IS 15891-8 (2012): Textiles – Test Methods for Nonwovens, Part 8: Determination of Liquid Strike – Through Time (Simulated Urine) [TXD 30: Geotextiles and Industrial Fabrics]

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IS 15891 (Part 8) : 2012
ISO 9073-8 : 1995

भारतीय मानक

वस्त्रादि — बिना बुने हुए वस्त्रों की परीक्षण विधियाँ

भाग 8 द्रव्य पार होने का समय ज्ञात करना (कृत्रिम मूत्र)

Indian Standard

TEXTILES — TEST METHODS FOR NONWOVENS

PART 8 DETERMINATION OF LIQUID STRIKE-THROUGH TIME (SIMULATED URINE)

ICS 59.080.01

BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

May 2012 **Price Group 2**

Geosynthetics Sectional Committee, TXD 30

NATIONAL FOREWORD

This Indian Standard (Part 8) which is identical with ISO 9073-8 : 1995 'Textiles — Test methods for nonwovens — Part 8: Determination of liquid strike-through time (simulated urine)' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Geosynthetics Sectional Committee and approval of the Textile Division Council.

This standard has been published in various parts. Other parts in this series are:

Part 1 Determination of mass per unit area

Part 2 Determination of thickness

Part 3 Determination of tensile strength and elongation

Part 4 Determination of tear resistance

Part 6 Absorption

Part 7 Determination of bending length

Part 9 Determination of drape coefficient

The text of ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their respective places are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 139 : 1973 Textiles — Standard atmospheres for conditioning and testing	IS 6359 : 1971 Method for conditioning of textiles	Technically Equivalent
ISO 186 : 1985 Paper and board — Sampling to determine average quality	IS 2500 (Part 1) : 2000 Sampling procedure for inspection by attributes: Part 1 Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection (*third revision*)	do
ISO 3696 : 1987 Water for analytical laboratory use — Specification and test methods	IS 1070 : 1992 Reagent grade water — Specification (*third revision*)	do

(*Continued on third cover*)

Indian Standard

TEXTILES — TEST METHODS FOR NONWOVENS

PART 8 DETERMINATION OF LIQUID STRIKE-THROUGH TIME (SIMULATED URINE)

1 Scope

This part of ISO 9073 specifies a method for measuring the time of liquid (simulated urine) strike-through for nonwoven coverstocks. The method is suitable for making comparisons between different nonwoven coverstocks. It does not simulate in-use conditions for finished products.

NOTE 1 This International Standard describes a test method specific to nonwovens. Other International Standards applicable to textile, paper, plastics, rubber or other materials can also be applied to test certain nonwoven characteristics.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 9073. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9073 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 139:1973, *Textiles — Standard atmospheres for conditioning and testing.*

ISO 186:1994, *Paper and board — Sampling to determine average quality.*

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods.*

3 Definition

For the purposes of this part of ISO 9073, the following definition applies.

3.1 strike-through time: Time taken for a known volume of liquid, applied to the surface of a piece of nonwoven coverstock with an absorbent pad underneath, to pass through the nonwoven coverstock.

4 Principle

A specified quantity of simulated urine is discharged at a specified rate under specified conditions onto a test piece of nonwoven which is placed on a reference absorbent pad. The time taken for all the liquid to penetrate the nonwoven is measured electronically.

5 Material and reagents

5.1 Reference absorbent pad, consisting of five layers of reference filter paper (100 mm × 100 mm) with the smooth sides uppermost, and having a mean strike-through time in 10 determinations without the nonwoven of (3 ± 0,5) s.

NOTE 2 Information concerning suitable filter paper may be obtained from:

INDA, 1001 Winstead Drive, Suite 460, Cary, NC 27513, USA;

EDANA, 157 av. Eugène Plasky, B-1040 Brussels.

5.2 Simulated urine, consisting of a 9 g/l solution of sodium chloride in grade 3 water conforming to ISO 3696, with a surface tension of (70 ± 2) mN/m.

NOTES

3 Surface tension should be checked before each series of tests, as surface tension can alter during storage.

4 The surface tension of adult human urine is published as 69 mN/m to 70 mN/m. There is a suggestion that some babies' urine could have a lower surface tension (e.g. 45 mN/m). The surface tension of the simulated urine used may be adjusted by the addition of a surfactant. Such addition should be reported as a deviation from standard procedure and the surface tension should be stated in the test report.

6 Apparatus

6.1 Burette, of 50 ml capacity, with a supporting stand.

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 1 and 2), constructed of transparent acrylic sheet, of total mass 500 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 × 7,0 mm cut in the base of the plate and fixed in place with quick-setting epoxy resin.

The electrodes shall be positioned as shown in figure 2.

6.5 Baseplate, of transparent acrylic sheet, approximately 125 mm × 125 mm square and 5 mm thick.

6.6 Electronic timer, which can be read to the nearest 0,01 s.

NOTE 5 The sensitivity of the timing mechanism is such that different apparatus could give results slightly lower or higher than the specification for the standard absorbent pad alone. Users of the method are therefore advised to validate their equipment against results provided by the producer of the filter paper.

7 Sampling

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

8 Preparation and conditioning of test pieces

8.1 Cut 10 test pieces measuring 125 mm × 125 mm.

8.2 Condition the test pieces and filter papers in one of the atmospheres specified in ISO 139.

9 Procedure

9.1 Set up the ring stand (6.3) holding the funnel (6.2) and position the burette (6.1) with the tip inside the funnel.

9.2 Place one nonwoven test piece on top of one set of five reference filter papers (5.1) on the baseplate (6.5). Place the nonwoven on the filter paper in such a way that the side of the nonwoven which is intended to be in contact with the user's skin is uppermost.

Ensure that the electrodes in the strike-through plate are clean.

Place the strike-through plate (6.4) on top of the nonwoven, with the centre of the plate over the centre of the test piece. Centre the burette and the funnel over the plate.

9.3 Adjust the height of the funnel so that it is (5 ± 0,5) mm above the top of the cavity in the plate (i.e. 30 mm above the test piece).

9.4 Ensure the electrodes are connected to the timer (6.6). Activate the timer and set the clock to zero.

9.5 Fill the burette with simulated urine (5.2). Keep the discharge valve of the funnel closed and run 5,0 ml of liquid from the burette into the funnel.

Dimensions in millimetres

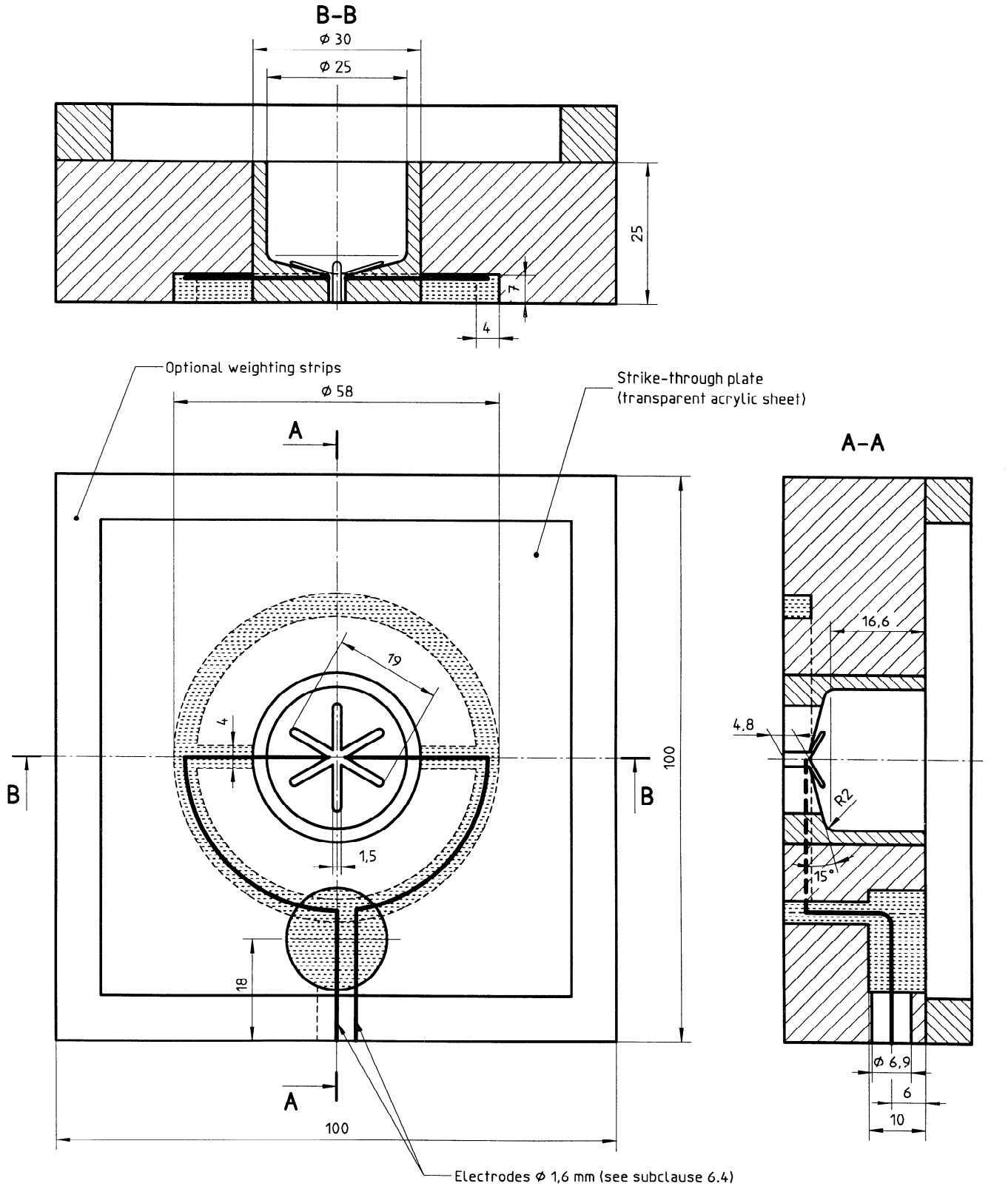

Figure 1 — Strike-through plate

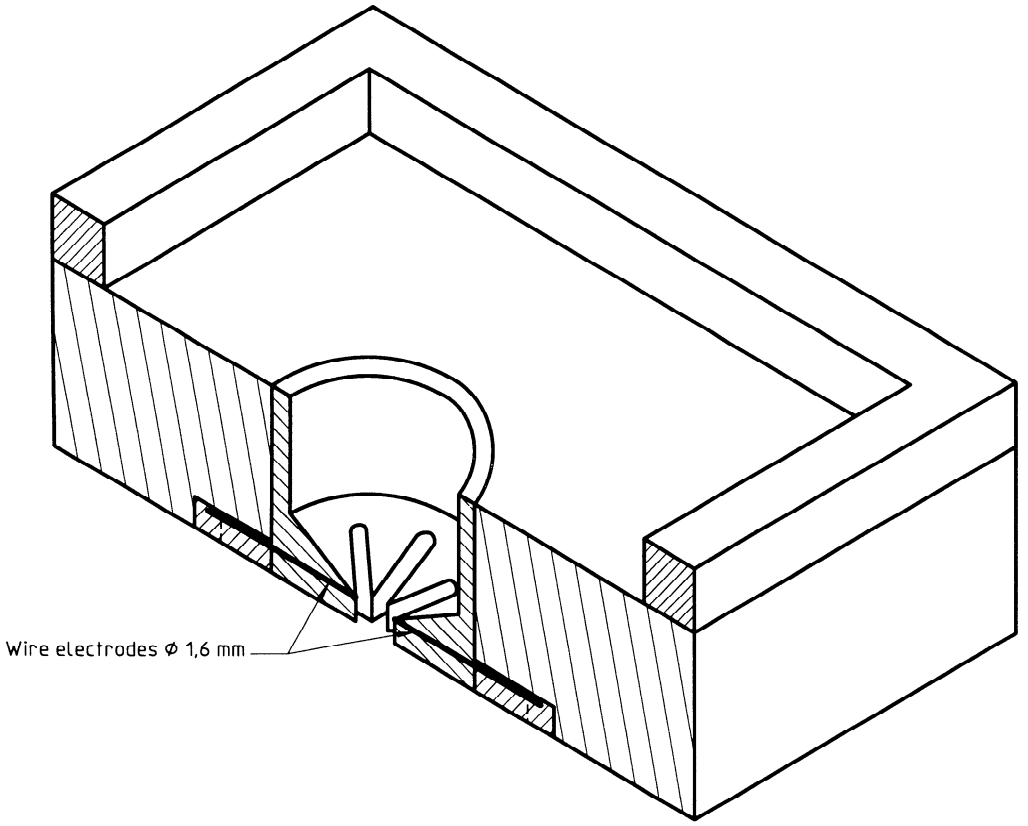

Figure 2 — Section across strike-through plate on centreline of 25 mm diameter cavity

9.6 Open the magnetic discharge valve of the funnel to discharge 5,0 ml of liquid. The initial flow of liquid will complete the electrical circuit and start the timer. It will stop when all the liquid has penetrated into the nonwoven and fallen below the level of the electrodes in the strike-through plate.

9.7 Record the time indicated on the electronic timer.

9.8 Repeat for the required number of test pieces.

NOTE 6 A minimum of 10 tests on test pieces from each sample is recommended.

10 Expression of results

For each sample, calculate the mean strike-through time, in seconds, and the coefficient of variation.

11 Test report

The test report shall include the following information:

a) a reference to this part of ISO 9073;

b) all details necessary for complete identification of the nonwoven material;

c) the conditioning atmosphere used;

d) if required, surfactant added and surface tension of simulated urine;

e) the individual strike-through times of the tests, in seconds;

f) the mean strike-through time, in seconds;

g) the coefficient of variation;

h) any unusual features noted during the testing, or deviations from the procedure specified in this part of ISO 9073.

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The conditioning temperature of 20±2°C as specified in International Standards is not suitable for tropical countries like India where the atmospheric temperature is normally much higher than 20°C. It is almost impossible to maintain this temperature specially during summer when the atmospheric temperature rises even up to 50°C. In view of the above, IS 6359 : 1971 'Method for conditioning of textiles' which specifies a temperature of 27±2°C for conditioning of the test specimens for the tropical countries like India shall be referred.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard alongwith amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc No.: TXD 30 (0932).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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