

DESIGN AND PERFORMANCE ANALYSIS OF A SOLAR AIR (SA) HEATER WITH PHASE CHANGE MATERIAL (PCM) HEAT STORAGE FOR RESIDENTIAL APPLICATIONS

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Abstract: Outlet air temperature can be seen as one of the main determinants of the functioning of the solar air heaters and this is one of the main features of the PCM. Variations in solar radiation can be considered a key determinant of the functioning of solar air heaters used in residential applications. Weather conditions can influence the presentation of the air heaters operated by solar energy to a great extent. Structuring of collector plates needs to be done in an effective manner by designers of air heaters used in residential applications. The contact surface of the collector plates is the other determinant of the presentation of the air heaters. A blower is one of the most vital components used in air heaters and the efficiency of the blower can improve the execution of this device. Transport fluid has been identified as a vital factor that can have a huge impact on the functioning of air heaters operated by solar energy. Air thermal capacity can be considered as the other determinant of the functioning of this device. The high cost of fluid circulation has been found as one of the negative factors in the structure and functioning of the air heaters used in residential applications.

Keywords: Solar air heaters, Phase change materials, Environmental factors, Thermal capacity, Solar energy.
