



SLOVENSKI STANDARD
SIST EN 14415:2004
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Geosynthetic barriers - Test method for determining the resistance to leaching

Geosynthetische Dichtungsbahnen - Prüfverfahren zur Bestimmung der Beständigkeit gegen Auslaugen

Géomembranes, géosynthétiques bentonitiques - Méthode d'essai pour la détermination de la résistance a la lixiviation (standards.iteh.ai)

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59.080.70 Geotekstilije Geotextiles

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EUROPEAN STANDARD
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Geosynthetic barriers - Test method for determining the resistance to leaching

Barrières géosynthétiques - Méthode d'essai pour la détermination de la résistance à la lixiviation

Geosynthetische Dichtungsbahnen - Prüfverfahren zur Bestimmung der Beständigkeit gegen Auslaugen

This European Standard was approved by CEN on 2 February 2004.

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.

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Foreword

This document (EN 14415:2004) has been prepared by Technical Committee CEN/TC 189, "Geosynthetics", the secretariat of which is held by IBN.

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of an identical text or by endorsement, at the latest by November 2004, and conflicting national standards shall be withdrawn at the latest by November 2004.

This document includes a Bibliography.

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.

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EN 14415:2004 (E)

Introduction

This European Standard defines a method for testing the behaviour geosynthetic barriers in hot water, aqueous alkaline liquids and organic alcohols, with respect to leaching, visible changes, and tensile properties. Leaching of stabilizers can accelerate the oxidation of the geosynthetic barrier.

The standard does not purport to address all of the safety problems, if any, associated with its use.

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1 Scope

This European Standard describes a method of testing the resistance to leaching of polymeric or bituminous geosynthetic barriers, and the polymeric component of geosynthetic clay barriers, in hot water (method A), aqueous alkaline liquids (method B) and organic alcohols (method C).

2 Normative References

This European Standard 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 Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN ISO 291	<i>Plastics - Standard atmospheres for conditioning and testing (ISO 291:1997)</i>
EN ISO 527-1	<i>Plastics - Determination of tensile properties - Part 1: General principles (ISO 527-1:1993 including Corr 1:1994)</i>
EN ISO 527-3	<i>Plastics - Determination of tensile properties - Part 3: Test conditions for films and sheets (ISO 527-3:1995)</i>
prEN ISO 10318:2000	<i>Geosynthetics - Geotextiles, geotextile-related products, geomembranes and geosynthetic clay liners - Terms and their definitions (ISO/DIS 10318:2000)</i>
EN 12226:2000	<i>Geotextiles and geotextile-related products-General tests for evaluation following durability testing</i>
EN 14030	<i>Geotextiles and geotextile-related products - Screening test method for determining the resistance to acid and alkaline liquids (ISO/TR 12960:1998, modified)</i>

3 Terms and Definitions

<https://standards.iteh.ai/catalog/standards/sist/806d05ca-6726-4595-b486-91aba31f58a9/sist-en-14415-2004>

For the purposes of this European Standard, the terms and definitions given in prEN ISO 10318:2000 apply.

4 Principle

A sample of geosynthetic barrier is placed in the test liquid for 56 days. Subsequently the sample is recovered from the liquid and changes in properties (mass change, mechanical and visible) are measured in accordance with EN ISO 527.

5 Reagents

Following reagents are used:

- Distilled or de-ionized water;
- Saturated Ca(OH)₂ in accordance with EN 14030;
- A mixture of:
 - 30 volume-% methanol;
 - 30 volume-% 2-propanol (isopropanol);
 - 40 volume-% 1,2-ethanediol (glycol).

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6 Apparatus

6.1 Analytical balance

A balance with a minimum measurement range of 200 g and a precision of at least 0,01 g.

6.2 Conditioned room

A room with an atmosphere controlled to a temperature of (20 ± 2) °C and a relative humidity of (65 ± 5) % according to EN ISO 291.

6.3 Liquid bath

A recipient with a volume of at least one litre per sample, comprising:

- an exposure tank made of inert, non-corrosive material, impermeable to the solution being used;
- a cover to prevent the intrusion of light;
- a stirring device to maintain the homogeneity of solvent, solutes and temperature;
- a system for maintaining the liquid at (50 ± 2) °C; and capable of being sealed with a chemically resistant material in order to prevent loss of volatile components of interest.

Unless otherwise specified, agreed upon, or required, provisions shall be made for maintaining ambient atmospheric pressure in the tank.

6.4 Drying chamber

A chamber with circulating air of (50 ± 2) °C for drying the samples.

6.5 Desiccator

A desiccator and desiccating agents (silica gel or calcium chloride).

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7 Sampling

7.1 Geosynthetic clay barriers

Sampling of geosynthetic clay barriers shall be done in accordance with EN 12226. The bentonite shall be removed from the geosynthetic clay barrier with the aid of compressed air, by washing, or by any other appropriate method. Take one group of test specimens and one group of control specimens.

7.2 Polymeric and bituminous geosynthetic barriers

A minimum of three samples of polymeric and bituminous geosynthetic barrier (200 mm × 200 mm) shall be taken. Take one group of test samples and one group of control samples. Specimens for tensile testing to EN ISO 527-3 shall be cut after exposure.

8 Procedure

8.1 Methods

This test can be performed using three different leaching environments:

- Method A: leaching by hot water;

- Method B: leaching by aqueous alkaline liquids;
- Method C: leaching by organic alcohols.

8.2 Test conditions

The test shall be performed in a room with a controlled atmosphere, according to EN ISO 291: a temperature of (20 ± 2) °C and a relative humidity of (65 ± 5) %.

8.3 Determination of the dry mass before testing

Store the samples for 24 h in the drying chamber at a temperature of (50 ± 2) °C. Subsequently cool the samples in the desiccator for at least 24 h or until they attain the temperature of the conditioning room.

Immediately after removing the samples from the desiccator, determine the mass (M_1) of the samples with a precision of 0,01 g.

8.4 Procedure for control specimens

8.4.1 Conditioning

The control specimens shall be conditioned in accordance with 8.2 and shall be tested at the same time as the immersed specimens to avoid ageing of the specimens (in particular for bituminous materials).

8.4.2 Geosynthetic clay barriers

Measure the tensile strength and elongation at break of the control specimens in accordance with EN 12226, but with elongation at break replacing strain at maximum load (see EN 12226:2000, 6.2).

8.4.3 Polymeric and bituminous geosynthetic barriers

Prepare specimens in accordance with EN ISO 527-3 (specimen type 5) and measure the elongation at break in accordance with EN ISO 527-1. Determine the mean elongation at break.

8.5 Procedure for test specimens

8.5.1 Immersion in liquid

Weigh the samples and place them immediately in the holder such that each sample shall be separated by at least 10 mm from all other samples and from the tank wall. Add the liquid and ensure that it covers the samples completely. Ballast the samples if necessary to prevent them from floating. Only samples based on the same material shall be placed in the same liquid bath.

Keep the test temperature of the liquid (method A, method B and method C) constant at (50 ± 2) °C. Renew the volume of the liquid completely at least every 12 to 14 days. Renewal shall be done within 30 min. During the whole test, the test liquid shall be stirred continuously.

After 56 days immersion remove the samples from the bath, rinse them with de-ionized water. Subsequently, place the samples in the drying chamber with circulating air at a temperature of (50 ± 2) °C.

After 24 h of drying, cool the samples and weigh them for the first time. Next, place the samples in the conditioning room for 24 h, cool them and weigh them for the second time. If the mass of the sample determined the second time, deviates by less than 0,20 % from the mass determined the first time, proceed to visual inspection and measurement of strength (see 8.6). If not, place the sample in the drying room for a further 24 h, cool and weigh it again until the difference between the last two drying steps is less than 0,20 %. This mass is denoted M_2 .

The samples shall not be placed in the drying room for more than 96 h. If after 96 h, the mass of the samples has not reached a constant value, the last mass of the samples shall be included in the test report.