

# AEROSPACE MATERIAL SPECIFICATION

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Superseding AMS 3136D

Coating Material, Phenolic Resin, PTFE Filled  
Pigmented, 150 °C (302 °F) Cure

## 1. SCOPE:

### 1.1 Type:

This specification covers a pigmented phenolic-resin-base coating material, filled with polytetrafluoroethylene (PTFE), supplied in kit form.

### 1.2 Application:

This coating has been used typically where lubricity is required on materials not adversely affected by the 150 °C (302 °F) curing temperature, 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 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.

AMS 2825 Material Safety Data Sheets

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#### TO PLACE A DOCUMENT ORDER:

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<http://www.sae.org>

#### SAE WEB ADDRESS:

## 2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM B 117 Salt Spray (Fog) Testing

## 2.3 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

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

## 3. TECHNICAL REQUIREMENTS:

### 3.1 Material:

#### 3.1.1 Composition:

Shall consist of a two-part formulation, one part being a phenolic resin base with dye and dispersing agents and the other part being a colloidal dispersion of polytetrafluoroethylene (PTFE) with necessary wetting and dispersing agents. After mixing in accordance with manufacturer's recommendations, the mixed product shall conform to the following percentages by weight.

Nonvolatile: 19 to 21%

Volatile: 79 to 81%

#### 3.1.1.1 The composition of the individual components shall be as follows:

##### 3.1.1.1.1 Pigmented Phenolic Resin Component (percent by weight):

Nonvolatile: 9.5 to 10.0

Volatile: 90.0 to 90.5

##### 3.1.1.1.1.1 Nonvolatile: Shall be a thermosetting phenolic resin with dye and dispersing agents.

##### 3.1.1.1.1.2 Volatile: Shall be an organic solvent composed of alcohols, esters, and diluents.

##### 3.1.1.1.2 PTFE Filler Component (percent by weight):

Nonvolatile: 61.5 to 63.5

Volatile: 36.5 to 38.5

##### 3.1.1.1.2.1 Nonvolatile: Shall be polytetrafluoroethylene (PTFE) resin particles with necessary wetting agents and dispersing agents.

3.1.1.1.2.2 Volatile: Shall be water.

3.1.2 Shelf Life: The PTFE filler component shall show no evidence of gelation after storage for not less than 60 days at  $25^{\circ}\text{C} \pm 1$  ( $77^{\circ}\text{F} \pm 2$ ) in a full, closed container and, at the end of this period, shall produce a uniform dispersion free from curds when mixed with the phenolic resin component in accordance with manufacturer's recommendations.

3.1.3 Pot Life: After mixing in accordance with manufacturer's recommendations, the mixed product, in 100-gram batches, shall have a useful pot life of not less than 22 hours when maintained at 15 to  $27^{\circ}\text{C}$  ( $59$  to  $81^{\circ}\text{F}$ ).

### 3.2 Properties:

The product shall conform to the following requirements:

3.2.1 Curing: When mixed and applied in accordance with manufacturers recommendations and cured at  $150^{\circ}\text{C} \pm 5$  ( $302^{\circ}\text{F} \pm 9$ ) for 1 hour  $\pm 0.1$ , the phenolic resin shall polymerize to produce a coating with a uniform dispersion of polytetrafluoroethylene resin solids.

3.2.2 Corrosion Resistance: A low-carbon steel panel with a cured coating 0.0002 to 0.0007 inch (5 to 18  $\mu\text{m}$ ) thick shall show no evidence of deterioration of the coating or corrosion of the basis metal after exposure for not less than 100 hours to salt spray test conducted in accordance with ASTM B 117.

3.2.3 Heat Resistance: The coating shall show no evidence of chalking, blistering, or loss of adhesion after exposure for not less than 100 hours at  $175^{\circ}\text{C} \pm 2$  ( $347^{\circ}\text{F} \pm 4$ ).

3.2.4 Adhesion: An anodized aluminum alloy test panel with a cured coating 0.0002 to 0.0007 inch (5 to 18  $\mu\text{m}$ ) thick shall have one half of its surface immersed in distilled water at room temperature for 24 hours  $\pm 0.2$ . The panel shall be removed and wiped dry with a soft cloth. Immediately thereafter, two parallel scratches 1 inch (25 mm) apart shall be made by a sharp stylus on the coated surface subjected to immersion. Within 1 minute after the panel has been removed from the water, a piece of pressure-sensitive, paper masking tape shall be placed across the two scratches and sufficient pressure applied to ensure adhesion. Removal of the tape, using an abrupt motion, shall cause no separation of the coating from the basis metal.

3.2.5 Coefficient of Friction: The cured coating shall have a coefficient of friction not greater than 0.1, determined at a speed of 25 feet per minute (127 mm/s) and 10 pounds force (44.5 N) on a Timken Tester, or equivalent, at 20 to  $30^{\circ}\text{C}$  ( $68$  to  $86^{\circ}\text{F}$ ).

### 3.3 Quality:

After mixing in accordance with manufacturers recommendations and curing as in 3.2.1, the cured coating shall be smooth, uniform, and free from tackiness, craters, pin holes, sags, runs, bubbles, heavy edges, and other imperfections detrimental to usage of the coating.

#### 4. QUALITY ASSURANCE PROVISIONS:

##### 4.1 Responsibility for Inspection:

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The manufacturer of the coating material shall supply all samples and shall be responsible for all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the coating material conforms to specified requirements.

##### 4.2 Classification of Tests:

4.2.1 Acceptance Tests: Composition (3.1.1), pot life (3.1.3), curing (3.2.1), and adhesion (3.2.4) are acceptance tests and shall be performed on each lot.

4.2.2 Preproduction Tests: All technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of coating material 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.

4.2.2.1 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:

4.3.1 For Acceptance Tests: Sufficient coating material shall be taken at random from each lot to perform the tests shown in Table 1.

TABLE 1 - Acceptance Testing

Requirement	Reference Paragraph	Number of Determinations
Composition	3.1.1	1
Pot Life	3.1.3	1
Curing	3.2.1	2 (See 4.3.1 .1)
Adhesion	3.2.4	2

4.3.1.1 Curing test shall be performed on panels prepared for the adhesion test.

4.3.1.2 A lot shall be all coating material produced in one continuous manufacturing operation from the same lots of raw materials and presented for manufacturer's inspection at one time.