

There are bubbles in the aluminum sheet of the photovoltaic panel

What causes bubbles in a photovoltaic module?

Bubbles are probably the results of an electrochemical reaction involving oxygen. Understanding photovoltaic modules degradation is one of the keys utilized to develop and design new high-performance materials. This work focuses on analyzing the bubbles formation on the front of the PV module, particularly on the fingers of the PV cells.

Why do PV cells have bubbles in the encapsulant?

During the visual inspection, the formation of bubbles was observed only in the encapsulant above the PV cells within the PV module. However, these bubbles position is consistent with other defects, such as chalking, browning, and bleaching, indicating that these bubbles are distinct from those usually observed.

1. Introduction

Are bubbles forming in PV cells in Algeria?

Visual inspection was carried on PV modules that operated for 30 years in Algeria. Bubbles formation observed only in fingers of the PV cells. Shape and a location rarely observed for these bubbles. Bubbles formation, chalking and browning are linked by a single phenomenon.

What is back sheet chalking & encapsulant discoloration in PV modules?

Back sheet chalking is a new reported failure type and has been recently observed in field exposed PV modules. 2. Encapsulant discoloration is most commonly found failure mode in old PV modules. Cell cracking is also a common defect which can take place at any stage in lifetime of PV module.

What causes glass breakage of PV module?

The module glass breakage may happen in the field due to heavy mechanical loads applied during field operation. It leads to water and oxygen penetration in the module. The broken glass layers of module are shown in Fig. 15. Fig. 15. Glass breakage of the PV module.

Why are all PV modules chalked?

Chalking The chalking is presented for all the 60 inspected PV modules, with 68% of the modules with substantial chalking. Paul Gebhardt and al (Gebhardt et al., 2018) have shown that chalking is due to the photo-catalysis of (TiO₂) particles present in the backsheet to protect it against UV light.

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