CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In this chapter, it’s discussed about the project background, the problem of the project, the objectives of the project and also the project scope.

1.2 PROJECT BACKGROUND

This title project is about improvement of interlocking thin sheet metal in joining using plastic deformation process. First of all, the method used in these joining two sheets metal is mechanical clinching. Clinching is the mechanical clamping methods to join sheet metal without extra components, which use the special tools to form a mechanical interlock between the sheets.

Normally, the tools of mechanical clinching are a punch and a die. The sheets are forces between the punch and die causing the sideways movement of the material to form an interlocking button. This method not requires electricity or heat which used in welding. Furthermore, it is a cold forming process and suitable to be used on coated and painted materials and can be used for joining dissimilar materials. The common materials that can be clinched are low carbon and micro alloyed steels, stainless steel, coated steels and also lightweight materials such as ductile aluminum alloys.
Clinching commonly used in the automotive, electrical and electronics, where it often replaces welding. This process has low cost, because of low energy which single step process using no consumable. It’s also fast and easy automation.

1.3 PROBLEM STATEMENT

In joining two sheets metal, the strength is very emphasis. In clinching, the strength of the joined materials is mainly affected by the shape of punch and die. Thus, the shape of punch and die must be optimizing to ensure the material joined has high strength. Furthermore, it also to prevent the fracture in the materials such as neck fractures mode and button separation mode.

1.4 OBJECTIVES

The objectives of this project are:-

- To investigate the effect of die and punch shape to get the strongest joining of two sheets metal,

- To prevents the defects in joining two materials especially the neck fracture mode and button separation mode,

- Analyze the suitable parameters for punch and die.
1.5 PROJECT SCOPES

To achieve the projects objectives, all the parameters that involve in improvement of interlocking thin sheet metal such as the diameter of die, the diameter of punch and the thickness of the sheets must be emphasis. This is very important because it’s affected the strength of joined materials. Moreover, few tests must be run to observe the strength in joining two sheets metal such as impact test and tensile test.