



**International
Standard**

ISO 5637

**Paper and board — Determination
of water absorption after
immersion in water**

*Papier et carton — Détermination de l'absorption d'eau après
immersion dans l'eau*

**Third edition
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Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	1
5 Apparatus, reagents and materials	1
6 Sampling	3
7 Test pieces	4
7.1 Preparation.....	4
7.2 Conditioning.....	4
8 Procedure	4
8.1 Preparation.....	4
8.2 Immersion time.....	4
8.3 Immersion of the test piece.....	4
8.4 Excess water removal.....	5
8.5 Mass determination.....	5
9 Calculation of results	6
9.1 General.....	6
9.2 Individual water absorption.....	6
9.3 Average water absorption.....	6
9.4 Relative water absorption.....	6
10 Test report	6
Annex A (informative) Examples for support systems	8

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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 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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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 6, *Paper, board and pulps*, Subcommittee SC 2, *Test methods and quality specifications for paper and board*.

This third edition cancels and replaces the second edition (ISO 5637:1989), which has been technically revised.

The main changes are as follows:

- [Clause 2](#) Normative references has been updated;
- Former [Clause 5](#) Reagent and [Clause 6](#) Apparatus incorporated into new [Clause 5](#) Apparatus, reagents and materials and revised;
- [Clause 6](#) Sampling is revised;
- [Clause 8](#) Procedure has been revised, especially immersion time and excess water removal;
- [8.5](#) "mass determination" has been added;
- Former [Clause 9](#) Expression of results has been updated and the average water absorption has been added;
- [Clause 11](#) Test report has been revised;
- [Annex A](#) with examples of possible support systems has been added;
- 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.

Paper and board — Determination of water absorption after immersion in water

1 Scope

This document specifies a method for the determination of the water absorption of paper and board after total immersion in water for a specified time.

The method is applicable to all types of paper and board which have a degree of water resistance. It is not applicable to very absorbent papers such as tissue papers and tissue products.

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 14487, *Pulps — Standard water for physical testing*

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 absorption

mass of water absorbed per unit area under the specified conditions of test

3.2

relative water absorption

ratio of the mass of water absorbed to the mass of the conditioned test piece

4 Principle

Weighing the test piece before and after immersion in water and calculating the water absorption, in g/m², or the relative water absorption as the percentage increase in mass.

5 Apparatus, reagents and materials

5.1 **Balance**, which enables reading to the nearest 1 mg.

5.2 Tank of water, maintained in the standard atmosphere according to ISO 187, large enough to hold the test pieces in a vertical position, cleaned with reagent water (5.7) to ensure that it is free from surfactants. The temperature shall be measured with a thermometer (5.8) before immersion to ensure that the water temperature is maintained in accordance with ISO 187.

If the tank (5.2) is maintained in a non-conditioned atmosphere, the tank shall include thermostatic control in accordance with ISO 187. If evaporation can expose samples to the air, a lid shall be added and the water level shall be monitored. Tanks should be cleaned periodically using tap water, cloths, and brushes with a following tap water rinse to eliminate any paper fibre film on the tank side walls and bottoms.

The used temperature shall be stated in the test report (see [clause 10](#)).

5.3 Metal roller, with a smooth face, 200 mm ± 10 mm wide, a diameter of 90 mm ± 10 mm, and a mass of 10 kg ± 0,5 kg.

5.4 Blotting paper, with a grammage of 250 g/m² ± 25 g/m². The blotting paper shall have larger dimensions than the test piece (see [7.1](#)) and smaller than the width of the metal roller ([5.3](#)).

5.5 Support system, either in the vertical or horizontal attitude, to facilitate immersion (see [8.3](#)), in water and to prevent a test piece from folding over on itself or coming in contact with other test pieces (examples are given in [Annex A](#), [Figures A.1](#) to [A.4](#)). A sketch of a possible support system is shown in [Figure 1](#). The support system shall keep the test pieces:

- a) above the bottom of the soak tank;
- b) 20 mm below the surface of the water;
- c) away from the sides/ends of the soak tank;
- d) hang straight (not able to fold over on themselves);
- e) away from each other.

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