

Photovoltaic (PV) modules - Salt mist corrosion testing

## EESTI STANDARDI EESSÕNA

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English Version

**Photovoltaic (PV) modules - Salt mist corrosion testing  
(IEC 61701:2020)**

Modules photovoltaïques (PV) - Essai de corrosion au  
brouillard salin  
(IEC 61701:2020)

Photovoltaik (PV-)Module - Salznebel-Korrosionsprüfung  
(IEC 61701:2020)

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## European foreword

The text of document 82/1693/FDIS, future edition 3 of IEC 61701, prepared by IEC/TC 82 "Solar photovoltaic energy systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61701:2020.

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) 2021-04-16
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-07-16

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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](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-2-52	-	Environmental testing - Part 2-52: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)	EN IEC 60068-2-52	-
IEC 61215-1	-	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1: Test requirements	-	-
IEC 61215-2	-	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 2: Test procedures	-	-
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 62108	-	Concentrator photovoltaic (CPV) modules and assemblies - Design qualification and type approval	-	-
ISO 9223	-	Corrosion of metals and alloys - Corrosivity of atmospheres - Classification, determination and estimation	EN ISO 9223	-
ISO 9227	-	Corrosion tests in artificial atmospheres - Salt spray tests	EN ISO 9227	-

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

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**Photovoltaic (PV) modules – Salt mist corrosion testing**

**Modules photovoltaïques (PV) – Essai de corrosion au brouillard salin**



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# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

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**Photovoltaic (PV) modules – Salt mist corrosion testing**

**Modules photovoltaïques (PV) – Essai de corrosion au brouillard salin**

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**PHOTOVOLTAIC (PV) MODULES –  
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International Standard IEC 61701 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

This third edition cancels and replaces the second edition issued in 2011. This edition constitutes a technical revision.

The main technical changes with respect to the previous edition are as follows:

- The scope has been updated to better reflect the applicability of the Standard.
- Test methods and requirements have been condensed and aligned with the new editions of IEC 61215-1, IEC 61215-2, and IEC 61730-2. References to crystalline silicon versus thin film technologies have been eliminated. The old Figure 2 on the thin film test sequence has been eliminated.
- The salt mist test references have been updated to harmonize with changes to IEC 60068-2-52.

- A normative annex A has been added to provide guidance on which of the test methods in IEC 60068-2-52 are applicable to different applications. This includes references to new test methods in the latest edition of IEC 60068-2-52.

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

FDIS	Report on voting
82/1693/FDIS	82/1725/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.

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## PHOTOVOLTAIC (PV) MODULES – SALT MIST CORROSION TESTING

### 1 Scope

Photovoltaic (PV) modules are electrical devices normally intended for continuous outdoor exposure during their lifetime. Highly corrosive wet atmospheres, such as marine environments or locations near the ocean or other large bodies of salt water, could eventually degrade some of the PV module components (corrosion of metallic parts, deterioration of the properties of some non-metallic materials – such as protective coatings and plastics – by assimilation of salts, etc.) causing permanent degradation that could impair their functioning. Temporary corrosive atmospheres are also present in places where salt is used in winter periods to melt ice formations on streets and roads.

This document describes test sequences useful to determine the resistance of different PV modules to corrosion from salt mist containing Cl (NaCl, MgCl<sub>2</sub>, etc.). All tests included in the sequences are fully described in IEC 61215-2, IEC 62108, IEC 61730-2 and IEC 60068-2-52. The bypass diode functionality test in this document is modified from its description in IEC 61215-2. They are combined in this document to provide means to evaluate possible faults caused in PV modules when operating under wet atmospheres having high concentration of dissolved salt (NaCl). Depending on the specific nature of the surrounding atmosphere to which the module is exposed in real operation several testing methods can be applied, as defined in IEC 60068-2-52. Guidance for determining the applicability of this document and selecting an appropriate method is provided in Annex A.

This document can be applied to both flat plate PV modules and concentrator PV modules and assemblies.

### 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 60068-2-52, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*

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

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

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

ISO 9223, *Corrosion of metals and alloys – Corrosivity of atmospheres – Classification, determination and estimation*