

**INFLUENCE OF HEAT TREATMENT TEMPERATURE ON MECHANICAL
PROPERTIES OF HEAT AFFECTED ZONE (HAZ)**

By

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Dissertation reporting submitted in partial fulfillment of
the requirements for the Bachelor of Engineering (Hons)
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CERTIFICATION OF APPROVAL

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A project dissertation submitted to the
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CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons

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ABSTRACT

Welding is used in ships, bridges, pressure vessels, industrial machinery, automobile, rolling stock and many other fields. The weldability of a metal is usually defined as its capacity to be welded into a specific structure that has certain properties and characteristics. The most common properties considered are hardness and ductility of the materials itself. The main objectives of this project are to know the effect of different temperature applied on the welded joint properties itself. Samples were thermally undergoing different heat treatment temperature ranging from 300°C, 400°C, 500°C, 600°C, 700°C and 800°C and the hardness profile was drawn through the BM, HAZ and FZ. The characteristic of the mechanical properties of the HAZ in welded joints of structural steels were evaluated by using samples made from the real welded joint using SMAW method. The hardness values and toughness of the welds were performed at room temperature via Vickers hardness test and Charpy V impact test. The result shows that hardness in HAZ area were decreases from 218HV to 195HV with increasing in temperature, while for toughness, the value were increase from 6.24J to 13.99J proportional to temperature.

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LIST OF ABBREVIATION

AWS	American Welding Society
AC	Alternating Current
ASTM	American Standard for Testing Material
BM	The Unaffected Base Metal
DC	Direct Current
FZ	The Fusion Zone
HAZ	Heat Affected Zone
HV	Hardness Vickers
OM	Optical Microscopic
PPE	Personal Protective Equipment
SMAW	Shield Metal Arc Welding
SEM	Scan Electrical Microscopic
WM	Weld Metal
WPS	Welding Procedure Specification