

New Design and Properties of the Photovoltaic Module with Transparent Polymer to Replace Glass

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In the presented paper the phenomena of the influence of the transparent conductive polymer that replaces the glass on the properties of the PV modules is presented.

The new highly transparent polymer material can be applied directly to the PV module surface at low temperature, eliminating the need for the adhesives required with glass and some other polymers. This eliminates the multi-layer structure including the reflective surfaces present with glass. No glass is used with this polymer coating. The polymer can be formed as a flat smooth surface or as a "crinkle coat". The "crinkle coat" version further enhances photon collection efficiency due to the light concentrating effect of the polymer material and its surface morphology.

The transparent polymer coating materials can be used for PV module sealing and have important advantages in that they increase the PV efficiency and improve PV module characteristics and performance.

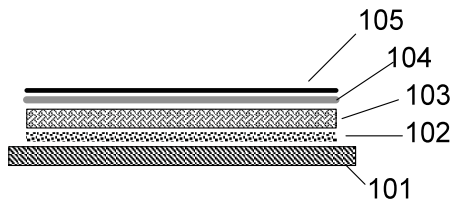


Fig. 1 Cross section of PV module with polymer coating

- 1 - substrate with insulating surface;
- 2 - adhesive layer;
- 3 - photovoltaic converters;
- 4 - transparent conductive oxide layer (for example ITO);
- 5 - highly transparent flexible protective cover layer made from Enerize proprietary polymeric material.

The new transparent polymer coating materials can be used to improve the conversion efficiency of monocrystalline, multicrystalline, amorphous silicon photovoltaics and solar cells based on non-silicon systems such as CIGS (copper indium gallium selenide).