
**Rubber, vulcanized or
thermoplastic — Rubber sheets
and rubber-coated fabrics —
Determination of transmission
rate of volatile liquids (gravimetric
technique)**

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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 on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 2, *Testing and analysis*.

This fifth edition cancels and replaces the fourth edition (ISO 6179:2010), which has been technically revised to include a calibration schedule in [Annex A](#).

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Rubber, vulcanized or thermoplastic — Rubber sheets and rubber-coated fabrics — Determination of transmission rate of volatile liquids (gravimetric technique)

WARNING 1 — Persons using this document should be familiar with normal laboratory practice. 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 to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

WARNING 2 — Certain procedures specified in this document might involve the use or generation of substances, or the generation of waste, that could constitute a local environmental hazard. Reference should be made to appropriate documentation on safe handling and disposal after use.

1 Scope

This document specifies two methods for determining, by measurement of the transmission rate, the permeability of rubber to volatile liquids diffusing into open air.

It is applicable only to materials in sheet form and to coated fabrics having thicknesses between 0,2 mm and 3,0 mm.

It is restricted to transmission rates of more than 0,1 g/m²·h.

The methods are particularly useful for comparing the relative transmission rates of one liquid through different materials, or of several liquids through one material.

Method A, with refilling, is used when testing mixtures of liquids which give different transmission rates.

Method B, with no refilling, is used for a single-component liquid.

NOTE A method for the determination of water vapour transmission rate is given in ISO 2528.

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 188, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 2231, *Rubber- or plastics-coated fabrics — Standard atmospheres for conditioning and testing*

ISO 2286-3, *Rubber- or plastics-coated fabrics — Determination of roll characteristics — Part 3: Method for determination of thickness*

ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

ISO 18899:2013, *Rubber — Guide to the calibration of test equipment*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

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:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

transmission rate

mass of a volatile liquid which permeates through a rubber test sheet of a given thickness under the test conditions specified in this document

Note 1 to entry: It is expressed in grams per square metre per hour ($\text{g/m}^2\cdot\text{h}$).

4 Apparatus

4.1 Container assembly, consisting of a container for the test liquid, a suitable clamping device for the test piece which does not impose a shearing force on the test piece, and a suitable support for the container, so that the test piece and the test liquid are in contact at all times (with the apparatus inverted after filling), and such as to permit free circulation of air across the surface of the test piece.

The container shall have a volume of 60 cm^3 to 100 cm^3 and an inlet valve for filling and refilling.

NOTE For Method B, an inlet valve is not necessary when introducing the test liquid before mounting the test piece in place.

The mass of the container, the clamping ring, the test piece and 50 cm^3 of the test liquid shall not exceed the capacity of the balance (4.2).

The open end of the container and the hole in the clamping ring shall have a diameter such that approximately 10 cm^2 of the surface of the test piece is exposed on each side.

A suitable apparatus is shown in [Figure 1](#).

When testing materials without fabric and with a high transmission rate or when testing at high test temperatures, a circular piece of stainless-steel wire mesh of aperture size 1 mm (in accordance with ISO 3310-1) shall be mounted together with the test piece so as to support the latter on its outer surface during the test.

4.2 Balance, with a capacity of at least 200 g and accurate to 1 mg.

4.3 Cabinet oven, complying with the requirements of ISO 188, for tests performed at elevated temperatures.

5 Calibration

The requirements for calibration of the test apparatus are given in [Annex A](#).

6 Test pieces

6.1 Preparation

The standard test piece shall be circular and cut from a flat sheet in the way specified in ISO 23529. The surface shall be flat, smooth and free from defects.

Each test piece shall be of a suitable size to fit the container assembly and to be securely clamped in position.