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Biowall for Residential Applications

A plant-based biowall offers a cost-effective, long-term, and aesthetic solution for removing gaseous air contaminants in residential HVAC systems.

Filtering air in residential space is vital to the health and safety of the occupants. For example, keeping a constant flow of filtered air in a home can help prevent the occupants from experiencing symptoms related to allergies and asthma, as well as preventing effects from air pollution. Carbon filters are the main component for removing gaseous contaminants in an HVAC system. While they work, they are costly and require replacement. There is a need for more long-term solutions that save homeowners money while improving indoor air quality.

Researchers at Purdue University have developed a biowall, an eco-friendly air filtration system that can be used in residential HVAC systems to improve air quality. This system uses plants grown in a loosely packed growth media, allowing air to pass through the media. As it does, the plant's roots absorb volatile organic compounds from the passing air, removing these compounds from circulation. By integrating this into the return duct of a central AC unit, a biowall can affect the air quality for the entire home.

Purdue researchers first featured a biowall in Purdue's 2011 Solar Decathlon entry called INhome, which earned a second place finish. For information on the INhome, click here http://www.purdue.edu/inhome/index.html and to learn more about the 2011 Solar Decathlon, click here http://www.solardecathlon.gov/past/2011/.

Advantages:

-Effective at cleaning air

-Does not require expensive replacement

-Aesthetic appeal

Potential Applications:

-Residential applications

Technology ID

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Category

GreenTech/Environmental Remediation & Pollution Control

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-Air filtration

-HVAC systems for homes and apartments

TRL: 8

Intellectual Property:

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Keywords: biowall, eco-friendly air filtration, residential HVAC system, indoor air quality, plant-based air purification, volatile organic compound removal, air cleaning technology, long-term air filtration, central AC unit integration, sustainable air filter, Agriculture, Air Filtration, Green Technology, HVAC, Mechanical Engineering