ABSTRAK

RBD Palm Oil merupakan komoditas utama industri kelapa sawit yang proses pemuatannya ke kapal tanker sangat bergantung pada pompa sentrifugal. Penelitian ini bertujuan menganalisis pengaruh variasi putaran elektromotor terhadap debit aliran dan efisiensi pemompaan di PT Smart Tbk. Metode yang digunakan adalah pengujian tiga variasi putaran motor (1400 *rpm*, 1500 *rpm*, dan 1600 *rpm*) dengan perhitungan debit, kecepatan aliran, head total, daya fluida, daya input, dan efisiensi. Hasil menunjukkan bahwa semakin tinggi putaran, debit dan efisiensi meningkat. Pada 1400 *rpm* diperoleh efisiensi 30,58%, pada 1500 *rpm* 40,86%, dan pada 1600 *rpm* mencapai 55,99%. Kesimpulannya, variasi putaran elektromotor berpengaruh signifikan terhadap kinerja pompa, dengan kondisi optimal pada putaran 1600 *rpm*.

Kata kunci: *RBD Palm Oil*, pompa sentrifugal, variasi putaran, efisiensi.

ABSTRACT

RBD Palm Oil is one of the main commodities in the palm oil industry, where the loading process to tanker vessels relies heavily on centrifugal pumps. This study aims to analyze the effect of motor speed variation on flow rate and pumping efficiency at PT Smart Tbk. The method involved testing three motor speed variations (1400 rpm, 1500 rpm, and 1600 rpm) by calculating flow rate, flow velocity, total head, fluid power, input power, and pump efficiency. The results showed that higher motor speed increased both flow rate and efficiency. At 1400 rpm, pump efficiency was 30.58%, at 1500 rpm it reached 40.86%, and at 1600 rpm the highest efficiency was achieved at 55.99%. In conclusion, motor speed variation significantly affects pump performance, with the optimal condition occurring at 1600 rpm.

***Keywords**: RBD Palm Oil, centrifugal pump, motor speed variation, efficiency.*