MINISTRY OF AVIATION

D.T.D. 5539A

June, 1960

Aircraft Material Specification

FOR RESINATED ASBESTOS FLOCK MOULDED MATERIAL

Points of difference from D.T.D. 5539 are indicated by marginal lines

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NOTE 1.—This specification is one of a series issued by the Ministry of Aviation either to meet a limited requirement not covered by an existing British Standard or to serve as a basis for inspection of materials the properties and uses of which are not sufficiently developed to warrant submission to the British Standards Institution for standardization.)

2.—The material is intended mainly for use in structural components fabricated by means of high pressure moulding processes. Its mechanical properties are inferior to the material specified in D.T.D. 5511A.

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1. **Description**

1.1. The material shall be a uniform mixture of chrysotile asbestos fibre and phenolic resin and shall be substantially free from resin aggregations, undispersed asbestos fibre and foreign matter.

2. **Asbestos Content**

2.1. The asbestos content of the material shall be $57\frac{1}{2} \pm 2\frac{1}{2}$ per cent when determined as in Appendix I.

3. **Bulk Factor**

3.1. The bulk factor of the material shall be $5\frac{1}{4} \pm \frac{3}{4}$ when determined as described in B.S.2782 Method 501C.

4. **Flow**

4.1. The cup flow time of the material shall be 5 to 12 seconds when determined as in Appendix II.

5. **Volatile Matter**

5.1. The volatile matter in the material shall not be greater than 3·5 per cent when determined as in Appendix III.

6. **Cross-Breaking Strength**

6.1. The cross-breaking strength of the material shall not be less than 10,000 lb. per square inch when determined as in Appendix IV.

7. **Acetone Soluble Matter in the Material after Moulding**

7.1. The acetone soluble matter in the moulded material shall not be greater than 5·0 per cent when determined as described in B.S.2782: Method 401A.

The finely divided material shall be prepared from pieces cut from a test board moulded as described in Appendix V.

This property which need be determined only infrequently will enable suitable levels to be set for assessing the degree of cure of moulded articles.

8. **Frequency of Testing**

8.1. Each mix of materials shall comply with the requirements of Clause 4.

8.1.1. A mix shall be defined as a quantity of material the whole of which is made from the same batch of material on the same equipment at the same time.

8.2. Each batch of material shall comply with all the requirements of this specification.

8.2.1. A batch shall be defined as a quantity of material so designated by the manufacturer and substantially uniform in quality.

8.3. In the event of failure to comply with any of the requirements of this specification, two further samples shall be taken from the batch of mix and failure of either of these to meet the requirements shall cause rejection of the complete batch or mix.

9. **Packing**

9.1. The material shall be packed in airtight polythene bags in stout metal drums. Each drum shall be identified with the specification number, cup flow time, batch number, and date before which the material should be used. The drums shall be marked—" Store under cool conditions ".

Appendix I

Method for the Determination of Asbestos Fibre Content

Two samples of the material, each of approximately one gram weight, shall be placed in previously weighed crucibles and cured by heating for 1 hour in an oven at 135° ± 3°C. The crucibles and contents shall be cooled in a desiccator and weighed. The crucibles and contents shall be ignited to constant weight in an electrically heated muffle-furnace at approximately 900°C. and after cooling in a desiccator shall be re-weighed.

The asbestos content shall be calculated as follows:—

$$\text{Per cent Asbestos Content} = \frac{\text{Weight of Ignited material}}{\text{Weight of Cured material}} \times 117$$

The average of the two determinations shall be recorded as the result.

Appendix II

Method for the Determination of Flow by the Cup Flow Test

The cup flow shall be determined as described in B.S.2782 Method 105B. The weight of material shall be 33g. and it shall be lightly compressed before charging into the mould so as to form a cylinder in accordance with the procedure for fibrous materials.

Appendix III

Method for the Determination of Volatile Matter

A 10 gram. sample of the material shall be made into a pellet 1½ in. in diameter in a cold tool using a positive pressure of 2 ± ½ tons.

The pellet shall be weighed on a tared watch glass and then dried at 135° ± 3°C for 1 hour. The pellet and watch glass shall be allowed to cool in a desiccator and then reweighed.

The volatile matter shall be calculated as follows:—

$$\text{Per cent Volatile matter} = \frac{\text{Original weight—final weight}}{\text{Original weight of pellet}} \times 100$$

Appendix IV

Method for the Determination of Cross-Breaking Strength

A test board 10 in. × 10 in. × 0·375 in. shall be moulded in a positive mould under a pressure of 1 ton per square inch, for 30 minutes at a temperature of 150° ± 5°C. The board shall be cooled before extraction from the mould. Six specimens shall be cut from the board, three each in two directions parallel to the edges of the board.

In other respects the method shall be as described in B.S.2782. Method 304A.

Approved for issue by

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