



**AN INVESTIGATION TO THE EFFECT OF PLASTIC DEFORMATION ON
THE PROPERTIES OF ALUMINIUM ALLOY 6063 SERIES**

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“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”

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ABSTRACT

This study focuses on the investigation to the effect of plastic deformation on the properties of the aluminium alloy 6063 series. The effect of plastic deformation on the hardness, crystallographic changes and microstructure of aluminium alloy 6063 was investigated to the as the received, plastically deformed specimen and annealed heat-treated specimen. Tensile tests were conducted to non-heat treatment and heat treatment. Prior to characterization by tensile tests, X-RD analysis and metallographic inspection, the test pieces were plastically deformed to 1%, 2%, 6%, 10% and 16% elongation. This is followed by annealing heat treatment to 250⁰c and 350⁰c with holding time at 30 minutes respectively. The present progress shows that hardness of aluminium alloy 6063 series increase following to the increase deformation. This phenomenon is collaborated by X-RD and metallographic observation. The annealing to 250⁰c and 350⁰c reduce the hardness and improve the ductility of this aluminium alloy 6063 series as the grain structure become crystallized.

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