

**Ministry of Defence  
Defence Procurement Agency, ADRP2  
Abbey Wood  
Bristol  
BS34 8JH**

## **OBSOLESCENCE NOTICE**

All DTD specifications were declared obsolescent from 1<sup>st</sup> April 1999. All DTD 900 series approvals also lapsed at that time. The standards will no longer be updated but will be retained as obsolescent documents to provide for the servicing of existing equipment.

### **Further Guidance**

The aim in declaring the specifications obsolescent is to recognise that the documents are not being updated and thus should be used with care by both purchaser and supplier. For example, a specification could contain valid technical information but may also contain type approval clauses that contradict procurement policy and/or use materials that do not comply with environmental legislation. The obsolescent specification can still be used as a basis for a purchase provided that the supplier and purchaser agree suitable changes to the specification within the purchase order/contract.

For the DTD 900 system, each specification has provided an MoD approved material and process. For these items, the declaration of obsolescence will constitute the termination of both the extant MoD approval and the continuing MoD assessment that had underpinned those approvals. Again, the technical content of the document remains valid and can be used by both purchaser and supplier as a basis for a contract but an acceptable (to the parties) approval/assessment procedure would be required.

## Aircraft Material Specification

## CELLULOSE GLOSSY BLACK FINISH FOR AEROPLANE DOPING SCHEMES

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*NOTE.-This specification is one of a series issued by the Ministry of Supply either to meet a limited requirement not covered by any existing British Standard Specification 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 standardisation.*

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**1. Definition**

The material shall be a pigmented nitrocellulose non-tautening finish of such a nature that when applied correctly to linen fabric to Specification D.T.D. 540 treated with the tautening dopes of Specifications D.T.D. 751, 752 or 753 a smooth, glossy and continuous surface is produced.

**2. Description**

(a) The aeroplane doping schemes shall consist of tautening dopes applied in accordance with the requirements of Specifications D.T.D. 751, 752 or 753 with a final application of the cellulose glossy black finish the weight addition of which shall be 1 oz./sq. yd. ( $\pm 20$  per cent) normally obtained by the application of two coats.

(b) The cellulose finish shall be formulated on nitrocellulose, the plasticiser shall be dibutyl phthalate B.S. 573 and/or other approved plasticiser and the remaining ingredients shall comply with the requirements of relevant B.S. or D.T.D. specifications where available.

(c) The cellulose finish shall be suitable for use by spray application when diluted with approximately 20 per cent of thinners.

(d) The cellulose finish shall be capable of being sprayed (when thinned as above) without showing signs of blushing or other defect (i) under normal atmospheric conditions and (ii) under adverse weather conditions of high temperature and high humidity when diluted with "anti-chill" thinners to Specification D.T.D. 843.

**3. Freedom from objectionable ingredients**

Solvents such as chlorinated compounds or other substances which may cause injury or discomfort to operators during or after application shall not be used.

**4. Colour**

(a) The film resulting from the application by pour of one coat of the finish to a smooth metal panel and air drying overnight shall match the standard in colour.

(b) The standard is obtainable from the Secretary, Ministry of Supply, I.NM.1, Harefield House, Harefield, Middlesex.

**5. Gloss**

(a) The finish when examined by the method described in Appendix I shall exhibit a degree of reflection sufficient to produce a sharp definition of the standard text.

(b) The standard text is obtainable from the Secretary, Ministry of Supply, I.NM.1, Harefield House, Harefield, Middlesex.

**6. Tautness retention on application of the non-tautening finish**

The non-tautening finish shall be so formulated that the application of approximately 1 oz. per sq. yd. over fabric already tautened by the use of tautening dopes applied in the manner indicated in Clause 2 of Specification D.T.D. 751, 752 or 753 shall not reduce the tautness of the system by more than 20 per cent.

**7. Freedom from blushing**

The non-tautening finish, when tested by the method described in Appendix II, shall be free from blushing and no wrinkling, bubbling or other defects shall occur.

**8. Resistance to high temperatures.**

The resistance to high temperatures of the complete doping schemes shall be such that when determined by the method described in Appendix III, no sign of cracking shall occur.

**9. Durability**

The durability of a film of the materials prepared and tested as described in Appendix IV shall be such that the film shall show no signs of cracking, chipping, flaking, blistering or more than a slight change in colour, slight loss in gloss or slight chalking. The underlying coats shall not be visible through the final finishing colour and the tautness of the system shall not be materially impaired. The tensile strength of the doped fabric after exposure shall be not less than the original tensile strength of the undoped fabric.

**10. Keeping qualities**

The keeping qualities shall be such that, when stored in their original containers, the materials shall retain the properties detailed above for not less than the following periods after the date of delivery :-

(a) 12 months in temperate climates.

(b) 6 months in tropical climates.

### 11. Type approval

Before any material is accepted as complying with the requirements of this specification, the manufacturer must obtain type approval. Applications for type approval shall be submitted to the Director of Aeronautical Inspection (I.NM.1) Harefield House, Harefield, Middlesex, accompanied by :-

- (i) evidence that the materials comply with Clauses 1 to 8 inclusive of this specification.
- (ii) wet samples including thinners of all materials for which approval is sought together with details of their formulation, *i.e.* percentage of pigment, medium, volatile, and nature of medium, pigments and extenders, and the specification references, where applicable, of the ingredients.
- (iii) one sprayed panel prepared in accordance with Appendix IV in respect of each finishing colour for which approval is sought, and marked on the reverse with the description and film weight of each applied coat.

The Director of Aeronautical Inspection (I.NM.1) may at his discretion grant a provisional type approval on the basis of short term tests before natural ageing tests can be completed. Provisional approvals will be issued only in special circumstances and after consideration of evidence supplied by the applicant of durability of materials of the same or similar formulation, definition of the type of medium and the names of the manufacturers of any proprietary resins used, in addition to details supplied under (i), (ii) and (iii) above.

After provisional or formal approval has been given no change in the formulation will be permitted unless approval of the change has been sought and given.

### 12. Routine inspection

A representative sample of each batch shall be tested by the manufacturer and proved to comply with Clauses 1 to 8 inclusive before release is authorised.

The Director of Aeronautical Inspection may require the manufacturer to test to Clause 9 at any time.

#### APPENDIX I

##### Method for the Determination of Gloss

The panel as prepared in Clause 4(a) shall be viewed in the apparatus as shown in Fig. I and the image of the illuminated standard text should be clearly legible.

#### APPENDIX II

##### Method for the Determination of Freedom from Blushing

The atmospheric conditions throughout the test shall be:-

Relative Humidity	..	..	..	..	not less than 65 per cent.
Temperature	..	..	..	..	65° F. ± 1° F.
Air Speed	..	..	..	..	3 ft. per second.

Test frames covered with linen fabric to Specification D.T.D. 540 shall be stored prior to doping, together with samples of dopes and finish to be tested and the brushes to be used for application, under the above test conditions. After a period of not less than 2 hours the fabric shall be doped with the materials by brush application, without the addition of thinners.

One full coat of the non-tautening finish shall be applied to a test frame previously doped with tautening dope (D.T.D. 751, 752 or 753) allowed to dry under the conditions given above and then examined visually.

#### APPENDIX III

##### Method for Determining the Resistance to High Temperatures

Test frames, the fabric on which shall be doped with the complete schemes as indicated in Clause 2, shall be prepared.

A strip 1 inch by not less than 6 inches of each of the doped fabrics cut in the warp direction shall then be heated at a temperature of not less than 96° C. for 96 hours and after cooling to room temperature, shall be bent double along the weft threads round a mandrel 1/16 inch in diameter. The strip shall be moved through at least 5 inches of its length over the mandrel during the bending operation.

#### APPENDIX IV

##### Method for the Determination of Durability

A strong rectangular wooden frame reinforced with metal to prevent warping, measuring 10 inches by 10 inches internally with two holes 3/16 inch in diameter bored through one of the sides shall be covered on one face with linen fabric to Specification D.T.D. 540 under a tension of approximately two pounds per inch in the warp and one pound per inch in the weft.

The complete doping schemes shall be uniformly applied as indicated in Clause 2.

The back of the test frame shall be suitably protected with a covering of waterproof material.

The test frame shall be freely exposed in the open, facing south, at an angle corresponding to maximum sunlight. An exposure of six months shall be given, the period to include at least two of the months from May to August inclusive. During the exposure the frame shall be examined at intervals for adhesion of the dope, cracks, etc., and the general behaviour in wet and dry weather shall be noted. Comparative tautness tests shall also be made at intervals in both wet and dry weather.

After exposure for the specified period the tensile strength of the doped fabric shall be determined as described below. The tensile strength of a piece of untreated fabric cut from the same length of fabric as was used to cover the test frame, shall be determined by the same method and under the same atmospheric conditions.

The tensile strength shall be determined as follows.

Six specimens, one inch wide and sufficiently long to allow seven inches between the jaws of a suitable testing machine, shall be cut in the warp direction from the fabric. All specimens shall then be submitted to a conditioned atmosphere for eighteen hours immediately preceding the test. At the end of this period the tensile strength shall be determined.

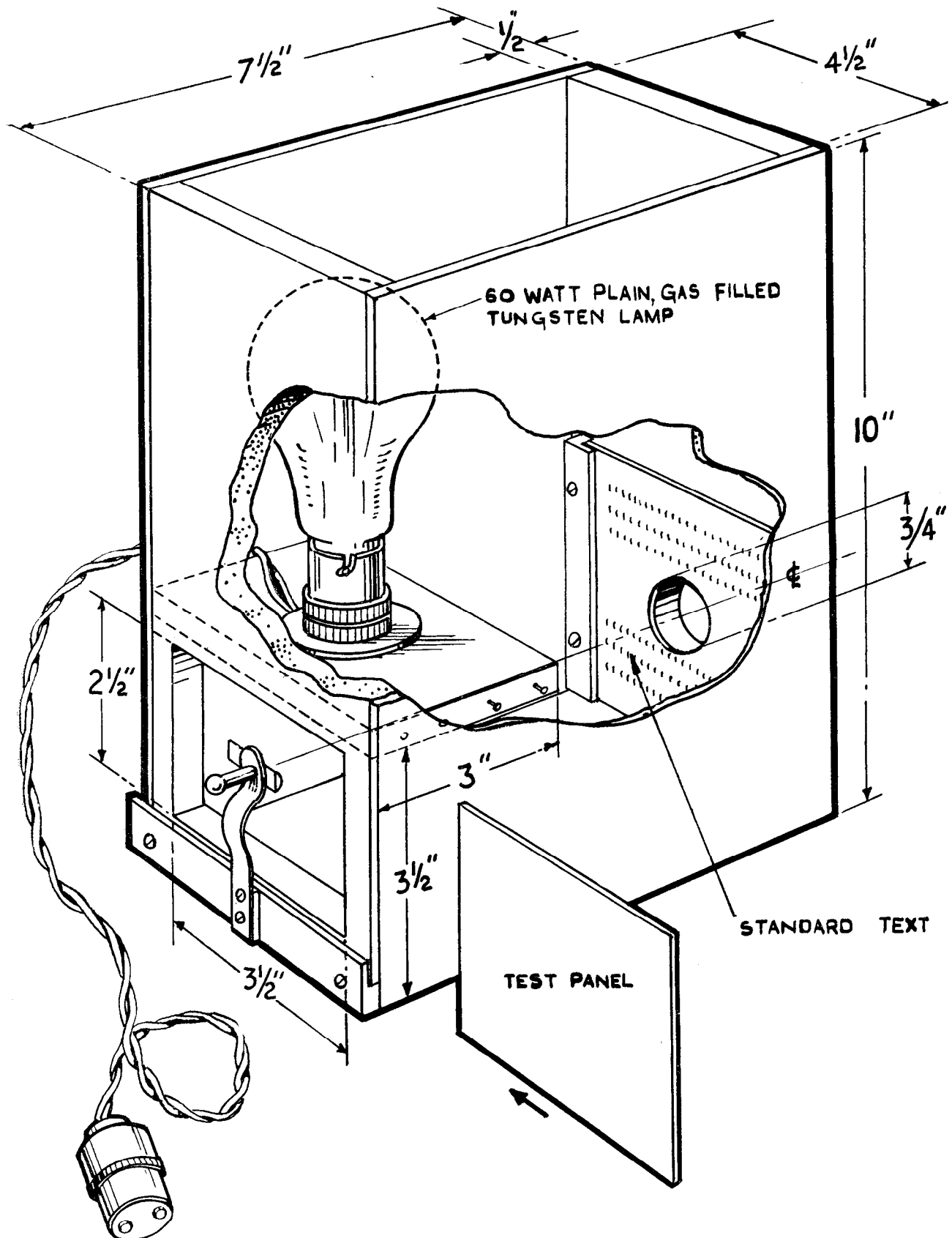


FIG. 1. Apparatus for determining gloss.

Approved for issue.

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