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Energy performance of buildings — Energy requirements and efficiencies of heating, cooling and domestic hot water (DHW) distribution systems —

Part 1: Calculation procedures

Performance énergétique des bâtiments — Besoins énergétiques et rendements des systèmes de distribution d'eau chaude sanitaire, chauffage et refroidissement —

Partie 1: Modes opératoires de calcul

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 205, *Building environment design*.

A list of all parts in the ISO 52032 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document belongs to the family of International Standards aimed at the international harmonization of the methodology for assessing the energy performance of buildings. Throughout, this group of standards is referred to as a "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. For the correct use of this document a template is given in Annex A to specify these choices. Default choices are provided in Annex B.

The main target groups of this document are all the users of the set of EPB set of standards (e.g. architects, engineers, regulators).

Further target groups are parties wanting to motivate their assumptions by classifying the building energy performance for a dedicated building stock.

More information is provided in ISO/TR 52032-2 [12][1)] and in CEN/TR 15316-6-3[4].

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

NOTE 1 In 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 can cover more than one module and one module can be covered by more than one EPB standard, e.g. a simplified and a detailed method respectively. See also Clause 2 and Tables A.1 and B.1.

1) Under preparation. Stage at the time of publication: ISO/AWI TR 52032-2.

Table 1 — Position of this document 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 (DHW)	Lighting	Building automation and control	Electricity production
sub1		M1	sub1	M2	sub1		M3	M4	M5	M6	M7	M8	M9	M10	M11
1	General		1	General	1	General									
2	Common terms and definitions; symbols, units and subscripts		2	Building energy needs	2	Needs									
3	Applications		3	(Free) Indoor conditions without systems	3	Maximum load and power									
4	Ways to express energy performance		4	Ways to express energy performance	4	Ways to express energy performance									
5	Building functions and building boundaries		5	Heat transfer by transmission	5	Emission and control									
6	Building occupancy and operating conditions		6	Heat transfer by infiltration and ventilation	6	Distribution and control	**ISO 52032-1** (this document)	**ISO 52032-1** (this document)				**ISO 52032-1** (this document)			
7	Aggregation of energy services and energy carriers		7	Internal heat gains	7	Storage and control									

Table 1 *(continued)*

Overarching			Building (as such)		Technical building systems										
	Descriptions			Descriptions		Descriptions	Heating	Cooling	Ventilation	Humidification	Dehumidification	Domestic hot water (DHW)	Lighting	Building automation and control	Electricity production
sub1		M1	sub1	M2	sub1		M3	M4	M5	M6	M7	M8	M9	M10	M11
8	Building partitioning		**8**	Solar heat gains	**8**	Generation									
					8–1	Combustion boilers									
					8–2	Heat pumps									
					8–3	Thermal solar photovoltaics									
					8–4	On-site cogeneration									
					8–5	District heating and cooling									
					8–6	Direct electrical heater									
					8–7	Wind turbines									
					8–8	Radiant heating, stoves									
9	Calculated energy performance		**9**	Building dynamics (thermal mass)	**9**	Load dispatching and operating conditions									
10	Measured energy performance		**10**	Measured energy performance	**10**	Measured energy performance									
11	Inspection		**11**	Inspection	**11**	Inspection									

Table 1 *(continued)*

Overarching			Building (as such)		Technical building systems										
	Descriptions			Descriptions		Descriptions	Heating	Cooling	Ventilation	Humidification	Dehumidification	Domestic hot water (DHW)	Lighting	Building automation and control	Electricity production
sub1		M1	sub1	M2	sub1		M3	M4	M5	M6	M7	M8	M9	M10	M11
12	Ways to express indoor comfort		12	–	12	BMS									
13	External environment conditions														
14	Economic calculation	15459–1													
NOTE The shaded modules are not applicable															

Energy performance of buildings — Energy requirements and efficiencies of heating, cooling and domestic hot water (DHW) distribution systems —

Part 1: Calculation procedures

1 Scope

This document specifies the energy performance calculation of water-based distribution systems for space heating, space cooling and domestic hot water (DHW).

This document is applicable to the heat flux from the distributed water to the space and the auxiliary energy of the related pumps.

The heat flux and the auxiliary energy for pumps can be calculated for any time interval (hour, month and year). The input and output data are mean values of the time interval.

Instead of calculating the energy performance of water-based distribution systems, it is also possible to use measurements as long as they follow the time intervals of the whole performance calculation or can be divided into those time intervals.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 7345, *Thermal performance of buildings and building components — Physical quantities and definitions*

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

ISO 52031, *Energy performance of buildings — Method for calculation of system energy requirements and system efficiencies — Space emission systems (heating and cooling)*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
tapping profile
domestic hot water (DHW) drawn off over time