

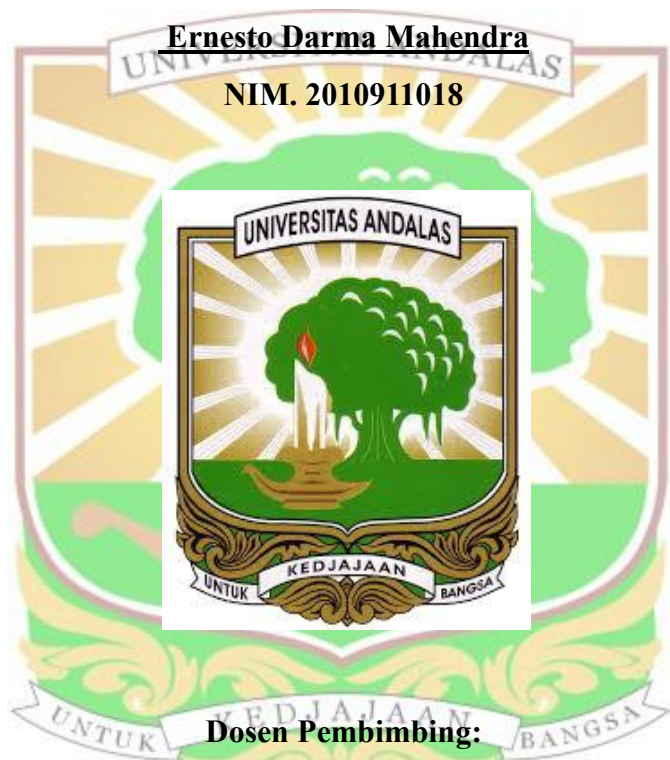
TUGAS AKHIR

PENGARUH TEMPERATUR TERHADAP NILAI KOEFSISIEN GESEK DENGAN PELUMAS SAE 30

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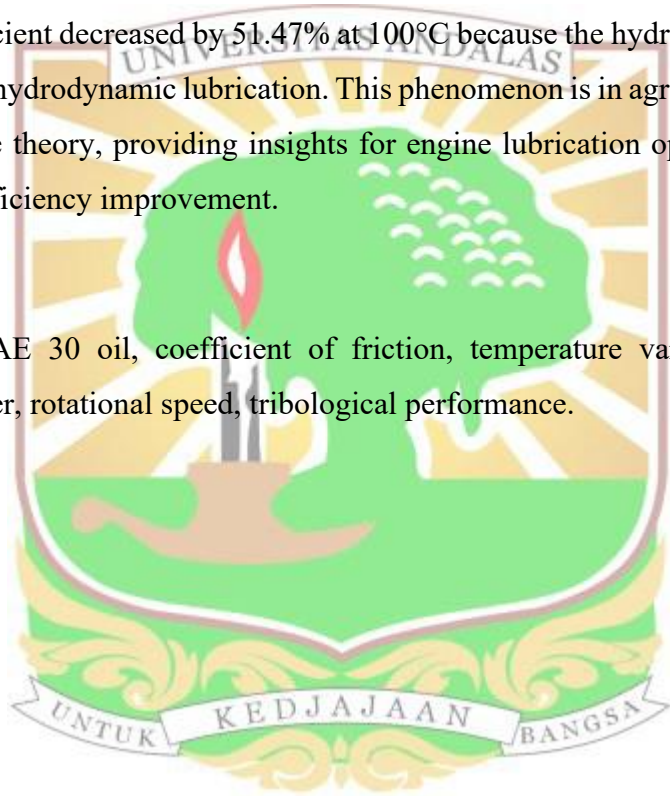
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ABSTRACT

This study examines the effect of SAE 30 oil temperature variation on the coefficient of friction using a Pin-on-Disc tribometer. The tests were conducted at 28°C, 60°C, and 100°C, with rotation speeds of 500 rpm and 1400 rpm, and a constant load of 50 N. The results showed that at 500 rpm, the coefficient of friction increased by 132.47% at 100°C compared to 28°C due to a decrease in viscosity causing lubrication to approach the boundary regime. In contrast, at 1400 rpm, the friction coefficient decreased by 51.47% at 100°C because the hydrodynamic shear force favored hydrodynamic lubrication. This phenomenon is in agreement with the Stribeck curve theory, providing insights for engine lubrication optimization and component efficiency improvement.

Keywords: SAE 30 oil, coefficient of friction, temperature variation, Pin-on-Disc tribometer, rotational speed, tribological performance.



ABSTRAK

Penelitian ini mengkaji pengaruh variasi temperatur oli SAE 30 terhadap koefisien gesek menggunakan tribometer Pin-on-Disc. Pengujian dilakukan pada temperatur 28°C, 60°C, dan 100°C, dengan kecepatan putaran 500 rpm dan 1400 rpm, serta beban konstan 50 N. Hasil menunjukkan bahwa pada 500 rpm, koefisien gesek meningkat 132,47% pada 100°C dibandingkan 28°C akibat penurunan viskositas yang menyebabkan pelumasan mendekati rezim batas. Sebaliknya, pada 1400 rpm, koefisien gesek menurun 51,47% pada 100°C karena gaya geser hidrodinamik mendukung pelumasan hidrodinamik. Fenomena ini sesuai dengan teori kurva Stribeck, memberikan wawasan untuk optimasi pelumasan mesin dan peningkatan efisiensi komponen.

Kata Kunci: Oli SAE 30, koefisien gesek, variasi temperatur, tribometer Pin-on-Disc, kecepatan putar, performa tribologi.

