SLOVENSKI STANDARD
SIST EN 16798-3:2018

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Nadomešča:
SIST EN 13779:2007

Energijske lastnosti stavb - Prezračevanje stavb - 3. del: Prezračevanje nestanovanjskih stavb - Zahtevane lastnosti za sisteme prezračevanja in klimatizacije prostorov - Modula M5-1, M5-4

Energy performance of buildings - Ventilation for buildings - Part 3: For non-residential buildings - Performance requirements for ventilation and room-conditioning systems (Modules M5-1, M5-4)

Energetische Bewertung von Gebäuden - Lüftung von Gebäuden - Teil 3: Lüftung von Nichtwohngebäuden -Leistungsanforderungen an Lüftungs- und Klimaanlagen und Raumkühlsysteme (Module M5-1, M5-4)

Performance énergétique des bâtiments - Ventilation des bâtiments - Partie 3: Pour bâtiments non résidentiels - Exigences de performances pour les systèmes de ventilation et de climatisation (Modules M5-1, M5-4)

Ta slovenski standard je istoveten z: **EN 16798-3:2017**

ICS:

91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning systems

SIST EN 16798-3:2018 **en,fr,de**

EUROPEAN STANDARD
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English Version

Energy performance of buildings - Ventilation for buildings - Part 3: For non-residential buildings - Performance requirements for ventilation and room-conditioning systems (Modules M5-1, M5-4)

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This European Standard was approved by CEN on 11 May 2017.

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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.

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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 16798-3:2017) has been prepared by Technical Committee CEN/TC 156 “Ventilation for buildings”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by February 2018, and conflicting national standards shall be withdrawn at the latest by February 2018.

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 standard has been produced to meet the requirements of Directive 2010/31/EU 19 May 2010 on the energy performance of buildings (recast), referred to as “recast EPDB”.

This document supersedes EN 13779:2007, which was produced to meet the requirements of Directive 2002/91/EC 16 December 2002 on energy performance of buildings referred to as “EPBD”.

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

For the convenience of Standards users CEN/TC 156, together with responsible Working Group Conveners, have prepared a simple table below relating, where appropriate, the relationship between the ‘EPBD’ and ‘recast EPBD’ standard numbers prepared by Technical Committee CEN/TC 156 “Ventilation for buildings”.

EPBD EN Number	Recast EPBD EN Number	Title
EN 15251	EN 16798-1	Energy performance of buildings – Ventilation for buildings - Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics (Module M1-6)
N/A	CEN/TR 16798-2	Energy performance of buildings – Ventilation for buildings - Part 2: Interpretation of the requirements in EN 16798-1 — Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics (Module M1-6)
EN 13779	EN 16798-3	Energy performance of buildings – Ventilation for buildings - Part 3: For non-residential buildings – Performance requirements for ventilation and room-conditioning systems (Modules M5-1, M5-4)
N/A	CEN/TR 16798-4	Energy performance of buildings – Ventilation for buildings - Part 4: Interpretation of the requirements in EN 16798-3 — For non-residential buildings – Performance requirements for ventilation and room-conditioning systems(Modules M5-1, M5-4)

EN 15241	EN 16798-5-1	Energy performance of buildings — Ventilation for buildings – Part 5-1: Calculation methods for energy requirements of ventilation and air conditioning systems (Modules M5-6, M5-8, M6-5, M6-8, M7-5, M7-8) — Method 1: Distribution and generation
EN 15241	EN 16798-5-2	Energy performance of buildings – Ventilation for buildings - Part 5-2: Calculation methods for energy requirements of ventilation systems (Modules M5-6.2, M5-8.2) - Method 2: Distribution and generation
N/A	CEN/TR 16798-6	Energy performance of buildings - Ventilation for buildings – Part 6: Interpretation of the requirements in EN 16798-5-1 and EN 16798-5-2 — Calculation methods for energy requirements of ventilation and air conditioning systems (Modules M5-6, M5-8, M 6-5, M6-8 , M7-5, M7-8)
EN 15242	EN 16798-7	Energy performance of buildings - Ventilation for buildings - Part 7: Calculation methods for the determination of air flow rates in buildings including infiltration (Module M5-5)
N/A	CEN/TR 16798-8	Energy performance of buildings – Ventilation for buildings – Part 8: Interpretation of the requirements in EN 16798-7 — Calculation methods for the determination of air flow rates in buildings including infiltration – (Module M5-5)
EN 15243	EN 16798-9	Energy performance of buildings – Ventilation for buildings - Part 9: Calculation methods for energy requirements of cooling systems (Modules M4-1, M4-4, M4-9) - General
N/A	CEN/TR 16798-10	Energy performance of buildings – Ventilation for buildings – Part 10: Interpretation of the requirements in EN 16798-9 — Calculation methods for energy requirements of cooling systems (Module M4-1,M4-4, M4-9) – General
EN 15243	EN 16798-13	Energy performance of buildings – Ventilation for buildings - Part 13: - Calculation of cooling systems (Module M4-8) – Generation
EN 15243	CEN/TR 16798-14	Energy performance of buildings – Ventilation for buildings - Part 14: Interpretation of the requirements in EN 16798-13 — Calculation of cooling systems (Module M4-8) – Generation
N/A	EN 16798-15	Energy performance of buildings – Ventilation for buildings – Part 15: Calculation of cooling systems (Module M4-7) – Storage
N/A	CEN/TR 16798-16	Energy performance of buildings – Ventilation for buildings – Part 16: Interpretation of the requirements in EN 16798-15 — Calculation of cooling systems (Module M4-7) – Storage

EN 15239 and EN 15240	EN 16798-17	Energy performance of buildings – Ventilation for buildings - Part 17: Guidelines for inspection of ventilation and air-conditioning systems (Module M4-11, M5-11, M6-11, M7-11)
N/A	CEN/TR 16798-18	Energy performance of buildings – Ventilation for buildings – Part 18: Interpretation of the requirements in EN 16798-17 — Guidelines for inspection of ventilation and air-conditioning systems (Module M4-11, M5-11, M6-11, M7-11)

The revision concerns mainly the following aspects:

— New structure to clarify designing and calculation aspects;

— Update of filtration aspects;

— Update of heat recovery aspects and leakages in these systems;

— Clear coordination with prEN 16798-1:2015, outdoor air volume flows have been shifted to prEN 16798-1:2015;

— All indoor air quality aspects have been deleted, supply air quality have been introduced;

— Aspects of energy performance have been updated;

— Update of definitions of systems;

— Update of SPF definitions and links to EU 327/2014 regulation;

— The document was split in a normative part, containing all the normative aspects and a supplementary technical report containing additional information and informative annexes;

— The standard allows a normative national annex;

— The standard was updated to cover hourly/monthly/seasonal time-step.

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 European Standard a normative template is given in Annex A to specify these choices. Informative default choices are provided in Annex B.

The main target groups of this European 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. 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 European 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 European 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 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 16798-4).

This European Standard also provides requirements especially for designers, installers, manufacturers, building owners and users, on ventilation, air-conditioning and room-conditioning systems in order to achieve a comfortable and healthy indoor environment in all seasons with acceptable installation and running costs. This European Standard focuses on the system-aspects for typical applications and covers the following:

— Aspects important to achieve and maintain a good energy performance in the systems without any negative impact on the quality of the indoor environment.

— Definitions of design and performances data.

1 Scope

This European Standard applies to the design, energy performance of buildings and implementation of ventilation, air conditioning and room conditioning systems for non-residential buildings subject to human occupancy, excluding applications like industrial processes. It focuses on the definitions of the various parameters that are relevant for such systems.

The guidance for design given in this European Standard and accompanying CEN/TR 16798-4 are mainly applicable to mechanical supply and/or exhaust ventilation systems. Natural ventilation systems or natural parts of hybrid ventilation systems are not covered by this European Standard. Reference is made to the Technical Report for informative guidance on the design of such systems.

Applications for residential ventilation are not dealt with in this European Standard. Performance of ventilation systems in residential buildings are dealt with in EN 15665 and CEN/TR 14788.

The classification uses different categories. For some values, examples are given and, for requirements, typical ranges with default values are presented. The default values given in this European Standard are not normative as such, and should be used where no other values are specified. Classification should always be appropriate to the type of building and its intended use, and the basis of the classification should be explained if the examples given in the European Standard are not to be used.

NOTE 1 Different standards may express the categories for the same parameters in a different way, and also the category symbols may be different.

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

NOTE 2 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 3 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 (in casu M5-1, M5-4), 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 & control	PV, wind, ..
sub 1	M1	sub 1	M2	sub 1		M 3	M4	M5	M6	M 7	M 8	M9	M10	M11
1	General	1	General	1	General			EN 16798 -3						
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			EN 16798 -3						
5	Building Functions and Building Boundaries	5	Heat Transfer by Transmission	5	Emission & control									
6	Building Occupancy and Operating Conditions	6	Heat Transfer by Infiltration and Ventilation	6	Distribution & control									
7	Aggregation of Energy Services and Energy Carriers	7	Internal Heat Gains	7	Storage & control									
8	Building Partitioning	8	Solar Heat Gains	8	Generation & control									

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									
12	Ways to Express Indoor Comfort			**12**	BMS									
13	External Environment Conditions													
14	Economic Calculation													
NOTE 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.

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 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).

EN 308, *Heat exchangers - Test procedures for establishing performance of air to air and flue gases heat recovery devices*

EN 779, *Particulate air filters for general ventilation — Determination of the filtration performance*

EN 1822-3, *High efficiency air filters (EPA, HEPA and ULPA) - Part 3: Testing flat sheet filter media*

EN 1886, *Ventilation for buildings - Air handling units - Mechanical performance*

EN 12599:2012, *Ventilation for buildings - Test procedures and measurement methods to hand over air conditioning and ventilation systems*

EN 12792:2003, *Ventilation for buildings - Symbols, terminology and graphical symbols*

EN 13053:2006+A1:2011, *Ventilation for buildings - Air handling units - Rating and performance for units, components and sections*

EN 15780, *Ventilation for buildings - Ductwork - Cleanliness of ventilation systems*

prEN 16798-1:2015, *Energy performance of buildings — Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics — Module M1-6*

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

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12792:2003, M1-6 and M1-9, EN ISO 7345:1995, EN ISO 52000-1, and the following apply.

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

3.1
EPB standard
standard that complies with the requirements given in EN ISO 52000-1, CEN/TS 16628 and CEN/TS 16629

Note 1 to entry CEN/TS 16628 and CEN/TS 16629 contain specific rules to ensure overall consistency, unambiguity, transparency and flexibility, supported by common templates. EN ISO 52000-1, the overarching EPB standard, is indispensable for each EPB standard, because of the modular structure, common terms and definitions, symbols and subscripts and because it provides the general framework for the EPB assessment.

[SOURCE: EN ISO 52000-1]

3.2
room conditioning system
combination of appliances designed to keep comfort conditions in a room within a defined range

Note 1 to entry: Air conditioning systems as well as surface based systems, such as embedded systems, chilled ceilings and chilled beams, are included.

3.3
occupied zone
volume designed for human occupancy specified by horizontal and vertical planes

3.4
ventilation effectiveness
performance of air diffusion system in removing the pollutants from the occupied zone of a room given by relation between the pollution concentrations in the supply air, the extract air and the indoor air in the breathing zone (within the occupied zone)

3.5
specific fan power
amount of electric fan power divided by the air volume flow

3.6
demand controlled ventilation
ventilation system where the ventilation rate is controlled by air quality, moisture, occupancy or some other indicator for the need of ventilation

3.7
ventilation system
combination of appliances designed to supply interior spaces with outdoor air and to extract polluted indoor air

Note 1 to entry: The system can consist of mechanical components (e.g. combination of air handling unit, ducts and terminal units). Ventilation system can also refer to natural ventilation systems making use of temperature differences and wind with facade grills in combination with mechanical exhaust (e.g. in corridors, toilets etc.). Both mechanical and natural ventilation can be combined with operable windows. A combination of mechanical and non-mechanical components is possible (hybrid systems).

3.8
Exhaust Air Transfer Ratio (EATR)
level of carry over of extract air to the supply air

3.9
Outdoor Air Correction Factor (OACF)
ratio of outdoor air mass flow (ODA) and supply air mass flow (SUP)

3.10
design nominal air flow condition
declared nominal air volume flow at a density of 1,2 kg m^{-3}

3.11
reference load condition for air handling units
filter pressure drop of clean filters, dry heat exchangers and humidifiers at reference condition

3.12
air conditioning system
combination of appliances designed to supply conditioned air to a space

3.13
reference conditions P_{SFP}
reference conditions for pressure drop are: Clean filters and dry conditions for other components (e.g. heat exchanger, cooling coil and humidifier)

3.14
design load condition P_{SFPd}
design load condition for pressure drop are: Average of clean filters and recommended maximum pressure drop and for other components (heat exchanger, cooling coil, humidifier, etc.) the average of dry and wet values

4 Symbols and subscripts

4.1 Symbols

For the purposes of this document, the symbols given in Clause 4 and Annex C of EN ISO 52000-1, EN 12792 and the specific symbols listed in Table 2 apply.