Polymeric materials, cellular flexible - Determination of stress-strain characteristics in compression - Part 1: Low-density materials (ISO 3386-1:2025)

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 3386-1:2025 sisaldab Euroopa standardi EN ISO 3386-1:2025 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 3386-1:2025 consists of the English text of the European standard EN ISO 3386-1:2025.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 23.07.2025.	Date of Availability of the European standard is 23.07.2025.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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EUROPEAN STANDARD

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EN ISO 3386-1

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English Version

Polymeric materials, cellular flexible - Determination of stress-strain characteristics in compression - Part 1: Low-density materials (ISO 3386-1:2025)

Matériaux polymères alvéolaires souples - Détermination de la caractéristique de contrainte-déformation relative en compression - Partie 1: Matériaux à basse masse volumique (ISO 3386-1:2025)

Polymere Materialien, weich-elastische Schaumstoffe - Bestimmung der Druckspannungs-Verformungseigenschaften - Teil 1: Materialien mit niedriger Dichte (ISO 3386-1:2025)

This European Standard was approved by CEN on 27 June 2025.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN ISO 3386-1:2025 E

European foreword

This document (EN ISO 3386-1:2025) has been prepared by Technical Committee ISO/TC 45 "Rubber and rubber products " in collaboration with Technical Committee CEN/TC 249 “Plastics” the secretariat of which is held by SIS.

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 January 2026, and conflicting national standards shall be withdrawn at the latest by January 2026.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 3386-1:1997.

Any feedback and questions on this document should be directed to the users’ national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO 3386-1:2025 has been approved by CEN as EN ISO 3386-1:2025 without any modification.

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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 document 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).

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For an explanation of 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 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),* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 249, *Plastics,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 3386-1:1986), which has been revised. It also incorporates the Amendment ISO 3386-1:1986/Amd 1:2010.

The main changes are as follows:

— revision of the text in the Scope, Clause 2 and 3;

— addition of a schematic representation of the test procedure in Clause 6;

A list of all parts in the ISO 3386 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The compression stress/strain characteristics is a measure of the load-bearing properties of the material, though not necessarily of its capacity to sustain a long-term load.

The compression stress/strain characteristics differs from the indentation hardness characteristics (as determined in accordance with ISO 2439), which are known to be influenced by the thickness and the tensile properties of the flexible cellular material under test, by the shape of the compression plate and by the shape and size of the test piece.

This document specifies a method for low-density materials and differs from part 2 in the following ways:

— It is mainly concerned with materials of density up to 250 kg/m3;

— Requires a compression stress value for a compression of 40%;

— It permits the use of a cylindrical test piece.

Polymeric materials, cellular flexible — Determination of stress-strain characteristics in compression —

Part 1: Low-density materials

1 Scope

This document specifies a method for the determination of the compression stress/strain characteristics of low-density flexible cellular materials up to 250 kg/m^3. It also specifies a method for the calculation of the compression stress value of such 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 1923, *Cellular plastics and rubbers — Determination of linear dimensions*

ISO 7500-1, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system*

3 Terms and definitions

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

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
compression stress/strain characteristic
CC
stress versus compression strain curve, measured at a constant rate of deformation during the fourth loading cycle, expressed in kilopascals and percent strain

3.2
compression stress value
CV_{40}
compression stress/strain characteristic for a compression of 40 %

4 Apparatus

4.1 Test machine

The test machine shall be capable of compressing the test piece between a support surface (see 4.2) and a compression plate (see 4.3), which shall have a uniform relative rate of motion in the vertical direction of 100 ± 20 mm/min.