CONDUCTIVE HEAT TRANSFER FOR GLAZED ROOFING MATERIAL AT DIFFERENT PITCH ANGLE IN MALAYSIA

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ABSTRACT

CONDUCTIVE HEAT TRANSFER FOR GLAZED ROOFING MATERIAL AT DIFFERENT ANGLE IN MALAYSIA

This is an empirical study on conductive heat transfer. The objectives are to measure surface temperature for roof angle of 0°, 25° and 45°, to calculate the conductive heat transfer at different angle of slope and to evaluate the relation for conductive heat transfer of glazed building between surfaces. Data were obtained via field experiment done in the campus of UiTM Shah Alam. In the experiment, two types of glazed roofing materials were used, one is a commercially available polycarbonate and the other one is a newly developed polyfilled. The sample materials were assembled at three pitch angles of 0°, 25° and 45°. Data were simultaneously collected for three pitch angles for material 1 and it was then repeated for material 2. Temperatures of the upper and lower surfaces of the sample materials were measured using thermocouple type T and logged on a data logger DT80. Data were recorded at an interval of ten minutes for duration of three days. The conductive heat transfer was calculated using Fourier's Law. The conductive heat transfer for material 1 are 469.39W, 439.92W, and 350.18W for pitch angle of 0°, 25° and 45° respectively that for material 2 are 5.22W, 4.41W, and 4.45W for 0°, 25° and 45° respectively. The conductive heat flux for material 1 are 1303.86W/m^2, 1222.0W/m^2, and 972.72W/m^2 for pitch angle of 0°, 25° and 45° respectively that for material 2 are 0.899W/m^2, 0.76Wm^2, and 0.77W/m^2 for 0°, 25° and 45° respectively. It is concluded that higher roof pitch angles gives better heat transfer for polycarbonate material whereas lower roof pitch angles gives better heat transfer for pollyfilled materials.