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Space systems — Solar cells — Calibration procedures

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Foreword

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This document was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 14, *Space systems and operations*.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document is consistent with the principles associated with photovoltaic solar cells established by IEC/TC 82, *Solar photovoltaic energy systems.* It provides specific requirements and procedures that apply to the generation of primary and secondary reference solar cells used for solar cell calibration for space applications. Wherever possible the document refers to existing standards such as the IEC 60891 and the IEC 60904 series which cover all aspects of solar cell calibration and measurements for terrestrial applications.

The primary calibration methods given in Annex A serve as examples of acceptable calibration techniques.

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Space systems — Solar cells — Calibration procedures

1 Scope

This document specifies the requirements and procedures for the calibration of primary and secondary reference solar cells under the air mass zero (AM0) spectrum. It is applicable to both single-junction and multi-junction solar cells.

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 60891, *Photovoltaic devices — Procedures for temperature and irradiance corrections to measured I-V characteristics*

IEC 60904-1, *Measurement of photovoltaic current-voltage characteristics*

IEC 60904-2, *Requirements for photovoltaic reference devices*

IEC 60904-4, *Reference solar devices — Procedures for establishing calibration traceability*

IEC 60904-7, *Computation of the spectral mismatch correction for measurements of photovoltaic devices*

IEC 60904-8, *Measurement of spectral responsivity of a photovoltaic (PV) device*

IEC 60904-8-1, *Measurement of spectral responsivity of multi-junction photovoltaic (PV) devices*

IEC 60904-9, *Solar simulator performance requirements*

IEC 60904-10, *Methods of linearity measurement*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60904-7, IEC 60904-10 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
absolute cavity radiometer
highly precise instrument used to measure solar irradiance

Note 1 to entry: The absolute cavity radiometer is a combined electrical substitution and cavity radiometer where the electrical substitution inequivalence, efficiency of the cavity, the area of the entrance aperture, radiative and conductive losses, and other energy exchanges are accounted for such that the electrically substituted heating can be absolutely equated to the radiant heating of the detector.

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