

ABSTRAK

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Judul Laporan Akhir : Rancang Bangun Mesin Pengering Kerupuk dengan Sistem Kontrol Suhu Otomatis dan Monitoring Suhu-Kelembapan Berbasis Internet of Things (Pengujian)

(2026: xii + 92 Halaman, 24 Gambar, 15 Tabel + 6 Lampiran)

Rancang Bangun Mesin Pengering Kerupuk dengan Sistem Kontrol Suhu Otomatis dan Monitoring Suhu-Kelembapan Berbasis Internet of Things (Pengujian) Penelitian ini bertujuan untuk merancang, membangun, dan menguji kinerja mesin pengering kerupuk dengan sistem kontrol suhu otomatis serta monitoring suhu dan kelembapan berbasis Internet of Things (IoT). Latar belakang penelitian ini adalah masih banyaknya pelaku usaha kerupuk yang menggunakan metode pengeringan konvensional dengan memanfaatkan sinar matahari, sehingga proses pengeringan sangat bergantung pada kondisi cuaca, memerlukan waktu yang lama, dan menghasilkan kualitas produk yang kurang seragam. Mesin yang dirancang menggunakan elemen pemanas listrik sebagai sumber panas utama, blower untuk mendistribusikan udara panas, thermostat digital sebagai pengontrol suhu otomatis, serta sensor DHT22 dan mikrokontroler ESP32 untuk monitoring suhu dan kelembapan secara real-time melalui aplikasi Telegram. Metode penelitian meliputi tahap perancangan, pembuatan, dan pengujian mesin. Pengujian dilakukan dengan mengamati perubahan suhu ruang pengering dan penurunan berat kerupuk selama proses pengeringan. Hasil pengujian menunjukkan bahwa mesin mampu mencapai dan mempertahankan suhu kerja pada kisaran 50–60°C secara stabil. Berat kerupuk

mengalami penurunan dari 5 kg menjadi 3,2 kg setelah proses pengeringan berlangsung. Sistem monitoring berbasis IoT berhasil menampilkan data suhu dan kelembapan secara real-time melalui jaringan internet. Waktu pengeringan yang dibutuhkan berkisar antara 6–8 jam, lebih cepat dibandingkan metode konvensional yang memerlukan waktu sekitar 2–3 hari. Berdasarkan hasil pengujian, dapat disimpulkan bahwa mesin pengering kerupuk yang dirancang mampu meningkatkan efisiensi proses pengeringan, menghasilkan produk yang lebih higienis dan merata, serta mengurangi ketergantungan terhadap kondisi cuaca.

Kata Kunci: Mesin Pengering Kerupuk, Kontrol Suhu Otomatis, IoT, ESP32, *Monitoring* Suhu dan Kelembapan

ABSTRACT
Desain of Apar Pin seal production Equipment
(Testing Process)

(2026: xii + 92 pp. + 24 Figures + 15 Tables + 6 Attachments)

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*DIPLOMA–III MECHANICAL ENGINEERING STUDY PROGRAM MECHANICAL
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Design and Construction of a Cracker Drying Machine with an Automatic Temperature Control System and IoT-Based Temperature-Humidity Monitoring (Testing) This research aims to design, build, and test the performance of a cracker drying machine with an automatic temperature control system and Internet of Things (IoT)-based temperature and humidity monitoring. The background of this research is that many cracker businesses still use conventional drying methods utilizing sunlight. This makes the drying process highly dependent on weather conditions, takes a long time, and results in less than uniform product quality. The designed machine uses an electric heating element as the primary heat source, a blower to distribute hot air, a digital thermostat as an automatic temperature controller, and a DHT22 sensor and ESP32 microcontroller for real-time temperature and humidity monitoring via the Telegram application. The research methodology includes the design, construction, and testing stages of the machine. Testing was conducted by observing changes in the drying chamber temperature and the weight loss of the crackers during the drying process. The test results showed that the machine was able to achieve and maintain a stable operating temperature of 50–60°C. The weight of the crackers decreased from 5 kg to 3.2 kg after the drying process. The IoT-based monitoring system successfully displayed real-time temperature and humidity data via the internet. The drying time required was between 6–8 hours, faster than conventional methods, which require around 2–3 days. Based on the test results, it can be concluded that the designed cracker drying machine can increase drying process efficiency, produce a more hygienic and even product, and reduce dependence on weather conditions.

Keywords : Cracker Drying Machine, Automatic Temperature Control, IoT, ESP32, Temperature and Humidity Monitoring