

Workplace exposure - Measurement of exposure by inhalation to chemical agents - Strategy for testing compliance with occupational exposure limit values (Corrected version 04.2019)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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|---|--|
| See Eesti standard EVS-EN 689:2018 sisaldab Euroopa standardi EN 689:2018+AC:2019 ingliskeelset teksti. | This Estonian standard EVS-EN 689:2018 consists of the English text of the European standard EN 689:2018+AC:2019. |
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English Version

Workplace exposure - Measurement of exposure by
inhalation to chemical agents - Strategy for testing
compliance with occupational exposure limit values

Exposition sur les lieux de travail - Mesurage de
l'exposition par inhalation d'agents chimiques -
Stratégie pour vérifier la conformité à des valeurs
limites d'exposition professionnelle

Exposition am Arbeitsplatz - Messung der Exposition
durch Einatmung chemischer Arbeitsstoffe - Strategie
zur Überprüfung der Einhaltung von
Arbeitsplatzgrenzwerten

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

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European foreword

This document (EN 689:2018+AC:2019) 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 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of an identical text or by endorsement, at the latest by November 2018, and conflicting national standards shall be withdrawn at the latest by November 2018.

This document includes Corrigendum 1 issued by CEN on 10 April 2019.

This document includes the corrigendum 1 which modifies abbreviations, the content in several Annexes, and modifies the bibliography and references in the text.

This document supersedes AC EN 689:2018 AC.

The start and finish of text introduced or altered by corrigendum is indicated in the text by the tags AC AC.

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 689:1995.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This European Standard deals with the measurement of exposure to chemical agents in workplace atmospheres, and in particular with measurement strategy for comparing workers' exposure by inhalation with occupational exposure limit values (OELVs). Other parts of management of exposure of workers are not dealt with in detail in this European Standard.

Within this European Standard, compliance means that workers' time weighted average $\langle AC \rangle$ occupational $\langle AC \rangle$ exposure is below an OELV with a corresponding reference period. OELVs include legal values and other numerical criteria (see Annex B).

Representative measurement of $\langle AC \rangle$ occupational $\langle AC \rangle$ exposure to chemical agents is difficult, because of the variability of exposure. Processes and products affecting exposure are numerous. Different workplace conditions can correspond to different generation rates, can involve a variety of chemical agents and can therefore present specific exposure conditions. Exposure can be affected by the distance of the exposed workers from emission sources; and parameters such as emission intensity, ventilation, climatic conditions, seasonal variations and the controls applied can also have a very marked influence. The spatial and temporal variabilities of exposure conditions are further enhanced by workers' practices and activities themselves.

The sampling equipment introduces its own limitations, and the analytical steps add further difficulties and uncertainties.

This European Standard is applicable for measuring procedures that fulfil the requirements of EN 482. If a measuring procedure does not fulfil these requirements some parts of the procedure described in this European Standard cannot be applied.

To assess the exposure of workers to chemicals and to state with certainty that it does not exceed the OELVs (short-term or long-term) would require measurement of the exposure of every worker for every working day. Unfortunately while this approach is possible for some agents such as ionizing radiation, it is not feasible or practical for many chemical agents due to limitations of the measurement techniques and costs.

The strategy described in this European Standard gives a procedure for the employer or other stakeholders to overcome the problem of variability and to use a relatively small number of measurements to demonstrate with a high degree of confidence that workers are unlikely to be exposed to concentrations exceeding the OELVs. To reduce the number of exposure measurements, and therefore the cost of assessment, personal air samples are collected among workers within similar exposure groups (SEGs). A single measurement or even several measurements below the limit value can be insufficient to reliably demonstrate compliance without using a statistical test like the one proposed in this European Standard.

Respiratory protective equipment (RPE) is used to reduce the amount of the chemical agent that is inhaled by the worker. However, this European Standard does not take into account the use and effectiveness of RPE in testing compliance with the OELV.

Before any measurements are performed, it is essential for an appraiser to conduct a basic characterization in order to collect relevant information on workplace factors, and the available information on exposure in the workplace concerned. This includes information on variation of exposure with time of day and season of the year, so that the measurement is representative.

If the basic characterization shows that exposure is probably higher than the OELV, then it is recommended to reduce exposure by risk management measures (RMM) before measurements are planned for compliance testing.

1 Scope

This European Standard specifies a strategy to perform representative measurements of exposure by inhalation to chemical agents in order to demonstrate the compliance with occupational exposure limit values (OELVs).

This European Standard is not applicable to OELVs with reference periods less than 15 min.

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

EN 1540, *Workplace exposure - Terminology*

3 Terms and definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1540 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1.1

appraiser

person who is sufficiently trained and experienced in occupational hygiene principles, working and measurement techniques, to conduct the part of the assessment they are performing according to the state of the art

Note 1 to entry: The appraiser may be supported by a team of qualified persons.

3.1.2

exposure profile

description of the exposure variations to a chemical agent in relation to the definable series of activities from the periods under consideration

Note 1 to entry: See Annex D.

3.1.3

similar exposure group

SEG

group of workers having the same general exposure profile for the chemical agent(s) being studied because of the similarity and frequency of the tasks performed, the materials and processes with which they work, and the similarity of the way they perform the tasks