CHAPTER 1

INTRODUCTION

1.0 Project Title
   A study of tool deflection during deep pocketing cycle.

1.1 Project Objectives
   • To overcome tool deflection during deep pocketing cycle
   • Come out with best cutting parameter

1.2 Project Scopes
   In order to achieve the project objective, this project needs a proper plan. The project scopes as shown below.
   i.   Study on cutting tools in milling process for pocketing.
   ii.  Initial study about cutting parameters in milling.
   iii. Study on tool path during pocketing process.
1.3 Project Background

Pocketing process is widely used in producing mould and die. The advance of modern technology and a new generation of manufacturing equipment, particularly computer numerical control (CNC) machine, have brought enormous changes to the manufacturing sector. Generally, the handbook or human experience is used to select convenient machine parameters in manufacturing industry. In process planning of pocketing process, selecting reasonable milling parameters is necessary to satisfy requirements involving machining economics, quality and safety.

In every machining process, defects on final product always occur either surface roughness or dimensional accuracy. Meanwhile in pocketing process, tool deflection will occur during the process and will affect dimensional accuracy of final product. Hence, this study is to overcome the tool deflection problem and come out with the best machining parameters at the end of this project.

The machining parameters in milling operations consists of cutting speed, depth of cut, feed rate and number of passes. These machining parameters significantly impact on the cost, productivity and quality of machining parts. The effective optimizations of these parameters affect dramatically the cost and production time of machined components as well as the quality of final products.

1.4 Problem Statement

One of the milling processes is pocketing. It is usually to machined mould and die. But it is always comes with tool deflection problem (Figure 1.1 and Figure 1.2). This problem logically can affect entire product that being produce. The defect on products can be costly for manufacturers and its need the best solution to overcome the tool deflection problem. Establishment of efficient machining parameters has been a problem that has confronted manufacturing industries for nearly a century, and is still
the subject of many studies. Optimum machining parameters are of great concern in manufacturing environments, where economy of machining operation plays a key role in competitiveness in the market.

**Figure 1.1:** Dimensional different between upper part and lower part

**Figure 1.2:** Tool deflection during deep pocketing cycle