TECH OFFER

Durable and Cost-Effective Anti-Fouling Coating

KEY INFORMATION

TECHNOLOGY CATEGORY:
Chemicals - Coatings & Paints
Materials - Composites
Sustainability - Circular Economy

TECHNOLOGY READINESS LEVEL (TRL): TRL8
COUNTRY: SINGAPORE
ID NUMBER: TO175133

OVERVIEW

Anti-fouling coatings have garnered significant attention due to the increasing demand for durable, low-maintenance, and aesthetically pleasing surfaces in both residential and commercial spaces. These coatings help maintain cleanliness and appearance, reduce cleaning frequency and effort, and offer substantial cost savings in maintenance. However, balancing the performance and cost of anti-fouling coatings, particularly in achieving both oil repellence and dust resistance, remains a challenge. There is also a growing emphasis on developing stain-repellent coatings that provide long-lasting protection against abrasion.

The technology offers a special fluororesin-based functional coating with excellent water and oil repellence and dust resistance. This thin, transparent and durable coating can be applied to metals, plastics, ceramics and various other surfaces. It effectively reduces the accumulation of oil and stain build-up on the surface, prolonging the life span of home appliances and reducing maintenance frequency. With these superior properties, such coatings have great potential for applications across electronics,

household appliances, and automotive applications, enhancing product performance and durability while improving user convenience and hygiene.

The technology owner is seeking joint R&D collaboration and partnership with companies interested in integrating this coating into their products and applications.

TECHNOLOGY FEATURES & SPECIFICATIONS

The coating formulation is a unique organic-inorganic composite resin that incorporates particle dispersion technology. It is synthesized by copolymerizing acrylic resin with polysiloxane and fluorine units, resulting in a resin with high water and oil repellency and low surface resistance. Key features of the anti-fouling coating include:

- Balanced performance: effectively repels water, oil stains, and dust
- Ultra-thin and transparent: preserve the appearance of materials with a 2-5 µm clear coating layer
- Long-lasting: improved scratch resistance due to the highly durable resin layer
- Customisable: tailor the coating by adding anti-static, antibacterial and antiviral properties
- Cost-effective: more affordable than existing PTFE and high fluorine content coatings
- Versatile application: suitable for a wide range of materials and surfaces
- Easy application: a simple 3-step process involving surface cleaning, spray coating and low temperature baking (100 °C).
- Energy saving and environmentally friendly

POTENTIAL APPLICATIONS

The potential applications of anti-fouling coating include but are not limited to:

- **Households:** interior walls, ceilings, kitchen countertops, toilet seats, furniture, etc.
- **Electrical appliances:** lighting, ventilation fans, refrigerators, ovens, etc.
- **Electronics:** mobile phones, displays, touch panels, printed circuit boards (PCBs), etc.
- **Automotive:** windows, dashboards, wheels, fabric seats, etc.
- **Industrial sectors:** machinery, equipment, packaging materials, etc.
- **Textiles and fashion:** silks, fabrics, wallpapers, etc.

UNIQUE VALUE PROPOSITION

- **Optimal performance:** balanced oil repellence and dust resistance
- **Enhanced durability:** ensures long-lasting effect
- **Cost-effective:** low material cost and simple process (low temperature baking)