

SVENSK STANDARD

SS-EN 14789:2017

Fastställt/Approved: 2017-01-23
Publicerad/Published: 2017-01-26
Utgåva/Edition: 2
Språk/Language: engelska/English
ICS: 13.040; 13.040.40

Utsläpp och utomhusluft – Bestämning av volymkoncentrationen oxygen (O₂)- Referensmetod: Paramagnetism

Stationary source emissions – Determination of volume concentration of oxygen – Standard reference method: Paramagnetism

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Denna standard ersätter SS-EN 14789:2005, utgåva 1.

The European Standard EN 14789:2017 has the status of a Swedish Standard. This document contains the official English version of EN 14789:2017.

This standard supersedes the Swedish Standard SS-EN 14789:2005, edition 1.

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EUROPEAN STANDARD

EN 14789

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2017

ICS 13.040.40

Supersedes EN 14789:2005

English Version

Stationary source emissions - Determination of volume concentration of oxygen - Standard reference method: Paramagnetism

Emissions de sources fixes - Détermination de la concentration volumique en oxygène - Méthode de référence normalisée: Paramagnétisme

Emissionen aus stationären Quellen - Bestimmung der Volumenkonzentration von Sauerstoff - Standardreferenzverfahren: Paramagnetismus

This European Standard was approved by CEN on 26 September 2016.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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 CEN-CENELEC Management Centre has the same status as the official versions.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 14789:2017) has been prepared by Technical Committee CEN/TC 264 "Air quality", the secretariat of which is held by DIN.

This document supersedes EN 14789:2005.

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 July 2017, and conflicting national standards shall be withdrawn at the latest by July 2017.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

Annex E provides details of significant technical changes between this document and the previous edition.

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1 Scope

This European Standard specifies the standard reference method (SRM) based on the paramagnetic principle for the determination of the oxygen concentrations in flue gases emitted to the atmosphere from ducts and stacks. It includes the sampling and the gas conditioning system as well as the analyser.

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

This European Standard specifies criteria for demonstration of equivalence of an alternative method (AM) to the SRM by application of EN 14793:2017.

This European Standard has been validated during field tests on waste incineration, co-incineration and large combustion plants and on a recognized test bench. It has been validated for sampling periods of 30 min in the range from 3 % to 21 %. Oxygen concentration values, expressed as volume concentrations, are used to allow results of emission measurements to be standardised to the oxygen reference concentration and dry gas conditions required e.g. by EU Directive 2010/75/EC on industrial emissions.

NOTE The characteristics of installations, the conditions during field tests and the values of repeatability and reproducibility in the field are given in Annex A.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 14793:2017, *Stationary source emission — Demonstration of equivalence of an alternative method with a reference method*

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.

NOTE In this European Standard, the volume concentration of oxygen is expressed in percent.

3.1 standard reference method

SRM

reference method prescribed by European or national legislation

[SOURCE: EN 15259:2007]

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 European Standard 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 systems (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.

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.

3.10 span gas

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