



# AEROSPACE MATERIAL

# AMS 3066

Society of Automotive Engineers, Inc.  
400 COMMONWEALTH DRIVE, WARRENDALE, PA. 15096

## SPECIFICATION

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Revised

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COMPOUND, CORROSION-INHIBITING  
Water-Displacing, Soft Film, Aerosol Canned

### 1. SCOPE:

1.1 Form: This specification covers a solvent-dispersed, water-displacing, corrosion-inhibiting compound which forms a thin, easily-removable film and is packaged in aerosol cans.

1.2 Application: Primarily for protection of bare steel or phosphate-treated surfaces where more-protective coatings are not functionally desirable, where reapplication in service is feasible, and where water or saline solutions must be displaced from corrodible surfaces and corrosion prevented or arrested. The product will provide protection for extended periods of storage when coated surfaces are packaged with suitable barrier materials.

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 Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

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 D86 - Distillation of Petroleum Products

ASTM D874 - Sulfated Ash from Lubricating Oils and Additives

ASTM D1310 - Flash Point of Liquids by Tag Open-Cup Apparatus

ASTM D1748 - Rust Protection by Metal Preservatives in the Humidity Cabinet

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

2.3.1 Federal Specifications:

PPP-C-96 - Can, Metal, 28 Gage and lighter

2.3.2 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

2.3.3 Code of Federal Regulations: Available from Superintendent of Documents, Government Printing Office, Washington, DC 20402.

16 CFR 1500.130 - Commercial Practices, Consumer Product Safety - Self-pressurization of Containers; Labeling

49 CFR 173-178 - Transportation - Hazardous Materials Regulations of the Department of Transportation (DoT)

SAE Technical Board rules provide that: "All technical reports, including standards approved and practices recommended, are advisory only. Their use by anyone engaged in industry or trade is entirely voluntary. There is no agreement to adhere to any SAE standard or recommended practice, and no commitment to conform to or be guided by any technical report. In formulating and approving technical reports, the Board and its Committees will not investigate or consider patents which may apply to the subject matter. Prospective users of the report are responsible for protecting themselves against liability for infringement of patents."

# REAFFIRMED

- 2.4 American Conference of Governmental and Industrial Hygienists Publications: Available from the Secretary-Treasurer, American Conference of Governmental and Industrial Hygienists, 1014 Broadway, Cincinnati, OH 45202.

Threshold Limit Values of Airborne Contaminants

3. TECHNICAL REQUIREMENTS:

- 3.1 Material: The corrosion-inhibiting compound shall be composed of a nonvolatile base compound dispersed in a solvent to form a fluid formulation and packaged in aerosol cans.

3.1.1 Compound Composition: Shall be optional with the manufacturer.

3.1.2 Solvent Composition: Shall be optional with the manufacturer, except that no aromatic or halogenated solvents shall be used in the formulation. The distillation end point of the solvent, determined in accordance with ASTM D86, shall be not higher than 210°C or 410°F. No solvent shall be used for which the threshold limit value (See 8.1) for toxic materials is less than 350 ppm.

3.1.3 Propellant Composition: Shall be optional with the manufacturer, except for the following limitations:

3.1.3.1 The propellant shall be a nonflammable type in accordance with Code of Federal Regulations 49 CFR 173.300.

3.1.3.2 No propellant shall be used for which the threshold limit value for toxic materials is less than 350 ppm.

3.2 Properties: The product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with the test procedures of this specification:

3.2.1 Compound Properties:

3.2.1.1 Nonvolatile Content: Shall be 95 - 110% of the qualification value (See 4.4.1), determined in accordance with 4.5.1.1.

3.2.1.2 Sulfated Residue: Shall be within  $\pm 0.05$  of the value determined on the approved sample when that value is 0 to 0.50% and within  $\pm 10\%$  of the value determined on the approved sample when that value is over 0.50%. Determination shall be made in accordance with ASTM D874.

3.2.1.3 Flash Point: Shall be not lower than 65°C or 150°F, determined in accordance with 4.5.1.2.

3.2.1.4 Abrasives: Shall be absent, determined in accordance with 4.5.1.3.

3.2.1.5 Stability: The compound shall be stable and homogeneous and shall recover from exposure to temperature extremes of -40°C (-40°F) and +53°C (+127°F), determined in accordance with 4.5.1.4.

3.2.2 Application Properties:

3.2.2.1 Wetability and Continuity: The compound shall readily wet surfaces and, upon evaporation of the solvent, the resultant coating shall be continuous, determined in accordance with 4.5.2.1.

3.2.2.2 Drying: The compound film shall remain soft on drying and exposure, determined in accordance with 4.5.2.2.

3.2.3 Film Properties:

3.2.3.1 Discernability: The compound shall be visually discernible for not less than 14 days on a surface to which it has been applied and allowed to stand in a well-lighted and ventilated room. The color of the finished compound shall be black or brown. An oil-soluble dye may be used.

3.2.3.2 Water Displacement: The compound shall satisfactorily displace water from a metal surface, determined in accordance with 4.5.3.1.

3.2.3.3 Protection of Metals: The compound shall produce no visual evidence of pitting or etching, or a weight change in excess of the following, determined in accordance with 4.5.3.2. In addition, specimens tested in dry heat shall show no dark discoloration.

Metal	Weight Change mg/cm <sup>2</sup> of surface area
Brass, leaded	1.0
Cadmium, anode	5.0
Zinc, anode	7.5
Magnesium alloy, AZ31B	0.5
Aluminum alloy, 2024	0.2
Steel, low-carbon	0.2

3.2.3.4 Humidity Resistance: The compound shall protect test specimens for not less than 30 days exposure to humidity, determined in accordance with 4.5.3.3.

3.2.3.5 Salt Spray Protection: The compound shall protect test panels from corrosion and pitting for not less than 7 days, determined in accordance with 4.5.3.4.

3.3 Aerosol Spray Cans: The compound shall be furnished in ready-to-use, pressurized aerosol cans, suitable for hand application, of the size ordered (See 5.1.1). The pressurized cans shall conform to Federal Specification PPP-C-96, Type IX, Class 2, and Code of Federal Regulations 49 CFR 173.302, 173.303, and 173.306. When an aerosol can is pressurized by the manufacturer to more than 380 kPa-gage at 20°C ± 1 or 55 psig at 70°F ± 2; a Type 2P container conforming to 49 CFR 178.33 shall be used. The exterior orifice of the pressurized containers shall be symmetrical and free of ragged edges and shall be in direct alignment with the angle of discharge.

3.3.1 Leakage: The pressurized cans shall not leak or become distorted when tested in accordance with 4.5.4.1.

3.3.2 Fill: Pressurized cans containing the compound shall have a compound net weight as specified, determined in accordance with 4.5.4.2. The complete, usable portion of the contents shall be expelled before the propellant is expended.

3.3.3 Sprayability:

3.3.3.1 Spray Pattern: All aerosol pressure cans shall be equipped with a spray nozzle. The nozzle shall provide a fine, steady spray and shall deposit the compound evenly on a flat or vertical surface when sprayed as specified in 4.5.4.3.1. No chunks of thickened or solid compound shall be expelled and no clogging of the nozzle shall occur. After clearing the nozzle in accordance with the manufacturer's instructions, there shall be no perceptible leakage.

3.3.3.2 Adherence, Buildup, and Sag: The compound shall adhere to the specimen surface and shall not excessively foam or sag upon application of repeated layers in accordance with 4.5.4.3.2.

- 3.3.3.3 Discharge Rate at 4° C or 40° F: The discharge rate of compound from a full, pressurized can shall be not less than 1.0 g/sec at 4° C  $\pm$  1 or 40° F  $\pm$  2, determined in accordance with 4.5.4.3.3.
- 3.3.3.4 Discharge Rate After Temperature Cycling: The compound shall be readily sprayable, shall meet the discharge rate of 3.3.3.3, and shall produce a uniform, continuous film after subjecting a full, pressurized can to temperature cycling between 53° C (127° F) and -40° C (-40° F) in accordance with 4.5.4.3.4.
- 3.4 Quality: The compound shall be homogeneous, free from water, chlorides, and other impurities. The compound shall not be injurious in any way to personnel if reasonable procedures and safety precautions are used.

4. QUALITY ASSURANCE PROVISIONS:

- 4.1 Responsibility for Inspection: The vendor of the product shall supply all samples 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 perform such confirmatory testing as he deems 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 the following requirements are classified as acceptance or routine control tests:

Test	Requirement Paragraph
Sulfated Residue	3.2.1.2
Abrasives	3.2.1.4
Drying	3.2.2.2
Discernibility	3.2.3.1
Leakage	3.3.1
Fill	3.3.2
Spray Pattern	3.3.3.1
Adherence, Buildup, and Sag	3.3.3.2

- 4.2.2 Periodic Control Tests: For products supplied on a routine or continuing basis, tests to determine conformance to the acceptance tests and the following additional requirements shall be conducted at designated intervals from the date of first submission or latest periodic control test (See 4.3.2).

Test	Requirement Paragraph
Nonvolatile Content	3.2.1.1
Flash Point	3.2.1.3
Stability	3.2.1.5
Water Displacement	3.2.3.2
Salt Spray Protection	3.2.3.5

- 4.2.3 Qualification Tests: Tests to determine conformance to all technical requirements of this specification are classified as qualification tests and may be the basis for approval of the product (See 4.4.1).

- 4.2.3.1 For direct U. S. Military procurement, qualification test material and supporting test data shall be submitted to the cognizant qualification agency as directed by the request for procurement, the procuring activity, or the contracting officer.
- 4.3 Sampling: Shall be as follows; a lot shall be all compound produced in a single production run from the same batches of raw materials under the same fixed conditions, packaged in aerosol cans, and presented for vendor's inspection at one time. The cans in a lot may be delivered separately under the basic lot approval as long as lot identity is maintained.
- 4.3.1 Acceptance Tests: Sufficient compound shall be taken from each lot to perform acceptance tests on the number of specimens required herein.
- 4.3.2 Periodic Control Tests: Sufficient compound shall be taken from a lot, established by the purchaser, to perform periodic control tests on the number of specimens specified herein.
- 4.4 Approval:
- 4.4.1 Sample compound shall be approved by purchaser before compound for production use is supplied, unless such approval be waived. Results of tests on production compound 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 compound which are essentially the same as those used on the approved sample compound. If any change is necessary in ingredients, in type of equipment for processing, or in manufacturing procedures, vendor shall submit for reapproval a statement of the proposed changes in ingredients or processing and, when requested sample revised compound. No production compound made by the revised procedure shall be shipped prior to receipt of reapproval.
- 4.5 Test Methods:
- 4.5.1 For Compound Properties:
- 4.5.1.1 Nonvolatile Content: Weigh approximately 2 g of freshly sprayed compound to the nearest mg in a tared, aluminum foil dish 2.0 - 2.5 in. or 50 - 65 mm in diameter. Place the dish in an explosion-proof, gravity-convection oven maintained at 105° - 110° C or 220° - 230° F for not less than 3 hours. Determine the nonvolatile content using the following formula:
- $$\text{Nonvolatile Content, \%} = \frac{A \times 100}{B}$$
- where, A = weight of residue, g  
B = original weight of sample, g
- 4.5.1.2 Flash Point: Collect 50 cm<sup>3</sup> of compound by spraying from an unused can into the neck of a 125-cm<sup>3</sup> Erlenmeyer flask, keeping a loose cover on the flask until the propellant gases have dissipated. Determine flash point in accordance with ASTM D1310 immediately thereafter.
- 4.5.1.3 Abrasives: Mix approximately 75 cm<sup>3</sup> of compound, freshly sprayed from an aerosol can into a clean glass container, with approximately 200 cm<sup>3</sup> of benzol and stir until all soluble matter is in solution. Allow to stand for approximately 1 hr at room temperature to permit any insoluble matter to settle. Carefully decant. Wash the residue with 100 cm<sup>3</sup> of fresh benzol and again carefully decant. Repeat the procedure with successively smaller portions of benzol until the solution is practically colorless. The residue after the last decantation shall be rubbed between 2 pieces of flat, clean, glass plate. The appearance of scratches on the glass plates shall be considered evidence of the presence of abrasive material.

4.5.1.4 Stability:

4.5.1.4.1 Recovery from Low Temperature: Collect 50 cm<sup>3</sup> of the compound by spraying from fresh aerosol cans into a test tube approximately 1 in. or 25 mm in ID and 8 in. or 200 mm long. After the propellant gases have dissipated, stopper the test tube with a cork stopper and heat the tube and contents to 52° - 54° C or 125° - 129° F and hold at heat for not less than 8 hours. At the end of this period, transfer the filled tube to a suitable cold chamber maintained at -40° C  $\pm$  2 or -40° F  $\pm$  4 and allow to remain at that temperature for 16 hr  $\pm$  0.1, taking care to avoid any physical disturbance of the compound. Repeat this cycle three times (a total of four complete cycles). The test tube shall then be allowed to warm, in an upright position, to room temperature and remain upright at room temperature (20° - 30° C or 68° - 86° F) for not less than 24 hr undisturbed.

4.5.1.4.1.1 The test tube shall then be tilted through an angle of 180 deg (3.14 rad) and held in that position for 5 seconds. The compound shall be considered as meeting the requirement if it shows no gelling or solidification and not more than a slight haze or precipitate. If the compound indicates evidence of gelling, haze, or separation, the tube shall be shaken vigorously by hand for 60 sec  $\pm$  5. The compound shall be considered as meeting the requirement for low temperature recovery if, when the tube is inverted, the compound flows and shows no lumps suggesting permanent solidification and not more than a slight haze or precipitate.

4.5.1.4.2 Homogeneity: Compound passing the test of 4.5.1.4.1 but showing separation shall be examined for precipitates and haziness in the solution. If the precipitate cannot be redissolved into the compound or the haziness dispelled by shaking, the supernatant liquid shall be tested to determine its ability to protect test panels from humidity as in 4.5.3.3.6; the supernatant liquid shall pass that test. The panels for the exposure tests may be coated by dipping them in a small dish filled with supernatant liquid. It may be necessary to repeat the low-temperature cycle using a larger sample in order to obtain sufficient supernatant liquid for test.

4.5.2 For Application Properties:

4.5.2.1 Wetability and Continuity: Test specimens, coated in accordance with 4.5.3.3.4, shall be examined visually to determine that the surfaces are wetted and the film is continuous.

4.5.2.2 Drying: Test specimens, prepared in accordance with 4.5.3.3.4, shall be allowed to dry in a vertical position at 20° - 30° C or 68° - 86° F for 24 - 26 hr prior to examination.

4.5.3 For Film Properties:4.5.3.1 Water Displacement:

4.5.3.1.1 Preparation of Test Panels: Test panels, approximately 0.06 x 2 x 3 in. or 1.6 x 50 x 75 mm with well-rounded edges, shall be prepared from low-carbon steel sheet or test specimens defined in 4.5.3.3 may be used. The surfaces shall be uniformly abraded with sharp, white, silica sand of the particle size noted below, the sand being free from organic matter, or with abrasive paper of size No. 10 to 20 (2000 to 850  $\mu$ m). Test panels shall not be rusted and any oil or organic residue shall be removed with hot naphtha and hot methanol rinses prior to abrasive cleaning.

Sand Particle Size	Percent
Pass through No. 10 US (2000 $\mu$ m) standard sieve, min	100
Retain on No. 20 US (850 $\mu$ m) standard sieve, max	10
Pass through No. 50 US (300 $\mu$ m) standard sieve, max	10

- 4.5.3.1.2 After abrading, each panel shall immediately be placed in a container of anhydrous methanol. Immediately before final cleaning, the methanol and the panels shall be heated so that, upon withdrawal from the solution, the panels shall be well above the dew point of the room. Final cleaning shall be accomplished by spraying each panel with naphtha, rinsing in hot naphtha, and finally rinsing in hot methanol. The warm panels shall be placed in a desiccator over calcium chloride and used within 12 hr of the final rinsing. To avoid fingerprint corrosion, the panels shall be handled with forceps or other instruments at all times during and after abrading and cleaning.
- 4.5.3.1.3 Preparation of Compound: Collect 50 cm<sup>3</sup> of the compound by spraying from fresh aerosol cans into the narrow neck of a 125 cm<sup>3</sup> Erlenmeyer flask, keeping a loose cover on the flask until the propellant gases have dissipated. Add 5 cm<sup>3</sup> of distilled water and shake the mixture for not less than 1 minute. Store the stoppered flask at 52° - 54° C or 125° - 130° F for 15 - 20 hr, cool to 25° C  $\pm$  3 or 77° F  $\pm$  6, and test within 1 hr of cooling.
- 4.5.3.1.4 Water Displacement Procedure: Dip each of three test panels, prepared as in 4.5.3.1.1 and 4.5.3.1.2, in distilled water momentarily and drain in a vertical position for not more than 5 sec with the bottom edge in contact with absorbent paper. Immediately immerse each panel, horizontally and without agitation, for 15 sec in a petri or evaporating dish containing the compound previously prepared in accordance with 4.5.3.1.3. After draining momentarily, place each panel in a static humidity cabinet (e.g., a desiccator body containing distilled water) for 60 min.  $\pm$  1 at 25° C  $\pm$  3 or 77° F  $\pm$  6. The compound shall be considered as having passed the water displacement test if, at the end of the 1 hr exposure and after removal of the compound, the panels show no evidence of rust, motiling, or abnormal surface stains and defects. A cleaned but uncoated specimen may be exposed as a control.
- 4.5.3.1.5 Dilution with Paraffin-Base Oil: The compound, prepared as in 4.5.3.1.3, shall be diluted 1:1 with a neutral, noninhibited, paraffin-base petroleum oil of 90 - 100 SUS viscosity at 38° C  $\pm$  1 (100.4° F  $\pm$  1.8) and the water displacement test performed as specified in 4.5.3.1.4 with the test results evaluated in a similar manner.
- 4.5.3.2 Protection of Metals:
- 4.5.3.2.1 Test Specimens: Prepare two specimens, 0.25 x 0.87 x 2.0 in. or 6.5 x 22 x 50 mm, of each metal shown in 3.2.3.3. Drill a small hole near one corner of each specimen to be used in the dry heat exposure test of 4.5.3.2.3. Abrade all specimens to remove pits, burrs, and irregularities from the faces and edges, finishing as specified in 4.5.3.3.3 (surface finish only). Clean the specimens by swabbing in hot naphtha with a final rinse in warm anhydrous methanol. (Use 95 % methanol for the magnesium alloy specimens.) The specimens shall be handled in a manner to avoid contact with the operator's hands. Immerse or coat immediately, or store in a desiccator for not more than 12 hr before coating.
- 4.5.3.2.2 Immersion Test: After weighing each test specimen to the nearest 0.1 mg, place one set of specimens in a container approximately 3 in. or 75 mm in diameter, arranging the specimens in the order shown in 3.2.3.3 in a symmetrical pattern and spaced equidistantly, standing on one of the narrow ends and separated from each other by glass rod separators. Cover the specimens with sufficient compound (approximately 300 cm<sup>3</sup>), so that their tops are at least 0.25 in. or 6.5 mm below the surface of the compound. Seal the container and place in an oven at 52° - 54° C or 125° - 129° F for 7 days  $\pm$  0.1. Upon completion of the elevated temperature exposure, remove the compound and any loose corrosion products from the specimens by swabbing with clean cheesecloth moistened with naphtha, then with methanol (Use 95% methanol for the magnesium alloy specimen.), rinse with clean methanol, and dry the specimens. Reweigh the specimens within 30 min. of drying and calculate the weight loss or gain to the nearest 0.1 milligram.

- 4.5.3.2.3 Dry Heat Test: After weighing to the nearest 0.1 mg, coat the other set of specimens, prepared as in 4.5.3.2.1, with compound as specified in 4.5.3.3.4. After 24-hr drying, place the specimens in a gravity-convection oven maintained at  $50^{\circ}\text{C} \pm 2$  or  $122^{\circ}\text{F} \pm 4$  for 7 days  $\pm 0.1$ . Upon completion of the dry heat test, remove the compound and any loose corrosion products from the specimens by swabbing with clean cheesecloth moistened with naphtha, then with methanol (Use 95% methanol for the magnesium alloy specimen.), rinse with clean methanol, and dry the specimens. Reweigh the specimens within 30 min. of drying and calculate the weight loss or gain to the nearest 0.1 milligram.
- 4.5.3.3 Humidity Resistance:
- 4.5.3.3.1 Specimen Handling Procedures: The utensils and cloths used in preparing test panels shall be clean and free from contamination. Solvents shall be clean and shall be redistilled before reuse. In all stages of treatment beginning with the initial solvent wipe, handling of equipment with bare hands shall be avoided. The test panels shall be handled with hooks or similar devices, care being taken to prevent contact of the panels with contaminated surfaces during cleaning and to prevent marring the film during coating and subsequent handling. Specimens on which the film has been damaged in any way shall be eliminated from the test.
- 4.5.3.3.2 Test Panels: Shall be fabricated from annealed, cold-finished, low-carbon steel (See 8.3). Each panel shall be 0.125 x 2 x 4 in. or 3 x 50 x 100 mm, conforming to the description in ASTM D1748.
- 4.5.3.3.3 Cleaning of Test Panels: After rounding the edges of the panel and reaming out the holes used for suspension, wipe the surfaces with clean cheesecloth saturated with dry-cleaning solvent or petroleum naphtha (See 8.4). Scrub the panels with a clean cheesecloth swab in a beaker of hot petroleum naphtha or dry cleaning solvent. If the panels are not to be used at once, preserve them in a desiccator. Abrade the test panel surface with no. 230 (63  $\mu\text{m}$ ) or no. 240 grit aluminum oxide cloth or paper-backed abrasive to produce a surface finish of 10 - 20 microin. or 0.25 - 0.50  $\mu\text{m}$ . "Wet or dry" cloths or papers shall not be used. The final abrasion marks shall be parallel to the length of the panel. Wipe off superficial dust from the abrasion operation using clean, dry, absorbent tissue or cheesecloth. Scrub the abraded face of the panel thoroughly with a lint-free cloth until there is no dark stain on a clean cloth surface. Spray the panel with hot naphtha using a wash bottle or a spray gun. The panel should be held in a rack at an angle of  $20 \text{ deg} \pm 5$  ( $0.349 \text{ rad} \pm 0.087$ ) from the vertical. The spray should be directed vertically down on the panel, flushing the test surface progressively downward. Spray the test surface, the back face, and then the test surface again. Finally, rinse the panel in fresh boiling anhydrous methanol, allowing the panel to be immersed for not less than 10 sec to permit the panel to reach the temperature of the methanol before withdrawal. Dry in air, place the panel in a desiccator, and use it within 12 hr of preparation.
- 4.5.3.3.4 Application of Compound: Apply the compound to all surfaces of each panel by holding the panel vertically and spraying to the point of complete coverage with an average film thickness not exceeding 0.001 in. (0.03 mm). All panel edges and holes in the panel shall be coated with compound. The film on the center portion of the panel shall not be touched or disturbed in any way. Coating shall be performed at an ambient temperature of  $25^{\circ}\text{C} \pm 3$  or  $77^{\circ}\text{F} \pm 6$  and a relative humidity of 50% or less. Coated panels shall be dried for not less than 24 hr in a draft-, dust-, and fume-free atmosphere prior to making film thickness measurements and exposure tests.
- 4.5.3.3.5 Film Thickness: The average film thickness of the compound on the panel shall be determined by a specific gravity weight on a panel coated as in 4.5.3.3.4.

4.5.3.3.5.1 The average film thickness in inches shall be calculated as follows:

$$\text{Film Thickness, in.} = \frac{W \times 0.061}{D \times A}$$

where, W = weight of film, g, to nearest mg  
 D = density of film, g/cm<sup>3</sup>, determined on nonvolatile portion of compound by means of a pycnometer  
 A = total surface area of the panel, sq in.

4.5.3.3.5.2 The average film thickness in millimetres shall be calculated as follows:

$$\text{Film Thickness, mm} = \frac{W \times 1000}{D \times A}$$

where, W = weight of film, g, to nearest mg  
 D = density of film, g/cm<sup>3</sup>, determined on nonvolatile portion of compound by means of a pycnometer  
 A = total surface area of panel, mm<sup>2</sup>

4.5.3.3.6 Humidity Exposure: Three specimens, prepared as in 4.5.3.3.1 through 4.5.3.3.4, suspended by 18-8 corrosion-resistant steel or nickel-copper alloy hooks, shall be exposed for 30 days  $\pm$  0.1 in a humidity cabinet constructed and operated in accordance with ASTM D1748. At the completion of the exposure period, the compound shall be considered as having passed this test if, after removal of the compound, none of the panels show more than a trace of corrosion on the leading test surface of the panel. A trace of corrosion is defined as not more than three dots of rust, none of which is larger than one millimetre in diameter. Only corrosion within significant areas as outlined in ASTM D1748 shall be considered.

4.5.3.4 Salt Spray Resistance:

4.5.3.4.1 Test Panels: Four panels shall be prepared as in 4.5.3.3.1 through 4.5.3.3.4 except that two panels shall be freshly sandblasted and the other two shall be polished and alkaline-cleaned.

4.5.3.4.2 Salt Spray Exposure: After drying as in 4.5.3.3.4, the panels shall be exposed to salt spray for not less than 7 days in accordance with ASTM B117. Upon completion of exposure, panels shall be removed from the cabinet, cleaned with solvent, and examined. Visible corrosion or pitting shall be cause for rejection of the compound. If corrosion occurs, but to no greater extent than 3 spots, none larger than 1 mm in diameter, the compound may be retested. If, on retesting, no corrosion spots occur, the compound shall be acceptable. In any case, corrosion within 0.125 in. or 3 mm of an edge shall be disregarded.

4.5.4 For Container Performance:

4.5.4.1 Leakage: A pressurized container shall be completely submerged for not less than 5 min. in water maintained at 52° - 54° C or 125° - 129° F, during which time it shall be observed for emission of bubbles. Distortion of the container or emission of bubbles from any part of the container shall be considered evidence of leakage.

4.5.4.2 Fill: A full, pressurized can shall be weighed to the nearest 0.1 oz or to the nearest g and sprayed until the contents of the can and all the propellant are exhausted, vigorously shaking the can periodically during the spraying, and collecting the contents in a suitable tared container. The can shall be reweighed and the net weight of the compound calculated. This value may be verified by weighing the compound collected in the tared container. This compound may be used in other tests.