

TECH OFFER

Water-based Barrier Coatings for Paper Packaging



KEY INFORMATION

TECHNOLOGY CATEGORY:

Sustainability - Circular Economy

Chemicals - Bio-based

Chemicals - Coatings & Paints

Foods - Packaging & Storage

Chemicals - Organic

TECHNOLOGY READINESS LEVEL (TRL): **TRL4**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO175069**

OVERVIEW

Paper packaging is a versatile material used for a wide range of products. Its widespread adoption is due to its renewable and relatively low-cost resource along with environmental benefits such as recyclability and biodegradability. While paper packaging offers several advantages, some drawbacks of the material include porosity and the lack of barrier properties against moisture, oil, and grease. To overcome these limitations, conventional coatings such as polyethylene (PE) or polyfluoroalkyl substances (PFAS) have been employed to impart the required barrier protection. However, during the paper recycling process, it is difficult to repulp the coated paper due to several factors and results in reduced recyclability of such packaging materials.

The technology on offer is a water-based coating formulation that can be applied onto paper packaging surfaces to act as a barrier against grease, liquid water, and water vapour. The coating imparts barrier protection functionalities, improving the

paper's resistance to grease, liquid water, and water vapor significantly. Use of bio-sourced constituents in the coating also improves product sustainability. As the coating's constituents are repulpable, recyclability of the paper packaging can be achieved. With increasing awareness of reducing packaging waste, the deployment of this technology will offer companies a recyclable paper packaging with notable barrier properties.

The technology owner is seeking for R&D co-development, test bedding and IP out licensing opportunities of this technology with interested companies.

TECHNOLOGY FEATURES & SPECIFICATIONS

The water-based barrier coating technology has the following features:

- Consists of bio-sourced constituents to improve product sustainability
- Enables repulping of coated paper, largely improving recyclability of such packaging materials
- Improved barrier to water vapour transmission (WVTR) - WVTR value as low as 100 g/m².day (based on ASTM E96)
- Improved liquid water resistance - Cobb60 value as low as 10 g/m² (based on TAPPI T441)
- Improved grease resistance - a KIT rating as high as 12 (based on TAPPI T559)
- Easily applied by standard coating equipment

POTENTIAL APPLICATIONS

Potential applications include (but are not limited to):

- Paper-based food packaging
- Paper boards, bags, and shipping sacks
- Products requiring enhanced barrier paper packaging

UNIQUE VALUE PROPOSITION

- Improves paper-based product recyclability while improving barrier properties of the paper
- Utilisation of bio-sourced constituents in coating formulation increases product sustainability
- Offers an alternative to PE and PFAS coated paper that are difficult to repulp