SLOVENSKI STANDARD
SIST ENV ISO 13438:1999

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Geotekstilije in geotekstilijam sorodni izdelki - Preskusna metoda za ugotavljanje odpornosti proti oksidaciji (ISO/TR 13438:1999)

Geotextiles and geotextile-related products - Screening test method for determining the resistance to oxidation (ISO/TR 13438:1999)

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ICS:

59.080.70 Geotekstilije Geotextiles

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Geotextiles and geotextile-related products - Screening test method for determining the resistance to oxidation (ISO/TR 13438:1999)

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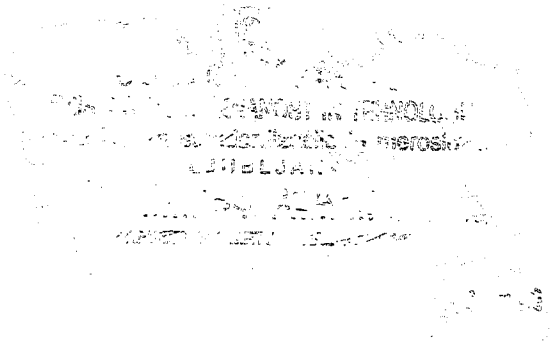

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

The text of ENV ISO 13438:1999 has been prepared by Technical Committee CEN/TC 189 "Geotextiles and geotextile-related products", the secretariat of which is held by IBN, in collaboration with Technical Committee ISO/TC 38 "Textiles".

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

Introduction

In many civil engineering applications geotextiles and geotextile-related products may be in contact with water or aqueous solutions in the present soil environment. At the same time, in specific parts of the construction the geotextiles or geotextile-related products may be exposed to slowly diffusing oxygen in the soil.

The presence of oxygen gives rise to a very slow oxidative degradation process. Polyolefin materials such as polypropylene and polyethylene may be relatively more sensitive to oxidative degradation than polyesters, depending on the formulation of the material and the circumstances in use.

It is the purpose of this prestandard to provide a method for screening the resistance of geotextiles and geotextile-related products to oxidation in service up to 25 years.

1 Scope

This European prestandard specifies a test method for screening the resistance of geotextiles and geotextile-related products to oxidation. The test is applicable to polypropylene and polyethylene based products.

The data are suitable for screening but not for deriving performance data such as lifetime unless supported by further evidence.

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

ISO 188	Rubber, vulcanised - Accelerated ageing or heat-resistance test
ENV 12226	Geotextiles and geotextile-related products - General test for evaluation following durability testing

3 Principle

Test specimens are exposed to an elevated temperature in air during a fixed time period, using a regulated laboratory oven with or without forced air circulation.

Oven ageing on polypropylene shall be carried out at a temperature of (110 ± 1)°C (Method A).

Oven ageing of polyethylene shall be carried out at a temperature of (100 ± 1)°C (Method B).

The test specimens shall hang freely in the oven space.

After the fixed time period of oven ageing the exposed test specimens are submitted to a tensile test. The tensile strength and the strain at maximum load are measured for both the control specimens and the exposed specimens. The tensile test shall be carried out in accordance with ENV 12226. For woven fabrics both the machine and cross direction will be tested, unless otherwise agreed.

4 Specimens

Products shall have been manufactured at least 24 hours prior to testing. The number of specimens shall be five test specimens and five control specimens, unless further specimens are required to assure statistical significance.

The specimens to be tested shall be in accordance with ENV 12226.

> Note:It is recommended to expose additional specimens in case an extra mechanical test is required (see 7.2.4).

5 Apparatus

For testing a thermostatically regulated oven with or without forced air circulation, according to ISO 188 (section 3.2.2), is required with an internal volume of sufficient size, capable of exposing test specimens to a temperature of (110 ± 1)°C or (100 ± 1)°C.

The oven with or without forced air circulation shall be provided with a ventilation opening which shall be adjusted such that the set temperature can be maintained in the part of the oven in which the specimens are to be suspended.

The specimens shall be suspended from glass or other chemically inert fixtures in the center of the oven, spaced and not touching; the distance from each wall being at least 100 mm.

The temperature around the specimens shall be monitored at least every 15 minutes, for instance with the aid of suitable calibrated thermocouples and a data logger.

6 Conditioning

Conditioning of the specimens before exposure in the laboratory oven is not required. Because of the possible occurrence of shrinkage during the oven test, the control specimens shall be exposed to the same conditions as in the oven test for 6 h.

7 Test procedure

7.1 Oven temperature

Set the oven temperature at (110 ± 1) °C or (100 ± 1) °C in accordance with the chosen method in clause 3.

7.2 Specimens

Attach the specimens to the fixtures. Place the specimens in the oven once the temperature has reached a steady value. Suspend the specimens in the centre of the oven, spaced, not touching each other, and so that the distance from each wall shall be at least 100 mm.

7. 3 Duration of the oven test

Geotextile specimens for reinforcing applications, or for other applications where long-term strength is a significant parameter, shall be exposed to the oven ageing test for 28 days when test method A (110°C) is used, or for 56 days when method B (100°C) is used. For all other applications, the specimens shall be exposed to the oven ageing for 14 days (test method A - 110°C) or 28 days (method B -100°C).

The control specimens shall be exposed to the same oven temperature for 6 h and then removed and stored.

7.4 Determination of mechanical properties

When the fixed time period of oven ageing has elapsed, remove the specimens and test them according to ENV 12226 (evaluation tests). Determine both the tensile strength and the strain at maximum load for both the control specimens and the exposed specimens. If the mechanical test on one of the specimens is invalid, a further specimen shall be tested in its place.

NOTE 1:

Practical experience has shown that, to achieve good reproducibility, the following should be taken into account:

a) place the specimens in the middle of the oven;
b) avoid draughts near the oven if a reproducible natural air circulation is to be maintained;
c) before each new test, clean the oven and the fixtures of any remaining residues;
e) thermo-oxidative degradation of polymer material (e.g. polypropylene) may release substances which have a catalytic effect; therefore, polymers containing different stabilisers should not be tested at the same time in the same oven, with the exception of geotextile composites.

NOTE 2: Ovens with forced air circulation provide more homogeneous heat distribution and may provide a faster degradation rate than conventional ovens.

8 Test report

The test report shall include the following information:

a) reference to this prestandard and to the method (method A and/or method B);
b) test laboratory;
c) full identification of the geotextile or geotextile-related product;
d) period of testing;
e) type and internal volume of laboratory oven used;
f) oven temperature and tolerance;
g) observation of the effect of temperature on the control specimen;
g) results, expressed in accordance with ENV 12226;
h) any deviation from this prestandard or any factor likely to have influenced the results.