UNIVERSITI TEKNOLOGI MARA

EXPLORING THE CORRELATION BETWEEN HARDNESS OF HEAT–TREATED ALUMINIUM

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ABSTRACT

The overview of this project is to explore into the hardness of heat- treated aluminium, which are used extensively in industry because of their high strength, low density, and resistance to corrosion. The application of heat treatment to sustain the raw aluminium has not received enough attention in the scientific community, even though it is frequently used to improve mechanical properties. The goal of the investigation is to explore how hardness can increase the aluminium's sustainability by doing an experiment about heat treatment on aluminium like annealing the aluminium at 500 degree celsius for about 3 hours. The research aims to achieve a balance between mechanical performance and sustainability factors by optimizing the heat treatment process because aluminium is recyclable but it requires a lot of energy to produce, so it is important to understand how heat treatment can reduce the use of raw material to produce a new material. Samples of aluminium are prepared, sustainability and hardness are measured, and statistical analysis is done. The results are intended to offer useful information to heat-treated aluminium industries, helping them to choose materials and optimize processes in a way that supports environmental sustainability objectives. Furthermore, environmentally friendly methods used in the heat treatment process improve aluminium's overall performance. This connection highlights how crucial it is to use environmentally friendly production methods in order to guarantee the long-term sustainability of heat-treated aluminium.

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