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BSI Standards Publication

## **Workplace exposure — Procedures for the determination of the concentration of chemical agents — Basic performance requirements**

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## National foreword

This British Standard is the UK implementation of EN 482:2021. It supersedes BS EN 482:2012+A1:2015, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EH/2/2, Work place atmospheres.

A list of organizations represented on this committee can be obtained on request to its committee manager.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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**Compliance with a British Standard cannot confer immunity from legal obligations.**

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## EUROPÄISCHE NORM

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Supersedes EN 482:2012+A1:2015

English Version

## Workplace exposure - Procedures for the determination of the concentration of chemical agents - Basic performance requirements

Exposition sur les lieux de travail - Procédures pour déterminer la concentration d'agents chimiques - Exigences élémentaires relatives aux performances

Exposition am Arbeitsplatz - Verfahren zur Bestimmung der Konzentration von chemischen Arbeitsstoffen - Grundlegende Anforderungen an die Leistungsfähigkeit

This European Standard was approved by CEN on 8 February 2021.

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

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

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## European foreword

This document (EN 482:2021) has been prepared by Technical Committee CEN/TC 137 "Assessment of workplace exposure to chemical and biological agents", the secretariat of which is held by DIN.

This document corresponds to ISO 20581:2016, published by the International Organization for Standardization (ISO) which contains a modified version of EN 482:2012+A1:2015.

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 September 2021, and conflicting national standards shall be withdrawn at the latest by September 2021.

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

This document supersedes EN 482:2012+A1:2015.

The major technical changes between this document and the previous edition are as follows:

- a) standard title adapted to the wording used in the scope;
- b) 4.4, which comprised two subclauses, was revised;
- c) recommendation regarding exposure peaks inserted in 5.4.4;
- d) 5.4.7 reformulated to improve comprehensibility;
- e) new Table 2 with additional requirements for the testing parameters added to 5.10;
- f) Annex A specified more in detail;
- g) new subclause B.9 for blank subtraction added.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: 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 the United Kingdom.

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## Introduction

National laws and regulations require the assessment of the exposure of a worker to chemical agents in workplace atmospheres. One way of assessing such exposure is to measure the concentration of a chemical agent in the air in the worker's breathing zone. The procedures used for such measurements should provide reliable and valid results for the comparison purpose of exposure measurements with occupational exposure limit values (OELVs) and for the provision of acceptable control strategies.

This document introduces basic requirements to fulfil the measurement procedures in the process of quantitative exposure assessment. Specific European Standards and International Standards have been prepared for different types of measuring procedures and measuring devices. These include standards for airborne particle samplers (EN 13205, all parts), diffusive samplers (EN 838 and ISO 16107), pumped samplers (EN ISO 22065), short-term detector tubes (EN ISO 17621), personal sampling pumps (EN ISO 13137), metals and metalloids in airborne particles (EN ISO 21832), mixtures of airborne particles and vapour (EN 13936) and direct-reading instruments for toxic gases and vapours (EN 45544, all parts). In these specific documents, additional requirements have been included for the procedure or device in question, so that the basic requirements of this document are not compromised. Where no specific European Standard and/or International Standard exist, only the basic requirements apply.

Performance requirements given in this document are intended to apply under environmental conditions present at the workplace. However, because a wide range of environmental conditions are encountered in practice, this document specifies requirements that have to be fulfilled by measuring procedures when tested under prescribed laboratory conditions.

It is the user's responsibility to choose the appropriate procedures or devices that meet the requirements of this document. One way of doing this is to obtain information or confirmation from the provider of a procedure or the manufacturer of a device. Type-testing or, more generally, assessment of the performance of procedures or devices, can be undertaken by the manufacturer, user, testing house or research and development laboratory, as is most appropriate. A number of existing procedures for workplace measurements have either been tested over a part of the required minimum measuring range, but not over the entire range, or have not been tested for all environmental influences and potential interferences. If these partially validated procedures meet the performance requirements of this document, they can be used at present. Nevertheless, these procedures should be tested over the full ranges as soon as is reasonably practicable.

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## 1 Scope

This document specifies basic performance requirements for procedures for the determination of the concentration of chemical agents in workplace atmospheres as required by the Chemical Agents Directive 98/24/EC [13]. These requirements apply to all steps of measuring procedures regardless of the physical form of the chemical agent (gas, vapour, airborne particles), measuring procedures with separate sampling and analytical methods, and direct-reading instruments.

This document specifies requirements that are fulfilled by measuring procedures when tested under prescribed laboratory conditions due to a wide range of environmental conditions encountered in practice.

## 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 481, *Workplace atmospheres - Size fraction definitions for measurement of airborne particles*

EN 838, *Workplace exposure - Procedures for measuring gases and vapours using diffusive samplers - Requirements and test methods*

EN 1540, *Workplace exposure - Terminology*

EN 13205 (all parts), *Workplace exposure - Assessment of sampler performance for measurement of airborne particle concentrations*

EN 13936, *Workplace exposure - Procedures for measuring a chemical agent present as a mixture of airborne particles and vapour - Requirements and test methods*

EN 45544 (all parts), *Workplace atmospheres - Electrical apparatus used for the direct detection and direct concentration measurement of toxic gases and vapours*

EN ISO 13137, *Workplace atmospheres - Pumps for personal sampling of chemical and biological agents - Requirements and test methods (ISO 13137)*

EN ISO 17621, *Workplace atmospheres - Short term detector tube measurement systems - Requirements and test methods (ISO 17621)*

EN ISO 21832, *Workplace air - Metals and metalloids in airborne particles - Requirements for evaluation of measuring procedures (ISO 21832)*

EN ISO 22065, *Workplace air - Gases and vapours - Requirements for evaluation of measuring procedures using pumped samplers (ISO 22065)*

ISO 78-2, *Chemistry - Layouts for standards — Part 2: Methods of chemical analysis*

ISO 16107, *Workplace atmospheres - Protocol for evaluating the performance of diffusive samplers*