

Osaka Gas Wins the 2021 KCS Award in Environmental Technology for the Development and Verification Tests of SPACECOOL,<sup>®</sup> a Radiative sky Cooling Material That Cools with Zero Energy

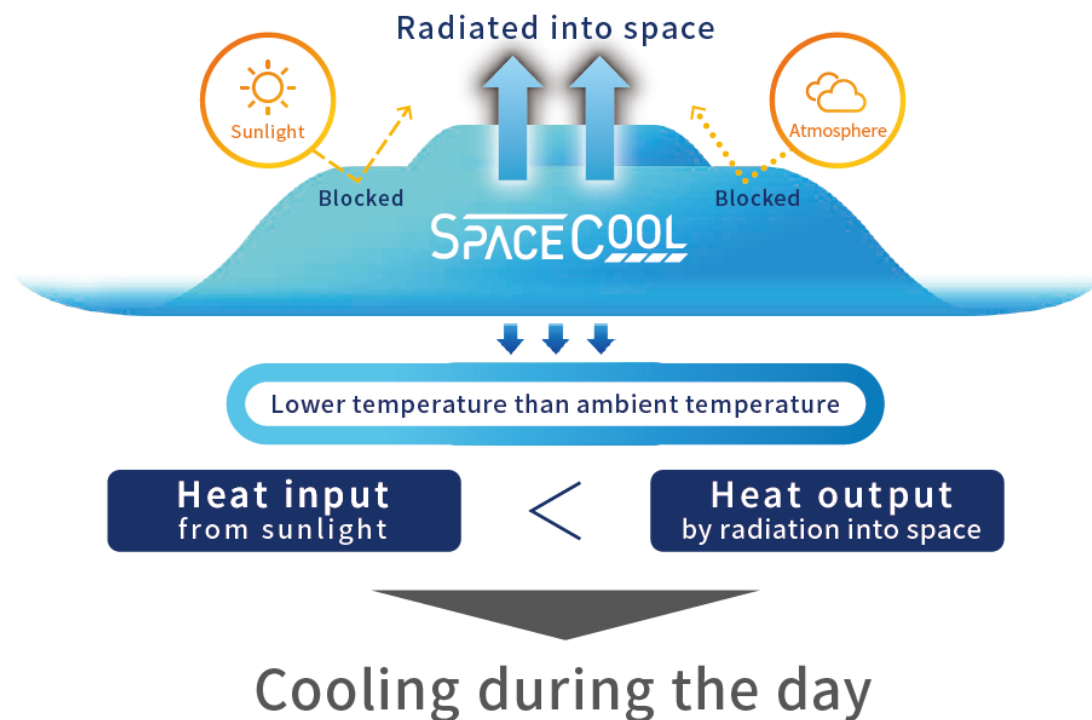
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Osaka Gas Co., Ltd.

The Kinka Chemical Society (KCS) has granted Osaka Gas the 2021 KCS Award in Environmental Technology<sup>\*1</sup> for the development and verification tests of SPACECOOL, a radiative sky cooling material that cools with zero energy.

The radiative sky cooling material SPACECOOL (“this material”) is designed to cool down in direct sunlight to a lower temperature than the ambient temperature without using energy by allowing its heat to escape to space by the principle of radiative cooling<sup>\*2</sup> as well as blocking heat from sunlight and the atmosphere to suppress heat absorption. A demonstration experiment conducted in the summer of 2020 by Osaka Gas, which has developed this material, found that the surface temperature of this material was up to about 6°C<sup>\*3</sup> lower than the outside air temperature under direct sunlight, realizing world-class<sup>\*4</sup> radiative cooling performance.

(Fig. 1: Principle of this material)



This award has been granted in high appreciation of the verification tests and Osaka Gas’s effort to market this material as well as innovativeness of the technology.

Radiative cooling is a well-known phenomenon that drops the temperature at night. To make a surface temperature lower than the ambient temperature by this phenomenon in the daytime, when heat input from

sunlight is large, the optical design is the key. Osaka Gas started its own research and development on this theme in 2017 and, with material design using optical control technologies, became the first in Japan<sup>\*4</sup> to confirm a material's performance of radiative cooling in the daytime. Also, the company has given the material durability sufficient for practical use and established a technology of mass-producing the material. Moreover, Osaka Gas has conducted demonstration experiments<sup>\*5</sup> of this material at sites, including the planned Expo venue on Yumeshima, to evaluate this material's merits, including energy efficiency and comfort. Furthermore, the company has formed SPACECOOL Inc., a startup that manufactures and sells this material, and has been actively making efforts to market the product.

(Fig. 2: Photos of developed products, left: film, right: canvas)



Osaka Gas will strive for further technology development and remain committed to helping customers achieve a comfortable lifestyle and reducing environmental impacts.

\*1: KCS Award in Environmental Technology

This award is granted by the Kinka Chemical Society, a public interest incorporated association that has a history and tradition of over 100 years, to "new or improved technologies, in the field of chemical research, which are actively aware of and oriented to environmental maintenance and improvement and coexistence with the global environment and whose industrial, social, and academic value has been proved."

\*2: A phenomenon in which the heat of a heated object is transferred as electromagnetic waves (light)

\*3: The temperature was measured at Osaka Gas Energy Technology Laboratories in Konohana-ku, Osaka (ambient temperature at the time of measurement at noon: approximately 35°C). The temperature on the reverse side of a steel sheet covered with this radiative cooling material was measured.

\*4: According to research by Osaka Gas using published papers

\*5: Described in the press release on August 26, 2021: "Demonstration Test Using SPACECOOL® Radiative Sky Cooling Material Begins at Yumeshima Expo Venue—Evaluating Energy Efficiency, Comfort, Etc. in Collaboration with Various Companies—"

<https://www.spacecool.jp/en/news/demonstration-test-using-spacecool-radiative-sky-cooling-material-begins-at-yumeshima-expo-venue-evaluating-energy-efficiency-comfort-etc-in-collaboration-with-various-companies/>

