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Metode preskušanja cementa - 2. del: Kemijska analiza cementa

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

Prüfverfahren für Zement - Teil 2: Chemische Analyse von Zement

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

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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 22 September 2025.

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Contents

Page

European foreword ... 3

Introduction ... 5

1 Scope ... 6

2 Normative references ... 6

3 Terms and definitions ... 6

4 General requirements for testing ... 7
4.1 Number of tests ... 7
4.2 Repeatability and reproducibility ... 7
4.3 Expression of masses, volumes, factors and results ... 7

5 Analysis by wet chemistry ... 8
5.1 General ... 8
5.2 Reagents ... 9
5.3 Apparatus ... 21
5.4 Analysis procedure ... 27
5.5 Determination of major elements ... 35

6 Chemical analysis by X-ray fluorescence ... 60
6.1 Reagents and reference materials ... 60
6.2 Apparatus ... 62
6.3 Flux ... 63
6.4 Determination of loss on ignition and the change in mass on fusion of the cement ... 64
6.5 Factoring test results and correcting total analyses for presence of sulfides and halides ... 66
6.6 Preparation of fused beads and pressed pellets ... 68
6.7 Calibration and validation ... 70
6.8 Calculation and expression of results ... 80
6.9 Performance criteria (repeatability, accuracy and reproducibility limits) ... 81

7 Chemical analysis by inductively coupled plasma optical emission spectroscopy (ICP-OES) ... 81
7.1 Determination of SO_3 – alternative method ... 81

Annex A (informative) **Examples of fluxes** ... 84

Annex B (informative) **Sources of certified reference materials** ... 85

Annex C (informative) **Examples of calibration standards and monitor beads and pellets** ... 86

Annex D (informative) **Guidance on preparation of standard calibration solutions** ... 87

D.1 Stock solutions ... 87

D.2 Blank calibration solution ... 87

Bibliography ... 88

European foreword

This document (EN 196-2:2025) has been prepared by Technical Committee CEN/TC 51 “Cement and building limes”, the secretariat of which is held by NBN.

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 May 2026, and conflicting national standards shall be withdrawn at the latest by May 2026.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 196-2:2013.

EN 196-2:2025 includes the following significant technical changes with respect to EN 196-2:2013:

— redefinition of the introduction;

— introduction of concept;

— determination of reactive silica;

— introduction of the concept of determination of total carbonate content instead of determination of CO_2;

— determination of chloride by potentiometric titration as alternative method;

— determination of total carbonate content by gas volumetric method as alternative method;

— determination of total carbonate content by infrared detection system (method A and B) as alternative method;

— determination of SO_3 by inductively coupled plasma optical emission spectroscopy as alternative method.

This European Standard series, under the general title *Methods of testing cement*, comprises the following parts:

— *Part 1: Determination of strength*;

— *Part 2: Chemical analysis of cement*;

— *Part 3: Determination of setting times and soundness*;

— *Part 5: Pozzolanicity test for pozzolanic cement*;

— *Part 6: Determination of fineness*;

— *Part 7: Methods of taking and preparing samples of cement*;

— *Part 8: Heat of hydration — Solution method*;

— *Part 9: Heat of hydration — Semi-adiabatic method*;

— *Part 10: Determination of the water-soluble chromium (VI) content of cement*;

— *Part 11: Heat of hydration — Isothermal conduction calorimetry method*.

NOTE Another document, CEN/TR 196-4 Methods of testing cement — Part 4: Quantitative determination of constituents, has been published as a CEN Technical Report.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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

Introduction

In this document, the elemental chemical analysis of a clinker or cement, as of any natural or artificial mineral material (volcanic pozzolan, blast furnace slag, fly ash, etc.) is expressed in a conventional manner in the form of the mass proportions of the common oxides corresponding to the most frequent and stable degree of oxidation (Si: SiO_2; Al: Al_2O_3, etc.). This expression of the chemical analysis does not indicate how these elements are combined into minerals such as silicates, oxides, carbonates, sulphates or sulphides.

This means that the presence of SiO_2 in a chemical analysis sheet does not necessarily imply the presence of crystalline silica e.g. quartz or cristobalite, but most likely silicates. Moreover, even if quartz is detected in the material, this does not necessarily imply an inhalation hazard if the particle size is larger than the inhalable fraction. Similarly, the presence of TiO_2 in a chemical analysis report does not necessarily imply the presence of the mineralogical phase(s) corresponding to this formula (rutile, anatase, brookite), although the presence of the mineralogical phase(s) does not necessarily imply an inhalation hazard if the particle size is larger than the inhalable fraction. In the same way, determination of total carbonate content (TCC) can be done by dosing CO_2 induced by acid attack, which does not mean, in any case, that the material contains CO_2.

The only way to identify mineralogical phases in a powdered mineral material is by X-ray diffraction, which is the only analytical technique that is sensitive to the crystalline character of minerals. For an accurate quantification of inhalable fractions, it advisable be necessary to perform a quantitative particle size selection (e.g. by aerosolization technique) in order to eliminate coarse fractions that could reduce the quantitative character of the X-ray diffraction analysis.

Standardization to 100 made it possible to know if no constituent element had been left out. Hence the expression “percentage by mass of oxides” in the chemical analysis.