



SLOVENSKI STANDARD

SIST EN 15217:2007

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Energijske lastnosti stavb - Metode za izražanje lastnosti energije in za certificiranje energije v stavbah

Energy performance of buildings - Methods for expressing energy performance and for energy certification of buildings

Energieeffizienz von Gebäuden - Verfahren zur Darstellung der Energieeffizienz und zur Erstellung des Gebäudeenergieausweises

Performance énergétique des bâtiments - Méthodes d'expression de la performance énergétique et de certification énergétique des bâtiments

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ICS:

91.120.10 Toplotna izolacija stavb Thermal insulation

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ICS 91.120.01

English Version

Energy performance of buildings - Methods for expressing energy performance and for energy certification of buildings

Performance énergétique des bâtiments - Méthodes d'expression de la performance énergétique et de certification énergétique des bâtiments

Energieeffizienz von Gebäuden - Verfahren zur Darstellung der Energieeffizienz und zur Erstellung des Gebäudeenergieausweises

This European Standard was approved by CEN on 10 May 2007.

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Foreword

This document (EN 15217:2007) has been prepared by Technical Committee CEN/TC 89 "Thermal performance of buildings and building components", the secretariat of which is held by SIS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2007, and conflicting national standards shall be withdrawn at the latest by December 2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association (Mandate M/343), and supports essential requirements of EU Directive 2002/91/EC on the energy performance of buildings (EPBD). It forms part of a series of standards aimed at European harmonisation of the methodology for the calculation of the energy performance of buildings. An overview of the whole set of standards is given in CEN/TR 15615.

Attention is drawn to the need for observance of EU Directives transposed into national legal requirements. Existing national regulations (with or without reference to national standards) may restrict for the time being the implementation of this European Standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Introduction

Expression of the energy performance of buildings is needed:

- to enable the establishment of regulations regarding energy performance of buildings;
- to encourage building designers, owners, operators and users to improve the energy performance of buildings.

This European Standard provides methods to express the energy performance of buildings in a way that serves these purposes. It is based on standards that provide methods to calculate or measure energy performance.

This European Standard is intended to be used:

- by developers of a procedure for building energy certification;
- by building authorities setting minimum requirements on the energy performance;
- by building designers, building owners, building operators and building users to assess the performance of a planned or existing building and ways to improve it, and to express this performance.

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1 Scope

This European Standard specifies:

- a) overall indicators to express the energy performance of whole buildings, including heating, ventilation, air conditioning, domestic hot water and lighting systems. This includes different possible indicators;
- b) ways to express energy requirements for the design of new buildings or renovation of existing buildings;
- c) procedures to define reference values;
- d) ways to design a procedure for building energy certification.

The standard can be applied to a group of buildings, if they are on the same lot, if they are serviced by the same technical building systems and if no more than one of them has a conditioned area of more than 1 000 m².

This European Standard provides different options at different levels. When this European Standard is used to set up national or regional methods for expressing energy performance and/or for energy certification of buildings, the choices between the options is not made by the individual user, but by authorized national or regional bodies.

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.

EN ISO 7345:1995, *Thermal insulation — Physical quantities and definitions* (ISO 7345:1987)

prEN 15603¹⁾, *Energy performance of buildings — Overall energy use and definition of energy ratings*

3 Terms and definitions

For the purposes of this document, terms and definitions given in prEN 15603 and in EN ISO 7345:1995 and the following apply.

3.1

energy certification

procedures enabling to produce an energy certificate

3.2

energy certificate

document recognised by a member state or a legal person designated by it, which includes the energy performance of a building

NOTE The meaning of the terms "certificate" and "certification" in this European Standard differ from that in EN ISO/IEC 17000.

1) prEN 15603 is a merge of prEN 15203 and prEN 15315.

- 3.3 energy class**
easy to understand metric (e.g. A to G) for indicating the energy performance of a building
- 3.4 reference value**
standard legal or calculated value against which an energy indicator is compared
- 3.5 energy performance requirement**
minimum level of energy performance that is to be achieved to obtain a right or an advantage: e.g. right to build, lower interest rate, quality label

- 3.6 calculated energy rating**
energy rating based on calculations of the weighted net delivered energy used annually by a building for heating, cooling, ventilation, domestic hot water and lighting

NOTE National bodies can decide whether other energy uses resulting from occupants' activities such as cooking, production, laundering, computer equipment etc. are included or not. If included, standard input data needs to be provided for the various types of building and uses. Lighting is always included except (by decision of national bodies) for residential buildings.

- 3.7 standard energy rating**
calculated energy rating using actual data for a building and a standard use data set

NOTE 1 The thermal envelope area represents the intrinsic annual energy use of a building under standardised conditions. This is particularly relevant to certification of standard energy performance.

NOTE 2 It can also be termed "asset energy rating". [SIST EN 15217:2007](https://standards.iteh.ai/catalog/standards/sist/74a1f7b5-dceb-4a78-a692-01f4e151afc6/sist-en-15217-2007)

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- 3.8 design energy rating**
calculated energy rating using design data for a building and a standard use data set

NOTE It represents the calculated intrinsic annual energy use of a designed building under standardised conditions. This is particularly relevant to obtain a building permit at the design stage.

- 3.9 tailored energy rating**
calculated energy rating using actual data for a building, and actual climate and occupancy data

- 3.10 standard use data set**
standard input data for internal and external climates, use and occupancy

NOTE 1 This set can also include information on surroundings (such as shading or sheltering by adjacent buildings).

NOTE 2 Such data sets are defined at national level.

- 3.11 measured energy rating**
energy rating based on measured amounts of delivered and exported energy

NOTE 1 The measured rating is the weighted sum of all energy carriers used by a building, as measured by meters or other means. It is a measure of the in-use performance of a building. This is particularly relevant to certification of actual energy performance.

NOTE 2 Also known as "operational rating".

3.12**energy performance indicator**

energy rating divided by conditioned area

3.13**measured energy indicator**

measured energy performance indicator divided by conditioned area

3.14**standard energy indicator**

standard energy performance indicator divided by conditioned area

3.15**building**

construction as a whole, including its envelope and all technical building systems, for which energy is used to condition the indoor climate, to provide domestic hot water and illumination and other services related to the use of the building

NOTE This term can refer to the building as a whole or to parts thereof that have been designed or altered to be used separately.

3.16**new building**

for calculated energy rating: building at design stage or under construction

for measured energy rating: building too recently constructed to have reliable records of energy use

3.17**existing building**

for calculated energy rating: building that is erected

for measured energy rating: building for which actual data necessary to assess the energy use are known or can be measured

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3.18**technical building system**

technical equipment for heating, cooling, ventilation, domestic hot water, lighting and electricity production

NOTE 1 A technical building system can refer to one or to several building services (e.g. heating system, heating and DHW system).

NOTE 2 Electricity production can include cogeneration and photovoltaic systems.

3.19**internal dimension**

length measured from wall to wall and floor to ceiling inside a room of a building

3.20**overall internal dimension**

length measured on the interior of a building, including interruptions by internal partitions

3.21**external dimension**

length measured on the exterior of a building

3.22**heated space**

room or enclosure which for the purposes of a calculation is assumed to be heated to a given set-point temperature or set point temperatures

**3.23
cooled space**

room or enclosure which for the purposes of a calculation is assumed to be cooled to a given set-point temperature or set point temperatures

**3.24
conditioned space**
heated and/or cooled space

NOTE The heated and/or cooled spaces are used to define the thermal envelope.

**3.25
unconditioned space**
room or enclosure which is not part of a conditioned space

**3.26
conditioned area**
floor area of conditioned spaces excluding non-habitable cellars or non-habitable parts of a space, including the floor area on all storeys if more than one

NOTE 1 Internal, overall internal or external dimensions can be used. This leads to different areas for the same building.

NOTE 2 Some services, such as lighting or ventilation, might be provided to areas not included in this definition (e.g. a car park).

NOTE 3 The precise definition of the conditioned area is given by national authorities.

NOTE 4 Conditioned area can be taken as the useful area mentioned in the Articles 5, 6 and 7 of the EPBD²⁾ unless it is otherwise defined in national regulations.

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**3.27
thermal envelope area**
total of the area of all elements of a building that enclose conditioned spaces through which thermal energy is transferred to or from the external environment or to or from unconditioned spaces

NOTE 1 Thermal envelope area depends on whether internal, overall internal or external dimensions are being used.

NOTE 2 The respective areas of the building envelope may be weighted with a (nationally fixed) reduction factor in case of e.g. unheated adjacent spaces and ground floors.

**3.28
energy carrier**
substance or phenomenon that can be used to produce mechanical work or heat or to operate chemical or physical processes

[ISO 13600:1997]

NOTE The energy content of fuels is given by their gross calorific value.

**3.29
energy need for heating or cooling**
heat to be delivered to or extracted from a conditioned space by a heating or cooling system to maintain the intended temperature conditions during a given period of time

²⁾ Directive 2002/91/EC of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings

NOTE 1 The energy need is calculated and cannot easily be measured.

NOTE 2 The energy need can include additional heat transfers resulting from non-uniform temperature distribution and non-ideal temperature control, if they are taken into account by increasing (decreasing) the effective temperature for heating (cooling) and not included in the heat transfer due to the heating (cooling) system.

3.30 delivered energy

energy, expressed per energy carrier, supplied to the technical building system through the system boundary, to satisfy the uses taken into account (heating, cooling, ventilation, domestic hot water, lighting, appliances etc.) or to produce electricity

NOTE 1 For active solar and wind energy systems the incident solar radiation on solar panels or on solar collectors or the kinetic energy of wind is not part of the energy balance of the building. It is decided at national level whether or not renewable energy produced on site is part of the delivered energy.

NOTE 2 Delivered energy can be calculated for defined energy uses or it can be measured.

3.31 exported energy

energy, expressed per energy carrier, delivered by the technical building systems through the system boundary and used outside the system boundary

NOTE 1 It can be specified by generation types (e.g. CHP, photovoltaic) in order to apply different weighting factors.

NOTE 2 Exported energy can be calculated or it can be measured.

3.32 net delivered energy

delivered energy minus exported energy, both expressed per energy carrier

NOTE 1 A balance of the delivered and exported energy per energy carrier can be performed only if the same primary energy factors and/or CO₂ coefficients apply to the delivered and exported amounts of that energy carrier.

NOTE 2 The term "net" can also be applied to quantities derived from net delivered energy, e.g. primary energy or CO₂ emissions.

3.33 primary energy

energy that has not been subjected to any conversion or transformation process

NOTE 1 Primary energy includes non-renewable energy and renewable energy. If both are taken into account it can be called total primary energy.

NOTE 2 For a building, it is the energy used to produce the energy delivered to the building. It is calculated from the delivered and exported amounts of energy carriers, using conversion factors.

4 Symbols and abbreviations

Table 1 — Symbols and units

Symbol	Quantity	Unit
A	area	m^2
A_C	conditioned area	m^2
A_E	thermal envelope area	m^2
EP	energy performance indicator	$MJ/(m^2 \cdot a)$, $kWh/(m^2 \cdot a)$, $kg_{CO_2}/(m^2 \cdot a)$, $€/ (m^2 \cdot a)$ *
f	factor	-
R	reference	

* The unit depends on the indicator chosen. See Clause 5.

Table 2 — Subscripts

r	required by regulation
C	conditioned
s	building stock
e	envelope

5 Energy performance indicators

5.1 Indicators

The energy performance of a building is represented by an overall indicator EP that is the weighted algebraic sum of the delivered and exported energy per energy carrier determined according to Clause 5 of prEN 15603, normalized according to 5.3.

EP may represent:

- primary energy (E_p);
- CO_2 emissions (m_{CO_2});
- net delivered energy weighted by any other parameter defined by national energy policy (e.g. delivered energy, or cost).

This overall indicator EP may be complemented by other indicators, for example thermal performance of the building envelope.

5.2 Indicator basis

The indicators shall be based on one of the two types of ratings defined in prEN 15603:

- standard energy rating;
- measured energy rating.

The standard energy rating can be calculated either for planned buildings or for actual buildings.

If the indicator is based on a standard energy rating it is called standard energy indicator.

If the indicator is based on a measured energy rating it is called measured energy indicator.