

Determination of the freeze-thaw resistance of autoclaved aerated concrete

The European Standard EN 15304:2007 has the status of a
British Standard

ICS 91.100.30

National foreword

This British Standard was published by BSI. It is the UK implementation of EN 15304:2007.

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.

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

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 July 2007

© BSI 2007

ISBN 978 0 580 54454 5

Amendments issued since publication

Amd. No.	Date	Comments

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 10 May 2007.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, 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 United Kingdom.



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents		Page
Foreword.....		3
1	Scope	4
2	Normative references	4
3	Principle	4
4	Apparatus	4
5	Test specimens	5
6	Testing procedure.....	6
7	Test results	8
8	Test report	9
Annex A (informative) Determination of the loss in mass and compressive strength		10
Annex B (informative) Flow chart of freeze-thaw test.....		13
Bibliography		15
Figures		
Figure 1 – Cutting scheme		6

Foreword

This document (EN 15304:2007) has been prepared by Technical Committee CEN/TC 177 “Prefabricated reinforced components of autoclaved aerated concrete or light-weight 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 December 2007, and conflicting national standards shall be withdrawn at the latest by December 2007.

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, 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 United Kingdom

1 Scope

This document specifies a method of determining the freeze-thaw resistance of autoclaved aerated concrete manufactured according to prEN 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 679:2005, *Determination of the compressive strength of autoclaved aerated concrete*

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

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

3 Principle

Cubic test specimens (two equal groups consisting of main test specimens and reference test specimens) are cut from products sampled from normal production, saturated in water for 48 h, removed and then placed in polythene bags or similar protecting against drying for 24 h to equilibrate.

The main test specimens are subjected to repeated freezing at $-15\text{ }^{\circ}\text{C}$ for at least 8 h followed by thawing in an environment of $> 95\%$ relative humidity and $20\text{ }^{\circ}\text{C}$ for at least 8 h. The reference test specimens are stored in a climatic chamber at $20\text{ }^{\circ}\text{C}$ in conditions that prevent drying of the AAC during storage.

After the specified number of freeze-thaw cycles (not less than 15), the mass loss of the main test specimens is determined. The dry density and moisture content is also determined on the reference test specimens. If the loss in compressive strength is also required to be determined, then Annex A should be followed.

NOTE Depending on the conditions at the place of use, the number of freeze-thaw cycles can be specified by national provisions.

4 Apparatus

- a) saw with rotating carborundum or diamond blade or similar equipment for cutting test specimens;
- b) balance, capable of determining the mass of the test specimens to an accuracy of $0,1\%$;
- c) callipers, capable of reading the dimensions of the test specimens to an accuracy of $0,1\text{ mm}$;
- d) container, to store the test specimens under water at $(20 \pm 2)\text{ }^{\circ}\text{C}$;
- e) feeler gauge, capable of measuring $0,1\text{ mm}$, (if required) $0,5\text{ mm}$ and 1 mm ;
- f) conditioned room or cabinet for thawing of the main test specimens able to maintain a relative humidity $> 95\%$ at $(20 \pm 2)\text{ }^{\circ}\text{C}$;
- g) storage room for reference test specimens able to maintain a relative humidity $> 95\%$ at $(20 \pm 5)\text{ }^{\circ}\text{C}$;