SLOVENSKI STANDARD
oSIST prEN 12447:2020

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Geotekstilije in geotekstilijam sorodni izdelki - Presejalna preskusna metoda za ugotavljanje odpornosti proti hidrolizi v vodi

Geotextiles and geotextile-related products - Screening test method for determining the resistance to hydrolysis in water

Geotextilien und geotextilverwandte Produkte - Auswahlprüfverfahren zur Bestimmung der Hydrolysebeständigkeit in Wasser

Géotextiles et produits apparentés - Méthode d'essai sélective pour la détermination de la résistance à l'hydrolyse dans l'eau

Ta slovenski standard je istoveten z: **prEN 12447**

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59.080.70	Geotekstilije	Geotextiles

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English Version

Geotextiles and geotextile-related products - Screening test method for determining the resistance to hydrolysis in water

Géotextiles et produits apparentés - Méthode d'essai sélective pour la détermination de la résistance à l'hydrolyse dans l'eau

Geotextilien und geotextilverwandte Produkte - Auswahlprüfverfahren zur Bestimmung der Hydrolysebeständigkeit in Wasser

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 12447:2020) has been prepared by Technical Committee CEN/TC 189 “Geosynthetics”, the secretariat of which is held by NBN.

This document is currently submitted as Enquiry.

This document will supersede EN 12447:2001.

In comparison with the previous edition, the following technical modifications have been made:

— test temperature has been reduced;

— the exposure of the control specimen has been extended to 6 h;

— table with test durations has been added.

Introduction

This document describes a screening test method to establish a minimum acceptance level of resistance of geotextiles and geotextile-related products to soil moisture.

In certain polymers moisture leads to hydrolysis throughout the thickness of the fibre (internal hydrolysis) but the rate of degradation is such that over short periods it is only measurable at elevated temperatures, e.g. by immersion in hot water.

1 Scope

This document specifies a screening test method for determining the resistance of geotextiles and geotextile-related products to hydrolysis by exposing test specimens to water at elevated temperatures, followed by an evaluation of the changes in properties resulting from such exposure. It is intended as a means of establishing a minimum acceptable level of durability.

The test is applicable to any geotextile and geotextile-related product susceptible to hydrolysis, in particular polyester and polyamide based materials, and in addition to the yarns from which these geotextiles are made.

This method is not intended for determining the resistance of geotextiles to hydrolysis under highly acid or alkaline conditions.

NOTE Performance tests to predict long-term lifetime or to compare products of different polymers or of similar polymers with differing structures can be based on the same method but with a wider range of temperatures and durations.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 12226, *Geosynthetics — General tests for evaluation following durability testing*

EN ISO 2062, *Textiles — Yarns from packages — Determination of single-end breaking force and elongation at break using constant rate of extension (CRE) tester (ISO 2062)*

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696)*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

4 Principle

Both test and control specimens are immersed in hot water for specified durations and at a specified temperature. The properties of the specimens are determined after immersion.

Both, the machine and cross machine direction shall be tested unless otherwise agreed (e.g. if the machine and cross machine direction uses the same size, raw material, stabilizers). For nonwovens only one direction has to be tested.

Reinforcing materials shall be tested without the coating and manufacturers shall ensure that the degradation of the coating will not attack or have any negative influence on the degradation of the yarns.

5 Water

Use deionised water according to EN ISO 3696, class 3.

6 Safety precautions

Refer to national safety regulations.

7 Apparatus

7.1 Container

The container shall be made of a material which is inert under the conditions of test such as stainless steel or borosilicate glass.

The total volume of the test specimens shall not exceed 10 % of the free space in the container. The test specimens shall be suspended free of significant load and shall be exposed to the test medium on both sides.

The container shall be provided with a means of heating and controlling the temperature to (80 ± 1) °C and a separate means of measuring the temperature.

NOTE Experience has shown that some types of glass are susceptible to hydrolysis. It is therefore essential to monitor the pH.

7.2 Thermometer

To measure the temperature in the container.

7.3 Tubes

Made of chemically inert material, e.g. borosilicate glass tubes of 60 mm external diameter, for winding yarn specimens.

8 Specimens

8.1 Size and shape

Prepare specimens to the size and shape specified in EN 12226. If the requirements of EN 12226 cannot be met due to container capacity then the relevant components (such as yarns or the components of a geocomposite) should be tested individually.

8.2 Number of specimens

Prepare enough specimens to provide a minimum of five test specimens and five control specimens.

It is recommended to expose additional specimens in case an extra mechanical test is required (see Clause 9).

9 Procedure

Deionised water as specified in Clause 4 shall always be used in the tests.

NOTE The quality of the water used as hydrolysing agent in this test is important for the reproducibility of the test results.

Expose the test specimens, free of significant load, on both sides to the test medium.

The test temperature shall be (80 ± 1) °C.

Test yarns as strands or wind them loosely on a tube, e.g. glass (see 7.3). Do not overwind, and separate the yarns by at least one diameter. Wind the control specimens in the same way.

Because of the possible occurrence of shrinkage during the test, the control specimen and the test specimen can be tested with a fixing of the specimen without pre-strength.

The ratio between the mass of water and the mass of the test specimens shall be at least 30 : 1. Cover the specimens completely with water. Do not treat materials differing in chemical composition in the same enclosure.

It is essential that pH is monitored at least once a week. If the pH exceeds 8, measured at room temperature, the water should be replaced.

The following Table 1 shows the test duration for service life of geosynthetics in natural soil with $4 \leq pH \leq 9$ and a soil temperature ≤ 25 °C:

Table 1 — Test duration for service life of geosynthetics in natural soil

Test duration	Services life
28 days	25 years
56 days	50 years
112 days	100 years

The control specimens shall be exposed to the same environment for 6 hours and then removed and stored.

10 Determination of changes in properties

The test and control specimens shall be conditioned for at least 16 h at (20 ± 2) °C and (65 ± 5) % relative humidity before evaluation of the desired properties. For the method of test refer to EN 12226.

Exposed and control yarns shall be tested in accordance with EN ISO 2062 and the results evaluated according to EN 12226.

If the mechanical test on one of the specimens is invalid (see EN 12226), a further specimen shall be tested in its place.

11 Test report

The test report shall include the following information:

a) a reference to this document, i.e. EN 12447;

b) a description of the material;

c) the procedure and conditions used;

d) changes in maximum tensile strength as defined in EN 12226;

e) date of test;

f) any deviation from this document or other factors that may influence the result of this test.

Bibliography

[1] EN 13249, *Geotextiles and geotextile-related products — Characteristics required for use in the construction of roads and other trafficked areas (excluding railways and asphalt inclusion)*

[2] EN ISO 5077, *Textiles — Determination of dimensional change in washing and drying (ISO 5077)*

[3] EN ISO 10318-1, *Geosynthetics — Part 1: Terms and definitions (ISO 10318-1)*