

**COMPARATIVE STUDIES ON THE PERFORMANCE PARAMETERS,
EXHAUST EMISSIONS AND COMBUSTION CHARACTERISTICS
OF MODIFIED SI ENGINE OVER CONVENTIONAL ENGINE**

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ABSTRACT

Experiments were conducted for evaluating the performance parameters, control of pollution levels and combustion characteristics of a single cylinder, air-cooled, Bajaj make, 2.2 kW BP, 3000 rpm, two-stroke, catalytic coated (copper coated on the piston crown and on the inner surface of cylinder head), methyl alcohol-gasoline blend (80% gasoline, 20% methyl alcohol, by volume) operated SI engine with a compression ratio of 7.5:1, connected to an electrical swinging field dynamometer with resistive loading for. The engine performance parameters are brake thermal efficiency (BTE), brake specific energy consumption (BSEC), exhaust gas temperature (EGT) and volumetric efficiency (VE), while, the engine exhaust emissions are carbon monoxide (CO), un-burnt hydro carbons (UBHC) and aldehydes (formaldehydes and acetaldehydes). The combustion characteristics are peak pressure (PP), time of occurrence of peak pressure (TOPP), maximum rate of pressure rise (MRPR), maximum heat release (MHR) and temperature of exhaust emissions at exhaust port opening (EPO). The performance parameters, exhaust emissions and combustion characteristics were determined at full load operation of the engine, while, BTE was determined at peak load operation. Alcohol-gasoline blend fueled copper coated combustion chamber considerably improved the performance, reduced the pollutants with sponge iron catalyst in the catalytic converter fitted to the exhaust pipe, and improved the combustion parameters over conventional engine with pure gasoline operation.

KEYWORDS: *Conventional Engine, Copper Coating, Performance, Exhaust Emissions, Combustion Characteristics*

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