



# AEROSPACE MATERIAL

Society of Automotive Engineers, Inc.

TWO PENNSYLVANIA PLAZA, NEW YORK, N. Y. 10001

## SPECIFICATION

AMS 3126

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Revised

### ALUMINUM COATING, CORROSION AND HEAT RESISTANT Thermosetting, Inorganic Binder

#### 1. SCOPE:

1.1 Form: This specification covers a corrosion and heat resistant aluminum coating material supplied as a liquid of suitable consistency for coating parts after being thoroughly mixed.

1.2 Application: Primarily for coating ferrous parts to be exposed to temperatures below 1200 F (649 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., Two Pennsylvania Plaza, New York, New York 10001.

##### 2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

AMS 5040 - Carbon Steel Sheet and Strip, Deep Forming Grade

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

ASTM B117 - Salt Spray (Fog) Testing

ASTM D471 - Change in Properties of Elastomeric Vulcanizates  
Resulting from Immersion in Liquids

ASTM C430 - Fineness of Hydraulic Cement by No. 325 Sieve

#### 3. TECHNICAL REQUIREMENTS:

##### 3.1 Composition:

|                  |                      |
|------------------|----------------------|
| Total Solids     | 56 - 62% (by weight) |
| Volatile (Water) | remainder            |

3.1.1 Pigment: Shall consist of commercially pure (99% min aluminum) spherical aluminum powder or atomized powder having an average particle size not greater than 10 microns and shall contain no other filler or adulterant.

3.1.2 Binder: Shall be an acidic, water-base inorganic type.

##### 3.2 Properties:

3.2.1 General: Material, after mixing thoroughly, shall be of uniform consistency, and free from hydrogen evolution, toxic ingredients, grit, and floating or caked pigments. Ingredients shall be processed as required to produce a product which is stable and not subject to abnormal change with age in sealed containers. The formation of agglomerates which can be dispersed by high speed mixing shall not be cause for rejection.

SAE Technical Board rules provide that: "All technical reports, including standards, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against infringement of patents."

- 3.2.2 Weight: Shall be not less than 13.2 lb per gallon (1584 kg/m<sup>3</sup>).
- 3.2.3 Coarse Particles: Not more than 0.1% by wt of the material shall be retained on a No. 325 screen, determined in accordance with ASTM C430.
- 3.2.4 Viscosity: Shall be 16 - 18 sec at 77 F  $\pm$  0.5 (25 C  $\pm$  0.3), using No. 2 Zahn cup.
- 3.2.5 Shelf Life: Shall be not less than 1 yr from date of manufacture when material is stored in sealed containers at temperatures between 35 F (1.7 C) and 120 F (48.9 C).
- 3.2.6 Film Properties: Shall be as specified in 3.2.6.1 thru 3.2.6.7, determined on films prepared as follows: Finish shall be sprayed on both sides of abrasive-blasted, clean, smooth AMS 5040 or equivalent steel panels to a total dried film thickness of 0.0015 - 0.0025 in. (0.038 - 0.064 mm), attained in two coats. Following each coat, finish shall be dried by heating to 175 F  $\pm$  25 (79.4 C  $\pm$  14) for not less than 15 min. and cured by heating to 650 F  $\pm$  25 (343.3 C  $\pm$  14) for not less than 15 minutes. Following the final cure at 650 F  $\pm$  25 (343.3 C  $\pm$  14), finish for the tests of 3.2.6.3, 3.2.6.6, and 3.2.6.7 shall be postcured by heating to 1000 F  $\pm$  25 (537.8 C  $\pm$  14) for 90 minutes.
- 3.2.6.1 Appearance: Shall be uniform matte gray and shall closely match the color of the standard panel agreed upon by purchaser and vendor.
- 3.2.6.2 Adhesion: Film shall not loosen from the panel or flake at the bend when the panel is bent at room temperature through an angle of 90 deg (1.57 rad) around a diameter equal to 8 times the thickness of the uncoated panel. Flaking or loosening of film within 1/8 in. (3.18 mm) of edges will not be cause for rejection.
- 3.2.6.3 Heat Resistance: Film, after heating for 23 hr at 700 F  $\pm$  25 (371.1 C  $\pm$  14) followed by 4 hr at 1200 F  $\pm$  25 (648.9 C  $\pm$  14) shall show no cracking, checking, or blistering; discoloration will not be cause for rejection.
- 3.2.6.4 Hot Water Resistance: Film shall withstand immersion in boiling water for 10 minutes. When observed 5 min. after removal, film shall show no checking, no blistering, and no leaching out of coating constituents. After 3 hr air drying, film shall be capable of meeting the adhesion test of 3.2.6.2. Discoloration will not be cause for rejection.
- 3.2.6.5 Fuel Resistance: Film shall withstand immersion in ASTM Reference Fuel B (ASTM D471) at room temperature for 4 hours. Film, 24 hr after removal from fuel, shall be capable of meeting the adhesion test of 3.2.6.2.
- 3.2.6.6 Hot Oil Resistance: Film, after immersion in ASTM Service Fluid No. 101 (ASTM D471) for 8 yr at 400 F  $\pm$  25 (204.4 C  $\pm$  14) shall show no peeling or blistering and not more than slight softening.
- 3.2.6.7 Corrosion Resistance: Coated panels which have been exposed to heat as in 3.2.6.3, cross scratched "X" on one face with a sharp instrument so that each leg of "X" is approximately 1 - 1/2 in. (2.54 - 3.81 cm) long, and then subjected to salt spray test in accordance with ASTM B117 for 100 hr, shall show no pitting of the basis metal except within 1/8 in. (3.18 mm) of any edge or within 1/16 in. (1.59 mm) of scratches. Discoloration or superficial rust spots on the film will not be cause for rejection.
- 3.3 Quality: The material, as applied to panels or parts, shall produce a cured coating which shall be smooth, uniform, and free from pinholes, sags, runs, bubbles, heavy edges, foreign materials, and other imperfections detrimental to performance of parts.

#### 4. QUALITY ASSURANCE PROVISIONS:

- 4.1 Responsibility for Inspection: The vendor shall supply all samples and shall be responsible for performing all required tests. Results of such tests shall be reported to purchaser as required by 4.5. Purchaser reserves the right to perform such confirmatory testing as he deems necessary to assure that material conforms to the requirements of this specification.

4.2 Classification of Tests:

- 4.2.1 Routine Control Tests: Tests to determine conformance to the requirements of 3.1 through 3.2.4 are classified as routine control tests.
- 4.2.2 Periodic Control Tests: Tests to determine conformance to the requirements of 3.2.6 are classified as periodic control tests which shall be conducted on a semi-annual basis.
- 4.2.3 Qualification Tests: Tests to determine conformance to all requirements of this specification are classified as qualification tests.
- 4.3 Sampling: A minimum of three randomly selected samples of coating material per batch shall be used for testing. A batch is defined as all material in an identifiable quantity processed at one time and presented for inspection at one time.

4.4 Approval:

- 4.4.1 Material shall be approved by purchaser before material for production use is supplied, unless such approval be waived.
- 4.4.2 Vendor shall use manufacturing procedures, processes, and methods of inspection on production material to determine conformance to this specification which are essentially the same as those used on the approved sample material. If any change in ingredients, in established composition limits, or in methods of compounding and mixing is necessary, vendor shall submit samples for reapproval unless purchaser grants written approval of the changed material after review of a detailed statement of changes in the material. No changed material shall be shipped prior to receipt of approval of such material.

4.5 Reports:

- 4.5.1 Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report of the results of routine control tests made on the material and a statement that the product conforms to all other technical requirements of this specification. This report shall include the purchase order number, material specification number, vendor's material designation, form or part number, and quantity.
- 4.5.2 Unless otherwise specified, the vendor of finished or semi-finished parts shall furnish with each shipment three copies of a report showing the purchase order number, material specification number, contractor or other direct supplier of material, supplier's material designation, part number, and quantity. When material for coating parts is produced or purchased by the parts vendor, that vendor shall inspect each lot of material to determine conformance to the requirements of this specification, and shall include in the report a statement that the material conforms, or shall include copies of laboratory reports showing the results of tests to determine conformance.
- 4.6 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements disposition of the product may be based on the testing of three additional specimens for each original non-conforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the material represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

- 5.1 Identification: Each container shall be marked to show this specification number and title, vendor's identification, formula number and/or batch number, date of manufacture, quantity, and any directions for use of precautions for storage.
- 5.2 Packaging: The product shall be prepared for shipment in accordance with commercial practice to assure carrier acceptance and safe transportation to the point of delivery. Packaging shall conform to requirements of carrier rules and regulations applicable to the mode of transportation.