CHAPTER I
INTRODUCTION

1.1 Background

The purpose of technology is to facilitate various jobs that humans do. Along with improving technology in the machining process, progress has also occurred in the tools used to carry out the machining process. The machining process is generally used to manufacture products from metal materials, but with technological advancement, the machining process can also make products from wood materials. Simple technology in the machining process requires much energy but only gets minimal results. The minimal result underlies the need to use technology in the machining process.

One of the technologies used in the machining process is CNC (Computer Numerical Control) machines. A CNC machine is a machine that is controlled by a computer using a numerical language (command data with number codes, letters, and symbols often called G-code) according to the ISO 6983 standard [1].CNC technology is a technology that synchronizes between computers and mechanics. Machine tools that use CNC technology are more thorough, faster, more precise, and more flexible when compared to using conventional technology[1]. Therefore, machine tools using CNC technology can support production requiring a high level of complexity and accuracy and reduce operator intervention during machine operation.

Technological advances make wood that can be processed using machine tools. One type of wood that can be used is teak wood. Because of its strength, teak wood (*Tectona grandis Linn F.*) became a commodity in demand. Woodworking aims to turn wood or solid wood panels into products with uses, values, and aesthetics after going through a series of production processes.

Other researchers have researched the influence of spindle speed and feeding speed on teak wood surfaces in the 3-axis CNC machining process. The study concluded that the higher the spindle speed and feeding speed, the higher the tool wear, and if the spindle speed and feeding speed have a lower speed, the result is a lower wear rate. Therefore, this study was conducted to see the effect of

spindle speed and feed rate on the wear rate of high-speed steel cutting tools with teak wood workpieces.

1.2 Objective of Research

The research objective is to determine the effect of spindle speed and feed rate of 3-axis CNC router machine toward the wear rate of cutting tool for wood machining.

1.3 Benefit of Research

The research benefit is understanding the wear rate characteristics of HSS cutting tools with teak wood workpieces on 3-axis CNC router machines.

1.4 Scope of Problem

The limitations of the problem aim to limit the breadth of discussion in this study. The limitation of the problem in this study is that the tool used is an HSS cutting tool, a teak wood workpiece, and the machine used is a three-axis CNC router machine.

1.5 Writing Systematics

The systematics of this writing is broadly divided into three parts, namely:

CHAPTER I INTRODUCTION Explain the background, objectives, benefits, problem boundaries, and writing systematics.

CHAPTER II LITERATUR REVIEW Explaining related theories in completing the final project.

CHAPTER III RESEARCH METHODOLOGY Explain the implementation of the final task.

CHAPTER IV RESULTS AND DISCUSSION Explains the research results obtained and their analysis.

CHAPTER V CONCLUSION Contains the results obtained during the final project research.