

Study of Heat Transfer Characteristics of Heat Pipe Using Water as a Working Fluid

Prathamesh Tendolkar¹, Om Mayekar², Shubham Talekar³, Aniruddha Vaidya⁴, Kedar Bhide⁵

U.G. Students, Department of Mechanical Engineering^{1,2,3,4}

Assistant Professor, Department of Mechanical Engineering⁵

Finolex Academy of Management and Technology, Ratnagiri, India

Abstract: Heat pipes are efficient and versatile thermal management devices widely used in various applications to transfer heat. This study focuses on investigating the heat transfer characteristics of a heat pipe employing de-ionized water as the working fluid. The experiment involved analyzing the thermal performance, heat transport capacity, and operational limits of the heat pipe. The aim of the experiment is to assess the heat pipe's performance under different operating conditions, such as varying heat loads. The study aimed to understand the heat transfer limitations and advantages of water-based heat pipes, which can have practical implications for numerous applications, such as electronics cooling, solar thermal systems, and space technology.

Keywords: versatile thermal management, heat transfer characteristics, thermal performance, heat transport capacity, operational limits, electronics cooling, solar thermal systems, space technology