



**SLOVENSKI STANDARD**  
**SIST ENV 12226:1999**

**01-marec-1999**

---

**Geotekstilije in geotekstilijam sorodni izdelki - Splošni preskusi za ocenitev sprememb po preskusu staranja**

Geotextiles and geotextile-related products - General tests for evaluation following durability testing

Geotextilien und geotextilverwandte Produkte - Allgemeine Prüfverfahren für die Bewertung nach Beständigkeitsprüfungen

Géotextiles et produits apparentés - Essais généraux pour l'évaluation apres les essais de durabilité

**STANDARD PREVIEW**  
**(standards.iteh.ai)**  
<https://standards.iteh.ai/catalog/standards/sist/b9f0b96e-b1f9-4d01-8beb-6059582d6c91/sist-env-12226-1999>

**Ta slovenski standard je istoveten z: ENV 12226:1996**

---

**ICS:**

59.080.70      Geotekstilije                      Geotextiles

**SIST ENV 12226:1999**                      **en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST ENV 12226:1999

<https://standards.iteh.ai/catalog/standards/sist/b9f0b96e-b1f9-4d01-8beb-6059582d6c91/sist-env-12226-1999>

EUROPEAN PRESTANDARD

ENV 12226

PRÉNORME EUROPÉENNE

EUROPÄISCHE VORNORM

October 1996

ICS 59.080.70

Descriptors: geotextiles, tests, durability, visual examination, microscopic analysis, estimation, variation, dimensions, tensile properties

English version

**Geotextiles and geotextile-related products -  
General tests for evaluation following durability  
testing**

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)

Géotextiles et produits apparentés - Essais  
généraux pour l'évaluation après les essais de  
durabilité

Geotextilien und geotextilverwandte Produkte -  
Allgemeine Prüfverfahren für die Bewertung nach  
Beständigkeitsprüfungen

SIST ENV 12226:1999

<https://standards.iteh.ai/catalog/standards/sist/b9f0b96e-b1f9-4d01-8beb->



REPUBLIKA SLOVENIJA  
MINISTRSTVO ZA ZNANOST IN TEHNOLOGIJO  
Urad RS za standardizacijo in meroslovje  
LJUBLJANA

SIST..... ENV 12226 .....

PREVZET PO METODI RAZGLASITVE

03-1999

This European Prestandard (ENV) was approved by CEN on 1996-03-12 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 existence 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 Standard has been prepared by Technical Committee CEN/TC 189 "Geotextiles and geotextile-related products", the secretariat of which is held by IBN.

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

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST ENV 12226:1999

<https://standards.iteh.ai/catalog/standards/sist/b9f0b96e-b1f9-4d01-8beb-6059582d6c9f/sist-env-12226-1999>



## 1 Scope

This prestandard specifies test methods for determining the change in specific properties of aged geotextiles. It is applicable to geotextiles and geotextile-related products.

## 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 Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

|                  |  |
|------------------|--|
| EN 963           | Geotextiles and geotextile related products - Sampling and preparation of test specimens               |
| EN 965           | Geotextiles and geotextile related products - Determination of mass per unit area                      |
| EN 20139         | Textiles - Standard atmospheres for conditioning and testing (ISO 139:1973)                            |
| prEN ISO 13934-1 | Textiles - Tensile properties of fabrics - Maximum force and elongation at maximum force, strip method |
| EN 29073-3       | Textiles - Test methods for nonwovens - Determination of tensile strength and elongation               |

## 3 Principle

The test specimens are exposed with reference to a durability test for geotextiles. The exposure is followed by visual and microscopic inspection, determination of changes in dimensions and tensile properties and where applicable changes in mass.

## 4 Specimens

### 4.1 Number of specimens

For each durability test the number of test and control specimens defined in the relevant standard shall be prepared in both the machine and the cross-direction, unless the nature of the geotextile or geotextile-related product makes this inappropriate. If several durability tests are carried out simultaneously, common control specimens may be used. Where specimens are exposed for more than one time duration, control specimens shall be prepared for each duration.

## 4.2 Sampling

See EN 963 on sampling of specimens. For woven geotextiles and geotextile-related products with linear strands of fibres, threads or wires, sets of test and control specimens containing the same system of strands shall be cut. For nonwovens sets of test and control specimens adjacent along the larger dimensions shall be cut.

## 4.3 Dimensions

Each specimen shall be cut at least 50 mm wide and at least 300 mm long except for woven fabrics, which shall be cut at least 60 mm wide. For products other than wovens and nonwovens wider specimens could be required. For geogrids the specimen shall contain only complete ribs in the width and at least three junctions in the length with one junction in the centre of the specimen.

**NOTE:** Composite products may be separated to assess the durability of their constituent parts. Attention has to be paid to the fact that the performance of the composites may be affected by the separation into single layers.

## 4.4 Preparation and measurements

The specimens shall be conditioned in accordance with EN 20139. Weigh the specimens according to EN 965 and record the masses as  $m_{oi}$ , where "i" indicates the specimen.

For determination of dimensional change mark the specimens with a suitable device. Draw one line along the length and in the middle of the specimen. Mark two lines perpendicular to the length at least 250 mm apart. Measure along the centre line the distance between the two parallel lines and record it as  $d_{oi}$ . "i" indicates the specimen.

For testing tensile properties of woven fabrics count the number of threads within 50 mm in both the machine and the cross-direction. Record the numbers as  $n_1$  and  $n_2$  respectively.

Expose the specimens with reference to the durability tests for geotextiles.

## 5 Procedures

### 5.1 Visual examination

Inspect the exposed specimens with the naked eye and report changes relative to the control specimens, e.g. discolourations.

### 5.2 Determination of change in mass

After exposure weigh the conditioned exposed specimens according to EN 965 and record their masses per unit area as  $m_{ei}$ , where "i" indicates the specimens.

### 5.3 Determination of dimensional change

For determination of dimensional change, measure the conditioned exposed specimens in a relaxed state, laid flat in the standard atmosphere. Determine the distance between the two parallel lines, measuring along the centre line. Record the distance as  $d_{ei}$ , where "i" indicates the specimens.

### 5.4 Tensile properties

See prEN ISO 13934-1 (woven fabrics) or EN 29073-3 (nonwovens) for testing tensile properties, but using a strain rate of 100 mm/min. Where required (see 4.3) specimens wider than 50 mm may be used. For woven fabrics remove threads in approximately equal numbers from each of the long selvages of the cut strip until the width of the exposed and control specimens contains a number of threads identical to the corresponding number  $n_1$  or  $n_2$  (see 4.4). For machine and cross-direction record separately the breaking loads of the control specimens as  $F_{ci}$  and of the exposed as  $F_{ei}$ . Record the strains at maximum load as  $e_{ci}$  and  $e_{ei}$  respectively, "i" indicating the specimens.

### 5.5 Microscopic inspection

Use a microscope with a magnification of about 250 to give a qualitative prediction of obvious differences between the exposed and the control specimens. Report the magnification factor.

**NOTE:** It is advisable to examine the threads for damage. This requires a destruction of the specimens.

## 6 Expression of results

### 6.1 Change in mass

Calculate to the first decimal place the percentage change in mass  $P_m$  for each group of specimens as follows:

$$P_m = \frac{m_e - m_c}{m_o} \times 100 \%$$

where "m" denotes mass and the subscripts "e" and "c" denote the exposed and control specimens respectively.

The value of  $P_m$  is negative for a loss and positive for a gain.

### 6.2 Dimensional change

Calculate to the first decimal place the percentage dimensional change  $P_d$  for each group of test specimens as follows:

$$P_d = \frac{d_e - d_c}{d_o} \times 100 \%$$

where "d" denotes dimension and the subscripts "e" and "c" are used as in 6.1

Page 6  
ENV 12226:1996

The value of  $P_d$  is negative for shrinkage and positive for expansion. Determine the mean and the standard deviation of  $P_d$ .

### 6.3 Change in tensile properties

Calculate the percentage retained strength  $R_F$  to one decimal place according to the formula:

$$R_F = \frac{F_e}{F_c} \times 100 \%$$

where  $F$  denotes the maximum load and the subscripts "e" and "c" are used as in 6.1. Determine the mean and standard deviation of  $R_F$ .

Calculate the percentage retained elongation at break  $R_\varepsilon$  to one decimal place according to the formula:

$$R_\varepsilon = \frac{\varepsilon_e}{\varepsilon_c} \times 100 \%$$

where " $\varepsilon$ " is the elongation at break and the subscripts "e" and "c" are used as in 6.1.

## 7 Test report

The test report shall include the following particulars:

- a) reference to this prestandard;
- b) identification of the sample;
- c) number and dimensions of tested specimens;
- d) conditioning atmosphere;
- e) type of exposure with reference to the corresponding standard;
- f) results of visual examination and, if carried out, microscopic inspection, including the magnification factor;
- g) mean and standard deviation of percentage change in mass  $P_m$ , specified to one decimal place;
- h) mean and standard deviation of percentage dimensional change,  $P_d$ , specified to one decimal place;
- i) mean and standard deviation of percentage retained strength,  $R_F$ ;
- j) mean and standard deviation of percentage retained elongation at break,  $R_\varepsilon$ ;
- k) deviations from this prestandard;
- l) date of the test.