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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



IEC 62925:2016-12(en-fr)



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CONTENTS

FOREWORD 3
INTRODUCTION 5
1 Scope 6
2 Normative references 6
3 Terms and definitions 6
4 Sampling 7
5 Marking 7
6 Testing 8
7 Rating 8
8 Report 8
9 Modifications 9
10 Test procedure 9
10.1 General 9
10.2 Cell evaluation 9
10.2.1 Purpose 9
10.2.2 Procedure 10
10.2.3 Requirements 10
10.3 Thermal cycling 10
10.3.1 Purpose 10
10.3.2 Test sample 10
10.3.3 Procedure 10
10.4 Outdoor exposure test 12
10.4.1 Purpose 12
10.4.2 Procedure 12
Bibliography 13

Figure 1 – Number of required cycles as a function of average temperature ramp rate in order to complete an equivalent test 11
Figure 2 – Overall test time as a function of temperature ramp rate 12

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

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International Standard IEC 62925 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

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.

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- withdrawn,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.

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.

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

For the purposes of this document, the following terms and definitions 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
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.