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**Footwear — Test methods for outsoles —  
Tensile strength and elongation**

*Chaussures — Méthodes d'essai applicables aux semelles d'usure —  
Résistance à la traction et à l'allongement*

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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 3.

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 International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 22654 was prepared by CEN (as EN 12803:2000) and was adopted, under a special “fast-track procedure”, by Technical Committee ISO/TC 216, *Footwear*, in parallel with its approval by the ISO member bodies.

For the purposes of international standardization, a list of corresponding International and European Standards for which equivalents are not given in EN 12803 has been added as Annex ZZ.

The version of EN 12803 reproduced in this International Standard incorporates the corrigendum EN 12803:2000/AC:2002.

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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 309 "Footwear", the secretariat of which is held by AENOR.

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of an identical text or by endorsement, at the latest by August 2000, and conflicting national standards shall be withdrawn at the latest by August 2000.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.

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## 1 Scope

This European standard specifies a method for the determination of the tensile strength and elongation of outsoles.

## 2 Normative references

This European Standard incorporates by dated or 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.

EN 10002-2	<i>Metallic materials – Tensile testing – Part 2: Verification of the force measuring system of the tensile testing machines.</i>
EN 12222	<i>Footwear – Standard atmospheres for conditioning and testing of footwear and components for footwear.</i>
prEN 13400:1998	<i>Footwear – Sampling location of components for footwear.</i>
ISO 4661-1	<i>Rubber, vulcanized or thermoplastic – Preparation of samples and test pieces – Part 1: Physical tests.</i>

## 3 Definitions

ISO 22654:2002  
<https://standards.iteh.ai/catalog/standards/sist/ad6ccc40-0c01-4b38-a405-3ca123ca7dc180-22654-2002>

For the purposes of this standard the following definitions apply:

### 3.1

#### **tensile strength**

the tensile stress at maximum force

### 3.2

#### **elongation at break**

the relative increase in length when subjected to the tension just required to rupture it

### 3.3

#### **stress at a given elongation**

the tensile stress in the test length required to produce a given elongation

## 4 Apparatus and material

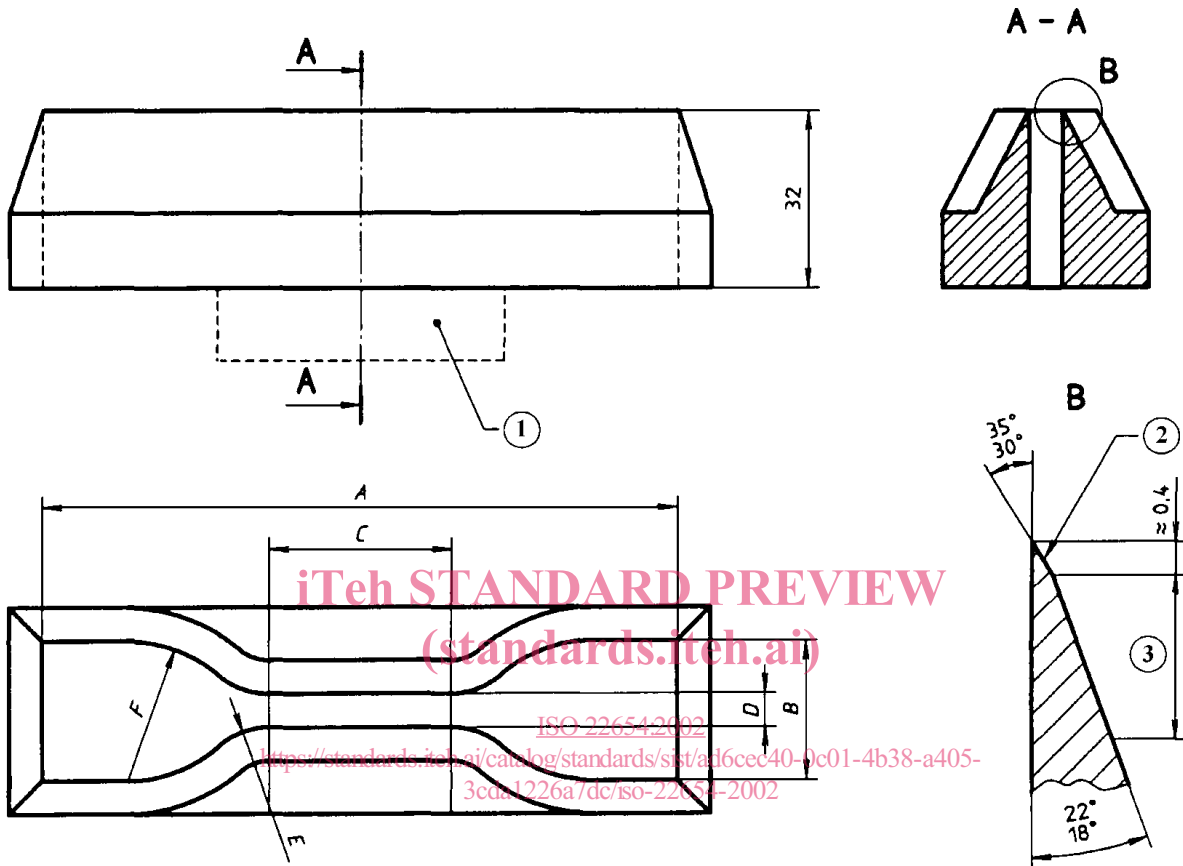
The following apparatus and material shall be used:

### 4.1 Dies and cutters

All dies and cutters used shall be in accordance with ISO 4661-1.

Dies for preparation of dumb-bells shall have the dimensions given in table 1 and figure 1. The departure from parallelism at any point along the width of the narrow portion of the die shall nowhere exceed 0,05 mm.

Dimensions in millimetres



- 1 Type of fixing to suit machine
- 2 Ground smooth
- 3 6 mm (ground)

NOTE For dimensions A to F, see table 1

Figure 1 – Die for dumb-bell test pieces

Table 1 – Dimensions of dies for dumb-bells test pieces

Dimension	Dimensions in millimetres	
	Type 1	Type 2
A Overall length (minimum)	115	75
B Width of ends	$25,0 \pm 1,0$	$12,5 \pm 1,0$
C Length of narrow portion	$33,0 \pm 2,0$	$25,0 \pm 1,0$
D Width of narrow portion	$6,0^{+0,4}_{0,0}$	$4,0 \pm 0,1$
E Transition radius outside	$14,0 \pm 1,0$	$8,0 \pm 0,5$
F Transition radius inside	$25,0 \pm 2,0$	$12,5 \pm 1,0$

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

#### 4.3 Tensile-testing machine

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The tensile-testing machine shall comply with the requirements of EN 10002-2, to an accuracy corresponding to grade B, with a constant rate of traverse of  $100 \text{ mm/min} \pm 10 \text{ mm/min}$ , and should preferably be equipped with facilities for the autographic recording of stress and strain.

#### 5 Sampling and conditioning

The test specimen to be tested are taken in accordance to prEN 13400:1998.

All test specimens shall be conditioned according to EN 12222 before testing, for a minimum of 24 h.

The thickness of the test specimen shall be:

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

The test is being performed with at least 3 specimens. Their uniform thickness (see specification above) 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.