

INTERNATIONAL STANDARD

ISO 505

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Conveyor belts — Method for the determination of the tear propagation resistance of textile conveyor belts

*Courroies transporteuses — Méthode de détermination de la résistance
à la propagation d'une déchirure dans les courroies transporteuses
à carcasse textile*



Reference number
ISO 505:1999(E)

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 505 was prepared by the European Committee for Standardization (CEN) in collaboration with ISO Technical Committee TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 3, *Conveyor belts*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this standard, read "...this European Standard..." to mean "...this International Standard...".

This second edition cancels and replaces the first edition (ISO 505:1982), which has been technically revised.

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Foreword

The text of EN ISO 505:1999 has been prepared by Technical Committee CEN/TC 188 "Conveyor belts", the secretariat of which is held by BSI, in collaboration with Technical Committee ISO/TC 41 "Pulleys and belts (including veebelts)".

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2000, and conflicting national standards shall be withdrawn at the latest by May 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This Standard specifies a method of test for the measurement of the propagation resistance of an initial tear in textile conveyor belts, either in full thickness or of the carcass only.

This test is intended for application to textile belts in installations where there is a risk of longitudinal tearing.

2 Normative references

This European Standard incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

ISO 6133:1998 Rubber and plastics - Analysis of multi-peak traces obtained in determinations of tear strength and adhesion strength

3 Principle

The test consists in measuring, by means of tensile testing at a given speed, the force necessary to propagate an initial tear made in a test piece.

4 Apparatus

The apparatus consists of a dynamometric tensile testing machine with the following essential characteristics:

- a) the machine shall be chosen so that the forces to be measured come within the upper 90 % range of its full rated capacity;
- b) the speed of separation of the jaws shall be capable of being adjusted to (50 ± 10) mm/min;
- c) the free distance between the jaws shall be capable of being adjusted to at least 300 mm.

The machine shall be provided with a device for the graphical recording of the force necessary to continue tearing the test piece.

5 Test pieces

5.1 Method of sampling

Test pieces shall be taken from the sample in the longitudinal direction of the belt and at a minimum distance of 50 mm from the edges of the belt.

5.2 Shape and dimensions

Shape : rectangular.

Length: 300 mm.

Width : (100 ± 1) mm.

Thickness: Full belt thickness or without covers.

NOTE. If it is found that weft threads are pulled out of the test piece instead of breaking, the width of the test piece should be increased to 300 mm.

5.3 Number

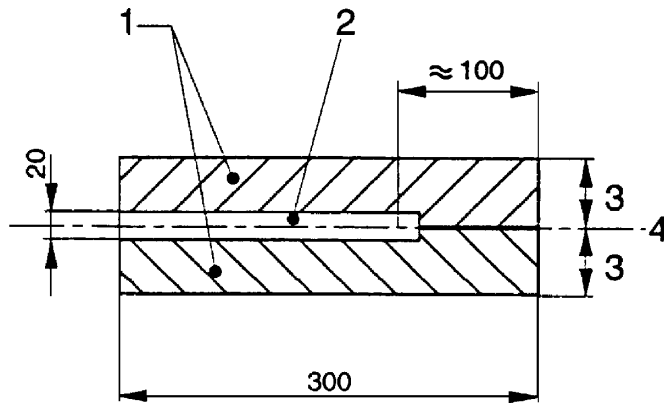
Two test pieces shall be used : one in sense A and one in sense B (see Figure 4).

5.4 Preparation

Where the test is to be conducted without covers, the covers of the test pieces shall be removed by stripping or by buffing.

If there is a breaker ply, strip the corresponding covers without cutting the breaker ply over a width of 20 mm only, i.e. 10 mm on each side of the longitudinal axis of the test piece with the exception of the zone held in the jaws of the machine (see Figure 1).

Dimensions in millimetres



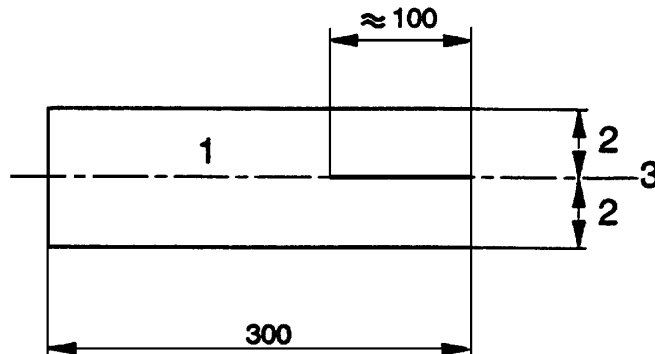
Key

- 1 With covers
- 2 Covers removed
- 3 50 or 150 (see 5.2)
- 4 Cut line

Figure 1 - Test piece with breaker

Cut the test pieces from the middle of one of their ends over a length of about 100 mm parallel to the length (see Figure 2).

Dimensions in millimetres



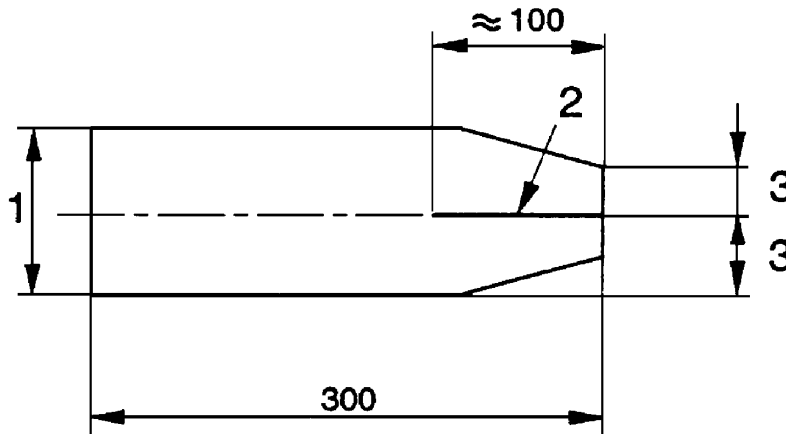
Key

- 1 Without covers
- 2 50 or 150 (see 5.2)
- 3 Cut line

Figure 2 - Test piece without breaker

If necessary, the width of the test piece (cut-edge) may be adjusted to the gripping width of the jaws by tapering the edges symmetrically on a length at most the same as that of the cut, as indicated in Figure 3, with the width at the end of the cut part as great as the width of the jaws permits.

Dimensions in millimetres



Key

- 1 300 or 100 (see 5.2)
- 2 Cut line
- 3 see 5.4

Figure 3 - Tapered test piece

6 Method of test

6.1 Conditioning of test pieces

The tests shall start not less than 24 h after manufacturing. This time includes 8 h for conditioning. The conditioning atmosphere shall be one of the following:

temperature $(20 \pm 2) ^\circ\text{C}$ with $(65 \pm 5) \%$ relative humidity, or,

temperature $(23 \pm 2) ^\circ\text{C}$ and $(50 \pm 5)\%$ relative humidity, or,

temperature $(27 \pm 2) ^\circ\text{C}$ and $(65 \pm 5) \%$ relative humidity.

The tests shall be conducted in the same atmosphere as used for conditioning.

The atmosphere at which the test pieces were conditioned and tested shall be reported in the test report.

In the event of dispute the period of conditioning shall be 72 h.

6.2 Test conditions

The test conditions with regard to temperature and humidity shall be those adopted in 6.1.

6.3 Procedure

Mount the two cut ends of the test piece in the jaws of the tensile testing machine either in sense A or in sense B as indicated in Figure 4, so that the inner edges of the cut are situated at the centre of each jaw.

Fix the speed of separation of the jaws at (50 ± 10) mm/min and continue testing until the tear has extended for at least 100 mm.

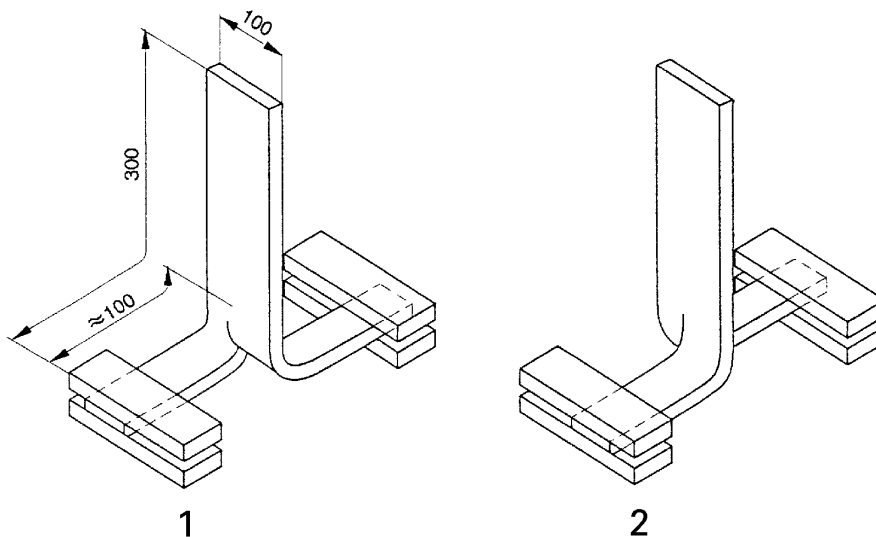
Record the tearing forces over the length of the tear by means of a graphical device

6.4 Expression of results

Examination and analysis of the multi-peak tear resistance test traces shall be in accordance with ISO 6133. The median peak force is defined as the mean tear resistance.

Indicate the resistance of each test piece separately and then indicate the mean value of the resistance of the two test pieces.

Dimensions in millimetres



Key

- 1 Sense A
- 2 Sense B

Figure 4 - Mounting of the two cut ends of the test piece

6.5 Test report

The test report shall make reference to this Standard and shall include:

- a) the identification of the belt tested;
- b) the temperature and relative humidity adopted for the conditioning of the test pieces and the tests;
- c) the results expressed in accordance with 6.4;
- d) whether the test was conducted with or without covers;
- e) an account of any test or operating conditions not specified in this Standard.

