

Fly ash for concrete — Definitions, requirements and quality control

The European Standard EN 450:1994 has the status of a
British Standard

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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
- Cementitious Slag Makers' Association
- Department of the Environment (Building Research Establishment)
- Department of Transport
- Electricity Association
- Federation of Civil Engineering Contractors
- Quality Ash Association

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National foreword

This British Standard is the English language version of EN 450:1994 *Fly ash for concrete — Definitions, requirements and quality control* prepared under the authority of the European Committee for Standardization (CEN). This standard has been prepared as part of a package of standards harmonized within the member countries of CEN to support the essential requirements of the Construction Products Directive.

The term “fly ash” used in this standard covers pulverized-fuel ash (pfa) which is the more precise term for fly ashes produced from electricity generating power stations burning pulverized hard coals and which has been in common use in the UK for many years.

BS EN 450 does not supersede BS 3892-1 which remains in force and covers a processed material, as explained in the introduction of this standard. BS 3892-2:1984 is under revision.

This standard was drafted with the cooperation of the UK which proposed a requirement for different classes of ash each with specific applications in order to maintain the successful system of classification and use established under BS 3892 since 1965. This was not required or accepted by the majority of CEN member countries. However, the introduction to EN 450 acknowledges that the UK and Ireland require that ash, for use as a cementitious component in concrete, be processed in order to restrict variations in quality and to enhance performance in concrete. It further recognizes that the specific requirements for controlled properties which allow such processed ash to be used as a special component of cementitious systems in concrete are not included in EN 450. Pfa conforming to BS 3892-1 is subject to such processing. BS 5328-1 and BS 8110-1 refer to the use of other fly ashes that do not conform to BS 3892-1 provided that satisfactory data on their use are available.

Requirements in both BS EN 450 and BS 3892-1 are specified as characteristic values and conformity is assessed by means of a statistical procedure for continuous inspection operated by the ash producer (autocontrol). This includes the concept of “major defects” which are likely to reduce materially the usability of the ash for its intended purpose. In this respect both BS EN 450 and BS 3892-1 are based upon the text on conformity criteria given in the European Prestandard for cement, ENV 197-1:1992. Subsequent draft revisions of this text have removed reference to major defects, referring instead to “limit values” (upper and lower). The sum of the specified characteristic value and the corresponding major defect is the limit value for the particular property. The latter term is used throughout National annex NA in which the main differences between BS EN 450 and BS 3892-1 are summarized.

BS EN 450 makes reference in **3.2**, **3.3** and **4.2.2** to certain items which are permitted to be fixed on a national basis. Normative National annex NB indicates how these clauses are to be interpreted for the UK.

Most ash produced in the UK would conform to BS EN 450 without further processing. Rules to allow ash conforming to BS EN 450 to be used in concrete produced in accordance with EN 206 are, however, still under development. Until such rules have been developed and agreed, users of ash conforming to BS EN 450 are advised that, for the specific use as part of the cement content in concrete, pfa is required by BS 5328 and BS 8110 to conform to BS 3892-1. In particular, BS 5328 requires that, when pfa is combined with a Portland cement in the concrete mixer to give a combination equivalent to a cement conforming to BS 6588 or BS 6610, the pfa conforms to BS 3892-1.

Cross-references

Publications referred to	Corresponding British Standard
EN 196-1:1994	BS EN 196-1:1995 <i>Methods of testing cement Part 1: Determination of strength</i>
EN 196-2:1994	BS EN 196-2:1995 <i>Methods of testing cement Part 2: Chemical analysis of cement</i>
EN 196-3:1994	BS EN 196-3:1995 <i>Methods of testing cement Part 3: Determination of setting time and soundness</i>
EN 196-6:1989	BS EN 196-6:1992 <i>Methods of testing cement Part 6: Determination of fineness</i>
EN 196-7:1989	BS EN 196-7:1992 <i>Methods of testing cement Part 7: Methods of taking and preparing samples of cement</i>
EN 196-21:1989	BS EN 196-21:1990 <i>Methods of testing cement Part 21: Determination of chloride, carbon dioxide and alkali content of cement</i>
ENV 197-1:1993	DD ENV 197-1:1995 <i>Cement — Composition, specifications and conformity criteria Part 1: Common cements</i>
ENV 206:1990	DD ENV 206:1992 <i>Concrete — Performance, production, placing and compliance criteria</i>
EN 451-1:1994	BS EN 451-1:1995 <i>Method of testing fly ash Part 1: Determination of free calcium oxide content</i>
EN 451-2:1994	BS EN 451-2:1995 <i>Method of testing fly ash Part 2: Determination of fineness by wet sieving.</i>

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Summary of pages

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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.

