

SPACECOOL Wins the 2024 Good Design Gold Award

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Osaka Gas Co., Ltd.

SPACECOOL (hereinafter referred to as “this material”), a daytime radiative sky cooling material developed and sold by SPACECOOL Inc., an investee company of Osaka Gas, has won the 2024 Good Design Gold Award.

This material blocks heat from sunlight and the atmosphere and dissipates it into space through the principle of radiative cooling, enabling the temperature to be lowered below the ambient air temperature with zero energy consumption. This material’s unique optical design has successfully controlled the wavelength of infrared rays radiated by this material within the range of the “atmospheric window,”*1 which allows these rays to pass through to space easily. This makes it possible to cool temperatures during the day by efficiently using radiative cooling.

This award was given amid the escalating global warming crisis in recognition of the idea of “dissipating heat into space through the atmospheric window,” as well as the fact that the films and sheets have already been put to practical use and this material is expected to be applied in a variety of fields in the future.

Osaka Gas and SPACECOOL will continue to contribute to the realization of a carbon-neutral society by spreading the use of this material.

*1: The range of wavelengths in light that can easily pass through the atmosphere to outer space

■ Daytime radiative sky cooling material “SPACECOOL”



[About the daytime radiative sky cooling material SPACECOOL]

SPACECOOL is a new material that blocks heat from sunlight and the atmosphere and dissipates it into space through the principle of radiative cooling, enabling the temperature to be lowered below the ambient air temperature with zero energy consumption. Radiative cooling is a natural phenomenon that lowers the temperature by radiating the Earth’s warm heat as infrared rays into space, where the temperature is minus 270 degrees Celsius. However, since the amount of heat coming in from sunlight during the day usually exceeds the amount of heat radiated out from the Earth’s surface, it is difficult for the radiative cooling effect to cool down the Earth. Furthermore, many infrared rays radiated from the earth’s surface are absorbed or reflected by the atmosphere depending on their wavelengths, preventing them from escaping into space. This causes heat to be trapped on the Earth (global warming).

This material's unique optical design has successfully controlled the wavelength of radiated infrared rays within the range of the "atmospheric window," which allows these rays to pass through to space easily. This makes it possible to cool temperatures during the day by efficiently using radiative cooling. By applying this material to facilities exposed to direct sunlight, such as buildings and outdoor electrical equipment, it is possible to suppress temperature rise without emitting CO₂ and even reduce the amount of energy used for air conditioning. This contributes to the realization of carbon neutrality, the prevention of heatstroke, and the improvement of labor productivity.

[Award website]

Award-winning item: Daytime radiative sky cooling material "SPACECOOL" (<https://spacecool.jp/en/>)

Award summary: <https://www.g-mark.org/en/gallery/winners/21357>

[Comments from the jury members]

As global warming becomes more serious, the idea and realization of "dissipating heat into space through the atmospheric window" is stimulating. Currently, the Earth is the only known place that supports life, and one of the factors that allows life to exist is a stable temperature, achieved through the balance of solar energy, the atmosphere, and radiative cooling. Within the mechanisms of the universe and life, it is hard not to feel excited about the possibility that a film only 0.1 mm thick, utilizing the principles of radiative cooling, could contribute to combating global warming. The technical explanation that it not only reflects incident light but also converts heat on the ground into light energy within a wavelength range that is less absorbed by greenhouse gases to radiate it through the atmospheric window is also interesting. Films and sheets have already been put to practical use, and other applications in a variety of fields are expected in the future.

[About the Good Design Award]

Based on the Good Design Products Selection System introduced in 1957, this is a program that involves evaluation and promotion of design that represents Japan. As a global design award, it has been held every year with the participation of many companies and organizations from Japan and abroad. The goal is to empower design to improve the quality of life and provide solutions to social issues and challenges. The award symbol, the "G Mark," is widely recognized as a symbol of excellent design.

* Good Design Award

<https://www.g-mark.org/en>