

**Paper - Determination of tearing resistance - Elmendorf method (ISO 1974:2012)**

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English Version

Paper - Determination of tearing resistance - Elmendorf method  
(ISO 1974:2012)

Papier - Détermination de la résistance au déchirement -  
Méthode Elmendorf (ISO 1974:2012)

Papier - Bestimmung des Durchreißwiderstandes -  
Elmendorf Methode (ISO 1974:2012)

This European Standard was approved by CEN on 10 May 2012.

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## Foreword

This document (EN ISO 1974:2012) has been prepared by Technical Committee ISO/TC 6 “Paper, board and pulps” in collaboration with Technical Committee CEN/TC 172 “Pulp, paper and board” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2012, and conflicting national standards shall be withdrawn at the latest by November 2012.

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### Endorsement notice

The text of ISO 1974:2012 has been approved by CEN as a EN ISO 1974:2012 without any modification.

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# Paper — Determination of tearing resistance — Elmendorf method

## 1 Scope

This International Standard specifies a method for determining the (out-of-plane) tearing resistance of paper. It can also be used for boards having a low grammage if the tearing resistance is within the range of the instrument.

This International 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 (or board).

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO 187, *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples*

ISO 536, *Paper and board — Determination of grammage*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1

#### **tearing resistance**

mean force per sheet required to continue the tearing started by an initial cut in the test piece

NOTE 1 If the initial cut is in the machine direction, the result is given as the machine-direction tearing resistance; similarly, if the initial cut is in the cross-direction, the result is given as the cross-direction tearing resistance.

NOTE 2 The tearing resistance is expressed in millinewtons (mN).

### 3.2

#### **tear index**

tearing resistance of the paper (or board) divided by its grammage

NOTE The tear index is expressed in millinewton square metres per gram ( $\text{mN}\cdot\text{m}^2/\text{g}$ ).

### 3.3

#### **test piece**

pack of four rectangular sheets of the same size

NOTE The dimensions depend on the design of the apparatus clamp used (see Clause 8).

## 4 Principle

An initial cut is made in a test piece (of four superimposed sheets), which is then torn out-of-plane through a given distance along one single tear line using a pendulum. The work done in tearing the test piece is measured as the loss in energy of the pendulum.

The mean tearing force of a single sheet is calculated by dividing the work done by the distance torn and the number of sheets in a test piece.