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Impact of Fuel Additives on Diesel Engine Exhaust Emissions and Performance

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Abstract: *Diesel engines are widely used in transportation and agriculture due to their high efficiency. However, diesel engines emit harmful exhaust gases such as carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NOx), and particulate matter, which affect human health and the environment. One simple method to reduce exhaust emissions without major engine modification is the use of fuel additives. This study investigates the effect of commercial diesel fuel additives on engine performance and exhaust emissions. The analysis is based on experimental data reported by Laurinaitis and Mickevičius (2018). Results show that fuel additives influence combustion behavior by changing ignition delay and in-cylinder pressure. It is observed that while some additives reduce smoke and improve combustion, they may increase CO and HC emissions at low engine loads. Simple performance and emission calculations are included to understand the impact of additives on brake specific fuel consumption and emission variation.*

Keywords: Diesel engine, fuel additives, exhaust emissions, CO, HC, NOx, BSFC

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