7th International Conference on Concentrating Photovoltaic Systems (CPV-7)

HEAT RELEASE EFFECT OF HIGH RADIATION LAYER COATED ON ALUMINUM CHASSIS OF CONCENTRATOR PHOTOVOLTAIC MODULE

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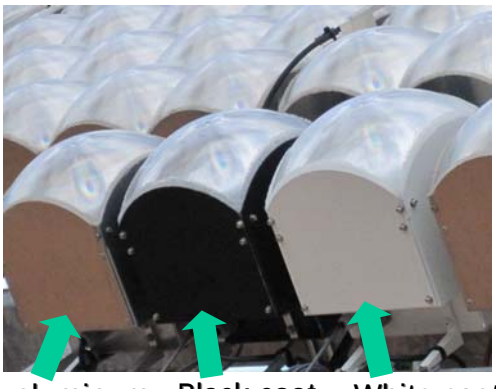
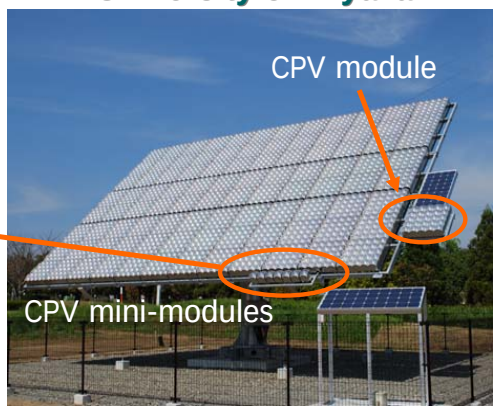
EXPERIMENTAL PROCEDURES

- A CPV mini-module consisted of a pair of Fresnel lens (160 mm x 160 mm) and triple-junction solar cell (7 mm x 7mm), and an aluminum chassis was used.
- A heat radiation layer (PELNOX LTD., PELCOOL(R)) was coated on the aluminum chassis of CPV mini-module.
- A Pt100 was embedded just below the triple-junction solar cell.
- A CPV module was fabricated by connecting 25 lens-cell pairs in series.

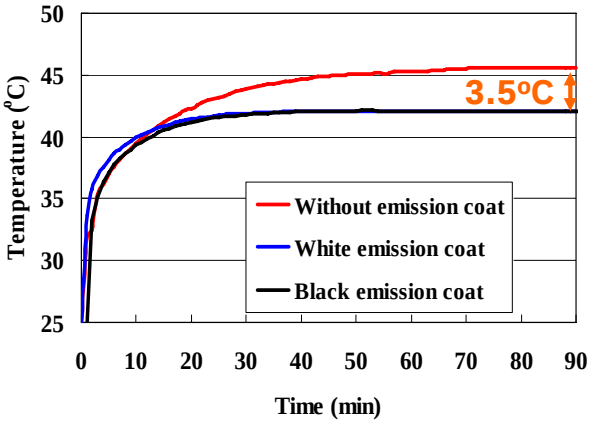
CPV mini-modules



14kW CPV system installed in University of Miyazaki

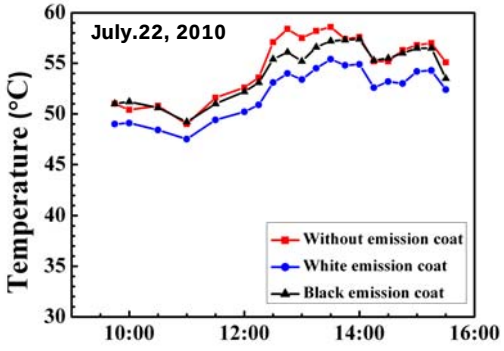


RESULT MEASURED WITH SOLAR SIMULATOR (AM1.5G)

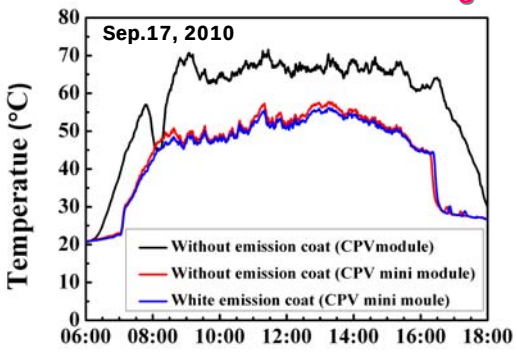


- Cell temperature of CPV mini-module with heat emission coat was 3.5°C lower than that without coat.
- Cell temperature of CPV mini-modules with white and black coats was same.

RESULTS MEASURED IN OUTSIDE



- White coat was better than black coat.
- Black coat absorbs scattered light.



- Effect of heat emission coat will be pronounced for CPV module because cell temperature is high.