

Superior air purification function  
and environment protection function



# Takachiho Shirasu-kabe

Interior wall use plastering material made of 100% natural materials,  
the volcanic product, shirasu

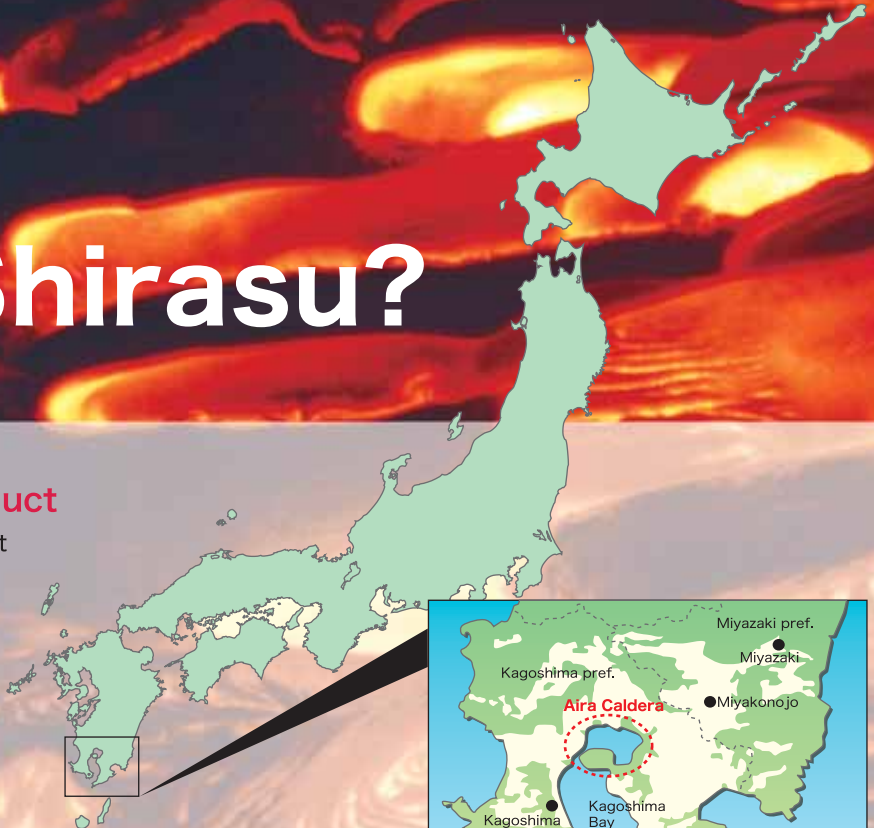
Made In Japan

高千穂シラス株式会社  
Takachiho Shirasu Corp.

# What is Shirasu?

## An unparalleled volcanic product

Shirasu is the accumulated product of giant pyroclastic flows triggered 25,000 years ago by an eruption of the Aira Caldera with its crater located in what is now northern Kagoshima Bay in Japan.



## Unique magma ceramic material

Shirasu is a natural ceramic material created by magma, so we call it a magma ceramic. Shirasu is also known as amorphous volcanic glass, with its amorphous portion ranging from 60% to 80%, giving it unique properties distinguishing it from other volcanic products.

It is highly amorphous, so its molecular composition is unstable and activated, and according to its environment, it easily causes a catalytic reaction. It therefore, presumably provides functions such as deodorization, decomposition, sterilization, ionization, and so on.

## Porous structure and composition of diverse substances

Shirasu has a porous structure featuring numerous holes in extremely fine particles.

Silicate, which is a major constituent of shirasu, is a major source material used to make dehumidifying agents, and is, therefore, the source of the superior humidity control function of Shirasu Wall.

And alumina contained in shirasu is a material with a strong gas absorption function.

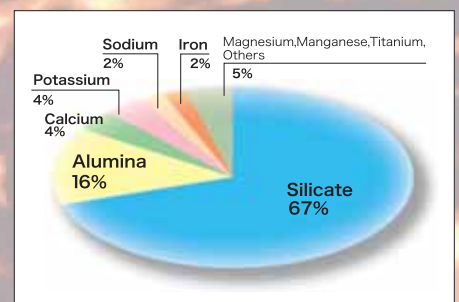
Their extremely complex structure and constituent composition, which cannot be created artificially, are unique features of shirasu, which differs from volcanic products from other regions.



Shirasu distribution map of Southern Kyushu



Electron micrograph of a shirasu grain.



Composition of shirasu



## Constituents of magma which remain today

Grains of shirasu contain a substance called melt inclusion. Melt inclusion is formed by the enclosure without modification of water, minerals, and other volatile constituents of magma, and they are the object of continuing research as materials which preserve information about the magma prior to its eruption. This too is assumed to be one of the sources of the unique functions of Shirasu Wall.



(EPA=JII)

## Magma is the source of life

Approximately 4.6 billion years ago. On the surface of the earth, then still in its infancy, gas and steam were gushing profusely upward from a sea of hot magma. As the earth gradually cooled, the steam formed clouds triggering rainfall. Finally, the ancient oceans formed, and as the magma within them gently cooled, creating minerals, a variety of substances contained in the magma dissolved in the ocean waters. This means that the sea can also be called a soup containing the essence of magma.

In the ocean, proteins, which are the origin of life, were created, and with the passage of vast periods of time, these evolved to become the life, including humans, which now inhabit the earth. The sea, or in other words, a magma soup, played a major role in the creation of life.



(EPA=JII)

## Close links between people and shirasu

As already explained, magma created life on earth, and played a big role in its later evolution. Thus, we believe that shirasu, which is a product of magma, is somehow linked to humans, who are the distant descendants of magma. Customers who have used Shirasu Wall have often told us, "Now that I have Shirasu Wall, I sleep better" or, "For some reason, I can relax in a room finished with Shirasu Wall", and I think this shows the close affinity we humans have for shirasu. Shirasu, a product of magma, has a special function: acting gently on, and calming, the memory of our human DNA, also created by magma.







## Commitment which allows no compromise, **100% natural materials**

A person ingests about 2kg of food per day.

A person also breathes about 15kg of air per day.

The air in homes, where people spend much of their time, is even more important for family health than food.

Modern homes are highly airtight.

Even with 24 hour/day ventilation by ventilation fans, the indoor air is much more polluted than imagined by chemicals vaporized from building materials and by odors and moisture produced by people's daily lives.

In the same way that we select chemical-free vegetables or mineral water for the sake of our health, we consider it necessary to be even more careful of the safety of indoor air.

Takachiho Shirasu-kabe is 100% natural material completely.

Its main raw material is shirasu, which has co-existed with people for 25,000 years.

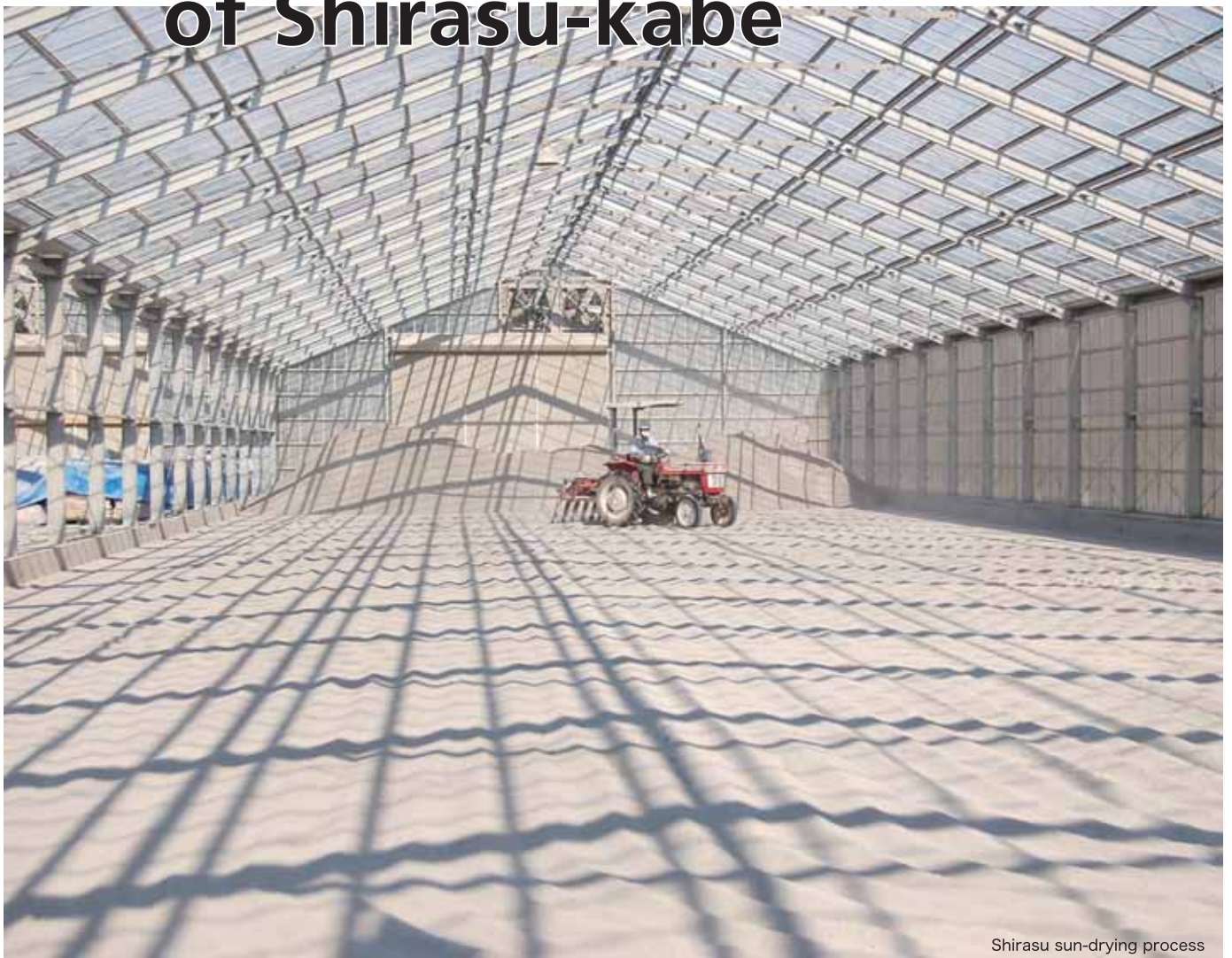
Its secondary raw materials are all natural materials surrounding people's daily lives.

It is reassuring material, incomparable with the level of safety only adequate to meet standard values established by humans.





## Environmental Function of Shirasu-kabe





# Takachiho Shirasu-kabe creates comfortable healthy homes and reduces environmental load.

## Protects the environment thanks to low-tech and low energy consuming manufacturing

Shirasu consists of loose particles. Unlike silica soil etc., which is cut from lumps, it can be extracted easily without crushing. And the shirasu obtained is sun dried to remove excess moisture, so calcination is unnecessary. Takachiho Shirasu-kabe, which is manufactured based on a total commitment to low tech methods—using human hands without depending on machinery wherever possible during other processes—is an eco-building material which consumes little energy and places a small load on the global environment.



Sieving process



Pigment straining process

## Protecting the environment with a humidity control function

During humid seasons, if the humidity falls in a room, its inhabitants feel cool, even if the room temperature does not decline.

Shirasu-kabe provides a superior humidity control function, maintaining a comfortable level of humidity and keeping the air comfortably dry indoors even during a humid Japanese summer.

This increases cooling efficiency, conserving energy.



## Environmental functions of Shirasu-kabe attract interest

In recent years, Shirasu-kabe has been watched with expectations of its unique low energy consuming manufacturing process and the CO<sub>2</sub> emission control effects of a function provided only by shirasu, and has been adopted for many low energy housing trial projects conducted in Japan.

Following its adoption in 2009 by the private sector projects, Eco Sky House (Mitsubishi Heavy Industries Group) and the Energy Creating House (Nippon Oil Corporation), in 2010, its energy saving effects resulting from its superior humidity control function and air cleaning function were praised in the Eco House Model Project of the

Ministry of the Environment of Japan, and it was adopted as interior and exterior finishing of Eco-houses constructed in the cities of Yamanashi and Kita-Kyushu.



Eco-house in Kita-Kyushu

## Ministry of the Environment Eco-house Model Project

Twenty local governments selected from throughout Japan received subsidies from the Ministry of the Environment to undertake the development and popularization of Eco-houses which restrict emissions of CO<sub>2</sub> by taking advantage of the climate and other unique features of their respective regions. Each model house developed in these regions was opened to the public for use as places for the local people to see and learn about Eco-houses.

# Customers' opinions

The following are impressions from people living in homes constructed or renovated using Shirasu-kabe.

I am happy there is no smell. I am also pleased that my walls are in very good condition.

there is no tobacco odor where we smoke. And when I dry laundry indoors, there is no smell and it dries very well.

My family members were surprised when no smell remained in the house the morning after we grilled meat.

It's wonderful to sleep so well.

Only the rooms coated with Shirasu-kabe are free of dew condensation. And there is no problem even when I dry laundry!! No dampness!!

My biggest surprise was that the toilet was completely odorless. Next was the lack of dampness inside during the rainy season

I was delighted that it did not cause any symptoms of sick-house syndrome.

I keep a pet in my house, but I am delighted that there is no animal smell.

People who visit our house tell us that it does not have the characteristic new-house smell.



We moved  
into the house  
in May,  
and did not use  
an air-conditioner  
all summer.

My son had  
atopic dermatitis,  
but since we moved,  
I have not applied  
medication to him once.  
And his hands  
and feet are clear.

## Multi-function interior use wall plaster **Takachiho Shirasu-kabe**

My daughter  
suffered from  
sick house syndrome,  
but that has  
now cleared up,  
and even her asthma  
has disappeared.

Our children's  
stuffy noses  
are cured, and  
they can now  
sleep quietly.



Multi-function interior use wall plaster  
**Takachiho Shirasu-kabe**

**Biocera** *Biocera light*

©Japanese Patent No. 3283799 ©Japanese Patent No. 3415790

©U.S.A. Patent US6171655 ©EU Patent 1113050

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Takachiho Shirasu-kabe, “wall which breathes”.

Ancient magma constituents inside fine shirasu particles display a variety of functions including deodorization, humidity control, and so on.

The mysterious power of nature, which humans cannot hope to ever duplicate, creates a comfortable living environment.

## Deodorization

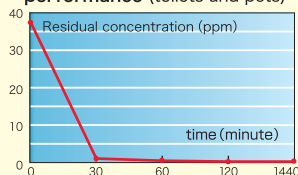
Odors of pets and cigarettes, and other annoying odors of daily life quickly disappear.  
Unpleasant odors are banished from homes.

A specialized organization measured the deodorization function of Shirasu-kabe.

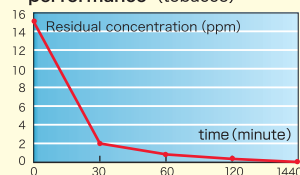
The results can be seen at a glance in the following graph. The odor of ammonia from toilets and pets is completely eliminated in 30 minutes.

### ■ Deodorization performance data (residual concentration)

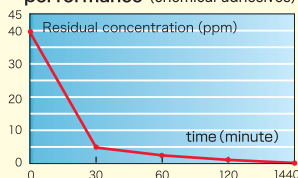
#### ● Ammonia deodorization performance (toilets and pets)



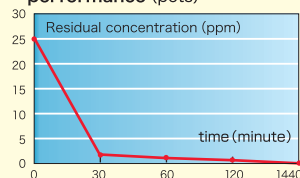
#### ● Acetaldehyde deodorization performance (tobacco)



#### ● Formaldehyde deodorization performance (chemical adhesives)



#### ● Methylmercaptan deodorization performance (pets)

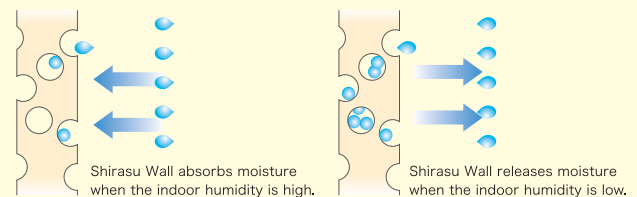


## Humidity control

The indoor air is dry, even during rainy season. You will never worry about mold or dew condensation.

Shirasu-kabe is material with a property which absorbs moisture when the indoor humidity is high and releases the moisture when the indoor humidity is low, maintaining the humidity at a level comfortable for people.

In the summer, when the humidity is high, this holds down the indoor humidity, reducing the sensible temperature, thereby cutting electric power consumed by air-conditioners. And by discouraging dew condensation, it can prevent mold or mites caused by humidity.

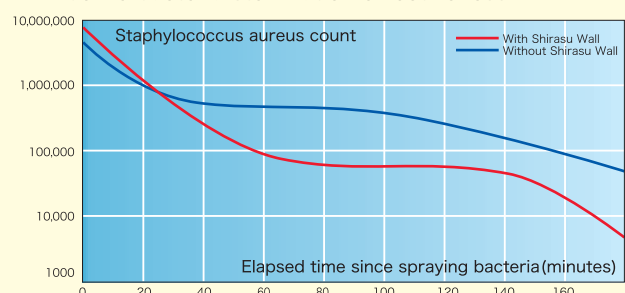


## Air purification

You will never need another air purifier!!  
Cleans air with a mysterious power.

Shining light on titanium oxide among shirasu constituents causes charge decomposition, producing the substance called the OH radical. OH radicals are powerful oxidants which steal electrons from nearby organic materials, breaking molecular bonds. This is the phenomena called an oxidation-reduction reaction, which removes bad odors and makes hazardous substances harmless. Therefore, indoor air coming into contact with Shirasu-kabe is always purified. You will no longer need an air purifier.

### ■ Airborne bacteria sterilization effectiveness



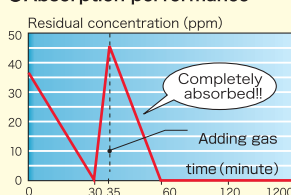
## 100% natural materials

The Shirasu-kabe is useful materials for the prevention of the health hazard with volatility chemicals.

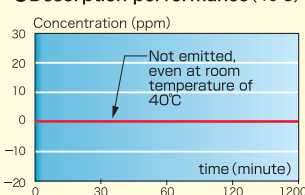
Consisting of 100% natural materials, Shirasu-kabe is completely free of substances which are causes of sick house. And it also absorbs and does not reemit VOC generated by furniture or other building materials.

### ■ Formaldehyde absorption and discharge test

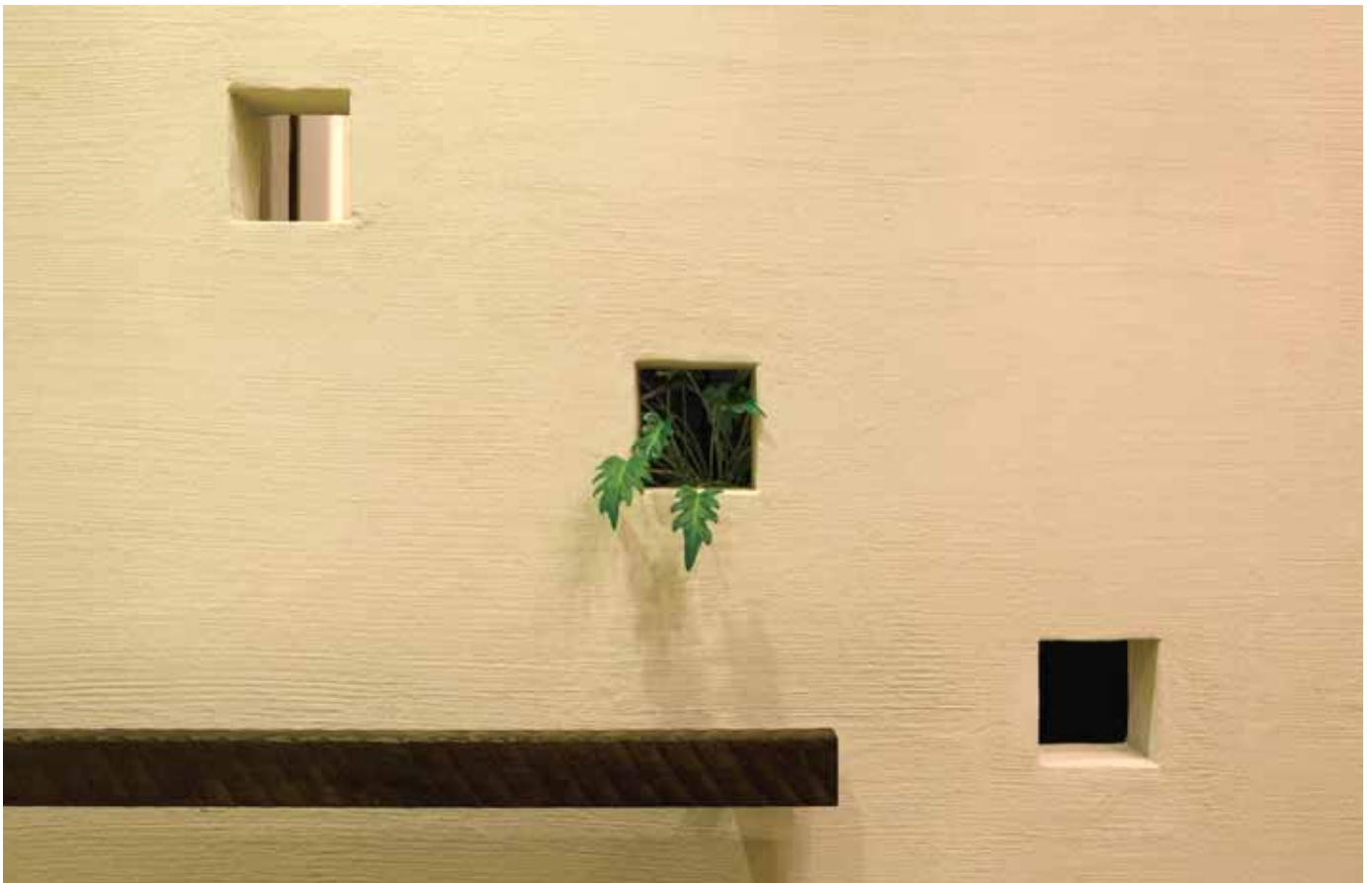
#### ● Absorption performance



#### ● Desorption performance (40°C)



## Interior use wall plaster





Multi-function interior use wall plaster

# Biocera

Coating thickness : 5mm

## ■Color variations (total of 20 colors)

※This photo is printed material, so the colors may differ from the actual colors.



## ■Finishing patterns



## Interior use wall plaster





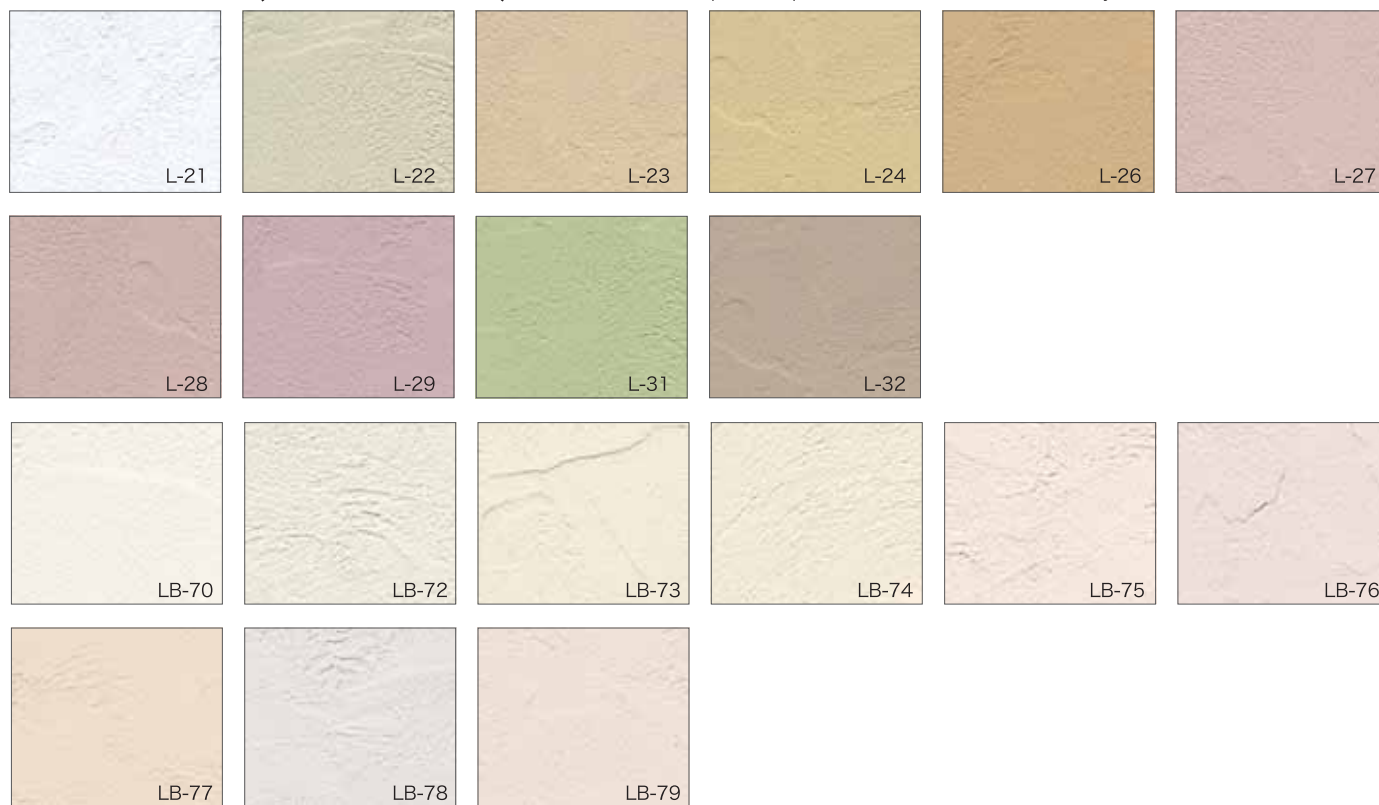
Multi-function interior use wall plaster

# Biocera *light*

Coating thickness : 2.5mm

## ■Color variations (total of 19 colors)

※This photo is printed material, so the colors may differ from the actual colors.



## ■Finishing patterns



# Our total commitment to 100% natural materials

Some people buy only vegetables grown without the use  
of agricultural chemicals.

They are, of course, considering good taste,  
but above all, their family's health.

The same is true of a house.

The most important thing is that its inhabitants can live healthy  
and comfortable lives.

So we are committed to 100% natural materials.



- ◆The product photos in this catalog differ a little from the real products because they are printed.
- ◆The specifications may be partly changed without warning to improve the products.
- ◆Please refer to the specialized written execution instructions for execution method.

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