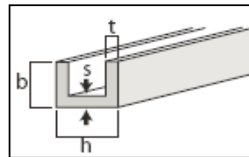


ALUMINUM 6060 T-6; (Extruded), EN 573-3, EN 755-2, EN 755-1, EN 755-9, DIN 1725, DIN 1748, DIN 1771

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
15 x 10 x 2	0.13	0.09	40 x 25 x 4	0.67	0.45	60 x 30 x 3	0.72	0.48	100 x 40 x 4	1.50	1.01
20 x 10 x 2	0.15	0.10	40 x 30 x 2	0.37	0.25	4	0.95	0.64	100 x 50 x 3	1.21	0.82
20 x 15 x 2	0.18	0.12	3	0.55	0.37	5	1.17	0.79	4	1.61	1.08
2.5	0.22	0.15	4	0.73	0.49	60 x 40 x 2	0.54	0.36	5	1.99	1.34
3	0.26	0.18	45 x 10 x 2	0.29	0.20	3	0.80	0.54	6	2.38	1.60
25 x 10 x 2	0.18	0.12	45 x 20 x 2	0.35	0.23	4	1.06	0.71	8	3.12	2.10
25 x 15 x 2	0.21	0.14	45 x 30 x 3	0.59	0.40	5	1.31	0.88	10	3.85	2.59
2.5	0.26	0.17	50 x 15 x 2	0.35	0.23	6	1.55	1.04	100 x 60 x 6	2.54	1.71
3	0.31	0.21	3	0.51	0.35	70 x 15 x 2	0.46	0.31	110 x 30 x 2	0.76	0.51
25 x 20 x 2	0.24	0.16	50 x 20 x 2	0.37	0.25	70 x 20 x 2	0.48	0.33	120 x 20 x 2	0.76	0.51
3	0.35	0.23	2.5	0.46	0.31	70 x 25 x 2.5	0.64	0.43	120 x 40 x 4	1.72	1.16
30 x 10 x 2	0.21	0.14	3	0.55	0.37	70 x 30 x 2	0.54	0.36	120 x 50 x 5	2.27	1.53
30 x 15 x 2	0.24	0.16	50 x 25 x 2	0.40	0.27	3	0.80	0.54	120 x 60 x 6	2.87	1.93
3	0.35	0.23	2.5	0.50	0.34	75 x 50 x 5	1.65	1.11	8	3.78	2.55
30 x 20 x 2	0.26	0.18	3	0.59	0.40	80 x 15 x 2	0.51	0.35	120 x 80 x 10	5.23	3.52
2.5	0.33	0.22	4	0.78	0.53	80 x 20 x 2	0.54	0.36	130 x 30 x 3	1.30	0.87
3	0.39	0.26	50 x 30 x 2	0.43	0.29	80 x 25 x 2	0.57	0.38	140 x 40 x 3	1.46	0.98
4	0.51	0.34	3	0.64	0.43	2.5	0.71	0.47	150 x 50 x 4	2.16	1.45
30 x 25 x 2	0.29	0.20	4	0.84	0.56	80 x 30 x 3	0.88	0.59	150 x 75 x 8	4.77	3.21
3	0.43	0.29	5	1.03	0.69	80 x 40 x 2	0.65	0.44	10	5.91	3.98
35 x 20 x 2	0.29	0.20	50 x 40 x 2	0.48	0.33	3	0.97	0.65	150 x 100 x 5	3.37	2.27
3	0.43	0.29	3	0.72	0.48	4	1.28	0.86	10	6.60	4.44
35 x 25 x 3	0.47	0.32	4	0.95	0.64	5	1.58	1.06	180 x 150 x 6	5.35	3.60
40 x 10 x 2	0.26	0.18	5	1.17	0.79	6	1.88	1.27	200 x 100 x 10	7.98	5.37
40 x 15 x 2	0.29	0.20	60 x 15 x 2	0.40	0.27	80 x 50 x 5	1.72	1.16			
40 x 20 x 2	0.32	0.22	60 x 20 x 2	0.43	0.29	80 x 50 x 6	2.05	1.38			
2.5	0.40	0.27	60 x 20 x 2.5	0.53	0.36	80 x 60 x 4	1.50	1.01			
3	0.47	0.32	3	0.64	0.43	6	2.21	1.49			
4	0.62	0.42	60 x 25 x 2.5	0.57	0.38	100 x 20 x 2	0.65	0.44			
40 x 25 x 2	0.35	0.23	3	0.68	0.46	100 x 30 x 3	1.05	0.71			
3	0.51	0.35	60 x 30 x 2	0.48	0.33	100 x 40 x 3	1.13	0.76			

(Note: Not all sizes are available for all of the listed materials)

**Metric Channels – Aluminum**



ALUMINUM 6060 T-6 (Extruded) EN573-3, EN 755-2, EN 755-1, EN 755-9, DIN 1725, DIN 1748, DIN 9713

DIMENSION (H x B x S)	EST. kg/m	EST. LBS./FT
10 x 10 x 1.5	0.111	0.075
10 x 10 x 2	0.143	0.096
12 x 12 x 2	0.176	0.118
14 x 12 x 2	0.187	0.126
15 x 15 x 1.5	0.173	0.116
15 x 15 x 2	0.226	0.152
15 x 20 x 1.5	0.215	0.145
15 x 20 x 2	0.281	0.189
20 x 15 x 2	0.253	0.17
20 x 20 x 1.5	0.235	0.158
20 x 20 x 2	0.308	0.207
20 x 20 x 3	0.446	0.3
20 x 30 x 2	0.418	0.281
20 x 40 x 2.5	0.653	0.439
20 x 40 x 4	1.012	0.681
23 x 23 x 1.5	0.272	0.183
25 x 15 x 2	0.281	0.189
25 x 20 x 2	0.336	0.226
25 x 25 x 2	0.391	0.263
25 x 25 x 3	0.569	0.383
30 x 15 x 2	0.308	0.207
30 x 20 x 2	0.363	0.244
30 x 20 x 3	0.528	0.355
30 x 30 x 2	0.473	0.318
30 x 30 x 3	0.693	0.466
35 x 35 x 2	0.556	0.374
35 x 35 x 3	0.817	0.55

WEB s mm	EST. kg/m	EST. LBS./FT
40 x 20 x 2	0.418	0.281
40 x 20 x 2.5	0.516	0.347
40 x 20 x 3	0.611	0.411
40 x 25 x 3	0.693	0.466
40 x 30 x 3	0.776	0.522
40 x 30 x 4	1.012	0.681
40 x 40 x 2	0.638	0.429
40 x 40 x 2.5	0.791	0.532
40 x 40 x 3	0.941	0.633
40 x 40 x 4	1.232	0.829
50 x 20 x 2	0.473	0.318
50 x 25 x 2.5	0.67	0.451
50 x 25 x 3	0.776	0.522
50 x 30 x 2	0.583	0.392
50 x 30 x 3	0.858	0.577
50 x 30 x 4	1.222	0.822
50 x 40 x 4	1.342	0.903
50 x 50 x 3	1.188	0.78
50 x 50 x 4	1.562	1.051
50 x 50 x 5	1.925	1.296
55 x 45 x 2	0.776	0.522
60 x 20 x 2	0.528	0.355
60 x 30 x 3	0.941	0.633
60 x 40 x 2.5	0.928	0.625
60 x 40 x 3	1.106	0.744
60 x 40 x 4	1.452	0.977
60 x 40 x 5	1.778	1.197

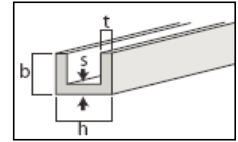
WEB s mm	EST. kg/m	EST. LBS./FT
60 x 50 x 2	0.858	0.577
60 x 50 x 3	1.271	0.855
60 x 60 x 4	1.892	1.273
60 x 60 x 5	2.338	1.573
65 x 65 x 2	0.756	0.509
65 x 55 x 2	1.169	0.787
70 x 40 x 3	1.188	0.8
80 x 30 x 3	1.106	0.744
80 x 40 x 3	1.271	0.855
80 x 40 x 4	1.672	1.125
80 x 40 x 5	2.063	1.388
80 x 40 x 6	2.442	1.643
80 x 45 x 6	2.607	1.754
80 x 50 x 5	2.338	1.573
86 x 40 x 3	1.32	0.888
88 x 50 x 3	1.502	1.011
90 x 40 x 3	1.353	0.911
100 x 20 x 2	0.748	0.503
100 x 40 x 3	1.436	0.966
100 x 50 x 5	2.613	1.759
106 x 40 x 3	1.485	0.999
120 x 40 x 3	1.601	1.077
120 x 55 x 7 / 9	4.82	3.244
125 x 80 x 8	5.918	3.983
140 x 40 x 3	1.766	1.189
160 x 80 x 10	8.25	3.533

(Note: Not all sizes are available for all of the listed materials)

**Metric Channels – European - Carbon & Stainless Steel**

CARBON STEEL DIN 1026, UPN, EN 10279, St37-2, St52-3, S235JrG2C, S355J2GC

STAINLESS STEEL 304, ASTM A-276, EN 10272



U SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm			
				WEB s mm	EST. kg/m	EST. LBS./FT
30 x 15	30	15	4.5	4	1.74	1.17
30	30	33	7	5	4.27	2.87
40 x 20	40	20	5.5	5	2.87	1.93
40	40	35	7	5	4.87	3.28
50 x 25	50	25	6	5	3.86	2.60
50	50	38	7	5	5.59	3.76
60	60	30	6	6	5.07	3.41
65	65	42	7.5	5.5	7.09	4.77
80	80	45	8	6	8.64	5.81
100	100	50	8.5	6	10.60	7.13
120	120	55	9	7	13.41	9.02
140	140	60	10	7	16.00	10.77

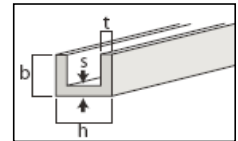
U SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm			
				WEB s mm	EST. kg/m	EST. LBS./FT
160	160	65	10.5	7.5	18.80	12.65
180	180	70	11	8	22.00	14.81
200	200	75	11.5	8.5	25.30	17.03
220	220	80	12.5	9	29.40	19.79
240	240	85	13	9.5	33.20	22.35
260	260	90	14	10	37.90	25.51
280	280	95	15	10	41.80	28.13
300	300	100	16	10	46.20	31.09
320	320	100	17.5	14	59.50	40.04
350	350	100	16	14	60.60	40.78
380	380	102	16	13.5	63.10	42.46
400	400	110	18	14	71.80	48.32

(Note: Not all sizes are available for all of the listed materials)

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**Metric Channels – Japanese Carbon Steel**

CARBON STEEL JIS G3192, SS400, Comparable to A-36



U SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm			
				WEB s mm	EST. kg/m	EST. LBS./FT
75 x 40	75	40	7	5	6.92	4.66
100 x 50	100	50	7.5	5	9.36	6.30
125 x 65	125	65	8	6	13.40	9.02
150 x 75	150	75	10	6.5	18.60	12.52
150 x 75	150	75	12.5	9	24.00	16.15
180 x 75	180	75	10.5	7	21.40	14.40
200 x 80	200	80	11	7.5	24.60	16.56
200 x 90	200	90	13.5	8	30.30	20.39

U SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm			
				WEB s mm	EST. kg/m	EST. LBS./FT
250 x 90	250	90	13	9	34.60	23.28
250 x 90	250	90	14.5	11	40.20	27.05
300 x 90	300	90	13	9	38.10	25.64
300 x 90	300	90	15.5	10	43.80	29.48
300 x 90	300	90	16	12	48.60	32.71
380 x 100	380	100	16	10.5	54.50	36.68
380 x 100	380	100	16.5	13	62.00	41.73
380 x 100	380	100	20	13	67.30	45.30

(Note: Not all sizes are available for all of the listed materials)

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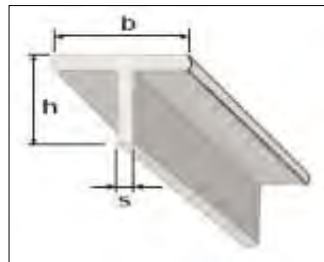
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## Metric Tees – Aluminum



ALUMINUM 6060 T-6, (Extruded) AlMgSi0,5 F22, EN 573-3, EN 573-4, EN755-2, EN 755-9

DIMENSION (H x B x S)	EST. kg/m	EST. LBS./FT
15 x 15 x 2	0.154	0.104
20 x 20 x 2	0.209	0.141
20 x 20 x 3	0.305	0.205
25 x 25 x 2	0.264	0.178
25 x 25 x 3	0.388	0.261
30 x 30 x 2	0.319	0.215
30 x 30 x 3	0.47	0.316
35 x 35 x 3	0.553	0.372
40 x 20 x 2	0.319	0.215

DIMENSION (H x B x S)	EST. kg/m	EST. LBS./FT
40 x 40 x 2	0.429	0.289
40 x 40 x 3	0.635	0.427
40 x 40 x 4	0.836	0.563
50 x 50 x 4	1.056	0.711
50 x 50 x 5	1.306	0.879
60 x 60 x 4	1.276	0.859
60 x 60 x 6	1.881	1.266
100 x 60 x 5	2.131	1.434
100 x 100 x 10	5.225	3.516

(Note: Not all sizes are available for all of the listed materials)

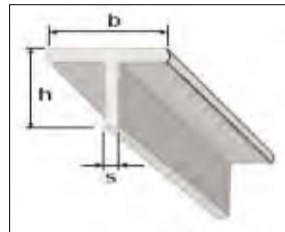
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**Metric Tees – Hot Rolled**



CARBON STEEL DIN 1024, EN 10055, St37-2, St52-3, S235JrG2C, S355J2G3C

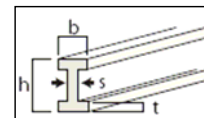
STAINLESS STEEL 316TI, ASTM A-276

		Round Edge Deep Webbed T-Bars				Round Edge Wide Flanged T-Bars	
DIMENSION (H x B x S)	EST. LBS./FT	DIMENSION (H x B x S)	EST. LBS./FT	DIMENSION (H x B x S)	EST. LBS./FT	DIMENSION (H x B x S)	EST. LBS./FT
20 x 20 x 3	0.59	45 x 45 x 5.5	2.47	90 x 90 x 10	9.02	30 x 60 x 5.5	2.45
25 x 25 x 3.5	0.86	50 x 50 x 6	2.99	100 x 100 x 11	11.04	35 x 70 x 6	3.14
30 x 30 x 4	1.20	60 x 60 x 7	4.20	120 x 120 x 13	15.62	40 x 80 x 7	4.18
35 x 35 x 4.5	1.57	70 x 70 x 8	5.60	140 x 140 x 15	21.07	50 x 100 x 8.5	6.34
40 x 40 x 5	2.00	80 x 80 x 9	7.20			60 x 120 x 10	9.02

(Note: Not all sizes are available for all of the listed materials)

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**Metric Beams - Narrow Flange I Beams**



CARBON STEEL IPN, I Range Sections, EN 10024, DIN 1025, PART 1, St37-2, St52-3, S235JrG2C, S355J2G3C,

Stock Lengths 6 or 12 Meters

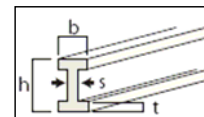
IPN SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm	WEB		
				s mm	EST. kg/m	EST. LBS./FT
80	80	42	5.9	3.9	5.94	4.00
100	100	50	6.8	4.5	8.34	5.63
120	120	58	7.7	5.1	11.10	7.47
140	140	66	8.6	5.7	14.30	9.62
160	160	74	9.5	6.3	17.90	12.05
180	180	82	10.4	6.9	21.90	14.74
200	200	90	11.3	7.5	26.20	17.63
220	220	98	12.2	8.1	31.10	20.93
240	240	106	13.1	8.7	36.20	24.36
260	260	113	14.1	9.4	41.90	28.20
280	280	119	15.2	10.1	47.90	32.24
300	300	125	16.2	10.8	54.20	36.48

(Note: Not all sizes are available for all of the listed materials)

IPN SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm	WEB		
				s mm	EST. kg/m	EST. LBS./FT
320	320	131	17.3	11.5	61.00	41.05
340	340	137	18.3	12.2	68.00	45.76
360	360	143	19.5	13	76.10	51.15
380	380	149	20.5	13.7	84.00	56.53
400	400	155	21.6	14.4	92.40	62.19
425	425	163	23	15.3	104.00	69.99
450	450	170	24.3	16.2	115.00	77.40
475	475	178	25.6	17.1	128.00	86.14
500	500	185	27	18	141.00	94.89
550	550	200	30	19	166.00	111.72
600	600	215	32.4	21.6	199.00	133.93

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**Metric Beams - Medium Flange I Beams**



CARBON STEEL IPE Range Sections, EN 10034, DIN 1025, SHEET 5 St37-2, St52-3, S235JrG2C, S355J2G3C,

Stock Lengths 6 or 12 Meters

IPE SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm	WEB		
				s mm	EST. kg/m	EST. LBS./FT
80	80	46	5.2	3.8	6.00	4.04
100	100	55	5.7	4.1	8.10	5.45
120	120	64	6.3	4.4	10.40	7.00
140	140	73	6.9	4.7	12.90	8.68
160	160	82	7.4	5	15.80	10.63
180	180	91	8	5.3	18.80	12.65
200	200	100	8.5	5.6	22.40	15.08
220	220	110	9.2	5.9	26.20	17.63
240	240	120	9.8	6.2	30.70	20.66

(Note: Not all sizes are available for all of the listed materials)

IPE SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm	WEB		
				s mm	EST. kg/m	EST. LBS./FT
270	270	135	10.2	6.6	36.10	24.30
300	300	150	10.7	7.1	42.20	28.40
330	330	160	11.5	7.5	49.10	32.97
360	360	170	12.7	8	57.10	38.43
400	400	180	13.5	8.6	66.30	44.62
450	450	190	14.6	9.4	77.60	55.23
500	500	200	16	10.2	90.70	61.04
550	550	210	17.2	11.1	106.00	71.34
600	600	220	19	12	122.00	82.10

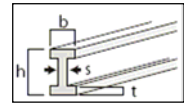
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**Metric Beams - Wide Flange Heavy Weight**



CARBON STEEL IPBv Range Sections, IWF, DIN 1025, Part 4, EN 10034, Euronorm (HE ...M), St37-2, St52-3, S235JR/G2C, S355J2G3C

Stock Lengths 6 or 12 Meters

IPBv SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm	WEIGHT		
				WEB s mm	EST. kg/m	EST. LBS/FT
100	120	106	20	12	41.80	28.13
120	140	126	21	12.5	52.10	35.06
140	160	146	22	13	63.20	42.53
160	180	166	23	14	76.20	51.28
180	200	186	24	14.5	88.90	59.83
200	220	206	25	15	103.00	69.32
220	240	226	26	15.5	117.00	78.74
240	270	248	32	18	157.00	105.66
260	290	268	32.5	18	172.00	115.76
280	310	288	33	18.5	189.00	127.20

IPBv SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm	WEIGHT		
				WEB s mm	EST. kg/m	EST. LBS/FT
300	340	310	39	21	238.00	160.17
320/305	320	305	29	16	177.00	119.12
320	359	309	40	21	245.00	164.89
340	377	309	40	21	248.00	166.90
360	395	308	40	21	250.00	168.25
400	432	307	40	21	256.00	172.30
450	478	307	40	21	263.00	176.90
500	524	306	40	21	270.00	181.70
550	572	306	40	21	278.00	187.10
600	620	305	40	21	285.00	191.80

(Note: Not all sizes are available for all of the listed materials)

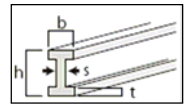
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**Metric I Beams - Japanese**



CARBON STEEL IJ, JIS G3101, JIS G3192-4, SS400, Comparable to A36

Stock Lengths 6-6.3, 10-10.6 Meters

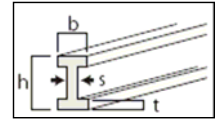
h x b SECTION	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm	WEIGHT		
				WEB s mm	EST. kg/m	EST. LBS/FT
100x75	100	75	8	5	12.90	8.68
125x75	125	75	9.5	5.5	16.10	10.84
150x75	150	75	9.5	5.5	17.10	11.51
150x125	150	125	14	8.5	36.20	24.36
180x100	180	100	10	6	23.60	15.88
200x100	200	100	10	7	26.00	17.50
200x150	200	150	16	9	50.40	33.92
250x125	250	125	12.5	7.5	38.30	25.78

h x b SECTION	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm	WEIGHT		
				WEB s mm	EST. kg/m	EST. LBS/FT
250x125	250	125	19	10	55.50	37.35
300x150	300	150	13	8	48.30	32.50
300x150	300	150	18.5	10	65.50	44.08
300x150	300	150	22	11.5	76.80	51.69
350x150	350	150	15	9	58.50	39.37
350x150	350	150	24	12	87.20	58.68
400x150	400	150	18	10	72.00	48.46
400x150	400	150	25	12.5	95.80	64.39

(Note: Not all sizes are available for all of the listed materials)

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**Metric Beams - Wide Flange Light Weight**



CARBON STEEL IPB-1 Range Sections, IWF, DIN 1025, Part 2, EN 10034, Euronorm (HE ...A), St37-2, St52-3, S235JrG2C, S355J2G3C

Stock Lengths 6 or 12 Meters

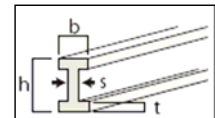
IPB-1 SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm	WEB		
				s mm	EST. kg/m	EST. LBS./FT
100	96	100	8	5	16.70	11.24
120	114	120	8	5	19.90	13.39
140	133	140	8.5	5.5	24.70	16.62
160	152	160	9	6	30.40	20.46
180	171	180	9.5	6	35.50	23.89
200	190	200	10	6.5	42.30	28.47
220	210	220	11	7	50.50	33.99
240	230	240	12	7.5	60.30	40.58
260	250	260	12.5	7.5	68.20	45.90
280	270	280	13	8	76.40	51.42

IPB-1 SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm	WEB		
				s mm	EST. kg/m	EST. LBS./FT
300	290	300	14	8.5	88.30	59.43
320	310	300	15.5	9	97.60	65.70
340	330	300	16.5	9.5	105.00	70.66
360	350	300	17.5	10	112.00	75.38
400	390	300	19	11	125.00	84.13
450	440	300	21	11.5	140.00	94.22
500	490	300	23	12	155.00	104.31
550	540	300	24	12.5	166.00	111.72
600	590	300	25	13	178.00	119.79
650	640	300	26	13.5	190.00	127.87

(Note: Not all sizes are available for all of the listed materials)

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**Metric Beams - Wide Flange Medium Weight**



CARBON STEEL IPB Range Sections, IWF, DIN 1025, Part 2, EN 10034, Euronorm (HE ...B), St37-2, St52-3, S235JrG2C, S355J2G3C

Stock Lengths 6 or 12 Meters

IPB SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm	WEB		
				s mm	EST. kg/m	EST. LBS./FT
100	100	100	10	6	20.40	13.73
120	120	120	11	6.5	26.70	17.97
140	140	140	12	7	33.70	22.68
160	160	160	13	8	42.60	28.67
180	180	180	14	8.5	51.20	34.46
200	200	200	15	9	61.30	41.25
220	220	220	16	9.5	71.50	48.12
240	240	240	17	10	83.20	55.99
260	260	260	17.5	10	93.00	62.59
280	280	280	18	10.5	103.00	69.32

IPB SECTION NUMBER	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm	WEB		
				s mm	EST. kg/m	EST. LBS./FT
300	300	300	19	11	117.00	78.74
320	320	300	20.5	11.5	127.00	85.47
340	340	300	21.5	12	134.00	90.18
360	360	300	22.5	12.5	142.00	95.56
400	400	300	24	13.5	155.00	104.31
450	450	300	26	14	171.00	115.08
500	500	300	28	14.5	187.00	125.85
550	550	300	29	15	199.00	133.92
600	600	300	30	15.5	212.00	142.67
650	650	300	31	16	225.00	151.43

(Note: Not all sizes are available for all of the listed materials)

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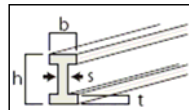
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**Metric I Beams - Japanese Wide Flange**

CARBON STEEL IWE, JIS G-3192, Table 8 Grade SS400, Comparable to A-36

Stock Lengths 6-6.3, 10-10.6 Meters



h x b SECTION	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm				h x b SECTION	DEPTH h mm	FLANGE WIDTH b mm	FLANGE THICK t mm			
				WEB s mm	EST. kg/m	EST. LBS./FT					WEB s mm	EST. kg/m	EST. LBS./FT
100x50	100	50	7	5	9.30	6.26	200x100	200	100	8	5.5	21.30	14.33
100x100	100	100	8	6	17.20	11.58	200x150	200	150	9	6	30.60	20.59
125x60	125	60	8	6	17.20	8.88	200x200	200	200	12	8	49.90	33.59
125x125	125	125	9	6.5	23.80	16.02	200x200	200	200	12	12	56.20	37.82
148x100	148	100	9	6	21.13	14.20	250x125	250	125	8	5	25.70	17.30
150x75	150	75	7	6	14.00	9.42	250x125	250	125	9	6	29.60	19.92
150x100	150	100	9	6	21.10	14.20	250x175	175	175	11	7	44.10	29.68
150x150	150	150	10	7	31.50	21.20	250x250	250	250	14	9	72.40	48.73
175x90	175	90	8	5	18.10	12.18	250x250	250	250	14	14	82.20	55.32
175x175	175	175	11	7.5	40.20	27.05	300x150	300	150	8	5.5	32.00	21.53
200x100	200	100	7	4.5	18.20	12.25	300x150	300	150	9	6.6	37.70	25.37

(Note: Not all sizes are available for all of the listed materials)

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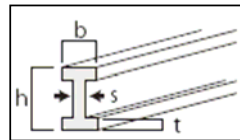
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## Metric I Beams - Stainless Steel

STAINLESS STEEL IPE, 304, ASTM A276, DIN 1025, DIN 17440

Stock Lengths 6-6.3, 10-10.6 Meters



## Medium Flange I Beams - IPE 304

h x b SECTION	EST. kg/m	EST. LBS./FT
100 x 55 x 6 x 6	9.50	6.93
120 x 64 x 6 x 4	10.40	7.00
140 x 73 x 7 x 5	13.12	8.80
160 x 82 x 7 x 5	15.50	10.43
190 x 91 x 8 x 5	18.80	12.65
200 x 100 x 8 x 6	21.40	14.40
220 x 110 x 20 x 15	56.80	38.22
240 x 120 x 10 x 9	35.04	23.58

## Wide Flange Medium Weight Beams - IPB 304

h x b SECTION	EST. kg/m	EST. LBS./FT	h x b SECTION	EST. kg/m	EST. LBS./FT
100 x 100 x 8 x 6	15.23	10.25	160 x 152 x 9 x 6	30.40	20.46
100 x 100 x 10 x 6	20.40	13.73	160 x 160 x 13 x 8	42.90	28.87
120 x 114 x 8 x 5	19.90	13.39	180 x 180 x 14 x 8	51.20	34.46
120 x 120 x 11 x 7	27.70	18.64	200 x 200 x 12 x 8	49.00	32.98
120 x 120 x 12 x 10	31.60	21.27	220 x 210 x 16 x 11	69.70	46.91
140 x 140 x 12 x 7	33.40	22.48	250 x 250 x 14 x 9	75.20	50.61
140 x 140 x 12 x 9	35.50	23.89	300 x 300 x 16 x 10	98.60	66.36
150 x 150 x 10 x 8	32.90	22.14			

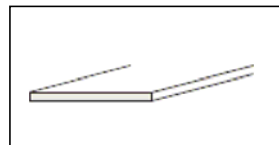
(Note: Not all sizes are available for all of the listed materials)

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**Metric Hot Rolled Mild Structural Plates**

• = Commonly available

CARBON STEEL A-36, ASTM A-572 Grade 50, DIN 1543, EN 10029, St37-2, St52-3, S235JrG2C, S355J2G3C, BS4360

STAINLESS STEEL 304, 304L, 316, 316L, ASTM A-240/240M DIN/EN 10028-7, EN 10088-2

ALUMINUM 5754, H22/H111 (Extruded), EN485/10204 (Multiply Weights Below by 0.35)

BRASS MS63 (Similar to C274), DIN 17660 (Multiply Weights Below by 1.084)

THICKNESS mm	2000 x 1000	2500 x 125	3000 x 01500	3660 x 1830	4000 x 2000	5000 x 2500	6000 x 2000	6000 x 2500	6000 x 3000	8000 x 2000	8000 x 2500	EST. LBS. PER SQ FT.
3	•	•	•	•	•							4.82
4	•	•	•	•	•							6.43
5	•	•	•	•	•			•				8.04
6	•	•	•	•	•		•	•		•	•	9.65
7	•	•	•									11.25
8	•	•	•	•	•		•	•			•	12.86
9	•	•	•									14.47
10	•	•	•	•	•	•	•	•	•	•	•	16.08
11	•	•	•									17.69
12	•	•	•	•				•	•			19.29
12.5	•	•	•	•	•	•	•	•				20.1
13	•	•	•									20.9
14	•	•	•									22.51
15	•	•	•		•	•	•	•	•			24.12
16	•	•	•		•	•						25.72
18	•	•	•									28.94
20	•	•	•		•	•	•	•	•			32.16
22	•	•	•									35.37
22.5	•	•	•		•	•						36.18
25	•	•	•		•	•		•	•			40.19
30	•	•	•		•	•		•	•			48.23
32	•	•	•		•	•						51.45
35	•	•	•		•	•						56.27
40	•	•	•		•	•		•	•			64.31
45	•	•	•		•	•						72.35
50	•	•	•		•	•	•	•	•			80.39
55	•	•	•									88.43
60	•	•	•		•	•						96.47
65	•	•	•		•	•						104.51
70	•	•	•		•							111.77
75	•	•	•		•	•						120.58
80	•	•	•		•	•						128.62
100	•	•	•		•	•						160.78

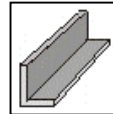
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**Metric Hot Rolled Unequal Angles**



CARBON STEEL 1008/1018, A-36 Modified, St37-2, St52-3, S235JrG2C, S355J2G3C, BS 4360, EN 10056-2, DIN 1028

STAINLESS STEEL 304, ASTM A-276, EN 10056

SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT	SIZE mm	EST. LBS./FT
20 x 10 x 3	0.43	65 x 65 x 9	5.06	100 x 65 x 10	8.28	150 x 75 x 11	12.52
25 x 15 x 3	0.75	70 x 50 x 6	3.63	11	9.02	12	13.59
30 x 20 x 3	0.75	7	4.38	100 x 75 x 7	6.28	150 x 90 x 9	11.04
4	0.98	75 x 50 x 6	3.74	8	7.13	10	12.25
40 x 20 x 3	0.91	7	4.38	9	7.95	12	14.54
4	1.20	8	4.97	10	8.75	15	17.90
40 x 25 x 4	1.29	9	5.54	11	9.63	150 x 100 x 9	11.86
45 x 30 x 3	1.16	10	5.99	12	10.36	10	12.79
4	1.52	75 x 55 x 5	3.33	120 x 80 x 8	8.21	12	15.21
5	1.87	7	4.58	10	10.10	14	17.57
50 x 30 x 4	1.63	9	5.78	12	11.98	160 x 80 x 10	12.25
5	2.00	80 x 40 x 6	3.64	125 x 75 x 7	7.20	12	14.54
50 x 40 x 4	1.83	8	4.76	8	8.21	180 x 90 x 10	13.86
5	2.27	80 x 60 x 6	4.29	10	10.10	12	16.48
6	2.69	7	4.96	12	11.98	200 x 100 x 10	15.48
60 x 30 x 5	2.27	8	5.61	130 x 65 x 8	8.01	12	18.37
6	2.69	80 x 65 x 8	5.82	10	9.83	14	21.30
60 x 40 x 5	2.53	10	7.20	11	10.74	15	22.68
6	3.00	90 x 60 x 6	4.59	12	11.65	200 x 150 x 12	21.54
7	3.46	8	6.03	130 x 90 x 10	11.44	16	24.17
60 x 50 x 9	5.14	100 x 50 x 6	4.61	12	13.26	250 x 90 x 10	17.92
65 x 30 x 5	2.27	8	6.06	137 x 102 x 6.4	7.89	12	21.50
65 x 50 x 5	2.93	10	7.47	7.9	9.76	14	25.08
6	3.47	100 x 65 x 7	5.90	150 x 75 x 8	9.22	16	28.66
7	4.02	8	6.69	9	10.30		
8	4.54	9	7.47	10	11.44		

(Note: Not all sizes are available for all of the listed materials)

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• = Commonly available

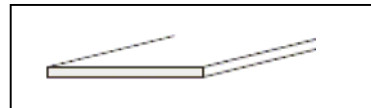
CARBON STEEL 1005, 1008, 1010, St1203, DC01AM, DIN 1541, 1623, EN 10130, BS 1449

STAINLESS STEEL 304, 316, ASTM A-240/A-240M, DIN/EN 10028-7, EN 10088-2

ALUMINUM 5754, H22/H11, EN 485/10204 (Multiply Weights Below by 0.35)

BRASS MS63 (Similar to C274), DIN 17660 (Multiply Weights Below by 1.084)

THICKNESS mm	2000 x 1000	2500 x 1250	3000 x 1500	EST. LBS. PER SQ. FT.
0.5	•			0.81
0.6	•			0.97
0.7	•	•	•	1.13
0.8	•	•		1.29
0.9				1.45
1	•	•		1.61
1.1	•		•	1.77
1.2	•	•		1.93
1.25				2.01
1.4	•	•	•	2.24
1.5				2.42
1.6	•	•		2.57
1.8				2.89
2	•	•		3.22
2.2				3.53
2.5	•	•	•	4.02
3	•	•		4.82



(Note: Not all sizes are available for all of the listed materials)

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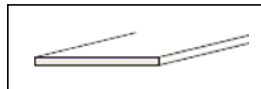
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phones: (410)358-3130 (800)638-1830 faxes: (410)358-3142 (800)872-9329

web: <http://mdmetric.com> email: [sales@mdmetric.com](mailto:sales@mdmetric.com)

**Metric Electro Galvanized Sheets**

• = Commonly available



**CARBON STEEL DIN 1763, EN 1015**

THICKNESS mm	2000 x 1000	2500 x 1250	3000 x 1500	EST. LBS. PER SQ. FT.
1	•	•		1.61
1.2	•	•		1.93
1.5	•	•		2.42
1.6	•	•		2.57
2	•	•		3.22

(Note: Not all sizes are available for all of the listed materials)

ver cc02f

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**Metric Galvanized Sheets**

• = Commonly available



**CARBON STEEL DIN 59232, 17162 Hot Dipped, DX51DTZ**

THICKNESS mm	2000 x 1000	2500 x 1250	3000 x 1500	EST. LBS. PER SQ. FT.
0.8	•	•		1.29
1	•	•		1.61
1.2	•	•		1.93
1.6	•	•		2.57
2	•	•		3.22

(Note: Not all sizes are available for all of the listed materials)

ver cc02f

**MARYLAND METRICS P.O. Box 261 Owings Mills, MD 21117 USA***The one-stop source for all your METRIC METALS needs!*phones: (410)358-3130 (800)638-1830 faxes: (410)358-3142 (800)872-9329 web: <http://mdmetric.com> email: [sales@mdmetric.com](mailto:sales@mdmetric.com)**Metric Hard Chrome Plated Shafting**

CARBON STEEL (Please see other pages for Induction Hardened Shafting specifications and other pages for Hard Chrome Plated Shafting Specifications.)

1045/1050 C.P., 1045/1050 IHCP, 1050/1060 IHCP, 1141 C.P., 1144 C.P., ASTM A-108, A-311, UNI C45/C50, EN 10278

ALLOY STEEL 4140 H.T., SR., Q.T., 42CrMo4, A-193 B7, ASTM A-29 (106,000 min. yield)

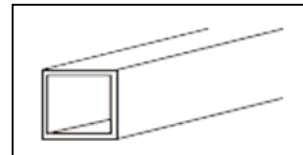
STAINLESS STEEL 303, 416, ASTM A-582, 304, A-276, 17-4PH, A-564

DIAMETER mm	DIAMETER Inches	EST. LBS. PER FT.	EST. kg/m	DIAMETER mm	DIAMETER Inches	EST. LBS. PER FT.	EST. kg/m	DIAMETER mm	DIAMETER Inches	EST. LBS. PER FT.	EST. kg/m
6	0.2362	0.149	0.222	36	1.4173	5.365	7.984	105	4.1339	45.644	67.926
8	0.315	0.265	0.394	38	1.4961	5.978	8.896	110	4.3307	50.094	74.548
10	0.3937	0.414	0.616	40	1.5748	6.624	9.858	115	4.5276	54.752	81.480
12	0.4724	0.596	0.887	45	1.7717	8.384	12.477	120	4.7244	59.616	88.718
14	0.5512	0.811	1.207	50	1.9685	10.35	15.402	125	4.9213	64.688	96.266
15	0.5906	0.932	1.387	55	2.1654	12.524	18.638	130	5.1181	69.966	104.121
16	0.6299	1.06	1.577	56	2.2047	12.983	19.321	140	5.5118	81.144	120.756
17	0.6693	1.196	1.780	60	2.3622	14.904	22.180	150	5.9055	93.15	138.622
18	0.7087	1.341	1.996	63	2.4803	16.432	24.454	160	6.2992	105.984	157.722
20	0.7874	1.656	2.464	65	2.5591	17.492	26.031	170	6.6929	119.646	178.053
22	0.8661	2.004	2.982	70	2.7559	20.286	30.189	180	7.0866	134.136	199.616
24	0.9449	2.385	3.549	75	2.9528	23.288	34.656	190	7.4803	149.454	222.412
25	0.9843	2.588	3.851	80	3.1496	26.496	39.430	200	7.874	165.6	246.440
28	1.1024	3.246	4.831	85	3.3465	29.912	44.514	220	8.6614	200.303	298.084
30	1.1811	3.726	5.545	90	3.5433	33.534	49.904	250	9.8425	258.75	385.062
32	1.2598	4.239	6.308	95	3.7402	37.364	55.604				
35	1.378	5.072	7.548	100	3.937	41.4	61.610				

(Note: Not all sizes are available for all of the listed materials)

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**Metric Square Aluminum Tubing**

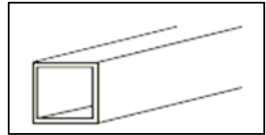


ALUMINUM 6060 T-6 (Extruded) EN 573-3, EN755-2, EN755-1, EN 755-9,  
DIN 1725, DIN 1746, DIN 1748-5

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
10 x 10 x 1	0.09	0.06	35 x 35 x 3	1.06	0.71	70 x 70 x 4	2.90	1.95
15 x 15 x 1.5	0.23	0.15	40 x 40 x 2	0.84	0.56	80 x 80 x 2	1.72	1.16
2	0.29	0.19	2.5	1.03	0.69	3	2.54	1.71
20 x 20 x 1.5	0.31	0.21	3	1.22	0.82	4	3.34	2.25
2	0.40	0.27	4	1.58	1.07	5	4.13	2.78
3	0.56	0.38	45 x 45 x 2	0.95	0.64	6	4.88	3.29
25 x 25 x 1.5	0.39	0.26	50 x 50 x 2	1.06	0.71	90 x 90 x 4	3.78	2.55
2	0.51	0.34	2.5	1.31	0.88	100 x 100 x 2	2.16	1.45
3	0.73	0.49	3	1.55	1.04	3	3.20	2.15
30 x 30 x 2	0.62	0.42	4	2.02	1.36	4	4.22	2.84
3	0.89	0.56	5	2.48	1.67	5	5.23	3.52
4	1.15	0.77	60 x 60 x 2	1.28	0.86	120 x 120 x 5	6.33	4.26
34 x 34 x 2	0.70	0.47	3	1.88	1.27	150 x 150 x 5	7.98	5.37
3	1.02	0.69	4	2.46	1.66			
35 x 35 x 2	0.73	0.49	70 x 70 x 2	1.50	1.01			

(Note: Not all sizes are available for all of the listed materials)

**Metric Square Hollow Sections – Tubing**



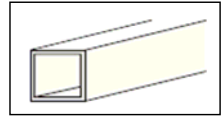
**CARBON STEEL HR - EN10210, St52-3, S355J2H - EN10219, DIN 59410, DIN 59411**  
**STAINLESS STEEL 304, 304L, 316, 316L, ASTM A-276, EN 10217-7**

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
20 x 20 x 1.60	0.87	0.59	80 x 80 x 6.00	12.98	8.72	120 x 120 x 6.30	22.00	14.81
30 x 30 x 1.60	1.38	0.93	6.3	14.42	9.69	8	27.40	18.44
2.6	2.10	1.41	7.1	15.90	10.70	10	33.30	22.41
40 x 40 x 1.60	1.88	1.27	8.8	19.20	12.92	125 x 125 x 6.00	22.16	14.89
2.6	2.92	1.97	90 x 90 x 3.20	8.51	5.73	11	38.93	26.16
2.9	3.32	2.23	3.6	9.68	6.51	140 x 140 x 4.00	16.80	11.31
3.2	3.49	2.35	4.5	11.90	8.01	5	20.50	13.80
4	4.41	2.97	5.56	14.60	9.83	5.6	23.30	15.68
50 x 50 x 1.60	2.38	1.60	7.1	16.10	10.84	6.3	25.40	17.09
2.6	3.73	2.51	8.8	21.90	14.74	7.1	29.00	19.52
2.9	4.23	2.85	10	24.83	16.69	8	31.40	21.13
3.2	4.50	3.03	100 x 100 x 3.20	9.52	6.41	8.8	35.30	23.76
4	5.67	3.82	4	12.00	8.08	10	39.60	26.65
5	6.90	4.64	5	14.70	9.89	12.5	46.10	31.03
60 x 60 x 2.60	4.55	3.06	100 x 100 x 6.30	18.30	12.32	150 x 150 x 4.00	18.00	12.11
2.9	5.14	3.46	8	22.70	15.28	5	22.10	14.87
3.2	5.50	3.70	10	27.60	18.57	6	26.82	18.02
4	6.93	4.66	110 x 110 x 4.00	13.10	8.82	6.3	27.40	18.44
5	8.47	5.70	5	16.20	10.90	8	33.90	22.82
70 x 70 x 3.20	6.64	4.47	6.3	20.00	13.46	10	40.60	27.32
4	8.18	5.51	8	24.80	16.69	160 x 160 x 4.00	19.30	12.99
5	10.00	6.73	10	30.20	20.32	5	23.70	15.95
80 x 80 x 2.60	6.18	4.16	120 x 120 x 3.20	11.50	7.74	6	28.24	18.98
3.2	7.51	5.05	4	14.30	9.62	6.3	29.60	19.92
3.6	8.55	5.75	4.5	16.10	10.84	8	36.90	24.83
4.5	10.50	7.07	5	17.40	11.71	10	45.10	30.35
5.6	12.90	8.68	5.6	19.70	13.26	12.5	54.70	36.81

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
160 x 160 x 14.20	60.90	40.99	200 x 200 x 12.50	70.40	47.38	260 x 260 x 8.80	67.80	45.63
175 x 175 x 6.00	31.48	21.15	14.2	78.80	53.03	11	83.60	56.26
6.3	33.65	22.61	16	97.30	65.48	14.2	106.00	71.34
180 x 180 x 4.00	21.80	14.67	220 x 220 x 6.30	41.50	27.93	16	117.00	78.74
5	26.80	18.04	8	52.00	35.00	17.5	127.00	85.47
6.3	33.60	22.61	10	63.90	43.01	280 x 280 x 6.30	53.10	35.74
8	41.90	28.15	12.5	78.30	52.70	8	67.00	45.09
8.8	45.70	30.76	14.2	87.70	59.02	10	81.40	54.78
10	51.40	34.59	16	97.30	65.48	12.5	102.00	68.65
12.5	62.60	42.13	250 x 250 x 5.00	37.80	25.44	300 x 300 x 6.30	57.00	38.36
14.2	69.90	47.04	6.3	47.10	31.70	8	71.60	48.19
200 x 200 x 5.00	29.90	20.12	8	59.10	39.77	10	87.70	59.02
6.3	37.50	25.24	10	72.00	48.46	320 x 320 x 10.00	95.30	64.14
8	46.90	31.56	12.5	88.00	59.22	12.5	118.00	79.41
10	57.60	38.77	260 x 260 x 7.10	55.40	37.28	16	148.00	99.60

(Note: Not all sizes are available for all of the listed materials)

**Metric Square Welded Tubing Carbon & Stainless Steels**



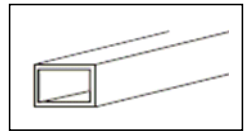
**CARBON STEEL S137-2, DIN 2395, EN 10305-5, DIN 17100, S235JrG2, EN 10025**  
**STAINLESS STEEL 304, 304L, 316, 316L, ASTM A-276, EN 10217-7**

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
10 x 10 x 1.00	0.28	0.19	25 x 25 x 3.00	2.07	1.39	45 x 45 x 2.00	2.67	1.80
1.25	0.33	0.22	30 x 30 x 1.00	0.90	0.61	2.5	3.29	2.22
1.5	0.39	0.26	1.25	1.12	0.75	3	3.90	2.62
12 x 12 x 1.00	0.34	0.23	30 x 30 x 1.50	1.33	0.89	4	4.89	3.28
1.25	0.41	0.28	2	1.73	1.16	5	5.43	3.66
1.5	0.48	0.32	2.5	2.12	1.42	50 x 50 x 1.50	2.27	1.53
15 x 15 x 1.00	0.43	0.29	3	2.48	1.67	1.6	2.40	1.62
1.25	0.53	0.36	4	3.32	2.23	2	2.99	2.01
1.5	0.62	0.42	34 x 34 x 1.50	1.52	1.02	2.3	3.41	2.29
2	0.79	0.53	2	1.98	1.33	2.5	3.69	2.48
16 x 16 x 1.50	0.67	0.45	2.5	2.43	1.64	3	4.37	2.94
2	0.85	0.57	3	2.86	1.92	3.2	4.65	3.12
18 x 18 x 1	0.52	0.35	35 x 35 x 1.25	1.31	0.88	3.5	5.03	3.38
1.5	0.76	0.51	1.5	1.56	1.05	4	5.67	3.82
2	0.98	0.66	2	2.05	1.38	5	6.90	4.64
20 x 20 x 1.00	0.59	0.40	2.5	2.51	1.69	6.3	8.64	5.80
1.25	0.73	0.49	3	2.95	1.99	55 x 55 x 2.00	3.30	2.22
1.5	0.86	0.58	40 x 40 x 1.50	1.80	1.21	2.5	4.08	2.75
2	1.10	0.74	1.6	1.91	1.28	3	4.84	3.26
2.5	1.33	0.90	2	2.36	1.59	4	6.30	4.24
22 x 22 x 1.50	0.95	0.64	2.3	2692.00	1.81	5	7.35	4.94
2	1.23	0.83	2.5	2.90	1.95	60 x 60 x 1.50	2.76	1.86
25 x 25 x 1.00	0.75	0.50	3	3.43	2.31	1.6	2.90	1.95
1.25	0.92	0.62	3.2	3.65	2.45	2	3.62	2.43
1.5	1.09	0.73	4	4.41	2.97	2.30	4.12	2.77
2.00	1.42	0.95	5.00	5.51	3.70	2.5	4.47	3.01
2.5	1.72	1.16	45 x 45 x 1.50	2.03	1.37			

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
60 x 60 x 3.00	5.31	3.57	80 x 80 x 4.50	10.55	7.09	120 x 120 x 6.00	20.73	13.93
3.2	5.64	3.79	5	11.61	7.81	6.3	22.03	14.80
3.5	6.13	4.12	6	13.22	8.88	8	27.40	18.45
4	6.93	4.66	6.3	14.42	9.69	125 x 125 x 3.20	12.10	8.14
5	8.47	5.70	8.8	19.20	12.92	4.5	16.83	11.33
6	9.45	6.35	90 x 90 x 3.00	8.14	5.47	6	22.16	14.89
70 x 70 x 2.00	4.26	2.87	4	10.69	7.20	11	38.93	26.16
2.5	5.26	3.54	5	13.18	8.87	140 x 140 x 5.60	23.33	15.68
3	6.25	4.21	6	15.12	10.16	8.8	35.34	23.75
4	8.18	5.51	8.8	21.90	14.73	150 x 150 x 4.50	20.31	13.67
5	10.04	6.75	10	25.24	16.96	6	26.82	18.02
6	11.33	7.61	100 x 100 x 2.00	6.16	4.15	160 x 160 x 6.00	28.24	18.98
75 x 75 x 1.60	3.65	2.45	2.5	7.61	5.12	10	45.10	30.35
2.3	5.19	3.50	3	9.08	6.11	175 x 175 x 6.00	31.47	21.15
2.5	5.63	3.78	3.2	9.62	6.46	180 x 180 x 6.30	33.65	22.61
75 x 75 x 3.20	7.13	4.80	4	11.95	8.04	200 x 200 x 6.30	37.50	25.24
4.5	9.85	6.63	4.5	13.34	8.97	8	46.90	32.04
80 x 80 x 2.00	4.89	3.29	5	14.75	9.92	10	57.60	38.80
2.3	5.55	3.73	6	17.03	11.44	12.5	78.80	49.13
2.5	6.04	4.07	6.3	18.30	12.32	16	97.30	61.58
3	7.19	4.84	10	27.60	16.96	220 x 220 x 6.30	41.50	27.93
3.2	7.63	5.13	120 x 120 x 4.00	14.32	9.62	10	63.90	43.81
3.6	8.56	5.76	4.5	16.10	10.80	12.5	78.30	52.70
4	9.49	6.39	5	17.53	11.78			

(Note: Not all sizes are available for all of the listed materials)

**Metric Rectangular Hollow Sections – Tubing**



**CARBON STEEL HR - S152-3, S355J2H, EN10210, EN10219, DIN 59410, DIN 59411**

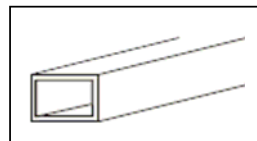
**STAINLESS STEEL 304, 304L, 316, 316L, ASTM A-276, EN10217-7**

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
40 x 20 x 1.60	1.38	0.93	100 x 50 x 5.60	12.00	8.08	120 x 80 x 6.30	17.50	11.78
2.6	2.10	1.41	7.1	14.80	9.96	140 x 70 x 4.00	12.50	8.41
50 x 30 x 1.60	1.88	1.27	8	16.40	11.04	5	15.40	10.36
2.6	2.92	1.97	100 x 60 x 3.20	7.51	5.05	6.3	19.00	12.79
2.9	3.32	2.23	3.6	8.55	5.75	7.1	21.20	14.27
3.2	3.49	2.35	4.5	10.50	7.07	8.8	25.60	17.23
4	4.41	2.97	5.6	12.90	8.68	140 x 80 x 3.20	10.50	7.07
60 x 40 x 2.60	3.73	2.51	6.3	13.50	9.09	4	13.10	8.82
2.9	4.23	2.85	7.1	15.90	10.70	5	16.20	10.90
3.2	4.50	3.03	8.8	19.20	12.92	6.3	20.00	13.46
4	5.67	3.82	100 x 80 x 6.3	16.37	11.02	8	24.80	16.69
70 x 40 x 2.90	4.69	3.16	110 x 60 x 3.60	9.05	6.09	10	30.20	20.32
4	6.30	4.24	4.5	11.10	7.47	150 x 100 x 3.20	12.00	8.08
80 x 40 x 2.60	4.55	3.06	5.6	13.60	9.15	4	14.90	10.03
2.9	5.14	3.46	7.1	16.80	11.31	5	18.20	12.25
3.2	5.50	3.70	8.8	20.10	13.53	6.3	22.40	15.08
4	6.93	4.66	110 x 70 x 3.20	8.51	5.73	8	27.70	18.64
5	8.47	5.70	4	10.80	7.27	10	35.71	24.04
6.3	10.40	7.00	5	12.70	8.55	160 x 80 x 3.20	11.50	7.74
90 x 50 x 2.60	5.37	3.61	6.3	15.50	10.43	4	14.30	9.62
3.2	6.64	4.47	120 x 60 x 3.20	8.51	5.73	5	17.40	11.71
4	8.18	5.51	4	10.60	7.13	6.3	21.40	14.40
5	10.00	6.73	5	13.00	8.75	8	26.40	17.77
6.3	12.30	8.28	6.3	16.10	10.84	10	32.55	21.87
7.1	13.70	9.22	7.1	17.90	12.05	160 x 90 x 4.50	16.60	11.17
100 x 50 x 3.60	7.98	5.37	8.8	21.50	14.47	5.6	20.40	13.73
4.5	9.83	6.62	120 x 80 x 3.20	12.10	8.14			

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
160 x 90 x 7.10	25.30	17.03	200 x 120 x 6.30	29.6	19.92	260 x 140 x 8.00	46.90	31.56
8.8	30.50	20.53	8	36.5	24.56	10.00	57.60	38.76
10	34.10	22.95	8.8	36.9	24.83	12.5	70.40	47.38
180 x 100 x 4.00	16.80	11.31	10	45.1	30.35	14.2	78.80	53.03
5	20.50	13.80	12.5	54.7	36.81	260 x 180 x 6.30	41.50	27.93
5.6	23.00	15.48	14.2	60.9	40.99	8	52.00	35.00
6.3	25.40	17.09	220 x 80 x 6.00	26.816	18.02	10	63.90	43.00
7.1	28.60	19.25	220 x 120 x 6.30	31.6	21.27	12.5	78.30	52.70
8.8	34.70	23.35	8	39.4	26.52	14.2	87.70	59.02
10	38.80	26.11	10	46.2	31.09	300 x 100 x 5.00	30.27	20.34
12.5	46.90	31.56	12.5	58.7	39.51	8	47.68	32.04
200 x 100 x 4.00	18.00	12.11	14.2	65.4	44.01	10	58.98	39.63
5	22.10	14.20	250 x 150 x 5.00	29.9	20.12	300 x 200 x 5.00	37.80	25.44
6.3	27.40	18.44	6.3	37.3	25.1	6.3	47.10	31.70
8	34.00	22.88	8	46.5	31.29	8	59.10	39.77
10	40.60	27.32	10	56.3	37.89	10	72.00	48.46
200 x 120 x 4.00	19.30	12.99	12.5	68.3	45.97	12	88.00	59.22
5	23.70	15.95	260 x 140 x 6.30	37.5	25.23			

(Note: Not all sizes are available for all of the listed materials)

**Metric Rectangular Tubing – Aluminum**



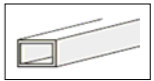
ALUMINUM 6060 T-6 (Extruded) EN 573-3, EN755-2, EN755-1, EN 755-9, DIN 1725, DIN 1746, DIN 1748-5

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
20 x 10 x 1.5	0.22	0.15	40 x 30 x 4	1.36	0.92	60 x 50 x 3	1.72	1.16
2	0.29	0.19	45 x 20 x 2	0.67	0.45	4	2.24	1.51
20 x 15 x 2	0.34	0.23	45 x 25 x 2	0.73	0.49	70 x 20 x 2	0.95	0.64
1.5	0.31	0.21	50 x 15 x 2	0.67	0.45	70 x 30 x 2	1.06	0.71
2	0.40	0.27	50 x 20 x 2	0.73	0.49	3	1.55	1.04
25 x 20 x 2	0.45	0.30	3	1.06	0.71	75 x 50 x 3	1.96	1.32
30 x 10 x 1.5	0.31	0.21	4	1.36	0.92	80 x 20 x 2	1.06	0.71
30 x 15 x 1.5	0.35	0.23	50 x 25 x 1.5	0.59	0.40	80 x 25 x 2	1.11	0.75
2	0.45	0.30	2	0.78	0.53	80 x 30 x 2	1.17	0.79
30 x 20 x 1.5	0.39	0.26	3	1.14	0.77	3	1.72	1.16
2	0.51	0.34	50 x 30 x 2	0.84	0.56	80 x 40 x 2	1.28	0.86
3	0.73	0.49	2.5	1.03	0.69	2.5	1.58	1.06
30 x 25 x 2	0.56	0.38	3	1.22	0.82	3	1.88	1.27
34 x 20 x 2	0.55	0.37	50 x 34 x 3	1.29	0.87	4	2.46	1.66
35 x 15 x 2	0.51	0.34	50 x 40 x 2	0.95	0.64	80 x 50 x 2	1.39	0.93
35 x 20 x 2	0.56	0.38	2.5	1.17	0.79	3	2.05	1.38
35 x 25 x 1.5	0.47	0.32	3	1.39	0.93	4	2.68	1.81
2	0.62	0.42	4	1.80	1.21	80 x 60 x 3	2.21	1.49
40 x 15 x 2	0.56	0.38	60 x 20 x 2	0.84	0.56	4	2.90	1.95
40 x 20 x 1.5	0.47	0.32	3	1.22	0.82	100 x 18 x 2	1.25	0.84
2	0.62	0.42	60 x 25 x 2	0.89	0.60	100 x 20 x 2	1.28	0.86
2.5	0.76	0.51	3	1.30	0.88	100 x 25 x 2	1.33	0.90
3	0.89	0.60	60 x 30 x 2	0.95	0.64	100 x 30 x 2	1.39	0.93
4	1.14	0.77	3	1.39	0.93	3	2.05	1.38
40 x 25 x 2	0.67	0.45	60 x 34 x 3	1.45	0.98	100 x 40 x 2	1.50	1.01
3	0.97	0.66	60 x 40 x 2	1.06	0.71	3	2.21	1.49
40 x 30 x 2	0.73	0.49	2.5	1.31	0.88	4	2.90	1.95
2.5	0.89	0.60	3	1.55	1.04	100 x 50 x 2	1.61	1.08
3	1.06	0.71	4	2.02	1.36			

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
100 x 50 x 3	2.38	1.60	120 x 40 x 2	1.72	1.16	150 x 60 x 4	4.44	2.99
4	3.12	2.10	4	3.34	2.25	150 x 100 x 3	4.03	2.71
5	3.85	2.59	120 x 50 x 3	2.71	1.82	160 x 60 x 4	4.66	3.14
100 x 60 x 2	1.72	1.16	4	3.56	2.40	180 x 40 x 4	4.66	3.14
3	2.54	1.71	120 x 60 x 3	2.87	1.93	180 x 50 x 5	4.88	3.29
4	3.34	2.25	4	3.78	2.55	200 x 18 x 2	2.35	1.58
100 x 80 x 3	2.78	1.87	120 x 80 x 3	3.20	2.15	200 x 50 x 4	5.32	3.58
120 x 20 x 2	1.50	1.01	140 x 80 x 4	4.66	3.32	200 x 60 x 4	5.54	3.73
120 x 30 x 2	1.61	1.08	150 x 40 x 4	4.00	2.70	200 x 80 x 4	5.98	4.03
3	2.38	1.60	150 x 50 x 4	4.22	2.84	200 x 100 x 4	6.42	4.32

(Note: Not all sizes are available for all of the listed materials)

**Metric Rectangular Welded Tubing**



**CARBON STEEL S137-2, DIN 2395, EN 10305-5, DIN 17100, S235JrG2, EN 10025**

**STAINLESS STEEL 304, 304L, 316, 316L, ASTM A-276, EN 10217-7**

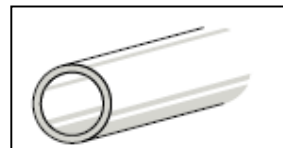
SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
15 x 10 x 1.5	0.57	0.38	30 x 20 x 1.00	0.75	0.51	40 x 20 x 3.00	2.48	1.67
20 x 10 x 1.00	0.43	0.29	1.25	0.92	0.62	40 x 25 x 1.25	1.22	0.82
1.25	0.53	0.36	1.5	1.09	0.73	1.5	1.45	0.97
1.5	0.62	0.42	2	1.42	0.95	2	1.89	1.27
2	0.79	0.53	30 x 20 x 2.50	1.72	1.16	2.5	2.31	1.56
20 x 15 x 1.00	0.51	0.34	3	2.07	1.39	3	2.63	1.77
1.25	0.63	0.42	30 x 25 x 1.50	1.22	0.82	40 x 30 x 1.50	1.56	1.05
1.5	0.74	0.50	2	1.56	1.05	2	2.05	1.38
2	0.95	0.64	34 x 20 x 1.50	1.19	0.80	2.5	2.51	1.69
25 x 10 x 1.00	0.51	0.34	2	1.54	1.04	3	2.95	1.99
1.25	0.63	0.42	35 x 15 x 1.50	1.09	0.73	45 x 20 x 1.50	1.45	0.97
1.5	0.74	0.50	2	1.42	0.95	2	1.89	1.27
2	0.95	0.64	35 x 20 x 1.50	1.21	0.81	2.5	2.31	1.56
25 x 15 x 1.00	0.59	0.40	2	1.57	1.06	45 x 25 x 1.50	1.56	1.05
1.25	0.73	0.49	35 x 25 x 1.50	1.33	0.89	2	2.05	1.38
1.5	0.86	0.58	2	1.73	1.16	2.5	2.51	1.69
2	1.10	0.74	3	2.39	1.61	50 x 10 x 1.50	1.33	0.89
25 x 20 x 1.50	0.97	0.66	36 x 11 x 2.00	1.34	0.90	50 x 20 x 1.25	1.31	0.88
2	1.26	0.85	40 x 10 x 1.50	1.09	0.73	1.5	1.56	1.05
30 x 10 x 1.00	0.59	0.40	2	1.42	0.95	2	2.05	1.38
1.25	0.73	0.49	40 x 15 x 1.50	1.21	0.81	2.3	2.33	1.57
1.5	0.86	0.58	2	1.57	1.06	2.5	2.54	1.71
2	1.10	0.74	40 x 20 x 1.00	0.91	0.61	3	2.86	1.93
30 x 15 x 1.00	0.67	0.45	1.25	1.12	0.75	50 x 25 x 1.50	1.68	1.13
1.25	0.82	0.55	1.5	1.33	0.89	2	2.20	1.48
1.5	0.97	0.66	2	1.73	1.16	2.5	2.71	1.82
2	1.26	0.85	2.5	2.12	1.42	3	3.19	2.15

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
50 x 30 x 1.50	1.80	1.21	60 x 33 x 2.50	3.41	2.30	80 x 30 x 2.00	3.32	2.24
2	2.36	1.59	3	4.04	2.72	3	4.84	3.25
2.3	2.69	1.81	60 x 35 x 1.50	2.15	1.45	4	6.33	4.26
2.5	2.90	1.95	2	2.83	1.90	80 x 40 x 2.00	3.62	2.43
3	3.43	2.31	2.5	3.49	2.35	2.5	4.47	3.01
4	4.41	2.97	60 x 40 x 1.50	2.27	1.53	3	5.31	3.57
50 x 34 x 1.50	1.89	1.27	2	2.99	2.01	4	6.93	4.66
2	2.49	1.67	2.5	3.69	2.48	5	8.47	5.70
2.5	3.06	2.06	3	4.37	2.94	80 x 50 x 2.00	3.93	2.64
50 x 35 x 1.50	1.92	1.29	4	5.67	3.82	2.5	4.86	3.27
2	2.52	1.69	5	6.90	4.64	3	5.78	3.89
2.5	3.10	2.08	6.3	8.55	5.75	4	7.34	4.94
50 x 40 x 1.50	2.03	1.37	60 x 50 x 2.00	3.30	2.22	5	8.91	6.00
2	2.67	1.80	2.5	4.08	2.75	80 x 60 x 2.00	4.24	2.86
2.5	3.29	2.22	3	4.84	3.26	2.5	5.26	3.54
3	3.90	2.62	4	6.30	4.24	3	6.25	4.21
55 x 34 x 1.50	2.01	1.35	67 x 35 x 2.00	3.05	2.05	4	8.18	5.51
2	2.64	1.78	70 x 20 x 3.00	3.91	2.63	5	10.04	6.75
3	3.76	2.53	70 x 30 x 3.00	4.29	2.88	80 x 60 x 6.00	11.10	7.46
4	4.82	3.24	70 x 35 x 2.00	3.14	2.12	6.35	12.55	8.43
60 x 20 x 1.50	1.80	1.21	2.5	3.88	2.61	90 x 40 x 4.00	7.38	4.96
2	2.36	1.59	70 x 40 x 2.00	3.30	2.22	90 x 50 x 3.00	6.24	4.19
3	3.43	2.31	2.5	4.08	2.75	4	8.20	5.51
60 x 25 x 1.50	1.92	1.29	3	4.85	3.26	100 x 20 x 2.00	3.62	2.43
2	2.52	1.69	4	6.30	4.24	3	5.49	3.69
2.5	3.10	2.08	70 x 50 x 2.00	3.62	2.43	100 x 40 x 2.00	4.24	2.86
60 x 30 x 1.50	2.03	1.37	2.5	4.47	3.01	2.5	5.26	3.54
2	2.67	1.80	3	5.31	3.57	3	6.25	4.21
2.3	3.05	2.05	3.5	6.13	4.12	4	8.18	5.51
2.5	3.29	2.22	4	6.93	4.66	5	9.70	6.53
3	3.90	2.62	75 x 20 x 2.30	3.23	2.17	100 x 50 x 2.00	4.58	3.08
3.2	4.15	2.79	75 x 50 x 2.30	4.30	2.89	2.5	5.65	3.80
4	4.89	3.28	80 x 20 x 2.00	2.99	2.01	3	6.72	4.52
60 x 33 x 2.00	2.77	1.86	3	4.28	2.88			

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
100 x 50 x 4.00	8.60	5.79	100 x 80 x 8.00	18.90	12.70	120 x 80 x 4.00	11.95	8.04
5	10.47	7.05	110 x 70 x 3.00	8.14	5.47	5	14.75	9.92
6	12.04	8.09	4	10.69	7.20	6	18.19	12.22
8	16.43	11.04	5	13.18	8.87	140 x 40 x 3.00	8.14	5.47
100 x 60 x 2.50	6.04	4.07	120 x 40 x 2.00	4.89	3.29	140 x 70 x 4.00	12.54	8.43
3	7.19	4.84	3	7.19	4.84	140 x 80 x 4.00	13.12	8.82
4	9.44	6.35	4	9.44	6.35	150 x 50 x 3.00	9.02	6.06
5	11.61	7.81	5	11.62	7.82	4	12.02	8.08
100 x 60 x 6.00	14.62	9.83	120 x 50 x 3.00	7.74	5.20	5	14.75	9.91
7.1	15.92	10.70	120 x 60 x 2.00	5.52	3.71	6.3	18.47	12.41
8.8	19.23	12.92	3	8.14	5.47	150 x 80 x 5.00	17.07	11.47
100 x 80 x 2.00	5.52	3.72	4	10.69	7.20	150 x 100 x 4.00	14.09	9.47
3	8.14	5.47	5	13.18	8.87	5	18.08	12.15
4	10.69	7.20	6	14.87	9.99	150 x 100 x 6.00	21.47	14.43
5	13.18	8.87	6.3	16.13	10.84	10	33.65	22.61
6.3	16.37	11.00	120 x 80 x 3.00	9.08	6.11	160 x 80 x 3.00	10.89	7.32

(Note: Not all sizes are available for all of the listed materials)

**Metric Round Honed Tubing**



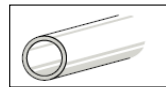
CARBON STEEL Tubes up to 220 mm; St52, DIN 2391.C, St2.3, DIN 2393 and Tubes over 220 mm; St52, DIN 2448/1630

ID mm	OD mm	WALL mm	WEIGHT PER FT.	ID mm	OD mm	WALL mm	WEIGHT PER FT.	ID mm	OD mm	WALL mm	WEIGHT PER FT.
25	35	5	2.48	63	75	6	6.86	100	120	10	18.22
25	40	7.5	4.04	63	78	7.5	8.76	100	125	12.5	23.29
25	45	10	5.80	63	83	10	12.09	105	115	5	9.11
30	40	5	2.90	65	75	5	5.80	105	120	7.5	13.97
30	45	7.5	4.66	65	80	7.5	9.00	105	125	10	19.04
30	50	10	6.62	65	85	10	12.42	110	120	5	9.52
32	42	5	3.06	70	80	5	6.21	110	125	7.5	14.59
35	45	5	3.31	70	82	6	7.55	110	130	10	19.87
35	50	7.5	5.28	70	85	7.5	9.63	110	140	15	31.05
40	50	5	3.73	70	90	10	13.25	115	130	7.5	15.21
40	52	6	4.57	75	85	5	6.62	115	135	10	20.70
40	55	7.5	5.90	75	90	7.5	10.25	115	140	12.5	26.39
40	60	10	8.28	75	95	10	14.08	120	130	5	10.35
45	55	5	4.14	80	90	5	7.04	120	135	7.5	15.84
45	60	7.5	6.52	80	92	6	8.55	120	140	10	21.53
45	65	10	9.11	80	95	7.5	10.87	120	145	12.5	27.43
50	60	5	4.55	80	100	10	14.90	120	150	15	33.53
50	62	6	5.56	80	105	12.5	19.15	125	140	7.5	16.46
50	65	7.5	7.14	80	110	15	23.60	125	145	10	22.36
50	70	10	9.94	85	95	5	7.45	125	150	12.5	28.46
55	65	5	4.97	85	100	7.5	11.49	125	155	15	34.78
55	70	7.5	7.76	85	105	10	15.73	130	140	5	11.18
55	75	10	10.76	90	100	5	7.87	130	145	7.5	17.08
60	70	5	5.38	90	105	7.5	12.11	130	150	10	23.18
60	72	6	6.56	90	110	10	16.56	130	155	12.5	29.50
60	75	7.5	8.38	100	110	5	8.69	130	160	15	36.02
60	80	10	11.59	100	112	6	10.53	140	150	5	12.01
63	73	5	5.63	100.00	115	7.5	13.3515	140	155	7.5	18.32

ID mm	OD mm	WALL mm	WEIGHT PER FT.	ID mm	OD mm	WALL mm	WEIGHT PER FT.	ID mm	OD mm	WALL mm	WEIGHT PER FT.
140	160	10	24.84	160	190	15	43.47	200	210	5	16.97
140	165	12.5	31.57	170	190	10	29.81	200	215	7.5	25.77
140	170	15	38.50	170	200	15	45.95	200	220	10	34.78
150	160	5	12.83	180	200	10	31.46	200	225	12.5	43.99
150	165	7.5	19.56	180	205	12.5	39.85	200	230	15	53.41
150	170	10	26.50	180	210	15	48.44	200	235	17.5	63.03
150	180	15	40.99	180	215	17.5	57.24	200	240	20	72.86
160	180	10	28.15	180	220	20	66.24				
160	185	12.5	35.71	190	220	15	50.92				

(Note: Not all sizes are available for all of the listed materials)

**Metric Round Seamless & Hydraulic Tubing**



CARBON STEEL S135, S137-4, S152, S355, DIN 2391-C SHEET 2, EN 10305-1
STAINLESS STEEL 304, 304L, 316, 316L, 316 Ti, 321, ASTM A-276
ALLOY STEEL 4140 Modified, 42CrMo, SCM440, ASTM A-29
ALUMINUM 6060 T-6 (Extruded)
BRASS OT63 (Similar To C330)
COPPER ASTM B68, Alloy 122

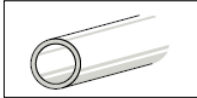
Seamless precision steel tubes DIN 2391, Sheet 2, EN 10305-1 and seamless high pressure steel tubes, 37-4 NBK bonderized (phosphate treated); Qualities: St. 35, St. 52, S355, and others available upon request; Availabilities: BK-bright hard, BKW-bright soft, GBK-bright annealed, NBK-normalised bright annealed

OUTER DIAMETER Da	PERMISSIBLE DEVIATION	WALL THICKNESS S = NOMINAL SIZE. PERMISSIBLE DEVIATION: NOMINAL SIZE ± 10%															
		THE ECCENTRICITY IS INCLUDED IN THE PERMISSIBLE WALL THICKNESS.															
		0.5	0.8	1	1.2	1.5	1.8	2	2.2	2.5	2.8	3	3.5	4	4.5		
4	±0.1	3±0.30	2.4±0.30	2±0.30	1.6±0.30												
5		4±0.30	3.4±0.30	3±0.30	2.6±0.30												
6		5±0.25	4.4±0.25	4±0.25	3.6±0.30	3±0.30	2.4±0.40	2±0.40									
7		6±0.20	5.4±0.20	5±0.25	4.6±0.30	4±0.30	3.4±0.40	3±0.40									
8		7±0.20	6.4±0.20	6±0.20	5.6±0.30	5±0.30	4.4±0.35	4±0.35	3.6±0.40	3±0.40							
9		8±0.15	7.4±0.15	7±0.20	6.6±0.25	6±0.25	5.4±0.35	5±0.35	4.6±0.40	4±0.40	3.4±0.45						
10		9±0.15	8.4±0.15	8±0.20	7.6±0.25	7±0.25	6.4±0.30	6±0.30	5.6±0.35	5±0.35	4.4±0.40	4±0.45					
12		11±0.15	10.4±0.15	10±0.15	9.6±0.20	9±0.20	8.4±0.25	8±0.25	7.6±0.30	7±0.30	6.4±0.40	6±0.40	5±0.45	4±0.45			
14		13±0.08	12.4±0.08	12±0.08	11.6±0.15	11±0.15	10.4±0.20	10±0.20	9.6±0.25	9±0.25	8.4±0.30	8±0.30	7±0.35	6±0.40	5±0.45		
15		14±0.08	13.4±0.08	13±0.08	12.6±0.08	12±0.15	11.4±0.20	11±0.20	10.6±0.25	10±0.25	9.4±0.30	9±0.30	8±0.35	7±0.35	6±0.40		
16	15±0.08	14.4±0.08	14±0.08	13.6±0.08	13±0.08	12.4±0.15	12±0.15	11.6±0.20	11±0.20	10.4±0.30	10±0.30	9±0.35	8±0.35	7±0.40			
18	17±0.08	16.4±0.08	16±0.08	15.6±0.08	15±0.08	14.4±0.08	14±0.08	13.6±0.20	13±0.20	12.4±0.20	12±0.20	11±0.35	10±0.35	9±0.35			
20	19±0.08	18.4±0.08	18±0.08	17.6±0.08	17±0.08	16.4±0.08	16±0.08	15.6±0.15	15±0.15	14.4±0.15	14±0.20	13±0.30	12±0.35	11±0.35			
22	21±0.08	20.4±0.08	20±0.08	19.6±0.08	19±0.08	18.4±0.08	18±0.08	17.6±0.08	17±0.08	16.4±0.15	16±0.15	15±0.20	14±0.30	13±0.35			
25	24±0.08	23.4±0.08	23±0.08	22.6±0.08	22±0.08	21.4±0.08	21±0.08	20.6±0.08	20±0.08	19.4±0.15	19±0.15	18±0.15	17±0.20	16±0.20			
26	25±0.08	24.4±0.08	24±0.08	23.6±0.08	23±0.08	22.4±0.08	22±0.08	21.6±0.08	21±0.08	20.4±0.15	20±0.15	19±0.15	18±0.15	17±0.20			
28	27±0.08	26.4±0.08	26±0.08	25.6±0.08	25±0.08	24.4±0.08	24±0.08	23.6±0.08	23±0.08	22.4±0.08	22±0.15	21±0.15	20±0.15	19±0.15			
30	29±0.08	28.4±0.08	28±0.08	27.6±0.08	27±0.08	26.4±0.08	26±0.08	25.6±0.08	25±0.08	24.4±0.08	24±0.15	23±0.15	22±0.15	21±0.15			
32	31±0.15	30.4±0.15	30±0.15	29.6±0.15	29±0.15	28.4±0.15	28±0.15	27.6±0.15	27±0.15	26.4±0.15	26±0.15	25±0.15	24±0.15	23±0.15			
35	34±0.15	33.4±0.15	33±0.15	32.6±0.15	32±0.15	31.4±0.15	31±0.15	30.6±0.15	30±0.15	29.4±0.15	29±0.15	28±0.15	27±0.15	26±0.15			
38	37±0.15	36.4±0.15	36±0.15	35.6±0.15	35±0.15	34.4±0.15	34±0.15	33.6±0.15	33±0.15	32.4±0.15	32±0.15	31±0.15	30±0.15	29±0.15			
40	39±0.15	38.4±0.15	38±0.15	37.6±0.15	37±0.15	36.4±0.15	36±0.15	35.6±0.15	35±0.15	34.4±0.15	34±0.15	33±0.15	32±0.15	31±0.15			
42	±0.20			40±0.20	39±0.20	38±0.20	38±0.20	37±0.20	37±0.20	36.4±0.20	36±0.20	35±0.20	34±0.20	33±0.20			
45				43±0.20	42±0.20	42±0.20	41.4±0.20	41±0.20	40±0.20	40±0.20	39.4±0.20	39±0.20	38±0.20	37±0.20	36±0.20		
48				46±0.20	45±0.20	45±0.20	44.4±0.20	44±0.20	43±0.20	43±0.20	42.4±0.20	42±0.20	41±0.20	40±0.20	39±0.20		
50				49±0.20	47±0.20	47±0.20	46.4±0.20	46±0.20	45±0.20	45±0.20	44.4±0.20	44±0.20	43±0.20	42±0.20	41±0.20		
55		±0.25			53±0.25	52±0.25	52±0.25	51.4±0.25	51±0.25	50±0.25	50±0.25	49.4±0.25	49±0.25	48±0.25	47±0.25	46±0.25	
60					58±0.25	57±0.25	57±0.25	56.4±0.25	56±0.25	55±0.25	55±0.25	54.4±0.25	54±0.25	53±0.25	52±0.25	51±0.25	
65		±0.30			63±0.30	62±0.30	62±0.30	61.4±0.30	61±0.30	60±0.30	60±0.30	59.4±0.30	59±0.30	58±0.30	57±0.30	56±0.30	
70					68±0.30	67±0.30	67±0.30	66.6±0.30	66±0.30	65±0.30	65±0.30	64.4±0.30	64±0.30	63±0.30	62±0.30	61±0.30	
75		±0.35			73±0.35	72±0.35	72±0.35	71.4±0.35	71±0.35	70±0.35	70±0.35	69.4±0.35	69±0.35	68±0.35	67±0.35	66±0.35	
80					78±0.35	77±0.35	77±0.35	76.6±0.35	76±0.35	75±0.35	75±0.35	74.4±0.35	74±0.35	73±0.35	72±0.35	71±0.35	
85	±0.40					82±0.40	81±0.40	81±0.40	80±0.40	80±0.40	79.4±0.40	79±0.40	78±0.40	77±0.40	76±0.40		
90						87±0.40	86±0.40	86±0.40	85±0.40	85±0.40	84.4±0.40	84±0.40	83±0.40	82±0.40	81±0.40		
95	±0.45							91±0.45	90±0.45	90±0.45	89.4±0.45	89±0.45	88±0.45	87±0.45	86±0.45		
100								96±0.45	95±0.45	95±0.45	94.4±0.45	94±0.45	93±0.45	92±0.45	91±0.45		
110	±0.50							106±0.50	105±0.50	105±0.50	104.4±0.50	104±0.50	103±0.50	102±0.50	101±0.50		
120								116±0.50	115±0.50	115±0.50	114.4±0.50	114±0.50	113±0.50	112±0.50	111±0.50		
130	±0.70									125±0.70	124.4±0.70	124±0.70	123±0.70	122±0.70	121±0.70		
140										135±0.70	134.4±0.70	134±0.70	133±0.70	132±0.70	131±0.70		

OUTER DIAMETER Da	PERMISSIBLE DEVIATION	WALL THICKNESS S = NOMINAL SIZE. PERMISSIBLE DEVIATION: NOMINAL SIZE ± 10%															
		THE ECCENTRICITY IS INCLUDED IN THE PERMISSIBLE WALL THICKNESS.															
		5	5.5	6	7	8	9	10	12	14	16	18					
15	±0.08	5±0.45															
16		6±0.40	5±0.45	4±0.45													
18		8±0.35	7±0.40	6±0.40													
20		10±0.35	9±0.35	8±0.35	6±0.35												
22		12±0.35	11±0.35	10±0.35	8±0.35												
25		15±0.30	14±0.30	13±0.30	11±0.35	9±0.35											
26		16±0.30	15±0.30	14±0.30	12±0.35	10±0.35											
28		18±0.30	17±0.30	16±0.30	14±0.30	12±0.35											
30		20±0.15	19±0.30	18±0.30	16±0.30	14±0.30	12±0.30	10±0.35									
32		22±0.15	21±0.30	20±0.30	18±0.30	16±0.30	14±0.30	12±0.30									
35	25±0.15	24±0.20	23±0.20	21±0.20	19±0.25	17±0.30	15±0.30										
38	28±0.15	27±0.15	26±0.15	24±0.20	22±0.25	20±0.25	18±0.30										
40	30±0.15	29±0.15	28±0.15	26±0.20	24±0.25	22±0.30	20±0.30										
42	±0.20	32±0.20	31±0.20	30±0.20	28±0.20	26±0.20	24±0.20	22±0.30									
45		35±0.20	34±0.20	33±0.20	31±0.20	29±0.20	27±0.20	25±0.25									
48		38±0.20	37±0.20	36±0.20	34±0.20	32±0.20	30±0.20	28±0.20									
50		40±0.20	39±0.20	38±0.20	36±0.20	34±0.20	32±0.20	30±0.20									
55		45±0.25	44±0.25	43±0.25	41±0.25	39±0.25	37±0.25	35±0.25	31±0.25								
60		50±0.25	49±0.25	48±0.25	46±0.25	44±0.25	42±0.25	40±0.25	36±0.25								
65		55±0.30	54±0.30	53±0.30	51±0.30	49±0.30	47±0.30	45±0.30	41±0.30	37±0.30							
70		60±0.30	59±0.30	58±0.30	56±0.30	54±0.30	52±0.30	50±0.30	46±0.30	42±0.30							
75		65±0.35	64±0.35	63±0.35	61±0.35	59±0.35	57±0.35	55±0.35	51±0.35	47±0.35	43±0.35						
80		70±0.35	69±0.35	68±0.35	66±0.35	64±0.35	62±0.35	60±0.35	56±0.35	52±0.35	48±0.35						
85	75±0.40	74±0.40	73±0.40	71±0.40	69±0.40	67±0.40	65±0.40	61±0.40	57±0.40	53±0.40							
90	80±0.40	79±0.40															

**Metric D.O.M. – Drawn Over Mandrel Tubing**

Welded precision drawn over mandrel (DOM) steel tubes DIN 2393; Qualities: St34-2, St37-2, St42-2, St52-3, and others available upon request; Availabilities: BK-bright hard, BKW-bright soft, GBK-bright annealed, NBK-normalised bright annealed. By special order only, non-stocked item.

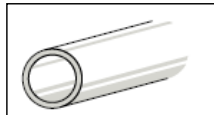


OUTER DIAMETER Da NOMINAL SIZE	PERMISSIBLE DEVIATION	WALL THICKNESS S = NOMINAL SIZE. PERMISSIBLE DEVIATION: NOMINAL SIZE ± 10%																						
		THE ECCENTRICITY IS INCLUDED IN THE PERMISSIBLE WALL THICKNESS.																						
		0.5	0.8	1	1.2	1.5	1.8	2	2.2	2.5	2.8	3	3.5	4	4.5	5	5.5	6	7					
4	±0.1	3±0.30	2.4±0.30	2±0.30																				
5		4±0.30	3.4±0.30	3±0.30																				
6		5±0.25	4.4±0.25	4±0.25																				
7		6±0.20	5.4±0.20	5±0.25	4.6±0.30	4±0.30																		
8		7±0.20	6.4±0.20	6±0.20	5.6±0.30	5±0.30																		
9		8±0.15	7.4±0.15	7±0.20	6.6±0.25	6±0.25																		
10		9±0.15	8.4±0.15	8±0.20	7.6±0.25	7±0.25	6.4±0.30	6±0.30																
12		11±0.15	10.4±0.15	10±0.15	9.6±0.20	9±0.20	8.4±0.25	8±0.25																
14		13±0.08	12.4±0.08	12±0.08	11.6±0.15	11±0.15	10.4±0.20	10±0.20	9.6±0.25	9±0.25														
15		14±0.08	13.4±0.08	13±0.08	12.6±0.08	12±0.15	11.4±0.20	11±0.20	10.6±0.25	10±0.25														
16	15±0.08	14.4±0.08	14±0.08	13.6±0.08	13±0.08	12.4±0.15	12±0.15	11.6±0.20	11±0.20															
18	17±0.08	16.4±0.08	16±0.08	15.6±0.08	15±0.08	14.4±0.08	14±0.08	13.6±0.20	13±0.20	12.4±0.20	12±0.20	11±0.35												
20	19±0.08	18.4±0.08	18±0.08	17.6±0.08	17±0.08	16.4±0.08	16±0.08	15.6±0.15	15±0.15	14.4±0.15	14±0.20	13±0.30	12±0.35											
22	21±0.08	20.4±0.08	20±0.08	19.6±0.08	19±0.08	18.4±0.08	18±0.08	17.6±0.08	17±0.15	16.4±0.15	16±0.15	15±0.20	14±0.30											
25	24±0.08	23.4±0.08	23±0.08	22.6±0.08	22±0.08	21.4±0.08	21±0.08	20.6±0.08	20±0.08	19.4±0.15	19±0.15	18±0.15	17±0.20											
26	25±0.08	24.4±0.08	24±0.08	23.6±0.08	23±0.08	22.4±0.08	22±0.08	21.6±0.08	21±0.08	20.4±0.15	20±0.15	19±0.15	18±0.15											
28	27±0.08	26.4±0.08	26±0.08	25.6±0.08	25±0.08	24.4±0.08	24±0.08	23.6±0.08	23±0.08	22.4±0.08	22±0.15	21±0.15	20±0.15											
30	29±0.08	28.4±0.08	28±0.08	27.6±0.08	27±0.08	26.4±0.08	26±0.08	25.6±0.08	25±0.08	24.4±0.08	24±0.15	23±0.15	22±0.15	21±0.15										
32	31±0.15	30.4±0.15	30±0.15	29.6±0.15	29±0.15	28.4±0.15	28±0.15	27.6±0.15	27±0.15	26.4±0.15	26±0.15	25±0.15	24±0.15	23±0.15										
35	34±0.15	33.4±0.15	33±0.15	32.6±0.15	32±0.15	31.4±0.15	31±0.15	30.6±0.15	30±0.15	29.4±0.15	29±0.15	28±0.15	27±0.15	26±0.15										
38	±0.15	37±0.15	36.4±0.15	36±0.15	35.6±0.15	35±0.15	34.4±0.15	34±0.15	33.6±0.15	33±0.15	32.4±0.15	32±0.15	31±0.15	30±0.15	29±0.15	28±0.15								
40		39±0.15	38.4±0.15	38±0.15	37.6±0.15	37±0.15	36.4±0.15	36±0.15	35.6±0.15	35±0.15	34.4±0.15	34±0.15	33±0.15	32±0.15	31±0.15	30±0.15								
42		40±0.20	39.6±0.20	39±0.20	38.4±0.20	38±0.20	37.6±0.20	37±0.20	36.4±0.20	36±0.20	35.2±0.20	34±0.20	33±0.20	32±0.20	31±0.15	30±0.15								
45	±0.20	43±0.20	42.6±0.20	42±0.20	41.4±0.20	41±0.20	40±0.20	40±0.20	39.4±0.20	39±0.20	38±0.20	37±0.20	36±0.20	35±0.20										
48		46±0.20	45.6±0.20	45±0.20	44.4±0.20	44±0.20	43.6±0.20	43±0.20	42.4±0.20	42±0.20	41±0.20	40±0.20	39±0.20	38±0.20										
50		48±0.20	47.6±0.20	47±0.20	46.4±0.20	46±0.20	45.6±0.20	45±0.20	44.4±0.20	44±0.20	43±0.20	42±0.20	41±0.20	40±0.20										
55	±0.25	53±0.25	52.6±0.25	52±0.25	51.4±0.25	51±0.25	50±0.25	50±0.25	49.4±0.25	49±0.25	48±0.25	47±0.25	46±0.25	45±0.25										
60		58±0.25	57.6±0.25	57±0.25	56.4±0.25	56±0.25	55.6±0.25	55±0.25	54.4±0.25	54±0.25	53±0.25	52±0.25	51±0.25	50±0.25	49±0.25									
65		63±0.30	62.6±0.30	62±0.30	61.4±0.30	61±0.30	60.6±0.30	60±0.30	59.4±0.30	59±0.30	58±0.30	57±0.30	56±0.30	55±0.30	54±0.30									
70	±0.30	68±0.30	67.6±0.30	67±0.30	66.4±0.30	66±0.30	65.6±0.30	65±0.30	64.4±0.30	64±0.30	63±0.30	62±0.30	61±0.30	60±0.30	59±0.30									
75		73±0.35	72.6±0.35	72±0.35	71.4±0.35	71±0.35	70.6±0.35	70±0.35	69.4±0.35	69±0.35	68±0.35	67±0.35	66±0.35	65±0.35	64±0.35									
80		78±0.35	77.6±0.35	77±0.35	76.4±0.35	76±0.35	75.6±0.35	75±0.35	74.4±0.35	74±0.35	73±0.35	72±0.35	71±0.35	70±0.35	69±0.35	68±0.35								
85	±0.40	82±0.40	81.4±0.40	81±0.40	80.6±0.40	80±0.40	79.4±0.40	79±0.40	78.6±0.40	78±0.40	77±0.40	76±0.40	75±0.40	74±0.40	73±0.40									
90		87±0.40	86.4±0.40	86±0.40	85.6±0.40	85±0.40	84.4±0.40	84±0.40	83±0.40	82±0.40	81±0.40	80±0.40	79±0.40	78±0.40										
95		91±0.45	90.6±0.45	90±0.45	89.4±0.45	89±0.45	88.4±0.45	88±0.45	87±0.45	86±0.45	85±0.45	84±0.45	83±0.45	82±0.45	81±0.45	80±0.45								
100	±0.45	96±0.45	95.6±0.45	95±0.45	94.4±0.45	94±0.45	93±0.45	92±0.45	91±0.45	90±0.45	89±0.45	88±0.45	87±0.45	86±0.45	85±0.45	84±0.45	83±0.45							
110		106±0.50	105.6±0.50	105±0.50	104.4±0.50	104±0.50	103±0.50	102±0.50	101±0.50	100±0.50	99±0.50	98±0.50	97±0.50	96±0.50	95±0.50	94±0.50	93±0.50	92±0.50	91±0.50	90±0.50	89±0.50	88±0.50	87±0.50	86±0.50
120		116±0.50	115.6±0.50	115±0.50	114.4±0.50	114±0.50	113±0.50	112±0.50	111±0.50	110±0.50	109±0.50	108±0.50	107±0.50	106±0.50	105±0.50	104±0.50	103±0.50	102±0.50	101±0.50	100±0.50	99±0.50	98±0.50	97±0.50	96±0.50
130	±0.70	126±0.70	124.4±0.70	124±0.70	123±0.70	122±0.70	121±0.70	120±0.70	119±0.70	118±0.70	117±0.70	116±0.70	115±0.70	114±0.70	113±0.70	112±0.70	111±0.70	110±0.70	109±0.70	108±0.70	107±0.70	106±0.70	105±0.70	104±0.70
140		136±0.70	134.4±0.70	134±0.70	133±0.70	132±0.70	131±0.70	130±0.70	129±0.70	128±0.70	127±0.70	126±0.70	125±0.70	124±0.70	123±0.70	122±0.70	121±0.70	120±0.70	119±0.70	118±0.70	117±0.70	116±0.70	115±0.70	114±0.70
150		146±0.80	144.4±0.80	144±0.80	143±0.80	142±0.80	141±0.80	140±0.80	139±0.80	138±0.80	137±0.80	136±0.80	135±0.80	134±0.80	133±0.80	132±0.80	131±0.80	130±0.80	129±0.80	128±0.80	127±0.80	126±0.80	125±0.80	124±0.80

(Note: Not all sizes are available for all of the listed materials)

**Metric Round Welded Precision Steel Tubing**

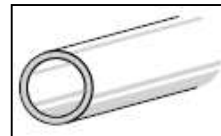
Black heavy wall welded hot rolled steel tubes DIN 2448; Qualities: St34-2, St37-2, St44-2, St52-3, and others available upon request; Availabilities: DKM, GBK, NBK (with scraped inner seam). By special order only, not a stocked item.



OUTER DIAMETER Da		WALL THICKNESS S = NOMINAL SIZE. PERMISSIBLE DEVIATION: NOMINAL SIZE ± 10%																		
NOMINAL SIZE	PERMISSIBLE DEVIATION	THE ECCENTRICITY IS INCLUDED IN THE PERMISSIBLE WALL THICKNESS.																		
		0.7	1	1.2	1.5	1.8	2	2.2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7		
10	±0.12	0.161	0.222	0.26	0.314															
12		0.195	0.271	0.32	0.398	0.453	0.493													
16		0.264	0.37	0.438	0.536	0.63	0.691	0.749												
18		0.299	0.419	0.497	0.61	0.719	0.789	0.857	0.956											
20	±0.15	0.333	0.469	0.556	0.684	0.808	0.888	0.966	1.08	1.26										
22		0.367	0.513	0.616	0.758	0.897	0.986	1.07	1.2	1.41										
25		0.419	0.592	0.704	0.869	1.03	1.13	1.24	1.39	1.63										
30		0.506	0.715	0.852	1.05	1.25	1.38	1.51	1.7	2	2.29									
32	±0.20		0.765	0.911	1.13	1.34	1.48	1.62	1.82	2.15	2.46									
35			0.838	1	1.24	1.47	1.63	1.78	2	2.37	2.72									
38			0.912	1.09	1.35	1.61	1.78	1.94	2.19	2.59	2.98	3.35								
40			0.962	1.15	1.42	1.7	1.87	2.05	2.31	2.74	3.15	3.55								
45	±0.30		1.09	1.3	1.61	1.92	2.12	2.32	2.62	3.11	3.58	4.04								
50			1.21	1.44	1.79	2.14	2.37	2.59	2.93	3.48	4.01	4.54	5.05							
55				1.59	1.98	2.36	2.61	2.86	3.24	3.85	4.45	5.03	5.6							
60				1.74	2.16	2.58	2.86	3.14	3.55	4.22	4.88	5.52	6.16	6.78	7.39					
70	±0.40			2.04	2.53	3.03	3.35	3.68	4.16	4.96	5.74	6.51	7.27	8.01	8.75					
80				2.33	2.9	3.47	3.85	4.22	4.78	5.7	6.6	7.5	8.38	9.25	10.1					
90					3.27	3.92	4.34	4.76	5.39	6.44	7.47	8.48	9.49	10.5	11.5	12.4				
100					3.64	4.36	4.83	5.31	6.01	7.18	8.33	9.47	10.6	11.7	12.8	13.9				
108	±0.50			3.94	4.73	5.23	5.74	6.5	7.77	9.02	10.3	11.5	12.7	13.9	15.1					
114					4.98	5.52	6.2	6.87	8.21	9.54	10.9	12.2	13.4	14.7	16	17.2	18.5			
120						5.25	5.82	6.39	7.24	8.66	10.1	11.4	12.8	14.2	15.5	16.9	18.2	19.5		
133						5.82	6.46	7.1	8.05	9.62	11.2	12.7	14.3	15.8	17.3	18.9	20.3	21.8		
159	±1.2					6.98	7.74	8.51	9.65	11.5	13.4	15.3	17.2	19	20.8	22.6	24.5	26.2		

(Note: Not all sizes are available for all of the listed materials)

**Capillary Tubing**



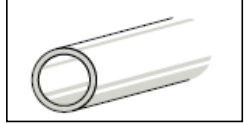
STAINLESS STEEL 304, 316, 316L, 321, ASTM A213, ASTM A-269, DIN 17458 CLASS 1, DIN 2462-1

Tolerance: Permissible variations in OD +/- .005" (.13 mm), Wall Thickness +/- 15%

I.D. in mm, listed in center area.

O.D. mm	wall																												
	0.025	0.075	0.080	0.090	0.100	0.125	0.130	0.150	0.175	0.200	0.225	0.250	0.300	0.350	0.375	0.400	0.450	0.500	0.600	0.75	0.80	0.85	1.00	1.25	1.50	2.00	2.50		
0.10	0.05																												
0.20			0.04																										
0.30		0.15	0.14		0.10																								
0.40					0.20																								
0.50					0.30			0.20																					
0.55				0.37																									
0.60					0.40		0.34																						
0.62								0.32																					
0.70						0.45		0.40																					
0.80							0.50	0.45			0.30		0.10																
0.90									0.50																				
1.00					0.80			0.70		0.60		0.50	0.40	0.30															
1.10										0.70																			
1.20										0.80								0.30											
1.30											0.85	0.80																	
1.40									1.00																				
1.50							1.20		1.10		1.00		0.80		0.70		0.50												
1.60									1.20			1.00					0.60		0.10										
1.70										1.30																			
1.80												1.30				1.00													
1.90													1.40																
2.00					1.80					1.60		1.50	1.40					1.00											
2.20													1.60									0.50							
2.40																1.60													
2.50										2.10		2.00	1.90			1.70		1.50											
2.60													2.00																
2.80																2.00													
3.00										2.60		2.50						2.00		1.50			1.00						
3.20										2.80																			
3.25																													
3.50															2.75			2.50	2.30										
4.00												3.50						3.00		2.50			2.00	1.50	1.00				
4.50												4.00						3.50											
5.00								4.70		4.60		4.50						4.00		3.50			3.00		2.00				
5.30												4.80																	
5.50																												3.50	
6.00								5.70				5.50				5.20		5.00		4.50	4.40		4.00			3.00	2.00	1.00	

**Metric Round Tubing – Aluminum**

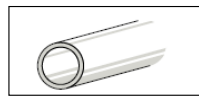


ALUMINUM 6060 T-6 (Extruded) EN 573-3, EN755-2, EN755-1, EN 755-9, DIN 1725, DIN 1746, DIN 1748-5

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
8 x 1	0.06	0.04	25 x 3	0.57	0.38	40 x 4	1.24	0.84
2.5	0.12	0.08	5	0.86	0.58	5	1.51	1.02
10 x 1	0.08	0.05	28 x 1.5	0.34	0.23	8	2.21	1.49
x 2	0.14	0.09	2	0.45	0.30	10	2.59	1.74
12 x 1	0.10	0.06	2.5	0.55	0.37	42 x 2	0.69	0.47
1.5	0.14	0.92	4	0.83	0.56	3	1.01	0.68
2	0.17	0.12	30 x 1.5	0.37	0.25	45 x 1.5	0.56	0.38
14 x 2	0.21	0.14	2	0.48	0.33	2	0.74	0.50
15 x 1	0.12	0.08	2.5	0.59	0.40	2.5	0.92	0.62
1.5	0.18	0.12	3	0.70	0.47	3	1.09	0.73
2	0.23	0.15	4	0.90	0.60	4	1.42	0.95
16 x 1	0.13	0.09	5	1.08	0.73	5	1.73	1.16
1.5	0.19	0.13	32 x 1.5	0.40	0.27	48 x 2	0.79	0.53
2	0.24	0.16	2	0.52	0.35	2.5	0.98	0.66
3	0.34	0.23	3	0.75	0.51	3	1.17	0.79
18 x 1	0.15	0.10	35 x 1.5	0.43	0.29	4	1.52	1.02
1.5	0.21	0.14	2	0.57	0.38	50 x 1.5	0.63	0.42
2	0.28	0.19	2.5	0.70	0.47	2	0.83	0.56
20 x 1	0.16	0.11	3	0.83	0.56	2.5	1.03	0.69
1.5	0.24	0.16	4	1.07	0.72	3	1.22	0.82
2	0.31	0.21	5	1.30	0.87	4	1.59	1.07
2.5	0.38	0.25	38 x 1.5	0.47	0.32	5	1.94	1.31
3	0.44	0.30	2	0.62	0.42	10	3.45	2.33
5	0.65	0.44	3	0.91	0.61	54 x 2	0.90	0.60
22 x 1.5	0.27	0.18	4	1.17	0.79	55 x 2.5	1.13	0.76
2	0.35	0.23	40 x 1.5	0.50	0.34	5	2.16	1.45
25 x 1.5	0.30	0.21	2	0.66	0.44	60 x 1.5	0.76	0.51
2	0.40	0.27	2.5	0.81	0.55	2	1.00	0.67
2.5	0.49	0.33	3	0.96	0.65			

SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT	SIZE mm	EST. kg/m	EST. LBS./FT
60 x 2.5	1.24	0.84	3	2.00	1.34	115 x 5	4.75	3.20
3	1.48	0.99	4	2.63	1.77	120 x 3	3.03	2.04
4	1.93	1.30	5	3.24	2.18	5	4.97	3.34
5	2.38	1.60	10	6.05	4.07	10	9.50	6.39
6	2.80	1.88	84 x 2	1.42	0.95	125 x 5	5.18	3.49
10	4.32	2.91	86 x 3	2.15	1.45	130 x 3	3.29	2.21
65 x 2	1.09	0.73	90 x 2	1.52	1.02	5	5.40	3.63
2.5	1.35	0.91	3	2.25	1.52	140 x 5	5.83	3.92
5	2.59	1.74	5	3.67	2.47	150 x 3	3.81	2.56
70 x 2	1.17	0.79	100 x 2	1.69	1.14	5	6.26	4.21
3	1.74	1.17	2.5	2.11	1.42	10	12.09	8.14
4	2.28	1.53	3	2.51	1.69	156 x 3	3.96	2.67
5	2.81	1.89	4	3.32	2.23	160 x 3	4.07	2.74
10	5.18	3.49	5	4.10	2.76	5	6.69	4.50
75 x 2.5	1.57	1.05	10	7.77	5.23	180 x 5	7.56	5.09
5	3.02	2.03	106 x 3	2.67	1.80	200 x 5	8.42	5.67
76 x 2.5	1.59	1.07	108 x 3	2.72	1.83	10	16.41	11.04
3	1.89	1.27	4	3.59	2.42	250 x 5	10.58	7.12
80 x 2	1.35	0.91	110 x 3	2.77	1.87			
2.5	1.67	1.13	5	4.53	3.05			

(Note: Not all sizes are available for all of the listed materials)



Metric Round Tubing / Pounds Per Lineal Foot Chart

Outside Diameter mm	Wall Thickness mm																												
	0.5	0.8	1	1.2	1.5	1.8	2	2.2	2.5	2.8	3	3.5	4	4.5	5	5.5	6	7	8	9	10	12	14	16	18	20	22	25	
4	0.03	0.04	0.05	0.06	0.06	0.07																							
5	0.04	0.06	0.07	0.08	0.09	0.10	0.10	0.10																					
6	0.05	0.07	0.08	0.10	0.11	0.13	0.13	0.14	0.14	0.15																			
7	0.05	0.08	0.10	0.12	0.14	0.16	0.17	0.17	0.19	0.19	0.20																		
8	0.06	0.10	0.12	0.14	0.16	0.18	0.20	0.21	0.23	0.24	0.25	0.26																	
9	0.07	0.11	0.13	0.16	0.19	0.21	0.23	0.25	0.27	0.29	0.30	0.32	0.33																
10	0.08	0.12	0.15	0.17	0.21	0.24	0.26	0.28	0.31	0.33	0.35	0.38	0.40	0.41															
12	0.10	0.15	0.18	0.21	0.26	0.30	0.33	0.36	0.39	0.43	0.45	0.49	0.53	0.56	0.58	0.59													
14	0.11	0.17	0.22	0.25	0.31	0.36	0.40	0.43	0.48	0.52	0.55	0.61	0.66	0.71	0.75	0.77	0.79												
15	0.12	0.19	0.23	0.27	0.34	0.39	0.43	0.47	0.52	0.57	0.60	0.67	0.73	0.78	0.83	0.87	0.89	0.93											
16	0.13	0.20	0.25	0.29	0.36	0.42	0.46	0.50	0.56	0.61	0.65	0.72	0.79	0.86	0.91	0.96	0.99	1.04											
18	0.14	0.23	0.28	0.33	0.41	0.48	0.53	0.58	0.64	0.70	0.75	0.84	0.93	1.01	1.08	1.14	1.19	1.28	1.32										
20	0.16	0.25	0.31	0.37	0.46	0.54	0.60	0.65	0.72	0.80	0.84	0.96	1.06	1.16	1.24	1.32	1.39	1.51	1.59	1.64									
22	0.18	0.28	0.35	0.41	0.51	0.60	0.66	0.72	0.81	0.89	0.94	1.07	1.19	1.30	1.41	1.50	1.59	1.74	1.85	1.94	1.99								
25	0.20	0.32	0.40	0.47	0.58	0.69	0.76	0.83	0.93	1.03	1.09	1.25	1.39	1.53	1.66	1.78	1.89	2.09	2.25	2.38	2.48	2.58							
26	0.21	0.33	0.41	0.49	0.61	0.72	0.79	0.87	0.97	1.08	1.14	1.30	1.46	1.60	1.74	1.87	1.99	2.20	2.38	2.53	2.65	2.78							
28	0.23	0.36	0.45	0.53	0.66	0.78	0.86	0.94	1.06	1.17	1.24	1.42	1.59	1.75	1.90	2.05	2.19	2.43	2.65	2.83	2.98	3.18							
30	0.24	0.39	0.48	0.57	0.71	0.84	0.93	1.01	1.14	1.26	1.34	1.54	1.72	1.90	2.07	2.23	2.38	2.67	2.91	3.13	3.31	3.58	3.71						
32	0.26	0.41	0.51	0.61	0.76	0.90	0.99	1.09	1.22	1.35	1.44	1.65	1.85	2.05	2.24	2.41	2.58	2.90	3.18	3.43	3.64	3.97	4.17						
35	0.29	0.45	0.56	0.67	0.83	0.99	1.09	1.19	1.35	1.49	1.59	1.83	2.05	2.27	2.48	2.69	2.88	3.25	3.58	3.88	4.14	4.57	4.87	5.03					
38	0.31	0.49	0.61	0.73	0.91	1.08	1.19	1.30	1.47	1.63	1.74	2.00	2.25	2.50	2.73	2.96	3.18	3.59	3.97	4.32	4.64	5.17	5.56	5.83	5.96				
40	0.33	0.52	0.65	0.77	0.96	1.14	1.26	1.38	1.55	1.72	1.84	2.12	2.38	2.65	2.90	3.14	3.38	3.83	4.24	4.62	4.97	5.56	6.03	6.36	6.56				
42		0.68	0.81	1.01	1.20	1.32	1.45	1.64	1.82	1.94	2.23	2.52	2.79	3.06	3.32	3.58	4.06	4.50	4.92	5.30	5.96	6.49	6.89	7.15	7.29				
45		0.73	0.87	1.08	1.29	1.42	1.56	1.76	1.96	2.09	2.41	2.72	3.02	3.31	3.60	3.88	4.40	4.90	5.37	5.80	6.56	7.19	7.68	8.05	8.28	8.38			
48		0.78	0.93	1.16	1.38	1.52	1.67	1.88	2.10	2.24	2.58	2.91	3.24	3.56	3.87	4.17	4.75	5.30	5.81	6.29	7.15	7.88	8.48	8.94	9.27	9.47			
50		0.81	0.97	1.20	1.44	1.59	1.74	1.97	2.19	2.33	2.70	3.05	3.39	3.73	4.05	4.37	4.98	5.56	6.11	6.62	7.55	8.35	9.01	9.54	9.94	10.2			
55		0.89	1.07	1.33	1.59	1.76	1.92	2.17	2.42	2.58	2.98	3.38	3.76	4.14	4.51	4.87	5.56	6.23	6.86	7.45	8.54	9.51	10.33	11.03	11.59	12.02	12.42		
60		0.98	1.17	1.45	1.73	1.92	2.11	2.38	2.65	2.83	3.27	3.71	4.14	4.55	4.96	5.37	6.14	6.89	7.60	8.28	9.54	10.66	11.66	12.52	13.25	13.84	14.49		
65		1.06	1.27	1.58	1.88	2.09	2.29	2.59	2.88	3.08	3.56	4.04	4.51	4.97	5.42	5.86	6.72	7.55	8.35	9.11	10.53	11.82	12.98	14.01	14.90	15.67	16.56		
70		1.14	1.37	1.70	2.03	2.25	2.47	2.79	3.12	3.33	3.85	4.37	4.88	5.38	5.87	6.36	7.30	8.21	9.09	9.94	11.53	12.98	14.31	15.50	16.56	17.49	18.63		
75		1.23	1.47	1.83	2.18	2.42	2.65	3.00	3.35	3.58	4.14	4.70	5.25	5.80	6.33	6.86	7.88	8.88	9.84	10.76	12.52	14.14	15.63	16.99	18.22	19.31	20.7		
80		1.31	1.57	1.95	2.33	2.58	2.83	3.21	3.58	3.83	4.43	5.03	5.63	6.21	6.79	7.35	8.46	9.54	10.58	11.59	13.51	15.30	16.96	18.48	19.87	21.13	22.77		
85			2.07	2.48	2.75	3.02	3.42	3.81	4.07	4.72	5.37	6.00	6.62	7.24	7.85	9.04	10.20	11.33	12.42	14.51	16.36	18.28	19.87	21.53	22.95	24.84			
90			2.20	2.63	2.91	3.20	3.62	4.04	4.32	5.01	5.70	6.37	7.04	7.70	8.35	9.62	10.86	12.07	13.25	15.50	17.62	19.61	21.46	23.18	24.77	26.91			
95					3.08	3.38	3.83	4.28	4.57	5.30	6.03	6.74	7.45	8.15	8.84	10.20	11.53	12.82	14.08	16.49	18.78	20.93	22.96	24.84	26.6	28.98			
100					3.25	3.56	4.04	4.51	4.82	5.59	6.36	7.12	7.87	8.61	9.34	10.78	12.19	13.56	14.90	17.49	19.94	22.26	24.44	26.50	28.42	31.05			
110					3.58	3.93	4.45	4.97	5.32	6.17	7.02	7.86	8.69	9.52	10.33	11.94	13.51	15.05	16.56	19.47	22.26	24.91	27.42	29.81	32.06	35.19			
120					3.91	4.29	4.86	5.43	5.81	6.75	7.68	8.61	9.52	10.43	11.33	13.10	14.84	16.54	18.22	21.46	24.58	27.56	30.40	33.12	35.7	39.33			
130						5.28	5.90	6.31	6.73	8.35	9.35	10.35	11.34	12.32	14.26	16.16	18.03	19.87	23.45	26.89	30.21	33.38	36.43	39.35	43.99	47.61			
140						5.69	6.36	6.81	7.91	9.01	10.10	11.18	12.25	13.31	15.42	17.49	19.52	21.53	25.44	29.21	32.86	36.37	39.74	42.99	46.35	50.89			
150							7.30	8.49	9.67	10.84	12.01	13.16	14.31	15.58	18.81	21.01	23.18	27.42	31.53	35.50	39.35	43.06	46.63	51.75					
160							7.80	9.07	10.33	11.59	12.83	14.07	15.30	17.74	20.14	22.51	24.84	29.41	33.85	38.15	42.33	46.37	50.28	54.85	59.89				
170							8.30	9.65	11.00	12.33	13.66	14.98	16.30	18.89	21.46	24.00	26.50	31.40	36.17	40.80	45.31	49.68	53.92	60.03					
180							10.23	11.66	13.08	14.49	15.89	17.29	20.05	22.79	25.49	28.15	33.38	38.49	43.45	48.29	52.99	57.56	64.17						
190							10.81	12.32	13.82	15.32	16.80	18.28	21.21	24.11	26.98	29.81	35.37	40.80	46.10	51.27	56.30	61.21	68.31						
200								11.39	12.98	14.57	16.15	17.72	19.28	22.37	25.44	28.47	31.46	37.36	43.12	48.75	54.25	59.62	64.85	72.45					
220										16.06	17.80	19.54	21.26	24.69	28.09	31.45	34.78	41.33	47.76	54.05	60.21	66.24	72.14	80.73					
240											17.55	19.46	21.36	23.25	27.01	30.74	34.43	38.09	45.31	52.40	59.35	66.17	72.86	79.42	89.01				
260												21.11	23.18	25.24	29.33	33.38	37.41	41.40	49.28	57.03	64.65	72.14	79.49	86.71	97.29				

**METRIC STEEL ROUND TUBING & PIPE - WEIGHT (MASS) IN kg/m (kilograms per meter)**

OUTER DIAMETER mm	WALL THICKNESS in mm																									OUTER DIAMETER mm			
	0.5	0.8	1	1.2	1.5	1.8	2	2.2	2.5	2.8	3	3.5	4	4.5	5	5.5	6	7	8	9	10	12	14	16	18		20	22	25
4	0.04	0.06	0.07	0.08																								4	
5	0.06	0.08	0.10	0.11																								5	
6	0.07	0.10	0.12	0.14	0.17	0.19	0.20																					6	
7	0.08	0.12	0.15	0.17	0.20	0.23	0.25																					7	
8	0.09	0.14	0.17	0.20	0.24	0.28	0.30	0.31	0.34																			8	
9	0.10	0.16	0.20	0.23	0.28	0.32	0.35	0.37	0.40	0.43																		9	
10	0.12	0.18	0.22	0.26	0.31	0.36	0.39	0.42	0.46	0.50	0.52																	10	
12	0.14	0.22	0.27	0.32	0.39	0.45	0.49	0.53	0.59	0.64	0.67	0.73	0.79															12	
14	0.17	0.26	0.32	0.38	0.46	0.54	0.59	0.64	0.71	0.77	0.81	0.91	0.99	1.06	1.11	1.15	1.18											14	
15	0.18	0.28	0.35	0.41	0.50	0.59	0.64	0.69	0.77	0.84	0.89	0.99	1.09	1.17	1.23	1.29	1.33											15	
16	0.19	0.30	0.37	0.44	0.54	0.63	0.69	0.75	0.83	0.91	0.96	1.08	1.18	1.28	1.36	1.43	1.48	1.55										16	
18	0.22	0.34	0.42	0.50	0.61	0.72	0.79	0.86	0.96	1.05	1.11	1.25	1.38	1.50	1.60	1.70	1.78	1.90	1.97									18	
20	0.24	0.38	0.47	0.56	0.68	0.81	0.89	0.97	1.08	1.19	1.26	1.43	1.58	1.72	1.85	1.97	2.07	2.25	2.37	2.44								20	
22	0.27	0.42	0.52	0.62	0.76	0.90	0.99	1.08	1.20	1.33	1.41	1.60	1.78	1.94	2.10	2.24	2.37	2.59	2.76	2.89	2.96							22	
25	0.30	0.48	0.59	0.70	0.87	1.03	1.14	1.24	1.39	1.53	1.63	1.86	2.07	2.28	2.47	2.65	2.81	3.11	3.36	3.55	3.70							25	
26	0.31	0.50	0.62	0.73	0.91	1.08	1.18	1.29	1.45	1.60	1.70	1.94	2.17	2.39	2.59	2.78	2.96	3.28	3.55	3.78	3.95	4.15						26	
28	0.34	0.54	0.67	0.79	0.98	1.16	1.28	1.40	1.57	1.74	1.85	2.12	2.37	2.61	2.84	3.05	3.26	3.63	3.95	4.22	4.44	4.74						28	
30	0.36	0.58	0.72	0.85	1.06	1.25	1.38	1.51	1.70	1.88	2.00	2.29	2.57	2.83	3.09	3.33	3.55	3.97	4.34	4.66	4.94	5.33	5.53					30	
32	0.39	0.62	0.77	0.91	1.13	1.34	1.48	1.62	1.82	2.02	2.15	2.46	2.76	3.05	3.33	3.60	3.85	4.32	4.74	5.11	5.43	5.92	6.22					32	
35	0.43	0.68	0.84	1.00	1.24	1.47	1.63	1.78	2.01	2.23	2.37	2.72	3.06	3.39	3.70	4.00	4.29	4.84	5.33	5.78	6.17	6.81	7.26	7.50				35	
38	0.46	0.73	0.91	1.09	1.35	1.61	1.78	1.94	2.19	2.43	2.59	2.98	3.36	3.72	4.07	4.41	4.74	5.36	5.92	6.44	6.91	7.70	8.29	8.69	8.88			38	
40	0.49	0.77	0.96	1.15	1.43	1.70	1.88	2.05	2.31	2.57	2.74	3.15	3.55	3.94	4.32	4.68	5.03	5.70	6.32	6.89	7.40	8.29	8.98	9.48	9.77			40	
42	0.51	0.81	1.01	1.21	1.50	1.79	1.97	2.16	2.44	2.71	2.89	3.33	3.75	4.16	4.57	4.95	5.33	6.05	6.71	7.33	7.90	8.88	9.67	10.27	10.66	10.86		42	
45	0.55	0.87	1.09	1.30	1.61	1.92	2.12	2.32	2.62	2.92	3.11	3.58	4.05	4.50	4.94	5.36	5.78	6.56	7.31	8.00	8.64	9.77	10.71	11.45	11.99	12.34		45	
48	0.59	0.93	1.16	1.39	1.72	2.05	2.27	2.49	2.81	3.12	3.33	3.84	4.34	4.83	5.31	5.77	6.22	7.08	7.90	8.66	9.38	10.66	11.75	12.64	13.33	13.82	14.12	48	
50	0.61	0.97	1.21	1.45	1.80	2.14	2.37	2.60	2.93	3.26	3.48	4.02	4.54	5.05	5.55	6.04	6.52	7.43	8.29	9.11	9.87	11.25	12.44	13.43	14.22	14.81	15.20	50	
55	0.67	1.07	1.33	1.59	1.98	2.36	2.62	2.87	3.24	3.61	3.85	4.45	5.03	5.61	6.17	6.72	7.26	8.29	9.28	10.22	11.11	12.73	14.17	15.40	16.44	17.28	17.92	55	
60	0.73	1.17	1.46	1.74	2.17	2.59	2.86	3.14	3.55	3.95	4.22	4.88	5.53	6.16	6.79	7.40	8.00	9.16	10.27	11.33	12.34	14.22	15.89	17.37	18.66	19.74	20.63	21.60	60
65	0.80	1.27	1.58	1.89	2.35	2.81	3.11	3.41	3.86	4.30	4.59	5.31	6.02	6.72	7.40	8.08	8.74	10.02	11.25	12.44	13.57	15.70	17.62	19.35	20.88	22.21	23.35	24.68	65
70	0.86	1.37	1.70	2.04	2.54	3.03	3.36	3.68	4.16	4.64	4.96	5.74	6.52	7.27	8.02	8.76	9.48	10.88	12.24	13.55	14.81	17.18	19.35	21.32	23.10	24.68	26.06	27.77	70
75	0.92	1.47	1.83	2.19	2.72	3.25	3.60	3.95	4.47	4.99	5.33	6.18	7.01	7.83	8.64	9.43	10.22	11.75	13.23	14.66	16.04	18.66	21.08	23.30	25.32	27.15	28.78	30.85	75
80	0.98	1.56	1.95	2.33	2.91	3.47	3.85	4.22	4.78	5.33	5.70	6.61	7.50	8.39	9.26	10.11	10.96	12.61	14.22	15.77	17.28	20.14	22.80	25.27	27.54	29.62	31.49	33.94	80
85	1.04	1.66	2.07	2.48	3.09	3.70	4.10	4.50	5.09	5.68	6.07	7.04	8.00	8.94	9.87	10.79	11.70	13.48	15.20	16.88	18.51	21.62	24.53	27.25	29.76	32.08	34.21	37.02	85
90	1.10	1.76	2.20	2.63	3.28	3.92	4.34	4.74	5.40	6.03	6.44	7.47	8.49	9.50	10.49	11.47	12.44	14.34	16.19	17.99	19.74	23.10	26.26	29.22	31.99	34.55	36.92	40.11	90
95	1.17	1.86	2.32	2.78	3.46	4.14	4.59	5.04	5.71	6.37	6.81	7.90	8.98	10.05	11.11	12.15	13.18	15.20	17.18	19.10	20.98	24.58	27.99	31.20	34.21	37.02	39.64	43.19	95
100	1.23	1.96	2.44	2.93	3.65	4.36	4.84	5.31	6.02	6.72	7.18	8.34	9.48	10.61	11.72	12.83	13.92	16.07	18.16	20.21	22.21	26.06	29.71	33.17	36.43	39.49	42.35	46.28	100
110	1.35	2.16	2.69	3.22	4.02	4.81	5.33	5.85	6.63	7.41	7.92	9.20	10.46	11.72	12.96	14.18	15.40	17.79	20.14	22.43	24.68	29.02	33.17	37.12	40.87	44.42	47.78	52.45	110
120	1.47	2.35	2.94	3.52	4.39	5.25	5.82	6.40	7.25	8.10	8.66	10.06	11.45	12.83	14.19	15.54	16.88	19.52	22.11	24.66	27.15	31.99	36.63	41.07	45.31	49.36	53.21	58.62	120
130	1.60	2.55	3.18	3.81	4.76	5.70	6.32	6.94	7.87	8.79	9.40	10.93	12.44	13.94	15.43	16.90	18.36	21.25	24.09	26.88	29.62	34.95	40.08	45.02	49.75	54.30	58.64	64.79	130
140	1.72	2.75	3.43	4.11	5.13	6.14	6.81	7.48	8.48	9.48	10.14	11.79	13.43	15.05	16.66	18.26	19.84	22.98	26.06	29.10	32.08	37.91	43.54	48.97	54.20	59.23	64.07	70.96	140
150	1.84	2.95	3.68	4.41	5.50	6.58	7.31	8.02	9.10	10.17	10.88	12.65	14.41	16.16	17.89	19.61	21.32	24.70	28.04	31.32	34.55	40.87	46.99	52.91	58.64	64.17	69.50	77.13	150
160	1.97	3.14	3.92	4.70	5.87	7.03	7.80	8.57	9.72	10.86	11.62	13.52	15.40	17.27	19.13	20.97	22.80	26.43	30.01	33.54	37.02	43.83	50.45	56.86	63.08	69.10	74.93	83.30	160
170	2.09	3.34	4.17	5.00	6.24	7.47	8.29	9.11	10.33	11.55	12.36	14.38	16.39	18.38	20.36	22.33	24.29	28.16	31.99	35.76	39.49	46.79	53.90	60.81	67.52	74.04	80.36	89.47	170
180	2.22	3.54	4.42	5.30	6.61	7.92	8.79	9.65	10.95	12.25	13.11	15.25	17.37	19.49	21.60	23.69	25.77	29.89	33.96	37.98	41.96	49.75	57.36	64.76	71.97	78.98	85.79	95.64	180
190	2.34	3.74	4.66	5.59	6.98	8.36	9.28	10.20	11.57	12.94	13.85	16.11	18.36	20.60	22.83	25.04	27.25	31.62	35.93	40.20	44.42	52.72	60.81	68.71	76.41	83.91	91.22	101.81	190
200	2.46	3.93	4.91	5.89	7.35	8.80	9.77	10.74	12.19	13.63	14.59	16.97	19.35	21.71	24.06	26.40	28.73	33.34	37.91	42.42	46.89	55.68	64.27	72.66	80.85	88.85	96.65	107.98	200
220	2.71	4.33	5.40	6.48	8.09	9.69	10.76	11.83	13.42	15.01	16.07	18.70	21.32	23.93	26.53	29.12	31.69	36.80	41.86	46.87	51.83	61.60	71.18	80.56	89.74	98.72	107.51	120.32	220
240	2.96	4.72	5.90	7.07	8.83	10.58	11.75</																						

**CONVERSION CHARTS**

MILLIMETERS TO INCHES CONVERSION CHART (LARGE NUMBERS)

mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES
1	0.0394	21	0.8268	41	1.6142	61	2.4016	81	3.189
2	0.0787	22	0.8661	42	1.6535	62	2.4409	82	3.2283
3	0.1181	23	0.9055	43	1.6929	63	2.4803	83	3.2677
4	0.1575	24	0.9449	44	1.7323	64	2.5197	84	3.3071
5	0.1969	25	0.9843	45	1.7717	65	2.5591	85	3.3465
6	0.2362	26	1.0236	46	1.811	66	2.5984	86	3.3858
7	0.2756	27	1.063	47	1.8504	67	2.6378	87	3.4252
8	0.315	28	1.1024	48	1.8898	68	2.6772	88	3.4646
9	0.3543	29	1.1417	49	1.9291	69	2.7165	89	3.5039
10	0.3937	30	1.1811	50	1.9685	70	2.7559	90	3.5433
11	0.4331	31	1.2205	51	2.0079	71	2.7953	91	3.5827
12	0.4724	32	1.2598	52	2.0472	72	2.8346	92	3.622
13	0.5118	33	1.2992	53	2.0866	73	2.874	93	3.6614
14	0.5512	34	1.3386	54	2.126	74	2.9134	94	3.7008
15	0.5906	35	1.378	55	2.1654	75	2.9528	95	3.7402
16	0.6299	36	1.4173	56	2.2047	76	2.9921	96	3.7795
17	0.6693	37	1.4567	57	2.2441	77	3.0315	97	3.8189
18	0.7087	38	1.4961	58	2.2835	78	3.0709	98	3.8583
19	0.748	39	1.5354	59	2.3228	79	3.1102	99	3.8976
20	0.7874	40	1.5748	60	2.3622	80	3.1496	100	3.937

INCHES TO MILLIMETERS CONVERSION CHART (SMALL NUMBERS)

INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm
0.0005	0.0127	0.006	0.1524	0.016	0.4064	0.035	0.889	0.1	2.54
0.001	0.0254	0.007	0.1778	0.018	0.4572	0.04	1.016	0.125	3.175
0.0015	0.0381	0.008	0.2032	0.02	0.508	0.045	1.143	0.25	6.35
0.002	0.0508	0.009	0.2286	0.022	0.5588	0.05	1.27	0.5	12.7
0.0025	0.0635	0.01	0.254	0.024	0.6096	0.06	1.524	0.75	19.05
0.003	0.0762	0.011	0.2794	0.025	0.635	0.0625	1.5875	1	25.4
0.0035	0.0889	0.012	0.3048	0.026	0.6604	0.07	1.778	1.25	31.75
0.004	0.1016	0.013	0.3302	0.028	0.7112	0.075	1.905	1.5	38.1
0.0045	0.1143	0.014	0.3556	0.03	0.762	0.08	2.032	1.75	44.45
0.005	0.127	0.015	0.381	0.032	0.8128	0.09	2.286	2	50.8

MILLIMETERS TO INCHES CONVERSION CHART (SMALL NUMBERS)

mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES	mm	INCHES
0.01	0.00039	0.09	0.00354	0.25	0.00984	0.95	0.0374	8	0.31496
0.015	0.00059	0.095	0.00374	0.26	0.01024	1	0.03937	9	0.35433
0.02	0.00079	0.1	0.00394	0.28	0.01102	1.1	0.04331	10	0.3937
0.025	0.00098	0.105	0.00413	0.3	0.01181	1.2	0.04724	11	0.43307
0.03	0.00118	0.11	0.00433	0.35	0.01378	1.25	0.04921	12	0.47244
0.035	0.00138	0.115	0.00453	0.4	0.01575	1.5	0.05906	13	0.51181
0.04	0.00157	0.12	0.00472	0.45	0.01772	2	0.07874	14	0.55118
0.045	0.00177	0.125	0.00492	0.5	0.01969	2.5	0.09843	15	0.59055
0.05	0.00197	0.13	0.00512	0.55	0.02165	3	0.11811	16	0.62992
0.055	0.00217	0.14	0.00551	0.6	0.02362	3.5	0.1378	17	0.66929
0.06	0.00236	0.15	0.00591	0.65	0.02559	4	0.15748	18	0.70866
0.065	0.00256	0.16	0.0063	0.7	0.02756	4.5	0.17717	19	0.74803
0.07	0.00276	0.18	0.00709	0.75	0.02953	5	0.19685	20	0.7874
0.075	0.00295	0.2	0.00787	0.8	0.0315	5.5	0.21654	25	0.98425
0.08	0.00315	0.22	0.00866	0.85	0.03346	6	0.23622		
0.085	0.00335	0.24	0.00945	0.9	0.03543	7	0.27559		

INCH & MILLIMETER EQUIVALENCY CHART

FRACTION	DECIMAL	mm	FRACTION	DECIMAL	mm	FRACTION	DECIMAL	mm
1/64	0.0156	0.3969	23/64	0.3594	9.1281	45/64	0.7031	17.8594
1/32	0.0313	0.7938	3/8	0.3750	9.5250	23/32	0.7188	18.2563
3/64	0.0469	1.1906	25/64	0.3906	9.9219	47/64	0.7344	18.6532
1/16	0.0625	1.5875	13/32	0.4063	10.3188	3/4	0.7500	19.0500
5/64	0.0781	1.9844	27/64	0.4219	10.7157	49/64	0.7656	19.4469
3/32	0.0938	2.3813	7/16	0.4375	11.1125	25/32	0.7813	19.8438
7/64	0.1094	2.7781	29/64	0.4531	11.5094	51/64	0.7969	20.2407
1/8	0.1250	3.1750	15/32	0.4688	11.9063	13/16	0.8125	20.6375
9/64	0.1406	3.5719	31/64	0.4844	12.3032	53/64	0.8281	21.0344
5/32	0.1563	3.9688	1/2	0.5000	12.7000	27/32	0.8438	21.4313
11/64	0.1719	4.3656	33/64	0.5156	13.0969	55/64	0.8594	21.8282
3/16	0.1875	4.7625	17/32	0.5313	13.4938	7/8	0.8750	22.2250
13/64	0.2031	5.1594	35/64	0.5469	13.8907	57/64	0.8906	22.6219
7/32	0.2188	5.5563	9/16	0.5625	14.2875	29/32	0.9063	23.0188
15/64	0.2344	5.9531	37/64	0.5781	14.6844	59/64	0.9219	23.4157
1/4	0.2500	6.3500	19/32	0.5938	15.0813	15/16	0.9375	23.8126
17/64	0.2656	6.7469	39/64	0.6094	15.4782	61/64	0.9531	24.2094
9/32	0.2813	7.1438	5/8	0.6250	15.8750	31/32	0.9688	24.6063
19/64	0.2969	7.5406	41/64	0.6406	16.2719	63/64	0.9844	25.0032
5/16	0.3125	7.9375	21/32	0.6563	16.6688	1	1.0000	25.4001
21/64	0.3281	8.3344	43/64	0.6719	17.0657			
11/32	0.3438	8.7313	11/16	0.6875	17.4625			

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web: <http://mdmetric.com> email: [sales@mdmetric.com](mailto:sales@mdmetric.com)**CONVERSION CHARTS**

TO CONVERT	INTO	MULTIPLY BY
Feet (ft.)	Meters (m)	0.3048
Gallons (U.S.)	Liters (l)	3.7853
Inches (in.)	Millimeters (mm)	25.4
Kilograms (kg)	Pounds (lbs.)	2.2046
Kilograms/Meters (kg/m)	Pounds/Feet (lbs./ft.)	0.673
Liters (l)	Gallon (gal)	0.264172
Megapascals (MPa)	Newtons per square millimeter (N/mm <sup>2</sup> )	1
Megapascals (MPa)	Pounds per square inch (psi)	145.04
Megapascals (MPa)	Kilograms per square inch (ksi)	0.14504
Meters (m)	Feet (ft.)	3.2808
Meters (m)	Inches (in.)	39.37008
Millimeters (mm)	Inches (in.)	0.03937
Newtons per square millimeter (N/mm <sup>2</sup> )	Pounds per square inch (psi)	145.04
Newtons per square Pounds (lbs.)	Megapascals (MPa) Kilograms (kg)	1
Pounds (lbs.)	Kilograms (kg)	0.4536
Pounds/Feet (lbs./ft.)	Kilograms/Meters (kg/m)	1.4881
Pounds per square inch (psi) millimeter (N/mm <sup>2</sup> )	Newtons per square millimeter (N/mm <sup>2</sup> )	0.006895
Pounds per square inch (psi)	Megapascals (MPa)	0.006895
Square millimeters (mm <sup>2</sup> )	Square feet (ft. <sup>2</sup> )	0.000010759
Square inches (in. <sup>2</sup> )	Square millimeters (mm <sup>2</sup> )	645.16
Square meters (m <sup>2</sup> )	Square feet (ft. <sup>2</sup> )	10.7639
Square feet (ft. <sup>2</sup> )	Square meters (m <sup>2</sup> )	0.0929
Square inches (in. <sup>2</sup> )	Square meters (m <sup>2</sup> )	0.00064516

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**ISO 286-2 ROUND BAR TOLERANCES**

NOMINAL SIZE DIAMETER mm	ROUND STEEL ISO TOLERANCE "h SERIES" IN MILLIMETERS							
	h5	h6	h7	h8	h9	h10	h11	h12
1 to 3	-0.004	-0.006	-0.01	-0.014	-0.025	-0.04	0.06	-0.1
	(-0.00016")	(-0.00024")	(-0.00039")	(-0.00055")	(-0.00098")	(-0.00158")	(-0.00236")	(-0.00394")
over 3 to 6	-0.005	-0.008	-0.012	-0.018	-0.03	-0.048	-0.075	-0.12
	(-0.00020")	(-0.00032")	(-0.00047")	(-0.00071")	(-0.00118")	(-0.00189")	(-0.00295")	(-0.00472")
over 6 to 10	-0.006	-0.009	-0.015	-0.022	-0.036	-0.058	-0.09	-0.15
	(-0.00024")	(-0.00035")	(-0.00059")	(-0.00086")	(-0.00142")	(-0.00228")	(-0.00354")	(-0.00591")
over 10 to 18	-0.008	-0.011	-0.018	-0.027	-0.043	-0.07	-0.11	-0.18
	(-0.00032")	(-0.00043")	(-0.00071")	(-0.0010")	(-0.00169")	(-0.00275")	(-0.00433")	(-0.00709")
over 18 to 30	-0.009	-0.013	-0.021	-0.033	-0.052	-0.084	-0.13	-0.21
	(-0.00035")	(-0.00051")	(-0.00083")	(-0.00129")	(-0.00205")	(-0.00331")	(-0.00512")	(-0.00827")
over 30 to 50	-0.011	-0.016	-0.025	-0.039	-0.062	-0.1	-0.16	-0.25
	(-0.00043")	(-0.00063")	(-0.00098")	(-0.00153")	(-0.00244")	(-0.00393")	(-0.00630")	(-0.00984")
over 50 to 80	-0.013	-0.019	-0.03	-0.046	-0.074	-0.12	-0.19	-0.3
	(-0.00051")	(-0.00075")	(-0.00118")	(-0.00181")	(-0.00291")	(-0.00472")	(-0.00748")	(-0.01181")
over 80 to 120	-0.015	-0.022	-0.035	-0.054	-0.087	-0.14	-0.22	-0.35
	(-0.00059")	(-0.00087")	(-0.00138")	(-0.00213")	(-0.00343")	(-0.00551")	(-0.00866")	(-0.01378")
over 120 to 180	-0.018	-0.025	-0.04	-0.063	-0.1	-0.16	-0.25	-0.4
	(-0.00071")	(-0.00098")	(-0.00158")	(-0.00248")	(-0.00393")	(-0.00629")	(-0.00984")	(-0.01575")
over 180 to 250	-0.02	-0.029	-0.046	-0.072	-0.115	-0.185	-0.29	-0.46
	(-0.00079")	(-0.00114")	(-0.00181")	(-0.00283")	(-0.00453")	(-0.00723")	(-0.01142")	(-0.01811")

Tolerances are all plus 0 mm, - mm size. Parenthetical numbers indicate "inches."  
Refer to the above chart for the following example:

Example: a 20 mm Round h9 will have a tolerance of + 0 mm, - 0.052 mm which equals + 0", - 0.00205"

**Equivalent German Specifications**

DIN 668 = h11	DIN 671 = h9	DIN 670 = h8
DIN 669 = h9	DIN 175 = h9	

**Mechanical Properties of Standard Cold Drawn Steels**

These figures are NOT GUARANTEED. These figures show the APROXIMATE range of mechanical properties.

These properties are for 20 mm to 30 mm round bars. Sizes under 20 mm will usually show a strength which is slightly higher than those shown in the tables. The mass effect of larger sections has a direct influence on mechanical properties and results in slightly lower values as the section size increases

THESE FIGURES CANNOT BE USED AS A BASIS OF ACCEPTANCE OR REJECTION OF MATERIAL.

It must not be assumed that these properties will be obtained in all cases, as they vary widely with permissible variation in analysis, size of section, rolling condition, grain size, amount of draft taken during cold drawing, and methods of heat treatment.

The properties of turned and polished or turned and ground types of cold finished material will correspond to the hot rolled values. Reliable mechanical properties can only be obtained by exactly controlled heat treatment or special processing.

SAE and/or AISI	Estimated Tensile Strength PSI	Estimated Yield Strength PSI	Estimated Minimum Values Elongation in 2 in %	Reduction in Area %	Brinell Hardness	Average Machinability Rating Cold Drawn 12L14 = 100%
1008 Cd	49000	41000	20	45	95	34
1010 Cd	53000	44000	20	40	105	34
1018 Tg&P	58000	32000	25	50	116	43
1018 Cd	64000	54000	15	40	126	43
1020 Cd	61000	51000	15	40	121	40
1035 Cd	80000	67000	12	35	167	40
1040 Cd	85000	71000	12	35	170	37
1045 Tg&P	82000	45000	16	40	163	34
1045 Cd	91000	77000	12	35	179	34
1045 ANN. Cd.	85000	73000	12	45	170	40
1050 Cd	100000	84000	10	30	197	28
1050 ANN.Cd	95000	80000	10	40	189	34
1117 Cd	69000	58000	15	40	137	56
1140 Cd	88000	74000	12	35	170	43
1141 Cd	105000	88000	10	30	212	43
1144 Cd	108000	90000	10	30	207	40
1144 STRESS	115000min	100000min	7	20	235	51
1215 Cd	78000	60000	10	35	167	84
12114 Cd	78000	60000	10	35	163	100
ALLOY STEEL						
4130 Nor.Cd	85000	70000	25	55	187 / 229	43
4140 ANN Cd	105000	85000	20	50	187 / 229	40
4140 Q&T	105000	80000	15	40	262 / 321	31
TOOL STEEL						
0-1 SA Cd	90000	65000	10	30	200 / 240	24
STAINLESS						
303 ANN Cd	85000	30000	45	50	160 / 210	45
304 ANN Cd	80000	30000	55	65	150 / 180	28
316 ANN Cd	75000	30000	40	60	150 / 180	25

ANN = ANNEALED CD = COLD DRAWN NOR = NORMALIZED Q&T = QUENCH & TEMPERED

SA = SPHEROIDIZE ANNEALED TG&P = TURNED GROUND AND POLISHED

STRESS = ASTM 311 CLASS B

**Metric Round Honed Tubing Specifications**

**Condition and Grade**

Tubes up to 250mm in diameter are skived and roller burnished and are produced from cold drawn steel tubes, seamless DIN 2391.C steel, grade St52 or welded DIN 2393. Steel Grade St52 stress relieved condition (BK+S)  
 Tubes greater than 250mm in diameter are honed steel and are produced from hot rolled according to DIN 2448/1629 and the steel grade is St52.

**Straightness of Cylinder Tubes**

The straightness is better than 0.5mm/1000mm.  
 I.D. Surface Roughness  
 All our cylinder tubes have an inside diameter tolerance of H8. The surface smoothness of the inside of the tubes average RMS 12 or better. (Nominal value Ra um less than or equal to 0.20 um for skived and roller burnished and is 0.40 um for honed tubes.)  
 Formula for Wall Thickness in Millimeters  
 The formula for wall thickness required for a cylinder tube subject to internal hydraulic pressure is as follows:

Chemical Analysis compared to AISI 1018 steel					
Steel Grade	C%	Mn%	Si%	P% Max	S% Max
St52	0.20 Max	1.50 Max	0.050 Max	0.025 Max	0.035 Max
AISI 1018	0.15/0.20	0.60/0.90	0.15/0.30	0.040 Max	0.050 Max

$$0.05 * I * P * F$$

Wall Thickness in mm =  $\frac{Y}{}$

**Strength – Yield and Tensile**

Our cylinder tubes made from DIN 2391 seamless or DIN 2393 welded steel grade St52 BK+S, the yield point for wall thickness is 490MPa (71,050 psi) minimum. The Ultimate Tensile Strength (UTS) is a minimum 600 MPa (87,000 psi). Tubes greater than 250mm in diameter are produced from DIN 2448 hot rolled tubes in steel grade St52 and the minimum yield strength is 345 MPa (50,022 psi) and a minimum UTS of 500 MPa (72,495 psi).

I = Inside Diameter

P = Pressure in Bar

F = Safety Factor (Should be greater than or equal to 2)

Y = Yield Point

**Inside Diameter Tolerance**

The tubes are ready to use with inside diameter tolerance of ISO H8. Tubes greater than 250mm in diameter are honed steel and are hot rolled according to DIN 2448/1629 and the steel grade is St52.

To convert bar into psi multiply by 144.98

To convert psi into bar multiply by 0.0069

Hole Above	Size in Millimeters Up to and Including	ISO 286-2 Minus Zero (-0.0000)	Capital H 8 for Holes
6	10	+0.022mm	( + 0.00086" )
10	18	+0.027mm	( + 0.0010" )
18	30	+0.033mm	( + 0.00129" )
30	50	+0.039mm	( + 0.00153" )
50	80	+0.046mm	( + 0.00181" )
80	120	+0.054mm	( + 0.00213" )
120	180	+0.063mm	( + 0.00248" )
180	250	+0.072mm	( + 0.00283" )
250	315	+0.081mm	( + 0.00319" )
315	400	+0.089mm	( + 0.00350" )

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**Comparison of USA Standards to International Standards for Chemistry**

USA	Europe	Germany	Germany	England	Italy	Japan
A.S.T.M. S.A.E. A.I.S.I.	Euronorm	Werkstoff W.-Nr	Kurzname DIN	BS 970	UNI	JIS
<b>CARBON</b>						
1018	C15D	1.1141	CK15	040A15	C15	S15
1018	C18D	1.0401	C15	080M15	C16	S15CK
1018		1.0453	C16.8	080A15	1C15	S15C
1018				EN3B		
1045	C45	1.0503	C45	060A47	C45	S45C
1045		1.1191	CK45	080A46	1C45	S48C
1045		1.1193	CF45	080M46	C46	
1045		1.1194	CQ45	EN8D	C43	
1140/1146	35S20	1.0726	35S20	212M40		
1140/1146	45S20	1.0727	45S20	en8M		
1215	12SMn35	1.0715	9SMn28	230M07	CF9SMn28	SUM 25
1215		1.0736	9SMn36	En1A	CF9SMn36	SUM 22
12114	11SMnPb28	1.0718	9SMnPb28	230M07leaded	CF9SMnPb28	SUM 22L
12114		1.0737	9SMnPb36	En1A leaded	CF9SMnPb36	SUM 23L
12114						SUM 24L
<b>ALLOY</b>						
4130		1.7218	25CrMo4	708A30	25CrMo4 (KB)	SCM 420
4130			GS-25CrMo5	CDS110	30CrMo4	SCM 430
4130					30CrMo4	SCCrM1
4140/4142	42CrMo4	1.7223	41CrMo4	708M40	41CrMo4	SCM 440
4140/4142		1.7225	42CrMo4	708A42	38CrMo4 KB	SCM 440h
4140/4142		1.7227	42CrMoS4	709M40	G40 CrMo4	SNB 7
4140/4142		1.3563	43CrMo4	En19	42CrMo4	SCM 4M
4140/4142				En19C		SCM 4
4340	34CrNiMo6	1.6582	34CrNiMo6	816M40	35NiCrMo6 KB	SNCM 447
4340		1.6562	40 NiCrMo8 4	en24	40NiCrMo7 KB	SNB24-1-5
8620	20NiCrMo2-2	1.6543	21NiCrMo22	805A20	20NiCrMo2	SNCM 220 (H)
8620		1.6523	21NiCrMo2	805M20		
<b>STAINLESS</b>						
303	X8CrNiS18-9	1.4305	X10CrNiS18-9	303S 21	X10CrNiS 18 09	SUS 303
303				303S 22		
303				En58M		
304	X2CrNi19-11	1.4301	X5CrNi 18 9	304S 15	X5CrNi 18 10	SUS 304
304	X2CrNi18-10		X5CrNi 18 10	304S 16		SUS 304-CSP
304			XCrNi 19 9	304S 18		
304				304S 25		
304				304S 31		
304				En58E		
316	X5CrNiMo17-12-2	1.4401	X5CrNiMo17 12 2	316S 29	X5CrNiMo17 12	SUS 316
316	X5CrNiMo18-14-3	1.4436	X5CrNiMo17 13 3	316S 31	X5CrNiMo17 13	SUS 316TP
316			X5CrNiMo 19 11	316S 33	X8CrNiMo17 13	
316			X5CrNiMo 18 11	En58J		
<b>TOOL STEEL</b>						
A-2	X100CrMov5	1.2363	X100CrMov51	BA 2	X100CrMov5 1 KU	SKD 12
D-2	X153CrMov12	1.2379	X155CrvMo12 1	BD 2	X155CrvMo12 1	SKD 11
M-2	HS6-502	1.3343	S 6-5-2	BM 2	hS 6-5-2	SKH 51
M-2	HS6-5-2C					
O-1		1.251	100MnCrW4	BO 1	95MnWCr 5 KU	
W-1	CT105	1.1625	C80W2	BW 1B	110 W4 KU	SKC 3
W-1	CT80	1.1645	C80W1	BW1A	AB2C70 KU	SK 5
W-1	C105U	1.1673	C85W	BW1C	C120 KU	SK 6

Substitution is only possible after a complete examination of the individual specifications.

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QUALITY/STANDARD		TENSILE		MINIMUM YIELD	
		P.S.I.	N/mm2	P.S.I.	N/mm2
USA					
ASTM A-36		58,000/80,000	400/550	36,000	250
ASTM A-572	Grade 50	65,000 Min.	450 Min.	50,000	345
Euronorm					
EN 10025	S235JRG2	52,200/73,950	360/510	32,900	235
	Grade 43A	62,300/74,000	430/510	35,600	245
	S355JO	68,150/91,350	470/630	49,700	355
	S355J2G3	68,150/91,350	470/630	49,700	355
	Grade 50B	72,500/90,000	490/620	50,000	345
England					
BS 4360	RST 37-2	52,000/74,000	360/510	32,500	225
	ST 37-2	52,000/74,000	360/510	32,500	225
	Grade 43A	62,300/74,000	430/510	35,600	245
	Grade 50B	72,500/90,000	490/620	50,000	345
Germany					
DIN 17100	SS 400	52,200/73,950	360/510	32,900	235
	SS 490	58,150/91,350	470/630	49,700	355
	ST 42-2	62,300/83,500	430/580	38,500	265
	ST 52-3	74,000/98,500	510/680	50,000	345
Japan					
JIS-G-3101	SS 41	58,000/74,000	402/510	34,000	235
	SM 41	58,000/74,000	402/510	34,000	235
	SS 50	72,500/88,500	490/608	40,000	275
	SM 50	72,500/88,500	490/608	45,000	314
	SS 540	72,500/88,500	490/608	49,700	355

ver cc03f

Substitution is only possible after a complete examination of the individual specifications.

For sections of over 16 mm (0.630") up to and including 25 mm (.984") thick, the above figures are only a guide and are approximate.

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**COMPARISON CHART - U.S.A. STEEL GRADES VS METRIC PROPERTY CLASS**

**PHYSICAL REQUIREMENTS**

		YIELD(MPA)	TENSILE(MPA)	ELONGATION	REDUCTION AREA	HARDNESS (ROCKWELL)
METRIC PROPERTY CLASS	4.6	240	400	22%	35%	RB 67-95
	4.8	340	420	14%	35%	RB 71-95
	5.8	420	520	10%	35%	RB 82-95
AISI	1018	480	585	28%	55%	RB 85-89
	1020					RB 70-85
	1045					RB 92.5-99
	12L13					
	12L14					RB 85-89
	1144					RC 17-23

**PHYSICAL REQUIREMENTS**

METRIC PROPERTY CLASS		YIELD(MPA)	TENSILE(MPA)	ELONGATION	REDUCTION AREA	HARDNESS (ROCKWELL)
	8.8	660	830	12%	35%	RC 23-34
ASTM	B7	720	860	16%	50%	RC 25-34
AISI	4140 HT					RC 32

METRIC PROPERTY CLASS		YIELD(MPA)	TENSILE(MPA)	ELONGATION	REDUCTION AREA	HARDNESS (ROCKWELL)
	10.9	940	1040	09%	35%	RC 33-39
ETD	150	900	1035	10%	37%	RC 32

METRIC PROPERTY CLASS		YIELD(MPA)	TENSILE(MPA)	ELONGATION	REDUCTION AREA	HARDNESS (ROCKWELL)
	8.8	660	830	12%	35%	RC 23-34
ASTM	B7	720	860	16%	50%	RC 25-34
AISI	4140 HT					RC 32

METRIC PROPERTY CLASS		YIELD(MPA)	TENSILE(MPA)	ELONGATION	REDUCTION AREA	HARDNESS (ROCKWELL)
	10.9	940	1040	09%	35%	RC 33-39
ETD	150	900	1035	10%	37%	RC 32

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A.S.T.M. S.A.E. A.I.S.I.	Euronorm	Werkstoff W.-Nr	Kurzname DIN	BS 970	UNI	JIS
<b>CARBON</b>						
1018	C15D	1.1141	CK15	040A15	C15	S15
1018	C18D	1.0401	C15	080M15	C16	S15CK
1018		1.0453	C16.8	080A15	1C15	S15C
1018				EN3B		
1045	C45	1.0503	C45	060A47	C45	S45C
1045		1.1191	CK45	080A46	1C45	S48C
1045		1.1193	CF45	080M46	C46	
1045		1.1194	CQ45	EN8D	C43	
1140/1146	35S20	1.0726	35S20	212M40		
1140/1146	45S20	1.0727	45S20	en8M		
1215	12SMn35	1.0715	9SMn28	230M07	CF9SMn28	SUM 25
1215		1.0736	9SMn36	En1A	CF9SMn36	SUM 22
12114	11SMnPb28	1.0718	9SMnPb28	230M07leaded	CF9SMnPb28	SUM 22L
12114		1.0737	9SMnPb36	En1A leaded	CF9SMnPb36	SUM 23L
12114						SUM 24L
<b>ALLOY</b>						
4130		1.7218	25CrMo4	708A30	25CrMo4 (KB)	SCM 420
4130			GS-25CrMo5	CDS110	30CrMo4	SCM 430
4130					30CrMo4	SCCrM1
4140/4142	42CrMo4	1.7223	41CrMo4	708M40	41CrMo4	SCM 440
4140/4142		1.7225	42CrMo4	708A42	38CrMo4 KB	SCM 440h
4140/4142		1.7227	42CrMoS4	709M40	G40 CrMo4	SNB 7
4140/4142		1.3563	43CrMo4	En19	42CrMo4	SCM 4M
4140/4142				En19C		SCM 4
4340	34CrNiMo6	1.6582	34CrNiMo6	816M40	35NiCrMo6 KB	SNCM 447
4340		1.6562	40 NiCrMo8 4	en24	40NiCrMo7 KB	SNB24-1-5
8620	20NiCrMo2-2	1.6543	21NiCrMo22	805A20	20NiCrMo2	SNCM 220 (H)
8620		1.6523	21NiCrMo2	805M20		
<b>STAINLESS</b>						
303	X8CrNiS18-9	1.4305	X10CrNiS18-9	303S 21	X10CrNiS 18 09	SUS 303
303				303S 22		
303				En58M		
304	X2CrNi19-11	1.4301	X5CrNi 18 9	304S 15	X5CrNi 18 10	SUS 304
304	X2CrNi18-10		X5CrNi 18 10	304S 16		SUS 304-CSP
304			XCrNi 19 9	304S 18		
304				304S 25		
304				304S 31		
304				En58E		
316	X5CrNiMo17-12-2	1.4401	X5CrNiMo17 12 2	316S 29	X5CrNiMo17 12	SUS 316
316	X5CrNiMo18-14-3	1.4436	X5CrNiMo17 13 3	316S 31	X5CrNiMo17 13	SUS 316TP
316			X5CrNiMo 19 11	316S 33	X8CrNiMo17 13	
316			X5CrNiMo 18 11	En58J		
<b>TOOL STEEL</b>						
A-2	X100CrMov5	1.2363	X100CrMov51	BA 2	X100CrMov5 1 KU	SKD 12
D-2	X153CrMov12	1.2379	X155CrvMo12 1	BD 2	X155CrvMo12 1	SKD 11
M-2	HS6-502	1.3343	S 6-5-2	BM 2	hS 6-5-2	SKH 51
M-2	HS6-5-2C					
O-1		1.251	100MnCrW4	BO 1	95MnWCr 5 KU	
W-1	CT105	1.1625	C80W2	BW 1B	110 W4 KU	SKC 3
W-1	CT80	1.1645	C80W1	BW1A	AB2C70 KU	SK 5
W-1	C105U	1.1673	C85W	BW1C	C120 KU	SK 6

Substitution is only possible after a complete examination of the individual specifications.

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**WEIGHT FORMULA CONVERSIONS FROM STEEL TO OTHER MATERIALS**

MATERIAL	NOTE A:
ALUMINUM 1100	0.3462
ALUMINUM 2011	0.3604
ALUMINUM 2014	0.3568
ALUMINUM 2017	0.3568
ALUMINUM 2024	0.3533
ALUMINUM 3003	0.3498
ALUMINUM 5052	0.3427
ALUMINUM 5083	0.3392
ALUMINUM 6061	0.3462
ALUMINUM 6063	0.3462
ALUMINUM 7075	0.3568
ALUMINUM 7178	0.3702
ALUMINUM - PURE	0.3640
ALUMINUM ALLOYS	0.3560
BRASS	1.0840
BRONZE 90	1.1180
COLUMBIUM	1.1070
COPPER	1.1480
COPPER ALLOYS	1.1200

MATERIAL	NOTE A:
GOLD	2.4590
HASTELLOY B	1.1870
HASTELLOY B-2	1.1740
HASTELLOY C	1.1390
HASTELLOY C-276	1.1320
HASTELLOY X	1.0560
HAYNES 188	1.1830
HAYNES 25 (L-605)	1.1720
INCOLOY 800	1.0250
INCONEL 600	1.0740
INCONEL 625	1.0820
INCONEL 718	1.0290
INCONEL X-750	1.0530
MAGNESIUM	0.2230
MOLYBDENUM	1.3210
MONEL 400	1.1270
MONEL 405	1.1270
MONEL 500	1.0780
MULTIMET (N-155)	1.0560

MATERIAL	NOTE A:
NICKEL 200	1.1340
NICKEL 400	1.1250
NICKEL 600	1.0720
NICKEL 625	1.0750
NICKEL 800	1.0120
NICKEL 904L	1.0260
NIObIUM	1.1070
RENE 41	1.0570
STAINLESS 300 SERIES	1.0100
STAINLESS 400 SERIES	1.0000
TANTALUM	2.1420
TITANIUM ALLOYS	0.5750
TOOL STEEL-HIGH SPEED	1.1200
TOOL STEEL-TUNGSTEN/MOLY	1.0400
TUNGSTEN	2.4640
WASPALLOY	1.0570
ZINC	0.9040
ZIRCONIUM	0.8350

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NOTE A: MULTIPLY STEEL WEIGHT BY THE VALUE IN THIS COLUMN TO OBTAIN ESTIMATED WEIGHT IN THE SELECTED MATERIAL. EXAMPLE: A STEEL WEIGHT OF 120 kg WOULD BE ESTIMATED AS  $120 \times 1.084 = 130.08$  kg FOR AN EQUIVALENT VOLUME OF BRASS.

This information is only for estimating purposes.

These are only theoretical weights.

**Hard Chrome Plated Shafting Specifications**

**Chrome Plated Shafting**

**Grade & Strength**

Our chrome plated shafting is produced from C45 and C50 steel which is virtually the same as AISI 1045/1050 steel. The yield point is 320MPa ( 46,400 psi) and the Ultimate Tensile Strength (UTS) is 520 MPa minimum (75,400 psi minimum).

**Roundness and Straightness**

The out of roundness tolerance is 1/2 of the ISO 286-2 f7 fi eld for shafts greater than 20mm and 1/2 of the ISO 286-2 f8 fi eld for shafts 20mm and smaller. Straightness is better than 0.5mm/2000mm.

**Surface Roughness**

The surface roughness is RMS 8 or better. (Nominal values Ra less than or equal to 0.2um).

**Thickness of Chrome Plating**

The chromium layer on shafting 20mm and less in diameter is 14um minimum (0.00055") and greater than 20mm is 20um minimum (0.00078").

**Surface Hardness**

The Rockwell hardness of the chrome plating itself is HR C66-69.

The Rockwell hardness of the surface of the Non-Induction hardened bars UNDER the chromium overlay on C45/C50 Steel is a Rockwell hardness of B80/99.

The Rockwell hardness of the Induction Hardened bars UNDER the chromium overlay on C45/50 steel is a Rockwell hardness of C54/60.

The surface hardness of DIN 42CrMo4 quench and tempered alloy steel under the chromium layer on the non induction hardened steel is 0.1 Hardness Vickers 620 to 750. This corresponds to RockWell C 32 to 38.

**Corrosion Resistance of the Chromium Layer**

Corrosion Resistance on carbon, alloy, and induction hardened steel is 200 hour in a neutral salt spray tests with a rating of 9 minimum. The laboratory test is according to ISO 9227 (NSS) and results evaluation are according to ISO10.289.

**Depth of Induction Hardening**

Diameters	Metric Tolerances	Inch Tolerances
Greater than 16mm-20mm	1.0mm +/-0.5mm	0.039"/+/-0.020"
Greater than 20mm-40mm	1.5mm +/-0.5mm	0.059"/+/-0.020"
Greater than 40mm-80mm	2.0mm +/-0.5mm	0.079"/+/-0.020"
Greater than 80mm-140mm	2.5mm +/-0.5mm	0.098"/+/-0.020"

**Chrome Plated Shafting Diameter Tolerance**

The diameter tolerance of the chrome plated shafting 16mm and greater is ISO 286-2 lower case f7 which is a double undersize

Bar Above	Dia. (mm) Up to and Including	ISO 286-2 Lowercase f8 f8 Double undersized for shafting
3	6	-0.010mm/-0.028mm (-0.00039"/-0.00110")
6	10	-0.013mm/-0.035mm (-0.00051"/-0.00137")
10	18	-0.016mm/-0.043mm (-0.00063"/-0.00169")
18	20	-0.020mm/-0.053mm (-0.00078"/-0.00209")

Bar Above	Dia. (mm) Up to and Including	ISO 286-2 Lowercase f7 f7 Double undersized for shafting
20	30	-0.020mm/-0.041mm (-0.00078"/-0.0016")
30	50	-0.025mm/-0.050mm (-0.00098"/-0.0026")
50	80	-0.030mm/-0.060mm (-0.00118"/-0.0024")
80	120	-0.036mm/-0.071mm (-0.00142"/-0.0028")
120	180	-0.043mm/-0.083mm (-0.00169"/-0.0033")
180	250	-0.050mm/-0.096mm (-0.00197"/-0.0038")

**High Strength 100,000 min. PSI**

This material is produced from Euronorm/DIN 42CrMo4 steel which is very similar to AISI/ASTM 4140 and is quenched and tempered. It is stocked in both the induction hardened and non induction hardened condition.

**Mechanical Properties of High Strength Shafting**

Diameters	Minimum Yield	U.T.S.
16mm to 120mm	106,000 psi	130,491 to 166,739 psi
120mm to 140mm	100,000 psi	123,242 to 166,739 psi

**Chemistry Comparisons**

Grade	C%	Mn %	P%	S %	Cr%	Mo%
1045	0.43/0.50	0.60/0.90	0.04	0.05		
C45 & Ck45	0.42/0.50	0.50/0.80	0.035	0.035		
1050	0.48/0.55	0.60/0.90	0.04	0.05		
C50 & Ck50	0.47/0.55	0.60/0.90	0.035	0.035		
4140	0.38/0.43	0.75/1.00	0.035	0.04	0.80/1.10	0.15/0.25
42CrMo4	0.38/0.45	0.60/0.90	0.035	0.035	0.90/1.20	0.15/0.30
SCM 440	0.38/0.43	0.60/0.90	0.03	0.03	0.90/1.20	0.15/0.30
42CrMo	0.38/0.45	0.50/0.80	0.035	0.035	0.90/1.20	0.15/0.25
B7/B7M	0.37/0.49	0.65/1.10	0.035	0.04	0.75/1.10	0.15/0.35

Silicon in 4140, SCM 440, and 42CrMo is 0.15/0.35% and in 42CrMo4, B7 and B7M are 0.40% maximum. The numbers 1045, 1050, 4140, B7 and B7M are American grades SAE/ASTM/AISI. The number letter combinations C45, Ck45, C50, Ck50 and 42CrMo4 are both Euronorm EN10083 and DIN standards. Lower case k stands for cold drawn. SCM 440 is a Japanese JIS G grade and 42CrMo is a Chinese GB grade.

**Induction Hardened Shafting Specifications**

**Surface Hardness**

The 1045 induction hardened bars have a case hardness of rockwell C 50/60 and the 1060 induction hardened bars have a case hardness of rockwell C 60/65.

**Depth of Hardness**

our induction hardened bars 1045 and 1060 have a case hardened depth range of 0.060" /0.090"

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**DIN To EN Comparison**

Hot Roll Bars	DIN	EN
Flat	DIN 1017	EN 10058
equal Angle	DIN 1028	EN 10056-2
Unequal Angle	DIN 1029	EN 10056-2
T-Bar	DIN 1024	EN 10055
round Bar (hot roll)	DIN 1013	EN 10060
Square Bar (hot roll)	DIN 1014	EN 10059

Channel & I Beam	DIN	EN
Channel	DIN 1026	EN 10279
INP (IPN)	DIN 1025 part 1	EN 10024
IPe	DIN 1025 part 5	EN 10034
IPB-1	DIN 1025 part 3	EN 10034
IPB	DIN 1025 part 2	EN 10034
IPBv	DIN 1025 part 4	EN 10034
hot roll Plate	DIN 1025 part 4	EN 10029

Cold Drawn Bars	DIN	EN
Flat	DIN 174	EN 10278
Square	DIN 178	EN 10278
hexagon	DIN 176	EN 10278
round	DIN 671	EN 10278 h9
key Stock	DIN 6880	DIN 6880
Cold drawn Angle	DIN 59370	DIN 59370
Cold roll Plate Tubes	DIN 1541	EN 10305-1
round Tubes	DIN 2391	EN 10305-1
Welded hr round Tube	DIN 2394	EN 10305-3
DOM round Tube	DIN 2393	EN 10305-2
hydraulic Tube	DIN 2391C	EN10305-4
Square and rectangle	DIN 2395	EN 10305-5
hr hollow Section	DIN 59410	EN 10210
Cold Finish hollow Section	DIN 59411	EN 10219

**Material Names**

Old Designations	New Designations
DIN 1652-2	EN 10277-2
ST 37-2	S235Jrg2C
ST 52-3	S355J2g3C
ST 1203	dC 01 AM
C 15	C15
Ck 15	C15e
Cm 35	C35r

Old Designations	New Designations
C 45	C45
Ck 45	C45e
Cm 45	C45r
9SMn28	11SMn30
9SMnPb 28	11SMnPb30
16MnCrS 5	16MnCrS5

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## **Fahrenheit & Centigrade Temperature Comparisons**

Degrees Fahrenheit	Degrees Centigrade	Degrees Fahrenheit	Degrees Centigrade	Degrees Fahrenheit	Degrees Centigrade	Degrees Fahrenheit	Degrees Centigrade
-30	-34.4	20	-6.7	60	15.5	90	32.2
-28	-33.3	22	-5.6	61	16.1	91	32.7
-26	-32.2	24	-4.4	62	16.7	92	33.3
-25	-31.6	25	-3.9	63	17.2	93	33.9
-24	-31.1	26	-3.3	64	17.8	94	34.4
-22	-30	28	-2.2	65	18.3	95	35
-20	-28.9	30	-1.1	66	18.9	96	35.5
-18	-27.8	32	0	67	19.4	97	36.1
-16	-26.6	34	1.1	68	20	98	36.6
-15	-26.1	35	1.7	69	20.5	99	37.2
-14	-25.5	36	2.2	70	21.1	100	37.7
-12	-24.4	38	3.3	71	21.6	101	38.3
-10	-23.3	40	4.4	72	22.2	102	38.9
-8	-22.2	42	5.6	73	22.8	103	39.4
-6	-21.1	44	6.7	74	23.3	104	40
-5	-20.5	45	7.2	75	23.9	105	40.5
-4	-20	46	7.8	76	24.4	106	41.1
-2	-18.9	47	8.3	77	25	107	41.6
0	-17.8	48	8.9	78	25.5	108	42.2
2	-16.7	49	9.4	79	26.1	110	43.3
4	-15.5	50	10	80	26.6	111	43.8
5	-15	51	10.5	81	27.2	112	44.4
6	-14.4	52	11.1	82	27.8	113	45
8	-13.3	53	11.7	83	28.3	114	45.5
10	-12.2	54	12.2	84	28.9	115	46.1
12	-11.1	55	12.8	85	29.4	116	46.6
14	-10	56	13.3	86	30	118	47.7
15	-9.4	57	13.9	87	30.5	120	48.8
16	-8.9	58	14.4	88	31.1	122	50
18	-7.8	59	15	89	31.6	212	100