

INVESTIGATION OF HEAT TRANSFER IN PACKED BED SOLAR AIR HEATER

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ABSTRACT

An experimental investigation has been carried out on a porous packed bed solar air heater. Investigation covers various parameters of iron chips, i.e. equivalent chip diameter 1.51 mm, and range of porosity from 0.652 & 0.816 and packing Reynolds number range from 244-975. The range of the mass flow rate used in experiment is between 0.014 and 0.036 kg/s. It is seen that heat transfer coefficient and friction factor are strong functions of geometrical parameters of the porous packed bed. The results of a packed bed solar air heater show a substantial enhancement in the thermal efficiency as compare to the conventional collector also a decrease in porosity increases the volumetric heat transfer coefficient.

KEYWORDS: Solar Air Heater, Thermal Efficiency, Thermohydraulic.