Nusselt Number Correlation of SAH

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Abstract

This paper presents the experimentally investigated thermal performance of a single pass solar air heater. The effects of mass flow rate of air on the outlet temperature, Nusselt Number, Reynolds Number, Prandtl Number, heat transfer in the thickness of the solar collector and thermal efficiency were studied. Experiments were performed for the mass flow rates of 0.0108, 0.0145 and 0.0184 kg/s. For this effect was have created a new correlation correspondent of solar air collector with using fins it was written Nu=K1Re^0.939 Pr^0.523 exp(1.2 m) h^(0.0505Pr).The maximum efficiency levels obtained for the 0.0108, 0.0145 and 0.0184 kg/s were 28.63, 39.69 and 55.69% respectively. A comparison of the results of the solar collector without fins shows a substantial enhancement in thermal efficiency.

Keywords : Correlation, Solar air collector, Heat transfer, Design, Temperature, Nusselt number.

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