INTERNATIONAL STANDARD

ISO 15928-7

First edition
2021-06

Houses — Description of performance —

Part 7: Accessibility and usability

Constructions d'habitation — Description des performances —

Partie 7: Accessibilité et utilisabilité

Reference number
ISO 15928-7:2021(E)

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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 documents 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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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 59, *Buildings and civil engineering works*, Subcommittee SC 15, *Framework for the description of housing performance.*

A list of all parts in the ISO 15928 series can be found on the ISO website.

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

This document is one of a series under the general title "Houses — Description of performance". The objective of the ISO 15928 series is to identify the methods used to describe the performance of houses. The ISO 15928 series is confined to buildings occupied for residential purposes that may be separated or linked horizontally, but not linked vertically, and which have their own access and do not share any common space.

Each part of the ISO 15928 series relates to a separate attribute. ISO 15928 (all parts) do not specify levels of performance and are not intended to replace national standards, but to provide a standardized framework to facilitate the development of national standards. ISO 15928 (all parts) do not provide design methods and/or design criteria.

Based on the framework provided by the ISO 15928 series, purchasers, regulators and standards writers in their respective countries can describe their requirements in standardized performance terms, as appropriate. Additionally, the manufacturers/providers can respond by describing the performance of their products in a similar manner. The purpose of this document is to provide a standardized system of describing performance that can be used to specify performance requirements and performance levels, or to rate houses in terms of accessibility, usability, and safety during use.

The intent is to provide a standardized system that is to be used to realize performance description.

The objectives of this document are as follows:

a) to facilitate international trade in housing systems and housing products and to exchange housing information and knowledge by eliminating technical barriers;

b) to facilitate innovation in housing by providing a systematic framework for evaluation and acceptance;

c) to establish user needs related to in specific technical engineering terms in order to facilitate communication among all stakeholders.

This document can also be useful in increasing consumer product awareness and in developing quality systems for houses.

NOTE Annex A provides a commentary on this document.

Houses — Description of performance —

Part 7: Accessibility and usability

1 Scope

This document sets out a method for describing the performance of houses. It covers user needs, provides performance descriptions, and outlines evaluation processes. It includes the description of relevant parameters necessary to ensure accessibility and usability in houses. It also includes features to ensure safety during daily use, i.e., reasonable consideration to prevent accident like tripping, falls, or collision.

This document is intended for use in the evaluation of the design and construction of houses, in the international trading of houses or their sub-systems, and in developing risk-management tools for the protection of houses. It does not specify a level of performance and it is not intended to provide design method and/or criteria.

NOTE 1 Structural safety, fire safety, and other performance attributes of a house are covered in other parts of the ISO 15928 series.

NOTE 2 Exporting a house (as a complete set, "kit house" for example) does mean that the site is not necessarily predetermined. Therefore, surrounding conditions cannot be known in advance. Even the interface between the entrance door and the ground cannot be predetermined (including how flat entry can be achieved). It is up to the builder and the client to decide how to design the interface. However, design examples for accessibility can be given.

NOTE 3 The way to describe performance of buildings is given in ISO 19208.

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.

ISO 6707-1, *Buildings and civil engineering works — Vocabulary — Part 1: General terms*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6707-1 and the following apply.

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

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

— IEC Electropedia: available at http://www.electropedia.org/

3.1
accident during use
accident (3.11) occurring as an interaction between building features and the *user* (3.7) during use

EXAMPLE Tripping, falling, collision, etc.

Note 1 to entry: Injury or fatality occurring from fire is excluded.

3.2
visitability
ability of a *house* (3.3) to accommodate a temporary visitor, not a permanent resident

3.3
house
building occupied for residential purposes and designed as one unit (dwelling)

Note 1 to entry: The house can be a separate building or linked horizontally with another house but not linked vertically.

Note 2 to entry: Where houses are linked, each has its own access and does not share any space in common with another.

[SOURCE: ISO 15928-2:2015, 3.5, modified — At the end of the definition, "with its own access" has been removed; notes 3, 4 and 5 to entry have been removed.]

3.4
parameters
group of variables used to quantitatively describe *performance* (3.5)

3.5
performance
behaviour of *houses* (3.3) related to *user needs* (3.8)

[SOURCE: ISO 15928-2:2015, 3.9, modified — "use" has been replaced by "user needs".]

3.6
performance description
statement that identifies agents which affect *performance* (3.5) in a qualitative manner and establishes how these agents affect the state of the *house* (3.3)

3.7
user
person that a *house* (3.3) is designed to accommodate

Note 1 to entry: Here, user includes children, seniors, and people with disabilities.

Note 2 to entry: A user can be a visitor who just stays in the house for a short period of time.

3.8
user needs
general statement of requirements for a *house* (3.3) that are regarded as being satisfactory by the *user* (3.7)

3.9
usability
characteristic of the built environment which can be used by everybody in convenience and safety

[SOURCE: ISO 21542:2011, 3.61]

3.10
accessibility
provision of buildings or parts of buildings for people, regardless of disability, age or gender, to be able to gain access to them, into them, to use them and exit from them

[SOURCE: ISO 21542:2011, 3.2, modified — Note 1 to entry has been removed.]

3.11
accident
unfortunate event, disaster, mishap

4 performance

4.1 User needs

In identifying and considering user needs, users are taken to be the owners and the occupiers of the house. The user needs are thought of in terms of the people living in the house. The acceptable level of performance can vary from user to user and can depend on user expectation. In this document, however, occupants are likely to include people of all ages and abilities. Besides, to some extent, needs of visitors shall be taken into account. It is why visitability is included in this document.

NOTE Users of this document can include regulators, specifiers, or emergency services personnel.

The performance of a house shall be such that the difficulty of the following activity does not exceed a level acceptable to the user:

a) access into the house;

b) circulating indoors through routes;

c) access to and use of space;

d) use of functional elements.

Also, a reasonable degree of safety during daily use shall be secured. Possibility of accidents during use shall be minimal.

NOTE Users are varied in their abilities: resulting requirements can vary considerably.

4.2 Performance description

The performance description is an expression of the ability of the house to fulfil the following requirements, with an appropriate degree of accessibility, usability, and safety:

a) ease of entry through an entrance door;

b) reasonable circulation dimensions to move around within a house;

c) ease of access and entry to essential rooms and spaces;

d) ease of reach and operation of functional elements like switches;

e) non-existence of dangerous accident triggering features.

NOTE Types of accidents and related building features are listed in Table 1. They are examples only and non-exhaustive.

Table 1 — Type of accidents

Type	Related building features
Fall: slip, trip	Floor
Fall: trip, misstep	Stairs
Fall: fall from height	Through window, over balcony
Collision	Against wall, opening, glass
Caught	Between objects
Hit	Falling objects
Rubbing against	Rough surfaces
Burns and scalds	Heat and fire
Electrocution	Electricity

Table 1 *(continued)*

Type	Related building features
Gas poisoning	Gas

4.3 Principles for describing performance

The performance can be described by accessibility, usability and safety of various building features, and in terms of a combination of some or all of the following:

a) level differences along the route;

b) effective width;

c) operating methods;

d) reachability;

e) spatial dimensions;

Also, design of major building features needs to be described for safety evaluation, which can include preventive measures.

NOTE Preventive measures can be markings, or physical barriers.

5 Parameters for the description of performance

5.1 General

The performance of a house shall, as a minimum, be described by a combination of parameters provided on each of the relevant building elements or building characteristics described in 4.3.

5.2 Parameters for the description of level differences

The parameters for describing level differences are:

a) nature of floor, i.e., existence/non-existence of steps along the route;

b) characteristics of the floor material;

c) design of door sills.

5.3 Parameters for describing effective width

The parameters for describing effective width are:

a) width of main entrance door;

b) width of sub entrance door, if any;

c) width of internal doors;

d) width of corridors;

e) width at the turn of corridor;

f) width of stairs, if any.

5.3.1 Parameters for describing operating methods for doors and windows

The parameters for describing the performance of doors and windows are:

a) type of operation, such as levers, knobs, or switches;

b) whether manually or automatically operated;

c) direction of movement, such as sliding or swing, and in case of swing, inward or outward;

d) forces needed to operate in case of manual operation.

5.3.2 Parameters for describing operating methods for lifts and stair climbers

The parameters for describing the performance of lifts and stair climbers are:

a) type of operation, such as buttons, or switches;

b) whether manually or automatically operated;

c) direction of movement, such as straight or winding.

5.4 Parameters for describing reachability

The parameters for describing reachability are:

a) relative position of devices to be operated;

b) existence/non-existence of obtruding objects as it would determine the effective distance from the user;

5.5 Parameters for describing spatial dimensions

The parameters for describing spatial dimensions are:

a) type of room or space, such as hallway, corridor, living room, kitchen, bedroom;

b) size of the entry door to the room or space;

c) size of the room or space;

5.6 Parameters for describing design of major building appliances

The parameters for describing design of major building appliances are the type of appliances installed, if any.

5.7 Parameters for describing features for safety evaluation

The parameters for describing features for safety evaluation are:

a) (warning) markings for potential accidents;

b) physical barriers to prevent direct contact.

6 Evaluation

6.1 General

Evaluation may be carried out by

a) analysis,

b) testing,

c) service experience, or

d) a combination of the above.

In evaluating any design, the design should present enough detailed information to allow its evaluation in terms of meeting the objectives when assessed against the user. The level can be ensured by comparing the proposed design to the expected performance.

6.2 Analysis

Whether the performance criteria have been satisfied can be determined by an analysis of the trial design. Analysis involves consideration of the occupant's assumed activities. Analysis methods can be used to evaluate the occupants of a house and their condition that affects their ability to safely and comfortably move around within the house. Such an analysis considers, among others, the location, type and activity of the assumed occupants.

6.3 Testing

When examples are already built, such as prototypes, actual user testing can be conducted.

6.4 Service experience

Service experience shall comprise a sufficient number of representative examples, together with adequate documentation.

6.5 Combination

A combination of analysis, testing and service experience may be used for evaluation. Simplified analytical procedures using a combination of results may be used.