

AEROSPACE MATERIAL SPECIFICATION



AMS 4974D

Issued	NOV 1967
Revised	OCT 1988
Noncurrent	APR 1994
Cancelled	JUL 2002

Superseding AMS 4974C

Titanium Alloy, Bars and Forgings
11Sn - 5.0Zr - 2.3Al - 1.0Mo - 0.21Si
Solution and Precipitation Heat Treated
(Composition similar to UNS R54790)

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Documents

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1. SCOPE:

1.1 Form:

This specification covers a titanium alloy in the form of bars, wire, forgings, and forging stock.

1.2 Application:

Primarily for parts requiring high strength and toughness and good creep resistance up to 900°F (482°C). Certain processing procedures and service conditions may cause these products to become subject to stress-corrosion cracking; ARP 982 recommends practices to minimize such conditions.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications and Aerospace Recommended Practices shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications:

Available from SAE, 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
MAM 2241	Tolerances, Metric, 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
AMS 2375	Control of Forgings Requiring First Article Approval
AMS 2808	Identification, Forgings
AMS 2809	Identification, Titanium and Titanium Alloy Wrought Products

2.1.2 Aerospace Recommended Practices:

ARP982	Minimizing Stress Corrosion Cracking in Wrought Titanium Alloy Products
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2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19130.

ASTM E8	Tension Testing of Metallic Materials
ASTM E21	Elevated Temperature Tension Tests of Metallic Materials
ASTM E120	Chemical Analysis of Titanium and Titanium Alloys
ASTM E139	Conducting Creep, Creep-Rupture, and Stress-Rupture Tests of Metallic Materials
ASTM E292	Conducting Time-for-Rupture Notch Tension Tests of Materials

2.3 U.S. Government Publications:

Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Specifications:

MIL-H-81200 Heat Treatment of Titanium and Titanium Alloys

2.3.2 Military Standards:

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

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 spectrochemical methods, or by other analytical methods acceptable to purchaser.

	min	max
Tin	10.50	11.50
Zirconium	4.00	6.00
Aluminum	2.00	2.50
Molybdenum	0.80	1.20
Silicon	0.15	0.27
Oxygen	--	0.15
Iron	--	0.12
Carbon	--	0.04
Nitrogen	--	0.04 (400 ppm)
Hydrogen	--	0.0125 (125 ppm)
Yttrium (3.1.1)	--	0.005 (50 ppm)
Residual Elements, each (3.1.1)	--	0.10
Residual Elements, total (3.1.1)	--	0.30
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; no variation over maximum will be permitted for yttrium.