SLOVENSKI STANDARD
oSIST prEN IEC 62941:2024

01-maj-2024

Prizemni fotonapetostni (PV) moduli - Sistem kakovosti za proizvodnjo PV-modulov

Terrestrial photovoltaic (PV) modules - Quality system for PV module manufacturing

Terrestrische Photovoltaik(PV)-Module - Qualitätssystem zur Fertigung von PV-Modulen

Modules photovoltaïques (PV) pour applications terrestres - Système de qualité pour la fabrication des modules photovoltaïques

Ta slovenski standard je istoveten z: **prEN IEC 62941:2024**

ICS:

03.120.99	Drugi standardi v zvezi s kakovostjo	Other standards related to quality
27.160	Sončna energija	Solar energy engineering

oSIST prEN IEC 62941:2024 **en,fr,de**

82/2217/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 62941 ED2**	
DATE OF CIRCULATION: **2024-03-01**	CLOSING DATE FOR VOTING: **2024-05-24**
SUPERSEDES DOCUMENTS: **82/2181/CD, 82/2207A/CC**	

IEC TC 82 : SOLAR PHOTOVOLTAIC ENERGY SYSTEMS	
SECRETARIAT: United States of America	SECRETARY: Mr George Kelly
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC ☐ ENVIRONMENT ☒ QUALITY ASSURANCE ☐ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING **Attention IEC-CENELEC parallel voting** The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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Recipients of this document are invited to submit, with their comments, notification of any relevant “In Some Countries” clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (See AC/22/2007 or NEW GUIDANCE DOC).

TITLE:

Terrestrial photovoltaic (PV) modules – Quality system for PV module manufacturing

PROPOSED STABILITY DATE: 2029

NOTE FROM TC/SC OFFICERS:

This project was discussed and supported by WG2 during their meeting in 2023-11.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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TERRESTRIAL PHOTOVOLTAIC (PV) MODULES – QUALITY SYSTEM FOR PV MODULE MANUFACTURING

FOREWORD

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International Standard IEC 62941 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
82/1635/FDIS	82/1641/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.

TERRESTRIAL PHOTOVOLTAIC (PV) MODULES – QUALITY SYSTEM FOR PV MODULE MANUFACTURING

1.Scope

This document is applicable to organizations manufacturing photovoltaic (PV) modules certified to IEC 61215 series and IEC 62108 for design qualification and type approval and IEC 61730 for safety qualification. The design qualification and type approval of PV modules depend on appropriate methods for product and process design, as well as appropriate control of materials and processes used to manufacture the product. This document lays out best practices for product design, manufacturing processes, and selection and control of materials used in the manufacture of PV modules that have met the requirements of IEC 61215 series and IEC 61730. These standards also form the basis for factory audit criteria of such sites by various certifying and auditory bodies.

The object of this document is to provide a framework for the improved confidence in the ongoing consistency of performance and reliability of certified PV modules. The requirements of this document are defined with the assumption that the quality management system of the organization has already fulfilled the requirements of ISO 9001 or equivalent quality management system. This document is not intended to replace or remove any requirements of ISO 9001 or equivalent quality management system. By maintaining a manufacturing system in accordance with this document, PV modules are expected to maintain their performance as determined from the test sequences in IEC 61215 seriesand IEC 61730.

NOTE: Reference to IEC 61730 means reference to both parts 1 and 2.

This document is applicable to all PV modules independent of design and technology, i.e. flat panel, concentrator photovoltaic (CPV). Quality controls for CPV and nonconventional flat-plate manufacturing will differ somewhat from those of more conventional designs; this document has not considered these differences.

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 60812: *Failure modes and effects analysis (FMEA and FMECA)*

IEC 60891*, Photovoltaic devices – Procedure for temperature and irradiance corrections to measured I-V characteristics*

IEC 60904-1*, Photovoltaic devices – Part 1: Measurement of photovoltaic current-voltage characteristics*

IEC 60904-2, *Photovoltaic devices – Part 2: Requirements for photovoltaic reference devices*

IEC 60904-3, *Photovoltaic devices – Part 3: Measurement principles for terrestrial photovoltaic (PV) solar devices with reference spectral irradiance data*

IEC 60904-4, *Photovoltaic devices – Part 4: Reference solar devices – Procedures for establishing calibration traceability*

IEC 60904-7, *Photovoltaic devices – Part 7: Computation of the spectral mismatch correction for measurements of photovoltaic devices*

IEC 60904-9, *Photovoltaic devices – Part 9: Solar simulator performance requirements*

IEC TR 60904-14, Photovoltaic devices - Part 14: Guidelines for production line measurements of single-junction PV module maximum power output and reporting at standard test conditions

IEC 61215 (all parts), *Terrestrial photovoltaic (PV) modules – Design qualification and type approval*

IEC 61340-5-1, Electrostatics - Part 5-1: Protection of electronic devices from electrostatic phenomena - General requirements

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 61853-1, *Photovoltaic (PV) module performance testing and energy rating – Part 1: Irradiance and temperature performance measurements and power rating*

IEC 62108, *Concentrator photovoltaic (CPV) modules and assemblies – Design qualification and type approval*

IEC 62759-1*, Photovoltaic (PV) modules – Transportation testing – Part 1: Transportation and shipping of module package units*

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

ISO/IEC Guide 98-3, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement*

ISO 9001:2015*, Quality management systems – Requirements*

3.Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions given in IEC TS 61836 and the following apply.

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

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1

containment
action taken to protect the customer from the effect of a harmful situation

Note 1 to entry: Containment may include correcting an existing situation or adding additional screening or retesting.

3.2
control plan
documented description of the systems and processes, and controls required for maintaining the product and process quality as well as reaction to non-conformance

3.3
customer
end user, investor, installer who purchases modules from the organization for their own use

3.4
design lifetime
design target period during which PV modules are expected to safely satisfy the specified performance under the specified conditions

Note 1 to entry: Specified conditions include application of use, installation environment configurations and operation conditions of the PV module in use. The design target period is set considering changes in performance of PV modules due to aging degradation of parts and materials used in the stated environment.

3.5
Design Failure Mode and Effects Analysis
DFMEA
application of the Failure Mode and Effects Analysis (FMEA) method specifically to design activities related to the product/service

3.6
Define, Measure, Analyse, Improve, Control
DMAIC
data-driven quality strategy for improving processes and an integral part of a Six Sigma quality initiative

3.7
Electrostatic discharge
ESD
transfer of electric charge between bodies of different electric potential in proximity or through direct contact

Note 1 to entry: Electrostatic discharge (ESD) events are known to damage semiconductor devices such as diodes.

3.8
Failure, Modes and Effects Analysis
FMEA
document that defines the design, process, or solution with requirements and includes potential modes, causes and severity of effects of failure, along with an evaluation of the likelihood of their occurrence and ease of detection

Note 1 to entry: FMEA provides a mechanism to prioritize the risks and take appropriate mitigation steps.

3.9
key materials
those materials that affect safety, reliability, product performance, or lifetime of the PV module

Note 1 to entry: Key materials may include indirect materials. Those materials which are used during the manufacturing process of PV modules, but are not found in the end product. In most chemical processes, catalyzers are indirect materials.

3.10
key process
processes that need special attention to ensure designed safety, reliability, product performance and/or lifetime of the PV module