



SAE The Engineering
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400 COMMONWEALTH DRIVE WARRENDALE PA 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 4925B

Issued 11-1-52
Revised 10-1-82

UNS R56440

TITANIUM ALLOY BARS AND FORGINGS
4Al - 4Mn
Annealed, 130,000 psi Yield

This specification was declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of 10-28-68. It is recommended, therefore, that this specification not be specified for new designs.

This cover sheet should be attached to the "B" revision of the subject specification.

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This specification has been declared "CANCELLED" by the Aerospace Materials Division, SAE, as of 10-1-82. By this action, subject specification number and title will be deleted from the active specification index of Aerospace Material Specifications.

It has been indicated by several producers that the subject alloy is no longer being produced.

This specification is under the jurisdiction of AMS Committee "G".

SAE Technical Board rules provide that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade or their use by governmental agencies is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

CANCELLED

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MATERIAL
SPECIFICATION

AMS 4925B

Issued 11-1-52

Revised 3-15-66

TITANIUM ALLOY BARS AND FORGINGS

4Al - 4Mn

Annealed, 130,000 psi Yield

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 strength up to 750 F (399 C).
4. **COMPOSITION:** The product shall conform to the following:

	min	max
Manganese	3.0	5.0
Aluminum	3.0	5.0
Iron	--	0.50
Oxygen, if determined	--	0.20 (1)
Carbon	--	0.15
Nitrogen	--	0.07
Hydrogen	--	0.0125 (125 ppm)
Other Impurities, total	--	0.40 (2)
Titanium	remainder	

(1) Oxygen need not be determined but if found in excess of this limit shall not be cause for rejection if all other requirements of this specification are met.

(2) Need not be reported.

- 4.1 **Check Analysis:** Composition variations shall meet the requirements of the latest issue of AMS 2249.
5. **CONDITION:** Unless otherwise specified, material shall be supplied in the following condition:
 - 5.1 **Bars:** Hot finished, with or without subsequent cold reduction, annealed, and descaled.
 - 5.2 **Forgings:** Annealed and descaled.
6. **TECHNICAL REQUIREMENTS:** Material shall conform to the following requirements and, unless otherwise specified, shall be capable of meeting these requirements at room temperature in specimens, taken from bars or forgings, that have been maintained at $700\text{ F} \pm 10$ ($371.1\text{ C} \pm 5.6$) under an axial stress of 50,000 psi for not less than 100 hours.
 - 6.1 **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 values, a referee test shall be performed on a machine having a strain rate pacer, using a rate of 0.005 in. per in. per min. through the yield strength. These properties apply to section thicknesses 3 in. and under; properties of heavier sections shall be as agreed upon by purchaser and vendor.

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Tensile Strength, psi	140,000 min
Yield Strength at 0.2% Offset or at 0.0208 in. in 2 in. Extension Under Load (E = 15,500,000), psi	130,000 min
Elongation, % in 4D	10 min
Reduction of Area, % (Bar)	25 min
Reduction of Area, % (Forgings)	20 min

6.1.1 When a dispute occurs between purchaser and vendor over the yield strength values, yield strength \emptyset determined by the offset method shall apply.

6.2 Hardness: Shall be not higher than Rockwell C 40 or equivalent.

6.3 Room Temperature Notched Stress-Rupture Test: Specimens taken from bars and forgings shall be capable of meeting the following requirements:

6.3.1 A tensile test specimen machined to the dimensions shown in Fig. 1 and Table I, maintained at room temperature while an axial stress of 160,000 psi is applied continuously, shall not rupture in less than \emptyset 5 hours. The initial stress may be less than 160,000 psi and increased to 160,000 psi in increments of 10,000 psi at intervals of not less than 5 hours. Tests shall be conducted in accordance with the issue of ASTM E139 specified in the latest issue of AMS 2350.

7. QUALITY: Unless otherwise specified, material shall be produced by multiple melting using consumable \emptyset electrode practice; at least one of the melting cycles shall be under vacuum. The product 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 for tensile properties of each size from each heat. This report shall include the purchase order number, heat number, material specification number, size, quantity from each heat, and specific annealing treatment used. 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:

10.1 Bars: Individual pieces or bundles shall have attached a metal tag, stamped with the purchase order number, AMS 4925B, 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.

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

\emptyset 10.3 Forging Stock: Shall be identified as agreed upon by purchaser and vendor.

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