AEROSPACE MATERIAL SPECIFICATION

AMS2506™	REV. E

Issued 1971-05
Revised 2018-06
Reaffirmed 2022-05

Superseding AMS2506D

Coating of Fasteners
Aluminum Filled, Ceramic Bonded Coating

RATIONALE

AMS2506E results from a Five-Year Review and update of this specification with changes to Ordering Information, Electrical Resistivity 3.4.5, Periodic Tests 4.2.2 and Specimens 4.3.3.

AMS2506E has been reaffirmed to comply with the SAE Five-Year Review policy.

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:

- AMS2506E
- Basis metal to be coated
- Precoating stress relief, if desired (see 3.2.1)
- Quantity of pieces to be coated

2. Parts manufacturing operations such as heat treating, forming, joining and media finishing can affect the condition of the substrate for coating, or, if performed after coating, could adversely affect the coated 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.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS2506E/

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

This coating has been used typically 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), but usage is not limited to such applications.

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 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.

AMS3126 Aluminum Coating Material, Corrosion and Heat Resistant, Thermosetting, Inorganic Binder

2.2 AIA Publications

Available from Aerospace Industries Association, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209-3928, Tel: 703-358-1000, www.aia-aerospace.org.

NASM 1312-1 Fastener Test Methods, Method 1, Salt Spray

NASM 1312-12 Fastener Test Methods, Method 12, Thickness of Metallic Coatings

3. TECHNICAL REQUIREMENTS

3.1 Coating Material

Shall conform to AMS3126.

3.2 Preparation

3.2.1 When specified, 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 a material meeting the requirements of AMS3126. 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 a temperature and for a time required to cure the coating without reducing properties of parts below drawing or specification limits. The curing temperature shall be within the range 375 to 700 °F (191 to 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 shown in Table 1:

Table 1 - Curing

Cure Temperature	Minimum Time at Temperature
375 °F ± 15 °F (191 °C ± 8 °C)	24 hours
450 °F ± 15 °F (232 °C ± 8 °C)	18 hours
500 °F ± 15 °F (260 °C ± 8 °C)	7.0 hours
550 °F ± 15 °F (288 °C ± 8 °C)	2.5 hours
600 °F ± 15 °F (316 °C ± 8 °C)	1.0 hour
650 °F ± 15 °F (343 °C ± 8 °C)	30 minutes
700 °F ± 15 °F (371 °C ± 8 °C)	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 NASM 1312-12. 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 hours at 1000 °F ± 25 °F (538 °C ± 14 °C) 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 NASM 1312-1, 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 NASM 1312-1.

3.4.5 Electrical Resistivity

Shall be not greater than 15 Ω·in (0.38 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 processor shall supply all samples for vendor's tests and shall be responsible for the performance of 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 specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

Thickness (3.4.1), adhesion (3.4.3), electrical resistivity (3.4.5), and quality (3.5) are acceptance tests and shall be performed on each lot.

4.2.2 Periodic Tests

Heat resistance (3.4.2) adhesion after heat resistance test (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.

4.3 Sampling and Testing

Shall be as follows; a lot shall be all coated parts of approximately the same size, shape, and basis metal for the range of coating thickness required, processed in a continuous operation, and presented for processor's inspection at one time.