

TITANIUM ALLOY BARS
11.5Mo - 6.0Zr - 4.5Sn
1375°F (745°C) Solution Heat Treated

UNS R58030

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of 23 October 1985. It is recommended that this specification not be specified for new designs.

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

Noncurrent refers to those materials which have previously been widely used and which may be required on some existing designs in the future. The Aerospace Materials Division does not recommend these as standard materials for future use in new designs. Each of these "Noncurrent" specifications is available on request.

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Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 4980B

Superseding AMS 4980A

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1. SCOPE:

1.1 Form: This specification covers a titanium alloy in the form of bars and wire.

1.2 Application: Primarily for parts requiring high strength-to-weight ratio up to 700°F (370°C) after appropriate precipitation heat treatment and where cold formability in the solution heat treated condition is desirable. Suitable for parts requiring high strength and deep hardenability.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2241 - Tolerances, Corrosion and Heat Resistant Steel, Iron Alloy,
Titanium, and Titanium Alloy Bars and Wire

AMS 2249 - Chemical Check Analysis Limits, Titanium and Titanium Alloys

AMS 2350 - Standards and Test Methods

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM E8 - Tension Testing of Metallic Materials

ASTM E120 - Chemical Analysis of Titanium and Titanium Alloys

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Federal Standards:

Federal Test Method Standard No. 151 - Metals; Test Methods

2.3.2 Military Standards:

MIL-STD-163 - Steel Mill Products, Preparation for Shipment and Storage

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3. TECHNICAL REQUIREMENTS:

- 3.1 Composition: Shall conform to the following percentages by weight, determined by wet chemical methods in accordance with ASTM E120, by spectrographic methods in accordance with Federal Test Method Standard No. 151, Method 112, or by other analytical methods approved by purchaser:

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	min	max
Molybdenum	10.00	13.00
Zirconium	4.50	7.50
Tin	3.75	5.25
Iron	--	0.35
Oxygen	--	0.18
Carbon	--	0.10
Nitrogen	--	0.05 (500 ppm)
Hydrogen	--	0.015 (150 ppm)
Yttrium	--	0.005 (50 ppm)
Residual Elements, each (3.1.1)	--	0.10
Residual Elements, total (3.1.1)	--	0.40
Titanium	remainder	

- 3.1.1 Determination not required for routine acceptance.
- 3.1.2 Check Analysis: Composition variations shall meet the requirements of AMS 2249.
- 3.2 Condition: The product shall be supplied in the following condition:
- 3.2.1 Bars: Hot finished with or without subsequent cold reduction, solution heat treated, straightened, and descaled.
- 3.2.2 Wire: Hot finished with or without subsequent cold reduction, solution heat treated, and descaled.
- 3.3 Heat Treatment: The product shall be solution heat treated by heating to a temperature within the range 1300° - 1450°F (705° - 790°C), holding at the selected temperature within $\pm 25^\circ\text{F}$ ($\pm 15^\circ\text{C}$) for not more than 15 min., and quenching in water.
- 3.4 Properties: Product 3.000 in. (76.20 mm) and under in nominal diameter or distance between parallel sides shall conform to the following requirements; property requirements for bars over 3.000 in. (76.20 mm) in nominal diameter or distance between parallel sides shall be as agreed upon by purchaser and vendor:
- 3.4.1 Tensile Properties: Shall be as specified in 3.4.1.1 and 3.4.1.2, determined in accordance with ASTM E8 with the rate of strain maintained at 0.003 - 0.007 in. per in. per min. (0.003 - 0.007 (mm/mm)/min.) through the yield strength and then 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. (0.005 (mm/mm)/min.) through the yield strength and a minimum crosshead speed of 0.10 in. (2.5 mm) per min. above the yield strength.