



Institut luxembourgeois de la normalisation
de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 61730-2:2007

**Photovoltaic (PV) module safety
qualification -- Part 2: Requirements
for testing**

Photovoltaik(PV)-Module -
Sicherheitsqualifikation - Teil 2:
Anforderungen an die Prüfung

Qualification pour la sûreté de
fonctionnement des modules
photovoltaïques (PV) -- Partie 2:
Exigences pour les essais

05/2007



National Foreword

This European Standard EN 61730-2:2007 was adopted as Luxembourgish Standard ILNAS-EN 61730-2:2007.

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**Photovoltaic (PV) module safety qualification –
Part 2: Requirements for testing
(IEC 61730-2:2004, modified)**

Qualification pour la sûreté de
fonctionnement des modules
photovoltaïques (PV) –
Partie 2: Exigences pour les essais
(CEI 61730-2:2004, modifiée)

Photovoltaik (PV) -Module –
Sicherheitsqualifikation –
Teil 2: Anforderungen an die Prüfung
(IEC 61730-2:2004, modifiziert)

This European Standard was approved by CENELEC on 2006-12-01. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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 CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of the International Standard IEC 61730-2:2004, prepared by IEC TC 82, Solar photovoltaic energy systems, together with the common modifications prepared by the Technical Committee CENELEC TC 82, Solar photovoltaic energy systems, was submitted to the formal vote and was approved by CENELEC as EN 61730-2 on 2006-12-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2008-02-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2010-02-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61730-2:2004 was approved by CENELEC as a European Standard with agreed common modifications as given below.

COMMON MODIFICATIONS

General

Replace all references to "IEC 61730-1", "IEC 61730-2" and "this part of IEC 61730" by "EN 61730-1", "EN 61730-2" and "this part of EN 61730".

2 Normative references

Replace the entire clause by:

See Annex ZA.

3 Application classes

3.2 Class A: General access, hazardous voltage, hazardous power applications

Replace the text by:

Modules rated for use in this application class may be used in systems operating at greater than 120 V DC. Modules qualified for safety through EN 61730-1 and this part of EN 61730 within this application class are considered to meet the requirements for safety class II.

3.4 Class C: Limited voltage

Change the title of the subclause as given above.

Replace the text by:

Modules rated for use in this application class are restricted to systems operating at less than 120 V DC. Modules qualified for safety through EN 61730-1 and this part of EN 61730 within this application class are considered to meet the requirements for safety class III.

NOTE Safety classes are defined within EN 61140.

5 Application classes and their necessary test procedures

Table 7 Delete "MST 23" from the row referring to "Fire test" and replace the content of footnote ** by:

** A European fire test is under consideration.

8 Testing

Figure 1 Delete "MST 23" from the box referring to "Fire test" and add "***" referring to a footnote reading:

* A European fire test is under consideration.

10 Test procedures

10.4.2 Apparatus

Renumber the note into NOTE 1.

Add the following notes:

NOTE 2 The maximum over-current protection rating of a module can be interpreted as the module series fuse rating. A series fuse may be required in the installation of PV arrays. According to Subclause 12.2 of EN 61730-1 the maximum over-current protection rating has to be provided by the manufacturer.

NOTE 3 A procedure for determination of maximum reverse current is described in EN 50380.

10.8 Replace the entire subclause by:

10.8 Fire test

Under consideration.

10.9.2 Procedure

Renumber the note into NOTE 1.

Add the following note:

NOTE 2 The maximum over-current protection rating of a module can be interpreted as the module series fuse rating. A series fuse may be required in the design of PV arrays. According to Subclause 12.2 of EN 61730-1 the maximum over-current protection rating has to be provided by the manufacturer.

10.10 Module breakage test MST 32

Add the following note:

NOTE If the glass is qualified in accordance with EN 12150-1 this test can be omitted.

11.1.2 Preconditioning

Replace the text by:

It is advisable to perform the partial discharge-test before using the back sheet foil in the PV module construction.

NOTE In order to achieve a certain statistical relevance 10 pieces should undergo the test. The size of the specimen depends on requirement originating from the test apparatus.

11.1.3 Apparatus

Add the following sentence:

The geometry of the electrodes shall be in conformance with EN 60243-1.

11.1.4 Procedure

In item a) **add** the following notes:

NOTE 1 Any voltage below maximum systems voltage can be used but the test should start at zero voltage because it may happen that maximum systems voltage is not stated or unknown.

NOTE 2 When increasing the test voltage partial discharges may appear periodically. In that case, the inception voltage is the test voltage at which permanent discharges occur for a duration of at least 60 s.

In item b) **add** the following note:

NOTE 3 Because partial discharges can disappear periodically, partial discharges at extinction voltage should stay below 1 pC for a minimum of 60 s.

In item e) **replace** " U_{oc} " by " V_{oc} ".

Annex A

Delete the annex.

Bibliography

Add the following notes for the standards indicated:

IEC 60068-2-21	NOTE Harmonized as EN 60068-2-21:1999 (not modified).
IEC 60364-1	NOTE Superseded by IEC 60364-1:2005, which is at draft stage for harmonization as HD 60364-1 (modified).
IEC 60529	NOTE Harmonized as EN 60529:1991 (not modified).
IEC 61345	NOTE Harmonized as EN 61345:1998 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
–	–	Glass in building - Thermally toughened soda lime silicate safety glass – Part 1: Definition and description	EN 12150-1	– ¹⁾
–	–	Datasheet and nameplate information for photovoltaic modules	EN 50380	2003
IEC 60060-1	– ¹⁾	High-voltage test techniques – Part 1: General definitions and test requirements	HD 588.1 S1	1999 ²⁾
IEC 60068-1	– ¹⁾	Environmental testing – Part 1: General and guidance	EN 60068-1	1994 ²⁾
IEC 60243-1	1998	Electrical strength of insulating materials - Test methods – Part 1: Tests at power frequencies	EN 60243-1	1998
IEC 60410	– ¹⁾	Sampling plans and procedures for inspection by attributes	–	–
IEC 60664-1 + A1 + A2	1992 2000 2002	Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests	EN 60664-1	2003
IEC 60904-2	– ¹⁾	Photovoltaic devices – Part 2: Requirements for reference solar devices	EN 60904-2	2007
IEC 61032	1997	Protection of persons and equipment by enclosures - Probes for verification	EN 61032	1998
IEC 61140	– ¹⁾	Protection against electric shock - Common aspects for installation and equipment	EN 61140	2002 ²⁾
IEC 61215	2005	Crystalline silicon terrestrial photovoltaic (PV) modules - Design qualification and type approval	EN 61215	2005
IEC 61646	1996	Thin-film terrestrial photovoltaic (PV) modules - Design qualification and type approval	EN 61646	1997
IEC 61730-1 (mod)	2004	Photovoltaic (PV) module safety qualification– Part 1: Requirements for construction	EN 61730-1	2007
ISO/IEC 17025	– ¹⁾	General requirements for the competence of testing and calibration laboratories	EN ISO/IEC 17025	2005 ²⁾

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.