Workplace exposure - Quantitative measurement of airborne endotoxins

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 14031:2021 sisaldab Euroopa standardi EN 14031:2021 ingliskeelset teksti.	This Estonian standard EVS-EN 14031:2021 consists of the English text of the European standard EN 14031:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 14.07.2021.	Date of Availability of the European standard is 14.07.2021.
Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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EUROPEAN STANDARD

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English Version

Workplace exposure - Quantitative measurement of airborne endotoxins

Exposition sur les lieux de travail - Mesure quantitative des endotoxines aéroportées

Exposition am Arbeitsplatz - Quantitative Messung von luftgetragenen Endotoxinen

This European Standard was approved by CEN on 7 June 2021.

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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 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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Contents

Page

European foreword

This document (EN 14031:2021) 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 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 January 2022, and conflicting national standards shall be withdrawn at the latest by January 2022.

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 14031:2003.

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

a) document title adjusted to the wording used in the Scope;

b) terms and definitions taken over from EN 13098:2019, where appropriate;

c) Clause 4 restructured;

d) requirements for sample storage at the laboratory rewritten;

e) recommendations for extraction of samples revised;

f) storage conditions described more precisely;

g) further requirements on documentation of extraction added;

h reference given to the recombinant Factor C (rFC) method as Note to 6.1;

i) new Table A.1 with examples on working areas with exposure to endotoxin added;

j) new Annex C on deposition of endotoxins on inner sampler walls added;

k) whole document editorially revised.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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.

Introduction

The term 'endotoxin' refers to lipopolysaccharides that are present in the outer membrane of the cell walls of Gram-negative bacteria. These lipopolysaccharides are a class of pure lipid carbohydrate molecules (free of protein and other cell wall components) that are held responsible for most of the biological properties characteristic of bacterial endotoxins.

Endotoxins play an important role in the development of organic dust-related symptoms (for example, inflammatory reactions in the airways and/or systemic reactions) among workers exposed via inhalation.

To investigate ill health resulting from occupational exposure to airborne endotoxins it is important therefore to measure their presence in workplace air accurately. At present, different methods are used to measure airborne endotoxins. Standardization with respect to sampling, transportation, extraction, analytical methods and storage of samples or extracts is important in order to obtain accurate and comparable results and reduce uncertainties in exposure assessment.

1 Scope

This document specifies methods for the quantitative measurement of airborne endotoxins and gives general requirements for sampling on filters, transportation, storage as well as the analysis of samples.

This document provides also guidelines for the assessment of workplace exposure to airborne endotoxins.

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 1540, *Workplace exposure — Terminology*

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

3 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 https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

Note 1 to entry: In particular, the following terms used in this document are defined in EN 1540: aerosol, biological agent, bioaerosol, exposure (by inhalation), inhalable fraction, measuring procedure, personal sampling, static sampling and workplace.

3.1
control standard endotoxin
CSE
standard that is traceable to the reference standard endotoxin (RSE)

3.2
endotoxin
constituent of the external membrane of Gram-negative bacteria (lipopolysaccharide), consisting of a complex lipid, lipid A, which is covalently bound to a polysaccharide

Note 1 to entry: "Free endotoxin" is liberated after cell death and by budding from living cells. Lipid A is the active (toxic) part and is a potent pro-inflammatory substance and can induce febrile, bronchial and other symptoms in exposed workers. The composition and the toxicity of endotoxin differ between bacteria species.

Note 2 to entry: A brief overview with respect to physical and chemical properties of endotoxins and sources of occupational exposure is given in Annex A.

[SOURCE: EN 13098:2019, 3.9 – modified, Note 2 to entry added]