AERONAUTICAL MATERIAL SPECIFICATION

Society of Automotive Engineers, Inc.
29 West 39th Street
New York City

AMS 3540

Issued 4-1-43
Revised

WRAPPER - GREASEPROOF PAPER
(Single Ply)

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

2. MATERIAL: The material covered by this specification is primarily a coated or impregnated paper base sheet.

3. APPLICATION: This specification covers the requirements for a greaseproof and non-corrosive material for use as a primary wrapper in contact with highly finished and corrodible metallic surfaces, which usually will be coated with an oil or preservative compound.

4. GENERAL REQUIREMENTS: (a) The strength and flexibility of the wrapper shall be sufficient to permit folding and shaping ordinarily encountered in any manual or machine packaging operations without mechanical failure or appreciable loss in greaseproof properties.

(b) It is desirable that the wrapper have a "dead-fold" characteristic to facilitate its application to irregularly shaped objects.

(c) The wrapper shall not be hygroscopic to the extent which will produce corrosion when contacting any metal used in aircraft engine construction.

(d) The wrapper shall not display deterioration or other undesirable characteristics during its normal use in service.

5. DETAIL REQUIREMENTS: (a) Hydrogen Ion Concentration - The p^H value of the finished wrapper shall be within the range of 6.5 to 7.5.

(b) Chlorides and Sulphates - The finished wrapper shall contain not more than a trace of sulphates and chlorides, with a combined tolerance not exceeding 0.1%.

(c) Aging - The finished wrapper after artificial aging for three days at 125°F (51.7°C) shall not display brittleness, and coatings, when applied, shall not show evidence of flow.

(d) Water Repellency - The finished wrapper shall repel water satisfactorily for 24 hours.

(e) Greaseproofness - At 77°F±5°, (25°C±2.8°) and 65 percent maximum relative humidity, an average of at least 30 minutes shall elapse before the first penetration of the test turpentine.

(f) Corrosiveness - The wrapper shall not produce corrosion or staining on steel, aluminum, magnesium, brass copper, cadmium, zinc, tin, silver, or lead.

(g) Color - The wrapper shall be noticeably colored, throughout or by identifying stripes, with a fast red dye.

6. TEST PROCEDURES: (a) Hydrogen Ion Concentration Determination - Place 2.5 gms. of finely shredded material in a 150 c.c. beaker and add 125 c.c. of boiling distilled water having a p^H of 6.9 to 7.1. Cover with a watch glass to prevent rapid evaporation. Boil for 10 minutes, cool and decant free of material. Determine the p^H value electrometrically.

(b) Chloride Determination - A two gram sample, or any suitable amount of finely shredded material accurately weighed, shall be immersed in any convenient volume of distilled water which is then boiled for 10 minutes. The solution shall be filtered free of paper, making certain that the paper is thoroughly washed with distilled water. Three drops of concentrated nitric acid shall be added to the filtrate followed by the addition of a slight excess of approximately one-tenth (.1) normal silver nitrate solution. The resultant precipitate of silver chloride shall be filtered through a Gooch crucible, which previously has been weighed, and thoroughly washed with distilled water containing one ml. nitric acid per 100 ml. of water. The crucible then shall be heated to 250-300°F (121.1-148.9°C) to expel all water. Cool and weigh as silver chloride. Calculate the percent chlorine from the weight of the sample taken by the following formula:

$$\frac{\text{Ag Cl} \times 0.2474}{\text{wt. of sample}} \times 100 = \% \text{ Cl}$$

(c) Sulphate Determination - A two gram sample, or any suitable amount of finely shredded material accurately weighed, shall be immersed in any convenient volume of distilled water which is then boiled for 10 minutes. The solution shall be filtered free of paper, making certain that the paper is thoroughly washed with distilled water. Three drops of concentrated HCl shall be added to the filtrate followed by the addition of a slight excess of approximately one-tenth (.1) normal barium chloride solution. The beaker shall be placed on a steam bath and the resulting precipitate of barium sulphate allowed to settle for about one hour. The solution shall be filtered, using a fine grade of filter paper. The precipitate then shall be washed 10 times with hot water, dried and ignited gently over a Bunsen burner, or in a muffle for a half hour. Cool and weigh. Calculate the percent sulphate from the weight of the sample taken by the following formula:

$$\frac{\text{Ba } SO_4 \times 0.4115}{\text{wt. of sample}} \times 100 = \% \ SO_4$$

(d) Aging Test - A sample of the material approximately three inches square shall be suspended in an oven uniformly heated at 125°F±5° (51.7°C±2.8°) for 70 hours. At the end of this period any evidence of embrittlement, or coating flow, shall be cause for rejection.

(e) Water Repellency Test - A disc of the material approximately two inches in diameter which has been creased at right angles and unfolded and slightly dished shall be placed gently on the surface of a water bath. Potassium permanganate finely ground shall be sprinkled over the inside cupped surface of the sample. Any discoloration of water after 24 hours shall be cause for rejection.