SLOVENSKI STANDARD
oSIST prEN ISO 9073-13:2022

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Vlaknovine - Metode preskušanja - 13. del: Čas zapovrstnega prepuščanja tekočin (simulirani seč) (ISO/DIS 9073-13:2022)

Nonwovens - Test methods - Part 13: Repeated liquid strike-through time (simulated urine) (ISO/DIS 9073-13:2022)

Vliesstoffe - Prüfverfahren - Teil 13: Wiederholte Durchdringzeit von Flüssigkeiten (künstlicher Urin) (ISO/DIS 9073-13:2022)

Nontissés - Méthodes d'essai - Partie 13: Temps de transpercement successifs des liquides (urine artificielle) (ISO/DIS 9073-13:2022)

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Nonwovens — Test methods —

Part 13:
Repeated liquid strike-through time (simulated urine)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 38 *Textiles*, Working Group WG9, *Nonwovens*.

This second edition cancels and replaces the first edition (ISO 9073-13:2006), which has been technically revised.

The main changes compared to the previous edition are as follows:

— Title change

— Textual review and improvement

— Items 5.1 and 10.3 changed

— Report items and addition of blotter paper identification

— Precision data in Annex A updated

— Items 10.11 and 10.12 changed

A list of all parts in the ISO 9073 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Nonwovens — Test methods —

Part 13:
Repeated liquid strike-through time (simulated urine)

SAFETY WARNING — This standard does not claim to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. It is expected that the person performing this test has been fully trained in all aspects of this procedure

1 Scope

This document specifies a test method for the determination of the strike- through time (STT) for each of three subsequent doses of liquid (simulated urine) applied to the surface of a test specimen of nonwoven coverstock. The STT is defined as the time taken for a known volume of liquid to pass through the nonwoven that is in contact with an underlying dry standard absorbent pad.

This test method is intended for Quality Control and is designed for comparison of STT for different nonwoven coverstocks. It does not simulate in-use conditions for finished products.

SI values are regarded as the official standard system of measurement for this standard procedure. If other systems of measurement are used in place of SI units (including inch-pound), their values must be reported independently. Systems of measurement must not be combined in any way, but shall be regarded and reported separately.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 139, *Textiles — Standard atmospheres for conditioning and testing*

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 3951-1, *Sampling procedures for inspection by variables — Part 1: Specification for single sampling plans indexed by acceptance quality limit (AQL) for lot-by-lot inspection for a single quality characteristic and a single AQL*

ISO 5725-1, *Accuracy (trueness and precision) of Measurement Methods and Results — Part 1: General Principles and Definitions*

ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*

NWSP 001.0, *Standard Terminology Relating to the Nonwoven Industry, EDANA's and INDA's Standard Procedures*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
sample
product or portion of a product taken from a production lot for testing purposes, identifiable and traceable back to the origin

3.2
simulated urine
testing liquid consisting of a 9 g/l solution of sodium chloride in demineralized water with a surface tension of (70 ± 2) mN/m

3.3
test specimen
specific portion of the identified sample upon which a test is performed, many specimens sometimes being tested from the same sample, using different locations

3.4
strike-through time
the time taken for a known volume of liquid to pass through the nonwoven that is in contact with an underlying dry standard absorbent pad.

4 Principle

Three subsequent doses of simulated urine are discharged at a prescribed rate, and under specified conditions, onto a test specimen of nonwoven which is placed on a reference absorbent pad. The time taken for each of the liquid doses to penetrate the nonwoven is measured electronically, using conductometric detection. The absorbent pad remains unchanged and wet between the doses.

5 Reagents and materials

Use reagents of recognized analytical grade, unless otherwise specified, and demineralized water.

5.1 Absorbent pad (blotter paper), consists of 7 layers of blotter paper (100 mm x 100 mm) with the smooth side up.

The blotter paper needs to meet the following specifications:

a) The mass per unit area of the paper is (139 ± 11) g/m^2.

b) The liquid absorption capacity, of the paper, as determined by NWSP 010.1 is at least of 480 %

c) The mean first strike-through time is 2 seconds or less, using test procedure NWSP 70.7, but without a test specimen.

NOTE Information concerning a potential source of suitable blotter paper can be obtained from the nonwovens industry associations:

EDANA, www.edana.org or look directly at the test method webpage

INDA, www.inda.org

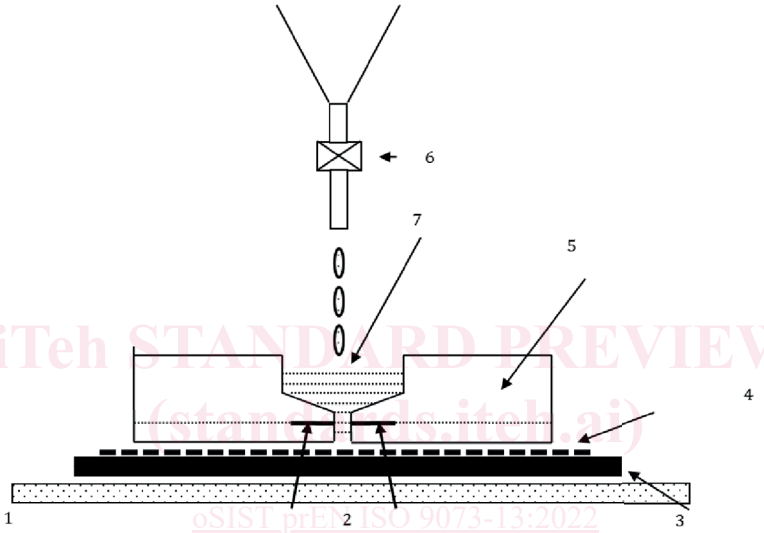
5.2 Simulated urine, consisting of a 9 g/l solution of sodium chloride in water with a surface tension of (70 ± 2) mN/m at (23 ± 2) ºC. This surface tension should be checked before each series of tests, as it can alter during storage.

5.3 Grade 3 water, according to ISO 3696.

6 Apparatus

6.1 Burette, 50 ml capacity with supporting stand, or a 5 ml pipette.

6.2 Strike-through tester (see Figure 1)**,** designed such that it releases a standard aliquot of saline solution into a cavity. Through a (star-shaped) opening in the bottom of the well that rests on the test piece, liquid drains through the test piece into an absorbent pad. The presence and disappearance of the test liquid in the well is detected conductometrically. The time required for the liquid to drain from the well is determined by an electronic timer that is connected to the conductometer.



Key

1 base plate
2 electrodes
3 absorbent
4 nonwoven
5 electrode plate
6 valve
7 saline
1 base plate
2 electrodes

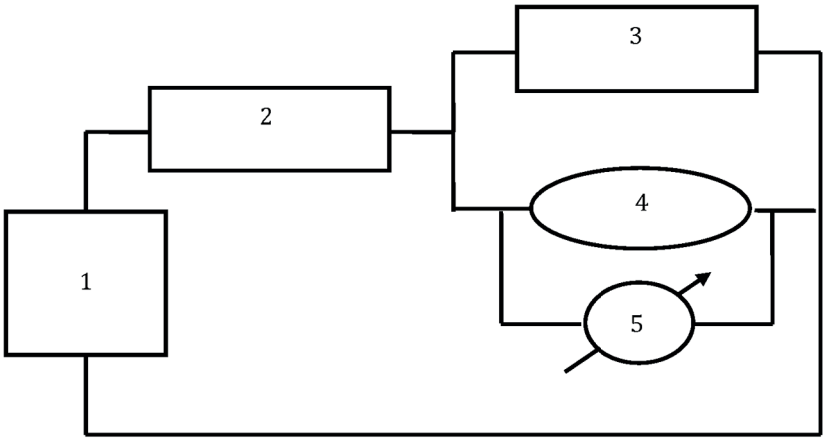
Figure 1 — Strike-through tester

The instrument consists of the following parts:

a) Funnel, fitted with a magnetic exit valve, capable of discharging 25 ml of saline solution in (3,5 ± 0,25) s.

b) Support for the funnel so the funnel position can be adjusted vertically. The distance between the funnel exit and the base plate must be adjustable from 4,5 cm to at least 15 cm.

c) Electronic conductivity detector capable of detecting saline solution with 0,05 s response time. The detector should be connected with the electrodes in the strike-through plate 6.2.f. The principle of electrical wiring should be as indicated in Figure 2 below:



Key

1 voltage generator: 1V, 300Hz
2 programming resistance 100 kΩ
3 resistance 25kΩ
4 strike-trough cell
5 voltage metre

Figure 2 — Electrical wiring

d) Typically, a threshold value is defined for V. Below the threshold value the cell condition is "conducting" which corresponds with presence of liquid. Above the threshold, the cell condition is "non-conducting", i.e. absence of liquid. A threshold value of 0,150 V has proven to be successful.

e) Equivalents are allowed. To be successful, the applied voltage must alternate with a frequency of about 300 Hz, the cell current must be about 10 µA and the voltage drop across the strike-through cell must be steep enough when going from a "conducting" to a "non-conducting" condition, such that the disappearance from fluid from the cell can be detected with an accuracy of 0,05 s.

f) Electrode plate (see figures B.1 and B.2) constructed of 25 mm thick transparent acrylic sheet of total mass (500 ± 5) g, fitted with corrosion-resistant electrodes consisting of 1,6 mm diameter platinum or stainless-steel wire.

g) The electrodes shall be positioned as shown in figures B.1 and B.2.

h) The plate surface, electrode surface and the star-shaped cavity must be clean and free from deposits and particulate matter. Clean regularly, e.g. with a mildly abrasive car polish and a dry cloth, and/or hot water.

i) The voltage drop across the electrodes must be (0,2 ± 0,01) V when the electrode compartment is empty and < 0,140 V when the compartment is filled with 0,9 % saline solution.

j) Baseplate made of transparent acrylic sheet, approximately 125 mm x 125 mm square and 5 mm thick.

k) Electronic timer for measuring the STT, accurate to 0,01 sec. The timer is connected with the conductivity detector (6.2.c) such that as conductive liquid closes/opens the contact between the electrodes, the timer starts/stops.