

Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1:2025)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>See Eesti standard EVS-EN ISO 1183-1:2025 sisaldab Euroopa standardi EN ISO 1183-1:2025 ingliskeelset teksti.</p> <p>Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.</p> <p>Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 09.07.2025.</p> <p>Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.</p>	<p>This Estonian standard EVS-EN ISO 1183-1:2025 consists of the English text of the European standard EN ISO 1183-1:2025.</p> <p>This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.</p> <p>Date of Availability of the European standard is 09.07.2025.</p> <p>The standard is available from the Estonian Centre for Standardisation and Accreditation.</p>
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EUROPEAN STANDARD

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Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1:2025)

Plastiques - Méthodes de détermination de la masse volumique des plastiques non alvéolaires - Partie 1: Méthode par immersion, méthode du pycnomètre en milieu liquide et méthode par titrage (ISO 1183-1:2025)

Kunststoffe - Verfahren zur Bestimmung der Dichte von nicht verschäumten Kunststoffen - Teil 1: Eintauchverfahren, Verfahren mit Flüssigkeitspycnometer und Titrationsverfahren (ISO 1183-1:2025)

This European Standard was approved by CEN on 4 July 2025.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

## European foreword

This document (EN ISO 1183-1:2025) has been prepared by Technical Committee ISO/TC 61 "Plastics" 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of an identical text or by endorsement, at the latest by January 2026, and conflicting national standards shall be withdrawn at the latest by January 2026.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 1183-1:2019.

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.

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## Endorsement notice

The text of ISO 1183-1:2025 has been approved by CEN as EN ISO 1183-1:2025 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 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)).

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This document was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 5, *Physical-chemical properties*, 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 fourth edition cancels and replaces the third edition (ISO 1183-1:2019), which has been technically revised.

The main changes are as follows.

- In [Clause 4](#), the temperature specifications of the immersion liquid and air have been added.
- In [5.1](#), an alternate version of the immersion method has been introduced which does not need a wire to suspend the specimen.
- In [5.1](#), the technical requirements for the pycnometer, the thermometer and the immersion liquids have been revised.
- In [5.1](#), the (classic) procedure using a wire to suspend the specimen has been clarified.
- In [5.1.4](#), the formulae for the calculation of the density have been revised to include the buoyancy in air.
- [Clause 6](#) has been deleted, the buoyancy correction has been moved to [5.1.4.4](#) and the calculation of the density of air has been moved to [Annex B](#).
- [Annex B](#) (changed from informative to normative) has been shortened to cover the calculation of air only. The method of correction for buoyancy of air has been revised and is now included in [Formulae \(3\) and \(4\)](#) in [5.1.4.4](#).
- [Annex C](#) has been added to present formulae for the determination of the volume of specimens measured by the immersion method.
- [Annex D](#) has been added to explain the updated formulae in [5.1](#) and [Annex C](#).

— Precision data has been added in [Annex E](#).

A list of all parts in the ISO 1183 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](http://www.iso.org/members.html).

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# Plastics — Methods for determining the density of non-cellular plastics —

## Part 1: Immersion method, liquid pycnometer method and titration method

**WARNING** — The use of this document can involve hazardous materials, operations or equipment. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this document to establish appropriate health and safety practices prior to its use.

### 1 Scope

This document specifies three methods for the determination of the density of non-cellular plastics in the form of void-free moulded or extruded objects, as well as powders, flakes and granules.

- Method A: Immersion method, for solid plastics (except for powders) in void-free form.
- Method B: Liquid pycnometer method, for particles, powders, flakes, granules or small pieces of finished parts.
- Method C: Titration method, for plastics in any void-free form.

**NOTE** Density is frequently used to follow variations in physical structure or composition of plastic materials. Density can also be useful in assessing the uniformity of samples or specimens. Often, the density of plastic materials depend upon the choice of specimen preparation method. When this is the case, precise details of the specimen preparation method are intended to be included in the appropriate material specification. This note is applicable to all three methods.

[Annex C](#) provides further information for calculating the volume of the specimen used for the determination of the density in the case that method A (the immersion method) is applied.

### 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 472, *Plastics — Vocabulary*

### 3 Terms, definitions and symbols

#### 3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 472 and the following 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>