

ABSTRAK

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Judul Laporan Akhir : Rancang Bangun Mesin *Mixer* Minyak Jelantah
Menjadi Sabun Cair dengan Kapasitas 10 Liter
(Proses Perawatan)

(2026: xiv + 42 Halaman, 15 Gambar, 5 Tabel + 6 Lampiran)

Minyak jelantah merupakan limbah rumah tangga dalam jumlah besar yang jika dibuang sembarangan berpotensi mencemari tanah dan saluran air. Salah satu upaya peningkatan nilai gunanya adalah melalui proses saponifikasi menjadi sabun cair. Namun, proses pencampuran bahan secara manual membutuhkan waktu lama dan menghasilkan tingkat homogenitas yang kurang merata. Oleh karena itu, dirancang sebuah mesin *mixer* minyak jelantah berkapasitas 10 liter. Fokus utama dari penelitian laporan akhir ini adalah merumuskan dan menerapkan sistem perawatan (maintenance) pada mesin tersebut guna menjamin keandalan operasional, meminimalkan waktu henti (*unplanned downtime*), serta memperpanjang umur pakai komponen. Metode yang digunakan dalam penelitian ini adalah metode eksperimen dan observasi lapangan. Pengamatan dilakukan terhadap komponen utama mesin seperti motor listrik, poros pengaduk, bearing, wadah pencampur, rangka, dan sistem kelistrikan sederhana untuk menyusun prosedur perawatan yang tepat. Strategi perawatan difokuskan pada perawatan rutin pencegahan (*preventive maintenance*) yang dijadwalkan secara berkala. Kegiatan ini meliputi pembersihan wadah dan pengaduk dari sisa-sisa bahan kimia setelah proses produksi, pemeriksaan kekencangan baut dan mur, pengecekan kondisi kabel kelistrikan, serta pelumasan berkala pada komponen. Dengan pencapaian bergerak seperti dan poros. Dengan penerapan sistem perawatan yang terstruktur, diharapkan mesin *mixer* dapat beroperasi secara optimal, aman, dan memiliki umur pakai yang lebih panjang. Selain itu, penerapan *preventive maintenance* mampu mengurangi potensi kerusakan, menekan biaya perbaikan, meningkatkan efisiensi proses produksi, serta menjaga kualitas sabun cair yang dihasilkan tetap konsisten.

Kata Kunci: Minyak jelantah, Mesin *mixer* , Sabun cair, *Preventive Maintenance*

ABSTRACT

Design and Construction of a Mixing Machine

(2026: xiii + 52 pp. + 23 Figures + 10 Tables + 1 Attachments)

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*DIPLOMA THREE MECHANICAL ENGINEERING STUDY PROGRAM
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Used cooking oil is a household waste that has the potential to pollute the environment if not managed properly. One way to utilize it is by processing it into liquid soap through the saponification process. However, the manual mixing process takes a long time and produces a less homogeneous mixture. This study aims to test the performance of a previously designed and manufactured 10-liter used cooking oil mixer machine into liquid soap, and to compare its effectiveness with the manual mixing process. The test was conducted using 4 liters of used cooking oil, 972 grams of KOH, and 1,443.6 grams of distilled water. The mixing process uses a mixer machine with the help of a WIPRO SP-8A speed controller to regulate the motor rotation speed. The speed is adjusted in stages: LOW position for the first 0–10 minutes, MEDIUM for 10–20 minutes, and HIGH in the final phase until the soap paste is formed. The test results show that the mixer machine is able to complete the saponification process in an average time of 26.67 minutes and produce a homogeneous soap paste. Compared to manual methods, which take an average of 60 minutes and produce inconsistent results, the mixer machine has been shown to be 55.6% faster and produces a more even mixture. This machine is suitable for use as a liquid soap production tool for households and small-to-MEDIUM industries. moving parts such as bearings and shafts. Through the implementation of a structured maintenance system, the mixer is expected to operate optimally and safely while achieving a longer service life. Furthermore, preventive maintenance helps minimize the risk of breakdowns, reduce repair costs, enhance production efficiency, and ensure consistent quality in the liquid soap produced.

Keywords : *used cooking oil, liquid soap, mixer machine, saponification, speed controller*