



AEROSPACE MATERIAL SPECIFICATION

AMS2487™

REV. B

Issued	1993-04
Revised	2018-01
Reaffirmed	2022-01

Superseding AMS2487A

Anodic Treatment of Titanium and Titanium Alloys
Solution pH 12.4 Maximum

RATIONALE

AMS2487B results from a Five-Year Review with changes made to paragraphs Ordering Information, Preparation 3.3.2, Voltage Breakdown Resistance 3.5.3.1.1 and 3.5.3.1.2, Abrasion Resistance 3.5.5, Wear Resistance 3.5.6, Electrical Resistance 3.5.8, and Periodic Test 4.2.2.

NOTICE

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

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

- AMS2487B
 - Basis metal to be anodized
 - Special features, geometry or processing present on parts that requires special attention by the processor
 - Quantity of pieces to be anodized
 - Part or assembly number of parts to be coated
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 coated 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.

1. SCOPE

1.1 Purpose

This specification describes the engineering requirements for producing an electrically-insulating, non-powdery anodic coating on titanium and titanium alloys and the properties of such coatings.

1.2 Application

This process has been used typically to increase resistance to galvanic and high temperature corrosion and voltage breakdown and to form a receptive base for the application of lubricants and paints on titanium and titanium alloys, but usage is not limited to such applications.

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SAE WEB ADDRESS:

For more information on this standard, visit
<https://www.sae.org/standards/content/AMS2487B/>

1.3 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.

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.

AMS3084	Lubricant, Solid Film, Minimal Outgassing
AMS4001	Aluminum Sheet and Plate, 0.12Cu (1100-0), Annealed
AMS4911	Titanium Alloy Sheet, Strip, and Plate, 6Al - 4V, Annealed
AMS4928	Titanium Alloy Bars, Wire, Forgings, and Rings, 6Al - 4V, Annealed
ARP4992	Periodic Test Plan for Process 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 B117	Operating Salt Spray (Fog) Apparatus
ASTM B244	Measurement of Thickness of Anodic Coatings on Aluminum and of Other Nonconductive Coatings on Nonmagnetic Basis Metals with Eddy-Current Instruments
ASTM D257	DC Resistance or Conductance of Insulating Materials
ASTM D2714	Calibration and Operation of the Falex Block-on-Ring Friction and Wear Testing Machine
ASTM D 4060	Abrasion Resistance of Organic Coatings by the Taber Abraser

2.3 U.S. Government Publications

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

MIL-PRF-46010	Lubricant, Solid Film, Heat Cured, Corrosion Inhibiting
MIL-PRF-81329	Lubricant, Solid Film, Extreme Environment

3. TECHNICAL REQUIREMENTS

3.1 Solutions

3.1.1 Electrolyte shall be any suitable solution with a pH not higher than 12.4.

3.2 Equipment

3.2.1 Tanks and Cathodes: Processing tanks shall be fabricated from a material which is suitable for containment of the electrolyte being used. Cathode materials shall be insoluble in the electrolyte.

3.2.2 Fixturing: Racks, wires, hooks, and clamps, in contact with the parts or the electrolyte, which are used to suspend parts in the electrolyte shall be made of titanium or titanium alloys.

3.3 Preparation

3.3.1 Cleaned parts shall be free of water break. The use of halogenated solvents is prohibited.

3.3.2 Anodic cleaning of titanium parts shall be prohibited.

3.3.3 Electrical contact points shall be in areas acceptable to the purchaser.

3.3.4 Suspension in Electrolyte: Parts shall be positioned in a manner to avoid gas entrapment.

3.4 Procedure

The cleaned and racked parts shall be immersed in the electrolyte. Current shall be applied and the voltage raised manually or automatically to maintain the required current density for the time necessary to achieve the required coating thickness. Air agitation shall be used to minimize entrapment of gas in the coated surface. After anodizing, parts shall be thoroughly rinsed and dried.

3.5 Properties

Coatings on parts shall conform to the following requirements:

3.5.1 Thickness

May be specified by AMS2487 and a suffix number designating the nominal thickness in ten-thousandths of an inch (2.5 μm); thus, AMS2487-1 designates a coating thickness of 0.0001 inch (2.5 μm) and AMS2487-3 designates a finished coating thickness of 0.0003 inch (7.6 μm). A tolerance of ± 0.00005 inch (1.27 μm) per 0.0001 inch (2.5 μm) of nominal coating thickness will be permitted. If thickness is not specified, coating thickness shall be 0.0001 inch (2.5 μm).

3.5.1.1 Thickness of coating shall be determined on representative parts or on specimens to the nearest 0.0001 inch (2.5 μm) by direct micrometer measurement, by eddy current measurement in accordance with ASTM B244, or by other method acceptable to purchaser. Specimens, if used, shall be fabricated from the same alloy as the parts they represent and shall be processed with the parts represented. In case of dispute, eddy current method shall govern. Coating thickness requirements shall not apply to blind holes or recesses with depth greater than seven times the diameter unless a specific coating thickness is specified on those areas.

3.5.2 Color

Shall be substantially uniform on anodized parts of the same alloy, with a similar surface finish, processed to the same nominal coating thickness.

3.5.3 Voltage Breakdown Resistance

Shall be not less than 75 volts, alternating current on a 0.0001-inch (2.5- μm) thick coat applied to specimens fabricated from AMS4911 titanium alloy, determined in accordance with the procedure in 3.5.3.1 through 3.5.3.2. Specimens shall be processed with the parts they represent. Voltage breakdown resistance for other thicknesses shall be as agreed upon by purchaser and processor.