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Optimization of Design Parameters in Shell and Tube Heat Exchanger using Aspen HYSYS

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Abstract: *This journal documents the process of designing a shell and tube heat exchanger using Aspen HYSYS, powerful process simulation software. The objective of this design project is to optimize the heat transfer performance of the heat exchanger while meeting specific temperature specifications and constraints. Through a combination of theoretical understanding, engineering principles, and software simulation, this journal captures the journey of exploring heat transfer mechanisms, configuring the heat exchanger model, and analysing simulation results. The journal begins with defining the design objectives, including desired heat transfer rates and temperature specifications. The process flow diagram is then established in Aspen HYSYS, with careful consideration given to fluid streams entering and leaving the heat exchanger, their properties, flow rates, and temperatures. The shell and tube heat exchanger model is chosen for its suitability to the design requirements. Key design parameters, such as the number of tubes, tube dimensions, tube layout, and shell specifications, are determined to create an effective heat exchanger design. The selection of the heat transfer mechanism, such as parallel or counter flow, is thoroughly analysed to optimize the overall performance and efficiency of the heat exchanger.*

Keywords: Shell and tube heat exchanger, Kerosene, Simulation, design

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