

## **Evaluation of Combustion and Emission Characteristics of Diesel Engine by Addition of Various Fuel Additives**

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### **Abstract**

An automobile with internal combustion engines using gasoline and diesel creates pollution that has become a great threat to the very existence of mankind. Every year there is a spurt in the demand for lower pollution levels combined with the demand for higher fuel efficiency.

Reduction of diesel engine emissions especially the reduction of smoke and the particulate emissions has become a serious issue due to environmental concerns. Stringent regulations have been enforced in various countries including India. Improvements on fuel properties are essential for the reduction of the exhaust gas emissions of diesel engines.

In this study, one of the prospective methods to reduce emissions and improve combustion is to use oxygenated fuel additives in diesel. The combustion characteristics under various cycles in a diesel engine fueled with Diethylene Glycol Dimethyl ether (DEGDME), Ethylene glycol Dimethyl Ether (EGDME) and the combustions of both DEGDME and EGDME as additives blend to diesel with 1%, 2%, 3%, and 4% by Volume to diesel were investigated. The experiment was carried out on a two cylinder, water-cooled DI diesel engine. The parameters of peak pressure, heat release and emissions for both sole fuel (diesel) and oxygenated additives were tabulated during the process of combustion and were compared. The smoke concentration was found to decrease by 20% when 3% of DEGDME and EGDME by volume to sole fuel were used as fuels. But Nox emission increased slightly and results were observed for different cycles of combustion 200, 400,600 and 800 in the diesel engine.