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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.

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**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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EN IEC 62892:2019 (E)**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.

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Annex ZA

(normative)

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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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
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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Extended thermal cycling of PV modules – Test procedure

Cycle thermique étendu de modules PV – Procédure d'essai

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**EXTENDED THERMAL CYCLING OF PV MODULES –
TEST PROCEDURE****FOREWORD**

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

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

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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 stress¹. 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.

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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*

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*

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