ISO/FDIS 535: ####2022 (E)

ISO TC 6/SC 2/WG 47

Date: 2022-10-0711-03

Secretariat: SIS

Paper and board — Determination of water absorptiveness — Cobb method

ISO copyright office

CP 401 • Ch. de Blandonnet 8

CH-1214 Vernier, Geneva

Phone: +41 22 749 01 11

Fax: +41 22 749 09 47

Email: copyright@iso.org

Website: www.iso.org

Published in Switzerland

Contents

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 6, *Paper, board and pulps*, Subcommittee SC 2, *Test methods and quality specifications for paper and board,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 172, *Pulp, paper and board,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 535:2014), which has been technically revised.

The main changes are as follows:

— requirements in 5.1 and 5.2 added;

— Clause 6 and 6.2 revised;

— preparation of test pieces added in Clause 9;

— Subclauses 10.3 and 10.4 revised and requirements added;

— several additional explanations added in 10.5;

© ISO 2022 – All rights reserved

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 absorptiveness — Cobb method

1 Scope

This document specifies a method for determining the water absorptiveness of paper and board, including corrugated fibreboard, under standard conditions.

This document is not applicable for paper of grammage less than 50 g/m^2 or embossed paper. It is not applicable for porous papers such as newsprint or papers such as blotting paper or other papers having a relatively high-water absorptiveness for which ISO 8787 is more suitable.

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 5269-1, *Pulps — Preparation of laboratory sheets for physical testing — Part 1: Conventional sheet-former method*~~

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 absorptiveness
Cobb value
calculated mass of water absorbed in a specified time by 1 m^2 of paper or board under specified conditions

Note 1 to entry: The test area is normally 100 cm^2.

4 Principle

A test piece is weighed immediately before and after exposure for a specified time of one surface to water, followed by blotting. The result of the increase in mass is expressed in grams per square metre (g/m^2).

The test piece shall not show any sign of penetration through or leakage outside the test ring (see 10.5).

5 Reagents and materials

5.1 Water, distilled or deionized, at the laboratory conditioning temperature, i.e. 23 °C ± 1 °C or 27 °C ± 1 °C in tropical countries. The water shall fulfil the requirements of ISO 14487.

5.2 Blotting paper, having a grammage of 250 g/m^2 ± 25 g/m^2.

The blotting paper shall have dimensions of at least 140 mm × 140 mm either circular or rectangular.

Blotting papers in accordance with ISO 5269-1 are suitable, see .Annex B.

6 Apparatus

6.1 Absorptiveness tester for the determination of water absorptiveness.

Any type of apparatus may be used which permits

— an immediate and uniform contact of the water with the part of the test piece submitted to the test,

— controlled rapid removal of the unabsorbed water from the test piece at the end of the contact period, and

— the rapid removal of the test piece without the risk of water contacting the test piece outside the test area.

In its simplest form, the apparatus consists of a rigid base with a smooth, planar surface, and a rigid metal cylinder of 112,8 mm ± 0,2 mm internal diameter (corresponding to a test area of 100 cm^2) and with a means of clamping it firmly to the base plate. The edge of the cylinder in contact with the test piece shall be flat and machined smooth with a thickness sufficient to prevent the cylinder cutting into the test piece. The height of the cylinder is not important, provided it is sufficient to contain a water depth of 10 mm.

For materials where leakage between the cylinder and the upper surface of the test piece can occur during the test, a soft, elastic, non-absorbent gasket may be interposed to prevent this. This gasket shall have the same internal diameter as the cylinder after clamping.

If a gasket is used, it shall be used for all test pieces.

The diameter of the compressed gasket can be tested as follows: mount a piece of carbonless paper which has roughly the same dimensions as the test piece, into the absorptiveness tester, and close the cylinder as for the test. If the pressure is not high enough for an adequate impression, use a usual test piece and

the carbonless paper to increase the thickness of the arrangement. In some cases, a compressible, blotter-like paper or other papers can be more suitable to test the diameter of the gasket.

To prevent damage to the machined edge of the cylinder caused by clamping it upside down it is recommended to mark the top in some way so that it can be identified readily. If a cylinder of a small area is used it should not be less than 50 cm^2. The water depth shall still be 10 mm.

When testing corrugated fibreboard, it is recommended to use an apparatus with adjustable pressure to adjust the cylinder according to the structural conditions of the test piece.

6.2 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.

6.3 Balance, which can be read to the nearest 1 mg.

6.4 Timer, reading in seconds and capable of timing up to at least 30 min.

6.5 Graduated cylinder, or other means of measuring appropriate aliquots.

7 Sampling

If the tests are made to evaluate a lot, the sample shall be selected in accordance with ISO 186. If the tests are made on another type of sample, the test pieces shall be representative of the sample received.

8 Conditioning

Condition the sample as specified in ISO 187. Keep them in the conditioning atmosphere throughout the test.

9 Preparation of test pieces

Prepare the test pieces in the atmospheric conditions identical to those used to condition them. Avoiding contact of the test area with hands or fingers, cut from the sample at least ~~5~~five test pieces for each face to be tested. The test pieces shall be of sufficient size to exceed the diameter of the cylinder by at least 10 mm from any edge. Ensure that the test area is free from visible folds, creases, cracks or other defects.

If printed areas are present, these areas should be avoided if possible. If not possible, it shall be mentioned in the test report.

When the test pieces available are too small to allow the common apparatus to be used, a smaller test area may be agreed upon between the interested parties taking account of equipment availability.

10 Procedure

10.1 General

Carry out the test in the same atmospheric conditions used to condition the test pieces (see Clause 8).

10.2 Mounting of the test pieces

Ensure that the surface of the base plate and the edge of the cylinder that will come in contact with the test piece are clean and dry before commencing each test. Weigh the specimen to the nearest 1 mg and place it with the surface to be tested in such a way that it will be in contact with the water during the test. Bring the smooth machined edge cylinder in contact with the test piece and clamp sufficiently firmly to prevent any leakage of water between it and the test piece.

10.3 Exposure to water and blotting

For the purposes of this document, the time of test is defined as the time between first contact between water and test piece and the commencement of blotting.

Pour 100 ml ± 5 ml of water (5.1) or proportionately less for a smaller test area, into the cylinder, thus providing a head of 10 mm and start the timer (6.4) immediately. Replace water for each determination.

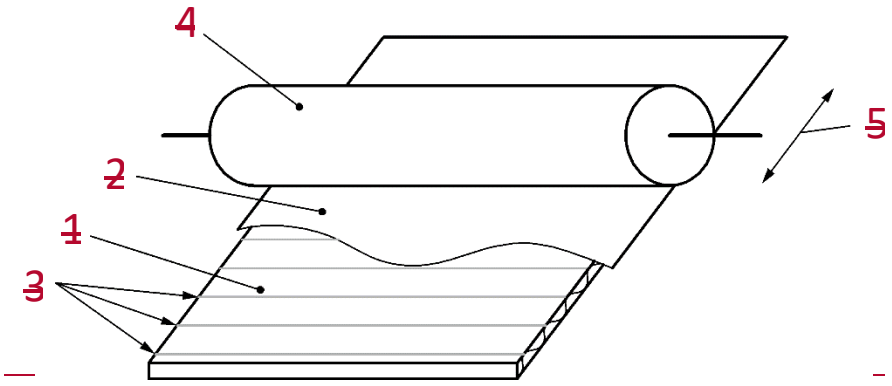
NOTE On some types of instruments, the timer will start automatically after the water is brought in contact with the test sample.

The test procedure for any selected exposure time should follow the conditions summarized in 10.4. The exposure time is selected according to the expected water absorptiveness of the paper and board (3.1) (see Table 1). If, for example, a test time of 60 s has been selected, pour off the excess water after 45 s ± 1 s, taking care that no water comes into contact with the surface of the test piece outside the test area. Quickly unclamp the cylinder and remove it. Remove the test piece and place it, test face uppermost, on a sheet of dry blotting paper (5.2) previously placed on a flat rigid surface. 60 s ± 2 s after commencement of the test, place a second sheet of blotting paper (5.2) on top of the test piece and remove the excess water, using the metal roller (6.2) with two rollings (once forward and once back) without exerting any pressure on the metal roller.

If using a rotatable test device[1], it is recommended to place the test piece with the test face, face down on a sheet of dry blotting paper (5.2) to avoid excess water from spilling outside the test area.

Use new blotting paper (5.2) for each test piece.

On corrugated fibreboard the metal roller (6.2) should be applied with its axis parallel to the gluelines.



[1] The rotable device is also called cobb-unger tester. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of this product. Equivalent products may be used if they can be shown to lead to the same results.