

Tsemendi katsetamine. Osa 2: Tsemendi keemiline analüüs

Methods of testing cement - Part 2: Chemical
analysis of cement

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 196-2:2005 sisaldab Euroopa standardi EN 196-2:2005 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 196-2:2005 consists of the English text of the European standard EN 196-2:2005.</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>Käsitlusala: This document specifies the methods for the chemical analysis of cement. This document describes the reference methods and, in certain cases, an alternative method which can be considered to be equivalent. In the case of a dispute, only the reference methods are used.</p>	<p>Scope: This document specifies the methods for the chemical analysis of cement. This document describes the reference methods and, in certain cases, an alternative method which can be considered to be equivalent. In the case of a dispute, only the reference methods are used.</p>
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English version

Methods of testing cement - Part 2: Chemical analysis of cement

Méthodes d'essais des ciments - Partie 2: Analyse chimique des ciments

Prüfverfahren für Zement - Teil 2: Chemische Analyse von Zement

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

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Contents

Page

Foreword.....	4
1 Scope	6
2 Normative references	6
3 General requirements for testing	6
3.1 Number of tests.....	6
3.2 Repeatability and reproducibility	6
3.3 Expression of masses, volumes, factors and results.....	7
3.4 Ignitions	7
3.5 Determination of constant mass	7
3.6 Check for absence of chloride ions (silver nitrate test).....	7
3.7 Blank determinations	7
4 Reagents	8
5 Apparatus	19
6 Preparation of a test sample of cement	24
7 Determination of loss on ignition.....	24
7.1 Principle.....	24
7.2 Procedure	24
7.3 Calculation and expression of results.....	24
7.4 Correction for oxidation of sulfides	25
7.5 Repeatability and reproducibility	25
8 Determination of sulfate.....	25
8.1 Principle.....	25
8.2 Procedure	25
8.3 Calculation and expression of results.....	26
8.4 Repeatability and reproducibility	26
9 Determination of residue insoluble in hydrochloric acid and sodium carbonate	26
9.1 Principle.....	26
9.2 Procedure	26
9.3 Calculation and expression of results.....	27
9.4 Repeatability and reproducibility	27
10 Determination of residue insoluble in hydrochloric acid and potassium hydroxide	27
10.1 Principle.....	27
10.2 Procedure	27
10.3 Calculation and expression of results.....	28
10.4 Repeatability and reproducibility	28
11 Determination of sulfide.....	28
11.1 Principle.....	28
11.2 Procedure	28
11.3 Calculation and expression of results.....	28
11.4 Repeatability and reproducibility	29
12 Determination of manganese	29
12.1 Principle.....	29
12.2 Procedure	29
12.3 Calculation of results	29
12.4 Repeatability and reproducibility	30
12.5 Expression of results	30
13 Determination of major elements.....	30

13.1	Principle.....	30
13.2	Decomposition with sodium peroxide	30
13.3	Precipitation and determination of silica — Double evaporation method (reference method).....	33
13.4	Precipitation and determination of silica — Polyethylene oxide method (alternative method).....	33
13.5	Decomposition with hydrochloric acid and ammonium chloride and precipitation of silica (alternative method)	34
13.6	Determination of pure silica	35
13.7	Decomposition of the evaporation residue	35
13.8	Determination of soluble silica	36
13.9	Determination of total silica	36
13.10	Determination of iron (III) oxide	37
13.11	Determination of aluminium oxide	38
13.12	Determination of calcium oxide by EGTA (reference method)	38
13.13	Determination of magnesium oxide by DCTA (reference method)	39
13.14	Determination of calcium oxide by EDTA (alternative method)	40
13.15	Determination of magnesium oxide by EDTA (alternative method).....	41
14	Determination of chloride	42
14.1	Principle.....	42
14.2	Procedure	42
14.3	Calculation and expression of results	43
14.4	Repeatability and reproducibility.....	43
15	Determination of carbon dioxide (reference method)	43
15.1	Principle.....	43
15.2	Apparatus	43
15.3	Procedure	43
15.4	Calculation and expression of results	44
15.5	Repeatability and reproducibility.....	44
16	Determination of carbon dioxide (alternative method).....	44
16.1	Principle.....	44
16.2	Apparatus	44
16.3	Procedure	45
16.4	Calculation and expression of results	45
16.5	Repeatability and reproducibility.....	45
17	Determination of alkali (reference method)	46
17.1	Principle.....	46
17.2	Reagents.....	46
17.3	Preparation of calibration solutions and calibration curves	46
17.4	Dissolution of the test portion	46
17.5	Procedure	47
17.6	Calculation and expression of results	48
17.7	Repeatability and reproducibility.....	48
18	Determination of alkali (alternative method)	48
18.1	Principle.....	48
18.2	Reagents.....	49
18.3	Construction of the calibration curves	49
18.4	Procedure	49
18.5	Calculation and expression of results	50
18.6	Repeatability and reproducibility.....	50

Foreword

This document (EN 196-2:2005) 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 196-2:1994 and EN 196-21:1989.

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) EN 196-21 has been consolidated into EN 196-2;
- b) calibration against internationally accepted reference materials is permitted;
- c) the number of tests to be carried out, when the analysis is part of a series subject to statistical control, has been reduced to one;
- d) a requirement for blank determinations has been included;
- e) limiting ranges have been set for masses, volumes and temperatures wherever these are significant;
- f) the required accuracy of the balance is consistent with that of equipment traditionally used;
- g) a specification for a laboratory oven has been included;
- h) the calibration procedure for standard silica solution has been simplified;
- i) additional indicators have been included for the visual determination of EDTA titrations;

- j) an ignition temperature of (950 ± 25) °C has been set for the determination of loss on ignition and the ignition of barium sulfate and insoluble residues;
- k) determination of sulfate before and after ignition in the determination of loss on ignition becomes the reference method when correcting for sulfide;
- l) determination of silica by the double evaporation method becomes the reference method;
- m) in the determination of carbon dioxide by decomposition with sulfuric acid an additional, empty, gas washing bottle is included as a safety precaution against the reverse flow of sulfuric acid should pressure be lost;
- n) in the determination of alkali the influence of phosphoric acid on the potassium emission from the calibration solutions is suppressed by the addition of calcium to the calibration solutions. The procedure is adjusted accordingly.

Analytical methods utilising x-ray fluorescence (XRF) were considered during this revision but no published, standardised method was considered sufficiently comprehensive to be included. A new work item has been established by CEN/TC51 in order to prepare a method based on XRF.

XRF and other instrumental methods such as differential thermal analysis for determination of carbon dioxide, atomic absorption spectroscopy, etc. may be used as alternative methods provided they are calibrated against the reference methods, or against internationally accepted reference materials.

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 methods for the chemical analysis of cement.

This document describes the reference methods and, in certain cases, an alternative method which can be considered to be equivalent. In the case of a dispute, only the reference methods are used.

Any other methods may be used provided they are calibrated, either against the reference methods or against internationally accepted reference materials, in order to demonstrate their equivalence.

This document describes methods which apply principally to cements, but which can also be applied to their constituent materials. They can also be applied to other materials, the standards for which call up these methods.

Standard specifications state which methods are used.

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 — Part 7: 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 General requirements for testing

3.1 Number of tests

Analysis of a cement may require the determination of a number of its chemical properties. For each determination one or more tests shall be carried out in which the number of measurements to be taken shall be as specified in the relevant clause of this document.

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

Where the analysis is not part of a series subject to statistical control, the number of tests for determination of each chemical property shall be two (see also 3.3).

In the case of a dispute, the number of tests for determination of each chemical property shall be two (see also 3.3).

3.2 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.