INTERNATIONAL STANDARD 5635

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Paper — Measurement of dimensional change after immersion in water

Papier — Mesurage des variations dimensionnelles après immersion dans l'eau

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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 5635 was developed by Technical Committee ISO/TC 6, *Paper, board and pulps*, and was circulated to the member bodies in December 1976.

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

Australia	Finland	Mexico
Austria	France	New Zealand
Belgium	Germany	Norway
Brazil	Hungary	Romania
Bulgaria	India	South Africa, Rep. of
Canada	Iran	Sweden
Chile	Ireland	Switzerland
Czechoslovakia	Israel	Turkey
Egypt, Arab Rep. of	Italy	United Kingdom

The member body of the following country expressed disapproval of the document on technical grounds :

U.S.A.

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Paper — Measurement of dimensional change after immersion in water

1 SCOPE

This International Standard specifies a method of measuring the dimensional change of paper after immersion in water. This property should not be confused with hygro-expansivity.[1)]

2 FIELD OF APPLICATION

The method described in this International Standard is suitable for use with most kinds of paper. However, it may not be suitable for some papers, which soaking makes extremely fragile or causes to curl excessively.

3 REFERENCES

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

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

4 DEFINITION

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

dimensional change : The change in length, in the machine or cross direction, resulting from the immersion in water of paper previously conditioned in a standard atmosphere, relative to the length measured in the conditioned state. It is normally expressed as a percentage.

5 PRINCIPLE

Soaking of a strip of paper in water until no further change in length occurs and measurement of the change in length.

An essential requirement of the test is that the paper should not be under any load while wet; most papers are very weak when wet and an extremely small load is sufficient to stretch them.

6 APPARATUS

6.1 Test piece marker, consisting of a rigid bar of a material that is stable under the conditions of test and measuring approximately 250 mm × 40 mm × 5 mm, having two metal pins, filed so that the tips are chisel-shaped, set into one of the narrow edges 200 ± 2 mm apart (see the figure).

6.2 Magnifying lens.

6.3 Accurate graticule for measurement. The graticule should be graduated to 0,2 mm.

Dimensions in millimetres

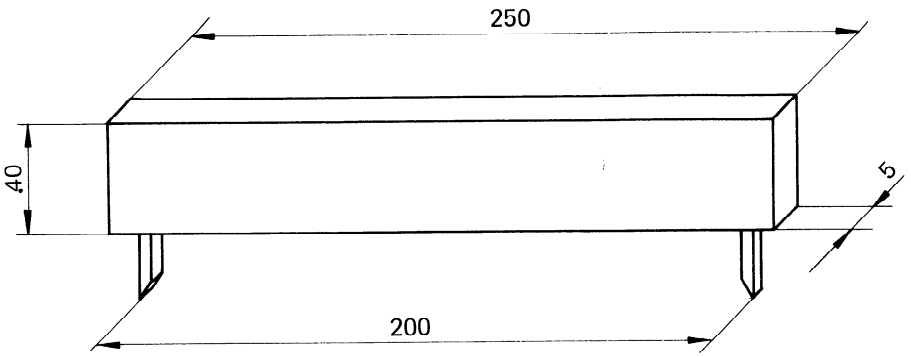

FIGURE — **Test piece marker**

1) An International Standard concerning hygro-expansivity is in preparation.

7 SAMPLING

Sample as described in ISO 186.

8 CONDITIONING

Condition the sample according to ISO 187.

9 PREPARATION OF TEST PIECES

Cut five test pieces for each test, each 250 mm long and 15 mm or 20 mm wide, the longer dimension being in the direction in which the property is to be measured.

10 PROCEDURE

Place the test piece on a flat surface and cut two small slits in it, 200 mm apart, by means of the chisel-shaped tips in the rigid bar (6.1). Then place it in a dish and soak it in distilled water at the temperature selected for conditioning (see clause 8) until maximum variation has occurred, 15 min usually being sufficient.

At the end of this time, remove the test piece from the dish and lay it carefully on a flat surface, taking care not to stretch the test piece.

Immediately re-locate one of the chisel-shaped tips in the bar in one of the slits previously cut into the test piece and align the bar along the straight line connecting the two previously cut slits. Cut a further slit with the chisel-shaped tip at the other end of the bar.

Measure the distance between the first and second slits cut into the test piece with the aid of the magnifying lens (6.2) and graticule (6.3). The cuts in the paper will be chisel-shaped, with one side vertical. Measure the distance from the vertical sides of the cuts.

11 EXPRESSION OF RESULTS

The change in length expressed as a percentage of the original length, where the test length is 200 ± 2 mm as required in this method, is given by the following formula :

$$0,5 \times \Delta L \ \%$$

where ΔL is the change in length, in millimetres.

12 PRECISION

No information is at present available on the repeatability or reproducibility of this method.

13 TEST REPORT

The test report shall state the following particulars :

a) reference to this International Standard;

b) the direction or directions of the paper for which the property has been measured;

c) the conditioning atmosphere used;

d) the soaking time used and the temperature of the water used;

e) the average of the five results to the nearest 0,1 %;

f) any deviation from this International Standard and any circumstances or influences that may have affected the results.