SLOVENSKI STANDARD
SIST ISO 5627:1996

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Papir, karton in lepenka - Določanje gladkosti (Bekkova metoda)

Paper and board -- Determination of smoothness (Bekk method)

Papier et carton -- Détermination du lissé (Méthode Bekk)

Ta slovenski standard je istoveten z: **ISO 5627:1995**

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INTERNATIONAL STANDARD

ISO 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
ISO 5627:1995(E)

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 cm^2 $\pm$ 0,05 cm^2. The central hole in the glass plate shall be capable of being connected with a vacuum container and also of being disconnected.

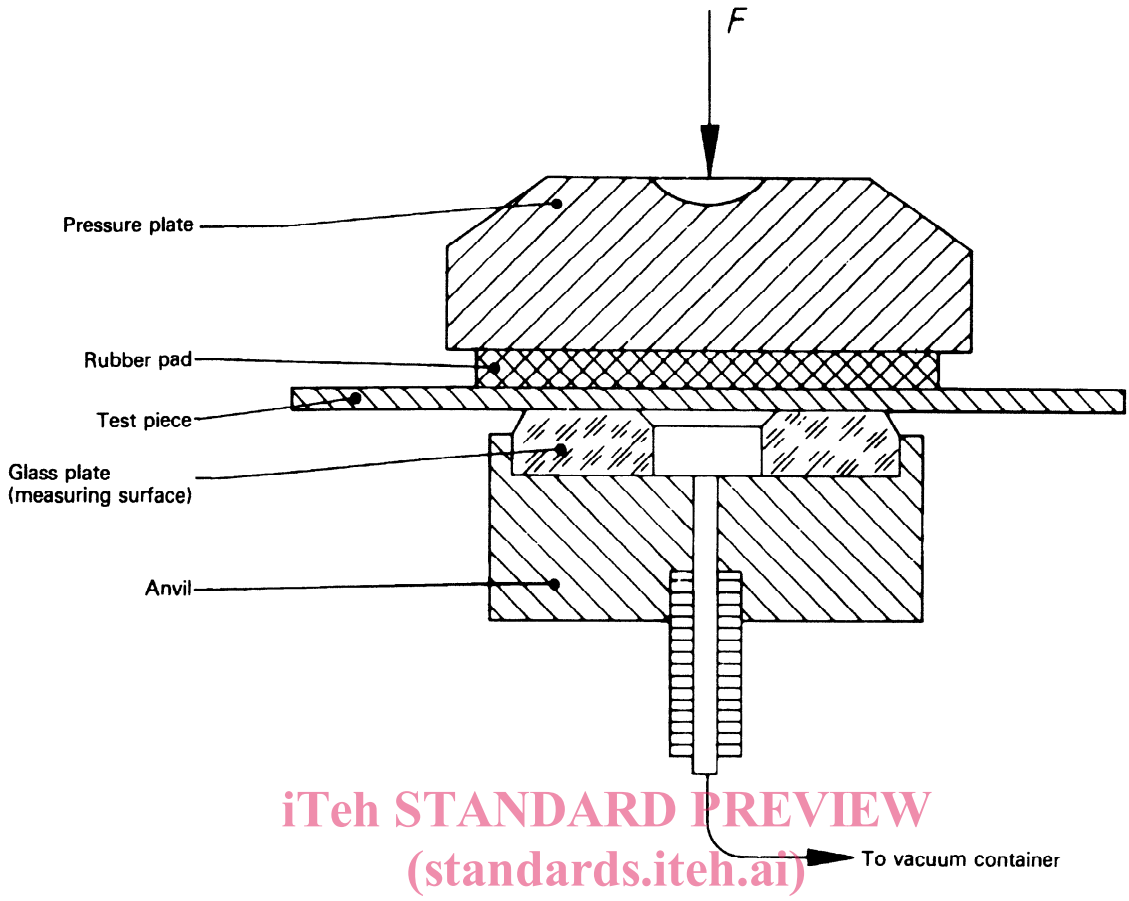
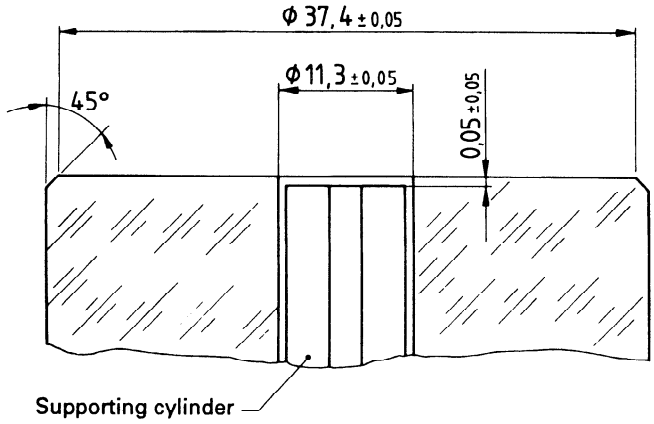


Figure 1 — Measuring principle

Dimensions in millimetres



NOTES

1 Some manufacturers do not provide a glass plate with a bevelled outer edge. In such cases a vertical glass cylinder of diameter 37,4 mm may be used.

2 Glass plates may be available with a bevelled inner edge. In such cases the angle of bevel is 45°.

Figure 2 — Glass plate

A supporting metal plug should be placed loosely in the hole with its upper surface in plane with the upper side of the glass plate to prevent the test piece from being pressed into the hole. If fitted, this plug shall have a central hole of diameter 1,5 mm to 2,0 mm. Its base shall have four radial channels through which the air can pass without obstruction.

NOTE 1 Some instruments have a glass plate without a plug. For most papers this does not significantly affect the results obtained, but the use of a plug is desirable.

The test surface shall be kept scrupulously clean and shall not be touched by hand. Before each measurement, any fibres and the like that may have adhered to the plate shall be removed. When not in use, the plate shall be protected by a cover. Scratches or cracks render it unusable.

5.2 Device to clamp the test piece against the glass plate with a pressure of 100 kPa ± 2 kPa[1].

5.3 Pressure plate, having a circular, even surface of not less than 45 mm diameter and which shall be connected to the device that presses the pressure plate against the glass plate at 100 kPa.

5.4 Rubber pad, placed between the pressure plate and the test piece.

When examined by incident light under a magnifying glass, the surface of the rubber pad shall be free from marks, scratches and tears and shall have the following dimensions:

a) thickness: 4 mm ± 0,2 mm (measured with a ratchet screw micrometer having an anvil diameter of approximately 8 mm); the maximum thickness variation of one pad shall be ± 0,05 mm;

b) surface: circular with a diameter of not less than 45 mm, or rectangular with sides not less than 50 mm in length.

Furthermore, the rubber pad shall have the following mechanical properties:

a) hardness: 40 IRHD ± 5 IRHD (measured in accordance with ISO 48, method N);

b) rebound resilience: at least 62 % (measured in accordance with ISO 4662).

5.5 Vacuum containers, capable of being evacuated to a vacuum greater than 50,7 kPa and capable of being hermetically sealed.

5.5.1 Large vacuum container, having a volume, including the connecting tube up to the surface of the glass plate (5.1), of 380 ml ± 1 ml.

5.5.2 Small vacuum container, having a volume, including the connecting tube up to the surface of the glass plate (5.1), of 38 ml ± 1 ml.

This container is not fitted to all instruments; in such cases means shall be provided to reduce the volume of the large vacuum container (5.5.1) to 190 ml or 95 ml.

5.6 Manometer, or other means of indicating a vacuum corresponding to 50,7 kPa, 48,0 kPa and 29,3 kPa to an accuracy of ± 0,07 kPa.

A drop in the vacuum from 50,7 kPa to 48,0 kPa means that 10 ml of the ambient air has entered the large container (5.5.1) or 1 ml has entered the small container (5.5.2). A drop in vacuum from 50,7 kPa to 29,3 kPa means that 80 ml of the ambient air has entered the large container or 8 ml has entered the small container.

5.7 Timing device, capable of being read to the nearest 1 s.

6 Sampling

Select specimens in accordance with ISO 186, making sure that there are no folds, creases, visible cracks or other defects in the area to be tested. The test pieces shall not include any part of the sample that is less than 15 mm from the edge of the sheet or reel. If watermarks are present, these areas should be avoided if possible.

Take at least 10 test pieces for each side to be tested, each larger in area than the pressure plate. To ensure careful handling of the test pieces, the size should not exceed A4 size. Differentiate the two faces of the test pieces.

1) 1 kPa = 10^3 N/m^2 = 1 kN/m^2 = 7,5 mmHg