

CONFIRMED
DECEMBER 1986

Specification for

Pigments for Portland cement and Portland cement products

UDC 667.662:666.942:691.542

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:

British Colour Makers' Association*
 Department of the Environment
 Department of the Environment, Building Research Establishment*
 Department of Industry
 Department of Industry, Laboratory of the Government Chemist
 Greater London Council
 Institute of Corrosion Technology
 London Transport Executive
 Ministry of Defence*
 National Federation of Builders' and Plumbers' Merchants
 Oil and Colour Chemists' Association*
 Paint Research Association
 Paintmakers' Association of Great Britain Limited*
 Post Office
 Royal Institute of British Architects
 Royal Institute of Public Health and Hygiene
 Society of Chemical Industry
 Titanium Pigment Manufacturers' Technical Committee*
 White Lead Manufacturers' Association*
 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:

British Precast Concrete Federation
 Cement and Concrete Association
 Cement Makers' Federation
 Chemical Industries Association
 Concrete Society
 Jointless Flooring Association
 Panel of Independent Consultants

This British Standard, having been approved by the Pigments, Paints and Varnishes Industry Standards Committee, was published under the authority of the Executive Board on 29 August 1975.

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First published April 1942
 First revision April 1961
 Second revision August 1975

The following BSI references relate to the work on this standard:

Committee reference PVC/1/2
 Draft for comment 72/50556 DC

ISBN 0 580 08883 9

Amendments issued since publication

Amd. No.	Date of issue	Comments

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Foreword

This British Standard provides specifications for a range of pigments suitable for the colouring of Portland cement and Portland cement products. The pigments specified may also be suitable for use with other hydraulic cements but the use of the pigments in these cements has not been covered in this British Standard because experience in the use of these cements with pigments is limited.

The pigments specified are manufactured either synthetically or from naturally occurring mineral ores.

This revision differs from the 1961 edition with regard to the following matters:

- a) owing to the decline of the magnesium oxychloride flooring trade, reference to the use of the pigments in this material has been replaced by reference to their usage in mortar compositions and cement products generally;
- b) because information on the precise content of metal oxide in a pigment is not necessarily a guide to its tinting strength or hue, it is, therefore, permitted that materials with metal oxide contents outside those specified may be supplied by agreement between the contracting parties;
- c) the section covering brown iron-manganese oxide pigments has been widened to include the non-manganese brown iron oxide pigments;
- d) the section relating to zinc sulphide pigments has been excluded because their use with cement has ceased to be significant;
- e) the section relating to mineral black pigments has been deleted because these pigments are no longer available;
- f) new clauses relating to phthalocyanine pigments, blended pigments, and pigment dispersions have been introduced, notes on pigment dispersions are given in Appendix G;
- g) the chemical methods of testing have been revised and where possible are identical with those in the specifications already published for pigments for paint;
- h) appendices are included for the first time to cover respectively a comparative test for effect on the setting times of Portland cement and a comparative test for effect on the strength development of Portland cement;
- i) notes on the incorporation of pigments in Portland cement and Portland cement products are given in Appendix H.

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, page 1 to 10, 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.

1 Scope

This British Standard specifies the requirements for pigments for colouring Portland cement and Portland cement products.

NOTE 1 It is thought that pigments found suitable for Portland cement will also be suitable for supersulphate and high alumina cements but their usages for such purposes is not covered by this standard because of the limited experience in the use of pigments with these cements. It should not be inferred, however, that the pigments specified in this standard could not be satisfactorily used with cements other than Portland cement.

NOTE 2 It should be noted that certain cadmium pigments, cobalt blue pigments and titanium complex pigments are also suitable for use with Portland cement but because of their cost they are generally not used for this purpose.

2 References

The titles of the British Standards referred to in this standard are listed on the inside back cover.

3 Sampling

For the purpose of testing a pigment in accordance with this standard, a sample of not less than 100 g shall be taken and packed according to the method described in BS 4726.

4 Agreed sample

The agreed sample referred to in Table 1 and Appendix D shall be one and the same and shall comply in all respects with the other relevant requirements of this standard. The sample shall be packed in the manner described in BS 4726 and shall be not less than 100 g.

5 Description

5.1 Powders. The pigment shall be in the form of a dry, soft powder or in such a condition that it may be readily reduced thereto by crushing it under a palette knife without any grinding action being necessary.

5.2 Dispersions. By agreement between the contracting parties the pigment may be in the form of a slow setting suspension of the pigment in water. Any dispersion which settles in storage shall be readily re-dispersable by simple stirring or shaking.

6 Composition

The pigment shall consist essentially of the chemical compound or compounds shown in Table 1 and shall not contain compounds or other impurities, such as lead or zinc compounds, capable of affecting adversely the setting and development of strength of Portland cement. By agreement between the contracting parties, limits for metal oxide content other than those given in Table 1 may be specified.

7 Required characteristics

The pigment shall have the characteristics and requirements specified in the appropriate column of Table 1.

8 Effect of pigment on Portland cement products

8.1 Setting time. The pigment, when used in the maximum proportions recommended by the manufacturer shall not be regarded as significantly affecting the setting time of Portland cement products if, when tested in accordance with Appendix E, the initial setting time is not less than 45 min, the final setting time not more than 10 h, and the difference for both setting times between the mixes with and without added pigment not more than 30 min.

8.2 Strength development. The pigment, when used in the maximum proportions recommended by the manufacturer shall not be regarded as significantly affecting the strength development of Portland cement products if, when tested in accordance with Appendix F, the mean compressive strength of the mix containing the pigment does not differ by more than 20 % from the mean compressive strength of the mix without pigment.

9 Packaging

All packages containing the material shall be clearly marked with the number of this British Standard.