AEROSPACE
MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York, N.Y. 10017

AMS 6327D
Superseding AMS 6327C

Issued 9-1-42
Revised 9-30-66

STEEL BARS AND FORGINGS
0.50Cr - 0.55Ni - 0.25Mo (0.38 - 0.43C) (SAE 8740)
Heat Treated (125,000 psi Tensile)

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

2. FORM: Bars and forgings up to 1-1/2 in., incl, in section thickness, and forging stock.

3. APPLICATION: Primarily for parts, such as nuts, bolts, and screws, requiring a minimum tensile Ø strength of 125,000 psi.

4. COMPOSITION:

	min	max
Carbon	0.38	0.43
Manganese	0.75	1.00
Silicon	0.20	0.35
Phosphorus	--	0.025
Ø Sulphur	--	0.025
Chromium	0.40	0.60
Nickel	0.40	0.70
Molybdenum	0.20	0.30
Copper	--	0.35

4.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2259, Ø paragraph titled "Low Alloy Steels".

5. CONDITION:

Ø 5.1 Bars and Forgings: Hardened and tempered, and cleaned.

Ø 5.2 Forging Stock: As ordered by the forging manufacturer.

6. TECHNICAL REQUIREMENTS: When ASTM methods are specified for determining conformance to the Ø following requirements, tests shall be conducted in accordance with the issue of the ASTM method listed in the latest issue of AMS 2350.

6.1 Heat Treatment: Bars and forgings shall be hardened by quenching from 1550 F ± 25 (843.3 C ± 14) Ø and tempered as required.

6.2 Tensile Properties: Test specimens cut from bars and forgings shall conform to the following requirements:

Tensile Strength, psi	125,000 min
Yield Strength at 0.2% Offset or at 0.0108 in. in 2 in. Extension Under Load (E = 29,500,000), psi	100,000 min
Elongation, % in 2 in. or 4D	16 min
Reduction of Area, %	50 min

6.3 Hardness: Bars and forgings shall have hardness of Brinell 262 - 311 at any location, unless otherwise specified.

6.4 Grain Size: Predominantly 5 or finer with occasional grains as large as 3 permissible, ASTM E112, Ø McQuaid-Ehn test.

6.5 Decarburization:

6.5.1 Bars ordered ground, turned, or polished shall be free from decarburization on the ground, turned, or polished surfaces.

6.5.2 Allowable decarburization of forgings shall be as specified on drawings or as agreed upon by purchaser Ø and vendor.

6.5.3 Decarburization of bars to which 6.5.1 is not applicable shall be not greater than the following:

Nominal Diameter or Distance Between Parallel Sides Inches	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 1.000, incl	0.017
Over 1.000 to 1.500, incl	0.020

6.5.4 Unless otherwise agreed upon by purchaser and vendor, decarburization shall be measured by the microscopic method or by Rockwell Superficial 30-N scale hardness method, or equivalent hardness testing method, on hardened but untempered specimens protected during heat treatment to prevent Ø changes in surface carbon content. Depth of decarburization, when measured by a hardness method, is defined as the perpendicular distance from the surface to the nondecarburized depth under that surface below which there is no further increase in hardness. Such measurements shall be far enough away from any adjacent surface to be uninfluenced by any decarburization or lack of decarburization thereon.

6.5.5 When determining the depth of decarburization, it is permissible to disregard local areas provided Ø the decarburization of such areas does not exceed the above limits by more than 0.005 in. and the width is 0.065 in. or less.

7. QUALITY: Steel shall be aircraft quality and shall conform to the requirements of the latest issue of Ø AMS 2301. The product shall be uniform in quality and condition, sound, and free from foreign materials and from internal and external imperfections detrimental to fabrication or to performance of parts.

8. TOLERANCES: Unless otherwise specified, tolerances shall conform to all applicable requirements of Ø the latest issue of AMS 2251.

9. REPORTS:

9.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report of the results of tests for chemical composition, grain size, and AMS 2301 frequency-severity Ø rating for each heat and for tensile properties of each size from each heat in the shipment. This report shall include the purchase order number, heat number, material specification number, size, and quantity from each heat. If forgings are supplied, the part number and size of stock used to make the forgings shall also be included.