

BIPV모듈의 제조공정에 관한 실험적 연구

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An Experiment Study on Manufacturing process of BIPV Module

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In this study, the correlation between temperature and the gel-content of the module were analyzed through experiments. Amorphous thin-film solar cell used in this experiment has a visible light transmission performance of 10%. In addition, ethylene vinyl acetate(EVA) film and the clear glass have been used for the modulation. The most important process is to laminate the module in the manufacturing process of BIPV(Building integrated photovoltaic) module. Setting parameters of laminator in the lamination process are temperature, pressure and time. Setting conditions significantly affect the durability, watertightness and airtightness of module. The most important factor in the setting parameters is temperature to satisfy the gel-contents. The bottom and top surface temperature of module are measured according to setting temperature of laminator. The results showed 145°C of max temperature of the bottom surface and 128°C of max temperature of top surface on the module at the temperature condition of 160°C. And at the another temperature condition of laminator with 150°C, the max temperature do bottom and top are 117°C and 134°C respectively. The temperature difference between bottom and top of the module occurred, that is because heat has been blocked by the clear glass and the bottom of the cells absorb the heat from the laminator. In this particular, the temperature difference between setting temperature of the laminator and the surface temperature of the module showed 15°C, because the heat of laminator plate is transferred to the surface of the module and heat is lost at this time. As a results, gel-content showed 94.8%, 88.7% and 81.7% respectively according to the setting temperature 155°C, 150°C and 145°C of the laminator. In conclusion, the surface temperature of module increases, the gel-contents is relatively increased. But if the laminator plate temperature is too high, the gel-content shows rather decline in performance. Furthermore, the temperature difference between setting temperature and the surface temperature of the module is affected by laminating machine itself and the temperature of module should be considered when setting the laminator.

Key words : BIPV(건물일체형 태양광발전), Lamination(접합), Gel-content(가교율), Bubble(기포), Temperature(온도), Pressure(압력),

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