Hoonete küttesüsteemid. Süsteemide energiavajaduse ja süsteemide tõhususe arvutusmeetod. Osa 4-1: Küttesüsteemide soojusallikad, põlemisprotsessiga süsteemid

Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-1: Space heating generation systems, combustion systems (boilers)

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

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NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 15316-4-1:2008 sisaldab Euroopa standardi EN 15316-4-1:2008 ingliskeelset teksti.	This Estonian standard EVS-EN 15316-4-1:2008 consists of the English text of the European standard EN 15316-4-1:2008.
Standard on kinnitatud Eesti Standardikeskuse 21.07.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 21.07.2008 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 28.05.2008.	Date of Availability of the European standard text 28.05.2008.
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Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-1: Space heating generation systems, combustion systems (boilers)

Systèmes de chauffage dans les bâtiments - Méthode de calcul des besoins énergétiques et des rendements des systèmes - Partie 4-1 : Systèmes de génération de chauffage des locaux, systèmes de combustion (chaudières)

Heizanlagen in Gebäuden - Berechnung und Bewertung der Energieeffizienz von Systemen - Teil 4-1: Wärmeerzeugung für die Raumheizung, Verbrennungssysteme

This European Standard was approved by CEN on 11 April 2008.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 15316-4-1:2008) 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 November 2008, and conflicting national standards shall be withdrawn at the latest by November 2008.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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 CEN/TR 15615, ‘Explanation of the general relationship between various CEN standards and the Energy Performance of Buildings Directive (EPBD)’ ("Umbrella document").'

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 the United Kingdom.

Introduction

This European Standard presents methods for calculation of the additional energy requirements of a heat generation system in order to meet the distribution and/or storage sub-system demand. The calculation is based on the performance characteristics of the products given in product standards and on other characteristics required to evaluate the performance of the products as included in the system.

This method can be used for the following applications:

— judging compliance with regulations expressed in terms of energy targets;

— optimisation of the energy performance of a planned heat generation system, by applying the method to several possible options;

— assessing the effect of possible energy conservation measures on an existing heat generation system, by calculating the energy use with and without the energy conservation measure.

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

1 Scope

This European Standard is part of a series of standards on the method for calculation of system energy requirements and system efficiencies of space heating systems and domestic hot water systems.

The scope of this specific part is to standardise the:

— required inputs;

— calculation method;

— resulting outputs;

for space heating generation by combustion sub-systems (boilers), including control.

This European Standard is the general standard on generation by combustion sub-systems (boilers). If a combustion generation sub-system is within the scope of another specific part of the EN 15316 series (i.e. part 4.x), the latter shall be used.

EXAMPLE Biomass combustion generation sub-systems are within the scope of prEN 15316-4-7.

This European Standard is also intended for the case of generation for both domestic hot water production and space heating. The case of generation only for domestic hot water production is treated in EN 15316-3-3.

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 297, *Gas-fired central heating boilers - Type B_{11} and B_{11Bs} boilers fitted with atmospheric burners of nominal heat input not exceeding 70 kW*

EN 303-5, *Heating boilers – Part 5: Heating boilers for solid fuels, hand and automatically stocked, nominal heat output of up to 300 kW - Terminology, requirements, testing and marking*

EN 304, *Heating boilers — Test code for heating boilers for atomizing oil burners*

EN 656, Gas-fired central heating boilers — *Type B boilers of nominal heat input exceeding 70 kW but not exceeding 300 kW*

EN 15034:2006, *Heating boilers - Condensing heating boilers for fuel oil*

EN 15035, *Heating boilers - Special requirements for oil fired room sealed units up to 70 kW*

EN 15316-2-1, *Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 2.1: Space heating emission systems*

EN 15316-2-3:2007, *Heating systems in building - Method for calculation of system energy requirements and system efficiencies – Part 2.3: Space heating distribution systems*

EN 15316-3-2, *Heating systems in buildings - Method for calculation of system energy requirements and system efficiencies – Part 3.2: Domestic hot water systems, distribution*

EN 15456, *Heating boilers – Electrical power consumption for heat generators – System boundaries – Measurements*

EN 15603, *Energy performance of buildings — Overall energy use and definition of energy ratings*

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

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

3 Terms and definitions

3.1 Definitions

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

3.1.1
space heating
process of heat supply for thermal comfort

3.1.2
domestic hot water heating
process of heat supply to raise the temperature of the cold water to the intended delivery temperature

3.1.3
heated space
room or enclosure which for the purposes of the calculation is assumed to be heated to a given set-point temperature or set-point temperatures

3.1.4
system thermal loss
thermal loss from a technical building system for heating, cooling, domestic hot water, humidification, dehumidification, ventilation or lighting or other appliances that does not contribute to the useful output of the system

NOTE Thermal energy recovered directly in the sub-system is not considered as a system thermal loss but as heat recovery and is directly treated in the related system standard.

3.1.5
auxiliary energy
electrical energy used by technical building systems for heating, cooling, ventilation and/or domestic hot water to support energy transformation to satisfy energy needs

NOTE 1 This includes energy for fans, pumps, electronics, etc.

NOTE 2 In EN ISO 9488 [4], the energy used for pumps and valves is called "parasitic energy".

3.1.6
heat recovery
heat generated by a technical building system or linked to a building use (e.g. domestic hot water) which is utilised directly in the related system to lower the heat input and which would otherwise be wasted (e.g. preheating of the combustion air by flue gas heat exchanger)