

Irish Standard I.S. EN 15316-2:2017

Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 2: Space emission systems (heating and cooling), Module M3-5, M4-5

© CEN 2017 No copying without NSAI permission except as permitted by copyright law.

I.S. EN 15316-2:2017

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on: EN 15316-2:2017 *Published:* 2017-05-03

This document was published under the authority of the NSAI and comes into effect on:

2017-05-21

ICS number:

91.140.10

NOTE: If blank see CEN/CENELEC cover page

NSAI	T +353 1 807 3800	Sales:				
1 Swift Square,	F +353 1 807 3838	T +353 1 857 6730				
Northwood, Santry	E standards@nsai.ie	F +353 1 857 6729				
Dublin 9	W NSAI.ie	W standards.ie				
Dublin 9	W NSALie	W standards.ie				

Údarás um Chaighdeáin Náisiúnta na hÉireann

National Foreword

I.S. EN 15316-2:2017 is the adopted Irish version of the European Document EN 15316-2:2017, Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies - Part 2: Space emission systems (heating and cooling), Module M3-5, M4-5

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

For relationships with other publications refer to the NSAI web store.

Compliance with this document does not of itself confer immunity from legal obligations.

In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

This is a free page sample. Access the full version online.

This page is intentionally left blank

This is a free page sample. Access the full version online. I.S. EN 15316-2:2017

EUROPEAN STANDARD NORME EUROPÉENNE

EN 15316-2

EUROPÄISCHE NORM

May 2017

ICS 91.140.10

Supersedes EN 15316-2-1:2007

English Version

Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies -Part 2: Space emission systems (heating and cooling), Module M3-5, M4-5

Performance énergétique des bâtiments - Méthode de calcul des besoins énergétiques et des rendements des systèmes - Partie 2 : Systèmes d'émission des locaux (chauffage et refroidissement), Module M3-5, M4-5 Energetische Bewertung von Gebäuden - Verfahren zur Berechnung der Energieanforderungen und Nutzungsgrade der Anlagen - Teil 2: Wärmeübergabesysteme (Raumheizung und kühlung), Modul M3-5, M4-5

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

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-CENELEC 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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

This is a free page sample. Access the full version online. $I.S.\ EN\ 15316-2:2017$

EN 15316-2:2017 (E)

Contents

Europ	ean foreword	4
Introd	uction	5
1	Scope	7
2	Normative references	9
3	Terms and definitions	9
4 4.1 4.2	Symbols and abbreviations Symbols Subscripts	10 10 10
5 5.1 5.2	Description of the method Output of the method General description of the method	10 10 11
6 6.1 6.2 6.3 6.4 6.5	Calculation Method Output data Calculation time steps Input data Monthly and yearly calculation procedure Hourly calculation procedure	11 12 12 12 15 20
7	Quality control	. 24
8	Compliance check	. 24
Annex	A (normative) Template for choices, input data and references (Additional heating and cooling losses / auxiliary energy)	. 25
A.1	Introduction	25
A.2	Temperature variation for free heating surfaces (radiators), room heights ≤ 4 m (heating case)	. 26
A.3	Temperature Variation for component integrated heating surfaces (panel heaters) (room heights ≤ 4 m, heating case)	. 28
A.4	Temperature variation for air heating systems; room heights ≤ 4 m (heating case)	. 30
A.5	Temperature Variation for electrical heating (room heights ≤ 4 m, heating case)	. 31
A.6	Temperature Variation air heating (ventilation systems, room heights ≤ 4 m, heating case)	. 32
A.7	Temperature variation for room spaces with heights > 4 m (large indoor space buildings, heating case)	. 32
A.8	Temperature variation for room heaters fired by solid fuel	. 35
A.9	Temperature variation for water based cooling systems; room heights ≤ 4 m (cooling case)	. 36
A.10	Auxiliary Energy	37

A.11	Additional Information	8
Annex	B (informative) Default choices, input data and references (additional heating and cooling losses / auxiliary energy)44	0
B.1	Introduction	0
B.2	Temperature variation for free heating surfaces (radiators); room heights ≤ 4 m (heating case)	1
B.3	Temperature Variation for component integrated heating surfaces (panel heaters) (room heights ≤ 4 m, heating case)	3
B.4	Temperature variation for air heating systems; room heights ≤ 4 m (heating case)	5
B.5	Temperature Variation for electrical heating (room heights ≤ 4 m, heating case)40	6
B.6	Temperature Variation air heating (ventilation systems, room heights ≤ 4 m, heating case)4′	7
B.7	Temperature variation for room spaces with heights > 4 m (large indoor space buildings, heating case)	7
B.8	Temperature variation for room heaters fired by solid fuel	0
B.9	Temperature variation for water based cooling systems; room heights ≤ 4 m (cooling case)	1
B.10	Auxiliary Energy	2
B.11	Additional Information	3
Bibliog	graphy	5

European foreword

This document (EN 15316-2:2017) has been prepared by Technical Committee CEN/TC 228 "Energy performance of buildings", the secretariat of which is held by DIN.

This document supersedes EN 15316-2-1:2007.

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.

The main changes compared to the previous version are:

- a) only one calculation method for heating and cooling emission systems;
- b) the calculation method is only based on temperature differences (the calculation method based on efficiency values are no longer exist in the new standard);
- c) the new calculation method define input parameter from product standards;
- d) the new standard includes consistent default values for the control devices.

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

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

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

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.

CEN/TC 228 deals with heating systems in buildings. Subjects covered by CEN/TC 228 are:

- a) energy performance calculation for heating systems;
- b) inspection of heating systems;
- c) design of heating systems;
- d) installation and commissioning of heating systems.

This standard constitutes the specific part related to space heating and cooling emission, of a set of standards determining methods for calculation of energy losses/requirements of space heating and cooling systems, space cooling systems and domestic hot water systems in buildings.

This standard specifies the structure for calculation of the additional heat and cooling losses and energy requirements of a heat and cooling emission systems for meeting the building net energy demand.

The calculation method is used for the following applications:

- calculation of the additional energy losses in the heat emission system or cooling system;
- optimization of the energy performance of a planned heat emission system or cooling system, by applying the method to several possible options;

The user should refer to other European Standards or to national documents for input data and detailed calculation procedures not provided by this standard. This standard was developed during the first EPBD mandate and the first version was published in 2008. The revision for inclusion in the second mandate package was performed in 2014. The two calculation methods have been removed from the standard and a new one was added. The standard was updated to cover hourly and monthly time-step.

The main target group of this standard are all the users of the set of EPB standards. 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, in particular for the application within the context of EU Directives transposed into national legal requirements. 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.

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 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, for certain applications, 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, the National Annex may refer to the legal texts where national choices have been made by public authorities.

It is expected, if the default values and choices 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 15316-6-2,).

1 Scope

This European Standard's scope is to standardize the required inputs, the outputs and the links (structure) of the calculation method in order to achieve a common European calculation method.

This standard covers energy performance calculation of heating systems and water based cooling space emission sub-systems.

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										
	Descriptions			Descriptions		Descriptions	Heating	Cooling	Ventilation	Humidification	Dehumidification	Domestic Hot water	Lighting	Building automation and control	Electricity production
sub 1		M1	sub1	M2	sub1		М3	M4	М5	M6	М7	M8	м9	M10	M11
1	General		1	General	1	General	15316-1					15316-1			
2	Common terms and definitions; symbols, units and subscripts		2	Building Energy Needs	2	Needs						12831-3			
3	Applications		3	(Free) Indoor Conditions without Systems	3	Maximum Load and Power	12831-1					12831-3			
4	Ways to Express Energy Performance		4	Ways to Express Energy Performance	4	Ways to Express Energy Performance	15316-1					15316-1			
5	Building Functions and Building Boundaries		5	Heat Transfer by Transmission	5	Emission and control	15316-2	15316-2							
6	Building Occupancy and Operating Conditions		6	Heat Transfer by Infiltration and Ventilation	6	Distribution and control	15316-3	15316-3				15316-3			
7	Aggregation of Energy Services and Energy Carriers		7	Internal Heat Gains	7	Storage and control	15316-5					15316- 5 15316- 4-3			
8	Building Partitioning		8	Solar Heat Gains	8	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	15316-					15316-			15316-
					0 1	On-site	15316-					15316-			4-5 15316-
					0-4	cogeneration	4-4	15216				4-4			4-4
					8-5	and cooling	4-5	4-5							4-5
					8-6	Direct electrical	15316- 4-6					15316-			
					8-7	Wind turbines	10					10			15316-
<u> </u>					8-8	Radiant heating,	15316- 4-8								4-7
9	Calculated Energy Performance		9	Building Dynamics (thermal mass)	9	Load dispatching and operating conditions	10								
10	Measured Energy Performance		10	Measured Energy Performance	10	Measured Energy Performance	15378-3					15378-3			
11	Inspection		11	Inspection	11	Inspection	15378-1					15378-1			
12	ways to Express Indoor Comfort		12	-	12	BMS									
13	External Environment														
14	Economic Calculation	15459- 1													



This is a free preview. Purchase the entire publication at the link below:

Product Page

S Looking for additional Standards? Visit Intertek Inform Infostore

> Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation