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# AEROSPACE MATERIAL SPECIFICATION

AMS2473™ REV. J

Issued 1953-02
Reaffirmed 2007-07
Revised 2020-01

Superseding AMS2473H

## Chemical Film Treatment for Aluminum Alloys General Purpose Coating

RATIONALE

AMS2473J results from a Five-Year Review and update of this specification with changes to Ordering Information, Classification (1.3), Cleaning (3.2.1), Fixture Contact Locations (3.2.2), Application (3.3.1), Touch Up (3.3.2), Properties (3.4), Corrosion Resistance (3.4.1), Color (3.4.3), Responsibility for Inspection (4.1), Periodic Tests (4.2.2), Preproduction Tests (4.2.3), Sampling for Testing (4.3), Acceptance Tests (4.3.1), Periodic Tests (4.3.2), Control Factors (4.4.3), and Table 1.

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:

   - AMS2473J
   - Basis metal and metal temper, and/or basis metal material specification, to be conversion coated
   - Quantity of pieces to be conversion coated
   - Special features, geometry or processing present on parts that requires special attention by the processor
   - Specified coating Type (1.3) and color (3.4.3)
   - Optional: Fixture contact locations, when not specified (3.2.2.1)
   - Primer and application process, if applicable (3.4.2)

2. Parts manufacturing operations such as heat treating, forming, joining and media finishing can affect the condition of the substrate and adversely affect the finished 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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## 1. SCOPE

### 1.1 Purpose

This specification establishes the requirements for chemical-film (conversion) coatings on aluminum alloys.

### 1.2 Application

This process has been used typically for increasing the corrosion resistance of aluminum alloy parts, as a base for paint or other organic finishes, and for repair of abraded surfaces or discontinuous anodized coatings on aluminum alloy parts, but usage is not limited to such applications. AMS2477 is intended for applications that include electrical bonding requirements.

### 1.3 Classification

Chemical coatings covered by this specification are classified as follows (see Ordering Information):

Type I - Hexavalent chromate treatment

Type II - Trivalent chromium treatment

Type III - Phosphate treatment

Type IV - Silicate treatment

Type V - Oxide treatment

1.3.1 When no type is specified, any type may be supplied (see 3.1, 3.4.3, and 4.4).

### 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.

## 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.

| | |
|---|---|
| AMS2477 | Conversion Coating for Aluminum Alloys, Low Electrical Resistance Coating |
| 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 Process Solutions |

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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 D3359 Rating Adhesion by Tape Test

2.3 U.S. Government Publications

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

MIL-PRF-23377 Primer Coatings: Epoxy, High-Solids

MIL-PRF-85582 Primer Coatings: Epoxy, Waterborne

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

3. TECHNICAL REQUIREMENTS

3.1 Processing solution shall be an aqueous solution of chemicals which will form an oxide, phosphate, silicate, or chromate coating meeting the requirements of 3.4.

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

3.2 Preparation

3.2.1 Cleaning

Surfaces to be coated shall be free from water breaks, erosion, or pitting. Cleaning by a process imparting a slightly etched surface is desirable but should not be used on parts with tight tolerances. The cleaning procedure shall preserve dimensional requirements. After cleaning alkaline residues shall be removed by water rinsing. This cleaning and etching procedure shall not cause pitting or intergranular attack of the base alloy.

3.2.2 Fixture contact locations shall be as follows:

3.2.2.1 For parts which are to be coated all over, and fixture contact points are not specified, contact locations shall be at the discretion of the processor (see 4.4.3).

3.2.2.2 For parts which are not to be coated all over, and fixture contact locations are not specified, locations shall be in areas on which chemical conversion coating is not required.

3.3 Procedure

3.3.1 Application

Coating shall be applied using a solution in accordance with 3.1 for a time and at a temperature that will produce coatings meeting the requirements of 3.4, followed by rinsing as necessary and drying. If parts are not to be coated all over, areas that are to be free of coating may be masked. The coating application method may consist of immersion, spray, pen or brush (swab/wipe), capable of generating a coating compliant with the requirements of this specification (see 3.4).

3.3.2 Touch Up

Unless otherwise specified by the cognizant engineering organization, contact points and areas which the coating has been scratched or otherwise damaged (exposing base metal), may be touched-up provided the area touched-up does not exceed 5% of the coated surface area, excluding contact points.