

TECH OFFER

Solar Reflective Aerogel Paint



KEY INFORMATION

TECHNOLOGY CATEGORY:

Sustainability - Low Carbon Economy

Green Building - Façade & Envelope

Materials - Nano Materials

TECHNOLOGY READINESS LEVEL (TRL): **TRL8**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO175093**

OVERVIEW

Reducing heat transfer across surfaces within built environments and transportation units is critical for optimising energy efficiency in thermal comfort systems and mitigating associated costs and carbon emissions. Implementing measures to minimise heat transfer help maintain liveable thermal conditions and promote environmental sustainability. Some of the efficient methods for reducing heat transfer from the surrounding environment include reflecting solar radiation and providing thermal insulation to minimise heat conduction through surfaces.

The technology offered here is a nano-engineered aerogel paint designed to reduce heat transfer across surfaces in the built environment. Unlike traditional solar reflectance paint that merely reflects sunlight, this paint actively minimises solar heat absorption, reducing the reliance on cooling and air conditioning systems and resulting in significant energy savings. Additionally, the paint provides excellent weather resistance and reduces maintenance costs by shielding against ultraviolet (UV) and infrared (IR) emissions, moisture, algae, and fungal growth. Its superior coverage capabilities of up to 3 square meter per liter per coat

further contribute to cost savings and ensure long-lasting protection for various surfaces.

With a proven track record in increasing energy efficiency for containerised offices and refrigeration trucks, the technology owner is now seeking to expand into other applications through on-site testbedding and performance trials. These include warehouses and building rooftop insulation, enhancing data center energy efficiency, and numerous other potential applications.

TECHNOLOGY FEATURES & SPECIFICATIONS

- Eco-friendly water-based paint infused with aerogel powder delivering substantial energy and cost saving.
- Weather resistance, curbing maintenance expenses by shielding surfaces from UV and IR emissions, moisture, algae, and fungal growth.
- Offers solar reflectivity, insulation, and weatherproofing – a 3-in-1 solution for residential, commercial, and industrial use.
- Up to 87% solar reflectance per ASTM E-903.
- Up to 110 in solar reflective index.
- Ability to mitigate heat transfer through layers enhances its utility across diverse surfaces and applications.
- Lowering surface temperatures by 15-20 degC in a recent demonstration, which helps in reducing cooling loads and associated air conditioning costs by approximately 10%.

POTENTIAL APPLICATIONS

Solar reflective aerogel paint addresses the growing need for increasing energy-efficiency in buildings, energy industry and sustainable construction practices, making it important for application in various industries such as:

- Containerised offices
- Commercial and industrial warehouses
- Residential buildings and housing developments
- Manufacturing facilities and production plants
- Data centres and server rooms

MARKET TRENDS & OPPORTUNITIES

Solar reflective aerogel paint enters a vibrant market shaped by significant growth projections and industry dynamics. With the Global Reflective Cooling Paint Market estimated at USD 673.60 million in 2023 and projected to reach USD 862.21 million by 2029, reflecting a Compound Annual Growth Rate (CAGR) of 4.20%, there is a clear trend towards adopting energy-efficient solutions.

This growth is fueled by a growing emphasis on sustainable construction practices and the critical role reflective cooling paints play in reducing heat absorption. As demand for such solutions continues to surge, aerogel paint's solar reflective, insulative, and weatherproof features are poised to meet the needs of residential, commercial, and industrial sectors seeking effective and environmentally friendly coatings.

UNIQUE VALUE PROPOSITION

Unlike existing products in the market that rely solely on solar reflection or insulating materials with potential drawbacks, the Solar reflective aerogel paint presents a distinct advantage by combining solar reflectivity, superior thermal insulation, and

weatherproofing in a single paint formulation. This multifunctionality sets it apart from competitors that focus on only one aspect of thermal management.