AEROSPACE MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
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AMS 3610

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PLASTIC FILM - TRANSPARENT, MOISTURE-RESISTANT

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

2. USE: This material shall be a transparent, pliable, moisture resistant film suitable for use in the fabrication of envelopes or bags for enclosing aircraft engines and/or spare parts preparatory to shipment or storage.

3. PHYSICAL PROPERTIES: (a) Moisture Diffusion - The Moisture diffusion rate of the recommended film construction shall not exceed 7.5 x 10^{-7} lbs/sq.ft/hr./mm. Hg. water vapor pressure differential when determined at 77°F with a vapor pressure corresponding to 15-20% R.H. on one side of the test diaphraghm and 80-90% on the other side. The effectiveness of the film construction shall not be impaired by operations incidental to handling such as converting, folding, creasing, laminating and heat sealing.

(b) Heat Sealing - The material shall be heat-sealable to form a welded bond, which bond shall be as strong and as moisture-resistant as the material itself. The heat required to make this welded bond shall be in the range recommended in AS6, Envelope, Transparent, Moisture Resistant.

(c) Flammability - This material shall not support combustion when ignited with a match.

(d) Corrosion - The material shall not have a corrosive effect on any metals enclosed within the envelope or bag.

(e) Shock Resistance - The shock resistance of the recommended film composition shall be such that when a steel ball 1" in diameter (weighing approximately 67 grms.) is dropped upon a tautly stretched sample of this film composition at 77°F, the first appearance of a break should not occur at less than a 20" drop.

(f) Oil Resistance - This material shall be unaffected by contact with engine lubricating oil.

4. TEST PROCEDURES: (a) Moisture Diffusion -

(1) Preparation of Film: A porcelain crucible containing any standard salt-solution giving a relative humidity of 15 to 20 percent shall be placed upon a sample of the recommended film large enough to project approximately 1-1/2 inches beyond the O.D. of the moisture diffusion cell. The salt solution shall be sufficient in volume to the extent that when emptied in the diffusion cell as described below, the surface of the solution shall be approximately two inches below the surface of the film under test. The film shall then be sealed around the edges of the moisture-diffusion cell using the following procedure:

4-(a)-(1) - Continued)

Invert a moisture-diffusion cell having an internal diameter of not less than 3 inches into melted beeswax to a depth of one inch. Remove and quickly place over the crucible filled with the salt solution and weigh down to prevent sliding. When the wax has solidified and formed a seal between the edge of the cell and the film, the weight shall be removed and the cell turned over to an upright position.

Then the film shall be trimmed around the cell leaving a 1/4 inch flange, which shall be cut at right angles to the edge of the dish at frequent intervals. The flange shall be pasted against the sides of the dish with melted beeswax applied by a camel's-hair brush, continuing the coating over the beeswax until inspection shows the cell to be airtight.

(2) Procedure: The cell shall be placed in a constant temperature-constant humidity cabinet having a temperature maintained at 77 $\pm$ 1°F.

The cabinet atmosphere, freely circulated about the cell by a fan, shall be in equilibrium with a saturated salt-solution giving a relative humidity of 80 to 90 percent. The cell shall be given a minimum of two days to come to equilibrium and shall then be weighted to 0.2 mg. accuracy. Successive weighing shall be accomplished every 48 hours until the moisture pick-up rate is established as constant for at least three successive weighings. The area of the exposed film under test shall be measured with a planimeter, since the beeswax will prevent moisture diffusion through the film. The moisture diffusion rate shall be computed as follows:

$$\frac{A}{B \times C \times 48} = \text{Moisture Diffusion rate}$$

Where A = Constant weight increase per 48 hours in pounds

B = Area of film under test in square foot

C = Water vapor pressure differential in mm. Hg.

A saturated solution of Potassium Chloride giving a relative humidity of 85.01 percent shall be used to establish a relative humidity within the specified range.

(3) The Moisture Diffusion Test shall be repeated (or run concurrently) on a sample of the film which has been folded twice at right angles and which has supported a three-pound/ sq.in. load placed upon the apex of the folds for a period of one hour.

(b) Shock Resistance:

(1) Preparation of Film Sample: A film sample shall be tautly clamped in a horizontal position by means of two concentric rings, the inside diameter of the inner ring being not less than 3 inches. A steel ball