

UNIVERSITI TEKNOLOGI MARA

**THE INFLUENCE OF GEOMETRY
SPECIMENS ON MILD STEEL IN
SLOW COOLING PROCESS**

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ABSTRACT

This project presents the influence of geometry specimens in the slow cooling process in heat treatment on the mild steel. Mild steel is a widespread steel grade used in the engineering world. The geometry used in the experiment is cylinder and cuboid. By applying process annealing heat treatment, this heat treatment can soften the mild steel's mechanical properties by changing its microstructure. This project aims to observe the microstructure of the specimens on the mild steel in the annealing process and study the hardness of the specimens by using vickers hardness testing machine. The experimental work begins with listing the materials and equipment used in the project. Next is drawing the design of the specimens, which are cylinder and cuboid. After fabrication of specimens, the specimens were heated in the furnace using process heat treatment at 700°C. The heating stage is from room temperature until the 700 °C meets. Then, the soaking hour is 2 hours. Following, the slow cooling process in furnace temperature in 20 hours. The specimens were later ground with sandpapers, polished, and etched to obtain a mirror-like surface to capture the microstructure image under a microscope. The specimens then evaluate the vickers hardness test to get a hardness result using the vickers hardness testing machine. The result shows that the hardness values of the mild steel decrease due to the presence of ferrite structure and disappearance of the pearlite by proving with vicker hardness test, a diamond indentation on the heat treated specimen surface bigger than as-cast. The bigger the diamond indentation on the surface material, the softer the material. In the end, research successfully to observe the metallurgical microstructure of the mild steel specimens after the annealing process and to evaluate the hardness of the specimens by using Vickers hardness testing machine.

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