International Standard

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION MEXACHAPODHAR OPPAHUSALUUR TO CTAHDAPTUSALUUSORGANISATION INTERNATIONALE DE NORMALISATION

# Paper and board — Determination of tensile strength after immersion in water

Papier et carton — Détermination de la résistance à la traction 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 3781 was developed by Technica Committee ISO/TC 6, Paper, board and pulps.

This second edition was submitted directly to the ISO Council, in accordance with clause 6.11.2 of part 1 of the Directives for the technical work of ISO to cancels and replaces the first edition (i.e. ISO 3781-1976), which had been approved by the member bodies of the following countries:

Belgium Bulgaria Canada Czechoslovakia Finland France Germany, F.R. Hungary Iran

Ireland Israel Italy Mexico Netherlands Norway Poland Romania

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retated by FLS The member bodies of the following countries had expressed disapproval of the document on technical grounds:

South Africa, Rep. of

Australia New Zealand

International Organization for Standardization, 1983  $\bigcirc$ 

# Paper and board — Determination of tensile strength after immersion in water



#### 1 Scope and field of application

This International Standard specifies methods for the determination of the wet strength of paper by measuring its tensile strength after it has been immersed in water for a specified period.

In principle, the method is applicable to board as well as to paper, provided that an appropriate soaking time agreed between the interested parties.

#### 2 References

ISO 186, Paper and board - Sampling for testing.

ISO 187, Paper and board – Conditioning of samples.

ISO 1924, Paper and board — Determination of tensile strength.

#### **3** Definitions

For the purpose of this International Standard, the following definitions apply:

**3.1 wet tensile strength**: The maximum force that a test piece of paper or board will stand, after soaking in water, before it breaks, under the specified conditions.

**3.2** wet strength retention: The ratio of the value of the tensile strength of a paper or board in the wet state to that of the same paper or board in the dry state, measured under the specified conditions.

#### 4 Principle

Immersion in water, for the appropriate period of time, of a test piece of the paper or board to be tested and determination of the tensile strength.

#### 5 Apparatus and material

**5.1** Apparatus, complying with ISO 1924 for dry tensile testing.

**5.2** Soaking attachment (optional), as described in the annex.

**5.3** Water for soaking: use distilled or deionized water, at the temperature specified for conditioning in ISO 187.<sup>1)</sup>

6 Sampling

pecimens shall be selected in accordance with ISO 186.



Test pieces shall be prepared in accordance with ISO 1924.

NOTE - If the soaking anachment (see the annex) is used (see 8.2.2), it may be convenient to have the clamps only 100 mm apart. A convenient length for the test piece is then about 150 mm.

### 7.2 Conditioning

**7.2.1** For dry tensile tests and for tests which involve soaking for less than 1 h, the specimen and the test pieces shall be conditioned in accordance with ISO 187. Conditioning is not necessary before soaking for 1 h (or longer).

**7.2.2** If the material has been specially treated (for example, with urea-formaldehyde), care shall be taken to ensure that sufficient time has elapsed after treatment for the wet strength to be fully developed before soaking the test pieces.

<sup>1)</sup> Preferred temperature: 23  $\pm$  1 °C.