

PAIKSETE SAASTEALLIKATE HEITED
Süsinikmonooksiidi, süsinikdioksiidi ja hapniku
määramine suitsugaasides
Automaatmõõteseadmete efektiivsuse näitajad

Stationary source emissions
Determination of the mass concentration of carbon
monoxide, carbon dioxide and oxygen in flue gas
Performance characteristics of automated measuring
systems
(ISO 12039:2019, identical)

EESTI STANDARDI EESSÕNA**NATIONAL FOREWORD**

<p>See Eesti standard EVS-ISO 12039:2024 sisaldab rahvusvahelise standardi ISO 12039:2019 „Stationary source emissions -- Determination of the mass concentration of carbon monoxide, carbon dioxide and oxygen in flue gas -- Performance characteristics of automated measuring systems“ identset ingliskeelset teksti.</p>	<p>This Estonian Standard EVS-ISO 12039:2024 consists of the identical English text of the International Standard ISO 12039:2019 „Stationary source emissions -- Determination of the mass concentration of carbon monoxide, carbon dioxide and oxygen in flue gas -- 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 12039:2024 on jõustunud sellekohase teate avaldamisega EVS Teatajas.</p>	<p>Standard EVS-ISO 12039:2024 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

See dokument määrab kindlaks süsinikmonooksiidi (CO), süsinikdioksiidi (CO₂) ja hapniku (O₂) automaatsete mõõtesüsteemide põhistruktuuri ja kõige olulisemad karakteristikad, mida kasutatakse paiksete allikate heitmete korral. Selles dokumendis kirjeldatakse nende gaaside kontsentratsioonide mõõtmise meetodeid ja seadmeid.

Antud meetod võimaldab CO, CO₂ ja O₂ suitsugaaside kontsentratsiooni pidevat seiret püsivalt paigaldatud mõõtesüsteemidega. See rahvusvaheline standard kirjeldab gaasi väljavõtuga (ekstraktiivseid) ja mitteekstraktiivseid (saasteallikasiseseid (*in situ*)) süsteeme erinevate analüsaatoritega, mille töö põhineb näiteks järgmistel meetoditel:

- infrapuna kiirguse neeldumise mõõtmine (CO ja CO₂);
- paramagnetismi mõõtmine (O₂);
- tsirkooniumoksiidi meetod (O₂);
- elektrokeemiline rakk (O₂);
- timmlaser spektroskoopia (TLS) (CO, CO₂ ja O₂).

Kasutada võib ka muid mõõtemetodeid, eeldusel, et need vastavad selles dokumendis sätestatud miinimumnõuetele.

Eespool loetletud meetoditel põhinevat automaatmõõtesüsteemi (AMS) on selles rakenduses sobivate mõõtevahemike jaoks näidatud lisan G.

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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).

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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 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 the following URL: 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 12039:2001), which has been technically revised. The main changes compared to the previous edition are as follows:

- The structure and the components are changed to be similar to the latest ISO standards; ISO 17179 (measurement of NH₃), ISO 13199 (measurement of total VOC), ISO 25140 (measurement of CH₄), ISO 21258 (measurement of N₂O) and others.
- Addition or deletion and change in terms and definitions.
- Addition of a new analytical technique (tunable laser spectroscopy) for in-situ measurement of CO, CO₂ and O₂
- The performance characteristics and criteria as well as QA/QC procedures are changed to harmonize with latest ISO standards.
- Examples of performance test results and the results of uncertainty calculation are shown for CO, CO₂ and O₂ 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

Carbon monoxide, carbon dioxide, and oxygen are gases found in the exhaust gases of combustion processes. Determination of the concentration of these gases is necessary to demonstrate compliance with local regulations and can assist the operator in the optimization of the combustion process. The determination of O₂ and/or CO₂ is also necessary to normalize the measured concentration of other gases and dusts to defined conditions. There are a number of ways to measure concentrations of CO, CO₂ and O₂ in stacks/ducts.

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Stationary source emissions — Determination of the mass concentration of carbon monoxide, carbon dioxide and oxygen in flue gas — Performance characteristics of automated measuring systems

1 Scope

This document specifies the fundamental structure and the most important performance characteristics of automated measuring systems for carbon monoxide (CO), carbon dioxide (CO₂) and oxygen (O₂) to be used on stationary source emissions. This document describes methods and equipment for the measurement of concentrations of these gases.

The method allows continuous monitoring with permanently installed measuring systems of CO, CO₂ and O₂ emissions. This international standard describes extractive systems and in situ (non-extractive) systems in connection with analysers that operate using, for example, the following principles:

- infrared absorption (CO and CO₂);
- paramagnetism (O₂);
- zirconium oxide (O₂);
- electrochemical cell (O₂);
- tuneable laser spectroscopy (TLS) (CO, CO₂ and O₂).

Other instrumental methods can be used provided they meet the minimum requirements proposed in this document.

Automated measuring systems (AMS) based on the principles above have been used successfully in this application for measuring ranges which are described in Annex G.

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 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.

3.1

analyser

analytical part in an extractive or *in situ* AMS (3.3)

3.2

automated measuring system

AMS

measuring system interacting with the flue gas under investigation, returning an output signal proportional to the physical unit of the *measurand* (3.8) in unattended operation