IEC 62788-1-2

Edition 1.0 2016-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Measurement procedures for materials used in photovoltaic modules – Part 1-2: Encapsulants – Measurement of volume resistivity of photovoltaic encapsulants and other polymeric materials

Procédures de mesure des matériaux utilisés dans les modules photovoltaïques – Partie 1-2: Encapsulants – Mesurage de la résistivité transversale des encapsulants photovoltaïques et autres matériaux polymères

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International Standard IEC 62788-1-2 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

The text of this standard is based on the following documents:

FDIS	Report on voting
82/1085/FDIS	82/1105/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62788 series, published under the general title *Measurement procedures for materials used in photovoltaic modules*, can be found on the IEC website.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

MEASUREMENT PROCEDURES FOR MATERIALS USED IN PHOTOVOLTAIC MODULES –

Part 1-2: Encapsulants – Measurement of volume resistivity of photovoltaic encapsulants and other polymeric materials

1 Scope

This part of IEC 62788 provides a method and guidelines for measuring the volume resistivity of materials used as encapsulation, edge seals, front-sheets, backsheets, or any other insulating material in a photovoltaic (PV) module. The test is performed on dry, humid or wet preconditioned samples. In the case of frontsheets and backsheets comprised of multiple layers, the measured resistivity is an effective value. This test is designed for room temperature measurement, but can also be utilized at higher temperatures.

Degradation of PV modules is known to occur in part by electrochemical corrosion, and other potential induced degradation processes. These processes may be dependent upon the resistivity of a polymeric component. Therefore, the DC resistivity of polymeric components is relevant to module design and durability in the field. The resistivity may depend on cure state, temperature, water content, and voltage history. A number of options are included to allow the measurement to be performed in a manner consistent with representative fielded module conditions.

Most resistivity measurement methods and equipment typically become inaccurate and variable for materials with volume resistivity above 10^{16} Ω·cm [5][1].Therefore, this standard is used for measurements less than $1 \cdot 10^{17}$ Ω·cm.

Both monolithic and multilayer materials (e.g. frontsheets and backsheets) are suitable for measurement. Methods are described for room temperature measurement, with guidelines included for testing at elevated temperatures.

Results will vary with moisture content, therefore materials should be tested in a manner anticipatory of usage. Preconditioning procedures for dry, humid and wet environments are included.

Depending on the material, voltage history will affect the measured result. The rate of change of current, and time to equilibrium varies with material often taking hours or days to come to a static level. For this reason, long and short duration methods are included (Methods A and B). The specified short-duration alternating polarity Method B is intended for qualitative comparison. Method A, long-duration on/off polarity, is recommended for characterization with regard to PID resistance.

Measurements obtained using either method may be used by material manufacturers for the purpose of quality control of their electrical insulating material as well as for reporting in product datasheets. PV module manufacturers may use these methods for the purpose of material acceptance, material selection, process development, design analysis, or failure analysis.

1 Numbers in square brackets refer to the Bibliography.