

CANCELLED

AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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BARRIER MATERIAL, WATER VAPOR RESISTANT, FLEXIBLE, OPAQUE

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 envelopes or bags for enclosing aircraft engines, accessories and spare parts when desiccated for shipment or storage.
3. MATERIAL: Shall be an opaque, flexible, moisture resistant sheet consisting of one or more plies.
4. TECHNICAL REQUIREMENTS:
 - 4.1 Water Vapor Transmission Rate: Shall not exceed 0.05 g of water per 100 sq in. per 24 hr when determined as follows:
 - 4.1.1 Humidity Cabinet: Shall be the General Foods Water Vapor Transmission Cabinet or equivalent. The cabinet shall provide a relative humidity of $90\% \pm 2$ at $100\text{ F} \pm 0.5$, with no condensation on the test dishes or in the space in which the dishes are placed. Circulation over the test dishes shall be negligible.
 - 4.1.2 Test Dishes and Brass Template: Shall be made as shown in Figure 1, or be the equivalent.
 - 4.1.3 Specimens:
 - 4.1.3.1 As Received: Two representative samples of the film, each 6 in. square, shall be selected. Four equidistant parallel folds shall be placed in each square by alternating the direction of folding on each successive fold so that the apex of each successive fold is facing an opposite side of the sheet, in accordion style. The folded square shall then be creased by placing it between two 6 x 10 in. flat, rigid plates and applying a total weight of 36 lb (6 lb per in. of length of fold) for 1 minute. The center of gravity of the weight shall be over the center of the sample. The squares shall be opened and the folding and creasing under weight repeated, making the second series of four folds perpendicular to the original folds. A circular specimen shall then be cut from the center of the creased square.
 - 4.1.3.2 Heat Sealed: Four representative samples of the film, each 4 x 6 in. shall be selected. Two samples are then heat sealed along the 6 in. length in a fin type seal approximately 1 in. wide, made in accordance with good commercial practice and otherwise meeting the requirements of 4.2. Two such samples are prepared and allowed to rest, after formation of the seals, for not less than 24 hr at room temperature before testing. A circular specimen shall be cut from each sample so that the joint of the seal falls on a diameter of the specimen. These specimens are to be tested with the fin on the external surface of the test dish assembly.

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4.1.3.3 After Oil Exposure: Two samples after treatment as in 4.5 shall be wiped clean of oil and a circular specimen cut from each.

4.1.4 Procedure:

- 4.1.4.1 A 50 ml beaker shall be filled with 8 mesh anhydrous calcium chloride (minimum 96% as CaCl_2) and then emptied into a thoroughly cleaned test dish. The calcium chloride shall be spread evenly over the bottom surface of the dish and the test specimens placed over the calcium chloride, concentric with the rim of the dish. The brass template (Figure 1) shall be carefully placed over the specimen, taking care to have the template centralized with respect to the dish top before allowing it to come into contact with the specimen.
- 4.1.4.2 A wax mixture consisting of 60% amorphous wax and 40% paraffin wax shall be heated in a porcelain casserole to at least 212 F. It shall then be poured through a 20 mesh screen to remove any large pieces of foreign matter that may be in the wax.
- 4.1.4.3 The wax mixture shall be poured into the annular space between the template and the rim of the test dish, filling this space approximately flush with the top of the template. The dish shall then be cooled to harden the wax sufficiently so that the template can be removed. Care shall be taken not to cool the dish so long as to make the wax hard and brittle. The template shall be removed by inserting a screw driver under an ear of the template and giving a slight twist, tending to press the wax against the dish and at the same time raising the template. This shall be done on three ears of the template. An difficulty experienced in extracting the template from the dish can be overcome by first rubbing the edge of the template with petrolatum before pouring the wax.
- 4.1.4.4 After the template has been removed, the assembly shall be inspected for loose pieces of wax, etc., and examined for flaws in the seal. It shall then be conditioned in the humidity cabinet as follows, according to the construction of the material being tested, any surface coating 0.001 in. or more in thickness being considered a ply, but no laminate being considered a ply: Material of 1 or 2 plies, 24 hr; material of 3 or more plies, 48 hours. Assemblies shall then be removed from the humidity cabinet, cooled to room temperature in a suitable desiccator containing anhydrous calcium chloride or its equivalent, and weighed on an analytical balance. The assembly shall then be replaced in the humidity cabinet for a period of 68 hr, removed, cooled as before and reweighed. The cycle of exposure in the humidity cabinet, cooling and weighing shall be repeated at intervals of 24 hr thereafter until 2 consecutive weighings indicate that a practically constant rate of moisture transmission has been attained.