

The Using of Liquefied Petroleum Gas (LPG) on a Low Heat Loss Si Engine

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Abstract : In this study, Thermal Barrier Coating (TBC) application is performed in order to reduce the engine emissions. Piston, exhaust, and intake valves of a single-cylinder four-cycle gasoline engine were coated with chromium carbide (Cr₃C₂) at a thickness of 300 μm by using the Plasma Spray coating method which is a TBC method. Gasoline engine was converted into an LPG system. The study was conducted in 4 stages. In the first stage, the piston, exhaust, and intake valves of the gasoline engine were coated with Cr₃C₂. In the second stage, gasoline engine was converted into the LPG system and the emission values in this engine were recorded. In the third stage, the experiments were repeated under the same conditions with a standard (uncoated) engine and the results were recorded. In the fourth stage, data obtained from both engines were loaded on Artificial Neural Networks (ANN) and estimated values were produced for every revolution. Thus, mathematical modeling of coated and uncoated engines was performed by using ANN. While there was a slight increase in exhaust gas temperature (EGT) of LPG engine due to TBC, carbon monoxide (CO) values decreased.

Keywords : LPG fuel, thermal barrier coating, artificial neural network, mathematical modelling

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