ORIGINAL

CONTROLLED

British Standard Method for

Measurement of dimensional change of paper after immersion in water

[ISO title: Paper — Measurement of dimensional change after immersion in water]

Méthode pour le mesurage des variations dimensionelles du papier après immersion dans l'eau

Verfahren zur Messung der Maßänderung von Papier nach Eintauchen in Wasser

National foreword

This British Standard has been prepared under the direction of the Paper Standards Committee. It is identical with ISO 5635 'Paper — Measurement of dimensional change after immersion in water', which was developed by Technical Committee ISO/TC 6, Paper, board and pulps, and was published by the International Organization for Standardization (ISO).

Terminology and conventions. The text of the international standard has been approved as suitable for publication, without deviation, as a British Standard. Some terminology and certain conventions are not identical with those used in British Standards; attention is especially drawn to the following.

The comma has been used throughout as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'British Standard'.

Cross-references

International standard	Corresponding British Standard
ISO 186-1977	BS 3430 : 1979 Method for sampling for testing paper and board (Identical)
ISO 187-1977	BS 3431 : 1973 Method for the conditioning of paper and board for testing (Technically equivalent)

NOTE. *Textual error.* In clause 1, 'hydro-expansivity' should be read as 'hygro-expansivity'.

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 x 40 mm x 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

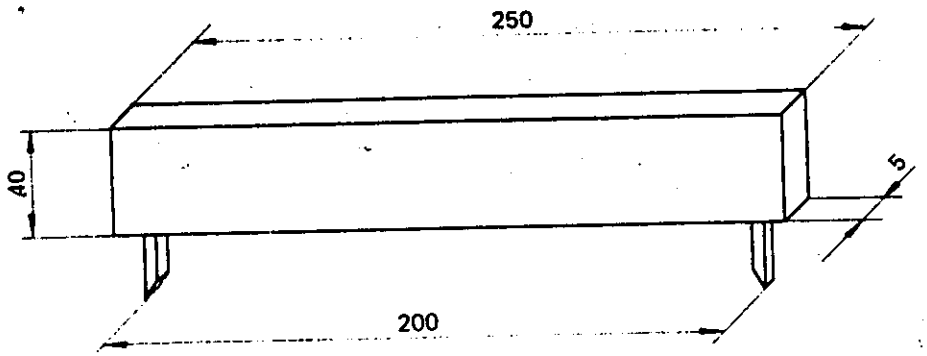

FIGURE — Test piece marker

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.

Standards publications referred to

See national foreword.