Society of Automotive Engineers, Inc.
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AEROSPACE MATERIAL SPECIFICATION

AMS 3110D
Superseding AMS 3110C
Issued 10-15-40
Revised 5-1-68

PRIMER, ZINC CHROMATE

1. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

2. APPLICATION: As a protective coating and as an undercoat for use on metals and on molded or laminated synthetic resins.

3. COMPOSITION (By Weight):

3.1 Product:

		min	max
Ø	Nonvolatile	59	62%
	Volatile	38	41%

3.1.1 Nonvolatile:

		min	max
Ø	Resin	42	47%
	Pigment	53	58%

3.1.1.1 Resin: Shall consist of 81 - 84% drying-type phthalic alkyd containing not less than 37% phthalic Ø anhydride plus 16 - 19% oil-modified phenol-aldehyde resin. It shall be free of rosin and rosin derivatives.

3.1.1.2 Pigment: Shall consist of not less than 85% zinc chromate and not more than 15% siliceous Ø extenders. A relatively small amount of other chromates will not necessarily be cause for rejection.

Ø 3.1.2 Volatile: Shall consist of xylene, toluene, or a mixture thereof.

4. TECHNICAL REQUIREMENTS:

4.1 General: Primer shall be of uniform consistency and free from bubbles, skins, lumps, grit, rough particles, and floating or caked pigments. Component ingredients shall be intimately mixed and Ø processed as required to produce a product which is stable, not subject to abnormal change with age in sealed containers, and is capable of being mixed to a smooth, homogeneous condition both when received and after six months storage.

4.2 Odor: Shall be normal for the hydrocarbons permitted by the specification.

4.3 Color: Shall be yellow, characteristic of zinc chromate, unless a green tinted product is ordered, Ø in which case the color shall match Interior Green, Color No. 34151 of Federal Standard No. 595.

Ø 4.4 Weight: Shall be 9.8 - 10.7 lb per gal at 77 F (25 C).

4.5 Coarse Particles: Not more than 0.05% by weight, calculated on the basis of total solids, shall be Ø retained on a No. 325 screen, determined in accordance with the issue of ASTM D185 specified in the latest issue of AMS 2350.

Ø 4.6 Water Content: Shall be not higher than 0.5% by weight.

4.7 Viscosity: Shall be 0.12 - 0.28 poise absolute at 77 F (25 C) as determined on a mixture of one part of Ø primer and one part of toluene conforming to the latest issue of AMS 3180.

4.8 Stability: Material, from a full closed container which has been stored at 120 F ± 5 (48.9 C ± 2.8) for 96 hr, shall produce films showing no seediness or clear areas lacking in yellow color when one volume of aged material is reduced with two volumes of toluene. After aging, the consistency of the material shall not be such that it is unsuitable for production use. Slight silking is permissible provided a continuous film is produced.

4.9 Skinning and Livering: Shall be absent in a 1/4-filled, closed container after standing for 24 hr at room Ø temperature.

4.10 Separation: There shall be not more than 10 ml of clear or cloudy supernatant liquid when 70 ml of a mixture of one volume of primer with 2.5 volumes of toluene is allowed to stand 4 hours. After standing 24 hr, all pigment shall be completely replaced in suspension by vigorously shaking the graduate for not more than 60 seconds. A flow-out film on an aluminum alloy panel immediately following the shaking shall show no seediness or clear areas lacking in yellow color. Slight silking is permissible provided a continuous film is produced.

4.11 Dip Tank Stability: A mixture of one volume of primer and two volumes of toluene shall be suitable for use in dip tanks, as shown by passing the following test.

4.11.1 A container of suitable size shall be filled to approximately 80% of capacity with the mixture specified in 4.11. Air shall be bubbled through the mixture, at a rate of approximately one liter per min. per 100 ml of mixture, for a total of 200 hours. Aeration may be interrupted as necessary to fit working schedules. During aeration, the level of the mixture shall be maintained by additions of toluene at least every 12 hr and/or by bubbling the influent air through toluene. In addition, the nonvolatile matter shall be maintained in suspension by mechanical agitation or shall be replaced in suspension by stirring with a spatula or other suitable instrument at least once each day. At the end of the 200 hr, there shall be no appreciable oxidation or gelling of the resins and a dipped film of the aerated mixture on an aluminum alloy panel shall be free from seeding. Slight silking is permissible provided a continuous film is produced.

4.12 Drying Time:

4.12.1 A mixture of one volume of primer and two volumes of toluene when applied to aluminum alloy panels in a thin, wet, cross-coat showing a semi-transparent film shall air-dry for handling in not more than 5 minutes. After air-drying for 1 hr, stacking these panels at room temperature under a pressure of one psi for 1 hr shall not cause these panels to stick to each other.

4.12.2 A mixture of one volume of primer and two volumes of toluene when used as a prime coat shall be suitable for recoating, after 30 min. air-drying, with a high gloss lacquer, without undue absorption of primer by the lacquer or loss of gloss of the lacquer.

4.13 Flexibility: A mixture of one volume of primer and two volumes of toluene shall be flowed on to a clean AMS 4040 alclad aluminum alloy panel, air-dried 5 min., baked at 350 - 365 F (176.7 - 185 C) for 4 hr, and cooled to room temperature. The film shall not crack when the panel is bent through an angle of 180 deg around a mandrel having a diameter 6 times the thickness of the panel. Other panel materials may be used when agreed upon by purchaser and vendor.

4.14 Adhesion: A clean panel of AMS 4037 aluminum alloy shall be sprayed with a mixture of one volume of primer and two volumes of toluene. The coating shall be 0.0005 - 0.00075 in. thick. The sprayed panel shall then be baked at 212 F ± 2 (100 C ± 1.1) for 4 hours. One coat of cellulose nitrate lacquer shall be applied over the baked primer, and after air-drying for 1 hr and baking at 212 F ± 2 (100 C ± 1.1) for 16 hr, shall show satisfactory anchorage and adhesion to the primer. Another panel similarly prepared, except omitting the baking of the lacquer coat, shall have adhesion characteristics equal to the above panel on which the lacquer coat was baked.