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

GB/T 6495.3-2025

Replacing GB/T 6495.3-1996

**Photovoltaic devices - Part 3: Measurement principles for
terrestrial photovoltaic(PV) solar devices with reference
spectral irradiance data**

光伏器件 第3部分：基于标准光谱辐照度数据的地面光伏器件测量原理
(English Translation)

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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 3 of GB/T 6495 "Photovoltaic Devices". GB/T 6495 has already published the following parts.

- Part 1: Measurement of Photovoltaic Current-Voltage Characteristics;
- Part 1-1.Measurement of Current-Voltage Characteristics of Multijunction Photovoltaic Devices;
- Part 2: Requirements for Standard Photovoltaic Devices;
- Part 3: Measurement Principle of Ground-Based Photovoltaic Devices Based on Standard Spectral Irradiance Data;
- Part 5: Determining the Equivalent Cell Temperature (ECT) of Photovoltaic Devices Using the Open-Circuit Voltage Method;
- Part 7: Calculation Method for Spectral Mismatch Correction in Photovoltaic Device Measurements;
- Part 8: Measurement of the Spectral Response of Photovoltaic Devices;
- Part 8-1.Measurement of the Spectral Response of Multijunction Photovoltaic Devices;
- Part 9: Characteristic Classification of Solar Simulators;

---Part 10: Methods for measuring linear correlation and linearity;

---Part 11: Initial light-induced degradation test method for crystalline silicon solar cells.

This document replaces GB/T 6495.3-1996 "Photovoltaic Devices - Part 3: Measurement Principles and Standard Spectral Radiation of Ground-Mounted Photovoltaic Devices".

Compared with GB/T 6495.3-1996, the main technical changes in "Illuminance Data" are as follows, apart from structural adjustments and editorial modifications.

- a) The scope and purpose have been combined, and the content of the scope has been changed (see Chapter 1, Chapters 1 and 2 of the 1996 edition);
- b) Added terms and definitions (see Chapter 3);
- c) The content regarding the measurement principle has been revised, and a description of its relationship with relevant standards has been added (see Chapter 4, Chapter 3 of the 1996 edition);
- d) The requirements for geometric and environmental parameters have been changed, with increased consideration of land surface type and the generation of spectral data using SMARTS models.

The method of cloth cutting (see Chapter 5);

- e) Add the irradiance distribution of direct irradiance to Table 1, including direct spectral irradiance, direct photon flux, and cumulative integrated direct irradiance.

(See Table 1, 1996 edition);

- f) Redraw the irradiance distribution map based on the standard spectral distributions of total radiation and direct radiation (see Figure 1, 1996 edition);
- g) The description of the current-voltage characteristics has been deleted. This content is described in GB/T 6495.1 (see Chapter 5 of the 1996 edition);
- h) The terminology content in Appendix A has been deleted (see Appendix A in the 1996 edition).

This document is equivalent to IEC 60904-3:2019 "Photovoltaic devices - Part 3: Ground-mounted photovoltaics based on standard spectral irradiance data".

Measurement principle of components.

The following editorial changes have been made to this document.

---Adjust the scope of the chapter description;

---Move the footnotes in the text to the references.

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 6495 proposes methods for measuring the performance of photovoltaic devices, as well as standards, value transfer, and result correction related to performance measurement.

The requirements for the classification of testing equipment, etc., have positive guiding significance for the performance measurement of photovoltaic devices such as photovoltaic cells and photovoltaic modules.

GB/T 6495 is proposed to consist of the following parts.

---Part 1: Measurement of Photovoltaic Current-Voltage Characteristics. The purpose is to specify the basic requirements for measuring the IV curve of photovoltaic devices.

---Part 1-1.Measurement of Current-Voltage Characteristics of Multijunction Photovoltaic Devices. The purpose is to specify the measurement of the IV characteristics of multijunction photovoltaic devices.

Quantification method.

---Part 1-2.Measurement of Current-Voltage Characteristics of Bifacial Photovoltaic Devices. The purpose is to specify the IV characteristics measurement of bifacial photovoltaic modules.

Quantification method.

---Parts 1-3.Measurement of Current-Voltage Characteristics of Curved Photovoltaic Devices. The purpose is to specify the measurement of the IV characteristics of curved photovoltaic devices.

Quantification method.

---Part 2: Requirements for Standard Photovoltaic Devices. The purpose is to specify the requirements for standard photovoltaic devices.

---Part 3: Measurement Principles of Ground-Based Photovoltaic Devices Based on Standard Spectral Irradiance Data. The aim is to provide standard photovoltaic irradiance data.

Degree data.

---Part 4: Procedures for Establishing Standard Photovoltaic Device Calibration Traceability. The purpose is to establish traceability for photovoltaic device calibration.

program.

---Part 5: Determining the Equivalent Cell Temperature (ECT) of Photovoltaic Devices Using the Open-Circuit Voltage Method. The aim is to define the equivalent cell temperature (ECT) of photovoltaic devices.

Method for testing the open-circuit voltage of battery temperature.

---Part 7: Calculation Method for Spectral Mismatch Correction in Photovoltaic Device Measurements. The purpose is to specify the calculation method for spectral mismatch correction.

---Part 8: Measurement of the Spectral Response of Photovoltaic Devices. The purpose is to specify the methods for measuring the spectral response.

---Part 8-1: Measurement of the Spectral Response of Multijunction Photovoltaic Devices. The purpose is to specify the measurement method for the spectral response of multijunction photovoltaic devices.

method.

---Part 9: Classification of Solar Simulator Characteristics. The purpose is to specify the classification requirements for solar simulators used to measure photovoltaic devices.

---Part 10: Methods for Measuring Linear Correlation and Linearity Characteristics. The aim is to define the linearity characteristics of photovoltaic devices and their testing.

method.

---Part 11: Test Method for Initial Light-Induced Degradation of Crystalline Silicon Solar Cells. The purpose is to specify the initial light-induced degradation test method for crystalline silicon solar cells.

Attenuation test method.

---Part 12: Measurement methods for the current-voltage (IV) characteristics of perovskite photovoltaic cells and modules. The purpose is to specify the measurement methods for the current-voltage (IV) characteristics of perovskite photovoltaic cells and modules.

Methods for measuring the IV characteristics of voltage-voltage devices.

---Part 13: Electroluminescence of Photovoltaic Modules. The purpose is to specify the testing methods for the electroluminescence of photovoltaic modules.

Note: The correspondence between each part and the IEC 60904 series of international standards is as follows.