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Textiles — Test methods for nonwovens — Part 1: Determination of mass per unit area

*Textiles — Méthodes d'essai pour nontissés —
Partie 1: Détermination de la masse surfacique*

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Reference number
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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 9073-1 was prepared by Technical Committee ISO/TC 38, *Textiles*.

ISO 9073 consists of the following parts, under the general title *Textiles — Test methods for nonwovens* :

- *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*

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Introduction

Although nonwovens are classified within the textile industry, it should be recognized that nonwovens technologically share characteristics not only with textile products but also with paper and/or plastic products. There is an existing international textile test, ISO 3801. However, in order to meet the specific needs of nonwovens, alternative requirements to those listed in ISO 3801 are specified in this part of ISO 9073. These are

- a) a different sampling procedure;
- b) an alternative specification for dimensions of test piece;
- c) a greater accuracy for the balance.

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Textiles — Test methods for nonwovens —

Part 1: Determination of mass per unit area

1 Scope

This part of ISO 9073 specifies a method for the determination of mass per unit area of nonwovens.

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 listed 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 : 1985, *Paper and board — Sampling to determine average quality*.

ISO 3801 : 1977, *Textiles — Woven fabrics — Determination of mass per unit length and mass per unit area*.

3 Principle

Measurement of the area and mass of a test piece and calculation of its mass per unit area in grams per square metre.

4 Apparatus

4.1 Apparatus for cutting the test pieces, chosen from among the following.

4.1.1 **Die**, which cuts a test piece of an area of at least 50 000 mm².

4.1.2 **Template**, with an area of at least 50 000 mm² (e.g. 250 mm × 200 mm) and a **razor blade**.

4.1.3 **Steel rule**, accurately graduated in millimetres, and a **razor blade**.

4.2 Balance, capable of determining the mass of a test piece to an accuracy of $\pm 0,1\%$ of the determined mass.

5 Sampling

Carry out sampling in accordance with ISO 186.

NOTES

1 The optimum sample size will vary with different nonwovens and should be agreed between purchaser and vendor. The size should preferably not be smaller than the size specified in 4.1 due to anisotropy of various nonwovens.

2 Attention is drawn to the fact that with nonwovens, sampling error may be greater than the testing error.

3 This method of sampling recognizes and makes provisions for "anisotropy" (differences in properties along various directions, principally machine and cross direction) in the final specimens. However, these specimens are random representatives of the material and in some cases it may be desirable to investigate systematic variations of properties (including anisotropy), for example across the width, or in certain positions along the length of a given reel. In all such cases, special provisions should be agreed between purchaser and vendor and recorded in the test report. A procedure for more detailed examination of variability within a given batch of material is available in TAPPI T 11-05-74 and may be found helpful. This publication may be obtained from: The Technical Association of Pulp and Paper Industries, 1 Dunwoody Park, Atlanta, Georgia 30338, USA.

6 Preparation and conditioning of test pieces

6.1 From each sample, cut at least three test pieces, each of an area of at least 50 000 mm², using either the die, or the template and a sharp razor blade.

If there is insufficient material to cut test pieces of the specified size, cut the largest rectangle possible and measure its area using the steel rule.

NOTE — Although it is not recommended, the interested parties may agree on the use of a smaller test area, and this fact should be mentioned in the test report [clause 9 g)].

If the coefficient of variation is required, use a minimum of five test pieces.

6.2 Condition the test pieces as specified in ISO 139.

7 Procedure

Determine the mass of each piece in the standard atmosphere for testing (see ISO 139) using the balance (4.2).

8 Expression of results

Calculate the mass per unit area of each test piece, the mean value in grams per square metre and, if required, the coefficient of variation, as a percentage.

9 Test report

The test report shall include the following information :

- a) a reference to this part of ISO 9073;
- b) all details necessary for the identification of the material;
- c) the test results;
- d) the mean value in grams per square metre;
- e) if required, the coefficient of variation, as a percentage;
- f) the conditioning atmosphere used;
- g) any unusual features noted during the testing, or deviations from the standard procedure.