

Public release document

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IAEI Photovoltaic code official

Solar energy project.

PHYSICS OF RELIABILITY: EVALUATING DESIGN INSIGHTS FOR COMPONENT TECHNOLOGIES IN SOLAR.

Sun light falling on the solar panel contains more than 50% of infrared rays which are

Converted in to heat instead of producing electricity. CO<sub>2</sub> gas has a good quality to absorb infrared

Radiation. In view of this, CO<sub>2</sub> gas filled solar panel shall filter the infrared radiation, thereby improving the reliability, durability and safety of Residential Photovoltaic system. Moreover the effective module cooling shall reduce the normally operating Cells temperature (NOCT) which shall increase open circuit voltage of the P V system. The increase in open circuit voltage shall improve the module power conversion efficiency. The module higher output shall cover the additional cost of CO<sub>2</sub> filled module.

The PV module will be filled with CO<sub>2</sub> gas between support board and luminescent glass covering in the factory, hermetically sealed and no periodic filling will be required throughout its life.

The CO<sub>2</sub> having excellent property to extinguish electric fire shall ensure safety of inhabitants in houses fitted with roof mounted solar panels. It shall also minimize damage to solar from hot spot which could occur any time on roof mounted PV panels.

Module will be laminated with a perforated sheet instead of plain sheet. Perforations in lamination sheet will improve thermal conductivity of the module assembly and will allow flow of heat transfer out of the solar panel. The perforation in lamination sheet shall allow CO<sub>2</sub> gas to be in touch with solar cells for their protection against sparking, hot spot and insulation failure.

CO<sub>2</sub> gas is heavier than air, high gas density compared to air shall not allow ingress of moisture and air. In view of this, module components and solar cells shall be well protected from damage through

Corrosion or oxidation.

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