

STANDARD

9073-3

First edition
1989-07-01

**Textiles — Test methods for nonwovens —
Part 3:
Determination of tensile strength and elongation**

Textiles — Méthodes d'essai pour nontissés —

Partie 3: Détermination de la résistance à la traction et de l'allongement



Reference number
ISO 9073-3 : 1989 (E)

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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.

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 9073-3 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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Case postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

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 5081. However, in order to meet the specific needs of nonwovens, alternative requirements to those listed in ISO 5081 are specified in this part of ISO 9073. These are

- a) a different sampling procedure;
- b) a constant rate of extension, i.e. 100 mm/min.

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Textiles — Test methods for nonwovens —

Part 3: Determination of tensile strength and elongation

1 Scope

This part of ISO 9073 specifies a method for the determination of the tensile properties of nonwovens by the cut strip method.

NOTE — Anomalies can occur when testing some spun-laid and glass fibre nonwovens. This may require modification of the test procedure.

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 5081 : 1977, *Textiles — Woven fabrics — Determination of breaking strength and elongation (Strip method)*.

3 Principle

Application of a force longitudinally to a test piece of a specified length and width at a constant rate of extension.

Determination of values for breaking strength and elongation from the recorded force-elongation curve.

4 Apparatus

4.1 Tensile testing machine, constant rate of extension type, equipped with an autographic recorder to register applied force and clamp separation.

4.2 Clamps, with jaws capable of holding the test pieces securely across their full width without damage.

5 Sampling

Carry out sampling in accordance with ISO 186, where possible taking test specimens of an approximate length at 1 m from the full width of the material. Ensure that the areas from which the specimens are taken have no visible flaws and are not creased.

NOTE — 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 Unless otherwise specified, cut five test pieces in the machine direction and five in the cross-machine direction, ensuring that they are all taken at least 100 mm from the edge and are equally distributed across the width and length of the specimen.

6.2 Cut the test pieces 50 mm \pm 0,5 mm wide and of sufficient length to allow a jaw separation of 200 mm, thus avoiding risks due to local heterogeneity of nonwovens or to undue cutting of long-fibre nonwovens.

NOTE — Wider test pieces and different forms of clamping, e.g. C-form or piped form, may be used by agreement between the interested parties; a note of these special conditions should be included in the test report.

6.3 Condition the test pieces as specified in ISO 139.

6.4 If wet tensile tests are required, soak the test pieces, without conditioning, for at least 1 h in a solution containing