

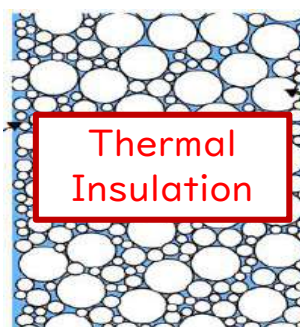
The Industry's first Multifunctional Paint & Coating

Non-combustible, heat insulation, constant temperature, sound insulation, condensation prevention, far infrared, anti-oxidation, deodorant, antibacterial, anti-fungal

Non-combustible, Energy-Saving, Health-promotion for Body-friendly

CoolHeat Shield NF PLUS※

※Nofire



Background of the development

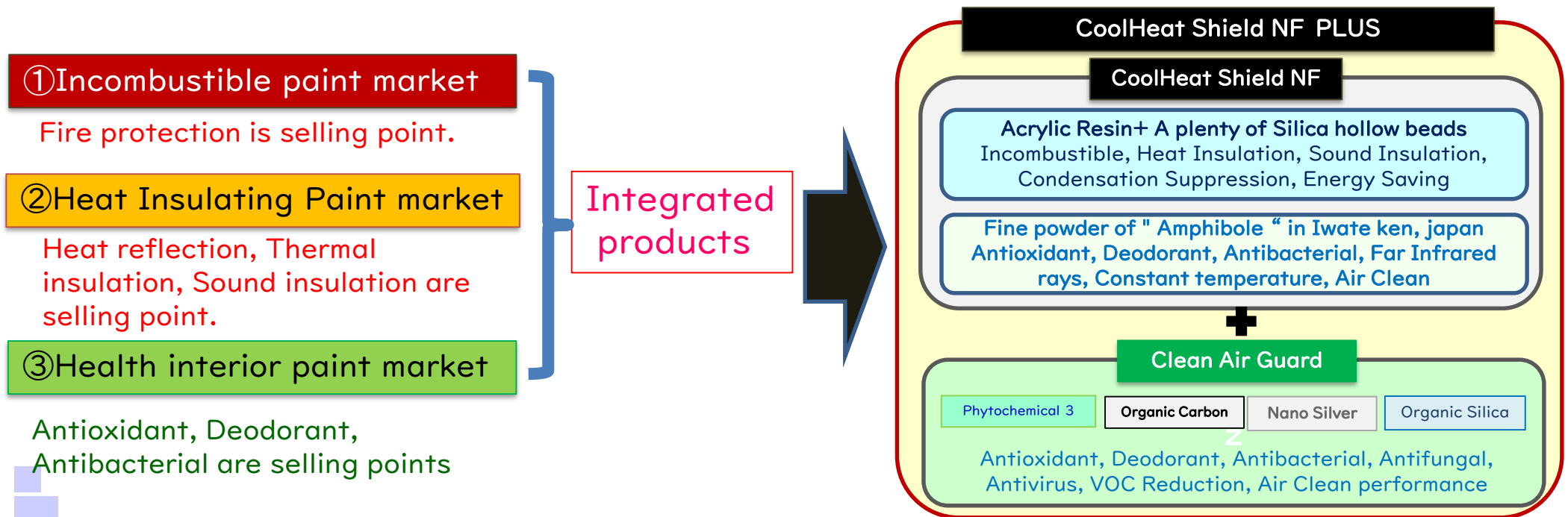
Problem① In China, due to the building rush, cheap paints and adhesives that can not still satisfy the VOC standards are still in use, and many health hazards have appeared. Although it was expected to be able to decompose VOC by the photocatalyst from Japan so far, it has been applied, but it can not pass the VOC standard after all, there are many instant deodorants and formaldehyde decomposing solution only for passing the inspection. However, it is a very serious problem now one week to 1 month after application , since it has not overcome the VOC standard again and it is not a fundamental problem solution as a sick house.

Problem②, Correspondence is late about fire prevention measures. Unlike in Japan, even if a fire breaks out, fire engines do not come in immediately, so residents living on high floors are more likely to lose their place and lose their lives. Therefore, as a fire protection measure, a new incombustible paint market was created in the United States and the EU, which creates an environment in which the room is difficult to burn even if a fire occurs. However, Incombustible paint is not very popular in the world because ① the cost of materials is high. ② Toxic gas is generated from the surface of the coating film when it becomes fire.

Solution; Under these circumstances, the need for 5 to 10% of the population of China as a whole seeking safe and secure indoor safety and requiring healthy paint, It is requested to have the performance quality better than the diatomaceous earth and the plaster, to request that the best health paint be developed, it can not be imitated by other companies, it is groundbreaking We developed a highly functional health paint “CoolHeat Shield NF”. As a feature , there are antioxidant effects on the body by using minus ions that are recognized in the Chinese medical industry, special ore that radiates far-infrared rays at a high level, amphibole(Kakusenseki) stone powder and Silica hollow beads powder . In addition, by using the far infrared radiation by the ore and the heat insulating effect by the hollow beads, the entire room temperature is made constant (constant indoor temperature, temperature unevenness is eliminated), energy saving measures are also supported. Furthermore, it added the function of American non-combustible paint NOFIRE.

In addition, It applies a “Clean Air Guard” with enhanced antioxidant and deodorant coating on coating film of CoolHeat Shield NF.

Incombustible paint market + interior insulation paint market + antioxidant and health paint market. An ultra-multifunctional paint that includes these three markets and is cheaper than other products in material cost and application cost.



History of development of indoor paints and coating solutions so far.

for the Chinese market, we have sold a large amount of three air freshening products so far.① Instant deodorant / decomposition agent “Air Refresh”; Used to reduce the numerical value of VOC for new buildings or to pass the VOC standard at the time of delivery.② “Form guard”: A special decomposition agent for formaldehyde.③ “Photocatalytic deodorant antibacterial coat”; visible light photocatalyst made by TOSHIBA, TOYOTA. + nano platinum. In China, these products are sold at an application cost of around 15 yuan (元) / m². However, as experience so far, photocatalyst products did not pass the Chinese standard at air pollution levels in China. Therefore, in response to requests from Chinese customers, we have developed a product, “Clean Air Guard”, which can pass only one application of TVOC standards such as formaldehyde, benzene, and paint odors. In recent years, instead of temporary symptomatic treatment for these problems, the need for health paints has increased in order to make the basic indoor environment safe and comfortable, and diatomaceous earth has come to be sold in large quantities.

Under these circumstances, SETSUDEN ECO SHOP Co.,Ltd was asked to develop the world's best safe multi-functional paint with better performance than diatomaceous earth and cheaper materials. As a basic function, we started development of multi-functional paint that can be used for power saving, non-combustible and health promotion measures as well as sick house measures and TVOC measures. In collaboration with Japanese resin experts, specialists in special ceramics and non-combustible paint manufacturers to solve this problem, the world's first non-combustible, power saving, health paint = succeeded in developing a “CoolHeat shield NF” based on the American non-combustible paint Nofire with hollow silica beads and far-infrared emissivity Japan's best ceramic powder. Paints with such many functions have not been developed in the world.

The “CoolHeat shield NF” has 10 functions in one paint. 1 incombustible, 2 heat insulation, 3 constant temperature, heat retention, 4 dew condensation suppression, 5 sound insulation, sound absorption 6 far infrared radiation, 7 antibacterial, 8 antifungal, 9 deodorant, air freshener, negative ion, 10, antioxidation.

In addition, there are cases where clean air guard is used alone and cases where it is used in combination with a CoolHeat Shield NF, and it is possible to propose improvement of indoor air purification and antioxidant function. The Mainstream of Interior paint is how cheap, how quick paint work so far. However, it is expected that in the future, health and safety-oriented comfortable indoor environments will be focused. In Setsuden ECO SHOP Co.,Ltd, we will develop brand of the best paint with non-combustible, power saving and health promotion functions that other companies can not imitate. Power saving ECO shop proposes living comfortable renovation and office comfortable renovation by combining IRUV Cut Coat, CoolHeat Shield NF and Clean Air Guard as professionals of power saving measures.

What is “CoolHeat Shield NF PLUS” ?

“CoolHeat shield NF” is an aqueous based interior paint developed for the inner wall of the room, which has various functions of non-combustibility, heat insulation, constant temperature, condensation suppression, sound insulation, anti-oxidation, antibacterial, deodorant, anti-fungal and far infrared rays. Furthermore, apply “Clean Air Guard” as the top coating, In addition air freshening & health promotion effect. This is the world's first installation system that can simultaneously target 3markets: fire protection market + power saving market + health market.

- 1 Incombustible:** Noncombustible effect based on American noncombustible paint "NOFIRE".
- 2 Thermal insulation:** Cool in Summer and Warm in winter by a plenty of Silica hollow beads
- 3 Constant temperature:** The room temperature is stabilized by the infrared radiation 98% of amphibole and the silica hollow beads
- 4 Sound Insulation:** The silica hollow beads reduces external noise by 10 db and the internal sound reduces leakage.
- 5 Condensation Suppression:** by double effect of Silica hollow beads and far infrared rays radiation from Amphibole
- 6 Far Infrared rays:** by Amphibole and Silica hollow beads for health promotion
- 7 Antioxidant:** by Amphibole and Silica hollow beads for health promotion
- 8 Deodorant:** by Amphibole and Clean Air Guard
- 9 Antifungal:** by American incombustible paint, “NOFIRE”
- 10 Antibacterial:** by Amphibole and Clean Air Guard



Clean Air Guard

Raw Material 1) Amphibolite (granite porphyry) Far infrared emissivity No. 1

Amphibole (granite porphyry) is a natural ceramic ore discovered in mountains of Iwate Prefecture in 1988. It is classified as Granite Porphyry, but as evidenced by various data, especially those produced from Iwate Prefecture, the vibrational energy value is superior so that it is unparalleled. It is evaluated as ore with special effect. By using it as a material for HOT guard interior, we create a clean and comfortable health space with "insulation effect", "deodorant and antibacterial effect" and "antioxidant effect" inside the room.

It conforms to all 26 items based on the Food Sanitation Law, and its safety has been proved. (Japan Food Research Laboratories Center No. 103023288-001)

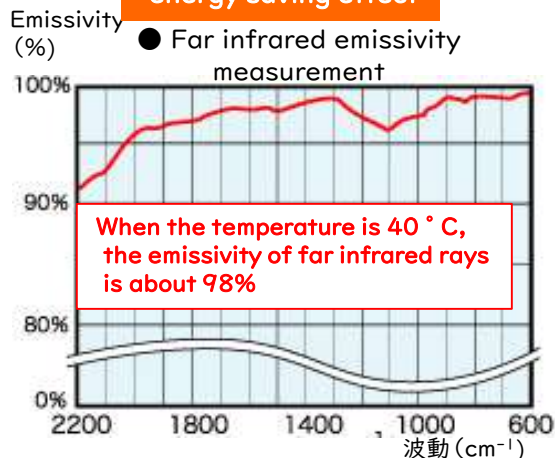


Amphibole in Tono, Iwate Prefecture



Powder before mixing in paint

① Heat insulation / energy saving effect



(Sep 5, 1989 Kanagawa Prefecture Industrial Test Site)

Eliminate temperature unevenness in the upper and lower parts of indoor space
 ⇒ Air conditioning load reduction = energy saving effect
 ⇒ cool in summer · warm in winter = comfortable space

② Deodorant effect

● Measuring method

Sample and odor gas were sealed in the deodorant drage bag and the change in gas concentration after 3 hours was measured

● Test result (deodorization rate%)

Ammonia ... 67%
 Hydrogen sulfide ... 71%

● Inspection agency: June 27 - July 3, 1990
 Unitika Research Laboratories Inc.
 Product Research Department Y02-0774

Deodorizing effect can be expected mainly in the living odor of pet, toilet, etc.

③ Antibacterial effect

● Antibacterial test result

面の種類	大腸菌群数	黄色ブドウ球菌
検体名	No.1	No.1
角閃石なしの当初菌数	200/ml	300/ml
No.1+角閃石 24時間後 (水100ml+角閃石50g)	3/ml	10以下/ml

大腸菌やブドウ球菌等の雑菌の発生がおさえられるため、安全で衛生的な岩盤浴を楽しむことができます。

(Iwate Prefecture Pharmaceuticals and Health Inspection Center, November 29, 1990, Pharmaceutical Assay No. 724 N and 2010)

Escherichia coli decreased to 3 / ml when it was inspected after 24 hours with 100 ml of water and 50 g of hornblende added to E. coli 200 / ml. 100 ml of water and 50 g of amphibole were added to 300 / ml of Staphylococcus aureus, and after 24 hours, it decreased to less than 10 / ml.

④ Antioxidant effect

● Oxidation-reduction potential measurement (ORP)

Transition data of ORP when 1 kg of "amphibole" is added to 1 l of tap water

Elapsed time	0 min	30min	60min	2hours	6hours	7hours	8hours	24hours
PH	-	7.8	7.5	7.7	7.6	7.8	7.9	8.1
ORP	638	505	491	488	348	301	195	177

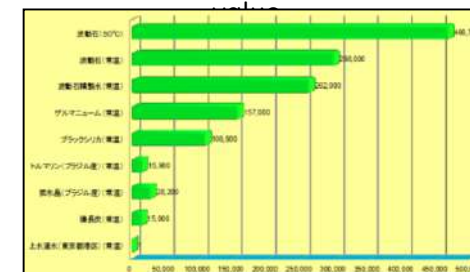
※Prove that the water containing the "amphibole" in about 8 hours is changed to alkali, tap water has an oxidation-reduction potential of change = minus in high-quality natural water and the equivalent of a number. = Antioxidant effect
 In general tap water ORP value is around 630. It decreased to 177 after 24 hours.

④ Antioxidant effect

● Negative ion measurement

Specimen name	Test Result
General paint	1
Building materials coated with put powder amphibole	26
Coated paper containing amphibole powder	66

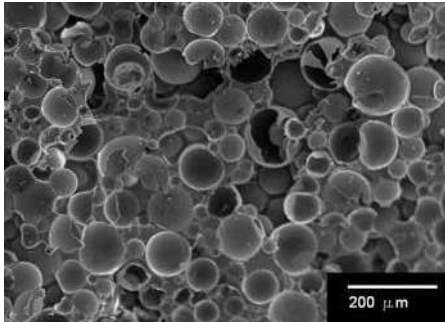
● vibrational energy Numeric



The vibrational energy necessary for the body's immunity and natural healing power is also high, It has vibrational energy Numeric value (298,000) of 7.5 times for Elvan Stone, 17 times for Tourmaline and 20 times high grade Charcoal.

Raw Material 2) Silica Balloon hollow beads

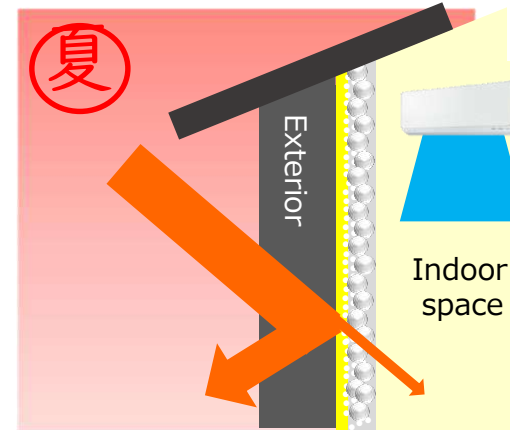
A silica balloon is a hollow glass sphere of about 20 μm to 1.4 mm in size made of glass. It has excellent features such as incombustibility, heat insulation and sound insulation.



- Silica itself is non-flammable because it is an inorganic material.
- When the temperature is high, heat is stored in the air layer to prevent it from entering the room = heat insulation in Summer
- When the temperature is low, warm air tries to escape outside,
- The hollow beads store warm air and do not escape heat to outside.= insulation in Winter.
- Sound insulation effect by air layer of hollow beads
- Sound leakage to the outside, noise suppression from the outside.

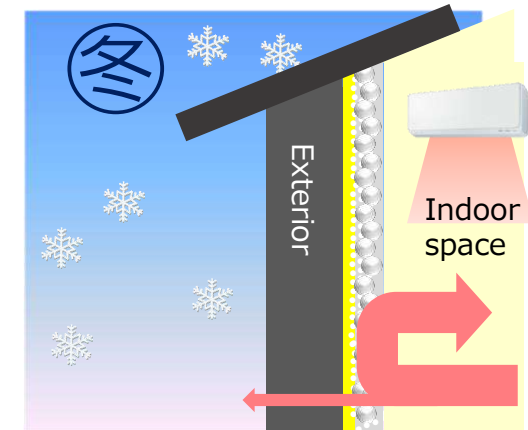
<Summer>

The heat shield effect by the air layer of the hollow silica balloon prevents heat from flowing into the room



<Winter>

Thermal insulation by the air layer of the hollow silica balloon prevents heat escape from the heating heat



Raw Material 3) Incombustible material ... **nofire**

nofire Certification, Authentication

nofire is a high performance nontoxic, water base fire retardant paint

NoFire A-18:

• Patented in the U.S. and over 50 countries, NOFire manufactures a Nontoxic, water-based, intumescent coating that has 3 very unique properties

1. ZERO Flame Spread
 2. ZERO Smoke Developed
 3. ZERO Toxicity
- Advanced formulation -One thin-film coat coverage
 - Extremely Low VOC's
 - Non-Hazardous and Environmentally Safe. Nontoxic when wet, dry or exposed to heat
 - Rated to temperatures up to 1371° Celsius (2500° F)
 - Over 99% effective in reducing the incident of Flashover
 - Requires no special training or equipment and can be applied by brush, roller or spray
 - Can be manufactured to match most colors, has an extremely durable finish and can be used as a primer or topcoat
 - Inhibits mold growth for up to 5 years



Why is the insulation, temperature and heat retention performance of the CoolHeat Shield NF excellent?



① Incombustible
= No fire & Silica hollow beads

② Energy Saving
= Silica hollow beads & Amphibolite
(Thermal Insulation) (constant temperature)

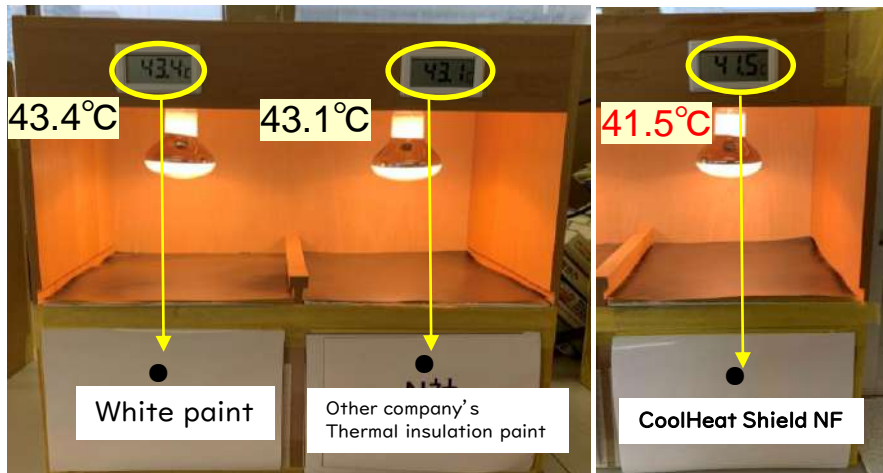
③ Health promotion = Amphibolite
(Antioxidant · Far infrared radiation ·
Deodorant, Antibacterial)

Silica Hollow balloon + Far infrared radiation powder

The CoolHeat Shield NF uses a special binder resin and is double-mixed with a hollow silica balloon that creates an air layer and amphibolite ceramic with a far infrared emissivity of 98%. As a result, it has become possible to have not only incombustibility, but also high thermal insulation performance, constant temperature by far infrared radiation, and heat retention performance.

Thermal insulation performance comparison with other company's paint by lamp (hollow bead quantity)

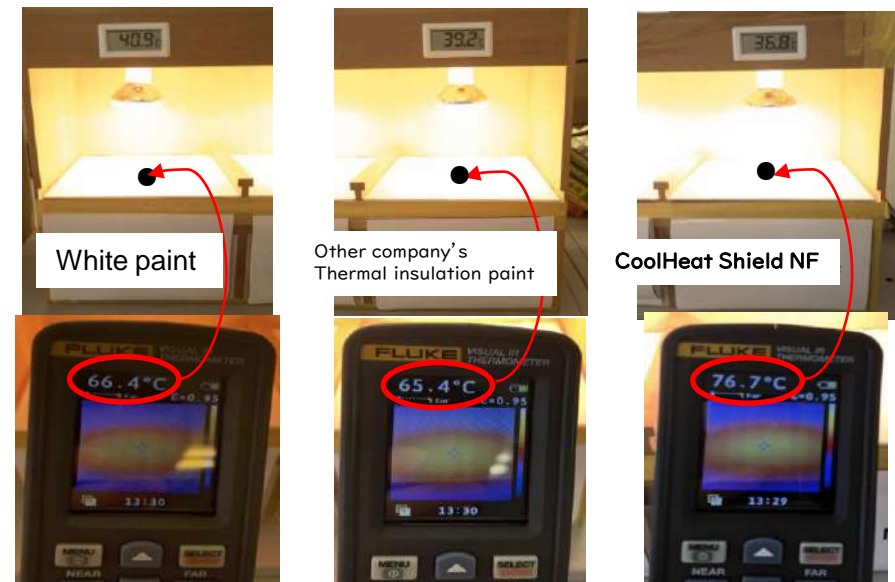
Each paint was applied to 3mm glass and black paper was put on the back so that the heat escape by the reflection of the paint film could not be done. Turn over the coated surface, place the lamp on black paper, and measure the temperature inside the box. It measures how much the heat absorbed by black paper transfers to the inside of the box. In the summer, from the outer wall and the ceiling of the exterior material, heat enters the room through the interior materials, the paint was applied to the inner wall and the ceiling was to verify whether the room is how much can maintain a cool temperature.



The CoolHeat shield NF is a temperature difference of 1.9 degrees with white paint and 1.6 degrees with other insulation paint.

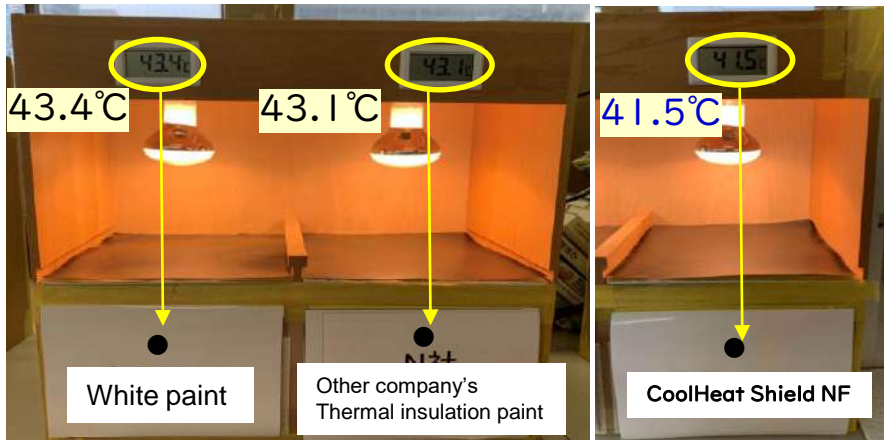
Surface temperature comparison with other company's paint by lamp (far infrared effect)

Apply each paint to 3 mm glass and measure the surface temperature of the coated surface. Light is used as a substitute for indoor heating heat (far infrared) to verify the temperature change on the coating surface.



In the temperature comparison test with the lamp, the surface temperature is as high as about 10 ° C. for the CoolHeat Shield NF
= In summer, the room is cooled, and in winter, the room is warmed by the resonance vibration of the far infrared rays.

Thermal insulation, far infrared radiation performance comparison



< Temperature comparison of sensors installed inside the box >

White Paint > Other thermal paint > CH Shield NF >
 43.4°C > 43.1°C > 41.5°C

Thermal Insulating performance

< Comparison of surface temperature of each painted surface in thermography >

CH Shield NF > White Paint > Other thermal Paint >
 76.7°C > 66.4°C > 65.4°C >

Far-infrared absorption and re-emission performance



This test shows how much solar heat gets into the room from the roof and outer wall. It is a test of thermal insulation performance. It can compare the insulation performance of insulation paint containing hollow silica balloon to general white paint. When painted with a non-combustible shield, the room temperature is insulated at 2.9 °C compared to general paint. The energy saving rate is 29%.

This test is a test of how much heat the room heat is absorbed and re-radiated on the ceiling and wall paint. In contrast to general white paint, it can be seen that the thermal insulation non-combustible shield blocks heat because of its low thermal conductivity.

In addition, it contains 10.3 °C warmer than general paint because it contains ore with high far infrared emissivity. The far infrared rays of heating and the far red rays of the cold and warm noncombustible shield resonate and are heated by radiation.

It is possible to warm the room evenly and improve the heating efficiency by more than 20%.

From the above, when the ceiling is covered with “CoolHeat shield NF”, the heat from the outside is insulated and the heating heat of the room is further warmed to prevent heat escape.

+ In combination with Thermal insulated glass coat, “IRUV Cut Coat” to reduce heat escape from the window. It becomes renovation for living comfortable by application.

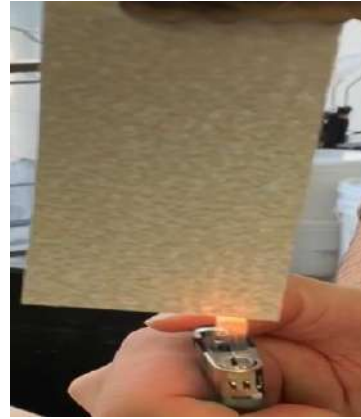
Incombustibility test of the coating film of the other company's thermal insulation paint and the coating film of the heating and cooling noncombustible shield

Put a light on only the coating with a gas lighter and verify whether it fires or not.



Other companies insulation paint, at the start

Big fire after 4 seconds



CoolHeat Shield NF At the start

Incombustible after 30 seconds

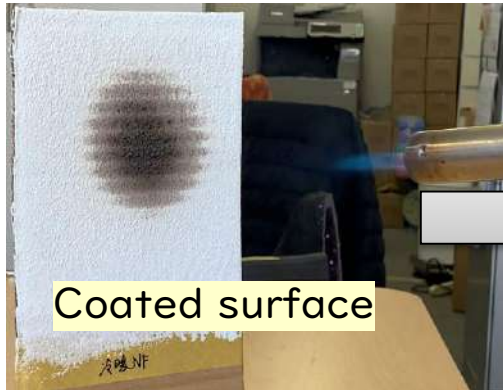
Other thermal insulation paint products have passed the non-combustibility test approved by the Ministry of Land, Infrastructure, Transport and Tourism of Japan. However, **the coating itself ignited in less than four seconds.** Our CoolHeat Shield NF did not ignite for 30 seconds.

Noncombustible test for coated cardboard

Cardboard coated with a cooling and heating non-combustible shield, with 20seconds and 3 minutes fire in the burner, verification whether burning or not.

【20 seconds test in Japan】

【3minutes Test in Singapore】



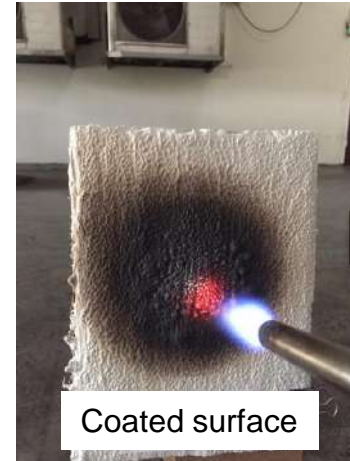
Coated surface



Back side



Test in Japan



Coated surface

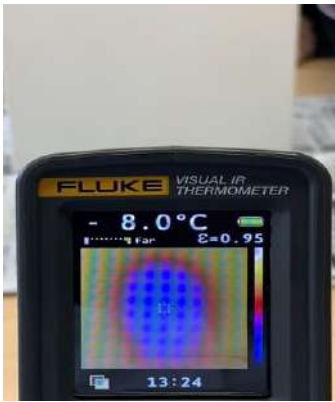


Back Side

The coated surface is black, but without ignition. There is no change in the back of the cardboard.

Thermal insulation performance comparison with other company's paint by cold spray (thermal conductivity)

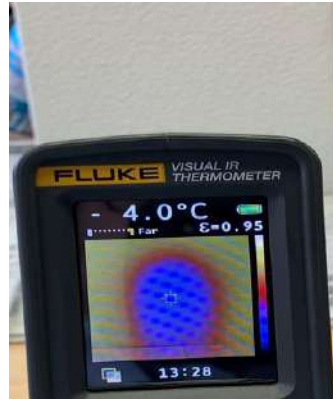
White paint
Up to -8°C



Other insulation paint
Up to -7.6°C



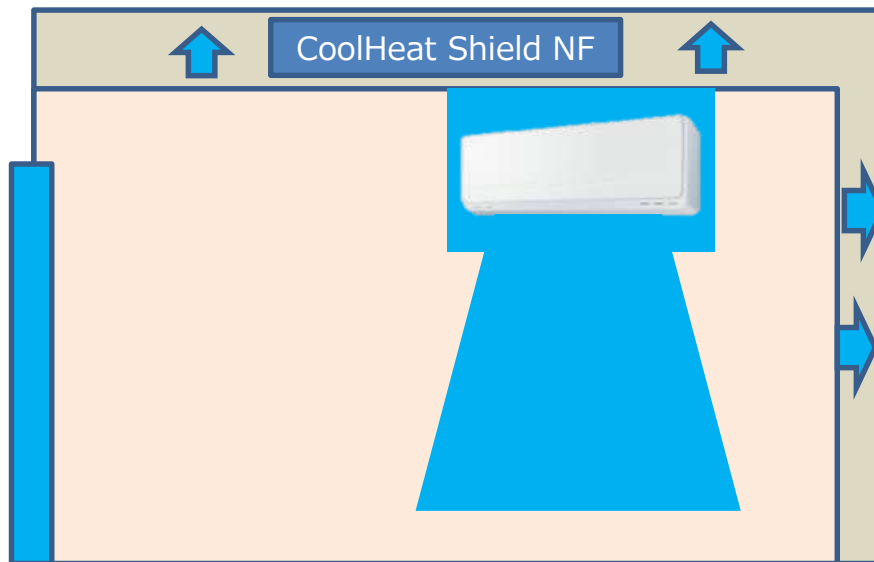
CoolHeat Shield NF
Up to -4°C



Apply each paint to 3 mm glass, spray cold spray for 6 seconds on the back glass surface, and measure the minimum temperature. Apply with cold spray instead of winter cold. Cold air is transmitted to the room through the interior materials from the exterior material of the outer wall and ceiling of winter. By applying to the inner wall and ceiling, we verify how cold the surface temperature of the coated surface is.

The CoolHeat shield NF has a temperature difference of 4°C with white paint and 3.6°C with other company's insulation paint. The CoolHeat Shield NF makes it difficult to take cold air from outside into the room in Winter.

If the thermal conductivity is low, the heat retention effect is high, so it is hard to warm and hard to cool.



Due to the high thermal conductivity, it will soon get hot and cold again

