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Nonwovens — Test methods —

Part 14: Coverstock wetback (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](http://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](http://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](http://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 9073-14:2006), which has been technically revised.

The main changes are as follows:

- the title has been changed; ~~specifying it is a nonwoven test method from "Textiles — Test methods for nonwovens — Part 14: Coverstock wetback"~~ to "Nonwovens — Test methods — Part 14: Coverstock wetback (simulated urine)";
- ~~improved description of~~ descriptions in 5.1, 5.2 and 5.3 have been improved;
- procedure description in 9.3 has been changed;
- ~~Report~~ report items have been updated and blotter paper identification has been added.

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

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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](http://www.iso.org/members.html).

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## Nonwovens — Test methods — Part 14: Coverstock wetback (simulated urine)

### 1 Scope

This document specifies a test method for the determination of the ability of diaper coverstock to resist the transport back onto the skin of a liquid which has already penetrated the coverstock.

This test corresponds with repeated liquid strike-through time according to NWSP 070.7.

This test method is intended for ~~Quality Control~~ quality control and is designed for comparison of wetback for different nonwoven coverstocks and treatments. It does not simulate in use conditions for finished products.

### 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*~~

~~NWSP 70.7, *Repeated Liquid Strike Through Time (Simulated Urine)*~~

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

~~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 9073-13, *Nonwovens — Test methods — Part 13: Repeated liquid strike-through time (simulated urine)*~~

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

~~ISO 5636-1, *Paper and board — Determination of air permeance (medium range) — Part 1: General method*~~  
~~Corrected in French~~

~~ASTM D 3574 D3574, *Standard test method for flexible cellular materials, slab, bonded and moulded urethane foams.*~~

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

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NWSP 005.0, Nonwoven sampling

NWSP 70.7, Repeated Liquid Strike-Through Time (Simulated Urine)

### 3 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>
- 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  $(70 \pm 2)$ -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**

##### **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

### 4 Principle

A test specimen of coverstock is placed over a standard absorbent medium (ply of blotter paper) which is then loaded three times according to the ~~Repeated~~ repeated STT ~~according to the~~, in accordance with ISO-9073-13, with a specific quantity of simulated urine. After the third dose a ~~Simulated Baby Weight~~ simulated baby weight (SBW) is placed onto the coverstock and absorbent medium to ensure even spreading of the liquid.

A pre-weighed pick-up paper is then placed on the coverstock and the weight (SBW) again put on top.

The mass of liquid absorbed by the pickup paper is defined as wetback.

### 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 shall meet the following specifications:

- The mass per unit area of paper ~~is shall be~~ (139 ~~±~~ 11)-g/m<sup>2</sup>.
- The liquid absorption capacity, of the paper, as determined by NWSP 010.1, ~~is shall be~~ at least 480-%.
- The mean first strike-through time ~~is shall be~~ 2-s or less, using test procedure NWSP 70.7, but without a test sample.

NOTE Information concerning a potential source of suitable blotter paper can be obtained from the nonwovens industry associations, see [Bibliography-References \[6\] and \[7\]](#).

**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. This surface tension should be checked before each series of tests, as it can alter during storage.

**5.3 Pick-up (blotter) paper**, with dimensions 125-mm ~~x~~ 125-mm, needs to meet the same specifications as the absorbent pad, see 5.1.

**5.4 Grade 3 water**, according to ISO 3696.

## 6 Apparatus

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

**6.2 Funnel**, fitted with a magnetic valve, giving a rate of discharge of 25-ml in (3,5 ~~±~~ 0,25)-s.

**6.3 Ring stand**, to support the funnel.

**6.4 Strike-through plate**, see Figures-C.1 and C.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 set in grooves of cross-section 4,0-mm ~~x~~ 7,0-mm cut in the base of the plate and fixed with quick-setting epoxy resin.

- The electrodes shall be positioned as shown in Figures-C.1 and C.2 in Annex-C.
- Base plate, of transparent acrylic sheet, approximately 125-mm ~~x~~ 125-mm square and the thickness about 5 mm.

The plate surface, electrode surface and the star-shaped orifice shall be clean and free from deposit or particulate matter. Clean regularly, e.g. with mildly abrasive car polish and dry cloth, and/or hot water.

**6.5 Electronic timer**, measuring to the nearest 0,01-s

**6.6 Simulated baby weight (SBW)**, consisting of as the following.

- A weight, stainless steel base 10-cm ~~x~~ 10-cm including a handle, of total mass (4 000 ~~±~~ 20)-g.
- A polyurethane foam rubber, 10-cm ~~x~~ 10-cm with a height of 2-cm, and its specifications as follows:

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- Density: 25-kg/m<sup>3</sup> to 75-kg/m<sup>3</sup> (in accordance with ASTM [D 3574](#)/[D3574](#), test A)
  - Hardness: 150-N to 250-N for 40-% compression and 5-cm sample (in accordance with ASTM [D 3574](#)/[D3574](#), test B)
- c) A polyethylene film 25- $\mu$ m thick.

Wrap the polyethylene film around the foam, securing the film in place with tape then taping the film and foam to the weight (see Figure C.-3 in Annex-C).

NOTE More remarks can be found on Annex-B

## 7 Conditioning

Bring samples to moisture equilibrium in the standard atmosphere for testing nonwovens as directed in ISO 139. Equilibrium is considered to have been reached when the increase in mass of the specimen in successive weighing made at intervals of not less than 2-h does not exceed 0,25-% of the mass of the specimen.

NOTE While conditioning for a fixed time cannot be accepted in cases of dispute, it can be sufficient in routine testing to expose the material to the standard atmosphere for testing textiles for a reasonable period of time before the specimens are tested, i.e. 4-h.

## 8 Sampling

### 8.1 General

Carry out sampling in accordance with ISO 186. Ensuring that the areas from which samples are taken, have no visible flaws and are not creased.

### 8.2 Lot size

A lot should be established based on a logical break in the process or as prescribed by a regulation or traceability requirements.

Test specimens shall be selected in accordance with NWSP 005.0, if applicable.

### 8.3 Sampling

If provided in the customer specification, take random sample as directed. If no requirements are provided, ISO 2859-1 or ISO 3951-1 shall be used. 3 samples should be taken for this test. In and of themselves, these are not valid sampling plans by default. An agreement between the purchaser and supplier requires taking into account process stability, producer's risk, consumer's risk, acceptable quality level and also the cost needs to be established.

In general, if the test characteristic can be considered normally distributed, the sampling procedures for inspection by variables will require fewer samples. However, small samples cannot reflect that normal distribution and the estimated percent defective can therefore be over or underestimated. In this case, as well as for attribute data, the sampling procedures for inspection by attributes should be used.

In the absence of any sampling size requirement, Table 1 and Table 2 can be used. Switching rules are required to maintain the AQL protection.

Table 1 — Attributes (1.0 AQL, General Inspection Level II)

Number of units in the lot inclusive	Number of units that comprise the lot sample
1 to 150	13
151 to 280	32
281 to 500	50
501 to 1-200	80

Table 2 — Variables ("s" method, General Inspection Level II)

Number of units in the lot inclusive	Number of units that comprise the lot sample
1 to 15	3
16 to 25	4
26 to 50	6
51 to 90	9
91 to 150	13
151 to 280	18
281 to 500	25
501 to 1-200	35

NOTE An adequate specification or other agreement between the purchaser and supplier requires taking into account the variability between rolls of nonwoven fabric and between specimens from a swatch from a roll of material to provide a sampling plan with meaningful producer's risk, consumer's risk, acceptable quality level, and limiting quality level.

## 9 Procedure

This test ~~is~~shall be conducted in conjunction with the repeated strike-through test ISO-9073-13 as follows:

9.1 Set up the ring stand holding the funnel, make sure that the timer and conductivity detector are switched on, and electrodes are connected.

9.2 Cut the nonwoven test specimen, to the size of 125-mm ~~x~~ 125-mm.

9.3 Prepare the absorbent pad (see 5.1), ~~Stacking~~stacking the paper layers on top of each other, smooth side upwards.

9.4 Weigh the absorbent pad, place it with the smooth side upwards on the strike-through baseplate. The mass ( $W$ ) of the blotter paper pad will be used as a parameter to determine the total quantity of liquid ( $Q$ ) required for the wetback test.

- The quantity of liquid ( $Q$ ) will be calculated by multiplying  $W$  by the loading factor ( $LF$ ) of the blotter paper (see ~~remarks clause~~Annex B).
- Use the mean loading factor that is indicated on the technical datasheet. (for Ahlstrom grade 989 this is ~~3,60~~).