

Thermal Performance of Sandwich Wall Panels With Core Insulating Material

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Abstract

Air conditioning systems account for bulk total energy consumption in buildings. The major phenomenon behind thermal insulation is the conservation of energy. In this paper, experimental analysis on the thermal performance of concrete sandwich wall panels (SWP) was studied by varying the core insulation material and was compared with conventional concrete wall panels (CCWP). Insulation materials used for analysis include expanded polystyrene (EPS), air cavity, paper boards, and wood sawdust.

In the laboratory, the thermal conductivity of core insulation materials was quantified using Lee's disc apparatus. The thermal conductivity values of SWP specimens are entirely dependent on the thermal conductivity of core insulation materials. Field thermal performance is measured with the help of an infrared thermometer.

It is found that the outer surface of SWP experienced high temperatures compared to the outer surface of CCWP. In the inner surface, the temperature increase is gradual in SWP and about 4°C less compared to CCWP at maximum temperature.

Keywords: *Thermal conductivity, Sandwich wall panels, Expanded Polystyrene (EPS), Conventional Concrete Wall Panels (CCWP), Lee's disc apparatus, Infrared thermometer*