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400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 2506B

Superseding AMS 2506A

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COATING OF FASTENERS
Aluminum Filled, Ceramic Bonded Coating

1. SCOPE:

1.1 Purpose: This specification covers the procedure for application to fasteners of a corrosion and heat resistant aluminum coating material having a thermosetting inorganic binder and the properties of the finished coating.

1.2 Application: Primarily to provide an anodic coating on fasteners to provide corrosion and oxidation resistance up to 1000°F (540°C).

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, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods
AMS 3126 - Aluminum Coating Material, Corrosion and Heat Resistant, Thermosetting, Inorganic Binder

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

2.2.1 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of
MIL-STD-1312 - Fasteners, Test Methods

3. TECHNICAL REQUIREMENTS:

3.1 Coating Material: Shall conform to AMS 3126.

3.2 Preparation:

3.2.1 Parts shall be stress relieved prior to coating if they have been subjected to operations which may cause detrimental residual stresses. Temperatures to which the parts are heated and time at temperature shall be such that maximum stress relief is obtained without affecting properties of the parts.

3.2.2 Any residual compressive stress-inducing operation such as shot peening, fillet rolling, and thread rolling shall follow stress relieving.

3.2.3 Before coating, parts shall have clean, roughened surfaces, prepared with minimum erosion, pitting, or unintended abrasion. Roughening of the surfaces may be accomplished by wet or dry grit blasting.

3.3 Procedure:

3.3.1 The cleaned parts shall be coated with AMS 3126. Parts may be coated, cured, and burnished by any suitable technique capable of producing a uniform coating conforming to the requirements of 3.4.

3.3.2 The coating on parts, and on specimens representing the parts when used, shall be cured in a circulating air furnace at such temperature and for such time as required to cure the coating without reducing properties of parts below drawing or specification limits. Unless otherwise specified, the curing temperature shall be within the range 375° - 700°F (190° - 370°C). If a specific time/temperature cycle is required it shall be as specified by the purchaser. Typical curing temperatures and corresponding minimum times at temperature are as follows:

Cure Temperature	Time (Minimum)
375°F ± 15 (190°C ± 8)	24 hr
450°F ± 15 (230°C ± 8)	18 hr
500°F ± 15 (260°C ± 8)	7.0 hr
550°F ± 15 (290°C ± 8)	2.5 hr
600°F ± 15 (315°C ± 8)	1.0 hr
650°F ± 15 (345°C ± 8)	30 min.
700°F ± 15 (370°C ± 8)	15 min.

3.3.3 The cured coating shall be burnished by glass bead peening or other suitable means to produce a conductive surface meeting the requirements of 3.4 and 3.5.

3.4 Properties: Coating on parts or test specimens shall conform to the following requirements:

3.4.1 Thickness: Unless otherwise specified, coating thickness shall be within the range of 0.0003 to 0.0007 in. (8 to 18 µm), determined on representative parts or on separate specimens representing parts and coated simultaneously with the parts. Determination of coating thickness shall be made by any method specified in Test No. 12 of MIL-STD-1312. For referee tests, the microscopic method shall be used. Distribution of coating shall be such that parts are within drawing tolerances after coating.

3.4.2 Heat Resistance: Coating on parts, or on specimens representing parts and processed through the complete cleaning and coating process, shall withstand, without evidence of blistering or cracking, being heated in air at 1000°F ± 25 (540°C ± 15) for 4 hr and cooled in air.

3.4.3 Adhesion: Coating shall be continuously bonded to the basis metal. Parts or specimens shall withstand a scrape test so conducted as to indicate quality of the bond. Coating shall shear away from the basis metal without bond failure of the adjacent coating. This requirement applies to parts as coated as well as after the heat resistance test of 3.4.2.

3.4.4 Corrosion Resistance:

3.4.4.1 Parts, or representative specimens processed with the parts, shall withstand, without evidence of corrosion of the basis metal, continuous exposure for 1000 hr to salt spray test in accordance with Test No. 1 of MIL-STD-1312.

3.4.4.2 Parts, or representative specimens processed with the parts, subjected to the heat resistance test of 3.4.2 shall withstand, without evidence of corrosion of the basis metal, continuous exposure for 200 hr to salt spray test as in 3.4.4.1.

3.4.5 Electrical Resistivity: Shall be not greater than 15 ohms per in. (4.78 Ω/m), determined by means of a Wheatstone bridge or suitable direct reading ohm-meter operated on direct current with a minimum distance of 1 in. (25 mm) between probes where possible. The contact areas of the probes shall be of such configuration as to make intimate contact with the surface without penetrating the coating.

3.5 Quality: The coating, as received by purchaser, shall be smooth, continuous, adherent to the basis metal, uniform in appearance, and free from pin holes, blisters, nodules, pits, and other imperfections detrimental to usage of the coating.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The processing vendor shall supply all samples for vendor's tests and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.5. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the coating conforms to the requirements of this specification.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Tests to determine conformance to requirements for thickness (3.4.1), electrical resistivity (3.4.5), and quality (3.5) are classified as acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests to determine conformance to requirements for heat resistance (3.4.2), adhesion (3.4.3), and corrosion resistance (3.4.4) are classified as periodic tests and shall be performed at a frequency selected by the processing vendor unless frequency of testing is specified by purchaser.

4.2.3 Preproduction Tests: Tests to determine conformance to all technical requirements of this specification are classified as preproduction tests and shall be performed on the initial shipment of coated parts to a purchaser, when a change in material or processing requires reapproval as in 4.4.2, and when purchaser deems confirmatory testing to be required.

4.2.3.1 For direct U.S. Military procurement, substantiating test data and, when requested, preproduction test material shall be submitted to the cognizant agency as directed by the procuring activity, the contracting officer, or the request for procurement.

4.3 Sampling: Unless otherwise specified in the applicable fastener specification, sampling shall be not less than the following; a lot shall be all coated fasteners of approximately the same size, shape, and basis metal for the range of coating thickness required, processed in a continuous operation, and presented for vendor's inspection at one time.

4.3.1 For Acceptance Tests:

4.3.1.1 Thickness: Three parts from each lot.

4.3.1.2 Electrical Resistivity: Three parts from each lot.

4.3.1.3 Quality: As agreed upon by purchaser and vendor.

4.3.2 For Periodic Tests and Preproduction Tests: As agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 Coated parts shall be approved by purchaser before parts for production use are supplied, unless such approval be waived. Results of tests on production parts shall be essentially equivalent to those on the approved sample parts.