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Performance Investigation of Thermal Insulation Materials for Walls: A Case Study in Nicosia (Turkish Republic of North Cyprus)

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Abstract : The performance of thermal energy in homes and buildings is a significant factor in terms of energy efficiency of a building. In a large sense, the performance of thermal energy is dependent on many factors of which the amount of thermal insulation is at one end a considerable factor, as likewise the essence of mass and the wall thickness and also the thermal resistance of wall material. This study is aimed at illustrating the different wall system in Turkish Republic of North Cyprus (TRNC), acknowledge the problem and suggest a solution through comparing the effect of thermal radiation two model rooms-L1 (Ytong wall) and L2 (heat insulated wall using stone wool) set up for experimentation. The model room has four face walls. The study consists of two stage, the first test is to access the effect of solar radiation for south facing wall and the second stage is to test the thermal performance of Ytong and heat insulated wall, the effects of climatic condition during winter. The heat insulated wall contains material hollow brick, stone wool, and gypsum while the Ytong wall contains cement concrete, for the outer surface and the inner surface and Ytong stone. The total heat of the wall was determined, 7T-Type thermocouple was used with a data logger system to record the data, temperature change recorded at an interval of 10 minutes. The result obtained was that Ytong wall save more energy than the heat insulated wall at night while heat insulated wall saves energy during the day when intensity is at maximum.

Keywords : heat insulation, hollow bricks, south facing, Ytong bricks wall
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