
INTERNATIONAL STANDARD**3342**

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Textile glass — Determination of tensile breaking force of mats

Verre textile — Détermination de la force de rupture en traction des mats

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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 3342 was drawn up by Technical Committee ISO/TC 61, *Plastics*, and circulated to the Member Bodies in January 1974.

It has been approved by the Member Bodies of the following countries :

Belgium	India	South Africa, Rep. of
Brazil	Iran	Spain
Bulgaria	Israel	Sweden
Canada	Italy	Switzerland
Czechoslovakia	Japan	Thailand
Egypt, Arab Rep. of	Mexico	Turkey
France	Netherlands	United Kingdom
Germany	Poland	U.S.A.
Hungary	Romania	

The Member Body of the following country expressed disapproval of the document on technical grounds :

Ireland

Textile glass — Determination of tensile breaking force of mats

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the determination of the tensile breaking force of textile glass mats.

2 REFERENCES

ISO 139, *Textiles — Standard atmospheres for conditioning and testing.*

ISO/R 291, *Plastics — Standard atmospheres for conditioning and testing.*

3 DEFINITIONS

For the purposes of this International Standard, the following definitions apply.

3.1 tensile breaking force : The maximum force required to break the test specimen in a tensile test carried to rupture. It is generally expressed in newtons.

3.2 time to break : The time-interval, measured in suitable units such as seconds, during which the test specimen is under a (generally increasing) tension, i.e. absorbing the energy required to reach the maximum force.

NOTE — Time to break does not include the time to remove slack from the specimen. On machines fitted with an autographic recorder, the time to break is indicated by the time elapsing after the pen registers the initial force sustained by the specimen until the pen registers the maximum force.

4 PRINCIPLE

Elongation of a pre-conditioned test specimen¹⁾ of standard dimensions by a suitable mechanical device which indicates the tensile breaking force on a recorder or scale.

5 APPARATUS

5.1 Tensile testing machine.

5.1.1 All testing machines shall include :

- a) A pair of suitable clamps to grip the specimen. They shall have a width of 160 mm and a minimum depth of 25 mm.

The faces of the clamps shall be plane and parallel, shall ensure uniform pressure over the whole width of the test specimen, and shall prevent it from slipping.

The clamps shall also allow, at any moment, alignment of the axis of the test specimen with the direction of the applied force. The initial distance between the clamps shall be 200 mm.

b) A means for applying tension to the specimen.

c) A mechanism which will continuously indicate or record the force sustained by the specimen.

The mechanism shall be practically free from inertia at the specified speed of testing and shall indicate the force with an accuracy within 1 % of the true value.

Two types of testing machine are generally used, one with a constant rate of separation, the other with a constant time to break.

5.1.2 The maximum error of the indicated force, at any point in the range in which the machine is used, shall not exceed 1 % of the true force. The error allowed for the indicated clamp separation shall not exceed 1 mm. The accuracy of the tensile testing machine shall be verified, for example by means of calibrated springs of appropriate characteristics.

5.2 Equipment for producing a suitable atmosphere for pre-conditioning (see 6.1).

5.3 Equipment for producing and maintaining the standard test laboratory atmosphere (see 6.2).

5.4 Polished template, 150 mm wide and of suitable length *b* (see clause 7).

5.5 Suitable trimming tool, for example knife, scissors or disk cutter.

5.6 Stopwatch.

1) Test specimens shall always be taken from rolls of mat even when sampling is done at the delivery end of the mat plant.

6 CONDITIONING AND TEST ATMOSPHERES

6.1 Conditioning of specimens

Condition the specimens for 16 h in one of the standard laboratory atmospheres specified in ISO 139 and ISO/R 291.

Indicate in the test report the conditioning atmosphere chosen.

6.2 Test atmosphere

Carry out the tests in one of the standard laboratory atmospheres specified in ISO 139 and ISO/R 291.

7 TEST SPECIMENS

Use a series of test specimens with the major axes of the specimens parallel to the longitudinal direction of the mat. If additional tests are made with the major axes parallel to the transverse direction of the mat, this shall be mentioned in the test report.

Select the specimens from a strip of mat having no apparent defects, and of a width b equal to the free length between the clamps plus twice the depth of one clamp. This width shall be at least 250 mm. To facilitate handling, and if the material allows, it is recommended that the width of the strip be increased by 50 mm, i.e. that a minimum of 300 mm be taken for b . By means of the template (5.4), cut from the strip :

- one test specimen 150 mm \times b mm at each end, and not less than 10 mm from the edges, in the case of trimmed edges;
- between the ends, as many test specimens 150 mm \times b mm as possible in the remaining length. The test specimens shall be evenly distributed and equidistant from each other.

At least five test specimens shall be used.

If the width of the mat does not allow selection of test specimens of the "longitudinal" series side by side, this selection shall be completed by cutting test specimens from additional strips, ensuring that they are evenly distributed over the mat.

8 PROCEDURE

8.1 Adjust the distance between the clamps to give a free specimen length of 200 mm.

8.2 Adjust the speed of the testing machine :

- in the case of a testing machine where one of the clamps is virtually fixed, use a testing speed in the range 100 ± 10 mm/min;

- in the case of a testing machine where the two clamps move (as, for example, a pendulum-type machine), use a speed such that the specimen breaks in 20 ± 3 s.

8.3 Ensure that the clamps are properly aligned and parallel.

Position the specimen in the clamps so that the longitudinal axis of the specimen is aligned with the mechanical axis of the tensile tester.

Evenly and firmly tighten the clamps, applying a slight tension to the specimen to remove all slack.

Start the tensile tester and extend the specimen to the point of break.

Record the force in newtons required to break the specimen.

Discard results obtained from test specimens that break within 10 mm of the clamps or which slip in the clamps, and test an appropriate number of additional specimens.

9 EXPRESSION OF RESULTS

The tensile breaking force of the mat in the longitudinal direction and, if necessary, in the transverse direction shall be expressed in newtons.

The tensile breaking force is the arithmetic mean of the individual results rounded off to the nearest 1 N.

10 TEST REPORT

The test report shall include the following particulars :

- a) reference to this International Standard;
- b) a complete reference to the mat tested;
- c) the number of specimens submitted to the test;
- d) the chosen conditioning and test atmospheres;
- e) the test specimen length;
- f) the type and the capacity of the testing machine and the scale range used;
- g) the depth and the width of the clamps used;
- h) the method used, i.e. constant time or constant speed, and the mean time to break;
- i) the tensile breaking force of the mat in the longitudinal direction and, if applicable, in the transverse direction;
- j) the standard deviation and the confidence level of the mean.