

Specification for

Portland pulverized-fuel ash cements

Committees responsible for this British Standard

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- British Aggregate Construction Materials Industries
- British Cement Association
- British Precast Concrete Federation
- British Ready Mixed Concrete Association
- Cement Admixtures Association
- Cementitious Slag Makers' Association
- County Surveyors' Society
- Department of the Environment (Building Research Establishment)
- Department of Transport (Highways Agency)
- Electricity Association
- National Rivers Authority
- Quality Ash Association
- Society of Chemical Industry

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Foreword

This edition of this British Standard has been prepared by Subcommittee B/516/6. It introduces technical changes but it does not reflect a full review or revision of the standard, which will be undertaken in due course. It is based on the work of Technical Committee 51, Cement and building limes, of the European Committee for Standardization (CEN), which has prepared a European Prestandard specification for cements published as DD ENV 197-1. As an intrinsic part of this activity, CEN has published EN 196, a series of methods of testing cement, which the UK is implementing to replace the relevant Parts of BS 4550. In consequence, this British Standard specifies requirements in terms of the test procedures in BS EN 196. It supersedes BS 6588:1991 which is withdrawn.

The requirements for compressive strength, physical and chemical properties are specified as characteristic values and conformity is assessed by means of a statistical procedure for continuous inspection operated by the cement manufacturer (autocontrol) (see annex A). This includes the concept of “major defects” which are “likely to reduce materially the usability of the cement for its intended purpose”. However, DD ENV 197-1 is considered to be inappropriate in its entirety for the manufacture of cement in the UK and the annex therefore incorporates several footnotes identifying specific aspects. In particular, it is assumed, for this edition of this British Standard, that some limits are required for acceptance inspection. Clause 12 therefore gives appropriate values which in several cases are more stringent than those for major defects given in annex A derived from DD ENV 197-1.

The strength requirements are based on the BS EN 196-1 mortar prism test at 28 days. In addition to the two classes of standard strength, 32.5 and 42.5, each with two subclasses of early strength, this British Standard includes a higher class of standard strength, 52.5, to cover all Portland pulverized-fuel ash cements available in the UK (see Table 2). It should be noted that for prescribed or standard mixes, as described in BS 5328-1, unless the cement content is increased appropriately, the use of cements of the 32.5 standard strength class will lead to concrete of lower compressive strength and may reduce durability, compared with cements of a higher strength class.

This edition introduces the following changes.

- a) The names of the two types of pulverized-fuel ash cement have been changed to avoid confusion with the pozzolanic pulverized-fuel ash cement specified in BS 6610. Portland fly ash cement is now called Portland fly ash cement A and pozzolanic cement is now called Portland fly ash cement B.
- b) The two methods of producing Portland pulverized-fuel ash cements, i.e. by intergrinding and by dry blending, have been retained (see 6.3). A procedure for combining Portland cement and pulverized-fuel ash in the concrete mixer is included in BS 5328-1.
- c) Compositional requirements are expressed as a percentage of the total mass of the constituents but excluding calcium sulfate and any additives. This departure from the traditional method of calculation in the UK is fully explained in annex B.

d) The pulverized-fuel ash constituent is required to be siliceous with a minimum reactive silicon dioxide (SiO_2) content of 25 % (m/m). The proportion of siliceous pulverized-fuel ash is specified as 6 % (m/m) to 20 % (m/m) for Portland fly ash cement A or as 21 % (m/m) to 35 % (m/m) for Portland fly ash cement B. These proportions are expressed as a percentage of the total mass of the constituents but excluding calcium sulfate and any additives. Thus, the maximum permissible pulverized-fuel ash content of cement complying with BS 6588 has been reduced from 40 % (m/m) to 35 % (m/m), expressed as a percentage of the final cement which corresponds to 37 % (m/m), but it should be noted that the highest proportions may not produce a cement complying with the higher strength requirements. (A cement with a proportion of pulverized-fuel ash of 36 % (m/m) to 55 % (m/m) is specified in BS 6610 with the name pozzolanic pulverized-fuel ash cement.)

e) The limit for total sulfur (expressed as SO_3) of 3.0 % (m/m) has been changed to an autocontrol maximum limit for sulfate of 3.5 % (m/m) (corresponding to an acceptance inspection limit of 3.6 % (m/m) of the final cement).

f) Guidance on the use of cement is included in annex C and attention is drawn to the safety precautions recommended therein when working with cement. Cement will partially hydrate when exposed to water vapour; annex C also includes guidance on storage.

New editions of other British Standards for cement, i.e. BS 12, BS 146, BS 4027, BS 4246, BS 6610 and BS 7583 have been prepared at the same time.

Product certification. Purchasers are recommended to specify cement manufactured and supplied to a nationally recognized third party product certification scheme.

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 to 12, 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.

