International Standard 5633

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

Paper and board — Determination of resistance to water penetration

Papier et carton — Détermination de la résistance à la pénétration de l'eau

First edition — 1983-11-15

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UDC 676.3/.7 : 620.165.29 **Ref. No. ISO 5633-1983 (E)**

Descriptors : papers, paperboards, tests, water resistance tests.

Price based on 3 pages

Foreword

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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.

International Standard ISO 5633 was developed by Technical Committee ISO/TC 6, *Paper, board and pulps*, and was circulated to the member bodies in November 1982.

It has been approved by the member bodies of the following countries:

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Sweden

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Printed in Switzerland

Paper and board — Determination of resistance to water penetration

1 Scope

This International Standard specifies a method for the determination of the resistance of paper and board to water penetration under standard conditions.

2 Field of application

The method is applicable to papers and boards which have been rendered water resistant or waterproof. They may have been rendered waterproof by internal sizing, by surface sizing, by coating, or by lamination using waterproof laminants, or by any other method.

The method is not suitable for corrugated fibreboard but may be applied to the components of such boards.

3 References

ISO 186, *Paper and board — Sampling for testing.*

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

4 Definition

For the purpose of this International Standard, the following definition applies:

resistance to water penetration: That property of paper or board which retards the passage of water from one surface of the paper or board to the other surface.

5 Principle

Measurement of the time taken for penetration of the paper or board under a static head of water under the conditions specified in this International Standard.

6 Reagent

Distilled water, containing 0,1 % eosin dye.

NOTE — The temperature of the water is important and should be maintained at the temperature selected for conditioning (see clause 10).

7 Apparatus (see figures 1 and 2)

NOTE — The dimensions quoted in 7.1 to 7.3 apply to apparatus as shown in figure 2. Other types of apparatus in compliance with the system illustrated in figure 1 are also suitable.

7.1 Cylindrical metal cup, having an internal diameter of 112,8 ± 0,2 mm and an external diameter of approximately 170 mm, fitted with a water inlet and outlet, each fitted with a tap.

7.2 Annular metal ring, with an internal diameter of 112,8 ± 0,2 mm, an external diameter of approximately 170 mm and approximately 10 mm thick.

7.3 Two rubber gaskets, each with an internal diameter of 112,8 ± 0,2 mm and an external diameter of approximately 170 mm.

7.4 Means of clamping the ring to the cup, with the gaskets between, to give a leakproof seal.

7.5 Manometer, allowing a pressure of up to 1 000 mm head of water to be applied.

7.6 Timing device.

8 Sampling

Sampling shall be carried out in accordance with ISO 186. No creases, obvious flaws nor prints shall be included in the test area.

9 Preparation of the test pieces

Sufficient test pieces, each measuring 175 mm × 175 mm, shall be cut from each specimen to permit at least two valid determinations to be made. Test pieces of other sizes are permissible, according to the requirements of the apparatus used.

10 Conditioning and test conditions

Conditioning of the test pieces shall be carried out in accordance with ISO 187.

The procedure (clause 11) shall be carried out under the same atmospheric conditions used for conditioning.

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11 Procedure

Clamp a conditioned test piece, with a rubber gasket on each side, between the top of the cup and the annular ring. Turn on both the inlet and outlet taps. Allow water to enter until air is no longer trapped below the test piece and then turn off the outlet tap. Subject the test piece to increasing water pressure until the manometer reading indicates the head of water required and maintain the pressure at this head of water. (A hydrostatic head of 500 ± 5 mm[1)] is recommended, but other heads may be applied if specified.) Watch for evidence of penetration of water and note the time when the first spot appears.

Repeat the procedure using the same side of the other test piece.

Record which side of the test piece was subjected to the water.

If the penetration time is greater than 10 days, discontinue the test and report the penetration time as "greater than 10 days".

12 Expression of results

Express the result for each test piece

a) for penetration times of less than 2 h: to the nearest minute;

b) for penetration times between 2 and 6 h: to the nearest 15 min;

c) for penetration times between 6 and 24 h: as "between 6 and 24 h";

d) for penetration times between 24 h and 10 days: to the nearest day;

e) for penetration times greater than 10 days: as "greater than 10 days".

13 Test report

The test report shall include the following particulars:

a) a reference to this International Standard;

b) the number of test pieces tested;

c) the conditioning atmosphere used;

d) identification of the side which was subjected to the water;

e) the result for each test piece (expressed in accordance with clause 12);

f) the head of water applied;

g) the cross-sectional area of the cup, if a non-standard cup was used;

h) details of any operations not specified in this International Standard, or regarded as optional, which might have affected the results.

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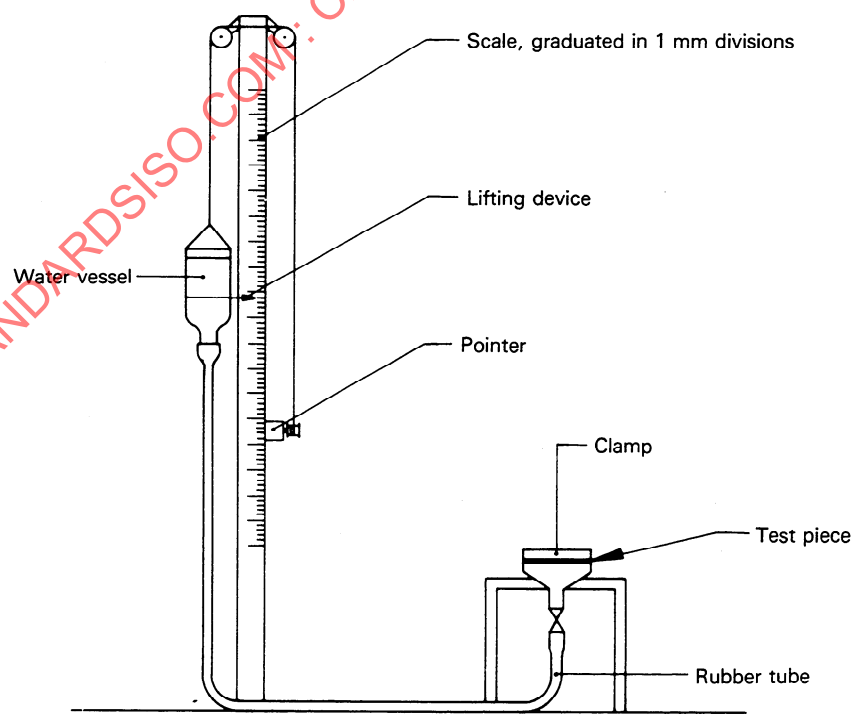

Figure 1 — Schematic diagram of suitable apparatus

1) 1 mmH_2O = 9,81 Pa

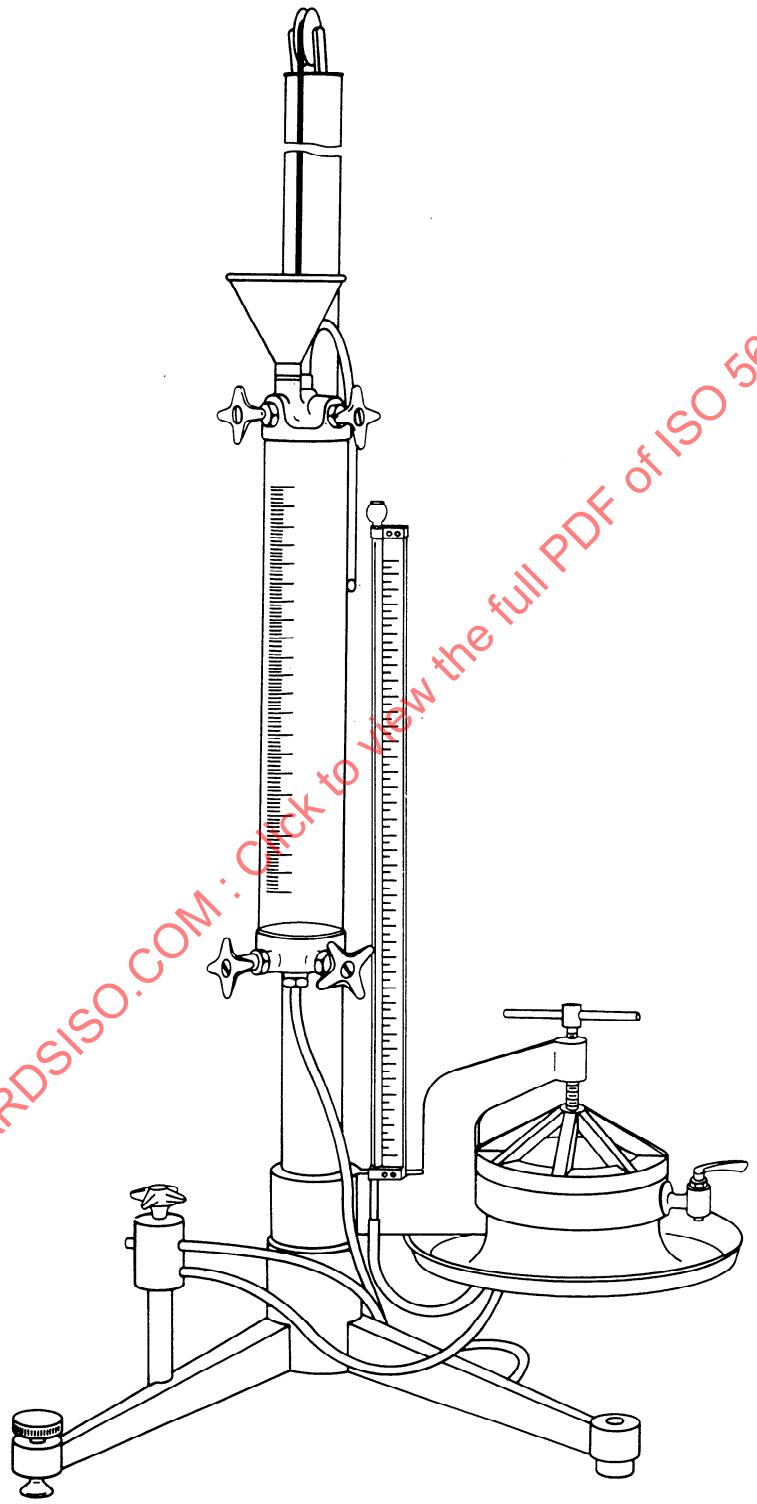

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Figure 2 — Test apparatus

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