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DESIGN AND ANALYSIS OF A HEAT EXCHANGER

ABSTRACT -The characteristics of heat exchanger design are the procedure of specifying a design, heat transfer area and pressure drops and checking whether the assumed design satisfies all requirements or not. The purpose of heat exchanger is how to design the oil cooler especially for shell-and-tube heat exchanger which is the majority type of liquid-to-liquid heat exchanger. General design considerations and design procedure are also illustrated. In design calculation, the HTRI code and Ansys software are used. Heat transfer concepts and complex relationships involved in such exchanger are also presented. The primary aim of this design is to obtain a high heat transfer rate without exceeding the allowable pressure drop. This HTRI code and computer package is highly useful to design the heat exchanger and to compare the design. In this the thermal and pressure drop calculations are done by using the empirical formula, as per TEMA and verified with HTRI software package (USA).

The pressure drop values on shell side and tube side at the same time, overall heat transfer coefficient values are found out and observed that they are with a variation of 0.29%, 1.4% and 1.68% respectively and matching with the HTRI software. From the theoretical modeling, the convection heat transfer coefficients along with the bulk temperature are found out and imposed as boundary conditions to predict the temperature distribution in heat transfer analysis in both the shell and tube.