

CARBON ALLOY

Although carbon alloy is produced to commercial specification for the automotive and oil tool industries, we are primarily involved with the supply of these materials to aircraft or military specification. These grades of steels have had Chromium, Nickel and/or Molybdenum added to facilitate heat treatment. Carbon alloy is produced in the form of round, square, flat and hex bar, as well as in tubing, sheet and plate. The material is available in the following physical and surface conditions, although a particular size will not be available in all conditions from stock.

The following is a summary of the symbols used in military (MIL) specifications to designate various conditions of materials.

Physical Condition

A – As Forged
 B – As Rolled
 C – Annealed
 D – Normalized
 E – Normalized & Tempered
 F – Quenched & Tempered

Surface Condition

1 – As Forged or Rolled
 2 – Pickled or Blast Cleaned
 3 – Rough Turned
 4 – Cold Finished
 5 – Turned, Ground & Polished

The following is a listing of the most common grades of aircraft quality carbon alloy and some of the specifications to which they are standardly produced for stock.

ALLOY	SPECIFICATIONS
E-4130	MIL-S-6758, AMS-6370, AMS-2301
E-4130 H.T.R.C. 26/32	MIL-S-6758, AMS-2301, EMS-626A
E-4140	MIL-S-5626, AMS-6382, AMS-2301
E-4330 Mod N&T	MIL-S-8699, AMS-6427, AMS-2301, BMS-7-27
E-4330 Mod. Vac. Melt. N&T	MIL-S-8699, AMS-6411, AMS-6427 BMS-7-27, AMS-2300, BMS-7-122, EMS-96242, GM-1010, CE-0906, FMS-1012
E-4340 N&T	MIL-S-5000, AMS-6415, AMS-2301
E-4340 Vac. Melt. N&T	MIL-S-8844 CL 1, MIL-S-5000, AMS-6415, AMS-2300, AMS-6414, EMS-641, DMS-1555, BMS 7-28, BPS 299-947-055
E-4340 Mod. Vac. Melt N&T "300M"	MIL-S-8844-CL 3, MIL-S-83135, AMS-6417, AMS-6419, AMS-2300, EMS-96244, CE-0896, GM-1012, BMS 7-26 CL-1, STM-05-501, DMS-1935, LC05-1190
E-4620	MIL-S-7493, AMS-6294, AMS-2301
E-6150	MIL-S-8503, AMS-6448, AMS-2301
E-8740	MIL-S-6049, AMS-6322, AMS-2301
E-9310 N&T	MIL-S-7393C, AMS-6260, AMS-2301, Alres, HT 5042
E-9310 N&T Vac. Melt.	MIL-S-7393C, AMS-6265, AMS-6260, AMS-2300, BMS 7-249, Alres, HT-5042, BPS 299-947-032, MIL-S-83030 Comp. 3, AMS 6267
E-52100	MIL-S-7420, AMS-6440, AMS-2301
E-52100 Vac. Melt.	MIL-S-7420, AMS-6444, AMS-6440, AMS-2300
D6AC Vac. Melt.	MIL-S-8949, AMS-6431, Gen. Dyn. FMS-1011-C, LCM-05-2190, AMS-2300, STM-05-500, GM-1013
H-11 Vac. Melt.	AMS-6487, EMS 642, AMS 2300, AMS 6488
Hy-Tuf	MIL-S-7106, AMS-6418, AMS-2301, DMS-1841, GR B
Hy-Tuf Vac. Melt.	AMS 6418, MIL-5-7108, DMS 1841 GR A, AMS 2300
Nitriding BHN 241-285	MIL-S-6709A, AMS-6470 Exc. Hardness, AMS-6472, AMS-2301
Nitriding Vac. Melt.	MIL-S-6709A, AMS-6471-B 135 Modified, AMS-2300
9-4-30 Vac. Melt.	AMS 6526, BMS-7-182B, STO-160-LB-0012, MMS-2102 Exc. Fracture Test

AIRCRAFT QUALITY CARBON ALLOY

Aircraft quality bars are produced in twelve foot random lengths. Listed below are the standard stock sizes.

ROUND BAR											
Size in Inches	Est. Wt. Lbs.		Size in Inches	Est. Wt. Lbs.		Size in Inches	Est. Wt. Lbs.		Size in Inches	Est. Wt. Lbs.	
	per foot	12-ft. Bar		per foot	12-ft. Bar		per foot	12-ft. Bar		per foot	12-ft. Bar
¼	.1671	2.005	1½	6.014	72.17	3⅞	30.45	365.3	6¾	121.8	1461
⅓	.2610	3.132	1⅝	7.058	84.70	3½	32.74	392.9	7	131.0	1572
⅜	.3759	4.510	1¾	8.186	98.23	3⅝	35.12	421.5	7½	150.4	1804
7/16	.5116	6.139	1⅞	9.397	112.8	3¾	37.59	451.0	8	171.1	2053
½	.6682	8.019	2	10.69	128.3	4	42.77	513.2	8¼	181.9	2183
9/16	.8457	10.15	2⅛	12.07	144.8	4¼	48.28	579.3	8½	193.1	2317
5/8	1.044	12.53	2¼	13.53	162.4	4½	54.13	649.5	9	216.5	2598
11/16	1.263	15.16	2⅜	15.08	180.9	4¾	60.31	723.7	9½	241.2	2895
¾	1.504	18.04	2½	16.71	200.5	5	66.82	801.9	10	267.3	3207
13/16	1.765	21.17	2⅝	18.42	221.0	5¼	73.67	884.0	10½	294.7	3536
7/8	2.046	24.56	2¾	20.21	242.6	5½	80.86	970.2	11	323.4	3881
15/16	2.349	28.19	2⅞	22.09	265.1	5¾	88.37	1060	11½	353.5	4242
1	2.673	32.07	3	24.06	288.7	6	96.22	1155	12	384.9	4619
1⅛	3.383	40.59	3⅛	26.10	313.2	6¼	104.4	1253	12½	417.6	5012
1¼	4.176	50.12	3¼	28.23	313.8	6½	112.9	1355	14	523.9	6287
1⅝	5.053	60.64									

HEX BAR					
Size in Inches	Est. Wt. Lbs.		Size in Inches	Est. Wt. Lbs.	
	per foot	12-ft. Bar		per foot	12-ft. Bar
¼	.1842	2.210	15/16	2.590	31.08
5/16	.2878	3.454	1	2.947	35.37
3/8	.4145	4.973	1 1/16	3.327	39.93
7/16	.5641	6.769	1 1/8	3.730	44.76
½	.7368	8.842	1 3/16	4.156	49.87
9/16	.9325	11.19	1¼	4.605	55.26
5/8	1.151	13.82	1 5/16	5.077	60.93
11/16	1.393	16.72	1⅜	5.572	66.87
¾	1.658	19.89	1 7/16	6.090	73.08
13/16	1.946	23.35	1½	6.631	79.56
7/8	2.257	27.08	1⅝	7.783	93.39

SQUARE BAR					
Size in Inches	Est. Wt. Lbs.		Size in Inches	Est. Wt. Lbs.	
	per foot	12-ft. Bar		per foot	12-ft. Bar
3/8	.4790	5.74	2	13.61	163.4
½	.8508	10.21	2¼	17.23	206.7
5/8	1.329	15.95	2½	21.27	255.2
¾	1.914	22.97	3	30.63	367.5
1	3.403	40.84	3½	41.69	500.3
1¼	5.318	63.81	4	54.45	653.4
1½	7.657	91.89	5	85.08	1021
1¾	10.42	125.1	6	122.5	1470