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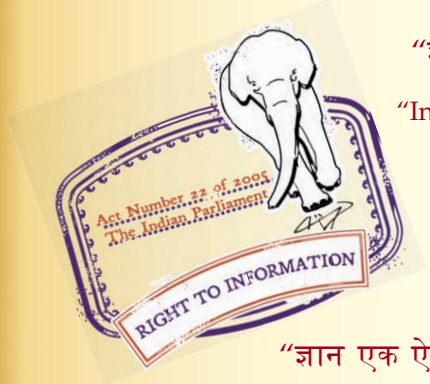
IS 7702 (2012): Textiles-Determination of Thickness of Textiles and Textile Products [TXD 1: Physical Methods of Tests]



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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 7702 : 2012
ISO 5084 : 1996

भारतीय मानक

वस्त्रादि — वस्त्रादि एवं वस्त्रादि उत्पादों की मोटाई ज्ञात करना

(पहला पुनरीक्षण)

Indian Standard

TEXTILES — DETERMINATION OF THICKNESS OF TEXTILES AND TEXTILE PRODUCTS

(First Revision)

ICS 59.080.30

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

March 2012 **Price Group 3**

Physical Methods of Test Sectional Committee, TXD 01

NATIONAL FOREWORD

This Indian Standard (First Revision) which is identical with ISO 5084 : 1996 'Textiles — Determination of thickness of textiles and textile products' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of the Physical Methods of Test Sectional Committee and approval of the Textile Division Council.

This standard was first published in 1975 and has been revised to align it with the latest ISO 5084 : 1996 by adoption under dual numbering system.

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.

The text of ISO Standard has been approved as suitable for publication as an Indian Standard with the above 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[1)] Textiles — Standard atmospheres for conditioning and testing	IS 6359 : 1971 Method for conditioning of textiles	Technically Equivalent
ISO 10012-1 : 1992[2)] Quality assurance requirements for measuring equipment — Part 1: Metrological confirmation system for measuring equipment	IS/ISO 10012 : 2003 Measurement management systems — Requirements for measurement processes and measuring equipment	do

In reporting the results of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

[1)] Since revised in 2005.
[2)] Since revised in 2003.

Indian Standard

TEXTILES — DETERMINATION OF THICKNESS OF TEXTILES AND TEXTILE PRODUCTS

(First Revision)

1 Scope

This International Standard specifies a method for the determination of the thickness of textiles and textile products when under a specified pressure. It is not applicable to textile floor coverings, nonwovens, geotextiles and coated fabrics for which specific International Standards exist (see annex B).

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard 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 10012-1:1992, *Quality assurance requirements for measuring equipment — Part 1: Metrological confirmation system for measuring equipment.*

3 Definition

For the purposes of this International Standard, the following definition applies.

3.1 thickness of a textile: Perpendicular distance between two reference plates exerting a pressure of 1 kPa or less on the textile.

4 Principle

The thickness of a specimen is measured as the distance between the reference plate on which the specimen rests and a parallel circular presser-foot that exerts a specified pressure on the area of the textile under test.

A test specimen is placed between two reference plates which exert a known pressure on the specimen. The perpendicular distance between the reference plates is measured and recorded after a specified time.

5 Apparatus

5.1 Thickness tester

The confirmation system for the thickness tester shall comply with ISO 10012-1. The thickness tester shall incorporate (or be equipped with) the following elements.

5.1.1 Interchangeable presser-feet, of area appropriate to the type of fabric to be tested.

The recommended pressure-foot area for the test is (2 000 ± 20) mm^2, corresponding to a circular presser-foot of diameter (50,5 ± 0,2) mm (see also annex A). If other test areas have to be used, this shall be agreed by the interested parties and shall be stated in the test report.

5.1.2 Reference plate, with a plane upper surface of diameter at least 50 mm greater than that of the presser-foot (5.1.1).

5.1.3 Means for moving the presser-foot (in a direction normal to the upper surface of the reference plate), so that its bearing surface is maintained horizontal and parallel to the upper surface of the refer-

ence plate (5.1.2) and so that pressures of (1 ± 0,01) kPa and (0,1 ± 0,001) kPa can be applied to a test specimen supported on the plate (see annex A).

5.1.4 Thickness gauge, capable of registering the distance between the bearing surface of the presser-foot (5.1.1) and the reference plate (5.1.2) to an accuracy of 0,01 mm.

5.2 Stopwatch.

6 Atmosphere for conditioning and testing

The textile samples shall be conditioned and the test conducted in the standard atmosphere for conditioning and testing of textiles specified in ISO 139.

7 Sampling, selection and conditioning of specimens

7.1 Take samples in one of the following ways, as appropriate:

a) in accordance with the directions given in the relevant material specification;

b) if such directions are not included in the material specification, in accordance with the procedure agreed upon by the parties interested in the test results.

7.2 Select test areas for samples in accordance with clause A.3. For fabrics which are sensitive to deformation, e.g. certain knitted fabrics, cut test specimens in accordance with clause A.3. If wide-width fabrics cannot be handled without distortion, cut test specimens.

7.3 Condition the samples or test specimens in the relaxed state until equilibrium is reached with the standard atmosphere for testing.

NOTE 1 It is recommended to condition the samples at least for 16 h in the relaxed state.

8 Procedure

8.1 Clean the presser-foot (5.1.1) and the reference plate (5.1.2). Check that the presser-foot shaft moves freely. Load the presser-foot to exert the appropriate specified pressure on the reference plate, and set the thickness gauge (5.1.4) to read zero. An applied pressure of (1 ± 0,01) kPa is recommended.

8.2 Raise the presser-foot and position the sample or test specimen, without tension and distortion, on the reference plate so that no part of the area to be measured is closer than 150 mm to the selvedge. Ensure that the area chosen for the test is free from creases.

8.3 Lower the presser-foot gently onto the specimen and note the gauge reading after (30 ± 5) s.

8.4 Determine, in accordance with the procedure in 8.2 and 8.3, the thickness of at least five different areas on the sample or at least five test specimens (see annex A).

9 Expression of results

Calculate the arithmetic mean of the measurements determined in accordance with clause 8 to an accuracy of 0,01 mm. Calculate the coefficient of variation to the nearest 0,1 % and the 95 % confidence limits to the nearest 0,01 mm.

10 Test report

The test report shall include at least the following information:

a) statement that the test was conducted in accordance with this International Standard, and date of test;

b) description of the fabric; width of narrow fabrics, if relevant;

c) area of the presser-foot used;

d) applied pressure;

e) number of tests;

f) thickness of the textile or textile product, presented as the arithmetic mean, expressed in millimetres and, if required, the coefficient of variation expressed as a percentage and the 95 % confidence limits, expressed in millimetres (see clause 9);

g) any deviation, by agreement or otherwise, from the procedure specified, and the reasons for this.

Annex A
(normative)

Test area position and alternatives for presser-foot area and applied pressure

A.1 Presser-foot

If the test area of the presser-foot recommended in 5.1.1 is not used, then use one of the following:

— for narrow fabrics, e.g. usable width less than 50 mm, test area (100 ± 1) mm^2 corresponding to a circular presser-foot of diameter (11,28 ± 0,05) mm;

— for other fabrics, test area (10 000 ± 100) mm^2 corresponding to a circular presser-foot of diameter (112,84 ± 0,5) mm.

A.2 Applied pressure

If the pressure recommended in 8.1 is not used, then use (0,1 ± 0,001) kPa, e.g. for raised, pile or loop fabrics and certain knitted fabrics.

A.3 Test areas

The position of test areas or test specimens on the textile sample is shown in figure A.1.

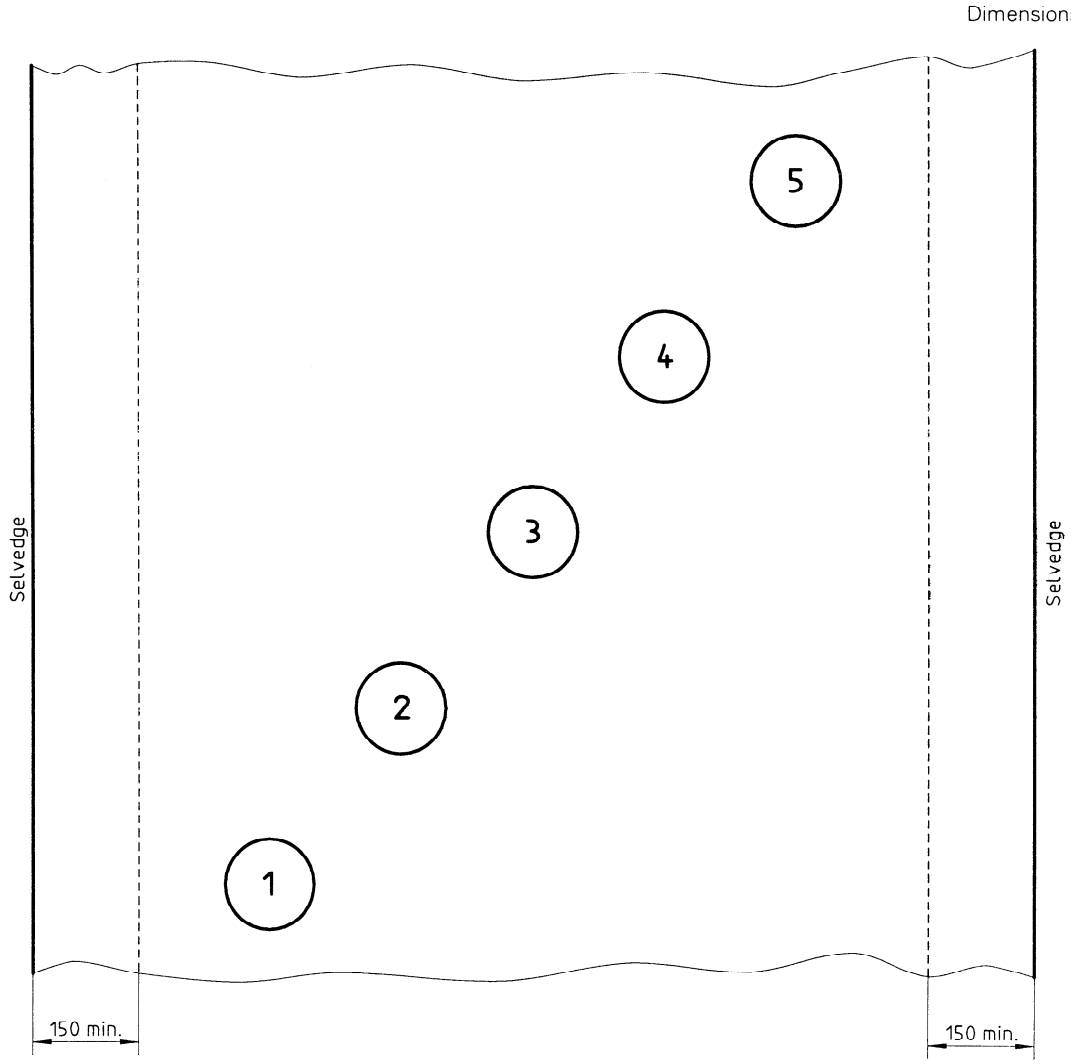

Figure A.1 — Position of test areas or test specimens

Annex B
(informative)

Bibliography

For determination of thickness of textile floor coverings or nonwovens or geotextiles see:

[1] ISO 1765:1986, *Machine-made textile floor coverings — Determination of thickness.*

[2] ISO 9073-2:1995, *Textiles — Test methods for nonwovens — Part 2: Determination of thickness.*

[3] ISO 9863:1990, *Geotextiles — Determination of thickness at specified pressures.*

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Amendments Issued Since Publication

Amendment No.	Date of Issue	Text Affected

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