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Derisking photovoltaic modules – Sequential and combined accelerated stress testing

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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IEC TR 63279, which is a Technical Report, has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

The text of this Technical Report is based on the following documents:

Enquiry draft	Report on voting
82/1657/DTR	82/1692B/RVDTR

Full information on the voting for the approval of this technical report 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- withdrawn,
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- amended.

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DERISKING PHOTOVOLTAIC MODULES – SEQUENTIAL AND COMBINED ACCELERATED STRESS TESTING

1 Scope

This document reviews research into sequential and combined accelerated stress tests that have been devised to determine the potential for degradation modes in PV modules that occur in the field that single-factor and steady-state tests do not show. This document is intended to provide data and theory-based motivation and help visualize the next steps for improved accelerated stress tests that will derisk PV module materials and designs. Any incremental savings as a result of increased reliability and reduced risk translates into lower levelized cost of electricity for PV. Lower costs will result in faster adoption of PV and the associated benefits of renewable energy.

2 Normative references

The following documents are referred 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 60721-2-1, *Classification of environmental conditions – Part 2-1: Environmental conditions appearing in nature – Temperature and humidity*

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

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

IEC 61730-2:2016, *Photovoltaic (PV) module safety qualification – Part 2: Requirements for testing*

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

IEC TS 62782:2016, *Photovoltaic (PV) modules – Cyclic (dynamic) mechanical load testing*

IEC 62788 (all parts), *Measurement procedures for materials used in photovoltaic modules*

IEC TS 62804-1, *Photovoltaic (PV) modules – Test methods for the detection of potential-induced degradation – Part 1: Crystalline silicon*

IEC TS 62804-1-1, *Photovoltaic (PV) modules – Test methods for the detection of potential-induced degradation – Part 1-1: Crystalline silicon – Delamination*

ASTM D7869-17 *Standard Practice for Xenon Arc Exposure Test with Enhanced Light and Water Exposure for Transportation Coatings*