

## **Tsemendi katsemeetodid. Osa 5: Putsolaantsemendi putsolaansuskatse**

Methods of testing cement - Part 5: Pozzolanicity  
test for pozzolanic cement

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 196-5:2005 sisaldab Euroopa standardi EN 196-5:2005 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 28.04.2005 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 196-5:2005 consists of the English text of the European standard EN 196-5:2005.</p> <p>This document is endorsed on 28.04.2005 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><b>Käsitlusala:</b></p> <p>This document specifies the method of measuring the pozzolanicity of pozzolanic cements conforming to EN 197-1. This document does not apply to Portland pozzolana cements or to pozzolanas.</p>	<p><b>Scope:</b></p> <p>This document specifies the method of measuring the pozzolanicity of pozzolanic cements conforming to EN 197-1. This document does not apply to Portland pozzolana cements or to pozzolanas.</p>
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**Võtmesõnad:** aparaat, etüleendiamiintetraatsetaat, kaltsiumhüdroksiid, keemilised reaktiivid, keemilised teimid, putsolaanid, sisalduse määramine, tsemendid

English version

## Methods of testing cement - Part 5: Pozzolanicity test for pozzolanic cement

Méthodes d'essais des ciments - Partie 5: Essai de pouzzolanité des ciments pouzzolaniques

Prüfverfahren für Zement - Teil 5: Prüfung der Pozzolinität von Puzzolanementen

This European Standard was approved by CEN on 29 December 2004.

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 Central Secretariat 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 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 196-5:2005) has been prepared by Technical Committee CEN/TC 51 '*Cement and building limes*', the secretariat of which is held by IBN/BIN.

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 2005.

This document supersedes EN 196-5:1994.

This European Standard on the methods of testing cement comprises the following Parts:

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 196-5, *Methods of testing cement — Part 5: Pozzolanicity test for pozzolanic cements*

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

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

EN 196-8, *Methods of testing cement — Part 8: Heat of hydration — Solution method*

EN 196-9, *Methods of testing cement — Part 9: Heat of hydration — Semi-adiabatic method*

NOTE A previous part, EN 196-21: *Methods of testing cement — Part 21: Determination of the chloride, carbon dioxide and alkali content of cement*, has been revised and incorporated into EN 196-2.

Another document, ENV 196-4 *Methods of testing cement — Part 4: Quantitative determination of constituents*, has been drafted and will be published as a CEN Technical Report.

This edition introduces the following technical changes based on comments received by the secretariat:

- a) the procedure, reagents and layout of the standard have been aligned with the relevant clauses of EN 196-2;
- b) the procedure for preparation of a test sample has been clarified;
- c) Patton and Reeders reagent has been included as an additional, optional indicator for visual determination of EDTA titrations;
- d) the specification for apparatus has been extended to include a balance of specified accuracy; apparatus for measuring the absorbance of a solution whilst being stirred and a pH meter of specified accuracy.

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.

## 1 Scope

This document specifies the method of measuring the pozzolanicity of pozzolanic cements conforming to EN 197-1. This document does not apply to Portland pozzolana cements or to pozzolanas.

This method constitutes the reference procedure.

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

ISO 385-1, *Laboratory glassware — Burettes — Part 1: General requirements*

ISO 835-1, *Laboratory glassware — Graduated pipettes — Part 1: General requirements*

## 3 Principle

The pozzolanicity is assessed by comparing the concentration of calcium ion, expressed as calcium oxide, present in the aqueous solution in contact with the hydrated cement, after a fixed period of time, with the quantity of calcium ion capable of saturating a solution of the same alkalinity. The cement is considered to satisfy the test, i.e. gives a positive result, if the concentration of calcium ion in the solution is lower than the saturation concentration.

NOTE Experiment has shown that a mixture of 20 g of cement and 100 ml of water at 40 °C achieves equilibrium after a period of between 8 d and 15 d. If the cement satisfies the test at 8 d (see 10.2) it is not necessary to continue to 15 d.

## 4 General requirements for testing

### 4.1 Number of tests

Where the determination is one of a series subject to statistical control, determination by a single test shall be the minimum required.

Where the determination is not part of a series subject to statistical control, the number of tests shall be two (see also 10.1).

In the case of dispute, the number of tests shall be two.

### 4.2 Repeatability and reproducibility

Repeatability - Precision under repeatability conditions where independent test results are obtained with the same method on identical test items (material) in the same laboratory by the same operator using the same equipment within short intervals of time.

Reproducibility - Precision under reproducibility conditions where test results are obtained with the same method on identical test items (material) in different laboratories with different operators using different equipment.