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STANDARD

**5627**

Second edition  
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**Paper and board — Determination  
of smoothness (Bekk method)**

*Papier et carton — Détermination du lissé (Méthode Bekk)*



Reference number  
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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 5627 was prepared by Technical Committee ISO/TC 6, *Paper, board and pulps*, Subcommittee SC 2, *Test methods and quality specifications for paper and board*.

This second edition cancels and replaces the first edition (ISO 5627:1984), which has been technically revised.

Annex A forms an integral part of this International Standard.

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## Introduction

In the present state of knowledge it is not possible to recommend a single method for measuring the smoothness or roughness of paper or board, and there is no exact correlation among the various methods used for determining these properties. Instruments of the air-flow type are designed to obtain a numerical value indicative of the smoothness or roughness of the paper or board; it is necessary to refer to the results of these tests in terms of the specific type of instrument used, such as Bendtsen roughness, Sheffield roughness, Bekk smoothness, etc.

Bekk smoothness is dependent on the shape, total volume and distribution of the hollow spaces between the surface of the test piece and a theoretically ideal plane under the specified conditions of contact. The greater the Bekk smoothness number, the smoother the sample.

The air permeability of the sample being tested can also affect the results.

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# Paper and board — Determination of smoothness (Bekk method)

## 1 Scope

This International Standard specifies a method of measuring the smoothness of paper and board, called the Bekk method.

The smoothness of a wide range of papers and boards may be measured by this method and it is especially recommended for smooth papers and boards. However, for very smooth samples, measurement times may be impractically long.

This method is not recommended for materials greater than 0,5 mm thick or very permeable papers and board, since the amount of air passing through the test piece can influence the result.

It is not recommended for newsprint and it is not suitable for rough papers and boards.

## 2 Normative references

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

ISO 48:1994, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness between 10 IRHD and 100 IRHD)*.

ISO 186:1994, *Paper and board — Sampling to determine average quality*.

ISO 187:1990, *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples*.

ISO 4662:1986, *Rubber — Determination of rebound resilience of vulcanizates*.

## 3 Definition

For the purposes of this International Standard, the following definition applies.

**3.1 Bekk smoothness:** Time in seconds which, under a defined pressure differential, is required to draw a definite quantity of air at atmospheric pressure between the surface of the test piece and a ring-shaped plane surface, under specified conditions of contact (see figure 1).

## 4 Principle

Subjection of a test piece of paper or board placed on a glass plate to a specified pressure and creation of a partial vacuum to draw atmospheric air across the contact surface. Measurement of the time required for a specified change in vacuum.

## 5 Apparatus

**5.1 Glass plate,** conforming to the design shown in figure 2.

The test surface shall be circular, plane and perfectly polished and have a contact area of  $10 \text{ cm}^2 \pm 0,05 \text{ cm}^2$ . The central hole in the glass plate shall be capable of being connected with a vacuum container and also of being disconnected.