

# PARAMETRIC ANALYSIS OF TUBE BUNDLE GEOMETRY IN SHELL & TUBE HEAT EXCHANGER

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A Thesis Submitted to  
Gujarat Technological University  
in Partial Fulfillment of the Requirements for  
the Degree of Master of Engineering  
in [Thermal Engineering]

May 2013



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## **ABSTRACT**

The Shell and Tube Heat Exchangers are most commonly used in industries. The shell-and-tube heat exchanger which is the majority type of liquid-to-liquid heat exchanger is used as feed water cooler in process industries, refineries, chemical plants and power plants. It is necessary to operate heat exchanger at optimum condition which serves high thermal efficiency in allowable condition and low running cost.

This research is intended to assist anyone with some general technical experience, but perhaps limited specific knowledge of heat transfer equipment. This research is about the analysis of Tube Bundle Geometry in Shell and tube heat exchanger. In practical applications Tube Thickness, Tube Pitch Ratio of heat exchanger are the major factor which directly affects the performance of the heat exchanger. The optimal values of tube thickness at various pitch ratio and related heat transfer in heat exchanger, with trial and error method optimal performance condition is estimated. The effect of tube thickness and pitch ratio on other thermal parameters such as Heat Duty, Over Design, Tube Side heat transfer coefficient, Tube Side pressure drop, Tube Side Velocity, Overall heat transfer coefficient in clean and fouled condition is analyzed. Efficient Results are achieved by varying tube thickness in operating limits.

In this dissertation attempt is made to overcome some major theoretical assumptions and serve practical approach as much as possible for shell tube heat exchanger. It is hoped that the software will bridge the gap between engineering fundamentals and the existing industry practice of shell and tube heat exchanger design.