



BSI Standards Publication

# Energy performance of buildings – Thermal, solar and daylight properties of building components and elements

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Part 2: Explanation and justification

## National foreword

This Published Document is the UK implementation of CEN ISO/TR 52022-2:2017.

The UK participation in its preparation was entrusted to Technical Committee B/540/2, Building performance - Moisture.

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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TECHNICAL REPORT

**CEN ISO/TR 52022-2**

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**Energy performance of buildings - Thermal, solar and  
daylight properties of building components and elements -  
Part 2: Explanation and justification (ISO/TR 52022-  
2:2017)**

Performance énergétique des bâtiments - Propriétés  
thermiques, solaires et lumineuses des composants et  
éléments du bâtiment - Partie 2: Explication et  
justification (ISO/TR 52022-2:2017)

Energieeffizienz von Gebäuden - Wärmetechnische,  
solare und tageslichtbezogene Eigenschaften von  
Bauteilen und Bauelementen - Teil 2: Erklärung und  
Begründung (ISO/TR 52022-2:2017)

This Technical Report was approved by CEN on 24 February 2017. It has been drawn up by the Technical Committee CEN/TC 89.

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

## European foreword

This document (CEN ISO/TR 52022-2:2017) has been prepared by Technical Committee ISO/TC 163 "Thermal performance and energy use in the built environment" in collaboration with Technical Committee CEN/TC 89 "Thermal performance of buildings and building components" the secretariat of which is held by SIS.

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.

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

This document is part of the set of standards on the energy performance of buildings (the set of EPB standards) and has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association (Mandate M/480, see reference [EF1] below) and supports essential requirements of EU Directive 2010/31/EC on the energy performance of buildings (EPBD, [EF2]).

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 applications by classifying the building energy performance for a dedicated building stock.

### References:

[EF1] Mandate M480, Mandate to CEN, CENELEC and ETSI for the elaboration and adoption of standards for a methodology calculating the integrated energy performance of buildings and promoting the energy efficiency of buildings in accordance with the terms set in the recast of the Directive on the energy performance of buildings (2010/31/EU) of 14th December 2010

[EF2] EPBD, Recast of the Directive on the energy performance of buildings (2010/31/EU) of 14th December 2010

### Endorsement notice

The text of ISO/TR 52022-2:2017 has been approved by CEN as CEN ISO/TR 52022-2:2017 without any modification.

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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](http://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](http://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 on 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 the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

ISO 52022-2 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 89, *Thermal performance of buildings and building components*, in collaboration with ISO Technical Committee ISO/TC 163, *Thermal performance and energy use in the built environment*, Subcommittee SC 2 *Calculation methods*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 52022 series can be found on the ISO website.

## Introduction

### The set of EPB standards, technical reports and supporting tools

In order to facilitate the necessary overall consistency and coherence, in terminology, approach, input/output relations and formats, for the whole set of EPB-standards, the following documents and tools are available:

- a) a document with basic principles to be followed in drafting EPB-standards: CEN/TS 16628:2014<sup>[1]</sup>;
- b) a document with detailed technical rules to be followed in drafting EPB-standards: CEN/TS 16629:2014<sup>[2]</sup>.

The detailed technical rules are the basis for the following tools:

- 1) a common template for each EPB-standard, including specific drafting instructions for the relevant clauses;
- 2) a common template for each technical report that accompanies an EPB standard or a cluster of EPB standards, including specific drafting instructions for the relevant clauses;
- 3) a common template for the spreadsheet that accompanies each EPB (calculation) standard, to demonstrate the correctness of the EPB calculation procedures.

Each EPB-standards follows the basic principles and the detailed technical rules and relates to the overarching EPB-standard, ISO 52000-1 <sup>[3]</sup>.

One of the main purposes of the revision of the EPB-standards is to enable that laws and regulations directly refer to the EPB-standards and make compliance with them compulsory. This requires that the set of EPB-standards consists of a systematic, clear, comprehensive and unambiguous set of energy performance procedures. The number of options provided is kept as low as possible, taking into account national and regional differences in climate, culture and building tradition, policy and legal frameworks (subsidiarity principle). For each option, an informative default option is provided ([Annex B](#)).

### Rationale behind the EPB technical reports

There is a risk that the purpose and limitations of the EPB standards will be misunderstood, unless the background and context to their contents – and the thinking behind them - is explained in some detail to readers of the standards. Consequently, various types of informative contents are recorded and made available for users to properly understand, apply and nationally or regionally implement the EPB standards.

If this explanation would have been attempted in the standards themselves, the result is likely to be confusing and cumbersome, especially if the standards are implemented or referenced in national or regional building codes.

Therefore each EPB standard is accompanied by an informative technical report, like this one, where all informative content is collected to ensure a clear separation between normative and informative content (see CEN/TS 16629<sup>[2]</sup>):

- to avoid flooding and confusing the actual normative part with informative content;
- to reduce the page count of the actual standard, and
- to facilitate understanding of the set of EPB standards..

This was also one of the main recommendations from the European CENSE project<sup>[5]</sup> that laid the foundation for the preparation of the set of EPB standards.

### **This technical report**

This technical report accompanies the suite of EPB standards on thermal transmission properties windows, doors and curtain wallings and the standards for solar and daylight characteristics for solar protection devices combined with glazing. It relates to ISO 10077-1 [6], ISO 10077-2 [7], ISO 12631 [8], ISO 52022-1 [9] and ISO 52022-3 [10] which form part of a set of standards related to the evaluation of the energy performance of buildings (EPB).

The role and the positioning of the accompanied standard(s) in the set of EPB standards is defined in the introductions to ISO 10077-1, ISO 10077-2, ISO 12631, ISO 52022-1 and ISO 52022-3.

### **Accompanying spreadsheets**

Concerning ISO 10077-1, ISO 10077-2, ISO 12631, ISO 52022-1 and ISO 52022-3, spreadsheets were produced for:

- ISO 10077-1;
- ISO 12631;
- ISO 52022-1.

No accompanying calculation spreadsheets were prepared on:

- ISO 10077-2: The calculation method of ISO 10077-2 cannot be implemented in a spreadsheet.
- ISO 52022-3: The calculation method of ISO 52022-3 cannot be implemented in a spreadsheet.

These spreadsheets are available at [www.epb.center](http://www.epb.center)

# Energy performance of buildings — Thermal, solar and daylight properties of building components and elements —

## Part 2: Explanation and justification

### 1 Scope

This document contains information to support the correct understanding and use of ISO 10077-1, ISO 10077-2, ISO 12631, ISO 52022-1 and ISO 52022-3.

This technical report does not contain any normative provision.

### 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 6946, *Building components and building elements — Thermal resistance and thermal transmittance — Calculation methods*

ISO 7345, *Thermal insulation — Physical quantities and definitions*

ISO 10077-1, *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Part 1: General*

ISO 10077-2, *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Part 2: Numerical method for frames*

ISO 12631:2017, *Thermal performance of curtain walling — Calculation of thermal transmittance*

ISO 52022-1, *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*

ISO 52022-3, *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*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6946, ISO 7345, ISO 10077-1, ISO 10077-2, ISO 12631, ISO 52022-1 and ISO 52022-3 apply.

More information on some key EPB terms and definitions is given in ISO/TR 52000-2.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>