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DRAFT INTERNATIONAL STANDARD

ISO/DIS 5270.2

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Pulps — Laboratory sheets — Determination of physical properties

Pâtes — Feuilles de laboratoire — Détermination des propriétés physiques

ICS: 85.040

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 6 Paper, board and pulps.

This fourth edition cancels and replaces the third edition (ISO 5270:2012), which has been editorially and technically revised.

The main changes compared to the previous edition are as follows:

- The option to determine air permeance using the Oken method (ISO 5636-6)'
- Rewriting of the section on Conditioning;
- Introduction of a minimum area for grammage determination;
- Permitting optical tests on sheets formed using the Rapid-Köthen method if the sheets are dried at room temperature;
- Inclusion of the option to report strain at break following determination of tensile properties.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The International Organization for Standardization (ISO) [and/or] International Electrotechnical Commission (IEC) draw[s] attention to the fact that it is claimed that compliance with this document may involve the use of a patent.

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Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those in the patent database. ISO [and/or] IEC shall not be held responsible for identifying any or all such patent rights.

This document includes the determination of physical properties of both “low grammage” sheets and “high grammage” sheets, prepared in accordance with ISO 5269-1, ISO 5269-2 or ISO 5269-3. The oven-dry grammage of the “low grammage” sheets is (60 ± 2) g/m² using the conventional sheet former, as described in ISO 5269-1 and ISO 5269-3, or (75 ± 2) g/m² using the Rapid-Köthen sheet former, as described in ISO 5269-2 and ISO 5269-3. The oven-dry grammage of the “high grammage” sheets is 140 g/m², with a tolerance of 3 % using the conventional and the Rapid Köthen sheet formers, except for the z-directional tensile strength where the grammage is ≥ 90 g/m².

For determination of physical properties, ISO 5270 refers to the relevant International Standards for paper and board for the description and calibration of the required equipment, and for the calculation and reporting of results. This document, however, specifies the procedures for testing laboratory sheets where the amount of material is limited, compared to testing of paper and board to which the relevant International Standards referred to are applicable, and for that reason there may be a discrepancy in the procedures.

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Pulps — Laboratory sheets — Determination of physical properties

1 Scope

This document specifies the relevant International Standards to be used for the determination of physical properties of laboratory sheets made of all kind of pulps. It is applicable to laboratory sheets prepared in accordance with ISO 5269-1, ISO 5269-2 or ISO 5269-3.

In this document, it is left to the pulp producer and the pulp user to agree upon which properties are relevant to be tested. The results are, if applicable, reported in index form.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 187:1990, *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples*

ISO 534, *Paper and board — Determination of thickness, density and specific volume*

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

ISO 1924-2, *Paper and board — Determination of tensile properties — Part 2: Constant rate of elongation method (20 mm/min)*

ISO 1924-3, *Paper and board — Determination of tensile properties — Part 3: Constant rate of elongation method (100 mm/min)*

ISO 1974, *Paper — Determination of tearing resistance — Elmendorf method*

ISO 2493-1, *Paper and board — Determination of bending resistance — Part 1: Constant rate of deflection*

ISO 2493-2, *Paper and board — Determination of resistance to bending — Part 2: Taber-type tester*

ISO 2758, *Paper — Determination of bursting strength*

ISO 5269-1, *Pulps — Preparation of laboratory sheets for physical testing — Part 1: Conventional sheet-former method*

ISO 5269-2, *Pulps — Preparation of laboratory sheets for physical testing — Part 2: Rapid-Köthen method*

ISO 5269-3, *Pulps — Preparation of laboratory sheets for physical testing — Part 3: Conventional and Rapid-Köthen sheet formers using a closed water system*

ISO 5626, *Paper — Determination of folding endurance*

ISO 5636-3, *Paper and board — Determination of air permeance (medium range) — Part 3: Bendtsen method*

ISO 5636-4, *Paper and board — Determination of air permeance (medium range) — Part 4: Sheffield method*

ISO 5636-5, *Paper and board — Determination of air permeance (medium range) — Part 5: Gurley method*

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ISO 5636-6, *Paper and board — Determination of air permeance (medium range) — Part 6: Oken method*

ISO 7263, *Corrugating medium — Determination of the flat crush resistance after laboratory fluting*

ISO 9895, *Paper and board — Compressive strength — Short-span test*

ISO 12192, *Paper and board — Determination of compressive strength — Ring crush method*

ISO 15754, *Paper and board — Determination of z-directional tensile strength*

NOTE A separate International Standard, ISO 153610, has been published for pulps describing the determination of zero-span tensile strength, wet or dry.

3 Terms and definitions

No terms and definitions are listed in this document.

4 Principle

Determination of physical properties of laboratory sheets using the procedure and equipment described in the relevant International Standards given in [Tables 1](#) and [2](#). The results are, if applicable, reported in index form.

NOTE The properties to be measured are jointly determined by the pulp producer and the pulp user.

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5 Apparatus

The equipment is specified in the respective International Standards given in [Tables 1](#) and [2](#) to which this International Standard refers. The equipment shall be calibrated in accordance with the instructions in the relevant International Standards given in [Tables 1](#) and [2](#).

International Standards given in [Tables 1](#) and [2](#)
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6 Trimmed Laboratory Sheets

6.1 Selection of Laboratory Sheets

Depending on the properties to be tested, determine the number of laboratory sheets required (see [Table 1](#) and/or [Table 2](#)). The specification of the number of test pieces needed for each property defines the area required for testing and thus the number of sheets.

Each sheet shall be free of visible defects.

6.2 Conditioning of Laboratory Sheets

Condition the laboratory sheets in the standard atmosphere (23 ± 1) °C and (50 ± 2) % relative humidity, or in the atmosphere allowed in tropical countries, according to ISO 187.

ISO 187 states in its Introduction that “Unless otherwise specified, the equilibrium condition should be attained by the sorptive process”. For tests in which the hysteresis of the equilibrium moisture content may lead to errors that are significant, ISO 187 requires the sample to be pre-conditioned before conditioning (see [7.1](#)) unless it is known that conditioning will result in an equilibrium moisture content equivalent to that achieved by sorption or the samples have been prepared in accordance with ISO 5269-1.

If the laboratory sheets have been prepared using the conventional sheet former, according to ISO 5269-1 or ISO 5269-3, the sheets will reach equilibrium moisture content by desorption and shall be tested at this moisture content. Thus such sheets shall not be preconditioned and, as stated in ISO 187, if they have been or may have been subjected to a relative humidity below the lower limit