

AERONAUTICAL**MATERIAL SPECIFICATIONS***Cancelled***AMS 4969**

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

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Revised**TITANIUM ALLOY**5.4Al - 1.4Cr - 1.3Fe - 1.25Mo
Annealed - 135,000 psi Yield

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. **FORM:** Forgings and forging stock.
3. **APPLICATION:** Primarily for parts requiring light weight, good corrosion resistance, and moderate strength up to 750 F.
4. **COMPOSITION:** The product shall conform to the following:

		Check Analysis	
		Under Min	or Over Max
Aluminum	4.75 - 6.00	0.40	0.40
Chromium	0.80 - 2.00	0.15	0.15
Iron	0.90 - 1.70	0.15	0.15
Molybdenum	0.80 - 1.70	0.15	0.15
Total Fe + Cr + Mo	3.30 - 4.70	--	--
Oxygen, if determined	0.20 max	--	--
Carbon	0.10 max	--	0.04
Nitrogen	0.07 max	--	0.02
Hydrogen	0.0125 max	--	0.002
Other Impurities, total	0.40 max (1)	--	--
Titanium	remainder	--	--

(1) Need not be reported.

5. **CONDITION:**5.1 **Forgings:** Annealed and descaled, unless otherwise specified.5.2 **Forging Stock:** As ordered by the forging manufacturer.6. **TECHNICAL REQUIREMENTS:**6.1 **Forgings:** The product shall conform to the following requirements, and shall be capable of meeting these requirements after being heated to any temperature up to 1200 F for 30 min. in air, cooled in air, and descaled.

6.1.1 **Tensile Properties:** These properties apply when the rate of strain is maintained at 0.003 - 0.007 in. per in. per min. through the yield strength and then is increased so as to produce failure in approximately one additional minute. When a dispute occurs between purchaser and vendor over the yield strength value, a referee test shall be performed on a test machine having a strain-rate pacer, using a rate of 0.005 in. per in. per min. through the yield strength. These properties apply for section thicknesses 3 in. and under; properties for thicker sections shall be as agreed upon by purchaser and vendor.

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6.1.1 (Cont'd)

Tensile Strength, psi	145,000 min
Yield Strength at 0.2% Offset or at 0.0214 in. in 2 in. Extension Under Load ($E = 15,500,000$), psi	135,000 min
Elongation, % in 4D	10 min
Reduction of Area, %	25 min

6.1.2 Hardness: Not higher than Rockwell C 39 or equivalent.

6.2 Forging Stock: When a sample of stock is forged to a test coupon and annealed, specimens taken from the coupon shall conform to the requirements of 6.1.1 and 6.1.2. If specimens taken from stock after annealing conform to the requirements of 6.1.1 and 6.1.2, the tests shall be accepted as equivalent to tests of the forged coupon.

7. QUALITY: Material shall be produced by multiple melting under vacuum using consumable electrode practice, unless otherwise permitted, and 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. REPORTS:

8.1 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 for tensile properties of each size from each heat. This report shall include the purchase order number, heat number, material specification number, size or part number, quantity from each heat, and specific annealing treatment used.

8.2 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.

9. IDENTIFICATION:

9.1 Forgings: Shall be identified in accordance with the latest issue of AMS 2808.

9.2 Forging Stock: Shall be identified as agreed upon by purchaser and vendor.

10. REJECTIONS: Material not conforming to this specification or to authorized modifications will be subject to rejection.