

WAKO CO.,LTD.
PRODUCT

Ceramic Composite Heat Insulation Paint

WAKOECO SHIELD

Product Overview

Reduce costs with heat insulation paint!

Paint yourself a more comfortable living space.

Cool in the summer and warm in the winter.

It is ever more vital that your living environment respond to changes in the natural world that surrounds it.

Using our new technology, we have created heat insulation paint that keeps you cool in the summer and warm in the winter, making it perfect for customers who want to keep their living arrangements comfortable, or simply want to reduce their air-conditioning and heating costs.

Let us help you create your ideal living environment.



14kg

WAKOECO SHIELD

About WAKO CO.,LTD.

We began with the sale and manufacture of special ceramic-based ship-bottom paint, and have had record sales for over 15 years, both in Japan and abroad. We are now carried by over 200 dealers throughout Japan. Through application of our ceramics technology, we have developed new heat insulation and soundproofing paints for use in a variety of construction applications beyond ship bottoms.



Hiroshima
JAPAN

Heat Insulation Mechanism

We are proud of our heat insulation, which demonstrated superior performance when tested and proved effective in Indoor exposure testing (simulated) as well. *Indoor exposure testing is described on the following page.

■ Reduced Energy Consumption

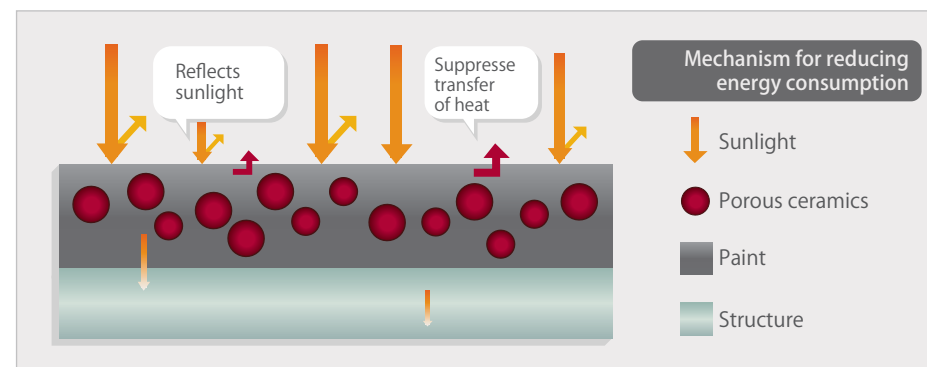
Special porous ceramics effect #1

Heat insulation effectively reflects sunlight

Special porous ceramics effect #2

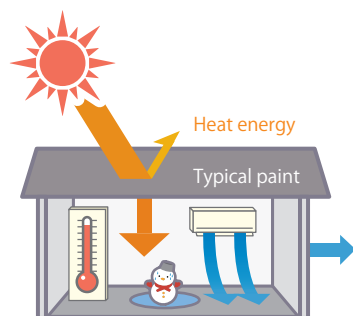
Heat insulation suppresses heat transfer between inside and outside

Increases cooling efficiency in summer and heating efficiency in winter

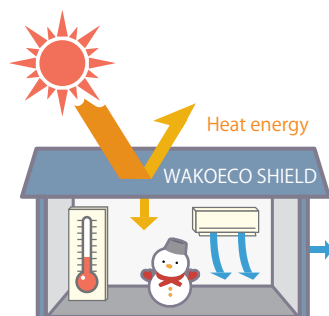


Key Point

The paint acts as a barrier that keeps pressure from being applied to the special porous ceramics, making them durable despite their porosity.



Heat is transmitted inside and cool air from air-conditioning escapes outside



Suppresses increases in temperature while keeping cool air-conditioned air inside

■ Special Porous Ceramics



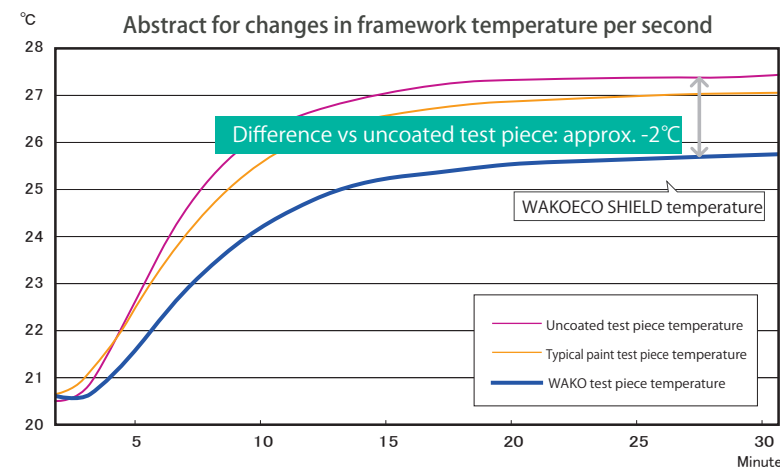
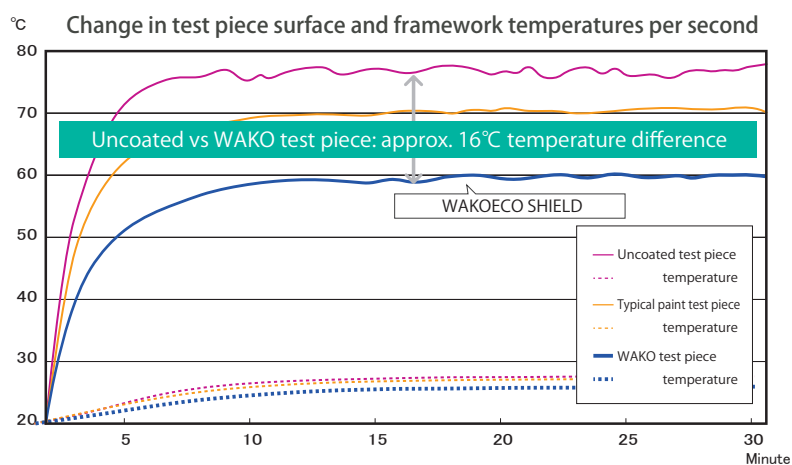
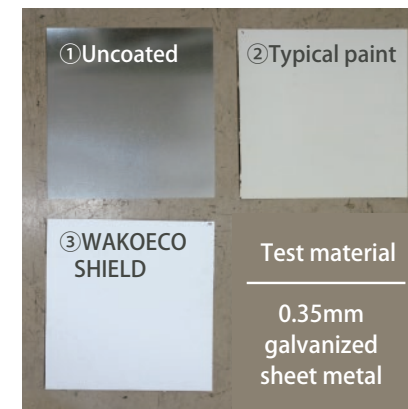
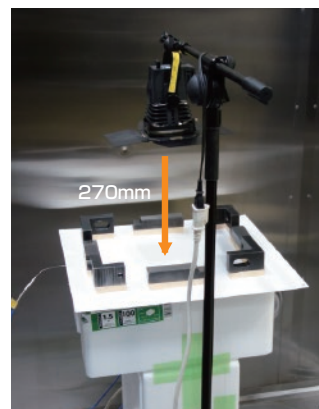
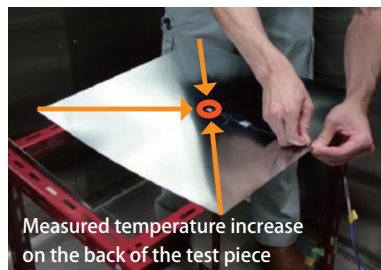
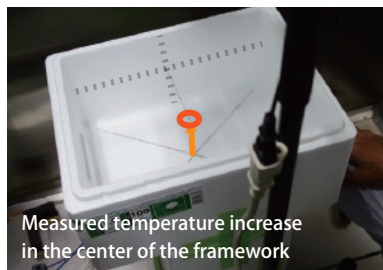
The paint contains porous ceramics of a very fine particle size that do not increase resistance or otherwise affect brush and roller application. The paint's heat and heat insulation is due to these ceramic beads.

Heat Insulation Performance Test 1

Test Location:
Hiroshima Western Industrial Technology Center

Equipment Settings

Framework: Styrofoam, temperature increase measured in the center of the framework
Heat source: 500W floodlight



Conclusion

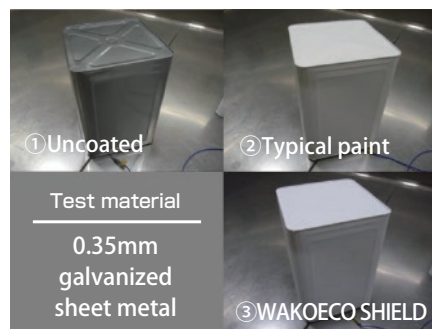
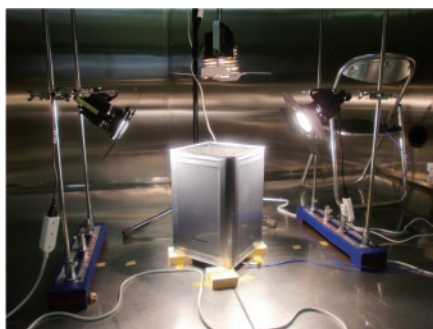
Test piece and framework interior coated with WAKOECO SHIELD shows greater suppression of temperature increases than test pieces those coated with typical paint or left uncoated

Heat Insulation Performance Test 2

Test Location:
Hiroshima Western Industrial Technology Center

Equipment Settings

Framework: 18 L steel can, temperature rise measured in the center of the base of the framework
Heat source: 2 to 3 500W floodlights



Average temperature difference of the center of the test piece vs uncoated test piece

Test environment (set)	Floodlights	Temperature difference vs uncoated test piece (°C)		
		Uncoated	Typical paint	WAKO
Ambient temperature 35°C	2	0.0	-3.4	-5.0
	3	0.0	-3.9	-5.9
Ambient temperature 10°C	3	0.0	-4.0	-5.8

Performance is comparable to competitor's thermal insulation paint.

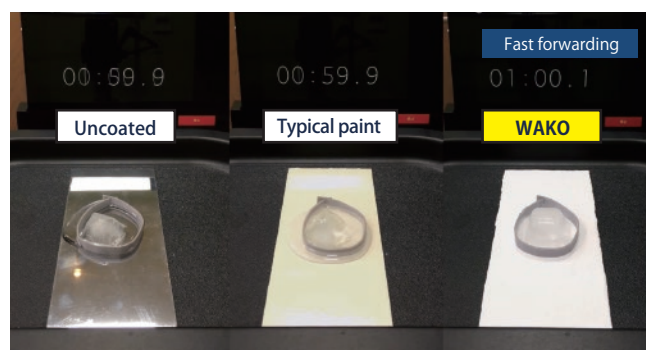
Conclusion

Thermal shielding was proportional to rise in temperature increase was suppressed compared to both the uncoated test piece and the test piece painted with typical paint.

Performance Tests

Heat Insulation Performance:

Comparison of heat transferred from a hot plate to the test piece



Procedure

- ① Heat the hot plate
- ② Turn off heat at 100 degrees
- ③ Apply the test piece and ice
- ④ Observe change in ice

The time for the ice to melt	
Uncoated	00:03:48
Typical paint	00:04:04
WAKO	00:07:31

The ice took the longest amount of time to melt with the WAKOECO SHIELD test piece, indicating sufficient thermal insulation.



WAKOECO SHIELD
YouTube

Video of these tests available on our website and YouTube
*Be advised that while visual confirmation is possible through these videos, explanations are in Japanese only.

Electrification Performance:

Determine if static-electricity charged paint is resistant to airborne dirt.



Procedure

- ① Rub the test piece (plastic board) 10 times in a towel
- ② Bring it closer to the styrofoam

Count the number of pieces which adhere to the test piece

The number adhered	
Uncoated	16
WAKO Front	0
WAKO Back	0

Static electricity was suppressed on both the coated side and the non-coated side of the test piece painted with WAKOECO SHIELD.



WAKOECO SHIELD
YouTube

Video of these tests available on our website and YouTube
*Be advised that while visual confirmation is possible through these videos, explanations are in Japanese only.

Test paint

Area : Okinawa-city JAPAN

Date : July

Painted places : Concrete building roof

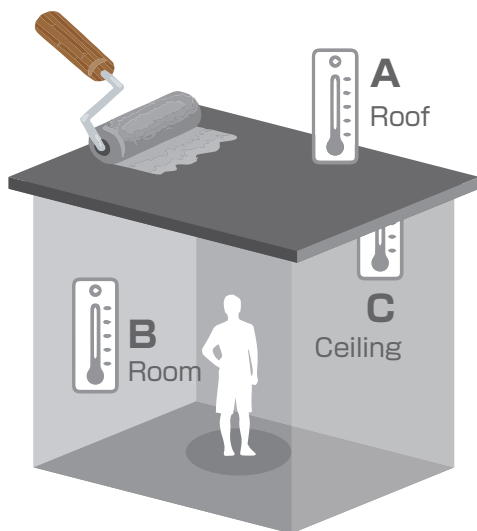
Usage of building : general house

Perform the test of temperature change situation by general residence before painting and after painting

Pictures during painting work



Painted



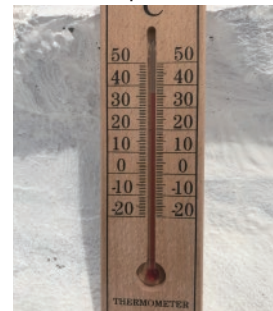
Temperature measurement position

Point A <Roof outside>

Before temperature



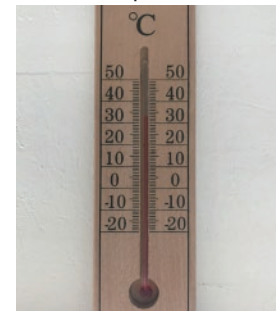
After temperature



41°C **about -4°C** 36.5°C

Point B <Room>

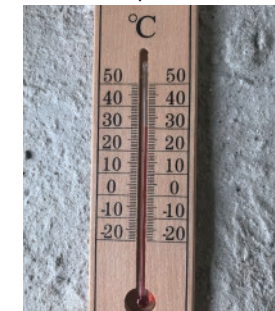
After temperature



Before 36°C **about -3°C** 33°C

Point C <Ceiling>

After temperature



30.8°C

Findings

Compared to before painting, the room temperature is -3°C, but the effect of -3°C or more is felt.

Performance and Application

This water-based paint provides heat and thermal insulation, prevents condensation and mold, and also blocks UV rays.

Environmentally friendly water-based paint

Heat insulation is composed of special inorganic acrylic and emulsion polymer fillers.

This formaldehyde-free, environmentally friendly water-based paint poses absolutely no danger to the human body.

Impact resistance

This strong, flexible coating resists fine cracks and structural breakage caused by physical impact.

Storage stability

Easy for anyone to work with and apply—can be sprayed on or smoothly coated using a roller or brush.

May be stored for up to six months from date of manufacture (indoors, 5 to 35°C).

Light-reflective and incombustible material

Reliably reflects UV rays and energy emitted by the sun.

This water-based paint is comprised of incombustible, heat-resistant and highly dependable materials.

Applications

Anywhere where thermal resistance is needed, from apartments and schools, to factories, warehouses, railway and refrigerated transport. Perfect for all kinds industrial facilities and even ships.

Surface Treatment

Surface Treatment

Remove foreign matter, oil, rust and other contaminants on the surface to be painted. Surface treatment is performed depending on the material as follows.

Concrete

1. New concrete surfaces must be fully cured. Remove laitance with a wire brush or polisher. Once the surface to be painted is ready, first coat with a water-based acrylic binder (primer).
2. If you are repainting, in addition to foreign matter, make sure that any mold has been completely removed

Slate

1. Use a high-pressure washer to remove all contaminants, then allow to dry for 24 hours. Repair any deteriorated material before applying paint.
2. Affixing pins are recommended to ensure breathability and durability when reapplying paint to level slate roofing.

Iron

1. Use a power tool or scraper to remove any rust.
2. Apply a first coat of rust-proof epoxy binder (primer) and allow it to cure completely before painting.

Galvanized sheet metal

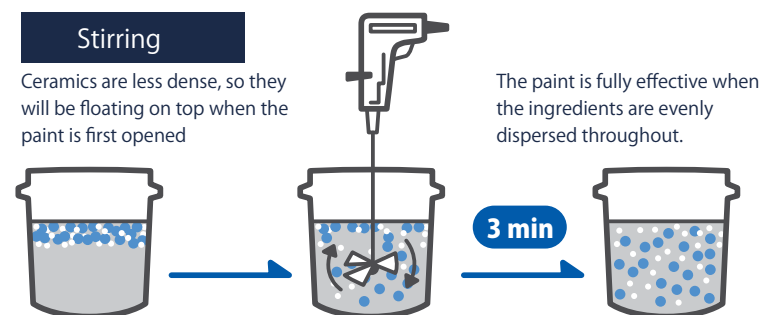
1. Applying a coat of metal pretreatment (etching primer) or acid treatment is effective for new sheet metal.
2. Old sheet metal must be washed with water, sanded and dried before paint is applied.

*Galvanized sheet metal exposed to outdoor conditions may exhibit varying adhesive performance depending on deterioration.

Applying Paint

Dilution and Stirring

1. Before applying paint, use an electric mixer to stir thoroughly for at least three minutes. Next, dilute with tap water as required by the application method to improve application efficiency. For brushes and rollers: 1.5L/can (14kg), for spray: no more than 3L.
2. Dilute the paint little by little to ensure that too much water is not added. Winged stirring rods are recommended for mixing—do not use wooden rods, etc.



Dilution Reference

Brush

0 to 10%

Roller

0 to 10%

Spray gun

10 to 20%

Application

1. Apply paint in several single, thin layers (at least 2 to 3 times). Multiple layers improve insulation performance. See the WAKOECO SHIELD technical data and specifications for details.
2. Remove all filters before application with an air-less spray gun, as filters will interfere with paint particles. Make sure to fully rinse the gun before use to ensure any remaining particles are removed.
3. When using a roller, short brushes are recommended. Recessed areas, seams, etc., should be first painted by hand.
4. Avoid application in rainy weather or on humid (85% humidity or more) or cold (5 degrees or less) days, as these environments may impair the paint's original effectiveness.
5. Use paint immediately after opening, as paint may deteriorate due to external contaminants once opened.

Test Report

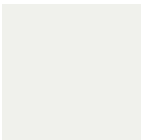







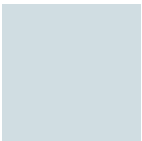
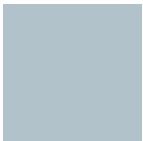
Test Location:
Japan Paint Inspection and Testing Association

Falling-weight(Dupon method)	No abnormality.
Cupping	No cracking and peeling at depth of indentation 8.0mm
Adhesion(Cross cut)	Classification 0
Alkali resistance No abnormality. 24hours	No abnormality.
Acid resistance No abnormality. 24hours	No abnormality.
The effect of heat 1hour	Temperature:150° C
	Color difference : (Rating 2) *1 No cracking, blister, peeling and loss decrease.
	Temperature:200° C
	Color difference : (Rating 2) *1 No cracking, blister, peeling and loss decrease.
Resistance to neutral spray 96hours	No abnormality.
Accelerated weathering 1000 hours	No abnormality.
Accelerated weathering 2000 hours	No abnormality.
Reflectance solar at 0hour, 1000 hours (The near-infrared region)	0hour : 85. 1
	1000 hours : 85. 5
Reflectance solar at 2000 hours (The near-infrared region)	85. 4
Humidity and cool-heat cycling	No abnormality.
Permeability test	0.3ml
Flexibility test	No abnormality.

*1 JIS K 5600-4-3:1999 Visual comparison of the color of paints Annex B (normative) Color difference rating scheme
Table B. 1 Rating scheme for components of color difference by visual assessment

Specifications

Colors

N-95	N-85	N-80	42-80D
			
22-90C	22-85C	22-85B	25-85F
			
75-90D	72-80D	—	
			

Contact us for additional colors other than the standard colors commercially available.

Technical Data

Information	Base color	White and light color (order)			
	Painted surface	matte			
	Mixing ratio	—			
	Theoretical coverage	0.42~0.48kg/m ² (2 coats of paint)			
	Flash point	—			
Application	Drying time	5°C	10°C	20°C	30°C
	— Surface dry	1hr	45mins	30mins	20mins
	— Hard dry	6hrs	4.5hrs	3hrs	2hrs
	Overcoat interval				
Application	— Min	6hrs	4hrs	3hrs	1hrs
	Precending coats	Depending on the material.			
	Number of coats	2 or more times			
	Method of dilution	Water			
	Method of dilution ratio	Airless spray - max.15% by volume , Roller or Brush - max.10% by volume			
	Method of application	Airless spray , Roller , Brush			
	Application condition				
	— Relative humidity	Max.85%			
	— Substrate temperature	Min.5°C (at least 3°C above the dew point)			
	— Atmosphere temperature	5~35°C			
Storage	Airless spray				
	— Nozzle orifice	0.023 ~ 0.030 inch			
	— Nozzle pressure	2,000 ~ 3,500 psi			
Storage	Shelf life : 9months at 5 to 35°C Store in dry,shaded conditions away from source of heat and ignition.				