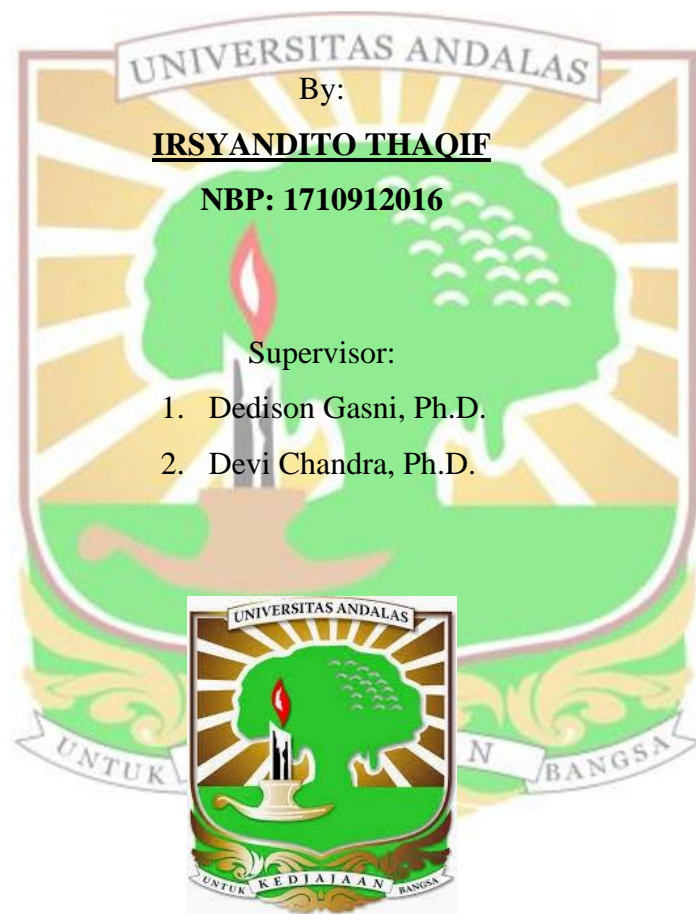


# FINAL PROJECT

## The Effect of Clove Oil Addition on Physical and Tribological Properties of Palm Oil on Pin on Disc Test Apparatus

*Submitted as One of The Requirements to Accomplish  
Bachelor Degree Study*



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## ABSTRACT

Currently, the use of lubricants is dominated by mineral oil-based and synthetic lubricants that if its not handled properly, it would cause environmental pollution. To reduce environmental pollution, alternative raw materials for base lubricant for environmentally friendly and biodegradable lubricants is used, such as lubricants that derived from vegetable oils to produce biolubricant. One of the vegetable oils used as a biolubricant is palm oil, but palm oil has the property of being oxidize easily so to reduce that clove oil is added as the additive where clove oil contains eugenol, a compound that contain antioxidant.

In this final project, the effect of clove oil addition to palm oil will be observe by testing the physical and tribological properties. For physical testing its used Oswald viscometer, and the result is palm oil with 0%wt have a highest viscosity. For tribological testing it used the pin on disc tribometer with speed variation of 500 rpm and 1400 rpm, with given load of 50 N and 100 N. From the wear test, palm oil with 0%wt has a lower wear rate. while from the surface texture that is observed with stereo microscope shows that palm oil with 5%wt has the highest disc scar width and pin scar diameter. From the coefficient of friction test the lowest value occurs at palm oil with 0%wt. The result shows that the addition of clove oil doesn't contribute to reduce the wear, but it increases the life usage of the lubricant.

**Keywords:** Palm oil, clove oil, biolubricant, viscosity, wear, coefficient of friction

