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Beproevingsmethoden voor cement - Deel 8: Hydratatiewarmte - Oplosmethode

Méthodes d'essai des ciments - Partie 8: Chaleur d'hydratation - Méthode par dissolution

Methods of testing cement - Part 8: Heat of hydration - Solution method

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Indice de classement: B 12

**Méthodes d'essai des ciments - Partie 8: Chaleur d'hydratation -
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La présente norme européenne EN 196-8:2010 a le statut d'une norme belge.

La présente norme européenne existe en trois versions officielles (allemand, anglais, français).

English Version

Methods of testing cement - Part 8: Heat of hydration - Solution method

Prüfverfahren für Zement - Teil 8: Hydrationswärme - Lösungsverfahren

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Foreword

This document (EN 196-8:2010) 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of an identical text or by endorsement, at the latest by September 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

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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).

This document supersedes EN 196-8:2003.

EN 196, *Methods of testing cement*, consists of 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*
- CEN/TR 196-4, *Methods of testing cement — Part 4: Quantitative determination of constituents*

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EN 196-8:2010 (E)

1 Scope

This European Standard describes a method of determining the heat of hydration of cements by means of solution calorimetry, also known as the solution method. The heat of hydration is expressed in joules per gram of cement.

This standard is applicable to cements and hydraulic binders whatever their chemical composition.

NOTE 1 Another procedure, called the semi-adiabatic method, is described in EN 196-9. Either procedure can be used independently.

NOTE 2 It has been demonstrated that the best correlation between the two methods is obtained at seven days for the solution method (EN 196-8) compared with 41 h for the semi-adiabatic method (EN 196-9).

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 197-1:2000, *Cement — Part 1: Composition, specifications and conformity criteria for common cements*

3 Principle

The method consists in measuring the heats of solution, in an acid mixture, of anhydrous cement and cement hydrated under standardized conditions for a predetermined period of time, e.g. seven days.

These standardized hydration conditions are as follows:

- water/cement ratio 0,40;
- use of neat cement paste;
- storage at constant temperature of $(20,0 \pm 0,2)$ °C during the whole hydration process.

The heat of hydration for each period, H_i , is obtained from the difference between the heat of solution of anhydrous cement, Q_a , and that of hydrated cement, Q_i .

4 Materials

4.1 Acid mixture

Analytical reagent quality acid mixture, obtained by adding 2,760 g of 40 % hydrofluoric acid (HF) for every 100,0 g of $(2,00 \pm 0,01)$ mol/l nitric acid (HNO_3), or 2,600 ml of hydrofluoric acid for every 100,0 ml of nitric acid.

WARNING — Hydrofluoric acid can cause painful skin burns which heal only with difficulty and precautions in handling this very corrosive substance should be strictly observed.

The quantity (mass or volume) of acid to be used, which is common to all tests, shall be measured to $\pm 0,2$ %.