SAE Aerospace
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS3122 REV. G

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Superseding AMS3122F

Enamel, Phenolic
Black Baking

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

STABILIZED NOTICE

This document has been declared "Stabilized" by SAE G-8, Aerospace Organic Coatings Committee, and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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1. SCOPE:

1.1 Type:

This specification covers a semigloss black baking enamel based on a phenolic resin.

1.2 Application:

Primarily as a coating for metal surfaces exposed to corrosive conditions.

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 2825 - Material Safety Data Sheets

2.2 ASTM Publications:

Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM D56 - Flash Point by Tag Closed Tester
ASTM D185 - Coarse Particles in Pigments, Pastes, and Paints
ASTM D445 - Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)
ASTM D1200 - Viscosity of Paints, Varnishes, and Laquers by Ford Viscosity Cup

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:

3.1.1 Enamel (by weight):

	min	max
Nonvolatile	50%	--
Volatile	--	50%

3.1.1.2 Nonvolatile:

	min	max
Resin	74	75%
Pigment	25	26%

3.1.1.2.1 Resin: Shall be a thermosetting phenolic type with softening agents added; it shall be free from rosin, rosin derivatives, oils, and cellulose derivatives.

3.1.1.2.2 Pigment: Shall consist of carbon black and animal black in proportions required to produce an enamel meeting the requirements of 3.2.2.2.

3.1.1.3 Volatile: Shall be optional with the manufacturer but shall meet applicable air pollution control regulations.

3.2 Properties:

Enamel shall conform to the following requirements:

3.2.1 Product Properties:

3.2.1.1 Viscosity: Shall be not less than 4 poises (0.4 Pa·s) at 77°F (25°C) not less than 24 hr after manufacture, determined in accordance with ASTM D445.

3.2.1.2 Flash Point: Shall be not lower than 60°F (15°C), determined in accordance with ASTM D56.

3.2.1.3 Skinning and Livering: Shall be absent in 1/4-filled closed containers after standing at least 7 days.

3.2.1.4 Coarse Particles: Not more than 0.1% by weight of the enamel shall be retained on a No. 325 (45 m) sieve, determined in accordance with ASTM D185.

3.2.2 Applied Film Properties:

3.2.2.1 Leveling: Enamel, applied by brushing, spraying, or dipping, shall be a freely working product having leveling properties acceptable to purchaser.

3.2.2.2 Color and Gloss: A coat, air-dried for not less than 30 min. and baked for 1 hr ± 0.1 at 325°F ± 5 (165°C ± 3), shall closely match the color and gloss of the standard panel specified by purchaser.

3.2.3 Cured Film Properties: Shall be as specified in 3.2.3.1, 3.2.3.2, and 3.2.3.3, determined on panels prepared as in 4.5.1.

3.2.3.1 Appearance: Film shall be firm, hard, and free from streaks, blisters, silking, and other surface irregularities.

3.2.3.2 Adhesion: Film shall not peel when a panel is bent at 32°F ± 2 (0°C ± 1) through an angle of 180 deg around a diameter equal to 20 times the nominal thickness of the panel. Cracking of film on bent portion of panel will be acceptable.

3.2.3.3 Solvent Resistance: Film, immersed at room temperature for 2 hr ± 0.2 in a solution of 50% denatured alcohol and 50% acetone, shall not be softened or removed. Dulling or change in color will be acceptable.

3.3 Quality:

Enamel, as received by purchaser, shall be of uniform consistency and free from bubbles, grit, rough particles, floating or caked pigments, and ingredients of respiratory toxicity under normal conditions of use. Component ingredients shall be intimately mixed and processed as required to produce a product which is stable and not subject to abnormal change with age in sealed containers.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of enamel 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 enamel 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), color and gloss (3.2.2.2), appearance (3.2.3.1), adhesion (3.2.3.2), and solvent resistance (3.2.3.3) are classified as acceptance tests and shall be performed on each lot.

4.2.2 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 enamel 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.

4.2.2.1 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, the contracting officer, or the request for procurement.

4.3 Sampling:

Shall be as follows:

4.3.1 For Acceptance Tests: Sufficient enamel shall be taken from each lot to perform the following tests:

Requirement	Reference Paragraph	Number of Determinations
Composition	3.1	1
Viscosity	3.2.1.1	1
Color and Gloss	3.2.2.2	2
Appearance	3.2.3.1	2 (See 4.3.1.1)
Adhesion	3.2.3.2	2
Solvent Resistance	3.2.3.3	2

4.3.1.1 This requirement is to be determined on the panels prepared for adhesion or solvent resistance tests.

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

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

4.4 Approval:

4.4.1 Enamel shall be approved by purchaser before enamel for production use is supplied, unless such approval be waived by purchaser. Results of tests on production enamel shall be essentially equivalent to those on the approved sample.

4.4.2 Vendor shall use ingredients, manufacturing procedures, processes, and methods of inspection on production enamel which are essentially the same as those used on the approved sample enamel. If necessary to make any change in ingredients or in manufacturing procedures or processing, vendor shall submit for reapproval a statement of the proposed changes in material or processing, or both, and, when requested, sample enamel. Production enamel made by the revised procedure shall not be shipped prior to receipt of reapproval.