

Performance, Combustion Characteristics and Emission Tests of Single Cylinder Engine Running on Fusel Oil - Diesel Blended (F20) Fuel

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ABSTRACT:

Alcohols produced from a renewable source are amongst the important alternative fuels for internal combustion engines. Investigations on alternative fuels for compression ignition engines regarded as one of the major research areas. This paper details an experimental examination of the performance and emissions in single cylinder compression ignition engines operating with fusel oil F20 and pure diesel F0 at five engine speeds and 50% engine load. The test results indicated that the engine power and torque slightly decrease with the F20 at low speeds compared with pure diesel. Further, the in-cylinder pressure was decreased at all engine speed for F20 in comparison with pure diesel. The volumetric efficiency and fuel consumption were increased for F20 due the low heating value of fusel oil. The results showed that CO₂ and CO emissions were increased because of the water content, low heating value and low cetane number for fusel oil. The maximum reduction in NO_x emissions was 18% for F20 at 1500 rpm.

KEYWORDS:

Fusel oil; NO_x emissions; Single cylinder engine; Alternative fuels; Engine performance

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