



**SLOVENSKI STANDARD**  
**SIST EN 450-2:2005**

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**Elektrofiltrski pepel – 2. del: Ovrednotenje skladnosti**

Fly ash for concrete - Part 2: Conformity evaluation

Flugasche für Beton Teil 2: Konformitätsbewertung

Cendres volantes pour béton - Partie 2: Evaluation de la conformité

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**ICS:**

91.100.30	Beton in betonski izdelki	Concrete and concrete products
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EUROPEAN STANDARD  
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**EN 450-2**

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English version

**Fly ash for concrete - Part 2: Conformity evaluation**

Cendre volant pour béton - Partie 2: Evaluation de la  
conformité

Flugasche für Beton - Teil 2: Konformitätsbewertung

This European Standard was approved by CEN on 22 December 2004.

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**EN 450-2:2005 (E)****Foreword**

This document (EN 450-2:2005) has been prepared by Technical Committee CEN/TC 104 "Concrete and related products", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2005, and conflicting national standards shall be withdrawn at the latest by August 2006.

This document supersedes EN 450:1994.

This document includes a Bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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## 1 Scope

This document specifies the scheme for the evaluation of conformity of fly ash according to EN 450-1.

The document provides technical rules for the production control by the producer, including autocontrol testing of samples. It also provides rules for actions to be followed in the event of non-conformity, the procedure for the certification of conformity and requirements for dispatching centres.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 196-1, *Methods of testing cement — Part 1: Determination of strength*.

EN 196-7, *Methods of testing cement — Methods of taking and preparing samples of cement*.

EN 450-1:2005, *Fly ash for concrete — Part 1: Definition, specifications and conformity criteria*.

EN 451-2, *Method of testing fly ash — Part 2: Determination of fineness by wet sieving*.

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## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1 Specific definitions

#### 3.1.1

##### **certificate of conformity to EN 450-1**

document issued under the rules of a certain scheme for the evaluation of conformity indicating that adequate confidence is provided that fly ash is in conformity with EN 450-1

#### 3.1.2

##### **conformity mark**

protected mark applied on the basis of the certificate of conformity (see 3.1.1)

#### 3.1.3

##### **certified fly ash**

fly ash for which a certificate of conformity has been issued

#### 3.1.4

##### **initial period**

immediate period after the first issuing of the certificate of conformity for a fly ash

#### 3.1.5

##### **certification body**

impartial body, governmental or non-governmental, possessing the necessary competence and responsibility to carry out conformity certification according to given rules of procedure and management

#### 3.1.6

##### **production control**

permanent internal control of fly ash production exercised by the producer consisting of internal quality control and autocontrol testing

**EN 450-2:2005 (E)****3.1.7****production plant**

facility used by a producer for the production of fly ash:

- a) power plant with one(several) boiler(s),
- b) processing plant, for example for the classification, selection, sieving, drying, blending, grinding and/or carbon reduction of fly ash(es).

In the production plant equipment has to be used which is suitable for production of fly ash including the necessary silo capacity for the storage and dispatch of the fly ash produced, and equipment to test, evaluate and control the fly ash production. This equipment and the production control applied allow the control of production with sufficient accuracy to ensure that the requirements of EN 450-1 are met

**3.1.8****new production plant**

production plant which is not already producing fly ash certified under this scheme

**3.1.9****existing production plant**

production plant which is already producing fly ash certified under this scheme

**3.1.10****depot**

bulk fly ash handling facility (not located at the production plant) used for the dispatch of fly ash (whether in bulk or bagged) after transfer or storage where the producer has full responsibility for all aspects of the quality of the fly ash

**3.1.11****dispatching centre**

bulk fly ash handling facility (not located at the production plant) used for the dispatch of fly ash after transfer or storage where an intermediary has full responsibility for all aspects of the quality of the fly ash

**3.1.12****intermediary**

natural or legal person who takes from the producer fly ash certified according to EN 450-2 and bearing the conformity mark, who undertakes full responsibility for maintaining in a dispatching centre all aspects of the quality of the fly ash and who supplies the fly ash onwards to a further natural or legal person

**3.1.13****confirmation autocontrol testing**

continual testing carried out by an intermediary which consists of testing of samples taken by the intermediary at the point(s) of release from the dispatching centre

**3.1.14****works' quality manual**

document that provides information on the production control which is applied by a producer at a particular production plant to ensure conformity of the fly ash with the requirements of the relevant product specification standard

**3.1.15****producer**

producer is the operator of the production plant or a person (natural or legal) authorised by the production plant. The producer is named in the certificate of conformity

**3.2 General definitions**

See Annex B (informative).



## 4 Tasks for the producer

### 4.1 Factory production control

#### 4.1.1 Concept

Production control means the permanent internal control of fly ash production exercised by the producer and consists of internal quality control (see 4.2) and autocontrol testing<sup>1)</sup> of samples of fly ash taken at the point of release (see 4.3).

NOTE The requirements of EN 450-2 as regards the production control take account of those clauses of EN ISO 9001 which are relevant to the production, process control and testing of fly ash.

#### 4.1.2 Works' quality manual

The producer's documentation and procedures for the production control shall be described in a Works' quality manual, which shall adequately describe, among other things:

- a) the quality aims and the organisational structure, responsibilities and powers of the responsible staff with regard to product quality and the means to monitor the achievement of the required product quality and the effective operation of the internal quality control (see 4.1.3);
- b) the production and quality control techniques, processes and systematic actions that will be used (see 4.2.1, 4.2.3 and 4.3.2);
- c) the inspections and tests that will be carried out before, during and after production, and the frequency with which they will be carried out (see 4.2.2, 4.3.1 and 4.3.3).

The Works' quality manual prepared by the producer for each production plant shall include an adequate system of documentation (see 4.1.4 and 4.3.4). In case of suitability testing of fly ash from co-combustion of pulverised coal with certain co-combustion materials according to EN 450-1, the procedure of sampling shall be documented in agreement with the certification body.

The Works' quality manual shall address and document the procedures operated to ensure that the fly ash conforms to the technical specifications. The manual may reference associated documents which provide further details of the autocontrol testing of samples and the internal quality control. For the purpose of this scheme, the term Works' quality manual shall be considered to include these associated documents.

NOTE In the case of an existing quality management system according to EN ISO 9001, the certification body may examine if the corresponding quality manual meets all the requirements of EN 450-1 which are relevant to the production control of fly ash. Provided all the requirements are included, this quality manual may also be applied for product certification.

#### 4.1.3 Management systems

##### 4.1.3.1 Quality policy statement

The Works' quality manual shall include a statement by the management of the producer defining its quality policy, objectives and commitments to the attainment of product quality.

##### 4.1.3.2 Management representative

If the producer is a person authorized by the production plant (see 3.1.15), suitable relations between the producer and the production plant shall be established and documented in order to ensure that the requirements of this document are met.

<sup>1)</sup> This testing corresponds also to the "further testing of samples" mentioned in Annex III Section 2 point (i) of the Construction Products Directive 89/106/EEC.

**EN 450-2:2005 (E)****4.1.3.3 Internal audits and management review**

In order to ensure the continuing suitability and effectiveness of the Work's quality manual to meet the requirements of EN 450-1, the producer shall perform at least once per year:

- a) internal audits covering the scope of this Clause 4 and 6.1;
- b) producer's management review of the production control, taking into account records of the internal audits.

**4.1.3.4 Training**

The Works' quality manual shall describe the measures taken to ensure that all the personnel involved in operations that can affect internal quality control and product quality have appropriate experience or training. Appropriate records shall be retained.

**4.1.4 System of documentation****4.1.4.1 Document control**

The management representative of the producer shall be responsible for the control of all documents and data related to the production control and to this scheme for the evaluation of conformity.

This control shall ensure that the appropriate issues of all documents are available at essential locations, that obsolete documents are withdrawn and that changes or modifications to any document are effectively introduced.

A master list shall be established to identify the current version of documents in order to prevent the use of non-applicable documents.

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**4.1.4.2 Quality records**

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The producer shall retain records of production control for at least the period required to comply with relevant legislation.

**4.2 Internal quality control****4.2.1 Process control****4.2.1.1 General**

The Works' quality manual shall describe the parameters for process planning, process control and testing, inspection, corrective action, verification, dispatch and the associated records.

Depending on the installation, the following measures shall be provided:

- a) in all types of production plants
  - 1) in-process testing of fly ash properties;
  - 2) silos of adequate capacity for storage of the fly ash produced allowing a proper identification of the product and giving possibilities of taking spot samples at any time without prior notice;
- b) additionally, in production plants using processing facilities:
  - 1) separate and adequate storing facilities for the fly ashes to be processed;
  - 2) controlled proportioning of the fly ashes to be processed in order to achieve the target properties of the produced fly ash;
  - 3) facilities for adequate homogenisation of fly ash;

- 4) in-process testing of fly ash properties.

#### 4.2.1.2 Provisions for processing plants

In production plants for the controlled processing of fly ash, for example by classification, selection, sieving, drying, blending, grinding, and carbon reduction, the relevant information on each consignment of incoming fly ash and all operating steps in the process shall be documented in the Work's quality manual by the producer in agreement with the certification body. The following data shall be at least part of this documentation:

- a) the producer and the production location from which the fly ash originates;
- b) an acknowledgement that the fly ash is according to 3.2 in EN 450-1:2005;
- c) the documented suitability and environmental compatibility as required in EN 450-1, where co-combustion materials have been used;
- d) in case of blending only, the properties of each incoming fly ash shall be controlled on a regular basis in order to be able to achieve the target properties of the fly ash blend. On each incoming fly ash the relevant properties listed in Table 2 of EN 450-1:2005, except particle density, activity index, initial setting time, and water requirement should be tested by the supplier of the incoming fly ash. The minimum testing frequency should be chosen as indicated in Table 2 of EN 450-1:2005, "Routine situation", and should be documented in the work's quality manual. Each incoming fly ash should conform to the requirements in Clauses 4 and 5 of EN 450-1:2005 with the exception of loss on ignition, fineness, and variation of fineness;
- e) if one of the incoming fly ashes is obtained from co-combustion, then the environmental compatibility of the blended fly ash shall be proven, as required by 4.3 of EN 450-1:2005.

#### 4.2.1.3 Provisions for co-combustion materials

In power plants where co-combustion of materials, or mixtures of materials, according to Clause 4 of EN 450-1:2005 and mixtures thereof is conducted, the following measures shall be ensured:

- a) different co-combustion materials shall be stored separately;
- b) the proportion of co-combustion material(s) related to pulverised coal used in the boiler shall be controlled at regular intervals.

#### 4.2.1.4 Control of off-specification production

The Works' quality manual shall contain procedures to ensure that off-specification production is adequately managed.

### 4.2.2 Measuring and testing

#### 4.2.2.1 Inspection, measuring and test equipment

The equipment for in-process inspection and testing shall be regularly checked and calibrated in accordance with the procedures and frequencies laid down in the Works' quality manual.

#### 4.2.2.2 Inspection and test status

Procedures for the inspection and test status through the stages of production shall be detailed in the Works' quality manual. These shall include procedures for the control of off-specification intermediate materials.

To ensure that only fly ash conforming to EN 450-1 is conveyed to the silo, samples shall be taken from appropriate places prior to the silo for certified fly ash in agreement with the certification body. The sampling places shall be laid down in the Works' quality manual. Spot samples shall be taken for the determination of fineness and loss on ignition in agreement with the certification body.