Kamolpatara Limratana 2010: A Performance, Efficiency and Emissions Testing for Biodiesel in Ship Engines. Master of Engineering (Mechanical Engineering), Major Field: Mechanical Engineering, Department of Mechanical Engineering. Thesis Advisor: Associate Professor Sompong Pichetpinyo, M.Eng. 93 pages

In this study, a fuel for ship engines produced from palm oil and its usability investigated as B100 Biodiesel and B5 Biodiesel in the main engines (MAN D2842 LE) and diesel generators (MAN D2866 TE). The objective of this study was to investigate on the performances, emissions and effects on engine parts of B100 Biodiesel compare with B5 Biodiesel.

This study investigated about main engines and diesel generators at 60 and 40% engine load, respectively, in working condition. All the investigated values would be analyzed from related research studies. The fuel consumption rate measured from both engines by observation from the level at plastic hose which installed with fuel tanks and bring the collected values to determine Brake Specific Fuel Consumption (BSFC) and brake thermal efficiency (η_{tb}). For the emissions, the flue gas analyser can be used in analyze temperature, O_2, CO and CO_2 content of the exhaust gas. In addition, disassemble of fuel injection pump and injection nozzle of both engines were investigated by visual inspection with magnifying glass.

From the experimental results, the average values of BSFC for B100 Biodiesel when using with main engine were higher than B5 Biodiesel in the range of 16.14 to 26.00%. The average values of η_{tb} for B100 Biodiesel when using with main engine were lower than B5 Biodiesel in the range of 0.55 to 7.68%. The average value of CO for B100 Biodiesel when using with main engine was lower than B5 Biodiesel 27.25% at speed 1400 rpm. In addition, corrosion with soot and deposit in engine parts from using B100 Biodiesel could be compared to B5 Biodiesel if water content is not above 0.05% by weight.

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