AEROSPACE MATERIAL SPECIFICATION

AMS4955™	REV. K
Issued 1965-09 Revised 2026-06 Superseding AMS4955J	

Titanium Alloy, Welding Wire,
8Al - 1Mo - 1V
(Composition similar to UNS R54810)

RATIONALE

AMS4955K results from a Five-Year Review and update of this specification with changes to update wording related to exceptions (see 4.4.2), relocate Definitions (see 2.3), and update Applicable Documents (see Section 2), Fabrication (see 3.4), Sampling and Testing (see 4.3), and Ordering Information (see 8.5).

1. SCOPE

1.1 Form

This specification covers a titanium alloy in the form of welding wire (see 8.5).

1.2 Application

This wire has been used typically as filler metal for gas-metal-arc and gas-tungsten-arc welding of titanium alloys, 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: 1-877-606-7323 (U.S. and Canada only) or 1-724-776-4970 (outside U.S. and Canada), www.sae.org.

AMS2249 Chemical Check Analysis Limits, Titanium and Titanium Alloys

AMS2368 Sampling and Testing of Wrought Titanium Raw Material, Except Forgings and Forging Stock

AMS2813 Packaging and Marking of Packages of Welding Wire, Standard Method

AMS2814 Packaging and Marking of Packages of Welding Wire, Premium Quality

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Documents Document Sharing Hub
Full document details: SAE AMS4955K

AMS2816 Identification, Welding Wire, Tab Marking Method

AMS2819 Identification, Welding Wire, Direct Color Code System

ARP1876 Weldability Test for Weld Filler Metal Wire

ARP4926 Alloy Verification and Chemical Composition, Inspection of Welding Wire

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 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 Reactive Metals and Reactive Metal Alloys by Inert Gas Fusion with Detection by Thermal Conductivity or Infrared Spectrometry

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 Plasma 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.

3. TECHNICAL REQUIREMENTS

3.1 Wire 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
Aluminum	7.35	8.35
Molybdenum	0.75	1.25
Vanadium	0.75	1.25
Iron	--	0.30
Oxygen (see 3.1.1.1)	--	0.12
Carbon (see 3.1.1.1)	--	0.08
Nitrogen (see 3.1.1.1)	--	0.05 (500 ppm)
Hydrogen (see 3.1.1.1)	--	0.01 (100 ppm)
Yttrium (see 3.1.1.2)	--	0.005 (50 ppm)
Residual Elements, each (see 3.1.1.2)	--	0.10
Residual Elements, total (see 3.1.1.2)	--	0.40
Titanium	remainder	

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3.1.1 Except for carbon, hydrogen, nitrogen, and oxygen, chemical analysis of initial ingot, bar, or rod stock before drawing is acceptable provided the processes used for drawing or rolling, annealing, and cleaning are controlled to ensure continued conformance to chemical composition requirements.

3.1.1.1 Carbon, hydrogen, nitrogen, and oxygen shall be determined on each lot of finished wire (see 4.3.1.1).

3.1.1.2 Determination not required for routine acceptance.

3.1.2 Check Analysis

Composition variations shall meet the applicable requirements of AMS2249.

3.2 Melting Practice

Alloy shall be multiple melted. Melting cycle(s) prior to final melting cycle shall be made using vacuum consumable electrode, nonconsumable electrode, electron beam cold hearth, or plasma arc cold hearth melting practice(s). The final melting cycle shall be made using vacuum arc remelting (VAR) practice with no alloy additions permitted.

3.2.1 The atmosphere for nonconsumable electrode melting shall be vacuum or shall be argon and/or helium at an absolute pressure not higher than 1000 mm of mercury.

3.2.2 The electrode tip for nonconsumable electrode melting shall be water-cooled copper.

3.3 Condition

Cold drawn, bright finish, in a temper, and with a surface finish that will provide proper feeding of the wire in machine welding equipment.

3.4 Fabrication

3.4.1 Finished wire shall be formed from rod, bar, or wire descaled by a process that does not affect the composition of the wire. Surface irregularities without alpha case consistent with normal forming processes are acceptable provided the wire conforms to the tolerances of 3.7.

3.4.2 In-process annealing, if required between rolling or drawing operations, shall be performed after cleaning the material and in a vacuum or in protective inert atmosphere to avoid surface oxidation and adsorption of other extraneous elements unless the contaminated surface is removed mechanically or chemically.

3.4.3 Butt welding is permissible provided both ends to be joined are either alloy verified using a method or methods capable of distinguishing the alloy from all other alloys processed within the facility or to join an in-process break at the wire processing station. The butt weld shall not interfere with uniform, uninterrupted feeding of the wire in machine welding equipment.

3.4.4 Drawing compounds, oxides, dirt, oil, and other foreign materials shall be removed by cleaning processes which will neither result in pitting, nor cause gas absorption by the wire, nor deposition of substances harmful to welding operations.

3.4.5 Surface contaminants or dissolved gases picked up during wire processing that can adversely affect the welding characteristics, the operation of the equipment, or the properties of the weld metal shall be removed.

3.4.6 Wire may be vacuum degassed after cleaning as in 3.4.4, if necessary, to meet the requirements of 3.1.1.1.

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