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DRAFT INTERNATIONAL STANDARD

ISO/DIS 20872

ISO/TC 216

Secretariat: AENOR

Voting begins on:
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2016-04-28

Footwear — Test methods for outsoles — Tear strength

Chaussures — Méthodes d'essai applicables aux semelles d'usure - Résistance au déchirement

ICS: 61.060

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ISO/CEN PARALLEL PROCESSING

This draft has been developed within the European Committee for Standardization (CEN), and processed under the **CEN lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.



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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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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 the member bodies casting a vote.

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

ISO 20872 was prepared by Technical Committee ISO/TC 216, *Footwear*, Subcommittee SC , and by Technical Committee CEN/TC 309, *Footwear* in collaboration.

This second/third/... edition cancels and replaces the first/second/... edition (), [clause(s) / subclause(s) / table(s) / figure(s) / annex(es)] of which [has / have] been technically revised.

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Footwear — Test methods for outsoles — Tear strength

1 Scope

This International standard specifies a method for the determination of the tear strength of outsoles, irrespective of the material, using trouser test pieces.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 18454 Footwear. Standard atmospheres for conditioning and testing of footwear and components for footwear.

ISO 17709 Footwear -- Sampling location, preparation and duration of conditioning of samples and test pieces.

ISO 7500-1 Metallic materials -- Verification of static uniaxial testing machines -- Part 1: Tension/compression testing machines -- Verification and calibration of the force-measuring system

ISO 4648 Rubber, vulcanized or thermoplastic. Determination of dimensions of test pieces and products for test purposes.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

trouser tear strength

the median force, required to propagate a cut in a specified trouser-shaped test piece by tearing, divided by the thickness of the test piece

3.2

median

If n measured values are arranged in increasing order of magnitude and numbered 1 to n , the median of these n values is the $((n+1)/2)$ th value, if n is odd.

If n is an even number, the median of these n values is the arithmetic mean of the $(n/2)$ th and the $(n/2+1)$ th values, unless further specified.

ISO/WD 20872

4 Apparatus and material

The following apparatus and material shall be used:

4.1 Dies

The die used for cutting trouser test pieces shall have the outline dimensions shown in figures 1 and 2.

4.2 Nick cutter

A sharp razor blade or a sharp knife free from ragged edges shall be used for producing a cut or a nick in the test piece. The test piece shall be cut to a depth of $40 \text{ mm} \pm 5 \text{ mm}$ in the direction indicated in figures 1 and 2. The last 1 mm (approximately) of the cut shall be made with a razor blade or a sharp knife.

4.3 Tensile-testing machine

The tensile-testing machine shall comply with the requirement of ISO 7500-1, to an accuracy corresponding to class 2, with a constant rate of traverse of $100 \text{ mm/min} \pm 10 \text{ mm/min}$. A low-inertia machine having autographic force recording facilities is essential.

4.3.1 Grips

The machine shall be provided with a type of grip which tightens automatically as the tension increases and exerts a uniform pressure across the clamped end of the test piece. Each grip shall incorporate a means for positioning so that the test pieces are inserted symmetrically and in axial alignment with the direction of the pull.

4.4 Thickness gauge

Thickness gauge, standing on a firm base and loaded with a dead weight such that the presser foot applies a pressure of $10 \text{ kPa} \pm 3 \text{ kPa}$ (see ISO 4648).

The gauge has a presser foot which is flat, circular and $10 \text{ mm} \pm 0,1 \text{ mm}$ in diameter. The gauge has scale division of 0,01 mm.

5 Sampling and conditioning

Three test pieces to be tested shall be taken according to ISO 17709. All test pieces shall be conditioned according to ISO 17709 before testing for a minimum of 24 h. Cut the test pieces with the die (see 4.1).

The thickness of the test piece shall be preferably:

- $2,0 \text{ mm} \pm 0,2 \text{ mm}$ for polymeric and elastomeric compact outsoles;
- $4,0 \text{ mm} \pm 0,2 \text{ mm}$ for semi-expanded and cellular outsoles;
- for leather outsole the full thickness shall be tested.

Take 3 measurements of thickness and take the average. Same paragraph that in ISO 20876 point 6.1

The test is being performed with at least 3 specimens. Their uniform thickness (see specification below) shall be obtained by means of an appropriate splitting machine. If feasible, smooth original "skin" surfaces of the sample shall remain unchanged in the specimens. This leads to three possible types of specimen:

Specimen with 2 original "skins" - S 2

Specimen with 1 original "skin" - S 1

Specimen with no original "skin" - S 0

The final result shall be based on only specimens of the same type, which shall be stated in the report.

6 Test methods

Measure the thickness of the test pieces, using the thickness gauge (see 4.4).

Mount the test piece in the testing machine; apply a steadily increasing traction force at a rate of separation of the grips of 100 mm/min \pm 10 mm/min until the piece breaks. Record the force throughout the tearing process.

7 Expression of results

The tear strength T_s expressed in newton per millimetre thickness, is given by the formula

$$T_s = F/d \quad (1)$$

where

F is the median force in newton, calculated in accordance with the following procedure:

From the force peak values of the trace for tear strength, the median peak force (see 3.2) of peak force values is determined by the appropriate method specified below.

NOTE In applying the methods described in this Standard, it should be assumed that the trace being evaluated is a time record of the variation of force during the period of test.

Method A (for traces having less than five peaks)

Determine the median of the values of the force peaks in the trace.

If there is only one force peak, consider its value to be the median.

Method B (for traces having five to twenty peaks)

Consider only the peak values of the central 80% of the complete trace and determine the median peak force of these values.

d is the median thickness, in millimetres, of the test piece.

The result is expressed as the average of the three determinations.

8 Test Report

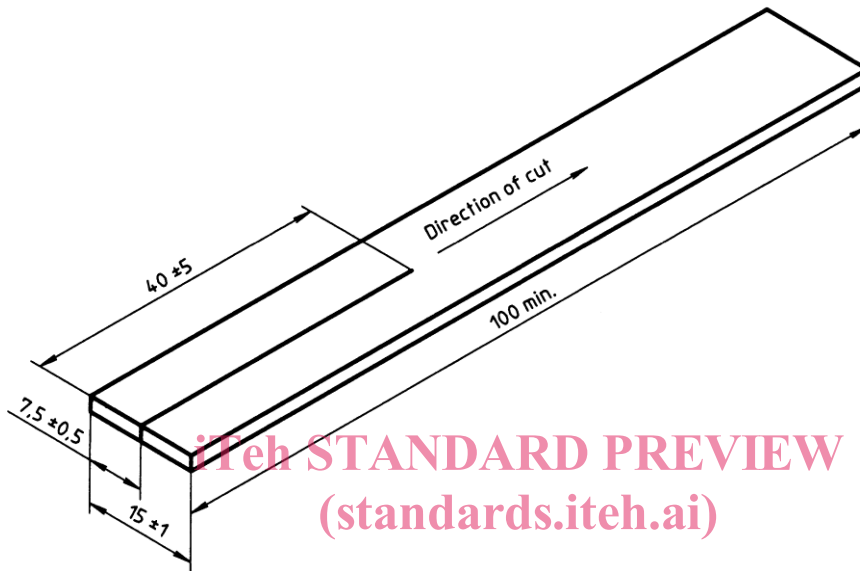
The test report shall include the following information:

- a) results, expressed in accordance with clause 7;
- b) thickness of the test pieces;
- c) full description of the samples tested including commercial styles, codes, colours, nature, etc.;
- d) reference of this method of test;
- e) date of testing;

ISO/WD 20872

- f) type of specimen;
- g) any deviations from this test method.
- h) standard atmospheric conditions observed during the test

Dimensions in millimetres



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Figure 1 — Trouser test piece

Dimensions in millimetres

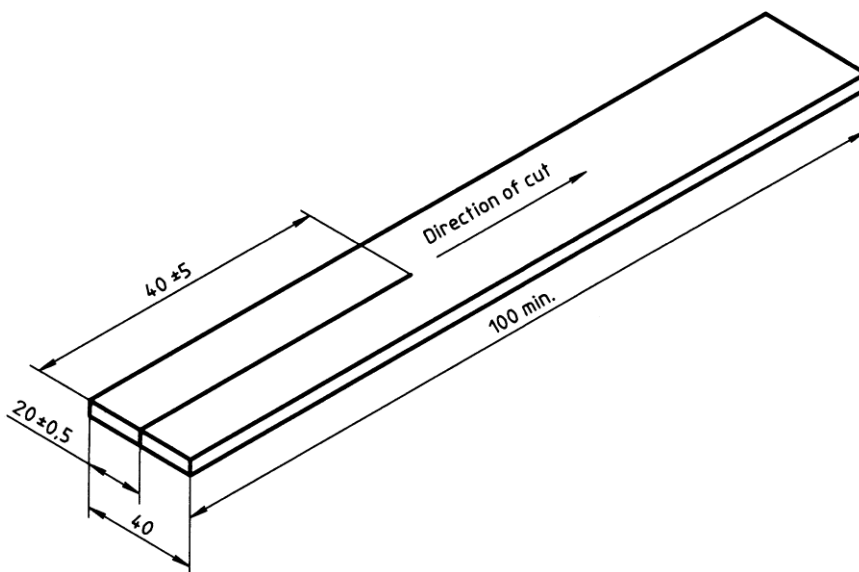


Figure 2 — Trouser test piece for leather outsoles