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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

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GB/T 455-2002

eqv ISO 1974:1990

Paper and board determination of tearing resistance

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Foreword

This Standard is the revision to GB/T 455.1-1989 “Paper - Determination of tearing resistance” and GB/T 455.2-1989 “Paperboard - Determination of tearing resistance”.

This Standard is equivalent to ISO 1974:1990 “Paper - Determination of tearing resistance (Elmendorf method)”.

Annex A of this Standard is a normative annex.

Annexes B and C of this Standard are informative annexes.

From the date of implementation, this Standard replaces GB/T 455.1-1989 and GB/T 455.2-1989.

This Standard was proposed by China Light Industry Council.

This Standard shall be under the jurisdiction of National Technical Committee on Paper Industry of Standardization Administration of China.

Drafting organization of this Standard: China National Pulp and Paper Research Institute.

Main drafters of this Standard: Ma Xin, Xu Zehong.

National Technical Committee on Paper Industry of Standardization Administration of China is entrusted to be responsible for the interpretation of this Standard.

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

Paper and board determination of tearing resistance

GB/T 455-2002

eqv ISO 1974:1990

Replacing GB/T 455.1-1989

GB/T 455.2-1989

1 Scope

This Standard specifies a method for determining the tearing resistance of paper and board.

This Standard applies to light boards of which the tearing resistance is within the range of the apparatus.

This Standard does not apply to corrugated fibreboard, but it may be applied to the components of such boards. It is not suitable for determining the cross-direction tearing resistance of highly directional paper.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

GB/T 450-2002 Paper and board-Sampling for testing (eqv ISO 186:1994)

GB/T 10739-2002 Paper, board and pulps - Standard atmosphere for conditioning and testing (eqv ISO 187:1990)

3 Definitions

For the purposes of this Standard, the following definitions apply.

3.1 Tearing resistance

The mean force required to continue the tearing started by an initial cut in a single sheet of paper (or board).

If the initial cut is in the vertical direction, the result is given as vertical-direction tearing resistance; similarly, if the initial cut is in the horizontal direction, the result is given as horizontal-direction tearing resistance. The result is expressed in millinewtons (mN).

3.2 Tearing index

The tearing resistance of the paper (or board) divided by its grammage. The result is expressed in millinewton square • metres/gram ($\text{mN} \cdot \text{m}^2/\text{g}$).

4 Principle

A test piece of superimposed sheets (normally four), with a specified pre-cut slit, is torn through a fixed distance using a pendulum which applies the tearing force by moving in a plane perpendicular to the initial plane of the test piece. The work done in tearing the test piece is measured by the loss in potential energy of the pendulum.

The average tearing force is indicated by a scale on the pendulum or a digital display. The tearing resistance of the paper is determined from the average tearing force and the number of sheets comprising the test piece.

5 Apparatus

5.1 Elmendorf-type tear tester, complying with the requirements specified in Annex A.

5.2 Adjustment and maintenance of apparatus, see Annex B.

5.3 Calibration of apparatus scales, see Annex C.

6 Conditioning of test pieces

CONDITION in accordance with GB/T 10739.

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