CHAPTER 1

INTRODUCTION

1.1 PROJECT BACKGROUND

The Olsen-Erichsen test is a method of measuring the ductility and drawing properties of strip or sheet metal which involves determination of the width and depth of impression. It is the oldest formability method of measuring the ductility and drawing properties of sheet metal. The test simulating a deep drawing operation is made by a cupping test in which a piece of sheet metal, restrained except at the center, is deformed by a cone-shaped spherical-end plunger until fracture occurs. The height of the cup in millimeters at fracture is a measure of the ductility. This test is sometimes used to detect stretcher straining and indicates the surface finish after drawing,

1.2 PROBLEM STATEMENT

The products made by sheet-forming processes consist of a large variety of shapes and sizes, ranging from simple bends to double curvatures with shallow or deep recesses. In many cases while deforming the sheet metal, the component tends to fractures at certain point. The causes of failure are parameters related to forming process. One of the main
problems with the planning of sheet metal forming is the testing of formability in sheet metals and to forecast the results. So analysis in Olsen-Erichsen Test is done to analyze the criteria of sheet metal.

1.3 OBJECTIVE

The focus of this research is to assess the characteristic and formability of sheet metal due to elasticity and plasticity and also performing the simulation of Olsen-Erichsen Test. Using finite element method this study will estimate the ductility of the sheet metal.

1.4 PROJECT SCOPES

This research is focus on the effect of deformation displacement for different material after given nodal prescribed displacement. The scopes of this project are:

1.4.1 To perform a simulation for forming process of OET:

This simulation test covers the procedure for conducting the ball punch deformation test for Brass, Aluminum and Magnesium sheet metal intended for forming application.

1.4.2 To assess characteristic & formability of sheet metal:

Estimate the ductility of sheet metal of Brass, Aluminum and Magnesium sheet metal from OET using the material properties table.