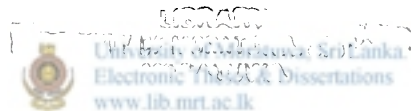


Enhancement of Mechanical Properties in the Heat
Affected Zone of AA 5083 Weld Joints

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This Thesis was submitted to the Department of Materials Engineering of the
University of Moratuwa in partial fulfillment of the requirements for the Degree of
Master of Philosophy.

University of Moratuwa



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DECLARATION

I certify that the Thesis with the title “ **Enhancement of Mechanical Properties in the Heat Affected Zone of AA 5083 Weld Joints** “ is entirely my own work. It has not been accepted for any degree and it is not being submitted for any other degree.

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Signature

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ACKNOWLEDGMENT

Initially, I would like to thank my supervisor Dr. Nanda Munasinghe for his guidance, support and encouragement. Then, to Dr. Rohan Thitagala for his kind and supportive advices, Commander Lalith Alahakone and Lieutenant Senaka Kumarasinghe of Sri Lanka Navy for their support and co-operation had given to my studies about the weld defects in marine applications.

In addition to that, I like to express my gratitude to Dr. S. U. Adikary and all the academic and non-academic staff of the Department of Materials Engineering, University of Moratuwa for their help and contribution for my research.

Same time I appreciate and thank to Prof. Jayasinghe of Engineering Design Center, CAD/CAM/CAE and workshop staff of Department of Mechanical Engineering at University of Moratuwa, Department of Botany, University of Colombo and Colombo Dockyard Ltd. staff for their support and assistance.



I must be indebted to Asian Development Bank funded personal development project for their awarding of a full scholarship for entire studies.

At last but not least, it is indeed to thank my mother, father and my wife Nadeesha for their encouragement, support and sacrifice.

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15th March 2005

ABSTRACT

Decline of Mechanical properties were observed at the Heat Affected Zone (HAZ) of the Gas Metallic Arc Weld (GMAW) joints of the Aluminium Alloy (AA) 5083. It was concerned as a direct effect of the weld thermal cycle on the work hardened material. Experimental efforts were aimed to set up a post welding procedure to recover this decline of properties. Presence of the Silicon in AA 5083 was significant in the experimental considerations due to its tendency of forming Mg_2Si precipitates at intensified temperatures. A series of mechanical and microstructure observations were done to evaluate the effectiveness of the post weld heat treatment, with the AA 5083. According to the experimental results heat treatment at 473K for 10 minutes produced the most effective improvement of mechanical properties at the HAZ of weld joint.



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