भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDRADS

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भारतीय मानक मसौदा

वस्त्रादि — पटसन के कपड़ों के द्रव्यमान को निर्धारण करने की विधियाँ

(आई एस 2387 का दूसरा पुनरीक्षण)

Draft *Indian Standard*

TEXTILES — METHODS FOR DETERMINATION OF MASS OF JUTE FABRICS

(Second Revision of IS 2387 *)*

ICS 59.080.30

Physical Methods of Test Sectional Committee, TXD 01	Last date for receipt of comments is **10 March 2024**

FOREWORD

(*Formal clauses will be added later*)

This standard was first published in 1963 and subsequently revised in 1969 with a view to eliminating unnecessary and undesirable variations in the testing procedure for the determination of mass per unit length and mass per unit area of jute fabrics. It is intended to prescribe generally applicable methods of giving results of an accuracy considered adequate for the purpose of a standard specification. This revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

a) Temperature and relative humidity have been specified for testing of samples;
b) Terminology has been modified;
c) New clause for 'Test Report' has been incorporated;
d) Amendment has been incorporated;
e) References to the Indian standard have been updated; and
f) Kindly mention other changes/modifications.

All quantities and dimensions in this standard have been expressed in the metric system. However, for the information of the overseas consumers using fps system conversion factors have been given in the form of notes at suitable places in the standard.

In the preparation of this standard, considerable assistance has been derived from ISO 3801 : 1977 'Textiles — Woven fabrics — Determination of mass per unit length and mass per unit area' issued by International Organization for Standardization.

In reporting the result 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 : 2022 'Rules for rounding off numerical values (*second revision*)'.

1 SCOPE

This standard prescribes methods for determination of mass per metre and mass per square metre of jute fabrics.

2 REFERENCES

The standard listed 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 possibility of applying the most recent editions of these standards:

IS No.	*Title*
IS 196 : 1966	Atmospheric conditions for testing (*revised*)
IS 1954 (Doc. 22997)	Textiles — Fabrics — Determination of width and length (*third revision*)

3 TERMINOLOGY

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

3.1 Contract 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 Lot — All the bales, bundles or rolls of jute fabrics purporting to be of one definite type and quality containing one definite number of cuts delivered to one buyer against one despatch note.

3.3 Moisture Regain — The mass of moisture present in a textile material (here jute fabric) expressed as a percent of its oven-dry mass.

3.4 Oven-Dry-Mass — The constant mass of textile material (here jute fabric) obtained by drying it at a temperature of 105 ℃ ± 3 ℃.

4 ATMOSPHERIC CONDITIONS FOR TESTING

The test may be carried out in the standard atmosphere at (65 ± 2) percent relative humidity and 27 °C ± 2 °C temperature (*see* IS 196).

5 APPARATUS

5.1 For the purpose of this standard, the following apparatus shall be used:

    a) Horizontal, smooth and flat table;
    b) Graduated steel scale;
    c) T-square;
    d) Balance capable of weighing a cut sample of fabric to an accuracy of 0.05 g;
    e) Conditioning oven suitable for drying samples to constant mass at 105 ℃ ± 3 ℃;
    f) A suitable moisture meter; and
    g) Balance capable of weighing full cut or roll of fabric to an accuracy of 100 g.

6 METHOD A — BASED ON OVEN-DRY WEIGHING OF CUT SAMPLE

6.1 Procedure for Full Width of Sample

6.1.1 Lay one end of cloth from a cut or roll smoothly on a flat table. By using a steel scale and a T-square make a swatch 500 mm ± 2 mm in length perpendicular to selvedges across the full width of the fabric and cut out the swatch so marked. This shall constitute a test specimen.

6.1.1.1 Prepare at least five such test specimens from a sample lot.

6.1.1.2 For determination of mass per square metre, measure the width of the specimen according to IS 1954.

6.1.2 Dry the test specimen to constant mass in an oven maintained at 105 ℃ ± 3 ℃ and mass it to an accuracy of 0.2 percent of its mass without removing the specimen from the oven, the draught (*see* Note 1) being stopped during mass. Calculate the mass per metre or mass per square metre of the specimen at the applicable contract moisture regain value (*see* Note 2) by using the following formulae:

$$\text{Mass per metre, in g/m} = \frac{Md\,(100 + Rc)}{50}$$

$$\text{Mass per square metre, in g/m}^2 = \frac{2Md\,(100 + Rc)}{w}$$

where

    M_d = oven-dry mass of the specimen in g;
    Rc = applicable contract moisture regain percent (*see* Note 2); and

w = width of the specimen in cm.

NOTES

1 In order to avoid the risk of oil evaporation, the draught in the drying oven shall not be continued throughout the drying period but shall be in operation only intermittently.

2 Contract moisture regain value of the jute fabrics, should be as stipulated in the relevant Indian Standard specifications for the material.

3 For determination of mass per yard or mass per square yard to suit the needs of overseas consumers, use the following formulae:

a) Mass per yard, in oz/yard = Mass per metre, in g/m $\times$ 0.032 2
b) Mass per square yard, in oz/yard^2 = Mass per square metre, in g/m^2 $\times$ 0.029 5

6.1.3 Similarly determine the mass per metre or square metre of the remaining test specimens prepared as in **6.1.1.**

6.1.4 Calculate the mean of all the values obtained as above and report it as specified in **7**.

6.2 Procedure for Square Cut Pieces

6.2.1 Lay one end of cloth from a cut or roll, smoothly on the flat table and mark at least one 500 mm $\pm$ 2 mm square specimen from a cut and three 500 mm $\pm$ 2 mm square specimens from a roll with the help of a template taking different sets of warp and weft threads as far as possible and cut out the specimens marked. Specimens should not be taken within 50 mm from a selvedge or 200 mm from an end of a cut or roll.

6.2.1.1 Prepare at least ten such specimens from a sample lot.

6.2.1.2 Measure the width of the fabric according to IS 1954.

6.2.2 Dry the test specimen to constant mass in an oven maintained at 105 ºC $\pm$ 3 ºC and mass it to an accuracy of 0.2 percent of its mass without removing the specimen from the oven, the draught (*see* Note 1 under **6.1.2**) being stopped during weighing. Calculate the mass per square metre or mass per metre at the applicable contract moisture regain value (*see* Note 2 under **6.1.2**) by the following formulae:

$$\text{Mass per square metre, in g/m}^2 = \frac{Md\ (100 + Rc)}{25}$$

$$\text{Mass per metre, in g/m} = \frac{Md\ (100 + Rc) \times w}{2\ 500}$$

where

M_d = oven-dry mass of the specimen in g;
Rc = applicable contract moisture regain percent (*see* Note 2 under **6.1.2**); and
w = fabric width in cm.

NOTE — *See* Note 3 under **6.1.2** for determination of mass per yard, in oz/yard or mass per square yard in oz/yard^2.

6.2.3 Similarly determine the mass per square metre or mass per metre of the remaining test specimens prepared as in **6.2.1.**

6.2.4 Calculate the mean of all the values obtained as above and report it as specified in **8**.

7 METHOD B — BASED ON WEIGHING FULL CUT OR ROLL AND CORRECTING IT TO CONTRACT MOISTURE REGAIN

7.1 Procedure

7.1.1 Determine the moisture regain of cloth in the cut or roll by the use of a suitable moisture meter. Take at least four readings on the cut and ten readings on the roll at random, along the length covering different portions across the width.

> NOTE — IJIRA (Indian Jute Industries Research Association) moisture meter may be used for the purpose (mention of the name of the specific instrument is not intended to promote or give preference to the use of that instrument over others not mentioned). This meter works on the principle of measuring the electrical resistance which changes with moisture content in the material. The specimen (jute product) is placed under the electrode gun having two poles of specially designed spring-loaded electrodes. The small amount of current passing through the electrodes is amplified and recorded on the meter calibrated against the actual moisture regain based on oven-dry method, of the material. A separate chart calibrating the actual moisture regain based on oven-dry method, of the material may also be used. The instrument shall be operated according to the manufacturer's instructions.

7.1.2 Weigh the cut to the nearest 100 g and the roll at least to the nearest 500 g. Determine the mass of the packing material (tare mass) of the roll to the nearest 100 g and calculate the net mass of cloth in the roll by deducting the tare mass from the gross mass. Determine the length and width of the fabric (in the cut or roll) according to IS 1954.

7.1.3 From the moisture regain, mass and dimensions as determined in **7.1.1** and **7.1.2,** calculate the mass in grams per metre or per square metre at the applicable contract moisture regain (*see* Note 2 under **6.1.2**) using the following formulae:

$$\text{Mass per metre, in g/l} = \frac{1\,000\,M}{l} \times \frac{100 + Rc}{100 + Ro}$$

$$\text{Mass per square metre, in g/m}^2 = \frac{10^5\,m}{l \times w} \times \frac{100 + Rc}{100 + Ro}$$

where

M	= net mass of cloth in a cut or roll in kg;
l	= length of cloth in a cut or roll in m;
R_c	= applicable contract moisture regain percent (*see* Note 2 under **6.1.2**);
R_o	= average moisture regain percent observed; and
w	= fabric width in cm.

> NOTE — *See* Note 3 under **6.1.2** for determination of mass per yard, in oz/yard or mass per square yard in oz/yard^2.

7.1.4 Similarly determine the mass per metre and mass per square metre of all the cuts or rolls under test and calculate their average and report it as specified in **8**.

8 Test Report

The test report shall include the following particulars:

    a) Type of fabric tested;
    b) Method (A or B) followed;
    c) Number of tests performed;
    d) Mean mass per unit length;
    e) Mean mass per unit area; and
    f) Details of any deviation from the specified test procedure.