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STN	**Cyklické tepelné namáhanie fotovoltických (PV) modulov Skúšobný postup**	**STN EN IEC 62892** 36 4606

Extended thermal cycling of PV modules - Test procedure

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 10/19

Obsahuje: EN IEC 62892:2019, IEC 62892:2019

129655

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 62892

June 2019

ICS 27.160

English Version

Extended thermal cycling of PV modules - Test procedure (IEC 62892:2019)

Cycle thermique étendu de modules PV - Procédure d'essai (IEC 62892:2019)

Erweiterte Temperaturwechselprüfung von PV Modulen (IEC 62892:2019)

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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

European foreword

The text of document 82/1537/FDIS, future edition 1 of IEC 62892, prepared by IEC/TC 82 "Solar photovoltaic energy systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62892:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-02-22
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-05-22

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62892:2019 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 61215-1	2016	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1: Test requirements	EN 61215-1	2016
IEC 61215-1-1	-	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1-1: Special requirements for testing of crystalline silicon photovoltaic (PV) modules	EN 61215-1-1	-
IEC 61215-1-2	-	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1-2: Special requirements for testing of thin-film Cadmium Telluride (CdTe) based photovoltaic (PV) modules	EN 61215-1-2	-
IEC 61215-1-3	-	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1-3: Special requirements for testing of thin-film amorphous silicon based photovoltaic (PV) modules	EN 61215-1-3	-
IEC 61215-1-4	-	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1-4: Special requirements for testing of thin-film $Cu(In,GA)(S,Se)_2$based photovoltaic (PV) modules	EN 61215-1-4	-
IEC 61215-2	2016	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 2: Test procedures	EN 61215-2	2017
IEC 61730-1	-	Photovoltaic (PV) module safety qualification - Part 1: Requirements for construction	EN IEC 61730-1	-
IEC 61730-2	-	Photovoltaic (PV) module safety qualification - Part 2: Requirements for testing	EN IEC 61730-2	-
IEC/TS 61836	-	Solar photovoltaic energy systems - Terms, definitions and symbols	-	-
IEC/TS 62915	-	Photovoltaic (PV) modules - Type approval, design and safety qualification - Retesting	-	-
IEC/TS 62941	2016	Terrestrial photovoltaic (PV) modules - Quality system for PV module manufacturing	-	-

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

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Cycle thermique étendu de modules PV – Procédure d'essai

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INTERNATIONAL STANDARD

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EXTENDED THERMAL CYCLING OF PV MODULES – TEST PROCEDURE

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62892 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
82/1537/FDIS	82/1560/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

The IEC 61215 series defines test requirements for the design qualification of flat-plate PV modules for long-term operation in general open-air climates. IEC TS 62941 provides technical guidance in application of the type-approval testing.

This document, IEC 62892, supplements IEC 61215 by providing an extended thermal cycling test intended to differentiate PV modules with improved durability to thermal cycling and evaluate modules for deployment in locations most susceptible to thermal cycling type stress.

EXTENDED THERMAL CYCLING OF PV MODULES – TEST PROCEDURE

1 Scope

This document defines a test sequence that extends the thermal cycling test of IEC 61215-2. It is intended to differentiate PV modules with improved durability to thermal cycling and evaluate modules for deployment in locations most susceptible to thermal cycling type stress[1]. This document is based on the ability for 95 % of the modules represented by the samples submitted for this test to pass an equivalency of 500 thermal cycles, as defined in IEC 61215-2:2016, 4.11.3, with a maximum power degradation of less than 5 %. Provisions are also provided to reduce overall test time by increasing the maximum cycle temperature and/or the number of modules submitted for test.

The test procedure in this document was developed based on analysis of the stress on tin-lead solder bonds on crystalline silicon solar cells in a glass superstrate type package. Changes to lead-free solder have an effect on the acceleration factors but not enough to change the overall results of this test. Monolithic type modules with integral cell interconnection do not suffer from this specific type of stress but there are still electrical connections within the module, for example between the integrated cell circuit and the module bus bars, that may be subject to wear out from thermal cycling. Flexible modules (without glass) are not stressed in the same way as those with glass superstrates or substrates, therefore use of the equivalency factor employed in this document may not be applicable to these modules.

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.

IEC 61215-1:2016, *Terrestrial photovoltaic (PV) modules – Design qualification and type approval – Part 1: Test requirements*

IEC 61215-1-1, *Terrestrial photovoltaic (PV) modules – Design qualification and type approval – Part 1-1: Special requirements for testing of crystalline silicon terrestrial photovoltaic (PV) modules*

IEC 61215-1-2, *Terrestrial photovoltaic (PV) modules – Design qualification and type approval – Part 1-2: Special requirements for testing of thin-film Cadmium Telluride (CdTe) based photovoltaic (PV) modules*

IEC 61215-1-3, *Terrestrial photovoltaic (PV) modules – Design qualification and type approval – Part 1-3: Special requirements for testing of thin-film amorphous silicon based photovoltaic (PV) modules*

IEC 61215-1-4, *Terrestrial photovoltaic (PV) modules – Design qualification and type approval – Part 1-4: Special requirements for testing of thin-film Cu(In,GA)(S,Se)$_2$ based photovoltaic (PV) modules*

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1 Guidance is provided in Annex B to assess if this test is warranted for the targeted deployment location.

IEC 61215-2:2016, *Terrestrial photovoltaic (PV) modules – Design qualification and type approval – Part 2: Test procedures*

IEC 61730-1, *Photovoltaic (PV) module safety qualification – Part 1: Requirements for construction*

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

IEC TS 61836, *Solar photovoltaic energy systems – Terms, definitions and symbols*

IEC TS 62915, *Photovoltaic (PV) modules – Type approval, design and safety qualification – Retesting*

IEC TS 62941:2016, *Terrestrial photovoltaic (PV) modules – Guideline for increased confidence in PV module design qualification and type approval*