

EXPERIMENTAL STUDIES ON DOUBLE PIPE HEAT EXCHANGER FOR HEAT TRANSFER ENHANCEMENT BY USING NANOFLUIDS

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Heat transfer is one of the most important processes in many industries. The inherently poor thermal performance of common fluids put a limitation on conventional heat exchangers using water as a fluid. With a strong need by industry in developing energy efficient fluid, advanced heat transfer fluid called Nano fluid is introduced. Thermal conductivity is considered important factor for rapid cooling and heating application. Base heat transfer fluid like (water) normally is having low thermal conductivity. So it is proposed to experiment with Nanofluid for increasing the heat transfer rate. Nanofluid is nanometre sized particle such as metal, metal oxide, and carbide etc., dispersed into base heat transfer fluid. All researchers tried to increase the heat transfer rate by considering thermal conductivity of Nanofluid. Thermal conductivity is increased with increasing concentration of metal particle within critical limit. Thermal conductivity is affected by the following parameters like shape, size, clustering, collision, porous layer, melting point of nano particle etc. Suspensions of Nano particles shows better enhancement of stability, heat transfer capabilities and reduction of particle clogging. Nano fluid is advanced heat transfer fluid for next generation. In this research work experiment is carried out through Concentric Double pipe Heat Exchanger with base fluid like water and Nano particles like Mno₂, Graphite, and Aluminium oxides and study is made to ascertain the effect of Nano fluids in enhancing the effectiveness of heat exchanger by varying the concentration for various Nano fluids.

Keywords: Thermal Conductivity, Heat Transfer, Nano fluid, Double Pipe Heat exchanger, Nano particles. Overall heat transfer coefficient.