

Passive Cooling System For Improving The Electrical Yield of PV Module Using Porous Media In Addition With Cotton Cloths

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ABSTRACT

Photovoltaic module usually converts only less than 20% of the incoming solar radiation into useful form of energy that is electricity and more is wasted due to dilution in solar radiations. Thus more than 50% of the incident solar energy is converted as heat and the temperature of PV module is increased to some extent. The increase in the module temperature decreases the electrical yield and efficiency of the module with a permanent structural damage of the module due to prolonged period of thermal stress which is also known as thermal degradation of the module.

Hence to improve the efficiency and reduce the rate of thermal degradation of a PV module, the operating temperature of PV module is to be reduced. This can be achieved by cooling the PV module by some external source.

Hence in the proposed work, a novel and simple passive cooling system using porous media in addition with cotton cloths structures is developed for standalone flat PV modules. The thermal and electrical performance of flat PV module with cooling system consisting of cotton cloths structures has been investigated experimentally. The experimental results are also to be compared with the thermal and electrical performance of flat PV module without cooling system.

Key words: *Photovoltaic module, solar energy, electrical yield.*