
**Plastics — Film and sheeting —
Determination of gas-transmission rate —**

**Part 1:
Differential-pressure methods**

*Plastiques — Film et feuille — Détermination du coefficient de
transmission d'un gaz —*

Partie 1: Méthodes en pression différentielle

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 15105-1 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 11, *Products*.

This second edition cancels and replaces the first edition (ISO 15105-1:2002), which has been revised to include a second method which uses a gas chromatograph to measure the amount of gas which permeates through the test specimen.

ISO 15105 consists of the following parts, under the general title *Plastics — Film and sheeting — Determination of gas-transmission rate*:

- *Part 1: Differential-pressure methods*
- *Part 2: Equal-pressure method*

Plastics — Film and sheeting — Determination of gas-transmission rate —

Part 1: Differential-pressure methods

1 Scope

This part of ISO 15105 specifies two methods for determining the gas transmission rate of single-layer plastic film or sheet and multi-layer structures under a differential pressure. One method uses a pressure sensor, the other a gas chromatograph, to measure the amount of gas which permeates through a test specimen.

2 Normative references

The following referenced documents are indispensable for the application 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 4593, *Plastics — Film and sheeting — Determination of thickness by mechanical scanning*

3 Terms and definitions

For the purposes of this part of ISO 15105, the following terms and definitions apply.

3.1

gas transmission rate

GTR

volume of gas passing through a plastic material, per unit area and unit time, under unit partial-pressure difference between the two sides of the material

NOTE When the gas used is oxygen, the value obtained is the oxygen transmission rate (O_2 GTR).

3.2

gas permeability

coefficient of gas permeability

P

volume of gas passing through a plastic material of unit thickness, per unit area and unit time, under unit partial-pressure difference between the two sides of the material

NOTE 1 The theoretical value of P is given by $P = \text{GTR} \times d$ [see Equations (A.2) and (B.2)].

NOTE 2 Although P is a physical property of a polymeric material, differences in film preparation affecting polymer orientation and crystal structure will have an effect on the permeation properties.