

COMPARISON OF PERFORMANCE CHARACTERISTICS OF DIRECT INJECTION DIESEL ENGINE USING BLENDS OF COTTONSEED OIL, PALM OIL, NEEM OIL WITH DIESEL

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Abstract

The increased particulate emissions and depleting fossil fuel reserves made to investigate the suitability of alternative fuels. In this study, the performance of single cylinder, 4-stroke, naturally aspirated direct injection compression ignition engine using blends of vegetable oils with diesel is carried out. The comparison of various properties like viscosity, density, flash point, fire point, cloud point etc., of diesel, cottonseed oil, palm oil, and their blends have been examined in this present work. Also the performance of the engine for different blends at different injection pressures are determined and compared with that of the diesel fuel. Briefly the suitability of alternating fuels to diesel engines, and the problems associated using these is the major study of this paper. In the present investigation the vegetable oils are chosen as alternative fuels as they have a high cetane number and calorific value very close to diesel. The biggest hindrance to the easily adaptation of these vegetable oils is high viscosity and low volatility. The method adopted to decrease the viscosity is blending the vegetable oils with diesel. In the performance analysis, the acquired data will be useful to predict the thermal efficiency, brake specific fuel consumption, and exhaust gas temperature. The test results showed that brake specific fuel consumption, exhaust gas temperature were higher for vegetable oil blends compared to diesel whereas thermal efficiency was lower for vegetable oil blends compared to diesel. While running the engine on different vegetable oil blends, performance parameters were very close to diesel for lower concentration blends.

Keywords : Alternate fuel; Blend; Viscosity; Injection pressure; Performance