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Interested committees:

Title: Draft BS EN 50583-1 Draft Photovoltaics in buildings. Part 1: BIPV modules.

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

English Version

Photovoltaics in buildings - Part 1: BIPV modules

Photovoltaïque dans la construction - Partie 1: Modules
photovoltaïques intégrés au bâtiment

Photovoltaik im Bauwesen - Teil 1 BIPV-Module

This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2024-03-08.

It has been drawn up by CLC/TC 82.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CENELEC in three official versions (English, French, German).
A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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37 European foreword

38 This document (prEN 50583-1:2023 has been prepared by CLC/TC 82 "Solar photovoltaic energy systems".

39 This document is currently submitted to the Enquiry.

40 The following dates are proposed:

- latest date by which the existence of this document has to be announced at national level (doa) dor + 6 months
- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) dor + 12 months
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) dor + 36 months (to be confirmed or modified when voting)

41 This document will supersede EN 50583-1: 2016.

42 This document is read in conjunction with EN 50583-2:2016.

1 Scope

This document applies to photovoltaic modules that contain at least one glass pane and which are used as construction products. It focuses on the properties of these photovoltaic modules relevant to essential building requirements as specified in the European Construction Product Regulation CPR 305/2011, and the applicable electro-technical requirements as stated in the Low Voltage Directive 2014/35/EU / or CENELEC standards. The CE mark of building integrated photovoltaic (BIPV) modules will thus state properties based on both documents as they are both equally applicable.

This document references international standards, technical reports and guidelines. For some mounting categories, in addition, national standards (or regulations) for building products may apply in individual countries, which are not explicitly referenced here and for which harmonized European Standards are not yet available.

The document is addressed to manufacturers, planners, system designers, installers, testing institutes and building authorities.

This document does not address concentrating or building-attached photovoltaic modules (BAPV).

This document addresses requirements on the PV modules in the specific ways they are intended to be mounted. Separable mounting structures are within the scope of EN 50583-2.

NOTE For the definition of building-attached photovoltaic modules (BAPV) refer to Clause 3.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document or its annexes 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.

EN 356, *Glass in building - Security glazing - Testing and classification of resistance against manual attack*

prEN 410:2023, *Glass in building - Determination of luminous and solar characteristics of glazing*

EN 572-9, *Glass in building - Basic soda lime silicate glass products - Part 9: Evaluation of conformity/Product standard*

EN 673, *Glass in building - Determination of thermal transmittance (U value) - Calculation method*

EN 674, *Glass in building - Determination of thermal transmittance (U value) - Guarded hot plate method*

EN 675, *Glass in building - Determination of thermal transmittance (U value) - Heat flow meter method*

EN 1063, *Glass in building - Security glazing - Testing and classification of resistance against bullet attack*

EN 1096-4, *Glass in building - Coated glass - Part 4: Product standard*

EN 1279-5, *Glass in building - Insulating glass units - Part 5: Product standard*

EN 1863-2, *Glass in building - Heat strengthened soda lime silicate glass - Part 2: Evaluation of conformity/Product standard*

EN 1990, *Eurocode - Basis of structural and geotechnical design*

EN 1991 (all parts), *Eurocode 1 - Actions on structures*

EN 1992, (all parts), *Eurocode 2 - Design of concrete structures*

EN 1993, (all parts), *Eurocode 3: Design of steel structures*

EN 1994, (all parts), *Eurocode 4 - Design of composite steel and concrete structures*

- 80 EN 1995, (all parts), *Eurocode 5 - Design of timber structures*
- 81 EN 1998, (all parts), *Eurocode 4: - Design of structures for earthquake resistance*
- 82 EN 1999, (all parts), *Eurocode 9: Design of aluminium structures*
- 83 EN 12150-2, *Glass in building - Thermally toughened soda lime silicate safety glass - Part 2: Evaluation of*
84 *conformity/Product standard*
- 85 EN 12337-2, *Glass in building - Chemically strengthened soda lime silicate glass - Part 2: Evaluation of*
86 *conformity/Product standard*
- 87 EN 12488, *Glass in building - Glazing recommendations - Assembly principles for vertical and sloping glazing*
- 88 EN 12519, *Windows and pedestrian doors - Terminology*
- 89 EN 12600, *Glass in building - Pendulum test - Impact test method and classification for flat glass*
- 90 EN 12758, *Glass in building - Glazing and airborne sound insulation - Product descriptions, determination of*
91 *properties and extension rules*
- 92 EN 13022, (all parts), *Glass in building - Structural sealant glazing*
- 93 EN 13119, *Curtain walling - Terminology*
- 94 EN 13501-1, *Fire classification of construction products and building elements - Part 1: Classification using data*
95 *from reaction to fire tests*
- 96 EN 13501-2, *Fire classification of construction products and building elements - Part 2: Classification using data*
97 *from fire resistance and/or smoke control tests, excluding ventilation services*
- 98 data from fire resistance tests, excluding ventilation services
- 99 EN 13541, *Glass in building - Security glazing - Testing and classification of resistance against explosion*
100 *pressure*
- 101 EN 13830, *Curtain walling - Product standard*
- 102 EN 14179-2, *Glass in building - Heat soaked thermally toughened soda lime silicate safety glass - Part 2:*
103 *Evaluation of conformity/Product standard*
- 104 EN 14351-1, *Windows and doors - Product standard, performance characteristics - Part 1: Windows and*
105 *external pedestrian doorsets*
- 106 EN 14449, *Glass in building - Laminated glass and laminated safety glass - Evaluation of conformity/Product*
107 *standard*
- 108 EN 14500, *Blinds and shutters - Thermal and visual comfort - Test and calculation methods*
- 109 EN 15804:2012+A2:2019, *Sustainability of construction works - Environmental product declarations - Core rules*
110 *for the product category of construction products*
- 111 EN 16612:2019, *Glass in building - Determination of the lateral load resistance of glass panes by calculation*
- 112 CEN/TS 19100 (all parts), *Design of glass structures*
- 113 EN 50380, *Marking and documentation requirements for Photovoltaic Modules*

- 114 EN 61082-1, *Preparation of documents used in electrotechnology - Part 1: Rules*
- 115 EN 61215-2, *Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 2: Test*
116 *procedures*
- 117 EN IEC 61730-1, *Photovoltaic (PV) module safety qualification - Part 1: Requirements for construction*
- 118 EN IEC 61730-2, *Photovoltaic (PV) module safety qualification - Part 2: Requirements for testing*
- 119 CLC/TS 61836, *Solar photovoltaic energy systems - Terms, definitions and symbols*
- 120 EN 62446-1, *Photovoltaic (PV) systems - Requirements for testing, documentation and maintenance - Part 1:*
121 *Grid connected systems - Documentation, commissioning tests and inspection*
- 122 EN IEC/IEEE 82079-1, *Preparation of information for use (instructions for use) of products - Part 1: Principles*
123 *and general requirements*
- 124 EN IEC 60904-9:2020, *Photovoltaic devices - Part 9: Classification of solar simulator characteristics*
- 125 EN ISO 12543 (all parts), *Glass in building - Laminated glass and laminated safety glass*
- 126 EN ISO 52022-3, *Energy performance of buildings - Thermal, solar and daylight properties of building*
127 *components and elements - Part 3: Detailed calculation method of the solar and daylight characteristics for solar*
128 *protection devices combined with glazing (ISO 52022-3)*

129 **3 Terms and definitions**

130 For the purposes of this document, the terms and definitions given in EN 1990, EN ISO 12543 (all parts),
131 EN 12519, EN 13119, CLC/TS 61836, EN 13022 (all parts), and the following apply.

132 Note Annex-specific definitions are included in the annexes themselves.

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

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

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

136 **3.1**

137 **Building-Integrated Photovoltaic modules**

138 **BIPV modules**

139 PV modules that form a construction product providing a function as defined in the European Construction
140 Product Regulation CPR 305/2011, and that are therefore prerequisites for the integrity of a building's
141 functionality

142 Note 1 to entry: If the integrated PV module is dismantled (in the case of structurally bonded modules, dismantling
143 includes the adjacent construction product), the PV module would have to be replaced by an appropriate construction
144 product in order to maintain the buildings functionality.

145 Note 2 to entry: The building's functions in the context of BIPV are one or more of the following:

- 146 • mechanical rigidity or structural integrity;
- 147 • primary weather impact protection: rain, snow, wind, hail;
- 148 • energy economy, such as shading, daylighting, thermal insulation;
- 149 • fire protection;

- noise protection;
- separation between indoor and outdoor environments;
- security, shelter or safety.

Note 3 to entry: Inherent electro-technical properties of PV alone, such as antenna function, power generation and electromagnetic shielding, etc., do not qualify PV modules to be building-integrated

3.2

Building-Attached Photovoltaic Modules

BAPV modules

PV modules that are mounted on a building envelope and do not fulfil the above criteria for building integration

Note 1 to entry: Negation: The integrity of the building functionality is independent of the existence of a building-attached photovoltaic module.

Note 2 to entry: Further important information on this type of photovoltaic system on roofs is provided by the Technical Report by CEN/TC 128/WG3 - Solar energy systems for roofs: Requirements for structural connections to solar panels.

4 Requirements

4.1 General

As electrical components, BIPV modules are subject to the applicable electro-technical requirements as stated in the Low Voltage Directive (LVD) 2014/35/EC / or the corresponding CENELEC standards.

The essential requirements defined in the LVD 2014/35/EC are:

- Protection against hazards arising from the electrical equipment,
- Protection against hazards which may be caused by external influences on the electrical equipment.

As construction products, BIPV modules are subject to the Essential Requirements as specified in the European Construction Product Regulation (CPR) 305/2011.

The essential requirements defined in the CPR 305/2011 are:

- Mechanical resistance and stability,
- Safety in case of fire,
- Hygiene, health and the environment, ¹
- Safety and accessibility in use,
- Protection against noise,
- Energy economy and heat retention,
- Sustainable use of natural resources.

4.2 Electrical requirements

The BIPV modules shall comply with harmonized electrical standard EN IEC 61730- 1 and 2 for photovoltaic module safety qualification

¹ As per Directive 2011/65/EU of the European parliament from 8th June 2011, photovoltaic modules have been exempted from the ROHS directive.

- Protection against hazards arising from the electrical equipment
- Protection against hazards which may be caused by external influences on the electrical equipment

The integration of a PV module, which already complies with the EN IEC 61730 standard, into a construction product to create a BIPV module may change the electrical properties with respect to the original PV module. New evaluation of the BIPV module with respect to a basic requirement of the LVD is only necessary if an essential characteristic of the BIPV module needed to fulfil this basic requirement is changed with respect to the original PV module.

4.3 Building/construction works related requirements

In addition to naming the general requirements of the CPR, this document classifies BIPV modules containing glass into five different categories depending on the intended mounting type (see Clause 5). Specific normative references with the requirements on BIPV modules that are derived from the CPR are listed for each mounting category (see Annex A).

As construction products, BIPV modules shall be designed to withstand wind, snow and other applicable loads as well as to comply with other requirements set out in the following standards, technical specifications and their national application documents:

- EN 1990 - Basis of structural design,
- EN 1991 (all parts)- Actions on structures,
- EN 1992 (all parts) - Design of concrete structures,
- EN 1993 (all parts) - Design of steel structures,
- EN 1994 (all parts) - Design of composite steel and concrete structures,
- EN 1995 (all parts) - Design of timber structures,
- EN 1998 (all parts) - Design of structures for earthquake resistance,
- EN 1999 (all parts) - Design of aluminium structures,
- CEN/TS 19100-1, 2 and -3 - Design of glass structures,
- EN 16612 - Glass in building. Determination of the lateral load resistance of glass panes by calculation.

The procedures and the input data for structural design of BIPV modules are described in Annex B.

In some countries, national regulations specify additional requirements. These depend on the mounting category and must be observed.

If a BIPV module already contains a frame or a support structure, its design and safety verification shall be performed according to the design codes for the respective materials, EN 12488 or their national equivalents, and EN 13022-1. In the case of curtain walling, EN 13830 applies. In the case of windows, EN 14351-1 applies.

NOTE The integration of photovoltaics into an existing construction product to create a BIPV module necessarily changes the properties with respect to the original construction product. New evaluation of the BIPV module with respect to a basic requirement of the CPR is necessary only if an essential characteristic of the BIPV module needed to meet this basic requirement is changed with respect to the original construction product.

As stated in the scope, this document applies to BIPV modules which contain one or more glass panes. Since EN ISO 12543-1 defines laminated glass as “an assembly consisting of one sheet of glass with one or more sheets of glass and/or plastic glazing sheet material joined together with one or more interlayers”, all PV modules that contain one or more glass panes are per definition “laminated glass” and shall comply with the

- 223 standard EN 14449. If PV laminated glass is a component of an insulating glass unit, the final product shall
 224 comply with the standard EN 1279-5.
- 225 Each of the panes used shall comply with one or more of the following product standards / evaluation of
 226 conformity standards for glass in buildings depending on its composition and/or its thermal treatment.
- 227 • EN 572-9: *Glass in building – Basic soda lime silicate glass products*
 - 228 • EN 1863-2: *Glass in building – Heat strengthened soda lime silicate glass*
 - 229 • EN 12150-2: *Glass in building – Thermally toughened soda lime silicate safety glass*
 - 230 • EN 1096-4: *Glass in building – Coated glass*
 - 231 • EN 14179: *Glass in building - Heat soaked thermally toughened soda lime silicate safety glass*
 - 232 • EN 14449: *Glass in building - Laminated glass and laminated safety glass*
 - 233 • EN 12337-2: *Glass in building - Chemically strengthened soda lime silicate glass*
 - 234 • EN 13022- 1: *Glass in building - Structural sealant glazing*
 - 235 • EN 1279-5: *Glass in building - Insulating glass units*
- 236 Photovoltaics in buildings is often subject to partial shading, which can cause thermally induced glass breakage
 237 – either directly or due to hot spots. The module manufacturer has to minimize the risk of breakage by the
 238 module design itself and/or the specification of relevant restrictions on mounting (see Annex C).