



Energy-saving plan for air conditioning costs of 15% or more.
Rust prevention, heat insulation, antifouling shield

THERMAL PAINT for outdoor unit

Waterproof & rust-proof coating for outdoor unit and its surroundings

「Rust Shield」

+

Thermal Paint for outdoor unit and its surroundings

「Thermo ECO Shield」

+

Antifouling and maintaining reflectance for outdoor unit and its surroundings

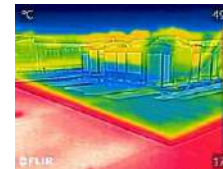
「Super Glass Barrier」



Before



After



Uncoated & Coated



Uncoated



Coated

Uncoated

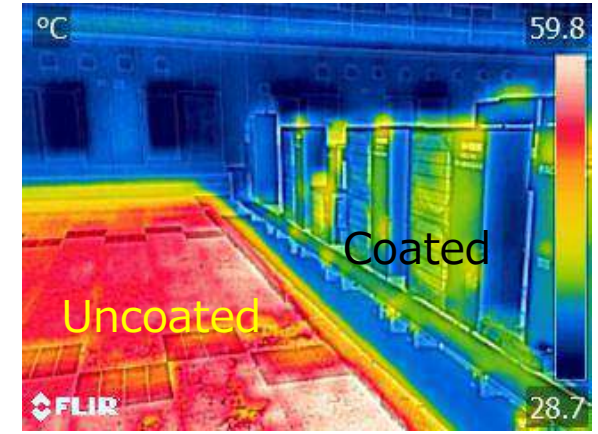
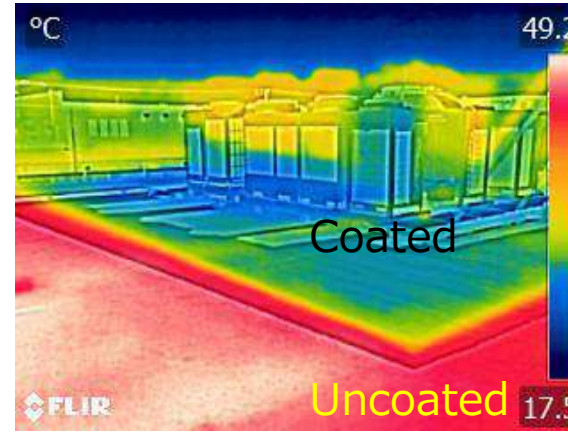
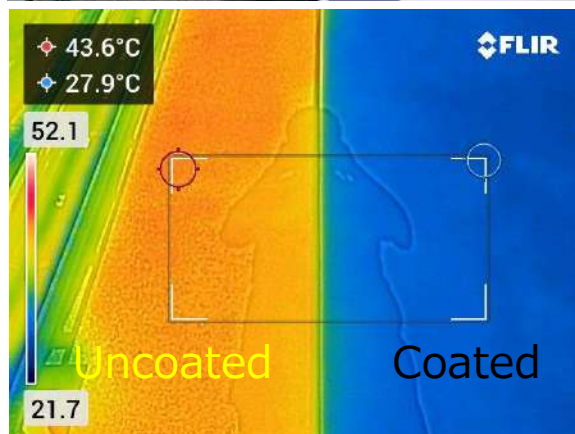
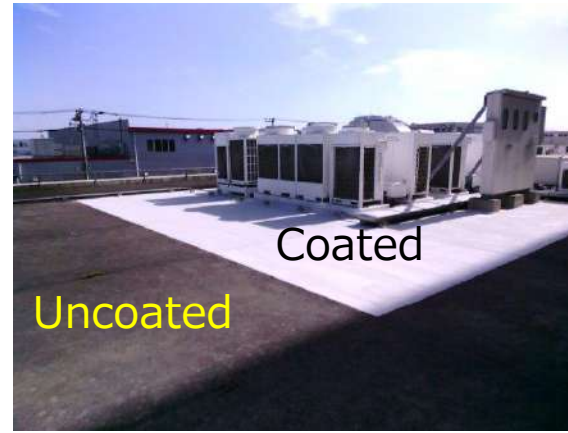
There is a big difference in energy saving with or without heat shielding and insulation measures for the outdoor unit and its surroundings.

Electricity bills are going up more and more since 2022

In the outdoor unit and its surroundings, which are exposed to direct sunlight in summer, the air temperature at the intake port is high due to solar heat, and the outdoor unit itself heats up, which places an excessive load on the compressor. Consume extra electricity.

Proposal to save energy by 15% or more

By coating the outdoor unit and its surroundings with Thermo ECO Shield, it is possible to reflect and insulate the heat of the sun. As a result, the load on the compressor is reduced, resulting in energy savings of 15% or more. .



4 cases of verification test

Verification Test ① by Kansai Electric Power

Energy-saving effect test for outdoor units of air conditioners

Test (1) Surround the outdoor unit with a light shielding net (light shielding rate 85%)

Result; Energy saving effect of about 10%. However, it is necessary to have a facility structure that can withstand strong winds such as typhoons.

Test (2) Sprinkle tap water on the outdoor unit (4L/h)

Result; Energy saving effect of about 10%. However, silica scale adheres to the heat exchanger, lowering the heat exchange ratio and degrading air conditioning efficiency. Also needs rust protection.

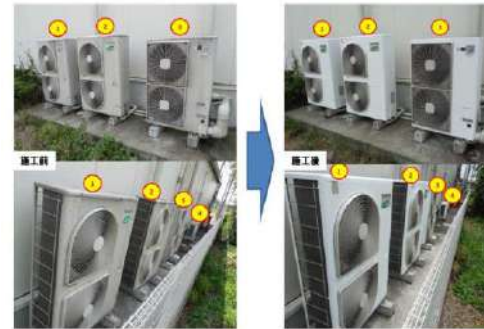
Test (3) Continuous watering (7 L/min) on the floor around the outdoor unit

Result; Energy saving effect close to 20%. There is about 35°C in the water-applied area and about 65°C in the non-applied area, confirming a difference of about 30°C. However, the increase in water and electricity charges due to water sprinkling is a problem. (Use of electric pumps for elevated water tanks, etc.)

Verification Test ② Case of convenience store

Demonstration of energy-saving effect by thermal painting only for outdoor unit.

Thermal paint was applied to the outdoor units of 3 shops, and changes in power consumption were measured.



Average of 3 stores

- ① Freezer; -9.7kwh
- ② Air conditioner; -6.9kwh
- ③ Main power 200V; -22.5kwh; -6.6%

The energy-saving effect was confirmed even with heat-insulating coating only for the outdoor unit. In particular, the outdoor unit faces southwest and is exposed to direct sunlight. Shop A has the highest energy saving rate.

■ Changes in electricity consumption before and after application for each shop

Shop	Equipment	Electricity usage		Reduction amount(kwh)	Reduction rate (%)
		Before coat	After coat		
Shop A in Saitama	Freezer	135.4	131.1	-4.3	-3.2%
	AC machine	59.0	45.8	-13.2	-22.3%
	200V	368.4	324.1	-44.3	-12.0%
Shop B in Saitama	Freezer	116.2	94.9	-21.3	-18.3%
	AC machine	79.3	74.7	-4.6	-5.8%
	200V	382.2	362.6	-19.6	-5.1%
Shop C in Saitama	Freezer	94.7	91.2	-3.5	-3.7%
	AC machine	72.7	69.6	-3.1	-4.3%
	200V	359.0	349.1	-9.9	-2.8%

5 cases of verification test

Verification Test ③ Central Research Institute of Electric Power Industry

Energy saving effect by changing the indoor set temperature of the air conditioner and the ambient temperature of the outdoor unit

Test) We changed the indoor air conditioner set temperature and the ambient temperature near the air intake around the outdoor unit to verify the power saving effect.

Prerequisite

Power consumption 450 W at outdoor unit ambient temperature 35 degrees & indoor temperature 23 degrees → Standard setting.

Test Result

①、When the room temperature is 5°C higher than the standard setting.

Outdoor unit ambient temperature 35°C & indoor temperature 28°C = power consumption 322W (28% reduction)

②、When the ambient temperature of the outdoor unit is lowered by 5°C with the same room temperature as in ①

Outdoor unit ambient temperature 30°C & indoor temperature 28°C = power consumption 187W (42% reduction)

Conclusion

14% energy-saving effect was confirmed just by lowering the ambient temperature of the outdoor unit by 5°C.

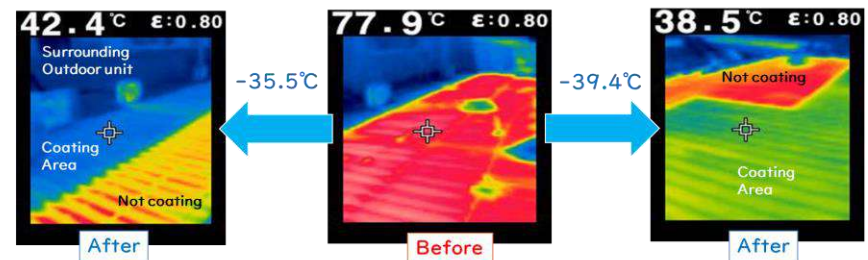
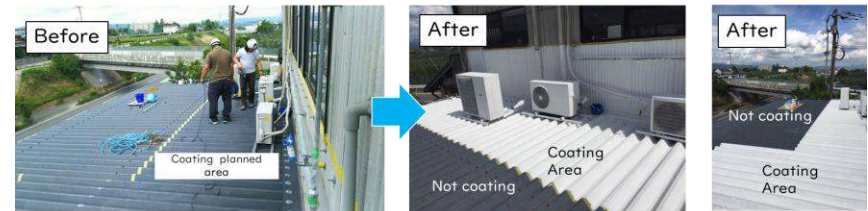
This test was conducted with the cooperation of NHK, and part of the test results was broadcast on NHK on May 31, 2011.

Verification Test④ by Sketch Co., Ltd

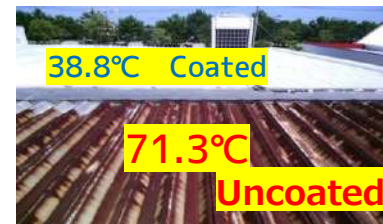
Application report for example

■Date: July 3~4th, 2017

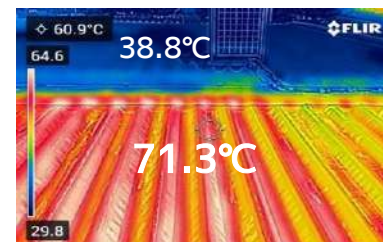
■Site: the roof of the Office building in Fukuoka-ken, Japan



Coating on a folded plate roof



32.5°C Down



= infrared thermography =

Indoor ceiling temperature without coating

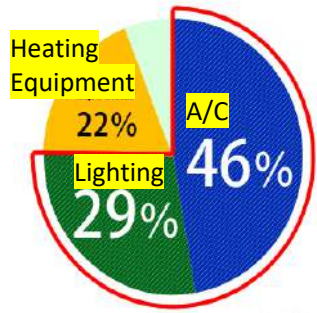


20.5°C Down



Indoor ceiling temperature with coating

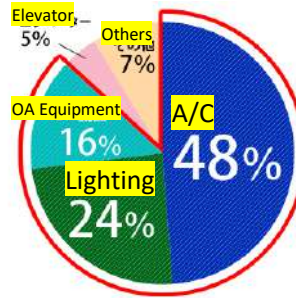
Amortization plan less than 3 years by 15% annual energy saving for 12-hours running Resto and so on.



出典：資源エネルギー庁推計

Restaurant

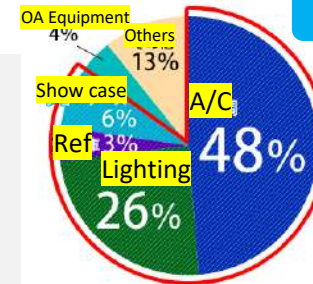
The electricity bill ratio of the air-conditioning accounts for **nearly 46%**.



出典：資源エネルギー庁推計

Office building

In the office building industry, air conditioning electricity bills account for **nearly 48%**.



出典：資源エネルギー庁推計

Wholesale & Retail Shop

In the wholesale/retail chain store industry, air conditioning electricity bills account for **nearly 48%**.

3-year amortization simulation in case of Japan

Simulation of energy saving rate 15%, case of 12-hour store in Japan

	Upper row; output during cooling	Electricity usage fee	Operating time	Cooling period 4 months	Utilization rate	electric bill	annual electricity bill	Energy saving rate 15%	Application Cost	amortization period Prospect
	Lower row; output during heating			4 months heating period						
5horse power	3.49Kw 3.36Kw	30JPY/kwh	12hours	120 Days	40%	60,307JPY	147,398JPY	22,109JPY	80,000JPY	3.6years
				120 Days	60%	87,091JPY				
10horse power	7Kw 6.7Kw	30JPY/kwh	12hours	120 Days	40%	120,960JPY	294,624JPY	44,193JPY	100,000JPY	2.3years
				120 Days	60%	173,664JPY				
15horse power	10.5Kw 10Kw	30JPY/kwh	12hours	120 Days	40%	170,100JPY	299,700JPY	44,955JPY	120,000JPY	2.7years
				120 Days	60%	129,600JPY				
20horse power	14Kw 13.4Kw	30JPY/kwh	12hours	120 Days	40%	241,920JPY	589,248JPY	88,387JPY	140,000JPY	1.6years
				120 Days	60%	347,328JPY				

3 steps of coating for Thermal paint

First coat 「Rust Shield」

1 Anti-Rust

: Long-term anti-rust effect with special epoxy resin

2 Auxiliary waterproof

: The special epoxy resin plays an auxiliary role in preventing rain and water leaks.

+

Second and Third coat 「Thermo ECO Shield」

3 High reflection

: Shields direct solar heat with a high reflectance of 85% or more
= Significant reduction in air conditioning costs in summer!

4 Heat insulation

: Uses 12% of special hollow silica beads, the highest in the industry. Significantly improved heat insulation in summer and winter

5 Sound insulation

: Reduces external noise by 10db and reduces internal sound leakage.

+

Topcoat 「Super Glass Barrier」

6 Antistatic and antifouling performance

: Mainly reduces adhesion of inorganic dirt such as yellow sand and volcanic ash.

7 Super hydrophilic antifouling performance

: It rinses away dirt with rain or running water.

8 Maintain infrared reflectance

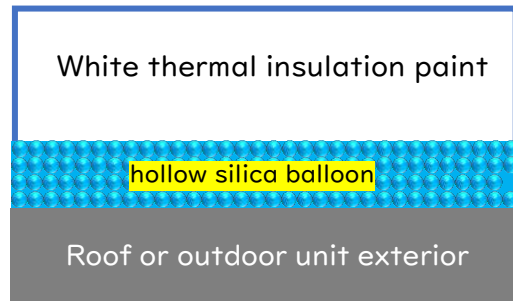
: Excellent antifouling performance continues to maintain high reflectance.
10% to 15% reduction in infrared reflectance without coating.

2 reasons why the heat shield and insulation performance is superior to other products

Reason 1: The higher the hollow bead content, the higher the insulation performance.

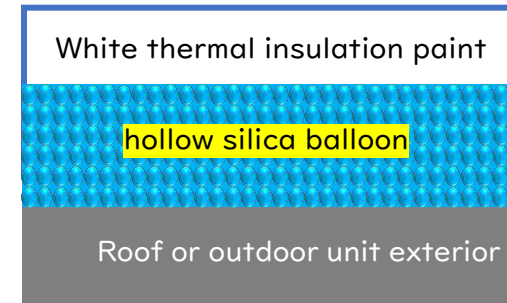
Thermo Eco Shield contains 12% hollow beads in the paint (60% in the paint film after application), which is more than twice that of other companies.

Competitor's thermal insulation paint



Assuming that the film thickness of the entire coating film is $300\ \mu\text{m}$, The film thickness of the hollow beads is $90\text{--}120\ \mu\text{m}$. (30-40% of total ratio)

Thermo ECO Shield

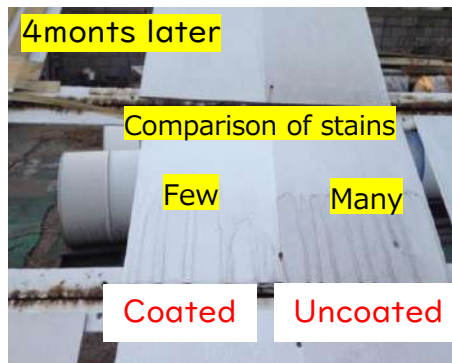


In a film thickness of $300\ \mu\text{m}$, Hollow bead film thickness $180\ \mu\text{m}$ (60% of total ratio)

Reason 2: The most important point in maintaining the heat shielding performance is not to reduce the infrared reflectance.

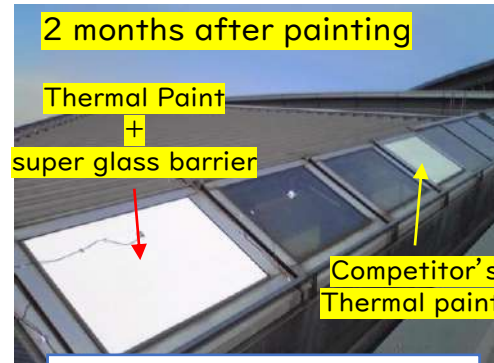
Reflectance is maintained by applying antistatic super hydrophilic antifouling coating "Super Glass Barrier".

Test in Korea



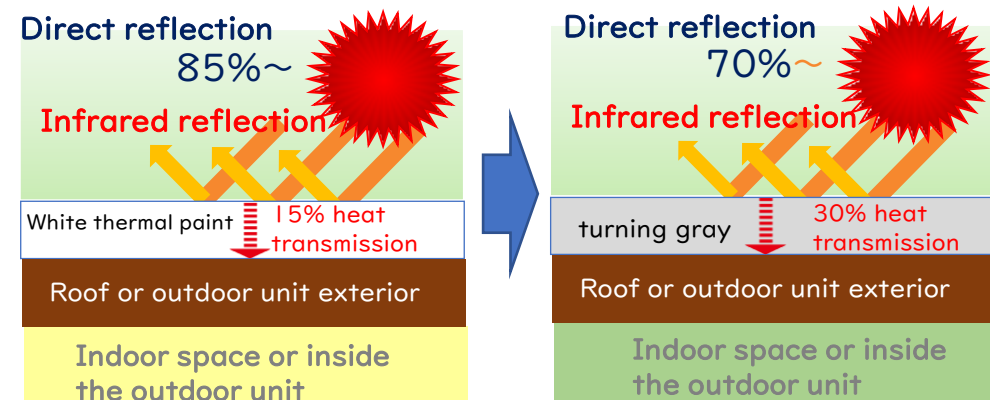
Dirt adhesion reduces reflectance

Tokyo Big Sight West Building



The coated area remains white and clean.

Degradation of white color due to adhesion of dirt

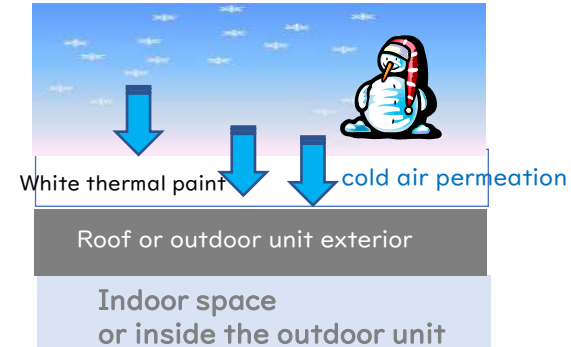
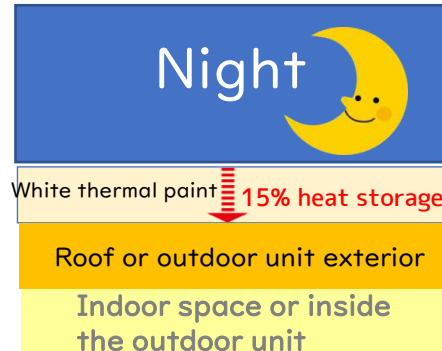
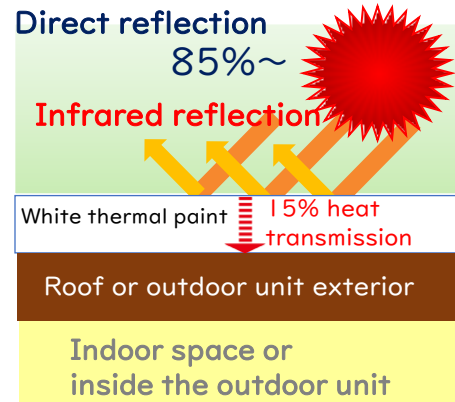
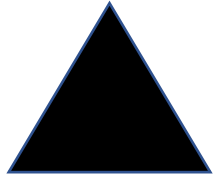


Difference in performance from other companies' products

Summer

Winter

Competitor's Thermal paint



VS

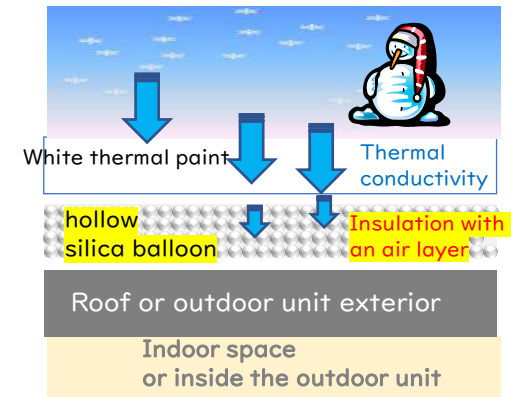
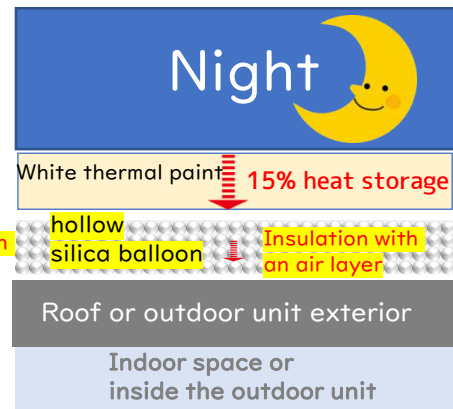
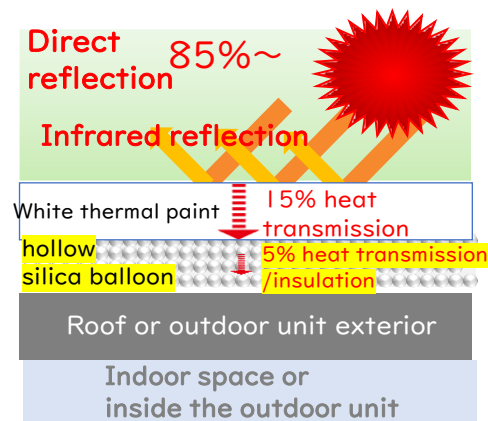
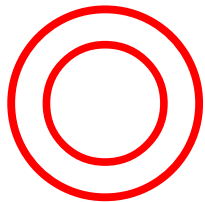
VS

VS

Summer

Winter

Our paint system
+Rust Shield
+Thermo ECO Shield
+Super Glass Barrier



Heat reflection and Thermal insulation performance comparison test

cooling in
summer



Infrared lamp 28°C difference

Winter
heating



Cold Spray 19°C difference

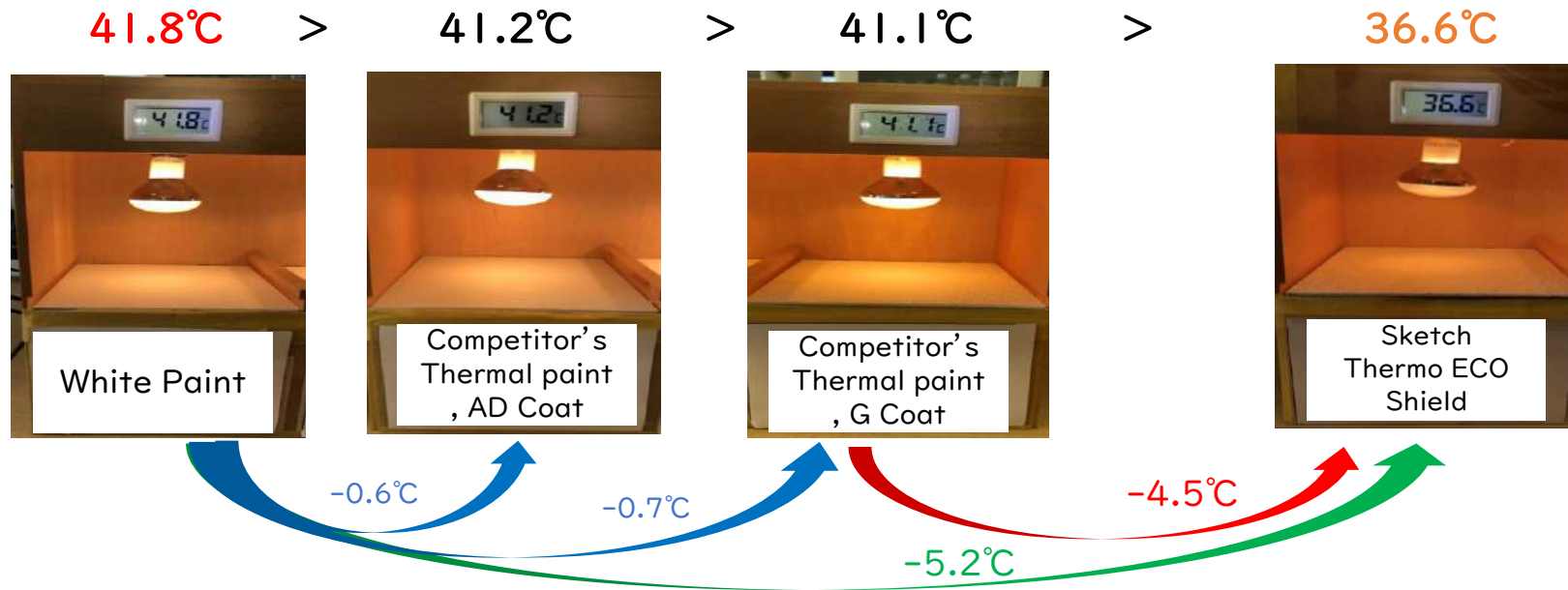
If the same board is coated with highly insulating paint, it will not get hot (upper left image) and cold (upper right image).

Thermal insulation performance comparison test

Spatial temperature of the sensor installed inside the box

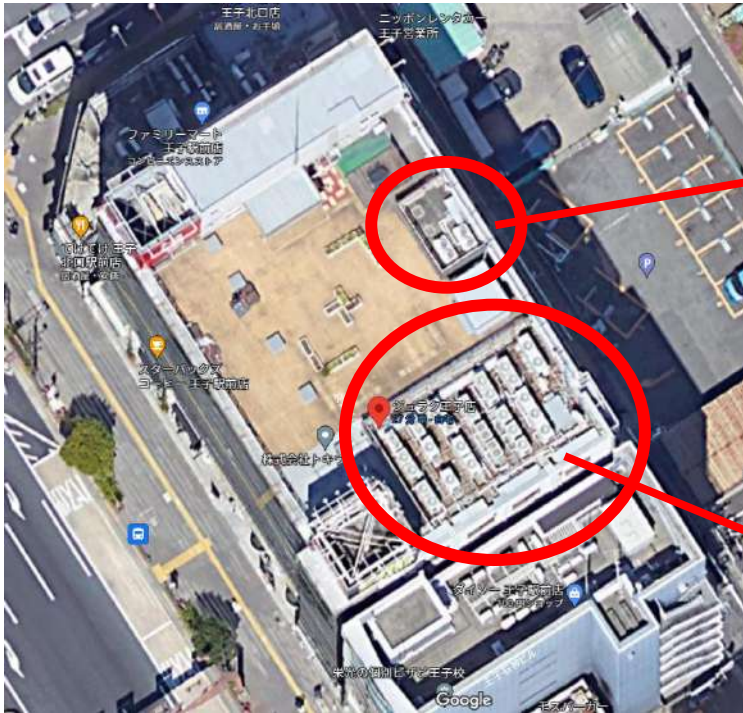
High internal temperature
= low thermal insulation performance

Low internal temperature
= high thermal insulation performance



Spatial temperature difference of 5.2°C with white paint, 4.5°C difference with other company's thermal insulation paint

A certain office building in Tokyo, Thermo ECO Shield Coating 285 m² Application completed in 3 days in August 2022



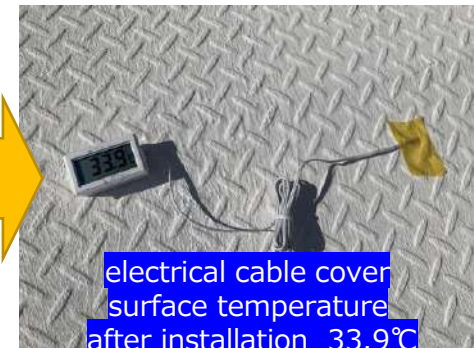
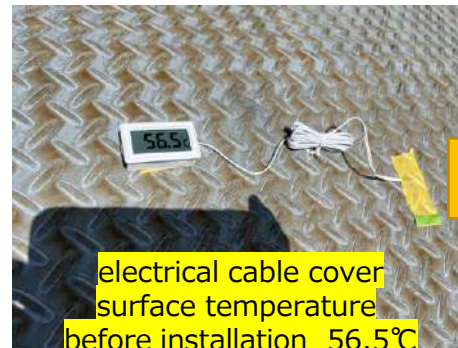
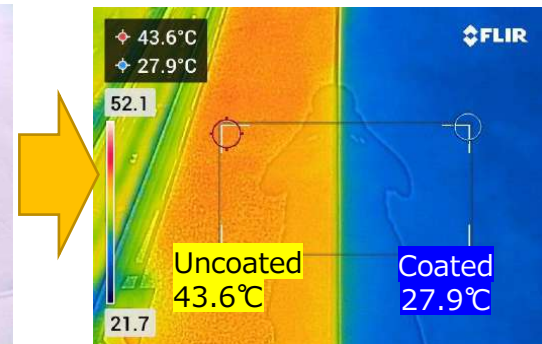
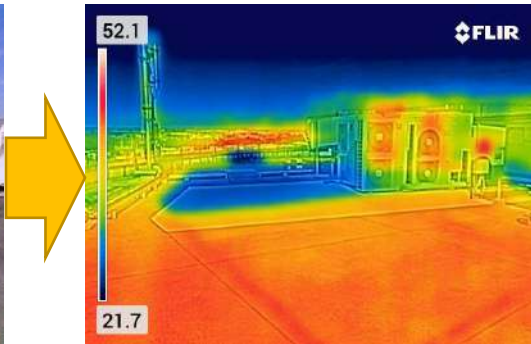
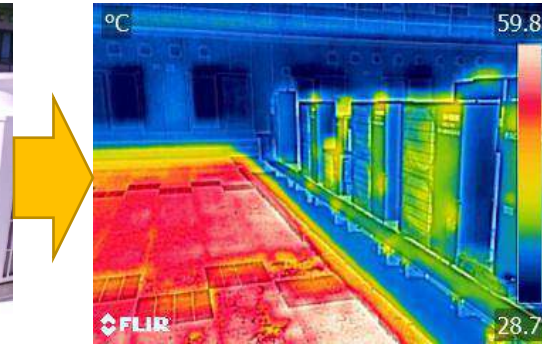
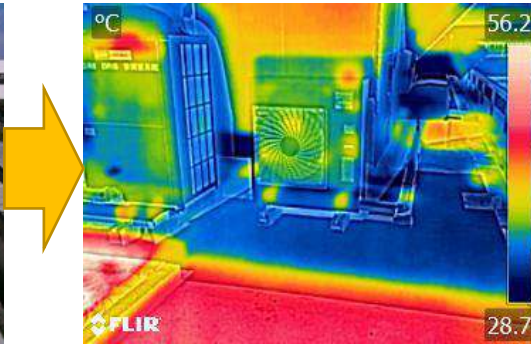
electric bill	2021								2022			
Electricity usage	May	June	July	August	September	October	November	December	January	February	March	April
	¥1,800,000	¥1,855,000	¥1,973,000	¥2,420,000	¥2,290,000	¥1,975,000	¥1,690,000	¥1,530,000	¥1,655,000	¥1,910,000	¥1,790,000	¥2,110,000
Air conditioning cost ratio 40%	¥720,000	¥742,000	¥789,200	¥968,000	¥916,000	¥790,000	¥676,000	¥612,000	¥662,000	¥764,000	¥716,000	¥844,000
Energy saving ratio 10%	¥72,000	¥74,200	¥78,920	¥96,800	¥91,600	¥79,000	¥67,600	¥61,200	¥66,200	¥76,400	¥71,600	¥84,400
Application Cost	¥3,320,000											
Amortization (year)	3.61											
<p>*As a precondition, 40% of the electricity consumption is assumed to be air conditioning cost, and it is assumed that 10% energy saving is achieved by painting the outdoor unit.</p> <p>In the energy-saving simulation, it is depreciated in 3.61 years, and the remaining 6.39 years is profit because the durability of the paint is 10 years.</p>												
<p>The remaining 6.39 years are profit.</p>												

Application example at a hospital facility in Japan

538.88sqm was completed at a Hospital in Tokyo in August 2022.



Temperature comparison after application



Outdoor unit surface temperature before installation 39.5°C

Outdoor unit surface temperature after installation 32.8°C

electrical cable cover surface temperature before installation 56.5°C

electrical cable cover surface temperature after installation 33.9°C

Application record : hospitals in Saitama ken, Japan

1,586sqm was applied at a Hospital in Saitama ken in November 2022

