

STN	Metódy skúšania cementu Časť 11: Stanovenie hydratačného tepla Izotermická vodivostná kalorimetrická metóda	STN EN 196-11 72 2100
------------	--	---

Methods of testing cement - Part 11: Heat of hydration - Isothermal Conduction Calorimetry method

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 04/19

Obsahuje: EN 196-11:2018

128457

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 196-11

December 2018

ICS 91.100.10

English Version

**Methods of testing cement - Part 11: Heat of hydration -
Isothermal Conduction Calorimetry method**

Méthodes d'essais des ciments - Partie 11: Chaleur
d'hydratation - Méthode par calorimétrie à conduction
isotherme

Prüfverfahren für Zement - Teil 11: Bestimmung der
Hydrationswärme von Zement durch isotherme
Wärmeflusskalorimetrie

This European Standard was approved by CEN on 24 September 2018.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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

Contents

Page

European foreword	3
1 Scope.....	4
2 Normative references.....	4
3 Terms and definitions	4
4 Apparatus	6
4.1 General.....	6
4.2 Principle.....	6
4.3 Thermostat.....	7
4.4 Calorimeter technical parameters.....	7
5 Calibration.....	8
5.1 General.....	8
5.2 Steady-state calibration.....	9
5.2.1 General.....	9
5.2.2 Calibration coefficient ε	10
5.2.3 Time constant τ	10
5.3 Pulse calibration	11
5.3.1 General.....	11
5.3.2 Time constant τ	12
5.4 Determination of the calorimeter parameters	12
5.5 Improvement of common calibration procedure	12
6 Sample.....	13
6.1 General.....	13
6.2 Test sample	13
6.3 Reference sample.....	13
7 Testing procedure	14
7.1 General.....	14
7.2 Method A - "External mixing"	14
7.3 Method B - "Internal mixing"	14
7.4 Measurement.....	15
7.5 Expression of results	15
7.6 Test result.....	16
7.7 Test report.....	16
8 Precision	17
8.1 Repeatability	17
8.2 Reproducibility.....	17

European foreword

This document (EN 196-11:2018) 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 June 2019, and conflicting national standards shall be withdrawn at the latest by September 2020.

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.

EN 196 consists of the following parts, under the general title *Methods of testing cement*:

- *Part 1: Determination of strength;*
- *Part 2: Chemical analysis of cement;*
- *Part 3: Determination of setting times and soundness;*
- *Part 4: Quantitative determination of constituents (CEN/TR 196-4);*
- *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.*

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 196-11:2018 (E)**1 Scope**

This document specifies the apparatus and procedure for determining the heat of hydration of cements and other hydraulic binders at different test ages by isothermal conduction calorimetry.

This test procedure is intended for measuring the heat of hydration of cement up to 7 days in order to obtain correspondence between Isothermal Conduction Calorimetry (ICC) and EN 196-8 and EN 196-9. Nevertheless this test duration may be critical for some apparatus, even if they can work properly at shorter test ages.

Contrary to EN 196-8 this method gives the heat of hydration continuously over the time. Additionally, the heat flow versus time is given.

2 Normative references

There are no normative references in this document.

koniec náhľadu – text ďalej pokračuje v platenej verzii STN