INTERNATIONAL STANDARD

ISO 9053-2

First edition
2020-09

Acoustics — Determination of airflow resistance —

Part 2: Alternating airflow method

Acoustique — Détermination de la résistance à l'écoulement de l'air —
Partie 2: Méthode avec écoulement d'air alternatif

Reference number
ISO 9053-2:2020(E)

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Published in Switzerland

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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.

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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 2, *Building acoustics*.

This first edition of ISO 9053-2, together with ISO 9053-1:2018, cancels and replaces ISO 9053:1991, which has been technically revised.

The main changes compared to the previous edition are as follows:

— the former method B in ISO 9053:1991 has been transferred to this document;

— the requirement to the dimensions of the test specimen have been updated;

— a correction for heat conduction has been added.

A list of all parts in the ISO 9053 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Acoustics — Determination of airflow resistance —

Part 2: Alternating airflow method

1 Scope

This document specifies an alternating airflow method for the determination of the airflow resistance[5], [6] of porous materials for acoustical applications.

Determination of the airflow resistance based on static flow is described in ISO 9053-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
airflow resistance
R
quantity defined by

$$R=\frac{\Delta p}{q_{\mathrm{v}}}$$

where

Δp is the RMS air pressure difference, across the test specimen, due to the alternating airflow, in pascals;

q_{v} is the RMS volumetric airflow rate, passing through the test specimen, in cubic metres per second.

Note 1 to entry: Airflow resistance is expressed in pascals seconds per cubic metre.

3.2
specific airflow resistance
R_s
quantity defined by

$$R_s = R \cdot A$$

where

R is the airflow resistance of the test specimen, in pascals seconds per cubic metre;

A is the cross-section area of the test specimen, perpendicular to the direction of flow, in square metres.

Note 1 to entry: Specific airflow resistance is expressed in pascals seconds per metre.

3.3
airflow resistivity
σ
quantity defined by the following formula if the material is considered as being homogeneous

$$\sigma = \frac{R_s}{d}$$

where

R_s is the specific airflow resistance of the test specimen, in pascals seconds per metre;

d is the thickness of the test specimen, in the direction of flow, in metres.

Note 1 to entry: Airflow resistivity is expressed in pascals seconds per square metre.

3.4
airflow velocity
v
quantity defined by

$$v = \frac{q_v}{A}$$

where

q_v is the RMS volumetric airflow rate, passing through the test specimen, in cubic metres per second;

A is the cross-sectional area of the test specimen, perpendicular to the direction of flow, in square metres.

Note 1 to entry: Airflow velocity is expressed in metres per second.