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SCHOOL OF MATERIALS ENGINEERING

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ECO-GLASS

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Problem Statement

A large quantity of agricultural wastes, especially palm ash found in Malaysia. These wastes are needed to be disposed properly, otherwise it may cause a major environmental sustainable issue.
Most of raw materials used to produce existing commercial glass are imported and hazardous; therefore it is the best time to highlight the potential of local natural waste as the raw material in production of glass.

Objectives

- Using agricultural wastes (palm ash) as raw material in glass production.
- Produce alternative, safe and low cost glass materials.

Product Description

- Eco-Glass is an eco-friendly product which is use agricultural waste (palm ash) as raw material in making glass. Recycling of agricultural wastes as a raw material for Eco-Glass hugely reduce the unnecessary materials on land and reducing the disposal cost.
- The term "ECO" is drawn from the idea that the glass is eco-friendly and economical. It is economical because it uses about 60% - 80% of palm ash as a main ingredient in the formula.

Process

Agricultural Waste + Kaolin & Feldspar / Dolomite → Eco-Glass

Data / Result

Table 1 : Chemical Composition (%)

Compound	SiO_2	CaO	FeO	K_2O	MgO	Al_2O_3
Palm Ash	22.10	13.20	1.65	52.70	2.30	-
Eco-Glass	48.60	12.70	2.68	21.50	2.70	6.41

Table 2 : Cost Comparison

	Cost (RM) / kg
Commercial Glass	1.70
Eco-Glass	0.50

Figure 1 : Palm Ash

Figure 2 : Solid Glass

Figure 3 : Eco-Glass

Novelty

- Using agricultural waste in making glass.
- Alternative, safe and low cost of materials in making glass.
- Turn waste into wealth.

Commercial Potential

- The price for the Eco-Glass product is cheaper compared to the commercial glass because of the availability of the empty fruit bunch throughout the year.
- This study contributes in saving the environment from the abundance agricultural waste especially in term of open burning activity.

Figure 4 : Potential Application

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