



AEROSPACE MATERIAL SPECIFICATION

AMS2474™**REV. E**

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Superseding AMS2474D

Chemical Treatment for Aluminum Alloys Low Electrical Resistance Coating

RATIONALE

AMS2474E stabilizes this document. It was previously made noncurrent because it was deemed by SAE Committee B that it should be not revised due to it containing certain testing frequencies, equipment, and conditions which are impractical to update. AMS2477 was written to be the successor document to it.

STABILIZED NOTICE

AMS2474E has been declared "STABILIZED" by SAE AMS Committee B Finishes, Processes and Fluids Committee. This document will no longer be updated and may no longer represent standard industry practice. Previously this document was reaffirmed non-current. The last technical update of this document occurred in October, 1987. Users of this document should refer any certification issues (e.g. exceptions listed on the certification report) to the cognizant engineering organization for their disposition.

NOTE: In many cases, the purchaser may be a sub tier supplier and not the cognizant engineering organization.

AMS Committee B recommends that the following technically equivalent (e.g., properties, fit, form, function) specification be used for future procurement. This listing does not constitute authority to substitute these specifications for the "STABILIZED" specification.

AMS2477 Conversion Coating for Aluminum Alloys Low Electrical Resistance Coating

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1. SCOPE:

1.1 Purpose: This specification establishes the engineering requirements for producing chemical-film coatings on aluminum and aluminum alloys and the properties of such coatings.

1.2 Application: Primarily for aluminum and aluminum alloys where increased corrosion resistance, improved paint adhesion, or a low-electrical resistance coating is required. Also useful for improving the corrosion resistance and paint adhesion properties of abraded or discontinuous anodized surfaces of aluminum and aluminum alloy parts.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

AMS 4037 - Aluminum Alloy Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn
(2024; -T3 Flat Sheet, - T351 Plate), Solution Heat Treated

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM B117 - Salt Spray (Fog) Testing

2.3 U.S. Government Publication: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Federal Standards:

FED-STD-141 - Paint, Varnish, Lacquer and Related Materials, Methods of Inspection, Sampling and Testing

2.3.2 Military Specifications:

MIL-P-23377 - Primer Coating, Epoxy Polyamide, Chemical and Solvent Resistant

MIL-P-81352 - Lacquer, Acrylic (For Naval Weapons Systems)

2.3.3 Military Standards:

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Solution: Shall be an aqueous solution of chemicals that will form a coating of chromate meeting the requirements of 3.4.

3.1.1 Only processes which permit adequate solution control by chemical analysis shall be used.

3.1.2 It shall be the responsibility of the vendor of proprietary processing chemicals to supply the purchaser with methods of analysis and directions for maintenance of the solution.

3.2 Preparation:

3.2.1 All heat treatment, machining, forming, brazing, welding, and perforating operations shall, insofar as practicable, be completed before parts are treated.

3.2.1 Parts, prior to being coated, shall have clean surfaces, free from waterbreaks, erosion, or pitting. Cleaning by a process giving a slightly etched surface is desirable. Alkaline residues shall be removed by thorough water rinsing, preferably by spray, after cleaning. This cleaning and etching procedure shall not cause intergranular attack of the base alloy.

3.3 Procedure: Coating shall be applied by immersing parts in the solution of 3.1 for such time and at such temperatures as will produce coatings meeting the requirements of 3.4, followed by rinsing, sealing if required, and drying. If parts are not to be coated all over, the solution may be applied by brushing, swabbing, or spraying the surfaces to be coated.

3.4 Properties: The coating shall conform to the following requirements:

3.4.1 Corrosion Resistance: Samples of AMS 4037 aluminum alloy sheet, nominally 0.040 x 3 x 10 in. (1 x 75 x 250 mm), treated in accordance with 3.3, shall withstand exposure for 168 hr to salt spray without showing more than a total of 15 scattered spots or pits, none larger than 1/32 in. (0.8 mm) in diameter, in a total of 150 sq in. (970 cm²) of test area nor more than 5 scattered spots or pits, none larger than 1/32 in. (0.8 mm) in diameter, in a total of 30 sq in. (195 cm²), except those area within 1/4 in. (6.25 mm) from identification markings and fixture contact marks remaining after processing. Salt spray corrosion tests shall be conducted in accordance with ASTM B117 except that the significant surface shall be inclined approximately 6 deg from the vertical.