SLOVENSKI STANDARD

SIST EN ISO 9169:2007

01-januar-2007

Kakovost zraka ï Definicije in doloį anje delovnih karakteristik avtomatskih merilnih sistemov (ISO 9169:2006)

Air quality - Definition and determination of performance characteristics of an automatic measuring system (ISO 9169:2006)

Luftbeschaffenheit - Definition und Ermittlung von Verfahrenskenngrößen einer automatischen Messeinrichtung (ISO 9169:2006)

Qualité de l'air - Définition et détermination de caractéristiques de performance d'un systeme automatique de mesurage (ISO 9169:2006)

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English Version

Air quality - Definition and determination of performance characteristics of an automatic measuring system (ISO 9169:2006)

Qualité de l'air - Définition et détermination de caractéristiques de performance d'un système automatique de mesurage (ISO 9169:2006)

Luftbeschaffenheit - Definition und Ermittlung von Verfahrenskenngrößen einer automatischen Messeinrichtung (ISO 9169:2006)

This European Standard was approved by CEN on 26 June 2006.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN ISO 9169:2006) has been prepared by Technical Committee ISO/TC 146 "Air quality" in collaboration with Technical Committee CEN/TC 264 "Air quality", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2007, and conflicting national standards shall be withdrawn at the latest by January 2007.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of ISO 9169:2006 has been approved by CEN as EN ISO 9169:2006 without any modifications.

INTERNATIONAL STANDARD

ISO 9169

Second edition
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Air quality — Definition and determination of performance characteristics of an automatic measuring system

Qualité de l'air — Définition et détermination de caractéristiques de performance d'un système automatique de mesurage

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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

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

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.

ISO 9169 was prepared by Technical Committee ISO/TC 146, *Air quality*, Subcommittee SC 4, *General aspects*.

This second edition cancels and replaces the first edition (ISO 9169:1994), of which it constitutes a technical revision, and ISO 6879:1995.

Introduction

In this International Standard, automatic air quality measuring systems are considered as *black boxes* operated according to specified procedures as described in the terms of reference given by the client to the laboratory performing the tests aiming at determining performance characteristics selected by the client for each automatic measuring system.

This International Standard specifies definitions and methods to determine performance characteristics of automatic air quality measuring systems. This is done for most performance characteristics under steady laboratory conditions so as to have available data on clearly defined characteristics, based on specified conditions that can be adjusted and maintained in laboratory. This is also done under field conditions for a few performance characteristics for which field testing provide relevant additional information.

Air quality — Definition and determination of performance characteristics of an automatic measuring system

1 Scope

This International Standard provides definitions and specifies methods to determine performance characteristics of an identified automatic air quality measuring system. Tests are carried out under stable laboratory conditions or field conditions. The automatic measuring system is considered as a *black box* operated according to specified procedures.

This International Standard applies to measuring systems for which the following information is available:

— a description of the automatic measuring system providing the result of measurement in the physical unit of the measurand;

— operating procedures of the automatic measuring system including, where appropriate, the procedures of routine adjustment, routine verification and calibration;

— terms of reference for the test program specifying the client requirements and test conditions.

This International Standard applies to measuring systems for which it is possible to apply several reference materials with accepted values with known uncertainty for the measurand, within the range of application.

This International Standard does not specify the number of automatic measuring systems to be tested.

NOTE 1 The number of automatic measuring systems is specified by the client in the terms of reference.

NOTE 2 The list of performance characteristics in this document is limited. Additional performance characteristics can be specified by the client in the terms of reference, if appropriate.

2 Terms and definitions

For the purpose of this document, the following terms and definitions apply. Definitions taken from VIM[1] are generally kept identical. Some definitions have been adapted from VIM to take into account the specific wordings of the present International Standard.

2.1 General terms

2.1.1
measuring system
complete set of measuring instruments and other equipment with operating procedures to carry out specified air quality measurements

NOTE 1 Adapted from VIM:1993, 4.5.

NOTE 2 In general, a measuring system encompasses the different steps of the measurement process, such as taking the sample, the analytical quantification, etc.

2.1.2
automatic measuring system
AMS
measuring system interacting with the air under investigation, returning an output signal proportional to the physical unit of the measurand in unattended operation

NOTE The air under investigation includes, e.g. ambient air and emissions.

2.1.3
continuous automatic measuring system
automatic measuring system providing a continuous signal upon continuous interaction with the air mass under investigation

2.1.4
discontinuous automatic measuring system
automatic measuring system providing a series of discrete signals

NOTE Each discrete signal corresponds to the averaging time for field operation specified in the terms of reference.

2.1.5
adjustment
⟨automatic measuring system⟩ operation of bringing an automatic measuring system into a state of performance suitable for its use

NOTE 1 Adapted from VIM:1993, 4.30.

NOTE 2 Adjustment may be automatic, semi-automatic or manual.

2.1.6
primary result of measurement
result of measurement produced by an automatic measuring system measuring the measurand over the shortest period of time for which valid measurements can be obtained and used by the automatic measuring system to calculate the result of measurement over the specified averaging period for routine field operations of the automatic measurement system

NOTE For continuous automatic measurement systems, primary results of measurement are typically obtained for time periods of 1 s to 100 s, while the typical averaging time is 1 h in ambient air measurements and 30 min in emission measurements. For discontinuous automatic measuring systems, one primary measurement result is typically obtained for a cycle of a few minutes.

2.1.7
time interval for the primary measurement result
shortest period of time for which valid measurements can be obtained and used by the automatic measuring system to calculate the measurement result over the specified averaging period during routine functioning of the automatic measurement system

2.1.8
averaging time
minimum time interval equal to a stated multiple of the response time

NOTE See 6.3.1.

2.1.9
averaging time for field operation
time interval used by the automatic measuring system to produce routine results of measurement under normal (or envisaged) field operations

NOTE 1 Examples of averaging time for field operations are half an hour for emission measurements and one hour for ambient air measurements.

NOTE 2 The averaging time for field operation may be too long to be used during laboratory tests. Therefore, an **averaging time for laboratory test** (2.1.10) is defined and specified.

2.1.10
averaging time for laboratory test
time interval used for laboratory test and specified in such a way that

— the duration of the test is limited to minimize the possible drift effect during the test as well as the cost of the test;

— all conditions and influences may be considered as equal under steady laboratory conditions (e.g. insignificant drift effects);

— the number of primary results of measurement collected over the averaging time is equal to the number of primary results of measurement collected over the *intended* averaging time for routine field operations.

NOTE See 6.4.1.

2.1.11
measurand
particular quantity subject to measurement

[VIM:1993, 2.6]

NOTE In the field of air quality, the measurand is, e.g. the mass concentration of particulate matter or SO_2 in air.

2.1.12
interferent
interfering substance
substance present in the air mass under investigation, other than the measurand, that affects the response

2.1.13
influence quantity
quantity that is not the measurand but that affects the result of measurement (VIM:1993, 2.7), either an interferent influence quantity (i.e. the concentration of a substance in the air under investigation that is not the measurand), or an external influence quantity (i.e. a quantity that is not the measurand nor the concentration of a substance in the air mass under investigation)

EXAMPLE Examples include:

— presence of interfering gases in the flue gas matrix (interferent influence quantity);

— temperature of the surrounding air (external influence quantity);

— atmospheric pressure (external influence quantity); and

— pressure of the gas sample (external influence quantity).

2.1.14
reference material
RM
material or substance for which one or more properties are sufficiently homogeneous and well established to be used for the calibration and/or the validation of a measuring system

NOTE 1 Adapted from VIM:1993, 6.13 and ISO 11095:1996, 3.1.

NOTE 2 A reference material can be a pure or mixed gas, liquid or solid.

