RAFFLES GIRLS' SCHOOL

A PM2.5 Sugarcane Bagasse Air Filter

Our Technology Story

Sugarcane bagasse, a by-product of the sugar industry, is typically incinerated for disposal—a process that generates greenhouse gases, such as carbon dioxide, and contributes to global warming. However, its unique properties make it a promising material for air filters. With a MERV rating of 14, sugarcane bagasse is capable of trapping particles ranging from 1.0 to 3.0 microns. Hence, it can potentially serve as a sustainable and eco-friendly alternative for air filtration.

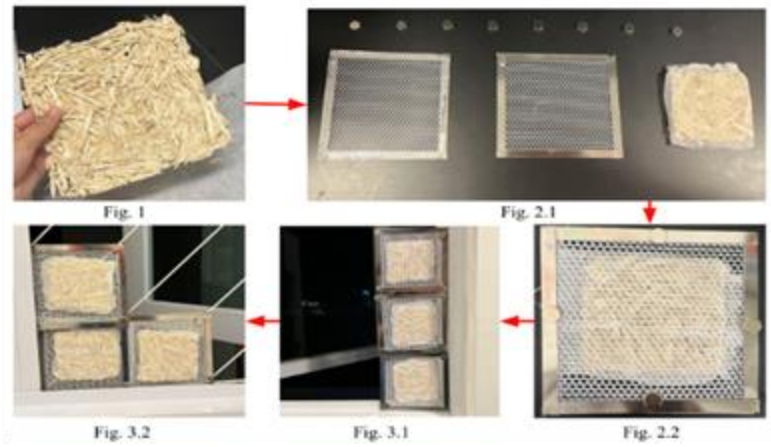

Fig. 1: Image of sugarcane filter prior to construction
Fig. 2.1 & 2.2: Images of filter prototype
Fig. 3.1 & 3.2 : Images of filter prototypes attached to windows

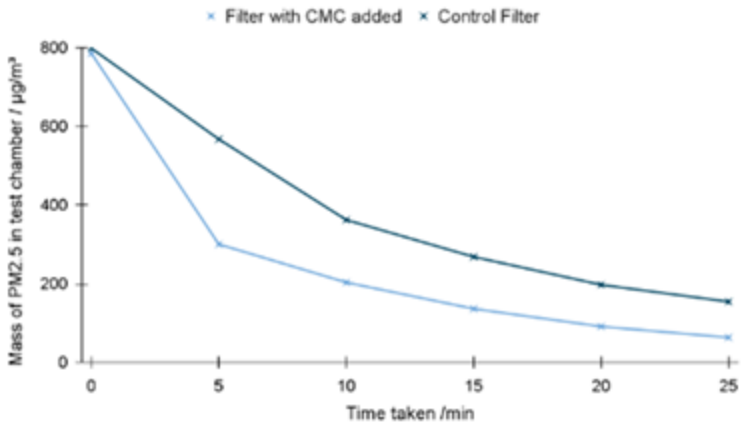

Fig. 7: Effectiveness of filter with CMC compared to control filter

Technology Features

- Eco-friendly - Sugarcane filter with the binding agent, CMC, is non-toxic and biodegradable.
- Economical - Each filter cost around $3.40.
- Efficiency - Fine particle removal of 88.83%, achieving MERV rating of 14.
- Reusability - After 8 hours of continuous use, particle removal efficiency is 82.44%.

Potential Applications

Climate change is a global challenge, and Singapore is not spared. Our product offers a sustainable solution to improve air quality, reduce pollution, and minimize waste. Using materials like sugarcane bagasse, we aim to create cleaner air, cut greenhouse gas emissions, and promote a circular economy for a greener future.

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