BRITISH STANDARD

BS 3900-G6: 1989

Methods of

Test for paints —

Part G6: Assessment of resistance to fungal growth

This Part is to be read in conjunction with BS 3900-0, issued separately

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Foreword

This Part of BS 3900 has been prepared under the direction of the Pigments, Paints and Varnishes Standards Committee. It is one of a series of standards in Group G of BS 3900 which is concerned with environmental testing of paint films.

This Part describes a method for assessing the resistance to fungal growth and has been developed as a result of an extensive series of international co-operative experiments conducted under the auspices of the International Biodeterioration Research Group. The results of the cooperative study, which were published in 1984 [A F Bravery, S Barry, M Pantke and W Worley, J. Oil Colour Chemists' Association, 1984, 67(1), 2)], showed that close agreement between and within the different laboratories could be achieved by experienced microbiologists.

It is assumed in the drafting of this standard that it will be used and applied by those who are appropriately qualified and experienced. The procedures described in this standard are intended to be carried out by suitably trained and/or supervised personnel. The substances and procedures described may be injurious to health if inadequate precautions are taken. This standard refers only to its technical suitability and does not absolve the user from statutory obligations relating to health and safety.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

This British Standard, having been prepared under the direction of the Pigments, Paints and Varnishes Standards Committee, was published under the authority of the Board of BSI and comes into effect on 31 July 1989

The committees responsible for this British Standard are shown in BS 3900-0

The following BSI references relate to the work on this standard:
Committee reference PVC/10
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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

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1 Scope

This Part of BS 3900 describes a method for assessing the fungal (mould) resistance of paints, varnishes and lacquers with or without fungicidal additives, applied either as part of a multi-coat system or separately.

In addition to the information given in the method certain supplementary information detailed in clause **3** is necessary before this method can be used.

WARNING When carrying out this method it is essential to avoid inhalation of spores by the operator and contamination by the spores of the laboratory. Guidance on precautions is given in Appendix A and attention is drawn to BS 2011-2.2J for more detailed advice.

NOTE 1 The method has been prepared to assess the resistance to fungal growth of paints applied in the laboratory to specified panels. The principle may also be applied to production applied coatings on sheet materials having established a criterion for assessment but a claim to comply with this Part of BS 3900 cannot be made.

NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of this Part of BS 3900, the definitions given in BS 2015 apply.

3 Supplementary information

For any particular application or product, the following supplementary information shall be provided for this method of test. This information shall be derived, partly or totally, from the product specification, British Standard or other documents relating to the product under test or, where appropriate, shall be the subject of agreement between the interested parties.

a) The material, thickness and surface preparation of the test substrate (see **5.1** and **6.1**).

b) The method of application of the test coating to the test substrate (see **6.3**).

c) The duration and conditions of drying the coating (or conditions of storing and ageing, if applicable) or conditioning before testing (see **6.4**).

d) The inoculum mixture to be used including the name and strain number of any additional fungal species against which the coating is to be tested (see **7.7**).

e) Whether a soiling medium is to be used and, if so, whether it is natural or artificial (see **7.2** and **7.4**).

f) The duration of the test (see **7.6**).

g) The wetting agent (see **F.1**).

4 Principle

Flat panels of wood, plaster, steel or other relevant and suitable substrates are painted, and then conditioned in a suitable environment before being inoculated with test organisms. The inoculated panels are incubated in a test cabinet under specified conditions and inspected at specified intervals for fungal growth. The extent of such growth is assessed using a numerical scale, together with a written description of the nature of the growth and, where possible, photographs.

5 Materials and apparatus

5.1 *Flat test panels*, selected and prepared as described in **6.1**.

NOTE The choice of test panel material depends on the intended field of use of the paints under test (see clause **3**).

5.2 *Apparatus for application of mixed inoculum* (see **7.3**).

5.3 *Apparatus for application of soiling medium* (see **7.4**).

5.4 *Test tank (incubator)* (see Appendix B and Figure 1).

5.5 *Cultures of appropriate test fungi species*, grown on suitable media (see Appendix C).

5.6 *Microscope*, enabling inspection of the painted surface to be carried out at a magnification of × 25 to × 30 and a spore count to be carried out at a magnification of approximately × 200.

NOTE A camera attachment suitable for taking photographs at × 25 to × 30 is desirable but not essential.

5.7 *Haemocytometer complying with BS 748*, or similar device for determining the concentration of spores in a suspension.

5.8 *Ancillary apparatus*, and facilities for mycological testing.

5.9 *Control paint*, (see Appendix D).

5.10 *Distilled water*, of at least grade 3 of BS 3978.

5.11 *Petroleum spirit*, 60 °C to 80 °C boiling range.

6 Preparation of test panels

6.1 Test panel substrates

6.1.1 *General.* Test panels shall be approximately 100 mm × 75 mm with a hole 2 mm to 3 mm in diameter drilled 9 ± 1 mm from the mid-point of one of the 75 mm sides. The edges of porous substrates shall be presealed with an inert sealant.

After preparation depending on the substrate (see below) the panels shall be conditioned at 23 ± 2 °C and 50 ± 5 % r.h. for at least 7 days before coating.

6.1.2 *Wood panels.* Test panels shall be 10 ± 1 mm thick, (see clause **3**) and cut from straight-grained stock with the grain in the 100 mm direction. When examined using normal or corrected vision without magnification, they shall be free from knots, stains, excess resin or other defects. Ensure that the panels do not contain residual chemicals from anti-sap-stain treatments often applied before shipping.

The sapwood of Scots pine (*Pinus sylvestris*) shall be used as the standard reference timber, if other species are used for the test panels this shall be clearly stated in any report.

Lightly sand the faces and edges of the panels with a fine-grade sand paper.

6.1.3 *Plaster panels.* From a mixture of 3 parts (by mass) of calcium sulphate hemi-hydrate ($CaSO_4.½H_2O$) and 2 parts (by mass) of distilled water (**5.10**), cast plaster test panels 10 ± 1 mm thick (see clause **3**). Form the panels in suitable moulds, with a level and smooth finish and then leave to set at room temperature for 17 ± 1 h, usually overnight.

Carefully remove the panels from the moulds.

6.1.4 *Metal panels.* Cut metal panels, from mild steel sheet or from other metal or alloy sheet if specified (see clause **3**), of approximately 1 mm thickness. Lightly roughen the surfaces with fine-grade sand or carborundum paper. Clean and degrease the panels with petroleum spirit (**5.11**).

NOTE BS 3900-A3 specifies metal standard test panels that may also be suitable for use in connection with this Part of BS 3900.

6.1.5 *Other materials.* e.g. mineral building boards, wood composite board. Cut panels from material at least 5 mm thick (see clause **3**).

If the boards contain cement type materials reduce the pH to approximately 7 by exposure to carbon dioxide atmosphere in sealed polyethylene bags. Test for the pH value of the surface using a moistened wide range indicator paper.

6.2 Paint samples

Take representative samples of each paint as described in BS 3900-A1. Examine and prepare each sample as described in BS 3900-A2.

6.3 Application of the paint

6.3.1 *General.* During the painting and drying operations and conditioning (see **6.4**), keep the test laboratory as free from dust and spores as practicable. Maintain the test atmosphere at 23 ± 2 °C and at 50 ± 5 % r.h. Prepare at least two coated test panels for each paint under test and the control paint (see Appendix D).

6.3.2 *Test paints.* Apply by brushing, dipping or spraying a uniform coat of the thoroughly mixed paint (see **6.2**) to all surfaces of the prepared test panel (see **6.1**). In accordance with the manufacturer's or other specified instructions (see clause **3**) allow the coated panels to dry and, if required, re-coat.

NOTE It is recommended that the first coat of a water-borne test paint should be thinned with water and that only subsequent coats of the paint are applied as received.

6.3.3 *Control paint.* Apply a coat of the control paint (see Appendix D) by brush to a substrate of the same material as that to which the test paint has been applied in the same test procedure. Allow the coated test panel to dry for 24 h and then apply a second coat by brush.

6.4 Conditioning of coated test panels

NOTE For paints for special purposes, special pre-treatments other than or as well as the conditioning described in **6.4.1** and **6.4.2** may be required and details should be recorded in the test report. Examples of two alternative procedures are given in Appendix E.

6.4.1 *Paint for interior use.* Allow panels coated with solvent-borne paint to condition for 21 days and the panels coated with water-borne paint to condition for 2 days under the specified conditions (see **6.3.1**).

6.4.2 *Paints for exterior use.* Allow panels coated with a paint for exterior use to condition for 7 days under the specified conditions (see **6.3.1**). Then expose the panels for 250 h in an artificial weathering machine of the type described in BS 3900-F3 unless otherwise specified (see clause **3**). At the end of the exposure period remove the panels and allow them to condition for at least 24 h under the specified conditions (see **6.3.1**).

6.4.3 *Control paint.* Allow panels prepared as described in **6.3.3** to dry for at least 24 h and then condition for 21 days under the specified laboratory conditions (see **6.3.1**).

7 Microbiological tests

7.1 Preparation of the mixed inoculum

7.1.1 The mixed inoculum shall consist of a mixture of all the species given in Table 1. A well-sporulating culture of each of the species grown on a sloped medium in a sterile glass tube shall be used.

7.1.2 Prepare the mixed inoculum using the method described in Appendix F.

7.2 Preparation of soiling medium

Prepare the material and artificial soil using the appropriate method described in Appendix G.

Table 1 — Composition of mixed inoculum

Species	Strain number
Aspergillus versicolor	IMI 45554
Aureobasidium pullulans	IMI 45533
Cladosporium cladosporioides	IMI 178517
Penicillium purpurogenum	IMI 178519
Phoma violacea	IMI 49948ii
Rhodotorula rubra	NCYC 1659
	NCYC 1660
Sporobolomyces roseus	NCYC 717
Stachybotrys chartarum	IMI 82021
Ulocladium atrum	IMI 79906

NOTE 1 The IMI Number is a strain prefix used by the Commonwealth Mycological Institute, Kew and is often used as a reference.
NOTE 2 The NCYC Number is the catalogue number of the National Collection of Yeast Cultures, Norwich.
NOTE 3 The species listed in Table 1 and Table 3 are not intended to be comprehensive. Known or suspected pathogens (e.g. *Aspergillus fumigatus, A. flavus*) have been omitted.

7.3 Inoculation of coated test panels

After preconditioning the coated panels (see **6.4**) place the panels horizontally and spray each on one side with 1 mL of the mixed inoculum to give as uniform a coverage as possible.

If the panels are to be tested without further treatment allow to dry for 3 ± 1 h before use.

If the panels are to be further treated with a soiling medium proceed direct to **7.4**.

7.4 Application of soiling medium to inoculated panels

NOTE Soiling is appropriate to paints for exterior use and to those for certain interior uses where a high soiling hazard may be found such as kitchens, breweries and bakeries.

Weigh approximately 0.03 g of the appropriate soiling medium (see **7.2**).

Whilst the inoculum is still wet, apply this quantity as uniformly as possible to the inoculated surface using a coarse spray.

7.5 Incubation

7.5.1 Place the treated test and control panels randomly in an operating test tank (see **B.2**). If the test tank does not contain compartments there shall be at least 25 mm between the nearest faces of adjacent panels and inoculated surfaces shall not face each other.

Continue the incubation ensuring that the conditions specified in **B.2** are maintained and avoiding washing of the inoculum from the panels.

7.6 Assessment

7.6.1 *Control panels.* After 14 days incubation examine the control panels using the microscope (**5.6**) and assess the fungal (mould) growth using the scale given in Table 2. Optimum fungal growth conditions in the cabinet are indicated if the rating at this stage is 2 to 3.

Return the control panels to the tank and continue the incubation for a further 14 days at which time the rating assessment of the control panels indicating optimum conditions, will be 4 to 5.

if these ratings have not been achieved the test shall be abandoned and repeated with reinoculated panels.

If the ratings are satisfactory replace the control panels and proceed to **7.6.2**.

Table 2 — Rating scale for assessment of fungal growth

Rating	Appearance
0	No growth
1	Trace of growth of up to 1 % coverage of the test inoculated area
2	Growth more than 1 % and up to 10 % coverage of test inoculated area
3	Growth more than 10 % and up to 30 % coverage of test inoculated area
4	Growth more than 30 % and up to 70 % coverage of test inoculated area
5	Growth more than 70 % coverage of test inoculated area

NOTE A full description of the nature of the growth is important in interpreting the results, e.g. mycelial characteristics, sporulation, etc. The presence of dominant or contaminant species should be reported. Use of the microscope is important in distinguishing incidental dirt contamination and dried shrivelled inoculum.

7.6.2 *Test panels.* Examine the test panels using the microscope (**5.6**). Assess the fungal growth using the scale given in Table 2 and report the rating for each at 28 days (4 weeks) incubation.

Replace the test panels and continue the incubation repeating the assessment after 2 and 8 week periods further incubation, and report the ratings at 6 and 12 weeks.

NOTE 1 If all the panels in a particular test show a rating of 5 at any of the interim assessments the test should be discontinued at that stage.
NOTE 2 It is recommended that photographs of the test panels at each assessment should be taken for record purposes.

7.7 Preparation of optional additional spore suspensions

7.7.1 In addition to the evaluation using the mixed inoculum specified in **7.1** other evaluations may be carried out using the species given in Table 3 either individually, in combination with other species in the table or mixed inoculum (**7.1**) if not already included in it.

7.7.2 The inoculum for these tests shall be prepared using the method described in Appendix F.

7.7.3 The inoculation, incubation and assessment shall be carried out using the method described in **7.3**, **7.4** (if required), **7.5** and **7.6**.

8 Test report

The test report shall include the following information:

a) the type and identification of the product tested;

b) a reference to this British Standard, i.e. BS 3900-G6;

c) the items of supplementary information referred to in clause **3**;

d) any deviation, by agreement or otherwise, from the procedure described;

e) the assessments reported as required in **7.6** [together with any further details referred to in c) and d) above];

f) whether any photographs were taken;

g) the date of the assessments.

Table 3 — Fungal species that may be used in additional tests

Interior situations	Exterior situations
Aspergillus versicolor[a]	*Alternaria alternata*
Cladosporium cladosporioides[a]	*Aspergillus versicolor*[a]
Cladosporium herbarum	*Aureobasidium pullulans*[a]
Cladosporium sphaerospermum	*Cladosporium cladosporioides*[a]
Paecilomyces variotii	*Cladosporium herbarum*
Penicillium purpurogenum[a]	*Cladosporium sphaerospermum*
Phoma violacea[a]	*Penicillium purpurogenum*[a]
Rhodotorula rubra[a]	*Phoma violacea*[a]
Sporobolomyces roseus[a]	*Sclerophoma pithyophila*
Stachybotrys chartarum[a]	
Stemphylium dendriticum	

[a] These species are also included in the mixed inoculum (see Table 1).

Appendix A Biological safety precautions

A.1 Introduction

None of the operations involved in the conduct of the method present particular hazards for trained personnel nor are the fungi listed in Table 1 and Table 3 recognized as presenting any serious risk of infection to operators or other personnel. However, the concentration of spores in the working environments should be kept to a minimum because some spores can cause allergic responses and because individuals vary in their sensitivity to particulate matter in the air.

A.2 Safety precautions

The following guidelines are recommended.

a) If departing from the list of suitable test organisms, ensure that alternatives are not recognized pathogens.

b) Avoid inhalation and direct skin contact of spores at all stages of the work. Carry out the inoculations in a safety cabinet or similar enclosed cabinet complying with BS 5726. Assess test panels inside a plastic fronted cabinet or bag.

c) Dispose of unwanted cultures and test panels as soon as possible. Autoclaving or immersing in a sterilizing solution is appropriate before wrapping for disposal.

Appendix B Test tank (incubator)

B.1 Construction

The test tank consists essentially of a tank of transparent walls,
approximately 395 mm × 245 mm × 280 mm deep, fitted with a means of thermostatically controlling the temperature of a layer of water in the base of the tank.

A thermometer is fitted to record the air temperature inside the tank. A transparent lid rests on the top of the tank, seated on a flexible plastics gasket to provide a vapour limiting seal between tank and lid.

NOTE 1 The lid may carry a number of clear plastics dividing partitions forming a number of individual compartments into which test panels are suspended from supports. These compartments, though not essential, partially isolate the individual specimens and so reduce the risk of volatile fungicides affecting neighbouring panels. They also help to reduce the risk of cross-contamination when using different inocula. They should allow a 25 mm gap between the face of the test panels and partition.

NOTE 2 An example of a suitable tank is shown in Figure 1.

NOTE 3 The heating should be capable of operation on a time cycle.

B.2 Operation

Use the tank in a laboratory in which the ambient temperature is maintained at 23 ± 2 °C [see **A.2** b)].

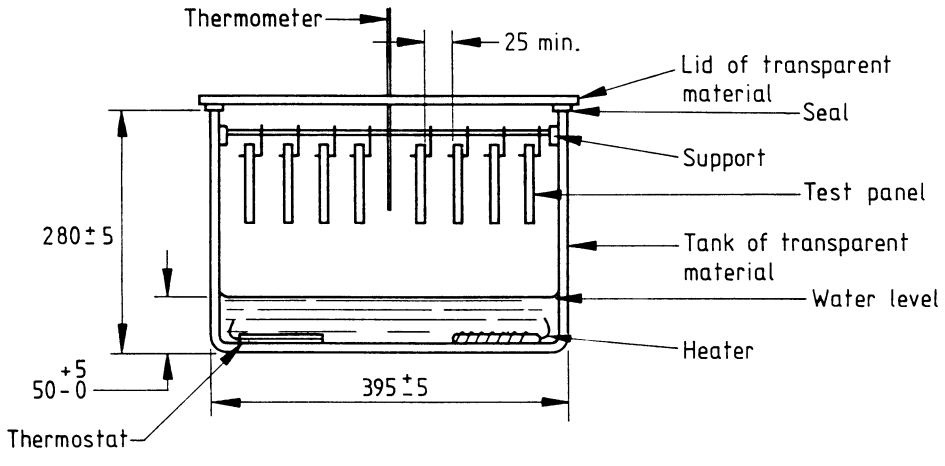

Figure 1 — Test tank (incubator)

Fill the tank to a depth of approximately 50 mm with distilled water (**5.10**), suspend the coated test panels in position and place the lid securely on top to close the tank. Set the temperature regulator to maintain a temperature differential above ambient of 4 ± 1 °C with the heater switched on. This condition should be reached in 55 min to 65 min. The condition in the tank should be such that condensation will occur on the paint surfaces of the test panels.

To maintain optimum conditions for fungal (mould) development at the panel surface, use a timing device to ensure the heaters switch on for 2 h and switch off for 10 h.

NOTE The object is to obtain rapid and extensive fungal (mould) development on the control panel and some adjustment of the operating conditions may be necessary to achieve this related to particular local conditions.

Appendix C Cultures of fungi

C.1 Preparation of cultures

Cultures of the test fungi are normally grown on slopes of Czapek Dox Agar (modified) for 14 days at 25 °C. However, fungi selected for the tests may be grown on any appropriate media under the appropriate conditions providing that well-sporulating cultures are obtained.

C.2 Maintenance of cultures

Stock cultures may be maintained on appropriate media (e.g. potato carrot agar) for up to 6 months, provided that they are kept at approximately 4 °C. Other methods of storage are by freeze drying or submerging under mineral oil. Ensure that cultures do not become contaminated by other species and/or mites, and check their morphology and growth characteristics carefully to ensure that no mutation or adaptation has occurred.

Appendix D Control paint

D.1 Introduction

A control paint is included with the paints under test. It is extremely susceptible to mould growth and if little or no growth occurs on this control paint during the test, it is an indication that the test conditions are unsatisfactory.

D.2 Composition

The composition of the control paint is as given in Table 4.

Table 4 — Control paint

Constituent	Mass
	%
Blanc fixe, complying with BS 1795	33
Linseed stand oil (140 poise), complying with BS 4725	6.6
Raw linseed oil, complying with BS 6900	18.6
Talc, complying with BS 1795	9
Titanium dioxide, R2, complying with BS 1851	21
White spirit, complying with BS 245	11.8

D.3 Preparation

Mix the constituents and grind in a ball mill until the fineness of grind corresponds to a reading of 35 ± 5 μm when determined as described in BS 3900-C6.

Add 0.21 % (*m*/*m*) of a cobalt drier containing 6 % (*m*/*m*) of cobalt, and grind in the ball mill for a further 35 ± 5 min.

Appendix E Preconditioning of coated test panels

E.1 Introduction

The following is an example of the preconditioning (see **6.4**) that might be applied to test panels coated with a paint for use in interior situations subject to heavy condensation.

Allow the coated test panels prepared as described in **6.3** to dry at 23 ± 2 °C and 50 ± 5 % r.h. for 7 days.

Expose the panels under the conditions described in **E.2** and **E.3** as specified [see clause **3** c)], and then allow to condition (see **6.3.1**) for 24 h.

E.2 Intermittent condensation conditions

Intermittent condensation conditions can be achieved by the following methods:

a) expose the coated test panels in the apparatus described in BS 3900-F9, or other apparatus giving similar conditions, e.g. as described in BS 3900-F2, for 10 days, and then remove the panels and condition under the specified conditions (**6.3.1**) for 24 h; or

b) expose the coated test panels in a cabinet similar in design to that described in Appendix A, modifying the procedure to produce copious intermittent condensation, (achieved by raising the internal cabinet temperature to approximately 40 °C for short periods) and continue the procedure for a period of 14 days, before removing the panels and then conditioning under the specified conditions (**6.3.1**) for 24 h.

E.3 Continuous condensation conditions

Immerse the coated test panels in a supply of running water at a temperature of approximately 15 °C, allowing the water to run directly to waste. Adjust the flow rate to approximately 20 L/h.

Continue the leaching process for 24 h or such other period as specified [see clause **3** c)] and then condition the panels (see **6.3.1**) for 24 h.

Appendix F Preparation of mixed inoculum of the test fungi

F.1 Prepare a spore suspension of each of the species separately by adding 10 mL of sterile distilled water (**5.10**) containing 0.01 % (*V*/*V*) of a wetting agent[1)] to each slope culture prepared as described in Appendix C.

NOTE Some wetting agents may affect the viability of spores.

F.2 Dislodge spores from the slope cultures by using a sterile wire loop while rotating the tube. Remove any large undispersed lumps of the spores by filtration through a sterile muslin filter.

F.3 Using a haemocytometer or similar device (**5.7**) for measurement, ensure that each filtrate contains not less than 10^4 spores per mL. If this level is not present repeat the preparation for that species using a fresh culture.

F.4 Mix equal volumes of each checked filtrate.

Appendix G Preparation of soiling medium

G.1 Introduction

Either natural or artificial soils may be used to aid establishment of the mould growth. This simulates the high biological risk of natural exterior conditions, or certain interior conditions (see **7.4**) by providing nutrients and support for spores.

G.2 Natural soil

Using any moderately light, loamy garden soil, dry the soil in an oven at 100 ± 2 °C. Grind the dried soil and pass it through a sieve with a nominal mesh aperture of 200 µm to 210 µm. Sterilize the material passing through the sieve by placing it in an autoclave for 1 h at 120 ± 2 °C on three consecutive days. Store this soil in a sterile container.

G.3 Artificial soil

G.3.1 *Materials*

G.3.1.1 *Mineral salts*

calcium tetrahydrogen phosphate, $CaH_4(PO_4)_2$	0.41 g
tri-calcium phosphate, $Ca_3(PO_3)_2$	0.90 g
calcium carbonate, $CaCO_3$	0.20 g
potassium sulphate, K_2SO_4	0.11 g
ammonium sulphate, $(NH_4)_2SO_4$	0.51 g
ammonium nitrate, NH_4NO_3	1.37 g

G.3.1.2 *Trace element solution.* Dissolve the following quantities of listed salts in distilled water (**5.10**) and dilute to 100 mL with distilled water (**5.10**).

iron (III) chloride, $FeCl_3.5H_2O$	1.46 g
copper (II) sulphate, $CuSO_4.5H_2O$	1.18 g
zinc sulphate, $ZnSO_4.7H_2O$	1.32 g
ammonium molybdate, $(NH_4)_6.Mo_7O_{24}$	0.01 g
manganese (IV) sulphate, $MnSO_4.4H_2O$	0.20 g

G.3.1.3 *Potato starch gel.* Mix 170.0 g potato starch with 20 mL of distilled water (**5.10**) to form a thin cream. Pour this mixture into approximately 120 mL of boiling distilled water (**5.10**), stir and allow to form a gel.

G.3.1.4 *Ballotini.* Thoroughly clean and dry 20 g of ballotini of approximate particle size range 55 µm to 100 µm.

G.3.2 *Procedure*

Suspend the quantities of the mineral salts listed in **G.3.1.1** in 60 mL of distilled water (**5.10**). Add this suspension together with 1 mL of the trace element solution (**G.3.1.2**) to the starch gel (**G.3.1.3**). Beat the mixture thoroughly to ensure a homogeneous mix. Then slowly add distilled water (**5.10**), thoroughly stirring during the addition, until the mix weighs approximately 250 g. Add 20 g of this mineral salts/starch paste to the ballotini (**G.3.1.4**). After thoroughly mixing, spread the mixture very thinly onto sheets of siliconized paper. Dry for 3 h at 100 ± 2 °C.

Scrape the dried film from the paper, grind gently in a mortar and pass the ground mixture through a sieve with a nominal mesh aperture of 200 µm to 210 µm (complying with BS 410). Store the material passing through the sieve in a sterile container.

[1)] Information regarding suitable wetting agents can be obtained from the Enquiry Section, British Standards Institution, Linford Wood, Milton Keynes MK14 6LE.

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Publications referred to

BS 245, *Specification for mineral solvents (white spirit and related hydrocarbon solvents) for paints and other purposes.*
BS 410, *Specification for test sieves.*
BS 748, *Specification for haemocytometer and particle counting chambers.*
BS 1795, *Specification for extenders for paints.*
BS 1851, *Specification for titanium dioxide pigments for paints.*
BS 2011, *Basic environmental testing procedures.*
BS 2011-2.2J, *Test J. Mould growth.*
BS 2015, *Glossary of paint terms.*
BS 3900, *Methods of test for paints.*
BS 3900-0, *General introduction.*
BS 3900-A1, *Sampling.*
BS 3900-A2, *Examination and preparation of the samples for testing.*
BS 3900-A3, *Standard panels for paint testing.*
BS 3900-C6, *Determination of fineness of grind.*
BS 3900-F2, *Determination of resistance to humidity (cyclic condensation).*
BS 3900-F3, *Resistance to artificial weathering (enclosed carbon arc).*
BS 3900-F9, *Determination of resistance to humidity (continuous condensation).*
BS 3978, *Specification for water for laboratory use.*
BS 4725, *Specification for linseed stand oils.*
BS 5726, *Specification for microbiological safety cabinets.*
BS 6900, *Specification for raw, refined and boiled linseed oils for paints and varnishes.*
Bravery, A.F., Barry, S., Pantke, M. and Warley, W. *J. Oil Colour Chemists' Association,* 1984, 67(1), 2

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