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400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS-2506 REV C

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Submitted for recognition as an American National Standard

COATING OF FASTENERS
Aluminum Filled, Ceramic Bonded Coating

1. SCOPE:

1.1 Purpose: This specification covers the requirements 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 a coating on fasteners which is anodic to the base metal and to provide corrosion and oxidation resistance up to 1000°F (538°C).

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 following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

2.1.1 Aerospace Material Specifications:

AMS-3126 - Aluminum Coating Material, Corrosion and Heat Resistant, Thermosetting, Inorganic Binder

2.2 U.S. Government Publications: Available from Naval Publications and Forms Center, Attn: NPODS, 5801 Tabor Avenue, Philadelphia, PA 19120-5099.

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, when specified, 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 a material meeting the requirements of 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. The curing temperature shall be within the range 375° - 700°F (191° - 371°C). If a specific time/temperature cycle is required it shall be as specified by purchaser. Typical curing temperatures and corresponding minimum times at temperature are as follows:

Cure Temperature	Minimum Time at Temperature
375°F ± 15 (191°C ± 8)	24 hours
450°F ± 15 (232°C ± 8)	18 hours
500°F ± 15 (260°C ± 8)	7.0 hours
550°F ± 15 (287°C ± 8)	2.5 hours
600°F ± 15 (316°C ± 8)	1.0 hour
650°F ± 15 (343°C ± 8)	30 minutes
700°F ± 15 (371°C ± 8)	15 minutes

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 3.4.5.

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

3.4.1 Thickness: Coating thickness shall be within the range of 0.0003 to 0.0007 inch (7.6 to 17.8 µm), determined on representative parts or on separate specimens representing parts and coated simultaneously with the parts. Determination of coating thickness shall be made in accordance with MIL-STD-1312, Test No. 12. 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 with the parts through the complete cleaning and coating process, shall withstand, without evidence of blistering or cracking, being heated in air for 4 hours ± 0.25 at 1000°F ± 25 (538°C ± 14) 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 hours to salt spray test in accordance with MIL-STD-1312, Test No. 1.

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 hours to salt spray test in accordance with MIL-STD-1312, Test No. 1.

3.4.5 Electrical Resistivity: Shall be not greater than 15 ohms/inch (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 inch (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 Ø samples for vendor's tests and shall be responsible for performing all required tests. 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 for thickness (3.4.1), electrical resistivity (3.4.5), and quality (3.5) are acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests: Tests for heat resistance (3.4.2), adhesion (3.4.3), and corrosion resistance (3.4.4) are 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 for all technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of coated parts to a purchaser, when a change in ingredients and/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, contracting officer, or request for procurement.

4.3 Sampling and Testing: Shall be as follows; a lot shall be all coated Ø 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 by purchaser. Results of tests on production parts shall be essentially equivalent to those on the approved sample parts.