
**Plastics — Determination of bulk
factor of moulding materials**

Plastiques — Détermination du facteur de contraction des matières à mouler

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Contents

	Page
Foreword.....	iv
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Principle.....	1
5 Procedure.....	2
6 Expression of results.....	2
7 Test report.....	2

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 5, *Physical-chemical properties*.

This second edition cancels and replaces the first edition (ISO 171:1980), which has been technically revised.

The main changes are as follows:

- the normative references have been updated;
- the definition of the bulk factor has been revised;
- the principle of the method has been added;
- the document has been editorially revised.

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.

Plastics — Determination of bulk factor of moulding materials

1 Scope

This document specifies a method of determining the bulk factor of a moulding material based on the ratio of the apparent volumetric density of a given quantity of particles and the corresponding material density.

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 60:—¹⁾, *Plastics — Determination of apparent density of material that can be poured from a specified funnel*

ISO 61:—²⁾, *Plastics — Determination of apparent density of moulding material that cannot be poured from a specified funnel*

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

ISO 1183 (all parts), *Plastics — Methods for determining the density of non-cellular plastics*

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

bulk factor

ratio of the apparent volumetric density of a given quantity of particles and the corresponding material density

4 Principle

Knowledge of the bulk factor of a moulding material enables the calculation of minimum cavity volume in the design of moulds.

The bulk factor is calculated from the independently determined apparent volumetric density of the material particles and density of the material.

1) Under revision. Stage at the date of publication: ISO/DIS 60:2022.

2) Under revision. Stage at the date of publication: ISO/DIS 61:2022.

5 Procedure

5.1 The determinations of the material density and apparent volumetric density of particles for calculation of the bulk factor shall be made at one of the test temperatures specified in ISO 291.

5.2 Determine the apparent volumetric density of a given quantity of particles of the material in accordance with ISO 60 or ISO 61.

5.3 Determine the density of the material in accordance with the ISO 1183 series.

6 Expression of results

The bulk factor shall be determined using [Formula \(1\)](#):

$$\gamma = \frac{\rho_{\text{app}}}{\rho_{\text{m}}} \quad (1)$$

where

γ is the bulk factor;

ρ_{app} is the apparent volumetric density of a given quantity of particles of the material, in grams per millilitre;

ρ_{m} is the density of the material, in grams per millilitre.

7 Test report

The test report shall include the following particulars:

- a) a reference to this document, including its year of publication, i.e. ISO 171:2022;
- b) the complete identification of the material tested;
- c) the test temperature;
- d) the apparent volumetric density of the particles of the material;
- e) the density of the material;
- f) the bulk factor;
- g) any deviations from the procedure;
- h) any unusual features observed;
- i) the date of the test.