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ECO-SUPPORT : ECO-FRIENDLY LIGHTWEIGHT SOIL SUPPORT STRUCTURE

PRODUCT DESCRIPTIONS

A lightweight support structure is finding increasing use in a wide range of load-bearing engineering applications. Moreover, the fabrication methods involved in producing the honeycomb structure are simpler than that of other conventional fabrication methods. Therefore, our current invention is paying attention on the implementation of the sustainable honeycomb structure on the soil support system. In the current practice, soil support structures are mainly made by the conventional raw materials such as steel, cement, concrete and etc. All of these conventional materials are less eco-friendly and not environmentally sustainable. To overcome this dilemma, we proposed our new eco-friendly honeycomb drainage system which made by the recycled high density polyethylene (HDPE) with added of natural filtration media (rice husk). With combination of light weight, low cost and high filtration efficiency criteria, it is believed that the product will be promising alternative materials for future soil support system in Malaysia

PROBLEM STATEMENT

Conventional soil support systems are made from combination of expensive construction materials like steel, cement, concrete and etc. Moreover, it is also permanent structure, less eco-friendly and not environmentally sustainable. Therefore, serious collaboration has been done by the industries and researcher in order to produce portable, lightweight and cost wise soil support system. Based on this concern, we had purposefully designed the drainage system from recycled materials (HDPE) in order to fulfil those limitations. Not only that, the implementation of natural filtration media within HDPE honeycomb structure had made the product become lighter as well as additional of filtration characteristic.

PRODUCT ADVANTAGES

- Portable
- Lighter
- Eco-friendly
- Cost-wise
- Sustainable
- With added of filtration characteristic

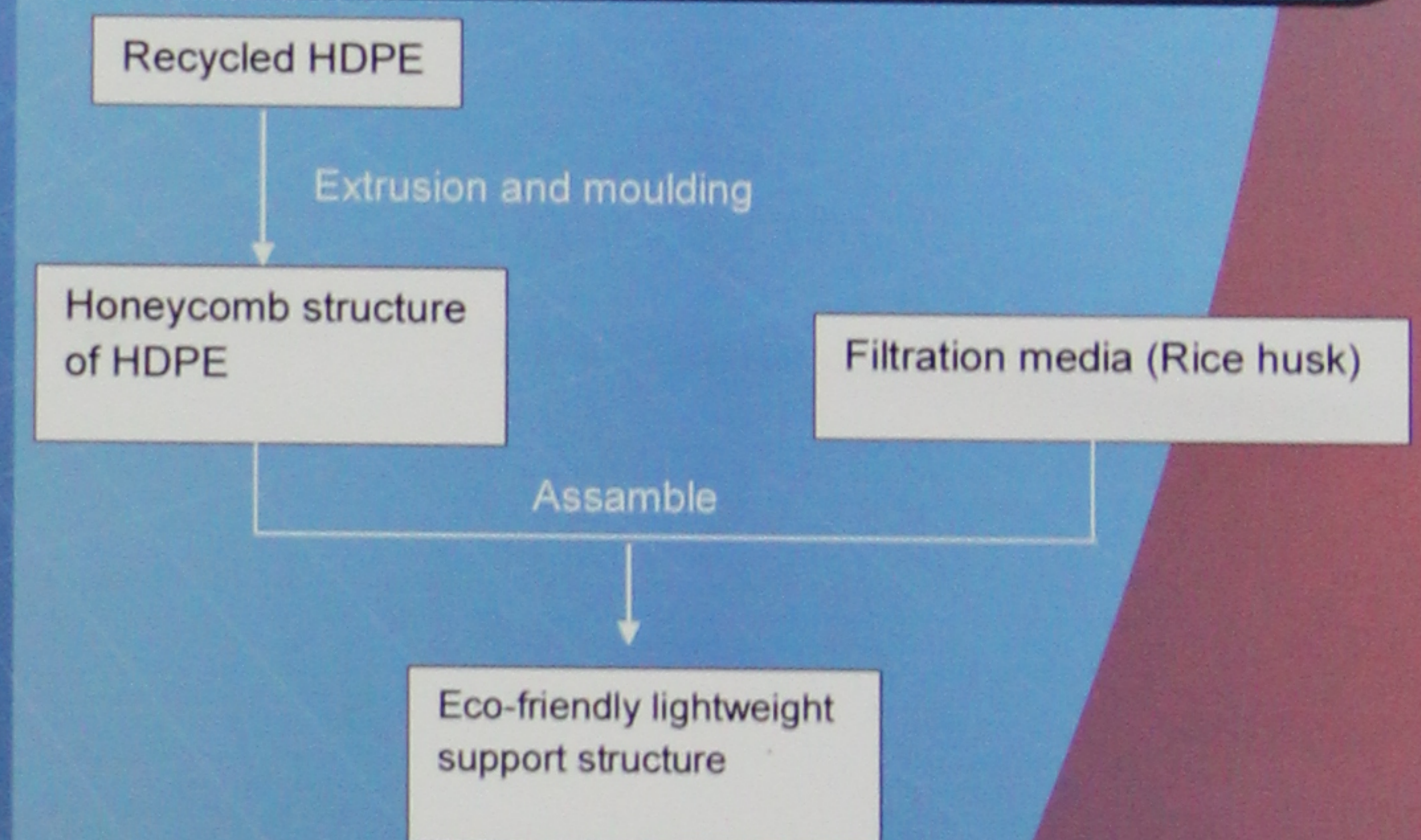
POTENTIAL APPLICATIONS



PUBLICATION

[1] Akil Hazizan M, Cantwell WJ. The low velocity impact response of foam-based sandwich structures. *Composites Part B: Engineering*. 2002;33(3):193-204.
 [2] Hazizan MA, Cantwell W. The low velocity impact response of an aluminium honeycomb sandwich structure. *Composites Part B: Engineering*. 2003;34(8):679-687.
 [3] Tan C, Akil HM. Impact response of fiber metal laminate sandwich composite structure with polypropylene honeycomb core. *Composites Part B: Engineering*. 2012;43(3):1433-1438.
 [4] Amir FA, Othman A, Akil HM. Damage Characterization of Polypropylene Honeycomb Sandwich Panels Subjected to Low-Velocity Impact. *Advances in Materials Science and Engineering*. 2013;2013.

MANUFACTURING FLOW



PRODUCT PERFORMANCES

Properties	Conventional drainage system	Eco-friendly lightweight support structure
Density (g/cm ³)	2.4	0.941
Specific compressive strength, (MPa/g/cm ³)	18.8-50.5	20.8-36.37
Specific flexural strength, (MPa/g/cm ³)	2.1-5.4	42.5
Cost	RM 80-120/ feet volume	RM 20-40/ feet volume
Portable	No	Yes (Experimentally proven)
Sustainable	No	Yes (Experimentally proven)
Eco-friendly and re-useable	No	Yes (Experimentally proven)
Filtration activities	No	Yes (Experimentally proven)

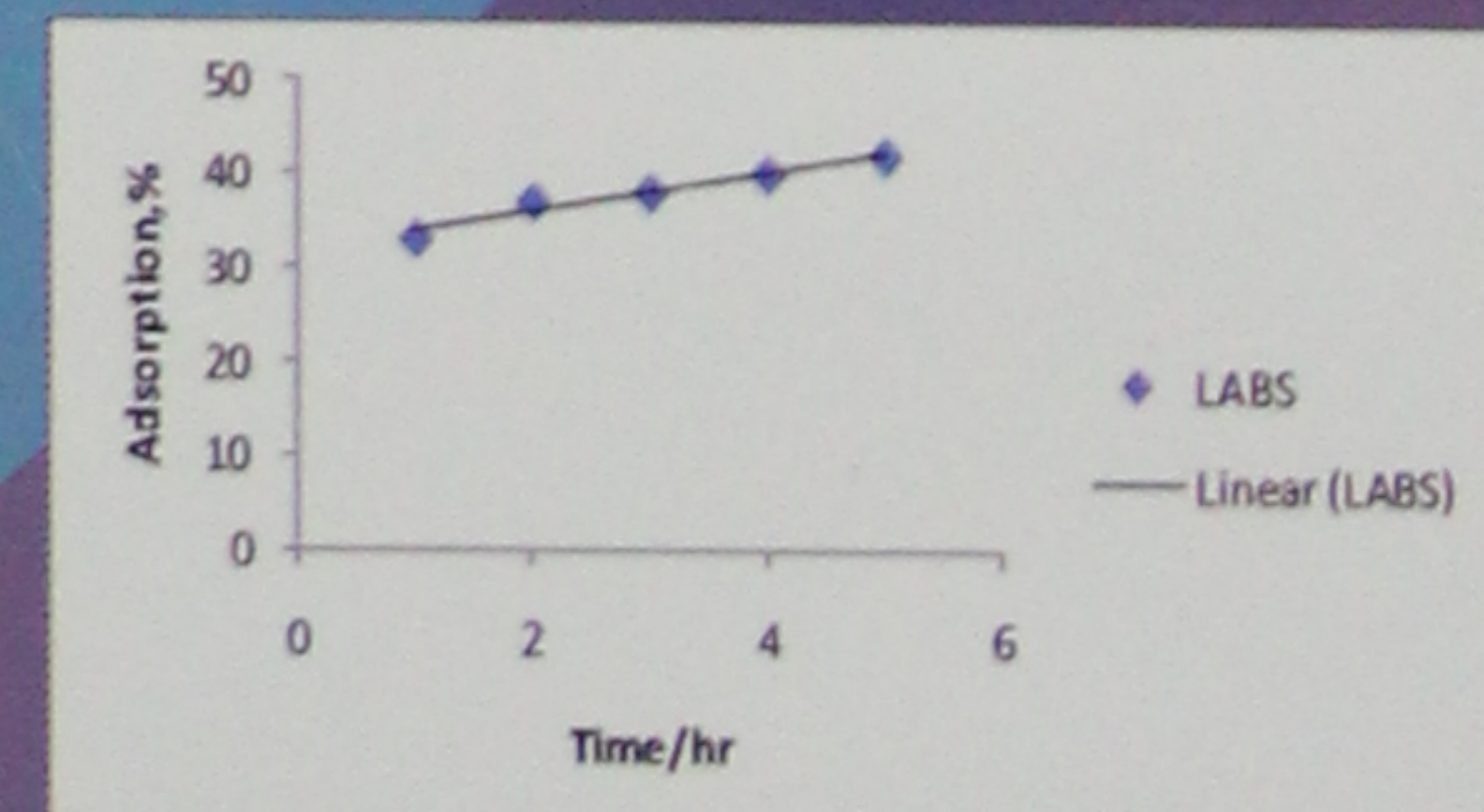


FIGURE 1 : THE EFFECT OF TIME ON ADSORPTION OF ANIONIC SURFACTANTS IN PH 4, 2 GRAM RICE HUSK IN 100 ML SOLUTION WITH 10 MG/LIT CONCENTRATION

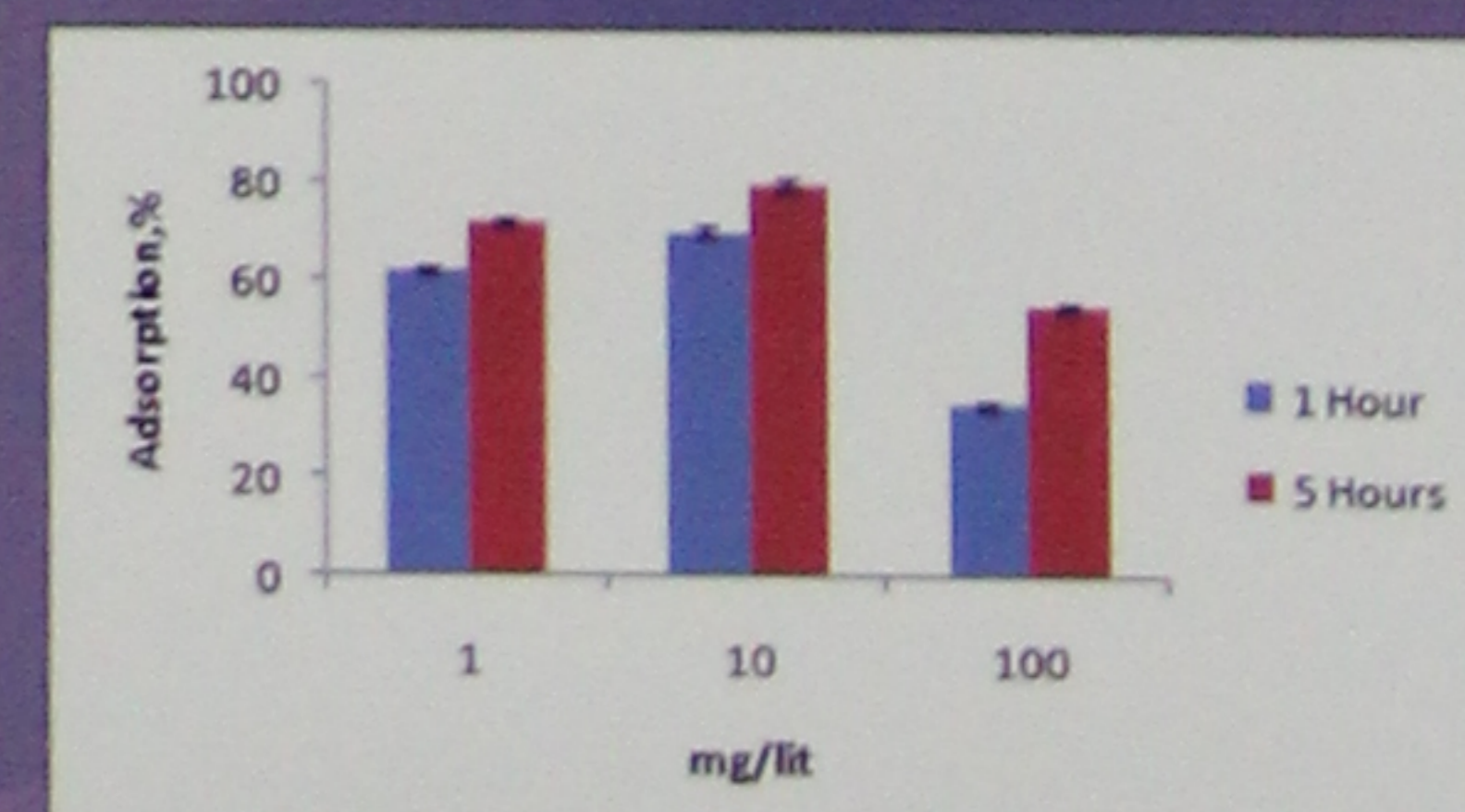


FIGURE 2 : ADSORPTION VALUES OF A 100 ML LABS SOLUTION WITH 1, 10 AND 100 MG/LIT CONCENTRATION IN TWO STIRRING TIME AND 2 GRAM HUSKS (PH2)