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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Concentrator photovoltaic (CPV) modules – Thermal cycling test to differentiate increased thermal fatigue durability

Modules photovoltaïques à concentration (CPV) – Essai de cycles thermiques pour la détermination de la durabilité renforcée à la fatigue thermique

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONCENTRATOR PHOTOVOLTAIC (CPV) MODULES – THERMAL CYCLING TEST TO DIFFERENTIATE INCREASED THERMAL FATIGUE DURABILITY

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The text of this standard is based on the following documents:

FDIS	Report on voting
82/1185/FDIS	82/1210/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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INTRODUCTION

IEC 62108 defines IEC requirements for the design qualification of concentrator modules for long-term operation in general open-air climates. This standard, IEC 62925, is not compulsory with but will supplement IEC 62108 by providing tests that differentiate thermal fatigue durability of concentrator modules for deployment in a larger range of applications and climates.

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CONCENTRATOR PHOTOVOLTAIC (CPV) MODULES – THERMAL CYCLING TEST TO DIFFERENTIATE INCREASED THERMAL FATIGUE DURABILITY

1 Scope

This document defines a test sequence that will quickly uncover CPV module failures that have been associated with field exposure to thermal cycling for many years. This document was specifically developed to relate to thermal fatigue failure of the HCPV die-attach, however, it also applies, to some extent, to all thermal fatigue related failure mechanisms for the assemblies submitted to test.

IEC 62108, the CPV module qualification test already includes an accelerated thermal cycle sequence in one leg of the testing, however, the parameters of that test only represent a qualification level of exposure. This test procedure applies more stress and will provide a route for comparative testing to differentiate CPV modules with improved durability to thermal cycling and the associated mechanical stresses.

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 62108:2016, *Concentrator photovoltaic (CPV) modules and assemblies – Design qualification and type approval*

3 Terms and definitions

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3.1
durability
system's capacity to resist degradation specific for a particular stress or set of stresses

Note 1 to entry: The durability with respect to all relevant stresses shall be assessed in order to gain information about the anticipated performance of the system.

3.2
reliability
probability for a system to perform and maintain its designed function in specific conditions for a specified period of time

Note 1 to entry: In this context the term reliability shall be accompanied by three numbers: a) a specified period of time, b) a criterion that quantifies its performance at that time and c) the probability that the criterion will be met.

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