AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
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AMS 3087A

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COMPOUND, INSULATING AND SEALING

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

2. APPLICATION: Primarily for sealing joints in aircraft engine ignition systems, but may be used where other gas- and fluid-tight joints are required.

3. TECHNICAL REQUIREMENTS:

3.1 General:

3.1.1 Compound shall be translucent, light gray in color and shall have the consistency of a medium heavy grease.

3.1.2 Compound shall be a smooth, homogeneous mixture, free from lumps, cakes, abrasives and other foreign materials.

3.1.3 Compound shall wet and adhere to both metallic and non-metallic surfaces.

3.1.4 Compound shall be highly resistant to the action of 91% isopropyl alcohol, 95% ethyl alcohol, ethylene glycol, and glycerine.

3.2 Physical Properties: Unless otherwise specified, compound shall conform to the following requirements; tests shall be performed in accordance with listed ASTM Methods, insofar as is practicable:

Property	Value	Test Method
Consistency, Unworked	240 - 260	ASTM D217-44T, Part I
Consistency, Worked, max	300	ASTM D217-44T, Part I
Specific Gravity, 77/77 F	0.98 - 1.00	ASTM D70-27
Reaction on Litmus	Neutral	

3.3 Electrical Properties: Unless otherwise specified, compound shall conform to the following requirements at room temperature; tests shall be performed in accordance with listed ASTM Methods, insofar as is practicable:

Property	Value	Test Method
Dielectric Constant, 1000 Cycles, max	2.8	ASTM D150-47T
Power Factor, 1000 Cycles, %, max	0.1	ASTM D150-47T
Dielectric Strength, Short Time Test at 0.010 in. with 1/2 in. hemispherical metal electrodes, volts per mil, min	500	ASTM D149-44
Volume Resistivity at 70 F and 350 F, ohm-cm, min	1.0×10^{12}	ASTM D257-47
Arc Resistance, sec, min	80	*ASTM D495-42

*Except use 1/8-in. layer of compound spread on a glass plate and silver-tipped electrodes just touching the surface of the compound.

3.4 Temperature Stability:

3.4.1 Compound shall retain its appearance and shall not crack or harden noticeably, a slight increase in stiffness being permitted, when a sample is placed in a clean open container, cooled to -40 F and maintained at that temperature for 4 hours.

3.4.2 Compound shall not completely liquefy or melt at any temperature up to 400 F, but may show loss by evaporation of not more than 2% and flow of not more than 10% by weight when tested as follows:

3.4.2.1 Loss by Evaporation: Approximately 10 grams of the compound shall be weighed into a 60-mesh screen cone approximately 2-3/32 in. in diameter at the open end by 1-3/16 in. high, soldered along the seam, and having a 0.040-in. diameter hole drilled through the tip. The cone shall be suspended in a clean, weighed 100-ml beaker; the assembly shall be weighed, and placed in an air oven, and maintained at 400 F ± 10 for 24 hours. The assembly shall then be removed, cooled in a dessicator, and reweighed. The weight loss as a percentage of the weight of compound originally placed in the cone is the percentage loss by evaporation.

3.4.2.2 Flow: The cone and contents shall then be removed from the beaker and the beaker weighed to determine the weight of compound which flowed through the cone. The weight of compound in the beaker as a percentage of the initial weight of compound placed in the cone is the percentage flow.

3.4.2.3 Visual Examination: After the weights have been determined, the residual compound in the cone shall be examined for surface hardening and cracking. The compound shall have retained its appearance, and shall not have cracked or hardened on the surface. A slight increase in stiffness of the compound retained in the cone will be permitted.

3.5 Solubility: Compound shall show no decrease in weight and an increase in weight of not more than 0.10% when tested as follows:

3.5.1 A weighed 25-ml beaker shall be filled with compound and the surface of the compound scraped off level with the top of the beaker. The beaker and contents shall be weighed, immersed in distilled water at 77 F ± 2 for 24 hours, dried in a dessicator for one hour, and reweighed.

3.6 Effect on Metals: Compound shall not cause corrosion of metals when tested as follows:

3.6.1 Panels of aluminum, magnesium, copper alloys, steel and cadmium plated steel, or couples thereof, coated with compound shall show no evidence of corrosion, as indicated by rusting or pitting, after suspending vertically in a convection current air oven at 212 F ± 2 for 70 hours. Slight darkening on comparison with freshly polished panels of the same materials will be permitted.

3.7 Effect on Nonmetals: Compound shall not react destructively with nonmetallic materials such as phenol-formaldehyde resins, urea-formaldehyde resins, rubber, synthetic rubber, and ignition cable insulation when tested as follows:

3.7.1 Samples of the nonmetallic materials listed above shall be coated with the compound. These samples, together with duplicate samples not so coated, shall be suspended vertically in a convection current air oven at 212 F ± 2 for 70 hours. Coated samples shall show no greater change in physical condition than uncoated samples.

3.8 Thermal Coefficient of Expansion: Shall be not greater than 0.0005 per degree Fahrenheit when determined as follows:

3.8.1 Procedure: Thermal coefficient of expansion may be calculated from two different specific gravity determinations, namely 77/77 F and 300/77 F. The specific gravity at 77/77 F shall be determined by ASTM D70-27. The specific gravity at 300/77 F shall be determined by the same procedure, except that the pycnometer filled with compound shall be heated to 300 F and the excess compound forced through the opening of the pycnometer stopper carefully removed with a clean dry cloth. The pycnometer and contents shall then be cooled in a dessicator to 77 F, after which the pycnometer and contents shall be weighed. The specific gravity at 300/77 F shall be calculated by substituting this weight for the weight "o" in the formula of ASTM D70-27, Section 5.

3.8.1.1 Calculation:

$$\frac{(\text{Sp gr } 77/77\text{ F}) - (\text{Sp gr } 300/77\text{ F})}{223} = \text{Thermal coefficient of expansion}$$

4. REPORTS: Unless otherwise specified, the vendor of compound shall furnish with each shipment three copies of a notarized report stating that the product meets the requirements of this specification. This report shall include the purchase order number, material specification number, batch number, and quantity.

5. PACKAGING AND MARKING:

5.1 Unless otherwise ordered, compound shall be supplied in collapsible aluminum or lead tubes approximately 2 in. in diameter and holding 8 ounces of compound. Tubes shall have wall thickness not less than 0.008 in. and shall have an open end spout and threaded cap. Spout shall be not less than 1/4 in. ID and approximately 1 in. long with a male thread near the bottom to receive the cap.

5.2 Each tube or container shall be marked to show AMS 3087A, manufacturer's identification, part number (when applicable), batch number, unworked consistency, and quantity.

5.3 A separate sheet of specific printed directions for use of the compound shall be supplied with each tube or container.

6. APPROVAL: A vendor shall not supply compound to this specification until samples have been approved by purchaser. After such approval, the ingredients and method of manufacture shall not be changed without permission from the purchaser. Results of tests on incoming shipments shall be essentially equal to those on approved samples.