International Standard

ISO 2528

Sheet materials — Determination of water vapour transmission rate (WVTR) — Gravimetric (dish) method

Matériaux en feuilles — Détermination du coefficient de transmission de la vapeur d'eau — Méthode (de la capsule) par gravimétrie

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Foreword

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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 document 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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This document was prepared by Technical Committee ISO/TC 6 *Paper, board and pulps,* Subcommittee SC 2, *Test methods and quality specifications for paper and board*.

This fourth edition cancels and replaces the third edition (ISO 2528:2017) which has been technically revised.

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The main changes are as follows:

— mechanically-sealed test dishes have been shown to be as satisfactory as wax-sealed test dishes and are included in the material that can be used for the determination of water-vapour transmission rate;

— wax-sealed test dishes are moved in Annex A;

— weighing method has been modified;

— preparation of test pieces and test dishes with mechanically-sealed upper parts have been added;

— in Annex B, the creasing method was modified and the calculation of the WVTR of the creases was generalized;

— precision data have been added in Annex D.

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.

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Introduction

This document describes a method which can in theory be applied to any sheet material. In practice its main use is for flat, usually thin, materials that can be processed to form a water vapour-resistant barrier, as used in packaging, such as paper, board, plastics films or laminates of paper with films or metal foils, and for fabrics coated with rubber or plastics.

This test is intended to give reliable values of the water vapour transmission rate (WVTR) by means of simple apparatus. The use of the results of any particular application should, however, be based upon experience.

Transmission rate is not a linear function of temperature, nor generally of relative humidity difference. A determination carried out under certain conditions of temperature and relative humidity is not, therefore, necessarily comparable with one carried out under other conditions. The conditions of test should, therefore, be chosen to be as close as possible to the conditions of use.

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Sheet materials — Determination of water vapour transmission rate (WVTR) — Gravimetric (dish) method

1 Scope

This document specifies a method for determining the water vapour transmission rate (often erroneously called "permeability") of sheet materials. This method is generally not applicable for use if the transmission rate is expected to be less than 1 g/m^2 per day or for materials thicker than 3 mm. In such cases, the method specified in ISO 9932 can be applied [2].

This document is not applicable to materials that change dimensionally (shrink or expand) to an appreciable extent under the test conditions used.

For materials that are damaged by hot wax, only mechanically-sealed test dishes can be used.

For cases where determination of the transmission rate of creased material is needed, a procedure is specified in Annex B.

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 186, *Paper and board — Sampling to determine average quality*

ISO 187, *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples*

ISO 209, *Wrought aluminium and aluminium alloys — Chemical composition*

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

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

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 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
water vapour transmission rate
WVTR
mass of water vapour transmitted through a unit area in a unit time under specified conditions of temperature and humidity

Note 1 to entry: Expressed in grams per square metre per day [g/(m^2.d)].

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