

SAE BAR COMPOSITIONS

Standard Alloy Steels Basic Oxygen and Electric Furnace

(Continued)

STANDARD BORON STEELS Boron content of 0.0005% to 0.003%

SAE No.	C	Mn	Si	Ni	Cr	Mo
50B40	.38-0.43	0.75-1.00	15-35	—	40-60	—
50B44	.43-0.48	0.75-1.00	15-35	—	40-60	—
50B46	.44-0.49	0.75-1.00	15-35	—	20-35	—
50B50	.48-0.53	0.75-1.00	15-35	—	40-60	—
50B60	.56-0.64	0.75-1.00	15-35	—	40-60	—
51B60	.56-0.64	0.75-1.00	15-35	—	70-90	—
81B45	.43-0.48	0.75-1.00	15-35	20-40	35-55	.08-15
86B45	.43-0.48	0.75-1.00	15-35	40-70	40-60	.15-25
94B15	.13-0.18	0.75-1.00	15-35	30-60	30-50	.08-15
94B17	.15-0.20	0.75-1.00	15-35	30-60	30-50	.08-15
94B30	.28-0.33	0.75-1.00	15-35	30-60	30-60	.08-15

NOTE: Phosphorus is 0.35% max., sulfur, 0.040% max.

NOTES ON ALLOY STEELS

NOTE 1: Grades shown with prefix letter E are normally made by the electric furnace process. All others are normally manufactured by basic oxygen processes but may be manufactured by the electric furnace process with adjustments in phosphorus and sulfur.

NOTE 2: Phosphorus and sulfur limits for each process are:

Steel Making Process	Maximum Percent	
	P	S
Basic electric furnace	0.025	0.025
Basic oxygen	0.040	0.050

NOTE 3: Small quantities of certain elements are present in alloy steels which are not specified or required. Elements considered incidental which may be present to the following maximum amounts: copper, 0.35%; nickel, 0.25%; chromium, 0.20%; and molybdenum, 0.06%, per ASTM A304.

NOTE 4: Where minimum and maximum sulfur content is shown it is indicative of resulfurized steel.

NOTE 5: Standard alloy steels can be produced with a lead range of 0.15 to 0.35%. Such steels are identified by inserting the letter "L" between the second and third numerals of the SAE number (example: 41L40). Ladle analysis for lead is not determinable since lead is added to the ladle stream while ingot is poured.

SAE PLATE COMPOSITIONS

Standard Alloy Steels Basic Oxygen and Electric Furnace

(For electric furnace steel see note d)

SAE No.	C	Mn	Ni	Cr	Mo	Other Elements
4130	.27-0.34	.35-0.60	—	80-1.15	.15-0.25	a, b
4140	.36-0.44	.70-1.00	—	80-1.15	.15-0.25	a, b
E4150	.46-0.54	.75-1.10	—	80-1.15	.15-0.25	b, e
4340	.36-0.44	.55-0.80	1.65-2.00	60-0.90	20-0.30	a, b
6150	.46-0.54	.60-0.90	—	80-1.15	—	a, b, c
8615	.12-0.18	.60-0.90	.40-0.70	.35-0.60	.15-0.25	a, b
8617	.15-0.21	.60-0.90	.40-0.70	.35-0.60	.15-0.25	a, b
8620	.17-0.23	.60-0.90	.40-0.70	.35-0.60	.15-0.25	a, b

(a) Phosphorus content is 0.035% maximum, sulfur, 0.40%.

(b) Silicon content is 0.15-0.40.

(c) Vanadium content is 0.15% minimum.

(d) When electric furnace steel is ordered, the carbon range is restricted 0.01%, manganese 0.05%, chromium 0.05% up to 1.25%, incl., and 0.10% over 1.25%. The maximum phosphorus and sulphur is 0.025% each.

(e) Phosphorus and sulfur content is .025% max.