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SWEDISH STANDARDS INSTITUTE

Utsläpp och utomhusluft – Bestämning av masskoncentrationen av dikväveoxid (N2O; lustgas) – Standardmetod: Icke-dispersiv infraröd metod (ISO 21258:2010)

Stationary source emissions – Determination of the mass concentration of dinitrogen monoxide (N2O) – Reference method: Non-dispersive infrared method (ISO 21258:2010)

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Europastandarden EN ISO 21258:2010 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 21258:2010.

The European Standard EN ISO 21258:2010 has the status of a Swedish Standard. This document contains the official English version of EN ISO 21258:2010.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Luftkvalitet, SIS/TK 423.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 21258

June 2010

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English Version

Stationary source emissions - Determination of the mass concentration of dinitrogen monoxide (N2O) - Reference method: Non-dispersive infrared method (ISO 21258:2010)

Émissions de sources fixes - Détermination de la concentration massique de protoxyde d'azote (N2O) - Méthode de référence: Méthode infrarouge non dispersive (ISO 21258:2010)

Emissionen aus stationären Quellen - Bestimmung der Massenkonzentration von Distickstoffmonoxid (N2O) - Referenzverfahren: Nicht-dispersives Infrarot-Verfahren (ISO 21258:2010)

This European Standard was approved by CEN on 19 May 2010.

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

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Foreword

This document (EN ISO 21258:2010) has been prepared by Technical Committee ISO/TC 146 "Air quality" in collaboration with Technical Committee CEN/TC 264 “Air quality” the secretariat of which is held by DIN.

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 December 2010, and conflicting national standards shall be withdrawn at the latest by December 2010.

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.

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Endorsement notice

The text of ISO 21258:2010 has been approved by CEN as a EN ISO 21258:2010 without any modification.

Introduction

Dinitrogen monoxide (N_2O, also known as nitrous oxide) is an important greenhouse gas with a global warming potential 310 times that of carbon dioxide (CO_2). N_2O is of both natural and anthropogenic origin. Increased emissions of N_2O have been observed, for example, in the exhaust gas of combustion processes using nitrogenous fuels at temperatures below 900 °C, and in the reduction of NO_x using the selective non-catalytic reduction (SNCR) process, in particular when urea is used. There is considerable uncertainty over current N_2O emissions, which is reflected in the wide range of emission factors cited. The largest uncertainties are for emissions from natural and agricultural sources, which are difficult to measure accurately. In the past, emissions from stationary sources such as coal-fired plants and industry were overestimated due to a serious artefact in the grab-sampling methodology used to measure emissions. N_2O is involved in the EU emission trading scheme along with CO_2 and methane (CH_4).

Improved measurement techniques are helping to reduce uncertainties in emission estimates. Improved measurement techniques are also a prerequisite for accurate information on N_2O and its potential role in the enhanced greenhouse effect.

Stationary source emissions — Determination of the mass concentration of dinitrogen monoxide (N_2O) — Reference method: Non-dispersive infrared method

1 Scope

This International Standard specifies a method for sampling, sample conditioning and determination of dinitrogen monoxide (N_2O) content in the flue gas emitted from ducts and stacks to atmosphere. It sets out the non-dispersive infrared (NDIR) analytical technique, including the sampling system and sample gas conditioning system.

This International Standard is a reference method for periodic monitoring and for calibration, adjustment or control of automatic monitoring systems permanently installed on a stack.

This reference method has been successfully tested on a sewage sludge incinerator where the N_2O concentration in the flue gas was up to about 200 mg/m^3.

2 Normative references

The following referenced documents are indispensable for the application 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 9169:2006, *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*

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.

3.1
influence quantity
quantity that is not the measurand but that affects the result of the measurement

[ISO/IEC Guide 98-3:2008, B.2.10]

3.2
interference
negative or positive effect upon the response of the measuring system, due to a component of the sample that is not the measurand

3.3
interferent
interfering substance
substance present in the air mass under investigation, other than the measurand, that affects the response

[ISO 9169:2006, 2.1.12]

3.4
lack of fit
systematic deviation within the range of application between the measurement results obtained by applying the calibration function to the observed response of the measuring system measuring reference materials and the corresponding accepted value of such reference materials

NOTE 1 Lack of fit may be a function of the measurement result.

[ISO 9169:2006, 2.2.9]

NOTE 2 The expression “lack of fit” is often replaced in everyday language for linear relations by “linearity” or “deviation from linearity”.

3.5
measurand
particular quantity subject to measurement

[ISO/IEC Guide 98-3:2008, B.2.9]

3.6
performance characteristic
one of the quantities assigned to equipment in order to define its performance

NOTE Performance characteristics can be described by values, tolerances, or ranges.

3.7
reference gas
gaseous mixture of stable composition used to calibrate the reference measuring system and which is traceable to national or international standards

3.8
reference method
measurement method taken as a reference by convention, which gives the accepted reference value of the measurand

3.9
repeatability in the laboratory
precision under repeatability conditions in the laboratory

NOTE 1 Repeatability can be expressed quantitatively in terms of the dispersion characteristics of the results. In this International Standard, the repeatability is expressed as a value with a level of confidence of 95 %.

NOTE 2 Adapted from ISO 3534-2:2006[1], 3.3.5.

3.10
repeatability conditions in the laboratory
observation conditions where independent test results are obtained with the same method on identical test items in the same test or measuring facility by the same operator using the same equipment within short intervals of time in the laboratory

NOTE 1 Repeatability conditions in the laboratory include:

— the same measurement procedure at the same laboratory;

— the same operator;

— the same measuring instrument used under the same conditions;

— the same location;

— repetition over a short period of time.

NOTE 2 Adapted from ISO 3534-2:2006[1], 3.3.6.

3.11
repeatability in the field
precision under repeatability conditions in the field

NOTE 1 Repeatability can be expressed quantitatively in terms of the dispersion characteristics of the results. In this International Standard the repeatability under field conditions is expressed as a value with a level of confidence of 95 %.

NOTE 2 Adapted from ISO 3534-2:2006[1], 3.3.5.

3.12
repeatability conditions in the field
observation conditions where independent test results are obtained with the same method on identical test items in the same test or measuring facility by the same operator using the same equipment within short intervals of time in the field

NOTE 1 Repeatability conditions in the field include:

— the same measurement procedure;

— two sets of equipment, the performance of which fulfils the requirements of the reference method, used under the same conditions;

— the same location;

— implemented by the same laboratory;

— typically calculated on short periods of time in order to avoid the effect of changes of influence parameters.

NOTE 2 Adapted from ISO 3534-2:2006[1], 3.3.6.

3.13
reproducibility in the field
precision under reproducibility conditions in the field

NOTE 1 Reproducibility in the field can be expressed quantitatively in terms of the dispersion characteristics of the results. In this International Standard the reproducibility under field conditions is expressed as a value with a level of confidence of 95 %.

NOTE 2 Adapted from ISO 3534-2:2006[1], 3.3.10.

NOTE 3 Results are usually understood to be corrected results.

3.14
reproducibility conditions in the field
observation conditions where independent test results are obtained with the same method on identical test items in different test or measurement facilities with different operators using different equipment in the field

NOTE 1 Reproducibility conditions in the field include:

— the same measurement procedure;