

International Standard



2286

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Rubber- or plastics-coated fabrics — Determination of roll characteristics

Supports textiles revêtus de caoutchouc ou de plastique — Détermination des caractéristiques des rouleaux

Second edition — 1986-11-15

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UDC 678.066.2 : 531.7

Ref. No. ISO 2286-1986 (E)

Descriptors : rubber, plastics, coated fabrics, fabrics coated with rubber, fabrics coated with plastics, rolls, tests, dimensional measurements, mass.

Price based on 4 pages

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.

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 2286 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*.

This second edition cancels and replaces the first edition (ISO 2286:1972), sub-clauses 3.2, 4.2, 5.1.2, 5.1.3, 6.1 and 6.2 of which have been technically revised.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Rubber- or plastics-coated fabrics — 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. 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, *Fabric coated with rubber or plastics — Standard atmospheres for conditioning and testing*.

3 Definition

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

usable width: The width of a roll limited by the points within which the coated fabric fulfils the specified requirements.

4 Determination of the length of a roll

4.1 Reference method

4.1.1 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.

4.1.2 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 (4.1.1), 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.

4.2 Alternative method

As an alternative to the manual technique described in 4.1, any suitable mechanical, electromechanical or photoelectric means of measuring the coated fabric length that gives results equivalent to those obtained using the method in 4.1 may be used. In cases of dispute the reference method in 4.1 shall be used.

NOTE — The above alternative means of measurement may not, however, be suitable for extensible coated fabrics, such as those having a knitted substrate.

4.3 Expression of results

Report the length of the roll, in metres, as the sum of all the readings, rounded to the nearest 0,1 m.

5 Determination of the width of a roll

5.1 Apparatus

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

5.1.2 Steel scale, of length greater than the width of the roll to be measured, graduated in millimetres.

5.2 Procedure

While the coated fabric is unrolled on the table (5.1.1) and free of tension during measurements taken at 4.1, using the scale (5.1.2) measure and record, at intervals of 10 m, the usable width of the coated fabric to the nearest 5 mm, ensuring that all measurements of width are taken at right angles to the longitudinal direction of the roll.

For rolls less than 20 m long, measure the width at three positions, i.e. near the two ends and in the middle of the roll.

5.3 Expression of results

Calculate the mean of the recorded widths and report the value obtained as the average usable width to the nearest 0,005 m. Report also the minimum usable width recorded.

6 Determination of the net mass and mean mass per unit area of a piece, cut, roll or sample

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

6.1.1 Apparatus

Weighing device, with a calibrated scale, accurate at full-scale deflection to 0,10 %.

6.1.2 Procedure

Place the roll of material centrally on the pan or other supporting arrangement of the weighing device (6.1.1). 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 clauses 4 and 5, and calculate the mean mass per unit area, in grams per square metre, rounded to the nearest 5 g.

NOTE — Any estimate of the mean mass per unit area of the coated fabric derived from the total net mass of the roll and its known length and width may be inaccurate owing to the fact that a complete roll of coated fabric cannot normally be conditioned to equilibrium in the standard atmosphere for conditioning and testing. Such inaccuracies are due to excesses or deficiencies in moisture regain through the complete roll.

6.1.3 Expression of results

The net mass shall be expressed in kilograms to the nearest 0,10 kg.

The mean mass per unit area shall be expressed in grams per square metre, rounded to the nearest 5 g/m².

6.2 Determination of the mass per unit area of a sample

6.2.1 Apparatus

Balance, accurate to 0,005 g.

6.2.2 Test piece

The test piece shall be square or circular in form, and have an area of 100 ± 1 cm².

6.2.3 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 piece A, B and C respectively.

Dry the test pieces to constant mass in an atmosphere with a relative humidity not higher than 10 % at a temperature between 60 and 70 °C.

NOTE — Air at 20 °C and 65 % relative humidity will, when heated at constant pressure to between 60 and 70 °C, have a relative humidity of approximately 5 %. Higher temperatures can lead to changes in some coatings.

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.

6.2.4 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/m².

NOTES

1 The procedure given in 6.2.3 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 the interested parties. If this is done, each sample should be tested in accordance with the procedure given in 6.2.3 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 should be checked immediately after conditioning and weighing. If this area differs from that obtained in the original measurement, the second value should be used in the calculation.

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

6.3.1 Materials

CAUTION — Where a flammable or toxic solvent is used, the customary precautions in handling such a material shall be exercised.

6.3.1.1 Suitable solvent or swelling agent.

6.3.1.2 Acetone.

6.3.2 Apparatus

6.3.2.1 Balance, accurate to 0,005 g.

6.3.2.2 Flask, capacity 500 ml, fitted with a reflux condenser.

6.3.2.3 Water bath.

6.3.2.4 Oven, with air circulation, capable of being controlled at 100 °C.

6.3.3 Test pieces

The test piece shall have an area of $100 \pm 1 \text{ cm}^2$.

6.3.4 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 selvage 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 the solvent or swelling agent (6.3.1.1) in the flask (6.3.2.2). Extract by refluxing for 30 min on the water bath (6.3.2.3), 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 the acetone (6.3.1.2). Dry the test pieces for 1 h in the oven (6.3.2.4), controlled 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.

6.3.5 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 1 g/m^2 .

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.

6.4 Determination of the mass per unit area of the coating

6.4.1 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 6.2), subtract the mass per unit area of the base fabric for the corresponding test piece (determined according to 6.3).

6.4.2 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/m^2 , as the mean of the three values found in accordance with the procedure given in 6.4.1.

7 Determination of thickness

7.1 Apparatus

7.1.1 Gauge, of the dead weight type, and equipped with a dial graduated to read directly to $0,02 \text{ mm}$. The gauge shall be constructed so as to permit one of the pressures specified in 7.2 to be obtained, using one of the presser foot sizes specified in 7.1.2.

7.1.2 Presser foot, smooth and circular, having a diameter of

$9,5 \text{ mm} \pm 1 \%$, or

$25,22 \text{ mm} \pm 1 \%$, or

$28,55 \text{ mm} \pm 1 \%$.

The presser foot and anvil surfaces shall be plane and parallel to within normal engineering tolerances.

7.2 Procedure

Measure the thickness at five evenly spaced positions across the full width of the coated fabric, preferably at a distance of about 1 m from the end of the roll, the first measurement at each side being taken at a position between 5 and 15 cm from the selvage.

Place the coated fabric on the anvil of the gauge (7.1.1), smooth, but without tension. Lower the presser foot (7.1.2) onto the material (without impact), allow it to rest for 10 s, exerting a pressure of 2 kPa, 10 kPa or 24 kPa, as required by the material specification. Observe and record the dial reading.

7.3 Expression of results

Express the results in millimetres to three significant figures. The mean linear thickness, in millimetres, is the arithmetic mean of the five measured values.

8 Test report

The test report shall include the following particulars:

- a) a reference to this International Standard;
- b) the identification of the coated fabric;
- c) the length of the roll;
- d) the width of the roll;

- e) the net mass;
- f) the net mass per unit area;
- g) the mass per unit area of the fabric;
- h) the mass per unit area of the coating;
- i) the thickness and the pressure at which it was measured;
- j) the dimensions of the presser foot used.

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