

Thermal resistance of two layers precast concrete sandwich panels

ABSTRACT

The main difference between normal precast wall and precast sandwich wall panel (PCSP) is the thermal insulation layer which is introduced not only to reduce the weight of the panel but more importantly is to improve the thermal resistance of the panel. Besides the type of insulation material, thermal performance of the sandwich wall panel is also influenced by the arrangement of the shear connector and the contact area between the concrete layers. This approach eliminates the direct transmission path between the two concrete layers at the same time. Hence, this study is conducted to determine the influence of shear connector spacing to the thermal path of PCSPs. A total of four specimens and each size of 500 mm x 500 mm by 150 mm thickness was prepared for the Hot Box Test. The staggered shear connector is spaced at 200 mm, 300mm, 400mm for P2, P3 and P4 specimen, respectively. While the control (P0) have steady shear connector at 200mm spacing. Based on the results, the control specimen achieved the highest thermal conductivity and the lowest is achieved by P4, a panel with shear connector at 400 mm spacing. Hopefully this two layers PCSP will provide to the industry a lighter weight and higher thermal resistance load bearing wall panel in the near future.

Keyword: Precast concrete; Two layers sandwich panel; Shear connection; Thermal performance