

## Product News

© ASM International 2021

### Scientists Invent Superwhite Paint that Reflects Heat to Space

Global energy use is predicted to grow 90% by 2050. Cooling techniques are not only a major driver of peak electricity demand but are a significant end-use of energy across the globe. Air conditioning alone accounts for around 15% of the primary energy used in U.S. buildings.



Superwhite paint reflects 95.5% of sunlight. (Image Credit: Sombat Muycheen/Shutterstock.com)

A team of engineers at Purdue University has developed a superwhite paint that uses radiative cooling in a bid to reduce our dependence on air conditioning.

Air conditioning units operate by moving heat from the inside of a building to the outside. Radiative cooling, on the other hand, is a passive technology that reflects the heat from a building's surface into space, where it can have no negative impact on the planet.

In 2014, a radiative cooler was developed by combining an integrated photonic solar reflector with a multi-layered thermal emitter, which reflected 97% of incident sunlight and was able to cool to 22 °C (41 °F) below ambient air temperature.

The superwhite paint developed by Xiulin Ruan and his colleagues at Purdue University absorbs almost no solar energy from the sun, reflecting 95.5% of sunlight and keeping surfaces up to 28 °C (50 °F) cooler than their ambient surroundings.

Compared with the photonic radiative cooler, the superwhite paint is thinner, cheaper, and easy to scale-up. It brushes on and dries easily, much like a commercial paint, and is abrasion resistant and waterproof. It's estimated that a typical 2150-square-foot house could save \$50 per month in cooling costs by replacing an existing variant of heat-resistant paint.

Thus far, Purdue University researchers have been testing the paint on rooftops, using an infrared camera to read its temperature. These experiments have confirmed the paint can indeed maintain a lower temperature than its surroundings in direct sunlight.

For more information: Thomasnet - Superwhite paint (<https://www.thomasnet.com/insights/scientists-invent-superwhite-paint-that-reflects-heat-to-space/>).

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.