KEMENTERIAN PENGAJIAN TINGGI

POLITEKNIK MALAYSIA
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UNIT PENYELIDIKAN DAN INOVASI

TAJUK PROJEK: BANANA SKIN COMPOSITE

JABATAN: KEJURUTERAAN AWAM

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1.0 PROBLEM STATEMENT

Nowadays, fried bananas have become the main choice dish to enjoy in the evening. So it is not surprising that we often see fried banana hawker seek around the corner. But what is worrying that there are numerous wasted of banana skin around in our country. This may cause to environmental pollution since no one took action to prevent it. During decomposition process some of the chemical that released can caused air pollution and they are very harmful to the body. We saw this as a problem after we observe some of fried banana stall at TTDI Shah Alam. We aware that this may affect human life if we don't take any action about this.

Other than that, peoples not see any potential in making the banana skin as an income for Malaysia's economy. People only see banana skin as an agriculture waste without any composite potential.

Besides that, banana skin residual will attract pest such as rats, cockroaches, and centipedes. This animal can possibly carry disease that harm to people.

2.0 RESEARCH METHODOLOGY

Before we proceed with the project, we identified the problems after we did some observation at fried banana stall at TTDI Shah Alam. Then we found out that the hawker will just throw in away in rubbish bin. They also will sell or give it to other farmers as animals food.

After identified the problem, we sat together and had a discussion with our supervisor about this research. Then we decided to pick the banana skin as our raw material after we analysed the problem's details. We use the term "agricultural waste" as our raw material. We believe if we use the agricultural waste in a proper way, we can solve the problems in future.

Next, we did some research and got some information about the agricultural waste. We found out that wood resources becomes limited from time to time because of rapid development in construction. Other than that, high demand for furniture cause to widespread deforestation so the wood resources become very limited. We would like to present the banana skin as a new non-wood resources in wood-based technology especially in composite making.

We decided to use the raw material in particle board making. We did some research about particleboard. We aware throughout the years, the production of particleboards is high but the quality of the product is low because of the limited of wood sources. So we want to investigate if the corn stalks can give a high quality of particleboard as much as ready stock particleboard.

After we did the survey, we got the material and we proceed with the process. We also did some research about the mixing material along with the banana skin such as resin as we use Urea formaldehyde and Phenol formaldehyde. We found the suitable standard which is MS Standard.

We continue the process with investigate the sample. We put the raw material into the Wood Flaker Machine. The result we got were the best condition to chip the banana skin when it still in air dried conditions.

We expect the banana skin can be a new source in wood-based industry especially in composite making.

3.0 SOLVING SUGGESTION

Use the term of “agricultural waste” as our raw material is banana skin. We believe if we use the agricultural waste in a proper way, we can presenting banana skin as a new composite raw material in furniture making and solve the problems in future.

4.0 BENEFITS TO SOCIETY

1. Reduce the environmental pollution.
2. Leads to zero agricultural waste.
3. Presenting the banana skin as a new composite raw material in furniture making industry.
4. Can generate income for the country as a new product.

4.0 METHOD OF USE

There are many kinds of engineered wooden products used to make furniture and other wooden items for interior and external usage. Particle board is also one of the many engineered wooden products. It is also known as low-density fiberboard or chipboard. The answer to the question what is particle board is that it is a waste wood product made by binding wood chips, sawdust or sawmill shavings with a synthetic resin or some other binder. Urea Formaldehyde is commonly used as a glue for binding the wooden chips. Particle board can be used as a substitute for plywood for making furniture, interior lining of walls and ceilings, substrate for countertops, floor decking, roof sheathing, underlayment, interior decorative paneling, etc.

5.1 Single Layer Particleboard

Single layer particle board consists of wood particles of same sizes which are pressed together. It is a flat and dense board which can be veneered or plastic laminated but not painted. This is a water-resistant type of particle board but is not waterproof. Single layer particle boards are suitable for interior applications.

5.2 Three-Layer Particleboard

Three-layer particle board consists of a layer of large wood particles sandwiched between two layers made of very small and highly dense wood particles. The amount of resin in the outer layer is more than in the inner layer. The smooth surface of a three-layer particle board is ideal for painting.

5.3 Graded-Density Particleboard

Graded-Density particle board consists of a layer of coarse wood particles which is sandwiched between two layers made of fine wood particles. This type of particle board is used to make cabinets and wooden furniture.

5.4 Melamine Particleboard

Melamine particle board is made by fixing a decor paper infused with melamine on the surface of the particle board under high heat and pressure. The wood particles in a melamine particle board are bonded using melamine-urea formaldehyde resin and wax emulsion. This makes it water resistant. Melamine particle board resists scratches. It comes in a plethora of colours and textures. Applications of melamine particle board include wall paneling, furniture, wall cladding, wardrobes and modular kitchen.

5.5 Cement-Bonded Particleboard

Cement-bonded particle board has magnesium-based cement or portland cement as the bonding agent. Cement content is 60% while the wooden particles such as wooden shavings, sawdust and wooden chips make up 20% of the composition. Remaining 20% is water. Due to presence of cement, this type of particle board is resistant against moisture, fire, termites and rotting. High moisture resistance makes them suitable for constructing false ceilings, walls and permanent coverings for

concrete floors and walls for buildings located in areas with high humidity. They are also used for making fire-resistant furniture products

5.6 Veneered Particleboard

Veneered particle board means that it has a thin slice of wood called veneer attached to its surface. Veneered particle board appears like a natural wooden board. Furthermore, a veneered particle board is also more resistant against warping as compared to a conventional particle board.

5.7 Laminated Particleboard

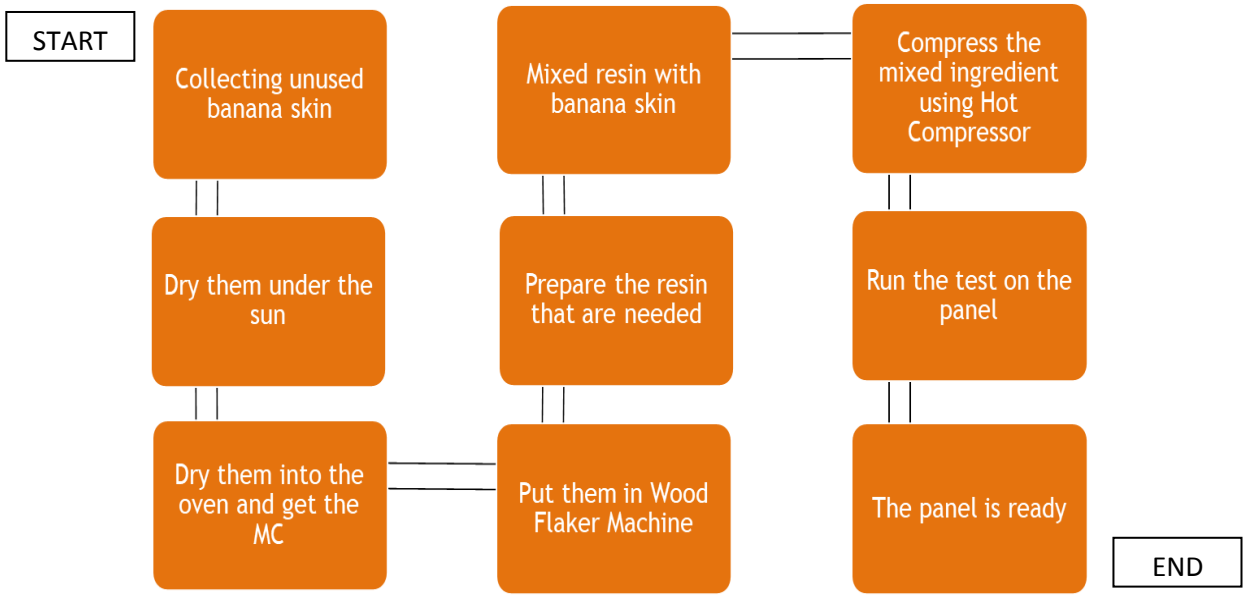
When a thin laminate sheet is attached to the surface of a plain particle board, it becomes a laminated particle board. Laminate sheet not only improves the aesthetics of the particle board but also increases its durability.

6.0 CONCLUSION

The conclusion is we expect that the banana skin can be presented as new raw material in composite industry. Other than that, we want to reduce the high demands for wood sources as the forest is habitats for the animals and prevent any natural disaster. We also want to commercialize a non-wood material for wood-based industry especially in furniture making and carpentry. We would like to upgrade the agricultural waste to a higher level.

APPENDIX

Flow Chart Overall Process



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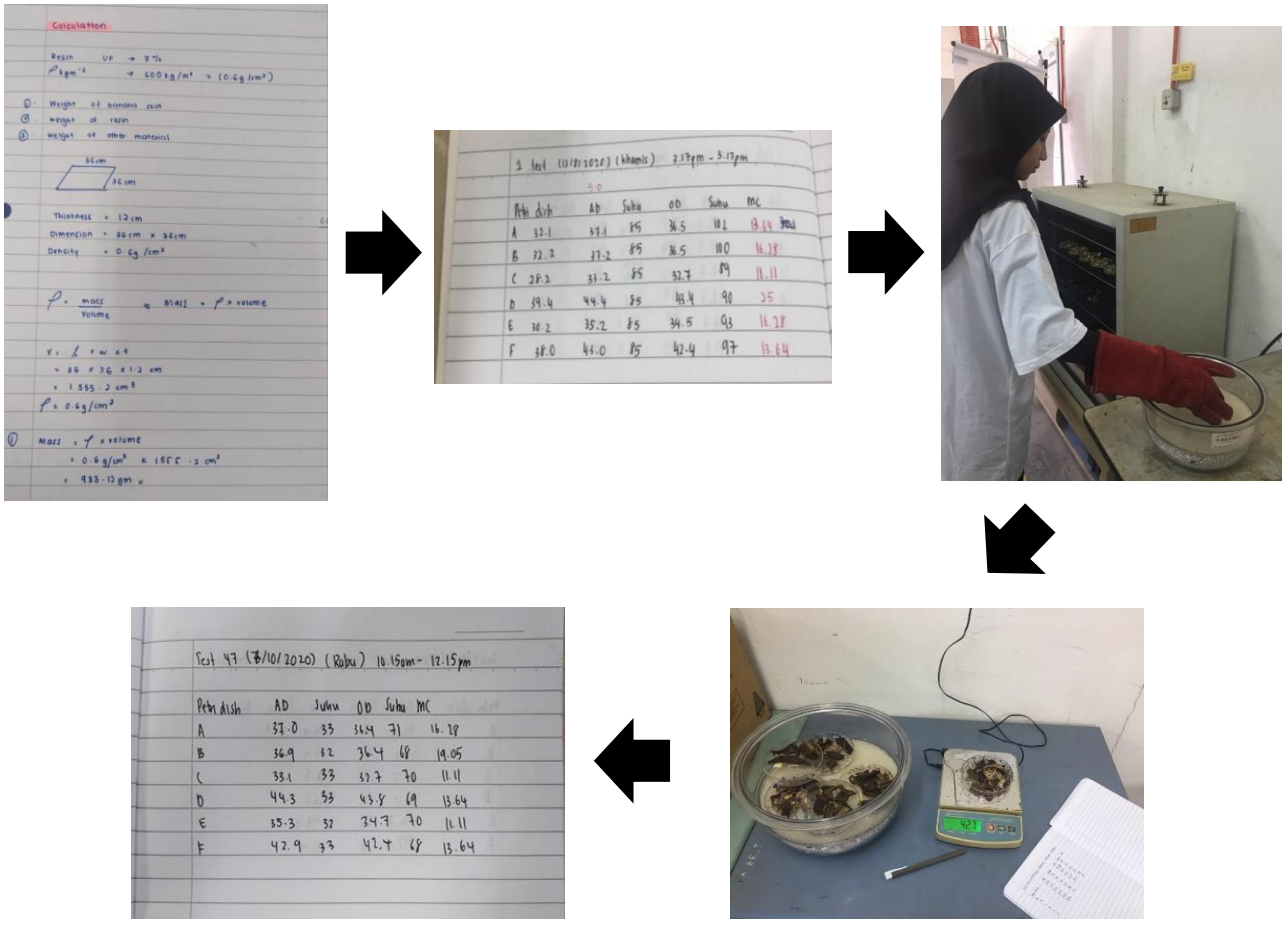

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