
Emisije nepremičnih virov - Določevanje masne koncentracije ogljikovega dioksida - Referenčna metoda: infrardeča spektroskopija

Stationary source emissions - Determination of the mass concentration of carbon dioxide
- Reference method: infrared spectrometry

Emissionen aus stationären Quellen - Ermittlung der Massenkonzentration von Kohlenstoffdioxid - Referenzverfahren: Infrarot-Spektrometrie

Émissions de sources fixes - Détermination de la concentration massique en dioxyde de carbone - Méthode de référence spectrométrie infrarouge

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ICS:

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ICS

English Version

Stationary source emissions - Determination of the mass
concentration of carbon dioxide - Reference method:
infrared spectrometry

Emissionen aus stationären Quellen - Ermittlung der
Massenkonzentration von Kohlenstoffdioxid -
Referenzverfahren: Infrarot-Spektrometrie

This draft Technical Specification is submitted to CEN members for Vote. It has been drawn up by the Technical Committee CEN/TC 264.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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FprCEN/TS 17405:2019 (E)

European foreword

This document (FprCEN/TS 17405:2019) has been prepared by Technical Committee CEN/TC 264 “Air quality”, the secretariat of which is held by DIN.

This document is currently submitted to the Vote on TS.

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1 Scope

This document specifies the reference method (RM) for the measurement of carbon dioxide (CO₂) based on the infrared (IR) absorption principle. It includes the sampling and the gas conditioning system, and allows the determination of the CO₂ in flue gases emitted to the atmosphere from ducts and stacks. This document specifies the measurement of the total CO₂ concentration and does not differentiate between biogenic and fossil derived CO₂.

This document specifies the characteristics to be determined and the performance criteria to be fulfilled by portable automated measuring systems (P-AMS) using the IR measurement method. It applies for periodic monitoring and for the calibration or control of automated measuring systems (AMS) permanently installed on a stack, for regulatory or other purposes.

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.

EN 15259:2007, *Air quality - Measurement of stationary source emissions - Requirements for measurement sections and sites and for the measurement objective, plan and report*

EN 15267-4:2017, *Air quality - Certification of automated measuring systems - Part 4: Performance criteria and test procedures for automated measuring systems for periodic measurements of emissions from stationary sources*

EN ISO 14956:2002, *Air quality - Evaluation of the suitability of a measurement procedure by comparison with a required measurement uncertainty (ISO 14956:2002)*

ISO/IEC Guide 98-3:2008, *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:

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

3.1

standard reference method

SRM

reference method prescribed by European or national legislation

[SOURCE: EN 15259:2007]

FprCEN/TS 17405:2019 (E)**3.2
reference method****RM**

measurement method taken as a reference by convention, which gives the accepted reference value of the measurand

Note 1 to entry: A reference method is fully described.

Note 2 to entry: A reference method can be a manual or an automated method.

Note 3 to entry: Alternative methods can be used if equivalence to the reference method has been demonstrated.

[SOURCE: EN 15259:2007]

**3.3
measurement method**

method described in a written procedure containing all the means and procedures required to sample and analyse, namely field of application, principle and/or reactions, definitions, equipment, procedures, presentation of results, other requirements and measurement report

[SOURCE: EN 14793:2017]

**3.4
alternative method****AM**

measurement method which complies with the criteria given by this document with respect to the reference method

Note 1 to entry: An alternative method can consist of a simplification of the reference method.

[SOURCE: EN 14793:2017]

**3.5
measuring system**

set of one or more measuring instruments and often other devices, including any reagent and supply, assembled and adapted to give information used to generate measured quantity values within specified intervals for quantities of specified kinds

[SOURCE: JCGM 200:2012]

**3.6
automated measuring system****AMS**

entirety of all measuring instruments and additional devices for obtaining a result of measurement

Note 1 to entry: Apart from the actual measuring device (the analyser), an AMS includes facilities for taking samples (e.g. probe, sample gas lines, flow meters and regulator, delivery pump) and for sample conditioning (e.g. dust filter, pre-separator for interferences, cooler, converter). This definition also includes testing and adjusting devices that are required for functional checks and, if applicable, for commissioning.

Note 2 to entry: The term “automated measuring system” (AMS) is typically used in Europe. The term “continuous emission monitoring system” (CEMS) is also typically used in the UK and USA.

[SOURCE: EN 15267-4:2017]

3.7

portable automated measuring system P-AMS

automated measuring system which is in a condition or application to be moved from one to another measurement site to obtain measurement results for a short measurement period

Note 1 to entry: The measurement period is typically 8 h for a day.

Note 2 to entry: The P-AMS can be configured at the measurement site for the special application but can be also set-up in a van or mobile container. The probe and the sample gas lines are installed often just before the measurement task is started.

[SOURCE: EN 15267-4:2017]

3.8

calibration

set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring method or measuring system, and the corresponding values given by the applicable reference

Note 1 to entry: In case of automated measuring system (AMS) permanently installed on a stack the applicable reference is the standard reference method (SRM) used to establish the calibration function of the AMS.

Note 2 to entry: Calibration should not be confused with adjustment of a measuring system.

[SOURCE: EN 15058:2017]

3.9

adjustment

set of operations carried out on a measuring system so that it provides prescribed indications corresponding to given values of a quantity to be measured

Note 1 to entry: The adjustment can be made directly on the instrument or using a suitable calculation procedure.

[SOURCE: EN 15058:2017]

3.10

span gas

test gas used to adjust and check a specific point on the response line of the measuring system

[SOURCE: EN 15058:2017]

3.11

measurand

particular quantity subject to measurement

[SOURCE: EN 15259:2007]

Note 1 to entry: The measurand is a quantifiable property of the stack gas under test, for example mass concentration of a measured component, temperature, velocity, mass flow, oxygen content and water vapour content.

FprCEN/TS 17405:2019 (E)**3.12****interference**

negative or positive effect upon the response of the measuring system, due to a component of the sample that is not the measurand

[SOURCE: EN 15058:2017]

3.13**influence quantity**

quantity that is not the measurand but that affects the result of the measurement

Note 1 to entry: Influence quantities are e.g. presence of interfering gases; ambient temperature, pressure of the gas sample.

[SOURCE: EN 15058:2017]

3.14**ambient temperature**

temperature of the air around the measuring system

[SOURCE: EN 15058:2017]

3.15**measurement campaign**

single measurement or series of measurements intended to achieve a measurement objective

3.16**measurement period**

designated period of time during which emission data set(s) are collected

3.17**measurement site**

place on the waste gas duct in the area of the measurement plane(s) consisting of structures and technical equipment, for example working platforms, measurement ports, energy supply

Note 1 to entry: Measurement site is also known as sampling site.

[SOURCE: EN 15259:2007]

3.18**measurement plane**

plane normal to the centreline of the duct at the sampling position

Note 1 to entry: Measurement plane is also known as sampling plane.

[SOURCE: EN 15259:2007]

3.19**measurement port**

opening in the waste gas duct along the measurement line, through which access to the waste gas is gained

Note 1 to entry: Measurement port is also known as sampling port or access port.

[SOURCE: EN 15259:2007]

3.20**measurement line**

line in the measurement plane along which the measurement points are located, bounded by the inner duct wall

Note 1 to entry: Measurement line is also known as sampling line.

[SOURCE: EN 15259:2007]

3.21**measurement point**

position in the measurement plane at which the sample stream is extracted or the measurement data are obtained directly

Note 1 to entry: Measurement point is also known as sampling point.

[SOURCE: EN 15259:2007]

3.22**performance characteristic**

one of the quantities (described by values, tolerances, range) assigned to equipment in order to define its performance

[SOURCE: EN 15058:2017]

3.23**response time**

duration between the instant when an input quantity value of a measuring instrument or measuring system is subjected to an abrupt change between two specified constant quantity values and the instant when a corresponding indication settles within specified limits around its final steady value

Note 1 to entry: By convention time taken for the output signal to pass from 0 % to 90 % of the final variation of indication.

[SOURCE: EN 15058:2017]

3.24**short-term zero drift**

difference between two zero readings at the beginning and at the end of the measurement period

[SOURCE: EN 15058:2017]