

CANCELLED



AEROSPACE MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc.

Two Pennsylvania Plaza, New York, N. Y. 10001

AMS 4923A

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TITANIUM ALLOY BARS AND FORGINGS

2Cr - 2Fe - 2Mo

Annealed, 120,000 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 450 F (232 C) and oxidation resistance up to 700 F (371 C).
4. COMPOSITION: The product shall conform to the following:

	min	max
Chromium	1.5	3.0
Iron	1.5	3.0
Molybdenum	1.5	3.0
Oxygen	--	0.20
Carbon	--	0.10
Nitrogen	--	0.10
Hydrogen	--	0.0125
Other Elements, each	--	0.10
Other Elements, total	--	0.40
Titanium	remainder	

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.

Ø 5.2 Forgings: Annealed, and descaled.

Ø 5.3 Forging Stock: As ordered by the forging manufacturer.

6. TECHNICAL REQUIREMENTS: Material shall conform to the following requirements, and shall be capable of meeting these requirements after being heated to 1200 F $\pm$ 25 (648.9 C $\pm$ 14) for 24 hr and air cooled, unless otherwise agreed upon by purchaser and vendor.

- 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 test machine having a strain rate pacer, using a rate of 0.005 in. per in. per min. through the yield strength.

Tensile Strength, psi	130,000 min
Yield Strength at 0.2% Offset or at 0.0195 in.	
in 2 in. Extension Under Load (E = 15,500,000), psi	120,000 min
Elongation, % in 4D (Sections under 3 in.)	15 min
Reduction of Area, % (Sections under 3 in.)	25 min

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

SAE Technical Board rules provide that: "All technical reports, including standards, approvals, and practices recommended, are advisory only. Their use by anyone engaged in industry or trade 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."

6.2 Hardness: Material shall have hardness not higher than Rockwell C 36 or equivalent.

6.3 Room Temperature Notched Stress-Rupture Test: Specimens taken from bars and forgings shall be capable of meeting the following requirements; test shall be conducted in accordance with the issue of ASTM E139 specified in the latest issue of AMS 2350.

6.3.1 A test specimen machined to the dimensions shown in Fig. 1 and Table I maintained at room temperature while an axial load of 160,000 psi is applied continuously, shall not rupture in less than 5 hours.

Ø The initial load 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.

7. QUALITY: Unless otherwise specified, material shall be produced by multiple melting using consumable 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, 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:

10.1 Bars: Individual pieces or bundles shall have attached a metal tag stamped with the purchase order number, AMS 4923A, 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.

Ø 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.