SLOVENSKI STANDARD
oSIST prEN ISO 844:2025

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Trdi penjeni polimerni materiali (trde pene) - Ugotavljanje lastnosti stiskanja (ISO/DIS 844:2025)

Rigid cellular plastics - Determination of compressive properties (ISO/DIS 844:2025)

Harte Schaumstoffe - Bestimmung der Druckeigenschaften (ISO/DIS 844:2025)

Plastiques alvéolaires rigides - Détermination des caractéristiques de compression (ISO/DIS 844:2025)

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Rigid cellular plastics — Determination of compressive properties

Plastiques alvéolaires rigides — Détermination des caractéristiques de compression

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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).

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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 61, *Plastics*, Subcommittee SC 10, *Cellular plastics*, 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 eighth edition cancels and replaces the seventh edition (ISO 844:2021), which has been technically revised. The main changes compared to the previous edition are as follows:

— “Compression” changed to “compressive” throughout the document, including the title.

— The scope changed to include details of Procedure A and Procedure B.

— “Relative deformation” changed “compressive strain.”

— “Nominal relative deformation” changed “nominal compressive strain”.

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

For the determination of compressive stresses, it is common practice to apply an overall deformation to a standard test specimen, especially for quality assurance. However, the test specimen has a complex and inhomogeneous deformation state, under compression, which is not subjected to further analysis in such an evaluation. Measurement results are, therefore not easily transferable to other test specimens or products. This standard describes this procedure as Procedure A, which determines the nominal properties. Procedure B, on the other hand, is used to determine conventional properties, as described below.

Procedure A employs relative plate displacement for the determination of compressive properties. It shall be used to determine:

— compressive strength and the corresponding nominal compressive strain;

— compressive stress at 10 % nominal compressive strain;

— nominal compressive modulus.

Procedure B employs displacement measuring devices directly positioned on the specimen (contact or optical extensometer) or similar devices that measure the specimen displacement. Procedure B shall be used to determine:

— compressive strength and the corresponding compressive strain;

— compressive modulus

Rigid cellular plastics — Determination of compressive properties

1 Scope

This document specifies methods for determining the compressive strength, the corresponding compressive strain, the compressive stress at 10 % nominal compressive strain, and the compressive modulus of rigid cellular plastics.

Two procedures are specified. Procedure A and Procedure B. Procedure A utilizes the compression plate displacement for the nominal property determination, while Procedure B uses an extensometer and determines the conventional properties.

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 291, *Plastics — Standard atmospheres for conditioning and testing*

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*

ISO 9513, *Metallic materials — Calibration of extensometer systems used in uniaxial testing*

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 https://www.iso.org/obp

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

3.1
nominal compressive strain
ε_C
ratio of the reduction (in relation to its initial value) in thickness of the test specimen

Note 1 to entry: It is expressed as a percentage.

Note 2 to entry: $\varepsilon_{C\mathrm{m}}$ is the nominal compressive strain at σ_{m} (see 3.3).

Note 3 to entry: Procedure A applies.

3.2
compressive strain
ε
ratio of the reduction (in relation to its initial value) of extensometer gauge length

Note 1 to entry: It is expressed as a percentage.

Note 2 to entry: ε_m is the compressive strain at σ_m (see 3.3).

Note 3 to entry: Procedure B applies.

3.3
compressive strength
σ_m
maximum compressive force F_m divided by the initial cross-sectional area A_0 of the test specimen when the ε and the ε_C respectively < 10 %

Note 1 to entry: It is expressed in megapascals (MPa).

3.4
compressive stress at 10 % nominal compressive strain
σ_{10}
ratio of the compressive force F_{10} at 10 % nominal compressive strain ε_{C10} to the initial cross-sectional area of the test specimen

Note 1 to entry: It is expressed in megapascals (MPa).

Note 2 to entry: Procedure A applies

3.5
nominal compressive modulus
E_C
difference in compressive stress divided by the difference in corresponding nominal compressive strain below the nominal proportional limit

Note 1 to entry: It is expressed in megapascals (MPa).

Note 2 to entry: Procedure A applies.

3.6
compressive modulus
E
difference in compressive stress divided by the difference in corresponding compressive strain below the proportional limit

Note 1 to entry: It is expressed in megapascals (MPa).

Note 2 to entry: Procedure A applies.

3.7
proportional limit
X_e
upper displacement limit of the linear part of the force–displacement curve

Note 1 to entry: It is expressed in millimetres (mm).

Note 2 to entry: Procedure B applies.

3.8
nominal proportional limit
X_{Ce}
upper displacement limit of the linear part of the force -nominal displacement curve

Note 1 to entry: It is expressed in millimetres (mm).

Note 2 to entry: Procedure A applies.