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# DRAFT INTERNATIONAL STANDARD

## ISO/DIS 20874

ISO/TC 216

Secretariat: AENOR

Voting begins on:  
2016-01-28Voting terminates on:  
2016-04-28

## Footwear — Test methods for outsoles — Needle tear strength

*Chaussures — Méthodes d'essai applicables aux semelles d'usure — Résistance du point de couture*

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

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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 20874 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 — Needle tear strength

## 1 Scope

This international standard specifies a method for the determination of the needle tear strength for outsoles, irrespective of the material.

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

ISO 17709 Footwear. Sampling location of components for footwear.

## 3 Definitions

For the purposes of this International Standard, the following definition applies:

### 3.1

#### **needle tear strength**

the quotient by division of the maximum force, occurring during tearing-out of the needle, by the thickness of the test piece

## 4 Apparatus and material

The following apparatus and material shall be used:

### 4.1 Tensile-testing machine

The tensile-testing machine shall comply with the requirements of ISO 7500-1, to an accuracy corresponding to grade B, with a constant rate of traverse of 100 mm/min  $\pm$  10 mm/min. Autographic recording of force or a maximum force pointer is recommended.

### 4.2 Needle

Either a smooth-surfaced steel needle of 1 mm  $\pm$  0,01 mm diameter or a corresponding piece of spring steel wire, ground to a point.

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### 4.3 Clamping device

The figure 1 shows an example of a clamping device. The distance between the support links for the needle shall be adjustable, so that it can be adjusted to the thickness of the specimen. The clamping device shall be equipped with a suitable protective device to prevent the needle from jumping out.

### 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  $10 \text{ kPa} \pm 3 \text{ kPa}$ . 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  $0,01 \text{ mm}$ .

## 5 Sampling and conditioning

The test pieces to be tested are taken in accordance to ISO 17709. All test pieces shall be conditioned according to ISO 18454 before testing for a minimum of 24 h.

Test pieces are strips of  $50 \text{ mm} \pm 1 \text{ mm}$  length and  $20 \text{ mm} \pm 1 \text{ mm}$  width. 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 outsoles the original thickness shall be tested.

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 piece, using the thickness gauge (see 4.4). Pierce the piece with a needle of 1 mm diameter (see 4.2), 5 mm from the edge at the centre of the narrow side (see figure 1), as nearly perpendicular as possible with the aid of a template. The piece shall not have been previously bored or punched. Place the needle, which is now stuck in the piece in the clamping device (see 4.3). The distance between the support links shall be adjusted so that they just touch the piece. Clamp the lower end of the piece in the lower grip (shown in figure 1 as a scissors-clamp). Stress the piece with a feed-rate of  $100 \text{ mm/min} \pm 10 \text{ mm/min}$  on the clamps. Read off the maximum strength in newton which occurs during the tearing-out of the needle.

## 7 Expression of results

The needle tear strength  $S_s$  expressed in newton per millimetres of thickness is given by the formula

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



where

$F$  is the maximum force in newton

$d$  is the thickness in millimetres

The result will be 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 to this method of test;
- e) date of testing;
- f) any deviation from this test method.
- g) standard atmospheric conditions observed during the test

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Dimensions in mm

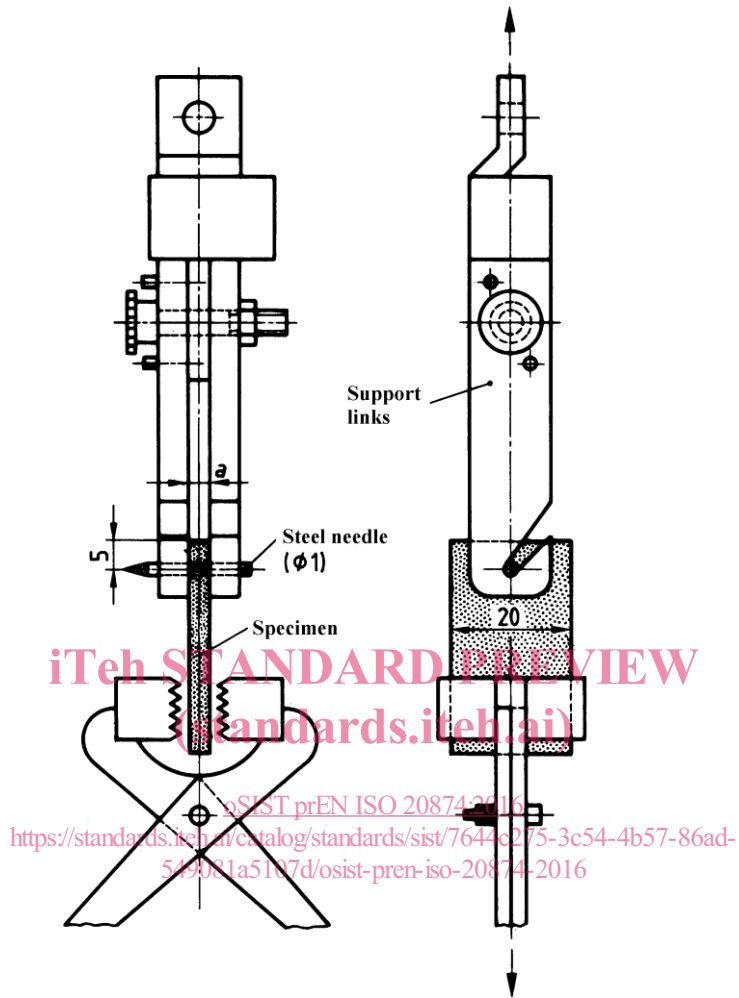


Figure 1 — Example of clamping device