

Workplace atmospheres - Assessment of performance of instruments for measurement of airborne particle concentrations

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 13205:2002 sisaldab Euroopa standardi EN 13205:2001 ingliskeelset teksti.	This Estonian standard EVS-EN 13205:2002 consists of the English text of the European standard EN 13205:2001.
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Käsitlusala: This European Standard specifies performance criteria and test methods for aerosol samplers and other instruments used to measure aerosol concentrations in workplace air. The performance criteria specified apply only to the process of sampling aerosol particles. Although analysis of samples collected in the course of testing is usually necessary in order to evaluate the sampler performance, the specified test methods ensure that analytical errors are kept very low during testing and do not contribute significantly to the end result.	Scope: This European Standard specifies performance criteria and test methods for aerosol samplers and other instruments used to measure aerosol concentrations in workplace air. The performance criteria specified apply only to the process of sampling aerosol particles. Although analysis of samples collected in the course of testing is usually necessary in order to evaluate the sampler performance, the specified test methods ensure that analytical errors are kept very low during testing and do not contribute significantly to the end result.
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English version

Workplace atmospheres - Assessment of performance of instruments for measurement of airborne particle concentrations

Atmosphères des lieux de travail - Evaluation des performances des instruments de mesure des concentrations d'aérosols

Arbeitsplatzatmosphäre - Bewertung der Leistungsfähigkeit von Geräten für die Messung der Konzentration luftgetragener Partikel

This European Standard was approved by CEN on 16 November 2001.

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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 Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 137 "Assessment of workplace exposure", 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 June 2002, and conflicting national standards shall be withdrawn at the latest by June 2002.

This document contains annexes A, B, D, E, that are normative and annexes C and F that are informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

EN 481 defines sampling conventions for the particle size fractions to be collected from workplace atmospheres in order to assess their impact on human health. Conventions are defined for the inhalable, thoracic and respirable aerosol fractions. These conventions represent target specifications for aerosol samplers, giving the ideal sampling efficiency as a function of particle aerodynamic diameter.

In general, the sampling efficiency of real aerosol samplers will deviate from the target specification, and the aerosol mass collected will therefore differ from that which an ideal sampler would collect. In addition, the behaviour of real samplers is influenced by many factors such as external wind speed, that depend on the environment in which the sampler is used.

1 Scope

This European Standard specifies methods for testing aerosol sampling instruments under prescribed laboratory conditions, and performance requirements that are specific to aerosol sampling instruments. These performance requirements, which include conformity with the EN 481 sampling conventions, apply only to the process of sampling the airborne particles from the air, not to the process of analysing particles collected by the process of sampling. Although analysis of samples collected in the course of testing is usually necessary in order to evaluate the sampler performance, the specified test methods ensure that analytical errors are kept very low during testing and do not contribute significantly to the end result. The determination of analytical errors and factors related to them (for example the bias, precision and limit of detection of the analytical method) is outside the scope of this standard. Where the aerosol sampling instrument requires the use of an external (rather than integral) pump, the pump is not subject to the requirements of this standard.

EN 482 contains general performance requirements for methods used for determining the concentrations of chemical agents in workplace atmospheres. These performance requirements include maximum values of overall uncertainty (a combination of precision and bias) achievable under prescribed laboratory conditions for the methods to be used. The requirements of EN 482 apply to the combined results of sampling airborne particles and analysing collected particles. This standard specifies how the performance of aerosol measurement methods is assessed with respect to the general requirements of EN 482, through the combination of sampling and analytical errors.

This standard applies to all instruments used for the health-related sampling of particles in workplace air, whatever their mode of operation. Different test procedures and types of evaluation are included to enable application of this standard to a wide variety of instruments. The standard should enable manufacturers and users of aerosol sampling instruments to adopt a consistent approach to sampler validation, and provide a framework for the assessment of sampler performance with respect to EN 481 and EN 482. It is the responsibility of the manufacturer of aerosol samplers to inform the user of the sampler performance under the laboratory conditions¹⁾ specified in this European Standard. It is the responsibility of the user to ensure that the sampler complies with the overall uncertainty requirements of EN 482 under the actual conditions of use.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed here. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated reference the latest edition of the publication referred to applies (including amendments).

EN 481, *Workplace atmospheres — Size fraction definitions for measurement of airborne particles.*

EN 482, *Workplace atmospheres — General requirements for the performance of procedures for the measurement of chemical agents.*

EN 1232, *Workplace atmospheres — Requirements and test methods for pumps used for personal sampling of chemical agents in the workplace.*

EN 1540, *Workplace atmospheres — Terminology.*

EN 12919, *Workplace atmospheres – Pumps for the sampling of chemical agents with a volume flow rate of over 5 l/min – Requirements and test methods.*

¹⁾ The inhalable convention is undefined for particle sizes in excess of 100 µm or for windspeeds greater than 4 m·s⁻¹. The tests required to assess performance are therefore limited to these conditions. Should such large particle sizes or wind speeds actually exist at the time of sampling, it is possible that different samplers meeting this standard may give different results.