

Effect of Corrugation Angle on Heat Transfer Studies of Viscous Fluids in Corrugated Plate Heat Exchangers

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Abstract

In the present investigation heat transfer studies are conducted in corrugated plate heat exchangers (PHEs) having three different corrugation angles of 30°, 40° and 50°. The plate heat exchangers have a length of 30 cm and a width of 10 cm with a spacing of 5 mm. Water and 20% glycerol solution are taken as test fluids and hot fluid is considered as heating medium. The wall temperatures are measured along the length of exchanger at seven different locations by means of thermocouples. The inlet and outlet temperatures of test fluid and hot fluid are measured by means of four more thermocouples. The experiments are conducted at a flowrate ranging from 0.5 lpm to 6 lpm with the test fluid. Film heat transfer coefficient and Nusselt number are determined from the experimental data. These values are compared with different corrugation angles. The effects of corrugation angles on heat transfer rates are discussed.

Keywords: corrugation angle, corrugated plate heat exchanger, Nusselt number, viscous fluids.

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