

Determination of the drying shrinkage of autoclaved aerated concrete

Determination of the drying shrinkage of autoclaved
aerated concrete

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 680:2006 sisaldab Euroopa standardi EN 680:2005 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 27.02.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 680:2006 consists of the English text of the European standard EN 680:2005.</p> <p>This document is endorsed on 27.02.2006 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
--	---

<p>Käsitlusala: This European Standard specifies a method for measuring the relative length changes due to drying (drying shrinkage) of autoclaved aerated concrete manufactured according to EN 771-4 or prEN 12602.</p>	<p>Scope: This European Standard specifies a method for measuring the relative length changes due to drying (drying shrinkage) of autoclaved aerated concrete manufactured according to EN 771-4 or prEN 12602.</p>
--	--

ICS 91.100.30

Võtmesõnad:

English Version

Determination of the drying shrinkage of autoclaved aerated concrete

Détermination du retrait de séchage du béton cellulaire
autoclavé

Bestimmung des Schwindens von dampfgehärtetem
Porenbeton

This European Standard was approved by CEN on 26 October 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, 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
5.1 Sample	5
5.2 Shape and size of the test specimens	5
5.3 Number of test specimens	5
5.4 Preparation of test specimens	6
5.5 Measurement of dimensions of test specimens and determination of their volume	6
5.6 Conditioning of test specimens	7
6 Testing procedure	7
6.1 Drying storage in a climate at $(20 \pm 2) ^\circ\text{C}$ and $(45 \pm 5) \%$ relative humidity and determination of length changes and variations of mass	7
6.2 Drying of test specimens at $(105 \pm 5) ^\circ\text{C}$	7
7 Test results	8
7.1 Calculation of relative length change	8
7.2 Calculation of moisture content	8
7.3 Determination of the conventional reference value of drying shrinkage	8
7.4 Determination of the total value of drying shrinkage	9
7.5 Calculation of the dry density	9
8 Test report	9

Foreword

This European Standard (EN 680:2005) 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 June 2006, and conflicting national standards shall be withdrawn at the latest by June 2006.

This document supersedes EN 680:1993.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This European Standard specifies a method for measuring the relative length changes due to drying (drying shrinkage) of autoclaved aerated concrete manufactured according to EN 771-4 or prEN 12602. The shrinkage characteristics determined according to this method are the following: The conventional reference value of drying shrinkage is the relative length change between two specified moisture contents. The total value of drying shrinkage is the relative length change due to drying from the saturated state until reaching constant length under specified climatic conditions. Other drying shrinkage values may be determined between other parameters to meet other specified national requirements.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. 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 dry density of autoclaved aerated concrete*

EN 771-4, *Specification for masonry units — Part 4: Autoclaved aerated concrete masonry units*

prEN 12602, *Prefabricated reinforced components of autoclaved aerated concrete*

3 Principle

Prismatic test specimens are cut from products from new production. For conditioning they are saturated in water at $(20 \pm 2)^\circ\text{C}$ for a period of at least 72 h and then stored in sealed plastic for a period of (24 ± 2) h. Subsequently they are dried in air at $(20 \pm 2)^\circ\text{C}$ and $(45 \pm 5)\%$ relative humidity (drying period under reference shrinkage storage conditions) until constant length is reached.

At the end of the conditioning period and in suitable time intervals during the drying period the length changes and the mass of the test specimens are determined.

Finally, the test specimens are dried to constant mass at $(105 \pm 5)^\circ\text{C}$ in order to determine the dry density of the autoclaved aerated concrete and to enable the calculation of the moisture content of the test specimens at each measuring date from the difference between the mass in the actual moist state and the dry mass.

A graph relative length change versus moisture content is plotted, and from the curve the conventional reference value of drying shrinkage, $\epsilon_{\text{CS,ref}}$, is determined as the relative length change between the two moisture contents 30 % by mass and 6 % by mass.

Where the total value of drying shrinkage is required, the relative length change of the test specimens from the end of the conditioning period until reaching constant length under reference shrinkage storage conditions at $(20 \pm 2)^\circ\text{C}$ and $(45 \pm 5)\%$ relative humidity shall also be measured.

4 Apparatus

- saw with rotating carborundum or diamond blade or other equipment for cutting test specimens;
- balance, capable of determining the mass of the test specimens to an accuracy of 0,1 %;
- callipers, capable of reading the dimensions of the test specimens to an accuracy of 0,1 mm;
- container, for immersion of the test specimens under water;