TECH OFFER

Passive Radiative Self-Cooling Paint

KEY INFORMATION

TECHNOLOGY CATEGORY:
Sustainability - Sustainable Living
Green Building - Heating, Ventilation & Air-conditioning
Chemicals - Coatings & Paints
Materials - Nano Materials

TECHNOLOGY READINESS LEVEL (TRL): TRL8
COUNTRY: HONG KONG
ID NUMBER: TO174809

OVERVIEW

As the earth gets warmer, the cooling of living and working spaces requires more energy. Governments are enacting standards for eco-friendly buildings in response to increasing concerns about rising energy use and carbon emissions. A novel “self-cooling” solution can help buildings and automobiles to cool down without heavily relying on air conditioning, leading to greater energy savings.

The technology offer is a high-performance passive radiative cooling paint (PRCP) using emerging nanomaterial technology. Different from conventional paint, this cooling paint combines high solar reflectivity with high thermal emissivity. Hence, the paint can reflect incoming solar radiation and emit thermal radiation simultaneously, achieving effective cooling even under direct sunlight.

The technology owner is interested in R&D collaboration and test-bedding with commercial and residential building owners, property developers and construction companies. The technology is also available for out-licensing to paint developers and manufacturers.

TECHNOLOGY FEATURES & SPECIFICATIONS

This technology has good cooling performance and is easy to apply. By applying the cooling paint on a building rooftop, the rooftop temperature can be reduced by 20-40^{o}C under direct sunlight, compared to when no cooling paint is applied, saving about 20-40% of energy used by traditional air-conditioning systems in buildings.

The advantages of this technology are:

- High solar reflectivity (>95%)
- High mid-infrared emissivity (>95%)
- Easy to apply
- Customised formulations and colors
- Eco-friendly and non-toxic

POTENTIAL APPLICATIONS

- Buildings and automobiles: reduce energy consumed by air-conditioning
- Outdoor electronic devices: improve electricity utilisation efficiency
- Outdoor storage systems: tanks, pipes, supply chain systems
- Solar cells and power plants: enhance power conversion efficiency
- Other infrastructures in hot climates: reduce urban heat island effect
- Self-cooling merchandise: umbrellas, hats, clothes, textiles

UNIQUE VALUE PROPOSITION

- Good cooling performance (indoor temperature reduction by 10^{o}C)
- Cost-effective
- Customisable for different applications
- Environmentally friendly

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