

Solar Energy South Africa

Principle of Photovoltaic Panel EL Tester



Overview

This non-destructive testing method utilizes the principle of electroluminescence. When solar cells have electric current flowing through them in one direction (called a forward bias), they start to glow. What is EL testing for PV modules?

Enhanced reliability: Electroluminescence (EL) testing for PV modules allows for a comprehensive quality inspection of PV modules before they leave the factory, reducing the failure rate and maintenance costs caused by quality issues and improving module reliability and lifetime.

How EL test can help a PV manufacturer detect hidden defects?

Testing of modules using this phenomenon can detect hidden defects in the structure of PV cells. This method makes the current distribution visible in the PV module and helps detect defects. With the help of an EL test, a PV manufacturer can evaluate the structural quality of the PV cells or any other defects generated while handling.

How EL test can help a PV manufacturer?

With the help of an EL test, a PV manufacturer can evaluate the structural quality of the PV cells or any other defects generated while handling. Defects that can be found from EL are as given below: Microcracks can create an electrical separation, resulting in inactive cell part. Determining the power loss caused by microcracks is difficult.

Why do solar modules need EL testing?

Due to its importance, solar module manufacturers frequently undertake EL testing twice during the manufacturing process. If left unchecked, cold soldering can develop into hot spots, lowering the module's power and causing a fire risk. Figure 3: Sample module with soldering defects.

Why is EL inspection important for solar PV project development?

Indeed, today, everyone involved in PV project development is aware of the EL inspection as a non-invasive and hands-on methodology for the detection of electrical-based defects in solar PV modules .

How EL technique is used for characterization of PV modules?

EL technique is used to detect almost all the types of defects that may be present in the PV modules. Using different biasing levels during the EL measurements maximizes the information that can be extracted. Market increasingly demands the possibility to perform the characterization of PV modules by means EL within the PV plant.

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Electroluminescence For PV Cells With SWIR

The image gallery below demonstrates the use of EL for solar cell inspection to find non-uniformities, cracks, defects, mismatched cell efficiencies, and the limited usefulness of thermal imaging for these applications. Left: Commercial 36 ...

[Products , SolarMarq Engineering LLP](#)

SolarMarq MINI Module EL Tester is our compact quality control solution for solar panel manufacturers and installers of street and home lighting systems, with the ability to test solar panels up to 100 Watt rating for cracks, poor soldering, and ...



Electroluminescence (EL) Testing for PV Modules

CEA's EL Testing provides: Comprehensive inspection report detailing modules tested and findings for each module. Explanation of most risk associated with the most common EL anomalies observed. Access to independent PV experts ...

Reliable Solar Module Manufacturers: EL Inspection

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EL testing is a method of detecting hidden defects in the structure of PV cells, such as microcracks, cell cracks, soldering defects, and diode failures. EL testing can help evaluate the quality and performance of solar ...



Review on IR and EL Imaging for PV Field Applications

IR and EL are two imaging techniques, which identify faults and problems developing with PV modules. The use of infrared (IR) imaging for the evaluation of PV modules has many advantages. First of all, a great number of failures ...

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