BRITISH STANDARD

BS 3698:1964

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Specification for

Calcium plumbate priming paints

Confirmed
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Co-operating organizations

The Pigment, Paints and Varnishes Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

Admiralty*
Air Ministry*
Association of British Chemical Manufacturers*
Board of Trade
British Colour Makers' Association*
British Railways Board
Crown Agents for Oversea Governments and Administrations*
D.S.I.R. — Building Research Station*
D.S.I.R. — Laboratory of the Government Chemist
Incorporated Institute of British Decorators*
Lead Oxide Convention
London County Council*
London Transport Board
Ministry of Aviation*
Ministry of Public Building and Works*
National Federation of Builders' and Plumbers' Merchants*
Oil and Colour Chemists' Association*
Paint Manufacturers' and Allied Trades Association
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White Lead Convention
Zinc Development Association*
Zinc Pigment Development Association

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the Committee entrusted with the preparation of this British Standard:

Federation of Painting Contractors
Gas Council
Incorporated Association of Architects and Surveyors
Institution of Municipal Engineers
National Federation of Building Trades Employers
National Federation of Master Painters and Decorators

This British Standard, having been approved by the Pigment, Paints and Varnishes Industry Standards Committee and endorsed by the Chairman of the Chemical Divisional Council, was published under the authority of the General Council on 15 January 1964

The following BSI references relate to the work on this standard:
Committee references PVC/2, PVC/2/10
Draft for comment D62/330

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Amendments issued since publication

Amd. No.	Date	Comments

Contents

Foreword

This standard makes reference to the following British Standards:

BS 242, BS 243, BS 259, *Linseed oil for paints.*

BS 245, *White spirit.*

BS 410, *Test sieves.*

BS 575, *Carbon tetrachloride.*

BS 580, *Trichloroethylene (Types A and C).*

BS 593, *Laboratory thermometers.*

BS 604, *Graduated measuring cylinders.*

BS 871, *Abrasive papers and cloths for general purposes.*

BS 1449, *Steel plate, sheet and strip.*

BS 1733, *Flow cups and methods of use.*

BS 1795, *Extenders for paints.*

BS 2660, *Colours for building and decorative paints.*

BS 2920, *Cold-reduced tinplate and cold-reduced black-plate.*

BS 3699, *Calcium plumbate for paints.*

The preparation of this British Standard was authorized by the Pigments, Paints and Varnishes Industry Standards Committee in order to provide specifications suitable for the requirements of Government Departments, the Defence Services and other users.

It was appreciated that calcium plumbate primers using media other than of the type specified in this specification are manufactured, but it was considered that materials with compositions such as those given in the specification had the most general use.

Two types of primer are specified, Type A and Type B. Type A is regarded as being suitable for general use as a primer for iron, steel and galvanized iron and Type B, which has a lower calcium plumbate content than the Type A material, as being suitable for galvanized iron only.

NOTE Where metric equivalents are stated the figures in British units are to be regarded as the standard. The metric conversions are approximate. More accurate conversions should be based on the tables in BS 350, "*Conversion factors and tables*".

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.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 5 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.

1 Scope

This British Standard applies to calcium plumbate based priming paints for use on iron, steel, galvanized iron and other structural materials.

2 Composition

The composition of the material shall conform to Type A or Type B as given in Table I.

3 Sample

For examination for compliance with this specification, representative samples of the material measuring not less than 560 ml shall be drawn either at the filling stage or from one or more original and previously unopened containers. The samples shall be placed in suitable, clean, dry, air-tight containers. The containers shall be so filled as to leave an ullage of 5 per cent when closed. Each sample container so filled shall be marked with full details and date of sampling.

The samples shall be stored in such a manner that the temperature does not vary unduly from the normal. Before examination, thoroughly mix the material and free it from coarse skins by passing through a suitable sieve.

4 Agreed sample

Except where otherwise agreed between purchaser and vendor, the agreed sample referred to in Clause **6** shall comply in all respects with the requirements of the other relevant clauses of this specification. The sample shall measure not less than 560 ml and shall be packed in the manner specified in Clause **3**.

5 Consistency

a) The material shall be in such a condition that stirring readily produces a smooth, uniform mixture suitable for application by brUsh.

b) The material when tested by the method described in Appendix A, shall have a flow time to collect 50 ml of not less than 20 seconds.

6 Finish

When a film of the material, prepared by the method described in Appendix B, has dried for 24 hours, it shall be smooth, opaque, with a low gloss finish, free from sagging and wrinkling, and in no way inferior to a film prepared in a similar way and at the same time from the agreed sample.

Table I — Composition of paints

Constituents	Type A	Type B
	Per cent by weight	Per cent by weight
Calcium plumbate complying with BS 3699[a]	48 min.	33 min.
Extenders complying with BS 1795[b], excluding china clay or any calcium carbonate compound (see Note 1)	15–18	30–35
White spirit complying with BS 245[c]	15 max.	15 max.
Stabilizing and suspending agents	1 max.	1 max.
Linseed oil, complying with BS 242, BS 243, BS 259[d] or linseed stand oil, viscosity not exceeding 30 poises at 25 °C (see Note 2)	18–37	16–37
Driers	See Note 3	

NOTE 1 The extenders may consist of the commonly used extenders or mixtures thereof, but shall not include china clay or any calcium carbonate. Tinting pigments may be added where necessary, the amount of extender being correspondingly reduced.
NOTE 2 It is recommended that at least 6 per cent by weight of the material should be oil complying with BS 242, BS 243, or BS 259[d].
NOTE 3 Driers may be added in order that the paint may comply with the drying requirements of the specification. Such driers shall not contain volatile material other than white spirit complying with BS 245[c], which if present shall be included in the maximum percentage of white spirit specified above. Rosinate driers shall not be used.
[a] BS 3699, "*Calcium plumbate for paints*".
[b] BS 1795, "*Extenders for paints*".
[c] BS 245, "*White spirit*".
[d] BS 242, BS 243, BS 259, "*Linseed oil for paints*".

7 Colour

When a film of the material prepared by the method described in Appendix B is examined 24 hours after application, its colour shall approximate to the cream colour No. 3–040, or the grey colour No. 9–100, of BS 2660[1)].

8 Drying time

The material when tested by the method described in Appendix C shall become surface-dry in not less than 4 hours or more than 8 hours and hard-dry in not more than 16 hours.

9 Flexibility and adhesion

The material when tested by the method described in Appendix D shall show no cracking or loss of adhesion.

10 Keeping properties

The material when stored at normal room temperature in the original sealed containers shall retain the properties detailed above for a period of not less than 12 months, or for such other periods or at such other temperature, or both, as may be agreed between purchaser and vendor.

11 Marking

Containers in which the material is packed shall be marked with the manufacturer's name or trade mark, the number of this British Standard and the type, i.e. BS 3698, Type —.

[1)] BS 2660, "*Colours for building and decorative paints*".

Appendix A Method for the determination of consistency

A.1 Apparatus

a) *Thermometer*, schedule mark A40C/100 complying with BS 593[2)].

b) *Flow cup*, Type B4, complying with BS 1733[3)].

c) *Graduated cylinder*, 50 ml, complying with BS 604[4)].

d) *Timing device*, stop-watch or stop-clock.

e) *Stand*, provided with means of levelling.

f) *Level gauge*.

g) *Straight-edged scraper*, for the top of the cup.

A.2 Procedure

Place the flow cup on the stand in a place free from draughts and level it by the use of the level gauge placed on the rim. Thoroughly mix and strain the material into a clean container and adjust the temperature to meet the requirements specified below. This, and the following operations, should be carried out with the minimum delay to avoid loss of solvent. With the orifice closed by the finger, fill the cup with the sample until it just begins to flow over into the gallery, taking care to reduce the formation of air bubbles to the minimum. Free the surface from bubbles if any are present. Place the thermometer bulb in the cup, and check that the temperature is 25 ± 0.5 °C.

Place the scraper on the rim of the cup and draw it slowly across to remove the excess of material into the gallery. Place the graduated receiver under the cup, remove the finger from the orifice and simultaneously start the timing mechanism. When exactly 50 ml of the sample has been collected in the graduated receiver, stop the timing device and record the time taken.

Appendix B Method for the preparation and coating of panels

B.1 Materials required

a) *Test panels*.

i) Clean, mild steel plate, 18 s.w.g. (0.048 in, 1.02 mm) in thickness and measuring 6 in × 4 in (15 cm × 10 cm), complying with the requirements of BS 1449[5)] for Grade En 2A, and free from surface imperfections such as rolling marks, scores and scale. Store totally immersed in light neutral mineral oil, free from additives.

ii) Clean tinplate, of substance 108 lb basis box [thickness 0.0118 in (0.300 mm)] complying with BS 2920[6)], and measuring 6 in × 4 in (15 cm × 10 cm).

iii) Clean tinplate, as above but measuring 6 in × 2 in (15 cm × 5 cm).

b) *Solvent*. Either carbon tetrachloride complying with BS 575[7)] or trichloroethylene complying with BS 580[8)].

c) *Emery cloth* No. 0, complying with BS 871[9)].

d) *Linen rags*, scoured and bleached. Alternatively lint-free cotton rags previously extracted with a suitable hydrocarbon solvent may be used.

B.2 Preparation of panels for coating

Roughly degrease the panels (in the case of mild steel panels after previously having wiped them free from excess oil) with the carbon tetrachloride or trichloroethylene. Apply the emery cloth uniformly to the surface, rubbing lightly to avoid embedding abrasive in the surface. A suitable sequence of abrading operations for mild steel panels is as follows:

i) Straight across the panel, in a direction parallel to any one side.

ii) At right angles to the first direction and until all signs of the original abrasion have been obliterated.

2) BS 593, "*Laboratory thermometers*".
3) BS 1733, "*Flow cups and methods of use*".
4) BS 604, "*Graduated measuring cylinders*".
5) BS 1449, "*Steel plate, sheet and strip*".
6) BS 2920, "*Cold-reduced tinplate and cold-reduced blackplate*".
7) BS 575, "*Carbon tetrachloride*".
8) BS 580, "*Trichloroethylene (Types A and C)*".
9) BS 871, "*Abrasive papers and cloths for general purposes*".

iii) With a circular motion, in circles of diameter approximately 2 inches, until a pattern consisting only of circular abrasion marks superimposed one upon another is produced. Remove traces of emery dust by wiping with the linen or cotton rag.

Abrade tinplate panels with a circular motion, as in iii) only so that a smooth uniform surface is obtained.

After abrading, degrease the panels by swabbing two or three times with the rag soaked in the carbon tetrachloride or trichloroethylene. Carry out the last swabbing with a clean piece of the rag soaked with clean solvent. Lightly dry the panels with a clean rag and if necessary warm very slightly to remove traces of condensed moisture, allow them to return to room temperature and then paint without delay. Take care that at no time between degreasing and painting are the prepared surfaces touched by hand or otherwise contaminated.

B.3 Coating of panels

Apply the thoroughly mixed material, by brush, to the panels to give the following dry film weights:

Type A 2.0–2.4 oz/yd^2 (65.8–79.0 g/m^2).

Type B 1.6–2.0 oz/yd^2 (52.6–65.8 g/m^2).

Expose the panels to dry in a vertical position in a well ventilated room at 15–21 °C (60–70 °F). Ensure that the painted surface is illuminated by diffused daylight for at least 6 hours during the drying period.

NOTE In order to avoid interference from excessive humidity, care should be taken throughout the drying process to ensure that the temperature of the room is above the dew point.

Appendix C Method for the determination of drying time

C.1 Material required

Ballotini, which will pass through a sieve of nominal aperture 210 μ (72 mesh)[10] and be retained on a sieve of nominal aperture 150 μ (100 mesh)[10].

C.2 Procedure

Prepare two 6 in × 4 in (15 cm × 10 cm) mild steel or tinplate panels and coat them as described in Appendix B. Allow one panel to dry for 8 hours, place in a horizontal position and sprinkle the ballotini on to the surface of the film from a height of 6 in (15 cm). After the ballotini have been left on the film for approximately 1 minute, brush it lightly with a camel hair brush and examine the film for signs of injury or adherence of ballotini.

NOTE 1 By the term "surface dry" is understood a condition of the film such that the ballotini can be removed without injury to the film.

Allow the second panel to dry for 16 hours and apply a further coat of the material to the dried film. Examine the panel for signs of disturbance of the dried film.

NOTE 2 By the term "hard-dry" is understood a condition such that a second coat of the material can be applied satisfactorily by brush to the dried first coat.

Appendix D Method of test for flexibility and adhesion

D.1 Apparatus

Bend test apparatus, having a mandrel of ¼ in (6.34 mm) diameter (see Figure 1).

D.2 Procedure

Carry out the test at a temperature between 16 °C and 21 °C (60 °F and 70 °F).

Prepare and coat a tinplate panel, 6 in × 2 in (15 cm × 5 cm), as described in Appendix B, laying off in the direction of the length of the panel. Allow the panel to dry for seven days.

On completion of the drying period, insert the panel in the bend test apparatus so that it may subsequently be bent with the paint coating outermost.

Close the hinge in a regular manner without jerking, in not less than one second and not more than one and a half seconds, thus bending the panel over the mandrel through 180°.

Remove the panel carefully from the hinge and examine the film by normal corrected vision for cracking or loss of adhesion.

[10] BS 410, "*Test sieves*".

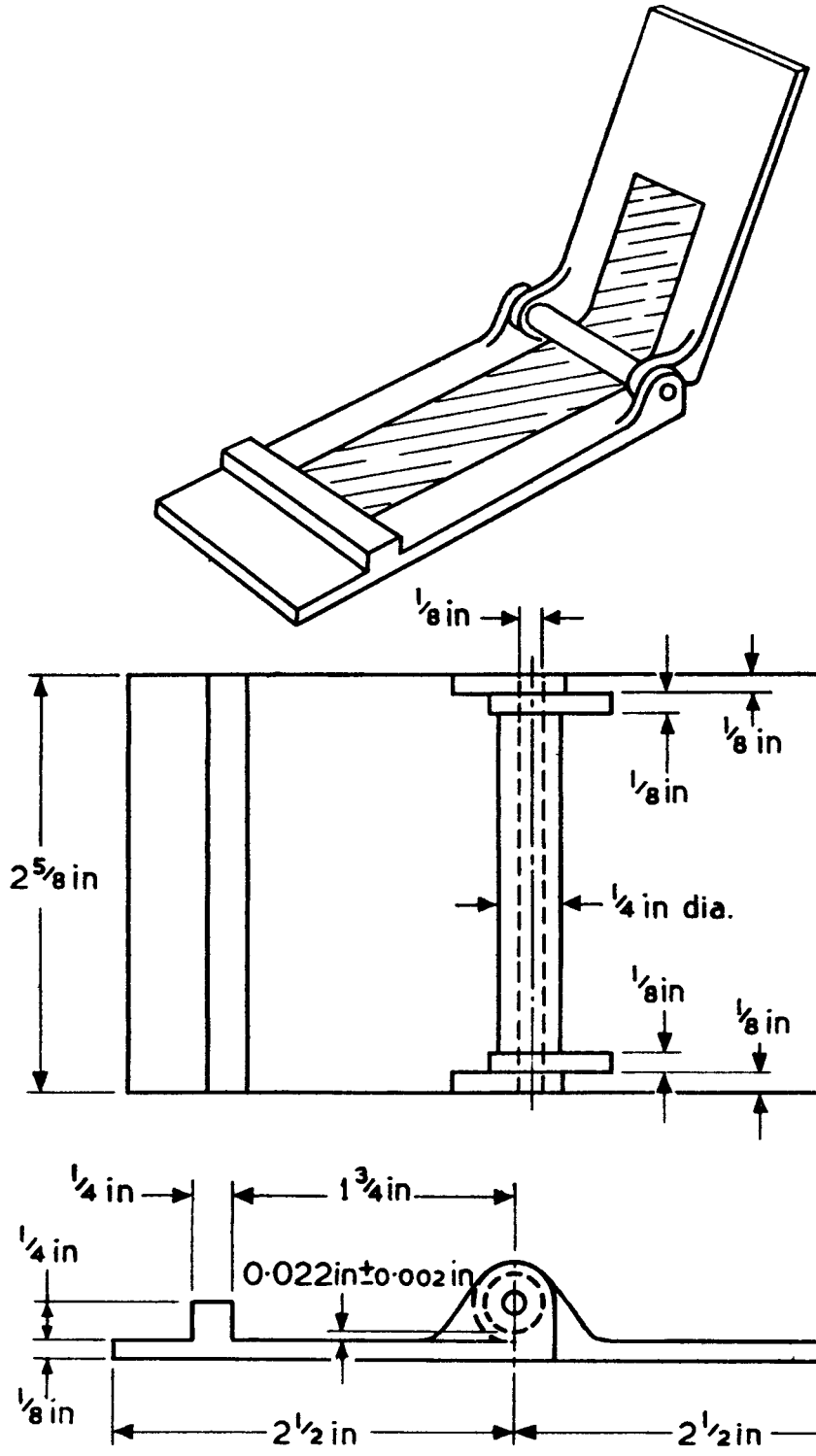

Figure 1 — Bend test apparatus

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