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| Thesis Title | Designing of a Multi–purpose PV-Window |
| Thesis Credits | 12 |
| Candidate | Mr. Wanchart Supheng |
| Supervisors | Assoc. Prof. Dr. Joseph Khedari |
| | Mr. Roongrojana Songprakorp |
| Degree of Study | Master of Engineering |
| Department | Energy Technology |
| Academic Year | 1999 |


## Abstract

The thesis discusses the performance of a new Type of PV slat window, which composed of PV slats window. Investigation is made based on power output, indoor illumination and Temperature. To this end, two box of 1 x 1x 1.5 $m^3$ volume were built by plywood. With the first the south-facing wall has a six-slat window of 0.5 x 0.6 $m^2$ of commercial transparent glass where as the window of the other box was topped with solar cells. The cells were connected in series giving a maximum electrical power output of 36 Watts (12V. x 3 Amp.). The circuit was connected to a direct current fan, located inside the PV-window, Box that requires a maximum power of 43 Watts. The two units were located at the 6 floor of the Energy and Materials building. Tests were conducted during winter (Dec.1998–March 1999) the slat angle was adjusted at 7 different angles varying from 9 degree to 68 degree from vertical plane. Data were recorded every 10 minutes.

It was found that the proposed new type of window is extremely interesting as it can produced up to 15 Watts decrease room temperature and provide sufficient daylighting. The maximum illumination was about 750 Lux with slat angle at 68° and The room Temperature was about 3 – 4 °C below than that of box equipped with Transparent window.

Finally, the electrical power produced by the solar PV-window was a hysteresis loop because of mainly the variability of solar intensity. Due to the air circulation through PV-slats, the temperature of solar cell didn't increase that therefore, reduces its effect on power produced by the PV window.


Keywords : Solar cells / Daylight / Daylight Factor / Natural Ventilation