

Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 4-8: Space heating generation systems, air heating and overhead radiant heating systems, including stoves (local), Module M3-8-8

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 15316-4-8:2017 sisaldab Euroopa standardi EN 15316-4-8:2017 ingliskeelset teksti.	This Estonian standard EVS-EN 15316-4-8:2017 consists of the English text of the European standard EN 15316-4-8:2017.
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English Version

Energy performance of buildings - Method for calculation
of system energy requirements and system efficiencies -
Part 4-8: Space heating generation systems, air heating
and overhead radiant heating systems, including stoves
(local), Module M3-8-8

Performance énergétique des bâtiments - Méthode de
calcul des besoins énergétiques et des rendements des
systèmes - Partie 4-8 : Systèmes de génération de
chauffage des locaux, systèmes de chauffage par air
chaud et par rayonnement, y compris les poêles (local),
Module M3-8-8

Energetische Bewertung von Gebäuden - Verfahren zur
Berechnung des Endenergiebedarfs und des
Nutzungsgrades von Anlagen - Teil 4-8:
Wärmeerzeugung von Warmluft- und
Strahlungsheizsystemen, Modul M3-8-8

This European Standard was approved by CEN on 27 February 2017.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 15316-4-8:2017) has been prepared by Technical Committee CEN/TC 228 “Heating systems and water based cooling systems in buildings”, the secretariat of which is held by DIN.

This document supersedes EN 15316-4-8:2011.

The main changes compared to EN 15316-4-8:2011 are:

- a) Support of hourly methods;
- b) Compliance with specifications given by CEN/TS 16629;
- c) Scope extended to stoves and local heaters included in lot 20 of Ecodesign.

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of an identical text or by endorsement, at the latest by October 2017, and conflicting national standards shall be withdrawn at the latest by October 2017.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

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Introduction

This European Standard is part of a series of standards aiming at international harmonization of the methodology for the assessment of the energy performance of buildings, called "set of EPB standards".

All EPB standards follow specific rules to ensure overall consistency, unambiguity and transparency.

All EPB standards provide a certain flexibility with regard to the methods, the required input data and references to other EPB standards, by the introduction of a normative template in Annex A and Annex B with informative default choices.

For the correct use of this standard, a normative template is given in Annex A to specify these choices. Informative default choices are provided in Annex B.

The main target group of this standard are all the users of the set of EPB standards (e.g. architects, engineers, regulators, product manufacturers and suppliers, software developers, etc.).

Use by or for regulators: In case the standard is used in the context of national or regional legal requirements, mandatory choices may be given at national or regional level for such specific applications. These choices (either the informative default choices from Annex B or choices adapted to national / regional needs, but in any case following the template of this Annex A) can be made available as national annex or as separate (e.g. legal) document (national data sheet).

NOTE 1 So in this case:

- the regulators will specify the choices;
- the individual user will apply the standard to assess the energy performance of a building, and thereby use the choices made by the regulators,.

Topics addressed in this standard can be subject to public regulation. Public regulation on the same topics can override the default values in Annex B of this standard. Public regulation on the same topics can even, for certain applications, override the use of this standard. Legal requirements and choices are in general not published in standards but in legal documents. In order to avoid double publications and difficult updating of double documents, a national annex may refer to the legal texts where national choices have been made by public authorities. Different national annexes or national data sheets are possible, for different applications.

It is expected, if the default values, choices and references to other EPB standards in Annex B are not followed due to national regulations, policy or traditions, that:

- national or regional authorities prepare data sheets containing the choices and national or regional values, according to the model in Annex A. In this case the national annex (e.g. NA) refers to this text;
- or, by default, the national standards body will consider the possibility to add or include a national annex in agreement with the template of Annex A, in accordance to the legal documents that give national or regional values and choices.

Further target groups are users of the voluntary common European Union certification scheme for the energy performance of non-residential buildings (EPBD art.11.9) and any other Pan EU parties wanting to motivate their assumptions by classifying the building energy performance for a dedicated building stock

More information is provided in the Technical Report accompanying this standard (CEN/TR 15316-6-9).

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.

This standard presents methods to take into account the energy performance of heat generation systems based on local air heaters, radiant heaters and stoves. 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 standard covers only the heat generation function of air heaters even though air heaters, as devices, also emit heat and include devices for space heating control. The emission and control function and the related losses are covered by module M3-5.

This standard is meant to be used as a module within the EN EPB package of standards. Specification of the connection of this standard with other calculation modules are given in module M3-1 and EN ISO 52000-1.

Default references to EPB standards other than EN ISO 52000-1 are identified by the EPB module code number and given in Annex A (normative template) and Annex B (informative default choice).

NOTE 2 Example of EPB module code number: M5-5, or M5-5.1 (if module M5-5 is subdivided), or M5-5/1 (if reference to a specific clause of the standard covering M5-5).

1 Scope

This European Standard is part of a series of standards on the method for calculation of system energy requirements and system efficiencies.

The scope of this specific part is to standardize the:

- required inputs;
- calculation method;
- resulting outputs,

for space heating generation by:

- air heating systems, including control;
- overhead radiant heating systems for non-domestic use, including control; and
- stoves and local heaters for residential use.

This standard does not apply to heating systems that utilize water as a heat transfer medium.

Other heat generation systems such as boilers, heat pumps and others are covered in other sub modules of M3-8.

Table 1 shows the relative position of this standard within the set of EPB standards in the context of the modular structure as set out in EN ISO 52000-1.

NOTE 1 In CEN ISO/TR 52000-2 the same table can be found, with, for each module, the numbers of the relevant EPB standards and accompanying technical reports that are published or in preparation.

NOTE 2 The modules represent EPB standards, although one EPB standard may cover more than one module and one module may be covered by more than one EPB standard, for instance a simplified and a detailed method respectively. See also Clause 2 and Tables A.1 and B.1.

Table 1 — Position of this standard, within the modular structure of the set of EPB standards

Overarching		Building (as such)		Technical Building Systems										
Submodule	Descriptions		Descriptions		Descriptions	Heating	Cooling	Ventilation	Humidification	Dehumidification	Domestic Hot water	Lighting	Building automation and control	Electricity production
sub 1		M1		M2		M3	M4	M5	M6	M7	M8	M9	M10	M11
1	General		General		General	15316-1					15316-1			
2	Common terms and definitions; symbols, units and subscripts		Building Energy Needs		Needs						12831-3			
3	Applications		(Free) Indoor Conditions without Systems		Maximum Load and Power	12831-1					12831-3			
4	Ways to Express Energy Performance		Ways to Express Energy Performance		Ways to Express Energy Performance	15316-1					15316-1			
5	Building categories and Building Boundaries		Heat Transfer by Transmission		Emission and control	15316-2	15316-2							
6	Building Occupancy and Operating Conditions		Heat Transfer by Infiltration and Ventilation		Distribution and control	15316-3	15316-3				15316-3			
7	Aggregation of Energy Services and Energy Carriers		Internal Heat Gains		Storage and control	15316-5					15316-5 15316-4-3			
8	Building zoning		Solar Heat Gains		Generation									
8-1					Combustion boilers	15316-4-1					15316-4-1			
8-2					Heat pumps	15316-4-2	15316-4-2				15316-4-2			
8-3					Thermal solar Photovoltaics	15316-4-3					15316-4-3			15316-4-3
8-4					On-site cogeneration	15316-4-4					15316-4-4			15316-4-4
8-5					District heating and cooling	15316-4-5	15316-4-5							15316-4-5
8-6					Direct electrical heater	15316-4-8					15316-4-8			
8-7					Wind turbines									15316-4-10
8-8					Radiant heating, stoves	15316-4-8								
9	Calculated Energy Performance		Building Dynamics (thermal mass)		Load dispatching and operating conditions									
10	Measured Energy Performance		Measured Energy Performance		Measured Energy Performance	15378-3					15378-3			
11	Inspection		Inspection		Inspection	15378-1					15378-1			
12	Ways to Express Indoor Comfort			-	BMS									
13	External Environment Conditions													
14	Economic Calculation	15459-1												

^a The shaded modules are not applicable

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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)*

EN ISO 52000-1:2017, *Energy performance of buildings - Overarching EPB assessment - Part 1: General framework and procedures (ISO 52000-1:2017)*

EN 416 (all parts), *Single burner gas-fired overhead radiant tube heaters for non-domestic use*

EN 419 (all parts), *Non-domestic gas-fired overhead luminous radiant heaters*

EN 1020, *Non-domestic forced convection gas-fired air heaters for space heating not exceeding a net heat input of 300 kW incorporating a fan to assist transportation of combustion air or combustion products*

EN 13410, *Gas-fired overhead radiant heaters - Ventilation requirements for non-domestic premises*

EN 13240, *Roomheaters fired by solid fuel - Requirements and test methods*

EN 13229, *Inset appliances including open fires fired by solid fuels - Requirements and test methods*

EN 14785, *Residential space heating appliances fired by wood pellets - Requirements and test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 7345:1995, EN ISO 52000-1 and the following definitions apply.

NOTE The terms of EN ISO 52000-1 that are indispensable for the understanding of the underlying standard are repeated here.

3.1

air heating system

heating system composed of one or more individual forced convection air heating appliances

3.2

thermal input

product of the fuel flow rate and the net caloric value of the fuel

3.3

condensing air heater

air heater designed to make use of the latent heat released by condensation of water vapour in the combustion flue products, which is to allow the condensate to leave the heat exchanger in liquid form by way of a condensate drain

3.4

forced convection air heater

appliance designed to provide space heating from a central source by distributing heated air, by means of an air moving device, either through ducting or directly into the heated space