



**SLOVENSKI STANDARD**  
**SIST EN ISO 1856:2000**  
**01-maj-2000**

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DYb^Yb]`dc`ja Yfb]`a UHf]U]`!`A Y \_Y`dYbY`!`8 c`c Ub^Y`nUcghU`Y`hU bY`XYZ`fa UW^Y`  
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Polymeric materials, cellular flexible - Determination of compression set (ISO 1856:1980)

Polymerwerkstoffe, Weich-elastische Schaumstoffe - Bestimmung des  
Druckverformungsrestes (ISO 1856:1980)

**iTeh STANDARD PREVIEW**

Matériaux polymères alvéolaires (souples) - Détermination de la rémanence a la  
compression (ISO 1856:1980)

[SIST EN ISO 1856:2000](https://standards.iteh.ai/catalog/standards/sist/4d1a696c-394a-44a5-812b-2795187d97b2/sist-en-iso-1856-2000)

Ta slovenski standard je istoveten z: **EN ISO 1856:1996**

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**ICS:**

83.100          Penjeni polimeri                          Cellular materials

**SIST EN ISO 1856:2000**                          **en**

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EUROPEAN STANDARD

EN ISO 1856

NORME EUROPÉENNE

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June 1996

ICS 83.100

Descriptors: See ISO document

English version

Polymeric materials, cellular flexible -  
Determination of compression set  
(ISO 1856:1980)

Matériaux polymères alvéolaires souples -  
Détermination de la rémanence à la compression  
(ISO 1856:1980)

Polymerwerkstoffe, Weich-elastische  
Schaumstoffe - Bestimmung des  
Druckverformungsrestes (ISO 1856:1980)

Technical STANDARD PREVIEW  
(standards.iteh.ai)



REPUBLIKA SLOVENIJA  
MINISTRSTVO ZA ZNANOST IN TEHNOLOGIJO  
Urad RS za standardizacijo in meroslovje  
LJUBLJANA-2000

<https://standards.iteh.ai/standards/standard/sist/en/iso/1856-1980-394a41a5-812b-2795f89d97b2/sist-en-iso-1856-1980>

SIST..... EN ISO 1856 .....

PREVZET PO METODI RAZGLASITVE

-05- 2000

This European Standard was approved by CEN on 1996-01-25. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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EN ISO 1856:1996

## Foreword

The text of the International Standard from Technical Committee ISO/TC 45 "Rubber and rubber products" of the International Organization for Standardization (ISO) has been taken over as an European Standard by Technical Committee CEN/TC 249 "Plastics", the secretariat of which is held by IBN.

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 December 1996, and conflicting national standards shall be withdrawn at the latest by December 1996.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## Endorsement notice

The text of the International Standard ISO 1856:1980 has been approved by CEN as a European Standard without any modification.

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International Standard



1856

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

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## Polymeric materials, cellular flexible — Determination of compression set

*Matériaux polymères alvéolaires souples — Détermination de la rémanence à la compression*

Second edition — 1980-11-01

Itch STANDARD PREVIEW  
(standards.itech.ai)

[SIST EN ISO 1856:2000](#)

<https://standards.itech.ai/catalog/standards/sist/4d1a6f8c-394a-44a5-812b-2795f89d97b2/sist-en-iso-1856-2000>

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UDC 678.4-405.8 : 620.173.22

Ref. No. ISO 1856-1980 (E)

Descriptors : cellular materials, cellular plastics, foam rubber, compression tests, compression set.

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (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 set up 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 1856 was developed by Technical Committee ISO/TC 45, *Rubber and rubber products*.

This second edition was submitted directly to the ISO Council, in accordance with clause 5.10.1 of part 1 of the Directives for the technical work of ISO. It cancels and replaces the first edition (i.e. ISO 1856-1972), which had been approved by the member bodies of the following countries :

Australia	Greece	Romania
Austria	Hungary	South Africa, Rep. of
Belgium	India	Spain
Brazil	Iran	Switzerland
Canada	Israel	Thailand
Chile	Italy	Turkey
Czechoslovakia	Japan	United Kingdom
Egypt, Arab Rep. of	Netherlands	USA
France	New Zealand	USSR
Germany, F.R.	Poland	

The member body of the following country had expressed disapproval of the document on technical grounds :

Sweden

# Polymeric materials, cellular flexible — Determination of compression set

## 1 Scope and field of application

This International Standard specifies three methods for determining the compression set of flexible cellular materials.

At present, this International Standard applies only to latex, and polyurethane foams of thickness greater than 2 mm. Methods for other materials will be added as required.

## 2 Reference

ISO 1923, *Rigid cellular plastics — Determination of linear dimensions.*<sup>1)</sup>

## 3 Definition

**compression set**: The difference between the initial thickness and the final thickness of a test piece of the cellular material after compression for a given time at a given temperature and after a given recovery time, this difference being referred to the initial thickness.

## 4 Principle

Maintaining a test piece for a specified time at a specified temperature under constant deflection and noting the effect on the thickness of the released test piece.

## 5 Apparatus

**5.1 Compression device**, consisting of two flat plates having dimensions larger than those of the test pieces, with spacers and clamps such that the plates are held parallel to each other and the space between the plates is adjustable to the required deflected height.

For testing thin materials, a requisite number of square photographic glass mounting slides shall be provided. The thickness of the slides shall be between 1 and 1,5 mm and the length of side shall be between 50 and 55 mm.

**5.2 Means of measuring the dimensions of test pieces** in accordance with ISO 1923.

## 6 Test pieces

### 6.1 Requirements

Test pieces shall have parallel top and bottom surfaces and essentially vertical sides. They shall be  $50 \pm 1$  mm long,  $50 \pm 1$  mm wide and  $25 \pm 1$  mm thick. All test pieces shall be free from contamination and skin on the vertical sides.

When thin materials are to be tested, sufficient test pieces, of dimensions  $50 \text{ mm} \times 50 \text{ mm}$ , shall be taken so that the sum of their thicknesses before compression is at least 25 mm. The test pieces shall be plied together and interleaved with the photographic mounting slides where the number of plies is greater than two, and the complete assembly shall be treated during the test as a single thick test piece.

### 6.2 Samples showing orientation

If samples show orientation of the cellular structure, the direction in which the compression is to be carried out shall be agreed between the interested parties. Normally, testing should be carried out in that direction in which the finished product will be stressed under service conditions.

### 6.3 Number of test pieces

Five 25 mm thick test pieces, or five assemblies in the case of thin materials, shall be tested.

### 6.4 Conditioning

Materials shall not be tested for at least 72 h after manufacture. Prior to the test, the test pieces shall be conditioned for at least 16 h in one of the following atmospheres :

$20 \pm 2$  °C,  $65 \pm 5$  % relative humidity; or

$23 \pm 2$  °C,  $50 \pm 5$  % relative humidity; or

$27 \pm 2$  °C,  $65 \pm 5$  % relative humidity.

1) At present at the stage of draft. (Revision of ISO/R 1923-1972 and ISO/R 1794-1971.)

## ISO 1856-1980 (E)

## 7 Procedure

The test may be carried out by either method A, method B or method C or all three. The three methods may, however, not give the same results.

### 7.1 Method A (compression at 70 °C)

After the test piece has been conditioned as specified in 6.4, measure its initial thickness in accordance with ISO 1923. In the case of thin materials, calculate the thickness of the foam ( $d_o$ ) by deducting the aggregate thickness of the glass slides from the measured total thickness of the assembly of glass slides and test pieces measured with the assembly in the horizontal position.

Place the test piece or assembly between the plates of the compression device; compress it by either 50 % or 75 % of its thickness and maintain it under this condition. In special cases, a compression of 90 % may be agreed upon.

Within 15 min, place the compressed test piece or assembly in an oven at  $70 \pm 1$  °C and leave it for 22 h.

Remove the apparatus from the oven and within 1 min remove the test piece from the apparatus and place it on a surface of low thermal conductivity, such as wood. The surface shall be at laboratory temperature. The test piece shall be allowed to recover for 30 min at the same temperature as that used for conditioning.

Remeasure its thickness ( $d_r$ ). In the case of thin materials, care shall be taken not to disturb the assembly. Calculate the thickness ( $d_r$ ) by deducting the aggregate thickness of the glass slides from the measured total thickness of the assembly of glass slides and test pieces.

### 7.2 Method B (compression at standard conditioning temperature)

Use the procedure specified for method A, but maintain the test piece under compression for 72 h at the same temperature as that used for conditioning the test piece.

### 7.3 Method C (compression under specially specified conditions)

Use the procedure specified for method A using the specially specified time, temperature and level of compression.

## 8 Calculation and expression of results

8.1 The compression set, expressed as a percentage, is given by the formula :

$$\frac{d_o - d_r}{d_o} \times 100$$

where

$d_o$  is the original thickness of the test piece;

$d_r$  is the thickness of the test piece after recovery.

8.2 Report the value of the compression set, followed by the test conditions, in parentheses, in the order : level of compression, time, temperature.

For example : value % (50 %, 22 h, 70 °C).

## 9 Test report

The test report shall include the following information :

- a) a description of the material;
- b) the temperature and humidity at which the test piece was conditioned;
- c) the method used;
- d) the thickness of the test piece, if other than that specified;
- e) all the values of compression set, calculated and expressed in accordance with clause 8;
- f) the median value of compression set.