CHAPTER 1

INTRODUCTION

1.1 Introduction

For this chapter, it is about discussion of the project background, problem statement, objective of the project, and lastly scope of the project.

1.2 Project background

Basically, welding is a process of joining the materials by using coalescence. This process are often use in many heavy industry and become one of the most important process in assembly process (http://en.wikipedia.org/wiki/Welding). Therefore, this welding process has been develops into automatic process. Nowadays, there are many machine can perform automatic welding process. One of it is called automatic welding machine which can be found in Universiti Malaysia Pahang (UMP).

Automatic Welding Machine is an important machine for those who are involved in welding research. This device is commonly used by those who want to do the analysis about the welding and to study about it strength. By using this machine, it
will help the user to reduce or to totally eliminate defects that may occur at the welding area because this machine can do a constant welding compare to manual welding that done by hand. Therefore, this becomes advantage for this machine because it produces the continuous constant and perfect welding.

Besides that, in welding there is preheating process. Preheating is a process of heating the material before the welding process (Modern Welding Technology, Scott C. Helzer, 2005). Basically, preheating process will provide the material in a suitable condition for the welding process. This is because, preheat can reduce the shrinkage stress and weld distortion. Next, it will promote the fusion and remove any moisture such as oil that may have on the materials.

1.3 Problem statement

Using high tech machine such as CNC Milling and Lathe machine means it is user friendly and easy to work with. At the same time, it does not require the user to use their energy a lot. It goes same with the automatic welding machine. This machine can perform the linear welding using a MIG welding automatically by itself. But unfortunately the machine arm can only hold the MIG welding torch. Therefore, this machine cannot hold another torch such as TIG torch. Because of that, this machine can only perform automatic welding process and cannot perform automatic preheat process at the same time. This situation will cause the user to face the problem of needing to preheat the work piece manually by hand using TIG or heating torch. By doing the preheat process manually, it will lead to unbalance heat distribution on work piece that will cause defects in welding area.
1.4 Objective

By finishing this project, the problem that is faced by the user can be solved in an effective way. Among it are:

i. Design and fabricate a hybrid heating/TIG and MIG welding torch holder which can be used in the automatic welding machine.

ii. Validate the effectiveness of the torch holder through a welding process.

1.5 Project scopes

The scopes of this project are:

i. Design a hybrid heating/TIG and MIG welding torch holder using the AutoCad programmer which is SolidWorks™.

ii. Fabricate a hybrid heating/TIG and MIG welding torch holder using the suitable materials based on the requirements of the project.

iii. Validate the product using TIG/MIG hybrid technique on butt welding of Aluminum-Alloys.