SLOVENSKI STANDARD
oSIST prEN 15267-3:2022

01-september-2022

Kakovost zraka - Ocenjevanje opreme za monitoring kakovosti zraka - 3. del: Merila za delovanje in postopki preskušanja nepremičnih avtomatskih merilnih sistemov za kontinuirani monitoring emisij iz nepremičnih virov

Air quality - Assessment of air quality monitoring equipment - Part 3: Performance criteria and test procedures for stationary automated measuring systems for continuous monitoring of emissions from stationary sources

Luftbeschaffenheit - Beurteilung von Einrichtungen zur Überwachung der Luftbeschaffenheit - Teil 3: Mindestanforderungen und Prüfprozeduren für stationäre automatische Messeinrichtungen zur kontinuierlichen Überwachung von Emissionen aus stationären Quellen

Qualité de l'air - Évaluation des équipements de surveillance de la qualité de l'air - Partie 3: Spécifications de performance et procédures d'essai pour systèmes de mesurage automatisés fixes de surveillance en continu des émissions de sources fixes

Ta slovenski standard je istoveten z: **prEN 15267-3**

ICS:

03.120.20	Certificiranje proizvodov in podjetij. Ugotavljanje skladnosti	Product and company certification. Conformity assessment
13.040.99	Drugi standardi v zvezi s kakovostjo zraka	Other standards related to air quality

oSIST prEN 15267-3:2022 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 15267-3

August 2022

ICS 13.040.99

Will supersede EN 15267-3:2007

English Version

Air quality - Assessment of air quality monitoring equipment - Part 3: Performance criteria and test procedures for stationary automated measuring systems for continuous monitoring of emissions from stationary sources

Qualité de l'air - Évaluation des équipements de surveillance de la qualité de l'air - Partie 3: Spécifications de performance et procédures d'essai pour systèmes de mesurage automatisés fixes de surveillance en continu des émissions de sources fixes

Luftbeschaffenheit - Beurteilung von Einrichtungen zur Überwachung der Luftbeschaffenheit - Teil 3: Mindestanforderungen und Prüfprozeduren für stationäre automatische Messeinrichtungen zur kontinuierlichen Überwachung von Emissionen aus stationären Quellen

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

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword

This document (prEN 15267-3:2022) 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 CEN Enquiry.

This document will supersede EN 15267-3:2007.

In comparison with the previous edition, the following technical modifications have been made:

a) The title of the revised EN 15267 series has been clarified to avoid the impression that all parts deal with the certification of automated measuring systems. The title has been generalized so that specifically Part 1 and Part 2 are also applicable to other air quality monitoring equipment.

b) The title of revised EN 15267-3 has been clarified to make it clear that Part 3 deals with stationary automated measuring systems for continuous monitoring of emissions from stationary sources.

c) The performance criteria and test procedures were adapted to the state of the art in measurement technology.

d) Requirements for stationary automated measuring systems measuring mercury have been added.

e) References have been updated.

This document is Part 3 of a series of European Standards:

— EN 15267-1, *Air quality — Assessment of air quality monitoring equipment — Part 1: General principles of certification*

— EN 15267-2, *Air quality — Assessment of air quality monitoring equipment — Part 2: Initial assessment of the manufacturer’s quality management system and post certification surveillance for the manufacturing process*

— EN 15267-3, *Air quality — Assessment of air quality monitoring equipment — Part 3: Performance criteria and test procedures for stationary automated measuring systems for continuous monitoring of emissions from stationary sources*

— EN 15267-4, *Air quality — Assessment of air quality monitoring equipment — Part 4: Performance criteria and test procedures for portable automated measuring systems for periodic measurements of emissions from stationary sources*

Introduction

0.1 General

The assessment of air quality monitoring equipment (AQME) supports the requirements of certain Directives of the European Union (EU), which require, either directly or indirectly, that this equipment complies with performance criteria, maximum permissible measurement uncertainties and test requirements. These Directives include Directive 2010/75/EU on industrial emissions (IED), Directive (EU) 2015/2193 on medium combustion plants and Directive 2008/50/EC on ambient air quality and cleaner air for Europe.

The assessment of AQME consists of the following sequential stages:

a) performance testing;

b) initial assessment of the manufacturer's quality management system (QMS);

c) certification;

d) surveillance for the manufacturing process.

This document specifies the performance criteria and test procedures for performance testing of stationary AMS for continuous monitoring of emissions from stationary sources. Testing applies to complete measuring systems.

The overall assessment for the purposes of certification is *conformity testing*, while the evaluation of performance against specified performance criteria is *performance testing*.

0.2 Legal drivers

This document supports at least the requirements of the following EU Directives:

— Directive 2010/75/EU on industrial emissions;

— Directive (EU) 2015/2193 on the limitation of emissions of certain pollutants into the air from medium combustion plants;

— Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading.

However, this document can also be applied to the monitoring requirements specified in other EU Directives.

0.3 Relationship to EN 14181

The quality assurance levels (QAL) defined in EN 14181 cover the suitability of an AMS for its measuring task (QAL1), the regular calibration and validation of the AMS (QAL2), and the control of the AMS during its ongoing operation on an industrial plant (QAL3). An annual surveillance test (AST) is also defined in EN 14181.

This document provides the detailed procedures covering the QAL1 requirements of EN 14181. Furthermore, it provides input data for QAL3.

0.4 Processes

Field testing of an AMS is ordinarily carried out on the most highly demanding industrial process in the range of applications for which a manufacturer seeks certification. The premise is that if the AMS performs acceptably on this process, then experience has shown that the AMS generally performs well on the majority of other processes. However, there are always exceptions and it is the responsibility of

the manufacturer in conjunction with the user to ensure that the AMS performs adequately on a specific process.

0.5 Performance characteristics

A combination of laboratory test and field test is detailed within this document. The laboratory test is designed to assess whether an AMS can meet, under controlled conditions, the relevant performance criteria. The field test is designed to assess whether an AMS can continue to work and meet the relevant performance criteria in a real application. Field testing is carried out on an industrial process representative of the intended application for the AMS for which the manufacturer seeks certification.

The main AMS performance characteristics are:

— response time;

— repeatability standard deviation;

— lack of fit (linearity);

— drift;

— influence of ambient temperature;

— influence of supply voltage variations;

— influence of vibration;

— influence of sample gas pressure;

— influence of sample gas flow for extractive AMS;

— cross-sensitivity to likely interferents contained in the waste gas other than the measured component;

— excursion of measurement beam of cross-stack in situ AMS;

— converter efficiency for AMS measuring NO_x;

— converter efficiency for AMS measuring Hg;

— response factors for AMS measuring TOC;

— performance and accuracy of the AMS against the standard reference method (SRM) or alternative method (AM);

— maintenance interval;

— availability;

— reproducibility.

The quality of reference or surrogate materials used under QAL3 for both gaseous measured components and particulate matter measuring AMS is also assessed.

This document is an application and elaboration of EN ISO 9169 with additional and alternative provisions for paired testing. Where this document appears to differ from EN ISO 9169, it either

elaborates upon the requirements of EN ISO 9169 or differs in minor ways owing to the necessity to conduct paired testing.

0.6 Relationship to EN 15267-4

This document forms the basis of prEN 15267-4, which specifies the performance test of portable automated measuring systems (P-AMS) for periodic measurements of emissions from stationary sources. Many requirements of prEN 15267-4 are identical to those of this document. prEN 15267-4 deviates from this document only where the portable use and the use as SRM or AM require different or additional requirements. Therefore, this document allows a combined testing according to prEN 15267-3 and prEN 15267-4 where an AMS is designed for stationary and portable use.

1 Scope

This document specifies the performance criteria and test procedures for the performance test of stationary automated measuring systems (AMS) that continuously measure gases and particulate matter in, and flow of, the waste gas from stationary sources.

This document supports the requirements of particular EU Directives. It provides the detailed procedures covering the QAL1 requirements of EN 14181 and, where required, input data used in QAL3.

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 13284-1, *Stationary source emissions - Determination of low range mass concentration of dust - Part 1: Manual gravimetric method*

EN 13284-2, *Stationary source emissions - Determination of low range mass concentration of dust - Part 2: Quality assurance of automated measuring systems*

EN 14181:2014, *Stationary source emissions - Quality assurance of automated measuring systems*

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

EN 50160, *Voltage characteristics of electricity supplied by public electricity networks*

EN 60068-2-6, *Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal) (IEC 60068-2-6)*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

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

IEEE 754, *Floating-point arithmetic*

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 https://www.electropedia.org/

3.1
air quality monitoring equipment
AQME
automated measuring system or data acquisition and handling system

[SOURCE: prEN 15267-1:2021, 3.1]

3.2
automated measuring system
AMS
entirety of all measuring instruments and additional devices for obtaining a result of measurement

Note 1 to entry: The term “automated measuring system” applies to stationary and portable AMS.

Note 2 to entry: Apart from the actual measuring device (the analyser), a stationary 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 interferents, cooler, converter). This definition also includes testing and adjusting devices that are required for functional checks and QAL3 procedures and, if applicable, for commissioning.

Note 3 to entry: The term “automated measuring system” (AMS) is typically used in Europe. The terms “continuous emission monitoring system” (CEM) and “continuous ambient-air-quality monitoring system” (CAM) are also typically used in the UK and USA.

[SOURCE: prEN 15267-1:2021, 3.2]

3.3
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: prEN 15267-1:2021, 3.3]

3.4
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, 3.8]

3.5
standard reference method
SRM
reference method prescribed by European or national legislation

Note 1 to entry: Standard reference methods are used e.g. to calibrate and validate AMS and for periodic measurements to check compliance with limit values.

[SOURCE: EN 15259:2007, 3.9]

3.6
alternative method
AM
measurement method which complies with the criteria given by EN 14793 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, 3.3, modified – "this European Standard" has been replaced by "EN 14793"]

3.7
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]

3.8
measurement
set of operations having the object of determining a value of a quantity

3.9
paired measurement
simultaneous recording of results of measurement at the same measurement point using two AMS of identical design

3.10
measurand
particular quantity subject to measurement

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

[SOURCE: EN 15259:2007, 3.5]

3.11
measured component
constituent of the waste gas for which a defined measurand is to be determined by measurement

[SOURCE: EN 15259:2007, 3.6]

Note 1 to entry: Measured component is also called determinand.

3.12
interferent
substance present in the waste gas under investigation, other than the measured component, that affects the output

3.13
calibration
determination of a calibration function with (time) limited validity applicable to the AMS at a specific measurement site

3.14
calibration function
linear relationship between the values of the SRM and the AMS with the assumption of a constant residual standard deviation

[SOURCE: EN 14181:2014, 3.13]

Note 1 to entry: The calibration function describes the statistical relationship between the starting variable (measured signal) of the measuring system and the associated result of measurement (measured value) simultaneously determined at the same point of measurement using an SRM.

3.15
reference material
substance or mixture of substances, with a known concentration within specified limits, or a device of known characteristics

3.16
zero gas
gas mixture used to establish the zero point of a calibration curve when used with a given analytical procedure within a given calibration range

3.17
zero point
specified value of the output of the AMS which, in the absence of the measured component, represents the zero crossing of the AMS characteristic

Note 1 to entry: In case of oxygen and some flow monitoring AMS, the zero point is interpreted as the lowest measurable value.

3.18
span point
value of the output of the AMS for the purpose of calibrating, adjusting, etc. that represents a correct measured value generated by reference material between 70 % and 90 % of the range tested

3.19
measured signal
output of the AMS in analogue or digital form which is converted into the measured value with the aid of the calibration function

3.20
output
reading, or digital or analogue electrical signal generated by the AMS in response to a measured object

3.21
independent reading
reading that is not influenced by a previous individual reading by separating two individual readings by at least four response times

3.22
individual reading
reading averaged over a time period equal to at least the response time of the AMS

3.23
averaging time
time period over which an arithmetic or time-weighted average of concentrations is calculated

3.24
short-term average
STA
average related to the shortest time period used for reporting

Note 1 to entry: Short-term averages are based on the shortest time period of averages the plant must report to the authorities for each measured component. According to variations in different EU Directives the shortest time period can be 10 min, 30 min or 1 h, depending on the type and application of the plant.

[SOURCE: EN 17255-1:2019, 3.25]

3.25
performance characteristic
quantity assigned to the AMS in order to define its performance

Note 1 to entry: The values of relevant performance characteristics are determined in the performance test and compared to the applicable performance criteria.

3.26
response time
t_{90}
time interval between the instant of a sudden change in the value of the input quantity to the AMS and the time as from which the value of the output quantity is reliably maintained above 90 % of the correct value of the input quantity

Note 1 to entry: The response time is also referred to as the 90 % time.

3.27
lack of fit
systematic deviation, within the measurement range, between the accepted value of a reference material applied to the measuring system and the corresponding result of measurement produced by the calibrated measuring system

Note 1 to entry: In common language lack of fit is often called “linearity” or “deviation from linearity”. Lack of fit test is often called “linearity test”.

3.28
NO_x converter efficiency
efficiency with which the converter unit of a NO_x analyser reduces NO_2 to NO

3.29
Hg converter efficiency
efficiency with which the converter unit of a mercury analyser reduces Hg^{2+} to Hg^0

3.30
interference
negative or positive effect that a substance has upon the output of the AMS, when that substance is not the measured component