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Fabrics coated with rubber or plastics — Determination of roll characteristics

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

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.

International Standard ISO 2286 was drawn up by Technical Committee ISO/TC 45, *Rubber and rubber products*.

It was approved in August 1971 by the Member Bodies of the following countries :

Canada	Italy	Sweden
Ceylon	Netherlands	Switzerland
Czechoslovakia	New Zealand	Thailand
Egypt, Arab Rep. of	Poland	Turkey
France	Portugal	United Kingdom
Germany	Romania	U.S.A.
Hungary	South Africa, Rep. of	U.S.S.R.
India	Spain	Yugoslavia

No Member Body expressed disapproval of the document.

Fabrics coated with rubber or plastics — Determination of roll characteristics

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies methods for determining the length, width, net mass, mass per unit area, and thickness of rolls of coated fabrics, with the exception of knitted type fabrics. Normally, the length of a roll is greater than 10 m. It should be noted that the roll cannot normally be conditioned in a standard atmosphere and, therefore, the results may be influenced by variations of moisture regain due to changes in atmospheric conditions.

2 REFERENCE

ISO 2231, *Fabrics coated with rubber or plastics — Reference atmosphere, test atmosphere, and methods of conditioning.* (At present at the stage of draft.)

3 DETERMINATION OF THE LENGTH OF A ROLL

3.1 General method

3.1.1 Apparatus

Flat table, not less than 5 m long and at least as wide as the roll to be tested. Both longitudinal edges of the table shall be marked off in 1 m lengths, at least one of these lengths, preferably at one end of the table, being sub-divided into 1 cm divisions.

3.1.2 Procedure

Trim the cut end of the roll if necessary so that it is at right angles to the warp (lengthwise) direction of the roll, such trimming being confined to the minimum which is necessary to effect this. With the cut end of the roll aligned with the zero mark on the table, unroll the material along the table so that no tension is introduced. On reaching the limit of the table, mark the back of the roll by some suitable method on both edges to coincide with a known division of length. Re-roll the portion that has been measured. Lay out, free from tension, a further portion of the unmeasured length and measure from the marked edges as before. Repeat this process until the end of the roll is reached, trimming this, if necessary, as before. Measure the final length to the nearest 5 cm.

3.2 Drum method

3.2.1 Procedure

Run the coated fabric over a measuring drum with just enough uniform tension to keep it running flat and true. Determine the length from the dial or counter on the drum.

3.2.2 Expression of results

Report the length of the roll, in metres, as the sum of all the readings, rounded to the nearest 10 cm.

4 DETERMINATION OF THE WIDTH OF A ROLL

4.1 Apparatus

4.1.1 *Flat table* not less than 2 m long and at least as wide as the roll to be tested.

4.1.2 *Steel scale* of length greater than the width of the roll to be measured, graduated in centimetres and millimetres.

4.2 Procedure

Unroll the material along the table with the face side of the coated fabric upwards, so that it is laid out smoothly without tension in either direction. Record to the nearest 5 mm at least five different measurements of width uniformly distributed along the full length of the roll or piece.

4.3 Expression of results

Calculate the mean of the recorded widths and report the value obtained as the average usable width. Report also the minimum usable width recorded.

5 DETERMINATION OF THE NET MASS AND MASS PER UNIT AREA OF A PIECE, CUT, ROLL OR SAMPLE

5.1 Determination of the net mass and mass per unit area of a piece, cut or roll

5.1.1 Apparatus

Weighing device, with a calibrated scale, accurate at full scale deflection to 0.10 %.

5.1.2 Procedure

Place the roll of material centrally on the pan or other supporting arrangement of the weighing device. Ensure that the roll and its support are free from contact with other bodies. Determine and record the gross mass.

Determine and record the mass of the tube or former upon which the material has been rolled and deduct this from the gross mass. Record the figure thus obtained as the net mass. Determine the length and width of the roll in accordance with the procedures given in sections 3 and 4, and calculate the mass per unit area in grams per square metre rounded to the nearest 5 g.

5.1.3 Expression of results

The net mass shall be expressed in kilograms to the nearest 0.10 kg.

The mass per unit area shall be expressed in grams per square metre rounded to the nearest 5 g.

5.2 Determination of the mass per unit area of a sample

5.2.1 Apparatus

Balance accurate to 0.005 g.

5.2.2 Test piece

The test piece shall be square or circular in form, and have an area of $100 \pm 1 \text{ cm}^2$.

5.2.3 Procedure

Cut from the sample three test pieces, one from the centre, and the other two symmetrical with the first, in such a manner that their external edge is between 5 and 15 cm from the selvedge of the sample taken along a line which makes an angle of 45° with the length of the roll. Designate these test pieces A, B and C respectively.

Condition the test pieces according to the procedure described in ISO 2231.

Weigh the test pieces to the nearest 0.005 g and calculate the mass per unit area in grams per square metre.

5.2.4 Expression of results

The mass per unit area shall be expressed as the average of the calculated values in grams per square metre rounded to the nearest 5 g.

NOTES

1 The procedure given in 5.2.3 is intended for use when a small sample is sent to the laboratory for test. The result is considered applicable to the sample, but not to the piece or lot of goods from which the sample was taken unless the number of samples and method are agreed by those concerned. If this is done, each sample shall be tested in accordance with the procedure given in 5.2.3 and the results averaged to obtain the average mass per unit area in grams per square metre.

2 As the presence of residual solvent may cause shrinkage of the cut test pieces during conditioning, the area shall be checked immediately after conditioning and weighing. If this area differs from that obtained in the original measurement, the second value shall be used in the calculation.

5.3 Determination of the mass per unit area of the base fabric

5.3.1 Apparatus

- a) balance, accurate to 0.005 g;
- b) 500 ml flask fitted with a reflux condenser;
- c) water bath;
- d) oven, with natural air circulation.

5.3.2 Test piece

The test piece shall be a square or rectangle having an area of $100 \pm 1 \text{ cm}^2$.

5.3.3 Procedure

Cut from the sample three test pieces, one from the centre and the other two symmetrical with the first in such a manner that their external edge is between 5 and 15 cm from the selvedge of the sample, taken along a line which makes an angle of 45° with the length of the roll. Designate these test pieces A, B and C respectively.

Immerse each test piece separately in 150 ml of an appropriate solvent or swelling agent. Extract by refluxing for 30 min, decant and remove where possible the bulk of the coating by hand from the cloth. Reflux again for 30 min, using fresh solvent and decant. Thereafter, immerse the fabric and any loose threads in 150 ml of solvent with occasional agitation for 30 min at room temperature. Remove the stripped test pieces together with any loose threads from the solvent and wash them in 100 ml of acetone. Dry the test pieces for 1 h at a temperature of approximately 100°C .

Condition the stripped test pieces for 24 h in accordance with ISO 2231 and weigh to the nearest 0.005 g.

Wash the stripped test pieces with a further quantity of the appropriate solvent in the manner indicated, wash in acetone, dry, and condition and weigh them as before. If the second weighing differs from the first by more than 1 %, repeat the solvent treatment until the difference is less than 1 %. Use the final mass for calculating the mass per unit area of the fabric.

5.3.4 Expression of results

The mass per unit area of the fabric shall be expressed as the mean value obtained from the three results in grams per square metre rounded to the nearest 5 g.

NOTES

- 1 This method is not valid for fabrics which are soluble in the solvent used for the test.
- 2 The mass of the fabric after removing the coating can be different from that of the original fabric.

5.4 Determination of the mass per unit area of the coating

5.4.1 Procedure

It is expedient to consider the mass per unit area of the coating as the difference between the mass per unit area of the coated fabric and the mass per unit area of the base fabric.

From the mass per unit area of the coated fabric (determined according to 5.2) subtract the mass per unit area of the base fabric for the corresponding test piece (determined according to 5.3).

5.4.2 Expression of results

The mass per unit area of the coating shall be expressed in grams per square metre rounded to the nearest 5 g as the mean of the three values found in accordance with the procedure given in 5.4.1.

6 DETERMINATION OF THICKNESS

6.1 Apparatus

Gauge, of the dead weight type, and equipped with a dial graduated to read directly to 0.02 mm. The presser foot shall be circular, having a diameter of 9.5 ± 0.02 mm.

The presser foot and connected moving parts shall be loaded to give a pressure of 24 kN/m^2 . The presser foot and anvil surfaces shall be plane to within 0.002 mm and parallel to one another to within 0.002 mm.

The gauge shall be calibrated for the actual load exerted by the presser foot by means of any device so arranged to measure the total force exerted by the presser foot at the several gauge readings or presser foot levels selected for calibration. The presser foot shall be brought to each calibration level from a higher one.

6.2 Procedure

Measure the thickness on an oblique line drawn at an angle of 45° to the length of the roll, preferably at a distance of about 1 m from the end of the roll. On this line, make five evenly distributed measurements, the first being taken at a position between 5 and 15 cm from the selvage.

Place the coated fabric on the anvil of the gauge, smooth, but without tension. Lower the presser foot onto the material (without impact), allow it to rest for 10 s, and observe and record the reading of the dial.

6.3 Expression of results

Express the results in millimetres. The mean linear thickness in millimetres is the arithmetic mean of the five measured values on the same oblique line.

7 TEST REPORT

The test report shall include the following particulars :

- a) the description of the coated fabric;
- b) the length of the roll;
- c) the width of the roll;
- d) the net mass;
- e) the net mass per unit area;
- f) the mass per unit area of the base fabric;
- g) the mass per unit area of the coating;
- h) the thickness.

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