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**Flexible cellular polymeric  
materials — Determination of  
resilience by ball rebound**

*Matériaux polymères alvéolaires souples — Détermination de la  
résilience par rebondissement d'une bille*

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

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

This third edition cancels and replaces the second edition (ISO 8307:2007), which has been technically revised.

The main changes compared to the previous edition are as follows:

- [Figure 1](#) has been modified.
- [Annex A](#) has been revised to represent the practical electric measurement.

# Flexible cellular polymeric materials — Determination of resilience by ball rebound

## 1 Scope

This document specifies a method for determining the resilience by ball rebound of flexible cellular polymeric materials.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

## 3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

### 3.1

#### **open-cell flexible cellular material**

flexible cellular material with less than 25 % of its cell volume closed

### 3.2

#### **closed-cell flexible cellular material**

flexible cellular material with more than 25 % of its cell volume closed

## 4 Principle

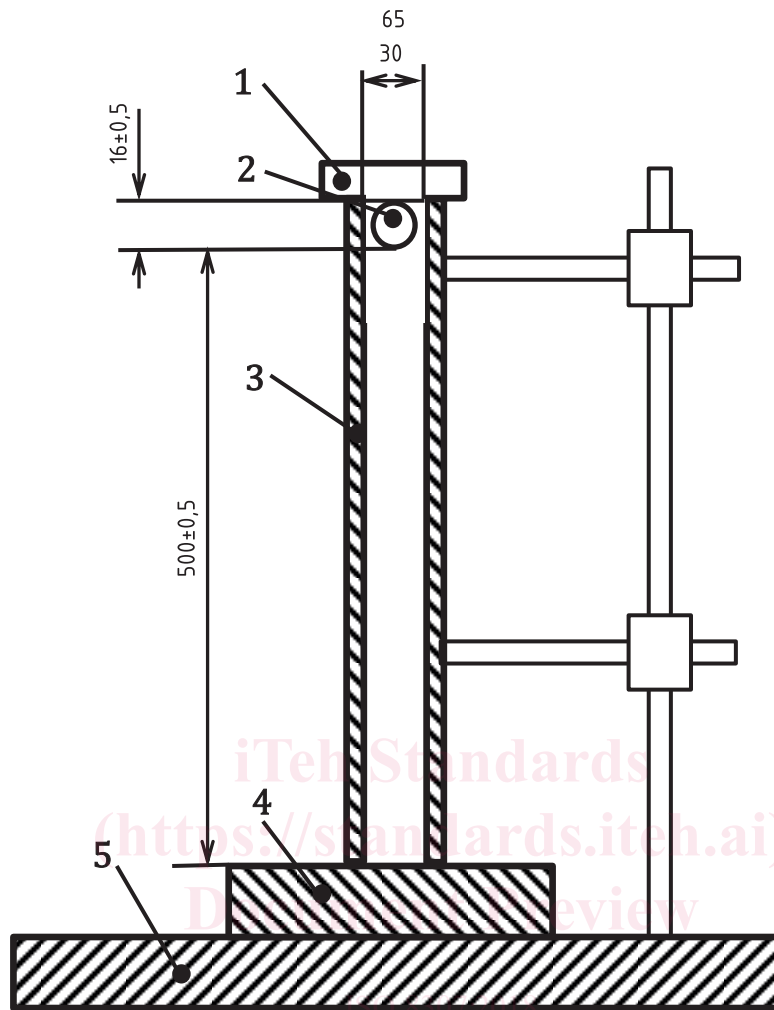
A steel ball is dropped on to a test piece from a specified height and the height of rebound is measured.

## 5 Apparatus

### 5.1 General

The rebound test apparatus (see [Figure 1](#)) shall consist of a vertical transparent tube, of inside diameter 30 mm to 65 mm. A steel ball of diameter  $16 \text{ mm} \pm 0,5 \text{ mm}$  and mass of  $16,8 \text{ g} \pm 1,5 \text{ g}$  is dropped vertically on the test piece through the tube from a height of  $500 \text{ mm} \pm 0,5 \text{ mm}$  using a magnet or other suitable device. The steel ball shall be released so that it falls without rotation and is effectively centred.

Measurement errors can arise if the tube is not held in a vertical position, and measurements might be invalid due to contact of the rebounding ball with the inner surface of the tube. It is therefore important to use a spirit level or similar device to ensure that the tube is mounted at right angles to the rigid baseplate, and that the baseplate itself is horizontal.



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- 1 magnet or other suitable device
- 2 steel ball
- 3 transparent tube
- 4 test piece
- 5 rigid baseplate

**Figure 1 — Diagrammatic arrangement of test apparatus**

## 5.2 Apparatus with manual reading

The scale on the back of the tube shall be graduated directly in per cent as follows: every 5 % (25 mm) a complete circle shall be scribed and at every 1 % a 120° arc shall be scribed on the tube. The complete circles are an essential part of the apparatus, since they are used to eliminate parallax error.

## 5.3 Apparatus with automatic reading

A device capable of determining the rebound height of the steel ball by electronic means can also be used, as long as it has been demonstrated to give the same results as the manual-reading apparatus. The rebound height can be calculated from, for example, the rebound velocity or the time interval between the first and second contacts of the ball with the foam surface (see [Annex A](#)). The apparatus can be equipped with any such device provided it is capable of determining the rebound height to a