
International Standard



5981

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

Rubber or plastics coated fabrics — Determination of flex abrasion

Supports textiles revêtus de caoutchouc ou de plastique — Détermination de la résistance à l'effet simultané de froissement dû à l'application d'un couple et de frottement

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UDC 678.066 : 620.178.162

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Descriptors : coated fabrics, fabrics coated with plastics, fabrics coated with rubber, tests, wear tests.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (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 authorized 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 5981 was developed by Technical Committee ISO/TC 45, *Rubber and rubber products*, and was circulated to the member bodies in January 1981.

It has been approved by the member bodies of the following countries :

Australia	Germany, F.R.	South Africa, Rep. of
Austria	India	Spain
Belgium	Indonesia	Sri Lanka
Canada	Iraq	Sweden
Czechoslovakia	Korea, Rep. of	Thailand
Denmark	Poland	USA
Egypt, Arab Rep. of	Portugal	USSR
France	Romania	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Italy
Netherlands
United Kingdom

Rubber or plastics coated fabrics — Determination of flex abrasion

1 Scope and field of application

This International Standard specifies a method of evaluating the resistance to combined shear flexing and rubbing of rubber or plastics coated fabrics.

The test may be carried out on either coated fabrics as delivered, or coated fabrics after having undergone any required pretreatment.

The test, as described in this International Standard, cannot be applied to products with an adhesive surface. In this case, the test could be carried out omitting the foot.

2 References

ISO 1302, *Technical drawings — Method of indicating surface texture on drawings.*

ISO 2231, *Fabric coated with rubber or plastics — Standard atmospheres for conditioning and testing.*

3 Principle

Subjection of a test piece to a succession of mild abrasive rubs applied to a continuously changing pattern of folds created by a rubbing machine. Visual assessment of the damage caused to the test piece.

4 Apparatus

The apparatus shall consist of a rubbing machine (see figures 1 and 2) having two parallel clamps giving contra-reciprocating motions of equal velocities and displacement in the plane of their major dimensions and a foot pressing on the flexing part of the test piece to bring it into contact with the base.

The apparatus shall be equipped with a counter¹⁾ and a device making it possible to bring the two clamps into juxtaposition manually.

The components of the rubbing machine shall comply with the requirements specified in 4.1, 4.2 and 4.3.

4.1 Dimensions and characteristics

The rubbing machine shall have the following dimensions and characteristics :

- a) distance between clamps : $12 \pm 0,3$ mm;
- b) distance, d , between the base and the upper plane of the lower clamp : $6 \pm 0,1$ mm or, by agreement, $3 \pm 0,1$ mm (for lightweight coated fabrics);
- c) amplitude of movement : 40 ± 1 mm;
- d) frequency of movement : $2,25 \pm 0,5$ cycles per second (each crossing of the clamp axes being counted as 1 rub);
- e) width of the foot : $10 \pm 0,2$ mm;
- f) length of the foot : 100 ± 1 mm;
- g) load applied through the foot : $5 \pm 0,1$ N.

All the parts or pieces of parts (except the gripping surfaces of the clamps) likely to come into contact with the test piece shall be polished (surface roughness, R_a , 0,4 to ISO 1302.)

4.2 Clamps

The clamps shall be composed of two parts (see figures 1 and 2) as follows :

- a) a lower part (A), equipped with a shoulder (P), for positioning the test piece, situated at a distance of $27,5 \pm 0,2$ mm from the edge of the clamp (giving the test piece a loop length of 45 or 55 mm), and two reference marks (C) for centering the test piece along the common axis of symmetry of the clamps when placed face to face;
- b) an upper part (B) serving as a compression plate.

The edges of the clamps shall have a radius of curvature of $1 \pm 0,1$ mm, in order to avoid cutting the test pieces.

The clamping system, comprising the upper clamp on the lower clamp, shall be so designed that it is impossible for the test piece to slip during testing.

1) Most counters, because of their method of drive, record only one impulse for one back and forth movement of the clamps, i.e. two rubbings. In this case, the number indicated by the counter shall be multiplied by 2 in order to obtain the number of rubbings (example : counter at 1 000, number of corresponding rubbings : 2 000).

4.3 Foot

The foot (see figure 3) shall be centered between the clamps so that it is at no time in contact with them. Its edges shall have a radius of curvature of $1 \pm 0,1$ mm.

The centre of gravity (G) of the foot, and of its guide system, shall be in the plane perpendicular to the clamping plane of the test piece and which passes through the common axis of symmetry of the two clamps when placed face to face. (This plane shall also contain the centre of gravity of the foot alone.)

The guide system of the foot shall permit movement both vertically and around the centre of gravity (G) (the centre of gravity always remaining, however, in the plane specified above).

The load applied via the foot on the part to be rubbed shall be $5 \pm 0,1$ N (or, by agreement, $10 \pm 0,2$ N by addition of a supplementary load).

5 Test pieces

5.1 Number

For each series of tests, take six test pieces, three in the longitudinal direction and three in the transverse direction.

As a general rule, the tests shall be made on two test pieces for each direction. In the case of conflicting results, however, the third test piece for each direction shall be tested.

In the case of fabrics coated on both sides, and for which both sides are to be tested, twice the number of test pieces shall be taken.

5.2 Shape and dimensions

5.2.1 The test pieces shall be cut to the finished test dimensions (see figure 4) and shall have the shape of a rectangle having the following dimensions :

- length : $100 \pm 0,25$ mm;
- width : $50 \pm 0,25$ mm.

They shall be taken in the following manner :

- a) test pieces taken in the longitudinal direction :
 - 100 mm longitudinal direction \times 50 mm transverse direction;
- b) test pieces taken in the transverse direction :
 - 100 mm transverse direction \times 50 mm longitudinal direction.

5.2.2 In the event that the test cannot be made with the type of test piece specified in 5.2.1 (particularly for coated fabrics which have little extensibility or which are torn in the clamps)

and after agreement between the supplier and purchaser a test piece of length $110 \pm 0,25$ mm may be used.

5.3 Sampling

The test pieces shall be taken so that their outside edges are at a minimum distance of 100 mm from the edges of the coated part. They shall not be taken at less than 1 m from the ends of the piece or at a place showing an apparent defect.

6 Time interval between manufacturing and testing

6.1 For all purposes, the minimum time between manufacturing and testing shall be 16 h.

6.2 For non-product tests, the maximum time between manufacturing and testing shall be 4 weeks and for evaluations intended to be comparable, the tests, as far as possible, should be carried out after the same time interval.

6.3 For product tests, whenever possible, the time between manufacturing and testing should not exceed 3 months. In other cases, tests shall be made within 2 months of the date of receipt by the customer.

7 Conditioning of test pieces

The test pieces shall be conditioned in the standard atmosphere for testing as defined in ISO 2231.

8 Test conditions

The test shall be carried out at the same temperature and relative humidity as used in clause 7.

9 Procedure

9.1 Trace on the test pieces two reference lines "X" (as shown in figure 4), parallel to the shorter sides and at a distance of 27,5 mm from the edges so as not to alter the test piece.

9.2 Bring the clamps face to face. Fix the test piece between the clamps so that the coated face faces the foot and the reference marks are flush with the clamps.

9.3 Set the apparatus in operation with the foot on the top of the test piece.

9.4 Interrupt the test from time to time to examine visually the condition of degradation of the test piece.

9.5 Continue the test until a predetermined number of rubs are completed or until visual examination reveals excessive degradation.

10 Expression of results

Evaluate damage to the test piece directly or compare it with that of a control specimen.

Examine each test piece separately.

11 Test report

The test report shall include the following information :

- a) a reference to this International Standard;
- b) the number of test pieces used;
- c) the references of the pieces subjected to the test;
- d) the conditioning of each test piece;
- e) any pretreatment, for example immersion in oil;
- f) the length of the test piece;
- g) the direction (longitudinal or transverse) of each test piece;
- h) the face tested in the case of a fabric coated on both faces;
- i) the exact frequency used;
- k) the number of rubs and the loading used;
- m) the distance, *d*, between base and foot;
- n) the degree and nature of damage;
- p) any deviation by agreement or otherwise from the procedure specified;
- q) the total number of rubs for test pieces after exposure to specified test media and conditions for exposure (time and temperature).

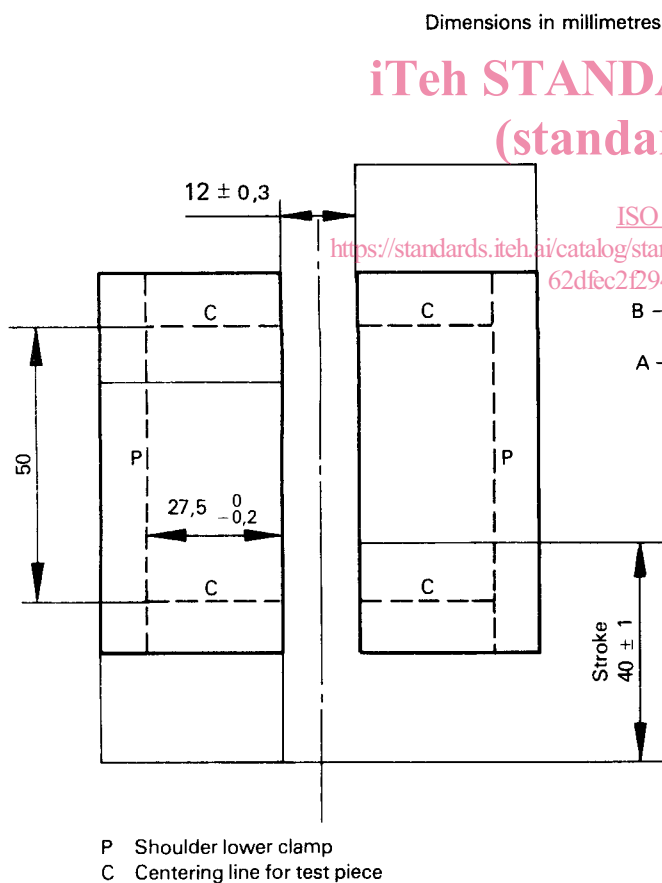


Figure 1 — Apparatus : View from above

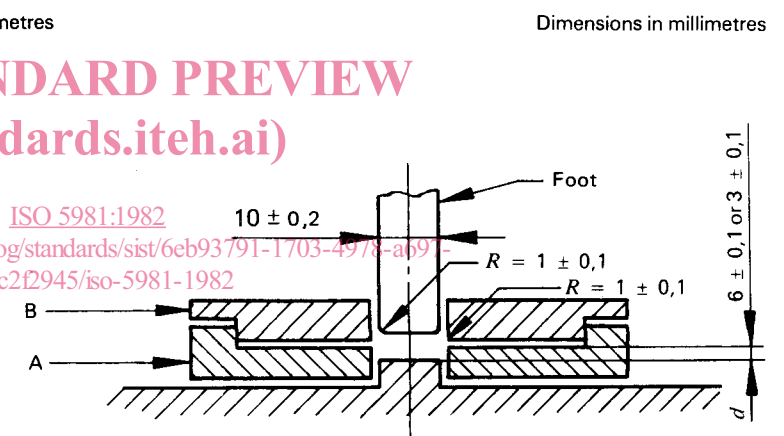
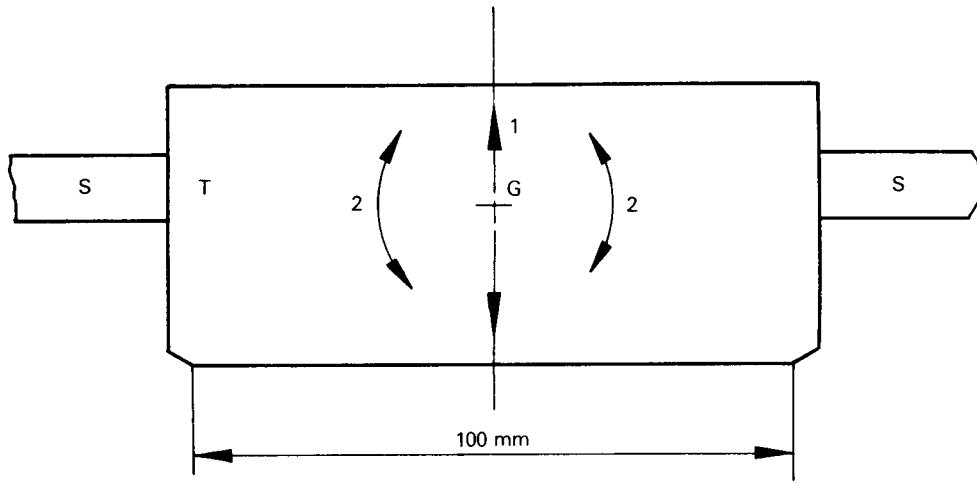


Figure 2 — Apparatus : Cross-section



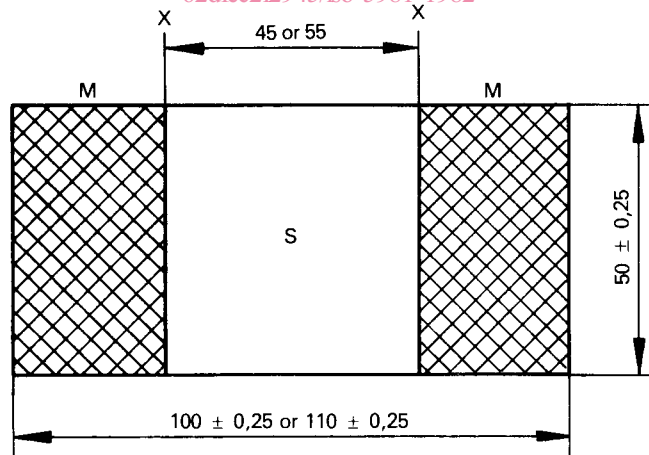
- 1 Vertical displacement
- 2 Displacement about the centre of gravity G
- S Guide system of the foot
- T Foot

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Figure 3 — Foot

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- M Location of the clamp
- S Useful area tested
- X Reference line

Figure 4 — Test piece

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