AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS6412B

Issued 1-23-40
Revised 8-1-45

STEEL
1.8 Ni .8 Cr .25 Mo (.35-.40C)

1. ACKNOWLEDGMENT: Vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. FORM: Bars, billets, forgings, or as ordered.

3. COMPOSITION:

		Individual Bar Check Analysis Over or Under
Carbon	0.35 - 0.40	0.02
Manganese	0.60 - 0.80	0.03
Phosphorus	0.040 max	0.005
Sulphur	0.040 max	0.005
Silicon	0.20 - 0.35	0.02
Nickel	1.65 - 2.00	0.05
Chromium	0.70 - 0.90	0.03
Molybdenum	0.20 - 0.30	0.02

4. GRAIN SIZE: 5 or finer, ASTM E19-39T, method a, unless otherwise specified. A heat of steel predominately 5 or finer with grains as large as 3 is permissible.

5. HARDENABILITY: The hardenability shall be J50=10 min. when determined by the standard end-quench test specimen in accordance with the SAE Method of Determining Hardenability published in the latest revision of the SAE Handbook, except that the steel shall be normalized at 1700°F ± 10 and the test specimen austenitized at 1525°F ± 10.

6. CONDITION: (a) Unless otherwise specified, bar stock shall be supplied in a machinable condition with a hardness of not more than Brinell 229, except that if cold drawn stock is ordered, a hardness of Brinell 248 is permissible.

(b) Stock ordered for forging shall be supplied in the condition and finish ordered by the forging manufacturer.

(c) Forgings shall be supplied as ordered.

7. DECARBURIZATION: (a) Bars ordered ground, turned or polished shall not be decarburized.

(b) Allowable decarburization of bars ordered for redrawing, forging, or to specified microstructural requirements shall be as agreed between purchaser and vendor.

7. DECARBURIZATION: (continued)

(c) Decarburization of all bars to which (a) or (b) above is not applicable shall be not greater than the following:

Nominal Diameter or Distance Between Opposite Faces of Bar -- Inches	Maximum Depth of Decarburization Inch
Up to 0.375, incl.	0.010
Over 0.375 to 0.500, incl.	0.012
Over 0.500 to 0.625, incl.	0.014
Over 0.625 to 1.00 , incl.	0.017
Over 1.00 to 1.50 , incl.	0.020
Over 1.50 to 2.00 , incl.	0.025
Over 2.00 to 2.50 , incl.	0.030
Over 2.50 to 3.00 , incl.	0.035

(d) Decarburization shall be measured by the microscopic method or by Rockwell Superficial 30N scale hardness method, or equivalent hardness testing method, on quenched specimens. Depth of decarburization is defined as the distance measured from the nearest original surface to the point at which no increase in hardness is found.

8. QUALITY: (a) Steel shall be aircraft quality. It shall be uniform in quality and condition, clean, sound, and free from foreign material and from internal and external defects which adversely affect its strength or machinability. Material revealing defects during fabrication shall be subject to rejection.

(b) Steel and parts made therefrom shall be subject to any method of inspection which will reveal defects.

9. TOLERANCES: Unless otherwise specified, tolerances shall conform to AMS 2251 as applicable and/or as specified below:

(a) Cold finished and all hexagons shall conform to Table I, column headed "Mean of Carbon .45% and less".

10. REPORTS: (a) Unless otherwise specified, the vendor of steel or forgings shall furnish three copies of a notarized report of the chemical composition, grain size and hardenability results of each heat in each shipment. This report shall include the purchase order number, heat number, material specification number, size, and quantity in each heat. If forgings are supplied, the part number and size of steel used to make the forgings shall also be included.

(b) Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a notarized report showing the purchase order number, material specification number, contractor or other direct supplier of material, part number, and quantity. When material for making parts is supplied by the parts vendor, the vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the above report a certification that the material conforms, or shall include copies of the laboratory report showing the results of tests to determine conformance.