

**PERFORMANCE OF DIESEL ENGINES WITH BIODIESEL FUEL
MIXTURE OF CASTOR OIL AND PALM OIL WITH COMPOSITION 3:7**

ABSTRACT

Consumption of fuel will continue to increasing the needs development of community in all sectors. Petroleum fuel that is often used is diesel fuel, but its use is massive so that scarcity occurs. Therefore, it is necessary to substitute alternative fuels, one of which is biodiesel that uses vegetable oil from castor oil and palm oil. The purpose of the study to get the characteristics of biodiesel fuel from castor oil - palm oil in the form of power, specific fuel consumption, and injection process.

This research used a single cylinder diesel engine that is connected to the generator by turning on the load of 5 lamps with each a power of 500 Watt load. Biodiesel varied with diesel to B5, B10, B15, and B20. Biodiesel made within 60 minutes and heated at a temperature of 70 °C. Then test the physical properties of diesel fuel and biodiesel, test diesel engine performance, and test diesel engine performance.

Result of this research show that there biodiesel fuel B5, B10, 15 and B20 were lower than diesel fuel. The power possessed by biodiesel B5 at maximum loading is better than other biodiesel which is 1.5458 kW and biodiesel B20 has the lowest power which is 1.44130 kW. Fuel consumption (SFC) in the B20 biodiesel mixture is lower than diesel fuel or more economical than diesel fuel in the amount of 0.159 kg/Watt.hour at a load of 2500 Watt. In testing the characteristics of the spray obtained a mixture of biodiesel B15 and B20 has a longer spray than diesel fuel. However, B15 and B20 have smaller angles compared to biodiesel B5 and B10.

Keywords: *Biodiesel, Diesel Engine Performance, Castor Oil, Palm Oil, Power, SFC, Injection Characteristics*