

PAIKSETE HEITEALLIKATE HEITED
Vääveldioksiidi massikontsentratsiooni määramine
suitsugaasides
Automaatmõõteseadmete efektiivsuse näitajad

Stationary source emissions
Determination of the mass concentration of sulfur
dioxide in flue gases
Performance characteristics of automated measuring
systems
(ISO 7935:2024, identical)

EESTI STANDARDI EESSÕNA**NATIONAL FOREWORD**

<p>See Eesti standard EVS-ISO 7935:2024 sisaldab rahvusvahelise standardi ISO 7935:2024 „Stationary source emissions — Determination of the mass concentration of sulfur dioxide in flue gases — Performance characteristics of automated measuring systems“ identset ingliskeelset teksti.</p>	<p>This Estonian Standard EVS-ISO 7935:2024 consists of the identical English text of the International Standard ISO 7935:2024 „Stationary source emissions — Determination of the mass concentration of sulfur dioxide in flue gases — Performance characteristics of automated measuring systems“.</p>
<p>Ettepaneku rahvusvahelise standardi ümbertrüki meetodil ülevõtuks on esitanud EVS/TK 28, standardi avaldamist on korraldanud Eesti Standardimis- ja Akrediteerimiskeskus.</p>	<p>Proposal to adopt the International Standard by reprint method has been presented by EVS/TC 28, the Estonian Standard has been published by the Estonian Centre for Standardisation and Accreditation.</p>
<p>Standard EVS-ISO 7935:2024 on jõustunud sellekohase teate avaldamisega EVS Teatajas.</p>	<p>Standard EVS-ISO 7935:2024 has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.</p>
<p>Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.</p>	<p>This standard is available from the Estonian Centre for Standardisation and Accreditation.</p>

Käsitlusala

Selles dokumendis täpsustatakse paiksete heiteallikate emissioonigaaside mõõtmiste juures kasutatavate vääveldioksiidide (SO₂) automaاتمöötesüsteemi (AMS-i) põhikonstruktsiooni ja peamisi efektiivsuse näitajaid.

Antud meetod võimaldab suitsugaasides SO₂ kontsentratsiooni pidevat seiret püsivalt paigaldatud mőotesüsteemidega.

See dokument kirjeldab gaasi väljavõetuga (ekstraktiivseid) ja mitteekstraktiivseid (saasteallikasisesed (*in situ*)) süsteeme erinevate analüsaatoritega, mille töö põhineb näiteks järgmistel meetoditel:

- dispersioonita infrapunaspetsroskoopia (NDIR);
- Fourier'i teisendusega infrapuna (FTIR) spektroskoopia;
- laserspektroskoopia meetodid või timmlaser-spektroskoopia (TLS);
- dispersioonita ultraviolettspektroskoopia (NDUV);
- diferentsiaalne optiline absorptsioonspektromeetria (DOAS).

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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 document 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).

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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 146, *Air quality*, Subcommittee SC 1, *Stationary source emissions*.

This second edition cancels and replaces the first edition (ISO 7935:1992), which has been technically revised.

The main changes are as follows:

- the structure and the components have been updated to be similar to the latest editions of e.g. ISO 10849 (measurement of nitrogen oxides), ISO 12039 (measurement of CO, CO₂ and O₂), ISO 17179 (measurement of NH₃), ISO 13199 (measurement of total VOC), ISO 25140 (measurement of CH₄), ISO 21258 (measurement of N₂O);
- [Clause 3](#) has been revised with the addition or deletion and change in terms and definitions;
- a new analytical technique has been added (laser spectroscopic technique or tunable laser spectroscopy) for measurement of SO₂;
- the performance characteristics and criteria as well as QA/QC procedures have been changed to harmonize with latest ISO standards;
- examples of performance test results and the results of uncertainty calculation have been added for SO₂ measurement.

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.

Introduction

Sulfur dioxide (SO₂) can arise in considerable quantities from combustion of fossil fuels used for energy generation, industrial activities processing sulfur or sulfur containing material, and from combustion of sulfur containing waste. The waste gas from these processes, containing sulfur dioxide, is usually discharged into the ambient atmosphere, via a duct or a chimney.

For evaluating the mass concentration of sulfur dioxide present in the waste gas of stationary source emissions, a number of highly developed methods of integrated sampling and subsequent determination by chemical analysis and automated measuring systems are available.

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Stationary source emissions — Determination of the mass concentration of sulfur dioxide in flue gases — Performance characteristics of automated measuring systems

1 Scope

This document specifies a method for the determination of sulfur dioxide (SO₂) in flue gases of stationary sources and describes the fundamental structure and the key performance characteristics of automated measuring systems.

The method allows continuous monitoring with permanently installed measuring systems of SO₂ emissions.

This document describes extractive systems and in situ (non-extractive) systems in connection with a range of analysers that operate using, for example, the following principles:

- non-dispersive infrared absorption (NDIR);
- Fourier transform infrared (FTIR) spectroscopy;
- laser spectroscopic technique or tunable laser spectroscopy (TLS);
- non-dispersive ultraviolet absorption (NDUV);
- differential optical absorption spectroscopy (DOAS).

Other equivalent instrumental methods can be used provided they meet the minimum performance requirements specified in this document. The measuring system can be validated with reference materials, according to this document, or comparable methods.

Automated measuring system (AMS) based on the principles listed above has been used successfully in this application for the measuring ranges as shown in [Annex E](#).

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 9169, *Air quality — Definition and determination of performance characteristics of an automatic measuring system*

ISO 14956, *Air quality — Evaluation of the suitability of a measurement procedure by comparison with a required measurement uncertainty*

3 Terms and definitions

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

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>