SPACECOOL

Autumn 2025

Coolness of Shade Trees for Everyone

Effective Zero-Energy Cooling

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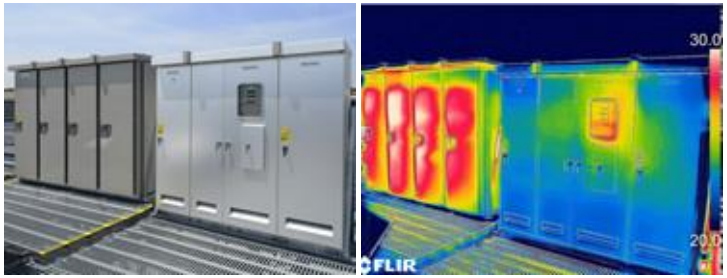
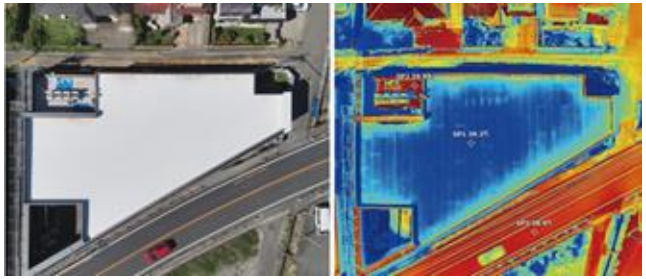
Passive Radiative Cooling Material

SPACECOOL

Just apply the film!

Passive Cooling, Energy & Cost Saving, CO2 Reduction





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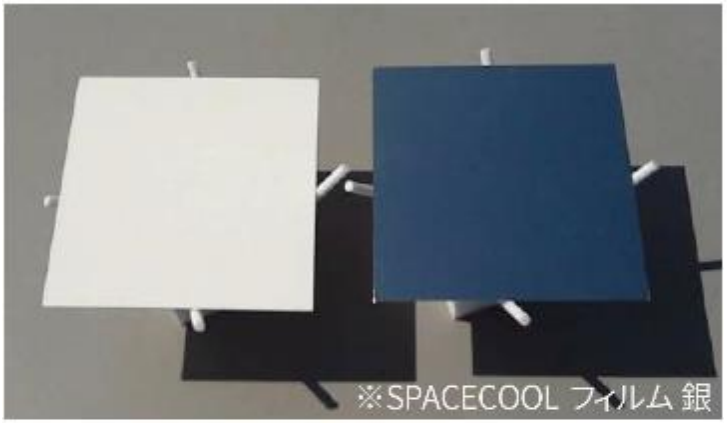
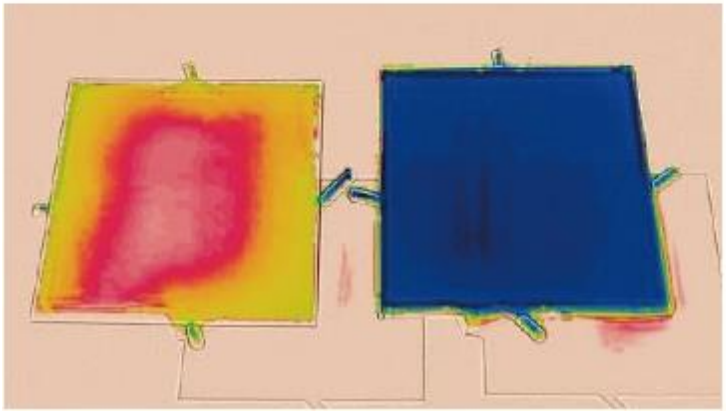
Performance of “SPACECOOL”

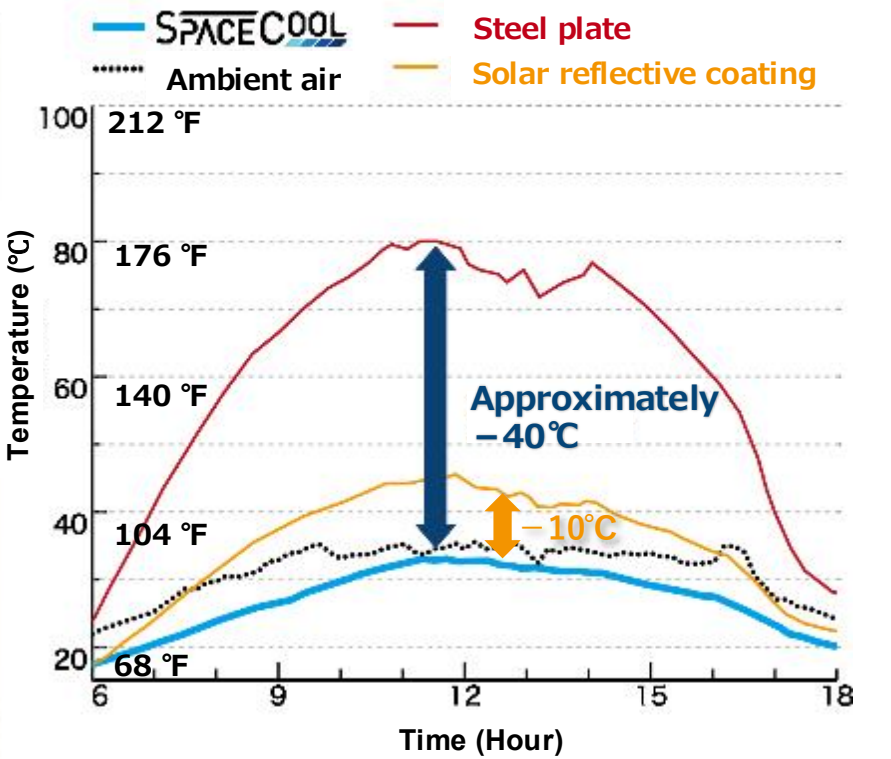
- ✓ ~40℃ lower surface temperature
- ✓ ~10℃ cooler than conventional reflective coating
- ✓ 2~6℃ cooler than ambient temperature (“sub-ambient cooling”)

Solar Reflective Coating SPACECOOL





Backside temperature of the test samples



- ◆ **Test Date**: September 1, 2017
- ◆ **Note**: Temperature varies depending on weather conditions.
- ◆ **Description**: The graph shows the backside temperature of steel plates coated with solar reflective coating and SPACECOOL.

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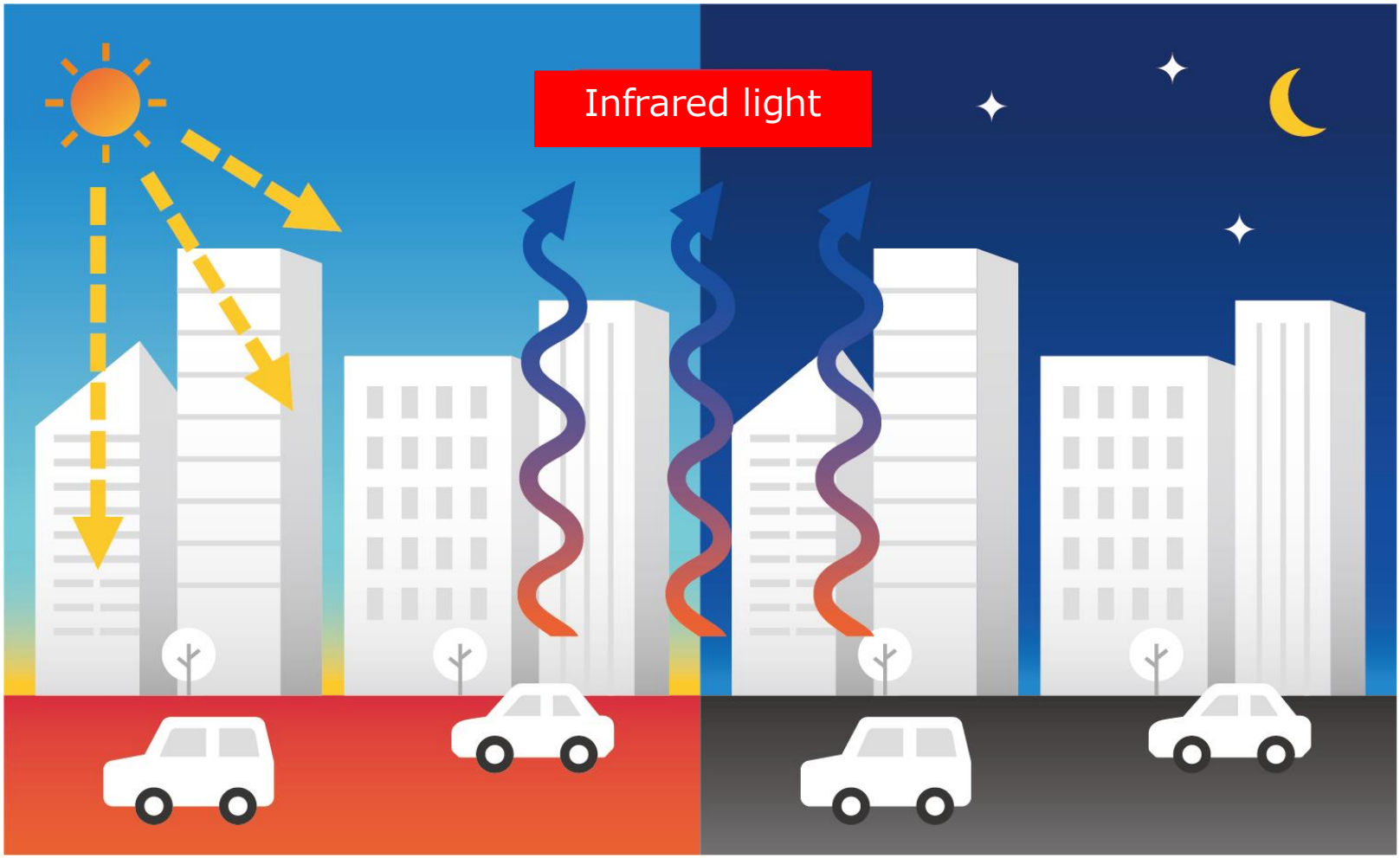
Radiative Cooling Phenomenon

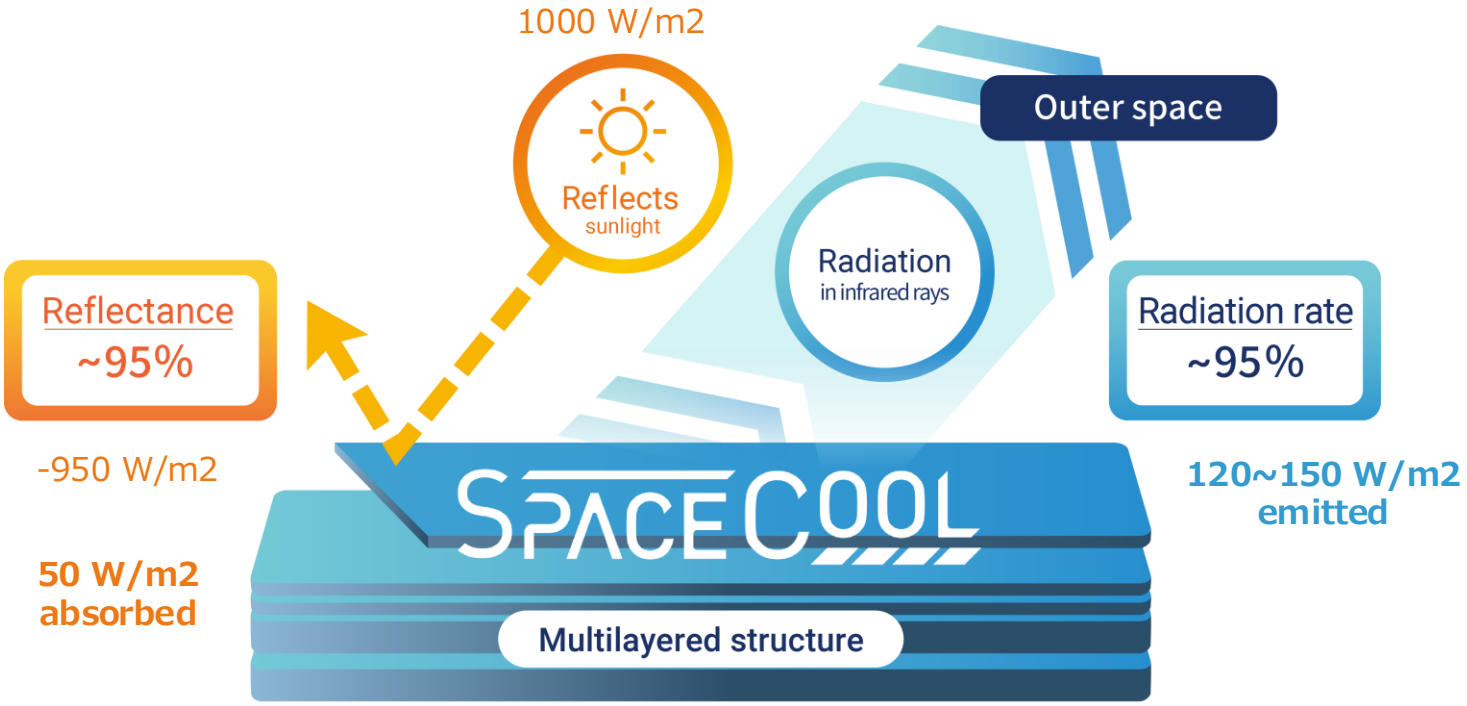
Radiative cooling is the **natural night-time loss of heat** to outer space (~−270 °C) via infrared radiation.



See also: https://www.nature.com/articles/nature13883

Passive Daytime Radiative Cooling

SPACECOOL, with high solar reflectance and high emittance, enables **radiative cooling even in daytime.**



Zero energy cooling is achieved

Absorbed Solar Energy < Radiative Cooling Energy

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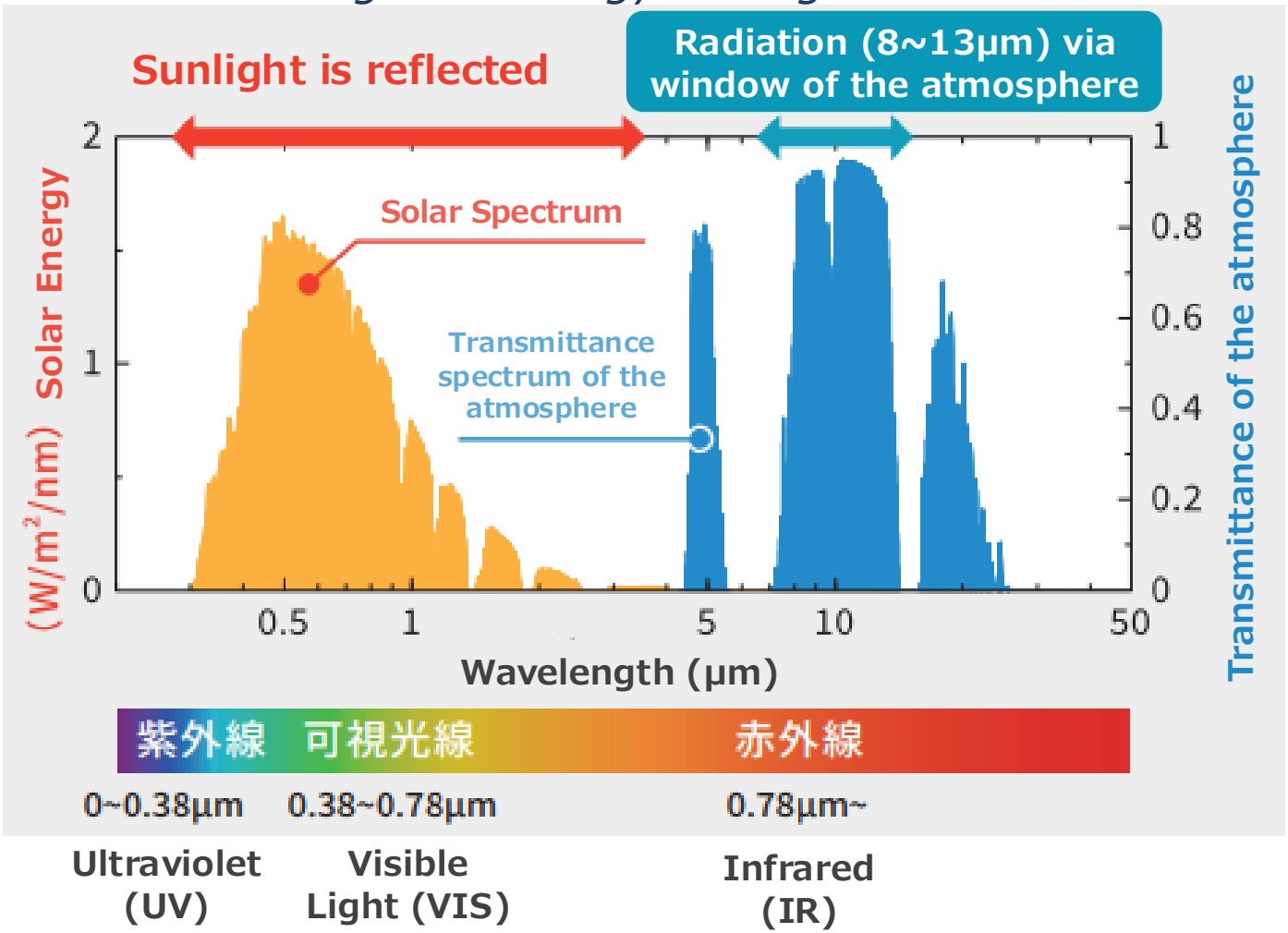
Mechanism

*Unique multilayer structure creates outstanding **reflectance** AND **emittance** effecting zero-energy cooling*



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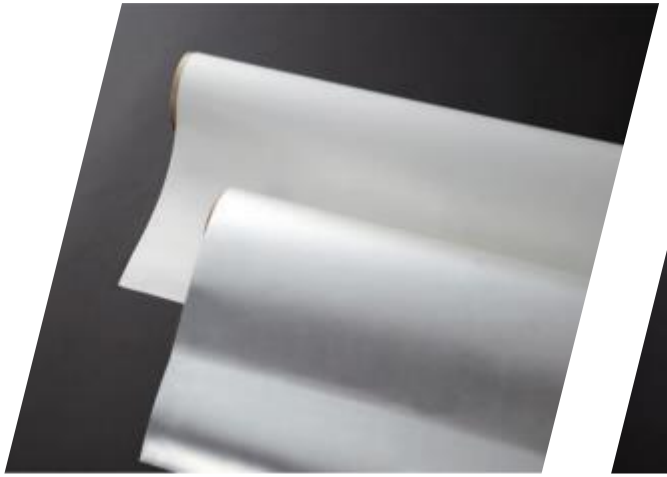
Product Lineup

Various Solutions Empowered by SPACECOOL

Self-Adhesive Film



Certified non-combustible material

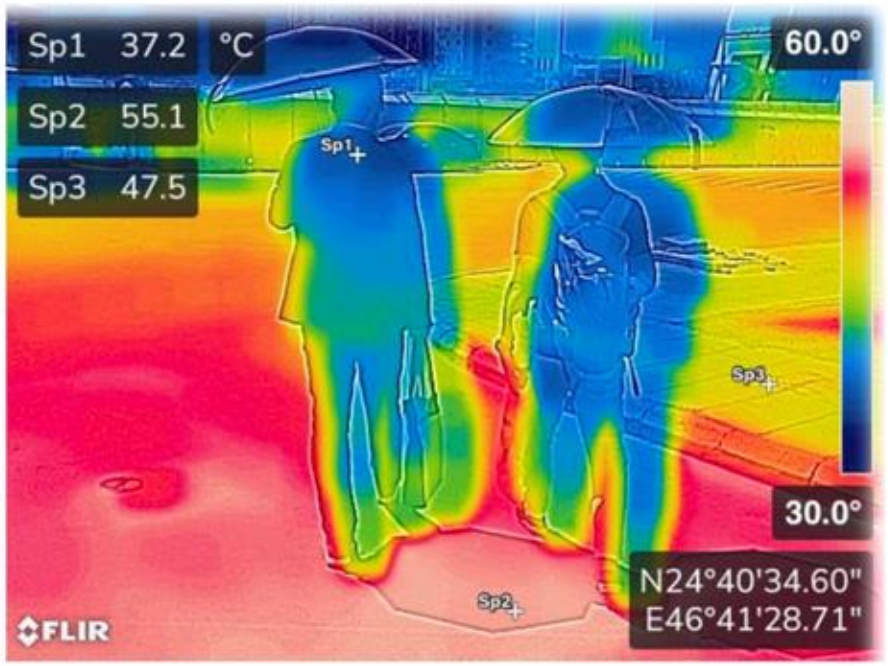
Membranes

Weldable and sewable

Magnet Sheet

Easily cut,
effortlessly affixed to steel.

Have Your Personal Cool Space with SPACECOOL



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Who Are We?

Company profile

Company name	SPACECOOL INC.
Location	[Sales Offices] Tokyo, Nagoya, Kyoto [R&D Laboratory] Kyoto
Date Founded	April 1st , 2021
Capital	100 million yen
Management	CEO & CTO: Masahiro Suemitsu CSO: Takayuki Hoshuyama
Business Description	• Production and sales of the radiative cooling material "SPACECOOL". • Sales and consulting services for energy-saving solutions and environmental improvement products.

Share Holders

WiL WORLD INNOVATION LAB

Daigas Group

SPARX Asset Management

MS&AD

MITSUI SUMITOMO INSURANCE Venture Capital Co., Ltd.

MITSUBISHI HC CAPITAL

＊Japan Gas Association press release, March 2023

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Major Awards / Media Coverage & Publications / International Events

■Japan Institute of Design Promotion

GOOD DESIGN AWARD 2024
グッドデザイン金賞

■Winner of the Excellence Award, Tokyo Venture Technology Awards 2024

TOKYO VENTURE TECHNOLOGY AWARD

■Ministry of the Environment

<4社共同受賞>
COOL分電盤
竹中工務店
セイリツ工業
大阪ガス
SPACECOOL

令和5年度
気候変動アクション大賞

■Sustainable Management Promotion Organization Eco Pro Award 2023 "Minister of Land, Infrastructure, Transport and Tourism Award"

EcoPro Awards

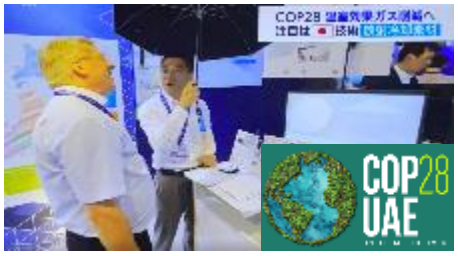
■PwC
Selected for “Middle East Net Zero Future 50”.
Nov 2023

■NHK News7
Special program on COP28

■TV Asahi’s
"Broadcast! Future Creator “

■Weekly Toyo Keizai 2024 Edition
Selected for "Amazing Ventures 100"

■COP28 in Dubai, Dec 2023
TV Tokyo's "World Business Satellite"



■COP27 in Egypt, Dec 2022
Japan Pavilion

■GRIC PITCH
Winner of Two Sponsor Awards

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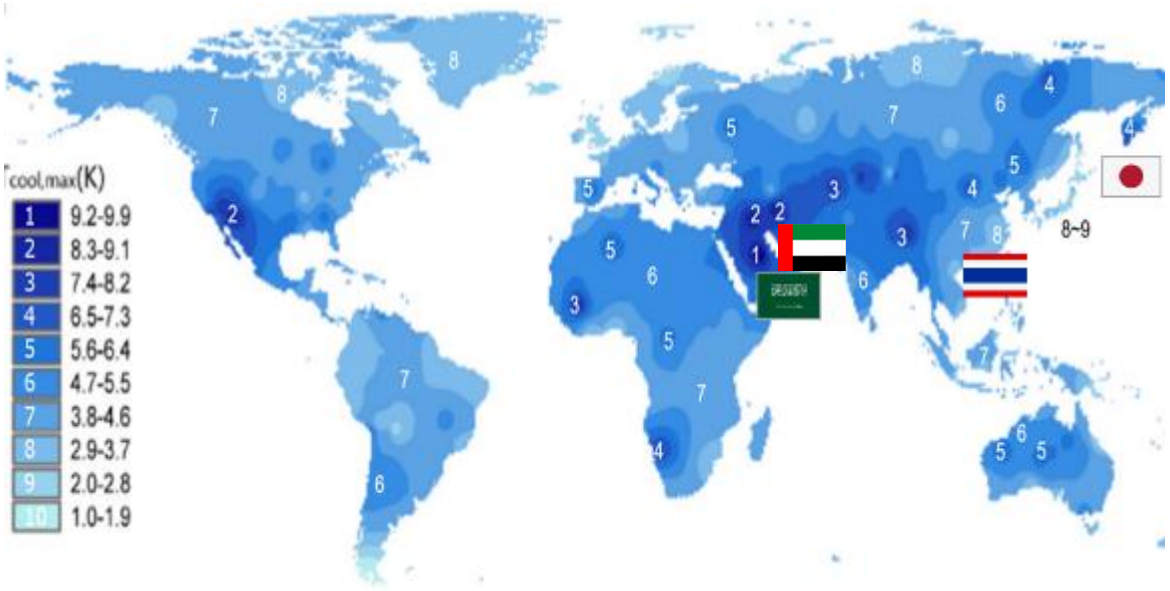
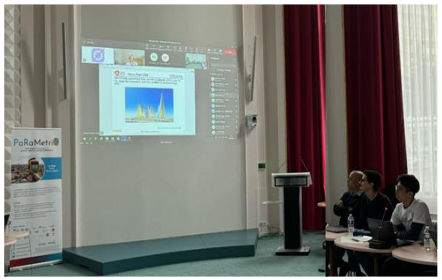
Global Expansion



Global Standardization

PaRaMetri

Co-funded by the European Union | METROLOGY PARTNERSHIP | EURAMET



MENA

Japan-Saudi Business Forum (Riyadh, July 2023)

OSP برنامج استدامة الطلب على البترول Oil Sustainability Program

أرامكو السعودية saudi aramco

Red Sea Global

Zamil Group

MISCGLOBAL

経済産業省 | وزارة الطاقة MINISTRY OF ENERGY

Japan-UAE Business Forum (Abu Dhabi, July 2023)

EMIRATES PALACE MANDARIN ORIENTAL ABU DHABI

ASEAN

SCG SIAM CEMENT GROUP

C.P. GROUP

SIAM STEEL

TRANE TECHNOLOGIES

HONDA

TOYOTA BOSHOKU

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Our Recent Global News

- We established our **first overseas subsidiary**, **SPACECOOL Europe GmbH i.G. in Munich**

-> Advancing strategic partnerships with universities and environmental groups, engaging in standardization bodies, developing new markets, and preparing for regional production.

- We have joined the **Cool Coalition**, led by **UNEP**, to support and promote the global adoption of **passive cooling**.
- We participated in **COP30**
- Participating in the startup event **SLUSH** in Helsinki.

World Expo 2025 - Osaka

“SPACECOOL” material installation and initiatives.

Gas Pavilion “Ghost Wonderland”

Radiative cooling material adopted for the sharp, silver-colored roof membrane of the pavilion structure.

East Gate Entrance Roof

Innovation Proof RR” waterproof sheet by LONSEAL Co., Ltd. adopted.

Japanese Red Cross Tent

Emergency aid tent at “Gallery WEST”

Play Area Objects

Installed to prevent burns in children’s play spaces.

SPACECOOL Umbrella

On-site special sales of SPACECOOL sun umbrellas at the Gas Pavilion.

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Use Cases

Heat Mitigation by SPACECOOL

Power & Cost Savings, CO2 Reduction

AC Outdoor Units

Telecom Station

Prevent Equipment Failure →
Increase Reliability &Reduce OPEX

Power Distribution Board & Cubicle

Gas Supply Control Panel

Improve Working Environment

Portable House

Corrugated Metal Roof

Enhance Productivity

Solar PCS Panel

Livestock Facility

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Outdoor Unit of HVAC System

SPACECOOL

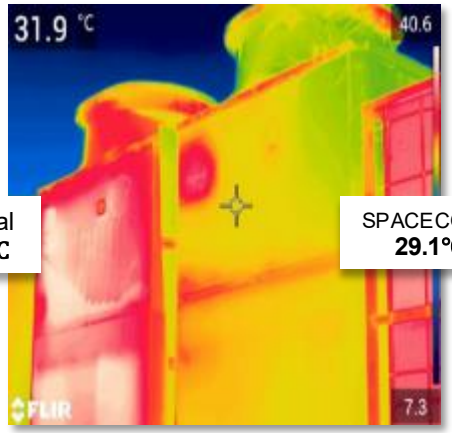
Installing SPACECOOL to outdoor unit can reduce temperature of the unit, prevent emergency stop and save energy for cooling

Location: **Food factory in Japan (Kanagawa)**

Object: Outdoor unit for refrigeration system
(Setting temp. 5℃ / Room 10.5㎡)
*Mitsubishi Electric ECOV-EN75MC 1

Measuring Item: 1. Surface temperature
2. Machine temperature of outdoor unit
3. Power consumption

Surface temp.

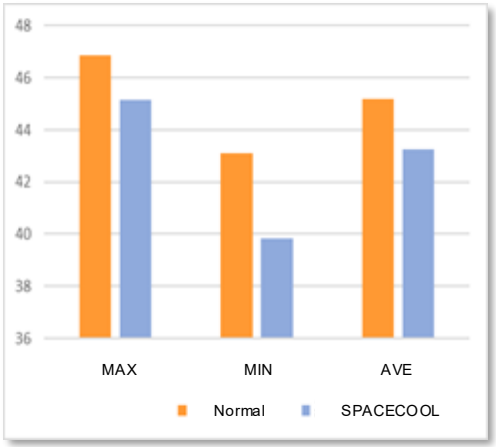


Normal
36.3℃

SPACECOOL
29.1℃

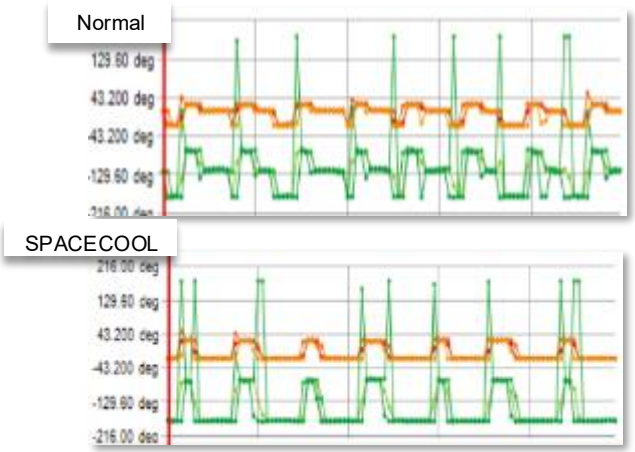
Temp. reduction -7.2℃

Machine temp.



Temp. reduction (AVE) -2℃

Power consumption



Power consumption -18%

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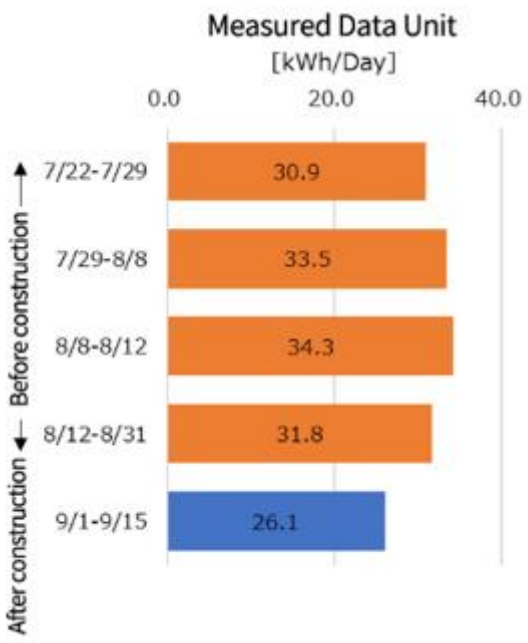
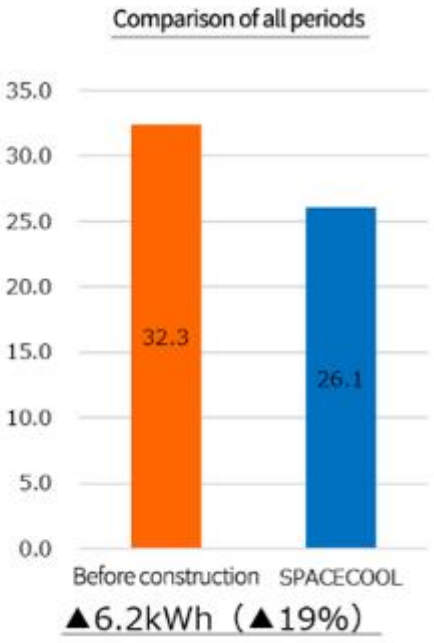
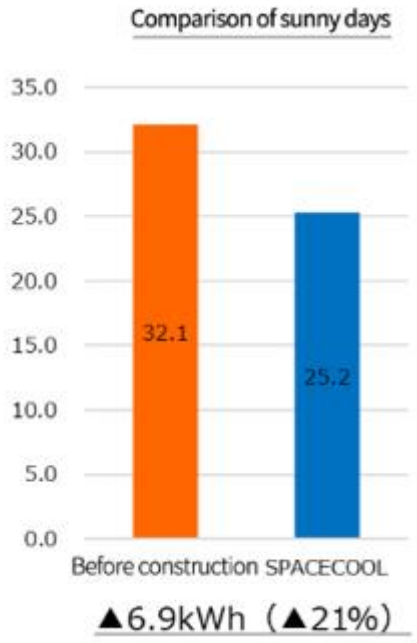
Energy Storage Battery

Average power consumption per day(kWh)







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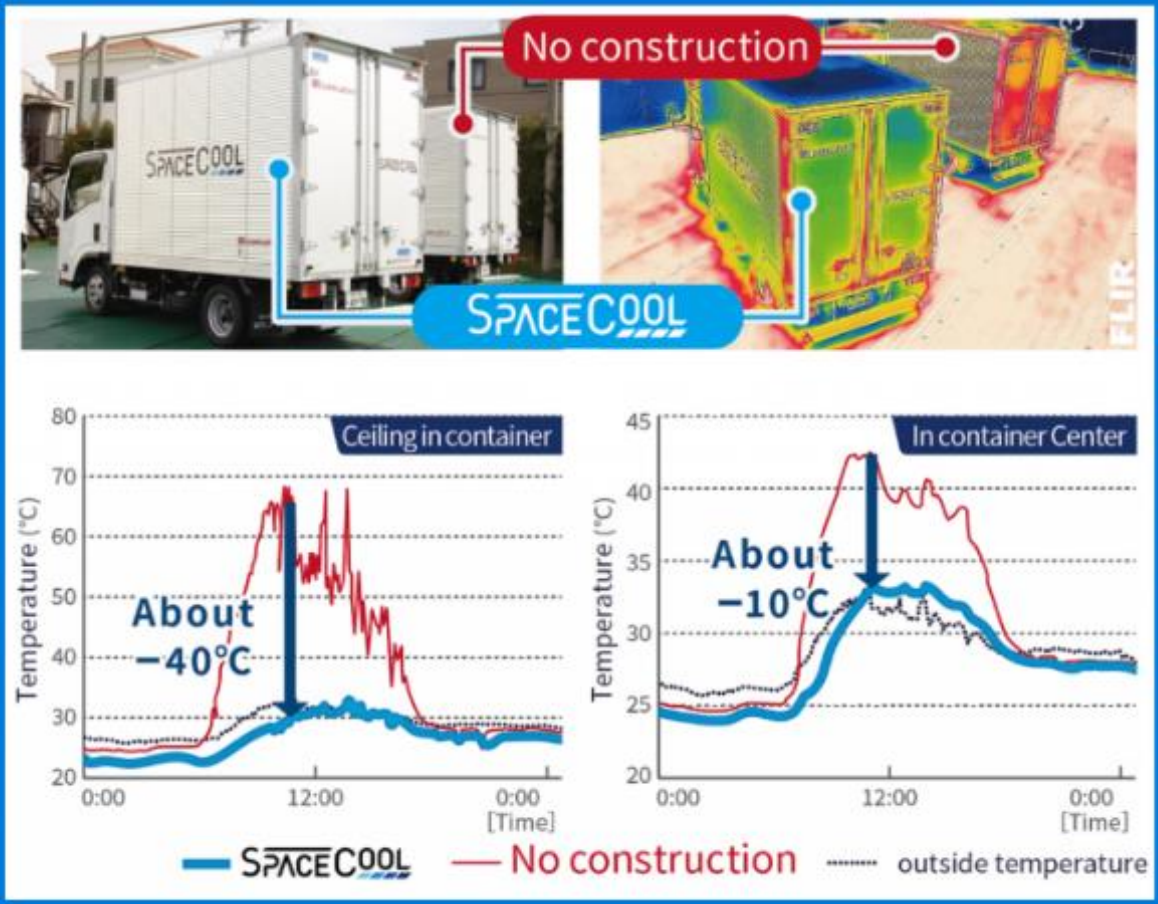
Truck Containers

Reduced the internal temperature of truck containers by approximately -10°C



＜Test condition＞

Measurement period：September 12th, 2020

Object of installation：Truck container made by Fruehauf Japan (dry pan)

Materials：Aluminum, plywood

Size：2 tons

Locations measured：The interior ceiling and middle of the container

＜Experiment Results＞

Ceiling：A temperature drop of approximately -40°C was confirmed compared to before installation.

Middle：A temperature drop of approximately -40°C was confirmed compared to after installation.

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Manufacturing Facilities

When implemented in a large-scale automobile factory, has the potential to further reduce CO2 emissions by up to 2% compared to conventional technology

Figure 3: Exterior of building after material application (total area of application: 500m2)

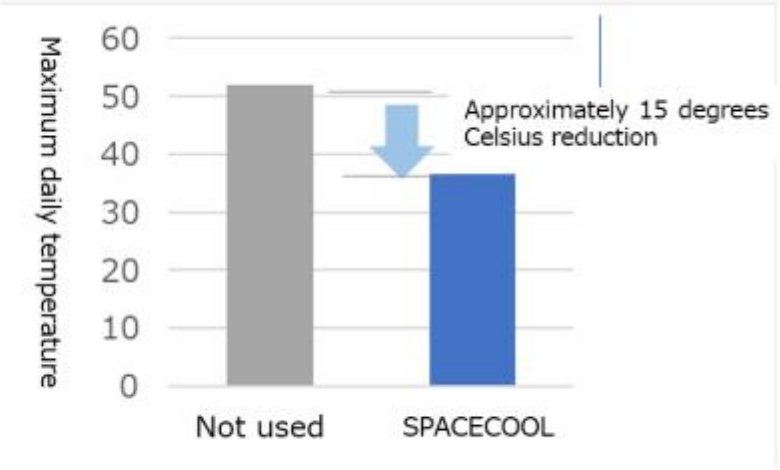


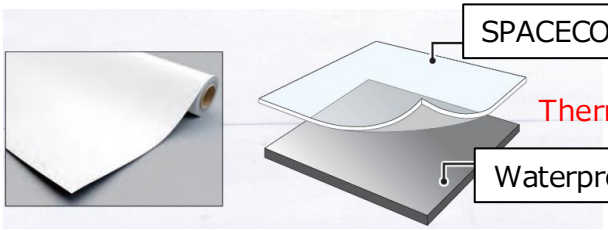
Figure 4: Temperature measurement inside the roof

Waterproof Roofing Membrane

SPACECOOL

LONSEAL CORPORATION

東京都交通局
Tokyo Metropolitan
Bureau of Transportation



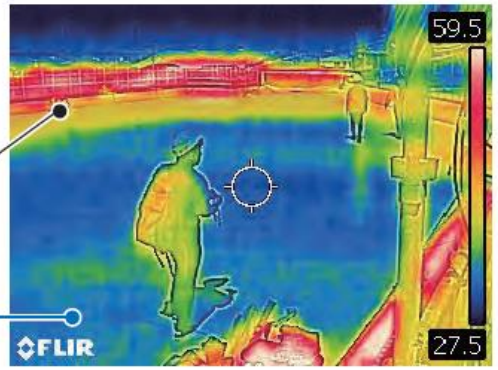
Cool 当社ニューベストプルーフとの比較

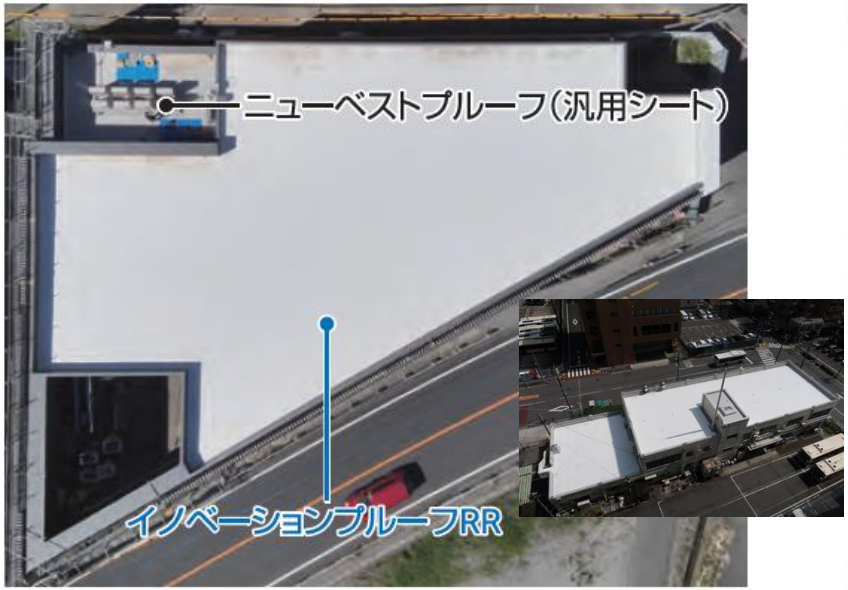
Surface temperature difference

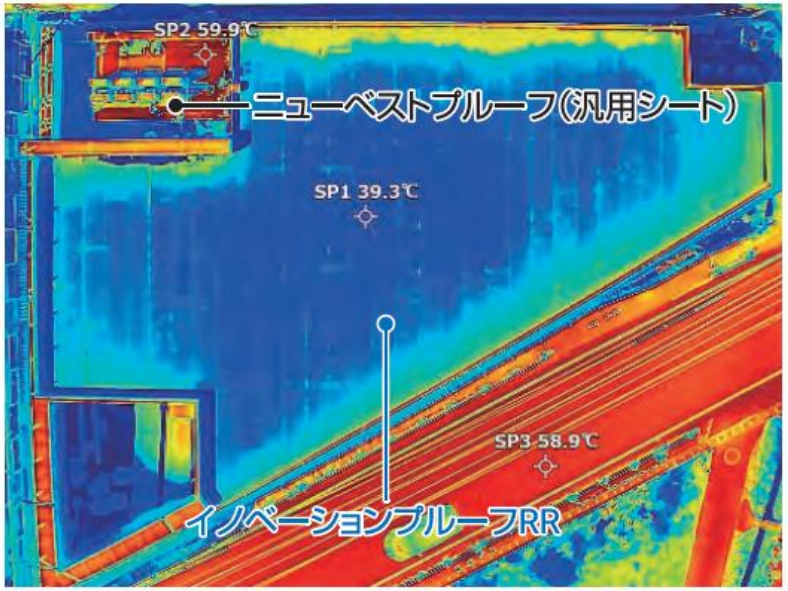
約-20℃～-30℃

Conventional Waterproof sheet

Innovation Proof RR (with SPACECOOL)







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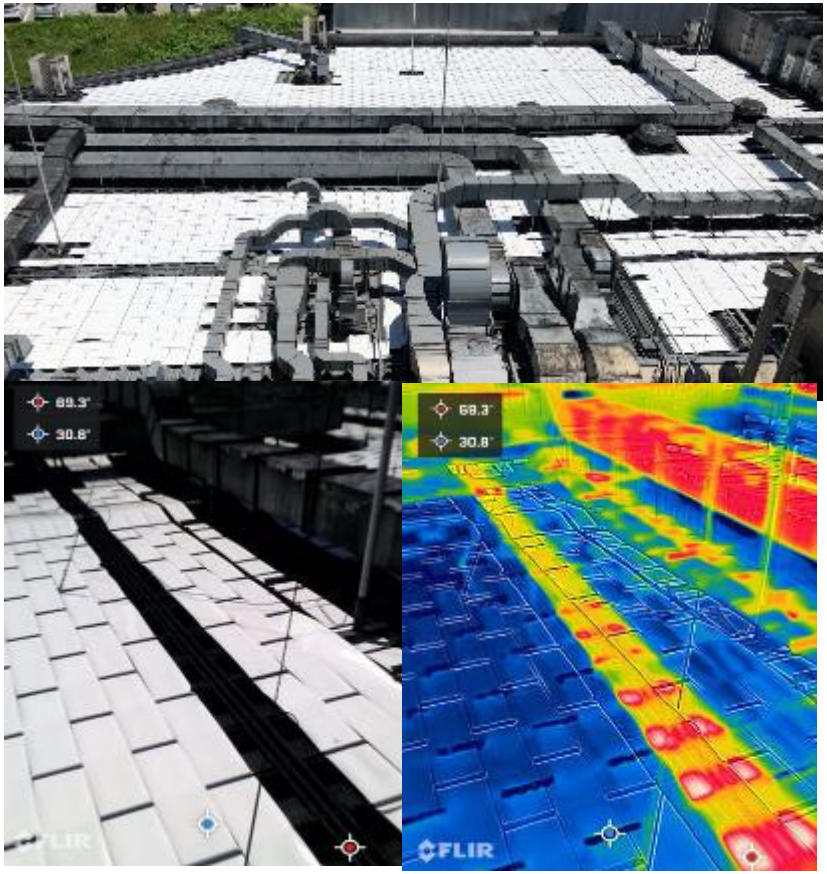
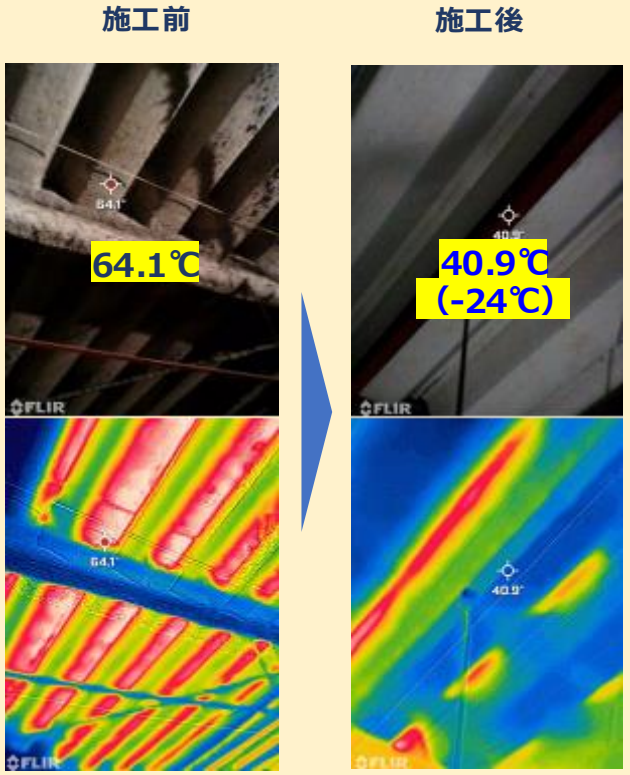
Roof Shade on Metal Roof Cover

NIHON WIDECLOTH Co., Ltd.
有限会社 石川テント



屋根裏折板の温度



1st floor (not air conditioned)	
44.3 ℃ ▶	**34.1 ℃ (-10.2℃)**
Ground floor (air conditioned)	
28.5 ℃ ▶	**26.4 ℃ (-2.1℃)**

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Roof Application in Thailand

- User : Honda Engineering Asian Co., Ltd.
- Product : SPACECOOL Tarpaulin
- Area : 420㎡

Purpose Cooling, Energy Saving (Estimated -40~50%*) *Calculation by HONDA

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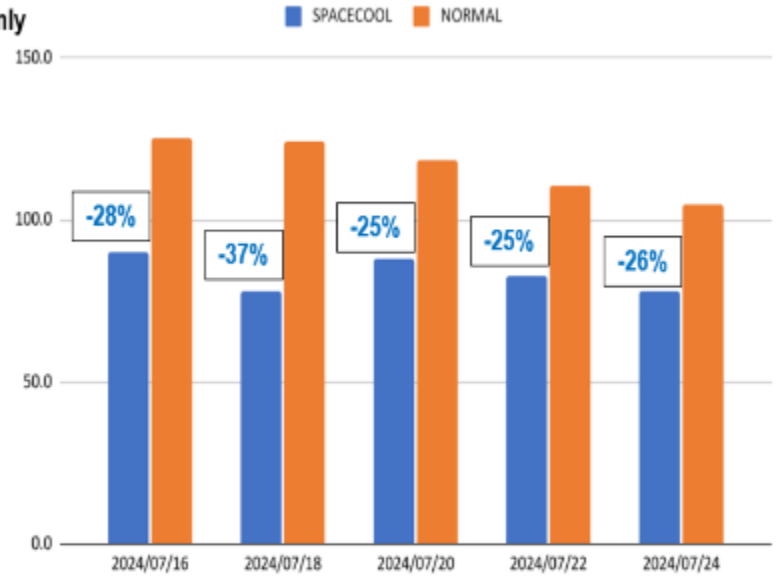
Case study in KSA -Portable house-

-29% reduction of AC energy consumption
-21 ton-CO2 decrease over 15 years



LinkedIn Arabic & English

	SPACECOOL	NORMAL	Difference
Average temperature (℃)@12PM	47.4	55.0	-7.6
Average daily power consumption for AC (kWh)	83	117	-34 (-29%)

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Evaluation Report by Saudi Aramco

SPACECOOL

Engineering Report

SAER-12856 March 16, 2025

A Comprehensive Evaluation of SPACECOOL's Radiative Cooling Technology

Document Responsibility: Process & Control Systems Dept. (P&CSD)

Author: Abdulmajeed Almohnna, P&CSD/ESD/NIEG

Field Partner: Fallatah, Hatem A, NGPD

Reviewer: Ayman Youssef, P&CSD/ESD/NIEG

Approval: Mohammed Al-Makhaita, Manager (A), P&CSD/ESD

Saudi Aramco DeskTop Standards

- ✓ **Effectiveness: Roof temperatures -20°C, cooling energy use - 14–20%,** without electricity or water.
- ✓ **Strong durability under UV and heat exposure**, with ongoing field tests confirming long-term performance.
- ✓ **5-year payback** and positive ROI —**wider deployment is strongly recommended**.
- ✓ Further deployment in Saudi Aramco's **remote and temporary building** where higher energy savings are expected.

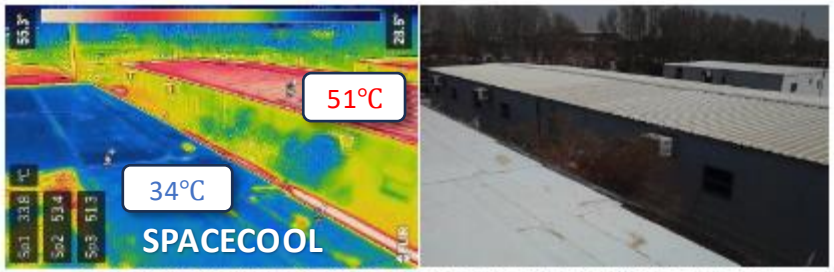

Figure 1 Thermal imagery to illustrate SPACECOOL's effect on roof's surface temperature at NGPD

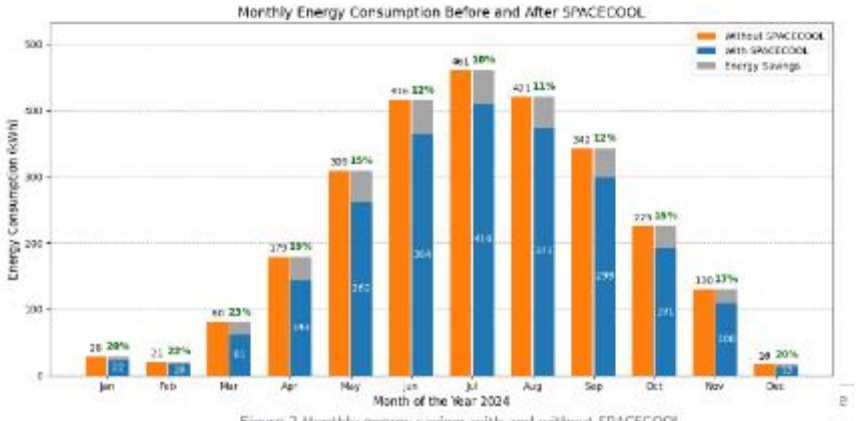

Figure 2 Monthly energy savings with and without SPACECOOL

Figure 3 Accelerated exposure testing and outdoor setup at RSDC KAUST

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Sunshade For Tennis Court

Sunshade for Tennis Court (3,200m^2) at Emirates Palace Hotel in Abu Dhabi

	Without SPACECOOL	With SPACECOOL
Ground surface temperature	54.3	38.5

- 15.8℃ reduction

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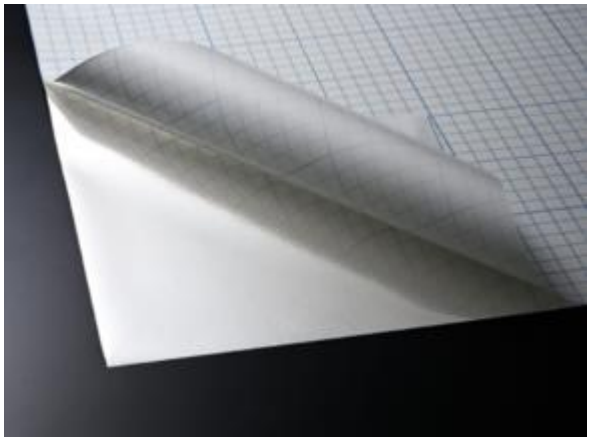
Product Line-up

SPACECOOL Film (HD)

- ✓ Self Adhesive Film.
- ✓ 15+ years outdoor durability.



Product	SPACECOOL Film (HD)
Serial number	SCF - 2BXX - XNW
Non-combustible / Flameproof	Non-combustible
Size (width × length)	1250 mm × 25 m
Material properties	Polyvinyl chloride, etc.
Thickness (typical value)	230 μm (Included adhesive)
Weight (typical value)	255 g/m² (Not including release paper)
Adhesive	Made of pressure-sensitive re-peelable acrylic
Adhesive strength (stainless steel plates)	About 18N/25 mm (Measured 24 hours after installation)

[Test methods]

Thickness: ISO 4593 as standard.

The values for the product attributes are based on the results of tests conducted at a temperature of 20℃ and a humidity of 65%.

MLIT-certified non-combustible material - Certification: NM-5897, NM-5898

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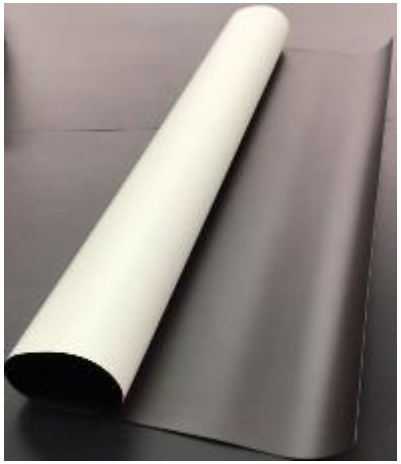
SPACECOOL Magnet Sheet

✓Easily cut, effortlessly affixed to steel.



Name of product	SPACECOOL Magnet Sheet_White
Product code	White：SCG-040I-KXW
Non-combustible / Flameproof	—
Size (width × length)	1020 mm × 10 m (Random length)
Material properties	Base Material: Bond magnet | Surface: PVC, etc.
Thickness	0.58 ± 0.02 mm
Weight (typical value)	1459 ± 50 g/㎡
Magnetized pitch	2.2 mm
Surface inductive flux	27 mT　270 G
Adsorption power	1.77 kPa　18 gf/㎠
Maximum energy product (BHmax)	4.0 kJ/㎥　0.5 MG・Oe
Remanence	150 mT　1500 G
Coercivity (bHc)	103 kA/m　1300 Oe
Coercivity (iHc)	219 kA/m　2750 Oe

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SPACECOOL Tarpaulin

✓ Weldable and sewable.

Name of product	SPACECOOL Tarpaulin-200F(high strength)_White SPACECOOL Tarpaulin-200F(high strength)_Silver	SPACECOOL Tarpaulin-50F(light weight)_ White
Product code	White：SCM-200E-XFW Silver：SCM-200E-XFS	White：SCM-050E-XFW
Non-combustible / Flameproof	Flameproof	Flameproof
Size (width × length)	104 cm × 50 m (Random length)	120 cm × 50 m (Random length)
Material properties	Base Material : Polyester Surface : PVC, etc.	Base Material : Polyester Surface : PVC, etc.
Thickness	0.73 ± 0.05 mm	0.56 ± 0.05 mm
Weight (typical value)	880 ± 50 g/㎡	700 ± 50 g/㎡
Tensile strength (vert × lat)	2100 N/3cm × 1800 N/3cm	490 N/3cm × 490 N/3cm
Elasticity (vert × lat)	19 % × 25 %	18 % × 25 %
Certified	・Japan Fire Retardant Association certified flame retardant product Certification: FR-03259	・Japan Fire Retardant Association certified flame retardant product Certification: FR-04296
Test methods	Size : JIS L 1096 as standard. Thickness : JIS L 1096 as standard. Weight : JIS L 1096 as standard. Tensile strength : JIS L 1096 as standard.	Size : JIS L 1096 as standard. Thickness : JIS L 1096 as standard. Weight : JIS L 1096 as standard. Tensile strength : JIS L 1096 as standard.

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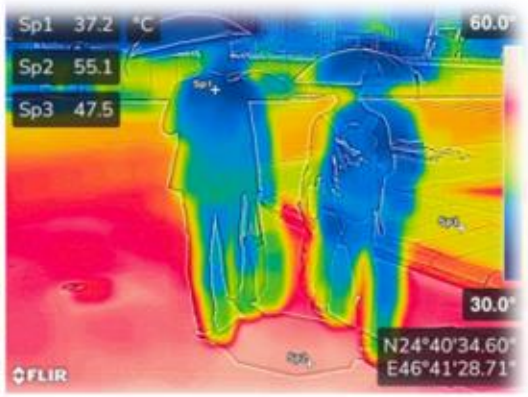
SPACECOOL

Appendix



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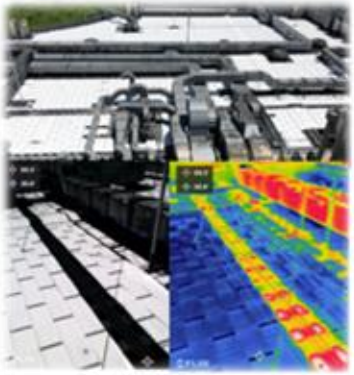
Appendix – Useful Resources



Spacecool Video Channel
https://www.youtube.com/@spacecoolinc.6793

Article of Prof. Raman on Passive Radiative Cooling (Nature 2014)
https://www.nature.com/articles/nature13883

Parametric Project (EU Project on measurement of passive radiative cooling)
https://parametric.inrim.it/home

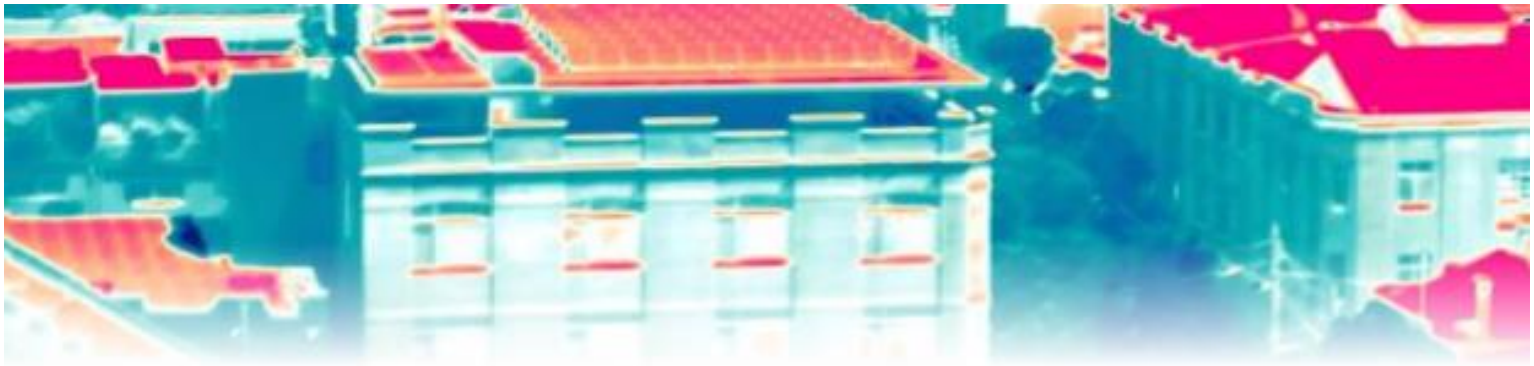
Paper on performance measurements from Parametric Project
https://link.springer.com/article/10.1007/s10765-025-03532-6

Wikipedia Introduction to Passive Radiative Cooling
https://en.wikipedia.org/wiki/Passive_daytime_radiative_cooling

Collaboration with European R&D Consortium

Our collaboration with EURAMET

- **We have started collaboration on the performance evaluation and life cycle assessment of SPACECOOL® material that can cool with 21GRD03-PaRaMetriC Consortium ("PaRaMetriC")**
- **SPACECOOL will participate in PaRaMetriC as a collaborator and contribute to the standardization of radiant cooling materials**



PaRaMetriC × SPACECOOL

Metrological framework for passive radiative cooling technologies

The project 21GRD03 PaRaMetriC has received funding from the European Partnership on Metrology, co-financed by the European Union's Horizon Europe Research and Innovation Programme and from the Participating States.

About PaRaMetriC

- PaRaMetriC is a consortium organized by public institutions and universities in the EU, which **aims to standardize radiant cooling materials in the future under the following objectives**
- 1) Development of a metrological framework to classify and compare radiative cooling materials (evaluation and validation of appropriate benchmark materials and test methods)
- 2) Development of modeling methods for characterization of radiative cooling materials (establishment of criteria for quality control, evaluation of long-term effectiveness)
- 3) Setting up long-term tests to evaluate material performance under various real-world conditions

Interim results of PaRaMetriC

- **Midway through the results of the evaluation at PaRaMetriC:**

  the emissivity of SPACECOOL in the window area of the atmosphere is in the opinion of PaRaMetriC the largest of the radiative cooling materials availa