

This Final Year Report entitled “**Effects of Filler Loading, Carbon Black Structure and Types Of Filler On Electrical Conductivity Of Rubber**” was submitted by Haslan Bin Harun, in partial fulfillment of the requirement for the Degree of Bachelor Science (Hons.) Polymer Technology, in the Faculty of Applied Sciences, Universiti Teknologi MARA Malaysia, and was proved by

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## **ABSTRACT**

### **EFFECTS OF FILLER LOADING, CARBON BLACK STRUCTURE AND TYPES OF FILLER ON RUBBER ELECTRICAL CONDUCTIVITY**

In this study, rubber samples were prepared based on different loading, different carbon black structure and different types of filler. The mixing and sampling method was done using two roll mill machine. The electronic conductivity of the rubber sample was tested using Impedance Spectroscopy. From the result, it showed that an increase of carbon loading leads to an increase of electrical conductivity of rubber. But, until 20g loading, maximum tunneling of electrons occurs and further increase of carbon, resulted in decreasing of the conductivity. 20g loading was then used to compare between different types of carbon structure and from the result. it proved that a carbon with higher structure has a higher electrical conductivity while by comparing types of filler, carbon showed the higher conductivity.

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.0 Background**

Insulator can be further define as any substance that has this unique capability to restrict the current flow to the maximum extent possible. One of the easiest examples is rubber itself. Rubber insulators have been used extensively from 1930's to the 1970' as replacement for glass insulator. They are especially common where damage to glass by hunters and rocks is extensive, as they are nearly indestructible.

Relating to its excellent capability as an insulator, electricians are the person yield a lot from this. Example is by the application of rubber gloves to protect themselves against electrical shock in their daily work to install and to repair electrical any appliances or components.

However, a struggle effort to cut the production cost was initiated and one of the alternatives of achieving this purpose is by applying filler into rubber compounding. This application has somehow numerous beneficial depends on tailored objectives, but most of all is relating to financial aspect. Adding filler is in any way, helps to reduce the