

---

# International Standard



# 8787

---

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

---

## Paper and board — Determination of capillary rise — Klemm method

*Papier et carton — Détermination de l'ascension capillaire — Méthode de Klemm*

First edition — 1986-08-15

ITeH STANDARD PREVIEW  
(standards.iteh.ai)

[ISO 8787:1986](https://standards.iteh.ai/catalog/standards/sist/6d890945-fb58-4770-8138-d200dd6a1bb6/iso-8787-1986)

<https://standards.iteh.ai/catalog/standards/sist/6d890945-fb58-4770-8138-d200dd6a1bb6/iso-8787-1986>



---

UDC 676.2 : 620.1 : 539.217

Ref. No. ISO 8787-1986 (E)

Descriptors : paper, paperboard, absorbent papers, tests, determination, absorption, capillarity, water absorption tests.

## 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8787 was prepared by Technical Committee ISO/TC 6, *Paper, board and pulps*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/6d890945-fb58-4770-8138-d200dd6a1bb6/iso-8787-1986>

# Paper and board — Determination of capillary rise — Klemm method

## 1 Scope and field of application

This International Standard specifies the procedure for determining the capillary rise of paper and board by the Klemm method. It is intended for unsized papers such as blotting papers and other papers having a relatively high water absorbency.

The method is not recommended for materials having a capillary rise of less than 5 mm, for which other tests such as in ISO 535, *Paper and board — Determination of water absorption — Cobb method*, may be more suitable.

## 2 References

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

ISO 187, *Paper and board — Conditioning of samples*.

ISO 3696, *Water for laboratory use — Specifications and test methods*.<sup>1)</sup>

ISO 5725, *Precision of test methods — Determination of repeatability and reproducibility by inter-laboratory tests*.

## 3 Principle

A strip of the material to be tested is suspended vertically with its lower end immersed in water. The capillary rise in 10 min is measured.

The test is carried out in a standard conditioned atmosphere in an open vessel and the measurement of capillary rise is made by means of a cathetometer or by a scale.

## 4 Test liquid

**Distilled water** to ISO 3696, grade 3, or **deionized or drinking water**, if the results obtained can be shown to be comparable with results obtained using distilled water.

## 5 Apparatus

**5.1 Water pan**, of sufficient depth to permit the immersion of the lower end of the test piece to the required depth.

**5.2 Device which permits the test pieces to be vertically suspended** and to be lowered into water to a depth of 10 to 15 mm.

**5.3 Device to determine the capillary rise** in relation to a datum point at the water surface. This may be a cathetometer or scales attached to the apparatus or separate from it.

**NOTE** — The use of a cathetometer will improve the accuracy and simplify reading the length of the capillary rise.

**5.4 Timer with alarm**, capable of indicating time up to 11 min to the nearest second.

**5.5 Clips**, such as metal paper clips, each of sufficient weight to ensure immersion of the end of the test piece.

**5.6 Pencil**, preferably a copy pencil of the indelible type.

## 6 Sampling and preparation of test pieces

Sample in accordance with ISO 186 and condition the samples in accordance with ISO 187.

Cut 10 strips at least 200 mm long and  $15 \pm 1$  mm wide from the sample in the machine direction and/or cross machine direction.

**NOTE** — Where a test piece length of 200 mm cannot be obtained, the greatest length possible should be taken and attached to an inert carrier by means of a staple.

Draw a line with the pencil (5.6) across each test piece perpendicular to the long dimension at a distance of 15 mm from one end. A clip (5.5) or other weight may be fixed between the line and that end to ensure immersion.

1) At present at the stage of draft.

## 7 Procedure

Carry out the tests under the same atmospheric conditions as used to condition the samples.

Fill the water pan (5.1) with fresh water (clause 4) at  $23 \pm 1$  °C. Attach each test piece to the suspension device (5.2) by the unmarked end. Check that the pencil lines are aligned. Lower the test pieces until the marks coincide with the water level in the pan, and start the timer (5.4). (See notes 1 and 2.)

If a cathetometer is used, align the zero with the pencil mark on the test piece at the commencement of the test and measure the height of the capillary rise to the nearest millimetre after  $10 \text{ min} \pm 10 \text{ s}$  (see note 3).

If a scale is attached to the device for holding the test pieces, read the capillary rise to the nearest millimetre after  $10 \text{ min} \pm 10 \text{ s}$  (see note 3).

If a separate scale is used, mark the moisture level with a pencil after  $10 \text{ min} \pm 10 \text{ s}$  (see note 3), so that the capillary rise can be measured to the nearest millimetre later.

If the moisture level on a test piece is uneven, estimate the mean level. If a cathetometer is used, read at the lowest level of the meniscus.

## NOTES

1 Results may be affected by contamination of the water by soluble materials from the paper. To minimize this, it is recommended that the water be changed frequently and fresh water should be used for each new series of tests.

2 Some means of accurately locating the test pieces relative to the water surface is beneficial to the accuracy of the test.

3 For very absorbent papers and boards, shorter times may be used by agreement, but this fact shall be reported.

4 The use of a lamp may make the moisture level more visible.

## 8 Expression of results

Calculate the mean value of the 10 results for each direction to the nearest millimetre.

## 9 Precision

A collaborative testing exercise, involving six laboratories testing seven papers, indicated the repeatability (see ISO 5725) of the method to be about 10 %.

The same exercise indicated the reproducibility (see ISO 5725) of the method to be about 20 %.

## 10 Test report

The test report shall include the following particulars:

- a) reference to this International Standard;
- b) precise identification of the sample;
- c) place and date of testing;
- d) the conditioning atmosphere used and the temperature of the water;
- e) mean capillary rise, Klemm, for the machine and/or cross direction;
- f) any departure from this International Standard, or any circumstances that may have affected the results.