International Standard 2252

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Rubber footwear, lined industrial, for use at low temperatures

Articles chaussants en caoutchouc, doublés, pour utilisation industrielle à basses températures

Third edition — 1983-05-01

UDC 685.312 : 678.4/.8

Ref. No. ISO 2252-1983 (E)

Descriptors : rubber products, footwear, low temperature tests, hardness tests, tension tests, flexibility.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2252 was developed by Technical Committee ISO/TC 45, *Rubber and rubber products.*

This third edition was submitted directly to the ISO Council, in accordance with clause 6.11.2 of part 1 of the Directives for the technical work of ISO. It cancels and replaces the second edition (i.e. ISO 2252-1976), which had been approved by the member bodies of the following countries :

Australia	Israel	Sweden
Austria	Netherlands	Switzerland
Chile	Poland	Turkey
Czechoslovakia	Portugal	United Kingdom
Egypt, Arab Rep. of	Romania	USA
France	South Africa, Rep. of	USSR
Hungary	Spain	
India	Sri Lanka	

No member body had expressed disapproval of the document.

Rubber footwear, lined industrial, for use at low temperatures

1 Scope and field of application

This International Standard specifies the requirements for lined industrial rubber footwear for use at low temperatures, to ensure that a sufficient degree of flexibility is retained to allow for comfort in wear.

2 References

ISO 37, *Rubber, vulcanized — Determination of tensile stress-strain properties.*

ISO 48, *Vulcanized rubbers — Determination of hardness (Hardness between 30 and 85 IRHD).*

ISO 1400, *Vulcanized rubbers of high hardness (85 to 100 IRHD) — Determination of hardness.*

ISO 1818, *Vulcanized rubbers of low hardness (10 to 35 IRHD) — Determination of hardness.*

ISO 2023, *Lined industrial rubber footwear.*

3 Requirements

3.1 The footwear shall conform to the requirements of ISO 2023.

3.2 In addition, the footwear shall pass the tests for low temperature performance laid down in clause 4.

4 Tests

4.1 Soling and heel — Hardness

Either sample pieces of the soling and heel or, alternatively, the entire article shall be kept in a suitable apparatus at a temperature of -25 ± 1 °C at atmospheric pressure for a period of 3 h. When tested in the low temperature apparatus, the hardness shall be not more than 20 IRHD (see ISO 48, ISO 1400 and ISO 1818) greater than the room temperature value. In no case, however, shall the hardness exceed 95 IRHD during or after treatment in the cooling apparatus.

4.2 Upper part of boot — Flexibility

When sample pieces from the upper part of the boots are tested at -25 ± 1 °C in accordance with the method given in the annex, the stress at 100 % elongation shall not be in excess of 8 MPa.[1)]

5 Marking

Each article of footwear shall be indelibly and legibly marked with the following particulars :

a) size;

b) manufacturer's identification;

c) reference number issued by the appropriate national standards organization.

1) 1 MPa = 1 MN/m^2

Annex

Method of test for flexibility

A.1 Apparatus

A suitable apparatus is shown in figure 1.

The test piece shall be fixed in the clamps. The upper clamp (7) shall be connected to the screw action grip of the tensile tester by means of a steel strip (4).

The lower clamp (9) shall be connected by means of a steel bar to a universal rack (5), the latter being connected to the moving crosshead (10) of the tensile tester as shown in figure 1. On the crosshead (10) shall be fixed a Dewar vessel (6) in which the clamps with the test piece shall be placed.

The clamps and test piece may be removed by loosening screws at A and B, and loosening the strip (4) from the grip (3).

If the tensile test machine has no crosshead, a platform shall be connected to the moving grip of the tensile tester. On this platform the same construction may be made. A suitable apparatus is shown in figure 2.

A.2 Test pieces

Dumb-bell test pieces conforming to ISO 37, type 2, shall be cut from the upper part of the boot, the fabric being carefully removed by buffing. The working section of the test piece shall be defined by marks applied before testing. The length of the working section shall be 25 mm, the width 4 mm, and the thickness approximately 2 mm.

A.3 Procedure

Mark the gauge length of the test piece and measure the thickness. Fix the test piece in the clamps according to the marks on the working section, and place the assembly in the Dewar vessel. Cool the Dewar vessel and contents to -25 °C and keep at a constant temperature of -25 ± 1 °C. The heat transfer medium shall be either liquid or gaseous; any material which does not affect the material being tested may be used.

Expose the test piece to these conditions for 20 min and then stretch to an elongation exceeding 100 % by separating the clamps at a uniform rate of 100 mm/min. Determine the force by means of the tension cell (1) and record the value.

Test three dumb-bell test pieces in this way.

A.4 Expression of results

The tensile stress is given by the formula

$$\frac{F}{A}$$

where

F is the observed force at 100 % elongation;

A is the cross-sectional area of the unstretched test piece.

A.5 Test report

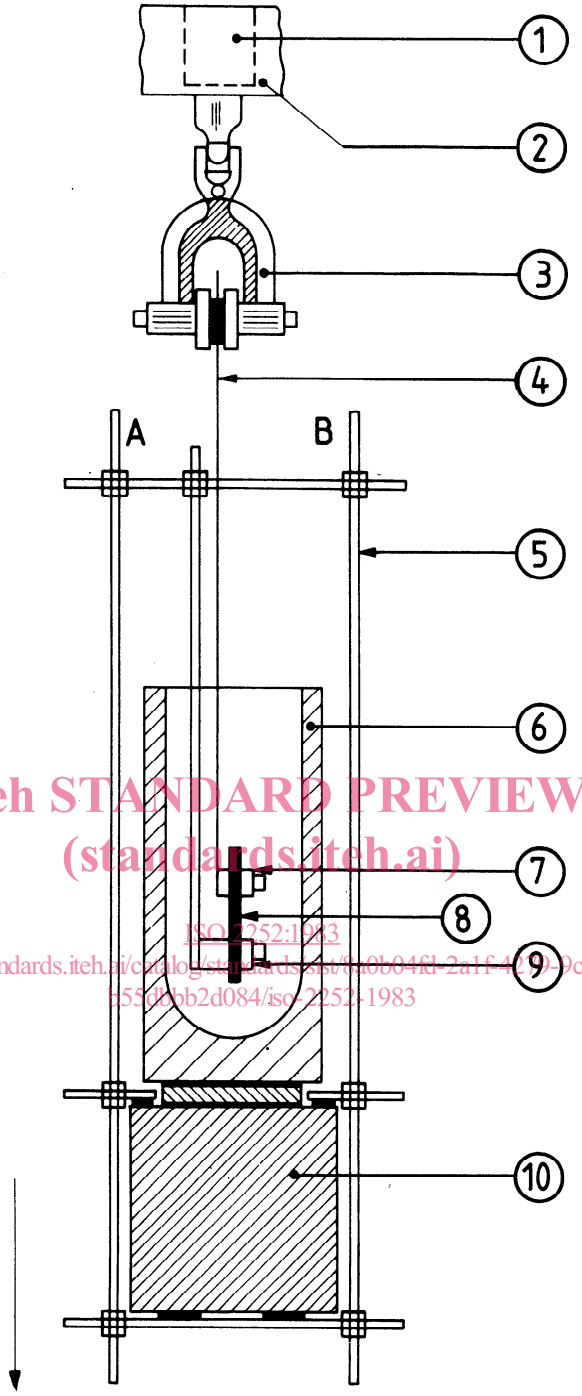
The test report shall contain the following information :

a) identification of the footwear tested;

b) sample thickness;

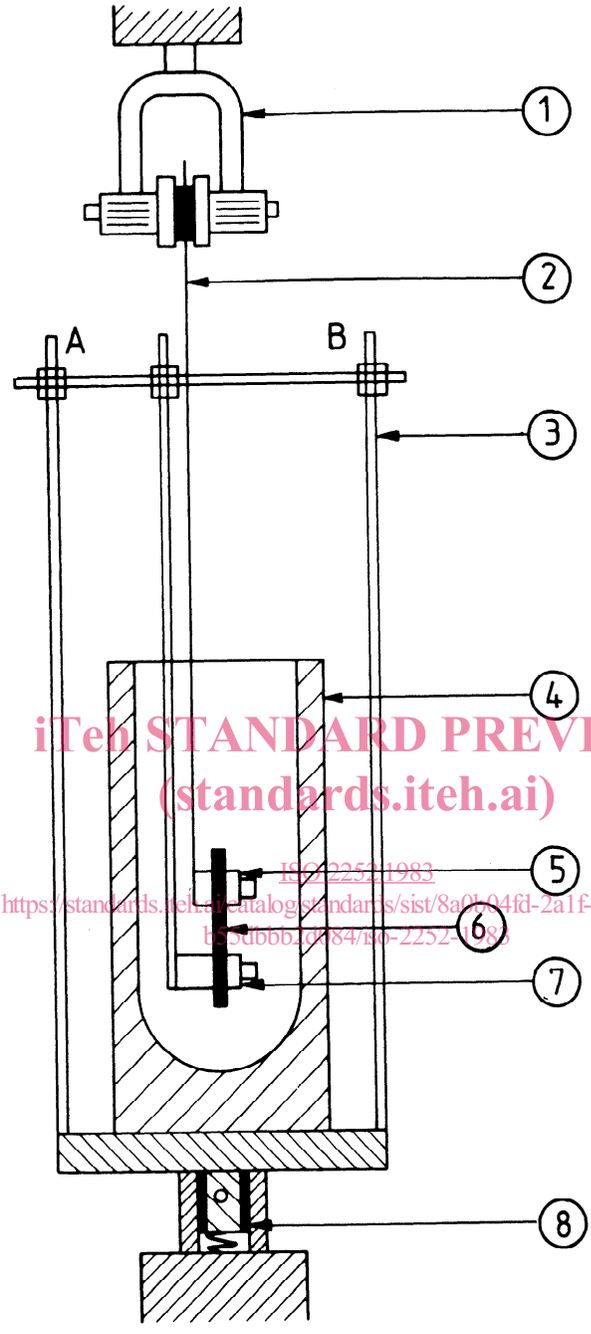
c) the tensile stress at 100 % elongation;

d) any other information concerning the test.



Fixed parts		Moving parts	
1	Tension-cell	5	Universal laboratory rack
2	Fixed crosshead of tensile tester	6	Dewar vessel
3	Grip	8	Test piece
4	Steel strip	9	Moving clamp
7	Fixed clamp	10	Moving crosshead of tensile tester

Figure 1 — Cross-section of suitable apparatus



Fixed parts

1. Fixed grip
2. Steel strip
5. Fixed clamp

Moving parts

3. Universal laboratory rack
4. Dewar vessel
6. Test piece
7. Moving clamp
8. Moving grip holder

Figure 2 — Suggested apparatus suitable for tensile tester without crosshead

This page intentionally left blank

This page intentionally left blank