

Heat Transfer and Friction Factor Study for Triangular Duct Solar Air Heater Having Discrete V-Shaped Ribs

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Abstract : Solar energy is a good option among renewable energy resources due to its easy availability and abundance. The simplest and most efficient way to utilize solar energy is to convert it into thermal energy and this can be done with the help of solar collectors. The thermal performance of such collectors is poor due to less heat transfer from the collector surface to air. In this work, experimental investigations of single pass solar air heater having triangular duct and provided with roughness element on the underside of the absorber plate. V-shaped ribs are used for investigation having three different values of relative roughness pitch (p/e) ranges from 4-16 for a fixed value of angle of attack (α), relative roughness height (e/D_h) and a relative gap distance (d/x) values are 60° , 0.044 and 0.60 respectively. Result shows that considerable augmentation in heat transfer has been obtained by providing roughness.

Keywords : artificial roughness, solar air heater, triangular duct, V-shaped ribs

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