

TECH OFFER

Fully Bio-based, Biodegradable and Compostable Bioplastics



KEY INFORMATION

TECHNOLOGY CATEGORY:

Sustainability - Circular Economy

Chemicals - Polymers

Materials - Plastics & Elastomers

Materials - Bio Materials

Manufacturing - Chemical Processes

TECHNOLOGY READINESS LEVEL (TRL): **TRL9**

COUNTRY: **SLOVAKIA**

ID NUMBER: **TO175011**

OVERVIEW

The use of bioplastics has grown rapidly in recent years as consumers and businesses become more aware of the environmental benefits of these materials. However, there are still some challenges that are inherent to bioplastics such as high costs in comparison to fossil-based plastics and that not all bioplastics are derived from bio-based sources, biodegradable or compostable. These materials also face processing limitations and lower mechanical properties which often results in the combination of fossil-based polymers being added to improve these properties. This technology aims to address these factors to increase the adoption of bioplastics in more applications.

The technology is a new bioplastic material that is fully bio-based and compostable. Based on a reactive processing technology combining polyhydroxyalkanoates (PHAs) with other biopolymers and bio-based polymers, the resultant blend provides unique

properties such as biodegradability (soil or water) and compostability (industrial and home). The material blends can be designed for processing using standard plastic processing technologies and modified for a wide range of mechanical properties.

The technology owner is interested in co-development and out-licensing opportunities with Singapore plastic processing companies looking to develop new products/applications with bioplastics.

TECHNOLOGY FEATURES & SPECIFICATIONS

The technology comprises of reactive blending of PHAs, with other biopolymers such as starch and bio-based polymers to provide the following characteristics:

- Biodegradable (soil or water)
- Compostable (industrial and home)
- Exhibits improved mechanical properties than conventional bioplastics (improved toughness, tensile strength, and elongation)
- Suitable for use with standard plastic processing such as injection molding, extrusion, fibre spinning, film blowing, film casting, thermoforming etc
- Special grades available for medical applications (tissue engineering)

POTENTIAL APPLICATIONS

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

- Sustainable packaging solutions for food, industrial and personal care
- Agriculture e.g., mulch films
- Automotive e.g., interior and exterior components
- Healthcare e.g., medical devices and equipment
- Textiles

UNIQUE VALUE PROPOSITION

- Derived from renewable plant sources
- Inherent biodegradability
- Enhanced material strength and durability
- Customisable to address diverse applications' needs