CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

In this chapter, the methodology of this study was carefully discussed in details. The specimen type for this study is Mild Steel. Methodology included in this study is dividing into several steps which are sample preparation, carburizing process, mechanical properties test and analysis on carburized specimens by using Optical Microscope, Vickers Hardness test and tensile testing equipment.

3.2 METHODOLOGY FLOW CHART

Methodology flow chart is use as guidelines and the sequences to make this project go with a smooth. As illustrated in Figure 3.1, firstly literature review was been study with the field that regards to this project. Then, the process begins with preparing the sample of specimens, Mild Steel. In this experiment, the constant temperature, 850°C with different time will be used in carburizing process.
START

SAMPLE PREPARATION

CARBURIZING PROCESS

QUENCHING

RESULT ANALYSIS
- ULTIMATE TENSILE TEST
- MICROSTRUCTURE ANALYSIS
- VICKERS HARDNESS TEST

CONCLUSION

END

Figure 3.1: Flow chart of project
3.3 SAMPLE PREPARATION

The material used in this project is Mild Steel. The material has been cut into nine specimens with a dimension 20mm width x 2mm height x 100mm length. The material was supplied as an extruded bar. Figure 3.2 shows the band saw machine that is used for cut the raw material of mild steel into small pieces before the specimens had been cut by using sectional cut off machine based on the dimension (Figure 3.3)

![Band Saw Machine](image1.png)

**Figure 3.2:** Band Saw Machine

![Sectional Cut Off Machine](image2.png)

**Figure 3.3:** Sectional Cut Off Machine