

잠열축열재를 이용한 태양열 집열 유닛의 개발에 관한 연구

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A Study on the Development of Solar Collector Unit Using Latent Heat Storage Material

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Key Words : Phase Change Material, Solar collector Unit, Renewable Energy, Indoor Heating, Zero Energy House

1. Outline and purpose of research

In recent years, with the green house effect and global warming, fine dust has become a serious social problem. The traditional fossil fuel resources are most important energy resource in every part of country. On the other hand, this fossil fuel is also treated as the most important factor of pollution. in this study, the endothermic porous plate was studied to reduce the heating load and to reduce the heating cost by assisting indoor heating in winter by using infinite and clean solar energy. Based on previous experimental studies, It is tried to graft a latent heat storage material to maximize efficiency.

2. Research Method

The experimental apparatus consists of a collecting section a heat storage section, and a circulating section. The surface of the housing is oriented to the south and the surface receiving the sun by a rectangle (15x90x150cm) is made of a transparent polycarbonate material, and the sun light is transmitted to the inside. The interior of the heat collecting unit is composed of a perforated plate for collecting solar heat and a stainless steel ball filled with a latent heat storage material. In addition, it is coated with a matte black paint to facilitate solar heat collection and consists of a rectangular chamber (90x84x174cm) using solar heat. First, the sunlight passing through the transparent polycarbonate

heats the endothermic plate and the stainless steel ball, and at the same time, the light passes through the hole in the middle of the endothermic plate and also heats the rear surface. The heated endothermic plate and the stainless steel ball heat the air introduced from the outside, and the heated air is transferred to the chamber through the fan.

3. Results and conclusions

Experimental results are classified as table.1

Table. 1 Position temperature

The latent heat storage material was charged.		
Plate surface	Chamber	Outdoor
54.3℃	33.9℃	19.8℃
The latent heat storage material wa not s charged.		
Plate surface	Chamber	Outdoor
64.2℃	41.4℃	25.8℃

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