

Determination of the freeze-thaw resistance of autoclaved aerated concrete

ICS 91.100.30

National foreword

This British Standard is the UK implementation of EN 15304:2010. It supersedes BS EN 15304:2007 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/523, Prefabricated components of reinforced autoclaved aerated concrete and lightweight aggregate concrete with open structure.

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

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English Version

**Determination of the freeze-thaw resistance of autoclaved
aerated concrete**

Détermination de la résistance au gel/dégel du béton
cellulaire autoclavé

Bestimmung des Frost-Tau-Widerstandes von
dampfgehärtetem Porenbeton

This European Standard was approved by CEN on 23 January 2010.

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Foreword

This document (EN 15304:2010) has been prepared by Technical Committee CEN/TC 177 "Prefabricated reinforced components of autoclaved aerated concrete or lightweight aggregate concrete with open structure", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by September 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

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

This document supersedes EN 15304:2007.

The main changes with respect to EN 15304:2007 are listed below:

- a) the clause "Definitions, symbols and abbreviations" has been added;
- b) the normative references have been updated;
- c) tolerances have been added to improve the ease of application;
- d) the calculation of moisture content has been expanded;
- e) the requirements for the test report have been expanded;
- f) the determination of mass loss, calculation of dry density and calculation of moisture content have been clarified.

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This document specifies a method of determining the freeze-thaw resistance of autoclaved aerated concrete (AAC) manufactured according to EN 12602 or EN 771-4.

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 678, *Determination of the dry density of autoclaved aerated concrete*

EN 1353, *Determination of moisture content of autoclaved aerated concrete*

EN 12390-4, *Testing hardened concrete — Part 4: Compressive strength — Specification for testing machines*

3 Definitions, symbols and abbreviations

3.1 Superscripts and subscripts

- m main test specimen (superscript)
- r reference test specimen (superscript)
- i identification number of the test specimen (subscript)

3.2 Symbols

3.2.1 Symbols used in the main body of the standard

- $m_{i,0}^r$ measured initial moist mass of the reference test specimen i immediately after removal from polythene bag (or similar)
- $m_{i,n}^r$ measured moist mass of the reference test specimen i representing the state immediately after completion of n freeze-thaw cycles (should be equal to $m_{i,0}^r$)
- $m_{id,n}^r$ measured oven-dry mass of the reference test specimen i immediately after completion of n freeze-thaw cycles of the main test specimens
- $m_{i,0}^m$ measured initial moist mass of the main test specimen i immediately after removal from polythene bag (or similar) prior to commencing the freeze-thaw cycles
- $m_{i,n}^m$ moist mass of the main test specimen i immediately after completion of n freeze-thaw cycles
- $m_{id,0}^m$ equivalent oven-dry mass of the main test specimen i immediately after removal from the polythene bag (or similar)
- $m_{id,n}^m$ measured oven-dry mass of the main test specimen i immediately after completion of n freeze-thaw cycles

$\mu_{i,0}^r$	moisture content of the reference test specimen i immediately after removal from polythene bag (or similar)
$\mu_{i,0}^m$	moisture content of the main test specimen i immediately after removal from polythene bag or similar (assumed to be equal to $\mu_{i,0}^r$)
$\mu_{i,n}^m$	moisture content of the main test specimen i immediately after completion of n freeze-thaw cycles (at the end of the freeze-thaw test)
m_{iL}	loss in oven-dry mass of the main test specimen i after completion of n freeze-thaw cycles

3.2.2 Symbols specific to Annex A

$m_{i,fa}^r$	measured moist mass of the fragments of the saturated (see A.3.2.2) reference test specimen i immediately after the compression test
$m_{i,fd}^r$	measured oven-dry mass of the fragments of the saturated (see A.3.2.2) reference test specimen i tested on compression
$m_{i,n2}^m$	measured moist mass of the saturated (see A.3.2.2) main test specimen i after finalisation of the n freeze-thaw cycles and after water immersion, immediately before testing of compressive strength (if grinding is needed, before that)
$m_{i,fa}^m$	measured moist mass of the fragments of the saturated (see A.3.2.2) main test specimen i immediately after the compression test
$m_{i,fd}^m$	measured oven-dry mass of the fragments of the saturated (see A.3.2.2) main test specimen i tested on compression
$\mu_{i,na}^r$	calculated moisture content of the saturated (see A.3.2.2) reference test specimen i immediately after compression test (assumed to be equal to the moisture content directly before compression test)
$\mu_{i,na}^m$	calculated moisture content of the saturated (see A.3.2.2) main test specimen i after finalisation of the n freeze-thaw cycles, immediately after compression test
$f_{ci,n}^m$	individual value of the compressive strength of the main test specimen i after the specified number of cycles (n) and subsequent conditioning according to A.3.2.1 or A.3.2.2, in megapascals
$f_{ci,n}^r$	individual value of the compressive strength of the appropriate reference test specimen i , conditioned in the same manner (according to A.3.2.1 or A.3.2.2) and tested at the same time as the corresponding main test specimen, in megapascals
$f_{ci,rel}$	relative decrease of compressive strength of the main test specimen i as a percentage of the initial compressive strength