

**PERFORMANCE EVALUATION AND POLLUTION EMISSION CHARACTERISTICS
OF FOUR STROKE DIESEL ENGINE FILLED WITH BIODIESEL.**

A Project Report submitted in partial fulfillment of requirements for the

Award of the degree of

**BACHELOR OF TECHNOLOGY IN
MECHANICAL ENGINEERING**

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CERTIFICATE

This is to certify that this project work entitled **"PERFORMANCE EVALUATION AND POLLUTION EMISSION CHARACTERISTICS OF FOUR STROKE DIESEL ENGINE"** that is being submitted by **B. ARUN KUMAR (15815A0303), G. MOHAN (15815A0319), K. SANKARI SIRISHA (15815A0321), K.SRIKARI HARITHA VAISHNAVI (15815A0322)** to AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY, Makavarapalem, Visakhapatnam in partial fulfillment of the requirements for the award of degree of **BACHELOR OF TECHNOLOGY in MECHANICAL ENGINEERING** is a bonafide work carried out by them under my guidance and supervision during the year 2014-2018.

The result embodied in this have not been submitted to any other College or University for the award any other degree.



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ABSTRACT

As crude oil price reaches high, the need for developing alternate fuels has become acute. Alternate fuels should be economically attractive in order to compete with currently used fossil fuels. In this work, biodiesel (ethyl ester) was prepared from mustard oil. Methanol with potassium hydroxide as a catalyst was used for the transesterification process. The biodiesel was characterized by its physical and fuel properties including density, viscosity, flash point according to ASTM standards. The viscosity of the biodiesel ethyl ester was found to be 5.03 mm²/sec at 40°C. Production of biodiesel from mustard oil for diesel substitute is particularly important because of the decreasing trend of economical oil reserves, environmental problems caused due to fossil fuel use and the high price of petroleum products in the international market.

The performance evaluation of a single cylinder four stroke VCR diesel engine has been done when fuelled with different blends of diesel and biodiesel made of mustard oil. It was found that brake thermal efficiency and SFC of engine slightly increases and with the increase in percentage of biodiesel.

Exhaust gas analysis indicates that with the use of biodiesel, the percentage of CO and CO₂ decreases and percentage of O₂ increases which is a good sign as far as ecological conservation is concerned.

One can understand from this experiment that mustard oil, is one of the most economical choices to produce biodiesel. Since one of the major concerns on biodiesel production is the price of feedstock, utilization of mustard oil significantly enhances the economic viability of biodiesel production.