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Modal Analysis of Keropok Keping Drying Machine

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Abstract. This project is about analyzing the effect of vibration towards the keropok keping drying machine. The structure frame of the drying machine has been analyzed by conducting modal analysis using ANSYS software. The results of this project consist of the mode shape (pattern of vibration) with the respective natural frequency and the total deformation that occur at the component. The structure of the component is being analyzed whether they are going to resonate or not by comparing the natural frequency obtained from the analysis results and the operating speed of the drying machine. This study will benefit the small and medium-sized enterprise (SMEs), whom the machine was originally developed for, by giving a better performance and low maintenance cost thus minimize the production cost of keropok keping.

Keywords: Keropok keeping drying machine, modal analysis, natural frequency, mode shape

1. Introduction

Cracker is a famous food product in Southeast Asia which known as *keropok* in Malaysia. *Keropok* usually made of seafood such as shrimp, fish or crab which then mixed with flour and flavoured with salt, sugar or monosodium glutamate (MSG). Due to high resource of the seafood, the coastal areas in Malaysia such as Kelantan, Johor, Kedah, Terengganu and Pahang actively operated small and medium enterprises (SMEs) based on keropok product.

Small and medium enterprises (SMEs) play a significant role in the economic development of a country. Thus, it is very important for the SMEs to hire human resources to ease the *keropok keping* production process since the production needs to undergo a lot of process. The most crucial process is the drying process. This process confronted a lot of issues where the temperature of the environment and the hygiene level need to be deliberated. Therefore, a drying machine has been developed for the SMEs for easing the process of drying. Unlike the old-style method, *keropok* commonly dried on a board which is called pemidai. This method is inefficient to be used since the bad weather can affect the drying process and it is also exposed to a very low level of hygiene. Way of solving the tedious problem of relating the process parameters to the performance measure.

The *keropok keping* drying machine consists of six main components namely drying chamber, moving tray, transmission system, heating element, cooling fan, and control system. The machine will improve the hygiene of *keropok keping* drying process in the SMEs. The drying machine that has been fabricated is shown in Figure 1.

