

**Design Of Automatic Thermal Control System Using
ESP32 Microcontroller Based On PID
Algorithm On Rotary Dryer**

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ABSTRACT

Grain drying in Indonesia is generally still carried out traditionally by utilizing sunlight as a heat source. This condition indicates the need for innovation in drying technology, so that a tool capable of carrying out the drying process is needed, namely a rotary dryer. This study aims to design and build a thermal control system that can automatically maintain the working temperature of the rotary dryer according to requirements. The results of the study on temperature variation testing showed that a temperature of 60°C was the most optimal temperature in this study. The mass lost in the drying process at 60°C was 43.6 grams with a drying rate of 0.726 grams/minute for corn and 43.5 grams with a drying rate of 0.725 grams/minute for grain in a drying time of 1 hour. The results of the study with time variations showed that the longer the drying time, the more mass was lost from the material. The thermal control system was proven to be able to reduce the water content in the drying process of corn and grain.

Keywords: corn, ESP32, grain, heater, k-type thermocouple, rotary dryer, temperature