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Analysis of Nano-Fluid and Water Using CFD for Heat Exchanger

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Abstract: *Heat exchangers are a device used to transfer heat between two or more fluids. Cold water is commonly used in heat exchangers. But the heat transfer rate of the heat exchangers using water is less. Our aim is to improve the heat transfer rate. So, instead of cold water, we are using Nano fluid along with water. Nano fluids have improved thermal properties and heat transfer rate. Nano fluid contains metallic or non-metallic nano powder with a size of 100 nm in base fluid. We designed a CATIA model and imported the geometry in ANSYS software. After importing, we completed meshing process. Next, in setup, we selected material for shell and tube. Then we selected Nano fluid as the heat transferring medium. We provided boundary conditions to the heat exchanger. This gave us the result. From the result, we calculated the efficiencies of heat exchanger using water, aluminium oxide and copper oxide respectively. By comparing, we observed that the efficiency of copper oxide is greater than aluminium oxide and the efficiency of aluminium oxide is greater than cold water. Thus, we conclude that Nano fluids increase the efficiency of heat exchanger.*

Keywords: Nano fluid, CFD, ANSYS, Heat Exchanger, Mass Flow Rate, Efficiency

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