Suriya Koonsawasdikool 2010: An Appropriate Glass Double Skin Façade (DSF) for Retrofitting Buildings in Thailand. Master of Architecture (Building Innovation), Major Field: Building Innovation, Department of Technology Building. Thesis Advisor: Professor Joseph Khedari, Ph.D. 128 pages.

This research was aimed to investigate and propose an appropriate glass Double Skin Façade (DSF) for retrofitting buildings in Thailand in order to improve the thermal performance and reduce heat transmission into buildings.

This research involved an investigation of heat gain through the building primary glass wall, which also provides daylight. Investigation of glass DSF with and without air ventilation was conducted using small mock ups at Phra Nakorn Si Ayutthaya province. Three mock ups were built with dimensions of 0.9 x 0.9 x 1.2 m. Glass DSF with dimensions of 0.3 x 0.9 x 1.2 m were integrated into the South-West two mock ups for comparison and analysis while the other mock up with single glass (mock up Case-A) was used as a reference. Data record included, mainly, room temperature, air cavity temperature at each glass DSF mock up. Comparison with base case of single glass wall was conducted and the result showed that the average room temperature of mock up Case-C (glass DSF with stack ventilation) was the lowest. And room temperature difference compared with base case was lower by 1.2 °C of five days in July 2009, lower by 1.3 °C of five days in August 2009, lower by 3.0 °C of six days in October 2009 and lower by 5.6 °C in two days in January 2010. The average room temperature difference in four months was 2.7 °C. Then an appropriate glass DSF is introduced which may later help to give guideline to designers and architects to choose suitable type of glass DSF that helps reducing energy consumption for retrofitting buildings, as every 1 °C indoor temperature decrease could save about 7 % of energy consumption. This is extremely interesting mainly for high rise and office buildings in Thailand, with large cooling load.

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