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**NATIONAL OCCUPATIONAL HEALTH STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GBZ 118-2020

**Photovoltaic modules - Extended-stress testing - Part 1:
Modules**

(English Translation)

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Reference

Foreword

This document is a standard or guiding technical document.

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 1 of GB/Z 118 "Photovoltaic Modules - Enhanced Stress Testing". GB/Z 118 has already published the following parts.

---Part 1: Components.

This document is equivalent to IEC TS63209-1:2021 "Photovoltaic modules - Stress testing - Part 1: Modules", and the document type is changed from...

The IEC technical specifications have been adapted into my country's national standardization guidance technical documents.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

This document is under the jurisdiction of the National Technical Committee on Standardization of Solar Photovoltaic Energy Systems (SAC/TC90).

Introduction

GB/Z 118 proposes a method for environmental stress testing of photovoltaic modules, which can provide data for evaluating the reliability of photovoltaic modules and facilitate research.

Areas not covered by the GB/T 9535 and GB/T 20047 series. GB/Z 118 is proposed to consist of the following parts.

---Part 1: Components. The purpose is to provide a checklist for enhanced environmental stress testing of photovoltaic modules.

---Part 2: Polymer Component Materials. This section aims to supplement component-level reinforcement environmental stress testing.

Note: The correspondence between each part and the IEC TS63209 series of international standards is as follows.

---Part 1 corresponds to IEC 63209-1;

---Part 2 corresponds to IEC 63209-2.

Existing qualification test standards, such as the GB/T 9535 series, are for identifying component designs to avoid most early field failures.

These qualification test standards are often useful, but they are not intended to, or cannot, prove the long-term performance of components at all locations within the scope of the standard documentation.

Performance. To assess the risk of product failure, industry practice dictates that type approval be performed according to the GB/T 9535 and GB/T 20047 series of standards.

Based on safety testing, more stringent testing protocols can be implemented to meet the needs of different stakeholders. These enhanced stress tests the agreement primarily includes the aforementioned basic tests, conducted with different sequences and/or increases in test time or number of cycles. The stress testing agreement...

The discussion stems from diverse experiences shared by third parties, such as testing agencies, independent engineering firms, and homeowner engineers, aiming to replicate the effects of long-term use on photovoltaic modules.

These stress testing protocols, or "extreme testing" methods, are designed to identify module weaknesses rather than reproduce the module's outdoor performance.

It does not provide detailed reliability or durability predictions/estimates, but it is helpful in revealing defects.

Given that many different stress testing protocols are in use, the industry needs a standardized approach. This document contains...

The included stress-enhancing test sequence standardizes various methods used by personnel in different industries, providing a universal method for reliability assessment.

The dataset. In practical terms, this document addresses the challenges faced by component manufacturers in simultaneously implementing (and maintaining) a series of [issues/processes] after product changes.

The problem lies in very similar testing protocols.

This global reference comparison document takes into account all sequences of different stress-enhancing testing protocols and was prepared using the method of common divisors. (Targeting...) each subsequence also has its corresponding special failure mode added at the appropriate position. Meanwhile, some sequences have been deleted from this document, according to their experimental...

Results obtained from conditions and durations do not necessarily provide information for evaluating component performance in the field. This document aims to standardize and strengthen testing protocols.

Test results from different institutions can be compared more directly, reducing testing costs and time for manufacturers.

This document aims to provide a series of reliability risk data for qualitative analysis, highlighting potential failure modes of components and the possible reasons for failure.

Improved areas. This method is only used in special cases, such as when performance differences are very large or when targeting specific known failure modes and mechanisms, for [specific applications].

Components and materials are classified. Classification or lifespan prediction for durable components is not within the scope of this document. A range of components.

The accompanying tests are being developed as a supplement to the component-level tests in this document.

Photovoltaic Module Enhanced Stress Test Part 1: Module

1 Scope

This document aims to provide information to supplement the basic qualification tests with pass-fail criteria defined in GB/T 9535.

The document provides a standardized testing methodology for evaluating photovoltaic (PV) modules and a list of different materials that can be used to manufacture these modules.

The long-term reliability of (BOMs). The test sequences included in this document are intended to provide information for qualitative comparative analysis, and are used in