Eco Design for Rooftop in Urban Housing

Norasmiza Mohd , Zubair Khalil

1.Faculty of Mechanical and Manufacturing EngineeringUniversiti Malaysia PahangPekanMalaysia
zubair@ump.edu.my

Abstract:
Malaysia is hot tropical climate country. This effects the residential environment over thermal comfort acceptable limit throughout the year. The main aim of this study is to study important parameters to house design on reducing temperature without air conditioning system. Four parameters were considered in this study. They were air flow types, gap holes, radiant barrier, and double skin façade (DSF) roof. An experiment was conducted and it has been revealed that air flow inward, the roof has a gap hole, radiant barrier at bottom of roof panel and thickness of DSF 1 cm shown the most significant results in reducing the temperature. The maximum temperature difference between indoor and outdoor is 7 ℃. The eco design of roof in the house is considered a better option for this climate not only for its ability to provide natural air circulation, but also in reducing energy consumption up to 30% per year. Implementing this design in a roofing system is to enhance the heat dissipation as well as contributing the thermal comfort for human in residential building.

Keywords: Energy saving; Eco design; Thermal comfort

Acknowledgement

The authors are grateful to Faculty of Mechanical & Manufacturing Engineering and Innovative Manufacturing, Mechatronics & Sports Laboratory for providing the facilities to carry out this research work. The publication of the manuscript is funded by Universiti Malaysia Pahang (RDU 1703251).