



**STUDY ON PROPERTIES OF DISSIMILAR METAL
WELDING BETWEEN STAINLESS STEEL (AISI 304L) AND
MILD STEEL (AISI 1018).**

MOHD SOLEHAM JURAIMI BIN KAMARUDIN


2005268701

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

**FACULTY MECHANICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA (UiTM)**

NOV 2009

“I declare 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: 23/4/2009

MOHD SOLEHAM JURAIMI BIN KAMARUDIN

UiTM No: 2005268701

ACKNOWLEDGEMENTS

I would like to express an immense gratitude to the God Al Mighty Allah an true idol of ours, Rasullah S.A.W who gave me that will to pursue this report until it finished, the courage to on my thoughts, and the astuteness to think wisely whenever I need it the most. I also want to dedicate my appreciation to my beloved wife, Dr Nor Dalila Husin and parents whose always stand by my side and keep encouraging me until the end of whatever I am doing.

Special thanks to my respected final year project supervisor, Dr-Ing Yupiter HP Manurung for his ideas and agreeable of making this report as something can be touched and observed physically, not just being expressed by speeches. His guidances, experiences and method of teaching were really useful for me in the future and I definitely think that it will somehow affect my opinion in a very positive way.

My sincere thanks to all of my friends, especially to AMC Workshop Superintendent, Mr. Chu Chi Ho and Mr. Mohd Shahrul Azli bin Yahya for their helps and opinions because all of it was functional to me in many kind of way.

Hopefully this report is a piece of written work that meets the criterion and worth to observed by others because somehow, the endeavor to finish this thesis was something I wish it to be worth my effort

ABSTRACT

The tensile strength and corrosion resistance of dissimilar metal welds between stainless steel and mild steel have been studied and analyzed. Three different filler metals were used to joint this combination using multi pass, Gas Tungsten Arc Welding (GTAW) process. Dissimilar metal weld were produced by using 3 different types of filler metal i.e. ER70S-G, ER308L and ER309L. Preliminary Welding Procedure Specification (p-WPS) was prepared for every filler metal used. Defect free welds were produced with each filler metal and inspected with digital radiography technique. The tensile strength of the ER70S-G, ER308L and ER309L deposits were acceptable, regardless of welding parameters. Tensile tests were conducted for both welds according to ASTM A370 requirements. The corrosion resistance of the welds produced by ER309L and ER 308L were relatively higher compared to ER 70S-G. All three specimens exhibited severe attack on the mild steel area. This investigation has shown that ER 309L and ER308L filler metals can be used to join mild steel to stainless steels, but ER 309L is the best due to high tensile strength values.

TABLE OF CONTENTS

	CONTENTS	PAGE
	DECLARATION	iii
	DEDICATION	vi
	ACKNOWLEDGEMENTS	vii
	ABSTRACT	viii
	TABLE OF CONTENTS	ix
	LIST OF TABLES	xiii
	LIST OF FIGURES	xiv
CHAPTER 1	INTRODUCTION	
	1.1 Introduction	1
	1.2 Overview of Study	1
	1.3 Objective	2
	1.4 Scope of Project	3
	1.5 Conclusion	3
CHAPTER 2	LITERATURE REVIEW	
	2.1 Introduction	4
	2.2 Overview of the tensile strength	4
	2.3 Effect of the parameter	6
	2.4 Overview of the corrosion resistance of the dissimilar metal	6