AEROSPACE MATERIAL SPECIFICATION

AMS2514™ REV. B

Issued 1995-01
Reaffirmed 2013-11
Revised 2020-10

Superseding AMS2514A

Anodic Coating on Aluminum Alloys Sulfuric Acid Process, Resin-Sealed

RATIONALE

AMS2514B results from a Five-Year Review and update of this specification with changes to ordering information, definitions (2.3), solutions (3.1.1), neutralizing rinse (3.1.2), cleaning (3.2.2), electrical contact points (3.2.3), anodizing (3.2.4), rinsing (3.2.5.1 and 3.2.5.3), coating thickness (3.3.1), corrosion resistance (3.3.2), responsibility for inspection (4.1), periodic tests (4.2.2), sampling and testing (4.3 and 4.3.1.1), for periodic tests (4.3.2), specimen configuration (4.3.3), resampling and retesting (4.6.1), rejections (Section 7), and notes (8.3 and 8.4). These changes were made to bring this specificaiton in line with the requirements of AMS2471.

NOTICE

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:
   - AMS2415B
   - Part number of parts to be anodized
   - Quantity of pieces to be anodized
   - Basis metal to be anodized
   - Optional: Electrical contact locations, when not specified (see 3.2.3)
   - 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)
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.

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/AMS2514B

1. SCOPE

1.1 Purpose

This specification covers the engineering requirements for producing an anodic coating on aluminum and aluminum alloys which are subsequently sealed with an organic resin.

1.2 Application

This coating has been used typically to increase corrosion resistance and provide surfaces which will ensure adhesion of subsequent organic finishes, but usage is not limited to such applications. This process is applicable to all forms and alloys of aluminum. Coatings produced through resin-seal anodizing cannot be subsequently dyed.

This process is not suitable for parts which contain joints or recesses in which the solutions utilized in the anodizing process may be retained.

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.

AMS4037 Aluminum Alloy, Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn (2024; -T3 Flat Sheet, -T351 Plate), Solution Heat Treated

ARP1917 Clarification of Terms Used in Aerospace Metals Specifications

ARP4992 Periodic Test for Processign Solutions

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) Testing 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 B487 Measurement of Metal and Oxide Coating Thicknesses by Microscopical Examination of a Cross Section

ASTM B567 Measurement of Coating Thickness by the Beta Backscatter Method

2.3 Definitions

Terms used in AMS are clarified in ARP1917 and as follows.

2.3.1 CORROSION PIT

A corrosion pit is defined as an area of localized corrosion having a depth greater than its width. Pit size may be determined by either direct dimensional measurement or by comparison to known references. A superficial pit or discontinuity in the anodize surface itself, not penetrating through to the base metal and not showing the presence of white corrosion products is not rejectable. As a general rule, a corrosion pit usually displays a characteristic tail or line of white aluminum corrosion products.

3. TECHNICAL REQUIREMENTS

3.1 Solutions

3.1.1 Electrolyte shall be an aqueous solution of sulfuric acid of suitable concentration maintained within ±2 °F (±1 °C) of the temperature approved in 4.4 (see 8.4).

3.1.2 Neutralizing Rinse

Shall be an aqueous solution of 4 to 6% by weight commercial grade sodium bicarbonate maintained at a temperature below 80 °F (27 °C) or other suitable neutralizing solution. Water used for solution preparation shall be demineralized water not exceeding a conductivity of 50 µS/cm or a chloride content of 25 ppm, when water with a conductivity of 100 µS/cm or 50 ppm or less total solids content is not available.

3.1.3 Sealer

Shall be a colloidal suspension in water of a suitable resin concentrate. The resin concentrate shall be diluted with water and maintained in accordance with manufacturer’s instruction.

3.2 Procedure

3.2.1 Preparation

All fabrication-type operations, such as heat treatment, machining, forming, brazing, welding, and perforating, shall be completed before parts are anodized.

3.2.2 Cleaning

Parts shall be cleaned to a water-break-free surface and deoxidized prior to anodizing. Acid or alkaline etching may be used to enhance surface preparation or coating adhesion. Cleaning and etching methods shall not cause pitting or intergranular attack of the base alloy.

3.2.3 Electrical Contact Points

Tight electrical contact shall be maintained during the anodic treatment process in order to prevent damage or contact arcing (burning) of parts, but small irregularities of coating at points of electrical contact are acceptable.

3.2.3.1 For parts that are to be anodized all over, and contact locations are not specified, contact locations shall be at the discretion of the processor.

3.2.3.2 For parts that are not to be anodized all over, and contact locations are not specified, locations shall be in areas on which coating is not required.