Society of Automotive Engineers, Inc.
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 2473D
Superseding AMS 2473C
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CHEMICAL TREATMENT FOR ALUMINUM ALLOYS
General Purpose Coating

1. SCOPE:

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

1.2 Application: Primarily for increasing the corrosion resistance of aluminum alloy parts, as a base for paint or other organic finishes, and for improving the corrosion resistance and coating adhesion properties of abraded or discontinuous anodized coatings on 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 (AMS) shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, Pennsylvania 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods
AMS 2470 - Anodic Treatment of Aluminum Alloys, Chromic Acid Process
AMS 4037 - Aluminum Alloy Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn
(2024; -T3 Flat Sheet, -T351 Plate)

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

ASTM B117 - Salt Spray (Fog) Testing

3. TECHNICAL REQUIREMENTS:

3.1 Solution: Shall be an aqueous solution of chemicals that will form a coating of oxide, phosphate, silicate, or chromate that will meet the requirements of 3.4.

3.1.1 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, unless otherwise specified.

3.2.2 Parts prior to being coated shall have clean surfaces, free from waterbreaks, prepared with minimum abrasion, 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.

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3.3 Procedure: Coating shall be applied by immersing parts in a solution 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.

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

3.4 Properties:

3.4.1 Corrosion Resistance:

3.4.1.1 For control purposes, samples of AMS 4037 aluminum alloy sheet 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. (968 cm^2) of test area grouped from five or more test pieces; 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. (194 cm^2) from one or more test pieces; except those areas within 1/16 in. (1.6 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 (0.105 rad) from the vertical.

3.4.1.2 Parts treated by immersion and not subsequently to be painted shall be capable of withstanding exposure for 168 hr to salt spray test conducted in accordance with ASTM B117 without showing more than a few scattered corrosion pits visible without magnification.

3.4.2 Paint Adhesion: A sample of AMS 4037 sheet treated in accordance with 3.3 and painted shall show paint adhesion equivalent to that on a similar sample anodized in accordance with AMS 2470 and painted in the same manner. The paint film shall be dried for not less than 24 hr and shall then be scribed by a sharp instrument such as a fine knife edge with 2 lines perpendicular to each other. The scratched panel shall be subjected to 500 hr salt spray exposure and then dried for not less than 24 hr. The salt-sprayed panel shall show no evidence of paint blisters or flaking in the areas adjacent to the scribing.

3.5 Quality: The coating shall have a uniform appearance, characteristic of the process used. Color of chromate coatings may range from iridescent yellow to dark olive green.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The coating vendor shall supply all samples and shall be responsible for performing all required tests. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to assure that processing conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to corrosion resistance (3.4.1.1) and paint adhesion (3.4.2) requirements are classified as acceptance or routine control tests.

4.2.2 Qualification Tests: Tests to determine corrosion resistance of parts which are not subsequently to be painted (3.4.1.2) are classified as qualification or periodic control tests.

4.3 Sampling:

4.3.1 Corrosion Resistance: Determinations shall be made on representative parts or on separate panels not less than 3 x 10 in. (76 x 254 mm), the 10 in. (254 mm) direction being perpendicular to the direction of rolling and 0.025 - 0.063 in. (0.64 - 1.60 mm) thick.

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