



**INFLUENCE OF MICROSTRUCTURES ON THE QUALITY OF WELDING
JOINTS**


**MUHAMMAD AFIF ARAFAT BIN RAMLI
(2006871368)**

**A thesis submitted in partial fulfillment of the requirements for the award
of Bachelor of Engineering (Hons.) Mechanical**

**Faculty of Mechanical Engineering
Universiti Teknologi MARA (UiTM)**

MAY 2009

“I declared that this thesis is the result of my own work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree.”

Signed: 

Date: 22/05/09

Muhammad Afif Arafat Bin Ramli

UiTM No: 2006871368

ACKNOWLEDGEMENT

In the name of Allah S.W.T, The Most Beneficent, The Most Merciful. Foremost, all praise to Allah for the entire incredible gift endowed upon me for giving me the health and strength to complete this thesis and project.

I would like to take this opportunity to express my most grateful appreciation to my advisor Prof. Ir. Dr. Mohamad Nor Berhan for his guidance, advice and willing in sharing the knowledge towards the completion of this thesis and project.

A bunch of thanks also dedicated to Mr. Faiz and Mr. Farid for their cooperation and assistance in material preparation and specimen processing. It is also pleasure to record my thanks to Mr. Rahimi the lab technician for helping me the whole time in conducting the microstructure observation procedure and Mr. Norazman who help me at strength laboratory for conducting quality test.

Special thanks to my lovely friends, Muhammad Aizat, Ahmad Zulhimi and Nor Syahira whose were involved in the progression of this thesis and project. Also thanks to everyone who has contributed either directly or indirectly throughout the preparation of this thesis and project.

Last but not least, these special thanks go to my parents and family for their faith and prayers that has enable me to succeed. Both of them have keep on supporting and encouraging me through all this year especially during my studies. There were a lot of things they had done for me since until I almost graduated.

ABSTRACT

Fundamentally, the main idea of this subject is to overview the influences of microstructure on the quality of welding joints. This study involves looking at the microstructure for different welded joints and evaluated the quality. In the working of welding, there are various types of welding joint. The microstructure on welded joint is so related to the quality of the welding. The objectives are to learn the basic understanding of the principal of welding and microstructures; to address this issue and try to observe the quality related on microstructure; to determine the transformation of phases during welding; to identify the result from the DT of the specimen produce by welding. Basically, the significance of the proposed project is to reduce the problem occur after the welding process such as crack which is must be avoid. To achieve the objective, 3 joints of welding will be held (Butt-Joint, T-Joint, and Lap-Joint). The process for each joint that is used is Gas Metal Arc Welding or MIG. For each joint, there will be 2 specimen with different parameter which are the wire speed, current and voltage. After all the welding process is finished, the specimen will undergo a quality test which is destructive test (DT) and only Butt-Joint that is suitable with this destructive test. The quality of other joint is observed with microstructure, this is because the designs of the joint do not meet the requirement. The result of this study is based on the microstructure of each joint which must go through several procedures with the specimen before the microstructure can been observed. With the microstructure itself, the size of grain boundaries can show the quality of the design with each joint.

TABLE OF CONTENTS

	CONTENTS	PAGE
	PAGE TITLE	
	ACKNOWLEDGEMENT	i
	ABSTRACT	ii
	TABLE OF CONTENTS	iii
	LIST OF TABLE	ix
	LIST OF FIGURES	x
CHAPTER I	INTRODUCTION	
	1.0 Project overview	1
	1.1 Problem statement	2
	1.2 Objectives of the study	3
	1.3 Scope of Project	3
	1.4 Significant of the project	4
CHAPTER II	LITERATURE REVIEW	
	2.0 Introduction	6