

***Design and Performance Test of Coffee Drying Utilizing Stationary Burned  
Motor Waste Heat***

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***ABSTRACT***

*The drying process is a method for reducing the water content of food products. The purpose of this study is to design and evaluate the performance of the drying chamber using heat rejected by a stationary combustion motor for drying coffee beans, analyze the effect of the condenser fan speed on the drying chamber temperature, and determine the heat energy generated and the efficiency of the drying device. The drying chamber has a volume dimension of  $54.5 \times 44.5 \times 136$  cm, which contains four drying racks made of aluminum that can dry coffee beans with a total amount of material that is 1 kg with the distribution of each rack as much as 0.25 kg. There are four treatments in this dryer test, including testing with low fan speed without drying material, testing with high fan speed without drying material, testing with low fan speed with drying material, and testing with high speed with drying material. Drying device testing is carried out for 1 hour for each treatment. The results showed that the diesel engine output temperature that can be used for drying potato chips with temperatures ranging from  $42^{\circ}\text{C}$  to  $43.05^{\circ}\text{C}$ . The heat energy generated in the drying chamber during the drying process is worth 2263,575 kJ under low fan speed conditions and 14997.23 kJ under high fan speed conditions with the efficiency generated by the drying device ie 0.43% to 1.91% for materials and 26.73% to 51.5% for output heat temperatures. The low efficiency is caused by the composition of the amount of material that is too small compared to the area of the drying rack, testing time that is too short, and the dimensions of the drying chamber.*

***Key words:*** *drying, stationary combustion motor, fan speed, coffee*