

AMS 3135D-84
26 September 1985
SUPERSEDING
AMS 3135C-78
20 February 1979

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Title of Document: COATING MATERIAL, SILICONE RESIN
205°C(400°F) CURE

Date of Specific Issue Adopted: 1 October 1984

Releasing Industry Group: Society of Automotive Engineers

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Navy - AS
(Project No. 9320-0471)

FSC 8010

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H-09-19



400 COMMONWEALTH DRIVE WARRENDALE PA 15096

AEROSPACE MATERIAL SPECIFICATION

AMS 3135D
 Superseding AMS 3135C

 Issued 6-15-59
 Revised 10-1-84

COATING MATERIAL, SILICONE RESIN 205°C (400°F) Cure

1. SCOPE:

- 1.1 Type: This specification covers an unpigmented silicone-resin-base coating material.
- 1.2 Application: Primarily for use on chemically or electrochemically treated magnesium and aluminum alloy surfaces to improve the high temperature corrosion and abrasion resistance and the air flow characteristics. The coating may also be used on steel for improvement of corrosion resistance.

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 SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

- AMS 2350 - Standards and Test Methods
 AMS 2476 - Electrolytic Treatment, Magnesium Base Alloys, Alkaline Type, Full Cast
 AMS 4375 - Magnesium Alloy Sheet and Plate, 3.0Al - 1.0Zn (AZ31B-0)

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

- ASTM B117 - Salt Spray (Fog) Testing
 ASTM D56 - Flash Point by Tag Closed Tester
 ASTM D445 - Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)
 ASTM D471 - Rubber Property - Effect of Liquids
 ASTM D1475 - Density of Paint, Varnish, Lacquer, and Related Products

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

2.3.1 Federal Specifications:

PPP-P-1892 - Paint, Varnish, Lacquer, and Related Materials; Packaging, Packing, and Marking of

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall be as follows:

3.1.1 Resin Coating (by weight):

Nonvolatile	18 - 22%
Volatile	78 - 82%

3.1.1.1 Nonvolatile: Shall be a thermosetting silicone resin.

3.1.1.2 Volatiles: Shall be a mixture of aromatics, olefins, and aliphatics as required to produce a product meeting the requirements of 3.2.

3.2 Properties: The product shall conform to the following requirements:

3.2.1 Product Properties:

3.2.1.1 Viscosity: Shall be 3 - 8 centipoises (0.003 - 0.008 Pa·s) at 25°C (77°F), determined in accordance with ASTM D445.

3.2.1.2 Specific Gravity: Shall be 0.82 - 0.88 at 25°C (77°F), determined in accordance with ASTM D1475.

3.2.1.3 Flash Point: Shall be not lower than -7°C (20°F), determined in accordance with ASTM D56.

3.2.1.4 Stability: Seeding out of resin material shall not occur within 30 days of date of manufacture. Skinning and livering shall be absent in partially-filled, closed containers at any time up to one week of standing.

3.2.2 Applied Film Properties: The product shall be freely working and shall have acceptable leveling properties when applied by brushing, spraying, or dipping. Recoating, following air drying for not less than 15 min., shall produce no film irregularity.

3.2.3 Cured Film Properties: Shall be as specified in 3.2.3.1 through 3.2.3.6, determined on panels prepared as in 4.5.1.

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- 3.2.3.1 Color and Appearance: The cured film shall be transparent, smooth, uniform, and free from craters, pin holes, sags, runs, bubbles, heavy edges, and other imperfections affecting its continuity. The film shall retain a distinct coloration.
- 3.2.3.2 Heat Resistance: The film shall withstand exposure to air at $260^{\circ}\text{C} \pm 5$ ($500^{\circ}\text{F} \pm 10$) for not less than 48 hr without evidence of chalking, blistering, or loss of adhesion.
- 3.2.3.3 Corrosion Resistance: Panels subjected to the heat resistance test of 3.2.3.2 shall show no evidence of corrosion after exposure for not less than 200 hr to salt spray test conducted in accordance with ASTM B117.
- 3.2.3.4 Fuel Resistance: Films shall withstand immersion for not less than 100 hr in ASTM Reference Fuel B (ASTM D471) at room temperature without appreciable softening or other evidence of deterioration.
- 3.2.3.5 Oil Resistance: Films shall withstand immersion for not less than 100 hr in ASTM Service Fluid No. 101 (ASTM D471) at $150^{\circ}\text{C} \pm 2$ ($300^{\circ}\text{F} \pm 5$) without appreciable softening. Slight discoloration of the film will be acceptable.
- 3.2.3.6 Adhesion: Film shall not crack, loosen from the panel, or flake at the bend when a panel is bent rapidly at room temperature through an angle of 180 deg around a diameter equal to six times the nominal thickness of the panel.
- 3.3 Quality: Coating material, as received by purchaser, shall be clear, transparent, homogeneous, and amber colored. It shall be free from bubbles. There shall be no trace of grit or rough particles. Material shall contain no substance of known toxicity under normal conditions of use.
4. QUALITY ASSURANCE PROVISIONS:
- 4.1 Responsibility for Inspection: The vendor of the product 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 4.6. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to the requirements of this specification.
- 4.2 Classification of Tests:
- 4.2.1 Acceptance Tests: Tests to determine conformance to requirements for composition (3.1), viscosity (3.2.1.1), specific gravity (3.2.1.2), flash point (3.2.1.3), applied film properties (3.2.2), color and appearance (3.2.3.1), fuel resistance (3.2.3.4), and adhesion (3.2.3.6) are classified as acceptance tests and shall be performed on each lot.

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4.2.2 Periodic Tests: Tests to determine conformance to requirements for heat resistance (3.2.3.2), corrosion resistance (3.2.3.3), and oil resistance (3.2.3.5) are classified as periodic tests and shall be performed at a frequency selected by the 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 prior to or on the initial shipment of coating material to a purchaser, when a change in material or processing, or both, 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: Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient coating material shall be taken at random from each lot to permit making the following numbers of determinations; a lot shall be all coating material produced in one continuous manufacturing operation from the same batches of raw materials and presented for vendor's inspection at one time. An inspection lot shall not exceed 500 gal (2000 L) and may be packaged in small quantities under the basic lot approval provided lot identification is maintained.

Requirement	Reference Paragraph	Number of Determinations
Composition	3.1	1
Viscosity	3.2.1.1	1
Specific Gravity	3.2.1.2	1
Flash Point	3.2.1.3	1
Applied Film Properties	3.2.2	3 (See 4.3.1.1)
Color and Appearance	3.2.3.1	3 (See 4.3.1.1)
Fuel Resistance	3.2.3.4	2
Adhesion	3.2.3.6	3

4.3.1.1 These requirements are to be determined on the panels prepared for other tests.

4.3.1.2 When a statistical sampling plan and acceptance quality level (AQL) have been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report of 4.6 shall state that such plan was used.

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

4.4 Approval: