

AERONAUTICAL MATERIAL SPECIFICATIONS

AMS 5743A

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

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STEEL, CORROSION AND MODERATE HEAT RESISTANT
15.5Cr - 4.5Ni - 2.9Mo - 0.1N

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 and assemblies requiring high strength and oxidation resistance up to 800 F.

4. COMPOSITION:

Carbon	0.10 - 0.15
Manganese	0.50 - 1.25
Silicon	0.50 max
Phosphorus	0.040 max
Sulfur	0.030 max
Chromium	15.00 - 16.00
Nickel	4.00 - 5.00
Molybdenum	2.50 - 3.25
Nitrogen	0.07 - 0.13

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

∅ 5. CONDITION: Unless otherwise specified, material shall be supplied in the following condition:

∅ 5.1 Bars and Forgings: Equalized and overtempered, and descaled, except as specified below:

5.1.1 Round Bars: Shall be ground, turned, or polished after heat treatment.

5.1.2 Squares, Hexagons, and Octagons: Shall be cold finished prior to heat treatment.

5.1.3 Flats: Shall be hot finished prior to heat treatment.

5.2 Forging Stock: As ordered by the forging manufacturer.

6. TECHNICAL REQUIREMENTS:

∅ 6.1 Heat Treatment: Unless otherwise specified, the product shall be equalized by heating to $1425\text{ F} \pm 50$, holding at heat for 3 - 4 hr, and cooling in air to 80 F or lower, and overtempered by heating to $1050\text{ F} \pm 25$, holding at heat for 3 hr, and cooling in air.

∅ 6.2 Hardness: Shall be not higher than Brinell 363 or equivalent.

6.3 Properties After Austenite Conditioning, Sub-Zero Cooling, and Tempering: Material heat treated as in 6.1 and then austenite conditioned by heating to $1710\text{ F} + 25$, holding at heat for not less than 1 hr per inch of cross section, and quenching in water or otherwise cooling as rapidly as possible to room temperature; cooled to not higher than -100 F , held at this temperature for not less than 3 hr, and warmed to room temperature; and then tempered by heating to $850\text{ F} + 25$, holding at heat for not less than 3 hr, and cooling in air shall be capable of meeting the following requirements:

6.3.1 Tensile Properties (Longitudinal Direction Only):

	Tensile Strength, psi	200,000 min
	Yield Strength at 0.2% Offset or at 0.0150 in. in 2 in. Extension Under Load ($E = 30,000,000$), psi	165,000 min
∅	Elongation, % in $4D$	10 min
	Reduction of Area, %	12 min

6.3.2 Hardness: Shall be Rockwell C 40 - 50 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 shall conform to the latest issue of AMS 2241 as applicable; diameter, thickness, and width tolerances shall be as specified below.

∅ 8.1 All Bars Other Than Flats: Table I.

∅ 8.2 Flat Bars: Table II.

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, material specification number, heat number, size, and quantity from each heat. If forgings are supplied, serial number of each forging when required 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.