
**Flexible cellular polymeric materials —
Moulded and extruded sponge or expanded
cellular rubber products — Compressibility
test on finished parts**

*Matériaux polymères alvéolaires souples — Produits en caoutchouc
alvéolaire expansé ou spongieux, moulés et extrudés — Essai de
compressibilité sur des produits finis*

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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.

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.

International Standard ISO 11752 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 4, *Products (other than hoses)*.

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WARNING — Persons using this International Standard should be familiar with normal laboratory practice. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

1 Scope

This International Standard specifies a method of determining the hardness or compressibility of a material by measuring the compression and/or deformation force on flexible cellular polymeric profiles not less than 3 mm thick.

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 471:1995, *Rubber — Temperatures, humidities and times for conditioning and testing*.

ISO 1923 :1981, *Cellular plastics and rubbers — Determination of linear dimensions*.

ISO 5893:1993, *Rubber and plastics test equipment — Tensile, flexural and compression types (constant rate of traverse) — Description*.

3 Principle

The compression produced by a defined test force acting perpendicular to the test piece axis and/or the test force (deformation force) required to deform the test piece to a defined size is measured.

4 Apparatus

4.1 Compression-testing equipment, conforming to grade A and grade A¹ of ISO 5893:1993, capable of compressing a test piece over its entire length between a level surface and an indenter situated parallel to it, moving at a uniform rate of between 0,2 mm/s and 0,8 mm/s. The limits of error shall be 0,1 mm for the compression and 2 % for the test force. The indenter size shall be sufficient to cover the entire area of the test specimen.

5 Test pieces

5.1 Number

Unless otherwise agreed between the interested parties, at least three test pieces shall be tested.

5.2 Dimensions

5.2.1 Testing of sections

Testing shall be conducted on representative cross-sections, of known area, of extruded sections or mouldings. The length of each test piece shall be 50 mm unless otherwise agreed between the interested parties.

5.2.2 Testing of finished parts

Testing shall be conducted on finished sections or mouldings of known cross-sectional area. The length of each test piece shall be 50 mm unless otherwise agreed between the interested parties.

NOTE The results of measurements obtained on test pieces of different shapes or under different test conditions will not be comparable.

6 Conditioning

Testing shall not take place less than 72 h after manufacture, unless it can be shown that, at either 16 h or 48 h after manufacture, the mean result obtained does not differ by more than $\pm 10\%$ from that obtained after 72 h, in which case testing after either of those two periods may be carried out.

Before testing, the test pieces shall be conditioned, undeflected and undistorted, for at least 16 h in one of the following atmospheres as given in ISO 471:

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

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

This conditioning period may form the latter part of the minimum period required after manufacture.

7 Procedure

Measure the initial height of the test piece using a gauge as described in ISO 1923. The zero point for measuring the compression shall be defined by applying an initial force of 1 N. In certain circumstances, e.g. for extremely soft materials, a lower initial force will be needed. The size of this force, which will also depend on the cross-section of the test piece, shall be the subject of agreement between the interested parties.

After conditioning, apply the force in the desired strain direction. If the cross-section of the test piece is not circular or square, the direction of the test force shall be as agreed between the interested parties.

The size of the test force or compression shall be agreed between the interested parties as a function of the service conditions to which the product will be exposed. The compression shall not, however, exceed 50 % of the test piece thickness.

After applying the initial force, carry out the test within 20 s, and read the compression or the test force immediately.

Do not carry out repeat tests on the same test piece before 24 h after completion of the previous test.