STUDY OF RELATIVE ROUGHNESS PITCH AND HEIGHT ON HEAT TRANSFER COEFFICIENT OF SOLAR AIR HEATER WITH ARTIFICIAL ROUGHNESS

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ABSTRACT

Solar air heater have low thermal performance because of development of the laminar sub region near the absorber wall to break this viscous sub layer and improve absorption efficiency experimental study shows that artificial roughness is the one of the best method. Artificial roughness created on the absorber plate in the form repeated rectangular inclined aluminum ribs which create turbulent flow inside the rectangular duct. Heat transfer of roughened duct is mainly depend on the Relative roughness pitch and relative roughness height parameter experimental study covers range of parameter relative roughness pitch (p/e) 33.89-88.23, relative roughness height from 0.012-0.021, by varying pitch 40mm, 50mm, 60mm of three different thickness diameter of wire 0.68mm, 0.87mm, 1.12mm by varying heat input values obtained are compared with smooth duct under similar flow conditions.

KEYWORDS: Relative Roughness, Heat Transfer Coefficient, Relative Roughness Pitch & Height

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