AS 1301.439:2019

Australian STANDARD

Methods of test for pulp and paper

Method 439: Bendtsen roughness of paper and paperboard (ISO 8791-2:2013, MOD)

STANDARDS Australia

AS 1301.439:2019

This Australian Standard® was prepared by PK-019, Methods of Test for Pulp and Paper. It was approved on behalf of the Council of Standards Australia on 6 May 2019.

This Standard was published on 22 May 2019.

The following are represented on Committee PK-019:

Appita
Australian Institute of Packaging
Monash University

This Standard was issued in draft form for comment as DR AS 1301.439:2019.

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ISBN 978 1 76072 476 4

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Originated in Australia as AS 1301.439s—1991.
Jointly revised and designated AS/NZS 1301.439s:2007.
Revised and redesignated as AS 1301.439:2019.

Preface

This Standard was prepared by the Australian members of Joint Standards Australia/Standards New Zealand Committee PK-019, Methods of Test for Pulp and Paper, to supersede AS/NZS 1301.439s:2007, *Methods of test for pulp and paper, Method 439s: Bendtsen roughness of paper and paperboard.*

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to specify a method for the determination of the roughness of paper and board using the Bendtsen apparatus.

This Standard is an adoption with national modifications, and has been reproduced from, ISO 8791-2:2013, *Paper and board — Determination of roughness/smoothness (air leak methods) — Part 2: Bendtsen method.* The modifications are additional requirements and are set out in Appendix ZZ, which has been added at the end of the source text.

Appendix ZZ lists the variations to ISO 8791-2:2013 for the application of this Standard in Australia.

As this document has been reproduced from an International Standard, the following applies:

(a) In the source text "this part of ISO 8791" should read "this Australian Standard".

(b) A full point substitutes for a comma when referring to a decimal number.

(c) Substitute "mL" for "ml" wherever it appears.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific Standards.

The terms "normative" and "informative" are used in Standards to define the application of the appendices or annexes to which they apply. A "normative" appendix or annex is an integral part of a Standard, whereas an "informative" appendix or annex is only for information and guidance.

Contents

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. 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. 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.

The committee responsible for this document is 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 8791-2:1990), which has been technically revised. In this second edition mainly editorial changes have been made to include the electronic version of the test apparatus and also precision data has been added as an informative Annex.

ISO 8791 consists of the following parts, under the general title *Paper and board — Determination of roughness/smoothness (air leak methods)*:

— *Part 1: General method*

— *Part 2: Bendtsen method*

— *Part 3: Sheffield method*

— *Part 4: Print-surf method*

NOTE *Part 1: General method* is considered to be redundant and will be withdrawn after Parts 2, 3 and 4 have been revised and published.

Australian Standard®

Methods of test for pulp and paper

Method 439: Bendtsen roughness of paper and paperboard (ISO 8791-2:2013, MOD)

1 Scope

This part of ISO 8791 specifies a method for the determination of the roughness of paper and board using the Bendtsen apparatus.

This part of ISO 8791 is applicable to paper and board which have Bendtsen roughness values between about 5 ml/min and 3 000 ml/min when measured with variable-area type testers and between about 50 ml/min and 5 000 ml/min when measured with electronic type testers. It is not suitable for soft papers which allow the land to make a significant impression on the surface or for high-air-permeance papers which allow a significant flow of air to pass through the sheet, or for papers which will not lie flat under the measuring head.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
Bendtsen roughness
a measure of the rate at which air will pass between a flat circular land and a sheet of paper or board when tested under specified conditions and at operating pressure

Note 1 to entry: Bendtsen roughness is expressed in millilitres per minute.

4 Principle

Clamping a test piece between a flat plate and a circular metal land. Supplying air at a nominal pressure of 1,47 kPa to the space enclosed inside the land and measuring the rate of air flow between the land and the test piece.

5 Apparatus

5.1 Bendtsen tester (two types)

Bendtsen tester, which operates according to one of the following principles of measurement of air flow rate:

— variable-area flowmeter type (see 5.2).