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R 1421

DETERMINATION OF BREAKING STRENGTH AND ELONGATION AT BREAK OF FABRICS COATED WITH RUBBER OR PLASTICS

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BRIEF HISTORY

The ISO Recommendation R 1421, *Determination of breaking strength and elongation at break of fabrics coated with rubber or plastics*, was drawn up by Technical Committee ISO/TC 45, *Rubber*, the Secretariat of which is held by the British Standards Institution (BSI).

Work on this question led to the adoption of Draft ISO Recommendation No. 1421, which was circulated to all the ISO Member Bodies for enquiry in December 1967.

The Draft was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	Ireland	Sweden
Austria	Israel	Switzerland
Czechoslovakia	Italy	U.A.R.
France	Japan	United Kingdom
Germany	Netherlands	U.S.A.
Hungary	New Zealand	Yugoslavia
India	Poland	
Iran	Spain	

No Member Body opposed the approval of the Draft.

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided to accept it as an ISO RECOMMENDATION.

ISO Recommendation | R 1421 | November 1971

DETERMINATION OF BREAKING STRENGTH AND ELONGATION AT BREAK OF FABRICS COATED WITH RUBBER OR PLASTICS

1. SCOPE

This ISO Recommendation specifies methods of preparation of test pieces and methods of test for the determination of breaking strength and elongation at break of fabrics coated with rubber or plastics.

Two methods of test are described, one employing a rectangular cut strip, the other, designated the "grab method", employing a test piece approximately 100 mm × 150 mm. The results obtained in one method are not necessarily comparable with those obtained in the other.

This ISO Recommendation does not apply to sponge-coated fabrics or to coated mesh fabrics.

NOTE. – When specifying a product, the customer should indicate the test method, the type of apparatus and the type of test piece to be employed. If no choice is made by the customer, the manufacturer should make the selection.

2. DEFINITIONS

2.1 *Breaking strength.* The force necessary for breaking the test piece.

2.2 *Elongation at break.* The percentage increase in the length with relation to the initial length of the test piece between the jaws determined at the moment of breaking.

3. APPARATUS

3.1 Constant rate of traverse

The test machine should be power-driven and equipped with a suitable dynamometer; it should be capable of maintaining, during the test, a substantially constant rate of traverse within the range 100 ± 10 mm/min or 300 ± 10 mm/min and should be fitted with an autographic recorder. An inertialess dynamometer (of electronic or optical type, for example) should preferably be used.

NOTE. – Pendulum-type inertia dynamometers may in fact give different results because of the effects of friction and inertia. When the use of an inertia dynamometer is unavoidable, information may be obtained on the tensile strength and elongation in the following way: the capacity of the machine, or the measuring scale selected when a variable range machine is involved, should be such that the separation force read is between 15 and 85 % of the rated capacity.

The accuracy of the machine should be such that the error in the force measurement as shown and recorded does not exceed 2 % of the force or 0.4 % of the maximum of the scale, whichever is the greater.

The jaws of the machine should be wider than the test piece, not less than 60 mm wide, and so designed that there is no tendency to cut the test piece or allow it to slip during a test.

For the purpose of the grab method, the clamps should have gripping surfaces, sufficiently smooth, flat and parallel to prevent the test piece from slipping or moving when held under pressure normal to operation. The dimension of all gripping surfaces parallel to the direction of the application of the load should be 25 mm; the dimension perpendicular to this should be 25 mm for the face jaw and 50 mm or more for the other.

All edges that might cause a cutting action should be rounded to a radius of not more than 0.4 mm. The pressure between the gripping surfaces, sufficient to clamp the piece firmly before the testing load is applied and to prevent slippage during the progress of the test, should be secured by any suitably constructed mechanical device operating on the movable member of the clamp.

Pneumatically operated jaws are permitted.

3.2 Constant rate of loading

Testing machine as described in clause 3.1 except that instead of having one clamp movable at a constant rate, the load is applied uniformly to give the specified or normally expected value in 60 ± 10 seconds.

4. SAMPLING

The sample should be cut so that it is as representative as possible of the whole consignment. The test piece should be taken not less than 0.10 m from the selvedge, and not less than 1 m from the extremity of the piece.

5. PREPARATION OF TEST PIECES

5.1 Type of test piece

Two types of test piece are permitted, one for use in the cut strip method, and one for use in the grab method. It is essential that the test piece should be parallel to the longitudinal or transverse directions. Where difficulty is experienced, the direction of the longitudinal or transverse threads should be established by tearing, and test pieces should be parallel to this direction. Where there is distortion of the fabric, such as bowing or skewing of the threads, the test pieces should be cut with edges and with their length in the mean direction of the threads. Where such distortion occurs it should be mentioned in the test report.

5.1.1 *Cut strip.* The test piece is a rectangular strip, 50 ± 0.5 mm wide, and of such a length as to permit a free length of 200 mm between the jaws.

A rectangular strip, 25 ± 0.5 mm wide and of such a length which permits a free length of 75 mm between the jaws may also be used, but this does not necessarily give the same test results as the 50 mm wide test piece.

5.1.2 *Grab method test piece.* The test piece is a rectangular strip, 100 ± 2 mm wide, and not less than 150 mm long, to permit a free length of 75 mm between the jaws.

5.2 Number of test pieces

For each series of tests, select ten test pieces, five parallel to the longitudinal threads, and five parallel to the transverse threads. The test pieces should not be taken in such a manner that they contain the same threads of the fabric in the direction of test.

6. CONDITIONING OF TEST PIECES

For all test purposes the minimum time between vulcanization and testing should be 16 hours.

Whenever possible, the time between vulcanization and testing should not exceed 3 months. In other cases tests should be made within 2 months of the date of receipt by the customer of the product.

The test piece should be conditioned according to ISO Recommendation R 471, *Standard atmospheres for the conditioning and testing of rubber test pieces,* depending on the requirements of the particular standard or specification which applies.

In order to estimate the properties of wet test pieces, they should be immersed in distilled water containing 1 % ethanol for 24 hours at one of the standard laboratory temperatures. The test pieces should be cut prior to this immersion. Immediately after removal of the test piece from the water it should be blotted between two sheets of absorbent paper and tested at once.