

# **Design and Implementation of an Automatic Tobacco Leaf Slicing Machine Using a Single-Phase AC Motor Drive System**

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## **ABSTRACT**

The tobacco leaf slicing process is an important stage in tobacco processing and is still commonly performed manually, resulting in relatively long processing times and less uniform slicing quality. This study aims to design and implement an automatic tobacco leaf slicing machine using a single-phase AC motor as the main driving system. The designed machine consists of a machine frame, a 0.5 HP single-phase AC motor drive system, a pulley and V-belt transmission system, a gearbox with a ratio of 1:60, a tobacco feeding conveyor, a pressing mechanism, and an output conveyor for collecting sliced tobacco. The research method included the stages of design, implementation, no-load testing, load testing, and electrical energy consumption measurement. The results showed that all machine systems functioned properly after several improvements were made during the testing phase. The machine was able to produce tobacco slices with satisfactory quality, although some non-uniform slices were observed due to differences in the compactness of the rolled tobacco leaves. In addition, the electrical energy consumption measurements indicated that the machine required relatively low power, resulting in economical operating costs. Based on the research results, it can be concluded that the designed automatic tobacco leaf slicing machine was successfully implemented and is capable of improving the effectiveness of the tobacco leaf slicing process compared to conventional manual methods.

**Keywords:** tobacco leaf, slicing machine, single-phase AC motor, conveyor, transmission system.