

**DESIGN & CFD ANALYSIS OF DOUBLE PIPE HEAT
EXCHANGER USING TWISTED TAPE WITH
EXPERIMENTAL VERIFICATION**

M Tech Dissertation

Submitted in
partial fulfilment of the requirements
for the degree of

MASTERS OF TECHNOLOGY

in

Thermal Engineering

by

Harshit Parasotam Dharsandia

150303210004

Under the supervision of

Asst. Prof. Kruten Patel



June 2017

**DEPARTMENT OF MECHANICAL ENGINEERING
PARUL INSTITUTE OF ENGINEERING & TECHNOLOGY
FACULTY OF ENGINEERING & TECHNOLOGY
PARUL UNIVERSITY**

P.O. Limda – 391 760, GUJARAT, INDIA

Abstract

This exchanger usually consists of two concentric pipes with the inner pipe One fluid flows in the inner pipe and the other fluid flows in the annulus between pipes in a counter flow direction for the ideal highest performance for the given surface area. However, if the application requires an almost constant wall temperature, the fluids may flow in a parallel flow direction. This is perhaps the simplest heat exchanger. Flow distribution is no problem, and cleaning is done very easily by disassembly. This configuration is also suitable where one or both of the fluids is at very high pressure, because containment in the small-diameter pipe or tubing is less costly than containment in a large-diameter shell. The working fluid is water at atmospheric pressure. Hot water is supplied to the inner tube stream by using hot water pump & cold water is being circulated in the annular space of double pipe heat exchanger using water pump from overhead water tank. When using simple, perforated & serrated twisted tapes in double pipe heat exchanger individually experimental obtained results are validated with results obtained by CFD analysis. Experimental results are found in good agreement with results obtained from CFD in counter fluid flow arrangements.