AEROSPACE
MATERIAL SPECIFICATIONS
SOCIETY OF AUTOMOTIVE ENGINEERS, Inc. 485 Lexington Ave., New York 17, N.Y.

AMS 5644B
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STEEL, BARS AND FORGINGS, CORROSION RESISTANT
17Cr - 7Ni - 1Al

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

2. FORM: Bars, forgings, and forging stock.

3. APPLICATION: Primarily for parts requiring corrosion resistance and high strength up to 600 F (315 C), and where such parts may require welding during fabrication.

4. COMPOSITION:

Carbon	0.09 max
Manganese	1.00 max
Silicon	1.00 max
Phosphorus	0.040 max
Sulfur	0.030 max
Chromium	16.00 - 18.00
Nickel	6.50 - 7.75
Aluminum	0.75 - 1.50

4.1 Check Analysis: Composition variations shall meet the requirements of the latest issue of AMS 2248.

5. CONDITION:

5.1 Bars: Solution heat treated at 1900 F ± 25 (1037.8 C ± 14) and water quenched, having hardness as indicated below when tested midway between center and surface.

5.1.1 Rounds: Unless otherwise specified ground, turned, or polished, having hardness not higher than Brinell 229 or equivalent, except that rounds ordered cold drawn for size after solution heat treatment may have hardness not higher than Brinell 255 or equivalent.

5.1.2 Hexagons: Cold drawn for size after solution heat treatment, having hardness not higher than Brinell 255 or equivalent.

5.1.3 Flats: Unless otherwise specified hot finished and descaled, having hardness not higher than Brinell 229 or equivalent, except that flats ordered cold drawn for size after solution heat treatment may have hardness not higher than 255 Brinell or equivalent.

5.2 Forgings: Unless otherwise specified, solution heat treated at 1900 F ± 25 (1037.8 C ± 14) and water quenched, having hardness not higher than Brinell 229 or equivalent.

5.3 Forging Stock: As ordered by the forging manufacturer.

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6. TECHNICAL REQUIREMENTS: Material shall conform to the following requirements after heating at 1400 F ± 25 (760 C ± 14) for 1-1/2 hr, cooling to 55 F ± 5 (12.8 C ± 2.8) within 1 hr, holding at that temperature for not less than 30 min., followed by heating rapidly to 1050 F ± 10, (565.6 C ± 5.6), holding at that temperature for 1-1/2 hr, and cooling.

6.1 Bars:

6.1.1 Tensile Properties:

Tensile Strength, psi	170,000 min
Yield Strength at 0.2% Offset or at 0.0133 in. in 2 in. Extension Under Load (E = 30,000,000), psi	140,000 min
Elongation, % in 4D	6 min
Reduction of Area, %	25 min

6.1.2 Hardness: Not lower than Brinell 363 or equivalent.

6.2 Forgings:

6.2.1 Hardness: Not lower than Brinell 363 or equivalent.

7. QUALITY: Material shall be uniform in quality and condition, clean, 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 for bars shall conform to all applicable requirements of the latest issue of AMS 2241.

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 of each heat in the shipment and the results of tests on each size from each heat to determine conformance to the technical requirements of this specification. 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.

9.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a 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 produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.