

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In material science, among the major developments in materials in recent years are composite materials. Composite are now one of the most important classes of engineering materials, because they offer several outstanding properties as compared to conventional materials.

A composite material is a combination of two or more chemically distinct and insoluble phases, which its properties and structural performances are superior to those constituents acting independently.

Metals, ceramics, and even plastics can be improved by embedding reinforcements of various types of fibers to improve their properties. These combinations are known as metal matrix composite, ceramic matrix composite and reinforced plastics.

Matrix material could be aluminium, magnesium, or titanium and in structural applications, the matrix is usually a lighter metal than the fiber itself and provides a compliant support for the reinforcement. Reinforced plastic, which also been know as fiber-reinforced plastic (FRP), are consist of fibers in a plastic matrix. Fiberglass which have higher mechanical properties is widely use in today's engineering world application. Fiberglass is strong, stiff, and has high specific strength. So, this project is mainly about an academic research on reinforced plastic, and on fibreglass specifically.

1.2 PROJECT BACKGROUND

Composite materials, a well known material because of its enhance and superior mechanical properties. They have better mechanical properties such as hardness, strength, and good thermal conductivity. As this project is investigating on fiberglass doing mechanical test on the specimens is one of the best options. Mechanical test such as tensile test and impact test can helps researches to find and study on impact load, and other mechanical properties. So, complete information and proper method on handling the test is important in hoping to get the results.

1.3 PROJECT OBJECTIVES

Every project has its own target. For this project, the objective is:

1. To study the mechanical properties of reinforced plastic using mechanical experimental procedure, such as impact toughness, and tensile strength of the fiberglass.
2. To investigate the relation of reinforced fiberglass and polyester resin to its mechanical properties.
3. Understanding on mechanical behavior of reinforced plastic by applying mechanical experiments.

1.4 PROJECT SCOPES

This project is confined to the following scope of study;

1. Polymer composites or fiberglass.
2. Apply the mechanical experiment method using;
 - Tensile Test - Tensile test
 - Impact Test - Izod and Charpy test

1.5 PROBLEM STATEMENTS

Composites widely used in various applications. The superior properties such as high tensile strength, good chemical resistance and thermal properties offered a better usage in real world such as in boats, aeroplane, and cars. Further studies have discovered that increase of reinforced element addition produced better mechanical properties such as impact toughness and tensile strength. One of the problems is that the weak bonding between the fiber and matrix will cause fiber pullout. Weak bonding will cause the fiber to loose its strength and easily be damaged. So, further studies will be made to investigate the mechanical properties of this material and to see the connection between fiber and matrix resin by applying mechanical experiment test.