



AEROSPACE MATERIAL SPECIFICATION

AMS2488™

REV. E

Issued	1977-07
Reaffirmed	2006-04
Revised	2019-10

Superseding AMS2488D

Anodic Treatment - Titanium and Titanium Alloys
Solution pH 13 or Higher

RATIONALE

AMS2488E results from a Five-Year Review and update of this specification with changes to ordering information, electrical contact (3.3.3), processing (3.4.1), wear resistance (3.5.2), approval (4.4.1), and control factors (4.4.3).

ORDERING INFORMATION: The following information shall be provided to the plating processor by the purchaser.

1. Purchase order shall specify not less than the following:

- AMS2488E
- Basis metal to be anodized
- Special features, geometry or processing present on parts that require special attention by the anodizing processor
- Periodic testing frequency and sample quantity, if different from 4.2.2 and 4.3.2
- Whether approval is based on approval of process/control factors or sample part or both (see 4.4.1)
- Quantity of pieces to be plated
- Permissible electrical contact locations, if not specified (see 3.3.3)

2. Parts manufacturing operations such as heat treating, forming, joining and media finishing can affect the condition of the substrate for anodizing, or, if performed after anodizing, could adversely affect the anodized part. The sequencing of these types of operations should be specified by the cognizant engineering organization or purchaser and is not controlled by this specification.

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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
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on this Technical Report, please visit
<http://standards.sae.org/AMS2488E>**

1. SCOPE

1.1 Purpose

This specification establishes the engineering requirements for producing an anodic coating on titanium and titanium alloys and the properties of the coating.

1.2 Application

These coatings have been used typically as a lubricating and anti-galling coating for elevated temperature forming, as an isolating film for increased resistance to galvanic corrosion, to provide improved wear resistance and as a pretreatment for the application of solid film lubricants, but usage is not limited to such applications.

1.3 Classification

Coatings are classified by end-product applications, as follows:

Type 1 As a coating for elevated-temperature forming.

Type 2 As an anti-galling coating without additional lubrication or as a pretreatment for improving adherence of film lubricants and in application where increased resistance to galvanic corrosion is required. Such coatings also are compatible with hypergolic propellants such as hydrazine-unsymmetrical-dimethylhydrazine and nitrogen tetroxide (see 8.4) and are electrically semi conductive.

1.3.1 Type 2 shall be furnished unless Type 1 is specified.

1.4 Safety - Hazardous Materials

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

1.5 Precautions

The use of hypergolic propellants as test media presents a special hazard. Test vessels should be contained in such a manner that breakage or inadvertent spills will be safely contained (see 8.4).

2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order form 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.

AMS3084 Lubricant, Solid Film Minimal Outgassing

AMS4911 Titanium Alloy, Sheet, Strip, and Plate 6Al - 4V Annealed

AMS4928 Titanium Alloy Bars, Wire, Forgings, Rings, and Drawn Shapes 6Al - 4V Annealed

ARP1917 Clarification of Terms Used in Aerospace Metals Specifications

ARP4992 Periodic Test for Processing Solutions

AS5272 Lubricant, Solid Film, Heat Cured, Corrosion Inhibiting, Procurement Specification

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 B244 Measurement of Thickness of Anodic Coatings on Aluminum and of Other Nonconductive Coatings on Nonmagnetic Basis Metals with Eddy-Current Instruments

ASTM D2714 Calibration and Operation of the Falex Block-on-Ring Friction and Wear Testing Machine

2.3 U.S. Government Publications

Copies of these documents are available online at <https://quicksearch.dla.mil>.

MIL-PRF-26539 Propellant, Nitrogen Tetroxide

MIL-PRF-27402 Propellant, Hydrazine-Uns-Dimethylhydrazine (50% N₂H₄ - 50% UDMH)

MIL-PRF-81329 Lubricant, Solid Film, Extreme Environment

3. TECHNICAL REQUIREMENTS

3.1 Solutions

3.1.1 Electrolyte

Shall be an alkaline solution with pH of 13 or higher (see 8.6).

3.2 Equipment

3.2.1 Tanks

Shall be fabricated from a material which is suitable for containment of the electrolyte being used. Cathode material shall be insoluble in the electrolyte.

3.2.2 Fixtures

Wire, hooks, clamps, and racks in contact with the parts or electrolyte which are used to suspend parts in the electrolyte shall be of titanium or titanium alloys.

3.3 Preparation

3.3.1 Cleaning

Parts shall be clean and free of water break. The use of halogenated solvents is prohibited.

3.3.2 Racking

Racks and clamps shall be free of anodic film.