

A
Dissertation report
On
**"Wear and Corrosion behavior of Spheroidal
Graphite Cast Iron in Biodiesel Blends"**

Submitted in partial fulfilment of the requirement
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ABSTRACT

Biodiesel, as an alternative fuel is steadily gaining attention to replace petroleum diesel partially or completely. Cast Iron has been used in many industrial applications for many years because of its thermal conductivity, good machinability, vibration damping, good strength properties and wear resistance. The aim of this work is to evaluate the wear and corrosion behavior of spheroidal graphitic cast iron in various biodiesel blends such as B100 (100% biodiesel), B20 (20% biodiesel), B10 (10% biodiesel), B5 (5% biodiesel), B0 (100% diesel). The tribological and corrosion performance of biodiesel on cast iron is crucial for its application in automobiles. Cast irons used in automobile engine parts as piston ring material. As biodiesel percentage increases, there is a formation of lubrication layer of ester compounds in palm biodiesel, which results in boundary lubrication which increases wear resistance but increases corrosion of the cast iron. Therefore, high wear and corrosion resistance is critical for ensuring a long life for the cast iron in biodiesel environment. Very less work had been done to evaluate the corrosion and wear behavior of heat treated cast iron in various biodiesel blends. Results showed the phenomenon of selective leaching in the most corrosive media i.e. in palm biodiesel due to fatty acids. Comparisons needed to be done to find which biodiesel blend is better for cast iron as piston ring to ensure longer life. The obtained results in each blend are compared and correlated with each other. The Scanning Electron Microscopy (SEM) and Energy Dispersive Spectroscopy (EDS) investigation was utilized to analyze the structure and surface morphology.

Keywords: spheroidal graphite cast iron, wear, corrosion, palm biodiesel, petroleum diesel, piston ring.