AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 3110 A

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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: This specification covers one grade of primer for general use as a protective coating and as an undercoat for use on metals and on molded or laminated synthetic resins.

3. COMPOSITION (By Weight): The primer shall contain not less than 60% non-volatile matter and not less than 35% volatile matter. The volatile portion shall consist wholly of aromatic and/or aliphatic hydrocarbons. The non-volatile portion shall consist of not less than 55% as pigment and not less than 40% as non-volatile vehicle. The pigmentation shall be composed of not more than 15% as extender and the remainder shall be zinc chromate. A relatively small amount of other chromates shall not necessarily be cause for rejection.

4. PROCESSING: The component ingredients shall be compounded and processed to produce a product suitable for the purpose intended and not subject to abnormal change with age within a sealed container.

5. TECHNICAL REQUIREMENTS:

(a) Appearance.- Primer shall be free from skins, lumps and grit and shall be capable of being easily mixed to a smooth homogeneous condition both when received and after six months storage.

(b) Odor.- The odor shall be normal for the hydrocarbons permitted by the specification.

(c) Color.- Unless otherwise specified, color shall be yellow, characteristic of zinc chromate.

(d) Weight.- Shall be not less than 9.8 pounds per gallon at 77 F.

(e) Viscosity.- Shall be 0.15-0.25 poise absolute at 77 F when primer is reduced with an equal volume of toluene conforming to the latest issue of AMS 3180.

(f) Stability.- Package material, from a full closed container, which has been stored at 120 F for 96 hours shall produce films showing no seediness or clear areas lacking in yellow color when one volume of aged packaged material is reduced with two volumes of toluene. After aging, the consistency of the package material shall not be such that it is unsuitable for production usage.

(g) Skinning.- Shall be absent in 1/4-filled, closed containers after 24 hours.

(h) 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 hours, all pigment shall be completely replaced in suspension by vigoriously shaking the graduate for not more than 30 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.

(i) Dip Tank Stability.- 80 ml of a mixture of one volume of primer and 2 volumes of toluene when placed in a 100 ml graduated cylinder and aerated by bubbling air through the mixture for 200 hours shall have dip stability. During the aeration, toluene shall be added to the container at least every 12 hours to maintain the original volume. At the end of the 200 hours there shall be no excessive gum settling at the bottom of the tank and a dipped film of the aerated primer on an aluminum alloy panel shall be free from seeding. Slight silking is permissible provided a continuous film is produced.

(j) Drying Time.- (1) A mixture of one volume of primer and 2 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 five minutes. After air drying for one hour, stacking these panels at 77F under a pressure of 1 psi for one hour shall not cause these panels to stick to each other.

(2) A mixture of one volume of primer and 2 volumes of toluene when used as a prime coat shall be suitable for recoating after 30 minutes air drying, with a high gloss lacquer, without undue absorption of primer by the lacquer or loss of gloss of the lacquer.

(k) Flexibility.- A mixture of one volume of primer and 2 volumes of toluene shall be flowed on to an AMS 4040 alclad aluminum alloy panel, air dried 5 minutes, baked at 350-365F for four hours, and cooled to room temperature. The film shall not crack when the panel is bent through an angle of 180 degrees around a mandrel having a diameter six times the thickness of the panel. Other panel materials may be used when agreed upon by purchaser and vendor.

(m) Adhesion.- A panel of AMS 4037 aluminum alloy shall be sprayed with a mixture of one volume of primer and 2 volumes of toluene. The coating shall be 0.0005-0.00075 in. thick. The sprayed panel shall then be baked at 212 F for 4 hours. One coat of cellulose-nitrate lacquer shall be applied over the baked primer, and after air-drying for one hour and baking at 212 F for 16 hours, 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.

(n) Lacquer Resistance.- Aluminum alloy panels shall be prepared using a mixture of one volume of primer and 2 volumes of toluene as a prime coat, and applying wet coats of cellulose-nitrate lacquer over the primer on a series of panels on which the primer has been air dried for 10 minutes, one hour, six hours, 16 hours, and 48 hours, respectively. The finish shall show no embrittlement, lifting or excessive loss of gloss on any of the panels.

(o) Water Resistance.- Flow-out films, on aluminum alloy panels, of a mixture of one volume of primer and 2 volumes of toluene, air-dried for 48 hours shall withstand immersion in freshly boiled distilled water at room temperature for 24 hours without checking or blistering of the film. After 2 hours air-drying following immersion, films shall show no evidence of excessive leaching.