

**Betooni valmistamisel kasutatav
lendtuhk. Osa 1: Definiitsioon,
spetsifikatsioonid ja
vastavuskriteeriumid
KONSOLIDEERITUD TEKST**

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 450-1:2005+A1:2007 sisaldab Euroopa standardi EN 450-1:2005+A1:2007 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 22.11.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 450-1:2005+A1:2007 consists of the English text of the European standard EN 450-1:2005+A1:2007.</p> <p>This document is endorsed on 22.11.2007 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala:</p> <p>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.</p>	<p>Scope:</p> <p>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.</p>
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Võtmesõnad: ashes, conformity tests, packages, packing, physical properties, production control, properties, quality assurance, quality control, specification, specification (approval), specifications, suitability, terminology, thermodynamic property, thermodynamic properties

English Version

**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

This European Standard was approved by CEN on 22nd December 2004 and includes Amendment 1 approved by CEN on 10 September 2007.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

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 CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 450-1:2005+A1:2007) has been prepared by Technical Committee CEN/TC 104 "Concrete and related products", the secretariat of which is held by DIN.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2007 and conflicting national standards shall be withdrawn at the latest by July 2009.

This document includes Amendment 1, approved by CEN on 2007-09-10.

This document supersedes EN 450:2005.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**.

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.

A1 Amendment A1:2007 contains the modified requirements for the initial setting time and the modification of Annex C. **A1**

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.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, 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, *Methods of testing cement — Part 1: Determination of strength*

EN 196-2, *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 196-8, *Methods of testing cement — Determination of heat of hydration*

EN 197-1, *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, *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)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. The values appearing in the definitions below shall not form part of the criteria for assessing conformity.