ILNAS

Institut luxembourgeois de la normalisation
de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 14175-8:2022

Fume cupboards - Part 8: Fume cupboards for work with radioactive materials

Abzüge - Teil 8: Abzüge für Arbeiten mit radioaktiven Materialien

Sorbonnes - Partie 8 : Sorbonnes pour matières radioactives

07/2022

National Foreword

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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN 14175-8

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English Version

Fume cupboards - Part 8: Fume cupboards for work with radioactive materials

Sorbonnes - Partie 8 : Sorbonnes pour matières radioactives

Abzüge - Teil 8: Abzüge für Arbeiten mit radioaktiven Substanzen

This European Standard was approved by CEN on 29 May 2022.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 14175-8:2022) has been prepared by Technical Committee CEN/TC 332 “Laboratory equipment”, 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of an identical text or by endorsement, at the latest by January 2023, and conflicting national standards shall be withdrawn at the latest by January 2023.

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.

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Introduction

Before using radioactive materials, a safety (risk) assessment is performed with reference to legislation and advice from radiation protection experts.

The maximum amount of activity allowed for every activity with radioactive material is evaluated in accordance to the three principles of radiological protection, namely justification, optimization, and the application of dose limits, clarifying how they apply to radiation sources delivering exposure and to individuals receiving exposure. Shielding or abatement system when appropriate are also evaluated.

There are three kinds of dose in radiological protection. Absorbed dose is a measurable, physical quantity, while equivalent dose and effective dose are specifically for radiological protection purposes. Dose is used in this document as defined in IAEA Glossary 2018.

Attention is drawn to the publication IAEA SAFETY STANDARDS SERIES, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards General Safety Requirements Part 3 (No. GSR Part 3).

1 Scope

This document specifies the characteristics of fume cupboards, as defined in EN 14175-1, for work with unsealed radioactive materials with specific requirements regarding radiation protection. It does not apply to fume cupboards, glove boxes or hot cells (shielded radiation containment cells which can incorporate fume extraction).

The purpose of this document is to set out rules for the design and testing of fume cupboards for work with unsealed radioactive materials, in order to provide guidelines for the manufacturer, planner, installer, operator, assessor and the authorities.

This document only covers bench type fume cupboards.

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 13150, *Workbenches for laboratories in educational institutions - Dimensions, safety and durability requirements and test methods*

EN 14056, *Laboratory furniture - Recommendations for design and installation*

EN 14175-1, *Fume cupboards - Part 1: Vocabulary*

EN 14175-2:2003, *Fume cupboards - Part 2: Safety and performance requirements*

EN 14175-3:2019, *Fume cupboards - Part 3: Type test methods*

EN 14175-4, *Fume cupboards - Part 4: On-site test methods*

EN 14175-6, *Fume cupboards - Part 6: Variable air volume fume cupboards*

ISO 16170:2016, *In situ test methods for high efficiency filter systems in industrial facilities*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 14175-1, EN 14175-2:2003, EN 14175-3:2019, EN 14175-4, EN 14175-6 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

3.1
abatement system
equipment dedicated to the removal or reduction of pollutants from releases from installation to air or liquid

Note 1 to entry: Examples for abatement systems are filters, scrubbers or holding tanks.

3.2
activity
quantity A of radionuclide that disintegrates in a second, defined as:

$$A(t) = \mathrm{d}N / \mathrm{d}t$$

where

$\mathrm{d}N$ is the expectation value of the number of spontaneous nuclear transformations from the given energy state in the time interval $\mathrm{d}t$.

Note 1 to entry: The SI unit for activity is reciprocal second (s^{-1}), termed becquerel (Bq).

Note 2 to entry: This definition is generally based on the definition of activity given in Council Directive 2013/59/Euratom.

3.3
chamber
materials that form the work space

3.4
contamination
unintended or undesirable presence of radioactive substances on surfaces or within solids, liquids or gases or on the human body

Note 1 to entry: The term 'contamination' might have a connotation that is not intended. The term 'contamination' refers only to the presence of radioactivity, and gives no indication of the magnitude of the hazard involved.

[SOURCE: Council Directive 2013/59/Euratom, Chapter II, Article 4 (18) – modified, Note 1 to entry was added]

3.5
decontamination
complete or partial removal of contamination by a deliberate physical, chemical or biological process

Note 1 to entry: This definition is intended to include a wide range of processes for removing contamination from people, equipment and buildings, but to exclude the removal of radionuclides from within the human body or the removal of radionuclides by natural weathering or migration processes, which are not considered to be decontamination.

[SOURCE: IAEA SAFETY STANDARDS SERIES, Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards General Safety Requirements Part 3 (No. GSR Part 3)]

3.6
exposure
act of exposing or condition of being exposed to ionising radiation

Note 1 to entry: If exposure is taken place outside the body this is called external exposure. If exposure is taken place inside the body, this is called internal exposure.

Note 2 to entry: This definition is generally based on the definition of exposure given in Council Directive 2013/59/Euratom.