
International Standard



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**Paper and board — Determination of roughness/smoothness (air leak methods) —
Part 1 : General method**

Papier et carton — Détermination de la rugosité/du lissé (méthodes du débit d'air) — Partie 1 : Méthode générale

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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.

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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8791/1 was prepared by Technical Committee ISO/TC 6, *Paper, board and pulps*.

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Paper and board — Determination of roughness/ smoothness (air leak methods) — Part 1 : General method

0 Introduction

ISO 8791 specifies methods of measuring the roughness or smoothness of the surface of a sheet of paper or board by a group of procedures which can be termed air leak procedures. The measurements may be made with any instrument which complies with ISO 8791.

This part of ISO 8791 specifies basic requirements for the apparatus and general operating procedures for test methods in which the air leak is between the test piece surface and a flat surface.

NOTE — Some air leak instruments, for example the Gurley instrument, measure the rate of air leak between surfaces of the test piece instead of between a surface of the test piece and a flat surface.

Subsequent parts specify detailed requirements and operating procedures applicable to specific instruments.

1 Scope

This part of ISO 8791 specifies basic requirements and operating procedures for determining the roughness/ smoothness of paper and board by air leak methods.

2 Field of application

The method is applicable to most paper and board. It is not applicable to embossed or creped papers, or papers which will not lie flat under the conditions of the test, or high air permeance papers which allow a significant flow of air through the sheet.

The Gurley instrument measures air leakage between the adjacent surfaces of the test piece and is excluded from this method.

3 References

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

ISO 187, *Paper and board — Conditioning of samples.*

4 Definition

For the purpose of ISO 8791, the roughness or smoothness of a sheet of paper or board is a function of the rate at which air will pass between a specified flat land and a sheet of the paper or board when tested under specified conditions.

The property is termed roughness if increasing numerical values indicate increasing roughness. Examples of this are the Bendtsen, Parker and Sheffield tests.

The property is termed smoothness if increasing numerical values indicate increasing smoothness. An example of this is the Bekk test.

The units used for expression of results depend on the instrument used but in most cases the units are millilitre per minute for roughness measurements, and second for smoothness measurements. The Parker Print-Surf apparatus is an exception and the roughness measurements are expressed in micrometres.

5 Principle

The test piece is placed between a flat plate and a flat circular land. The air pressure on one side of the land is normally atmospheric and the pressure on the other side is adjusted to create a specified pressure differential. The rate at which air passes between the land and test piece surfaces under the specified conditions of the test is used as a measure of the roughness/smoothness of the paper or board surface.

6 Apparatus

The apparatus shall comply with the detailed requirements in the appropriate parts of ISO 8791. It is essential that each type of apparatus meets the following general requirements:

- a) the rate of air flow shall be measurable to an accuracy of $\pm 5\%$ of the measured value;

or

- b) the volume shall be measurable to an accuracy of $\pm 2\%$ of the measured value, and/or the time shall be measurable to an accuracy of $\pm 1\%$ of the measured value.