

Biodiesel as alternative fuel for marine diesel engine applications: A review

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ABSTRACT

Transportation and shipping activities are major contributor to air pollution at sea where most of it occurs as a result of exhaust emissions from ships. Stringent emission limitations enforced by the International Maritime Organization have hastened the need to find a new alternative fuel for marine diesel engines. Thus, biodiesel fuel was chosen as one of the environmentally friendly alternative energy that can reduce ship toxic gas emissions and at the same time reduces dependence on petroleum-based fuels. Therefore, the purpose of this paper is to provide a comprehensive review of biodiesel as an alternative fuel for marine diesel engine applications. This review covers the biodiesel fuel background, engine performance, history, recent progress, engine warranty, issues, challenges, and possible solutions on using biodiesel for marine applications. A significant number of literatures from indexed journals were cited accordingly. The results of previous studies had shown that the use of biodiesel would mostly increase the amount of brake specific fuel consumption and nitrogen oxide gas while conversely reducing other toxic gas emissions. Although a number of issues and challenges arise, most marine engine manufacturers give conditional warranty against the use of biodiesel in the engines. The study concluded that biodiesel and its blends have a bright future in the marine sector, provided some of the highlighted issues can be solved.

Keywords: Biodiesel; Engine performance; Exhaust emission; Marine diesel engine; Air pollution

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