

Mara University Of Technology

FINAL YEAR PROJECT REPORT

**TO STUDY THE EFFECT OF HEAT TREATMENT ON
THE MECHANICAL PROPERTIES OF LOW-ALLOY
COLD WORK STEEL**

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Praise and grace to Allah for under His blessing, which allows us to complete our final project even through there are some problems occur during the experiment.

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ABSTRACT

Heat treatment is an operation involving the heating of the solid metal to definite temperature followed by cooling at suitable rates in order to obtain certain physical properties, which are associated with changes in the nature, form size and distribution of the micro constitutions.

In our project, we used low alloy cold work steel that we brought from mechanical shop at Sungai Rasau, Klang. We cut the raw materials into I tensile test specimen and we did a heat treatment on it.

Heat treatment that we done in our process can be classified as follows:

- (a) Hardening
- (b) Tempering
- (c) Quenching.

Our hardening temperature is about 1000° and then we hold for a soaking time at this temperature for one hour. After that put all the specimen into a cooling medium, that is liquid nitrogen

For our tempering process, we done in different temperatures, that is:

300°c	450°c	600°c
350°c	500°c	650°c
400°c	550°c	700°c

After all the heat treatments done, then we test the mechanical properties of steel by using a tensile test machine. Tensile test is used to study a strength or strain of steel. We also study a hardness of steel by using a Rockwell machine

For the last, we did a photomicrography process to see the microstructure and grain size of low-alloy cold work steel.