AEROSPACE MATERIAL SPECIFICATION

AMS7848™	REV. E

Issued 1964-01
Reaffirmed 2018-11
Revised 2024-11

Superseding AMS7848D

Tantalum Alloy, Bars and Rods, 90Ta - 10W

(Composition similar to UNS R05255)

RATIONALE

AMS7848E results from a Five-Year Review and update of this specification with changes to update wording to prohibit unauthorized exceptions (see 3.3.1.1, 3.6, 4.4.2, 5.1.1, and 8.4), relocate Definitions (see 2.3), update Applicable Documents (see Section 2 and 2.3), and allow the use of the immediate prior specification revision (see 8.3).

1. SCOPE

1.1 Form

This specification covers a tantalum alloy in the form of bars and rods up through 3.5 inches (88.9 mm), inclusive (see 8.5).

1.2 Application

Primarily for parts requiring exposure to ultrahigh temperatures. Applications in oxidizing atmospheres necessitate a protective coating.

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.

AMS2261	Tolerances, Nickel, Nickel Alloy, and Cobalt Alloy Bars, Rods, and Wire
AMS2809	Identification, Titanium and Titanium Alloy Wrought Products
AS7766	Terms Used in Aerospace Metals Specifications

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS7848E/

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 E384 Microindentation Hardness of Materials

2.3 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the following percentages by weight shown in Table 1; metallic elements shall be determined spectrochemically, carbon shall be determined conductometrically, oxygen shall be determined by the inert gas or vacuum fusion method, nitrogen shall be determined by the Kjeldahl Method or by vacuum fusion, and hydrogen shall be determined by the vacuum fusion or vacuum extraction method.

Table 1 - Composition

Element	Min	Max
Tungsten	8.50	11.00
Columbium	--	0.10
Molybdenum	--	0.030
Nickel	--	0.010
Iron	--	0.010
Carbon	--	0.005
Oxygen	--	0.010 (100 ppm)
Nitrogen	--	0.005 (50 ppm)
Hydrogen	--	0.001 (10 ppm)
Tantalum	remainder	

3.2 Condition

Fully annealed.

3.3 Properties

The product shall conform to the following requirements:

3.3.1 Tensile Properties

Shall be as specified in Table 2, determined in accordance with ASTM E8/E8M with the rate of strain set at 0.005 in/in/min (0.005 mm/mm/min) and maintained within a tolerance of ±0.002 in/in/min (±0.002 mm/mm/min) through the 0.2% offset yield strain and 0.05 in/in/min (0.05 mm/mm/min) and maintained within a tolerance of ±0.02 in/in/min (±0.02 mm/mm/min) above the yield strain to fracture.

Table 2A - Tensile properties, inch/pound units

Nominal Diameter or Distance Between Parallel Sides Inches	Tensile Strength ksi, min	Yield Strength at 0.2% Offset ksi, min	Elongation in 2 Inches or 4D %, min
Up to 2.000, excl	75	65	15
2.000 to 3.500, incl	70	60	15

Table 2B - Tensile properties, SI units

Nominal Diameter or Distance Between Parallel Sides Millimeters	Tensile Strength MPa, min	Yield Strength at 0.2% Offset MPa, min	Elongation in 50.8 mm or 4D %, min
Up to 50.80, excl	517	448	15
50.80 to 88.90, incl	483	414	15

3.3.1.1 Mechanical property requirements for product outside the size range covered by Table 2 shall be agreed upon between the purchaser and producer and reported per 4.4.2 (see 8.5).

3.3.2 Hardness

Should be not higher than 235 HV30, or equivalent, determined in accordance with ASTM E384, but the product shall not be rejected on the basis of hardness if the tensile property requirements are met.

3.4 Quality

The product, as received by the purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the product.

3.5 Tolerances

Shall conform to all applicable requirements of AMS2261.

3.6 Exceptions

Any exceptions shall be authorized by the purchaser and reported as in 4.4.2.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of the product shall supply all samples for the producer's tests and shall be responsible for the performance of all required tests. The purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests

Tests for all technical requirements are acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling and Testing

Shall be in accordance with the following; a lot shall be all product of the same nominal size from the same heat processed at the same time:

4.3.1 Composition

One sample from each heat, except that for carbon, oxygen, nitrogen, and hydrogen determinations one sample from each lot.

4.3.2 Tensile Property and Hardness Requirements

One sample from each lot.

4.4 Reports

4.4.1 The producer of the product shall furnish with each shipment a report showing: the results of tests for composition of each heat; the results of tests on each lot to determine conformance to the carbon, oxygen, nitrogen, and hydrogen requirements; and results for tests for tensile property and hardness requirements. The report shall state that the product conforms to the other technical requirements and shall include the purchase order number, lot number, AMS7848E, size, and quantity.

4.4.2 When material produced to this specification is beyond the sizes allowed in the scope or tables, or other exceptions are taken to the technical requirements listed in Section 3 (see 5.1.1), the report shall contain a statement “This material is certified as AMS7848E(EXC) because of the following exceptions:” and the specific exceptions shall be listed.

4.5 Resampling and Retesting

If any specimen used in the above tests fails to meet the specified requirements, disposition of the product may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the product represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY

5.1 Identification

Shall be in accordance with AMS2809.

5.1.1 When technical exceptions are taken (see 4.4.2), the material shall be marked with AMS7848E(EXC).

5.2 Packaging

5.2.1 Product shall be packed in wooden boxes, or other suitable protective containers of 2000 pounds (907 kg) maximum lifts, to prevent damage to surfaces during shipping and handling.

5.2.2 Product shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the product to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT

A producer shall include this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS

Product not conforming to this specification, or to modifications authorized by the purchaser, will be subject to rejection.