BRITISH STANDARD

BS 2523:1966

Incorporating Amendments Nos. 1 and 2

CONFIRMED
DECEMBER 1983

Specification for

Lead-based priming paints

UDC 667.638.2:667.633.415.1

Co-operating organizations

The Pigments, 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:

Association of British Chemical Manufacturers
Board of Trade
British Colour Makers' Association
British Railways Board
Crown Agents for Overseas Governments & Administrations
Greater London Council*
Incorporated Institute of British Decorators and Interior Designers
Lead Oxide Convention
London Transport Board
Ministry of Aviation
Ministry of Defence, Army Department*
Ministry of Defence, Navy Department
Ministry of Public Building and Works
Ministry of Technology — Building Research Station
Ministry of Technology — Laboratory of the Government Chemist
National Federation of Builders and Plumbers' Merchants
Oil & Colour Chemists' Association*
Paint Manufacturers and Allied Trades Association*
Paintmakers' Association of Great Britain*
Post Office
Research Association of British Paint, Colour and Varnish Manufacturers*
Royal Institute of British Architects
Royal Institute of Public Health and Hygiene
Titanium Pigment Manufacturers' Technical Committee
White Lead Convention
Zinc Development Association
Zinc Pigment Development Association*

The Government department 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.

Amalgamated Society of Painters and Decorators

This British Standard, having been approved by the Pigments, 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 10 February 1966

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First revision February 1966

The following BSI references relate to the work on this standard:
Committee reference PVC/16
Draft for comment D64/7898

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Amendments issued since publication

Amd. No.	Date of issue	Comments
6074	March 1967	
3941	May 1982	Indicated by a sideline in the margin

Contents

Foreword

This standard makes reference to the following British Standards:

BS 217, *Red lead for paints and jointing compounds.*

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

BS 245, *White spirit.*

BS 410, *Test sieves.*

BS 593, *Laboratory thermometers.*

BS 604, *Graduated measuring cylinders.*

BS 1733, *Flow cups and methods of use (for the consistency control of industrial materials such as paints and varnishes).*

BS 1795, *Extenders for paints.*

BS 3900, *Methods of test for paints — Part A3: Preparation of panels prior to painting — Part B1: Determination of water by the Dean and Stark method.*

BS 239, BS 254, BS 296, BS 338, BS 637 and BS 1851, *White pigments for paints.*

The 1954 edition of the British Standard specifications for ready mixed oil-based priming paints included, in one volume, the four specifications: BS 2521, *"Lead-based priming paint for woodwork"*; BS 2522, *"Leadless grey priming paint for interior woodwork"*; BS 2523, *"Lead-based priming paints for iron and steel (Types A, B and C)"*; and BS 2524, *"Red oxide priming paint for iron and steel"*. Only BS 2521 and BS 2523 were retained in the 1966 edition of this standard.

BS 2522 was omitted because any worthwhile revision would have to take into account the numerous materials currently manufactured, each of which is primarily intended to be used as a stage in a complete painting system, all the materials of which are supplied by the same manufacturer. It was therefore decided to withdraw this specification and to replace it by a new British Standard giving only the requirements for a paint with a limited lead content together with appropriate methods for the determination of total lead.

A new edition of BS 2524 was published separately under the title "Red oxide-linseed oil priming paint", because its continued association with BS 2521 and BS 2523 might have led to the material being confused with corrosion inhibitive primers of the red oxide-zinc chromate type now commonly used in industrial finishing. Subsequently, BS 2524 was withdrawn.

BS 2521 was withdrawn by an amendment in 1982 because it had been superseded by BS 5082, *"Water-thinned priming paints for wood"* and BS 5358, *"Specification for low-lead solvent-thinned priming paint for woodwork"*.

The main amendment to BS 2523 was the reduction of the minimum surface-drying time from 8 hours to 4 hours and the limitation of the amount of manganese and cobalt driers that may be added.

The EEC on 5 October 1981 adopted the revised Council Directive (81/916/EEC) relating to the classification, packaging and labelling of paints, varnishes and related products. By the terms of this Directive, its provisions are to be enacted by Member Bodies by 1 July 1983. Users of this specification are therefore advised that packages containing products complying with BS 2523 will be required, by Annex II of the Directive, to bear the inscription:

> "Contains lead. Must not be used on surfaces liable to be chewed or sucked by children."

If the package contains less than 125 ml, the inscription may be as follows:

> "Warning. Contains lead".

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 to iv, pages 1 and 2, 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.

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10 Scope

This British Standard applies to lead-based priming paints for iron and steel for use under ready mixed oil-based paints or hard gloss paint systems.

Three types are described, all of which are expected to give approximately equal protection. Types B and C, however, are more suitable for storage and Type A should be selected only when it is intended to be applied within a few weeks of manufacture.

11 Composition

The material shall consist of the following ingredients in the stated proportions by weight:

Type A	Red lead, Type 1, complying with BS 217[a]		78–82 per cent
	Mineral suspending agent (see Note 1)		4 per cent max.
	White spirit, complying with BS 245[b]		6 per cent max.
	Linseed oil, complying with BS 242, BS 243 or BS 259[c]		Remainder
Type B	Red lead, Type 1, complying with BS 217[a]		60 per cent min.
	Mineral suspending agent (see Note 1)		10–15 per cent
	White spirit (see Note 2) complying with BS 245[b]		6 per cent max.
	Linseed oil, complying with BS 242, BS 243 or BS 259[c]		Remainder
Type C	Red lead, Type 1, complying with BS 217[a]	2 parts	77–82 per cent
	White lead, complying with BS 239[d]	2 parts	
	Asbestine (see Note 1) complying with BS 1795[e]	1 part	
	White spirit, complying with BS 245[a]		8 per cent max.
	Linseed oil, complying with BS 242[b] and/or BS 243[b]	3 parts	Remainder
	Linseed stand oil, viscosity not exceeding 30 poises at 25 °C	2 parts	

NOTE 1 Surface active suspending agents up to 1 per cent of the total weight of paint may be included.

NOTE 2 By agreement between purchaser and supplier the limit for white spirit in Type B may be increased.

[a] BS 217, *"Red lead for paints and jointing compounds"*.

[b] BS 245, *"White spirit"*.

[c] BS 242, BS 243, BS 259, *"Linseed oil for paints"*.

[d] BS 239, *"White lead for paints"* (included in BS 239, BS 254, BS 296, BS 338, BS 637 and BS 1851, "*White pigments for paints*").

[e] BS 1795, *"Extenders for paints*".

Driers may be added in order that the material shall comply with the requirements of Clause **15** but if manganese and/or cobalt driers are used, the total quantity shall not exceed the equivalent of 0.1 per cent of metal, calculated on the oil content of the paint. Any driers present shall not contain volatile material other than white spirit complying with BS 245[1)] which if present shall be included in the maximum percentage of white spirit specified above. Rosinate driers shall not be used.

12 Sample

For the purposes of the tests specified below, representative samples of the material measuring not less than 300 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 approximately 5 per cent when closed. Each sample container so filled shall be sealed and marked with full details and date of sampling.

[1)] BS 245 *"White spirit"*.

13 Agreed sample

The agreed sample referred to in Clause **16** shall comply in all respects with the requirements of Clauses **11** and **14**–**18**. The volume of sample shall be not less than 300 ml and it shall be drawn and packed in the manner described in Clause **12**.

14 Consistency

a) The material shall be in such a condition that stirring readily produces a smooth, uniform mixture of good brushing consistency.

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

15 Drying time

The material, when tested in the manner described in Appendix B, shall not become surface-dry in 4 hours and shall become hard-dry in not more than 24 hours.

16 Finish

When a film of the material prepared in the manner described in Appendix B has dried for 24 hours, it shall have a semi-gloss finish and shall be in no way inferior as regards finish to a film prepared in the same way and at the same time from the agreed sample.

17 Water content

The water content of the material, determined in the manner described in BS 3900, Part B1[2)], shall be not more than 0.5 per cent.

18 Keeping properties (Types B and C only)

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 six months, or for such other period or at such other temperature, or both, as may be agreed between the purchaser and the supplier.

[2)] BS 3900, *"Methods of test for paint"*, Part B1, *"Determination of water by the Dean and Stark method"*.

Appendix A Method for the determination of consistency

A.1 Apparatus

a) *Thermometer*, schedule mark A40C/100 complying with BS 593[3].

b) *Flow cup*, Type B4, complying with BS 1733[4].

c) *Graduated cylinder*, 50 ml, complying with BS 604[5].

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 a level gauge placed on the rim. Thoroughly mix and strain the sample 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, or other suitable method, 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 slowly draw it across until the excess of the sample has flowed into the gallery. Place the graduated cylinder under the cup, remove the finger from the orifice and simultaneously start the timing device. When exactly 50 ml of the sample has been collected in the graduated cylinder, stop the timing device and record the time taken.

Appendix B Method for drying time test

B.1 Apparatus

a) *Ballotini*. The material should be graded so that none passes a sieve of nominal aperture 125μ (120 mesh)[6], all passes a sieve of nominal aperture 355μ (44 mesh)[6], and at least 75 per cent passes a sieve of nominal aperture 250μ (60 mesh)[6] and is retained on a sieve of nominal aperture 180μ (85 mesh)[6].

b) *Camel-hair brush*.

B.2 Procedure

Use two panels of burnished steel or tinplate prepared as described in BS 3900, Part A3[7].

Apply the thoroughly mixed material by brush to the panels at a spreading rate of 80–110 yd^2/gal (14.2 to 20.3 m^2/l). Expose the panels to dry in a well ventilated room at 20 ± 2 °C at a relative humidity of 60–70 per cent and not exposed to direct sunlight.

a) *Surface dry*. Allow one panel to dry for 4 hours, place in a horizontal position and sprinkle 0.5g of the ballotini from a height of 6 in (15.5 cm) on to the surface of the film.

WARNING NOTE. Ballotini spilt on the floor can constitute a hazard.

After leaving the ballotini on the film for approximately one minute brush lightly with the camel-hair brush and then, using normal corrected vision, examine the film for signs, of damage to the film or adherence of the ballotini. The paint film is "surface-dry" if all the ballotini can be brushed away without damage to the film.

b) *Hard dry*. Allow the second panel to dry for 24 hours and apply a further coat of material to the dried film. Examine the panel for signs of disturbance of the dried film. The paint film is "hard-dry" if the second coat of material can be applied satisfactorily by brush to the dried first coat.

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[3] BS 593, *"Laboratory thermometers"*.
[4] BS 1733, *"Flow cups and methods of use (for the consistency control of industrial materials such as paints and varnishes)"*.
[5] BS 604, *"Graduated measuring cylinders"*.
[6] BS 410, *"Test sieves"*.
[7] BS 3900, *"Methods of test for paints"*, Part A3, *"Method for preparation of panels prior to painting"*.

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