

# **Performance Evaluation of Single Cylinder Engine Using Different Blends of Ethanol as Fuel**

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## **Abstract**

Myanmar is endowed with rich natural resources for production of commercial energy. The available current sources of energy found in Myanmar are crude oil, natural gas, hydroelectricity, biomass, coal, and biofuel.

Ethanol (C<sub>2</sub>H<sub>5</sub>OH) or ethyl alcohol can be produced by fermentation of carbohydrates, which occur naturally and very abundantly in some plants like sugar cane, and from starchy materials like maize and potatoes. Ethanol is an attractive fuel and ethanol-gasoline blends can be used as fuel in order to substitute some parts of gasoline engine and automobile engine.

The study aimed to evaluate the performance of a single cylinder, four-stroke, compression ignition ROBIN (EY 13-3) engine using different blends of ethanol such as commercial gasoline (E10), ethanol blends (E20, E25, E30), and hydrous ethanol (hE95) as fuel based on varying load test, continuous running test, and smoke emission test. Performance evaluation was in terms of output power, fuel consumption, specific fuel consumption, engine oil temperature, noise level, and smoke emission.

E25 fuel setup gave the maximum average output power (1.4 KW) in varying load test, while E10 setup reached the highest average value (1.32 KW) in continuous running test. E25 fuel showed the best performance in smoke emission test. Therefore, E25 fuel is recommended as the maximum safe blend.