

Roasting Machine Design in IKM Republik Tani Mandiri

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Abstract

The development of the coffee industry in Indonesia is not matched by the supply of quality coffee, take coffee products from domestic farmers are unable to compete with imported coffee. One of the producers of coffee products in Indonesia is the IKM Republik Tani Mandiri which is located in Desa Kukur, Kecamatan Dau, Kabupaten Malang. The development of IKM is very much needed in making a product that is able to compete. In the product development process, there are many problems with it such as limited equipment, machines, and high production costs. High production costs are caused by inefficient and ineffective roasting machines. Therefore, this research was conducted to design a roasting machine.

This research was carried out using the QFD method by determining the attributes of consumer needs that need to be improved as follows: large capacity, the material used is strong, easy to use, rust-resistant material, fast roasting time, even burning, temperature can be measured, and safe when used. Determination of the order of priority engineering requirements as follows burner, material thickness, tube volume, engine cover, temperature gauge, and dynamo. The calculation of the QFD method that has been carried out will be used to determine the concept of the roasting machine design. The design concept can be seen as follows: gas burner, rectangular engine cover, manual temperature gauge, 3-5kg tube volume, and two ways dynamo.

The increase in capacity through the design of the roasting machine can be seen from the roasting time carried out at a capacity of 5 kg. In the design of a new roasting machine with one roasting cycle with a capacity of 5kg it takes 40 minutes, while the old machine with three roasting cycles with a capacity of 1kg, 2kg, and 2kg each takes 210 minutes, resulting in a 525% increase in capacity.

Economic analysis of product development is carried out by calculating the investment cost of Rp.6,506,000.00. By using the new roasting machine, it can be seen that roasting 5kg of coffee beans costs Rp.42,903.00 and the old machine Rp.92,111.00, so it can be seen that there is a cost savings of 53.42%. Based on the analysis of the investment and operational costs of IKM RTM carried out by calculating cash flow, payback period, Net Present Value and IRR. With the results of these calculations, it can be seen that the roasting machine design is worth investing in.

Keywords: Roasting machine, QFD phase 1, IKM, Coffee