

**STUDY OF BIODIESEL FUEL WITH HYDROGEN COMBINING  
HYDROGEN OXYGEN (HHO) IN DIESEL ENGINE**

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***ABSTRACT***

This research is motivated by the dwindling energy crisis, while the need is increasing. Biodiesel is an environmentally friendly alternative fuel because exhaust emissions are very low compared to fossil fuels. The process of making biodiesel includes the process of pressing, degumming, esterification, transesterification, and purification then testing the characteristics of biodiesel. This research applies an experimental method using the Pertamina biodiesel fuel process mixed with biodiesel composition B10, B15, and B20. This test was conducted to determine the effect of biodiesel with coconut oil biodiesel mixture on the performance of diesel engines, namely effective power and torque. Based on the test results, in the effective power test the highest value was obtained on B0 fuel at a load of 400 watts of 1120.174308 watts while the highest value of the effective power of the coconut oil biodiesel mixture was B10, B15, and B20 with a mixture of Hydrogen Hydrogen Oxygen (HHO) the highest value of effective power was obtained on the use of biodiesel fuel with a mixture of B10 of 956.919744 watts at a loading of 400 watts because coconut oil biodiesel has a higher density than the material Burn biosolar. The highest torque value in coconut oil biodiesel mixture fuel without Hydrogen Hydrogen Oxygen (HHO) is 6.186301911 Nm at 400 watts loading using biodiesel fuel with B10 coconut oil biodiesel mixture. The highest value in the mixture of Hydrogen and Hydrogen Oxygen (HHO) is 5.23028909 Nm at a loading of 400 watts using biodiesel fuel with a mixture of B10 coconut oil biodiesel.

**Keywords:** Biodiesel, Coconut Oil, Effective Power, Torque

# STUDI BAHAN BAKAR BIODIESEL DENGAN PENGGABUNGAN HYDROGEN HYDROGEN OXYGEN (HHO) PADA MESIN DIESEL

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## ABSTRAK

Penelitian ini dilatarbelakangi oleh krisis energi yang semakin menipis, sedangkan kebutuhannya semakin bertambah. Biodiesel merupakan bahan bakar alternatif ramah lingkungan dikarenakan emisi gas buang sangat rendah dibandingkan dengan bahan bakar fosil. Adapun proses pembuatan biodiesel antara lain proses pengepresan, *deguming*, esterifikasi, transesterifikasi dan pemurnian kemudian dilakukan pengujian karakteristik biodiesel. Penelitian ini mengaplikasikan metode *experimental* menggunakan proses bahan bakar biosolar pertamina yang dicampur dengan biodiesel komposisi B10, B15, B20. Pengujian ini dilakukan untuk mengetahui pengaruh biosolar dengan campuran biodiesel minyak kelapa terhadap unjuk kerja mesin diesel yaitu daya efektif dan torsi. Berdasarkan hasil pengujian, pada uji daya efektif nilai tertinggi diperoleh pada bahan bakar B0 pada beban 400 watt sebesar 1120,174308 watt sedangkan nilai tertinggi daya efektif campuran biodiesel minyak kelapa B10, B15, B20 dengan campuran *Hydrogen Hydrogen Oxygen* (HHO) nilai tertinggi daya efektif diperoleh pada penggunaan bahan bakar biosolar dengan campuran B10 sebesar 956,919744 watt pada pembebanan 400 watt karena biodiesel minyak kelapa memiliki densitas yang lebih tinggi dari bahan bakar biosolar. Nilai torsi tertinggi pada bahan bakar campuran biodiesel minyak kelapa tanpa *Hydrogen Hydrogen Oxygen* (HHO) sebesar 6,186301911 Nm pada pembebanan 400 watt menggunakan bahan bakar biosolar dengan campuran biodiesel minyak kelapa B10. Sedangkan nilai tertinggi pada campuran *Hydrogen Hydrogen Oxygen* (HHO) sebesar 5,23028909 Nm pada pembebanan 400 watt menggunakan bahan bakar biosolar dengan campuran biodiesel minyak kelapa B10.

**Kata Kunci :** Biodiesel, Minyak Kelapa, Daya efektif, Torsi