



BSI Standards Publication

Laboratory design — Vocabulary

National foreword

This British Standard is the UK implementation of ISO 22544:2025.

The UK participation in its preparation was entrusted to Technical Committee LBI/1/1, Laboratory furniture and fittings.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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© The British Standards Institution 2025
Published by BSI Standards Limited 2025

ISBN 978 0 539 29156 8

ICS 01.040.11; 01.040.71; 11.100.01; 71.040.10

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 December 2025.

Amendments/corrigenda issued since publication

Date	Text affected
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**International
Standard**

ISO 22544

Laboratory design — Vocabulary

Conception de laboratoire — Vocabulaire

**First edition
2025-12**

Reference number
ISO 22544:2025(en)

Full document details: BS ISO 22544:2025

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 336, *Laboratory design*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Laboratories play a crucial role across various economic sectors, and are integral for both operational and research and development (R&D) activities in fields such as:

- pharmaceuticals;
- agriculture and food production;
- consumer goods;
- healthcare;
- education;
- manufacturing;
- energy generation;
- law enforcement;
- environmental conservation; and
- waste management.

Laboratory design involves plans and requirements for the assembly or construction of a space and its fixed contents to allow personnel to conduct laboratory work in a healthy, safe, low risk, effective, comfortable and sustainable manner.

Laboratory design covers aspects such as safety, functionality, adaptability infrastructure, sustainability, ergonomics, and technology-readiness. The design process typically encompasses aspects of working spaces and storage, interior surfaces, water supply, ventilation systems, lighting and electricity and outflows of waste, extracted air and thermal load. The design process provides an opportunity to eliminate hazards and to mitigate risks concerning health, safety, well-being, property integrity and sustainability.

This document establishes the core terms and definitions relevant to laboratory design to create a consistent and precise vocabulary for practical application in this field of activity. It serves as a foundational reference for ISO/TC 336, *Laboratory design*, and offers guidance on terminology to support the development of new standards and future definitions.

This document serves as a reference for those involved in the planning, design, construction, operation, and ownership of laboratories, including architects, engineers, builders, laboratory designers and planners, laboratory personnel, facility managers and owners. Additionally, it is relevant to organizations and individuals within various industries who engage with laboratory facilities such as maintenance personnel, regulatory authorities, and certification agencies.

Laboratory design — Vocabulary

1 Scope

This document defines the core terms and definitions in the field of laboratory design.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

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

3.1 Terms related to laboratory structures

3.1.1

laboratory

any building or fixed part of a building used or intended to be used for scientific and related work for research and development, experimentation, testing, quality control, analysis, or teaching

Note 1 to entry: The laboratory can include areas such as instrument rooms, preparation rooms and stores, control rooms, write-up areas, and can include offices integral to the laboratory function.

Note 2 to entry: The term “laboratory” is commonly used to refer to individual workrooms used for scientific work. It can also refer to the total portion of the building devoted to scientific work. In a multi-occupancy building, the area occupied by the laboratory can be referred to as the “laboratory area”.

Note 3 to entry: Multiple disciplines can use the laboratory for preparative, analytical or application-related technology methods.

Note 4 to entry: Laboratory work can involve a variety of hazards such as chemical, physical, physico-chemical, biological, microbiological, medical, genetic engineering, and radiation, or processes including electrical or mechanical research and testing work.

Note 5 to entry: The term “laboratory” is sometimes applied to facilities such as computer rooms, mapping suites, and electronic workshops. In general, these facilities are not classed as laboratories covered by this document.

3.1.2

mobile laboratory

facility which is not a building or a fixed part of a building, is movable, transportable or relocatable, and performs research and development, experimentation, testing or calibration, metrology, education or community outreach

Note 1 to entry: Mobile laboratories are versatile and can be deployed in diverse settings, including remote or rural areas, disaster zones for rapid response, conflict zones, field research sites, urban locations, industrial sites, farms and food production areas, large events like festivals, marine environments and extreme conditions such as polar regions, high-altitude mountains, or outer space.

Note 2 to entry: A mobile laboratory can be delivered assembled or disassembled, and be contained in or loaded into a vehicle, train, marine vessel, aircraft, or spacecraft.

3.1.3

smart laboratory

laboratory (3.1.1) that utilizes digital and automation technology to synchronize online and offline operations, conduct experiments, and analyse data

Note 1 to entry: A smart laboratory can use advanced technologies such as Internet of Things (IoT), cloud computing, artificial intelligence, and blockchain to improve efficiency, data reliability, safety, and environmental protection.

3.1.4

modular laboratory

prefabricated modular laboratory

structure composed of prefabricated, standardized modules that can be quickly assembled, reconfigured, expanded, or relocated on site

Note 1 to entry: Modules are often built off-site in a factory and then transported to the final location.

Note 2 to entry: Modular laboratories can provide *scalability* (3.2.23) and *adaptability* (3.2.20) to meet changing operational, functional, environmental, and regulatory requirements across different locations.

3.1.5

laboratory building

building which is used for *laboratory* (3.1.1) activities

Note 1 to entry: Some countries specify a minimum percentage of a building space to be allocated to laboratory activities for it to be termed a “laboratory building”.

3.1.6

smart building

building that uses automation and technology to enable effective management of resources and systems

Note 1 to entry: Automation and technology can include sensors and communication networks.

Note 2 to entry: Management of resources and systems can include monitoring and control of heating, *ventilation* (3.4.23), lighting, *security* (3.3.18), *energy efficiency* (3.7.17), occupant comfort and operational costs.

3.1.7

airlock

enclosed space having two doors, situated between two spaces with different air conditions, making it possible to pass from one space to the other without significant disturbance to either *environment* (3.7.2)

Note 1 to entry: An airlock can be used by either people or goods to regulate conditions such as cleanliness and airflow when entering a controlled area.

[SOURCE: ISO 6707-1:2020, 3.2.4.12, modified — The spelling of the term has been changed from “air lock” to “airlock”; Note 1 to entry has been added.]

3.1.8

exit

designated point of departure from a building or from an enclosure

[SOURCE: ISO 13943:2023, 3.1.20]

3.1.9

building exit

any doorway, set of doors, or other form of portal that is ordinarily used for emergency egress or convenience exit

[SOURCE: ISO 16818:2008, 3.29]

3.1.10

means of egress

continuous and unobstructed path available for a person, valid or invalid, to leave a building, structure or space to reach a public way unexposed to fire threat

Note 1 to entry: Means of egress consist of three separate and distinct parts: 1) the exit access, 2) the *exit* ([3.1.8](#)), 3) the exit discharge.

[SOURCE: ISO/TS 17755-2:2020, 3.60]

3.1.11

means of escape

structural means whereby routes intended to be safe are provided for persons to travel from any point in a built environment to a place of safety

[SOURCE: ISO 13943:2023, 3.297]

3.1.12

travel distance

distance that needs to be travelled by a person from any point within a built environment to the nearest *exit* ([3.1.8](#)), having regard to the layout of walls, partitions and fittings

Note 1 to entry: Travel distance can also include travel to emergency equipment such as fire extinguishers or *emergency safety showers* ([3.5.12](#)).

[SOURCE: ISO 13943:2023, 3.456, modified — The domain “<escape from fire>” has been removed; Note 1 to entry has been added.]

3.1.13

cove

coving, GB

concave moulding at, or fitted to, the internal angle between two surfaces

Note 1 to entry: Coving is designed to eliminate sharp corners for easier cleaning and improved hygiene.

Note 2 to entry: Typical coving in a laboratory is between the floor and wall.

[SOURCE: ISO 6707-1:2020, 3.3.5.69, modified — Notes 1 and 2 to entry have been added.]

3.1.14

plinth

projection or recess at the base of construction, such as a wall, column, or construction for raising equipment above the level of the floor

[SOURCE: ISO 6707-1:2020, 3.3.5.16]

3.2 Terms related to laboratory planning and design

3.2.1

laboratory design

strategic planning and development of physical and functional spaces for scientific and related work for research and development, experimentation, testing, quality control, analysis or teaching

Note 1 to entry: Laboratory design also includes requirements for constructing spaces and their contents.

3.2.2

operational concept

outline of how a system, process or facility is designed to operate, detailing its purpose, capabilities, essential operational activities and workflows to achieve intended outcomes

3.2.3**integrated project delivery****IPD**

construction project delivery method by which parties involved in the design, fabrication and construction aspects of a project are joined together under a single agreement to increase productivity, reduce conflict, prevent time overruns and enhance final product quality

Note 1 to entry: Involved parties typically include the owner, architect, contractor and other stakeholders.

3.2.4**room data sheet****RDS**

document that specifies the detailed requirements for an individual room or space to ensure consistency and compliance throughout the design and construction process

Note 1 to entry: A typical RDS includes the room or space function, dimensions, environmental requirements, finishes, services, furniture, fittings, and equipment, access and security features, and compliance requirements.

3.2.5**user requirement brief****URB**

document that outlines the specific needs, objectives and expectations of a facility from the perspective of the end user

Note 1 to entry: A URB can contain details such as the facility's purpose, functions, equipment, *workflows* ([3.2.6](#)), technology, *security* ([3.3.18](#)), collaboration spaces and compliance with regulations.

3.2.6**workflow****laboratory process workflow**

stepwise analysis of planned processes in the *laboratory* ([3.1.1](#)), which enables understanding and communication of the sequential steps in each process, and what facilities, services, systems and spaces are required at each step

Note 1 to entry: Laboratory process workflow can be further categorized into flow of personnel, specimens, samples, materials and *laboratory waste* ([3.6.27](#)).

3.2.7**inherently safe design**

measures taken to eliminate hazards and/or to reduce *risks* ([3.6.14](#)) by changing the design or operating characteristics of the product or system

[SOURCE: ISO/IEC Guide 51:2014, 3.5]

3.2.8**sustainable design**

discipline that aims to optimize the positive environmental, economic and social impacts of a product

[SOURCE: ISO 8887-2:2023, 3.39]

3.2.9**ecodesign**

systematic approach that considers environmental aspects in design and development with the aim to reduce adverse environmental impacts throughout the *life cycle* ([3.7.7](#)) of a product

Note 1 to entry: Other terminology used worldwide includes “environmentally conscious design (ECD)”, “design for environment (DfE)”, “green design” and “environmentally sustainable design”.

Note 2 to entry: Ecodesign can also include the life cycle of an asset or building.

[SOURCE: ISO 14006:2020, 3.2.2, modified — Note 2 to entry has been added.]

3.2.10

environmental impact assessment

EIA

tool used to identify the environmental impacts of a project, asset and activity prior to decision-making

Note 1 to entry: The tool can be used to assess a project, asset and activity during its various stages, including when it is finished.

Note 2 to entry: An organization's activities or products or services can be a project, asset and activity to be considered for a request for financing.

[SOURCE: ISO 14100:2022, 3.1.6]

3.2.11

infrastructural-climate design

planning of infrastructure to optimize climate-related factors such as temperature, humidity, air quality, *ventilation* (3.4.23) and natural lighting for safety, comfort, functionality and *energy efficiency* (3.7.17) in different climate zones and extreme conditions

3.2.12

lighting design

consideration of visual factors such as uniformity, colour, *glare* (3.4.42), shadows and surface brightness, and vertical surface illumination

Note 1 to entry: Energy-saving technologies and controls can help achieve efficient lighting solutions.

3.2.13

universal design

design of products, *environments* (3.7.2), programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design

Note 1 to entry: Universal design shall not exclude assistive devices for particular groups or *persons with disabilities* (3.8.7) where this is needed.

Note 2 to entry: Terms such as universal design, *accessible design* (3.2.14), design for all, barrier-free design, inclusive design and transgenerational design are often used interchangeably with the same meaning.

[SOURCE: ISO/IEC Guide 71:2014, 2.18]

3.2.14

accessible design

design focused on diverse users to maximize the number of potential users who can readily use a system in diverse contexts

Note 1 to entry: This aim can be achieved by (1) designing systems that are readily usable by most users without any modification, (2) making systems adaptable to different users (by providing adaptable user interfaces) and (3) having standardized interfaces to be compatible with assistive products and assistive technology.

Note 2 to entry: Terms such as *universal design* (3.2.13), accessible design, design for all, barrier-free design, inclusive design and transgenerational design are often used interchangeably with the same meaning.

[SOURCE: ISO/IEC Guide 71:2014, 2.19]

3.2.15

accessibility

provision of buildings or parts of buildings for people, regardless of their age, size, ability or disability, to be able to gain access to them, into them, to use them and exit from them

Note 1 to entry: Accessibility includes ease of independent approach, entry, evacuation and/or use of a building and its services and facilities, by all of the building's potential users with an assurance of individual health, safety and welfare during the course of those activities.

[SOURCE: ISO 21542:2021, 3.1]