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## Method for the determination of C3A in the clinker from cement analysis

Verfahren für die Bestimmung des C3A-Gehalts im  
Klinker aus der Zementanalyse

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**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## European foreword

This document (CEN/TR 17365:2019) has been prepared by Technical Committee CEN/TC 51 “Cement and building limes”, the secretariat of which is held by NBN.

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## 1 Scope

This document describes the analytical procedures used to determine the content of  $C_3A$  in the clinker starting from a chemical analysis on cement. The method can be applied to CEM type I and IV for the determination of the requirement of  $C_3A$ , as defined on EN 197-1.

This document describes two methods, traditional wet and XRF analysis (EN 196-2), which can be considered to be equivalent, in the scope of this CEN/TR 17365, for the determination of  $Al_2O_3$ ,  $Fe_2O_3$  and  $SO_3$ .

The same methods are described in EN 196-2, but for the scope of this document, the X-ray fluorescence (XRF) is the preferred method to be used for the determination of  $Al_2O_3$ ,  $Fe_2O_3$  and  $SO_3$ .

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 196-2, *Method of testing cement — Part 2: Chemical analysis of cement*

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

ISO 385, *Laboratory glassware — Burettes*

ISO 835, *Laboratory glassware — Graduated pipettes*

## 3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

## 4 Principle of the method

The principle of the method is based on the calculation of the amounts of  $Al_2O_3$  and  $Fe_2O_3$  that may be occurring in the clinker by the chemical analysis of cement corrected for the oxide fraction resulting from materials other than clinker.

Once  $Al_2O_3$  and  $Fe_2O_3$  values are obtained, the amount of  $C_3A$  in the clinker is calculated according to Bogue.

The following assumptions should be made to determine the  $Al_2O_3$  and  $Fe_2O_3$  amounts in the clinker:

- a) Any sulfate occurring in the cement is ascribable to  $CaSO_4 \cdot 2H_2O$ ; all determined  $CO_2$  is  $CaCO_3$ . Moreover, the  $Al_2O_3$  and  $Fe_2O_3$  input from minor additional constituents and calcium sulfate is assumed to be zero.
- b) The residue from the base-complexing agent treatment (BCR) is constituted by pozzolanic materials only (natural pozzolana, siliceous fly ash and microsilica) and the dissolution is selective and complete.