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A Thin and Light-weight Coating of Boron Nitride Paints for Efficient Radiative Cooling

An ultra-reflective BN paint (98% solar reflectance) that passively cools surfaces below ambient temperature to cut A/C loads and heat-island effects.

Researchers at Purdue University have created a boron nitride paint with an ultra-high solar reflectance. This reflective paint reflects most of the incident sunlight back to deep space and emits infrared heat that travels through the atmospheric transparent window to deep space, meaning that the paint provides a cooling effect and will cool below outside temperatures. Reflective paints on the outside of buildings may reduce air conditioning use, which is a significant contributor to global warming because of electricity use. This paint achieves a solar reflectance of 98.1%.

Advantages:

-Thin

-Light-weight

-Reflective

Applications:

-Paints and coatings

Technology Validation:

The paint showed a solar reflectance of 98.1% and an emissivity of .085 in the sky window. The paint was demonstrated to cool below the ambient temperature in daytime under peak solar irradiation.

TRL: 2

Intellectual Property:

Provisional-Gov. Funding, 2021-08-28, United States

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Category
Chemicals & Advanced Materials/Coatings, Adhesives & Sealants

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NATL-Patent, 2022-08-24, Europe

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