

Our Belief

We can make a change in our environment.
Our radiative sky cooling technology will help eliminate
fundamental causes of global warming.

VISION

**Bringing the coolness
of shade trees
to the world**

Delivering natural coolness
in a safe, electricity-free way
for all.

MISSION

**Reversing global
warming with a radiative
sky cooling technology**

Our mission is to deliver durable,
radiative sky cooling materials that can
be used for various applications.
Our technology will not only provide
safety and comfort for us, but it
reduces energy costs and is
extremely environmentally
friendly.

VALUE

**For
people**



**Comfort
&
Safety**

- Heat stroke prevention
- Keeping perishable food cool

**For
Business**



**Stability
&
Efficiency**

- Overheating prevention for outdoor devices and equipment.
- Improving space efficiency.
- Reducing electricity consumption.

**For
the Environment**



**No Electricity
&
No CO2**

- Cooling without use of electricity.
- Reducing planet-warming emissions.

Bringing the coolness of shade trees to the world

Delivering natural coolness in a safe,
electricity-free way for all.

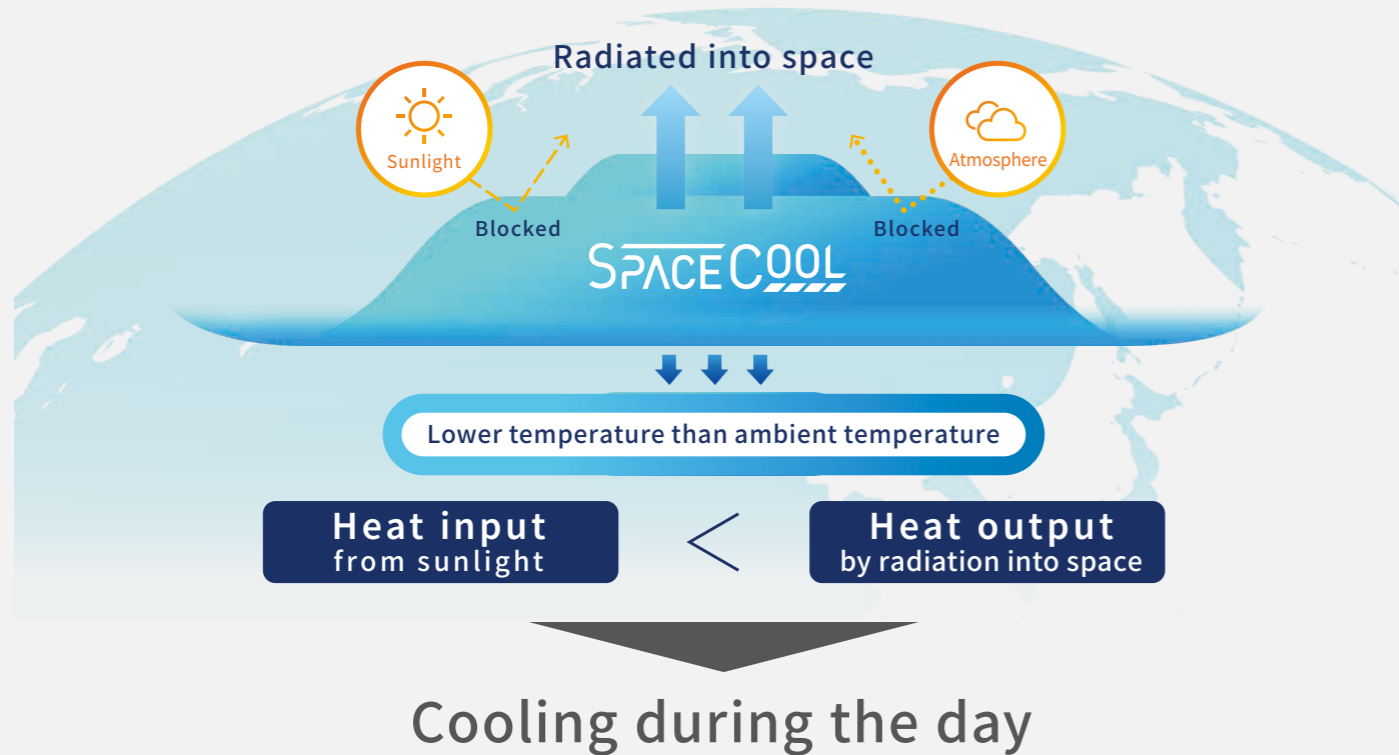
SPACECOOL

company profile

Company Name	SPACECOOL Inc.
Date Founded	April 1, 2021
Capital	JPY 350,000,000
Investors	WiL Fund II, L.P. 51% Osaka Gas Co., Ltd 49%
Management Team	CEO: Takayuki Hoshuyama
Head office	c/o ARCH Toranomon Hills Incubation Center Floor 4, Toranomon Hills Business Tower 1-17-1 Toranomon, Minato-ku, Tokyo, 105-6404 Japan
R&D Laboratory	Osaka Gas Co., Ltd. Energy Technology Laboratories 6-19-9 Torishima, Konohana-ku, Osaka-shi, Osaka 554-0051 Japan

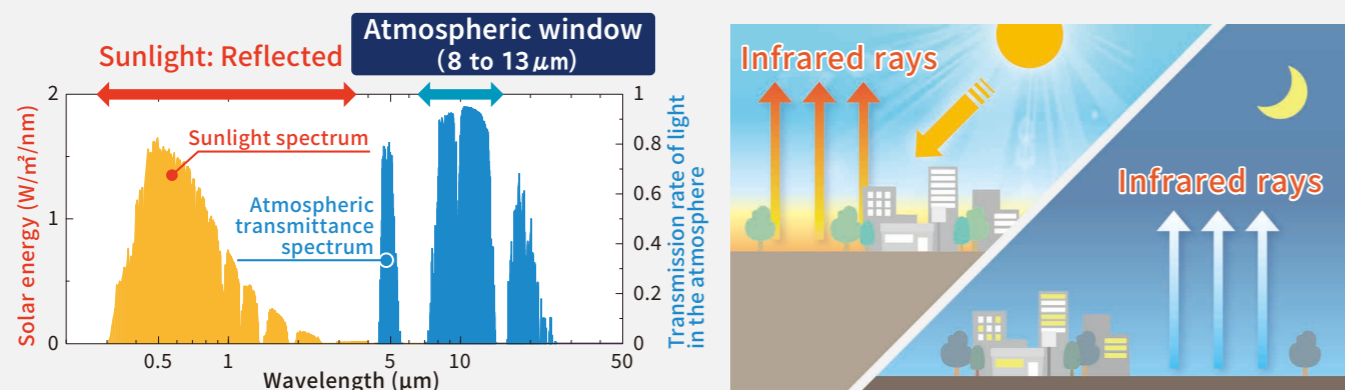
About **SPACECOOL**

SPACECOOL is a new material. It manages to achieve a lower temperature than the ambient temperature without consuming electricity by limiting heat absorption through blocking heat from sunlight and the atmosphere, as well as radiating heat into space. It is a product which can mitigate global warming while increasing comfort and safety. It can be used in various applications.



About Radiative Sky Cooling

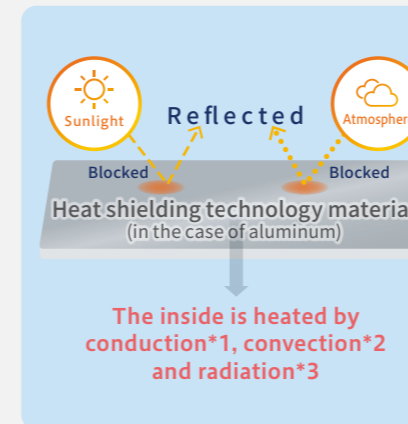
When heat from the ground surface is released into space and cools down, we call it “radiative sky cooling.” It is necessary to radiate heat in a limited wavelength range that passes through outer space called the “**atmospheric window**” to generate radiative sky cooling. Clear nights are cool because heat continues to be emitted from the earth into space with no solar radiation. Conversely, the ground warms up because the heat input from solar radiation is greater than the heat that is emitted from the earth during the day.



Difference between SPACECOOL and Heat Shielding Technology and Thermal Insulation Materials

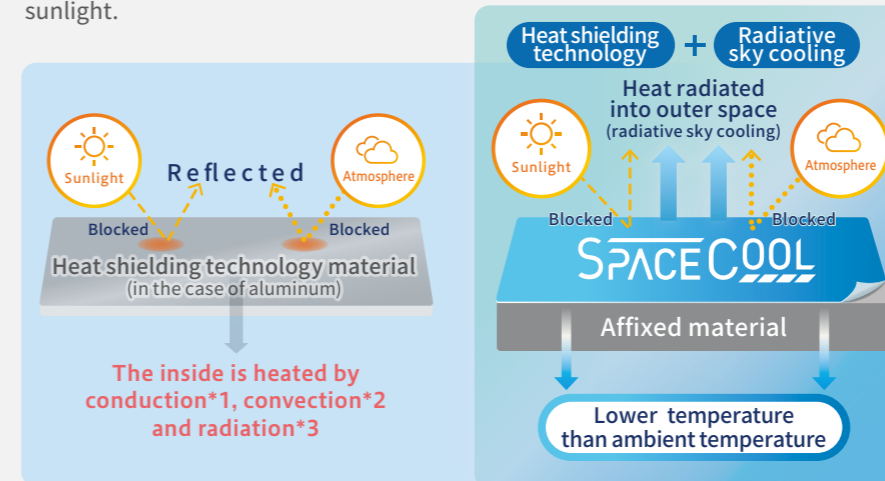
Heat Shielding Technology Materials

Materials that reduce the heat input of sunlight into a room from the surface of the material. The temperature rises above the ambient air temperature when exposed to sunlight.



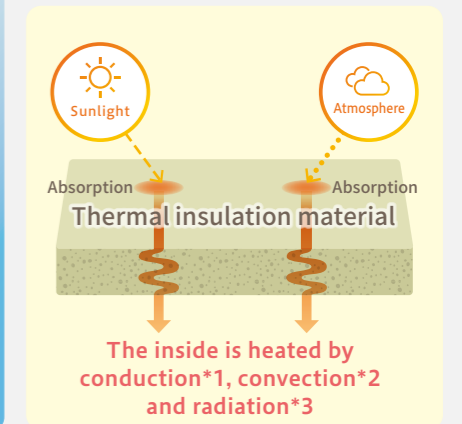
SPACECOOL (Radiative Sky Cooling Material)

A new material that manages to achieve a lower temperature than the ambient temperature without electricity consumption by reflecting sunlight and radiating heat into outer space.



Thermal Insulation Materials

Insulation materials slow down the heat flow. The temperature rises above the ambient air temperature when exposed to sunlight. Heat storage and heat buildup are likely to occur.

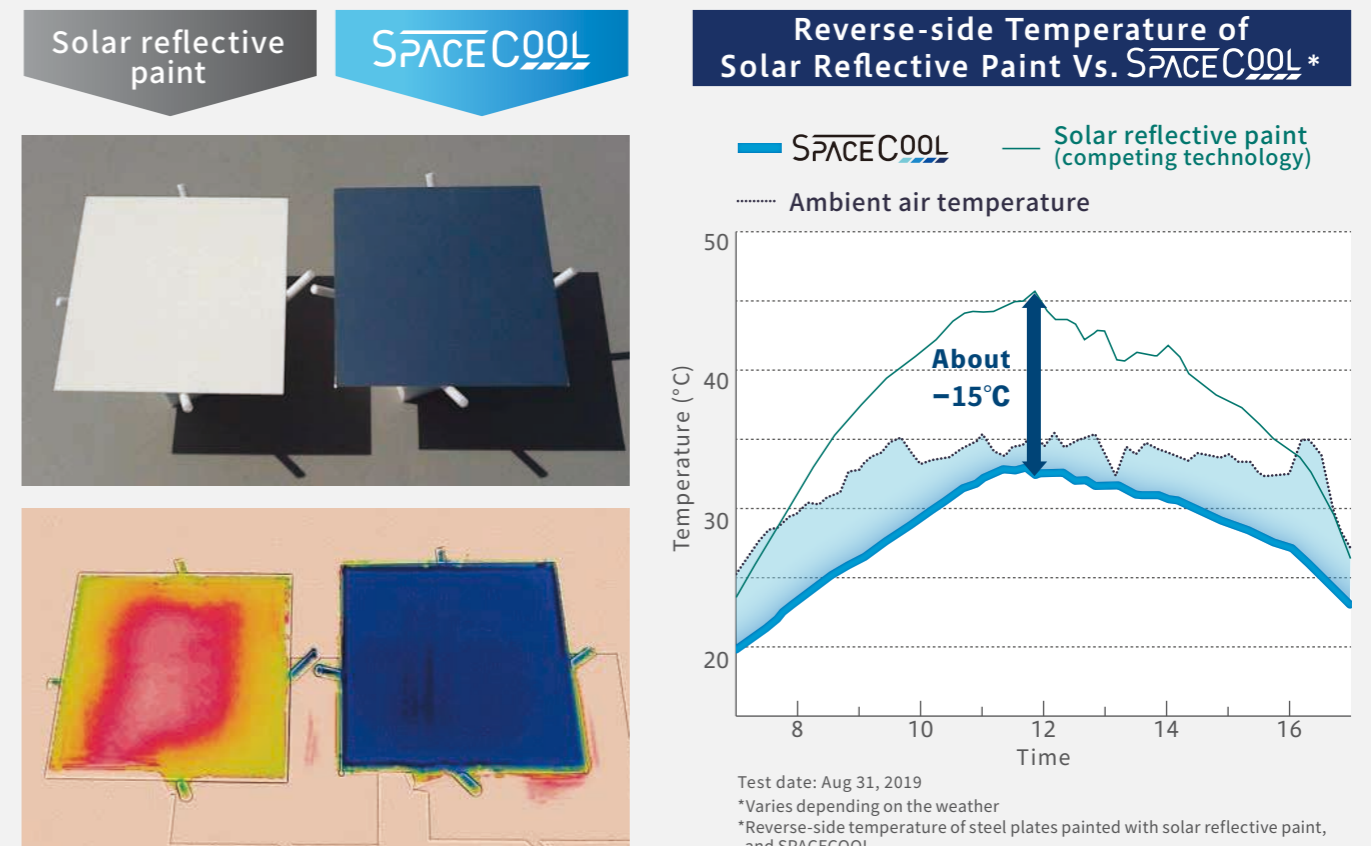


- *1. Conduction: A phenomenon in which heat is transferred through an object (solid).
- *2. Convection: A phenomenon in which heat is transferred by the movement of air.
- *3. Radiation: A phenomenon in which heat is transferred through light.

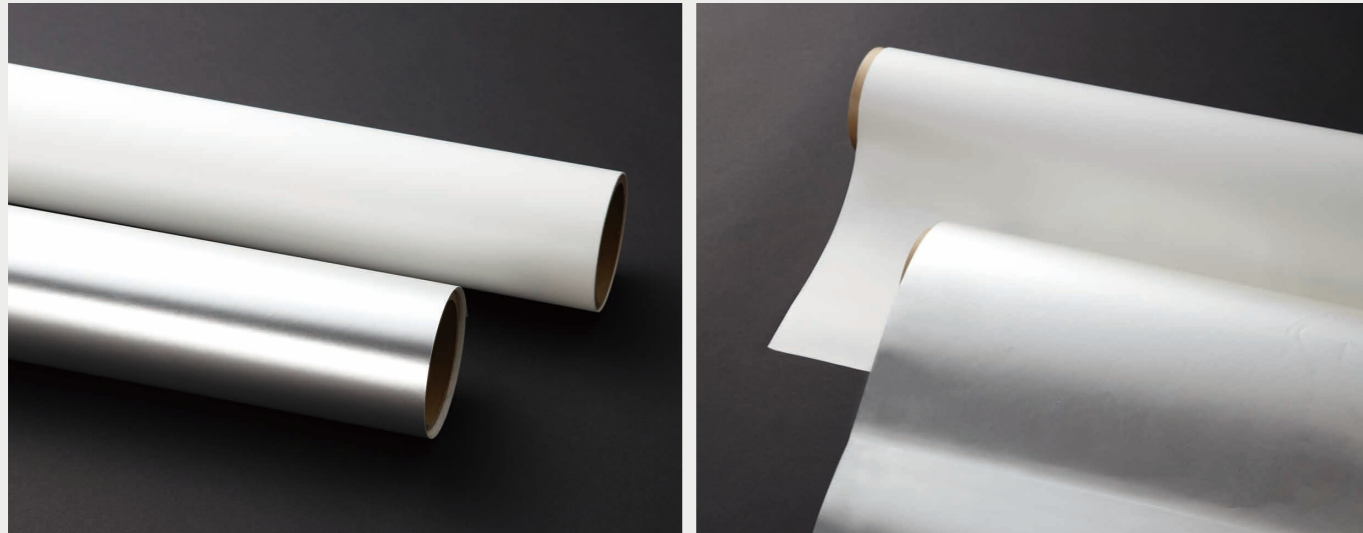
SPACECOOL Demonstration Experiment

Summer Performance

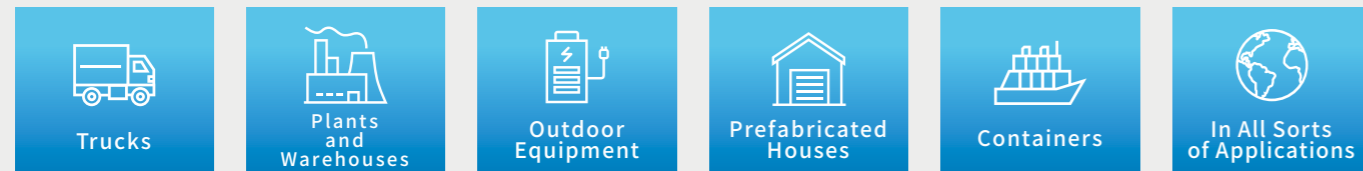
We confirmed a drop in temperature of about 2 to 6°C compared to the ambient air temperature.



SPACECOOL Film



Applications (Examples)



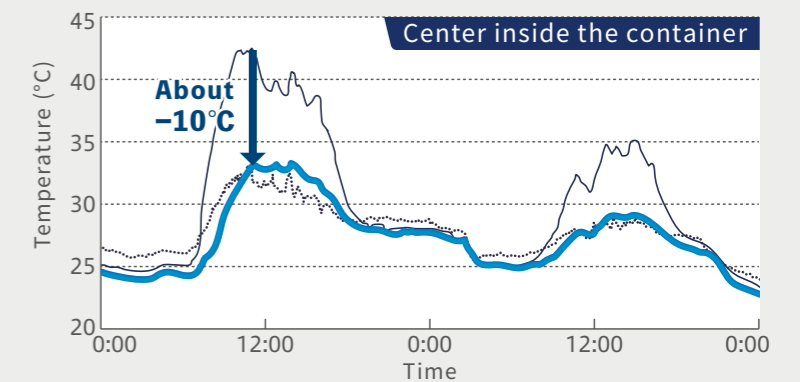
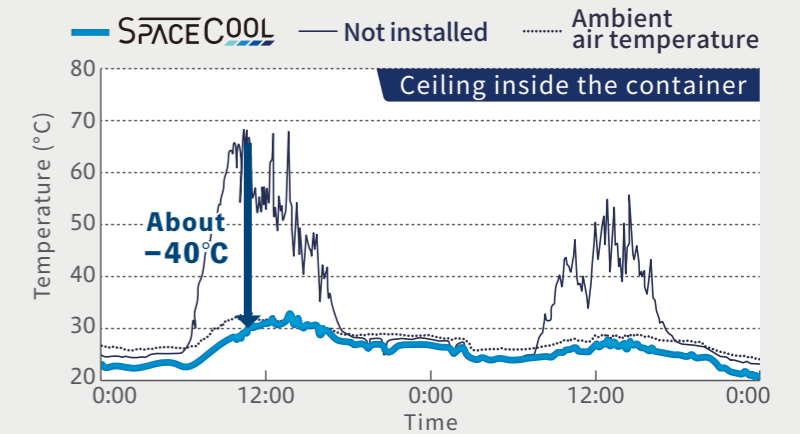
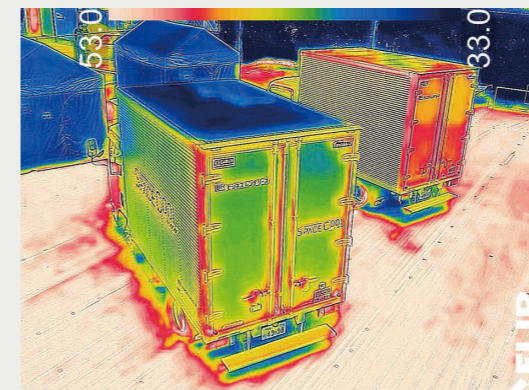
Product Characteristics

Item	Details	Item	Details
Size	1,250mm × 25m	adhesive	Pressure-sensitive re-release acrylic-based
Core	3-inch core (inside diameter: 77mm)	Bond strength	Aluminum plate About 9N/25mm (left for 24 hours after affixation)
Material	Poly vinyl chloride etc.	Usable temperature range	-20 to 50°C
Film color	White, Silver	Affixation temperature range	5 to 38°C
Thickness (representative value)	110μm (including adhesive)	Sunlight reflectance	95% or more
Weight (representative value)	145g/m ² (not including release paper)	Emissivity (8 to 13μm)	95% or more
Release paper	Woodfree paper-based white matrix release paper (rear surface: PE treatment)		

[Test Method]
Film thickness: Conforms to JIS K 7130:1999. Bond strength: Conforms to JIS Z0237.
The numerical values for the characteristics are based on test results at a temperature of 20°C and a humidity of 65% in principle.
*The product design and specifications are subject to change without notice for improvements.

Temperature Inside a 2-ton Truck Container

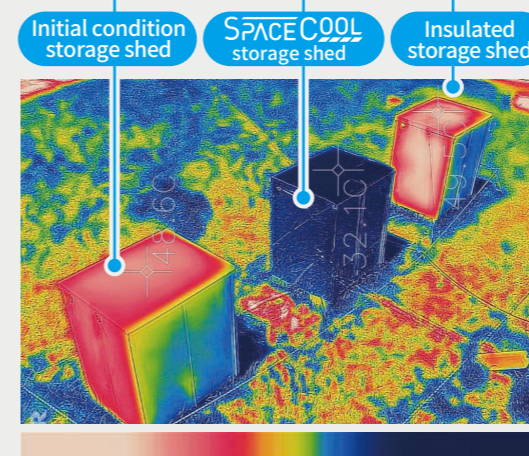
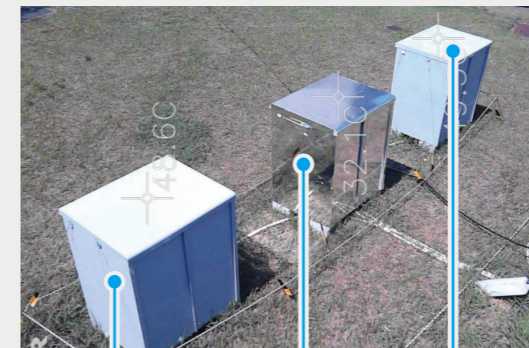
We installed SPACECOOL on a 2-ton truck and then measured the temperature inside the container. The ceiling had the largest temperature difference: up to about -40°C. We confirmed that the temperature at the top-center inside the container also dropped by up to about -10°C.



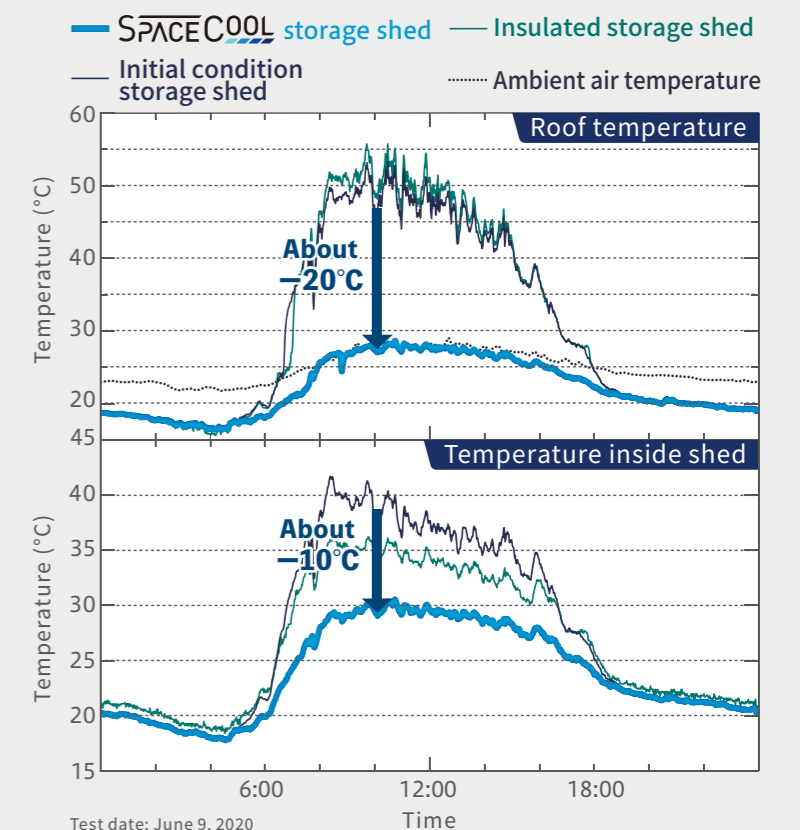
Test dates: Sep 12 to 14, 2020

Temperature Inside an Outdoor Storage Shed

We confirmed that the temperature inside the outdoor storage shed dropped about -10°C compared to the initial condition when SPACECOOL was installed.

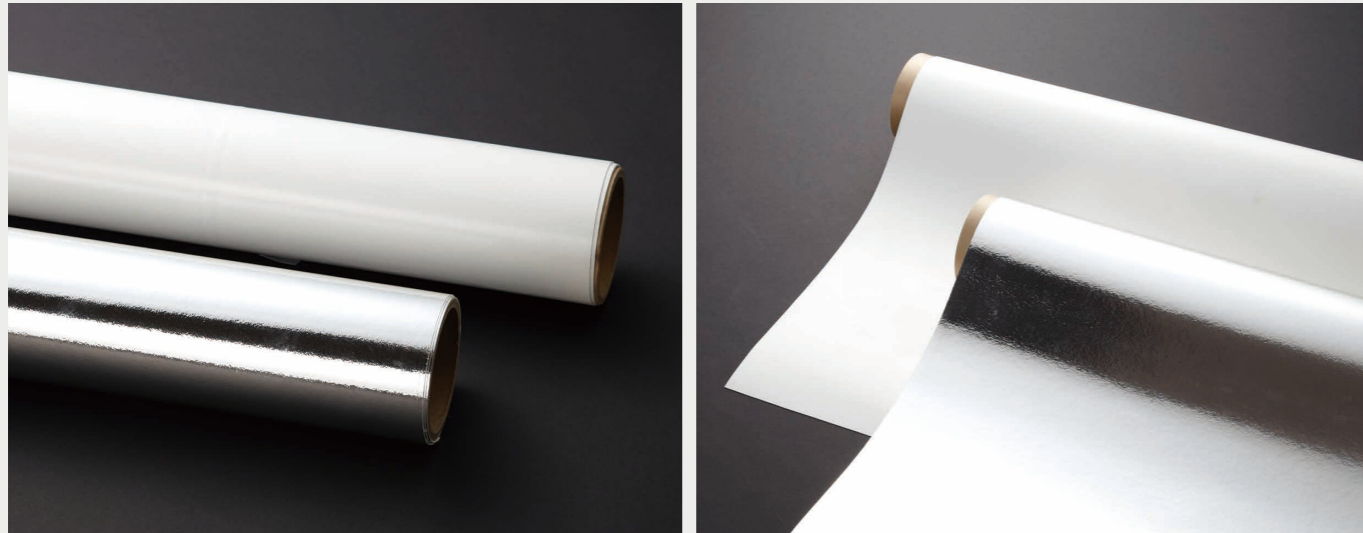


45°C 27°C

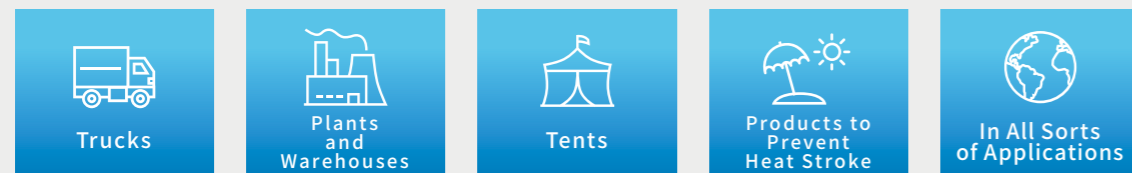


Test date: June 9, 2020

SPACECOOL Membrane



Applications (Examples)



Product Characteristics

Item	Details	Item	Details
Size	103 cm × 50 m *Irregular volume	Tensile strength	Vertical: 1,400 N/3 cm Horizontal: 1,200 N/3 cm
Core	3-inch core (diameter: 77 mm)	Elasticity	Vertical: 25% or less Horizontal: 30% or less
Material	Foundation cloth: Polyester Surface: PVC	Scott type crease -flex abrasion test (load: 29.4 N×200 times)	Vertical: No abnormalities Horizontal: No abnormalities
Fabric color	White, Silver	Sunlight reflectance	95% or more
Thickness	0.54±0.04mm	Emissivity (8 to 13 μm)	95% or more
Weight	560±50g/m ²		

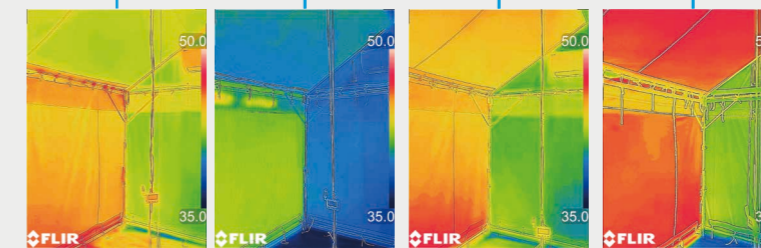
[Test Method]
Size: Conforms to JIS-L-1096-8.2.1. Thickness: Conforms to JIS-L-1096-8.4. Weight: Conforms to JIS-L-1096-8.6. Tensile strength: Conforms to JIS-L-1096-8.3.2. Elasticity: Conforms to JIS K6404-4 2015.
*The above physical properties are the values measured according to the initial strength. They are not guaranteed values. Do not perform high-frequency welding. There is a risk of electric shock.
*The product design and specifications are subject to change without notice for improvements.

Apparent Temperature of a Tent

We compared a tent using SPACECOOL and a regular tent made with the material of another company. We confirmed a difference of about -10°C in the apparent temperature inside the tents.

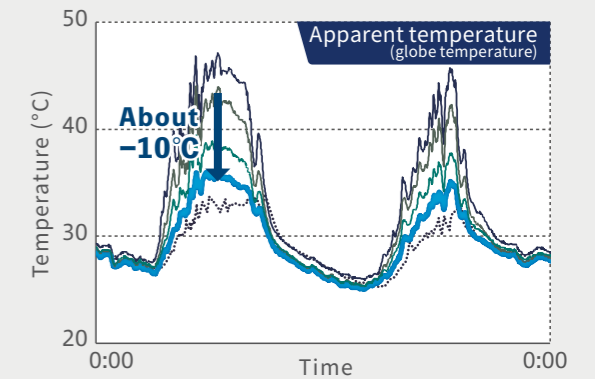
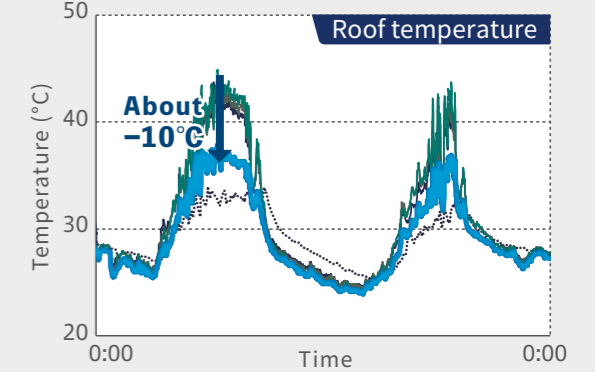


Regular tent SPACECOOL Company A's heat shielding technology tent Company B's heat shielding technology tent



〈Thermography Inside the Tents〉

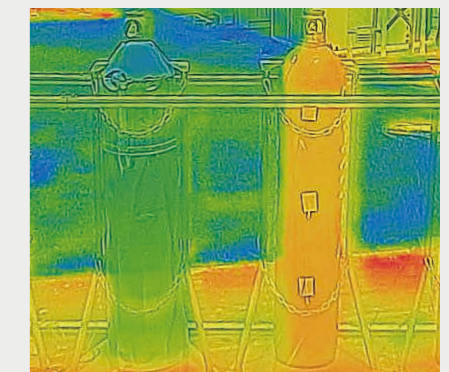
— Regular tent — SPACECOOL
— Company A's heat shielding technology tent
— Company B's heat shielding technology tent
— Ambient air temperature



Test dates: Aug 31 to Sep 1, 2021
*Measured with a globe thermometer

Surface Temperature of a Gas Cylinder

We installed SPACECOOL on a gas cylinder and then measured the temperature. We confirmed that the surface temperature dropped about -5°C.



— Ambient air temperature
— SPACECOOL
— Not installed

