



SLOVENSKI STANDARD
SIST EN ISO 4651:2000
01-maj-2000

DYb^Yb]dc`ja Yfb]`a UHf]U]]b`[i a Y!`8c`c Ub^YX]bUa] bYUa cfh]nUW]g_Y
gdcgcVbcgh]`fGC`(*)%%, , Ł

Cellular rubbers and plastics - Determination of dynamic cushioning performance (ISO 4651:1988)

Schaumstoffe aus Kautschuk und Kunststoffen - Bestimmung der Stoßabsorption (ISO 4651:1988)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Caoutchoucs et plastiques alvéolaires - Détermination de la capacité d'amortissement dynamique (ISO 4651:1988)

[SIST EN ISO 489:2000](#)

<https://standards.iteh.ai/catalog/standards/sist/ed5879df-8102-4423-a006-2a52b3043b56/sist-en-iso-489-2000>

Ta slovenski standard je istoveten z: EN ISO 4651:1995

ICS:

83.100

Penjeni polimeri

Cellular materials

SIST EN ISO 4651:2000

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 489:2000

<https://standards.iteh.ai/catalog/standards/sist/ed5879df-8102-4423-a006-2a52b3043b56/sist-en-iso-489-2000>

EUROPEAN STANDARD

EN ISO 4651

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 1995

ICS 83.100

Descriptors: cellular materials, rubber, cellular plastics, flexible cellular materials, tests, damping test, determination, damping capacity, test equipment

English version

**Cellular rubbers and plastics - Determination of
dynamic cushioning performance
(ISO 4651:1988)**

iTeh STANDARD PREVIEW

Caoutchoucs et plastiques alvéolaires -
Détermination de la capacité d'amortissement
dynamique (ISO 4651:1988)

Schaumstoffe aus Kautschuk und Kunststoffen -
Bestimmung der Stoßabsorption (ISO 4651:1988)

standards.iteh.ai[SIST EN ISO 489:2000](https://standards.iteh.ai/catalog/standards/sist/ed5879df-8102-4423-a006-2a52b3043b56/sist-en-iso-489-2000)

<https://standards.iteh.ai/catalog/standards/sist/ed5879df-8102-4423-a006-2a52b3043b56/sist-en-iso-489-2000>

This European Standard was approved by CEN on 1995-05-11. 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

© 1995

All rights of reproduction and communication in any form and by any means reserved in all countries to CEN and its members.

Ref. No. EN ISO 4651:1995 E

Foreword

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

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 November 1995, and conflicting national standards shall be withdrawn at the latest by November 1995.

According to CEN/CENELEC Internal Regulations, 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 4651:1988 has been approved by CEN as a European Standard without any modification.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

NOTE: Normative references to International publications are listed in annex ZA (normative).

SIST-EN ISO 489:2000

<https://standards.iteh.ai/catalog/standards/sist/ed5879df-8102-4423-a006-2a7403043056/sist-en-iso-489-2000>

OPREDELBAVA ZA EN ISO 489:2000
OPREDELBAVA ZA EN ISO 489:2000
OPREDELBAVA ZA EN ISO 489:2000
OPREDELBAVA ZA EN ISO 489:2000
OPREDELBAVA ZA EN ISO 489:2000
OPREDELBAVA ZA EN ISO 489:2000
OPREDELBAVA ZA EN ISO 489:2000
OPREDELBAVA ZA EN ISO 489:2000
OPREDELBAVA ZA EN ISO 489:2000
OPREDELBAVA ZA EN ISO 489:2000



Annex ZA (normative)**Normative references to international publications
with their relevant European publications**

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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 845	1988	Cellular plastics and rubbers - Determination of apparent (bulk) density	EN ISO 845	1995
ISO 1923	1981	Cellular plastics and rubbers - Determination of linear dimensions	EN ISO 1923	1995
ISO 2231	1989	Rubber- or plastic-coated fabrics - Standard atmospheres for conditioning and testing	EN ISO 2231	1995

iteh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 489:2000

<https://standards.iteh.ai/catalog/standards/sist/ed5879df-8102-4423-a006-2a52b3043b56/sist-en-iso-489-2000>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 489:2000

<https://standards.iteh.ai/catalog/standards/sist/ed5879df-8102-4423-a006-2a52b3043b56/sist-en-iso-489-2000>

INTERNATIONAL STANDARD

ISO
4651

Second edition
1988-12-01



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

Cellular rubbers and plastics — Determination of dynamic cushioning performance

*Caoutchoucs et plastiques alvéolaires — Détermination de la capacité d'amortissement
dynamique*

(standards.iteh.ai)

SIST EN ISO 489:2000

<https://standards.iteh.ai/catalog/standards/sist/ed5879df-8102-4423-a006-2a52b3043b56/sist-en-iso-489-2000>

ISO 4651 : 1988 (E)

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.

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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4651 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*.

This second edition cancels and replaces the first edition (ISO 4651 : 1979), sub-clauses 3.1, 7.1, 7.2.1, 7.2.2, 8.2 and 9.2 of which have been technically revised.

Annex A of this International Standard is for information only.

Cellular rubbers and plastics — Determination of dynamic cushioning performance

1 Scope

This International Standard specifies the procedure for determining the dynamic cushioning performance of cellular rubber materials and rigid and flexible cellular plastics, by measuring the peak deceleration of a mass when it is dropped on a test piece. The test described is intended primarily for quality assurance; in addition, however, since this type of test is also used to obtain design data, notes are given in annex A to assist in the latter respect.

The method is applicable solely to materials used in packaging.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 291 : 1977, *Plastics — Standard atmospheres for conditioning and testing*.

ISO 471 : 1983, *Rubber — Standard temperatures, humidities and times for the conditioning and testing of test pieces*.

ISO 845 : 1977, *Cellular rubbers and plastics — Determination of apparent density*.

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

ISO 2231 : 1973, *Fabric coated with rubber or plastics — Standard atmospheres for conditioning and testing*.

ISO 3205 : 1976, *Preferred test temperatures*.

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1 static stress, σ_{ST} : The total mass of the hammer and any additional masses multiplied by the gravitational acceleration g_n divided by the original area of the test piece.

3.2 peak deceleration, a : The maximum deceleration of the drop hammer during the impact on the test piece. In the International System of Units (SI), this is expressed in metres per second per second (m/s^2).

3.3 displacement curve: The curve describing the displacement of the impacted surface of the test piece as a function of time during the impact. (See annex A.)

3.4 dynamic stress: The decelerating force exerted by the material upon the drop hammer divided by the original area of the test piece.

3.5 deceleration force: The mass of the drop hammer multiplied by its instantaneous deceleration.

3.6 strain: Displacement expressed as a percentage of the original thickness.

3.7 dynamic compression diagram: The curve describing the relation between the dynamic stress (decelerating force per unit area) and the strain (displacement/thickness) in the cushioning material during impact. The slope of this curve at a specified strain (dynamic compressibility) may be used as a characteristic constant for the given speed of impact and the thickness of the test piece. (See annex A.)

3.8 cushioning diagram: The diagram indicating both the peak deceleration a and the maximum value ΔL_{max} of the displacement of the impact surface as a function of the static stress σ_{ST} for the test pieces of the concerned materials having given thickness L_0 . (See annex A.)

3.9 corrected value of peak deceleration, a_c : The value of the peak deceleration after correction for any small deviation of the test piece original thickness from the standard reference thickness of 50 mm. This is obtained by multiplying the measured peak deceleration by the original thickness divided by the standard reference thickness.

3.10 equivalent drop height, h : That drop height which, in conditions of free fall in vacuo under standard gravitational acceleration, would result in the same impact velocity of the hammer as was obtained during the test.