SLOVENSKI STANDARD
SIST ENV 1170-8:2001

01-april-2001

Nadomeģ a:
SIST EN 1170-8:2009

Montaģni betonski izdelki - Preskusna metoda za steklocementni kompozit - 8. del: Cikliļ ni vremenski preskus

Test method for glass-fibre reinforced cement - Part 8: Cyclic weathering type test

Prüfverfahren für Glasfaserbeton - Teil 8: Prüfung der Dauerhaftigkeit im Klimazyklus-Test

Méthode d'essai des composites ciment-verre - Partie 8: Essai type de durabilité par cycles

Ta slovenski standard je istoveten z: **ENV 1170-8:1996**

ICS:

91.100.30	Beton in betonski izdelki	Concrete and concrete products

SIST ENV 1170-8:2001 **en**

EUROPEAN PRESTANDARD **ENV 1170-8**

PRÉNORME EUROPÉENNE

EUROPÄISCHE VORNORM August 1996

ICS 91.100.30

Descriptors: composite materials, cements, glass, durability, tests, cyclic tests, ageing tests

English version

Test method for glass-fibre reinforced cement - Part 8: Cyclic weathering type test

Méthode d'essai des composites ciment-verre - Partie 8: Essai type de durabilité par cycles

Prüfverfahren für Glasfaserbeton - Teil 8: Prüfung der Dauerhaftigkeit im Klimazyklus-Test

This European Prestandard (ENV) was approved by CEN on 1994-09-19 as a prospective standard for provisional application. The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into an European Standard (EN).

CEN members are required to announce the existance of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart,36 B-1050 Brussels

Foreword

This European Prestandard has been prepared by Technical Committee CEN/TC 229 "Precast concrete products", the secretariat of which is held by AFNOR.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this European Prestandard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

0 Introduction

Several methods exist for evaluating the durability of glass-fibre reinforced cement :

- immersion test in hot water for 84 days at 50 °C or 50 days at 50 °C, or even 14 days at 80 °C ;

- cyclic wetting and drying test.

This latter test has been used in this European Prestandard, as, on the one hand, it permits the alkali resistance of the glass fibre used to be verified and, on the other hand, it incorporates the main ageing parameters to which a glass-fibre reinforced cement will be subjected under natural exposure conditions : humidity, drying, temperature.

However, it should be noted that it is always necessary to accumulate natural exposure data over several years before artificial ageing test data can be used to calculate in advance the ultimate life of the material.

1 Scope

This European Prestandard specifies a test method for identifying, for a given GRC formula (components and their ratio in the formula), the effect of environmental factors such as water and temperature on the change of mechanical characteristics.

2 Normative references

This European Prestandard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Prestandard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 1170-5[1)]	Test method for glass-fibre reinforced cement - Part 5 : Measurement of bending strength - "Complete bending test method"

3 Symbols and abbreviations

3.1 Symbols

L estimate of the ratio : $\frac{\text{"after ageing" performance}}{\text{"control" performance}}$;

L_C lower limit of the one-sided 95 % confidence interval of the mean of the analyzed parameter after ageing ;

L_R lower limit of the one-sided 95 % confidence interval of the mean of the reference sample analyzed parameter ;

---

1) In preparation

M_C mean of the individual values of σ_{LOP}, ε_{LOP}, σ_{MOR} and ε_{MOR} obtained from the sample evaluated after 50 ageing cycles ;

M_R mean of the individual values of ε_{LOP}, σ_{MOR} and ε_{MOR} obtained from the reference sample ;

S_C standard deviation of the individual values of ε_{LOP}, σ_{MOR} and ε_{MOR} obtained from the sample evaluated after 50 ageing cycles ;

S_R standard deviation of the individual values of ε_{LOP}, σ_{MOR} and ε_{MOR} obtained from the reference sample ;

ε_{LOP} deformation at the limit of proportionality ;

ε_{MOR} deformation at the limit of rupture ;

σ_{LOP} stress at the limit of proportionality, in megapascals ;

σ_{MOR} stress at the limit of rupture, in megapascals.

3.2 Abbreviation

GRC : Glass-fibre reinforced cement.

4 Apparatus

The apparatus comprises :

a) an automatic or manually operated climatic chamber where :

- ambient temperatures of (70 ± 5) °C and (20 ± 2) °C can be attained and maintained ;
- at least eight test pieces can be stored immersed in water, kept at (20 ± 2) °C ;
- a ventilation system capable of providing an air flow of (1 ± 0,1) m/s or of renewing air (30 ± 3) times per hour.

b) the equipment necessary to carry out the complete bending test as described in EN 1170-5.

All the equipment is located in a laboratory maintained at a temperature (20 ± 3) °C and a relative humidity of (60 ± 5) %.

5 Procedure

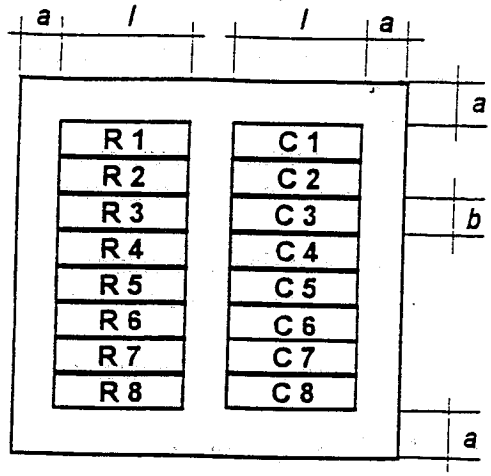
5.1 Samples

A total of (2 x 8) test pieces are taken as shown in figure 1 :

- eight test pieces comprising the reference sample "R" ;

- eight test pieces comprising the sample "C" subjected to the ageing cycles.

NOTE : See EN 1170-5 for taking the test pieces and determining their length (*l*).



a ≥ 50 mm
b = 50 mm ± 2 mm
l : see EN 1170-5

Figure 1 : Position and identification of the test pieces

5.2 Test method

5.2.1 Description

This is the complete bending test as specified in EN 1170-5. The odd numbered test pieces (C1, R1, C3, R3 ...) are placed with their mould face supported on the bottom rollers and the even numbered test pieces (C2, R2, C4, R4 ...) with their mould face in contact with the top rollers.

5.2.2 Storage

5.2.2.1 "R" sample

The complete bending test of the test pieces of the "R" sample is carried out at (28 ± 0,5) days after storage as specified in EN 1170-5.

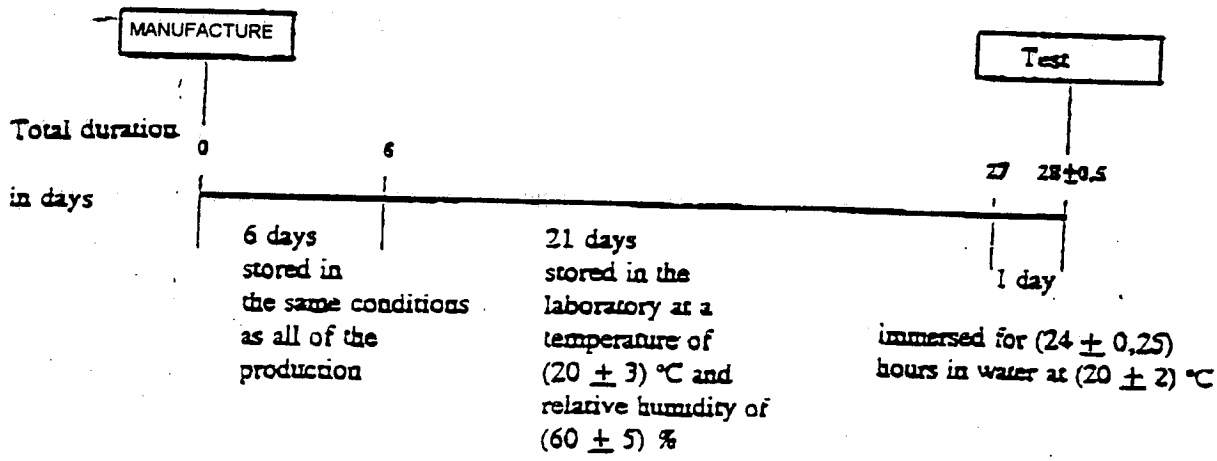


Figure 2 : Schematic diagram showing the storage phases of the "R" sample

5.2.2.2 "C" sample

The bending test on the test pieces of the "C" sample is carried out at (128 ± 1) days after storage for the first 27 days in accordance with EN 1170-5, then subjected to 50 ageing cycles of (48 ± 0,5) hours and finally immersed for (24 ± 0,25) hours in water at (20 ± 2) °C (see figure 3).

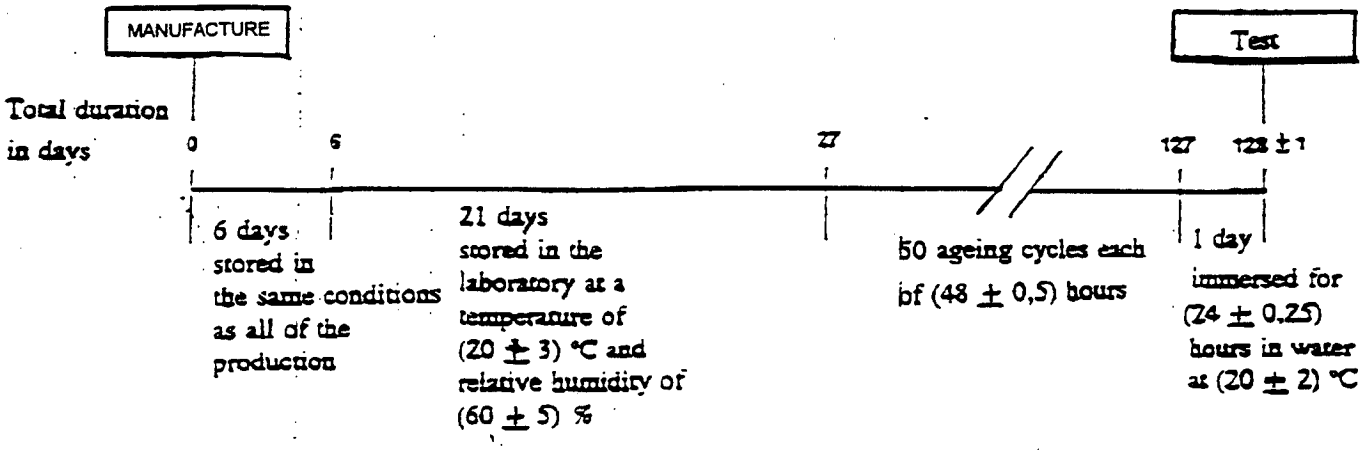


Figure 3 : Schematic diagram of the storage phases of the "C" sample

Each ageing cycle comprises the following four successive phases :

- first phase : immersion for (24 ± 0,25) hours in water at (20 ± 2) °C ;

- second phase : (30 ± 5) minutes of forced drying at a temperature of (70 ± 5) °C in an air flow of (1 ± 0,1) m/s or with the air being renewed (30 ± 3) times per hour ;

- third phase : (23 ± 0,25) hours in hot air at (70 ± 5) °C ;

- fourth phase : (30 ± 5) minutes of forced cooling at a temperature of (20 ± 2) °C in an air flow of (1 ± 0,1) m/s or with the air being renewed (30 ± 3) times per hour.

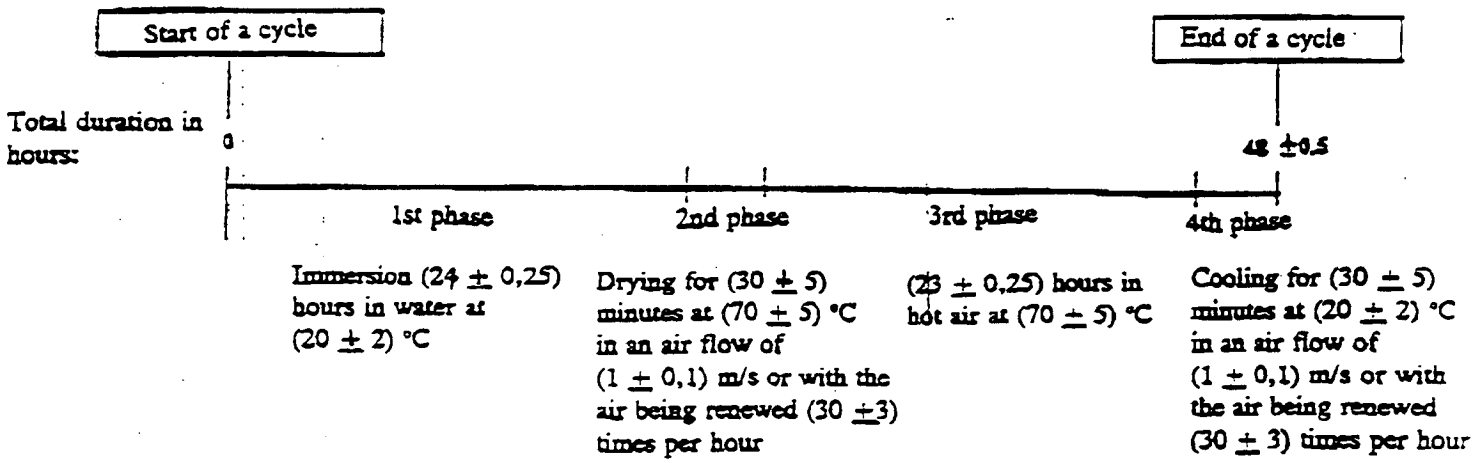


Figure 4 : Detailed diagram of an ageing cycle for the "C" sample