JAXA COSMODE PROJECT

GAINA is “JAXA COSMODE PROJECT” brand product.

■ Manufactured / Developed

Nissin Sangyo Co., LTD.

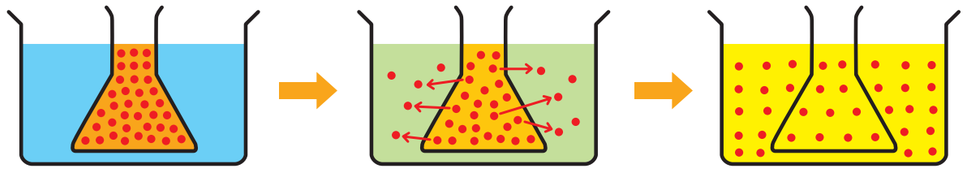
GAINA®

Nissin Sangyo Co., Ltd.

GAINA makes life more comfortable through “heat equilibrium.”

Everyone strives for year round comfort, but our lifestyles are influenced by stress of all kinds-from the blazing summer heat and bitter winter cold to unwanted noises and odors.
GAINA introduces innovative technology that suppresses not only extreme heat and cold, but offensive noise and odors as well.
Summer or winter, day or night, GAINA removes the unpleasant aspects of your living environment, creating the comfort you deserve.

Heat moves from high to low temperature areas.

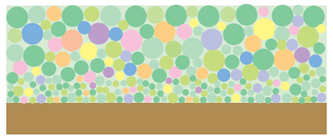


A glass of hot water is immersed in a pot of cold water.

Heat moves from the higher to the lower temperature.

As the heat escapes from the hotter environment in the glass, the temperature of the surrounding water increases. When the water temperature of both containers is equal, heat movement stops.

Heat Equilibrium-ceramic bead layering technique



GAINA comprises layers of special ceramic beads.
This special ceramic material is designed to adapt to the surround temperature, resulting in heat equilibrium and minimum heat transfer.

Cold Protection ▶ Insulation/Heat Retention

Heat escapes from low-temperature walls and ceilings even as room temperature increases.
Use of GAINA minimizes heat movement, unifying the temperature throughout the house.

Heat Protection ▶ Insulation/Heat Shield

GAINA’s ceramic beads reflect the sun’s infrared rays, allowing the GAINA-coated surface to adapt to the surrounding temperature and minimize heat transfer.

Noise Prevention ▶ Soundproofing

The GAINA-treated surface features a dense coat of ceramic beads which create a dampening effect to significantly reflect and reduce sound.

Odor Reduction ▶ Enhanced Air Quality

GAINA’s electrostatic propensity of 0.0 prevents dirt from adhering to surfaces, while its ionized moisture fuses with airborne dirt and particles, reducing the amount of impurities floating in the room environment.

Other Key Benefits ▶ Condensation prevention, Structural durability,Safety, Incombustibility

GAINA offers a multitude of features and advantages for any structure. Find out how GAINA can prevent condensation, enhance structural durability, fireproof and increase the overall safety of your home.

The GAINA Evolution

Integrating aerospace technology, GAINA brings comfort and safety to residential homes and apartments, large-scale factories and other structures, as well as camping cars, portable toilets, and other applications. Nissin Sangyo continues to develop GAINA, expanding its range of utility.

GAINA Data Guide

Various data spotlight GAINA’s performance that results in energy-saving effects and cost reductions. GAINA relieves the stress from summer heat, winter cold, and many other lifestyle issues, bringing more comfort to all.

Cold Protection

Insulation/Heat Shield

Room remains a comfortable 10ºC+ (50ºF+) at night even after heat is turned off!

Living in Nagano Prefecture, a region known as “snow country,” this family explains, “We can say from experience that GAINA truly insulates during the winter months.” In the past, they used a powerful electric heating system with an oil heater during the day. They kept the oil heater going while they slept at night, but the room temperature still dropped below 0ºC (32 ºF) by morning. “After we painted this spacious room with GAINA, we only needed one heater. We turn the heater off at bedtime, yet the room temperature is never below 10ºC+ the next morning.” GAINA significantly reduced the family’s electric and gas bills.

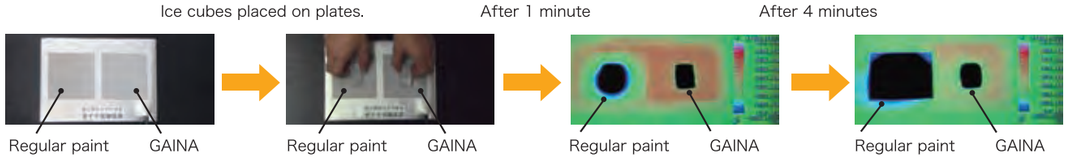
Painted area: walls/ceilings - about 175m² (1,884 sq. ft.), exterior: about 173m² (1,862 sq. ft.)

A warmer floor and less condensation!

After moving into their new condominium in suburban Tokyo, this family found the winters extremely cold. The condo’s concrete foundation kept the rooms perpetually chilly, and even with insulation, the floors in the rooms facing north felt like ice. Condensation was also a constant issue. Their initial thought was, “We have to break down the walls and add more insulation in order to capture the heat,” but upon hearing that GAINA could make a difference, they decided to coat the walls, ceilings, and inside the closets. The result was immediate. The rooms were warmer even in the winter, and condensation disappeared. “Before, we spent most of our time in the south-facing living room, but now the entire mansion is comfortable and we can enjoy using rooms on the north side as well,” says the family.

Painted area: walls/ceilings, closets - about 115.1m² (1,239 sq. ft.)

Calorific Value Experiment: GAINA boasts small calorific values



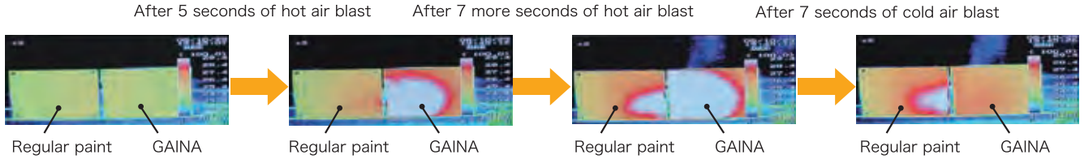
▲Two iron plates were placed on a heat sheet, the right plate coated with GAINA, the left plate coated with regular paint. Both plates were heated to 45ºC (113 ºF).

▲ A 3cm² (0.47sq. inch) ice cube was placed in the middle of each plate.

▲The ice cube on the plate coated with regular paint starts to melt.

▲The ice cube on the plate coated with regular paint has completely melted.
The ice cube on the GAINA-coated plate has not melted.

Temperature Adaptation Experiment: GAINA adapts to surrounding temperatures



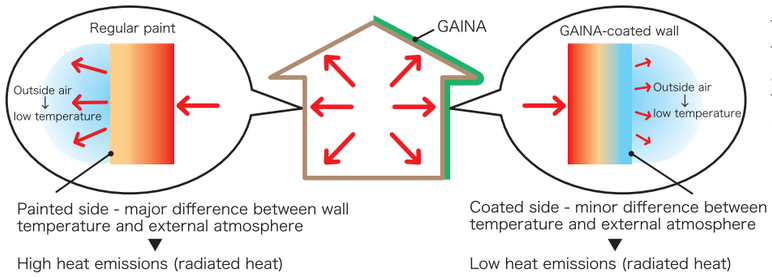
▲Two iron plates are placed side by side. The right plate is coated with GAINA, the left with regular paint. Both are exposed to hot air blasts from front-center.

▲The temperature of the GAINA-coated plate starts to rise as indicated by thermography (screen changes from red to white).

▲The temperature of the GAINA-coated plate continues to rise, while the plate coated with regular paint just starts to heat up.

▲After the air blast is switched from hot to cold, the temperature of the GAINA-coated plate drops significantly, showing GAINA’s ability to adapt to surrounding temperatures.

Exterior coating prevents heat from escaping

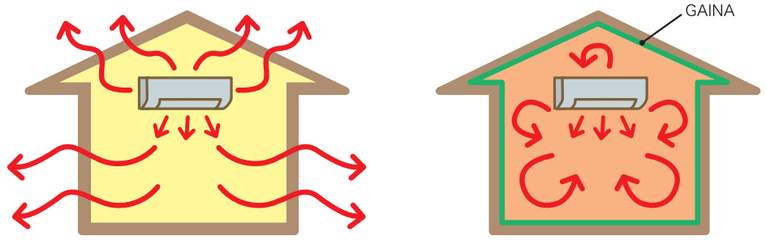


Painted side - major difference between wall temperature and external atmosphere
▼
High heat emissions (radiated heat)

Coated side - minor difference between wall temperature and external atmosphere
▼
Low heat emissions (radiated heat)

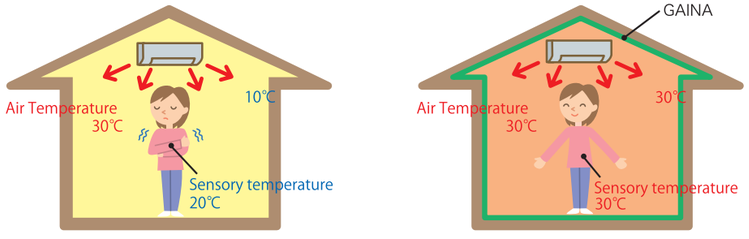
Heat moves from higher to lower areas. With GAINA painted on exterior walls, the surface adapts to the surrounding temperature, achieving heat equilibrium and minimum heat movement.
This phenomenon enables GAINA to keep the cold outside and the heat inside.

Interior coating improves heat retention



Even when the internal temperature is high, heat can escape if walls and ceilings are cooler. With GAINA coating the interior, the temperature of the air and wall surfaces balance out, minimizing heat movement.

GAINA helps improve your sensory temperature



Sensory temperature **20**℃

Sensory temperature **30**℃

On the left, the air temperature is 30°C (86°F), the walls and ceiling temperature 10°C (50°F), and the sensory temperature 20°C (68°F). In the GAINA-coated room on the right, even when the air temperature is the same 30°C, the walls and ceiling adapt and also maintain 30°C, and the sensory temperature also attains 30°C, a 10-degree increase.

Heat Protection

Insulation/Heat Shield

Less humidity, comfortable living… even in the summer months!

This couple built a house resembling a resort cottage in Aichi Prefecture. They painted GAINA on the exterior as well as on the interior walls and ceilings. The first thing the couple noticed was how refreshing the air was in the new home. "The air is not humid at all, even without the use of an air-conditioner; the house is very comfortable! Even the dehumidifying crystal packs we placed in the closets remain dry," say the owners.
The combination of GAINA's permeability and natural wood create a refreshing atmosphere.The insulation effect was greater than expected as well. In their previous home, the couple suffered during the hot and humid summers, but now they rarely need to turn on the air-conditioner. "Every day is so comfortable, thanks to GAINA," says the satisfied couple.

Painted area: walls/ceilings - about 415m² (4,467 sq. ft.); roof (waterproof roofing) - about 160m² (1,722 sq. ft.); exterior - about 175m² (1,884 sq. ft.)

Cooler houses, reduced need for air-conditioners!

Many people have benefitted from GAINA's insulation performance. "It was so hot, we needed air-conditioning 24-hours a day," says one Tokyo resident. When a friend recommended GAINA, which offers superior insulation without complicated construction, this owner decided to paint his roof and exterior walls. Now his house is surprisingly cool.
A resident of Shizuoka Prefecture says, "I don't feel the heat as much during the summer."
A home-owner in Aichi Prefecture, who couldn't stand the heat on the second floor of his house, says, "There is no major temperature difference between the first and second floors anymore. I can just open the windows and it feels cool."
One Ibaraki Prefecture resident measured the temperature of his roof after applying GAINA. He comments, "I was surprised to see that the temperature dropped more than 28℃(82℉)."

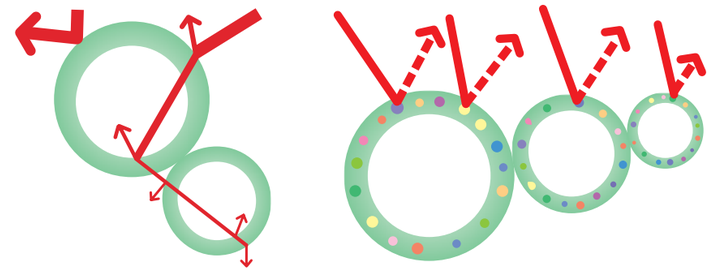
Tokyo Painted area: roof - about 130m² (1,400 sq. ft.); exterior - about 140m² (1,507 sq. ft.

Shizuoka Painted area: walls/ceiling - about 40m² (430 sq. ft.); exterior - about 260m² (2,800 sq. ft.)

Aichi Painted area: roof - 300m² (3,230 sq. ft.); exterior - about 180m² (1,938 sq. ft.)

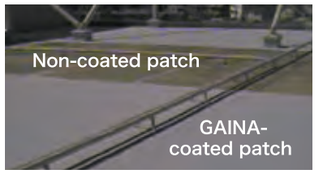
Ibaraki Painted area: roof - 94m², 1,102 sq. ft.); exterior - about 140m² (1,507 sq. ft.)

GAINA's heat prevention mechanism



The sun's infrared rays repeatedly reflect off, bend around, and move around GAINA's ceramic beads, reducing the amount of energy entering the house(see graphic on left). The heat prevention materials in the ceramic beads also reflect infrared rays (see graphic on right).

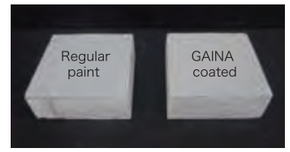
GAINA prevents external heat generation, cooling internal temperatures



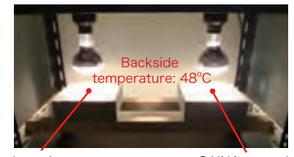
▲Comparison of GAINA-coated and non-coated patches on RC structure roof
Test date: September 3, 2008
External temp: 33℃ (91℉)

▲The temperature measured in the non-coated patch was 48℃(118℉) and in the GAINA-coated patch, 35 ℃ (95 ℉).

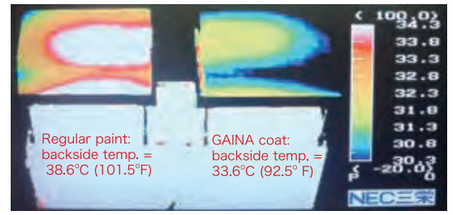
Room temperature calculated using data measured in comparison (left).



▲Two concrete blocks, with a thickness of 50mm (2 inches), were coated with regular paint and GAINA, respectively.



▲Both blocks were placed on test machine and heated until the surface reached 48℃ (118℉). The backside temperature was then measured.

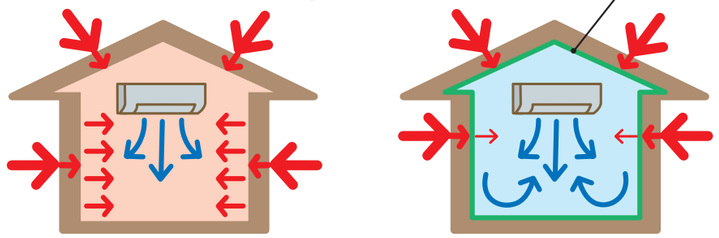


◀ The backside temperature of the block with regular paint was 38.6℃(101.5℉),and with GAINA, 33.6℃(92.5℉).

Surface temperature with GAINA dropped 13℃ (23℉)

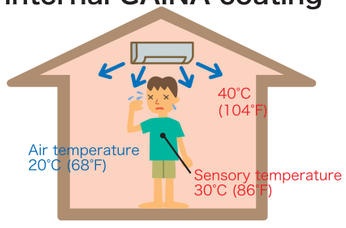
The room side dropped about 5℃ (9℉)

Air-conditioning improves with internal GAINA coating

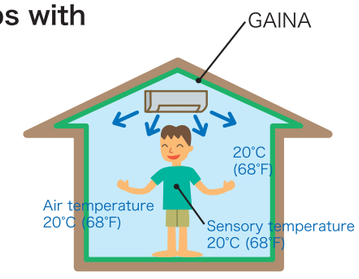


Even when the room temperature is low, if the temperature of the ceiling and walls are high, heat can permeate inside. With an internal coat of GAINA, cool air from the air conditioner and GAINA-coated surfaces immediately adapt, keeping heat transfer to a minimum.
(Same mechanism as *Interior coating improves heat retention* on page 5)

Sensory temperature drops with internal GAINA coating



Sensory temperature **30**℃ (86℉)



Sensory temperature **20**℃ (68℉)

In the room on the left, when room temperature is 20℃ (68℉) and wall/ceiling surfaces are 40℃ (104℉), sensory temperature is 30℃ (86℉). In other words, 20℃(68℉)+40℃(104℉)÷2=30℃(86℉).
In the GAINA-coated room on the right, even when room temperature is the same 20℃ (68℉) and wall/ceiling surfaces adapt to room temperature, sensory temperature remains at 20℃ (68℉). The difference is minus 10℃ (18℉). In other words, 20℃(68℉)+20℃(68℉)÷2=20℃(68℉).

Noise Prevention
Soundproofing

Less noise from cars has made family conversation more fun!

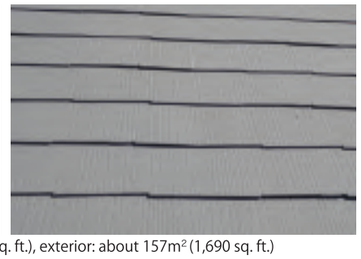
We used to turn the volume on the TV way up so we could hear it," says a family living in the suburbs of Hamamatsu City in Shizuoka Prefecture. The street in front of the house deals with heavy traffic and cars fly by at high speeds. Making matters worse is a truck and heavy machinery rental company across the street, producing loud engine noises. GAINA was the resolution to these problems. An external coating was all it took to reduce the noise. The family no longer has to turn up the TV volume to enjoy their favorite shows, even when sitting in the living room that faces the busy street. "Our conversations disappeared in the noise before, but now we chat more because we can hear each other very well!"

Painted area: roof - about 40m² (430 sq. ft.), exterior: about 260m² (2,800 sq. ft.)

The room is so quiet, even the sound of rain goes unnoticed!

This Kanagawa Prefecture family chose GAINA because their children complained about the heat on the second floor every year as summer approached. "After applying GAINA, not only did the temperature drop but the noise level went down as well. It's quiet inside even when it is raining. Sometimes we have to hurry to bring in the laundry from outside because we didn't notice the sudden rain," says the home owner.

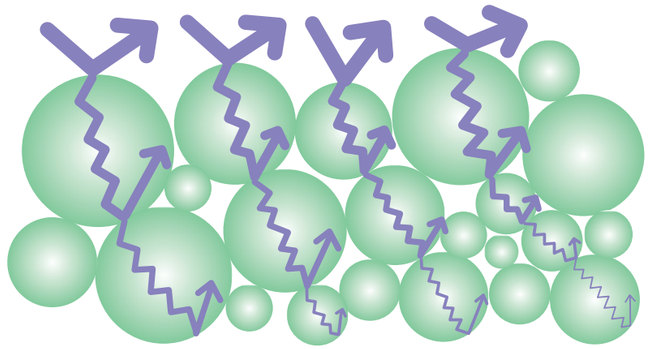
Another family in Souka City, Saitama Prefecture, had trouble with noise as they live near a busy shopping district with lots of traffic. "After we added a coat of GAINA, we realized how quiet it is at home. We don't even notice the noisy cars, a major point of frustration for us in the past."



Kanagawa Painted area: roof - about 90m² (970 sq. ft.), exterior: about 157m² (1,690 sq. ft.)

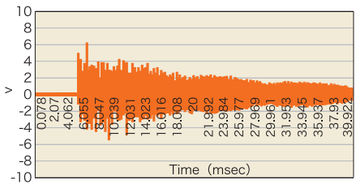
Saitama Painted area: interior - about 39.6m² (426 sq. ft.), ceiling - about 19.8 m² (213 sq. ft.), exterior: about 82.5m² (888 sq. ft.)

GAINA's special ceramic reflects sound and controls vibration

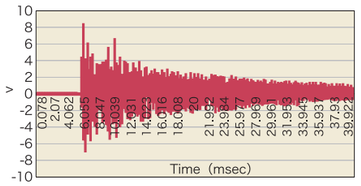


The GAINA membrane consists of many layers of hard ceramic beads filled with air. Sound is repeatedly reflected by the ceramic while being absorbed by the air.
Sound that permeates the membrane is also reduced by the dampening effect of the ceramic layers.

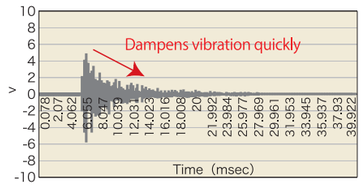
Dampening Test: GAINA absorbs vibration quickly



No coating: SS400



Phthalic acid coating: SS400



GAINA coating: SS400

Sound is generated through vibration and transmitted as vibration. GAINA dampens vibration, achieving effective soundproofing. The three waveforms shown above express data gathered from the GAINA dampening tests carried out at the Hamamatsu Industry Experiment Station.
The results show GAINA's superior capabilities of controlling vibration.

Impact Sound Test: GAINA prevents sound generation

Non-coated frying pan

Sound was measured when a hammer was used to hit a regular frying pan and one coated with GAINA.

Regular frying pan: 94.7dB
GAINA-coated pan: 74.9dB
Difference: 19.8dB

A 20dB difference indicates sound energy of 1/100. For comparison, consider a difference of 6dB, this would mean sound energy of 1/4, or hearing the same sound from twice the distance of the sound source.

GAINA-coated frying pan

Odor reduction
Enhanced Air Quality

Less cigarette and alcohol odors make for a more pleasant restaurant!

"Food and drinks taste better when the air is clean. I wanted to create a restaurant where the customer would feel refreshed," says the owner of a Japanese restaurant located near Fujisawa Station in Kanagawa Prefecture. The owner found that providing a coat of GAINA to the interior of his new shop created a homey atmosphere. What surprised him most was, "the lack of alcohol and cigarette odors lingering from the previous day. I almost forget to ventilate the room!"
GAINA makes cleaning a breeze as it greatly reduces the amount of unwanted smells and dust that stick to walls, a common issue with restaurants. This restaurateur could barely hide his pleasure at the unexpected yet very welcome effects GAINA provided.

Painted area: interior walls - about 55m² (592 sq. ft.)

Greatly improved air quality creates an atmosphere of living in the woods!

One family located in Fukushima Prefecture gave their new home a coat of GAINA to ensure it didn't become dusty, like their previous home. After living in their new home for a while, they were happy to find that, "it feels like we are living in the woods."

Another GAINA fan located in the north part of Tokyo was worried about odors in his condo. After renovating his condo and adding a coat of GAINA, he was pleased with the results. "After applying GAINA, my home smells great and is so comfortable."

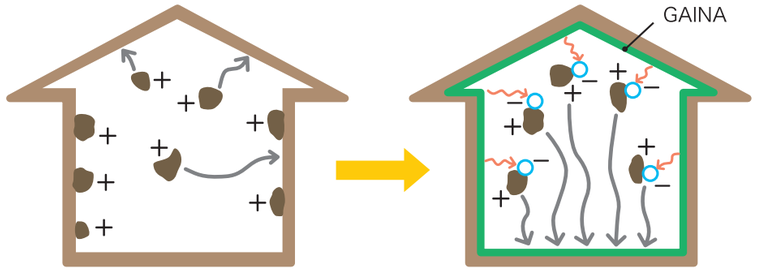
The owner of a dental office in Fuji City, Shizuoka Prefecture, used GAINA to improve the air in his offices and help patients feel more relaxed. He has since received many compliments from patients commenting on the comfortable atmosphere.

Fukushima Painted area:
interior - about 168m² (1,808 sq. ft.),
ceilings - about 175 m² (1,883 sq. ft.)

Tokyo Painted area:
interior - about 45m² (484 sq. ft.),
ceiling - about 35 m² (377 sq. ft.)

Shizuoka Painted area: interior/ceilings - about 168m² (1,808 sq. ft.)

●Prevents odor and contaminants from floating in air and adhering to walls.



Dust, dirt, pollen and other common airborne contaminants gain positive electric energy as they float in the air, which prompts electro-static adhesion to walls and ceilings. GAINA's electrostatic propensity of 0.0 prevents dust, dirt, and pollen from adhering to surfaces, while its ionized moisture fuses with airborne dirt and particles, reducing the amount of impurities floating in the room environment.

GAINA's Effect on Creating Air that Makes You Feel Good

◉—— By Dr. Teruo Iwasaki, Doctor of Education (Preventative Medicine)

The special ceramic beads featured in GAINA emit infrared radiation when heat or light energy is received, due to the ceramic's extreme infrared radiation emission capacity. This capacity activates water molecules in the room air, creating negative air ions.

The negative ionized moisture in the air is able to purify dust, dirt, and pollen present in the air. Our bodies also consume this negative ionized moisture in the air when we breathe.

This effect is created when the interior of a room is coated with GAINA, generating the ideal quality of air for human consumption. In other words, GAINA creates "air that makes you feel good," thus establishing a comfortable living environment.
When considering air quality, it is important to evaluate the balance between positive and negative ions. It is often said that positive ions are bad and negative ions are good, but the truth is, it is essential to have a good balance between the positive and negative ions in order to benefit from the negative ones. This has been verified through air quality control measures used inside spaceships.

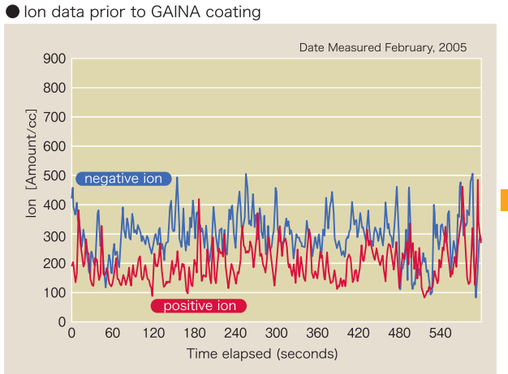
The ideal balance of the two kinds of ions will restrain the growth of toxic substances and germs through oxidation and restoration, resulting in excellent air quality.
Ion balance measurements taken in a room that has been applied with a coat of GAINA showed that the room, previously containing significant amounts of positive ion and dust particles, presented favorable counts of negative ions and significantly less dust and dirt, bringing the atmosphere much closer to the ideal level.

I find the effect GAINA achieves in improving room air quality and making comfortable living conditions highly valuable and hope many people benefit from GAINA's ability to enhance our lifestyles.

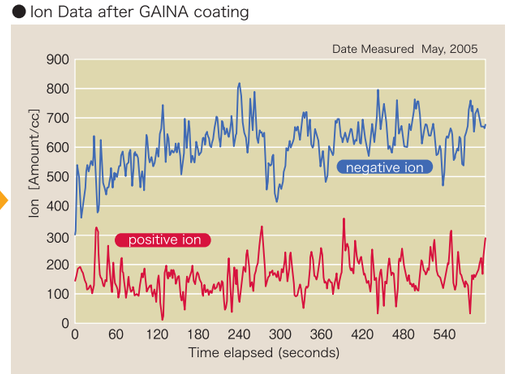
Dr. Teruo Iwasaki

Ph.D. in Education (Hokkaido University)
Born in Matsue City, Shimane Prefecture.
Proposed, planned and administered "Cure-house"as a type of balneotherapy, or hot spring therapy, and "Forest Bathing" as a forest therapy, while working in a complementary function for the Ministry of Welfare, the Ministry of Agriculture, Forestry and Fisheries, and the Ministry of the Environment.
He also measured distribution of negative air ions all over Japan in forests cultivated by Centenarians, and is currently creating a map the results. He is also focuses his attention on the deoxidizing sterilization of negative air ions and is involved in measures to prevent Legionella pneumophila and sick-house syndrome.

● Ion data prior to GAINA coating



● Ion Data after GAINA coating



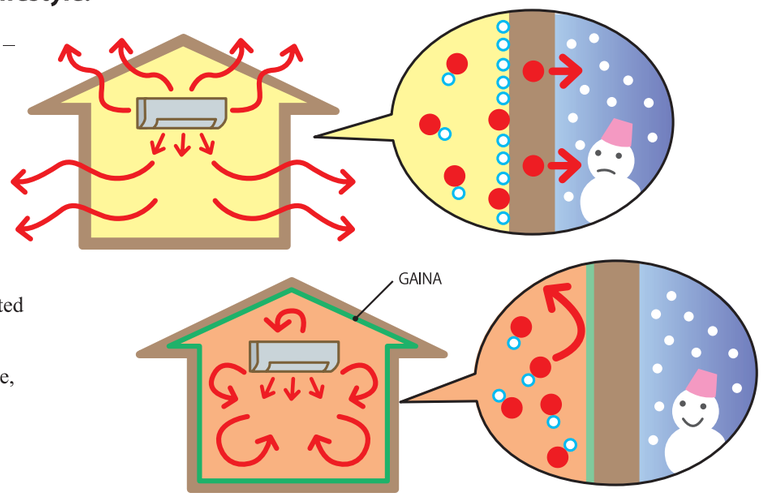
Other Key Benefits

Condensation prevention, Structural durability, Safety, Incombustibility

Condensation prevention

GAINA prevents condensation by restraining heat movement, creating a more comfortable lifestyle.

There are many places within the home – ceilings, walls, windows, closets – that are prone to condensation.
This phenomenon is usually generated when atmospheric heat permeates windows and walls. Heat moves from higher to lower places when there is a difference in temperatures. Thus, condensation occurs in colder areas such as windows and walls.
GAINA creates a film that adjusts to surrounding temperatures. GAINA-coated surfaces quickly take on a temperature similar to that of the room air.
With a smaller difference in temperature, there is less heat movement, and less condensation is generated.

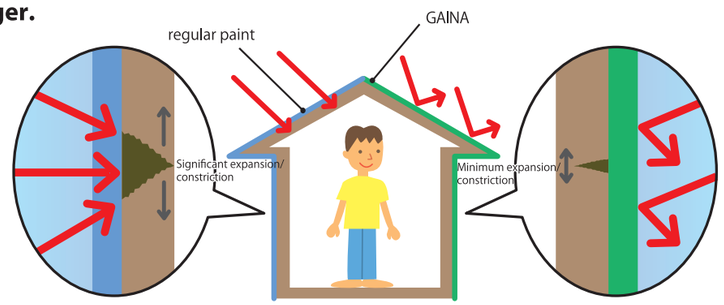


➡ (Same mechanism as *Interior coating improves insulation* on page 5)

Durability

GAINA helps buildings last longer.

GAINA boasts many ceramic layers that provide the strongest resistance to ultraviolet rays, creating a coating that is lasts 2 to 3 times longer than regular paint. GAINA's insulation and thermal barrier capabilities also suppress the expansion and constriction of structural materials. Anti-ultraviolet durability, as enabled by GAINA, is evaluated based on ultraviolet ray absorption rates.



● Anti-ultraviolet ray durability based on ultraviolet ray absorption rate

	Absorption Rate
Superfine particle titanium oxide (used in sunblock products)	87-90%
Carbon Black (tires, electric wires etc.)	95-97%
GAINA	93-95%

● Xenon 2000-hour compound cycle test (color: light gray)

Carbonate	No cracks, peeling, frosting, discoloration	
Carbonate Dioxide	Same as above	
Adhesion Strength (N/mm_)	After Carbonate 0.57	After Anticorrosion 0.69
Near Infrared Rays Reflectance (780-2100nm)	Standard Training (1 week later)	89.5%
	After the Xenon 2000-hour compound cycle test (14 years)	87.1%

Safety

Water-based GAINA is reassuringly safe; GAINA Interior received grade F☆☆☆☆.

GAINA is water-based and contains no organic solvents or any other hazardous materials. In fact, GAINA Interior (specially developed for interior use) received grade F☆☆☆☆ (four stars) for room air quality safety measurements (see table on right).

As the original GAINA can also be used as an exterior paint, it does not qualify for grade F☆☆☆☆, yet it holds the same level of safety evaluations for aldehydes and Volatile Organic Compounds, as seen in the table on the right.

● Emission rate analysis result of Aldehyde and Volatile Organic Compound (VOC) from sample

Sample name: GAINA Interior

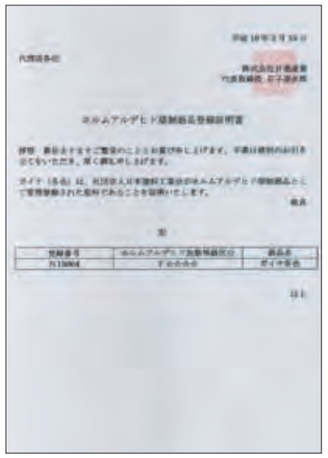
	Measurement Method	Emission Rate (ug/㎥·h)
Aldehydes	Formaldehyde	ND
	Acetaldehyde	ND
VOC	Toluene	ND
	Xylene	ND
	Paradichlorobenzene	ND
	Ethylbenzene	ND
	Styrene	ND

● Emission rate analysis result of Aldehyde and Volatile Organic Compound (VOC) from sample

Sample name: GAINA

	Measurement Method	Emission Rate (ug/㎥· h)
Aldehydes	Formaldehyde	<5
	Acetaldehyde	ND
VOC	Toluene	ND
	Xylene	ND

Registration Number: N13004
(GAINA Interior)



Incombustibility

GAINA is certified incombustible by Ministry of Land, Infrastructure, Transport and Tourism

Registration Number: NM-1194
Substrate
(Incombustible (excludes metal plates))

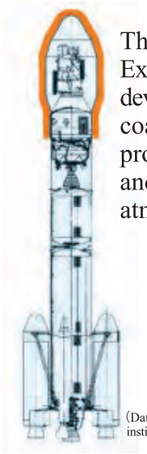
Registration Number: NM-1904
Substrate (Incombustible (metal plates))

Building materials are categorized into three qualification ranks of incombustibility set forth in a governmental ordinance: incombustibles, quasi-incombustibles, and fire-retardant materials. GAINA is certified as an incombustible, the highest ranking, by the Ministry of Land, Infrastructure, Transport and Tourism.

The GAINA Evolution

Integrating aerospace technology, GAINA brings comfort and safety to not only residential homes and apartments, but also large-scale factories and other structures, as well as camping cars, portable toilets, and other applications.
We continue to develop GAINA, expanding its range of utility.

Bringing aerospace technology to our lives



The Japan Aerospace Exploration Agency (JAXA) developed insulation paint to coat the tips of rockets, protecting both rockets and satellites from atmospheric heat.

(Data provided by independent administrative institution, Japan Aerospace Exploration Agency.)

Converted to civil use

GAINA®

GAINA is a product developed and manufactured for consumer use by Nissin Sangyo co., Ltd., integrating aerospace technology.

(Photo provided by independent administrative institution, Japan Aerospace Exploration Agency.)

GAINA Data Guide

GAINA boasts many lifestyle-improving functions, including protection from the summer heat and winter cold.
These functions are backed by strong data, proving energy-saving and cost-reduction benefits.

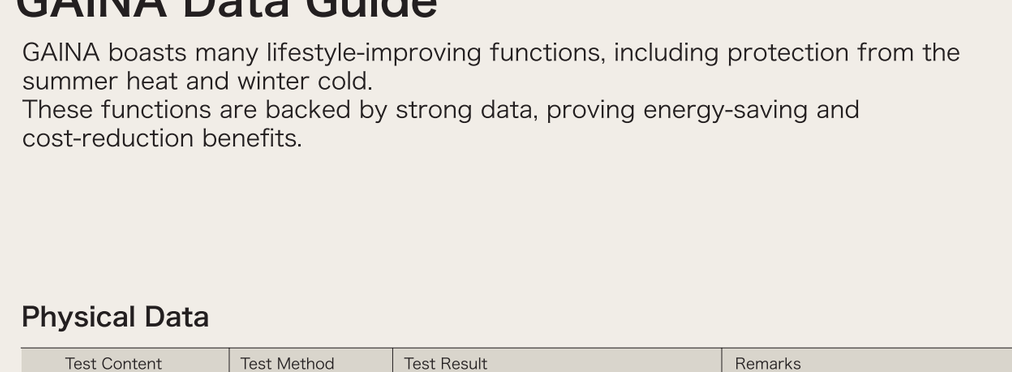
Physical Data

Test Content	Test Method	Test Result	Remarks
Hardness or Solidity Value (Pencil Scratch Test)	JIS-K5600 5.4	B	Mitsubishi Uni
Shock Test	JIS-K5600 5.3	No breaking, no peeling	Du Pont 500g/50cm
Erichsen Test (m/m)	JIS-K5600 6.2	No breaking, no peeling	30f/mm/6.0mm
Cross-cut Adhesion Test	JIS-K5600 5.5	100/100	Cutter Guide
Alkali Resistance Test	JIS-K5600 6.1	No breaking, no peeling	Sodium Hydroxide 5% NaOH, 20°C(68F)/24hrs
Acid Resistance Test	JIS-K5600 6.1	No breaking, no peeling	Sulfuric Acid 5% Solution, 20°C(68F) /24hrs
Heat Resistance Test	JIS-K5600 6.1	No change	Electric Furnace 150°C(302F) /60mins
		Slight yellowing, swelling	Electric Furnace 200°C (392F)/60mins
Salt Spray Resistance Test	JIS-K5600 6.1	No rust except rust around cross cut bur	5% Saline, 86hrs

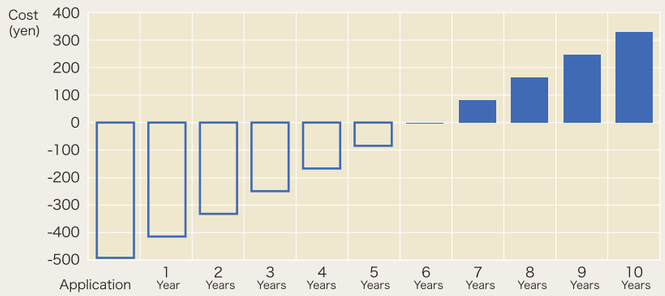
10-year total cost difference(paint cost less energy-saving effects)

Paint Cost		Useful Life	Summer Time Energy Saving Effect	Winter Time Energy Saving Effect	Annual Energy Saving Effect	10-year Cost Difference
GAINA	4.94 M yen (3,800 yen x 1,300m²(14,000sq.ft.)	15 years	600 K yen	220 K yen	820 K yen	+ 3.26 M yen
Heat Shielding Paint	4.94 M yen (3,800 yen x 1,300m²(14,000sq.ft.)	8 years	600 K yen	0 yen	600 K yen	- 3.88 M yen
Regular Paint	2.6 M yen (2,000 yen x 1,300m²(14,000sq.ft.)	10 years	0 yen	0 yen	0 yen	- 5.20 M yen

*First line, page16: figures calculated from coating on warehouse batten seam roofing in Shiki City, Saitama Prefecture; (1,300m²/14,000 sq. ft.)



Economic benefit of GAINA



Although initial costs are higher, use of GAINA reduces maintenance costs of facilities (warehouses, buildings, etc.) over time due to its energy-saving effects. Its many hidden economic benefits can be seen in this warehouse, which now uses fewer air-conditioners and no longer needs sprinklers on the roof in the summer, resulting in less damage to the building. Use of GAINA achieved a reduction in CO2 emissions of some 189.6 tons (424,704 lbs.), the equivalent of the amount produced by 40 families in one year. (Source: National Institute of Environmental Studies).

GAINA Data Guide

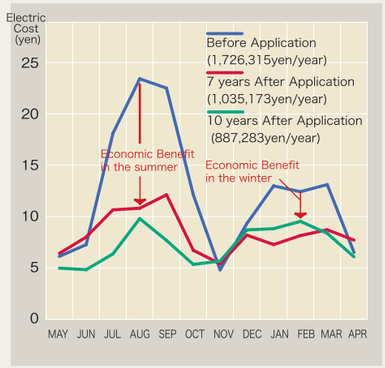
One coating remains effective for 10 or more years

Date applied: May, 2000
Location: Shiki City, Saitama Prefecture
Coated area: batten seam roofing
Color: Light Blue (69-70L)

Effects
- Temperature lowered 15°C (59°F) on the second floor
- No need for sprinklers on the roof during summer
- Need for air-conditioner is now down to 1 from 4
- Heat efficiency is up during the winter
- Repainting cycle is longer

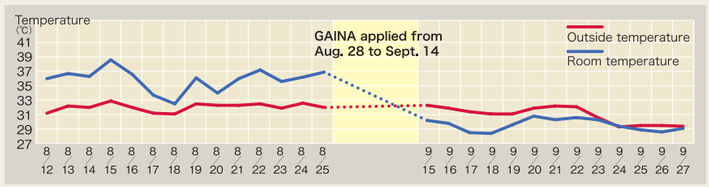
Total cost savings is about 8.2 million yen over 10 years.

Electricity Cost Transition



Cool rooms without air-conditioners

Comparison: Before and after GAINA application in the summer



Date applied: August, 2010
Location: Ginowan City, Okinawa Prefecture
Coated area: roof, exterior, interior
Color: White (N-90) Yellow-Green (32-90D)

Effects
- Room temperature was reduced to less than outside temperature
- Cooking odor in the kitchen is less obvious.

Room temperature was about 4°C (7.2°F), higher than outside; after GAINA application, temperature dropped to below outside temperature

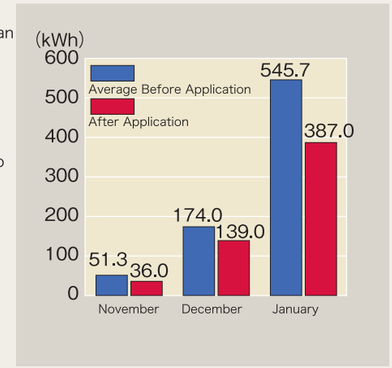
GAINA generates benefits in winter too!

Date applied: August, 2008
Location: Shibuya Ward, Tokyo Metropolitan
Coated area:
roof (about 193m²/2,077 sq. ft.),
exterior (about 193m²/2,077 sq. ft.)
Color: White (N-95) Beige (17-60H)

Effect
- Run-down house appearance renewed to beautiful home with white-wall effect

Electricity costs for heating reduced by 27.1%

Electricity Usage Comparison



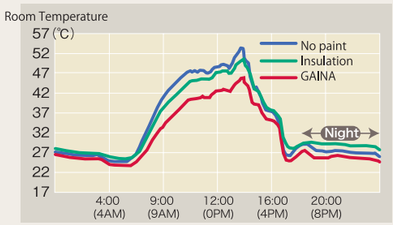
More effective than insulation materials

Test Outline
Comparison of internal temperatures for 3 sheds during the summer.
Period: July 20, 2005 to Aug. 31, 2005

Shed Specifications
Size: Height 1920mm (6'4") ×
Width 800mm (2'8") ×
Depth 900mm (2'11")
1. Shed without any paint
2. Shed with styrofoam insulation (25mm / 1") on walls and the ceiling
3. Shed with GAINA applied (exterior)

GAINA ensures lower temperatures during day and night

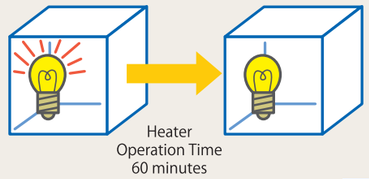
Temperature transition for one day



	No Application	Insulation	GAINA
Highest Temperature of the Day	53.3℃	50.7℃	45.4℃
Highest Temperature of the Night	28.9℃	29.9℃	28.2℃

＊Insulation material retains heat, making it ineffective in reducing internal temperatures. GAINA is able to lower temperatures during the day and night. (Night: 7 pm to 5 am)

Air temperature rises when heater is in operation

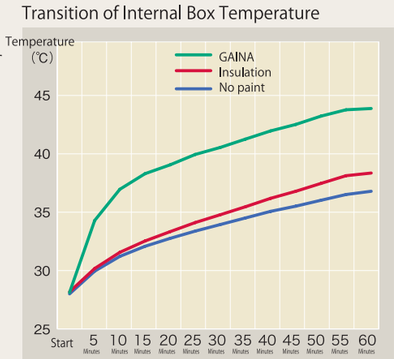


Test Outline
Comparison of internal temperatures for 3 sheds with heater in operation.

Box Specifications
Size: 400mm (1.3') cube
1. Box without any insulation
2. Box with polystyrol insulation (20mm (3/4")
3. Box with GAINA applied (interior)

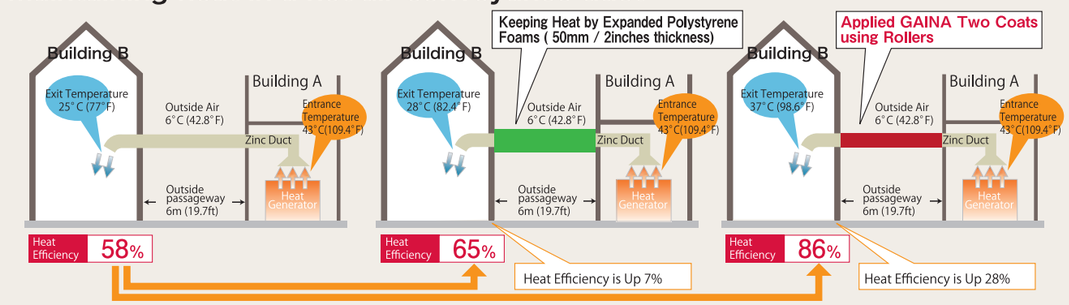
With the GAINA coating, the heating effect starts immediately after the heat source is in operation, rapidly warming the room.

Transition of Internal Box Temperature



＊Tested in Construction Quality Measurement Center, Liaoning Sheng, China

Maintaining heat in a hot air conveyance duct



GAINA achieves effective insulation by creating even layers of heat shielding, regardless of building shape.