

ABSTRAK

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Judul Laporan Akhir : Rancang Bangun Mesin Pengering Kerupuk dengan Sistem Kontrol Suhu Otomatis dan Monitoring Suhu-Kelembaban Berbasis IOT (Perawatan)

(2026: xiii + 73 Halaman, 20 Gambar, 6 Tabel + 8 Lampiran)

Tahap pengeringan dalam produksi kerupuk sangat krusial karena berpengaruh langsung terhadap kerenyahan, daya kembang, dan daya simpan. Namun, metode konvensional berbasis sinar matahari yang digunakan pelaku UMKM memiliki kelemahan karena ketergantungan cuaca dan rentan kontaminasi debu. Solusi rekayasa diaplikasikan melalui Mesin Pengering Kerupuk Elektrik Berbasis Kontrol Suhu Otomatis dan Monitoring Berbasis IoT dengan komponen utama chip ESP32, sensor DHT22, elemen pemanas 1000W, kipas axial AC, dan termostat. Masalah utama yang dihadapi pasca-operasi adalah penurunan performa komponen akibat paparan panas kontinu dan akumulasi debu adonan. Laporan akhir ini berfokus pada penyusunan Pemeliharaan mesin, baik secara preventif maupun korektif, untuk menjaga keandalan operasional sistem. Metode pengumpulan data dilakukan melalui observasi bengkel, studi literatur perawatan, dan wawancara teknis. Berdasarkan hasil pembahasan, disusun *Standard Operating Procedure* (SOP) pengoperasian serta lembar jadwal perawatan berkala harian, mingguan, dan bulanan. Hasil analisis menunjukkan bahwa perawatan preventif berkala, seperti penyekaan struktur bodi *Stainless Steel* 201 BA menggunakan air hangat dan sabun cuci piring, serta pembersihan berkala sensor DHT22 menggunakan *cotton bud*, efektif menjaga performa alat. Pengencangan baut pada *terminal block* dan inspeksi *voltmeter selector switch* secara bulanan berhasil menekan risiko korsleting, percikan api, serta kegagalan trip pada MCB. Untuk pengembangan ke depan, disarankan menambahkan sekring proteksi berlapis sebelum modul *step down* dan mengintegrasikan sistem pemeliharaan prediktif berbasis IoT pada chip ESP32 untuk pemantauan degradasi pemanas jarak jauh.

Kata Kunci: Perawatan Preventif, Korektif, Mesin Pengering, Kontrol Suhu, IoT.

ABSTRACT

Design And Construction Of An Iot-Based Cracker Drying Machine With An Automatic Temperature Control System And Temperature-Humadity Monitoring (Maintenance)

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DIPLOMA–III MECHANICAL ENGINEERING STUDY PROGRAM

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he drying phase in cracker production is highly critical as it directly affects crispiness, expansion capability, and shelf life. However, the conventional sun-drying method utilized by MSMEs suffers from weather dependency and vulnerability to dust contamination. An engineering solution was implemented through the Design and Construction of an Electric Cracker Dryer Based on Automatic Temperature Control and IoT Monitoring using an ESP32 chip, DHT22 sensor, 1000W heater, AC axial fan, and thermostat as its core components. The primary issue encountered post-operation is component performance degradation caused by continuous heat exposure and dough dust accumulation. This final report focuses on formulating a structured machine maintenance system, encompassing both preventive and corrective methods, to preserve system operational reliability. Data collection was conducted through workshop observation, literature review on maintenance, and technical interviews. Based on the discussion, an operational Standard Operating Procedure (SOP) and a periodic maintenance schedule (daily, weekly, and monthly) were established. The analysis indicates that routine preventive maintenance, such as wiping the Stainless Steel 201 BA body structure with warm water and dishwashing soap, alongside cleaning the DHT22 sensor using cotton buds, effectively maintains device performance. Monthly tightening of terminal block bolts and inspection of the voltmeter selector switch successfully minimized the risks of short circuits, arcing, and premature MCB tripping. For future developments, it is recommended to integrate a layered safety fuse before the step-down module and expand the ESP32 functionalities toward IoT-based predictive maintenance for remote heater degradation monitoring

Keywords : Preventive Maintenance, Corrective Drying Machine, Temperature Control, IoT.