

**HRN EN ISO 52018-1:2017**

**Energy performance of buildings — Indicators for partial EPB requirements related to thermal energy balance and fabric features — Part 1: Overview of options**

Subject: **National Datasheet conforming to the template in Annex A**

Version: 2019-12-20

# HRN EN ISO 52018-1/ National Datasheet (informative)

## Input and method selection data sheet — Choices for Croatia

### NA.1 General

This National Datasheet gives the choices to be used with respect to values, methods and references in Croatia when using the national methodology for assessment of energy performance of buildings for the purpose of issuing energy performance certificate, building permit and permit to use and for energy audit.

This National Datasheet is in line with the template in Annex A of the standard HRN EN ISO 52018-1:2017.

This National Datasheet takes into account national regulations, climatic conditions, traditions and a specific range of validity.

The specific national or regional regulations referred to in this document are:

- Technical regulation on energy economy and heat retention in buildings (Official Gazette 128/15, 70/18, 73/18, 86/18);
- Ordinance on energy audits and energy certification of buildings (Official Gazette 88/17);
- Methodology on energy audit (2017);
- Algorithms for assessment of energy performance of buildings (2017);
- Type solutions of application of alternative systems (2015);
- Handbook for energy certification of buildings (2010).

### NA.2 References

The references, identified by the module code number, are given in a table complying with the format given in Table A.1 (a template).

**Table NA.1 — References**

Reference	Reference document	
	Number	Title
<del>M1-4</del>	<del>ISO 52003-1</del>	<del>Energy performance of buildings—Indicators, requirements, ratings and certificates—Part 1: General aspects and application to the overall energy performance</del>
<del>M1-4</del>	Official Gazette 88/17  HRN EN 15217:2008	Ordinance on energy audits and energy certification of buildings  Energy performance of buildings -- Methods for expressing energy performance and for energy certification of buildings
<del>M1-6</del>	<del>ISO 17772-1</del>  <del>EN 16798-1 (under preparation)</del>	<del>Energy performance of buildings—Indoor environmental quality—Part 1: Indoor environmental input parameters for the design and assessment of energy performance of buildings</del>  <del>Energy performance of buildings—Ventilation 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)</del>

Reference	Reference document	
	Number	Title
M1-6	HRN EN 15251:2007	<i>Algorithms for assessment of energy performance of buildings (2017) Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics</i>
M1-13	ISO 52010-1	<i>Energy performance of buildings — External climatic conditions — Part 1: Conversion of climatic data for energy calculations</i>
M2-2	ISO 52016-1	<i>Energy performance of buildings — Energy needs for heating and cooling, internal temperatures and sensible and latent heat loads — Part 1: Calculation procedures</i>
M2-2	HRN EN ISO 13790:2008 Simple hourly method	<i>Energy performance of buildings -- Calculation of energy use for space heating and cooling</i>
M2-5.1	HRN EN ISO 13789:2008	<i>Thermal performance of buildings — Transmission and ventilation heat transfer coefficients — Calculation method</i>
M2-5.2	HRN EN ISO 10211:2008	<i>Thermal bridges in building construction — Heat flows and surface temperatures — Detailed calculations</i>
M2-5.3	HRN EN ISO 14683:2008	<i>Thermal bridges in building construction — Linear thermal transmittance — Simplified methods and default values</i>
M2-8.1	ISO 52022-1	<i>Energy performance of buildings — Thermal, solar and daylight properties of building components and elements — Part 1: Simplified calculation method of the solar and daylight characteristics for solar protection devices combined with glazing</i>
M2-8.1	HRN EN 13363-1:2008	<i>Solar protection devices combined with glazing – Calculation of solar and light transmittance – Part 1: Simplified method:</i>
M2-8.2	ISO 52022-3	<i>Energy performance of buildings — Thermal, solar and daylight properties of building components and elements — Part 3: Detailed calculation method of the solar and daylight characteristics for solar protection devices combined with glazing</i>
M2-8	HRN EN 13363-2:2008	<i>Solar protection devices combined with glazing Calculation of total solar energy transmittance and light transmittance Part 2: Detailed calculation method</i>
M5-8	EN 16798-5-1  EN 16798-5-2	<i>Energy performance of buildings — Modules M5-6, M5-8, M6-5, M6-8, M7-5, M7-8 — Ventilation for buildings — Calculation methods for energy requirements of ventilation and air conditioning systems — Part 5-1: Distribution and generation (revision of EN 15241) — Method 1 Energy performance of buildings — Modules M5-6.2, M5-8.2 — Ventilation for buildings — Calculation methods for energy requirements of ventilation systems — Part 5-2: Distribution and generation — Method 2</i>
M5-6	HRN EN 15241:2008	<i>Algorithms for assessment of energy performance of buildings (2017) Ventilation for buildings. Calculation methods for energy losses due to ventilation and infiltration in buildings</i>
M9-1	HRN EN 15193-1:2008	<i>Energy performance of buildings – Energy requirements for lighting – Part 1: Specifications, Module M9</i>

## NA.3 Mix of partial energy performance requirements

### NA.3.1 General

See Clause 6.

The table based on the template of Table A.2 shall be filled out as follows.

- The first column lists the partial EPB features that can be considered for setting requirements. The motivation for the mix that is chosen shall be reported below the table. If needed, still other partial EPB features can be added at the bottom of the table. By means of a numbered reference, a precise description of each additional EPB feature will then be given below the table. If possible, the description of the extra feature shall be taken from an EPB standard. Also, for each extra partial EPB feature, the motivation shall be described in a clear manner.
- In the second column, an X-mark is placed at each of the features that is chosen to set a requirement.
- In the third column, for each exception, a numbered reference is made to a full, detailed and clear explanation below the table, including the motivation for the exception. For some types of (detailed) requirements (e.g. on element level, such as thermal insulation), it may be easier to explain the exceptions in conjunction with the detailed description of the actual requirements. In these instances, it suffices to give here the general synthesis, the motivation and a precise reference to the regulatory texts where the requirements and exceptions are described.

### NA.3.2 Application: new buildings

Four different requirement mixes are distinguished depending on typical conditioning habits (i.e. commonly heated and/or cooled or not). The mix that is most appropriate for a certain building category (e.g. dwelling or office) obviously varies strongly with the local climate, typical internal gains, etc. It is clear that for a given geographical location, different building categories can best be served by different requirement mixes. For instance, in moderate summer climates, mix A may be best for dwellings, but for offices, mix D may be most appropriate.

**Table NA.2a — Choices with respect to the mix of partial EPB requirements related to thermal energy balance and fabric features (see Clause 6)**

Application: New constructions						
Partial EPB feature	Requirement?				Exceptions*?	Details in
	Mix A	Mix B	Mix C	Mix D		
Summer thermal comfort	—	—	—	—	—	Table A.3/B.3
Winter thermal comfort	—	—	X	—	—	Table A.4/B.4
Energy “need” for heating: give further specifications*	X (1)	X (1)	—	X (1)	(3)	Table A.5/B.5
Energy “need” for cooling: give further specifications*	—	X (2)	X (2)	X (2)	(4)	Table A.6/B.6
Combined energy “need” for heating and cooling (and possibly still other quantities): define precisely*	—	—	—	—	—	Table A.7/B.7
Overall thermal insulation of the envelope	X	X	—	—	—	Table A.8/B.8
Thermal insulation of individual elements of the thermal envelope	X	X	X	X	X (3)	Table A.9/B.9

Thermal bridges	—	—	—	—	—	Table A.10/B.10
Window energy performance	—	—	—	—	—	Table A.11/B.11
Airtightness of the thermal envelope: mandatory measurement: give further specifications*	X (5)	X (5)	<del>X (4)</del>	<del>X (4)</del>	X (7)	Table A.12/B.12 <sub>1</sub>
Airtightness of the thermal envelope: quantitative requirement: give further specifications*	X (6)	X (6)	—	—	X (7)	Table A.12/B.12
Solar control	X (8)	X (8)	—	—	X (9)	Table A.13/B.13
<free text> (Other requirement 1): define*)	—	—	—	—	—	Table A.14/B.14
<free text> (Other requirement 2): define*)	—	—	—	—	—	Table A.14/B.14
...	—	—	—	—	—	Table A.14/B.14
* The columns or cells that are marked with an asterisk (i.e. any cell involving a specific national/regional element) shall be marked with a numbered reference. A clear explanation and motivation shall be given for each of these new elements below the table.						
<p><b>Explanation:</b></p> <p>(a) If applicable, specify for the energy “need” for heating:</p> <ul style="list-style-type: none"> <li>— with the real or with a predefined fictitious ventilation system;</li> <li>— including/excluding the amount of heat needed for active preheating of the incoming hygienic ventilation air (if present);</li> <li>— including/excluding the latent heat need (i.e. the sensible heat need only or not);</li> <li>— still other aspects.</li> </ul> <p>(b) If applicable, specify for the energy “need” for cooling:</p> <ul style="list-style-type: none"> <li>— with the real or with a predefined fictitious ventilation system;</li> <li>— including/excluding the amount of cold needed for active precooling of the incoming hygienic ventilation air (if present);</li> <li>— including/excluding the latent cold need (i.e. the sensible cold need only or not);</li> <li>— still other aspects.</li> </ul>						
<p><b>Specifications according to each of the numbered references:</b></p> <p>The following types of requirement mixes are distinguished.</p> <ul style="list-style-type: none"> <li>— Type Mix A: building categories where only heating system is supposed to be installed as specified in Technical regulation on energy economy and heat retention in buildings (Official Gazette 128/15, 70/18, 73/18, 86/18);</li> <li>— Type Mix B: building categories where both heating and cooling systems are supposed to be installed as specified in Technical regulation on energy economy and heat retention in buildings (Official Gazette 128/15, 70/18, 73/18, 86/18);</li> </ul>						

<sup>1</sup> Suspected erratum in (EN) ISO 52018-1:2017 here corrected.

**Numbered references:**

(1) The annual energy need for heating comprises heat losses through envelope and the heat need for ventilation air treatment (including sensible and latent heat). The recovered heat losses from technical systems are not included.

(2) The annual energy need for cooling comprises heat losses through envelope and the cold need for ventilation air treatment (including sensible and latent heat). The recovered heat losses from technical systems are not included.

(3) Exceptions are allowed for:

- residential and non-residential buildings with useful floor area  $< 50 \text{ m}^2$  shall only satisfy requirement on U-coefficient

Motivation: to lower design and technical systems costs

- buildings with more than 70% of energy need for heating covered from renewable sources

Motivation: to promote use of renewables

- buildings with more than 50% of energy need is covered by heat internal gains from technology process

Motivation: to lower investment costs in production facilities

(4) Exceptions are allowed for:

- larger sport facilities, wholesale and retail trade services buildings

Motivation: difficulties to determine minimum requirements for buildings of variable geometries and shapes

- non-residential buildings (excluding the above mentioned) with the share of window surface area in total envelope surface area larger than 30% have higher minimum requirements

Motivation: relaxing requirement due to high solar gains

(3), (4) - when the primary energy use is at least 20% lower than the minimum requirement

Motivation: to promote use of renewables

(5) The air tightness measurement shall be performed according to HRN EN 13829:2002, method A.

(6) During measurement from (5) at the pressure difference 50 Pa, a maximum air change rate shall be  $n_{50} < 3,0 \text{ h}^{-1}$  for buildings without mechanical ventilation and  $n_{50} < 1,5 \text{ h}^{-1}$  for buildings with mechanical ventilation.

(7) The exception is allowed for buildings which are not classified as nZEB with the following annual energy needs:

-  $Q''_{H,nd} > 50 \text{ kWh}/(\text{m}^2 \cdot \text{a})$  when average ambient air monthly temperature in the coldest month (at building location) is  $\leq 3 \text{ }^\circ\text{C}$

-  $Q''_{H,nd} \leq 25 \text{ kWh}/(\text{m}^2 \cdot \text{a})$  when average ambient air monthly temperature in the coldest month (at building location) is  $> 3 \text{ }^\circ\text{C}$

(8) When overheating due to solar radiation of building rooms during summer period is to be prevented by solar protection devices, then glazing in the room with highest ratio glazing surface area to envelope surface area shall comply with solar control requirements.

(9) Exception: all transparent elements with surface area  $> 2 \text{ m}^2$   $g_{tot} < 0,4$ .

### Motivation for the chosen requirement mix:

(in up-bottom order)

- The requirement on annual energy need for heating ensures that building heat losses through envelope and ventilation losses are maintained low independently of heating systems, i.e. that the total energy consumption for heating is low, irrespective of consumed energy renewable or non-renewable origins.
- The requirement on annual energy need for cooling ensures that building heat gains through envelope and ventilation gains are maintained low independently of cooling system, i.e. that the total energy consumption for cooling is low, irrespective of consumed energy renewable or non-renewable origins.
- The requirement on overall thermal insulation of the envelope refers to the coefficient of transmission  $H_{tr,adj}$  [W/(m<sup>2</sup>K)] and is provided as complementary to the U-coefficient requirement, taking into account the shape factor of a building
- The requirement on thermal insulation of individual elements of the thermal envelope refers to the U-coefficient of building fabrics [W/(m<sup>2</sup>K)] with aim to prevent condensation inside and/or on surface of building structural components. It also ensures certain level of thermal comfort (by maintaining lower difference between surface and ambient air temperatures). Influence of thermal bridges is taken into account by increasing U-coefficient of each building element.
- The requirement on airtightness of the thermal envelope: mandatory measurement: creates a strong regulatory stimulus that due attention be paid to this aspect by all actors in the construction process (designers and contractors alike). The requirement also aims at preventing condensation inside and/or on surface of building structural components.
- The requirement on airtightness of the thermal envelope: quantitative requirement: ensures reaching of low energy consumption target in nZEB class designed buildings as well as in low energy and passive buildings (A and B energy class)
- The requirement on solar control aims at decreasing energy need for cooling in all categories of buildings.
  
- Mix A. Building categories which are not supposed to have cooling systems are family houses, multi-storey residential buildings, educational buildings and the other buildings. For this categories cooling need requirement is not set, while all the other requirements are the same as for Mix B. This choice is independent on the climate data and it applies to both new buildings and existing buildings undergoing reconstruction.
- Mix B. Comprises all the other categories which are not included in Mix A. For these categories cooling need requirement is set, along with all the other requirements stated for Mix A. This choice is independent on the climate data and it applies to both new buildings and existing buildings undergoing reconstruction.

### NA.3.3 Application: existing buildings

**Table NA.2b — Choices with respect to the partial EPB requirements related to thermal energy balance and fabric features (see Clause 6)**

Application: Works on existing buildings				
Partial energy performance feature	Requirement?		Exceptions*?	Details in
	Mix A	Mix B		
Summer thermal comfort	—	—	—	Table A.3/B.3
Winter thermal comfort	—	—	—	Table A.4/B.4
Energy “need” for heating: give further specifications (a)*	X (1)	X (1)	(3)	Table A.5/B.5
Energy “need” for cooling: give further specifications (b)*	—	X (2)	(4)	Table A.6/B.6
Combined energy “need” for heating and cooling (and possibly still other quantities): define precisely*	—	—	—	Table A.7/B.7
Overall thermal insulation of the envelope	—	—	—	Table A.8/B.8
Thermal insulation of individual elements of the thermal envelope	X <del>(1)</del>	X	<del>X</del> (2)	Table A.9/B.9
Thermal bridges	—	—	—	Table A.10/B.10

Window energy performance	—	—	—	Table A.11/B.11
Airtightness of the thermal envelope: mandatory measurement: give further specifications*	X (5)	X (5)	X (7)	Table A.12/B.12
Airtightness of the thermal envelope: quantitative requirement: give further specifications*	X (6)	X (6)	X (7)	Table A.12/B.12
Solar control	X (8)	—	X(9)	Table A.13/B.13
<free text> Other requirement 1; define*)	—	—	—	Table A.14/B.14
<free text> Other requirement 2; define*)	—	—	—	Table A.14/B.14
...	—	—	—	Table A.14/B.14

\* The columns or cells that are marked with an asterisk (i.e. any cell involving a specific national/regional element) shall be marked with a numbered reference. A clear explanation and motivation shall be given for each of these new elements below the table.

### Specifications and motivations:

#### Explanation:

(a) If applicable, specify for the energy “need” for heating:

- with the real or with a predefined fictitious ventilation system;
- including/excluding the amount of heat needed for active preheating of the incoming hygienic ventilation air (if present);
- including/excluding the latent heat need (i.e. the sensible heat need only or not);
- still other aspects.

(b) If applicable, specify for the energy “need” for cooling:

- with the real or with a predefined fictitious ventilation system;
- including/excluding the amount of cold needed for active precooling of the incoming hygienic ventilation air (if present);
- including/excluding the latent cold need (i.e. the sensible cold need only or not);
- still other aspects.

### Specifications according to each of the numbered references:

The following types of requirement mixes are distinguished.

- Type Mix A: building categories where only heating system is supposed to be installed as specified in Technical regulation on energy economy and heat retention in buildings (Official Gazette 128/15, 70/18, 73/18, 86/18);
- Type Mix B: building categories where both heating and cooling systems are supposed to be installed as specified in Technical regulation on energy economy and heat retention in buildings (Official Gazette 128/15, 70/18, 73/18, 86/18);

#### Numbered references:

(1) The annual energy need for heating comprises heat losses through envelope and the heat need for ventilation air treatment (including sensible and latent heat). The recovered heat losses from technical systems are not included.

(2) The annual energy need for cooling comprises heat losses through envelope and the cold need for ventilation air treatment (including sensible and latent heat). The recovered heat losses from technical systems are not included.

(3), (4) Exceptions are allowed for:

- buildings from the register of cultural properties if satisfying the energy requirements would ruin a building monument characteristics

#### Motivation: to preserve cultural heritage

- buildings undergoing reconstruction on less than 75% of total envelope surface area of heated part of a building
- buildings undergoing reconstruction on more than 75% of total envelope surface area of heated part of a building where satisfying the minimum requirements is not economically, technically and functionally and feasible approved by cost optimum analysis



Motivation: to ensure economic feasibility

- when the primary energy use is at least 20% lower than the minimum requirement

Motivation: to promote use of renewables

(5) The air tightness measurement shall be performed according to HRN EN 13829:2002, method A.

(6) During measurement from (5) at the pressure difference 50 Pa, a maximum air change rate shall be  $n_{50} < 3,0 \text{ h}^{-1}$  for buildings without mechanical ventilation and  $n_{50} < 1,5 \text{ h}^{-1}$  for buildings with mechanical ventilation.

(7) The exception is allowed for buildings which are not classified as nZEB with the following annual energy needs:

-  $Q''_{H,nd} > 50 \text{ kWh}/(\text{m}^2 \cdot \text{a})$  when average ambient air monthly temperature in the coldest month (at building location) is  $\leq 3 \text{ }^\circ\text{C}$

-  $Q''_{H,nd} \leq 25 \text{ kWh}/(\text{m}^2 \cdot \text{a})$  when average ambient air monthly temperature in the coldest month (at building location) is  $> 3 \text{ }^\circ\text{C}$

(8) When overheating due to solar radiation of building rooms during summer period is to be prevented by solar protection devices, then glazing in the room with highest ratio glazing surface area to envelope surface area shall comply with solar control requirements.

(9) Exception: all transparent elements with surface area  $> 2 \text{ m}^2$   $g_{tot} < 0,4$ .

#### **Motivation for the chosen requirement mix:**

(in up-bottom order)

— The requirement on annual energy need for heating ensures that building heat losses through envelope and ventilation losses are maintained low independently of heating systems, i.e. that the total energy consumption for heating is low, irrespective of consumed energy renewable or non-renewable origins.

— The requirement on annual energy need for cooling ensures that building heat gains through envelope and ventilation gains are maintained low independently of cooling system, i.e. that the total energy consumption for cooling is low, irrespective of consumed energy renewable or non-renewable origins.

— The requirement on thermal insulation of individual elements of the thermal envelope refers to the U-coefficient of building fabrics  $[\text{W}/(\text{m}^2\text{K})]$  with aim to prevent condensation inside and/or on surface of building structural components. It also ensures certain level of thermal comfort (by maintaining lower difference between surface and ambient air temperatures). Influence of thermal bridges is taken into account by increasing U-coefficient of each building element.

— The requirement on airtightness of the thermal envelope: mandatory measurement: creates a strong regulatory stimulus that due attention be paid to this aspect by all actors in the construction process (designers and contractors alike). The requirement also aims at preventing condensation inside and/or on surface of building structural components.

— The requirement on airtightness of the thermal envelope: quantitative requirement: ensures reaching of low energy consumption target in nZEB class designed buildings as well as in low energy and passive buildings (A and B energy class)

— Mix A. Building categories which are not supposed to have cooling systems are family houses, multi-storey residential buildings, educational buildings and the other buildings. For this categories cooling need requirement is not set, while all the other requirements are the same as for Mix B. This choice is independent on the climate data and it applies to both new buildings and existing buildings undergoing reconstruction.

— Mix B. Comprises all the other categories which are not included in Mix A. For these categories cooling need requirement is set, along with all the other requirements stated for Mix A. This choice is independent on the climate data and it applies to both new buildings and existing buildings undergoing reconstruction.

## NA.4 Partial energy performance requirements

### NA.4.1 Application: new buildings

Table NA.3a is applicable for requirement mixes A and B:

**Table B.3a — Numeric indicator used for the requirement on the summer thermal comfort (see Clause 7)**

Application: New constructions	
Numeric indicator	Choice
Time above a fixed reference temperature [h]	
Temperature weighted time above a fixed reference temperature [K·h]	✗
<free text> Other indicator; define*)	Not applicable
...	
* If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:	
<b>Description in case of other indicator:</b>	
Not applicable.	
<p><b>NOT APPLICABLE</b></p> <p>Technical regulation on energy economy and heat retention in buildings (Official Gazette 128/15, 70/18, 73/18, 86/18) refer to HRN EN 15251:2008 concerning recommended values of microclimate parameters. No limit values (requirements) are defined for evaluating thermal comfort conditions according to Method A or Method B from Annex F.</p>	

Table NA.4a is applicable for requirement mixes A and B:

**Table B.4a — Numeric indicator used for the requirement on the winter thermal comfort (see Clause 8)**

Application: New constructions	
Numeric indicator	Choice
Time above a fixed reference temperate [h]	
Temperature weighted time above a fixed reference temperature [K·h]	✗
<free text> Other indicator; define*)	Not applicable
...	
* If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:	
<b>Description in case of other indicator:</b>	
Not applicable.	
<p><b>NOT APPLICABLE</b></p> <p>Technical regulation on energy economy and heat retention in buildings (Official Gazette 128/15, 70/18, 73/18, 86/18) refer to HRN EN 15251:2008 concerning recommended values of microclimate parameters. No limit values (requirements) are defined for evaluating thermal comfort conditions according to Method A or Method B from Annex F.</p>	

Table NA.5a is applicable for requirement mixes A and B:

**Table NA.5a — Numeric indicator used for the requirement on the energy “need” for heating (see Clause 9)**

Application: New constructions	
Numeric indicator	Choice
Total “need” [kWh]	
“Need” per useful floor area [kWh/m <sup>2</sup> ]	X
Ratio (define*)	<del>X(1)</del>
<free text> Other indicator; define*)	
...	
* If a ratio or another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:	
<b>Description in case of ratio or other indicator:</b>	

Table NA.6a is applicable for requirement mix B

**Table NA.6a — Numeric indicator used for the requirement on the energy “need” for cooling (see Clause 10)**

Application: New constructions	
Numeric indicator	Choice
Total “need” [kWh]	
“Need” per useful floor area [kWh/m <sup>2</sup> ]	X
Ratio (define*)	<del>X(1)</del>
<free text> Other indicator; define*)	
...	
* If a ratio or another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:	
<b>Description in case of ratio or other indicator:</b>	

Table B.7a is not applicable for any of the requirement mixes A to B.

For the sake of completeness of the set of Tables in this document with fillable Annexes B, Table A.7 is provided here:

**Table A.7 — Numeric indicator used for the requirement on the combined energy “need” for heating and cooling (and possibly still other quantities) (see Clause 11)**

Application: ...	
Numeric indicator	Choice
Total “need” [kWh]	
“Need” per useful floor area [kWh/m <sup>2</sup> ]	
Ratio (define*)	
<free text> Other indicator; define*)	

...	
* If a ratio or another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:	
<b>Description in case of ratio or other indicator:</b>	
<free text>	
NOT APLICABLE	

Table NA.8a is ~~not~~ applicable to requirement mixes A and B.

For the sake of completeness of the set of Tables in this document with fillable Annexes B, Table A.8 is provided here:

**Table NA.8 — Numeric indicator used for the requirement on the overall thermal insulation of the thermal envelope (see Clause 12)**

Application: <b>New constructions</b>	
Numeric indicator	Choice
Overall transmission heat transfer coefficient $H_{tr}$ [W/K]	
Mean thermal transmittance $U_{mn}$ [W/(m <sup>2</sup> ·K)]	
Ratio; define*)	
Overall transmission heat transfer coefficient $H_{tr,adj}$ [W/(m <sup>2</sup> K)]	X
...	
* If a ratio or another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:	
<b>Description in case of a ratio or other indicator:</b>	
— The requirement on overall thermal insulation of the envelope refers to the coefficient of transmission $H_{tr,adj}$ [W/(m <sup>2</sup> K)] and is provided as complementary to the U-coefficient requirement, taking into account the shape factor of a building.	
Ref: Technical regulation on energy economy and heat retention in buildings (Official Gazette 128/15, 70/18, 73/18, 86/18);	

Table NA.9a is applicable for requirement mixes A and B:

**Table NA.9a — Numeric indicator used for the requirement on the thermal insulation of individual elements of the thermal envelope (see Clause 13)**

Application: <b>New constructions</b>	
Numeric indicator	Choice
Minimum temperature factor $f_{Rsi}$ [-]	
Thermal transmittance $U$ [W/(m <sup>2</sup> ·K)]	X
Total thermal resistance $R_{tot}$ [m <sup>2</sup> K/W]	
Intrinsic element thermal resistance $R_{c,op}$ [m <sup>2</sup> K/W]	
<free text> Other indicator; define*)	
...	
* If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:	

**Description in case of other indicator:**

Not applicable.

Concerning Table B.10a, Thermal bridges: no explicit requirement, but integrated into the EPB assessments in a practical manner that stimulates “good solutions”, as discussed in ISO/TR 52018-2<sup>[7]</sup>.

For the sake of completeness of the set of Tables in this document with fillable Annexes B, Table A.10 is provided here:

**Table A.10** — Numeric indicator used for the requirement on the thermal bridges (see Clause 14)

Application: ...	
Numeric indicator	Choice
Minimum temperature factor $f_{Rsi}$ [-]	
Linear thermal transmittance $\Psi$ [W/(m·K)], possibly differentiated per type of junction	
Point thermal transmittance $\chi$ [W/K], possibly differentiated per type of three dimensional thermal bridge	
Relative importance of thermal bridges compared to the overall heat transfer coefficient [-] $(\Sigma\Psi l + \Sigma\chi)/H_{tr}$	
<free text> Other indicator; define*)	
...	
* If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:	
<b>Description in case of other indicator:</b>	
<free text>	
NOT APPLICABLE	

Table B.11a is not applicable for any of the requirement mixes A and B.

For the sake of completeness of the set of Tables in this document with fillable Annexes B, Table A.11 is provided here:

**Table A.11** — Numeric indicator used for the requirement on the window energy performance (see Clause 15)

Application: ...	
Numeric indicator	Choice
Heating energy performance $P_{E;H;w}$ [kWh/m <sup>2</sup> ]	
Cooling energy performance $P_{E;C;w}$ [kWh/m <sup>2</sup> ]	
Combination of heating and cooling energy performance $P_{E;H^+C;w}$ [kWh/m <sup>2</sup> ]	
For glazing only: energy balance value $E$ [W/(m <sup>2</sup> ·K)]	
Minimal window area in certain types of rooms: specify*	
<free text> Other indicator; define*)	
...	
* If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:	

<b>Description in case of other indicator:</b>
<free text>
NOT APPLICABLE

Table NA.12a is ~~not~~ applicable for the requirement mixes A to B:

**Table NA.12a — Numeric indicator used for the requirement on the thermal envelope air tightness (see Clause 16)<sup>1</sup>**

Application: New constructions	
Numeric indicator	Choice
Specific leakage rate per thermal envelope area $q_{Epr}$ [m <sup>3</sup> /h/m <sup>2</sup> ]	—
Air change rate $n_{pr}$ [h <sup>-1</sup> ]	X
Specific leakage rate per useful floor area $q_{Fpr}$ [m <sup>3</sup> /h/m <sup>2</sup> ]	X
<free text> Other indicator; define*)	—
...	—
Specify for the chosen method of the air tightness measurement:	
<ul style="list-style-type: none"> <li>— the precise definition of the reference area or volume for the indicator used;</li> <li>— the reference pressure, <math>p_r</math>;</li> <li>— result of pressurization, depressurization or mean;</li> <li>— other, if needed.</li> </ul>	
<b>Specification (if method 1, 2 or 3):</b>	
<p>The air tightness measurement shall be performed according to HRN EN 13829:2002, method A.</p> <p>During measurement from at the pressure difference 50 Pa, a maximum air change rate shall be <math>n50 &lt; 3,0</math> h-1 for buildings without mechanical ventilation and <math>n50 &lt; 1,5</math> h-1 for buildings with mechanical ventilation.</p> <p>The exception is allowed for buildings which are not classified as nZEB with the following annual energy needs:</p> <ul style="list-style-type: none"> <li>– <math>Q''_{H,nd} &gt; 50</math> kWh/(m<sup>2</sup>·a) when average ambient air monthly temperature in the coldest month (at building location) is <math>\leq 3</math> °C</li> <li>– <math>Q''_{H,nd} \leq 25</math> kWh/(m<sup>2</sup>·a) when average ambient air monthly temperature in the coldest month (at building location) is <math>&gt; 3</math> °C</li> </ul>	
* If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:	
<b>Description in case of other indicator:</b>	
<free text>	

Table NA.13a ~~to B.14a are not~~ is applicable to requirement mixes A and B.

For the sake of completeness of the set of Tables in this document with fillable Annexes B, Table A.13 and Table A.14 are provided here:

**Table NA.13 — Numeric indicator used for the requirement on the solar control (see Clause 17)**

Application: New constructions	
Numeric indicator	Choice
Solar factor $g$ or $g_{tot}$ or $F_{nps}$ [-]	X
<free text> Other indicator; define*)	
...	

\* If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:

**Description in case of other indicator:**

The requirement is expressed in term of  $g_{tot}f$  for all transparent elements (glazings) and in term of  $g_{tot}$  for all transparent elements with surface area  $> 2m^2$ , where  $f$  is the ratio glazing surface area to envelope surface area.

Table B.14a is not applicable for any of the requirement mixes A and B.

**Table A.14** — Numeric indicator used for other requirements (see Table A.2/B.2)

Application: ...	
EPB feature	Numeric indicator
<free text> Other requirement 1; define*)	<free text>
<free text> Other requirement 2; define*)	...
...	
* All EPB features and their corresponding indicator shall be clearly described and precise reference shall be made to their definition and their assessment method. The numbers (1), (2), ... refer to the numbers of other requirements in Table A.2/B.2.	
<b>Specification:</b>	
Other requirement 1: ... <free text>	
Other requirement 2: ...	
<free text>	
NOT APPLICABLE	

**NA.4.2 Application: existing buildings**

Tables B.3b to B.4b ~~B.8b~~ are not applicable because there are no requirements set in Table B.2b for these EPB features.

**Table NA.5b** — Numeric indicator used for the requirement on the energy “need” for heating (see Clause 9)

Application: New constructions	
Numeric indicator	Choice
Total “need” [kWh]	
“Need” per useful floor area [kWh/m <sup>2</sup> ]	X
Ratio (define*)	<del>X</del> (1)
<free text> Other indicator; define*)	
...	
* If a ratio or another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:	
<b>Description in case of ratio or other indicator:</b>	

Table NA.6b is applicable for requirement mix B

**Table NA.6b — Numeric indicator used for the requirement on the energy “need” for cooling (see Clause 10)**

Application: New constructions	
Numeric indicator	Choice
Total “need” [kWh]	
“Need” per useful floor area [kWh/m <sup>2</sup> ]	X
Ratio (define*)	<del>X</del> (1)
<free text> Other indicator; define*)	
...	
* If a ratio or another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method: <b>Description in case of ratio or other indicator:</b>	

Tables B.7b and B.8b are not applicable for any of the requirement mixes A to B.

**Table NA.9b — Numeric indicator used for the requirement on the thermal insulation of individual elements of the thermal envelope (see Clause 13)**

Application: Works on existing buildings	
Numeric indicator	Choice
Minimum temperature factor $f_{Rsi}$ [-]	
Thermal transmittance $U$ [W/(m <sup>2</sup> ·K)]	X
Total thermal resistance $R_{tot}$ [m <sup>2</sup> K/W]	
Intrinsic element thermal resistance $R_{e,op}$ [m <sup>2</sup> K/W]	
<free text> Other indicator; define*)	
...	
* If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method: <b>Description in case of other indicator:</b>	

Tables B.10b, B.11b and B.12b are not applicable because there are no requirements set in Table B.2b for these EPB features.



**Table NA.12b — Numeric indicator used for the requirement on the thermal envelope air tightness (see Clause 16)<sup>1</sup>**

Application: Works on existing buildings	
Numeric indicator	Choice
Specific leakage rate per thermal envelope area $q_{Epr}$ [ $m^3/h/m^2$ ]	—
Air change rate $n_{pr}$ [ $h^{-1}$ ]	X
Specific leakage rate per useful floor area $q_{Fpr}$ [ $m^3/h/m^2$ ]	X
<free text> Other indicator; define*)	—
...	—
Specify for the chosen method of the air tightness measurement: <ul style="list-style-type: none"> <li>— the precise definition of the reference area or volume for the indicator used;</li> <li>— the reference pressure, <math>p_r</math>;</li> <li>— result of pressurization, depressurization or mean;</li> <li>— other, if needed.</li> </ul>	
<b>Specification (if method 1, 2 or 3):</b>	
<p>The air tightness measurement shall be performed according to HRN EN 13829:2002, method A.</p> <p>During measurement from at the pressure difference 50 Pa, a maximum air change rate shall be <math>n_{50} &lt; 3,0 h^{-1}</math> for buildings without mechanical ventilation and <math>n_{50} &lt; 1,5 h^{-1}</math> for buildings with mechanical ventilation.</p> <p>The exception is allowed for buildings which are not classified as nZEB with the following annual energy needs:</p> <ul style="list-style-type: none"> <li>– <math>Q''_{H,nd} &gt; 50 kWh/(m^2 \cdot a)</math> when average ambient air monthly temperature in the coldest month (at building location) is <math>\leq 3\text{ }^\circ C</math></li> <li>– <math>Q''_{H,nd} \leq 25 kWh/(m^2 \cdot a)</math> when average ambient air monthly temperature in the coldest month (at building location) is <math>&gt; 3\text{ }^\circ C</math></li> </ul>	
* If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:	
<b>Description in case of other indicator:</b>	
<free text>	

**Table NA.13b — Numeric indicator used for the requirement on the solar control (see Clause 17)**

Application: Works on existing buildings	
Numeric indicator	Choice
Solar factor $g$ or $g_{tot}$ or $F_{npss}$ [-]	X
<free text> Other indicator; define*)	Not applicable
...	
* If another indicator is used, it shall be clearly described below. And precise reference shall be made to its definition and its assessment method:	
<b>Description in case of other indicator:</b>	
The requirement is expressed in term of $g_{tot}f$ for all transparent elements (glazings) and in term of $g_{tot}$ for all transparent elements with surface area $> 2m^2$ , where $f$ is the ratio glazing surface area to envelope surface area.	

Table B.14b is not applicable because there are no requirements set in Table B.2b for other EPB features.