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Energy performance of buildings - Method for calculation of system energy requirements and system efficiencies

Part 4-1: Space heating and DHW generation systems, combustion systems (boilers, biomass), Module M3-8-1, M8-8-1

bsi.

National foreword

This British Standard is the UK implementation of EN 15316-4-1:2017. It supersedes BS EN 15316-3-3:2007, BS EN 15316-4-7:2008 and BS EN 15316-4-1:2008, which are withdrawn.

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A list of organizations represented on this committee can be obtained on request to its secretary.

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword ... **4**

Introduction ... **5**

1 Scope ... **7**

2 Normative references ... **9**

3 Terms and definitions ... **9**

4 Symbols and abbreviations ... **10**
4.1 Symbols ... **10**
4.2 Abbreviations and indices ... **11**

5 Description of the method ... **11**
5.1 Output of the method ... **11**
5.2 General description of the method ... **12**
5.3 Input data ... **13**
5.4 Boundaries between distribution and generation sub-system ... **15**
5.5 Default values ... **16**
5.5.1 Default values for generator efficiency at full load and intermediate load as a function of the generator power output ... **16**
5.5.2 Default value for the stand-by heat losses $f_{gen;ls;P0}$ as a function of the generator power output ... **16**
5.5.3 Auxiliary energy ... **16**
5.6 Product values ... **17**
5.7 Measured values ... **17**
5.7.1 Boiler efficiencies from measured values ... **17**
5.7.2 Measured total thermal losses, power input and calculated gains ... **17**
5.7.3 Additional default data and calculation for condensing boilers ... **18**
5.7.4 Thermal losses through the chimney with the burner on at full load $f_{ch;on}$ ... **19**
5.7.5 Thermal losses through the generator envelope $f_{gen;env}$ ... **19**
5.7.6 Thermal losses through the chimney with the burner off $f_{ch;off}$ ... **20**
5.8 Boiler rated output ... **20**

6 Generation sub-system basic energy balance ... **20**
6.1 Heat balance ... **20**
6.2 Expenditure factor ... **20**
6.3 Equation fuel heat input ... **21**
6.4 Generator auxiliary energy ... **21**
6.5 Generator losses ... **21**
6.5.1 Generator loss ... **21**
6.5.2 Generator thermal loss at specific load ratio βH;gen and power output P_X ... **21**
6.5.3 Generator thermal loss calculation at full load ... **22**
6.5.4 Generator thermal loss calculation at intermediate load ... **22**
6.5.5 Generator thermal loss calculation at 0 % load ... **23**
6.5.6 Correction factor by additional tests ... **23**
6.6 Recoverable thermal losses ... **23**
6.6.1 general ... **23**
6.6.2 Generator thermal losses through the jacket (generator envelope) ... **23**
6.6.3 Recoverable thermal losses out of auxiliary energy ... **23**
6.7 Recovered auxiliary energy ... **24**

6.8 Auxiliary energy 24
6.9 Generator thermal output 24
6.10 Heating time and load factor 25
6.11 Direct heated DHW heaters 25
6.11.1 Instantaneous electrical water heater 25
6.11.2 Gas-fired domestic storage water heaters 26
6.11.3 Boundary conditions for the default values 26
6.12 Method for domestic hot water appliance, tested with 24 h tapping cycles 27
Annex A (informative) Additional formulas and default values for parametering the boiler efficiency method 29
A.1 Information on the method 29
A.1.1 Generator efficiencies and stand-by losses 29
A.1.2 Auxiliary energy 33
A.1.3 Recoverable generation thermal losses and boiler location 34
A.2 Conversion of the energy content of energy carriers 34
A.3 Deviation from default values 35
A.4 Fuel constants for flue gas measurement depending on Siegert constants 35
A.5 Default values for calculation of thermal losses through the chimney with the burner off 37
A.6 Additional default data and calculation for condensing boilers 38
A.7 Additional default data for generator output and losses 39
A.8 Additional default data and calculation for water heaters 39
Annex B (informative) Additional formulas and default values for parametering the boiler efficiency method 40
B.1 Information on the method 40
B.1.1 Generator efficiencies and stand-by losses 40
B.1.2 Auxiliary energy 44
B.1.3 Recoverable generation thermal losses and boiler location 46
B.2 Conversion of the energy content of energy carriers 46
B.3 Deviation from default values 47
B.4 Fuel constants for flue gas measurement depending on Siegert constants 47
B.5 Default values for calculation of thermal losses through the chimney with the burner off 49
B.6 Additional default data and calculation for condensing boilers 50
B.7 Additional default data for generator output and losses 51
B.8 Additional default data and calculation for water heaters 51
Annex C (informative) General part default values and information 53
Bibliography 54

European foreword

This document (EN 15316-4-1:2017) 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 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 2017, and conflicting national standards shall be withdrawn at the latest by November 2017.

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.

This document supersedes EN 15316-3-3:2007, EN 15316-4-1:2008, EN 15316-4-7:2008.

In case this 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.

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 regional (e.g. Pan European) parties wanting to motivate their assumptions by classifying the building energy performance for a dedicated building stock.

The main changes compared to EN 15316-3-3:2007, EN 15316-4-1:2008 and EN 15316-4-7:2008 are:

a) the typology method was removed;

b) the boiler cycling method has been added for existing boilers to get the input parameters for the case specific boiler efficiency method.

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, 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 “EPB set of standards”.

EPB standards deal with energy performance calculation and other related aspects (like system sizing) to provide the building services considered in the EPBD directive.

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

— energy performance calculation for heating systems;

— inspection of heating systems;

— design of heating systems;

— installation and commissioning of heating systems.

This standard is intended to replace EN 15316-3-3:2007, EN 15316-4-1:2008 and EN 15316-4-7:2008 and includes biomass boilers (former EN 15316-4-7:2008). This revision was required as a result of the EPBD recast (2010/31/EU). The set of standards developed under mandate M/343 will be revised to become consistent with the overarching standard under mandate M/480.

Other generation systems are covered in other sub modules of part M3-8 (see Table 1).

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).

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, 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.

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 15316-6-4).

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.

This standard (EN 15316-4-1) specifies:

— required inputs;

— a calculation method;

— resulting outputs;

— a method to take into account the energy performance of heat generation devices based on fuel combustion;

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

This standard specifies methods for the calculation of:

— thermal losses from the heating and the domestic hot water generation system;

— recoverable thermal losses for space heating from the heating and the domestic hot water generation system;

— auxiliary energy of the heating and the domestic hot water generation systems.

This standard specifies the energy performance calculation of water based heat generation sub-systems including control based on combustion of fuels ("boilers"), operating with conventional fossil fuels as well as renewable fuels. This standard does not cover sizing or inspection of boilers.

This standard is also applicable to heat generators for heating or for combined service as domestic hot water, ventilation, cooling and heating. Generators for domestic hot water only are taken into account into part M8-8.

This European Standard is the general standard on generation by combustion sub-systems (boilers, biomass) and is also intended for generation for domestic hot water production and/or space heating. These values are input data for calculation of the overall energy use according to EN ISO 52000-1 and EN 15316-1.

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.