

**A
PROJECT REPORT
ON
PERFORMANCE AND EMISSION ANALYSIS OF WASTE
COOKING OIL BIODIESEL MIXED WITH TITANIUM
OXIDENANO ADDITIVES**

SUBMITTED BY

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DEPARTMENT OF AUTOMOBILE ENGINEERING



**BHARATH INSTITUTE OF HIGHER EDUCATION AND
RESEARCH**

(Declared under section 3 of the UGC Act, 1956)
SELAIYUR, CHENNAI-600073, TAMIL NADU, INDIA

MAY 2023

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**In partial fulfillment for the requirement of the degree
Of
Bachelor of Technology
in
Automobile Engineering**

Under the guidance of
Mr. R. Anbazhagan



**DEPARTMENT OF AUTOMOBILE ENGINEERING
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This is to certify that “**PERFORMANCE AND EMISSION ANALYSIS OF
WASTE COOKING OIL BIODIESEL MIXED WITH TITANIUM OXIDE
NANO ADDITIVES**” is a bonafide work done by **LOKASANI ASHOK
REDDY (U19AM012), NAVEEN S (U19AM701), KRISNES R
(U19AM703), YOKESHWARAN V (U19AM704)**, for the major
project in Automobile Engineering during the academic year 2022-2023.

Internal project guide

H.O.D

Submitted for the viva voce held on..... at
BIHER

Internal examiner

External examiner

DECLARATION

I hereby declare that the project report entitled “*PERFORMANCE AND EMISSION ANALYSIS OF WASTE COOKING OIL BIODIESEL MIXED WITH TITANIUM OXIDE NANO ADDITIVES*” submitted to BIHER, Chennai in partial fulfillment UG for the award of degree of Bachelor of Technology in Biomedical Engineering is the record of the original work carried out by me under the guidance of Mr. R. Anbazhagan.

I further declare that the result of the work have not been submitted to any other university or institute for the award of any degree or diploma.

Place: Chennai

Signature of student

Date:

ACKNOWLEDGEMENT

Before proceeding with the details of our project work we thank almighty god for making our endeavour as a successful one. From a twinkle of idea to visible reality this project has undergone many transitions and owes its success to enormous sources and many distinguished personalities.

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ABSTRACT

People are using biodiesel in compression ignition engines because it is more environmentally friendly and can be used as a good alternative to diesel. There is a new technology called nanoparticles that can change the way a fuel works. Because waste cooking has a lot of oil in it, it can make biodiesel. To make biodiesel, transesterification was used to turn nonedible oil from waste cooking oil into biodiesel that could be used. Nanoparticles made of titanium oxide were studied by using scanning electron microscopy, transmission electron microscopy, as well as energy dispersive X-ray analysis, among other things. TiO₂ nanoparticles are spread out in different amounts in the biodiesel blend. The dosage levels range from 25, 50, 75, and 100 ppm. Tests on how titanium nanoparticles in a waste cooking oil biodiesel blend affect a diesel engine's performance and how it emits were conducted in this study too. At a steady speed, the engine was used when there was a lot of work to do.

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CHAPTER 1

INTRODUCTION

Diesel is an extra-ordinary Fuel. Diesel fuel used in the all type of light duty and heavy duty engines. But the demand for energy around the world is increasing, specifically the demand for petroleum fuels. In conventional energy sources condition is increasing demand of energy is a matter of serious concern. Today 90% of energy demand is being met by way of fossil fuels, mainly in petroleum products.

Petroleum based fuels will neither be available at sufficient quantities nor at responsible prices. In future, exploring alternative fuels for engine should be derived from indigenous sources and preferable renewable energy sources.

Diesel-operated vehicles are becoming more popular nowadays owing to superiority in fuel efficiency and low emission of CO₂ (carbon di-oxide), CO (carbon mono-oxide), HC (hydrocarbon). It creates lot of CO, CO₂, carbon particles etc., Diesel engines are used in transportation, power plants, construction and industrial activities. It is also called as Waste Edible Oil (WEO). It is an oil-based substance consisting of vegetable matter that has been used in cooking or preparation of foods and is no longer suitable for human consumption.

Disposal of large amounts of WCO has become a problematic issue in most countries. WCO cannot be discharged into drains or sewers because this will lead to blockages and odour or vermin problems and may also pollute watercourses, causing problems for wildlife. It is also a prohibited substance and will cause problems.

In INDIA, most of the major hotels, sweets & bakery and etc., after using the cooking oil dispose in drainage. Its affect the plants, water, animals and human also.