GAINA makes comfortable living possible by “balancing heat”!

Everyone wants to live comfortably all year around, but we are living with a lot of stress — from the hot summer and the cold winter to noises and odors. GAINA’s original new technology can adapt to not only the weather, but noises and odors as well. Summer and winter, day and night, GAINA can make your life easier and give you the comfort you’ve always wanted.

Against cold ➤ Insulation/Heater
Heat can escape from the walls and ceilings even when room temperature gets high. GAINA can keep the heat’s movement to a minimum and equalize the temperature throughout the house.

Against heat ➤ Insulation/Interception
GAINA’s ceramic beads reflect the sun’s infrared rays, which makes GAINA’s surface adapt to surrounding temperature and keeps heat transfer to a minimum.

Against noise ➤ Soundproofing
The painted surface of GAINA is covered with many ceramic beads, which can reflect and reduce sound.

Against odor ➤ Air Freshener
GAINA has electrification 0.0 quality, so it prevents dirt from sticking to surfaces. Also, the ion water in the air combines with the dirt, and prevents dirt from floating around.

More Advantages ➤ Prevent condensation, Endurance, Safety, Fireproofing
GAINA has many more varieties. GAINA can prevent condensation; it can make a house or a building more durable; it can fireproof. It will make your home safer.

GAINA’s Development
GAINA, which uses aerospace technology, can be used not only in houses and apartments, but in large-scale constructions such as factories, and for campers and portable toilets, and we expect more developments from GAINA.

GAINA data guide
We introduce you to GAINA’s various effects such as dissolving summer heat and winter cold, eco effects, and cutting costs.
Against Cold
Insulation/Heater

At night, the cold room is now always 10°C (50°F) even after you turn the heater off!

"Now I know from my experience that GAINA has an insulating effect," says the I family from the Nagano prefecture. Until now, they used an air-conditioner with intense heater system, plus an oil heater during the day. They kept the oil heater going while they were asleep, but the room temperature still dropped below 0°C (32°F) by the morning. "But after we painted GAINA, this spacious room only needs one heater. And if we keep the heater on until right before bedtime, in the morning the room temperature doesn't go below 10°C (50°F)." As a result, the I family saved a lot on their electric bills and gas bills.

The room gets warm, and it is effective to prevent condensation

The I family bought an apartment in suburban Tokyo, which was very cold in the winter. Because the concrete foundation of their apartment gets very cold, the north side of the room had a cold floor, even with insulation, and the walls were wet with condensation. Mr. I was thinking "We have to break down the walls and add more insulation in order to keep the heat inside the room," but when he heard that he can just paint GAINA, he decided to paint the walls, ceilings, and the inside of the closets. Soon after, they saw the result. The room is warm even in the winter, and they do not see condensation anymore. "Before, we used to spend most of our time on the south side of the room, but now that it is comfortable, we spend more time on the north side of the room," says the I family.

[Caloric Value Experiment] GAINA has high caloric values

We placed ice cubes every minute after the experiment started. The temperature of both plates is 45°C (113°F).

[Temperature Adaptation Experiment] GAINA adapts to surrounding temperature

5 seconds after blasting them with hot air, keep blasting them with hot air for 7 more seconds.

Paint the exterior to prevent the heat from escaping

Painted side -- big temperature difference between the wall and outside

higher heat radiation level (radiation of heat)

Painted side -- little temperature difference between the wall and outside

lower heat radiation level (radiation of heat)

Even when the temperature inside the house is high, the heat can escape if the walls and ceilings have lower temperature. With GAINA painted on the interior, the temperature of the air and surface of the wall balance out, and minimize the heat's movement.

GAINA helps improve your sensory temperature

On the left, the temperature of the air is 30°C (86°F), the temperature of the walls and ceiling surface is 10°C (50°F), and the sensory temperature is 20°C (68°F). On the right, with GAINA painted on the interior, even when the air temperature is the same 30°C (86°F), the walls and ceiling surface adapt to the air temperature, which also makes the sensory temperature 30°C (86°F).
Against Heat
Insulation/Interception

The air is not humid, and comfortable in the summer

The Y couple built a house that resembles a resort cottage in Aichi prefecture. They painted GAINA on the exterior, the interior and the ceiling. The first thing the couple noticed in the new house was how the air is so refreshing. "The air is not at all humid even without the air-conditioner, and it is so comfortable. The damp courses in the closets do not even get water in them," says Mr. Y. GAINA's permeation of humidity and the fresh woods combined to produce a refreshing effect. Also, the insulation effect is greater than they expected. When the Y's lived in their previous house, it always felt hot and humid in the summer. Now, they do not have to use the air-conditioner often. "Every day is so comfortable, thanks to GAINA," says the satisfied couple.

The houses that depended on an air-conditioner is now cool

There are many people who have noticed GAINA's insulation power. "It was so hot we needed the air-conditioner 24 hours a day," says Tokyo resident Mr. M. When a friend recommended GAINA, which has a big effect on insulation yet does not need complicated construction, he decided to paint it on the roof and the exterior walls. Now his house is surprisingly cool.

Mr. X, who resides in Shizuoka prefecture, says, "I do not feel the heat as much during the summer." Mr. T, in Aichi prefecture, could not stand the heat on the second floor of his house. He says "There is no big difference in temperature between the first floor and the second floor anymore. I can just open the window and it feels cool."

Mr. S, in Ishikawa prefecture, measured the temperature of the roof after painting GAINA, and says, "I was surprised to see that the temperature dropped more than 28°C (82°F)."

- GAINA's heat prevention mechanism
- GAINA prevents the heat's occurrence outside the building and cools down the temperature inside
- Air conditioning effect improved when interior was painted
- Sensory temperature drops when GAINA is painted in the room

The Sun's infrared rays reflect, bend and move on GAINA's ceramic beads repeatedly, and it reduces the energy entering the house (see the chart on the left). Also, the heat prevention materials in the ceramic beads reflect infrared rays.

**Painted area** Interior (ceiling about 415m² [about 4,467 sqft]) Roof (water shield roofing paper) about 160m² (about 1,722sqft) Exterior about 175m² (about 1,884sqft)

**GAINA with GAINA**
- We compared two patches between where we painted one with GAINA and the other without GAINA.
- Tested date: September 3rd, 2008
- Outside temperature is 33°C (87°F).

**The patch with GAINA**
- The patch without GAINA became 48°C (118°F), and the patch with GAINA is 35°C (95°F)

**Air temperature**
- Sensory temperature 30°C (86°F)
- Sensory temperature 20°C (68°F)
- Sensory temperature 10°C (50°F)
Against Noise - Soundproofing

Now that we have less car noises, the family conversation is much easier.

"We used to turn the volume on the TV way up so we can hear it," says the K family who lives in the suburb of Hamamatsu City, Shizuoka prefecture. The street in front of the house has heavy traffic, and cars run very fast there. Also, there is a truck and heavy machinery rental company across the street, and their engine noise was very loud. GAINA solved the K family's trouble. Painting GAINA on the house's exterior reduced the noise a lot. Even in the living room that faces the street, they can enjoy TV with normal volume. "Our conversations disappeared in the noise before, but now we talk more because we can hear one another very well," says Mr. K.

The room is so quiet, they don't notice the sound of rain.

O family in Kanagawa prefecture chose GAINA because every year their children complained that "Our room on the 2nd floor is so hot." After painting GAINA, not only did the temperature drop significantly, but also they noticed less noise. "It's quiet even when it's raining. Sometimes we have to hurry to get our laundry from outside because we don't notice the sudden rain," says Mr. O.

T family in Saitama prefecture had trouble with noise because their house is in a busy shopping district, and there is a lot of traffic. "After we painted GAINA, we realize how quiet it is in the house. We don't even notice the noisy cars and people that we used to hate" says satisfied T family.

GAINA's special ceramic reflects sound and controls vibration

GAINA's membrane is made of many hard ceramic beads with air inside. The sound is repeatedly reflected by the ceramic, and absorbed by the air. Also, because of the effect of layered ceramic within the membrane, it controls vibration, and the sound that entered the membrane became quieter.

[Vibration Control Test] GAINA absorbs vibration quickly

Sound occurs by vibration and travels through vibration. GAINA controls vibration and makes soundproofing possible. These 3 waveform data are from GAINA's vibration control test at Hamamatsu Industry Experiment Station. It is obvious from the data above that GAINA controls vibration.

[Impact Sound Test] GAINA prevents occurrence of sound

We measured the sound when we hit a regular frying pan and GAINA coated frying pan with a hammer. A regular frying pan: 94.7dB GAINA coated frying pan: 74.9dB Differences: 19.8dB

The 20dB difference means sound energy is 1/100. For example, the 6dB difference means sound energy is 1/4, which means you are hearing the sound twice the distance from the sound source.
"The food and drinks taste better when the air is clean. I wanted to make a restaurant where the customer can spend a relaxing time," says Mr. S who chose GAINA prior to opening a Japanese restaurant in front of Fujisawa train station in Kanagawa prefecture. He painted GAINA on interior walls and made them look like plaster covered walls to make it feel relaxing. What surprised him most after painting GAINA, he says, was "there is no residual smell of alcohol and cigarettes from the day before. I might accidentally forget to ventilate the room." Also, they worry about cigarette smells and dust that stick to walls, but with GAINA's ability to prevent dirt from sticking, it is easy to clean. He cannot hide his surprise about GAINA's more-than-expected effects.

Painted area Interior, about 55sqft (about 50sqm)

It feels like living in the woods - realized how much the air quality improved

T family in Fukuokina prefecture painted GAINA on their new house because their previous home felt dusty. After they started living in their new house, they say "It feels like we live in the woods." Mr. M, who renovated his apartment in Tokyo, used to have trouble with the room's smell. He is pleased, saying "After GAINA, there is no bad smell and it is so comfortable." Also, the director of a f dentist in Fuji city, Shizuoka prefecture, used GAINA to improve air condition and to make patients feel relaxed. Now he gets a good reputation from patients saying that "It's comfortable.

Painted area Interior, about 55sqft (about 50sqm)

● Prevents odor and dust from floating and sticking.

GAINA

In general, dust, dirt, and pollen in the air float around containing positive electric energy. And they electro-statically adhere on walls and ceilings. GAINA has the characteristic of being harder for dust, dirt, and pollen to stick, and ionized moisture combines with dust, dirt, and pollen and prevents them from floating around.

GAINA’s attractive effect on creating air that makes you feel good

- By Doctor of Education (Preventive Medicine), Dr. Teruo Iwasaki

Special ceramic beads in GAINA emit extreme infrared radiation because of its excellent extreme infrared radiation emission capacity. Extreme infrared radiation works on water molecules in the room air and makes it negative ion.

The water in the air that turned to negative ion has an effect to purify dust, dirt, and pollen in the air. Also, the negative ion water molecule in the air can be consumed in our body by breathing.

Because of this effect, the room air within GAINA painted room brings ideal air to human bodies. It becomes "the air that makes you feel good," so to speak, and creates comfortable living situation.

The data measured February, 2005

Before measuring ion data

After measuring ion data

Dr. Teruo Iwasaki

Ph.D in Education, Tokyo Institute of Technology. Born in Mie Prefecture, Shimane Prefecture, and graduated from the University of Tokyo with a degree in Science. Specializes in research on environmental health and the impact of air pollution on health. He is also engaged in research on the effects of natural environments on health and the development of new technologies for improving environmental quality. He is actively involved in disseminating the benefits of natural environments to the general public and promoting the importance of green living. He is currently the director of the Air Quality Research Center at the University of Tokyo. He has been a key figure in the development of new technologies for improving indoor air quality and promoting the importance of green living to the general public. He is also actively involved in research on the effects of air pollution on health and the development of new technologies for improving environmental quality. He is currently the director of the Air Quality Research Center at the University of Tokyo. He has been a key figure in the development of new technologies for improving indoor air quality and promoting the importance of green living to the general public.
More effects

Dew prevention, Endurance, Safety, Incombustibility

Dew prevention

To prevent condensation by restraining heat’s movement that causes condensation, which creates a comfortable living situation.

There are many places – ceilings, walls, windows, in the closet – in our homes where condensation occurs. Condensation happens in general when the heat of the air moves through windows and walls. Heat moves from higher places to lower places when there is difference in temperature. That is why condensation happens in the lower temperature areas such as windows and walls.

GAINA’s coating film adjust to surrounding temperatures, so when painted with GAINA, the surface area’s temperature becomes comparable to the room air temperature. As a result, there is less movement of heat because there is less difference in temperature, and the effect of preventing condensation happens.

Endurance

GAINA can make buildings’ lives longer.

GAINA has many ceramic layers that are the strongest against ultraviolet rays, and is 2 to 3 times more durable than regular paint. Also, its insulation/thermal barrier effects restrict the building’s expansion/constriction.

- Endurance against ultraviolet rays by ultraviolet rays’ absorption rate

<table>
<thead>
<tr>
<th></th>
<th>Absorption Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finely Divided Titanium Oxides (rubblocka)</td>
<td>87.00%</td>
</tr>
<tr>
<td>Carbon Black (ties, electric wires etc.)</td>
<td>95-97%</td>
</tr>
<tr>
<td>GAINA</td>
<td>93-95%</td>
</tr>
</tbody>
</table>

- Xenon 2000 hours compound cycle test (color, light gray)

<table>
<thead>
<tr>
<th></th>
<th>No splits, peelings, frosts, color changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbonate</td>
<td>Same as above</td>
</tr>
<tr>
<td>Carbonate Oxide</td>
<td>After Carbamate 0.57</td>
</tr>
<tr>
<td>Adhesion Strength</td>
<td>After Anticorrosion 0.59</td>
</tr>
<tr>
<td>Near Infrared Rays</td>
<td>Standard Training (1 week later)</td>
</tr>
<tr>
<td>Reflectance (780-2100nm)</td>
<td>89.5%</td>
</tr>
<tr>
<td>GAINA</td>
<td>Xenon compound cycle test 2000 hours later (about 14 years) 87.1%</td>
</tr>
</tbody>
</table>

Incombustibility

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

To adorn incombustibles by the government ordinance, there are 3 ranks of building materials to fit in the engineering standards for incombustibility: Incombustibles, Quasi-incombustibles, Fire retarding materials. GAINA is certified as an incombustible, the highest rate, by Ministry of Land, Infrastructure, Transport and Tourism.
Evolution of GAINA

GAINA, which uses aerospace technology, can be used not only in houses and apartments, but in large-scale constructions such as factories, and for campers and portable toilets, and we expect more developments from GAINA.

●Bringing aerospace technology to our lives

Japan Aerospace eXploration Agency (JAXA) developed insulation paint to protect the rockets and satellites from the heat of the atmosphere.

Converted to civil use

GAINA is a product for consumer developed and manufactured by Nissin Sango yo Inc, using aerospace technique.

Data of Physical Property

<table>
<thead>
<tr>
<th>Test Content</th>
<th>Test Method</th>
<th>Test Result</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness or flexibility value of Insulation Paint</td>
<td>JS-K5600 5.4</td>
<td>B</td>
<td>Mitsubishi Liki</td>
</tr>
<tr>
<td>Shock Test</td>
<td>JS-K5600 5.3</td>
<td>No breaking, no peeling</td>
<td>Du Pont 500g/60cm</td>
</tr>
<tr>
<td>Enriched Test (Poly)</td>
<td>JS-K5600 6.2</td>
<td>No breaking, no peeling</td>
<td>303mm/8.6mm</td>
</tr>
<tr>
<td>Cross-cut Adhesion Test</td>
<td>JS-K5600 5.5</td>
<td>10x100</td>
<td>Cutter Guide</td>
</tr>
<tr>
<td>Allure Resistance Test</td>
<td>JS-K5600 6.1</td>
<td>No breaking, no peeling</td>
<td>Sodium Hydroxide 5% Nalco, 20°C(80F), 24hrs</td>
</tr>
<tr>
<td>Acid Resistance Test</td>
<td>JS-K5600 6.1</td>
<td>No breaking, no peeling</td>
<td>Sulfuric Acid 5% Solution, 20°C(80F), 24hrs</td>
</tr>
<tr>
<td>Heat-Resisting Property Test</td>
<td>JS-K5600 6.1</td>
<td>No change</td>
<td>Electric Furnace 150°C(302°F), 160mins</td>
</tr>
<tr>
<td>Salt Spray Resistance Test</td>
<td>JS-K5600 6.1</td>
<td>No Rust</td>
<td>Electric Furnace 250°C(502°F), 160mins</td>
</tr>
</tbody>
</table>

10-year total cost difference (paint cost minus energy saving effect)

<table>
<thead>
<tr>
<th>Paint Cost</th>
<th>Useful Life</th>
<th>Summer Time Energy Saving Effect</th>
<th>Winter Time Energy Saving Effect</th>
<th>Whole Year Energy Saving Effect</th>
<th>10-year Cost Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gallah</td>
<td>400=6000 y/m (300=6000 y/m x 1.33/1.416)</td>
<td>15 years</td>
<td>6000000yen</td>
<td>220000yen</td>
<td>880000yen</td>
</tr>
<tr>
<td>Heat Shielding Paint</td>
<td>400=6000 y/m (300=6000 y/m x 1.33/1.416)</td>
<td>5 years</td>
<td>600000yen</td>
<td>0yen</td>
<td>600000yen</td>
</tr>
<tr>
<td>Regular Paint</td>
<td>280=5000 y/m (200=5000 y/m x 1.33/1.416)</td>
<td>10 years</td>
<td>0yen</td>
<td>0yen</td>
<td>0yen</td>
</tr>
</tbody>
</table>

- First line, page 18, calculated by when paint for warehouse battery seam roofing in Saitama prefecture, Shiki city (1,300yen/14,000kw)

Economic benefit of GAINA

The initial cost of painting GAINA is higher, but it reduces the maintenance costs of facilities (warehouses, buildings, etc.) over time because of its eco-friendly effect. Also, as a hidden economic benefit, this warehouse now uses fewer air-conditioners and no longer needs sprinklers on the roof in the summer, resulting in less damage to the building. Amount of CO₂ cutback in 10 years by the eco effect is the same as the amount 40 families produce per year, about 188t (424,704lbs). [Source: National Institute of Environmental Studies]
When you paint it once, it is effective even after 10 years.

- Temperature lowered by 15°C (59°F)
- No need for sprinklers on the roof
- No need for an air-conditioner
- Heat efficiency is up during the winter
- Repainting cycle is longer

Total cost saving is about 8,200,000 yen in 10 years.

Cool rooms without air-conditioners

Comparison: Before and after GAINA application in the summer

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Outside temperature</th>
<th>Room temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>30°C</td>
<td>28°C</td>
<td>22°C</td>
</tr>
<tr>
<td>28°C</td>
<td>26°C</td>
<td>20°C</td>
</tr>
<tr>
<td>26°C</td>
<td>24°C</td>
<td>18°C</td>
</tr>
<tr>
<td>24°C</td>
<td>22°C</td>
<td>16°C</td>
</tr>
<tr>
<td>22°C</td>
<td>20°C</td>
<td>14°C</td>
</tr>
</tbody>
</table>

Effects
- Room temperature used to be higher than outside, but now, it is lower.
- Cooling odor in the kitchen is less obvious.

Air temperature rises when the heater is in operation

Test Outline: Compare inside temperature transitions for the 3 boxes when heater is operating

Box Specification:
1. Box without any insulations
2. Box with polystyrene insulation (200mm, 7.9")
3. Box with GAINA applied (interior)

Comparison

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Applied GAINA Interior</th>
<th>Applied Insulation Interior</th>
<th>No Insulation Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>45°C</td>
<td>35°C</td>
<td>25°C</td>
<td>15°C</td>
</tr>
</tbody>
</table>

By painting GAINA, the heating effect starts immediately after the heat source started operating, so it is possible to warm up the room temperature very quickly.

Keeping heat in a hot air conveyance duct

GAINA makes effective insulation possible by creating even layers of heat shielding, no matter what the object's shape is.