



MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE GWALIOR

Department of Mechanical Engineering

REPORT OF SKILL BASED MINI PROJECT

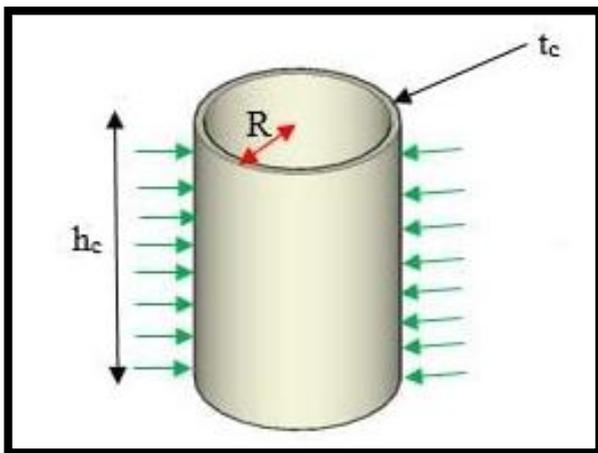
Heat and Mass Transfer (120513)

Title of Project: THERMAL CONDUCTIVITY MEASUREMENT OF FLUIDS

Introduction:

Thermal conductivity is a measure of a material's ability to conduct heat. It is a property that is important in a wide range of applications, including building insulation, heat exchangers, and thermal management of electronic devices. In fluids, thermal conductivity is a measure of how well the fluid can transfer heat through conduction.

Description of Model



In this project, I have explored the various methods for measuring the thermal conductivity of fluids, different parameters affecting thermal conductivity of fluids, and discussed the use of ANSYS to design and simulate a system for measuring the thermal conductivity of fluids, specifically water and oil.

Applications of Model

The measurement of thermal conductivity is important in a wide range of applications involving fluids.

- In the energy industry, it is used to optimize the design of heat exchangers and to predict the thermal performance of fuels and lubricants.
- In the construction industry, it is used to select appropriate insulation materials and to predict the heat loss through building envelopes.
- In the automotive industry, it is used to design cooling systems and to predict the heat transfer characteristics of engine oils.

What I Learned Through Project:

There are several key things that you may learn about thermal conductivity of fluids through studying this topic:

- It is an important property that affects the heat transfer characteristics of a material.
- There are several methods for measuring the thermal conductivity of fluids, including the hot wire method, the guarded hot plate method, and the transient plane source (TPS) method. Each of these methods has its own advantages and limitations.

- The thermal conductivity of a fluid depends on several factors, including its composition, temperature, and pressure. It may also be influenced by the presence of suspended particles or dissolved gases.
- Design and analysis of a system for measuring thermal conductivity of fluids



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