इंटरनेट मानक

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"जानने का अधिकार, जीने का अधिकार"
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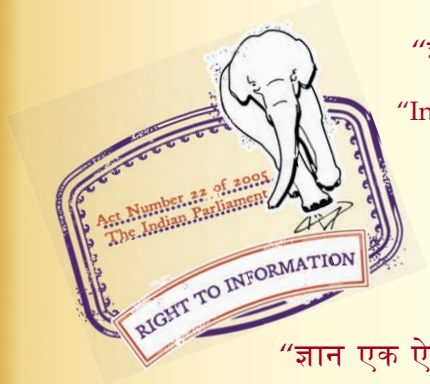
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 1964 (2001): Methods for Determination of Mass per Unit Lenght and Mass per Unit Area of Fabrics [TXD 1: Physical Methods of Tests]



"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 1964 : 2001

(Reaffirmed 2006)

भारतीय मानक

कपड़े के प्रति वर्गमीटर द्रव्यमान तथा प्रति मीटर लम्बाई के द्रव्यमान के निर्धारण की विधियाँ

(दूसरा पुनरीक्षण)

Indian Standard

TEXTILES — METHODS FOR DETERMINATION OF MASS PER UNIT LENGTH AND MASS PER UNIT AREA OF FABRICS

(Second Revision)

ICS 59.080.30

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

June 2001

Price Group 2

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Physical Methods of Tests Sectional Committee had been approved by the Textile Division Council.

This standard originally published in 1961 was revised in 1970. It has been revised again to provide for removal of selvedge in case the fabric mass is different than that of selvedge. The method based on determining the moisture present by moisture metre and then correcting the mass to commercial moisture regain has been deleted as the result obtained by mositure metre is not accurate. While revising the standard, assistance has been drawn from ISO 308 : 1977 'Textiles — Woven fabrics — Determination of mass per unit length and mass per unit area', issued by the International Organization for Standardization.

In reporting the result of a test 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*)'.

Indian Standard

TEXTILES — METHODS FOR DETERMINATION OF MASS PER UNIT LENGTH AND MASS PER UNIT AREA OF FABRICS

(Second Revision)

1 SCOPE

1.1 This standard prescribes two methods for determination of:

a) the mass per unit length; and
b) the mass per unit area of fabric.

1.2 These methods are not applicable to jute and tyre cord fabrics. The methods prescribed in this standard are applicable to all other textile fabrics irrespective of their composition (that is, whether they are made of cotton, wool, silk or man-made fibres or blends of two or more such fibres), manufacturing processes and finishing treatments.

1.2.1 The methods are also applicable to narrow fabrics.

2 REFERENCES

The Indian Standards given below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibilitiy of applying the most recent editions of the standards indicated below:

IS No.	*Title*
196 : 1966	Atmospheric conditions for testing (*revised*)
232 : 1985	Glossary of textile terms — Natural fibres (*second revision*)
1954 : 1990	Methods for determination of length and width of woven fabrics (*second revision*)

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Commercial Moisture Regain

An arbitrary value formally adopted as a regain to be used with the oven-dry mass for calculating the commercial or legal mass of a shipment or a delivery of any specific textile material.

3.2 Conditioned Mass

The mass of a textile material conditioned in the standard atmosphere for testing.

3.3 Moisture Regain

The mass of moisture present in a textile material expressed as a percentage of its oven-dry mass.

3.4 Oven-Dry Mass

The constant mass of textile material obtained by drying it at a temperature of 105 to 110°C.

NOTE — For other definitions reference may be made to IS 232.

4 PRINCIPLES

In Method A, the material is conditioned to moisture equilibrium in standard atmospheric conditions and then the mass is determined and in Method B, oven-dry mass of the material is determined and then to this is added the commercial moisture regain value of the material.

5 GENERAL INFORMATION

5.1 Choice of Method

Any method may be used for the determination of mass per unit length and mass per unit area of fabric depending upon the type of the instruments and facilities available subject to agreement between the buyer and the seller.

NOTE — In case of dispute, Oven-dry method is recommended to be used as a reference method.

5.2 Narrow Fabrics

In case of narrow fabrics, the mass per unit length shall preferably be determined from the mass and length of complete roll, but if this is not possible, a minimum length of 5 metres shall be used.

5.3 Selvedges

If the mass per unit length (or area) of the selvedge differs appreciably from the mass per unit length (or area) of the fabric, the mass per unit area shall be determined on a sample from which the selvedges

have been removed along the outermost warp threads of the body and calculation(s) shall be based on the mass of the trimmed sample and its length and width.

6 METHOD A — CONDITIONED MASS METHOD

6.1 Apparatus

6.1.1 *Horizontal, Flat Smooth Table*

6.1.2 *Graduated Steel Scale*

6.1.3 *Balance* — Capable of weighing to an accuracy of 0.005 g.

6.2 Atmospheric Conditions for Conditioning and Testing

6.2.1 Prior to test, the test samples shall be conditioned to moisture equilibrium from dry side in the standard atmosphere of 65 ± 2 percent relative humidity and 27 ± 2°C temperature (*see also* IS 196).

NOTE — The time required for a fabric to reach moisture equilibrium depends mainly on:

a) the thickness of the fabric or mass per unit area,

b) the closeness of the weave,

c) the hygroscopicity of the textile material comprising the fabric, and

d) type of finish given to the fabric.

The test samples shall be deemed to have been conditioned satisfactorily for the purpose of this test after these have been exposed to standard atmosphere for at least as much time as given below in such a way as to expose, as far as possible, all portions of the specimens to the atmosphere:

Textile Fabrics having Equilibrium Moisture Regain Values at Standard Atmosphere, Percent	*Time* h
Less than 4	6
From 4 to 10	12
Above 10	24 to 48

6.2.2 The test shall be carried out in a standard atmosphere (*see* **6.2.1**).

6.3 Procedure

Take the conditioned test sample (*see* Note) and determine its mass to an accuracy of 0.005 g.

NOTE — If the facilities to condition the full cut or roll of fabric are not available, cut swatches of 250 ± 2 mm × full width of fabric including selvedges (*see* **5.3**) and condition them. The swatches shall be so cut as to be representative of the lot.

6.3.1 Determine the length and width of samples according to IS 1954.

6.4 Calculations

Calculate the mass per unit length and mass per unit area by the following formula:

a) In case of full length pieces:

1) Mass per unit length, g/m $= \frac{M}{A} \times 10^3$

2) Mass per unit area, g/m^2 $= \frac{M}{A \times B} \times 10^5$

b) In case of swatches of 250 mm × full width:

1) Mass per unit length, g/m $= M \times 4 \times 10^3$

2) Mass per unit arear, g/m^2 $= \frac{M \times 4 \times 10^5}{B}$

where

M = mass of specimen in kg,

A = length of fabric in m, and

B = width of fabric in cm.

NOTE — The mass per unit length and mass per unit area are related by the equation:

$$\text{Mass per unit length in g/m} = \text{Mass per unit area in g/m}^2 \times \frac{B}{100}$$

6.5 Similarly, determine the mass per unit length and mass per unit area of at least four more test specimens and determine the average of all the values.

7 METHOD B — OVEN-DRY METHOD

7.1 Apparatus

7.1.1 *Horizontal, Smooth Flat Table*

7.1.2 *Graduated Steel Scale*

7.1.3 *Drying Oven* — Suitable for drying sample to constant mass at 105 to 110°C.

7.1.4 *Balance* — Capable of weighing to an accuracy of 0.005 g.

7.1.5 *T- Square*

7.2 Procedure

7.2.1 Lay the sample or one end of the cut or roll smoothly on a flat table. Mark either full width or square swatches (at least 5) with the help of the scale and T-square of the dimensions given below:

a) 250 ± 2 mm × full width of cloth including selvedges (*see* **5.3**), or

b) 250 ± 2 mm square.

Cut the swatches so marked with the help of a sharp scissors or razor blade. The swatches shall be so chosen as to be representative of the lot.

7.2.2 Determine the width of the fabric according to

IS 1954.

7.2.3 Dry the test specimen to constant mass in an oven maintained at 105 to 110°C and weigh to an accuracy of 0.5 g without removing the specimen from the oven, the draught being stopped during weighing.

7.3 Calculations

Calculate the mass per unit length or mass per unit area of specimen, at the applicable commercial moisture regain value (*see* Note 2) by the following formula:

a) In the case of full width swatches:

1) Mass per unit length, g/m $= \frac{M(100+R)}{25}$

2) Mass per unit area, g/m^2 $= \frac{4 \times M(100+R)}{B}$

b) In case of square swatches:

1) Mass per unit length, g/m $= \frac{M \times B(100+R)}{625}$

2) Mass per unit area, g/m^2 $= \frac{4 \times M(100+R)}{25}$

where

M = oven-dry mass of the specimen in g;

B = width of the fabric in cm; and

R = applicable commercial moisture regain, percent.

NOTES

1 The mass per unit length and mass per unit area are related by the equation:

$$\text{Mass per unit length in g/m} = \text{Mass per unit area in g/m}^2 \times \frac{B}{100}$$

2 Commercial moisture regain value of fabrics shall be as stipulated in the relevant Indian Standard specifications for the material or in the absence of such specifications, it shall be as agreed to between the buyer and the seller.

7.4 Similarly, determine the mass per unit length and mass per unit area of at least four more test specimens and calculate the average of all the values obtained.

8 REPORT

Report shall include the following:

a) Type of fabric tested,

b) Method followed,

c) Number of tests performed,

d) Mass per unit length,

e) Mass per unit area, and

f) Moisture regain value used (in case of Method B).

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BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 323 01 31, 323 33 75, 323 94 02

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110 002	323 76 17 323 38 41
Eastern	: 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi CALCUTTA 700 054	337 84 99, 337 85 61 337 86 26, 337 91 20
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Southern	: C. I. T. Campus, IV Cross Road, CHENNAI 600 113	254 12 16, 254 14 42 254 25 19, 254 13 15
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