



SLOVENSKI STANDARD
SIST EN 14030:2002

01-junij-2002

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SIST ENV ISO 12960:1999

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Geotextiles and geotextile-related products - Screening test method for determining the resistance to acid and alkaline liquids (ISO/TR 12960:1998, modified)

Geotextilien und geotextilverwandte Produkte - Auswahlprüfverfahren zur Bestimmung der Beständigkeit gegen Säure und alkalische Flüssigkeiten (ISO/TR 12960:1998, modifiziert)

Géotextiles et produits apparentés aux géotextiles - Méthode d'essai sélective pour la détermination de la résistance aux liquides acides et alcalins (ISO/TR 12960:1998, modifié)

Ta slovenski standard je istoveten z: EN 14030:2001

ICS:

59.080.70 Geotekstilije Geotextiles

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EUROPEAN STANDARD

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Geotextiles and geotextile-related products - Screening test method for determining the resistance to acid and alkaline liquids (ISO/TR 12960:1998, modified)

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This European Standard was approved by CEN on 29 September 2001.

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 Management Centre 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, 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

EN 14030:2001 (E)

Foreword

This European Standard 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 May 2002, and conflicting national standards shall be withdrawn at the latest by May 2002.

This European Standard supersedes ENV ISO 12960:1998.

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

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Introduction

In nearly all applications geotextiles and geotextile-related products (geotextile products) may be in contact with aqueous solutions of acids, bases or dissolved oxygen. The resistance of geotextile products to these chemicals depends on the one hand on polymer formulation, processing, textile structure and the presence of existing damage and on the other hand on the composition of the liquid and in situ conditions such as temperature, pressure and the presence of further mechanical stress.

It is the purpose of this standard to provide a method of screening (index testing) the resistance of geotextile products to these acids and bases.

Since an index test requires exposure times that are short compared to the expected lifetimes of geotextile products, it is necessary to accelerate the process. The data obtainable are suitable for screening but not for deriving performance data such as lifetime, unless supported by further evidence.

NOTE This standard should be used with reference to CR ISO 13434.

1 Scope

This standard specifies methods for screening the resistance of geotextile products to liquids while not subjecting them to external mechanical stress.

The standard is applicable to all geotextiles and geotextile related products. Method A applies particularly to polyamides and method B to polyesters and polyamides. The test results should be interpreted in the context of site conditions.

NOTE This standard only considers conditions where the specimens are fully immersed in the liquids. Though outside the scope of this standard, the test conditions may be modified to accommodate particular applications, e.g. gaseous media. This standard does not preclude use for test specimens that are pre-treated by some method, e.g. by weathering, aqueous extraction conditions or installation damage.

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 12226, *Geotextiles and geotextile-related products - General tests for evaluation following durability testing.*
ISO 3696:1987, *Water for analytical laboratory use - Specification and test methods.*

3 Principle

Test specimens are completely immersed in a test liquid for a given test duration at a fixed temperature. The properties of the test specimens are tested before and after immersion

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and if applicable after drying, and wherever possible, the test results are compared with those of control specimens stored under reference conditions.

4 General requirements and procedure**4.1 Apparatus**

A container, e.g. a pneumatic vessel, is to be used, equipped with:

- a sealing lid or equivalent device and if necessary a reflux condenser or equivalent device to restrict evaporation of volatile components;
- a stirring or equivalent device to maintain homogeneity of the liquid and the exchange of matter between the liquid and the specimens;
- specimen holders to ensure correct placing of the specimens (see 4.6.2), the free distance between specimens being at least 10 mm;
- at least one closable aperture in the lid for access to control the composition of the liquid.

The container shall be large enough for the test liquid (see 4.6.1), which shall be held at constant temperature (see 4.3).

The material of the container and equipment shall be resistant to the test chemicals. Such materials are in general borosilicate glass or stainless steel.

4.2 Test liquids

Two types of test liquids are to be used:
- an inorganic acid: 0,025 M sulfuric acid (method A);
- an inorganic base: calcium hydroxide (Ca(OH)₂), used as a saturated suspension, i.e. approximately 2,5 grams per litre (method B).

Chemicals or reagent of analytical grade should be used. Water shall comply with ISO 3696:1987, grade 3.

National safety regulations for handling of chemicals and for disposal of test liquids shall be followed.

NOTE For any test medium it is an important condition that its composition remains constant during the test exposure. This may be complicated if the concentration of any active component is low or if the liquid is not a stable one-phase system. In such cases the concentration should be monitored and if possible adjusted or replaced on a regular basis. Attention should be given also to possible catalytic or synergistic effects, including effects of simultaneous chemical and mechanical stresses (e.g. environmental stress cracking in polyolefins). The choice of the concentration of the active species is governed by the aim to avoid significant changes of the concentration during the test and to accelerate the reaction but to avoid a change in the active mechanism by using too high a concentration.

4.3 Test temperatures

The test temperature shall be (60 ± 1) °C for each method.

4.4 Test duration

The test duration shall be three days for each method.

4.5 Specimens

Reference is made to EN 12226.

The number of specimens shall be five test specimens and five control specimens.

NOTE 1 It is recommended that additional specimens be exposed. If a mechanical test is invalid, a further specimen should be tested in its place.

NOTE 2 If the products are sheathed by some coating, which could be penetrated during installation, the product should be tested with and without the coating. If not, the possibility of a change in chemical resistance in case of destruction or damage to the sheath should be noted in the report.

4.6 Procedure

4.6.1 Quantity of the test liquid

The quantity of test liquid shall be greater than 30 times the weight of the specimens and shall cover the specimens completely.

4.6.2 Positioning of specimens

The specimens shall be placed in the vessel free of any significant mechanical stress.

The mean distance between the specimens, between the specimens and the walls of the vessel, and between the specimens and the surface of the liquid, shall be at least 1 cm. No significant proportion of the surface of the specimens shall make contact with a material other than the test liquid itself.

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Specimens of different materials shall not be tested in the same vessel. During the test the exchange of matter between liquid and geotextile shall not be hindered by poor convection of the test liquid.

Calcium hydroxide shall be stirred continuously, sulfuric acid at least once per day. The pH of the liquid shall be measured from the beginning and recorded continuously and, where necessary, liquid shall be replenished or replaced to maintain the original pH at least every seventh day. The liquid and the specimens shall be shielded from light.

4.6.3 Control specimens

The control specimens shall be immersed for one hour in water at the same temperature as the test specimens. Water shall be in accordance with 4.2.

4.6.4 Rinsing, wiping and drying

Rinsing shall be performed in water complying with 4.2, then in 0,01 M sodium carbonate solution, finally in water again. The quantities shall be sufficient to ensure thorough cleaning.

In exposing polyester geotextiles to calcium hydroxide it is necessary to remove adhering crystals of calcium terephthalate. This may be done by rinsing for 5 min with a 10 % solution (by weight) of trisodiumnitrilotriacetate (NTA) in an agitating device, followed by rinsing in a 3 % solution (by weight) of acetic acid and finally rinsing with water.

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Specimens shall be dried at room temperature or at elevated temperature up to 60 °C. Specimens should not be subjected to undue stress during drying.

4.7 Determination of changes in properties

The changes are determined in accordance with EN~~14~~ 12226.

5 Test report

The test report shall contain particulars to the following items:

- reference to this ~~pr~~standard;
- description of the material;
- results expressed in accordance with EN~~14~~ 12226;
- date of test;
- any deviations from this standard and any factors likely to have influenced the results.

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