Energy performance of buildings - Overall energy use and definition of energy ratings

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 15603:2008 sisaldab Euroopa standardi EN 15603:2008 ingliskeelset teksti.	This Estonian standard EVS-EN 15603:2008 consists of the English text of the European standard EN 15603:2008.
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Energy performance of buildings - Overall energy use and definition of energy ratings

Performance énergétique des bâtiments - Consommation globale d'énergie et définition des évaluations énergétiques

Energieeffizienz von Gebäuden - Gesamtenergieverbrauch und Festlegung der Energiekennwerte

This European Standard was approved by CEN on 24 November 2007.

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Foreword

This document (EN 15603:2008) has been prepared by CEN/BT/TF 173 "Energy Performance of Building project group", the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by July 2008, and conflicting national standards shall be withdrawn at the latest by July 2008.

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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.

Introduction

Energy assessments of buildings are carried out for various purposes, such as:

a) Judging compliance with building regulations expressed in terms of a limitation on energy use or a related quantity;

b) Transparency in commercial operations through the energy certification and/or display of a level of energy performance (energy performance certification);

c) Monitoring of the energy efficiency of the building and its technical building systems;

d) Helping in planning retrofit measures, through prediction of energy savings which would result from various actions.

This standard specifies a general framework for the assessment of overall energy use of a building, and the calculation of energy ratings in terms of primary energy, CO_2 emissions or parameters defined by national energy policy. Separate standards calculate the energy use of services within a building (heating, cooling, hot water, ventilation, lighting) and produce results that are used here in combination to show overall energy use. This assessment is not limited to the building alone, but takes into account the wider environmental impact of the energy supply chain.

An allowance is made for energy that may be generated within, or on the surface of the building and which is used to offset fuel and power drawn from other sources. Energy generated on the building site and exported is credited, provided it is exported for use elsewhere.

Energy certification of buildings requires a method that is applicable to both new and existing buildings, and which treats them in an equivalent way. Therefore, a methodology to obtain equivalent results from different sets of data is presented in this standard. A methodology to assess missing data and to calculate a standard energy use for space heating and cooling, ventilation, domestic hot water and lighting is provided. This standard also provides a methodology to assess the energy effectiveness of possible improvements.

Two principal types of energy ratings for buildings are proposed in this standard:

e) calculated energy rating;

f) measured energy rating.

Because of the differences in the way these two ratings are obtained, they cannot be directly compared. However, the difference between the two ratings for the same building can be used to assess the cumulative effects of actual construction, systems and operating conditions versus standard ones and the contribution of energy uses not included in the calculated energy rating.

Local values for factors and coefficients needed to calculate primary energy and CO_2 emissions related to energy policy should be defined in a national annex.

NOTE Energy is not produced, but only transformed. In this standard however energy is used in one form by systems that generate other forms of energy. At its final stage in the building, energy is used to provide services such as heating, cooling, ventilation, hot water, lighting, etc.

1 Scope

The purpose of the standard is to:

a) collate results from other standards that calculate energy use for specific services within a building;

b) account for energy generated in the building, some of which may be exported for use elsewhere;

c) present a summary of the overall energy use of the building in tabular form;

d) provide energy ratings based on primary energy, carbon dioxide emission or other parameters defined by national energy policy;

e) establish general principles for the calculation of primary energy factors and carbon emission coefficients.

This standard defines the energy services to be taken into account for setting energy performance ratings for planned and existing buildings, and provides for this:

f) method to compute the standard calculated energy rating, a standard energy use that does not depend on occupant behaviour, actual weather and other actual (environment or indoor) conditions;

g) method to assess the measured energy rating, based on the delivered and exported energy;

h) methodology to improve confidence in the building calculation model by comparison with actual energy use;

i) method to assess the energy effectiveness of possible improvements.

This European standard is applicable to a part of a building (e.g. flat), a whole building, or several buildings.

It is up to national bodies to define under which conditions, for which purposes and for which types of buildings the various ratings apply.

This standard handles the energy performance of a building as a whole. The assessment of the energy performance of specific technical building systems is handled in the appropriate part of EN 15241, EN 15243 and EN 15316 series.

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 15193, *Energy performance of buildings — Energy requirements for lighting*

EN 15217, *Energy performance of buildings — Methods for expressing energy performance and for energy certification of buildings*

EN 15232:2007, *Energy performance of buildings - Impact of Building Automation, Controls and Building Management*

EN 15241, *Ventilation for buildings — Calculation methods for energy losses due to ventilation and infiltration in commercial buildings*

EN 15243, *Ventilation for buildings — Calculation of room temperatures and of load and energy for buildings with room conditioning systems*

EN 15316 (all parts), *Heating systems in buildings — Method for calculation of system energy requirements and system efficiencies*

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

EN ISO 12569, *Thermal insulation in buildings — Determination of air change in buildings — Tracer gas dilution method (ISO 12569:2000)*

EN ISO 13789, *Thermal performance of buildings - Transmission heat loss coefficient - Calculation method (ISO 13789:1999)*

EN ISO 13790, *Thermal performance of buildings - Calculation of energy use for space heating (ISO 13790:2004)*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 7345:1995 and the following apply.

3.1
Buildings

3.1.1
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 The term can refer to the building as a whole or to parts thereof that have been designed or altered to be used separately.

3.1.2
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

3.1.3
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

3.1.4
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 A technical building system is composed of different subsystems.

NOTE 3 Electricity production can include cogeneration and photovoltaic systems.

3.1.5
building services
services provided by the technical building systems and by appliances to provide the indoor climate condition, illumination and other services related to the use of the building