
**Houses — Description of
performance —**

**Part 3:
Structural durability**

Constructions d'habitation — Description des performances —

Partie 3: Durabilité de la structure

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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Structural durability performance	2
4.1 Objective	2
4.2 Performance descriptions	2
5 Parameters for the description of performance	3
5.1 Parameters for describing the house service life	3
5.2 Parameters for describing component service life	3
5.3 Parameters for describing the maintenance schedule	3
5.4 Parameters for describing internal and external environmental agents	3
5.4.1 General	3
5.4.2 Parameters for geographical location	3
5.4.3 Parameters describing agents causing environmental actions	3
6 Evaluation	4
6.1 General	4
6.2 Evaluation methods	4
6.2.1 General	4
6.2.2 Field testing	5
6.2.3 Laboratory testing	5
6.2.4 Service experience	5
6.2.5 Modelling	5
6.2.6 Combination	5
Annex A (informative) Commentary	6
Bibliography	12

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 59, *Buildings and civil engineering works*, Subcommittee SC 15, *Performance description of houses*.

This second edition cancels and replaces the first edition (ISO 15928-3:2009), which has been technically revised.

ISO 15928 consists of the following parts, under the general title *Houses — Description of performance*:

- *Part 1: Structural safety*
- *Part 2: Structural serviceability*
- *Part 3: Structural durability*
- *Part 4: Fire safety*
- *Part 5: Operating energy*

The following part is under preparation:

- *Part 6: Sustainable development contributions*

Introduction

This part of ISO 15928 is one of a series of standards. The objective of the ISO 15928- series is to identify the methods that will be 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 ISO 15928 relates to a separate attribute. The parts of ISO 15928 do not specify levels of performance and they are not intended to replace national standards or regulations, but provide a standardized framework to be used for development of national standards and regulations consistent with World Trade Organization (WTO) requirements. The parts of ISO 15928 do not provide design methods and/or design criteria.

Based on the framework provided by the ISO 15928- series, purchasers, regulators and standards-preparers in 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 part of ISO 15928 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 structural durability.

NOTE The WTO *Agreement on technical barriers to trade*, Clause 2.8, states: "Whenever appropriate, members shall specify technical regulations based on product requirements in terms of performance, rather than design or descriptive characteristics."

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Houses — Description of performance —

Part 3: Structural durability

1 Scope

This part of ISO 15928 sets out a method for describing the structural durability performance of houses. It covers objectives, provides performance descriptions, establishes parameter descriptions and outlines evaluation processes.

This part of ISO 15928 is intended for use in the evaluation of the design and construction of houses, in the international trading of houses or their subsystems and in developing quality systems for houses.

The ISO 15928- series does not specify a level of performance and it is not intended to provide a design method and/or criteria.

NOTE 1 [Annex A](#) includes background information on this part of ISO 15928, guidance on its use and suggestions on good practice.

NOTE 2 Details on references referred to in Notes are provided on Bibliography.

NOTE 3 Structural safety, serviceability and other attributes are covered in other parts of ISO 15928.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2394, *General principles on reliability for structures*

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

ISO 13823, *General principles on the design of structures for durability*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6707-1, ISO 2394, ISO 13823 and the following apply.

3.1 components

part of a house that can be identified

EXAMPLE Floor, wall.

Note 1 to entry: Includes fittings.

3.2 house

building occupied for residential purposes and designed as one unit (dwelling) with its own access

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.

Note 3 to entry: Where houses are linked, services including those related to energy usage and supply, heating and ventilation may be shared.

Note 4 to entry: Where houses are linked, the wall between the houses is typically designed and constructed to limit the probability of fire spread between houses.

Note 5 to entry: See ISO 6707-1:2014, 3.1.3 for the definition of 'building'.

3.3 maintenance schedule

series of actions and time intervals between these actions to maintain the levels of structural safety and serviceability performance of the whole house over the service life

3.4 parameters

(structural durability) group of variables used to quantitatively describe the structural durability performance

3.5 performance

behaviour of houses related to use

3.6 service life

period of time after installation during which a house or its components meet or exceed the structural safety and serviceability performance requirements

4 Structural durability performance

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4.1 Objective

The structural durability performance of a house which may affect the occupants, the functioning of the house and/or property damage, shall be such that its service life and the necessary maintenance schedules for the house as a whole and for its components shall be acceptable to the user.

4.2 Performance descriptions

The performance description for structural durability is the ability of the whole house and its parts, with an appropriate degree of reliability, to fulfil its intended structural safety and serviceability performance in the environment in which it is located over the service life when subject to its intended use.

The structural durability performance can be expressed in terms of:

- a) the service life of the house as a whole;
- b) component service life including accessibility consideration for inspection, repair or replacement;
- c) the maintenance schedules required to achieve the service life of the house as a whole and/or its components as appropriate;
- d) internal and external environmental agents that are likely to occur in the house service life.

5 Parameters for the description of performance

5.1 Parameters for describing the house service life

The house service life shall be described in terms of years that the house is expected to be in use.

5.2 Parameters for describing component service life

The component service life (if less than that of the house) shall be described in terms of years, between the replacement of structural components under the maintenance schedule.

Accessibility of components for inspection, repair or replacement shall be described.

5.3 Parameters for describing the maintenance schedule

The maintenance schedule shall be described by specifying all technical and administrative actions and their frequencies during the service life to keep the house or its components capable of performing their required function.

NOTE Guidance on parameters required can be found in ISO 15686-5, (5.4.2).

5.4 Parameters for describing internal and external environmental agents

5.4.1 General

The parameters for describing internal and external environmental agents considered relevant to the structural durability are:

- a) the geographical location of the house;
- b) agents causing environmental actions.

5.4.2 Parameters for geographical location

The parameters for describing geographical location include:

- a) the distance from a coast-line, other geographical features or sources of pollutants;
- b) the climate zone;
- c) the physical location, e.g. latitude and longitude.

5.4.3 Parameters describing agents causing environmental actions

The following agents shall be considered if appropriate:

- a) moisture and contaminants;
- b) air and contaminants;
- c) soil and ground contaminants;
- d) biological agents;
- e) temperature;
- f) solar radiation;
- g) incompatible chemicals;

h) use or exposure.

NOTE Environmental action can also occur as the result of a self-aging process.

Where appropriate, the following parameters should be used to quantify these influences:

- duration of wetness;
- duration of exposure;
- freeze–thaw cycles;
- temperature;
- pH value for acidity;
- concentration of chemicals and contaminants.

An assessment should be made as to whether these influences act either individually or in combination.

6 Evaluation

6.1 General

ISO 13823 describes the following two procedures for the evaluation of structural durability performance:

- a) Service life format: This procedure consists of ensuring that the predicted structural design life of a whole house or component, allowing for variations in durability, equals or exceeds the specified design life of the house or component.
- b) Limit state format: This procedure consists of ensuring that, at all the times during the specified design life of the whole house or component, the performance requirements for structural safety and serviceability are satisfied.

6.2 Evaluation methods

6.2.1 General

Performance or properties for both whole house and components and material over time for a specified environment and maintenance schedule can be determined by:

- a) field testing;
- b) laboratory (accelerated) testing;
- c) service experience;
- d) modelling.

Experience shall be used only for identical component and in the same environment.

Modelling and experience shall be used for (i) similar component in the same environment or (ii) identical components in moderately different environments.

Modelling and testing (field or laboratory) shall be used for (i) innovative components or (ii) identical components in significantly different environments.

6.2.2 Field testing

Full-scale dwellings, assemblies, components or materials in dwellings can be exposed to a real environment for a stipulated length of time prior to the determination of structural safety or serviceability performance. It is necessary that scientifically justified principles be used to relate the performance after the exposed time to that at the service life as appropriate.

NOTE Guidance on the relevant principles can be found in ISO 15686-1 and ISO 15686-2.

6.2.3 Laboratory testing

Accelerated ageing in laboratory facilities may be used for all testing (whether for whole dwellings, components, assemblies or materials) prior to the determination of structural safety or serviceability performance in accordance with the methods in ISO 15686-1, ISO 15686-2 and ISO 15686-8. It is necessary that scientifically justified principles be used to relate the performance in the laboratory test to that in reality.

6.2.4 Service experience

Service experience may be used in the assessment of the working life either of the whole house or of the component life (see ISO 15686-2). It is necessary to derive the data from a sufficient number of representative examples exposed to similar or more severe conditions. It is also necessary that construction methods, components and materials be similar to those of the houses being analysed. It is necessary to have available adequate documentation of environments and the performance over time.

NOTE Guidance on appropriate methods to extract service life data from the appraisal of existing buildings can be found in ISO 15686-7.

6.2.5 Modelling

Modelling may be used to assess the durability performance of individual components. Modelling shall be in accordance with ISO 13823. Individual component modelling is required to assess:

- a) the change in form or properties over the service life, taking into account the maintenance schedule and the environmental agents;
- b) the effect of these changes on structural safety and serviceability performance.

6.2.6 Combination

A combination of field and laboratory testing, service experience and analysis may be used for evaluation.