



AEROSPACE MATERIAL SPECIFICATIONS

SOCIETY OF AUTOMOTIVE ENGINEERS, Inc.

485 Lexington Ave., New York, N. Y. 10017

AMS 3075C

Superseding AMS 3075B

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COMPOUND, CORROSION-PREVENTIVE Hard Film, Hot Application

1. **ACKNOWLEDGMENT:** A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.
2. **TYPE:** A stable, nonvolatile, petroleum base compound suitable for application by dipping at 170 - 210 F (76.7 - 98.9 C).
3. **APPLICATION:** Primarily for preservation, during extended periods of shipment and/or storage, of miscellaneous metal parts, tools, subassemblies, and equipment where the compound is readily accessible for removal and removal does not damage the parts.
4. **TECHNICAL REQUIREMENTS:** When ASTM methods are specified for determining conformance to the following requirements, tests shall be conducted in accordance with the issue of the ASTM method listed in the latest issue of AMS 2350.
 - 4.1 **Abrasiveness:** Compound shall not contain abrasive substances.
 - 4.2 **Toxicity:** Compound shall contain no materials of known toxicity. The vapor shall not cause discomfort or injury to workmen engaged in application of the compound.
 - 4.3 **Coverage:** Compound shall provide a continuous, completely protective film on metal parts under normal conditions of storage in all climates.
 - 4.4 **Setting:** Compound as applied to metal parts shall set to a firm, hard film in 24 hr at room temperature ($77\text{ F} \pm 7$ ($25\text{ C} \pm 3.9$)) and, after 120 hr standing, shall not have checked or cracked so as to expose the metal surface underneath.
 - 4.5 **Removability:** Compound shall be readily removed by dipping in, or spraying with, AMS 3160 petroleum solvent or by wiping with cloths saturated with the solvent.
 - 4.6 **Corrosion:** Compound shall not corrode polished steel, copper, magnesium, aluminum, or cadmium plate when maintained in contact with those metals for 4 hr at $210\text{ F} \pm 2$ ($98.9\text{ C} \pm 1.1$).
 - 4.7 **Properties:** Compound shall conform to the following requirements:

4.7.1 Melting Point	150 - 170 F (65.6 - 76.7 C)	ASTM D127
4.7.2 Flash Point, min	350 F (176.7 C)	ASTM D92
4.7.3 Consistency	30 - 90	ASTM D217
 - 4.8 **Percentage of Nonvolatile Matter:** Compound shall contain not less than 99.0% (by weight) nonvolatile matter when determined as follows:
 - 4.8.1 Five g of compound shall be weighed to the nearest mg into a tared evaporating dish and the dish and contents heated for 24 hr in an oven at 221 - 230 F (105 - 110 C). After heating, the dish shall be cooled to room temperature and reweighed, and the nonvolatile matter calculated from the residual weight.

- 4.9 Lead Solubility: Compound shall not cause a change in weight of a lead specimen of more than 5 mg per sq in. when tested as follows:
- 4.9.1 A 1 x 1 x 1/16 in. polished specimen of lead sheet shall be accurately weighed and immersed for 4 hr in 50 g $\pm$ 1.0 of compound maintained at 205 - 210 F (96.1 - 98.9 C). Specimen shall be removed, cleaned with solvent, and reweighed. Change in weight per sq in. shall be calculated from the change in weight and the total area of the specimen.
- 4.10 Loss on Heating: Compound shall lose not more than 5.0% in weight when tested as follows:
- 4.10.1 Two 2 x 4 x 1/16 in. polished and alkaline-cleaned panels of AMS 5042 steel sheet, or equivalent, shall be weighed to the nearest milligram. Panels shall be immersed for 1 min. in compound at 205 - 210 F (96.1 - 98.9 C), withdrawn, and suspended vertically in an atmosphere of not more than 60% relative humidity at a temperature of 77 F $\pm$ 7 (25 C $\pm$ 3.9) for 24 hours. Panels shall be weighed to determine the weight of the coating and then suspended for 4 hr in an oven at 135 F $\pm$ 1 (57.2 C $\pm$ 0.6). After heating, panels shall be carefully removed from the oven, allowed to cool to room temperature, and reweighed. The percentage loss shall be calculated from the loss in weight and the original weight of coating.
- 4.11 Acidity: Compound shall show no evidence of the presence of inorganic acid when tested as follows:
- 4.11.1 Twenty-five to 50 g of compound shall be introduced into a 250 ml separatory funnel followed by 100 ml of boiling distilled water. The funnel shall be shaken vigorously and after compound and water have separated, the water layer shall be drained into a 500 ml casserole. Compound in the funnel shall be washed twice by vigorously shaking with 50 ml portions of boiling distilled water. After each washing and separation, the water layer shall be drained into the casserole. One drop of 1% solution of phenolphthalein shall be added to the 200 ml of accumulated water and the water then boiled. A change in color to pink indicates the solution is alkaline. If addition of phenolphthalein causes no change in color, two drops of 0.1% solution of methyl orange shall be added. A change to red or pink in such instances indicates the presence of inorganic acid.
- 4.12 Rosin: Compound shall show no evidence of the presence of rosin when tested as follows:
- 4.12.1 Twenty-five ml of 95% ethyl alcohol shall be added to 10 g of compound and the mixture heated to boiling. One or two drops of the solution of compound in alcohol shall be placed on a porcelain spot-plate with three or four drops of acetic anhydride. Subsequently, one drop of chemically pure sulfuric acid shall be added. A rose-violet coloration, or a flash of purple produced when the acid meets the anhydride, indicates the presence of rosin.
- 4.13 Stability: Compound shall remain homogeneous with age and when tested as follows:
- 4.13.1 A sample of compound shall be placed in a test tube, heated to 220 F $\pm$ 2 (104.4 C $\pm$ 1.1), and maintained at that temperature for 1 hour. Tube and compound shall be cooled to room temperature and held for 1 hr, then further cooled to -40 F $\pm$ 2 (-40 C $\pm$ 1.1) and maintained at that temperature for 1 hour. Tube and compound shall be reheated to 220 F $\pm$ 2 (104.4 C $\pm$ 1.1) and maintained at that temperature for 1 hour. Compound, after returning to room temperature, shall be examined for homogeneity.
- 4.14 Wetting Properties and Low Temperature Adhesion: Compound shall thoroughly wet the surface of test panels, shall form a smooth, unbroken film, and shall evince satisfactory adhesion when tested as follows:

- 4.14.1 Two 2 x 4 x 1/16 in. polished and alkaline-cleaned panels of AMS 5042 steel sheet, or equivalent, shall be immersed for 1 min. in compound at 205 - 210 F (96.1 - 98.9 C), withdrawn, and suspended vertically in an atmosphere of not more than 60% relative humidity at a temperature of 77 F $\pm$ 7 (25 C $\pm$ 3.9) for 24 hours. Panels shall be cooled to 0 F $\pm$ 2 (-17.8 C $\pm$ 1.1) and maintained at that temperature for 1 hour. While at 0 F $\pm$ 2 (-17.8 C $\pm$ 1.1), 4 parallel scratches about 1/8 in. apart and 1 in. long shall be made in the compound film with a pointed knife blade; 4 similar scratches which intersect the first four at right angles shall also be made. There shall be no flaking of the film within the area bounded by the scratches.
- 4.15 Humidity Protection: Compound shall protect metal panels from corrosion and pitting for 28 days when exposed to humid atmosphere as follows:
- 4.15.1 Test panels 2 x 4 x 1/16 in. shall be prepared. There shall be 2 freshly sandblasted panels and 2 polished and alkaline-cleaned panels of AMS 5042 steel sheet, or equivalent, and 2 polished panels of AMS 4037 aluminum alloy sheet. All panels shall be immersed for 1 min. in compound at 205 - 210 F (96.1 - 98.9 C), withdrawn, and suspended vertically in an atmosphere of not more than 60% relative humidity at a temperature of 77 F $\pm$ 7 (25 C $\pm$ 3.9) for 24 hours.
- 4.15.2 After conditioning as in 4.15.1, all panels shall be suspended vertically in humid atmosphere for 28 days in accordance with ASTM D1748. Upon completion of the exposure, panels shall be removed from the cabinet, cleaned with solvent, and examined. Visible corrosion or pitting of any surface shall be cause for rejection of the compound. If corrosion occurs, but to no greater extent than 3 spots no 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 1/8 in. of an edge shall be disregarded.
- 4.16 Salt Spray Protection: Compound shall protect metal panels from corrosion and pitting for the times listed below when exposed to salt spray as in 4.16.1 and 4.16.2.

Panel Material	Protection Time Days, min
Sand Blasted Steel	7
Polished Steel	7
Polished Aluminum	28

- 4.16.1 Test panels 2 x 4 x 1/16 in. shall be prepared. There shall be 2 freshly sandblasted panels and 2 polished and alkaline-cleaned panels of AMS 5042 steel sheet, or equivalent, and 2 polished panels of AMS 4037 aluminum alloy sheet. All panels shall be immersed for 1 min. in compound at 205 - 210 F (96.1 - 98.9 C), withdrawn, and suspended vertically in an atmosphere of not more than 60% relative humidity at a temperature of 77 F $\pm$ 7 (25 C $\pm$ 3.9) for 24 hours.
- 4.16.2 After conditioning as in 4.16.1, all panels shall be exposed to salt spray in accordance with ASTM B117 for the applicable time. Upon completion of the 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 no 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 1/8 in. of an edge shall be disregarded.
5. REPORTS: Unless otherwise specified, the vendor of the product shall furnish with each shipment three copies of a report of the results of tests on each batch of compound to determine conformance to the requirements of this specification. This report shall include the purchase order number, material specification number, batch number, date of manufacture, and quantity.
6. PACKAGING: Unless otherwise specified, compound shall be supplied in either 5 gal cans or 55 gal drums, as ordered.