CHAPTER I

INTRODUCTION

1.1 Background

In general, motorcycle brake shoes material made from asbestos and other additional elements such as SiC, Mn or Co. Based on the manufacturing process, brake shoes (brake) motor bikes, including the "particulate composite". Composites of this type, material reinforcements (reinforced) consists of particles dispersed uniformly in the matrix that serves as a binder, resulting in good solid shape. Through the process of suppression as well as heating during printing (sintering) will produce strength, hardness and friction forces increase. Heating is carried out at temperatures ranging from 130^0C - 150^oC, which causes the material will under go structural changes in which the particles with each other and sticking together will be obtained form a good solid and strong binder matrix. (Sulistijono, 2004). Fabrication process like this then resulted in the selling price of the brake is quite expensive.

Actually brakeshoes motorcycles can be made by utilizing waste wood powder and carbon powder (coconut shell charcoal) and copper powder as reinforcements and phenolic resin as matrix. In addition to environmentally friendly, waste utilization of carbon powder (coconut shell charcoal) and copper powder wood powder in

the manufacture of brake motorcycle has advantages in terms of production prices are cheaper than brake shoess made of asbestos.

Increasingly fierce competition among companies in services and manufacturing with the competition is forcing companies to find alternatives to win the competition, profit as much as possible and give satisfaction to customers.

Given such competition, technological developments in various fields very rapidly especially in the areas of automotive, motorcycle manufacturers to develop engine performance and technological capabilities that support growing, ranging from performance to its supporting accessories. By divulging the good performance of the vehicle to be created in high-performance machines that need an effective braking system as well as safety in driving. A good braking system must be able to support the power and speed of the vehicle. It is very important from the braking system is the brake, the media worked to slow or reduce the rate of the vehicle. To get maximum braking is in need brake with good braking ability and efficient.

Brake shoes is one component of a motor vehicle that serves to slow or stop the vehicle.At the high-speed vehicle brake shoes has a very important role, the quality of life impact on the safety brake rider. Not only safety but good health for the rider or the people around very influenced once by the material of the brake shoes.

Brake that is used most of the current war is made from a mixture of asbestos and other elements. The use of asbestos brake shoes made from a very environmentally unfriendly, because it has a negative impact on health which can cause asbestosis / fibrosis (thickening and scars on the lungs), lung cancer and respiratory tract cancers.(Anoname. 1981). For that it is needed once a brake shoes material to create a friendly environment and good for health also rider safety.

Material actually wood powder and coconut fiber can be a reinforcing material for the manufacture of brake shoes. Besides easily accessible, the material is able to utilize the waste wood powder carbon powder (coconut shell charcoal) and copper powder that have been very disturbing society.

Keep in mind with that in a design must be considered regarding the quality, production costs, availability of materials, and environmentally friendly, which will affect the quality of the capabilities and the usage. Production costs will affect the selling price of a product, and availability of materials will affect the smoothness and continuity of production, and environmentally friendly of course have a big impact on health, hygiene and environmental sustainability. If all of these requirements can be met, then a product will be profitable, both producers and consumers are also environmental sustainability.

Based on the description above, researchers will try to make the brake shoes of motorsysle make from wood powder and , carbon powder (coconut shell charcoal) and copper powder as reinforcements and phenolic resin as a material matriks.

1.2 Problem Formulation

1. Determine the effect of variations in the composition of wood powder, coconut shell charcoal (carbon), copper powder, and phenolic matrix against hardness of brake shoes.
2. Determine the effect of material composition on the physical properties of the brake shoes with macro-structure.
3. Determine the effect of variations in the composition of wood powder, coconut shell charcoal (carbon), copper powder, and phenolic matrix against wearing of brake shoes use Oghosi tool testing machine.
4. Determine the effect of variations in the composition of wood powder, coconut shell charcoal (carbon), copper powder, and phenolic matrix against wearing of brake shoes use Wipro tool testing machine.

1.3 Problem Limitation

To facilitate the implementation of the research, so the goal can be achieved, barring problems in this regard are:

1. Material

   In this analysis, researchers used material wood powder, carbon powder (coconut shell charcoal) and copper powder as reinforcement and phenolic as matrix material.

2. Research

   In this study, researchers made the brake with a mixture of wood powder, carbon powder (coconut shell charcoal) and copper powder with phenolic resin as a material matriks.

3. Printing system using a press mold with 2 ton load.

4. Mixing the ingredients.

   1. 50% Wood powder + 30% copper powder + 10% carbon powder + 10% Phenolic resin
   2. 40% Wood powder + 40% copper powder + 10% carbon powder + 10% Phenolic resin
   3. 30% Wood powder + 50% copper powder + 10% carbon powder + 10% Phenolic resin

4. Testing

   For testing, the researchers conducted several feasibility tests which are:

   a. Hardness test

      In hardness testing specimens was used to brake Brinell hardness testing. Because the materials include type of composite.

b. Macro Photograph

c. Abrasiveness test (Wear)

Tests conducted to obtain the amount of abrasion resistance against friction specimens.

d. Friction coefficient test

1.4 Objectives

Objectives of this research are:

1. Knowing the ability of brake shoes made from wood powder and , carbon powder (coconut shell charcoal) and copper powder among the 3 variations against of Hardness Brinell Number.
2. Comparison analysis in the manufacture of brake shoes between 3 variations to get the best composition.
3. Knowing braking ability of brake shoes made from 3 variations.

1.5 Benefit

Benefits of this research are related to several aspects:

a. For Science

Contribute information Renewable Sciences of the resulting theory of brake shoes material research.

b. For Education world

Provide additional data for learning and testing of alternative materials that can be used in the manufacture of brake shoes.

c. For the Business

Giving a new breakthrough in the business world to make brake shoes made from natural and environmentally friendly and economical.

1.6 Writing Systematic

The writing systematic in this final project are:

BAB I INTRODUCTION

Included bacground, objectives and benefit of analysis, problem limitation, and writing systematic.

BAB II REVIEW OF LITERATURES

Consist of literatures review, basic theory, specific grafity and the ingridients speciment brake and materials.

BAB III RESEARCH METHODOLOGY

Contains the flow chart of research, materials and tools used, process, testing and installation difficulties.

BAB IV RESULT AND DISCUSSION

Included the result of the testing, hardness test, abrasiveness (wear) test and microscopic test.

BAB V CONCLUTION AND SUGGESTION

Contains the conclution of result analysis of brake shoes and also the suggestion.