Hybrid Material Water Resistive Barriers via ALD/MLD

ID: 2012-053

Executive Statement:

An innovative method for creating durable, flexible, and functional water resistive barrier layers for textiles and electronics.

Technology Overview:

This technology involves a novel method of depositing water resistive barrier layers using an Atomic Layer Deposition (ALD) and Molecular Layer Deposition (MLD) approach, utilizing inorganic-organic hybrid materials. The process is designed to produce thick, transparent, and conductive layers that enhance hydrophobicity and oleophobicity, crucial for protecting sensitive materials in various industries.

Key Advantages:

- Precise control over layer thickness and properties
- Enhanced durability and flexibility of barrier layers
- Improved hydrophobicity and oleophobicity with low surface energy coatings
- Suitable for heat-sensitive devices due to low processing temperatures
- Prevention of defects and stress in coatings, ideal for industrial applications

Problems Addressed:

- Insufficient water and oil resistance in textiles and electronics
- Difficulty in applying uniform, defect-free barrier layers on sensitive materials
- Lack of flexible and durable protective coatings for various industrial applications

Market Applications:

- Textile industry for water-resistant fabrics
- Electronics for protecting sensitive components
- Manufacturing of heat-sensitive devices requiring protective layers
- Industrial applications where durable and flexible barrier layers are needed

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