عنوان مقاله:

Thermal analysis of PCM embedded in a brick, using ANSYS Fluent

محل انتشار:

هشتمین کنفرانس بین المللی کشاورزی پایدار در محیط زیست، غذا، انرژی و صنعت (سال: 1396)

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خلاصه مقاله:

During the last decades, environmental impacts of fossil fuels and also depletions of conventional resources such as coal, gas and oil has leaded researchers to move through the renewable energy resources, increasing the efficiency of energy consumption and diminishing heat loss. Thermal energy storage is necessary to develop the utilization of energy resources. Besides, it is used to minimize the heat loss in both the municipal buildings and the constructionsrelated to the food such as greenhouses and anaerobic digestions. Through the thermal energy storages, the latent heat thermal energy storage has gained much attention because of its high-energy densities per unitmass/volume at nearly constant temperatures. This is achieved by Phase-Changing Materials known as PCMs. In this study, a numerical model of an insulating brick, in which PCM is inserted, is presented. Indeed, the brick is composed of several air cavities to increase the insulation and strength. Numerical model is performed employing computational fluid dynamics (CFD). Two-dimensional geometry of the brick is modeled. Then specific boundary conditions would beimposed to the model according to climate of Shiraz City. Using ANSYS Fluent the energy and flow equations would be solved for the model. Finally, decreasing the value for heat flux crossing the internal wall of the brick would be demonstrated.

کلمات کلیدی:

Phase Changing Materials, insulation in greenhouses, Computational Fluids Dynamics