



Experimental Investigations of Heat Transfer Enhancement in a Double Tube Heat Exchanger with Rectangular Grooved

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Abstract



References



Citations



Supplementary Data



Suggestions

This study was performed to investigate experimentally the enhanced of heat transfer in a double tube heat exchanger system with rectangular grooves in turbulent flow regime. The shell side diameter is 28 mm which is made of acrylic. While the tube diameter is 20 mm which is made of aluminium. Grooves were incised in annulus room/outer surface of tube side, with grooves space (s) = 2 mm, distance between groove (t) = 8 mm, and the grooves height (h) = 0.3 mm. The experiments consist of temperature measurement of inlet and outlet heat exchanger with k -type thermocouples. Throughout the investigation, hot fluid and cold fluid flowed in the inner pipe (tube side) and the space between pipes (annulus), respectively. The Reynold number of cold fluid have been varied from 31981 to 43601 in a parallel flow condition. The mass flow rate of hot fluid remains constant with Reynold number 30904. Water is used as the working fluid. Result showed the considerable effect of grooves which is applied in double tube heat exchanger. The total heat transfer enhancement of 7.8% and the ratio of heat transfer enhancement is larger for higher Reynold number. Finally, the use of grooves in the heat exchanger give benefit of heat transfer process.

Keywords: Annulus; Double Pipe Heat Exchanger; Heat Transfer; Rectangular Grooves

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