PD IEC TS 62989:2018

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Primary optics for concentrator photovoltaic systems

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee GEL/82, Photovoltaic Energy Systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Primary optics for concentrator photovoltaic systems

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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PRIMARY OPTICS FOR CONCENTRATOR PHOTOVOLTAIC SYSTEMS

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62989, which is a technical specification, has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

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The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
82/1281/DTS	82/1376/RVDTS

Full information on the voting for the approval of this technical specification 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 publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- transformed into an International Standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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PRIMARY OPTICS FOR CONCENTRATOR PHOTOVOLTAIC SYSTEMS

1 Scope

This document encompasses key characteristics of primary optical elements (lenses and mirrors) and lens or mirror parquets for concentrator photovoltaics including: optical performance, mechanical geometry, mechanical strength, materials, and surface morphology. The document identifies the essential characteristics, the corresponding quantities of interest, and provides a method for measurement of each quantity.

This document allows lens and mirror manufacturers, concentrator module manufacturers, test laboratories and other interested parties to define lens/mirror qualities and inspect lenses and mirrors. There are no pass/fail criteria associated with the document.

This document defines the test conditions rather than to specify the precise setup of a measurement apparatus. For example, this enables laboratories to acquire reliable and comparable measurement results irrespective of the existing large variety of experimental setups for focal spot characterization. High priority is given to comparable and reproducible measurements of the irradiance distribution in the focal plane and of the optical efficiency. This requires trade-offs that reduce the similarities to outdoor conditions. Furthermore, it is intended not to refer to properties of specific solar cells as this document is dedicated to concentrator optics.

The terms for lenses are applicable for mirrors, unless otherwise specified.

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 60050-845, *International Electrotechnical Vocabulary. Lighting*

IEC 60904-3, *Photovoltaic devices – Part 3: Measurement principles for terrestrial photovoltaic (PV) solar devices with reference spectral irradiance data*

IEC 62108:2007, *Concentrator photovoltaic (CPV) modules and assemblies – Design qualification and type approval*

IEC 62788-1-4, *Measurement procedures for materials used in photovoltaic modules – Part 1-4: Encapsulants – Measurement of optical transmittance and calculation of the solar-weighted photon transmittance, yellowness index, and UV cut-off wavelength*

ISO 291, *Plastics – Standard atmospheres for conditioning and testing*

ISO 489:1999, *Plastics – Determination of refractive index*

ISO 10110-1:2006, *Optics and photonics – Preparation of drawings for optical elements and systems – Part 1: General*

ISO 10110-7, *Optics and photonics – Preparation of drawings for optical elements and systems – Part 7: Surface imperfection tolerances*

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