

CHAPTER I

INTRODUCTION

1.1 Background

In the development of industry today, the use and utilization of materials has more and more enthusiasts lately. As time goes by the increasing of material using which is increasingly expanding range from as simple as the craftsman tools house hold furnishings to industry sectors, either intermediate industry down and up. Composite has its own advantages compared with other alternative materials, such as the material is easy to obtain, easy to manufacture, powerful, lightweight, corrosion resistant and economical (Anton, 2012).

Back to nature concept was the appropriate term to describe the current condition of science. The problems that often arise with the development of technology today is the limited availability of natural resources that cannot be renewed, such as petroleum, coal, and others. One solution of the problem is to apply the result combination of composite materials with natural products such as fibers, powder from wood (Diharjo, 2005).

Actually, the composite material is so many available in nature, because composite materials can be consisted of organic and inorganic materials, such as bamboo, wood, and so on. Unconsciously, we actually have recognized several types of

material. A farmer strengthens clay with straw, the iron crafter makes swords layered and reinforced concrete is some kinds of composite that have long we know about it.

In the field of engineering where strength and rigidity are the main requirements. Composite term is associated with materials that combines matrix with a mixtures of filament as reinforcement. Composites developed from simple and practical idea, where two or more homogeneous materials with different properties combined. (Smallman, 1995)

Charcoal is a compound containing carbon that has space pore, where the room pore has very diverse size. The effectiveness of activated carbon depends on the porosity. The pores formed from carbon atoms that are interrelated thus form a space between these bonds. (Sitohang.AAA, 2011)

Pick up from the background of problem above, so the researcher makes a breakthrough or innovation in applying of waste from coconut shell formed into charcoal to make coconut shell charcoal composite material as damper sound wall.



Figure 1.1 Coconut Shell



Figure 1.2 Coconut Shell Charcoal

Fox glue material (PVAc) is right kinds of matrix as an adhesive of coconut shell charcoal composite manufacturing, because of the price is very cheap and easy to get. This material is very suitable to be used as composite adhesive because the component in the composite structure get a low loadings. Therefore, to reduce the cost of composite production needs to do an election of cheap material on the component that endures a small stress, such as composite part that is in the middle of panel.

From the above considerations, this study was to obtain data on the physical and mechanical properties such as bending strength and impact strength of coconut shell charcoal using Fox glue (PVAC) as matrix with a press mold process. Therefore, by this study, the coconut shell was hoped and expected to be useful in the manufacturing industry today.

1.2 Research Objective

The objective of this study are:

1. Observe the impact strength of composite coconut shell charcoal using standard ASTM D 256-00 with a volume fraction of 40%, 50% and 60%.
2. Observe the bending strength of composite coconut shell charcoal using standard ASTM D 790-02 with a volume fraction of 40%, 50% and 60%.
3. Investigate the sound absorption power of coconut shell charcoal composite using standard ANSI S1.13 with a volume fraction of 40%, 50% and 60%.

1.3 Benefits of Research

The benefits that expected from this study are:

1. Creating of a new material composed from coconut shell charcoal and Fox glue matrix (PVAc) which expected to be a source of alternative materials, which has advantages in strength, lightweight, and economical.

2. The usage of composites that can be expanded in the fields of manufacturing industries related to silencers.
3. Enrich the science in developing of composite and material technology as a reference for further research.

1.4 Experimental Limitation

Experimental limitation in this study as follows:

1. Specimen form

The study refer to coconut shell charcoal composite which taken from waste coconut shell using Fox glue (PVAc) as matrix.

2. Specimen material

The specimen was made using powder of coconut shell charcoal with water content of 8-10%.

3. Way of making specimen

The process of manufacturing by press mold using plate as dies.

4. Testing of composite

The testing of composite in the form of: charpy impact strength testing, bending strength testing (three points bending) and sound damper testing.