

Use of Phase Change Material in Residential Walls to Reduce Cooling

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Abstract

This paper describes a numerical method for calculating the temperature distribution and latent heat storage (LHS) in the treated wall (TW) and non-treated wall (NTW). The developed method was assumed that the outer cement layer (Iraqi wall) enveloping the external wall of building and houses are contains paraffin wax as a phase change material (PCM). (25%) is the volume percentage of paraffin wax is mixed with cement which forming a treated layer. A comparison results between the (TW) and (NTW) has been done. The paper presents a simple calculation of case study for air-conditioning in two walls type of residential building. The outer solar air temperatures as function of day time are considered for a hot day in summer (July) for Baghdad city. The aim of this paper was to obtain physical validation of the numerical results produced from using developed FORTRAN program. This validation was obtained through a comparison of numerical solution of two different wall compositions exposed to the same external and internal load conditions. The calculations on transient heat transmissions across different walls were conducted. It was found that when using the (TW) with (PCM) produces lower surface and heat flux towards the cooling space with respect to (NTW).