INTERNATIONAL STANDARD

ISO 15928-5

First edition
2013-01-15

Houses — Description of performance —

Part 5: Operating energy

Constructions d'habitation — Description des performances —

Partie 5: Énergie d'exploitation

Reference number
ISO 15928-5:2013(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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 15928-5 was prepared by Technical Committee ISO/TC 59, *Buildings and civil engineering works*, Subcommittee SC 15, *Performance description of houses*.

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

Part 1: Structural safety

Part 2: Structural serviceability

Part 3: Structural durability

Part 4: Fire safety

Part 5: Operating energy

Introduction

This part of ISO 15928 is one of a series of standards titled *Houses — Description of performance*. 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 operating energy.

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."

Houses — Description of performance —

Part 5: Operating energy

1 Scope

This part of ISO 15928 sets out a method for describing the operating energy performance of houses. It covers user needs, provides performance descriptions and outlines evaluation processes. It includes the description of relevant parameters for external and internal climatic conditions, user functional requirements, energy used by the house and energy generated by the house.

This part of ISO 15928 is intended to be used for houses that may be separated from, or linked horizontally to, another house(s). Where houses are linked, and some sharing of services occurs, it is intended that energy usage performance may be assessed both for individual houses, as well as a group of houses that are linked together.

The ISO 15928 series is intended for use in the evaluation of the design and construction of houses and in the international trading of houses or their sub-systems.

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 Structural performance and other attributes are covered in other parts of ISO 15928.

2 Normative references

The following referenced documents are indispensable for the application 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, *Building and civil engineering — Vocabulary — Part 1: General terms*

ISO 13790, *Energy performance of buildings — Calculation of energy use for space heating and cooling*

ISO 16818, *Building environment design — Energy efficiency — Terminology*

ISO 23045, *Building environment design — Guidelines to assess energy efficiency of new buildings*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6707-1, ISO 16818 and the following apply.

3.1
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.

[SOURCE: ISO 15928-2:2005, 3.1, modified]

3.2
operating energy
net energy used by heating, cooling, ventilation, hot water, lighting system and other built-in appliances (cooking facility, food storage facility, etc.), taking into account all sources of energy including renewable energy sources and co-generation

3.3
performance description
statement that identifies agents, which affect performance in a qualitative manner, and establishes how these agents affect the state of the house

3.4
user
person that a house is designed to accommodate

3.5
parameters
group of variables used to quantitatively describe performance

3.6
performance
behaviour of houses related to user needs

3.7
user needs
general statements of requirements for a house that are regarded as satisfactory by the user(s)

3.8
functionality
suitability or usefulness for a specific purpose or activity

3.9
functional requirement
functionality that is required by the user of a house

3.10
efficiency
performance at specified rating conditions

[SOURCE: ISO 16818:2008, 3.68]

3.11
thermal comfort
condition of mind derived from satisfaction with the thermal environment

Note 1 to entry: Thermal comfort is the combined thermal effect of environmental parameters including air temperature, vapour pressure, air velocity, mean radiant temperature (fixed factors) and clothing and activity level of occupants (variable factors).

[SOURCE: ISO 16813:2006, 3.28]

3.12
renewable energy
energy from a source that is not depleted by extraction, such as solar energy (thermal and photovoltaic), wind, water power, renewed biomass

[SOURCE: ISO/TR 16344:2012, 2.1.123]

3.13
non-renewable energy
energy taken from a source which is depleted by extraction (e.g. fossil fuels)

[SOURCE: ISO/TR 16344:2012, 2.1.105]

4 Operating energy performance

4.1 User needs

The operating energy of a house shall be such that the risk of the following does not exceed (or meet) a level acceptable to the user:

— not having suitable living conditions in regards to thermal comfort and functionality;

— inefficient energy use;

— use of non-renewable energy resources;

— use of renewable energy resources.

4.2 Performance description

The performance description for operating energy is the expression of the ability of the house and its parts, with an appropriate degree of reliability, to provide suitable indoor climate conditions and to fulfil the user needs on energy usage in the environment it is located over the specified design working life when subject to its intended use and expected normal climate, in terms of the probability of:

a) the occupants experiencing suitable levels of thermal comfort,

b) the adequacy of internal illumination (lighting),

c) the availability of sufficient amounts of domestic hot water,

d) the efficient operation of other built-in appliances,

e) the consumption of energy being excessive, and

f) the depletion of non-renewable energy resources being excessive

NOTE 1 Built-in appliances are appliances that are fixed in place that cannot be removed or replaced easily. Typical examples are lighting and domestic hot water, but could also include other items such as stove and refrigeration unit.

NOTE 2 For the purpose of this part of ISO 15928, durability is not considered to have a bearing on the operating energy performance of a house.

4.3 Principles for describing operating energy performance

The operating energy performance of the house can be described by the energy consumed under normal use in relation to:

a) external climatic environment of the house,