SLOVENSKI STANDARD
SIST EN ISO 11721-2:2003

01-december-2003

Tekstilije - Ugotavljanje odpornosti tekstilij, ki vsebujejo celulozo proti mikroorganizmom - Preskus z zakopavanjem v zemljo - 2. del: Prepoznavanje dolgotrajne odpornosti apretur proti gnitju

Textiles - Determination of the resistance of cellulose-containing textiles to micro-organisms - Soil burial test - Part 2: Identification of long-term resistance of a rot retardant finish (ISO 11721:2003)

Textilien - Bestimmung der Widerstandsfähigkeit zellulosehaltiger Textilien gegen Mikroorganismen - Erdeingrabetest - Teil 2: Nachweis der Langzeitbeständigkeit einer verrottungshemmenden Ausrüstung (ISO 11721-2:2003)

Textiles - Détermination de la résistance aux micro-organismes des textiles contenant de la cellulose - Essai d'enfouissement - Partie 2: Identification de la résistance a long terme d'un traitement d'imputrescibilité (ISO 11721-2:2003)

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ICS:

07.100.99	Drugi standardi v zvezi z mikrobiologijo	Other standards related to microbiology
59.080.30	Tkanine	Textile fabrics

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EUROPEAN STANDARD

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English version

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This European Standard was approved by CEN on 15 May 2003.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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Foreword

This document (EN ISO 11721-2:2003) has been prepared by Technical Committee CEN/TC 248 “Textiles and textile products”, the secretariat of which is held by BSI, in collaboration with Technical Committee ISO/TC 38 “Textiles”.

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 April 2004, and conflicting national standards shall be withdrawn at the latest by April 2004.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

Cellulose containing textiles are considered as resistant against the attack of microorganisms living in the soil, provided that their structure, appearance and maximum tensile strength have not been altered essentially after a soil burial test.

The assessment of damage resistance takes into account the structure, the aspect and the changes in the maximum tensile strength, compared to untreated specimens of the same material quality. It is assessed by comparing the relative decrease of maximum tensile strength of buried specimens, with that of unburied control specimens.

A long-term rot retardant finish or an increased long-term resistance meets with the requirements for cellulose containing textiles if the maximum tensile strength of a buried specimen, compared with an unburied specimen, does not decrease by more than 25 %.

The soil burial intervals for long-term retardant finishes take twice the time needed for control specimens to lose 80 % of their maximum tensile strength. The soil burial intervals for increased long-term resistant finishes takes four times the time needed for the controls to lose 80 % of their maximum tensile strength.

1 Scope

This European Standard describes a test procedure for identification of the long-term resistance of a rot retardant finish against the attack of microorganisms in the soil.

It allows distinction to be made between rot retardant finishes with no long-term resistance, with *regular long-term resistance* and with *increased long-term resistance*, in order to assess the suitability for use in the tropics.

As the soil burial test is a biological process and the test soil not accurately defined, this European Standard only covers the comparison of finished and unfinished specimens.

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 11721-1:2001, *Textiles - Determination of the resistance of cellulose-containing textiles to micro-organisms - Soil burial test - Part 1: Assessment of rot-retardant finishing (ISO 11721-1:2001).*

EN ISO 13934-1, *Textiles - Tensile properties of fabrics - Part 1: Determination of maximum force and elongation at maximum force using the strip method (ISO 13934-1:1999).*

ISO 7218, *Microbiology of food and animal feeding stuffs - General rules for microbiological examinations.*

3 Safety precautions and health hazards to operators

This method requires the use of mould fungi under conditions that favour the growth of mould fungi and bacteria. All the required safety and personal hygiene measures shall be followed according to ISO 7218.

4 Principle

According to EN ISO 11721-1, finished and unfinished specimens are submitted to the soil burial test until the unfinished specimens have lost 80 % of their maximum tensile strength. The burial time required for this purpose is defined as time interval t_1.

To determine the regular long-term resistance, a further set of specimens is removed from the test soil after $2 \times t_1$, for increased long-term resistance after $4 \times t_1$.

5 Apparatus and reagents

5.1 *Containers*, in accordance with EN ISO 11721-1:2001, 5.1.

5.2 *Test soil*, in accordance with EN ISO 11721-1:2001, 5.2.

6 Test specimens

6.1 Sampling and preparation of specimens

Specimens shall be sampled and prepared in accordance with EN ISO 11721-1:2001, 6.1.

6.2 Number of specimens

To determine the rot retardant efficacy of specimens with no long-term resistance, at least 20 specimens shall be used (i.e. at least 10 to be buried and 10 not to be buried). For regular long-term and increased long-term resistance tests 10 more specimens for each test shall be buried.

If additional leaching of textiles has been agreed, double the number of specimens shall be used.

EXAMPLE For the identification of the rot retardant efficacy of leached and unleached specimens with no long-term resistance, with regular long-term resistance and with increased long-term resistance, at least 80 specimens are required.

6.3 Control specimens

The end-point (f_1) shall be determined In accordance with EN ISO 11721-1 using at least 20 unfinished, unleached control strips of the same material or equivalent material quality for the soil burial test, together with 10 specimens which will not be buried, in order to determine the initial maximum tensile strength.

7 Leaching procedure

Carry out leaching in accordance with EN ISO 11721-1:2001, clause 7.

Leached and unleached specimens shall be tested. For determining waterproof rot retardant finishings, leached specimens shall be tested.

8 Determination of the degradation activity of the test soil

Determine the degradation activity of the test soil in accordance with ISO 11721-1:2001, clause 8.

The activity of the test soil shall fulfil the tensile strength loss of the control within (7 ± 2) days.

9 Procedure

Carry out the procedure described in EN ISO 11721-1:2001, clause 9.

The soil burial test shall last until the control strips have lost 80 % of their maximum tensile strength. The duration of the burial necessary to get this value shall be defined as time interval f_1, expressed in days.

Remove the specimens for the assessment of the regular long-term resistance from the test soil when $2 \times f_1$ has been reached.

Remove the specimens for the assessment of the increased long-term resistance from the test soil when $4 \times f_1$ has been reached.

Apply the following:

$$f_2 = 2 \times f_1 \quad (1)$$

$$f_4 = 4 \times f_1 \quad (2)$$

where

f_1 is the time interval in days needed until the control strips loose 80 % of their maximum tensile strength; identification of a rot retardant finish with no long term resistance

f_2 is the time interval in days needed to identify a rot retardant finish with a regular long-term resistance

f_4 is the time interval in days needed to identify a rot retardant finish with an increased long-term resistance.

10 Calculation and expression of results

Calculate the maximum tensile strength of all specimens in accordance with EN ISO 13934-1. Determine the relative loss of the maximum tensile strength $q_{H,M}$ of the buried specimens in relation to the average maximum tensile strength obtained from the 10 unburied specimens.

Determine the relative reduction in maximum tensile strength $q_{H,M}$ of the buried specimens compared with the unburied specimens from the mean values of at least 10 specimens, using the formulae

$$q_{f1\,H,M} = \frac{F_{f1\,H,E}}{F_{f1\,H,O}} \quad (3)$$

$$q_{f2\,H,M} = \frac{F_{f2\,H,E}}{F_{f1\,H,O}} \quad (4)$$

$$q_{f4\,H,M} = \frac{F_{f4\,H,E}}{F_{f1\,H,O}} \quad (5)$$

where

$q_{f1\,H,M}$ is the loss of the maximum tensile strength of the buried specimens after the burial time f_1.

$q_{f2\,H,M}$ is the loss of the maximum tensile strength of the buried specimens after the burial time f_2.

$q_{f4\,H,M}$ is the loss of the maximum tensile strength of the buried specimens after the burial time f_4.

$F_{f1\,H,O}$ is the maximum tensile strength of the unburied specimen after the burial time f_1.

$F_{f1\,H,E}$ is the maximum tensile strength of the buried specimens after the burial time f_1.

$F_{f2\,H,E}$ is the maximum tensile strength of the buried specimens after the burial time f_2.

$F_{f4\,H,E}$ is the maximum tensile strength of the buried specimens after the burial time f_4.

The regular increased long-term rot retardant efficacy of the finish is given if the finished specimens lose less than 25 % of the maximum tensile strength ($q_{H,M} > 0{,}75$) in the corresponding burial discipline.

See details and visual assessment according to EN ISO 11721-1.

11 Test report

The following information shall be included in the test report.

a) Number and date of this international standard;