

# AERONAUTICAL MATERIAL SPECIFICATIONS

AMS 4927

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

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Revised

## TITANIUM ALLOY 5Cr - 3Al

*cancelled*

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number in all quotations and when acknowledging purchase orders.
2. **FORM:** Bars, forgings, and forging stock.
3. **APPLICATION:** Primarily for parts requiring strength up to 700 F and oxidation resistance to 800 F.
4. **COMPOSITION:** The product shall conform to the following:

|                       |            |
|-----------------------|------------|
| Chromium              | 4.5 - 5.5  |
| Aluminum              | 2.5 - 3.5  |
| Oxygen, if determined | 0.20 max   |
| Carbon                | 0.10 max   |
| Nitrogen              | 0.05 max   |
| Hydrogen              | 0.0125 max |
| Other Elements, total | 0.40 max   |
| Titanium              | remainder  |
5. **CONDITION:** Unless otherwise specified, hot finished, with or without subsequent cold reduction, annealed, and descaled.
6. **TECHNICAL REQUIREMENTS:** Materials shall conform to the following requirements, and shall be capable of meeting these requirements after being heated to any temperature up to 700 F or within the range 1300 - 1475 F for approximately 30 min. in air and cooled in air, unless otherwise agreed upon by purchaser and vendor.
  - 6.1 **Tensile Properties:** These properties apply when the rate of strain is maintained through the yield strength between the values of 0.003 in. per in. per min. and 0.007 in. per in. per min., 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 values, 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.
    - 6.1.1 **Bars:**

|                                                                                                    |             |
|----------------------------------------------------------------------------------------------------|-------------|
| Tensile Strength, psi                                                                              | 145,000 min |
| Yield Strength at 0.2% Offset or at 0.0162 in. in 2 in. Extension Under Load (E = 16,700,000), psi | 135,000 min |
| Elongation, % in 4D                                                                                | 10 min      |
| Reduction of Area, %                                                                               | 25 min      |



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**6.1.2 Forgings:** As agreed upon by purchaser and vendor.

**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, diameter or thickness tolerances shall conform to the latest issue of AMS 2241, 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 for tensile properties of each size from each heat. 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.

**10. IDENTIFICATION:** Individual pieces or bundles shall have attached a metal tag stamped with the purchase order number, AMS 4927, nominal size, and heat number, or shall be boxed and the box marked with the same information. In addition to the above identification, bars 1 in. and over in diameter or distance between parallel sides shall be stamped with the heat number within 2 in. of one end.

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