



Institut luxembourgeois de la normalisation  
de l'accréditation, de la sécurité et qualité  
des produits et services

**ILNAS-EN 450-1:2005**

**Fly ash for concrete - Part 1: Definition,  
specifications and conformity criteria**

Cendres volantes pour béton - Partie 1:  
Définition, spécifications et critères de  
conformité

Flugasche für Beton - Teil 1: Definition,  
Anforderungen und  
Konformitätskriterien

**02/2005**



## National Foreword

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EUROPEAN STANDARD <sup>ILNAS-EN 450-1:2005</sup> **EN 450-1**  
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**Fly ash for concrete - Part 1: Definition, specifications and  
conformity criteria**

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Konformitätskriterien

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

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of 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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## Foreword

This document (EN 450-1:2005) 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of an identical text or by endorsement, at the latest by August 2005, and conflicting national standards shall be withdrawn at the latest by August 2006.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 has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

It is supported by standards of the series EN 451 for test methods for determination of free calcium oxide content and of the fineness by sieve residue. No existing European Standard, apart from EN 450:1995, is superseded.

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.

## Introduction

The use of coal for electricity production results in the generation of large quantities of fly ash.

Different types of coal and the type of boiler used in this process produce different fly ashes, such as siliceous, silico-calcareous, or calcareous fly ashes with pozzolanic and/or latent hydraulic properties. All these types of fly ash are used in concrete production in some European countries, based on national experiences and tradition.

Before its use fly ash maybe subject to processing, for example by classification, selection, sieving, drying, blending, grinding or carbon reduction, to optimize its fineness, reduce its water demand or to improve other properties. Such processed fly ashes may conform to this document to which reference is made in such case. When they are out of the scope of this document, their suitability for use as Type II additions in concrete according to EN 206-1 may also be established from National standards or provisions or European Technical Approvals valid in the place of use of the concrete and which refer specifically to the use of the addition in concrete conforming to EN 206-1.

When using fly ashes conforming to this document, it should be noted that, apart from the effect from the pozzolanicity of the fly ash, certain properties of fresh and hardened concrete may be affected. Where relevant, such effects have to be considered in concrete mix design (see EN 206-1).

## 1 Scope

This document specifies requirements for the chemical and physical properties as well as quality control procedures for siliceous fly ash, as defined in 3.2, for use as a type II addition for production of concrete, including in particular cast-in-situ or prefabricated structural concrete conforming to EN 206-1. Fly ash according to this document may also be used in mortars and grouts.

Fly ash produced with other types or higher percentages of co-combustion materials than those provided for in 4 is outside the scope of this document.

It is, however, beyond the scope of this document to specify provisions governing the practical application of fly ash in the production of concrete, i.e. requirements concerning composition, mixing, placing, curing etc. of concrete containing fly ash. As regards such provisions, reference should be made to other European or national standards for concrete, such as EN 206-1.

## 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 196-1:1994, *Methods of testing cement — Part 1: Determination of strength*.

EN 196-2:1994, *Methods of testing cement — Part 2: Chemical analysis of cement*.

EN 196-3, *Methods of testing cement — Part 3: Determination of setting time and soundness*.

EN 196-6, *Methods of testing cement — Determination of fineness*.

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

EN 196-21<sup>1)</sup>, *Methods of testing cement — Determination of the chloride, carbon dioxide and alkali content of cement*.

EN 197-1:2000, *Cement — Part 1: Composition, specification and conformity criteria for common cements*.

EN 206-1, *Concrete — Part 1: Specification, performance, production and conformity*.

EN 450-2:2005, *Fly ash for concrete — Part 2: Conformity evaluation*.

EN 451-1, *Method of testing fly ash — Part 1: Determination of free calcium oxide content*.

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

EN 1015-3:1999, *Methods of test for mortar for masonry — Part 3: Determination of consistence of fresh mortar (by flow table)*.

EN ISO 11885, *Water quality - Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (ISO 11885:1996)*.

ISO 10694, *Soil quality — Determination of organic and total carbon after dry combustion (elementary analysis)*.

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<sup>1)</sup> EN 196-21 is currently being incorporated in EN 196-2.