



SLOVENSKI STANDARD
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Izpostavljenost na delovnem mestu - Splošne zahteve za izvajanje meritev kemičnih agensov

Workplace exposure - General requirements for the performance of procedures for the measurement of chemical agents

Exposition am Arbeitsplatz - Allgemeine Anforderungen an die Leistungsfähigkeit von Verfahren zur Messung chemischer Arbeitsstoffe

Exposition sur les lieux de travail - Exigences générales concernant les performances des procédures de mesurage des agents chimiques

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13.040.30 Kakovost zraka na delovnem mestu Workplace atmospheres

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Workplace exposure - General requirements for the performance of procedures for the measurement of chemical agents

Exposition sur les lieux de travail - Exigences générales
concernant les performances des procédures de mesurage
des agents chimiques

Exposition am Arbeitsplatz - Allgemeine Anforderungen an
die Leistungsfähigkeit von Verfahren zur Messung
chemischer Arbeitsstoffe

This draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 137.

This draft amendment A1, if approved, will modify the European Standard EN 482:2012. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

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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.

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

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Foreword

This document (EN 482:2012/prA1:2014) 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 is currently submitted to the CEN Enquiry.

The aim of this Amendment to EN 482:2012 is to give in a new subclause 5.4.6 additional requirements and information how to deal with chemical agents whose limit value is considerably lowered when assessing the potential exposure of a worker to chemical agents in workplace atmospheres. In addition, the fourth paragraph of B.2.1.4 and the second paragraph of B.3.3.2 have been updated to take into account the requirements given in EN ISO 13137 and the splitting of the former EN 13205 in several parts, respectively. Furthermore, some normative and bibliographic references have been updated.

NOTE At present not all documents referenced in this Amendment have already been published. However, this will be the case when EN 482:2012 will be consolidated with regard to this Amendment.

EN 482:2012/prA1:2014 (E)**Introduction**

Replace the second paragraph with the following:

Because of their importance in the process of exposure assessment, it is required that the measuring procedures fulfil some general requirements which are given in this document. Specific European Standards have been prepared for different types of measuring procedures and measuring devices. These include European Standards for dust samplers (EN 13205-1), diffusive samplers (EN 838), pumped samplers (EN 1076), detector tubes (EN 1231¹⁾), sampling pumps (EN ISO 13137), metals and metalloids (EN 13890), mixtures of airborne particles and vapour (EN 13936) and direct reading instruments (EN 45544 (all parts)). In these specific European Standards, additional requirements have been included for the procedure or device in question, so that the general requirements of this document are not compromised. Where no specific European Standard exists, only the general requirements apply.

Delete Footnote 1 and substitute as follows:

- 1) EN 1231 is currently subject to revision and will be replaced by EN ISO 17621 later on.

1 Scope

Replace the first paragraph with the following:

This European Standard specifies general requirements for the performance of procedures for the determination of the concentration of chemical agents in workplace atmospheres as required by the Chemical Agents Directive 98/24/EC (see reference [9]). The requirements given apply to all measuring procedures, irrespective of the physical form of the chemical agent (gas, vapour, airborne particles), the sampling method and the analytical method used.

2 Normative references

Replace the given list of normative references with the following:

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 1076, *Workplace exposure — Procedures for measuring gases and vapours using pumped samplers — Requirements and test methods*

EN 1231, *Workplace atmospheres — Short term detector tube measurement systems — Requirements and test methods*

EN 1540, *Workplace exposure — Terminology*

EN 13205-1, *Workplace exposure — Assessment of sampler performance for measurement of airborne particle concentrations — Part 1: General requirements*

EN 13890, *Workplace exposure — Procedures for measuring metals and metalloids in airborne particles — Requirements and test methods*

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)*

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

Delete Footnote 2 completely.

4.2 Screening measurements of time weighted average concentration

Delete the underline sign between "occurrence." and "These.." at the end of the 3rd line.

5.4.4 Measuring range

Replace the given Note with the following:

NOTE For limit values see reference [10].

Add below 5.4.5 a new subclause 5.4.6 as follows:

5.4.6 Chemical agents with considerably lowered limit values

In exceptional cases, the limit value of a chemical agent can be so low that at present no measuring procedure is available which meets the requirements given in 5.4.4 and 5.4.5. Until a measuring procedure which fulfils these requirements is available the limit of quantification shall cover at least the concentration that allows the measurement of the corresponding limit value.

The expanded uncertainty should not exceed 50%.

EXAMPLE 1 The German risk based limit values e. g. for benzene, acrylonitrile or ethylene oxide calculated by the model given in the "Announcement on Hazardous Substances 910 - Risk figures and exposure-risk relationships in activities involving carcinogenic hazardous substances" are examples for chemical agents with considerably lowered limit values.

EXAMPLE 2 In France ANSES published a recommendation for beryllium occupational limit value of 0,01 µg/m³.

5.7 Environmental conditions

Replace the first sentence with the following:

The effect of environmental conditions (e.g. temperature, relative humidity, atmospheric pressure) on the performance of the method shall be tested in the laboratory.

5.10 Additional requirements

Replace the given text with the following:

In addition to the requirements given in 5.2 to 5.9, further requirements specified in EN 838, EN 1076, EN 1231, EN ISO 13137, EN 13205-1, EN 13890, EN 13936 and EN 45544 shall be met for particular types of measuring procedures and devices, as appropriate.

EN 482:2012/prA1:2014 (E)**6.1**

Replace the second paragraph above the given list as follows:

Calculate the expanded uncertainty, expressed as a percentage, according to the following procedure (see e.g. references [11], [12], [13] and ENV 13005):

Replace Note 3 with the following:

NOTE 3 For detailed calculation methods see EN 838, EN 1076, EN 13205-1 and EN 13890.

B.1 General

Replace the first sentence with the following:

The first step in estimating the uncertainty of measurement according to ENV 13005 is to construct a cause and effect diagram to identify individual random and non-random uncertainty components (see references [11], [12], [13] and ENV 13005).

B.2.1.3 Pump flow stability

Replace the second sentence of the first paragraph with the following:

EN ISO 13137 requires that the flow rate be maintained to within $\pm 5\%$ of the set value throughout the sampling period.

Replace the first sentence of the second paragraph with the following:

Actual values for the pump flow stability can be estimated from the value given by manufacturer or from the results of the tests prescribed in EN ISO 13137, and can be less than 5 %.

B.2.1.4 Sampling time

Replace the fourth paragraph with the following:

In case a pump with an internal timer is used for personal sampling, EN ISO 13137 requires that the indicated time shall not deviate by more than $\pm 0,5\%$ from that of a calibrated timer. The maximum tolerance for the sampling time is 0,5 %. Assuming a rectangular probability distribution, the maximum acceptable value of a non-random uncertainty component is $0,5/\sqrt{3} = 0,29\%$.

B.3.3.2 Closeness of matching with the required sampling convention(s)

Replace the second paragraph with the following:

EN 13205-1 specifies how the performance of aerosol measuring procedures is assessed with respect to the general requirements of this European Standard, through the combination of errors arising in the sampling, sample transportation/storage and sample preparation/analysis stages. EN 13205-2 specifies a laboratory performance test based on determining the sampling efficiency as a function of particle aerodynamic diameter. In EN 13205-4 the sampler performance is assessed by comparing the measured concentrations by a candidate sampler with those measured by a validated (reference) sampler for at least three test aerosols with widely different particle size distributions.

B.4.2.2 Aerosol samples

Replace the second sentence with the following:

The upper limit for the loading of the collection substrate can be determined as described in EN 13205-6 or ISO 15767.