BS ISO 5636-4:2013

BSI Standards Publication

Paper and board — Determination of air permeance (medium range)

Part 4: Sheffield method

bsi.

...making excellence a habit.™

Document Sharing Hub

National foreword

This British Standard is the UK implementation of ISO 5636-4:2013. It supersedes BS ISO 5636-4:2005 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PAI/11, Methods of test for paper, board and pulps.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2013. Published by BSI Standards Limited 2013

ISBN 978 0 580 66118 1

ICS 85.060

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 October 2013.

Amendments issued since publication

Date	Text affected

Documents
Document Sharing Hub

Full document details: BS ISO 5636-4:2013

INTERNATIONAL STANDARD

ISO 5636-4

Third edition
2013-11-01

Paper and board — Determination of air permeance (medium range) —

Part 4: Sheffield method

Papier et carton — Détermination de la perméance à l'air (valeur moyenne) —

Partie 4: Méthode Sheffield

Reference number
ISO 5636-4:2013(E)

Documents
Document Sharing Hub

© ISO 2013

Full document details: BS ISO 5636-4:2013

COPYRIGHT PROTECTED DOCUMENT

© ISO 2013

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

© ISO 2013 – All rights reserved

Documents
Document Sharing Hub

Full document details: BS ISO 5636-4:2013

Contents

Page

Foreword ..... **iv**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Principle **1**
5 Apparatus **2**
6 Sampling **3**
7 Conditioning **3**
8 Preparation of test pieces **3**
9 Calibration **4**
9.1 Variable-area flow-measuring device 4
9.2 Electronic flow-measuring device 4
10 Procedure **4**
11 Expression of results **4**
11.1 Calculation of air permeance 4
11.2 Reporting the results 5
11.3 Standard deviation and coefficient of variation 5
12 Test report **5**
Annex A (normative) **Calibration of flowmeters** **6**
Annex B (informative) **Conversion of Sheffield units (SU) to SI units** **10**
Annex C (informative) **Precision data** **11**
Bibliography **13**

© ISO 2013 – All rights reserved

Documents
Document Sharing Hub
Full document details: BS ISO 5636-4:2013

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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

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 third edition cancels and replaces the second edition (ISO 5636-4:2005), which has been technically revised. In this third edition mainly editorial changes have been made and also precision data has been added as informative Annex C.

ISO 5636 consists of the following parts, under the general title *Paper and board — Determination of air permeance (medium range)*:

— *Part 3: Bendtsen method*

— *Part 4: Sheffield method*

— *Part 5: Gurley method*

— *Part 6: Oken method*

NOTE 1 *Part 1: General method* will be withdrawn after the third editions of Parts 3, 4 and 5 have been published, as it was considered redundant.

NOTE 2 *Part 2: Schopper method* was withdrawn in 2006 as it was considered obsolete.

NOTE 3 *Part 6: Oken method* is being prepared.

© ISO 2013 – All rights reserved
Documents
Document Sharing Hub
Full document details: BS ISO 5636-4:2013

INTERNATIONAL STANDARD ISO 5636-4:2013(E)

Paper and board — Determination of air permeance (medium range) —

Part 4: Sheffield method

1 Scope

This part of ISO 5636 specifies the Sheffield method for determining the air permeance of paper and board using the Sheffield apparatus.

It is applicable to papers and boards which have air permeances between 0,02 µm/(Pa·s) and 25 µm/(Pa·s) when tested with the Sheffield apparatus.

It is unsuitable for rough-surfaced materials, which cannot be securely clamped to avoid leakage.

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
air permeance
mean air flow rate through unit area under unit pressure difference in unit time, under specified conditions

Note 1 to entry: Air permeance is expressed in micrometres per pascal second [1 ml/(m^2·Pa·s) = 1 µm/(Pa·s)].

Note 2 to entry: This property is called air permeance, and not air permeability, because it is reported as a sheet property and is not standardized with respect to thickness to give a material property per unit thickness.

Note 3 to entry: The Sheffield unit is not defined, since it has been shown that the scale units (Sheffield units) on different types of Sheffield instruments can correspond to different air flows, and there is no precise physical definition. This part of ISO 5636 requires that the flowmeters be calibrated to give a flow rate in millilitres per minute.

4 Principle

A test piece is clamped between two rubber orifice plates of known dimensions. The absolute air pressure on one side of the test piece is equivalent to atmospheric pressure and the difference in pressure between the two sides of the piece is maintained at a small, substantially constant, value. The air flow rate through the test area is determined and the air permeance is calculated.

© ISO 2013 – All rights reserved

Documents
Document Sharing Hub
Full document details: BS ISO 5636-4:2013