



AEROSPACE MATERIAL SPECIFICATION

AMS4942™

REV. H

Issued 1964-01
Revised 2022-07

Superseding AMS4942G

Titanium Tubing, Seamless
Annealed, 40.0 ksi (275 MPa) Yield Strength
(Composition similar to UNS R50400)

RATIONALE

AMS4942H results from a Five-Year Review and update of this specification with changes to revise the annealing practice to historical temperatures based on grain growth and property changes resulting from higher annealing temperatures previously indicated (3.3), update language related to unauthorized exceptions (3.7, 4.4.1, 5.1.1, 8.4), add ASTM E539 analytical method (2.2, 3.1), update applicable documents (Section 2), and allow use of immediate prior specification revision (8.5).

1. SCOPE

1.1 Form

This specification covers one grade of commercially pure titanium in the form of seamless tubing.

1.2 Application

This tubing has been used typically for parts, such as fluid-conducting lines, requiring strength up to 400 °F (205 °C) and oxidation resistance up to 600 °F (315 °C), but usage is not limited to such applications.

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

- AMS2244 Tolerances, Titanium and Titanium Alloy Tubing
- AMS2249 Chemical Check Analysis Limits, Titanium and Titanium Alloys
- AMS2368 Sampling and Testing of Wrought Titanium Raw Material Except Forgings and Forging Stock
- AMS2750 Pyrometry

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For more information on this standard, visit
<https://www.sae.org/standards/content/AMS4942H/>

AMS2809 Identification, Titanium and Titanium Alloy Wrought Products

AS1814 Terminology for Titanium Microstructures

AS7766 Terms Used in Aerospace Metals Specifications

2.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM E8/E8M Tension Testing of Metallic Materials

ASTM E539 Analysis of Titanium Alloys by Wavelength Dispersive X-Ray Fluorescence Spectrometry

ASTM E1409 Determination of Oxygen and Nitrogen in Titanium and Titanium Alloys by Inert Gas Fusion

ASTM E1447 Determination of Hydrogen in Titanium and Titanium Alloys by the Inert Gas Fusion Thermal Conductivity/Infrared Detection Method

ASTM E1941 Determination of Carbon in Refractory and Reactive Metals and Their Alloys by Combustion Analysis

ASTM E2371 Analysis of Titanium and Titanium Alloys by Direct Current Plasma and Inductively Coupled Atomic Emission Spectrometry (Performance-Based Test Methodology)

ASTM E2994 Analysis of Titanium and Titanium Alloys by Spark Atomic Emission Spectrometry and Glow Discharge Atomic Emission Spectrometry (Performance-Based Method)

2.3 Definitions

Terms used in AMS are defined in AS7766 and as follows:

2.3.1 Terminology relating to titanium microstructures is presented in AS1814.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1; carbon shall be determined in accordance with ASTM E1941, hydrogen in accordance with ASTM E1447, oxygen and nitrogen in accordance with ASTM E1409, and other elements in accordance with ASTM E539, ASTM E2371, or ASTM E2994. Other analytical methods may be used if acceptable to the purchaser.

Table 1 - Composition

Element	Min	Max
Iron	--	0.30
Oxygen	--	0.25
Carbon	--	0.10
Nitrogen	--	0.03 (300 ppm)
Hydrogen	--	0.015 (150 ppm)
Other Elements, each (3.1.1)	--	0.10
Other Elements, total (3.1.1)	--	0.30
Titanium	remainder	

3.1.1 Determination not required for routine acceptance.