

Thermal analysis of Malaysian double storey housing - low/medium cost unit

Abstract :

Almost half of the total energy used today is consumed in buildings. In the tropical climate, air-conditioning a housing unit takes much of the energy bill. Malaysia is no exception. Malaysian double storey terrace housing is popular among developers and buyers. Surveys have shown that housing occupants are much dissatisfied with the thermal comfort and artificial cooling is often sought. The objective of this study is to assess the thermal comfort of the low and medium-cost double storey housing in the area surrounding Universiti Teknologi Malaysia. A simulation program using the Weighting Factor Method calculates the heat transfer interaction, temperature distribution, and PMV level in three types of housing units in relation to the size. Fanger's PMV model based on ISO Standard 7730 is used here because it accounts for all parameters that affect the thermal sensation of a human within its equation. Results showed that both the low and medium-cost housing units studied are out of the comfortable range described by ASHRAE Standard 55 with the units all complied with the local bylaws. In view of the uncertainties in energy supply, future housing units should consider natural ventilation as part of the passive energy management.