

EUROPEAN STANDARD

EN 14223

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English Version

**Flexible sheets for waterproofing - Waterproofing of concrete
bridge decks and other concrete surfaces trafficable by vehicles
- Determination of water absorption**

Feuilles souples d'étanchéité - Etanchéité des ponts et
autres surfaces en béton circulables par les véhicules -
Détermination de l'absorption d'eau

Abdichtungsbahnen - Abdichtungen für Betonbrücken und
andere Verkehrsflächen auf Beton - Bestimmung der
Wasserabsorption

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.

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Contents

Page

Foreword.....	3
1 Scope.....	4
2 Normative references	4
3 Terms and definitions	4
4 Test method	4
4.1 Principle	4
4.2 Apparatus and materials.....	4
4.3 Preparation of test specimens.....	5
4.4 Drying and conditioning of the test specimens	5
4.5 Procedure.....	5
4.6 Expression of results	5
4.6.1 Calculation	5
4.6.2 Precision	6
4.7 Test report.....	6

Foreword

This document (EN 14223:2005) has been prepared by Technical Committee CEN/TC 254 "Flexible sheets for waterproofing", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by June 2006, and conflicting national standards shall be withdrawn at the latest by June 2006.

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 test method for the determination of water absorption in reinforced bitumen sheets which could influence the functional behaviour of these sheets.

NOTE It is primarily the reinforcement's ability to absorb water which is examined by this test.

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 13416, *Flexible sheets for waterproofing — Bitumen, plastic and rubber sheets for roof waterproofing — Rules for sampling*

prEN 14695, *Flexible sheets for waterproofing — Reinforced bitumen sheets for waterproofing of concrete bridge decks and other concrete surfaces trafficable by vehicles — Definitions and characteristics*

ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 13416, prEN 14695 and the following apply.

3.1

water absorption

increase in mass of test specimen after immersion in water expressed as a percentage

4 Test method

4.1 Principle

The water absorption of the reinforced bitumen sheet is measured after the test specimen has been immersed in water for a defined period and determined as the increase in mass of the test specimen.

4.2 Apparatus and materials

- a) *Balance*, capable of measurements to the nearest 0,1 g.
- b) *Water bath*, capable of maintaining a temperature of (23 ± 3) °C.
- c) *Chamber (or laboratory)*, capable of maintaining a temperature of (23 ± 3) °C and (50 ± 5) % RH.
- d) *Distilled water*, or de-ionized water.
- e) *Equipment for hanging test specimens*, without damaging the specimens.
- f) *Steel wire brush*, medium hard.

- g) *Oven with circulating air*, (without fresh air supply) and capable of maintaining a temperature of $(50 \pm 3) ^\circ\text{C}$.

4.3 Preparation of test specimens

Take samples in accordance with EN 13416. The test specimens shall be taken at random and at least 1 m from the end of the roll and 100 mm from the edge of the sheet.

Five test specimens with dimensions of (200 ± 1) mm x (200 ± 1) mm shall be prepared for testing. If the reinforced bitumen sheet has a surfacing of fine mineral or granules, the surface shall be brushed gently with a steel wire brush to remove any loose mineral or granule. Should problems with heterogeneous results occur (4.6.2) due to surfacing of fine mineral or granules, test specimens may be taken from parts free from such surfacing. The test specimen area shall be the same as described above.

4.4 Drying and conditioning of the test specimens

Dry the test specimens for $24 \text{ h} \pm 30 \text{ min}$ at $(50 \pm 3)^\circ\text{C}$ and then condition them for $1 \text{ h} \pm 5 \text{ min}$ at $(23 \pm 3)^\circ\text{C}$ and $(50 \pm 5) \% \text{ RH}$ before testing. During drying and conditioning the test specimens are placed hanging vertically with a space of at least 20 mm between test specimens.

4.5 Procedure

4.5.1 Weigh the test specimen (m_1) and then immerse it in water for $28 \text{ days} \pm 4 \text{ h}$ at $(23 \pm 3)^\circ\text{C}$. The test specimen shall be placed hanging vertically in the water with a space of at least 20 mm between test specimens. The entire area of the test specimen shall be covered with water during the entire test period.

4.5.2 After the 28 days of immersion in water, air dry the test specimen for $5 \text{ h} \pm 5 \text{ min}$ at $(23 \pm 3)^\circ\text{C}$ and $(50 \pm 5) \% \text{ RH}$. During air drying the test specimen shall be placed hanging vertically with a space of at least 20 mm between the test specimens. The set of five test specimens shall be placed in the laboratory with a free space of air surrounding it (at least 0.5 m on each side).

4.5.3 Reweigh the test specimen (m_2).

4.6 Expression of results

4.6.1 Calculation

The water absorption w for each test specimen (expressed as a percentage by mass) shall be calculated using equation (1)

$$w = \frac{m_2 - m_1}{m_1} 100 \quad (1)$$

where:

m_1 is the mass of the test specimen after drying and conditioning;

m_2 is the mass of the test specimen after immersion in water for 28 days and drying for 5 h.

The water absorption mean value of the five test specimens shall be calculated and recorded.

4.6.2 Precision

The repeatability r and the reproducibility R is determined by:

$$r = 0,0995w + 0,0766$$

$$R = 0,154w + 0,1048$$

where w is the water absorption, in % by mass.

Based on the given repeatability, the test shall be repeated if the difference between w_{max} and w_{min} is higher than $0,3098w_{mean} + 0,2385$.

NOTE Precision data are based on a ring test performed in accordance with ISO 5725-2 for water absorption values between 0,2 % and 5,1 % by mass.

4.7 Test report

The test report shall include at least the following information:

- a) all details necessary to identify the product tested;
- b) reference to this European Standard and any deviation from it;
- c) information about sampling, preparation, drying and conditioning of test specimens in accordance with 4.3 and 4.4;
- d) information about the procedure in accordance with 4.5;
- e) test results in accordance with 4.6;
- f) date of tests.