ISO TC 38/WG 9

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Nonwovens — Test methods —

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

Contents

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~~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~~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~~www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 38 *Textiles,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 248, *Textiles and textile products,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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

The main changes are as follows:

~~— the title has been changed;~~

~~— items~~ — the title has been changed from "Textiles — Test methods for nonwovens — Part 13: Repeated liquid strike-through time" to "Nonwovens — Test methods — Part 13: Repeated liquid strike through time (simulated urine)";

— details of blotter paper pad in 5.1 (former 4.1) and 10.3 (former 6.1) have been changed ~~(blotter paper pad details);~~

~~— updated of~~ — Clause 10 (former Clause 6, Procedure) has been changed;

— the test report items and addition of blotter paper identification (amount and manufacturer) have been updated;

— precision data in Annex A has been updated;.

— Items 10.11 and 10.12 changed (cleaning and repetition of the test method)

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.htmlwww.iso.org/members.html.

Nonwovens -— Test methods — Part 13: Repeated liquid strike through time (simulated urine)

SAFETY WARNING -— This document 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 document 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.

~~3~~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- 186, *Paper and board — Sampling to determine average quality*

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 3696, *Water for analytical laboratory use — Specification and test methods*

~~ISO~~ 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 9092, *Nonwovens — Vocabulary*

ISO- 11224, *Textiles — Web formation and bonding in nonwovens — Vocabulary*

NWSP 010.1, *Three Standard Test Methods for Nonwoven Absorption*

NWSP 005.0, *Nonwoven sampling*

NWSP 070.7, *Repeated Liquid Strike-Through Time (Simulated Urine)*

43 Terms and definitions

For the purposes of this document, the ~~following~~ terms and definitions given in ISO 9092, ISO 11224 and the following 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~~https://www.iso.org/obp

— IEC Electropedia: available at ~~https://www.electropedia.org/~~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 test specimens sometimes being tested from the same sample, using different locations.

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

54 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.

65 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 ~~×~~ × 100 mm) with the smooth side up.

The blotter paper shall 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 s 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. See References [2] and [3].

5.2 Simulated urine, consisting of a 9 g/l solution of sodium chloride in water (5.3), with a surface tension of (70 ± 2) mN/m at (23 ± 2) °C. This surface tension should be checked before each series of tests, as it can alter during storage.

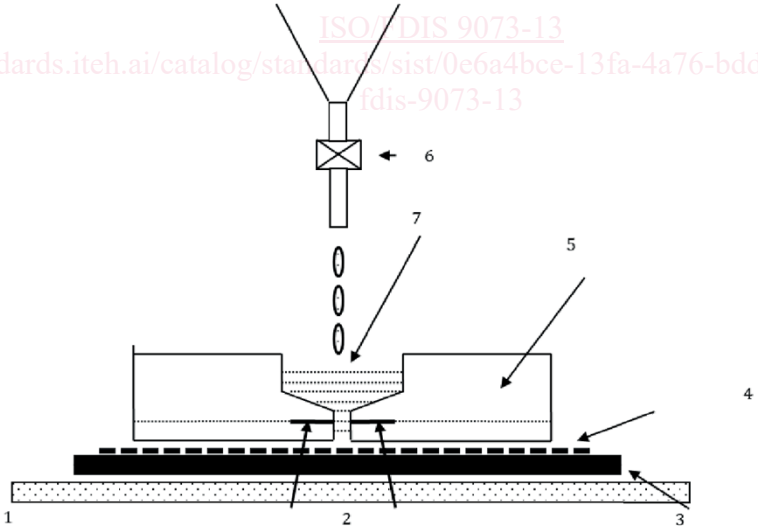
5.3 Grade 3 water, in accordance with ISO 3696.

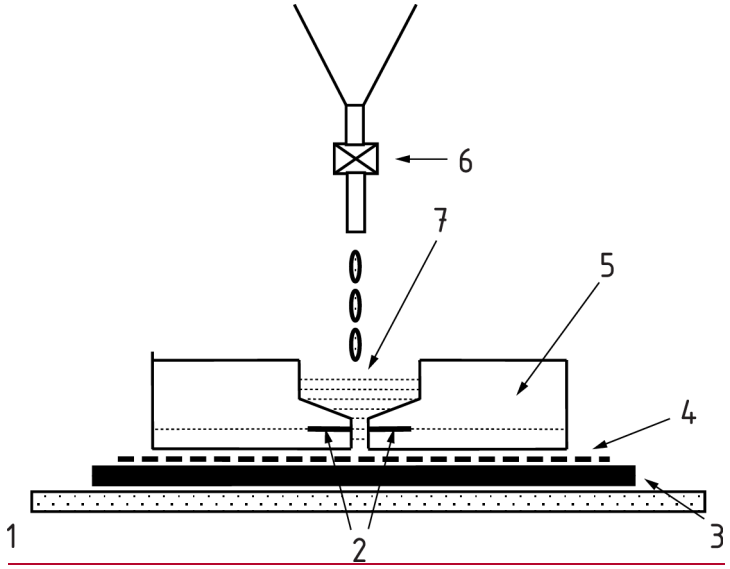
76 Apparatus

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 simulated urine 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.

NOTE More details of an example of apparatus can be found in the ANNEX Annex B, Figure B.1 and Figure B.2.





Key

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

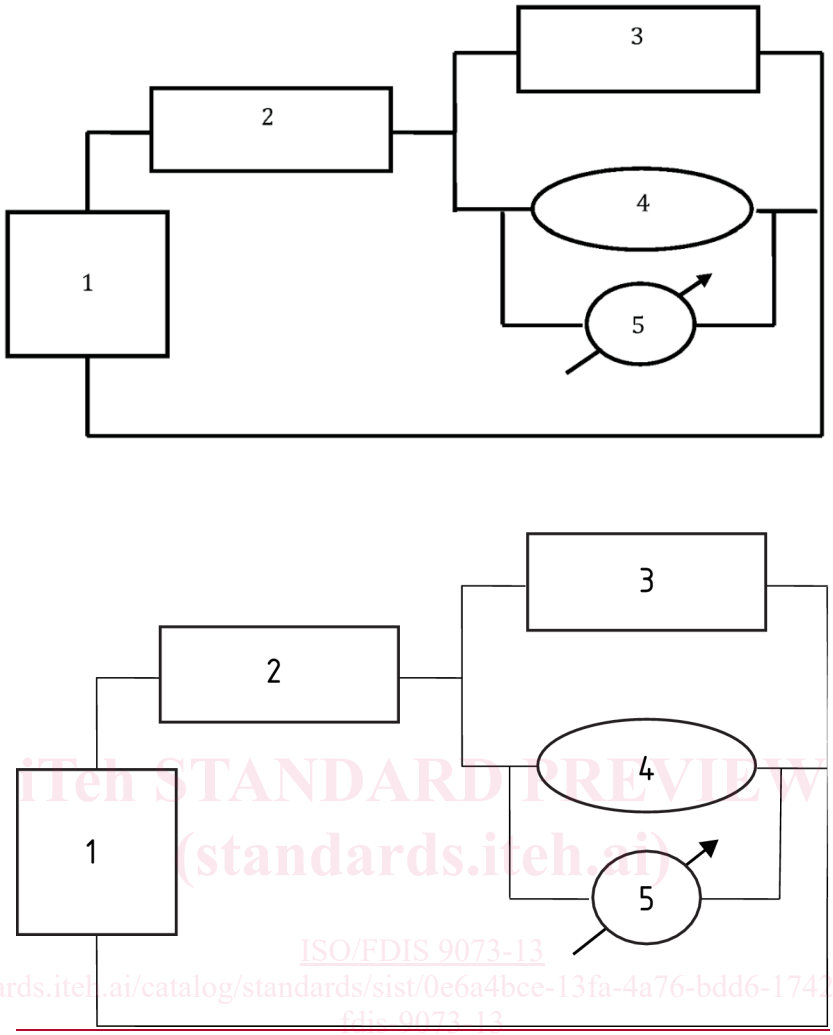
Figure 1 — Strike-through tester

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 shall 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:



Key

1 voltage generator: ~~1V, 300Hz~~1 V, 300 Hz

2 programming resistance 100 kΩ

3 resistance ~~25kΩ~~25 kΩ

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 shall alternate with a frequency of about 300 Hz, the cell current shall be about 10 µA and the voltage drop across the strike-through cell shall 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.