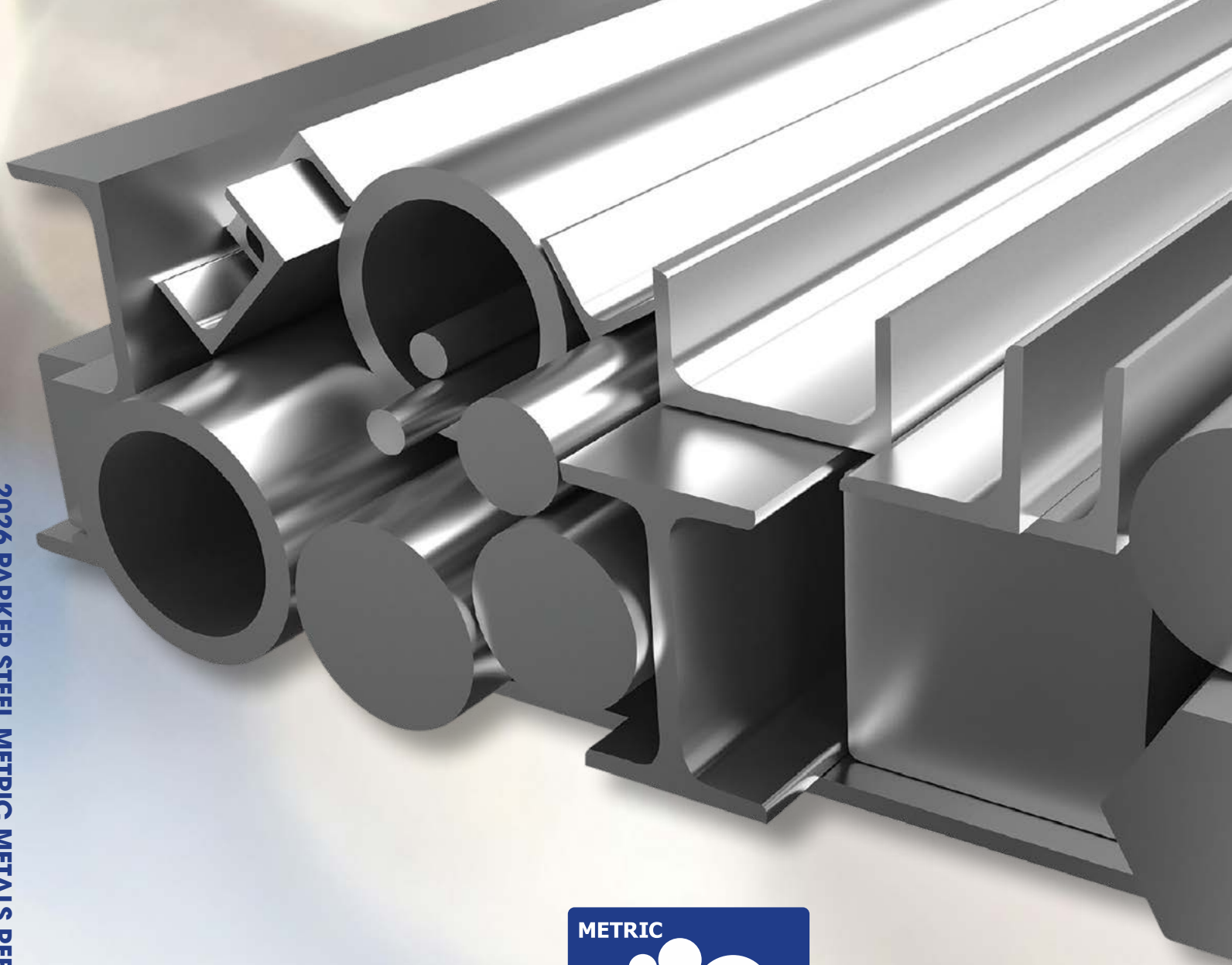


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Largest
Inventory in
North America

**Metric
Size
Metals**

20
26

Metric Size Metals 20 26

With more than 6,000 line items, Parker Steel Company® is by far the largest distributor of metric size metals in America. Parker Steel® exclusively stocks metric size metals and takes pride in the service and selection we have built since the firm was founded in 1955.

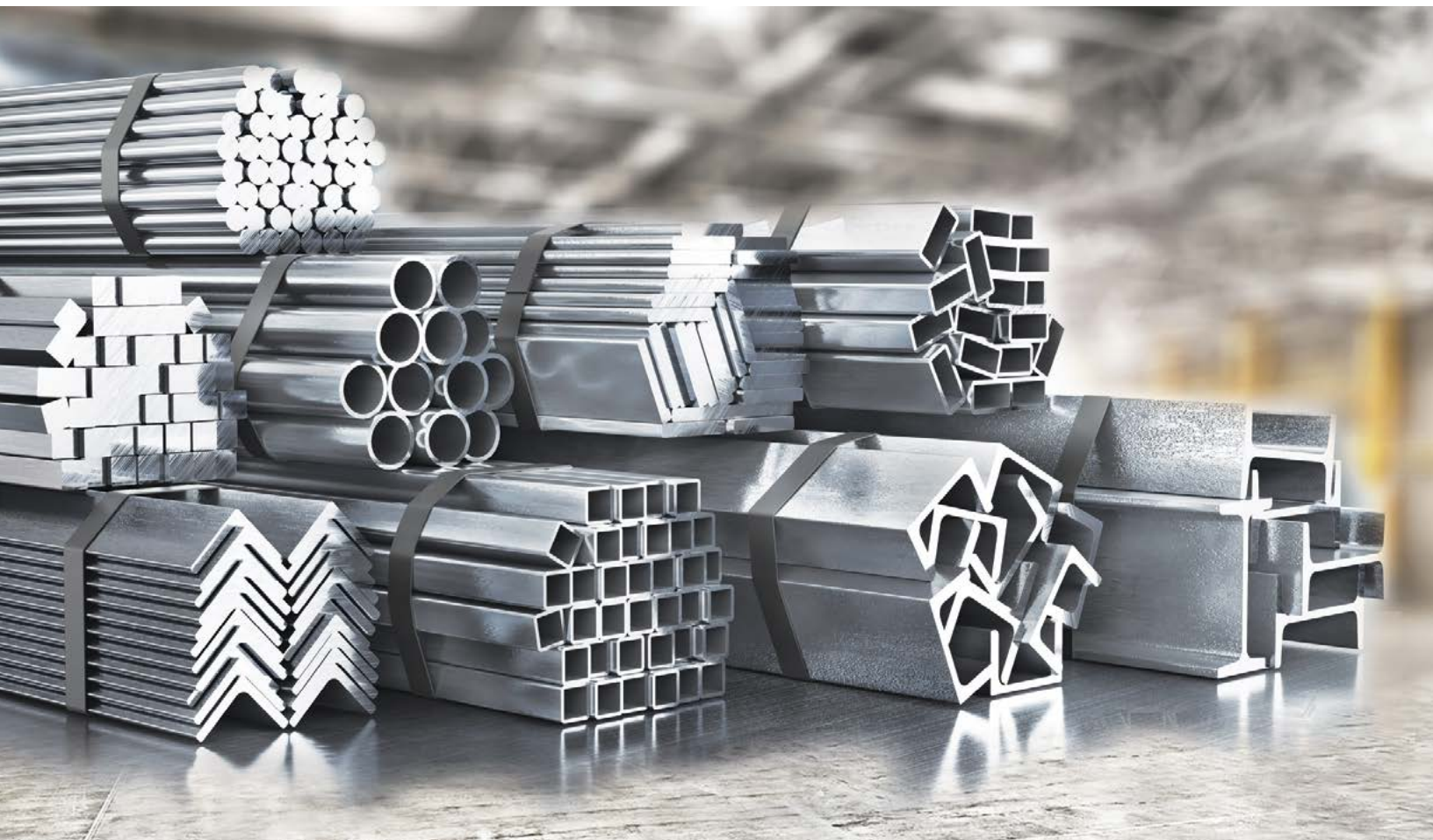
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Parker Steel Company

Distribution Center in Toledo, Ohio
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**Metric
Size
Metals** 20
26

Dear Customer:

Thank you for your business.

Please enjoy our 2026 Metric Metals Reference Guide. In it you will find most of the metric size metals stocked in our warehouses.

Parker Steel has the largest stock of metric size metals in North America. We offer the highest quality materials, exceptional service, and on-time delivery, ensuring a great customer experience.

• **Aluminum** • **Copper** • **Brass** • **Stainless Steel** • **Carbon** • **Tool Steel**

Please call if you don't see what you are looking for. To make it easy for you, all calls go directly to the sales room and our hours are from 7:30 a.m. to 6:00 p.m. EST weekdays.

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Thank you again for your business. We look forward to working with you again soon.

Yours truly,

Michael J. Tipping, CEO



We will search the world for your inquiry.

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Mission Statement & Social Responsibility



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OUR MISSION

The mission of Parker Steel® is to provide first class service and products, by having dedicated and well-trained people who are committed to making our customers' experience with Parker Steel extremely positive. We will also ensure that we have the most extensive and diverse inventory of metric size metals in America. Through commitment to Continual Improvement and our Quality Management System, our people will ensure that the quality of our products and services always meet or exceed our customers' expectations. We will always conduct our business with integrity and respect for our people, customers, suppliers, and the community. We are fully committed to operating in a safe and environmentally responsible manner.

SOCIAL RESPONSIBILITY STATEMENT

Parker Steel Company® is committed to utilizing the highest corporate, environmental, and social responsibility practices available to us. It is our pledge to operate with great care regarding human rights, environmental responsibility, and ethical business practices within our organization, in our community, throughout our supply chain, and on to our customers. We recognize that global, social, and environmental factors call for a continuous need to examine the way that we do business. Parker Steel Company® will evolve and adapt as needed to meet this commitment.

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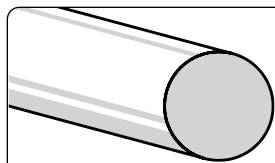
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Email: sales@MetricMetal.com



Metric Round Bar

CARBON STEEL – 1018, 1018 TG&P, 1045 TG&P, 1045 IH, 1060 IH, 1117, 1144 SR TG&P, 12L14, 12L14 TG&P, 1215, ISO 286 h6 & h11, ASTM A29, ASTM A108, ASTM A311 Class B, EN 10277-2, EN 10278

ALLOY STEEL – 4140 ANNEALED, 4140 ANNEALED TG&P, 4140 QT/SR HT TG&P, 4340 HT TG&P, E52100 AQ/SR TG&P, ASTM A29, ASTM A193-B7, ASTM A295, ASTM A322, ASTM A434-BC

COPPER – Cu-ETP, CW004A, Cu-EPT1, E-58, C110, ASTM B124, DIN EN 13601 (Multiply weights below by 1.1440)

BRASS – CuZn36Pb3, CW603N, CDA 360, CuZn39Pb3, CW614N, CDA 385, EN 12164, DIN EN 10365, (Multiply weights below by 1.084)

ALUMINUM – 6060 T6, 6082 T6 (Extruded), 2007 T3, 7075 T6,, EN 579-3, EN 754-2, EN 755-2, EN 755-3 (Multiply weights below by .3462)

STAINLESS STEEL – 303, 304, 304L, 316L, 416, 420, 430, 440C, 17-4 PH TG&P, Drawn ASTM A276, A582, A564, Condition A (Multiply weights below by 1.0100)

SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR
1	0.0394	0.004	0.05
1.5	0.0591	0.009	0.11
2	0.0787	0.017	0.20
2.5	0.0984	0.026	0.31
3	0.1181	0.037	0.44
3.5	0.1378	0.051	0.61
4	0.1575	0.066	0.79
4.5	0.1772	0.084	1.01
5	0.1969	0.104	1.25
5.5	0.2165	0.125	1.50
6	0.2362	0.149	1.79
6.5	0.2559	0.175	2.10
7	0.2756	0.203	2.44
7.5	0.2953	0.233	2.79
8	0.3150	0.265	3.18
8.5	0.3346	0.299	3.59
9	0.3543	0.335	4.02
9.5	0.3740	0.373	4.48
10	0.3937	0.414	4.97
10.5	0.4134	0.456	5.48
11	0.4331	0.501	6.01
11.5	0.4527	0.547	6.57
12	0.4724	0.596	7.15
12.5	0.4921	0.647	7.76

SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR
13	0.5118	0.700	8.40
13.5	0.5315	0.754	9.04
14	0.5512	0.811	9.73
14.5	0.5708	0.870	10.44
15	0.5906	0.932	11.18
15.5	0.6102	0.994	11.94
16	0.6299	1.060	12.72
17	0.6693	1.196	14.35
18	0.7087	1.341	16.09
19	0.7480	1.495	17.93
20	0.7874	1.656	19.87
21	0.8268	1.826	21.91
22	0.8661	2.004	24.05
23	0.9055	2.190	26.28
24	0.9449	2.385	28.62
25	0.9843	2.588	31.05
26	1.0236	2.799	33.58
27	1.0630	3.018	36.22
28	1.1024	3.246	38.95
29	1.1417	3.482	41.78
30	1.1811	3.726	44.71
31	1.2205	3.979	47.75
32	1.2598	4.239	50.87
33	1.2992	4.508	54.10

SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR
34	1.3386	4.786	57.43
35	1.3780	5.072	60.86
36	1.4173	5.365	64.38
37	1.4567	5.668	68.02
38	1.4961	5.978	71.74
39	1.5354	6.297	75.56
40	1.5748	6.624	79.49
41	1.6142	6.959	83.51
42	1.6535	7.303	87.64
43	1.6929	7.655	91.86
44	1.7323	8.015	96.18
45	1.7717	8.384	100.61
46	1.8110	8.760	105.12
47	1.8504	9.145	109.74
48	1.8898	9.539	114.47
49	1.9291	9.940	119.28
50	1.9685	10.350	124.20
51	2.0079	10.768	129.22
52	2.0472	11.195	134.34
53	2.0866	11.629	139.55
54	2.1260	12.072	144.86
55	2.1654	12.524	150.29
56	2.2047	12.983	155.80

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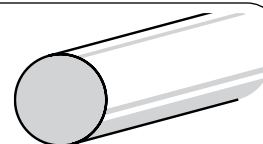
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SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR	SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR	SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR
58	2.2835	13.927	167.12	100	3.9370	41.400	496.80	160	6.2992	105.984	1271.81
60	2.3622	14.904	178.85	105	4.1339	45.644	547.73	165	6.4961	112.712	1352.54
62	2.4409	15.914	190.97	110	4.3307	50.094	601.13	170	6.6929	119.646	1435.75
63	2.4803	16.432	197.18	115	4.5276	54.752	657.02	175	6.8898	126.788	1521.46
64	2.5197	16.957	203.49	120	4.7244	59.616	715.39	180	7.0866	134.136	1609.63
65	2.5591	17.492	209.90	125	4.9213	64.688	776.26	185	7.2835	141.692	1700.30
70	2.7559	20.286	243.43	130	5.1181	69.966	839.59	190	7.4803	149.454	1793.45
75	2.9528	23.288	279.46	135	5.3150	75.452	905.42	195	7.6772	157.424	1889.09
80	3.1496	26.496	317.95	140	5.5118	81.144	973.73	200	7.8740	165.600	1987.20
85	3.3465	29.912	358.94	145	5.7087	87.044	1044.53	220	8.6614	200.303	2403.64
90	3.5433	33.534	402.41	150	5.9055	93.150	1117.80	250	9.8425	258.750	3105.00
95	3.7402	37.364	448.37	155	6.1024	99.464	1193.57				

Metric Hard Chrome Plated Bar



CARBON STEEL – 1045/1050 CP, 1045/1050 IHCP, UNI C45/C50, EN 10083-2, EN 10277-1/5, EN 10278, UNI EN 286/2 (ISO)
(Please see page 55 for Hard Chrome Plated Bar Specifications and page 56 for Induction Hardened Bar specifications.)

ALLOY STEEL – 4140 HT, QT, SR, 42CrMo4, EN 10083-1/3, EN 10277-5, EN 10278, UNI EN 286/2 (ISO)

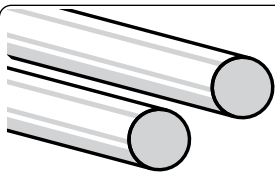
SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR	SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR	SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR
6	0.2362	0.149	2.98	36	1.4173	5.365	107.30	105	4.1339	45.644	912.88
8	0.3150	0.265	5.30	38	1.4961	5.978	119.56	110	4.3307	50.094	1001.88
10	0.3937	0.414	8.28	40	1.5748	6.624	132.48	115	4.5276	54.752	1095.04
12	0.4724	0.596	11.92	45	1.7717	8.384	167.68	120	4.7244	59.616	1192.32
14	0.5512	0.811	16.22	50	1.9685	10.350	207.00	125	4.9213	64.688	1293.76
15	0.5906	0.932	18.64	55	2.1654	12.524	250.48	130	5.1181	69.966	1399.32
16	0.6299	1.060	21.20	56	2.2047	12.983	259.66	140	5.5118	81.144	1622.88
17	0.6693	1.196	23.92	60	2.3622	14.904	298.08	150	5.9055	93.150	1863.00
18	0.7087	1.341	26.82	63	2.4803	16.432	328.64	160	6.2992	105.984	2119.68
20	0.7874	1.656	33.12	65	2.5591	17.492	349.84	170	6.6929	119.646	2392.92
22	0.8661	2.004	40.08	70	2.7559	20.286	405.72	180	7.0866	134.136	2682.72
24	0.9449	2.385	47.70	75	2.9528	23.288	465.76	190	7.4803	149.454	2989.08
25	0.9843	2.588	51.76	80	3.1496	26.496	529.92	200	7.8740	165.600	3312.00
28	1.1024	3.246	64.92	85	3.3465	29.912	598.24	220	8.6614	200.303	4006.06
30	1.1811	3.726	74.52	90	3.5433	33.534	670.68	250	9.8425	258.750	5175.00
32	1.2598	4.239	84.78	95	3.7402	37.364	747.28				
35	1.3780	5.072	101.44	100	3.9370	41.400	828.00				

*** BAR ENDS NOT CHROMED ***

Low Minimum Order

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Metric Drill Rods/Tool Steel

O-1, A-2, ASTM A681; Tolerances; 3mm and under $\pm .0003"$, 4mm to 12mm $\pm .0005"$; 13mm and larger $\pm 0.001"$
 $0.0003"=0.008\text{mm}$, $0.0005"=0.013\text{mm}$, $0.001"=0.025\text{mm}$

Diameter in mm/inch										
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	0.3150	0.3543	0.3937
WEIGHT/FT	lbs	0.0166	0.0373	0.0662	0.1035	0.1490	0.2029	0.2650	0.3353	0.4140

Diameter in mm/inch											
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	0.7480	0.7874
WEIGHT/FT	lbs	0.5009	0.5962	0.6997	0.8114	0.9315	1.0598	1.1965	1.3414	1.4945	1.6560

Diameter in mm/inch											
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	1.3780	1.5748	1.7717	1.9685
WEIGHT/FT	lbs	2.0038	2.1901	2.3846	2.5875	3.7260	4.2394	5.0715	6.6240	8.3835	10.3500



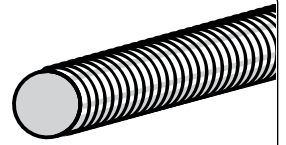
Round bar
 from 1mm – 250mm in diameter.

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Metric Threaded Rods



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

ALLOY STEEL – B7, 4140, ASTM A29, ASTM A193

STAINLESS STEEL – 304, 316, 17-4PH, ASTM A276, ASTM A564

Coarse & Fine Thread

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	0.700	0.800	1.000	1.000	1.000	1.250	1.250	1.500	1.250	1.750

THREAD	mm	M14	M16	M16	M18	M20	M20	M22	M24	M27	M30
DIAMETER	inch	0.551	0.630	0.630	0.709	0.787	0.787	0.866	0.945	1.063	1.181
PITCH	mm	2.000	1.500	2.000	2.500	1.500	2.500	2.500	3.000	3.000	3.500

THREAD	mm	M33	M36	M39	M42	M45	M48	M52	M56	M60	M64
DIAMETER	inch	1.299	1.417	1.535	1.654	1.772	1.890	2.047	2.205	2.362	2.520
PITCH	mm	3.500	4.000	4.000	4.500	4.500	5.000	5.000	5.500	5.500	6.000

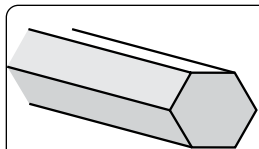


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Metric Cold Drawn Hexagon Bar

CARBON STEEL – 1008/1018, 1018, 1045, 1140, 1144, 1144 SR, 12L14, 1215, S235JR, C45, ASTM A29, ASTM A108, ASTM A311 Class B, EN 10277-2, EN 10278

ALLOY STEEL – 4140 Annealed, 4140 Q&T/SR, HT, 8650 Annealed, 42CrMo4, ASTM A29, EN 10083-1

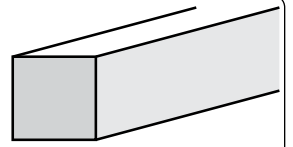
STAINLESS STEEL – 303, 304, 304L, 316, 316Ti, 430F, ASTM A582, ASTM A276, X8CrNiS18-9, X2CrNi18-10, X5CrNiMo17-12-2, X6CrNiMoTi17-12, W.Nr 1.4301, 1.4305, 1.4306, 1.4401, 1.4404, 1.4571, EN 10088-3
(Multiply weights below by 1.0100)

ALUMINUM – Extruded 2007, 2011 T3 & T8 Temper, 6082 T6 Temper, EN 573-3, EN 754-2, EN 754-6
(Multiply weights below by 0.3462)

BRASS – CW614N, CuZn39Pb3, CW603N, CuZn36Pb3, CDA 385, CDA 360, EN 12164
(Multiply weights below by 1.084)

SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR	SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR	SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR
2	0.0787	0.018	0.22	23	0.9055	2.418	29.02	44	1.7323	8.848	106.18
3	0.1181	0.041	0.49	24	0.9449	2.632	31.58	45	1.7717	9.254	111.05
4	0.1575	0.073	0.88	25	0.9843	2.856	34.27	46	1.8110	9.670	116.04
5	0.1969	0.114	1.37	26	1.0236	3.089	37.07	47	1.8504	10.095	121.14
6	0.2362	0.165	1.98	27	1.0630	3.332	39.98	48	1.8898	10.529	126.35
7	0.2756	0.224	2.69	28	1.1024	3.583	43.00	49	1.9291	10.973	131.68
8	0.3150	0.292	3.50	29	1.1417	3.843	46.12	50	1.9685	11.425	137.10
9	0.3543	0.370	4.44	30	1.1811	4.113	49.36	52	2.0472	12.357	148.28
10	0.3937	0.457	5.48	31	1.2205	4.392	52.70	54	2.1260	13.326	159.91
11	0.4331	0.553	6.64	32	1.2598	4.680	56.16	55	2.1654	13.824	165.89
12	0.4724	0.658	7.90	33	1.2992	4.977	59.72	56	2.2047	14.332	171.98
13	0.5118	0.772	9.26	34	1.3386	5.283	63.40	58	2.2835	15.373	184.48
14	0.5512	0.896	10.75	35	1.3780	5.598	67.18	60	2.3622	16.452	197.42
15	0.5906	1.028	12.34	36	1.4173	5.923	71.08	65	2.5591	19.308	231.70
16	0.6299	1.170	14.04	37	1.4567	6.256	75.07	70	2.7559	22.393	268.72
17	0.6693	1.321	15.85	38	1.4961	6.599	79.19	75	2.9528	25.706	308.47
18	0.7087	1.481	17.77	39	1.5354	6.951	83.41	80	3.1496	29.248	350.98
19	0.7480	1.650	19.80	40	1.5748	7.312	87.74	85	3.3464	33.018	396.22
20	0.7874	1.828	21.94	41	1.6142	7.682	92.18	90	3.5433	37.020	444.24
21	0.8268	2.015	24.18	42	1.6535	8.061	96.73	100	3.9370	45.700	548.40
22	0.8661	2.212	26.54	43	1.6929	8.450	101.40				

Metric Cold Drawn Square & Keystock



CARBON STEEL – 1008/1018, 1018, 1040, 1045, 1045 Keystock, 12L14, 1215, S235JR, C45, ASTM A29, ASTM A108, EN 10277-2, EN 10278, DIN 6880 (Keystock), SS400, JIS G3101, JIS G3123

ALLOY STEEL – 4140, 42CrMo4, SCM440, ASTM A29, EN 10083-1, JIS G4052, JIS G4053

TOOL STEEL – O-1 (Ground Stock) ASTM A681

STAINLESS STEEL – 303, 304, 304L, 316, 316Ti, ASTM A276, ASTM A582, X8CrNiS18-9, X2CrNi19-11, X5CrNiMo17-12-2, X6CrNiMoTi17-12, W.Nr 1.4301, 1.4305, 1.4306, 1.4401, 1.4404, 1.4571, EN 10088-3 (Multiply weights below by 1.0100)

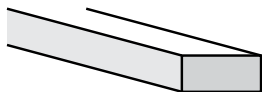
ALUMINUM – 6060 T6 (Extruded), EN 573-3, EN 755-2, EN 755-4 (Multiply weights below by 0.3462)

BRASS – CDA 385, CuZn39Pb3, CW 614N, EN 12164 (Multiply weights below by 1.084)

SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR	SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR	SIZE mm	SIZE INCHES	EST. LBS. PER FT.	EST. LBS. PER 12 FT. BAR
2	0.0787	0.021	0.25	24	0.9449	3.036	36.43	46	1.8110	11.151	133.81
3	0.1181	0.047	0.56	25	0.9843	3.294	39.53	47	1.8504	11.641	139.69
4	0.1575	0.084	1.01	26	1.0236	3.563	42.76	48	1.8898	12.142	145.70
5	0.1969	0.132	1.58	27	1.0630	3.842	46.10	49	1.9291	12.653	151.84
6	0.2362	0.190	2.28	28	1.1024	4.132	49.58	50	1.9685	13.175	158.10
7	0.2756	0.258	3.10	29	1.1417	4.432	53.18	52	2.0472	14.250	171.00
8	0.3150	0.337	4.04	30	1.1811	4.743	56.92	54	2.1260	15.367	184.40
9	0.3543	0.427	5.12	31	1.2205	5.064	60.77	55	2.1654	15.942	191.30
10	0.3937	0.527	6.32	32	1.2598	5.396	64.75	56	2.2047	16.527	198.32
11	0.4331	0.638	7.66	33	1.2992	5.739	68.87	58	2.2835	17.728	212.74
12	0.4724	0.759	9.11	34	1.3386	6.092	73.10	60	2.3622	18.972	227.66
13	0.5118	0.891	10.69	35	1.3780	6.456	77.47	65	2.5591	22.266	267.19
14	0.5512	1.033	12.40	36	1.4173	6.830	81.96	70	2.7559	25.823	309.88
15	0.5906	1.186	14.23	37	1.4567	7.215	86.58	75	2.9528	29.644	355.73
16	0.6299	1.349	16.19	38	1.4961	7.610	91.32	80	3.1496	33.728	404.74
17	0.6693	1.523	18.28	39	1.5354	8.016	96.19	90	3.5433	42.690	512.28
18	0.7087	1.707	20.48	40	1.5748	8.432	101.18	100	3.9370	52.700	632.40
19	0.7480	1.902	22.82	41	1.6142	8.859	106.31	110	4.3307	63.770	765.24
20	0.7874	2.108	25.30	42	1.6535	9.296	111.55	120	4.7244	75.890	910.68
21	0.8268	2.324	27.89	43	1.6929	9.744	116.93	150	5.9505	118.575	1425.00
22	0.8661	2.551	30.61	44	1.7323	10.203	122.44				
23	0.9055	2.788	33.46	45	1.7717	10.672	128.06				

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Metric Cold Drawn Flat & Keystone

CARBON STEEL – 1008/1018, 1018, 1045, 1045 Keystone, S235JR, C45, ASTM A29, ASTM A108, EN 10277-2, EN 10278, DIN 6880 (Keystone), SS400, SS400D, JIS G3101, JIS G3123

ALLOY STEEL – 4140 Annealed, 4140 Keystone, ASTM A108, 42CrMo4, EN 10083-1, EN 10029 (Hot rolled cut from plate)

TOOL STEEL – O-1 (Ground Stock) ASTM A681

STAINLESS STEEL – 303, 304, 304L, 316, 316Ti, ASTM A276, ASTM A582, X8CrNiS18-9, X2CrNi19-11, X5CrNiMo17-12-2, X6CrNiMoTi17-12, W.Nr 1.4301, 1.4305, 1.4306, 1.4401, 1.4404, 1.4571, EN 10088-3 (Multiply weights below by 1.0100)

ALUMINUM – 6060 T6 (Extruded), EN 573-3, EN 755-2, EN 755-5 (Multiply weights below by 0.3462)

BRASS – CDA 378, CuZn40Pb2, EN12167, CW617N (Multiply weights below by 1.084)

COPPER – C110, ASTM B124, Cu-ETP, CW004A, Cu-EPT1, E-58, DIN EN 13601 (Multiply weights below by 1.1440)

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	2	0.11	14	4	0.30	16	9	0.76	20	5	0.53
3	3	0.05	10	3	0.16	14	5	0.37	16	10	0.84	20	6	0.63
4	3	0.06	10	4	0.21	14	6	0.44	16	12	1.01	20	7	0.74
4	4	0.08	10	5	0.26	14	7	0.52	16	16	1.35	20	8	0.84
5	3	0.08	10	6	0.32	14	8	0.60	18	2	0.19	20	10	1.05
5	4	0.11	10	7	0.37	14	9	0.66	18	3	0.28	20	12	1.26
5	5	0.13	10	8	0.42	14	10	0.74	18	4	0.38	20	15	1.58
6	2	0.06	10	10	0.53	14	12	0.88	18	5	0.47	20	16	1.69
6	3	0.09	11	11	0.64	14	14	1.03	18	6	0.57	20	18	1.90
6	4	0.13	12	2	0.13	15	1	0.08	18	7	0.66	20	20	2.11
6	5	0.16	12	3	0.19	15	1.5	0.12	18	8	0.76	22	3	0.35
6	6	0.19	12	4	0.25	15	2	0.16	18	10	0.95	22	4	0.46
7	3	0.11	12	5	0.32	15	3	0.24	18	11	1.04	22	4.5	0.52
7	4	0.15	12	6	0.38	15	4	0.32	18	12	1.14	22	5	0.58
7	5	0.18	12	7	0.44	15	5	0.40	18	18	1.71	22	6	0.70
7	7	0.26	12	8	0.51	15	6	0.47	19	3	0.30	22	7	0.81
8	2	0.08	12	9	0.57	15	7	0.55	19	4	0.40	22	8	0.93
8	3	0.13	12	10	0.62	15	8	0.63	19	4.5	0.45	22	9	1.04
8	4	0.17	12	12	0.76	15	10	0.79	19	5	0.50	22	10	1.16
8	5	0.21	13	3	0.21	15	12	0.95	19	6	0.60	22	12	1.39
8	6	0.25	13	4	0.27	15	15	1.19	19	8	0.80	22	14	1.62
8	7	0.30	13	4.5	0.31	16	2	0.17	19	9	0.90	22	15	1.74
8	8	0.34	13	5	0.34	16	3	0.25	19	12	1.20	22	16	1.86
9	3	0.14	13	6	0.41	16	4	0.34	19	16	1.60	22	19	2.20
9	4.5	0.21	13	8	0.55	16	4.5	0.38	20	1	0.11	22	20	2.32
9	6	0.28	13	9	0.62	16	5	0.42	20	1.5	0.16	22	22	2.55
9	9	0.43	13	13	0.89	16	6	0.51	20	2	0.21	24	14	1.77
10	1	0.06	14	2	0.15	16	7	0.59	20	3	0.32	25	1	0.13
10	1.5	0.08	14	3	0.22	16	8	0.67	20	4	0.42	25	1.5	0.20

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- METRIC COLD DRAWN FLAT & KEYSTOCK continued from previous 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.
25	2	0.26	32	15	2.53	40	16	3.37	50	19	5.01	60	35	11.07
25	3	0.40	32	16	2.70	40	20	4.22	50	20	5.27	60	40	12.65
25	4	0.53	32	18	3.04	40	22	4.64	50	22	5.80	60	50	15.81
25	4.5	0.59	32	19	3.20	40	25	5.27	50	25	6.59	60	60	18.97
25	5	0.66	32	20	3.37	40	30	6.32	50	28	7.38	63	32	10.68
25	6	0.79	32	22	3.71	40	35	7.38	50	30	7.91	65	3	1.03
25	7	0.92	32	25	4.22	40	40	8.43	50	35	9.22	65	4	1.37
25	8	1.05	35	3	0.56	44	5	1.16	50	38	10.01	65	4.5	1.54
25	9	1.19	35	4	0.74	44	6	1.39	50	40	10.54	65	5	1.71
25	10	1.32	35	5	0.92	44	9	2.09	50	50	13.18	65	6	2.06
25	12	1.58	35	6	1.11	44	12	2.78	55	2.5	0.73	65	8	2.74
25	14	1.84	35	7	1.29	44	16	3.71	55	3	0.87	65	9	3.08
25	15	1.98	35	8	1.48	44	19	4.41	55	4	1.16	65	10	3.43
25	16	2.11	35	10	1.84	44	22	5.10	55	5	1.45	65	12	4.11
25	18	2.37	35	12	2.22	44	25	5.80	55	6	1.74	65	15	5.14
25	19	2.50	35	15	2.77	45	2	0.48	55	7	2.03	65	16	5.48
25	20	2.64	35	16	2.95	45	3	0.71	55	8	2.32	65	19	6.51
25	22	2.90	35	18	3.32	45	4	0.95	55	10	2.90	65	20	6.85
25	25	3.29	35	20	3.69	45	5	1.19	55	12	3.48	65	22	7.54
26	16	2.19	35	25	4.61	45	6	1.42	55	15	4.35	65	25	8.56
26	20	2.74	35	30	5.53	45	7	1.66	55	16	4.64	65	30	10.28
28	16	2.36	35	35	6.46	45	8	1.90	55	20	5.80	65	32	10.96
30	2	0.32	36	1	0.19	45	10	2.37	55	25	7.25	65	35	11.99
30	3	0.47	36	2	0.38	45	12	2.85	55	30	8.70	65	38	13.02
30	4	0.63	36	20	3.79	45	15	3.56	55	35	10.15	65	40	13.70
30	5	0.79	38	3	0.60	45	16	3.79	55	40	11.59	65	50	17.13
30	6	0.95	38	4.5	0.90	45	20	4.74	55	55	15.94	65	65	22.27
30	7	1.11	38	5	1.00	45	25	5.93	56	32	9.46	70	2	0.74
30	8	1.26	38	6	1.20	45	30	7.11	60	3	0.95	70	3	1.11
30	10	1.58	38	9	1.80	45	35	8.30	60	4	1.26	70	4	1.48
30	12	1.90	38	10	2.00	45	40	9.49	60	5	1.58	70	5	1.84
30	15	2.37	38	12	2.40	45	45	10.67	60	6	1.90	70	6	2.21
30	16	2.53	38	16	3.20	50	2	0.52	60	7	2.21	70	7	2.58
30	18	2.85	38	19	3.80	50	3	0.79	60	8	2.53	70	8	2.96
30	20	3.16	38	22	4.41	50	4	1.05	60	9	2.85	70	10	3.69
30	25	3.95	38	25	5.01	50	4.5	1.19	60	10	3.16	70	12	4.43
30	30	4.74	40	2	0.42	50	5	1.32	60	12	3.79	70	15	5.53
32	3	0.51	40	3	0.63	50	6	1.58	60	15	4.74	70	16	5.90
32	4	0.67	40	4	0.85	50	7	1.84	60	16	5.06	70	20	7.38
32	4.5	0.76	40	5	1.05	50	8	2.11	60	18	5.69	70	25	9.22
32	5	0.84	40	6	1.26	50	9	2.37	60	19	6.01	70	30	11.07
32	6	1.01	40	7	1.48	50	10	2.64	60	20	6.32	70	35	12.91
32	8	1.35	40	8	1.69	50	12	3.16	60	22	6.96	70	36	13.36
32	9	1.52	40	10	2.11	50	15	3.95	60	25	7.91	70	40	14.76
32	10	1.69	40	12	2.53	50	16	4.22	60	30	9.49	70	50	18.45
32	12	2.02	40	15	3.16	50	18	4.74	60	32	10.12	70	60	22.13

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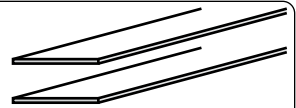
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WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.	WIDTH mm	THICKNESS mm	EST. LBS./FT.
70	70	25.82	90	19	9.01	120	8	5.06	150	5	3.95	200	15	15.81
75	5	1.98	90	20	9.49	120	10	6.32	150	6	4.74	200	16	16.86
75	6	2.37	90	22	10.43	120	12	7.59	150	8	6.32	200	19	20.03
75	8	3.16	90	25	11.86	120	15	9.49	150	9	7.11	200	20	21.08
75	9	3.56	90	30	14.23	120	20	12.64	150	10	7.91	200	25	26.35
75	10	3.95	90	40	18.97	120	25	16.31	150	12	9.49	200	30	31.62
75	12	4.74	90	45	21.34	120	30	18.97	150	15	11.86	200	32	33.73
75	15	5.93	90	50	23.72	120	40	25.30	150	16	12.65	200	38	40.05
75	16	6.32	90	60	28.46	120	50	31.62	150	19	15.02	200	40	42.16
75	19	7.51	90	90	42.69	120	60	37.94	150	20	15.81	200	50	52.70
75	20	7.91	100	4.5	2.37	125	6	3.95	150	25	19.76	200	60	63.24
75	22	8.70	100	5	2.64	125	8	5.27	150	30	23.72	250	6	7.91
75	25	9.88	100	6	3.16	125	9	5.93	150	38	30.04	250	10	13.18
75	30	11.86	100	8	4.22	125	10	6.59	150	40	31.62	250	12	15.81
75	35	13.83	100	9	4.74	125	12	7.91	150	50	39.53	250	15	19.76
75	38	15.02	100	10	5.27	125	15	9.88	150	60	47.43	250	20	26.35
75	40	15.81	100	12	6.32	125	16	10.54	160	6	5.06	250	25	32.94
75	50	19.76	100	15	7.91	125	19	12.52	160	8	6.75	250	30	39.53
75	75	29.64	100	16	8.43	125	20	13.18	160	10	8.43	250	40	52.70
80	3	1.26	100	19	10.01	125	25	16.47	160	12	10.12	250	50	65.88
80	4	1.69	100	20	10.54	125	30	19.76	160	15	12.65	250	60	79.05
80	5	2.11	100	22	11.59	125	32	21.08	160	16	13.49	300	6	9.49
80	6	2.53	100	25	13.18	125	38	25.03	160	20	16.86	300	10	15.81
80	7	2.95	100	30	15.81	125	40	26.35	160	25	21.08	300	12	18.97
80	8	3.37	100	32	16.86	125	50	32.94	160	30	25.30	300	15	23.72
80	10	4.22	100	35	18.45	130	6	4.11	160	40	33.73	300	20	31.62
80	12	5.06	100	38	20.03	130	8	5.48	160	45	37.94	300	25	39.53
80	15	6.32	100	40	21.08	130	10	6.85	160	50	42.16	300	30	47.43
80	16	6.75	100	50	26.35	130	12	8.22	160	60	50.59	300	40	63.24
80	20	8.43	100	60	31.62	130	15	10.28	180	8	7.59	350	10	18.45
80	25	10.54	100	65	34.26	130	16	10.96	180	9	8.54	350	12	22.13
80	30	12.65	100	75	39.53	130	20	13.70	180	10	9.49	350	15	27.67
80	35	14.76	110	5	2.90	130	25	17.13	180	12	11.38	350	20	36.89
80	40	16.86	110	6	3.48	130	30	20.55	180	15	14.23	350	25	46.11
80	50	21.08	110	8	4.64	130	40	27.40	180	16	15.18	350	30	55.34
80	60	25.30	110	10	5.80	130	50	34.26	180	20	18.97	350	40	73.78
80	80	33.73	110	12	6.96	130	60	41.11	180	25	23.72	350	50	92.23
85	10	4.48	110	15	8.69	140	6	4.43	180	30	28.46	350	60	110.67
85	20	8.96	110	16	9.28	140	10	7.38	180	40	37.94	400	8	16.86
90	5	2.37	110	20	11.59	140	12	8.85	180	50	47.43	400	10	21.08
90	6	2.85	110	25	14.49	140	15	11.07	180	60	56.92	400	12	25.30
90	8	3.79	110	30	17.39	140	20	14.76	180	75	71.15	400	15	31.62
90	9	4.27	110	40	23.19	140	25	18.45	200	7	7.38	400	20	42.16
90	10	4.74	110	50	28.99	140	30	22.13	200	8	8.43	400	50	105.40
90	12	5.69	110	60	34.78	140	40	29.51	200	9	9.49	400	60	126.48
90	15	7.12	120	5	3.16	140	50	36.89	200	10	10.54	500	50	131.75
90	16	7.59	120	6	3.79	140	60	44.27	200	12	12.65			

Metric Cold Drawn Shim Stock

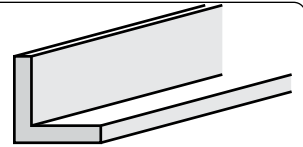


CARBON STEEL – 1008/1010, ASTM A109, QQS698, Full Hard

STAINLESS STEEL – 301/302, ASTM A666, 2B finish, QQ766, Full Hard
(Multiply weights below by 1.0100)

THICKNESS mm	WIDTH mm	WEIGHT FT	THICKNESS mm	WIDTH mm	WEIGHT FT	THICKNESS mm	WIDTH mm	WEIGHT FT
0.05	150	.03952	0.25	150	.19762	0.65	150	.51382
0.10	150	.07905	0.30	150	.23715	0.80	150	.63240
0.15	150	.11857	0.40	150	.31620			
0.20	150	.15810	0.50	150	.39525			

Metric Cold Drawn Equal Angles



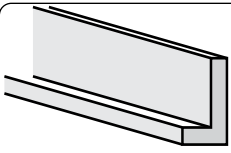
CARBON STEEL – 1008/1018, S235JR, EN 10277-2, DIN 59370

STAINLESS STEEL – 304, ASTM A276, EN 10088-1, EN 10088-3 (Multiply weights below by 1.0100)

SIZE mm	EST. LBS. PER FT.	SIZE mm	EST. LBS. PER FT.	SIZE mm	EST. LBS. PER FT.	SIZE mm	EST. LBS. PER 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

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Metric Cold Drawn Unequal Angle

CARBON STEEL – 1008/1018, S235JR, EN 10277-2, DIN 59370

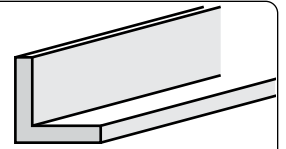
STAINLESS STEEL – 304, ASTM A276, EN 10088-1, EN 10088-3 (Multiply weights below by 1.0100)

SIZE mm	EST. LBS. PER FT.	SIZE mm	EST. LBS. PER FT.	SIZE mm	EST. LBS. PER FT.	SIZE mm	EST. LBS. PER FT.
15 x 10 x 2	0.24	30 x 15 x 3	0.67	40 x 30 x 4	1.38	60 x 30 x 5	2.27
3	0.35	30 x 20 x 3	0.75	45 x 20 x 2	0.60	60 x 40 x 3	1.48
20 x 10 x 2	0.29	4	0.97	3	0.90	5	2.56
3	0.43	40 x 20 x 3	0.90	45 x 30 x 4	1.50	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	0.50	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



Hot & Cold
Drawn Angle
available.
(Hot Rolled Angle pictured)

Metric Hot Rolled Equal Angle



CARBON STEEL – 1008/1018, S235JR, S355, EN 10025-2, EN 10277-2, EN 10056-2, SS400, JIS G3101, JIS G3192

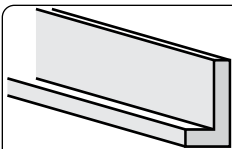
STAINLESS STEEL – 304, ASTM A276, EN 10088-3, EN 10056-2 (Multiply weights below by 1.0100)

SIZE mm	EST. LBS. PER FT.	SIZE mm	EST. LBS. PER FT.	SIZE mm	EST. LBS. PER FT.	SIZE mm	EST. LBS. PER FT.
20 x 20 x 2	0.40	50 x 50 x 5	2.54	75 x 75 x 12	8.75	120 x 120 x 15	17.90
3	0.59	6	3.01	80 x 80 x 6	4.94	130 x 130 x 9	12.06
4	0.76	7	3.47	8	6.48	12	15.89
25 x 25 x 3	0.75	8	3.92	10	8.01	15	19.38
4	0.98	9	4.38	12	9.46	140 x 140 x 13	18.51
5	1.19	55 x 55 x 6	3.34	90 x 90 x 6	5.59	150 x 150 x 10	15.48
6	1.50	60 x 60 x 4	2.40	7	6.47	12	18.37
30 x 30 x 3	0.92	5	3.08	8	7.34	14	21.27
4	1.20	6	3.65	9	8.20	15	22.75
5	1.47	8	4.77	10	9.02	18	27.19
6	1.74	10	5.85	12	10.70	20	30.02
35 x 35 x 4	1.42	65 x 65 x 5	3.25	13	11.51	160 x 160 x 14.6	23.36
5	1.73	6	4.18	100 x 100 x 6	6.00	15	24.37
6	2.02	7	4.60	7	7.20	17	27.39
40 x 40 x 3	1.24	8	5.16	8	8.21	175 x 175 x 12	21.87
4	1.63	9	5.44	10	10.10	15	26.25
5	2.00	70 x 70 x 6	4.29	12	11.98	180 x 180 x 16	29.27
6	2.37	7	4.97	13	12.85	18	32.70
8	3.11	8	5.63	15	14.74	200 x 200 x 16	32.68
45 x 45 x 3	1.41	9	6.29	16	15.81	18	36.55
4	1.84	10	6.93	110 x 110 x 10	11.18	20	40.31
5	2.27	75 x 75 x 6	4.59	120 x 120 x 8	9.89	24	47.85
6	2.69	7	5.34	10	12.25	250 x 250 x 25	62.5
8	3.11	8	6.08	11	13.40		
50 x 50 x 3	1.57	9	6.75	12	14.54		
4	2.05	10	7.44	13	16.15		

Low Minimum Order

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Metric Hot Rolled Unequal Angle

CARBON STEEL – 1008/1018, S235JR, S355, EN 10025-2, EN 10277-2, EN 10056-2, SS400, JIS G3101, JIS G3192

STAINLESS STEEL – 304, ASTM A276, EN 10088-3, EN 10056-2 (Multiply weights below by 1.0100)

SIZE mm	EST. LBS. PER FT.	SIZE mm	EST. LBS. PER FT.	SIZE mm	EST. LBS. PER FT.	SIZE mm	EST. LBS. PER FT.
20 x 10 x 3	0.43	65 x 65 x 9	5.06	100 x 65 x 11	9.02	150 x 75 x 11	12.52
25 x 15 x 3	0.75	70 x 50 x 6	3.63	100 x 75 x 7	6.28	12	13.59
30 x 15 x 3	0.68	7	4.38	8	7.13	150 x 90 x 9	11.04
30 x 20 x 3	0.75	75 x 50 x 6	3.74	9	7.95	10	12.25
4	0.98	7	4.38	10	8.75	12	14.54
40 x 20 x 3	0.91	8	4.97	11	9.63	15	17.90
4	1.20	9	5.54	12	10.36	150 x 100 x 9	11.86
40 x 25 x 4	1.29	10	5.99	120 x 80 x 8	8.21	10	12.79
40 x 30 x 5	1.75	75 x 55 x 5	3.33	10	10.10	12	15.21
45 x 30 x 3	1.16	7	4.58	12	11.98	14	17.57
4	1.52	9	5.78	125 x 75 x 7	7.20	15	18.75
5	1.87	80 x 40 x 6	3.64	8	8.21	160 x 80 x 10	12.25
50 x 30 x 4	1.63	8	4.76	10	10.10	12	14.54
5	2.00	80 x 60 x 6	4.29	12	11.98	180 x 90 x 10	13.86
50 x 40 x 4	1.83	7	4.96	13	13.00	12	16.48
5	2.27	8	5.61	125 x 90 x 3	3.23	200 x 100 x 10	15.48
6	2.69	80 x 65 x 8	5.82	10	10.64	12	18.37
60 x 30 x 5	2.27	10	7.20	130 x 65 x 8	8.01	14	21.30
6	2.69	90 x 60 x 6	4.59	10	9.83	15	22.68
60 x 40 x 5	2.53	8	6.03	11	10.74	200 x 150 x 12	21.54
6	3.00	90 x 75 x 9	7.43	12	11.65	16	24.17
7	3.46	100 x 50 x 6	4.61	130 x 90 x 10	11.44	250 x 90 x 10	17.92
60 x 50 x 9	5.14	8	6.06	12	13.26	12	21.50
65 x 30 x 5	2.27	10	7.47	137 x 102 x 6.4	7.89	14	25.08
65 x 50 x 5	2.93	100 x 65 x 7	5.90	7.9	9.76	16	28.66
6	3.47	8	6.69	150 x 75 x 8	9.22		
7	4.02	9	7.47	9	10.30		
8	4.54	10	8.28	10	11.44		

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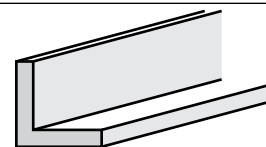
Distribution Center in Toledo, Ohio

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Metric Aluminum Equal Angle



ALUMINUM - 6060 T6; Extruded, EN 573-3, EN 755-2, EN 755-9

SIZE mm	WEIGHT kg/m	EST. LBS. PER FT.
10 x 10 x 2	0.099	0.067
15 x 15 x 2	0.154	0.104
3	0.223	0.150
20 x 20 x 1.5	0.159	0.107
2	0.209	0.141
3	0.305	0.205
4	0.396	0.267
25 x 25 x 2	0.264	0.178
3	0.388	0.261
4	0.506	0.341
30 x 30 x 2	0.319	0.215
3	0.470	0.316
4	0.616	0.415
5	0.756	0.509
35 x 35 x 2	0.374	0.252
3	0.553	0.372
4	0.726	0.489
5	0.894	0.602
40 x 40 x 2	0.429	0.289

SIZE mm	WEIGHT kg/m	EST. LBS. PER FT.
40 x 40 x 3	0.635	0.427
4	0.836	0.563
5	1.031	0.694
45 x 45 x 2	0.484	0.326
4	0.946	0.637
5	1.169	0.787
50 x 50 x 2	0.539	0.363
3	0.800	0.538
4	1.056	0.711
5	1.306	0.879
6	1.551	1.044
8	2.024	1.362
10	2.475	1.666
60 x 60 x 2	0.649	0.437
2.5	0.808	0.544
3	0.965	0.649
4	1.276	0.859
5	1.581	1.064
6	1.881	1.266

SIZE mm	WEIGHT kg/m	EST. LBS. PER FT.
60 x 60 x 8	2.464	1.658
10	3.025	2.036
70 x 70 x 2.5	0.945	0.636
5	1.856	1.249
6	2.211	1.488
7	2.560	1.723
80 x 80 x 3	1.295	0.872
4	1.716	1.155
5	2.131	1.434
6	2.541	1.710
8	3.344	2.251
10	4.125	2.776
100 x 100 x 4	2.156	1.451
6	3.201	2.154
8	4.224	2.843
10	5.225	3.516
120 x 120 x 8	5.104	3.435
10	6.325	4.257

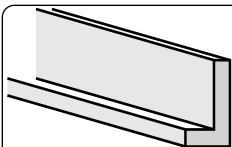


Image represents Extruded Aluminum products only.

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Metric Aluminum Unequal Angle

ALUMINUM - 6060 T6; (Extruded), EN 573-3, EN 755-2, EN 755-9

SIZE mm	WEIGHT kg/m	EST. LBS. PER FT.	SIZE mm	WEIGHT kg/m	EST. LBS. PER FT.	SIZE mm	WEIGHT kg/m	EST. LBS. PER FT.	SIZE mm	WEIGHT kg/m	EST. LBS. PER FT.
12 x 12 x 2	0.120	0.081	40 x 25 x 3	0.512	0.345	60 x 30 x 2	0.484	0.326	100 x 40 x 3	1.130	0.760
15 x 10 x 2	0.127	0.085	4	0.671	0.452	3	0.718	0.483	4	1.496	1.007
20 x 10 x 2	0.154	0.104	40 x 30 x 2	0.374	0.252	4	0.946	0.637	100 x 50 x 3	1.213	0.816
20 x 15 x 2	0.182	0.122	3	0.553	0.372	5	1.169	0.787	4	1.606	1.081
2.5	0.223	0.150	4	0.726	0.489	60 x 40 x 2	0.539	0.363	5	1.994	1.342
3	0.264	0.178	45 x 10 x 2	0.292	0.197	3	0.800	0.538	6	2.376	1.599
25 x 10 x 2	0.182	0.122	45 x 20 x 2	0.347	0.234	4	1.056	0.711	8	3.124	2.102
25 x 15 x 2	0.209	0.141	45 x 30 x 3	0.594	0.400	5	1.306	0.879	10	3.850	2.591
2.5	0.258	0.174	50 x 15 x 2	0.347	0.234	6	1.551	1.044	100 x 60 x 6	2.541	1.710
3	0.305	0.205	3	0.512	0.345	70 x 15 x 2	0.457	0.308	110 x 30 x 2	0.759	0.511
25 x 20 x 2	0.237	0.160	50 x 20 x 2	0.374	0.252	70 x 20 x 2	0.484	0.326	120 x 20 x 2	0.759	0.511
3	0.347	0.234	2.5	0.464	0.312	70 x 25 x 2.5	0.636	0.428	120 x 40 x 4	1.716	1.155
30 x 10 x 2	0.209	0.141	3	0.553	0.372	70 x 30 x 2	0.539	0.363	120 x 50 x 5	2.269	1.527
30 x 15 x 2	0.237	0.160	50 x 25 x 2	0.402	0.271	3	0.800	0.538	120 x 60 x 6	2.871	1.932
3	0.347	0.234	2.5	0.498	0.335	75 x 50 x 5	1.650	1.110	8	3.784	2.547
30 x 20 x 2	0.264	0.178	3	0.594	0.400	80 x 15 x 2	0.512	0.345	120 x 80 x 10	5.225	3.516
2.5	0.327	0.220	4	0.781	0.526	80 x 20 x 2	0.539	0.363	130 x 30 x 3	1.295	0.872
3	0.388	0.261	50 x 30 x 2	0.429	0.289	80 x 25 x 2	0.567	0.382	140 x 40 x 3	1.460	0.983
4	0.506	0.341	3	0.635	0.427	2.5	0.705	0.474	150 x 50 x 4	2.156	1.451
30 x 25 x 2	0.292	0.197	4	0.836	0.563	80 x 30 x 3	0.883	0.594	150 x 75 x 8	4.774	3.213
3	0.429	0.289	5	1.031	0.694	80 x 40 x 2	0.649	0.437	10	5.913	3.979
35 x 20 x 2	0.292	0.197	50 x 40 x 2	0.484	0.326	3	0.965	0.649	150 x 100 x 5	3.369	2.267
3	0.429	0.289	3	0.718	0.483	4	1.276	0.859	10	6.600	4.442
35 x 25 x 3	0.470	0.316	4	0.946	0.637	5	1.581	1.064	180 x 150 x 6	5.346	3.598
40 x 10 x 2	0.264	0.178	5	1.169	0.787	6	1.881	1.266	200 x 100 x 10	7.975	5.367
40 x 15 x 2	0.292	0.197	60 x 15 x 2	0.402	0.271	80 x 50 x 5	1.719	1.157			
40 x 20 x 2	0.319	0.215	60 x 20 x 2	0.429	0.289	80 x 50 x 6	2.046	1.377			
2.5	0.395	0.266	60 x 20 x 2.5	0.533	0.359	80 x 60 x 4	1.496	1.007			
3	0.470	0.316	3	0.635	0.427	6	2.211	1.488			
4	0.616	0.415	60 x 25 x 2.5	0.567	0.382	100 x 20 x 2	0.649	0.437			
40 x 25 x 2	0.347	0.234	3	0.677	0.456	100 x 30 x 3	1.048	0.705			

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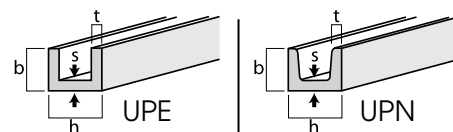
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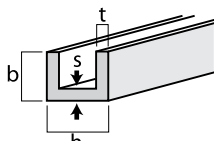
CARBON STEEL - European: S235JR, S355, EN 10025-2, EN 10279, DIN EN 10365
Japanese: SS400, JIS G3101, JIS G3192

STAINLESS STEEL - 304, ASTM A276, EN 10088-3 (Multiply weights below by 1.0100)

h mm	b mm	s mm	t mm	kg/m	lb/ft	Origin	U Section	Type
30	15	4	4.5	1.74	1.17	Euro	30x15	UPN - Tapered
30	33	5	7	4.27	2.87	Euro	30	UPN - Tapered
40	20	5	5.5	2.87	1.93	Euro	40x30	UPN - Tapered
40	35	5	7	4.87	3.28	Euro	40	UPN - Tapered
50	25	5	6	3.86	2.6	Euro	50x25	UPN - Tapered
50	38	5	7	5.59	3.76	Euro	50	UPN - Tapered
60	30	6	6	5.07	3.41	Euro	60	UPN - Tapered
65	42	5.5	7.5	7.09	4.77	Euro	65	UPN - Tapered
80	45	6	8	8.64	5.81	Euro	80	UPN - Tapered
80	50	4	7	7.9	5.31	Euro	80x50	UPE - Straight
100	50	5	7.5	9.36	6.3	Japanese	100x50	UPN - Tapered
100	50	6	8.5	10.6	7.13	Euro	100	UPN - Tapered
100	55	4.5	7.5	9.82	6.6	Euro	100x55	UPE - Straight
120	55	7	9	13.4	9.02	Euro	120	UPN - Tapered
120	60	5	8	12.1	8.13	Euro	120x60	UPE - Straight
125	65	6	8	13.4	9.02	Japanese	125x65	UPN - Tapered
140	60	7	10	16.0	10.75	Euro	140	UPN - Tapered
140	65	5	9	14.5	9.74	Euro	140x65	UPE - Straight
150	75	6.5	10	18.6	12.52	Japanese	150	UPN - Tapered
150	75	9	12.5	24.0	16.13	Japanese	150x75	UPN - Tapered
160	65	7.5	10.5	18.8	12.65	Euro	160	UPN - Tapered
160	70	5.5	9.5	17.0	11.42	Euro	160x70	UPE - Straight
180	70	8	11	22.0	14.81	Euro	180X70	UPN - Tapered
180	75	5.5	10.5	19.7	13.24	Euro	180	UPE - Straight
180	75	7	10.5	21.4	14.4	Japanese	180X75	UPN - Tapered
200	75	8.5	11.5	25.3	17.03	Euro	200X75	UPN - Tapered
200	80	6	11	22.8	15.32	Euro	200	UPE - Straight
200	80	7.5	11	24.6	16.56	Japanese	200X80	UPN - Tapered
200	90	8	13.5	30.3	20.39	Japanese	200X90	UPN - Tapered
220	80	9	12.5	29.4	19.79	Euro	220	UPN - Tapered
220	85	6.5	12	26.6	17.87	Euro	220X85	UPE - Straight
240	85	9.5	13	33.2	22.31	Euro	240	UPN - Tapered
250	90	9	13	34.6	23.25	Japanese	250	UPN - Tapered
250	90	11	14.5	40.2	27.05	Japanese	250X90	UPN - Tapered
260	90	10	14	37.9	25.47	Euro	260	UPN - Tapered
280	95	10	15	41.8	28.13	Euro	280	UPN - Tapered
300	90	9	13	38.1	25.6	Japanese	300X90	UPN - Tapered
300	90	10	15.5	43.8	29.48	Japanese	300X90	UPN - Tapered
300	90	12	16	48.6	32.66	Japanese	300X90	UPN - Tapered
300	100	10	16	46.2	31.09	Euro	300	UPN - Tapered
320	100	14	17.5	59.5	40.04	Euro	320	UPN - Tapered
350	100	14	16	60.6	40.78	Euro	350	UPN - Tapered
380	100	10.5	16	54.5	36.68	Japanese	380X100	UPN - Tapered
380	100	13	16.5	62.0	41.66	Japanese	380X100	UPN - Tapered
380	100	13	20	67.3	45.3	Japanese	380X100	UPN - Tapered
380	102	13.5	16	63.1	42.46	Euro	380	UPN - Tapered
400	110	14	18	71.8	48.24	Euro	400	UPN - Tapered

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Metric Channel

ALUMINUM – 6060 T6 (Extruded) EN 573-3, EN 755-2, EN 755-9

DIMENSIONS (H x B x S)	kg/m	WEIGHT lb/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	0.170
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	0.300
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	0.550
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	0.670	0.451
50 x 25 x 3	0.776	0.522

DIMENSIONS (H x B x S)	kg/m	WEIGHT lb/ft
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	0.780
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
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	0.800
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	1.320	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
125 x 80 x 8	5.918	3.983
140 x 40 x 3	1.766	1.189
160 x 80 x 10	8.250	3.533

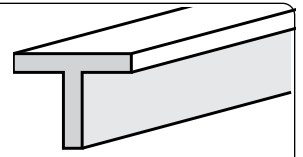
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Metric Tee – Hot Rolled

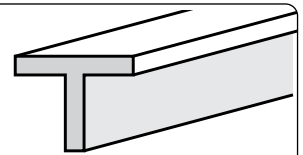


CARBON STEEL– S235JR, S355, EN 10025-2, EN 10055, DIN 17100

STAINLESS STEEL – 316Ti, ASTM A276, EN 10088-3 (Multiply weights below by 1.0100)

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

Metric Tee



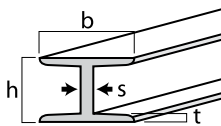
ALUMINUM – 6060 T6, Extruded AlMgSi0,5 F22, EN 573-3, EN 573-4, EN 755-2, EN 755-9

DIMENSIONS (H x B x S)	kg/m	WEIGHT lb/ft	DIMENSIONS (H x B x S)	kg/m	WEIGHT lb/ft
15 x 15 x 2	0.154	0.104	40 x 40 x 2	0.429	0.289
20 x 20 x 2	0.209	0.141	40 x 40 x 3	0.635	0.427
20 x 20 x 3	0.305	0.205	40 x 40 x 4	0.836	0.563
25 x 25 x 2	0.264	0.178	50 x 50 x 4	1.056	0.711
25 x 25 x 3	0.388	0.261	50 x 50 x 5	1.306	0.879
30 x 30 x 2	0.319	0.215	60 x 60 x 4	1.276	0.859
30 x 30 x 3	0.470	0.316	60 x 60 x 6	1.881	1.266
35 x 35 x 3	0.553	0.372	100 x 60 x 5	2.131	1.434
40 x 20 x 2	0.319	0.215	100 x 100 x 10	5.225	3.516

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Metric Carbon Steel I Beam

CARBON STEEL – IPN, IPE, IPB-1, HEA, IPB, HEB, IPBV, S235JR, S355, EN 10025-2, EN 10024, EN 10034, IIJ, IWFJ – SS400, JIS G3101, JIS G3192

h mm	b mm	s mm	t mm	kg/m	lb/ft	Description	U SECTION #
80	42	3.9	5.9	5.94	4.00	Narrow Flange	IPN 80
80	46	3.8	5.2	6.0	4.04	Medium Flange	IPE 80
96	100	5.0	8.0	16.70	11.24	Light Wide	IPB-1 100
100	50	4.5	6.8	8.3	5.63	Narrow Flange	IPN 100
100	50	5.0	7.0	9.30	6.26	Japanese Wide	IWFJ 100x50
100	55	4.1	5.7	8.1	5.45	Medium Flange	IPE 100
100	75	5.0	8.0	12.90	8.68	Japanese	IIJ 100x75
100	100	6.0	8.0	17.2	11.58	Japanese Wide	IWFJ 100x100
100	100	6.0	10.0	20.40	13.73	Wide Medium	IPB 100
114	120	5.0	8.0	19.9	13.39	Light Wide	IPB-1 120
120	58	5.1	7.7	11.10	7.47	Narrow Flange	IPN 120
120	64	4.4	6.3	10.4	7.00	Medium Flange	IPE 120
120	106	12.0	20.0	41.80	28.13	Heavy Wide	IPBv 100
120	120	6.5	11.0	26.7	17.97	Wide Medium	IPB 120
125	60	6.0	8.0	17.20	8.88	Japanese Wide	IWFJ 125x60
125	75	5.5	9.5	16.1	10.84	Japanese	IIJ 125x75
125	125	9.0	6.5	23.80	16.02	Japanese Wide	IWFJ 125x125
133	140	5.5	8.5	24.7	16.62	Light Wide	IPB-1 140
140	66	5.7	8.6	14.30	9.62	Narrow Flange	IPN 140
140	73	4.7	6.9	12.9	8.68	Medium Flange	IPE 140
140	126	12.5	21.0	52.10	35.06	Heavy Wide	IPBv 120
140	140	7.0	12.0	33.7	22.68	Wide Medium	IPB 140
148	100	6.0	9.0	21.10	14.20	Japanese Wide	IWFJ 150x100
150	75	5.0	7.0	14.0	9.42	Japanese Wide	IWFJ 150x75
150	75	5.5	9.5	17.10	11.51	Japanese	IIJ 150x75
150	125	8.5	14.0	36.2	24.36	Japanese	IIJ 150x125
150	150	7.0	10.0	31.50	21.20	Japanese Wide	IWFJ 150x150
152	160	6.0	9.0	30.4	20.46	Light Wide	IPB-1 160
160	74	6.3	9.5	17.90	12.05	Narrow Flange	IPN 160
160	82	5.0	7.4	15.8	10.63	Medium Flange	IPE 160
160	146	3.0	22.0	163.20	42.53	Heavy Wide	IPBv 140
160	160	8.0	13.0	42.6	28.67	Wide Medium	IPB 160
171	180	6.0	9.5	35.50	23.89	Light Wide	IPB-1 180
175	90	5.0	8.0	18.1	12.18	Japanese Wide	IWFJ 175x90
175	175	7.5	11.0	40.20	27.05	Japanese Wide	IWFJ 175x175
180	82	6.9	10.4	21.9	14.74	Narrow Flange	IPN 180
180	91	5.3	8.0	18.80	12.65	Medium Flange	IPE 180
180	100	6.0	10.0	23.6	15.88	Japanese	IIJ 180x100
180	166	14.0	23.0	76.20	51.28	Heavy Wide	IPBv 160
180	180	8.5	14.0	51.2	34.46	Wide Medium	IPB 180

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h mm	b mm	s mm	t mm	kg/m	lb/ft	Description	U SECTION #
190	200	6.5	10.0	42.30	28.47	Light Wide	IPB-1 200
194	150	6.0	9.0	30.6	20.59	Japanese Wide	IWFJ 200x150
198	99	4.5	7.0	18.20	12.25	Japanese Wide	IWFJ 200x100
200	90	7.5	11.3	26.2	17.63	Narrow Flange	IPN 200
200	100	5.5	8.0	21.30	14.33	Japanese Wide	IWFJ 200x100
200	100	5.6	8.5	22.4	15.08	Medium Flange	IPE 200
200	100	7.0	10.0	26.00	17.50	Japanese	IIJ 200x100
200	150	9.0	16.0	50.4	33.92	Japanese	IIJ 200x150
200	186	14.5	24.0	88.90	59.83	Heavy Wide	IPBv 180
200	200	8.0	12.0	49.9	33.59	Japanese Wide	IWFJ 200x200
200	200	9.0	15.0	61.3	41.25	Wide Medium	IPB 200
200	204	12.0	12.0	56.20	37.82	Japanese Wide	IWFJ 200x204
210	220	7.0	11.0	50.50	33.99	Light Wide	IPB-1 220
220	98	8.1	12.2	31.1	20.93	Narrow Flange	IPN 220
220	110	5.9	9.2	26.20	17.63	Medium Flange	IPE 220
220	206	15.0	25.0	103.0	69.32	Heavy Wide	IPBv 200
220	220	9.5	16.0	71.50	48.12	Wide Medium	IPB 220
230	240	7.5	12.0	60.3	40.58	Light Wide	IPB-1 240
240	106	8.7	13.1	36.20	24.36	Narrow Flange	IPN 240
240	120	6.2	9.8	30.7	20.66	Medium Flange	IPE 240
240	226	15.5	26.0	117.00	78.74	Heavy Wide	IPBv 220
240	240	10.0	17.0	83.2	55.99	Wide Medium	IPB 240
244	175	7.0	11.0	44.10	29.68	Japanese Wide	IWFJ 250x175
248	124	5.0	8.0	25.7	17.30	Japanese Wide	IWFJ 250x125
250	125	6.0	9.0	29.60	19.92	Japanese Wide	IWFJ 250x125
250	125	7.5	12.5	38.3	25.78	Japanese	IIJ 250x125
250	125	10.0	19.0	55.5	37.35	Japanese	IIJ 250x125
250	250	9.0	14.0	72.40	48.73	Japanese Wide	IWFJ 250x250
250	255	14.0	14.0	82.2	55.32	Japanese Wide	IWFJ 250x255
250	260	7.5	12.5	68.20	45.90	Light Wide	IPB-1 260
260	113	9.4	14.1	41.9	28.20	Narrow Flange	IPN 260
260	260	10.0	17.5	93.00	62.59	Wide Medium	IPB 260
270	135	6.6	10.2	36.1	24.30	Medium Flange	IPE 270
270	248	18.0	32.0	157.00	105.66	Heavy Wide	IPBv 240
270	280	8.0	13.0	76.4	51.42	Light Wide	IPB-1 280
280	119	10.1	15.2	47.90	32.24	Narrow Flange	IPN 280
280	280	10.5	18.0	103.0	69.32	Wide Medium	IPB 280
290	268	18.0	32.5	172.00	115.76	Heavy Wide	IPBv 260
290	300	8.5	14.0	88.3	59.43	Light Wide	IPB-1 300
294	200	8.0	12.0	56.80	38.22	Japanese	IWFJ 300x200
298	149	5.5	8.0	32.00	21.53	Japanese Wide	IWFJ 300x150
300	125	10.8	16.2	54.2	36.48	Narrow Flange	IPN 300
300	150	6.5	9.0	37.70	25.37	Japanese Wide	IWFJ 300x150
300	150	7.1	10.7	42.2	28.40	Medium Flange	IPE 300
300	150	8.0	13.0	48.3	32.50	Japanese	IIJ 300x150
300	150	10.0	18.5	65.5	44.08	Japanese	IIJ 300x150
300	150	11.5	22.0	76.80	51.69	Japanese	IIJ 300x150
300	300	10.0	15.0	94.0	63.26	Japanese	IWFJ 300x300

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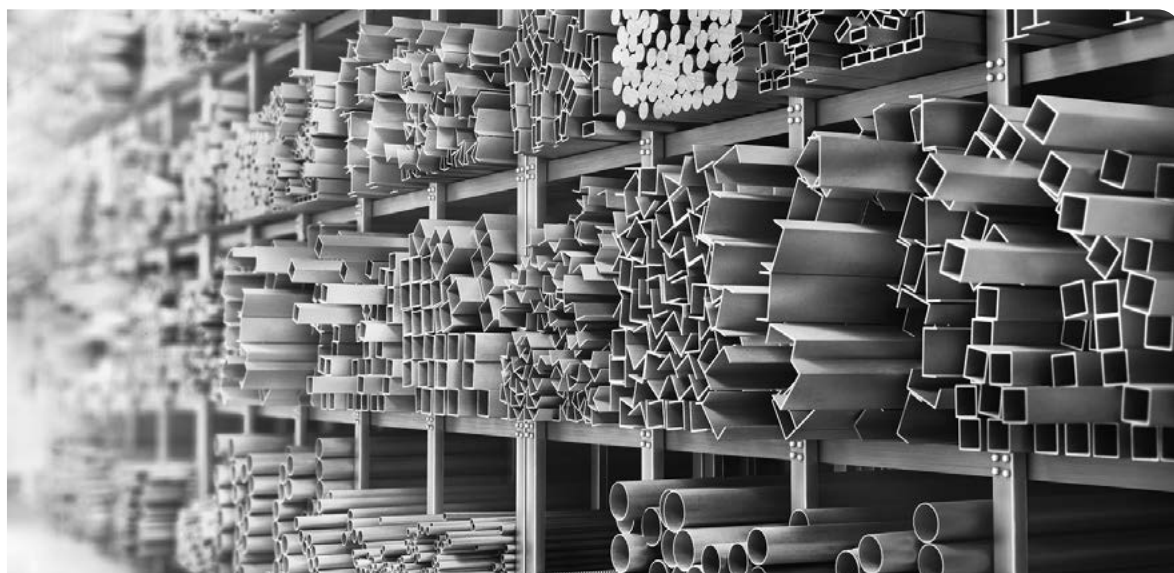
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h mm	b mm	s mm	t mm	kg/m	lb/ft	Description	U SECTION #
300	300	11.0	19.0	117.0	78.74	Wide Medium	IPB 300
300	305	15.0	15.0	106.0	71.34	Japanese	IWFJ 300x300
310	288	18.5	33.0	189.00	127.20	Heavy Wide	IPBv 280
310	300	9.0	15.5	97.6	65.70	Light Wide	IPB-1 320
320	131	11.5	17.3	61.00	41.05	Narrow Flange	IPN 320
320	300	11.5	20.5	127.0	85.47	Wide Medium	IPB 320
320	305	16.0	29.0	177.00	119.12	Heavy Wide	IPBv 320x305
330	160	7.5	11.5	49.1	32.97	Medium Flange	IPE 330
330	300	9.5	16.5	105.00	70.66	Light Wide	IPB-1 340
340	137	12.2	18.3	68.0	45.76	Narrow Flange	IPN 340
340	250	9.0	14.0	79.7	53.64	Japanese	IWFJ 350x250
340	300	12.0	21.5	134.00	90.18	Wide Medium	IPB 340
340	310	21.0	39.0	238.0	160.17	Heavy Wide	IPBv 300
346	174	6.0	9.0	41.4	27.86	Japanese	IWFJ 350x175
350	150	9.0	15.0	58.5	39.37	Japanese	IIJ 350x150
350	150	12.0	24.0	87.2	58.68	Japanese	IIJ 350x150
350	175	7.0	11.0	49.6	33.38	Japanese	IWFJ 350x175
350	300	10.0	17.5	112.00	75.38	Light Wide	IPB-1 360
350	350	12.0	19.0	137.0	92.2	Japanese	IWFJ 350x350
359	309	21.0	40.0	245.0	164.89	Heavy Wide	IPBv 320
360	143	13.0	19.5	76.10	51.15	Narrow Flange	IPN 360
360	170	8.0	12.7	57.1	38.43	Medium Flange	IPE 360
360	300	12.5	22.5	142.00	95.56	Wide Medium	IPB 360
377	309	21.0	40.0	248.0	166.90	Heavy Wide	IPBv 340
380	149	13.7	20.5	84.00	56.53	Narrow Flange	IPN 380
390	300	10.0	16.0	107.0	72.01	Japanese	IWFJ 400x300
390	300	11.0	19.0	125.0	84.13	Light Wide	IPB-1 400
395	308	21.0	40.0	250.00	168.25	Heavy Wide	IPBv 360
396	199	7.0	11.0	56.6	38.09	Japanese	IWFJ 400x200
400	150	10.0	18.0	72.0	48.46	Japanese	IIJ 400x150
400	150	12.5	25.0	95.8	64.39	Japanese	IIJ 400x150
400	155	14.4	21.6	92.4	62.19	Narrow Flange	IPN 400
400	180	8.6	13.5	66.30	44.62	Medium Flange	IPE 400
400	200	8.0	13.0	66	44.42	Japanese	IWFJ 400x200
400	300	13.5	24.0	155.0	104.31	Wide Medium	IPB 400
400	400	13.0	21.0	172.0	115.76	Japanese	IWFJ 400x400
425	163	15.3	23.0	104.00	69.99	Narrow Flange	IPN 425
432	307	21.0	40.0	256.0	172.30	Heavy Wide	IPBv 400
440	300	11.0	18.0	124.0	84.45	Japanese	IWFJ 450x300
440	300	11.5	21.0	140.00	94.22	Light Wide	IPB-1 450
446	199	8.0	12.0	66.2	44.55	Japanese	IWFJ 450x200
450	170	16.2	24.3	115.0	77.40	Narrow Flange	IPN 450
450	175	11.0	20.0	91.7	61.71	Japanese	IIJ 450x175
450	175	13.0	26.0	115	77.39	Japanese	IIJ 450x175
450	190	9.4	14.6	77.60	55.23	Medium Flange	IPE 450
450	200	9.0	14.0	76.0	51.15	Japanese	IWFJ 450x200
450	300	14.0	26.0	171.0	115.08	Wide Medium	IPB 450
475	178	17.1	25.6	128.00	86.14	Narrow Flange	IPN 475

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h mm	b mm	s mm	t mm	kg/m	lb/ft	Description	U SECTION #
478	307	21.0	40.0	263.0	176.90	Heavy Wide	IPBv 450
482	300	11.0	15.0	114.0	96.91	Japanese	IWFJ 500x300
488	300	11.0	18.0	128.0	86.14	Japanese	IWFJ 500x300
490	300	12.0	23.0	155.00	104.31	Light Wide	IPB-1 500
496	199	9.0	14.0	79.5	53.5	Japanese	IWFJ 500x200
500	185	18.0	27.0	141.0	94.89	Narrow Flange	IPN 500
500	200	10.0	16.0	89.6	60.3	Japanese	IWFJ 500x200
500	200	10.2	16.0	90.70	61.04	Medium Flange	IPE 500
500	300	14.5	28.0	187.0	125.85	Wide Medium	IPB 500
524	306	21.0	40.0	270.00	181.70	Heavy Wide	IPBv 500
540	300	12.5	24.0	166.0	111.72	Light Wide	IPB-1 550
550	200	19.0	30.0	166.00	111.72	Narrow Flange	IPN 550
550	210	11.1	17.2	106.0	71.34	Medium Flange	IPE 550
550	300	15.0	29.0	199.00	133.92	Wide Medium	IPB 550
572	306	21.0	40.0	278.0	187.10	Heavy Wide	IPBv 550
582	300	12.0	17.0	137.0	92.2	Japanese	IWFJ 600x300
588	300	12.0	20.0	151.0	101.62	Japanese	IWFJ 600x300
590	300	13.0	25.0	178.00	119.79	Light Wide	IPB-1 600
596	199	10.0	15.0	94.6	63.67	Japanese	IWFJ 600x200
600	190	13.0	25.0	133.0	89.51	Japanese	IJ 600x190
600	190	16.0	35.0	176.0	118.4	Japanese	IJ 600x190
600	200	11.0	17.0	106.0	71.34	Japanese	IWFJ 600x200
600	215	21.6	32.4	199.0	133.93	Narrow Flange	IPN 600
600	220	12.0	19.0	122.00	82.10	Medium Flange	IPE 600
600	300	15.5	30.0	212.0	142.67	Wide Medium	IPB 600
620	305	21.0	40.0	285.00	191.80	Heavy Wide	IPBv 600
640	300	13.5	26.0	190.0	127.87	Light Wide	IPB-1 650
650	300	16.0	31.0	225.00	151.43	Wide Medium	IPB 650
700	300	13.0	24.0	185.0	124.5	Japanese	IWFJ 700x300
800	300	14.0	26.0	210.0	141.3	Japanese	IWFJ 800x300
900	300	16.0	28.0	243.0	163.5	Japanese	IWFJ 900x300

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Metric Hot Rolled Structural Plate

CARBON STEEL – ASTM A36, ASTM A572 GR50, S235JR, S355, S355MC, S700MC, EN 10025-2, EN 10029, EN 10051, EN 10149-2

ALLOY STEEL – 4140 ANNEALED, 42CrMo4, ASTM A29, EN 10083-1, EN 10051

STAINLESS STEEL – 304, 304L, 316, 316L, ASTM A240/A240M, DIN/EN 10028-7, EN 10088-2, 1D FINISH (Multiply weight below by 1.0100)

ALUMINUM – 5083 HR Precision Plate: Temper H111, 6061, 7075: Temper T6/T651, 5754: Temper H22/H111, ASTM A209, ANSI H35.2, EN 485-1, EN 485-3, EN 573-3 (Multiply weights below by .035)

BRASS – CuZn37, CW508L, EN 1652 (Similar to 272) (Multiply weights below by 1.084)

COPPER – (E-Cu57) C110, ASTM B124, DIN EN 13599 (Multiply weights below by 1.1440)

THICKNESS mm	39" x 78"	49" x 98"	59" x 118"	72" x 120"	72" x 144"	78" x 236"	98" x 236"	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
13	●	●	●	●				20.9
14	●	●	●	●				22.51
15	●	●	●	●		●	●	24.12
16	●	●	●	●				25.72
18	●	●	●	●				28.94
19	●	●	●	●	●	●		30.55
20	●	●	●	●		●	●	32.16
22	●	●	●	●				35.37
25	●	●	●	●			●	40.19
30	●	●	●	●			●	48.23
32	●	●	●	●				51.45
35	●	●	●	●				56.27

● = Commonly available

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THICKNESS mm	39" x 78"	49" x 98"	59" x 118"	72" x 120"	72" x 144"	78" x 236"	98" x 236"	EST. LBS. PER SQ. FT.
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



Metric Hot Rolled Floor Plate

CARBON STEEL – S235JR, S355, ST37-2, ST52-3, EN 10025, DIN 59220, TEAR DROP PATTERN

THICKNESS mm (ON PLAIN)	39" x 78"	49" x 98"	59" x 118"	68" x 188"	EST. LBS. PER SQ. FT.
3	●	●	●		5.36
4					7.15
5					8.93
6	●	●	●	●	9.97
8	●	●	●	●	13.19
10	●	●	●	●	16.41

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Metric Cold Rolled Sheet

CARBON STEEL – 1005, 1008, 1010, DC01, DIN 1541, DIN 1623, EN 10130

STAINLESS STEEL - 304, 304L, 316, 316L, 2B, 409 1D, 2B and 2D, 420 2B, 430 2R, ASTM A240/A240M, EN 10088-2 (Multiply weights below by 1.0100)

ALUMINUM- - 5754, AIMg3, H22/H111, EN 485, EN 573-3 (Multiply weights below by 0.3462)

BRASS – MS63 (Similar to C274), DIN 17660 (Multiply weights below by 1.084)

THICKNESS mm	39" x 78"	49" x 96"	59" x 118"	EST. LBS. PER SQ. FT.
0.5	●			0.81
0.6	●			0.97
0.7	●	●	●	1.13
0.8	●	●		1.29
1.0	●	●		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
2.0	●	●		3.22
2.2				3.53
2.5	●	●	●	4.02
3.0	●	●		4.82
Thicknesses listed below are available in CR stainless only				
4.0	●		●	6.43
5.0	●		●	8.04
6.0	●		●	9.65
7.0	●		●	11.25
8.0	●		●	12.86

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Metric Electro Galvanized Sheet

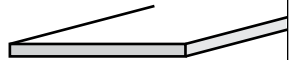


CARBON STEEL – DC01+ZE, EN 10131, EN 10152, DIN 59232

THICKNESS mm	39" x 78"	49" x 98"	59" x 118"	EST. LBS. PER SQ. FT.
1.0	●	●		1.61
1.2	●	●		1.93
1.5	●	●		2.42
1.6	●	●		2.57
2.0	●	●		3.22

● = Commonly available

Metric Hot Dipped Galvanized Sheet

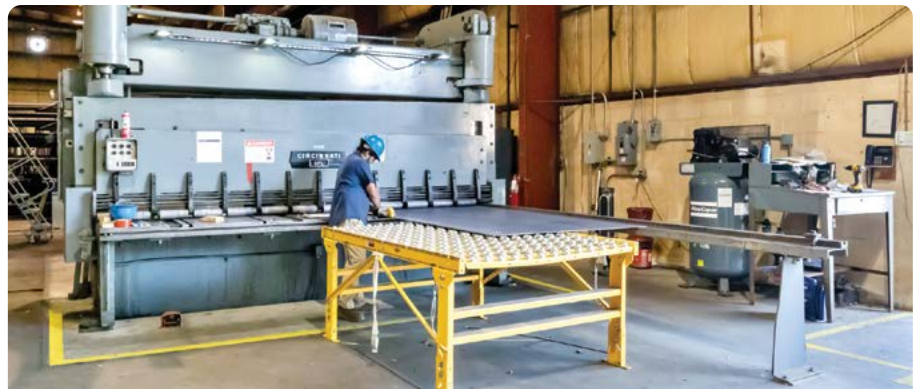


CARBON STEEL – DX51D+Z, EN 10142, EN 10346, DIN 59232

THICKNESS mm	39" x 78"	49" x 98"	59" x 118"	EST. LBS. PER SQ. FT.
0.8	●	●		1.29
1.0	●	●		1.61
1.2	●	●		1.93
1.6	●	●		2.57
2.0	●	●		3.22

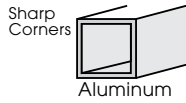
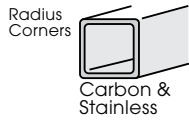
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Metric Square Tube

CARBON STEEL – E235, S235JR, S355, EN 10025, EN 10210 (HF), EN 10219 (CF), EN 10305-5, DIN 17100, DIN 59410, DIN 59411, STKMR, SS400, STKR400, JIS G3466 (All Welded Tube)

STAINLESS STEEL – 304, 304L, 316, 316L, 316Ti, ASTM A554, EN 10088-1, EN 10219-2
(Multiply weights below by 1.0100)

ALUMINUM – 6060 T6, AlMgSi05, Extruded, EN 573-3, EN 755-1, EN 755-2, EN 755-8, DIN 1748
(Multiply weights below by 0.3462)

SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.	SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.
10 x 10 x 1.00	0.282	0.19	20 x 20 x 2.50	1.372	0.92
1.25	0.342	0.23	3.0	1.607	1.08
1.50	0.385	0.26	21 x 21 x 1.20	0.745	0.50
11 x 11 x 1.20	0.369	0.24	1.60	0.974	0.65
12 x 12 x 1.00	0.339	0.23	22 x 22 x 1.50	0.95	0.64
1.25	0.411	0.28	2.00	1.229	0.83
1.50	0.479	0.32	24 x 24 x 1.20	0.858	0.57
13 x 13 x 1.60	0.572	0.38	1.60	1.12	0.75
14 x 14 x 1.20	0.481	0.32	25 x 25 x 1.00	0.751	0.51
15 x 15 x 1.00	0.433	0.29	1.25	0.922	0.62
1.25	0.529	0.36	1.50	1.092	0.73
1.50	0.621	0.42	2.00	1.442	0.97
2.00	0.815	0.55	2.50	1.763	1.19
16 x 16 x 1.50	0.668	0.45	3.00	2.07	1.39
2.00	0.877	0.59	26 x 26 x 1.20	0.933	0.62
18 x 18 x 1.00	0.517	0.35	1.60	1.22	0.82
1.50	0.775	0.52	28 x 28 x 1.20	1.01	0.67
2.00	1.003	0.67	1.60	1.32	0.89
19 x 19 x 1.20	0.67	0.45	30 x 30 x 1.00	0.904	0.61
1.60	0.873	0.58	1.25	1.118	0.75
20 x 20 x 1.00	0.59	0.40	1.50	1.327	0.89
1.25	0.725	0.49	1.60	1.424	0.96
1.50	0.856	0.58	2.00	1.756	1.18
1.60	0.922	0.62	2.30	1.99	1.34
2.00	1.127	0.76			

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**World's Largest Selection
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SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.	SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.
30 x 30 x 2.50	2.156	1.45	45 x 45 x 5.00	6.273	4.22
2.60	2.233	1.50	50 x 50 x 1.50	2.269	1.53
3.00	2.54	1.71	1.60	2.428	1.63
3.20	2.69	1.80	2.00	3.01	2.02
4.00	3.261	2.19	2.30	3.44	2.31
31 x 31 x 1.20	1.120	0.75	2.50	3.724	2.50
1.60	1.476	0.99	2.60	3.865	2.60
32 x 32 x 1.20	1.159	0.77	2.90	4.284	2.88
1.60	1.553	1.02	3.00	4.422	2.97
34 x 34 x 1.50	1.516	1.02	3.20	4.696	3.16
2.00	1.983	1.33	3.50	5.104	3.43
2.50	2.431	1.66	4.00	5.77	3.88
3.00	2.86	1.92	4.50	6.42	4.31
35 x 35 x 1.25	1.314	0.88	5.00	7.058	4.74
1.50	1.2	1.05	6.00	8.28	5.56
2.00	1.56	1.38	6.30	3.318	5.80
2.50	2.548	1.71	55 x 55 x 2.00	3.301	2.23
3.00	3.01	2.02	2.50	4.079	2.75
38 x 38 x 1.60	1.82	1.22	3.00	4.881	3.28
40 x 40 x 1.50	1.798	1.21	4.00	6.398	4.30
1.60	1.927	1.30	5.00	7.842	5.27
2.00	2.359	1.59	60 x 60 x 1.50	2.752	1.85
2.30	2.719	1.83	1.60	2.931	1.97
2.50	2.94	1.98	2.00	3.645	2.45
2.60	3.04	2.04	2.30	4.151	2.79
2.90	3.375	2.27	2.50	4.508	3.03
3.00	3.481	2.34	2.60	4.672	3.14
3.20	3.693	2.48	2.90	5.193	3.49
4.00	4.516	3.04	3.00	5.357	3.60
4.50	5.04	3.36	3.20	5.699	3.83
5.00	3.952	3.69	3.50	6.205	4.17
45 x 45 x 1.50	2.034	1.37	4.00	7.023	4.66
1.60	2.18	1.46	5.00	8.616	5.79
2.00	2.69	1.81	5.50	9.404	6.32
2.50	3.331	2.24	6.00	10.163	6.83
3.00	3.952	2.66	65 x 65 x 6.00	11.104	7.46
4.00	5.144	3.46			

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SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.	SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.
70 x 70 x 2.00	4.26	2.87	90 x 90 x 5.56	14.717	9.89
2.50	5.297	3.56	6.00	15.803	10.62
3.00	6.309	4.24	7.10	18.467	10.84
3.20	6.64	4.51	8.00	22.41	15.06
4.00	8.288	5.51	10.0	25.089	16.86
5.00	10.193	6.85	100 x 100 x 2.00	6.145	4.13
6.00	12.038	8.09	2.50	7.633	5.13
75 x 75 x 1.60	3.69	2.48	3.00	9.122	6.13
2.30	5.238	3.52	3.20	9.717	6.53
2.50	5.684	3.82	4.00	11.95	8.09
3.20	7.202	4.84	4.50	13.482	9.06
4.50	9.955	6.69	5.00	14.895	10.01
6.00	12.991	8.73	6.00	17.692	11.89
8.00	16.81	11.29	6.30	18.511	12.44
9.00	18.631	12.52	8.00	23.08	15.51
80 x 80 x 2.00	4.895	3.29	9.00	25.69	17.26
2.30	5.61	3.77	10.00	28.229	18.97
2.50	6.042	4.07	12.50	34.315	23.06
2.60	6.309	4.24	110 x 110 x 4.00	13.303	8.94
3.00	7.247	4.87	5.00	16.473	11.07
3.20	7.705	5.18	6.30	20.491	13.77
3.60	8.616	5.79	8.00	25.595	17.20
4.00	9.538	6.41	10.00	31.369	21.08
4.50	10.654	7.16	120 x 120 x 3.20	11.726	7.88
5.00	11.755	7.90	4.00	14.553	9.78
5.60	13.065	8.78	4.50	16.308	10.96
6.00	13.928	9.36	5.00	18.035	12.12
6.30	14.533	9.78	5.60	20.089	13.50
7.10	16.235	10.91	6.00	21.458	14.42
8.00	18.065	12.14	6.30	22.47	15.10
8.80	19.657	13.21	8.00	28.11	18.89
90 x 90 x 3.00	8.184	5.50	10.00	34.509	23.19
3.20	8.72	5.86	125 x 125 x 3.20	12.232	8.22
3.60	9.761	6.56	4.50	17.008	11.43
4.00	10.798	7.25	6.00	23.395	15.05
4.50	12.068	8.11	9.00	32.75	22.00
5.00	13.333	8.96	11.00	39.33	26.43

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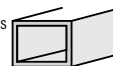
Metric Rectangular Tube

Radius
Corners



Carbon &
Stainless

Sharp
Corners



Aluminum

CARBON STEEL – E235, S235JR, S355, EN 10025, EN 10210 (HF), EN 10219 (CF), EN 10305-5, DIN 17100, DIN 59410, DIN 59411, STKMR, SS400, STKR400, JIS G3466 (All Welded Tube)

STAINLESS STEEL – 304, 304L, 316, 316L, 316Ti, ASTM A554, EN 10088-1, EN 10219-2 (All Welded Tube)
(Multiply weights below by 1.0100)

ALUMINUM – 6060 T6, AlMgSi05, Extruded, EN 573-3, EN 755-1, EN 755-2, EN 755-8, DIN 1748
(Multiply weights below by 0.3462)

SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.	SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.
15 x 10 x 1.50	0.565	0.38	30 x 10 x 1.25	0.733	0.49
20 x 10 x 1.00	0.438	0.29	1.50	0.868	0.58
1.25	0.537	0.36	2.00	1.120	0.74
1.50	0.632	0.42	30 x 15 x 1.00	0.673	0.45
2.00	0.810	0.53	1.25	0.831	0.55
20 x 15 x 1.00	0.516	0.34	1.50	0.985	0.66
1.25	0.635	0.42	2.00	1.280	0.85
1.50	0.750	0.5	30 x 20 x 1.00	0.752	0.51
2.00	0.967	0.64	1.20	0.910	0.611
22 x 10 x 1.20	0.551	.037	1.25	0.930	0.62
1.60	0.723	0.49	1.50	1.100	0.73
25 x 10 x 1.00	0.511	0.34	1.60	1.174	0.78
1.25	0.627	0.42	2.00	1.440	0.95
1.50	0.738	0.5	2.50	1.724	1.16
2.00	0.946	0.64	3.00	2.070	1.39
25 x 12 x 1.20	0.651	0.44	30 x 25 x 1.50	1.222	0.82
1.60	0.848	0.57	2.00	1.563	1.05
25 x 15 x 1.00	0.595	0.4	32 x 14 x 1.20	0.858	0.58
1.50	0.985	0.58	1.60	1.124	0.76
2.00	1.280	0.74	34 x 20 x 1.50	1.186	0.8
25 x 20 x 1.50	0.974	0.66	2.00	1.543	1.04
2.00	1.260	0.85	35 x 15 x 1.50	1.092	0.73
28 x 18 x 1.20	0.821	0.55	2.00	1.417	0.95
1.60	1.074	0.72	35 x 20 x 1.50	1.209	0.81
30 x 10 x 1.00	0.595	0.4	2.00	1.574	1.06

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SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.	SIZ mm	WEIGHT kg/m	EST. LBS. PER. FT.
35 x 25 x 1.50	1.327	0.89	40 x 25 x 1.25	1.216	0.82
2.00	1.731	1.16	1.50	1.460	0.97
3.00	2.390	1.61	1.60	1.551	1.04
40 x 10 x 1.50	1.092	0.73	2.00	1.910	1.27
2.00	1.417	0.95	2.50	2.340	1.56
40 x 15 x 1.50	1.209	0.81	3.00	2.630	1.77
2.00	1.574	1.06	40 x 30 x 1.50	1.570	1.05
40 x 16 x 1.20	1.009	0.68	2.00	2.070	1.38
1.60	1.325	0.89	2.50	2.540	1.69
40 x 20 x 1.00	0.910	0.61	3.00	2.860	1.99
1.25	1.118	0.75	45 x 20 x 1.50	1.445	0.97
1.50	1.340	0.89	2.00	1.888	1.27
1.60	1.38	0.93	2.50	2.313	1.56
2.00	1.750	1.16	45 x 25 x 1.50	1.563	1.05
2.30	1.998	1.34	2.00	2.045	1.38
2.50	2.150	1.42	2.50	2.509	1.69
2.60	2.100	1.41	50 x 10 x 1.50	1.327	0.89
3.00	2.390	1.67	50 x 20 x 1.25	1.314	0.88
3.20	2.69	1.81	1.50	1.570	1.05
40 x 25 x 1.20	1.178	0.79	1.60	1.681	1.13

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New high capacity vertical storage racks



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50 x 20 x 2.00	2.070	1.38	60 x 20 x 3.00	3.000	2.31
2.30	2.333	1.57	60 x 25 x 1.50	1.916	1.29
2.50	2.540	1.71	2.00	2.516	1.69
3.00	2.860	1.93	2.50	3.098	2.08
50 x 25 x 1.50	1.680	1.13	60 x 30 x 1.50	2.034	1.37
2.00	2.202	1.48	1.60	2.09	1.46
2.50	2.705	1.82	2.00	2.690	1.8
3.00	3.189	2.15	2.30	3.049	2.05
50 x 26 x 1.60	1.827	1.23	2.50	3.300	2.22
50 x 30 x 1.50	1.810	1.21	3.00	3.800	2.62
1.60	1.880	1.27	3.20	4.152	2.79
2.00	2.380	1.59	4.00	4.880	3.28
2.30	2.692	1.81	4.50	5.72	3.84
2.50	2.930	1.95	60 x 33 x 2.00	2.768	1.86
2.60	2.920	1.97	2.50	3.412	2.3
2.90	3.320	2.23	3.00	4.037	2.72
3.00	3.330	2.31	60 x 35 x 1.50	2.151	1.45
3.20	3.490	2.35	2.00	2.830	1.9
4.00	4.410	2.97	2.50	3.490	2.35
4.50	5.01	3.37	60 x 40 x 1.50	2.269	1.53
50 x 34 x 1.50	1.892	1.27	2.00	3.010	2.01
2.00	2.485	1.67	2.30	3.44	2.31
2.50	3.059	2.06	2.50	3.720	2.48
50 x 35 x 1.50	1.916	1.29	2.60	3.730	2.51
2.00	2.516	1.69	2.90	4.230	2.85
2.50	3.098	2.08	3.00	4.280	2.94
50 x 40 x 1.50	2.050	1.37	3.20	4.500	3.03
2.00	2.690	1.8	4.00	5.150	3.82
2.50	3.330	2.22	5.00	6.897	4.64
3.00	3.800	2.62	6.30	8.550	5.75
55 x 34 x 1.50	2.010	1.35	60 x 50 x 2.00	3.320	2.22
2.00	2.642	1.78	2.50	4.110	2.75
3.00	3.760	2.53	3.00	4.750	3.26
4.00	4.820	3.24	4.00	6.140	4.24
60 x 20 x 1.50	1.798	1.21	67 x 35 x 2.00	3.050	2.05
2.00	2.380	1.59	70 x 20 x 3.00	3.914	2.63

- continued on next page -

Low Minimum Order

Office Hours: Monday - Friday 7:30 - 6:00 EST

Telephone: 1-419-473-2481
 Fax: 1-419-471-2655 | Toll Free: 1-800-333-4140
 Email: sales@MetricMetal.com

SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.	SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.
70 x 30 x 2.00	1.359	2.02	80 x 40 x 4.00	6.926	4.66
3.00	4.286	2.88	5.00	8.467	5.7
70 x 35 x 2.00	3.144	2.12	6.30	10.400	7
2.50	3.883	2.61	80 x 50 x 2.00	3.950	2.64
70 x 40 x 2.00	3.320	2.22	2.50	4.900	3.27
2.50	4.110	2.75	2.60	5.370	3.61
2.90	4.690	3.16	3.00	5.690	3.89
3.00	4.750	3.26	4.00	7.390	4.94
4.00	6.140	4.24	5.00	8.910	6
70 x 50 x 2.00	3.615	2.43	80 x 60 x 2.00	4.280	2.86
2.50	4.472	3.01	2.50	5.290	3.54
3.00	5.309	3.57	3.00	6.160	4.21
3.50	6.127	4.12	4.00	8.020	5.51
4.00	6.926	4.66	5.00	10.037	6.75
75 x 20 x 1.60	2.306	1.55	6.00	11.101	7.46
2.30	3.227	2.17	6.35	12.545	8.43
75 x 25 x 1.60	2.490	1.63	90 x 30 x 1.60	2.93	1.97
75 x 45 x 1.60	2.931	1.97	2.30	4.16	2.8
2.30	4.152	2.79	3.20	5.7	3.83
3.20	5.595	3.76	90 x 40 x 4.00	7.381	4.96
4.50	7.843	5.26	90 x 45 x 2.30	4.955	3.33
75 x 50 x 2.30	4.298	2.89	3.20	6.800	4.57
4.20	7.680	5.16	4.20	8.34	5.6
4.50	8.189	5.5	90 x 50 x 3.00	6.240	4.19
6.00	10.620	7.14	3.20	6.640	4.47
80 x 20 x 2.00	3.010	2.01	4.00	8.180	5.51
3.00	4.280	2.88	5.00	10.000	6.73
80 x 30 x 2.00	3.320	2.24	6.30	12.300	8.28
3.00	4.000	3.25	7.10	13.700	9.22
4.00	4.750	4.26	100 x 20 x 1.60	2.946	1.98
80 x 40 x 2.00	3.615	2.43	2.00	3.616	2.43
2.50	4.472	3.01	3.00	5.491	3.69
2.60	4.550	3.06	100 x 40 x 2.00	4.260	2.86
2.90	5.140	3.46	2.50	5.290	3.54
3.00	5.309	3.57	3.00	6.160	4.21
3.20	5.500	3.7	100 x 40 x 4.00	8.020	5.51

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SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.	SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.
100 x 40 x 5.00	9.700	6.53	100 x 80 x 2.00	5.520	3.72
100 x 50 x 2.00	4.580	3.08	3.00	8.040	5.47
2.50	5.680	3.8	4.00	10.500	7.2
3.00	6.630	4.52	5.00	13.177	8.87
3.20	7.21	4.84	6.30	16.370	11.02
3.60	7.980	5.37	8.00	18.899	12.7
4.00	8.650	5.79	110 x 60 x 3.60	9.050	6.09
4.50	9.830	6.62	4.50	11.100	7.47
5.00	10.470	7.05	5.60	13.600	9.15
5.50	11.98	8.06	7.10	16.800	11.31
5.60	12.000	8.08	8.80	20.100	13.53
6.00	12.038	8.09	110 x 70 x 3.00	8.135	5.47
7.10	14.800	9.96	3.20	8.510	5.73
8.00	16.429	11.04	4.00	10.694	7.2
100 x 60 x 2.50	6.070	4.07	5.00	13.177	8.87
3.00	7.100	4.84	6.30	15.500	10.43
3.20	7.510	5.05	120 x 40 x 2.00	4.890	3.29
3.60	8.550	5.754	3.00	7.100	4.84
4.00	9.280	6.35	4.00	9.280	6.35
4.50	10.500	7.066	5.00	11.617	7.82
5.00	11.607	7.81	120 x 50 x 3.00	7.738	5.2
5.60	12.900	8.681	120 x 60 x 2.00	5.540	3.71
6.00	14.622	9.83	3.00	8.040	5.47
6.30	13.500	9.09	3.20	8.510	5.73
7.10	15.900	10.7	4.00	10.500	7.2
8.80	19.200	12.921	4.50	12.07	8.11

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**Toledo
warehouse
located along
the majestic
Maumee River**



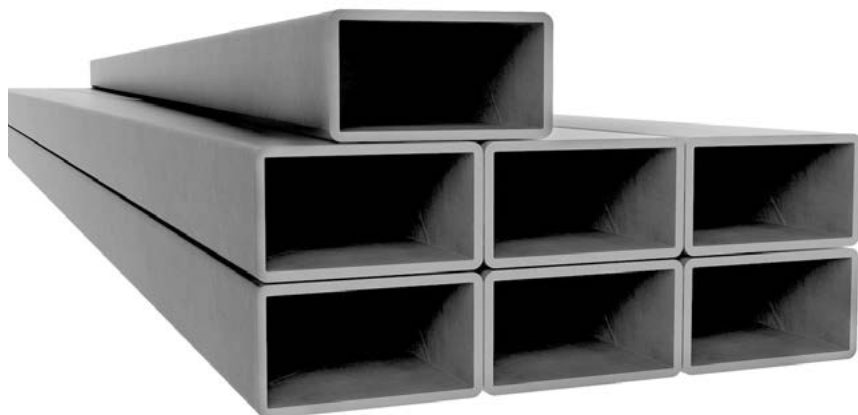
Same Day Shipping

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Email: sales@MetricMetal.com

SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.	SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.
120 x 60 x 5.00	13.176	8.87	140 x 70 x 7.10	21.200	14.27
6.00	14.866	9.99	8.80	25.600	17.23
6.30	16.100	10.84	140 x 80 x 3.20	10.500	7.07
7.10	17.900	12.05	4.00	13.120	8.82
8.80	21.500	14.47	5.00	16.200	10.9
120 x 80 x 3.00	9.077	6.11	6.30	20.000	13.46
3.20	12.100	8.14	8.00	24.800	16.69
4.00	11.950	8.04	10.00	30.200	20.32
5.00	14.747	9.92	150 x 50 x 3.00	9.023	6.06
6.00	18.191	12.22	4.00	12.024	8.08
6.30	17.500	11.78	5.00	14.745	9.91
8.00	23.154	15.51	6.30	18.467	12.41
120 x 100 x 6.00	19.57	13.15	150 x 75 x 3.20	10.9	7.37
8.00	25.60	17.20	4.50	14.9	10.01
125 x 40 x 1.60	4.03	2.73	6.00	19.84	13.33
2.30	5.774	3.88	150 x 80 x 5.00	17.069	11.47
3.20	7.96	5.35	150 x 100 x 3.20	12.000	8.08
125 x 75 x 2.30	7.068	4.75	4.00	14.092	9.47
3.20	9.72	6.53	5.00	18.080	12.15
4.50	13.332	8.96	6.00	21.473	14.43
6.00	17.000	11.42	6.30	22.400	15.08
140 x 40 x 3.00	8.140	5.47	8.00	27.700	18.64
140 x 70 x 4.00	12.541	8.43	9.00	32.74	22.01
5.00	15.400	10.36	150 x 100 x 10.00	33.646	22.61
6.30	19.000	12.79	160 x 80 x 3.00	10.893	7.32

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**Rectangular Tubing available
in Sharp and Radius corners.**

Metric Metal – A PARKER STEEL COMPANY®

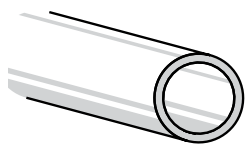
Distribution Center in Toledo, Ohio

Main Office: 1625 Indian Wood Circle, Maumee, OH 43537 USA

ISO 9001 Certified

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SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.	SIZE mm	WEIGHT kg/m	EST. LBS. PER. FT.
160 x 80 x 3.20	11.500	7.74	200 x 150 x 9.00	46.86	31.49
4.00	14.300	9.62	12.00	61.35	41.23
5.00	17.400	11.71	220 x 80 x 6.00	26.816	18.02
6.30	21.400	14.4	220 x 120 x 6.30	31.600	21.27
8.00	26.400	17.77	8.00	39.400	26.52
10.00	32.545	21.87	10.00	46.200	31.09
160 x 90 x 4.50	16.600	11.17	12.50	58.700	39.51
5.60	20.400	13.73	14.20	65.400	44.01
7.10	25.300	17.03	250 x 150 x 5.00	29.900	20.12
8.80	30.500	20.53	6.30	37.300	25.1
10.00	34.100	22.95	8.00	46.500	31.29
180 x 80 x 8.00	30.61	20.57	10.00	56.300	37.89
10.00	37.65	25.30	12.50	68.300	45.97
180 x 100 x 4.00	16.800	11.31	260 x 140 x 6.30	37.500	25.23
5.00	20.500	13.8	8.00	46.900	31.56
5.60	23.000	15.48	10.00	57.600	38.76
6.30	25.400	17.09	12.50	70.400	47.38
7.10	28.600	19.25	14.20	78.800	53.03
8.80	34.700	23.35	260 x 180 x 6.30	41.500	27.93
10.00	38.800	26.11	8.00	52.000	35
12.50	46.900	31.56	10.00	63.900	43
200 x 100 x 4.00	18.000	12.11	12.50	78.300	52.7
5.00	22.100	14.2	14.20	87.700	59.02
6.30	27.400	18.44	300 x 100 x 5.00	30.268	20.34
8.00	34.000	22.88	8.00	47.679	32.04
10.00	40.600	27.32	10.00	58.979	39.63
200 x 120 x 4.00	19.300	12.99	300 x 150 x 10.00	67.440	45.32
5.00	23.700	15.95	300 x 200 x 5.00	37.800	25.44
6.30	29.600	19.92	6.30	47.100	31.7
8.00	36.500	24.56	8.00	59.100	39.77
8.80	36.900	24.83	10.00	72.000	48.46
10.00	45.100	31.62	12.00	88.000	59.22
12.50	54.700	38.87	400 x 200 x 10	90.960	61.13
200 x 120 x 14.20	60.900	43.64	450 x 250 x 10	106.650	71.67
200 x 150 x 4.50	24.06	16.17			
6.00	31.17	20.95			



Metric Round Honed/Cylinder Tube

CARBON STEEL - E355+SR, ST52 BK+S, DIN 2391, EN 10305-1, ISO 286-2 (H8 - ID Tolerance)

See page 51 for specification information.

Wall Thickness in mm (ID and ID tolerance listed in the center)										
OD mm	OD Tolerance mm	5	6	7.5	10	12.5	15	20	22.5	27
35	±0.15	25 -0/+0.033	23 -0/+0.033	20 -0/+0.033						
40		30 -0/+0.033	28 -0/+0.033	25 -0/+0.033						
42	±0.20	32 -0/+0.039	30 -0/+0.033	27 -0/+0.033						
45		35 -0/+0.039	33 -0/+0.039	30 -0/+0.033	25 -0/+0.033					
50		40 -0/+0.039	38 -0/+0.039	35 -0/+0.039	30 -0/+0.033	25 -0/+0.033				
52		42 -0/+0.039	40 -0/+0.039	37 -0/+0.039	32 -0/+0.039	27 -0/+0.033				
55	± 0.25	45 -0/+0.039	43 -0/+0.039	40 -0/+0.039	35 -0/+0.033	30 -0/+0.033	25 -0/+0.033			
60		50 -0/+0.039	48 -0/+0.039	45 -0/+0.039	40 -0/+0.039	35 -0/+0.039	30 -0/+0.033			
65	±0.30	55 -0/+0.046	53 -0/+0.046	50 -0/+0.039	45 -0/+0.039	40 -0/+0.039	35 -0/+0.039			
70		60 -0/+0.046	58 -0/+0.046	55 -0/+0.046	50 -0/+0.039	45 -0/+0.039	40 -0/+0.039			
72		62 -0/+0.046	60 -0/+0.046	57 -0/+0.046	52 -0/+0.046	47 -0/+0.039	42 -0/+0.039			
73		63 -0/+0.046	61 -0/+0.046	58 -0/+0.046	53 -0/+0.046	48 -0/+0.039	43 -0/+0.039			
75	±0.35	65 -0/+0.046	63 -0/+0.046	60 -0/+0.046	55 -0/+0.046	50 -0/+0.039	45 -0/+0.039			
78		68 -0/+0.046	66 -0/+0.046	63 -0/+0.046	58 -0/+0.046	53 -0/+0.046	48 -0/+0.039			
80		70 -0/+0.046	68 -0/+0.046	65 -0/+0.046	60 -0/+0.046	55 -0/+0.046	50 -0/+0.039			
83		73 -0/+0.046	71 -0/+0.046	68 -0/+0.046	63 -0/+0.046	68 -0/+0.046	53 -0/+0.046			
85	±0.40	75 -0/+0.046	73 -0/+0.046	70 -0/+0.046	65 -0/+0.046	60 -0/+0.046	55 -0/+0.046	45 -0/+0.039		
90		80 -0/+0.046	78 -0/+0.046	75 -0/+0.046	70 -0/+0.046	65 -0/+0.046	60 -0/+0.046	50 -0/+0.039		
95	±0.45	85 -0/+0.054	83 -0/+0.054	80 -0/+0.046	75 -0/+0.046	70 -0/+0.046	65 -0/+0.046	55 -0/+0.046		
100		90 -0/+0.054	88 -0/+0.054	85 -0/+0.054	80 -0/+0.046	75 -0/+0.046	70 -0/+0.046	60 -0/+0.046		
105		95 -0/+0.054	93 -0/+0.054	90 -0/+0.054	85 -0/+0.054	80 -0/+0.046	75 -0/+0.046	65 -0/+0.046		
110	±0.50	100 -0/+0.054	98 -0/+0.054	95 -0/+0.054	90 -0/+0.054	85 -0/+0.054	80 -0/+0.046	70 -0/+0.046	65 -0/+0.046	
115		105 -0/+0.054	103 -0/+0.054	100 -0/+0.054	95 -0/+0.054	90 -0/+0.054	85 -0/+0.054	75 -0/+0.046	70 -0/+0.046	
120		110 -0/+0.054	108 -0/+0.054	105 -0/+0.054	100 -0/+0.054	95 -0/+0.054	90 -0/+0.054	80 -0/+0.046	75 -0/+0.046	
125		115 -0/+0.054	113 -0/+0.054	110 -0/+0.054	105 -0/+0.054	100 -0/+0.054	95 -0/+0.054	85 -0/+0.054	80 -0/+0.046	
130	±0.70	120 -0/+0.054	108 -0/+0.054	115 -0/+0.054	110 -0/+0.054	105 -0/+0.054	100 -0/+0.054	90 -0/+0.054	85 -0/+0.054	
135		125 -0/+0.063	123 -0/+0.063	120 -0/+0.054	115 -0/+0.054	110 -0/+0.054	105 -0/+0.054	95 -0/+0.054	90 -0/+0.054	
140		130 -0/+0.063	128 -0/+0.063	125 -0/+0.063	120 -0/+0.054	115 -0/+0.054	110 -0/+0.054	100 -0/+0.054	95 -0/+0.054	
145		135 -0/+0.063	133 -0/+0.063	130 -0/+0.063	125 -0/+0.063	120 -0/+0.054	115 -0/+0.054	105 -0/+0.054	100 -0/+0.054	
150	±0.80	140 -0/+0.063	138 -0/+0.063	135 -0/+0.063	130 -0/+0.063	125 -0/+0.063	120 -0/+0.054	110 -0/+0.054	105 -0/+0.054	
155		145 -0/+0.063	143 -0/+0.063	140 -0/+0.063	135 -0/+0.053	130 -0/+0.063	125 -0/+0.063	115 -0/+0.054	110 -0/+0.054	
160		150 -0/+0.063	148 -0/+0.063	145 -0/+0.063	140 -0/+0.063	135 -0/+0.063	130 -0/+0.063	120 -0/+0.054	115 -0/+0.054	
165		155 -0/+0.063	153 -0/+0.063	150 -0/+0.063	145 -0/+0.063	140 -0/+0.063	135 -0/+0.063	125 -0/+0.063	120 -0/+0.054	
170	±0.90	160 -0/+0.063	158 -0/+0.063	155 -0/+0.063	150 -0/+0.063	145 -0/+0.063	140 -0/+0.063	130 -0/+0.063	125 -0/+0.063	
180		170 -0/+0.063	168 -0/+0.063	165 -0/+0.063	160 -0/+0.063	155 -0/+0.063	150 -0/+0.063	140 -0/+0.063	135 -0/+0.063	
185		175 -0/+0.063	173 -0/+0.063	170 -0/+0.063	165 -0/+0.063	160 -0/+0.063	155 -0/+0.063	145 -0/+0.063	140 -0/+0.063	
190		180 -0/+0.063	178 -0/+0.063	175 -0/+0.063	170 -0/+0.063	165 -0/+0.063	160 -0/+0.063	150 -0/+0.063	145 -0/+0.063	
200	±1.00	190 -0/+0.072	188 -0/+0.072	185 -0/+0.072	180 -0/+0.063	175 -0/+0.063	170 -0/+0.063	160 -0/+0.063	155 -0/+0.063	146 -0/+0.063
215		205 -0/+0.072	203 -0/+0.072	200 -0/+0.072	195 -0/+0.072	190 -0/+0.072	185 -0/+0.072	175 -0/+0.063	170 -0/+0.063	161 -0/+0.063
220	±1.20	210 -0/+0.072	208 -0/+0.072	205 -0/+0.072	200 -0/+0.072	195 -0/+0.072	190 -0/+0.072	180 -0/+0.063	175 -0/+0.063	166 -0/+0.063
230		220 -0/+0.072	218 -0/+0.072	215 -0/+0.072	210 -0/+0.072	205 -0/+0.072	200 -0/+0.072	190 -0/+0.072	185 -0/+0.072	176 -0/+0.063
244.5									199.5 -0/+0.072	
245		235 -0/+0.072	233 -0/+0.072	230 -0/+0.072	225 -0/+0.072	220 -0/+0.072	215 -0/+0.072	205 -0/+0.072	200 -0/+0.072	191 -0/+0.072
250		240 -0/+0.072	238 -0/+0.072	235 -0/+0.072	230 -0/+0.072	225 -0/+0.072	220 -0/+0.072	210 -0/+0.072	205 -0/+0.072	196 -0/+0.072
254		244 -0/+0.072	242 -0/+0.072	239 -0/+0.072	234 -0/+0.072	229 -0/+0.072	224 -0/+0.072	214 -0/+0.072	209 -0/+0.072	200 -0/+0.072

OD tolerance is in accordance with EN 10305-1
ID tolerance is in accordance with ISO 286-2, H8 (minus 0/+). Our Honed Tubing is measured by OD and wall thickness

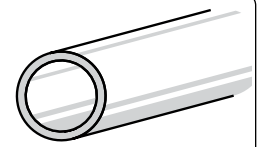
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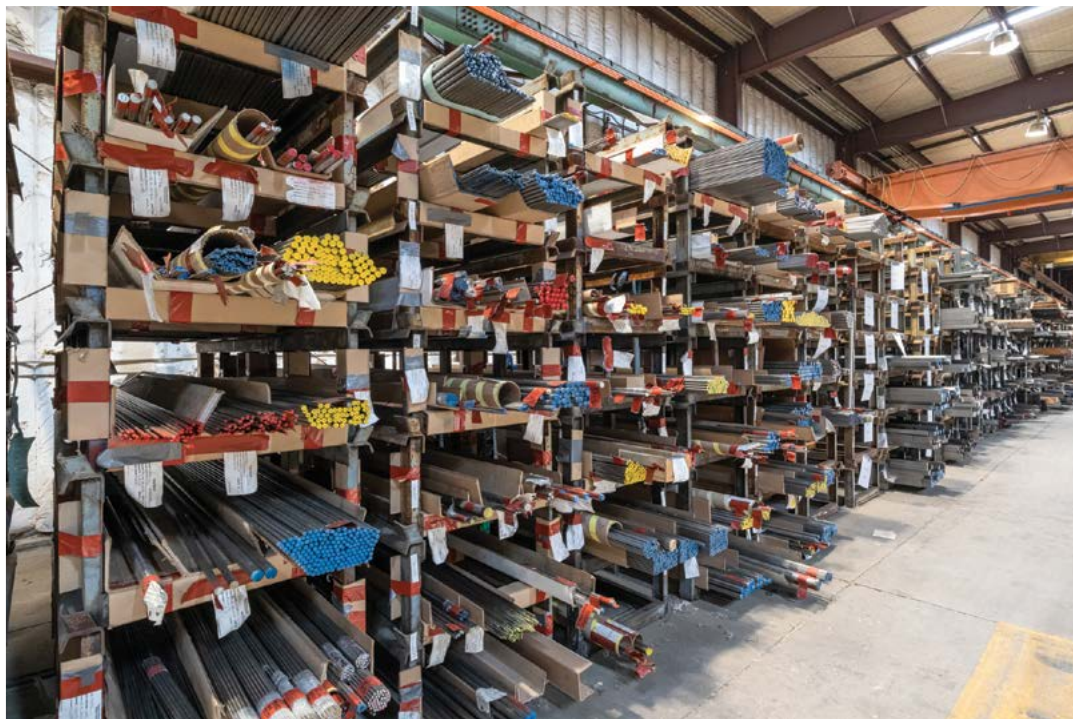
**World's Largest Selection
of Metric Cold Finished Bars**

Metric Hard Chrome Plated OD Tube



CARBON STEEL – E355+N/SR (ST 52.3 NBK/BKS), EN 10305-1, DIN 2391, Chromium layer minimum 20um, Surface hardness 850 HV, OD tolerance according to ISO 286-2 (f7) (double undersized). No chrome on the tube ends. ID is not chrome plated.

Wall Thickness in mm (ID and ID tolerance listed in the center)								
OD mm	OD Tolerance mm	3	5	6	7.5	10	12.5	15
16	-0.016/-0.043	10 ±.30	6 ±.40					
22	-0.020/-0.041	16 ±.15	12 ±.35					
25		19 ±.15	15 ±.30	13 ±.30	10 ±.35			
30		24 ±.15	20 ±.15	18 ±.30	15 ±.30			
35	-0.025/-0.050	29 ±.15	25 ±.15	23 ±.20	20 ±.25			
40		34 ±.15	30 ±.15	28 ±.15	25 ±.25	20 ±.30		
45		39 ±.20	35 ±.20	33 ±.20	30 ±.20	25 ±.25		
50		44 ±.20	40 ±.20	38 ±.20	35 ±.20	30 ±.20		
55	-0.030/-0.060	49 ±.25	45 ±.25	43 ±.25	40 ±.25	35 ±.25	30 ±.25	
60		54 ±.25	50 ±.25	48 ±.25	45 ±.25	40 ±.25	35 ±.25	
63		57 ±.25	53 ±.25	51 ±.25	48 ±.25	43 ±.25	38 ±.30	
65		59 ±.30	55 ±.30	53 ±.30	50 ±.30	45 ±.30	40 ±.30	35 ±.30
70		64 ±.30	60 ±.30	58 ±.30	55 ±.30	50 ±.30	45 ±.30	40 ±.30
80	-0.036/-0.071	74 ±.35	70 ±.35	68 ±.35	65 ±.35	60 ±.35	55 ±.35	50 ±.35
90		84 ±.40	80 ±.40	78 ±.40	75 ±.40	70 ±.40	65 ±.40	60 ±.40
100		94 ±.45	90 ±.45	88 ±.45	85 ±.45	80 ±.45	75 ±.45	70 ±.45
120		114 ±.50	110 ±.50	108 ±.50	105 ±.50	100 ±.50	95 ±.50	90 ±.50
140	-0.043/-0.083	134 ±.70	130 ±.70	128 ±.70	125 ±.70	120 ±.70	115 ±.70	110 ±.70

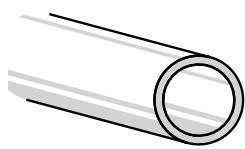


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Metric Round Seamless & Hydraulic Tube

CARBON STEEL - PRECISION MECHANICAL – E195+C, E235+C, EN 10305-1 (DIN 2391), EN10305-4 (DIN 2391-C)

ALLOY STEEL – 4140 Modified, 42CrMo4, SCM440, ASTM A519, EN 10083-1, JIS G4105

STAINLESS STEEL – 304, 304L, 316, 316L, 316Ti, 321, ASTM A213, ASTM A269, ASTM A312, EN 10088-3, EN 10216-5, EN 10297-2, EN 10305-1

ALUMINUM – 6060 T6 (Extruded), EN 573-3, EN 515, EN 755-1/2, EN 755-7/8

METRIC CHROME 6 FREE ROUND HYDRAULIC TUBE – (CR 6 Free Galvanized) E235 (St 37-4) +N (NBK)

BRASS – CuZn37/CuZn36, CW508L (Similar to 272), DIN EN 12449

COPPER – ASTM B68, ASTM B75, Alloy 122 (Not Oxygen Free)

Outer Diameter D _a (mm)		Wall thickness tolerance of $\pm 10\%$ or $\pm .1\text{mm}$ whichever is greater. The diameter tolerances include out-of-roundness.													
NOMINAL SIZE	PERMISSIBLE DEVIATION	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	± 0.08	3 $\pm$ 0.15	2.4 $\pm$ 0.15	2 $\pm$ 0.15	1.6 $\pm$ 0.15										
5		4 $\pm$ 0.15	3.4 $\pm$ 0.15	3 $\pm$ 0.15	2.6 $\pm$ 0.15										
6		5 $\pm$ 0.15	4.4 $\pm$ 0.15	4 $\pm$ 0.15	3.6 $\pm$ 0.15	3 $\pm$ 0.15	2.4 $\pm$ 0.15	2 $\pm$ 0.15							
7		6 $\pm$ 0.15	5.4 $\pm$ 0.15	5 $\pm$ 0.15	4.6 $\pm$ 0.15	4 $\pm$ 0.15	3.4 $\pm$ 0.15	3 $\pm$ 0.15							
8		7 $\pm$ 0.15	6.4 $\pm$ 0.15	6 $\pm$ 0.15	5.6 $\pm$ 0.15	5 $\pm$ 0.15	4.4 $\pm$ 0.15	4 $\pm$ 0.15	3.6 $\pm$ 0.15	3 $\pm$ 0.25					
9		8 $\pm$ 0.15	7.4 $\pm$ 0.15	7 $\pm$ 0.15	6.6 $\pm$ 0.15	6 $\pm$ 0.15	5.4 $\pm$ 0.15	5 $\pm$ 0.15	4.6 $\pm$ 0.15	4 $\pm$ 0.25	3.4 $\pm$ 0.25				
10		9 $\pm$ 0.15	8.4 $\pm$ 0.15	8 $\pm$ 0.15	7.6 $\pm$ 0.15	7 $\pm$ 0.15	6.4 $\pm$ 0.15	6 $\pm$ 0.15	5.6 $\pm$ 0.15	5 $\pm$ 0.15	4.4 $\pm$ 0.25	4 $\pm$ 0.25			
11		10 $\pm$ 0.15	9.4 $\pm$ 0.15	9 $\pm$ 0.15	8.6 $\pm$ 0.15	8 $\pm$ 0.15	7.4 $\pm$ 0.15	7 $\pm$ 0.15	6.6 $\pm$ 0.15	6 $\pm$ 0.15	5.4 $\pm$ 0.15	5 $\pm$ 0.25	4 $\pm$ 0.25	3 $\pm$ 0.25	
12		11 $\pm$ 0.15	10.4 $\pm$ 0.15	10 $\pm$ 0.15	9.6 $\pm$ 0.15	9 $\pm$ 0.15	8.4 $\pm$ 0.15	8 $\pm$ 0.15	7.6 $\pm$ 0.15	7 $\pm$ 0.15	6.4 $\pm$ 0.15	6 $\pm$ 0.15	5 $\pm$ 0.25	4 $\pm$ 0.25	
13		12 $\pm$ 0.08	11.4 $\pm$ 0.08	11 $\pm$ 0.08	10.6 $\pm$ 0.15	10 $\pm$ 0.15	9.4 $\pm$ 0.15	9 $\pm$ 0.15	8.6 $\pm$ 0.15	8 $\pm$ 0.15	7.4 $\pm$ 0.15	7 $\pm$ 0.15	6 $\pm$ 0.15	5 $\pm$ 0.15	4 $\pm$ 0.25
14		13 $\pm$ 0.08	12.4 $\pm$ 0.08	12 $\pm$ 0.08	11.6 $\pm$ 0.15	11 $\pm$ 0.15	10.4 $\pm$ 0.15	10 $\pm$ 0.15	9.6 $\pm$ 0.15	9 $\pm$ 0.15	8.4 $\pm$ 0.15	8 $\pm$ 0.15	7 $\pm$ 0.15	6 $\pm$ 0.15	5 $\pm$ 0.25
15		14 $\pm$ 0.08	13.4 $\pm$ 0.08	13 $\pm$ 0.08	12.6 $\pm$ 0.08	12 $\pm$ 0.15	11.4 $\pm$ 0.15	11 $\pm$ 0.15	10.6 $\pm$ 0.15	10 $\pm$ 0.15	9.4 $\pm$ 0.15	9 $\pm$ 0.15	8 $\pm$ 0.15	7 $\pm$ 0.15	6 $\pm$ 0.25
16		15 $\pm$ 0.08	14.4 $\pm$ 0.08	14 $\pm$ 0.08	13.6 $\pm$ 0.08	13 $\pm$ 0.08	12.4 $\pm$ 0.15	12 $\pm$ 0.15	11.6 $\pm$ 0.15	11 $\pm$ 0.15	10.4 $\pm$ 0.15	10 $\pm$ 0.15	9 $\pm$ 0.15	8 $\pm$ 0.15	7 $\pm$ 0.15
18		17 $\pm$ 0.08	16.4 $\pm$ 0.08	16 $\pm$ 0.08	15.6 $\pm$ 0.08	15 $\pm$ 0.08	14.4 $\pm$ 0.15	14 $\pm$ 0.08	13.6 $\pm$ 0.15	13 $\pm$ 0.15	12.4 $\pm$ 0.15	12 $\pm$ 0.15	11 $\pm$ 0.15	10 $\pm$ 0.15	9 $\pm$ 0.15
20		19 $\pm$ 0.08	18.4 $\pm$ 0.08	18 $\pm$ 0.08	17.6 $\pm$ 0.08	17 $\pm$ 0.08	16.4 $\pm$ 0.08	16 $\pm$ 0.08	15.6 $\pm$ 0.15	15 $\pm$ 0.15	14.4 $\pm$ 0.15	14 $\pm$ 0.15	13 $\pm$ 0.15	12 $\pm$ 0.15	11 $\pm$ 0.15
22		21 $\pm$ 0.08	20.4 $\pm$ 0.08	20 $\pm$ 0.08	19.6 $\pm$ 0.08	19 $\pm$ 0.08	18.4 $\pm$ 0.08	18 $\pm$ 0.08	17.6 $\pm$ 0.08	17 $\pm$ 0.15	16.4 $\pm$ 0.15	16 $\pm$ 0.15	15 $\pm$ 0.15	14 $\pm$ 0.15	13 $\pm$ 0.15
25		24 $\pm$ 0.08	23.4 $\pm$ 0.08	23 $\pm$ 0.08	22.6 $\pm$ 0.08	22 $\pm$ 0.08	21.4 $\pm$ 0.08	21 $\pm$ 0.08	20.6 $\pm$ 0.08	20 $\pm$ 0.08	19.4 $\pm$ 0.15	19 $\pm$ 0.15	18 $\pm$ 0.15	17 $\pm$ 0.15	16 $\pm$ 0.15
26		25 $\pm$ 0.08	24.4 $\pm$ 0.08	24 $\pm$ 0.08	23.6 $\pm$ 0.08	23 $\pm$ 0.08	22.4 $\pm$ 0.08	22 $\pm$ 0.08	21.6 $\pm$ 0.08	21 $\pm$ 0.08	20.4 $\pm$ 0.15	20 $\pm$ 0.15	19 $\pm$ 0.15	18 $\pm$ 0.15	17 $\pm$ 0.15
28		27 $\pm$ 0.08	26.4 $\pm$ 0.08	26 $\pm$ 0.08	25.6 $\pm$ 0.08	25 $\pm$ 0.08	24.4 $\pm$ 0.08	24 $\pm$ 0.08	23.6 $\pm$ 0.08	23 $\pm$ 0.08	22.4 $\pm$ 0.08	22 $\pm$ 0.15	21 $\pm$ 0.15	20 $\pm$ 0.15	19 $\pm$ 0.15
30		29 $\pm$ 0.08	28.4 $\pm$ 0.08	28 $\pm$ 0.08	27.6 $\pm$ 0.08	27 $\pm$ 0.08	26.4 $\pm$ 0.08	26 $\pm$ 0.08	25.6 $\pm$ 0.08	25 $\pm$ 0.08	24.4 $\pm$ 0.08	24 $\pm$ 0.15	23 $\pm$ 0.15	22 $\pm$ 0.15	21 $\pm$ 0.15
32	± 0.15	31 $\pm$ 0.15	30.4 $\pm$ 0.15	30 $\pm$ 0.15	29.6 $\pm$ 0.15	29 $\pm$ 0.15	28.4 $\pm$ 0.15	28 $\pm$ 0.15	27.6 $\pm$ 0.15	27 $\pm$ 0.15	26.4 $\pm$ 0.15	26 $\pm$ 0.15	25 $\pm$ 0.15	24 $\pm$ 0.15	23 $\pm$ 0.15
35		34 $\pm$ 0.15	33.4 $\pm$ 0.15	33 $\pm$ 0.15	32.6 $\pm$ 0.15	32 $\pm$ 0.15	31.4 $\pm$ 0.15	31 $\pm$ 0.15	30.6 $\pm$ 0.15	30 $\pm$ 0.15	29.4 $\pm$ 0.15	29 $\pm$ 0.15	28 $\pm$ 0.15	27 $\pm$ 0.15	26 $\pm$ 0.15
38		37 $\pm$ 0.15	36.4 $\pm$ 0.15	36 $\pm$ 0.15	35.6 $\pm$ 0.15	35 $\pm$ 0.15	34.4 $\pm$ 0.15	34 $\pm$ 0.15	33.6 $\pm$ 0.15	33 $\pm$ 0.15	32.4 $\pm$ 0.15	32 $\pm$ 0.15	31 $\pm$ 0.15	30 $\pm$ 0.15	29 $\pm$ 0.15
40		39 $\pm$ 0.15	38.4 $\pm$ 0.15	38 $\pm$ 0.15	37.6 $\pm$ 0.15	37 $\pm$ 0.15	36.4 $\pm$ 0.15	36 $\pm$ 0.15	35.6 $\pm$ 0.15	35 $\pm$ 0.15	34.4 $\pm$ 0.15	34 $\pm$ 0.15	33 $\pm$ 0.15	32 $\pm$ 0.15	31 $\pm$ 0.15
42	± 0.20			40 $\pm$ 0.20	39.6 $\pm$ 0.20	39 $\pm$ 0.20	38.4 $\pm$ 0.20	38 $\pm$ 0.20	37.6 $\pm$ 0.20	37 $\pm$ 0.20	36.4 $\pm$ 0.20	36 $\pm$ 0.20	35 $\pm$ 0.20	34 $\pm$ 0.20	33 $\pm$ 0.20
45				43 $\pm$ 0.20	42.6 $\pm$ 0.20	42 $\pm$ 0.20	41.4 $\pm$ 0.20	41 $\pm$ 0.20	40.6 $\pm$ 0.20	40 $\pm$ 0.20	39.4 $\pm$ 0.20	39 $\pm$ 0.20	38 $\pm$ 0.20	37 $\pm$ 0.20	36 $\pm$ 0.20
48				46 $\pm$ 0.20	45.6 $\pm$ 0.20	45 $\pm$ 0.20	44.4 $\pm$ 0.20	44 $\pm$ 0.20	43.6 $\pm$ 0.20	43 $\pm$ 0.20	42.4 $\pm$ 0.20	42 $\pm$ 0.20	41 $\pm$ 0.20	40 $\pm$ 0.20	39 $\pm$ 0.20
50				48 $\pm$ 0.20	47.6 $\pm$ 0.20	47 $\pm$ 0.20	46.4 $\pm$ 0.20	46 $\pm$ 0.20	45.6 $\pm$ 0.20	45 $\pm$ 0.20	44.4 $\pm$ 0.20	44 $\pm$ 0.20	43 $\pm$ 0.20	42 $\pm$ 0.20	41 $\pm$ 0.20
55	± 0.25			53 $\pm$ 0.25	52.6 $\pm$ 0.25	52 $\pm$ 0.25	51.4 $\pm$ 0.25	51 $\pm$ 0.25	50.6 $\pm$ 0.25	50 $\pm$ 0.25	49.4 $\pm$ 0.25	49 $\pm$ 0.25	48 $\pm$ 0.25	47 $\pm$ 0.25	46 $\pm$ 0.25
60				58 $\pm$ 0.25	57.6 $\pm$ 0.25	57 $\pm$ 0.25	56.4 $\pm$ 0.25	56 $\pm$ 0.25	55.6 $\pm$ 0.25	55 $\pm$ 0.25	54.4 $\pm$ 0.25	54 $\pm$ 0.25	53 $\pm$ 0.25	52 $\pm$ 0.25	51 $\pm$ 0.25
65	± 0.30			63 $\pm$ 0.30	62.6 $\pm$ 0.30	62 $\pm$ 0.30	61.4 $\pm$ 0.30	61 $\pm$ 0.30	60.6 $\pm$ 0.30	60 $\pm$ 0.30	59.4 $\pm$ 0.30	59 $\pm$ 0.30	58 $\pm$ 0.30	57 $\pm$ 0.30	56 $\pm$ 0.30
70				68 $\pm$ 0.30	67.6 $\pm$ 0.30	67 $\pm$ 0.30	66.4 $\pm$ 0.30	66 $\pm$ 0.30	65.6 $\pm$ 0.30	65 $\pm$ 0.30	64.4 $\pm$ 0.30	64 $\pm$ 0.30	63 $\pm$ 0.30	62 $\pm$ 0.30	61 $\pm$ 0.30
75	± 0.35			73 $\pm$ 0.35	72.6 $\pm$ 0.35	72 $\pm$ 0.35	71.4 $\pm$ 0.35	71 $\pm$ 0.35	70.6 $\pm$ 0.35	70 $\pm$ 0.35	69.4 $\pm$ 0.35	69 $\pm$ 0.35	68 $\pm$ 0.35	67 $\pm$ 0.35	66 $\pm$ 0.35
80				78 $\pm$ 0.35	77.6 $\pm$ 0.35	77 $\pm$ 0.35	76.4 $\pm$ 0.35	76 $\pm$ 0.35	75.6 $\pm$ 0.35	75 $\pm$ 0.35	74.4 $\pm$ 0.35	74 $\pm$ 0.35	73 $\pm$ 0.35	72 $\pm$ 0.35	71 $\pm$ 0.35
85	± 0.40					82 $\pm$ 0.40	81.4 $\pm$ 0.40	81 $\pm$ 0.40	80.6 $\pm$ 0.40	80 $\pm$ 0.40	79.4 $\pm$ 0.40	79 $\pm$ 0.40	78 $\pm$ 0.40	77 $\pm$ 0.40	76 $\pm$ 0.40
90						87 $\pm$ 0.40	86.4 $\pm$ 0.40	86 $\pm$ 0.40	85.6 $\pm$ 0.40	85 $\pm$ 0.40	84.4 $\pm$ 0.40	84 $\pm$ 0.40	83 $\pm$ 0.40	82 $\pm$ 0.40	81 $\pm$ 0.40
95	± 0.45							91 $\pm$ 0.45	90.6 $\pm$ 0.45	90 $\pm$ 0.45	89.4 $\pm$ 0.45	89 $\pm$ 0.45	88 $\pm$ 0.45	87 $\pm$ 0.45	86 $\pm$ 0.45

Tolerances above are for Carbon and Stainless European sizes only. Call Sales for more tolerance information.

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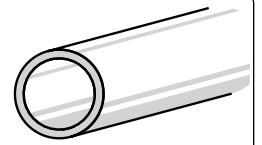
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- METRIC ROUND SEAMLESS & HYDRAULIC TUBE - continued from previous page -

NOTE: See page 53 for Hydraulic Carbon Steel Tube Pressure Chart.

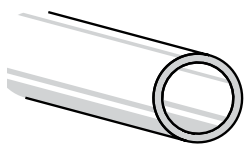
Seamless precision steel tubes DIN 2391, Sheet 2, EN 10305-1 and seamless high pressure steel tubes, 37-4 NBK bonderized (phosphate treated); **Qualities:** St. 35, St. 52, S355, and others available upon request; **Availabilities:** BK-bright hard, BKW-bright soft, GBK-bright annealed, NBK-normalised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

Outer Diameter D _a (mm)		Wall thickness tolerance of $\pm 10\%$ or $\pm 1\text{mm}$ whichever is greater. The diameter tolerances include out-of-roundness.													
NOMINAL SIZE	PERMISSIBLE DEVIATION	5	5.5	6	7	8	9	10	12	14	16	18	20	22	25
4	± 0.08														
5															
6															
7															
8															
9															
10															
11															
12															
13															
14															
15		5 ± 0.25													
16		6 ± 0.25	5 ± 0.25	4 ± 0.25											
18		8 ± 0.15	7 ± 0.20	6 ± 0.25											
20		10 ± 0.15	9 ± 0.15	8 ± 0.25	6 ± 0.25										
22		12 ± 0.15	11 ± 0.15	10 ± 0.15	8 ± 0.25										
25		15 ± 0.15	14 ± 0.15	13 ± 0.15	11 ± 0.15	9 ± 0.25									
26	± 0.15	16 ± 0.15	15 ± 0.15	14 ± 0.15	12 ± 0.15	10 ± 0.25									
28		18 ± 0.15	17 ± 0.15	16 ± 0.15	14 ± 0.15	12 ± 0.15									
30		20 ± 0.15	19 ± 0.15	18 ± 0.15	16 ± 0.15	14 ± 0.15	12 ± 0.15	10 ± 0.25							
32		22 ± 0.15	21 ± 0.15	20 ± 0.15	18 ± 0.15	16 ± 0.15	14 ± 0.15	12 ± 0.25							
35		25 ± 0.15	24 ± 0.15	23 ± 0.15	21 ± 0.15	19 ± 0.15	17 ± 0.15	15 ± 0.15							
38	± 0.20	28 ± 0.15	27 ± 0.15	26 ± 0.15	24 ± 0.15	22 ± 0.15	20 ± 0.15	18 ± 0.15							
40		30 ± 0.15	29 ± 0.15	28 ± 0.15	26 ± 0.15	24 ± 0.15	22 ± 0.15	20 ± 0.15							
42		32 ± 0.20	31 ± 0.20	30 ± 0.20	28 ± 0.20	26 ± 0.20	24 ± 0.20	22 ± 0.30							
45	± 0.25	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	± 0.30	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	± 0.35	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	± 0.40	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	± 0.45	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	78 ± 0.40	76 ± 0.40	74 ± 0.40	72 ± 0.40	70 ± 0.40	66 ± 0.40	62 ± 0.40	58 ± 0.40				
95		85 ± 0.45	84 ± 0.45	83 ± 0.45	81 ± 0.45	79 ± 0.45	77 ± 0.45	75 ± 0.45	71 ± 0.45	67 ± 0.45	63 ± 0.45	59 ± 0.45			

Tolerances above are for Carbon and Stainless European sizes only. Call Sales for more tolerance information.

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Metric Round Seamless & Hydraulic Tube

CARBON STEEL - PRECISION MECHANICAL - E195+C, E235+C, EN 10305-1 (DIN 2391), EN 10305-4 (DIN 2391-C)

ALLOY STEEL - 4140 Modified, 42CrMo4, SCM440, ASTM A519, EN 10083-1, JIS G4105

STAINLESS STEEL - 304, 304L, 316, 316L, 316Ti, 321, ASTM A213, ASTM A269, ASTM A312, EN 10088-3, EN 10216-5, EN 10297-2, EN 10305-1

ALUMINUM - 6060 T6 (Extruded), EN 573-3, EN 515, EN 755-1/2, EN 755-7/8

METRIC CHROME 6 FREE ROUND HYDRAULIC TUBE - (CR 6 Free Galvanized) E235 (St 37-4) +N (NBK)

BRASS - CuZn37/CuZn36, CW508L (Similar to 272), DIN EN 12449

COPPER - ASTM B68, ASTM B75, Alloy 122 (Not Oxygen Free)

Outer Diameter D _a (mm)		Wall thickness tolerance of $\pm 10\%$ or $\pm .1\text{mm}$ whichever is greater. The diameter tolerances include out-of-roundness.													
NOMINAL SIZE	PERMISSIBLE DEVIATION	0.5	0.8	1	1.2	1.5	1.8	2	2.2	2.5	2.8	3	3.5	4	4.5
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
110	± 0.50							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
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
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
150	± 0.80											144 ± 0.80	143 ± 0.80	142 ± 0.80	141 ± 0.80
160												154 ± 0.80	153 ± 0.80	152 ± 0.80	151 ± 0.80
170	± 0.90											164 ± 0.90	163 ± 0.90	162 ± 0.90	161 ± 0.90
180													173 ± 0.90	172 ± 0.90	171 ± 0.90
190	± 1.00												183 ± 1.00	182 ± 1.00	181 ± 1.00
200													193 ± 1.00	192 ± 1.00	191 ± 1.00
220	± 1.20														211 ± 1.20
240															231 ± 1.20
260	± 1.30														

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

Tolerances above are for Carbon and Stainless European sizes only. Call Sales for more tolerance information.



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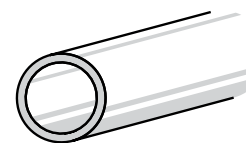
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Metric Round Seamless & Hydraulic Tube



- METRIC ROUND SEAMLESS & HYDRAULIC TUBE - continued from previous page -

NOTE: See page 53 for Hydraulic Carbon Steel Tube Pressure Chart.

Outer Diameter D _a (mm)		Wall thickness tolerance of $\pm 10\%$ or $\pm .1\text{mm}$ whichever is greater. The diameter tolerances include out-of-roundness.													
NOMINAL SIZE	PERMISSIBLE DEVIATION	5	5.5	6	7	8	9	10	12	14	16	18	20	22	25
100	± 0.45	90 ± 0.45	89 ± 0.45	88 ± 0.45	86 ± 0.45	84 ± 0.45	82 ± 0.45	80 ± 0.45	76 ± 0.45	72 ± 0.45	68 ± 0.45	64 ± 0.45			
110	± 0.50	100 ± 0.50	99 ± 0.50	98 ± 0.50	96 ± 0.50	94 ± 0.50	92 ± 0.50	90 ± 0.50	86 ± 0.50	82 ± 0.50	78 ± 0.50	74 ± 0.50			
120		110 ± 0.50	109 ± 0.50	108 ± 0.50	106 ± 0.50	104 ± 0.50	102 ± 0.50	100 ± 0.50	96 ± 0.50	92 ± 0.50	88 ± 0.50	84 ± 0.50			
130	± 0.70	120 ± 0.70	119 ± 0.70	118 ± 0.70	116 ± 0.70	114 ± 0.70	112 ± 0.70	110 ± 0.70	106 ± 0.70	102 ± 0.70	98 ± 0.70	94 ± 0.70			
140		130 ± 0.70	129 ± 0.70	128 ± 0.70	126 ± 0.70	124 ± 0.70	122 ± 0.70	120 ± 0.70	116 ± 0.70	112 ± 0.70	108 ± 0.70	104 ± 0.70			
150	± 0.80	140 ± 0.80	139 ± 0.80	138 ± 0.80	136 ± 0.80	134 ± 0.80	132 ± 0.80	130 ± 0.80	126 ± 0.80	122 ± 0.80	118 ± 0.80	114 ± 0.80	110 ± 0.80		
160		150 ± 0.80	149 ± 0.80	148 ± 0.80	146 ± 0.80	144 ± 0.80	142 ± 0.80	140 ± 0.80	136 ± 0.80	132 ± 0.80	128 ± 0.80	124 ± 0.80	120 ± 0.80		
170	± 0.90	160 ± 0.90	159 ± 0.90	158 ± 0.90	156 ± 0.90	154 ± 0.90	152 ± 0.90	150 ± 0.90	146 ± 0.90	142 ± 0.90	138 ± 0.90	134 ± 0.90	130 ± 0.90		
180		170 ± 0.90	169 ± 0.90	168 ± 0.90	166 ± 0.90	164 ± 0.90	162 ± 0.90	160 ± 0.90	156 ± 0.90	152 ± 0.90	148 ± 0.90	144 ± 0.90	140 ± 0.90		
190	± 1.00	180 ± 1.00	179 ± 1.00	178 ± 1.00	176 ± 1.00	174 ± 1.00	172 ± 1.00	170 ± 1.00	166 ± 1.00	162 ± 1.00	158 ± 1.00	154 ± 1.00	150 ± 1.00	146 ± 1.00	
200		190 ± 1.00	189 ± 1.00	188 ± 1.00	186 ± 1.00	184 ± 1.00	182 ± 1.00	180 ± 1.00	176 ± 1.00	172 ± 1.00	168 ± 1.00	164 ± 1.00	160 ± 1.00	156 ± 1.00	
220	± 1.20	210 ± 1.20	209 ± 1.20	208 ± 1.20	206 ± 1.20	204 ± 1.20	202 ± 1.20	200 ± 1.20	196 ± 1.20	182 ± 1.20	188 ± 1.20	184 ± 1.20	180 ± 1.20	176 ± 1.20	170 ± 1.20
240		230 ± 1.20	229 ± 1.20	228 ± 1.20	226 ± 1.20	224 ± 1.20	222 ± 1.20	220 ± 1.20	216 ± 1.20	212 ± 1.20	208 ± 1.20	204 ± 1.20	200 ± 1.20	196 ± 1.20	190 ± 1.20
260	± 1.30	250 ± 1.30	249 ± 1.30	248 ± 1.30	246 ± 1.30	244 ± 1.30	242 ± 1.30	240 ± 1.30	236 ± 1.30	232 ± 1.30	228 ± 1.30	224 ± 1.30	220 ± 1.30	216 ± 1.30	210 ± 1.30

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

Tolerances above are for Carbon and Stainless European sizes only. Call Sales for more tolerance information.

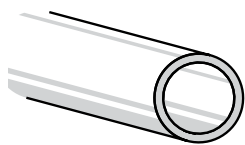
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Metric Capillary Tube

STAINLESS STEEL - 304, 316, 316L, 321, ASTM A213, ASTM A269, DIN 17458 CLASS 1, DIN 2462-1, EN 10216-5, ISO 1127 Tolerance: Permissible variations in OD +/- .005" (.13 mm), Wall Thickness +/- 15%

I.D. listed in center area.

	Wall (mm)																								
O.D. (mm)	.075	.080	.100	.125	.150	.175	.200	.225	.250	.300	.350	.375	.400	.450	.500	.600	.75	.80	.85	1.00	1.25	1.50	1.80	2.00	2.50
0.10																									
0.20		0.04																							
0.30	0.15	0.14	0.10																						
0.40			0.20																						
0.50			0.30		0.20																				
0.55																									
0.60			0.40																						
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						2.40												
3.25																					0.75				
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	1.40		
5.30									4.80																
6.00					5.70				5.50				5.20		5.00		4.50	4.40		4.00		3.00	2.40	2.00	1.00

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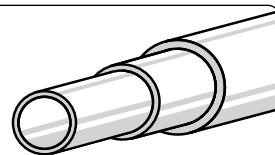
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Metric Round Telescopic Tube



CARBON STEEL - ST 35, E235, DIN 2391, EN 10305-1

ALLOY - 4140 Mod., 42CrMo4, SCM 440, ASTM A519, EN 10083-1, JIS G4105

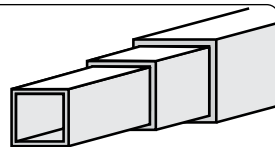
STAINLESS STEEL - 304, 304L, 316, 316L, 316Ti, 321, ASTM A213, ASTM A269, ASTM A312, EN 10088-3, EN 10216-5, EN 10297-2, EN 10305-1

ALUMINUM - 6060 T6 (Extruded), EN 573-3, EN 515, EN 755-1/2, EN 755-7/8 (Tolerances listed below do not apply to extruded aluminum tube.)

OUTSIDE TUBE (mm)	ID TOLERANCE (mm)	INSIDE TUBE (mm)	O.D. TOLERANCE (mm)	OUTSIDE TUBE (mm)	ID TOLERANCE (mm)	INSIDE TUBE (mm)	O.D. TOLERANCE (mm)
15 OD x 2 wall	±.20	10 OD x 2	±.08	60 OD x 2 wall	±.25	55 OD x 2	±.25
20 OD x 2 wall	±.08	15 OD x 2	±.08	65 OD x 2 wall	±.30	60 OD x 2	±.25
25 OD x 2 wall	±.08	20 OD x 2	±.08	70 OD x 2 wall	±.30	65 OD x 2	±.30
30 OD x 2 wall	±.08	25 OD x 2	±.08	75 OD x 2 wall	±.35	70 OD x 2	±.30
35 OD x 2 wall	±.15	30 OD x 2	±.08	80 OD x 2 wall	±.35	75 OD x 2	±.35
40 OD x 2 wall	±.15	35 OD x 2	±.15	85 OD x 2 wall	±.40	80 OD x 2	±.35
45 OD x 2 wall	±.20	40 OD x 2	±.15	90 OD x 2 wall	±.40	85 OD x 2	±.40
50 OD x 2 wall	±.20	45 OD x 2	±.15	95 OD x 2 wall	±.45	90 OD x 2	±.40
55 OD x 2 wall	±.25	50 OD x 2	±.20	100 OD x 2 wall	±.45	95 OD x 2	±.45

NOTE: Telescoping Tube sizes are sold as separate units.

Metric Square Telescopic Tube



CARBON STEEL - E195, E235, S235JR, (1002/1010), EN 10025-1, EN 10305-5, DIN 2395 (ID controlled weld bead)

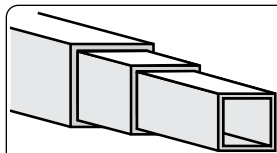
ALUMINUM - 6060 T6 Temper, AlMgSi0.5 (Extruded), EN 755-2, EN 573-3, DIN 1748 (Multiply weight below by .3462) Tolerances listed below do not include Extruded Aluminum material. All Aluminum tubes are extruded with sharp corners on OD and ID.

SIZE (mm)	Kg/m	LBS/FT	BEAD TOLERANCE (mm)	SIZE (mm)	Kg/m	LBS/FT	BEAD TOLERANCE (mm)
20 x 20 x 2	1.103	0.74	-.0 to max .2	60 x 60 x 4	7.02	4.72	-.0 to max .6
25 x 25 x 2	1.417	0.95	-.2 to max .1	70 x 70 x 4	8.29	5.57	-.0 to max .6
30 x 30 x 2	1.731	1.16	-.2 to max .1	80 x 80 x 4	9.54	6.41	-.0 to max .6
35 x 35 x 2	2.045	1.38	-.2 to max .1	90 x 90 x 4	10.78	7.25	-.0 to max .6
40 x 40 x 2	2.359	1.59	-.0 to max .2	100 x 100 x 4	12.04	8.09	-.0 to max .6
50 x 50 x 2	2.987	2.01	-.0 to max .2				

NOTE: Telescoping Tube sizes are sold as separate units.

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Metric Rectangular Telescopic Tube

CARBON STEEL – S235JR (RSt 37-2), 1008/1010, EN 10025, EN 10305-5, DIN 2395

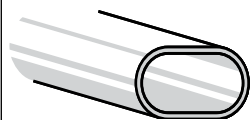
The inside weld bead tolerance is minimum .9mm to max 1.2mm

ALUMINUM – 6060 T6 Temper (Extruded), EN 755, EN 573-3

Extruded Aluminum tubes will have sharp corners on the OD and ID.

SIZE mm	WEIGHT kg/m	WEIGHT lbs/ft	SIZE mm	WEIGHT kg/m	WEIGHT lbs/ft
20 x 10 x 1.5	0.632	0.42	20 x 10 x 2	0.1335	0.1984
25 x 15 x 1.5	0.75	0.5	25 x 15 x 2	0.1723	0.2561
30 x 20 x 1.5	1.1	0.73	30 x 20 x 2	0.221	0.3285
35 x 25 x 1.5	1.327	0.89	35 x 25 x 2	0.5741	0.4074
40 x 30 x 2	2.07	1.38	40 x 30 x 2	0.726	0.4885
50 x 40 x 2	2.69	1.8	50 x 40 x 2	0.4221	0.6272
			60 x 50 x 2	1.716	2.553

NOTE: Telescoping Tube sizes are sold as separate units.



Metric Flat Oval Tube

CARBON STEEL - E195, E235, +CR1, EN 10305-3, EN 10305-5 (+CR1 - Normally not heat treated, but suitable for final annealing)

SIZE (mm)	WEIGHT (kg/m)	WEIGHT (lbs/ft)	SIZE (mm)	WEIGHT (kg/m)	WEIGHT (lbs/ft)	SIZE (mm)	WEIGHT (kg/m)	WEIGHT (lbs/ft)
20 x 10 x 1.5	0.550	0.369	35 x 20 x 2	1.360	0.914	50 x 25 x 2	1.920	1.29
25 x 12 x 1.5	0.690	0.463	38 x 20 x 2	1.450	0.974	50 x 30 x 2	2.010	1.352
25 x 15 x 1.5	0.750	0.504	40 x 15 x 2	1.430	0.961	55 x 25 x 2	2.080	1.397
30 x 10 x 1.5	0.790	0.531	40 x 20 x 1.5	1.160	0.779	60 x 20 x 2	2.140	1.438
30 x 10 x 2	1.020	0.685	40 x 20 x 2	1.520	1.023	60 x 25 x 2	2.230	1.501
30 x 15 x 1.5	0.850	0.571	45 x 20 x 2	1.670	1.122	60 x 30 x 2	2.320	1.559
30 x 15 x 2	1.110	0.747	48 x 20 x 1.5	1.340	0.901	60 x 30 x 2.5	2.870	1.928
30 x 20 x 2	1.200	0.807	48 x 20 x 2	1.770	1.189	65 x 35 x 2	2.570	1.726
35 x 10 x 2	1.260	0.847	50 x 20 x 2	1.830	1.229	80 x 25 x 2	2.860	1.921
35 x 15 x 2	1.270	0.853	50 x 20 x 2.5	2.260	1.749	100 x 25 x 2	3.490	2.345

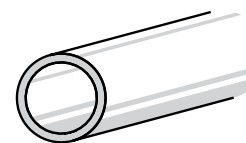
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Metric Round Honed/Cylinder Tube Specifications



Condition and Grade

Tubes up to 250mm OD are skived and roller burnished and are produced from cold drawn steel tubes according to EN 10305-1 (DIN 2391), Grade: E355+SR (ST52 BK+S). Steel grade E355+SR - Stress Relieved condition.

Tubes greater than 250mm in diameter are honed steel and are produced from hot rolled stock according to DIN 2448/1629. The steel grade is St52.

Chemical Analysis compared to AISI 1018 steel

Steel Grade	C%	Mn%	Si%	P%	S%
E355/ST52	≤.20	≤1.55	≤.50	≤.020	≤.010
1018	.15/.20	.60/.90	.15/.30	.40 Max	.050 Max

Strength – Yield and Tensile

Our cylinder tubes are made from EN 10305-1 (DIN 2391) Seamless, Grade E355+SR (ST52 BK&S). The Yield point for wall thicknesses ≤ 16mm is > 520 N/mm² (75,421 PSI), wall thicknesses > 16mm is > 490 N/mm² (71,070 PSI). The Ultimate Tensile Strength (UTS) is > 600 N/mm² (87,024 PSI) with wall thicknesses > 15mm.

Diameter Tolerance OD/ID

The tubes are ready to use with an outside diameter tolerance according to EN 10305-1 and an ID tolerance according to ISO 286-2 (H8), for 6mm wall thickness and up. Outside diameters ≥ 115mm with a 5mm wall thickness are according to ISO 286-2 (H9): -0/+0.03mm.

ID (Hole) size in Millimeters Up to and including		ISO 286-2 tolerance for inside dimensions (Minus 0/+, H8)	
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")

Straightness

The deviation from straightness over any 1-meter length shall not exceed 3mm.

Eccentricity

For tubes specified by outside and the inside diameter, the eccentricity shall comply with the following requirements:

$$\frac{T_{\max} - T_{\min}}{T_{\max} + T_{\min}} \times 100 \leq 10\%$$

Where T max and T min are measured in the same cross section: A reduced eccentricity is specified.

Wall Thickness

Tube specified by OD and wall thickness or by ID and wall thickness shall have a wall thickness tolerance of ± 10% or ± 0.1mm, whichever is greater.

ID 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 μm less than or equal to 0.20 μm for skived and roller burnished and is 0.40 μm 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:

$$\text{Wall Thickness in millimeters} = \frac{0.05 * I * P * F}{Y}$$

I = Inside Diameter

P = Pressure in Bar

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

Y = Yield Point

To convert BAR into PSI multiply by 14.5037738

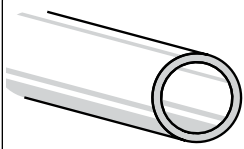
To convert PSI into BAR multiply by .0689475729

See page 55 for Hard Chrome Plated Bar Specifications.

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Metric Round Steel Tube Pounds Per Linear Foot Chart

For Aluminum multiply weights below by 0.3462. For Stainless multiply weights below by 1.0100. For Copper multiply weights below by 1.1440. For Brass multiply weights below by 1.084. For Titanium multiply weights below by .5750.

OD (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	10.20	
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	20.70
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	16.46	18.28	19.97	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	26.60	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	35.70	39.33
130									5.28	5.90	6.31	7.33	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	43.47
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	47.61
150											7.30	8.49	9.67	10.84	12.01	13.16	14.31	16.58	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	55.89
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	19.5												

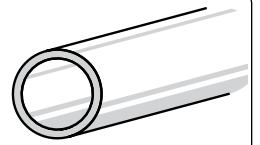
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Hydraulic Carbon Steel Tube Pressure Chart



CARBON STEEL – DIN 2445/2, EN 10305-4, Seamless CD Hydraulic, NBK Annealed

Hydraulic Tubing Pressure Chart				Hydraulic Tubing Pressure Chart			
OD (mm)	Wall (mm)	Pressure in BAR	PSI Safety 2X	Outside (mm)	Wall (mm)	Pressure in BAR	PSI Safety 2X
4	0.5	277	4017	30	2	166	2407
6	1	377	5467	30	2.5	207	3002
6	1.5	565	8193	30	3	249	3611
6	2	754	10933	30	4	332	4814
8	1	294	4263	30	5	415	6018
8	1.5	441	6395	35	2	142	2059
8	2	589	8541	35	2.5	178	2581
10	1	249	3611	35	3	213	3089
10	1.5	374	5423	35	4	285	4133
10	2	499	7236	35	5	356	5162
12	1	207	3002	38	2.5	164	2378
12	1.5	311	4510	38	3	197	2857
12	2	415	6018	38	4	262	3799
12	3	623	9034	38	5	328	4756
14	1.5	267	3872	42	2	118	1711
14	2	356	5162	42	3	178	2581
14	2.5	445	6453	42	4	237	3437
15	1.5	248	3596	42	5	297	4307
15	2	332	4814	48	5	259	3756
16	1.5	233	3379	48.3	2.6	134	1943
16	2	311	4510	48.3	5	258	3741
16	2.5	389	5641	48.3	6.3	325	4713
16	3	467	6772	50	3	149	2161
18	1.5	207	3002	50	5	249	3611
18	2	277	4017	50	6	299	4336
18	3	415	6018	50	8	399	5786
20	1.5	187	2712	50	10	499	7236
20	2	249	3611	60	3	124	1798
20	2.5	311	4510	60	5	208	3016
20	3	374	5423	60	6	249	3611
20	4	499	7236	60	8	333	4829
22	1.5	170	2465	60.3	2.9	120	1740
22	2	226	3277	60.3	6.3	260	3770
22	2.5	283	4104	60.3	8	331	4800
22	3	340	4930	65	8	307	4452
25	2	199	2886	76.1	2.9	95	1378
25	2.5	249	3611	76.1	8	263	3814
25	3	299	4336	76.1	10	327	4742
25	4	399	5786	80	10	311	4510
28	1.5	133	1929	88.9	3.2	89	1291
28	2	178	2581	88.9	10	318	4611
28	2.5	222	3219	88.9	11.1	327	4742
28	3	267	3872	101.6	14.2	348	5046
28	4	537	7787	114.3	3.6	78	1131

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ISO 286-2 Round Bar Tolerances

Round Steel ISO Tolerance "h Series" in Millimeters								
Nominal Size Diameter (mm)	h5	h6	h7	h8	h9	h10	h11	h12
1 to 3	-0.004 (-0.00016")	-0.006 (-0.00024")	-0.01 (-0.00039")	-0.014 (-0.00055")	-0.025 (-0.00098")	-0.04 (-0.00158")	-0.06 (-0.00236")	-0.100 (-0.00394")
Over 3 to 6	-0.005 (-0.00020")	-0.008 (-0.00032")	-0.012 (-0.00047")	-0.018 (-0.00071")	-0.03 (-0.00118")	-0.048 (-0.00189")	-0.075 (-0.00295")	-0.120 (-0.00472")
Over 6 to 10	-0.006 (-0.00024")	-0.009 (-0.00035")	-0.015 (-0.00059")	-0.022 (-0.00086")	-0.036 (-0.00142")	-0.058 (-0.00228")	-0.09 (-0.00354")	-0.150 (-0.00591")
Over 10 to 18	-0.008 (-0.00032")	-0.011 (-0.00043")	-0.018 (-0.00071")	-0.027 (-0.0010")	-0.043 (-0.00169")	-0.07 (-0.00275")	-0.11 (-0.00433")	-0.18 (-0.00709")
Over 18 to 30	-0.009 (-0.00035")	-0.013 (-0.00051")	-0.021 (-0.00083")	-0.033 (-0.00129")	-0.052 (-0.00205")	-0.084 (-0.00331")	-0.13 (-0.00512")	-0.210 (-0.00827")
Over 30 to 50	-0.011 (-0.00043")	-0.016 (-0.00063")	-0.025 (-0.00098")	-0.039 (-0.00153")	-0.062 (-0.00244")	-0.1 (-0.00393")	-0.16 (-0.00630")	-0.250 (-0.00984")
Over 50 to 80	-0.013 (-0.00051")	-0.019 (-0.00075")	-0.03 (-0.00118")	-0.046 (-0.00181")	-0.074 (-0.00291")	-0.12 (-0.00472")	-0.19 (-0.00748")	-0.300 (-0.01181")
Over 80 to 120	-0.015 (-0.00059")	-0.022 (-0.00087")	-0.035 (-0.00138")	-0.054 (-0.00213")	-0.087 (-0.00343")	-0.14 (-0.00551")	-0.22 (-0.00866")	-0.350 (-0.01378")
Over 120 to 180	-0.018 (-0.00071")	-0.025 (-0.00098")	-0.04 (-0.00158")	-0.063 (-0.00248")	-0.1 (-0.00393")	-0.16 (-0.00629")	-0.25 (-0.00984")	-0.400 (-0.01575")
Over 180 to 250	-0.02 (-0.00079")	-0.029 (-0.00114")	-0.046 (-0.00181")	-0.072 (-0.00283")	-0.115 (-0.00453")	-0.185 (-0.00723")	-0.29 (-0.01142")	-0.460 (-0.01811")

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

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

Equivalent German Specifications

DIN 668 = h11

DIN 669 = h9

DIN 671 = h9

DIN 175 = h9

DIN 670 = h8

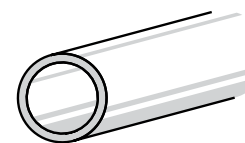
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Hard Chrome Plated Bar Specifications



Chrome Plated Bar

C45/C50 (1045/1050), 42CrMo4 Q&T (4140)

Grade & Strength

Our chrome plated bars are produced from C45/C50 (1045/1050) steel and 42CrMo4 Q&T (4140) alloy. C45/C50: The tensile strength is 520 N/mm² (75,400 PSI minimum) & the yield strength is 320 N/mm² (46,400 PSI minimum). 42CrMo4 Q&T: The tensile strength is 1000 N/mm² (145,000 PSI minimum) & the yield strength is 750 N/mm² (108,000 PSI minimum).

Roundness and Straightness

The out of roundness tolerance is 1/2 of the tolerance field. Straightness is better than 0.3mm/1000mm.

Surface Roughness

The surface roughness is RMS 8 or better. (Nominal values Ra less than or equal to 0.25µm).

Thickness of Chrome Plating

The chromium layer on bars 20mm and less in diameter is 10µm minimum (.0005") and greater than 20mm is 20µm minimum (.00078").

Surface Hardness

The Rockwell hardness of the chrome plating itself is HR C63-68. (Hardness Vickers 0.1/HV850-1000)

The surface hardness of the surface of the non-induction hardened bars UNDER the chromium overlay on C45/C50 steel is B80/99 Rockwell and the 42CrMo4 is C28/32 Rockwell.

The surface hardness of the induction hardened bars UNDER the chromium overlay on C45/50 steel is C48/52 Rockwell and 42CrMo4 is up to C60 Rockwell.

Corrosion Resistance of the Chromium Layer

Corrosion resistance on carbon, alloy, and induction hardened steel <20mm in diameter is 120 hours in a natural salt spray test and >20mm in diameter is 200 hours in a natural salt spray test, both with a rating of 9 minimum. The laboratory test is according to ISO 9227 (NSS) and results evaluation are according to ISO 10.289.

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 Bar

Diameter Tolerance

The diameter tolerance of the chrome plated bar above 20mm and greater is ISO 286-2 lower case f7 which is a double undersize tolerance. Bars less than 20mm are lower case f8 tolerance.

Bar Above	Dia. (mm) Up to and Including	ISO 286-2 Lowercase f8 f8 Double undersized for bar
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 bar
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")

Mechanical Properties of High Strength Bar

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% Max.	S % Max.	Cr%	Mo%
1045	0.43/0.50	0.60/0.90	0.040	0.050		
C45 & Ck45	0.42/0.50	0.50/0.80	0.035	0.035		
1050	0.48/0.55	0.60/0.90	0.040	0.050		
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	0.040	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	0.030	0.030	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	0.040	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.

See page 51 for Metric Round Honed Tubing Specifications.

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Induction Hardened Bar 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"

DIN To EN Comparison

Hot Rolled Material	DIN	EN	Cold Drawn Material	DIN	EN
Flat	DIN 1017	EN 10058	Flat	DIN 174	EN 10278
Equal Angle	DIN 1028	EN 10056-2	Square	DIN 178	EN 10278
Unequal Angle	DIN 1029	EN 10056-2	Hexagon	DIN 176	EN 10278
T-Bar	DIN 1024	EN 10055	Round	DIN 671	EN 10278 h9
Round Bar (hot roll)	DIN 1013	EN 10060	Keystock	DIN 6880	DIN 6880
Square Bar (hot roll)	DIN 1014	EN 10059	Cold Drawn Angle	59370	DIN 59370
Hot Rolled Plate	DIN 1543	EN 10029	Cold Rolled Sheet	1541	EN 10130

Channel & I Beam	DIN	EN	Tubes	DIN	EN
Channel	DIN 1026	EN 10279	Seamless Mechanical Tube	2391	EN 10305-1
INP (IPN)	DIN 1025 part 1	EN 10024	Welded Round Tube	2394	EN 10305-3
IPE	DIN 1025 part 5	EN 10034	Seamless Hydraulic Tube	2391-C	EN 10305-4
IPB-1	DIN 1025 part 3	EN 10034	Square & Rectangular Tube	2395	EN 10305-5
IPB	DIN 1025 part 2	EN 10034	HR Hollow Sections	59410	EN 10210
IPBv	DIN 1025 part 4	EN 10034	CR Hollow Sections	59411	EN 10219

Acronyms/Abbreviations

AQ/SR	Aircraft Quality/Stress Relieved	CF	Cold Finished	SQ/FT	Square/Foot
QT/SR	Quenched & Tempered/Stress Relieved	HR	Hot Rolled	LBS	Pounds
HT	Heat Treated	HF	Hot Finished	CWT	Hundredweight
IHCP	Induction Hardened Chrome Plated	SP	Stress Proof	NBK	Normalized Bright Annealed
CP	Chrome Plated	SR	Stress Relieved	BK	Bright Hard
IH	Induction Hardened	µm	Microns/Micrometers	BKW	Bright Soft
TG&P	Turned Ground & Polished	mm	Millimeters	GBK	Bright Annealed
CR	Cold Rolled	cm	Centimeters	>	Greater Than
CD	Cold Drawn	m	Meters	≤	Less Than or Equal To
CEV	Carbon Equivalent Value	IN	Inches	≥	Greater Than or Equal To
		FT	Feet	<	Less Than

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Mechanical Properties of Standard Cold Drawn Steels

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

These properties are for 20mm to 30mm round bar. Sizes under 20mm 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	Rockwell Hardness Average	Average Machinability Rating Cold Drawn 12L14 = 100%
1008 CD	49000	41000	20	45	95	70B	34
1010 CD	53000	44000	20	40	105	75B	34
1018 TG&P	58000	32000	25	50	116	75B	43
1018 CD	64000	54000	15	40	126	87B	43
1020 CD	61000	51000	15	40	121	88B	40
1035 CD	80000	67000	12	35	167	90B	40
1040 CD	85000	71000	12	35	170	92B	37
1045 TG&P	82000	50000	16	40	163	95B	34
1045 CD	91000	77000	12	35	179	95B	34
1045 ANN. CD.	85000	73000	12	45	170	90B	40
1050 CD	100000	84000	10	30	197	98B	28
1050 ANN.CD	95000	80000	10	40	189	91B	34
1117 CD	69000	58000	15	40	137	85B	56
1140 CD	88000	74000	12	35	170	93B	43
1141 CD	105000	88000	10	30	212	93B	43
1144 CD	108000	90000	10	30	207	20C	40
1144 STRESS	115000min	100000min	7	20	235	27C	51
1215 CD	78000	60000	10	35	167	90C	84
12L14 CD	78000	60000	10	35	163	87B	100
ALLOY STEEL							
4130 NOR.CD	85000	70000	25	55	187 / 229	21C	43
4140 ANN CD	105000	85000	20	50	187 / 229	22C	40
4140 Q&T	140000	125000	15	60	262 / 321	32C	31
TOOL STEEL							
O-1 SA CD	90000	65000	10	30	200 / 240	95B	24
STAINLESS							
303 ANN CD	100000	60000	45	65	160 / 210	B95	45
304 ANN CD	100000	60000	45	65	150 / 180	B95	28
316 ANN CD	90000	60000	45	60	160 / 190	B98	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

Same Day Shipping

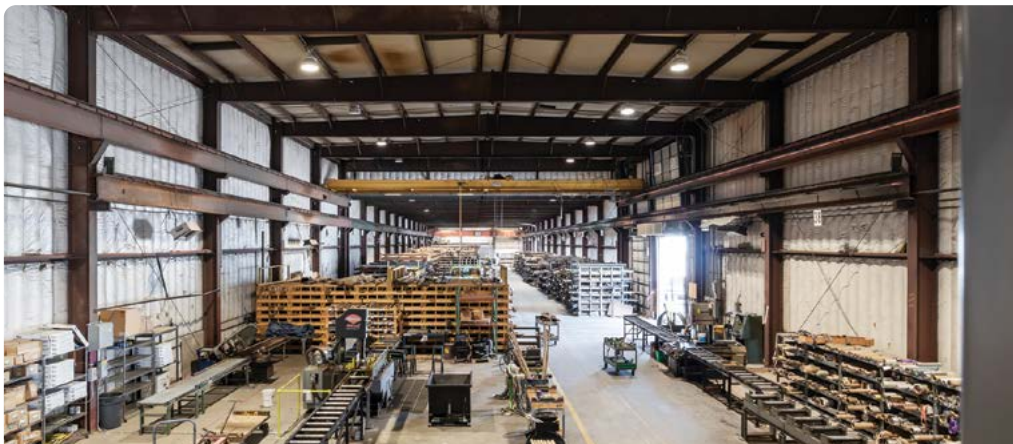
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Comparison of US to International Structural Strengths Standards

QUALITY/STANDARD		TENSILE		MINIMUM YIELD	
		P.S.I	N/mm ²	P.S.I.	N/mm ²
US					
ASTM A36		58,000/80,000	400/550	36,000	250
ASTM A572	Grade 50	65,000 Min.	450 Min.	50,000	345
Euronorm					
EN 10025	S235JR	52,200/73,950	360/510	34,000	235
	S355J2	68,150/91,350	470/630	51,000	355
EN 10149-2	S355MC	62,367/79,772	430/550	51,000	355
	S700MC	108,780/137,778	750/950	101,528	700
Germany					
DIN 17100	RST 37-2	52,000/74,000	360/510	32,500	225
	ST 37-2	52,000/74,000	360/510	32,500	225
	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 400	52,200/73,950	360/510	34,000	235
	SS 490	58,150/91,350	470/630	51,000	355
	SS 540	72,500/88,500	490/608	51,000	355

Substitution is only possible after a complete examination of the individual specifications. Sections of over 16mm (0.630") up to and including 25mm (.984") thick, the above figures are a guide and are approximate.



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Comparison of US to International Chemistry Standards

US ASTM SAE AISI	Europe Euronorm	Germany Werkstoff W.Nr	Germany Kurzname DIN	England BS	Italy UNI	Japan JIS
CARBON						
1008/1010	DC01	1.0330	FeP01/St12	Cr4	FeP01	SPCC
1015	S235JRC	1.0037	St37-2	S235JRC	Fe 360BFN	SS400
ASTM A656	S355J2	1.0577	St52	224-460	S355J2G4	SS490YA
1018		1.0401	C15	080M15	C16	S15CK
1045	C45	1.0503	C45	060A47	C45	S45C
1045		1.1191	CK45	080A46	1C45	S48C
1045		1.1194	CQ45	EN8D	C43	
1140	8M	1.0726	35S20	212M36		
1140/1146	45S20	1.0727	45S20	216M44	CF44SMn28	SUM43
1215	11SMn37	1.0715	9SMn28	230M07	CF9SMn28	SUM 25
1215		1.0736	9SMn36	En1A	CF9SMn36	SUM 22
12L14	11SMnPb30	1.0718	9SMnPb28	230M07Leaded	CF9SMnPb28	SUM 22L
12L14	11SMnPb37	1.0737	9SMnPb36	En1A Leaded	CF9SMnPb36	SUM 23L
ALLOY						
4130		1.7218	25CrMo4	708A30	25CrMo4 (KB)	SCM 420
4130			GS-25CrMo4	CDS110	30CrMo4	SCM 430
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
4340	34CrNiMo6	1.6582	34CrNiMo6	817M40	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)
STAINLESS						
303	X8CrNiS18-9	1.4305	X10CrNiS18-9	303S 21	X10CrNiS 18 09	SUS 303
304	X5CrNi18-10	1.4301	X5CrNi 18 9	304S 15	X5CrNi 18 10	SUS 304
304L	X2CrNi19 11	1.4307		304S 11		SUS304L
316	X5CrNiMo17-12-2	1.4401	X5CrNiMo17 12 2	316S 29	X5CrNiMo17 12	SUS 316
316	X5CrNiMo18-14-3	1.4436	X5CrNiMo19 11	316S 31	X5CrNiMo17 13	SUS 316TP
316L	X2CrNiMo17 12 2	1.4404		316S 11		SUS316L
316Ti		1.4571	X6CrNiMoTi17 12	320S 33		
321		1.4541	X6CrNiTi18 10	321S 31		SUS321
409	X2CrTi12	1.4512		409S19		SUH 409
420	X20Cr13	1.4021		420S 37		SUS 420J1
430	X8Cr17	1.4016		430S 17		SUS 430
430F	X12CrMoS17	1.4104				SUS430F
TOOL STEEL						
A-2	X100CrMoV5	1.2363	X100CrMoV51	BA 2	X100CrMoV5 1 KU	SKD 12
O-1	95MnWCr5	1.2510	100MnCrW4	BO 1	95MnWCr 5 KU	SKS3
BRASS						
272	CW 508L	2.0321	CuZn37	CZ108		H3100-C3650
360	CW 603N	2.0375	CuZn36Pb3	CZ124		C3601-C3602
385	CW 614N	2.0401	CuZn39Pb3	CZ121Pb3		C3603-C3604
COPPER						
110	CW 004A	2.0065	E Cu57 - E Cu58	C101		
ALUMINUM						
2007	AlCuMgPb	3.1645	AlCuMgPb			
2011	AlCuBiPb	3.1655	AlCuBiPb	FC1	P-AlCu5.5PbBi	
5754	AlMg3	3.3535	AlMg3		P-AlMg3.5	
5083	AlMg4.5Mn0.7	3.3547				
6060	AlMgSi0.5	3.3206	AlMgSi0.5	H9	P-AlMgSi	
6061	AlMg1SiCu	3.3211	AlMg1SiCu	H20	P-AlMg1SiCu	
7075	AlZn6MgCu	3.4365	AlZnMgCu1.5	2L95/96	P-AlZn5.8MgCu	A7075

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

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Metric Conversions

TO CONVERT	INTO	MULTIPLY BY
Feet (ft.)	Meters (m)	0.3048
Inches (in.)	Millimeters (mm)	25.4
Kilograms (kg)	Pounds (lbs.)	2.2046
Kilograms/Meters (kg/m)	Pounds/Feet (lbs./ft.)	0.673
Megapascals (MPa)	Newtons per square millimeter (N/mm ²)	1.000
Megapascals (MPa)	Pounds per square inch (psi)	145.04
Meters (m)	Feet (ft.)	3.2808
Meters (m)	Inches (in.)	39.37008
Millimeters (mm)	Inches (in.)	0.03937
Inch	Centimeters	2.54
Centimeters	Inches	0.3937001
Millimeters	Centimeters	0.1
Centimeters	Millimeters	10
Newtons per square millimeter (N/mm ²)	Pounds per square inch (psi)	145.04
Newtons per square millimeter (N/mm ²)	Megapascals (MPa)	1.000
Pounds (lbs.)	Kilograms (kg)	0.4536
Pounds/Feet (lbs./ft.)	Kilograms/Meters (kg/m)	1.4881
Pounds per square inch (psi)	Newtons per square millimeter (N/mm ²)	0.006895
Pounds per square inch (psi)	Megapascals (MPa)	0.006895
Square millimeters (mm ²)	Square Feet (ft. ²)	0.000010759
Square inches (in. ²)	Square millimeters (mm ²)	645.16
Square meters (m ²)	Square feet (ft. ²)	10.7639
Square feet (ft. ²)	Square meters (m ²)	0.0929
BAR	Pounds per square inch (psi)	14.5038
Pounds per square inch (psi)	BAR	.068947

Millimeters to Inches Conversion Chart

mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
0.05	0.00197	0.6	0.02362	19	0.748	53	2.0866	87	3.4252
0.055	0.00217	0.65	0.02559	20	0.7874	54	2.126	88	3.4646
0.06	0.00236	0.7	0.02756	21	0.8268	55	2.1654	89	3.5039
0.065	0.00256	0.75	0.02953	22	0.8661	56	2.2047	90	3.5433
0.07	0.00276	0.8	0.0315	23	0.9055	57	2.2441	91	3.5827
0.075	0.00295	0.85	0.03346	24	0.9446	58	2.2835	92	3.622
0.08	0.00315	0.9	0.03543	25	0.9843	59	2.3228	93	3.6614
0.085	0.00335	0.95	0.0374	26	1.0236	60	2.3622	94	3.7008
0.09	0.00354	1	0.03937	27	1.063	61	2.4016	95	3.7402
0.095	0.00374	1.1	0.04331	28	1.1024	62	2.4409	96	3.7795
0.1	0.00394	1.2	0.04724	29	1.1417	63	2.4803	97	3.8189
0.105	0.00413	1.25	0.04921	30	1.1811	64	2.5197	98	3.8583
0.11	0.00433	1.5	0.05906	31	1.2205	65	2.5591	99	3.8976
0.115	0.00453	2	0.0787	32	1.2598	66	2.5984	100	3.937
0.12	0.00472	2.5	0.09843	33	1.2992	67	2.6378	110	4.3307
0.125	0.00492	3	0.1181	34	1.3386	68	2.6772	120	4.7244
0.13	0.00512	3.5	0.1378	35	1.378	69	2.7165	130	5.1181
0.14	0.00551	4	0.1575	36	1.4173	70	2.7559	140	5.5118
0.15	0.00591	4.5	0.17717	37	1.4567	71	2.7953	150	5.9055
0.16	0.0063	5	0.1969	38	1.4961	72	2.8346	160	6.2992
0.16	0.0063	5.5	0.21654	39	1.5354	73	2.874	170	6.6929
0.18	0.00709	6	0.2362	40	1.5748	74	2.9134	180	7.0866
0.2	0.00787	7	0.2756	41	1.6142	75	2.9528	190	7.4803
0.22	0.00866	8	0.315	42	1.6535	76	2.9921	200	7.874
0.24	0.00945	9	0.3543	43	1.6929	77	3.0315	210	8.2677
0.25	0.00984	10	0.3937	44	1.7323	78	3.0709	220	8.6614
0.26	0.01024	11	0.4331	45	1.7717	79	3.1102	230	9.0551
0.28	0.01102	12	0.4724	46	1.811	80	3.1496	240	9.4488
0.3	0.01181	13	0.5118	47	1.8504	81	3.189	250	9.8425
0.35	0.01378	14	0.5512	48	1.8898	82	3.2283	260	10.2362
0.4	0.01575	15	0.5906	49	1.9291	83	3.2677	270	10.6299
0.45	0.01772	16	0.6299	50	1.9685	84	3.3071	280	11.0236
0.5	0.01969	17	0.6693	51	2.0079	85	3.3465	290	11.4173
0.55	0.02165	18	0.7087	52	2.0472	86	3.3858	300	11.811

Convert Inches to Millimeters: Inches x 25.4 Convert Millimeters to Inches: Millimeters x .03937

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Inch and Millimeter Equivalency Chart

Fraction	Decimal	Millimeter	Fraction	Decimal	Millimeter	Fraction	Decimal	Millimeter
1/64	0.015625	0.39688	23/64	0.359375	9.12814	45/64	0.703125	17.85941
1/32	0.031250	0.79375	3/8	0.375000	9.52502	23/32	0.718750	18.25629
3/64	0.046875	1.19063	25/64	0.390625	9.92189	47/64	0.734375	18.65316
1/16	0.062500	1.58750	13/32	0.406250	10.31877	3/4	0.750000	19.05004
5/64	0.078125	1.98438	27/64	0.421875	10.71565	49/64	0.765625	19.44691
3/32	0.093750	2.38125	7/16	0.437500	11.11252	25/32	0.781250	19.84379
7/64	0.109375	2.77813	29/64	0.453125	11.50940	51/64	0.796875	20.24067
1/8	0.125000	3.17501	15/32	0.468750	11.90627	13/16	0.812500	20.63754
9/64	0.140625	3.57188	31/64	0.484375	12.30315	53/64	0.828125	21.03442
5/32	0.156250	3.96875	1/2	0.500000	12.70003	27/32	0.843750	21.43129
11/64	0.171875	4.36563	33/64	0.515625	13.09690	55/64	0.859375	21.82817
3/16	0.187500	4.76251	17/32	0.531250	13.49378	7/8	0.875000	22.22504
13/64	0.203125	5.15939	35/64	0.546875	13.89065	57/64	0.890625	22.62192
7/32	0.218750	5.55626	9/16	0.562500	14.28753	29/32	0.906250	23.01880
15/64	0.234375	5.95314	37/64	0.578125	14.68440	59/64	0.921875	23.41567
1/4	0.250000	6.35001	19/32	0.593750	15.08128	15/16	0.937500	23.81255
17/64	0.265625	6.74689	39/64	0.609375	15.47816	61/64	0.953125	24.20942
9/32	0.281250	7.14376	5/8	0.625000	15.87503	31/32	0.968750	24.60630
19/64	0.296875	7.54064	41/64	0.640625	16.27191	63/64	0.984375	25.00318
5/16	0.312500	7.93752	21/32	0.656250	16.66878	1	1.000000	25.40005
21/64	0.328125	8.33439	43/64	0.671875	17.06566			
11/32	0.343750	8.73127	11/16	0.687500	17.46253			

EN 10204 Inspection Documents

EN 10204 Reference		Document Content	Document Validated By
Type 2.1	Declaration of compliance with order	Statement of compliance with order	The manufacturer
Type 2.2	Test report	Statement of compliance with order, with indication of results of nonspecific inspection	The manufacturer
Type 3.1	Inspection certificate 3.1	Statement of compliance with order, with indication of results of specific inspection	The manufacturer's authorized inspection representative, independent of the manufacturing department
Type 3.2	Inspection certificate 3.2	Statement of compliance with order, with indication of results of specific inspection	Manufacturer's authorized inspection representative independent of the manufacturing department and either the purchaser's authorized inspection representative or the inspector designated by the official regulations

This chart is for informational purposes only



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Weight Conversion for Steel to Other Metals

Multiply Steel Weight By		Multiply Steel Weight By		Multiply Steel Weight By		Multiply Steel Weight By		Multiply Steel Weight By	
Aluminum		Aluminum		Stainless		Nickel		Hastelloy	
1100	0.3462	5052	0.3427	300 Series	1.0100	600	1.0720	C-276	1.1320
2011	0.3604	5083	0.3392	400 Series	1.0000	625	1.0750	B-2	1.1740
2014	0.3568	6061	0.3462	Nickel		800	1.0120	Titanium	
2017	0.3568	6063	0.3462	200	1.1320	904L	1.0260	Brass	
2024	0.3533	7075	0.3568	400	1.1250			Copper	
3003	0.3498								

Mill Finishes of Stainless Steel Sheet and Plate

Mill finishes in the hot or cold rolled state are the basic supply condition for all stainless steel sheet and plate. They are used worldwide in standard building components and architectural requirements in areas where a subsequent finishing process is needed to alter the surface.

To maximize resistance to corrosion in the as-supplied condition the mill finish surfaces are acid cleaned (pickled) to remove scale that will form during the hot rolling and annealing process.

Four particular surface designations that are important in building and architectural applications are 1D, 2D, 2B and 2R.

1D

Hot rolled and annealed (pickled) with mill scale removed. This surface found on thicker plates will be slightly coarse with very low reflectivity. This is primarily used in non-decorative applications where the visual appearance is less relevant.

2D

This finish is more refined than the 1D and is done by cold rolling, heat treating and pickling. This will have a low reflective matte surface appearance used mainly in industrial and engineering applications. This finish is suitable for less critical aesthetic architectural applications.

2B

Smoother than 2D finish, achieved by a final light rolling using highly polished rolls that will give a smooth reflective, grey sheen appearance. This is a cold rolled, heat treated, pickled and skin passed process. This is a widely used surface finish and the starting point for most polished and brushed finishes.

2R

This finish is cold rolled, bright annealed done under oxygen-free atmospheric conditions then is passed through polished rollers to achieve a high reflective finish. This finish will reflect clear images, is ultra-smooth, is less likely to harbor airborne contaminants or moisture and is easy to clean.

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Technical Grade Designations

The guide below has been prepared to assist our customers with information on the different symbols used within the European specification EN 10025 and showing different structural grades.

Informational use only.

Symbols used in EN 10025-2

(Non-alloy structural steel)

S...	Structural Steel
E...	Engineering Steel
.235...	Minimum yield strength in N/mm2
...JR..	Longitudinal Charpy V-notch impacts 27 J @ +20 deg. C
...J0..	Longitudinal Charpy V-notch impacts 27 J @ 0 deg. C
...J2..	Longitudinal Charpy V-notch impacts 27 J @ -20 deg. C
...K2..	Longitudinal Charpy V-notch impacts 40 J @ -20 deg. C
...+AR	Supply condition as rolled
...+N	Supply condition normalised or normalised rolled
...C..	Grade suitable for cold forming
...Z..	Grade with improved properties perpendicular to the surface

Examples: S235JR +AR, S355K2C+N

Symbols used in EN 10025-3

(Normalised/normalised rolled weldable fine grain structural steels)

S...	Structural Steel
.275...	Minimum yield strength in N/mm2
...N..	Longitudinal Charpy V-notch impacts, temperature not lower than -20 deg. C
...NL..	Longitudinal Charpy V-notch impacts, temperature not lower than -50 deg. C
...Z..	Grade with improved properties perpendicular to the surface

Examples: S275N, S420NL Z35

Symbols used in EN 10025-4

(Thermomechanically rolled weldable fine grain structural steels)

S...	Structural Steel
.275...	Minimum yield strength in N/mm2
...M..	Longitudinal Charpy V-notch impacts, temperature not lower than -20 deg. C
...ML..	Longitudinal Charpy V-notch impacts, temperature not lower than -50 deg. C
...Z..	Grade with improved properties perpendicular to the surface

Examples: S355M, S460ML Z25

Symbols used in EN 10025-5

(Structural steels with improved atmospheric corrosion resistance, known as weathering steels)

S...	Structural Steel
.355...	Minimum yield strength in N/mm2
...J0..	Longitudinal Charpy V-notch impacts 27 J @ 0 deg. C
...J2..	Longitudinal Charpy V-notch impacts 27 J @ -20 deg. C
...K2..	Longitudinal Charpy V-notch impacts 40 J @ -20 deg. C
...W..	Improved atmospheric corrosion resistance
...P..	Greater phosphorus content (grade S355 only)
...+AR	Supply condition as rolled
...+N	Supply condition normalised or normalised rolled
...Z..	Grade with improved properties perpendicular to the surface

Examples: S235J0W+AR, S355K2W+N Z25

Symbols used in EN 10025-6

(Flat products of high yield strength structural steels quenched and tempered condition)

S...	Structural Steel
.460...	Minimum yield strength in N/mm2
...Q..	Longitudinal Charpy V-notch impacts, temperature not lower than -20 deg. C
...QL..	Longitudinal Charpy V-notch impacts, temperature not lower than -40 deg. C
...QL1..	Longitudinal Charpy V-notch impacts, temperature not lower than -60 deg. C
...Z..	Grade with improved properties perpendicular to the surface

Examples: S460Q, S690QL

This guide is provided to Parker Steel's customers to give guidance only on the symbols used with the EN 10025 specification. We do not accept liability for any inadvertent errors.

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CUTTING SERVICES

Plate Shearing – Our 12-foot Cincinnati Shear can shear material as thin as 2mm thick in carbon steel, stainless steel and aluminum sheet, and up to 14mm thick for carbon steel and aluminum plate or 12mm thick for stainless steel. Set-up and cut charges will be applied to each order. A pre-cut stocking program is being developed. Please contact sales for more information.

Production Saw Cutting – Our cut tolerance is $+1/8" / -0"$ ($+03/-0$ mm) for production cut saw. We do not charge to cut items for shipping purposes however, additional charges may apply for production cuts (multiple precision cuts).

Plate Plasma Cutting We have upgraded our plasma cutting unit to a Hypertherm 125. This means that we can support straight-line cuts on plate, regardless of grade, up to 55mm thick. We stock plate in various thicknesses, grades and physical dimension sizes, and we will straight-line cut plate for shipping purposes. Our tolerance on plate cuts is $-0" / +0.125"$

PACKING SERVICES

Crates – Our pre-made, high-quality crates are made to withstand long truck shipments and are ISPM 15 compliant. All non-crated material is placed in heavy-duty tubing or other wood packaging using metal bindings and strong plastic reinforcements. Parker Steel cannot be held responsible for damage due to driver mishaps or any cargo-related incident. In the case of product damage due to carrier mishandling or accident, which is properly documented, the carrier involved will be liable.

Specialty Metal Packaging – Parker Steel recognizes the strict requirements of the Food, Chemical, and medical industries. We have the appropriate materials needed to package and handle these sensitive products, such as special banding metals or plastics and markers. Please be sure to let your salesperson know the requirements you need.

MATERIAL CERTIFICATION for material is available upon request.

CUT TO SHIP – We do not charge to cut to ship orders; however, additional charges may apply for production cuts (multiple precision cuts). Our cut-to-ship tolerance is $\pm 1"$ (± 25.4 mm).

QUOTING SERVICES

Online RFQ, Email, Fax or Call – For a fast quote that will generally be answered within two business hours, you can fill out our online request form at www.metricmetal.com/request-quote or email our Sales Department at Sales@MetricMetal.com or fax your request to 419-471-2655, you can also call our toll free customer service number at 1-800-333-4140.

SHIPPING SERVICES

Truck Shipments – We ship our product both by commercial truck carriers and UPS. Speak with a member of our Sales Team for any special requirements (your designated carrier and/or air freight), and we will strive to accommodate your needs.

*Shipping Damage Claim: It is important to note on receiving papers any damage to the cargo that incurred while in transit via commercial truck carriers.

Shipping / Receiving Hours

Shipping: Mon-Fri from 8:00 am – 6:30 pm EDT.

Receiving: Mon-Fri from 8:00 am – 2:00 pm EDT.

TRACEABILITY

Parker Steel maintains the mill heat traceability of our products.

Reference Guide is also available online

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