

ICS 27.160
CCS K 83



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

GB/T 46989.1-2025

**Photovoltaic modules - Transportation testing - Part 1:
Transportation and shipping of module package units**

光伏组件 运输试验 第1部分：组件包装单元的运输和装卸

(English Translation)

Issued on: December 31, 2025

Implemented on: April 1, 2026

Issued by: State Administration for Market Regulation

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Foreword

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/T 46989 "Transportation Tests for Photovoltaic Modules". GB/T 46989 has already published the following parts.

---Part 1: Transportation and handling of component packaging units.

This document is equivalent to IEC 62759-1:2022 "Transportation tests for photovoltaic modules - Part 1: Transport and handling of module packaging units".

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/T 46989 "Transportation Tests for Photovoltaic Modules" outlines the transportation and loading/unloading procedures for photovoltaic module packaging units.

The methods and judgment requirements for related tests provide valuable guidance for performance measurement of photovoltaic modules during transportation. GB/T 46989 it is proposed to consist of the following parts.

---Part 1: Transportation and Handling of Module Packaging Units. The purpose is to provide information on the transportation and overall environment of photovoltaic module packaging units.

The test methods for the impact of the photovoltaic module transportation test curve are also provided, as well as the design for the photovoltaic module transportation test retest.

The design changes are applicable to flat-panel photovoltaic modules.

Photovoltaic module transport test Part 1.

Transportation and handling of component packaging units

1 Scope

Photovoltaic modules are electrical devices designed for continuous outdoor exposure throughout their lifespan. Existing type approval standards for these modules do not address this issue.

Consider the potential impact of mechanical stress on the quality of photovoltaic modules during transportation from the production site to the installation site.

This document specifies the testing methods for the transportation and overall environmental impact of photovoltaic module packaging units.

Appendix A provides the transport test curves for photovoltaic modules.

Appendix B provides a list of design changes for photovoltaic modules that require retesting.

This document applies to flat-panel photovoltaic modules.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

IEC 60068-2-27:2008 Environmental testing - Part 2-27. Testing Ea - Tests and guidelines. Impact Note. GB/T 2423.5-2019 Environmental testing - Part 2: Test methods - Test Ea and guidelines. Impact (IEC 60068-2-27:2008, IDT) ASTM D5277-92 Test method for program-controlled horizontal impact using an inclined impact testing machine.