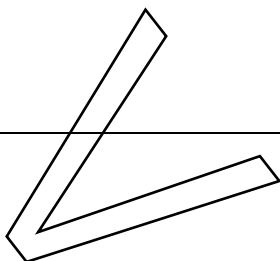


april 2018
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Commentaar vóór 2018-05-14



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Voorbeeld
Preview

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 17242

March 2018

ICS 71.040.10

English Version

Recirculatory Filtration Fume Cupboards

Sorbonnes à recirculation

Umluft-Filter-Einhausung

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 332.

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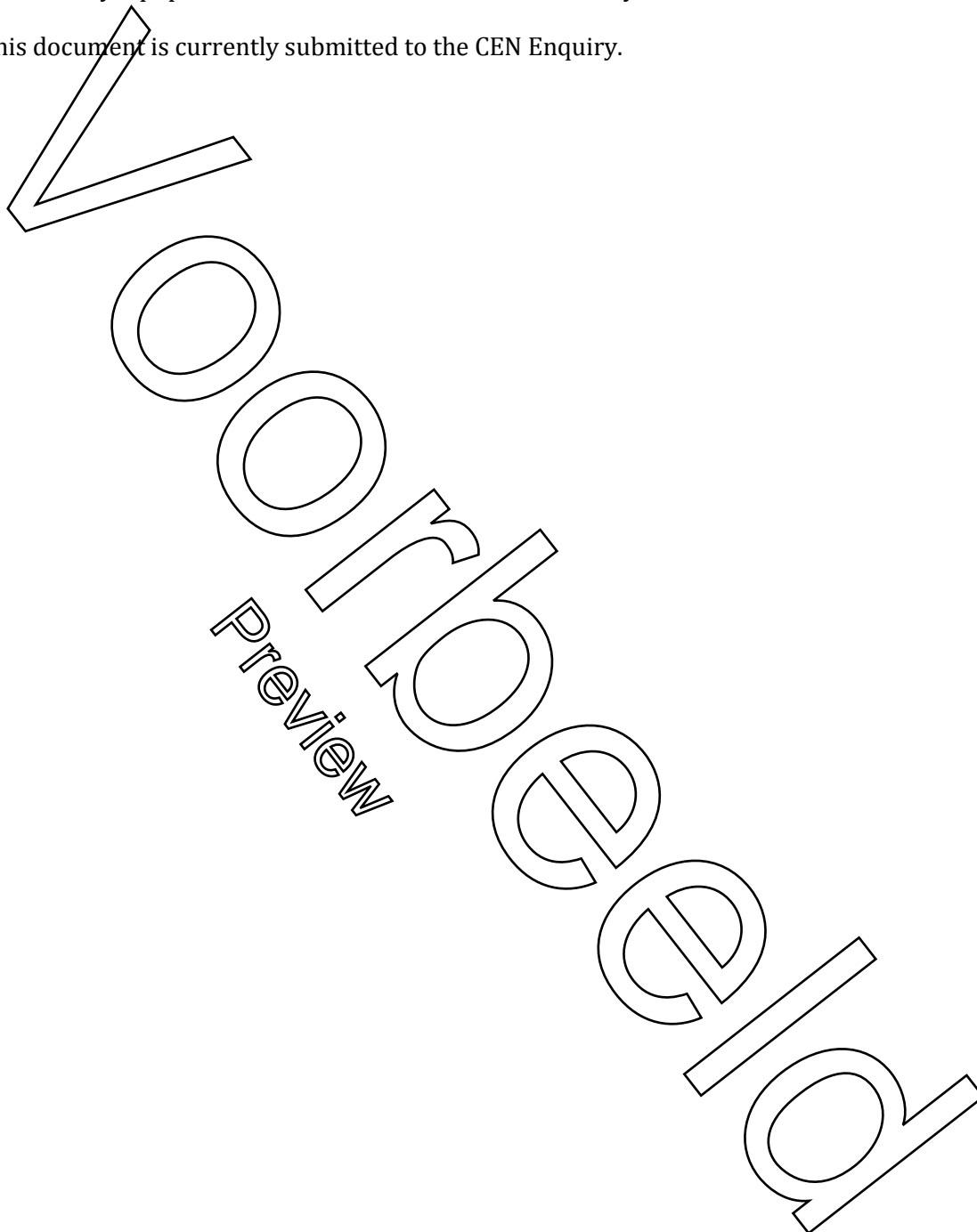
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European foreword

This document (prEN 17242:2018) has been prepared by Technical Committee CEN/TC 332 "Laboratory equipment", the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.



prEN 17242:2018 (E)**1 Scope**

This document applies to Recirculatory Filtration Fume Cupboards (RFFC).

Recirculation Filtration Fume Cupboards are devices intended to protect their users by means of:

- the ability to contain potentially hazardous materials;
- the ability to remove potentially hazardous materials from air exhausted from within the fume cupboard by means of filtration before the air is recirculated (to the room in which the fume cupboard is located).

This document includes design and manufacturing requirements together with type testing procedures.

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

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

EN 14175-3, *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*

EN 1822-1, *High efficiency air filters (HEPA, HEPA and ULPA) — Part 1: Classification, performance testing, marking*

EN ISO 14644-3:2005, *Cleanrooms and associated controlled environments — Part 3: Test methods (ISO 14644-3:2005)*

EN ISO 14644-1, *Cleanrooms and associated controlled environments — Part 1: Classification of air cleanliness by particle concentration (ISO 14644-1)*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in EN 14175-1 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**filtration system**

assembly of components that are used to remove/trap airborne contaminants

Note 1 to entry: It can be arranged to remove/trap particulates and/or gases/vapours by means of a single filter or a combination of two or more filters.

3.2**filtration fume cupboard****FFC**

fume cupboard equipped to remove materials from the exhaust air stream

3.3**recirculation filtration fume cupboard****RFFC**

fume cupboard equipped to remove materials from the exhaust air stream before recirculation to the room in which it is located

3.4**gas and vapours filter**

filter used to remove vapours or gases from an air stream

Note 1 to entry: It could for example, be an activated carbon filter.

3.5**particulate filter**

filter used to remove particulates from an air stream

Note 1 to entry: It could for example, be HEPA filter.

3.6**pre-filter**

initial stage of filtration used to remove particulates and/or gases/vapours prior to other components (of a filtration system) having higher removal efficiencies

3.7**limit value**

exposure limit of the challenge chemicals

Note 1 to entry: Expressed in 10^{-6} (ppm V) or in mg/m^3

Note 2 to entry: In this standard the value is the lowest published limit in GESTIS databases.

4 Classification of Recirculatory Filtration Fume Cupboards

The filtration fume cupboard of the present standard has the following 3-part classification:

X (general type of application) / **Y** (filters class) / **Z** (monitoring arrangements)

The details are set out below.

General type of application:

- Class A: RFFCs with integral filters;
- Class B: RFFCs with associated filters.

Filters:

- 1: particulate filter;
- 2: gas and vapour filter;
- 3: particulate and gas and vapour filters;

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- 4: other filtration devices or arrangements including those for FFCs having internal, filtered recirculation.

Filter monitoring arrangements:

- 0: no filter condition monitoring arrangements;
- 1: in-built continuous filter condition monitoring arrangements.

EXAMPLE

Examples for the designation of a RFFC with integral particulate and chemical filters and continuous filter conditioning monitoring would be:

Class A / 3 / 1.

5 Requirements of Recirculation Filtration Fume Cupboards**5.1 General requirements**

Filtration fume cupboards shall fulfil the requirements as given in EN 14175-2 with addition of the following chapters.

NOTE In many cases the life and efficiency of filters can be extended by pre-treatment of the extracted air.

5.2 Gas and vapour filtration

The chemicals that can be removed by the filtration system shall be identified by a label carrying the same information as that given to the operator in Clause 9 Marking.

For filtration evaluation reference should be made to the GESTIS International Limit Values from which the lowest limit values should be used. When a particular chemical under consideration is not in this list, an individual risk assessment shall be carried out to establish the suitability of filtration fume cupboard.

The filtration system of filtration fume cupboards shall be resistant to chemical agents allowed of being used in the filtration fume cupboards.

The design of the filtration system shall be such that filters can be changed by someone suitably trained without them requiring physical contact with the filter itself. Safe methods of changing filters shall be fully described in the product manual.

The filter installation date and its latest projected replacement date shall be indicated on the front of the FFC or in the fume cupboard log book attached to the fume cupboard manual.

NOTE Back-up gas and vapour filters, located after the primary gas and vapour filter can be requested by regulations, guidelines or recommendation in some countries.

RFFCs of classes A or B shall be submitted to the following tests:

- in the case of filters designed to be used with volatile organic chemicals: two successive types tests shall be made, one with cyclohexane (C_6H_{12} ; CAS n°110-82-7) and the other with isopropanol (C_3H_8O ; CAS n° 67-63-0). Each test shall be performed with a new filter following the procedure described in 6.2;
- in the case of filters designed to be used with acid vapours: a type test will be carried out with hydrochloric acid (HCl; CAS n° 7647-01-0) following the procedure described in 6.2;

- in the case of filters designed to be used with amines: a type test will be carried out with ammonia (NH_3 ; CAS n° 7664-41-7) following the procedure described in 6.2;
- in the case of filters designed to be used with formaldehyde: a type test will be carried out with formaldehyde (CH_2O ; CAS n° 50-00-0) following the procedure described in 6.2.

The filtration system of RFFCs of classes A and B shall not have a release at the filter or filters exhaust of more than 1% of the exposure limit value within the adsorption or chemisorption of the minimum quantities (LOW) of chemicals listed in 6.2.

5.3 Particulate filtration

RFFCs of classes A or B equipped with filter systems of type 1 or 3 shall have a particulates filter.

NOTE For example HEPA filters with efficiency H14 at least, as defined in EN 1822-1.

During the life of the filter its pressure drop will increase as it loads. This should be monitored to ensure that manufacturer's recommendations are not exceeded.

5.4 Filter monitoring arrangements

5.4.1 Fume cupboards without continuous filter monitoring

Fume cupboards without continuous filter monitoring shall have a procedure for checking the condition of the filter. A sampling port shall be equipped on the fume cupboard in order to allow this routine testing.

NOTE This can include an audible and visual alarm triggered by an adjustable hours run counter that informs the user of the need to perform a routine test of the filters efficiency. The filter replacement interval time will typically be set following a risk assessment.

Particulate filter saturation can be checked with, for example, a manometer or a flow sensor.

Gas and vapour filters can be checked measuring the air quality at the filter exhaust using portable detection equipment such as PID, GC, Colorimetric tubes or similar devices.

5.4.2 Fume cupboards with continuous filter monitoring

Fume cupboards with continuous filter monitoring shall automatically and continuously measure the efficiency of the filtering system.

In case of gas and vapour filters an audible and visual alarm shall inform the user when the concentration at the filter exhaust reaches a level of 1% of the exposure limit used in the RFFC. When detectors are not able to achieve detection of 1% of the exposure limit, manufacturer shall clearly inform users about detection limits of embedded sensors in its documentation.

All sensors shall be calibrated to the manufacturer's requirements and recommendations.

EXAMPLE Saturation sensors are: Photoionization sensors; electrochemical sensors; metal oxide array sensor.

In the case of particulates filters a continuous filter monitoring system that detects the degree of loading of the filter shall be installed. The RFFC shall be capable of maintaining the specified design air flow rate as filter element(s) load.

The particulate filter saturation level can be checked by measuring the face velocity at the working opening. If it is lower than any critical value declared in the product manual the filter(s) should be replaced.

NOTE Examples of sensors can include hot wire anemometers and differential manometers.

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