

English Version

## Laboratory installations - Ventilation systems in laboratories

Installations de laboratoire - Systèmes de ventilation  
pour laboratoires

Laboreinrichtungen - Lufttechnik in Laboratorien

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## European foreword

This document (CEN/TS 17441:2020) has been prepared by Technical Committee CEN/TC 332 “Laboratory equipment”, the secretariat of which is held by DIN.

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## Introduction

Operation of ventilation systems in laboratory buildings or in individual laboratory rooms requires particular care and attention due to its safety relevance. This applies for users of ventilation systems as well as for operators of laboratory buildings.

This technical specification supports design, planning, execution and maintenance tasks of these ventilation systems. A special expertise with regard to the operation and function of laboratories and the effectiveness of technical laboratory equipment is required, particularly because of the many possible interfaces for extract air equipment relevant to safety.

## 1 Scope

This document applies for the planning, design, installation and commissioning of ventilation systems in laboratories. It also applies for scientific classrooms in schools when equipped with a ventilation system.

The application of this document depends not on the term laboratory in its narrower sense but this document also applies also for laboratory-related rooms in which work with dangerous or health hazardous substances is performed.

## 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 12128:1998, *Biotechnology — Laboratories for research, development and analysis — Containment levels of microbiology laboratories, areas of risk, localities and physical safety requirements*

EN 12792:2003, *Ventilation for buildings — Symbols, terminology and graphical symbols*

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

EN 14175-7, *Fume cupboards — Part 7: Fume cupboards for high heat and acidic load*

EN 14470-1, *Fire safety storage cabinets — Part 1: Safety storage cabinets for flammable liquids*

EN 14470-2, *Fire safety storage cabinets — Part 2: Safety cabinets for pressurised gas cylinders*

EN 16798-1, *Energy performance of buildings — Ventilation for buildings — Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics — Module M1-6*

EN 16798-3:2017, *Energy performance of buildings — Ventilation for buildings — Part 3: For non-residential buildings — Performance requirements for ventilation and room-conditioning systems (Modules M5-1, M5-4)*

CEN/TR 16798-4:2017, *Energy performance of buildings — Ventilation for buildings — Part 4: Interpretation of the requirements in EN 16798-3 — For non-residential buildings — Performance requirements for ventilation and room-conditioning systems (Modules M5-1, M5-4)*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12792 and the following apply. For the different types of air in a laboratory or in a laboratory building EN 16798-3:2017, Table 6, applies.

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 <https://www.iso.org/obp/ui>

### 3.1 laboratory

workspace with associated areas, such as access and support areas, with specific technical requirements for which ventilation may be required

Note 1 to entry: In a laboratory, tasks are usually carried out during which possible hazards or potential sources of nuisance, e.g. due to substances or procedures, can be kept under control. A ventilation system is usually essential for such a task and can also be necessary for environmental control.

### 3.2 useable laboratory floor space

floor space of a laboratory room or a laboratory area; not included as useable laboratory floor space are constructionally separated corridors and areas used for writing or analysis of results with a separated ventilation

Note 1 to entry: Areas for writing or analysis of results can be considered to be separated from the useable laboratory floor space e.g. by a suitable directed air flow.

### 3.3 extract air equipment

laboratory equipment that requires specified extract air volumes for its proper function, e.g. fume cupboards, safety storage cabinets and local extract devices (see 3.9) or safety workbenches with extract air connection

Note 1 to entry: Extract air equipment may need constant, intermitting or a continuously changing (hereinafter referred to as “variable”) extracted air. Knowledge of all extract air equipment of a laboratory (see 3.4 to 3.17.) is important for balancing the air volumes of the ventilation system.

### 3.4 fume cupboard

protective device to be ventilated by an induced flow of air through an adjustable working opening

- with an enclosure designed to limit the spread of airborne contaminants to operators and other personnel outside the device,
- offering a degree of mechanical protection, and
- providing for the controlled release of airborne contaminants

Note 1 to entry: A fume cupboard is a ventilated enclosure complying with the requirements specified in EN 14175-2.

[SOURCE: EN 14175-1:2003, 3.1]

### 3.5 pressure cascade

process whereby air flows from one area, which is maintained at a higher pressure, to another area at a lower pressure

### 3.6 recirculatory filtration fume cupboard

protective device able, by trapping specified pollutants, to exhaust air back to the room

[SOURCE: EN 14175-1:2003, 3.6 modified - “room” was deleted from “room air” in the definition]