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SLOVENSKI STANDARD
SIST EN 14278-2:2004

01-julij-2004

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Textiles - Determination of cotton fibre stickiness - Part 2: Method using an automatic thermodetection plate device

Textilien - Bewertung der Klebrigkeit von Baumwolle - Teil 2: Verfahren mit dem automatischen Platten-Thermodetektionsgerät

Textiles - Détermination du collage des fibres de coton - Partie 2: Méthode utilisant un dispositif automatique de thermodétection a plateau

Ta slovenski standard je istoveten z: **EN 14278-2:2004**

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EUROPEAN STANDARD

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English version

Textiles - Determination of cotton fibre stickiness - Part 2: Method using an automatic thermodetection plate device

Textiles - Détermination du collage des fibres de coton - Partie 2: Méthode utilisant un dispositif automatique à plateau de thermodétection

Textilien - Bewertung der Klebrigkeit von Baumwolle - Teil 2: Verfahren mit dem automatischen Thermodetektionsplattengerät

This European Standard was approved by CEN on 24 December 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 14278-2:2004) has been prepared by Technical Committee CEN/TC 248 "Textiles and textile products", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by September 2004, and conflicting national standards shall be withdrawn at the latest by September 2004.

Annex A is informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Introduction

The aim of this method is to provide an indication of the stickiness potential of a sample of cotton fibres by simulating the tendency of "contaminated" cotton to stick to working surface during the spinning process. This test method does not distinguish between the various types of contamination which may cause stickiness.

Results of this method are not directly related to the determination of sugar content.

This standard consists of the following methods, under the general title "Textiles - Determination of cotton fibre stickiness":

- Part 1: Method using a manual thermodetection device

- Part 2: Method using an automatic thermodetection plate device

- Part 3: Method using an automatic thermodetection rotating drum device

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1 Scope

This standard describes an automatic technique to simulate the tendency of "contaminated" cotton fibres to stick to working surfaces of textile machines (e.g. card clothing, drafting rollers, crush rolls).

Test specimens can be raw cotton fibre (fibre sampled, e.g. from a bale), or opened fibre, slivers, etc.

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 20139   *Textiles - Standard atmospheres for conditioning and testing (ISO 139:1973).*

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1
stickiness level
number of sticky points indicating the severity of cotton fibre stickiness

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3.2
sticky points
entanglement of one or more fibres that become attached to a working surface as a result of contamination of the cotton by sticky substance

3.3
thermodetection
action of revealing sticky points through the combined application of heat and pressure

3.4
pad
thick homogeneous web of fibres formed by a special fibre opening and condensing device

3.5
remover
device for removing the non sticking fibres from the aluminium foil

4 Principle

A weighed fibre sample is processed through an opener to obtain a pad. This pad is placed on an aluminium foil and subjected to pressure by two separate pressure plates, one after the other. The first pressure plate is maintained at a temperature significantly higher than ambient. The second pressure plate is maintained at ambient temperature. The pad is removed from the foil and all loose fibres are cleaned away. Any fibre entanglements left sticking to the foil are noted and counted as sticky points. All the operations and result analysis are computer controlled.

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5 Apparatus

5.1 Automatic system

The automatic system comprises five devices stationed along a conveyor belt and the means for unrolling a roll of aluminium foil onto the conveyor. Test specimens are transported, on the aluminium foil, by the conveyor to each of the five stations in turn in less than 5 s.

The sequence of the 5 devices in the automatic system is as follows.

5.1.1 Pad preparation device

The device comprises :

- a rotating opener roller covered with metallic card clothing suitable for processing all types of cotton (saw or roller ginning) into a homogenous fibre pad. The type, dimensions and density of the card clothing are selected so as to be resistant to prevent contamination by sticking fibres from consecutive test specimens.

- an air stream and a chamber to collect the opened fibres and form a pad with a surface area of (222 ± 30) cm^2.

- a means to deliver the pad onto the aluminium foil.

5.1.2 Higher temperature pressure device

The device comprises a heated pressure plate which can be moved vertically so as to apply a specified pressure for a specified time on a pad positioned below it.

Device is set so as to apply a force of (1700 ± 150) N to the pad for (25 ± 2) s. The underside of the pressure plate, which comes into contact with the pad, has an area of (192 ± 1) cm² and is provided with a non-adhesive surface.

NOTE   The surface of the plate should remain clean without adhering fibres after applying and removing the pressure. Some adhering fibres on this surface will not influence the test results.

The heated surface, in contact with the pad, is maintained at a temperature of (53 ± 2) °C.

5.1.3 Ambient temperature pressure plate device

The device comprises a pressure plate which can be moved vertically so as to apply a specified pressure for a specified time on a pad positioned below it.

The device is set so as to apply a force of (1700 ± 150) N to the pad for (25 ± 2) s in order to fix the sticky points to the aluminium foil. The underside of the pressure plate, which comes into contact with the pad, has an area of (192 ± 1) cm² and is provided with a "non-adhesive" surface.

NOTE   The surface of the plate should remain clean without adhering fibres after applying and removing the pressure. Some adhering fibres on this surface will not influence the test results.

5.1.4 Pad removal device

The removal device provides a means for removing the pad from the foil and cleaning away all loose fibres.

The pad is removed by suction. Any remaining loose fibres are cleaned from the aluminium foil by a rotating cylinder covered with a suitable type of cleaning fabric. The cleaning fabric is cleaned by suction.

NOTE   A loop pile carpet made with polyamide loops, mass of pile per unit area above the substrate of 360 g/m² and loop height of 2,3 mm has been found suitable as cleaning fabric. The supplier's recommendation for the frequency of renewal of the cleaning fabric should be followed.

5.1.5   Image analysis device

The image analysis device comprises:

- Light sources sufficient to assure even illumination of the field of view, so as to maintain a uniform grey scale level over the full detection area of the camera.

- Video camera having a CCD sensor (for camera resolution and sensitivity, see the note below), to provide an image of any sticky points within the area of measurement of (192 ± 1) cm².

NOTE 1   At the moment of the redaction of the present method, a video camera, with a resolution of 581 (V) x 756 (H) and a sensitivity of at least 3 lux , is suitable. Camera with improved resolution and sensitivity could be used.

- Linear polarisation filters, to block that portion of the light which emanates from the light sources and is reflected directly from the flat surface of the foil in order to assure the detection of the light reflected from the sticky points.

NOTE 2   Computer provided with an appropriate video card and image analysis software to capture and analyse the camera image in terms of the number and sizes of sticky points.

Means for shielding the field of view and the camera assembly from the influence of external light sources.

NOTE 3   As each station works independently, it is not necessary to wait until one specimen is fully processed before the next is inserted. Therefore, up to four specimens may be being processed at the same time, which means that a result is obtained almost every 30 s.

5.2 Balance

Balance able to weigh between 2 g and 5 g with an accuracy of at least 0,1 g.

5.3 Aluminium foil

A roll of aluminium foil, whose thickness is between 10 µm and 30 µm - or whose weight per unit area is between 27 g/m^2 and 81 g/m² - having at least one bright surface, exhibiting no traces of oxidation and of a width between 200 mm and 300 mm.

6   Atmosphere for conditioning and testing

The atmosphere for conditioning and testing as defined in EN 20139 shall be used.

7   Preparation of test specimens

Condition the cotton fibre sample (laboratory sample) for at least 24 h in standard conditions.

NOTE   If the cotton fibre sample has a high moisture content, sample pre-drying could be required, because the equilibrium in moisture has to be reached from the dried state.

Prepare three test specimens picking fibre tufts randomly from the laboratory sample.

Weigh each fibre test specimen to be between 3,0 g and 3,5 g.