TECH OFFER

Sustainable Bio-based Material from Agricultural Side Streams

KEY INFORMATION

TECHNOLOGY CATEGORY:
Materials - Composites
Materials - Bio Materials
Sustainability - Circular Economy
Waste Management & Recycling - Food & Agriculture Waste Management

TECHNOLOGY READINESS LEVEL (TRL): TRL6
COUNTRY: SINGAPORE
ID NUMBER: TO175294

OVERVIEW

Agricultural, organic and fruit-based side streams constitute approximately 85% of the total industrial food wastage. In most cases, these substantial side-streams are converted into pelletised bran for animal feeds while those not suited for consumption are disposed of through landfilling or incineration. These practices contribute significantly to carbon emissions, releasing toxins, greenhouse gases, and pollutants that are harmful to the local air quality.

The technology on offer provides opportunities to repurpose agricultural and primary production side streams, as well as by-products from manufacturing and fruit-based processing through mechanical methods. The side streams are pre-treated through drying, grinding and cutting into manageable sizes prior to transforming them into a source of functional compounds to create green value-added products such as bio-composite materials, growing media, eco-friendly remedies, or sustainable

packaging products. Made with natural bio-compatible and green ingredients, it can be applied to various types of side streams and can be broken down for reuse as feedstock when it no longer meets its application requirement.

This technology provider is actively seeking R&D co-development and out-licensing of the developed IP to companies looking to produce and develop new products/applications using bio-composite materials derived from organic waste.

TECHNOLOGY FEATURES & SPECIFICATIONS

These eco-friendly bio-composite materials have the following features:

- Formulated with bio-constituents, ensuring an environment-friendly green material
- Pelletised material options that provide adaptability, flexibility and versatility in application and product fabrication methods
- Designed for recyclability and reuse, contributing to resource efficiency, energy conservation, and circular economy
- Compostable and bio-degradable properties
- Anti-mold and anti-fungus functional benefits
- Customizable formulations tailored to different side stream sources (e.g., coffee grounds, fibrous fruits, rice stalks) and applications - possible for heterogenous side stream sources

POTENTIAL APPLICATIONS

Potential applications of this technology include (but are not limited to):

- Sustainable rigid or flexible packaging for consumers and personal care
- Eco-friendly alternatives to leather
- Agricultural uses such as hydroponic foams and plant pots
- Personal care consumables alternatives such as sponges and loofahs
- Household products such as tablewares, cutleries, stationeries
- Pet products, such as pet toys and accessories

UNIQUE VALUE PROPOSITION

- Fully customisable bio-based material derived from renewable sources
- Offers a green technology and inherently recyclable and/or compostable for a circular economy
- Scalable and cost-efficient production of new products with side stream as feedstock