

Numerical Investigation on the Thermal Performance of Double Pipe Heat Exchanger Using Different Shapes of Fins

In this study, a numerical investigation on the thermo-hydraulic performance of the double pipe heat exchanger into heat transfer by different shapes of fins on the outer surface for the inner tube as extended surfaces. The inner and outer diameters of the inner pipe were (16.05 mm), (19.05 mm) respectively, and (34.1 mm), (38.1 mm) for the outer tube. The length of the heat exchanger was (1000 mm). Hot and cold water were used as the working fluid, where the hot water flows inside of the inner one in counter flow with the cold water which flows in the annulus. The inlet temperature for the hot water is (75 OC) while it is (30 OC) for the cold. The hot fluid flows at constant rate which is (0.1kg/s) while the cold is varied from (0.1 kg/s to 0.2 kg/s).The study was perform using the known commercial CFD package (ANSYS – FLUNET 15) .The results shows that both (rectangular and triangular) fins enhances the heat transfer coefficient compare with the conventional plain tube .The rectangular fins presents an heat transfer enhancement ratio of (61% to 74%). Using of extended surfaces present a good result in saving energy by enhancing the performance of the double pipe heat exchangers used in petroleum industry