

**Hoonete küttesüsteemid. Süsteemide  
energiavajaduse ja süsteemide  
tõhususe arvutusmeetod. Osa 2-1:  
Kütte soojusväljastussüsteemid**

Heating systems in buildings - Method for calculation  
of system energy requirements and system  
efficiencies - Part 2-1: Space heating emission  
systems

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 15316-2-1:2007 sisaldab Euroopa standardi EN 15316-2-1:2007 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 14.09.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 15316-2-1:2007 consists of the English text of the European standard EN 15316-2-1:2007.</p> <p>This document is endorsed on 14.09.2007 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b></p> <p>The scope of this European Standard is to standardise the required inputs, the outputs and the links (structure) of the calculation method in order to achieve a common European calculation method. The energy performance may be assessed either by values of the heat emission system efficiency or by values of the increased space temperatures due to heat emission system inefficiencies. The method is based on an analysis of the following characteristics of a space heating emission system, including control: - non-uniform space temperature distribution; - heat emitters embedded in the building structure; - control accuracy of the indoor temperature.</p>	<p><b>Scope:</b></p> <p>The scope of this European Standard is to standardise the required inputs, the outputs and the links (structure) of the calculation method in order to achieve a common European calculation method. The energy performance may be assessed either by values of the heat emission system efficiency or by values of the increased space temperatures due to heat emission system inefficiencies. The method is based on an analysis of the following characteristics of a space heating emission system, including control: - non-uniform space temperature distribution; - heat emitters embedded in the building structure; - control accuracy of the indoor temperature.</p>
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English Version

## Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 2-1: Space heating emission systems

Systèmes de chauffage dans les bâtiments - Méthode de calcul des besoins énergétiques et des rendements des systèmes - Partie 2-1 : Systèmes d'émission de chauffage des locaux

Heizungsanlagen in Gebäuden - Verfahren zur Berechnung der Energieanforderungen und Nutzungsgrad der Anlagen - Teil 2-1: Wärmeübergabesysteme für die Raumheizung

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

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## Foreword

This document (EN 15316-2-1:2007) has been prepared by Technical Committee CEN/TC 228 "Heating systems in buildings", the secretariat of which is held by DS.

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 January 2008, and conflicting national standards shall be withdrawn at the latest by January 2008.

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 calculation of the energy performance of buildings. An overview of the whole set of standards is given in prCEN/TR 15615.

The subjects covered by CEN/TC 228 are the following:

- design of heating systems (water based, electrical etc.);
- installation of heating systems;
- commissioning of heating systems;
- instructions for operation, maintenance and use of heating systems;
- methods for calculation of the design heat loss and heat loads;
- methods for calculation of the energy performance of heating systems.

Heating systems also include the effect of attached systems such as hot water production systems.

All these standards are systems standards, i.e. they are based on requirements addressed to the system as a whole and not dealing with requirements to the products within the system.

Where possible, reference is made to other European or International Standards, a.o. product standards. However, use of products complying with relevant product standards is no guarantee of compliance with the system requirements.

The requirements are mainly expressed as functional requirements, i.e. requirements dealing with the function of the system and not specifying shape, material, dimensions or the like.

The guidelines describe ways to meet the requirements, but other ways to fulfil the functional requirements might be used if fulfilment can be proved.

Heating systems differ among the member countries due to climate, traditions and national regulations. In some cases requirements are given as classes so national or individual needs may be accommodated.

In cases where the standards contradict with national regulations, the latter should be followed.

EN 15316 *Heating systems in buildings — Method for calculation of system energy requirements and system efficiencies* consists of the following parts:

*Part 1: General*

*Part 2-1: Space heating emission systems*

*Part 2-3: Space heating distribution systems*

*Part 3-1: Domestic hot water systems, characterisation of needs (tapping requirements)*

*Part 3-2: Domestic hot water systems, distribution*

*Part 3-3: Domestic hot water systems, generation*

*Part 4-1: Space heating generation systems, combustion systems (boilers)*

*Part 4-2: Space heating generation systems, heat pump systems*

*Part 4-3: Heat generation systems, thermal solar systems*

*Part 4-4: Heat generation systems, building-integrated cogeneration systems*

*Part 4-5: Space heating generation systems, the performance and quality of district heating and large volume systems*

*Part 4-6: Heat generation systems, photovoltaic systems*

*Part 4-7: Space heating generation systems, biomass combustion systems*

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.

## Introduction

This European Standard constitutes the specific part related to space heating emission, of the set of prEN 15316 standards on methods for calculation of system energy requirements and system efficiencies of space heating systems and domestic hot water systems in buildings.

This European Standard specifies the structure for calculation of the system energy losses and energy requirements of a heat emission system for meeting the building net energy demand.

The calculation method is used for the following applications:

- calculation of the system energy losses of the heat emission system;
- optimisation of the energy performance of a planned heat emission system, by applying the method to several possible options;
- assessing the effect of possible energy conservation measures on an existing heat emission system, by calculation of the energy requirements with and without the energy conservation measure implemented.

The user needs to refer to other European Standards or to national documents for input data and detailed calculation procedures not provided by this European Standard.



## 1 Scope

The scope of this European Standard is to standardise the required inputs, the outputs and the links (structure) of the calculation method in order to achieve a common European calculation method.

The energy performance may be assessed either by values of the heat emission system efficiency or by values of the increased space temperatures due to heat emission system inefficiencies.

The method is based on an analysis of the following characteristics of a space heating emission system, including control:

- non-uniform space temperature distribution;
- heat emitters embedded in the building structure;
- control accuracy of the indoor temperature.

The energy required by the emission system is calculated separately for thermal energy and electrical energy, in order to facilitate determination of the final energy and subsequently the corresponding primary energy according to other standards.

## 2 Normative references

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12831, *Heating systems in buildings — Method for calculation of the design heat load*

EN 15316-1, *Heating systems in buildings — Method for calculation of system energy requirements and system efficiencies — Part 1: General*

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

EN ISO 13370, *Thermal performance of buildings — Heat transfer via the ground — Calculation methods (ISO 13370:1998)*

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

## 3 Terms and definitions, symbols and units

### 3.1 Terms and definitions

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

#### 3.1.1

##### **calculation period**

period of time over which the calculation is performed

NOTE The calculation period can be divided into a number of calculation steps.