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AEROSPACE MATERIAL SPECIFICATION

SAE AMS 3079 | REV. B

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Superseding AMS 3079A

Compound, Corrosion-Preventive, Soft Film, Hot Application

This specification has been declared "NONCURRENT" by the Aerospace Materials Division, SAE, as of 4-21-83. It is recommended that this specification not be specified for new designs.

This cover sheet should be attached to the "B" revision of the subject specification.

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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 160 - 170 F (71 - 77 C).

3. APPLICATION: Protection of metal parts where a soft, readily-removable film is desired and additional protective packaging is provided.

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, soft film in 24 hr at room temperature (77 F ± 7 (25 C ± 3.9)).

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 F ± 2 (98.9 C ± 1.1).

4.7 Properties: Compound shall conform to the following requirements; tests shall be performed in accordance with listed ASTM methods:

Melting Point	125 - 150 F (51.7 - 65.6 C)	ASTM D127
Flash Point, min	350 F (176.7 C)	ASTM D92
Consistency	200 - 325	4.7.1

4.7.1 Consistency: Shall be determined in accordance with ASTM D217, except that the sample shall be prepared as follows: After the melting point of the compound has been determined, the consistency tests shall be made on a sample that has been heated to 25 F ± 3 (13.9 C ± 1.7) deg above the melting point and poured at that temperature into a glass dish (100 x 50 mm) up to a height of 40 millimeters. The sample shall then be allowed to cool and set at a temperature of 77 F ± 7 (25 C ± 3.9) for 24 hours.

4.8 Ash: Ash content of each different compound shall be established on the approval sample in accordance with ASTM D482, using a 1 g sample. If the established value is 0.15% or less, the ash for succeeding shipments shall not exceed the established value by more than 1/5 of that value; if the established value is over 0.15%, the ash for succeeding shipments shall not deviate from the established value by more than 1/10 of that value.

4.9 Percentage of Nonvolatile Matter: Compound shall contain not less than 99.9% (by weight) nonvolatile matter when determined as follows:

4.9.1 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 (105-110C). After heating, the dish shall be cooled to room temperature and reweighed, and the nonvolatile matter calculated from the residual weight

4.10 Acidity: Compound shall show no evidence of the presence of inorganic acid when tested as follows:

4.10.1 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 he 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.

4.11 Miscibility Compound shall be miscible in all proportions with aircraft engine lubricating oil as evinced by passing the following test:

4.11.1 A mixture **of** 95 parts by volume of ASTM Oil No. 1 (ASTM D471) and 5 parts by volume of compound shall be heated to 170 F ± 5 (76.7 C ± 2.8) for 15 min., examined for miscibility, cooled to room temperature, and re-examined after 24 hr for any separation.

4.12 Oxidation: Compound shall not cause a decrease in pressure of more than 10 psi in 100 hr when tested as follows:

4.12.1 Apparatus: Unless otherwise specified, the apparatus shall conform generally to Fig. 1. The equipment shall consist of a pressure-tight steel bomb and a constant-temperature bath thermostatically controlled to provide an overall temperature variation of not more than 1 F degree (0.6 C degree). Gil used in the bath shall be circulated in order to obtain the necessary temperature control. Glass sample dishes and bombs shall be clean; otherwise, erratic results may be obtained. The oxygen used shall be dry and of the highest purity.

4.12.2 Preparation of Discs:

4.12.2.1 Five l-5/16 in. diam discs shall be cut from 0.050 in. thick brass sheet having the following composltion:

	min	max
copper	67.00 -	73.00
Silicon	- -	0.07
Iron	- -	0. 01
Nickel	- -	0. 01
Lead	- -	0.003
Zinc	remainder	

4.12.2.2 Discs shall be washed in a suitable alkaline cleaner, rinsed in cold running tap water, and then immersed for 20 sec in the following etching solution:

water	450 ml
Conc Nitric Acid	225 ml
Conc Sulfuric Acid	300 ml
Conc Hydrochloric Acid	8 ml

4.12.2.3 After etching as in 4.12.2.2, discs shall be rinsed in cold running tap water and subsequently dipped in the following solution:

water	770 ml
Sodium Dichromate	68 g
Sulfuric Acid	15 ml

4.12.2.4 Discs shall be rinsed with distilled water and dried for 30 min. in an oven maintained at 250 F ± 2 (121 C ± 1.1).

4.12.3 Procedure: A clean, brass disc shall be placed in the bottom of each glass dish and 20.0 g ± 0.1 of compound shall be equally distributed over the disc in a uniform layer having a plane surface. The bomb shall be assembled, closed, and cleared of air by introducing oxygen slowly to a pressure of 100 psi and releasing slowly two times. The oxygen pressure shall be raised to 100 psi a third time and the bomb allowed to stand over night to ensure the absence of leaks. The bomb shall then be placed in the bath and the oxygen bled off until a constant pressure of 110 psi is reached in about 2 hours. The temperature of the bath shall then be maintained at 210 F ± 1 (98.9 C ± 0.6) for 100 hr and the drop in pressure noted.

4.13 Stability: Compound shall remain homogeneous with age and when tested as follows:

4 13.1 A 15 g sample of compound shall be placed in a test tube, heated to 220 F ± 2, (104 4 C ± 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 ± 2 (-40 C ± 1.1) and maintained at that temperature for 1 hour. Compound, after returning to room temperature, shall be examined for homogeneity.

4.14 Film Thickness: Film thickness of applied compound shall be 0.001 - 0.002 in. when tested as follows:

4.14.1 Two, or more, 2 x 4 x l/16 in. polished and alkaline-cleaned panels of AMS 5042, or equivalent, steel sheet shall be weighed to the nearest milligram. Panels shall be immersed for 3 min. in compound at 167 F ± 3 (75 C ± 1.7), withdrawn at the rate of 4 in. per min. , and suspended vertically in an atmosphere of not more than 60% relative humidity at a temperature of 77 F ± 7 (25 C ± 3.9) for 24 hours. panels shall be weighed to determine the weight of film. Film thickness shall be calculated as follows:

$$\text{Film Thickness} = \frac{\text{Weight of Film (g) x 0.061}}{\text{Density (g/cc) x Total Surface Area of Panel (sq in.)}}$$

where, 0.061 = Factor to convert from cc to cc inches
Density = Density of compound

4.15 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:

4.15.1 Two 2 x 4 x l/16 in. polished and alkaline-cleaned panels of AMS 5042, or equivalent. steel sheet shall be ummersed for 3 min. in compound at 167 F ± 3 (75 C ± 1.7), withdrawn at the rate of 4 in. per min. and suspended vertically in an atmosphere of not more than 60% relative humidity at a temperature of 77 F ± 7 (25 C ± 3.9) for 24 hours. Panels shall be cooled to 0 F ± 2 (-17.8 C ± 1.1) and maintained at that temperature for 1 hour. While at 0 F ± 2 (-17.8 C ± 1.1). 4 parallel scratches about l/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.

4.16 Humidity Protection: Compound shalt protect metal panels from corrosion and pitting for 30 days when exposed to humid atmosphere as follows: