



BSI Standards Publication

Testing hardened concrete

Part 15: Adiabatic method for the determination of heat released by concrete during its hardening process

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National foreword

This British Standard is the UK implementation of EN 12390-15:2019.

The UK participation in its preparation was entrusted to Technical Committee B/517/1, Concrete production and testing.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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EUROPÄISCHE NORM

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English Version

Testing hardened concrete - Part 15: Adiabatic method for the determination of heat released by concrete during its hardening process

Essai pour béton durci - Partie 15 : Méthode
adiabatique de détermination de la chaleur dégagée
par le béton en cours de durcissement

Prüfung von Festbeton - Teil 15: Adiabatisches
Verfahren zur Bestimmung der Wärme, die während
des Erhärtungsprozesses von Beton freigesetzt wird

This European Standard was approved by CEN on 17 June 2019.

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.

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

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European foreword

This document (EN 12390-15:2019) has been prepared by Technical Committee CEN/TC 104 "Concrete and related products", the secretariat of which is held by SN.

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 January 2020, and conflicting national standards shall be withdrawn at the latest by January 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.

This standard is one of a series on testing concrete.

EN 12390, *Testing hardened concrete*, consists of the following parts:

- *Part 1: Shape, dimensions and other requirements of specimens and moulds*
- *Part 2: Making and curing specimens for strength tests*
- *Part 3: Compressive strength of test specimens*
- *Part 4: Compressive strength - Specification for testing machines*
- *Part 5: Flexural strength of test specimens*
- *Part 6: Tensile splitting strength of test specimens*
- *Part 7: Density of hardened concrete*
- *Part 8: Depth of penetration of water under pressure*
- *Part 10: Determination of the carbonation resistance of concrete at atmospheric levels of carbon dioxide*
- *Part 11: Testing hardened concrete. Determination of the chloride resistance of concrete, unidirectional diffusion*
- *Part 12: Determination of the potential carbonation resistance of concrete: Accelerated carbonation method (in preparation)*
- *Part 13: Determination of secant modulus of elasticity*
- *Part 14: Semi-adiabatic method for the determination of heat released by concrete during its hardening process*
- *Part 15: Adiabatic method for the determination of heat released by concrete during its hardening process*
- *Part 16: Determination of shrinkage of concrete (in preparation)*
- *Part 17: Determination of creep of concrete in compression (in preparation)*

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, Turkey and the United Kingdom.

1 Scope

This document specifies the procedure for the determination of heat released by concrete during its hardening process in adiabatic condition.

The test is suitable for specimens having a declared value of D of the coarsest fraction of aggregates actually used in the concrete (D_{\max}) not greater than 32 mm.

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 12350-1, *Testing fresh concrete — Part 1: Sampling*

EN 12390-2, *Testing hardened concrete — Part 2: Making and curing specimens for strength tests*

3 Terms, definitions, symbols and scripts

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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>

3.1.1

adiabatic equipment

equipment whose error of adiabatism, as defined in 3.1.2, is less than 0,05 K/h at least in the temperature range 20 °C to 70 °C, and the ratio between the heat capacity of calorimeter and the heat

capacity of the sample $\frac{C_{cal}}{C_{con}}$ is less or equal than 0,1

3.1.2

adiabatism error

α

rate of decrease in temperature (K/h) of a fully hydrated reference concrete sample

Note 1 to entry: A concrete sample can be considered to be fully hydrated when cured for 12 months in accordance with EN 12390-2.

3.1.3

intrinsic temperature rise

ΔT_c^*

temperature rise in concrete in the absence of heat transfer from the concrete sample to the surrounding environment