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INTERNATIONAL STANDARD

ISO 9073-2

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Textiles — Test methods for nonwovens —

Part 2: Determination of thickness

Textiles — Méthodes d'essai pour nontissés —

Partie 2: Détermination de l'épaisseur

Reference number
ISO 9073-2 : 1989 (E)

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 9073-2 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 5084. However, in order to meet the specific needs of nonwovens, alternative requirements to those listed in ISO 5084 are specified in this part of ISO 9073. These are

a) a different sampling procedure;

b) specific pressures at which to test normal and bulky nonwovens;

c) a specific area for the size of the presser-foot;

d) a shorter time to note the gauge reading.

Textiles — Test methods for nonwovens —

Part 2: Determination of thickness

1 Scope

This part of ISO 9073 specifies methods for the determination of the thickness, when under a specific pressure, for normal and bulky 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 5084 : 1977, *Textiles — Determination of thickness of woven and knitted fabrics (other than textile floor covering).*

3 Definitions

For the purposes of this part of ISO 9073, the following definitions apply.

3.1 bulky nonwovens: Nonwovens which are compressible by 20 % or more when the pressure applied changes from 0,1 kPa to 0,5 kPa.

3.2 thickness: The distance between the face and back of a nonwoven measured as the distance between a reference plate on which the nonwoven rests and a parallel presser-foot that is applying a pressure to the nonwoven.

4 Principle

Measurement of the thickness of a nonwoven as the distance between the reference plate on which the nonwoven rests and a parallel presser-foot that exerts a specified pressure on the area under test.

5 Apparatus

5.1 For normal nonwovens

5.1.1 Two circular horizontal plates, attached to a stand. The upper plate, or presser-foot, shall be capable of moving vertically and shall have an area of approximately 2 500 mm^2. The reference plate shall have a plane surface of diameter at least 50 mm greater than that of the presser-foot.

5.1.2 Measuring device, having a scale with 0,01 mm graduations.

5.2 For bulky nonwovens with a maximum thickness of 20 mm

5.2.1 Vertical reference plate, with an area of 1 000 mm^2, **presser-foot** with an area of 2 500 mm^2, and equipment to suspend the test piece vertically between them.

5.2.2 Elbow lever, attached to the reference plate and capable of being balanced using a counterweight so that it exerts a very small force to the left when the balance weight is not in position.

5.2.3 Electrical contacts, which, when closed, cause a small bulb to become illuminated.

5.2.4 Balance weight, with a mass of 2,05 g ± 0,05 g, which, when in position, causes the contacts to separate and extinguish the bulb. This gives a measuring pressure of 0,02 kPa.

5.2.5 Screw, which, when turned, drives the presser-foot to the left and presses the test piece with increasing pressure against the reference plate until the force on the balance is overcome and the bulb becomes illuminated again.

5.2.6 Dial-gauge, to indicate the distance between the reference plate and the presser-foot corresponding to the thickness of the test piece at the pressure applied.

NOTE — An example of suitable apparatus is shown in figure 1.

5.3 For bulky nonwovens with a thickness greater than 20 mm

5.3.1 Testing area, of 200 mm × 200 mm.

5.3.2 Testing apparatus (see figure 2), consisting of the following.

5.3.2.1 Horizontal square base plate with a side length of 300 mm. This base plate shall have a smooth surface. In the centre of one side is a **vertical scale M** with graduations in millimetres, on which is placed a **horizontal measuring bar B,** which is movable in a vertical direction. This bar supports an **adjustable vertical probe T** at a distance of 100 mm from the vertical scale.

NOTE — The vertical probe T should be above the centre of the measuring plate P when in use (see 9.3.2) so that its distance from the vertical scale is slightly more than 100 mm and the measuring plate is not in contact with the scale.

5.3.2.2 Square measuring plate P, with a side length of 200 mm ± 0,2 mm and a mass of 82 g ± 2 g. The plate is made of glass with a thickness of 0,7 mm which can be brought to the required mass by the addition of weight-pieces. The measuring pressure is 0,02 kPa.

NOTE — If additional weight-pieces are necessary, they should be distributed symmetrically so that there is even pressure over the whole area of the plate.

5.4 Stop-watch.

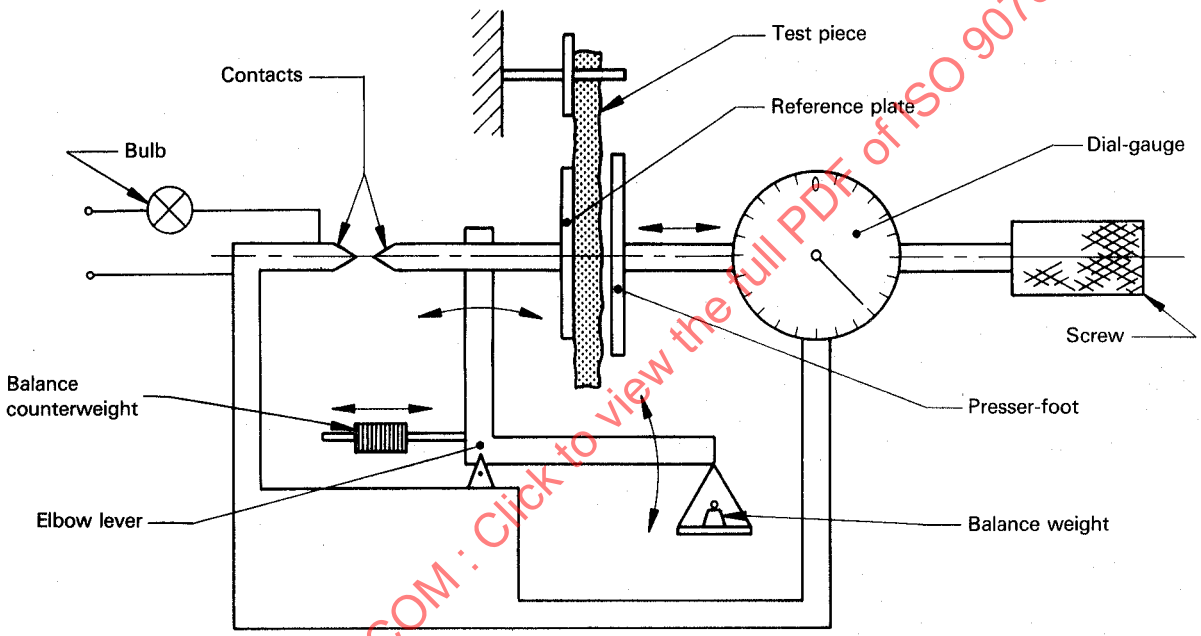

Figure 1 — Test apparatus for bulky nonwovens with a maximum thickness of 20 mm

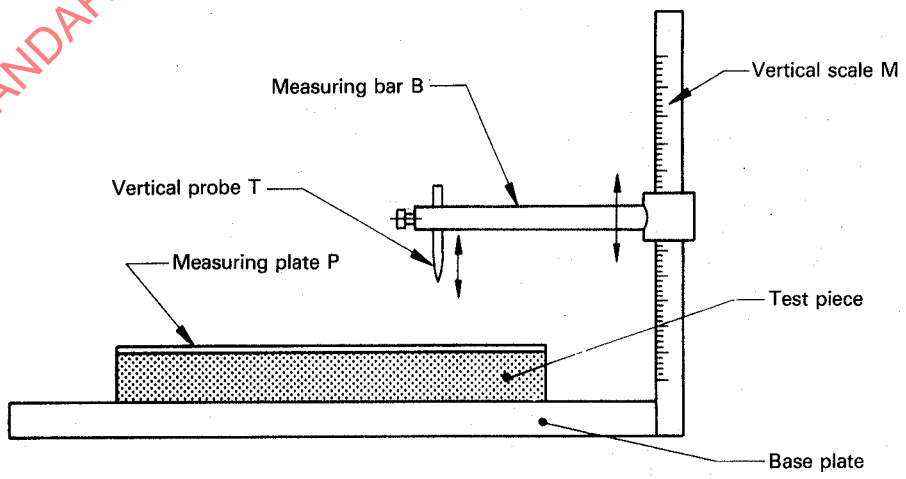

Figure 2 — Test apparatus for bulky nonwovens with a thickness greater than 20 mm