ABSTRACT

The automotive industry is continuously seeking sustainable solutions to enhanced lubrication properties, which should results in reduced friction, wear, and fuel consumption and Nano particles, known for their remarkable properties such as enhanced lubricity and wear resistance, are incorporated into RSO and Jatropha to further improve their performance. To reduce environmental impact and operational efficiency, one significant area of focus is the replacement of traditional mineral engine oils with more environmentally friendly alternatives. Vegetable oils possess inherent lubricating properties, such as high viscosity index, which can be further enhanced through additives and modifications. Nano lubricants, incorporating nanoparticles into lubricant matrices enhanced lubrication properties. These properties contribute to reduced friction and wear, resulting in improved mechanical efficiency and extended component lifespan. This study investigates the potential of utilizing rubber seed oil (RSO) and Jatropha oil with Nano particles as an alternative to mineral-based lubrication oil. They presents a promising avenue due to its renewable and biodegradable nature. The study evaluates the lubricats friction reduction, and wear protection capabilities of RSO and Jatropha with Nano particles through Pin on Disk Tribometer tests and comparisons with mineral-based lubricants. The project report provides a comprehensive analysis of the experimental setup, methodology, results, and conclusions, shedding light on the potential applications of alternative base fluids and nanoparticles in improving engine oil performance.

KEYWORDS: Mineral oil, vegetable oil, Rubber Seed Oil (RSO), Jatropha oil, Nano particles, Pin on disk tribometer, wear, friction, environmental impact, Taguchi design of experiments.