

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

OBSOLESCENCE NOTICE

All DTD specifications were declared obsolescent from 1st 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.

April, 1956
Superseding D.T.D. 770
Reprinted June, 1963

Aircraft Material Specification

POLISH FOR TRANSPARENT PERSPEX PANELS AND MOULDINGS

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

SECTION I

General Requirements

1. **Description.**—The polish shall consist essentially of a powdered abrasive and a liquid phase. The polish shall be readily mixed to a uniform consistency on shaking in its container. The polish shall be suitable for use with polishing cloths complying with Specification D.T.D. 763A.

2. **Containers.**—The polish shall be supplied in glass containers sealed by means of a non-metallic or corrosion resistant metal cap such that the loss in weight of the contents does not exceed 0.1 per cent when determined by the method described in Appendix I.

3. **Stability on Storage.**—The stability of the polish shall be such that there shall be no change in the consistency of the polish when tested by the method described in Appendix II.

4. **Efficiency in Removing Abrasion.**—The efficiency of the polish in removing abrasion shall be such that when determined by the method described in Appendix III the decrease in light scattering shall not be less than 80 per cent.

5. **Effect of "Wet" Polish on New Panels.**—The effect of "wet" polish on new panels shall be such that when tested by the method described in Appendix IV the increase in light scattering shall not exceed 0.2 per cent.

6. **Effect of "Dry" Polish on Wet Polished Panels.**—The effect of "dry" polish on wet polished panels shall be such that when tested by the method described in Appendix V the increase in light scattering shall not exceed 0.2 per cent.

7. **Freedom from Agents causing Crizzling.**—The polish shall be free from agents causing crazing when tested by the method described in Appendix VI.

8. **Oil and Water Removing Properties.**—The oil and water removing properties of the material shall be such that the specimens shall show no visible signs of residual oil and water, when tested by the method described in Appendix VII.

SECTION II

Type Approval

9. **Type Approval.**—Before a manufacturer proceeds to execute a contract or order for material to this specification he must obtain type approval by demonstrating to the satisfaction of the Director of Aeronautical Inspection that his material complies with the requirements of Section I.

SECTION III

Routine Inspection

10. **Routine Inspection.**—(a) Each Batch of material shall comply with Clauses 4, 5, 6 and 7 of Section I. (b) The Director of Aeronautical Inspection may call for any of the tests in Clause 9 (Type Approval) to be repeated at any time.

11. **Release Notes.**—The Manufacturer must state on each Release Note that the material being released is identical in all respects with the material which has previously received Type Approval in accordance with Clause 9.

APPENDIX I

Method for Determining the Efficacy of the Seal

A full sealed container shall be weighed and then maintained at $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for a period of seven days. The sample shall then be allowed to cool to room temperature and again weighed; the difference between the two weighings will be the weight of material lost by evaporation. The container shall then be emptied and, with the sealing cap, shall be cleaned and weighed. The loss in weight shall then be calculated as a percentage of the original weight of the contents of the container.

APPENDIX II

Method for Determining Stability of Polish during Storage

Two full, sealed containers, shall be tested as follows:—

- (a) One container shall be maintained at $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for seven days.
- (b) One container shall be maintained at $-20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for seven days.

After this treatment both containers shall be allowed to return to room temperature and then examined visually, before and after shaking, for any change in consistency.

APPENDIX III

Method for the Determination of the Efficiency in Removing Abrasion

Ten 1-inch squares of new material to Specification D.T.D. ~~5544~~ ⁶⁵⁷² (latest issue), $\frac{1}{8}$ -inch thick shall be cut, the corners on one face rounded with a file, and that face abraded by hand rubbing on a mixture of 0.2 gram of 150-170 mesh carborundum mixed with 0.5 ml of water, for a period of 3 minutes, with moderate pressure, on a fresh piece of plate glass. The abraded specimens shall then be washed in running cold tap water, rinsed in distilled water and dried in air at room temperature. Fresh carborundum powder and water shall be used in the preparation of each abraded specimen. Care shall be taken to avoid finger-marking the abraded surface or damaging the opposite original surface of the specimens.

The measurement of light scattering shall be made on the abraded specimens, before and after polishing, using a photo-meter comprising the following features. An approximately parallel beam of light of constant intensity shall pass at right-angles through a circular aperture of 20 mm diameter, provision being made for the specimens to be conveniently placed over the aperture, the surface to be measured being uppermost. The light scattering by the specimens shall be measured by a selenium photo-cell having a circular sensitive element of 30 mm diameter. The photo-cell shall be fixed in a plane at a distance of 50 mm from the centre of, and at right-angles to, the plane of the aperture, the centre of the photo-cell being 30 mm above the plane of the aperture. The photo-cell, suitably protected against stray light, shall be connected to a sensitive galvanometer. Provision shall be made to decrease the beam intensity by a known factor when measuring the light scattering of the abraded specimens before and after polishing. A convenient method is to incorporate a neutral density filter, placed in the path of the beam, and having a density of about 1.0. A suitable instrument is shown in Figure 1. This is adjusted to give almost maximum deflection when the standard abraded specimen is at A and the neutral density filter is in the light beam. Thereafter the conditions are maintained constant throughout.

Before polishing, the light scattering of the abraded specimens shall be determined as follows. For each specimen the difference in galvanometer deflections, with and without the abraded specimen at A, shall be measured and the mean value d_A , obtained. This value shall not differ from the value obtained with the standard abraded specimen by more than ± 5 per cent. The ten abraded specimens shall then be polished according to the following procedure. A suitable polishing machine is shown in Figure 2.

A polishing cloth, D.T.D. 763A, of suitable size, shall be tightly stretched over the disc and held securely in position by any suitable means. Polish shall then be applied to the cloth at the rate of 5 ml per 100 sq cm of cloth, and worked evenly into the cloth by the finger tips. The disc shall be rotated at 50 ± 5 r.p.m. The specimen being polished shall be held with its abraded surface in contact with the cloth, under a load of 1 Kg. and rotated in opposition to the polishing disc at 36 ± 5 r.p.m. The specimen holder shall be so made that the specimen adjusts itself to the cloth in order to obtain an even polishing of the flat surface of the specimen. A suitable specimen holder is shown in Figure 3. The polishing time shall be 3 minutes, the axis of rotation of the specimen being 1.5-inches from the centre of the disc. Fresh polish and a new cloth shall be used for each specimen.

After polishing, the specimens are carefully wiped to remove surplus polish and then mechanically wiped for a period of 1 minute, and allowed to stand for 1 hour after which the light scattering shall again be determined. For each specimen, the difference in galvanometer deflections, with and without the polished specimen at A shall be measured and the mean value, d , determined.

The decrease in percentage light scattering shall be defined as the value of $100 \left(1 - \frac{d}{d_A}\right)$.

APPENDIX IV

Method for the Determination of the Effect of "Wet" Polish on new Panels

Note.— The term "wet" polish is to be understood as meaning the normal state of the polish as supplied, when applied to the polishing cloth.

Ten 1-inch squares of new material to Specification D.T.D. 5544 (latest issue), $\frac{3}{8}$ -inch thick, shall be cut, the corners rounded on one face with a file, and the protecting layers of paper removed. The specimens shall be immersed for 30 minutes in a 0.1 per cent solution of Lissapol LS paste in water at approximately 50°C, rinsed in cold distilled water, allowed to dry in air at room temperature, and lightly wiped with a clean, dry polishing cloth. Care shall be taken to avoid scratching or finger-marking the surfaces of the specimens. The light scattering of the specimens shall then be measured using the photometer described in Appendix III (with the rounded comers uppermost).

The neutral density filter shall be removed from the path of the light beam, the galvanometer deflections, D_1 and D_0 , with and without each specimen at A, shall be measured, and the mean value for percentage light scattering, $\frac{100}{F.dA} (D_1 - 0.915D_0)$, obtained.

The filter factor F in the above expression is obtained by placing a specimen at A, abraded in such a manner, that without the filter in the light beam, approximately full scale deflection is obtained on the galvanometer. The filter is then interposed in the light beam and the deflection noted. The factor is taken as the ratio between the two deflections thus obtained.

The ten specimens shall then be polished and cleaned in exactly the same way as described in Appendix III, paragraph 4 and 5. The mean value for percentage light scattering of the polished specimens, $\frac{100}{F.dA} (D_2 - 0.915 D_0)$, shall be obtained and the change due to wet-polishing calculated by difference.

APPENDIX V

Method for the Determination of the Effect of "Dry" Polish on Wet Polished Panels

Note.— The term "dry" polish is to be understood as meaning the state of the polish on a previously used cloth, from which the volatile ingredients have evaporated.

The ten polishing cloths used in Appendix IV shall be allowed to dry in air at room temperature for 48 hours. No additional polish shall be added, and the ten polished specimens prepared in Appendix IV shall again be polished, using a separate dried polishing cloth for each, and cleaned in exactly the same way.

The mean value for percentage light scattering, $\frac{100}{F.dA} (D_3 - 0.915 D_0)$, shall be determined in the same way as described in Appendix IV, and the change from that of the wet-polished specimens calculated by difference.

APPENDIX VI

Method for the Determination of Freedom from Agents Causing Crazing

A specimen of new material to Specification D.T.D. 5544 (latest issue), 6 inches x 1 inch X $\frac{1}{8}$ inch thick shall be cut. The protective paper shall be removed and the specimen freed from any residual gelatine adhesive by soaking in distilled water at room temperature for approximately 30 minutes. The specimen shall then be rinsed with distilled water, allowed to dry in air at room temperature and lightly wiped with a clean dry polishing cloth (D.T.D. 763).

The specimen shall then be clamped lightly at each end so that it is bent flatwise round a suitable mandrel of radius 30 inches. Polish shall then be applied to about a three-inch length of the outer surface of the specimen at its centre. The assembly shall then be stored for 72 hours in an atmosphere free from organic solvent vapours at 20°C ± 3°C.

At the end of this period the polish shall be rinsed from the specimen which shall then be washed in lukewarm soapy water, rinsed with distilled water and allowed to dry at room temperature. The specimen shall then be examined for crazing.

APPENDIX VII

Method for the Determination of Oil and Water Removing Properties

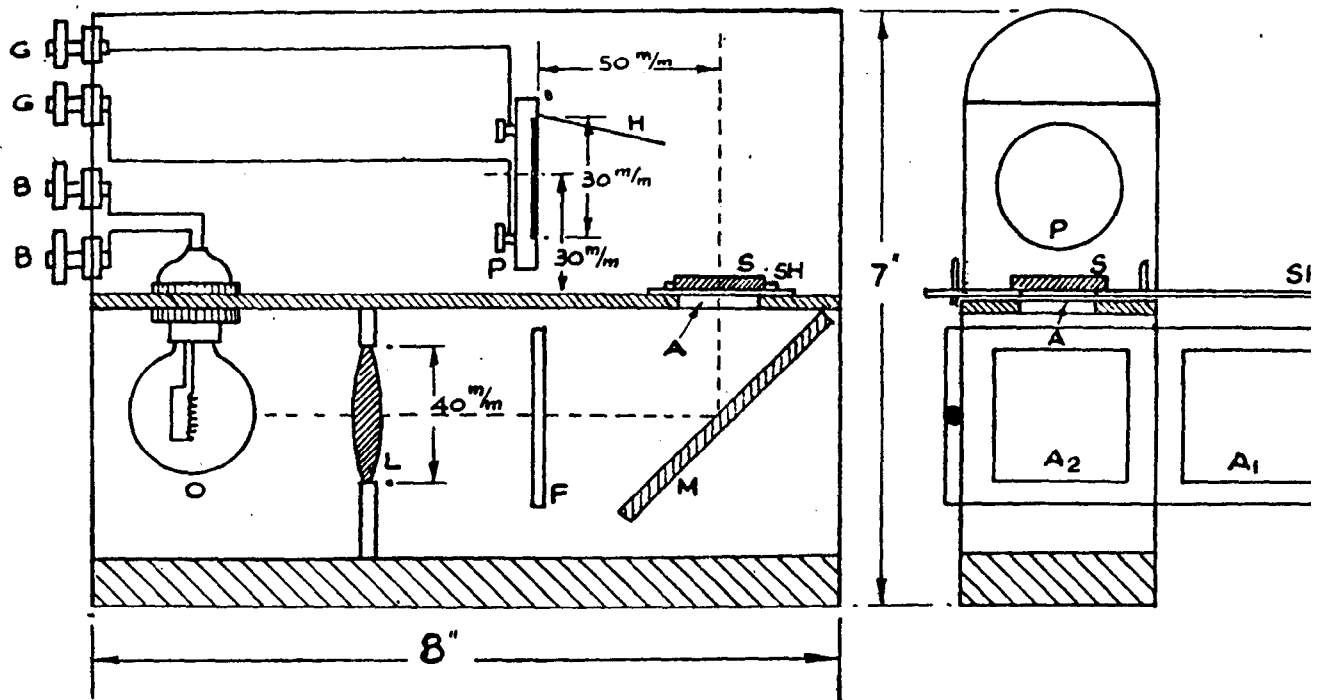
Two panels of material to Specification D.T.D. 5544 (latest issue) about 6 inches square shall be cut. The protective paper shall be removed and the specimens cleaned as described in Appendix VI paragraph 1. One panel shall be smeared with a film of oil (Specification D.Eng.R.D. 2472, Grade B/O) and the other wetted with water. The surfaces shall then be rubbed with separate cloths containing the polish for about two minutes, and finally rubbed with a clean cloth for a similar period. The panels shall then be examined visually for the presence of oil and water.

Approved for issue,

N. J. L. MEGSON,

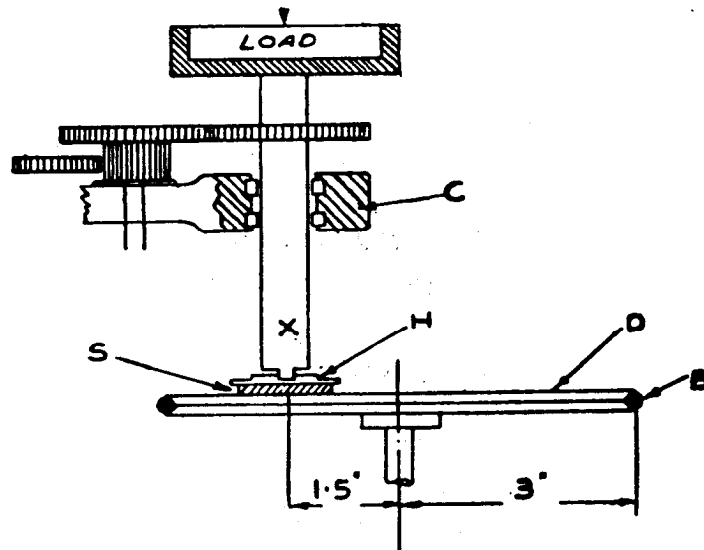
Director of Materials and Structures Research and Development.

* A standard abraded specimen may be obtained on application to the Director of Aeronautical Inspection (INM.1).
(90591)



- O LIGHT SOURCE (12V 24W. CAR HEADLAMP TYPE).
 L BI- CONVEX LENS. (FOCAL LENGTH 50^{m/m}).
 F NEUTRAL DENSITY FILTER SLIDE.
 A₁ CLEAR APERTURE.
 A₂ NEUTRAL DENSITY FILTER.
 M MIRROR.
 S "PERSPEX" SPECIMEN.
 SH SPECIMEN HOLDER.
 P BARRIER LAYER PHOTO-CELL.
 H HOOD TO PREVENT REFLECTED LIGHT REACHING P.
 TOP INSIDE SURFACE.
 G GALVANOMETER TERMINALS.
 B BATTERY SUPPLY TERMINALS.
 A 20^{m/m} CIRCULAR APERTURE.

Fig. 1. INSTRUMENT FOR MEASURING LIGHT SCATTER.



- D.....POLISHING DISC
 H.....SPECIMEN HOLDER
 C.....ROLLER-BEARING CAGE
 X.....STEEL ROD
 S.....SPECIMEN
 B.....CLOTH RETAINING BAND

Fig. 2. POLISHING MACHINE.

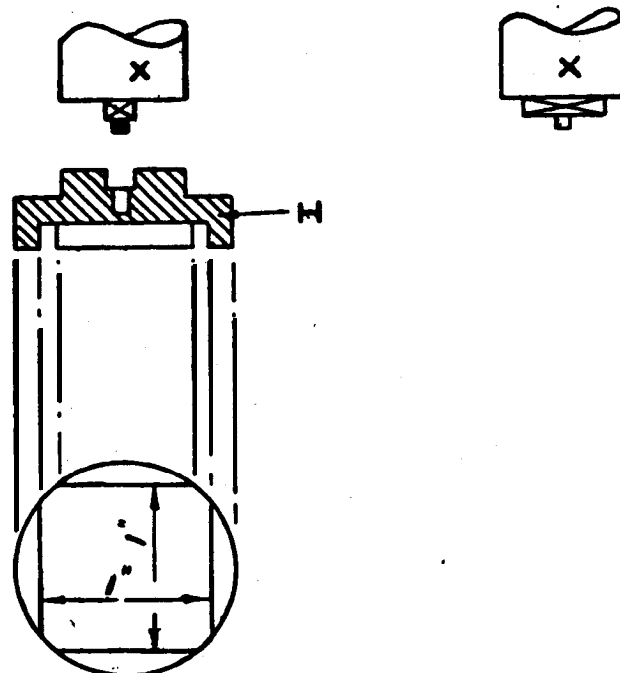


Fig. 3. ENLARGED DIAGRAM OF SPECIMEN HOLDER.

Crown copyright reserved

Published by
HER MAJESTY'S STATIONERY OFFICE

To be purchased from
York House, Kingsway, London. W.C.2
423 Oxford Street, London, W.1
13A Castle Street, Edinburgh 2
109 St. Mary Street, Cardiff
39 King Street, Manchester 2
50 Fairfax Street, Bristol 1
35 Smallbrook, Ringway, Birmingham 5
80 Chichester Street, Belfast 1
or through any bookseller
Price 1s. 3d. net

Printed in England for Her Majesty's Stationery Office
By Willsons (Printers) Ltd., Leicester.