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**Textiles — Test methods for nonwovens —**

**Part 4:**

**Determination of tear resistance**

*Textiles — Méthodes d'essai pour nontissés —*

*Partie 4: Détermination de la résistance à la déchirure*



## 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 voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9073-4 was prepared by Technical Committee ISO/TC 38, *Textiles*.

This second edition replaces and cancels the first edition (ISO 9073-4:1989), clause 3, figure 1, subclause 6.2, subclause 7.2 and clause 8 of which have been technically revised.

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 no current International Standard for determination of tear strength of textiles, but work is proceeding on determination of tear resistance (falling pendulum method, ISO 9290:1990, *Textiles — Woven fabrics — Determination of tear resistance by falling pendulum method*) and determination of tear resistance (tongue-tear method).

This method, which uses a trapezoidal tear, is a tension test in which the strength is determined primarily by the fibres of the composite structure and their bonding or interlocking. It is useful for estimating relative ease of tearing of nonwovens. In nonwovens, the mechanism of failure is affected by interfibre frictional forces and differs from that found for woven fabrics, where failure is essentially that of sequential rupture of yarns in tension.

There is evidence that this test may not be applicable to nonwovens above a certain mass per unit area and stiffness. Additional work on this problem is in progress.

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## Textiles — Test methods for nonwovens —

### Part 4: Determination of tear resistance

#### 1 Scope

This part of ISO 9073 specifies a method for the determination of tear resistance of nonwovens by the trapezoid method.

#### 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*.

#### 3 Principle

Marking of a trapezoid on a test piece.

Clamping of the non-parallel sides of the trapezoid in the jaws of a tensile testing machine.

Application of a continuously increasing extension to the test piece in such a way that a tear propagates across its width.

Determination of the average maximum tear resistance in newtons.

#### 4 Apparatus

**4.1 Tensile testing machine**, either constant rate of extension type or constant rate of traverse type, equipped with an autographic recorder to register applied force.

**4.2 Clamps**, of sufficient width to accommodate the full width of the test piece.

**4.3 Template**, with dimensions as shown in figure 1.