



Entire Houses, Offices, Shops and Facilities for

Anti-Mould  
Stain Resistant

Deodorization

Antiviral

Antibacterial

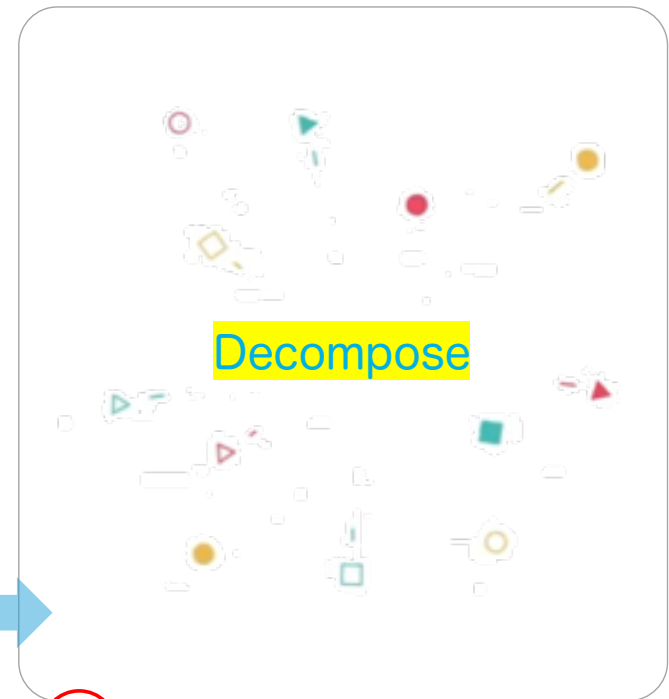
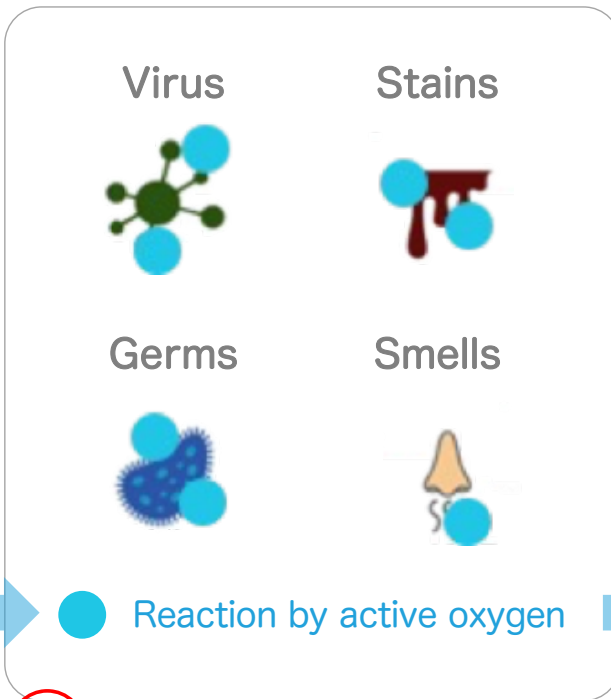
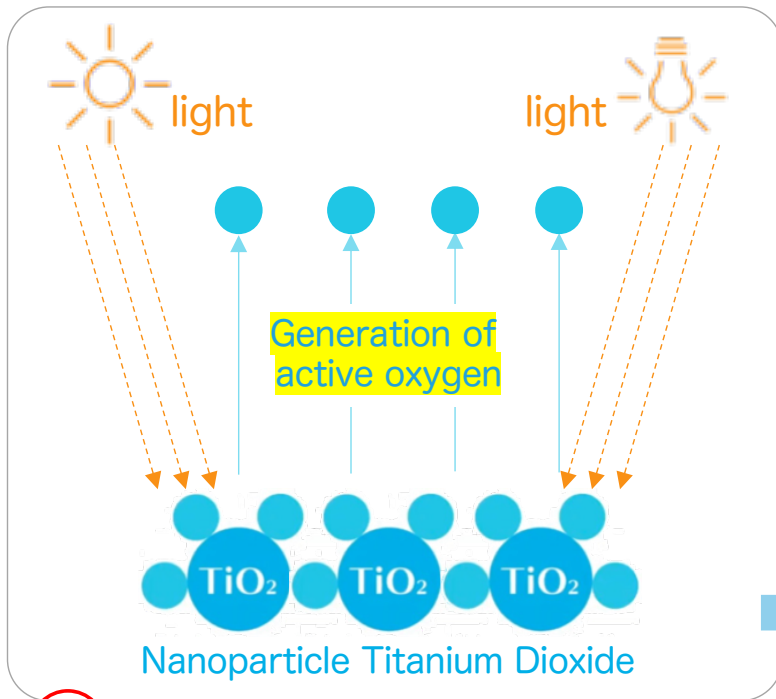
by Photocatalysis

- Maintenance free
- Long-lasting protection
- Glue-Free
- No sick house/building syndrome
- Transparent and colourless
- Suitable for any shape
- Economical



We provide  
safety and security for  
a new world of  
cleanliness

- P. 2 ... How nanoAce photocatalysis works
- P. 3 ... Mechanism of Photocatalysis
- P. 4 ... nanoAce photocatalyst, a further advance over previous models
- P. 5 ... Test data proving nanoAce's high photocatalytic efficacy
- P. 6 ... Evidence of nanoAce's high photocatalytic effect ①
- P. 7 ... Evidence of nanoAce's high photocatalytic effect ②
- P. 8 ... Comparison of cleaning methods after nanoAce installation and conventional cleaning methods
- P. 9 ... Advantages of installing nanoAce on a car (specific examples)
- P.10 ... Highly effective fields and forms of nanoAce installation
- P.11 ... nanoAce photocatalyst flow from inquiry to completion
- P.12 ... Frequently asked questions and answers
- P.13 ... Application results in Japan
- P.14 ... Application results in Philippines
- P.15 ... Application results in Vietnam
- P.16 ... Example of adoption of photocatalyst in a large facility
- P.17 ... Application results and response from customers' testimonials
- P.18 ... Developer introduction
- P.19 ... nanoAce organisational structure
- P.20 ... Acknowledgement



①

②

③

Photocatalysts are substances that catalyse when exposed to light.

Titanium dioxide, the main component of the nanoAce photocatalyst, acts on sunlight and even on the slightest light, such as LEDs. It then produces reactive oxygen species on its surface. The protection is long-lasting, using only the energy of light.

Titanium dioxide is a safe substance. It has long been widely used in everyday life as a food additive, in cosmetics, sun cream and paint, and is in fact very familiar.

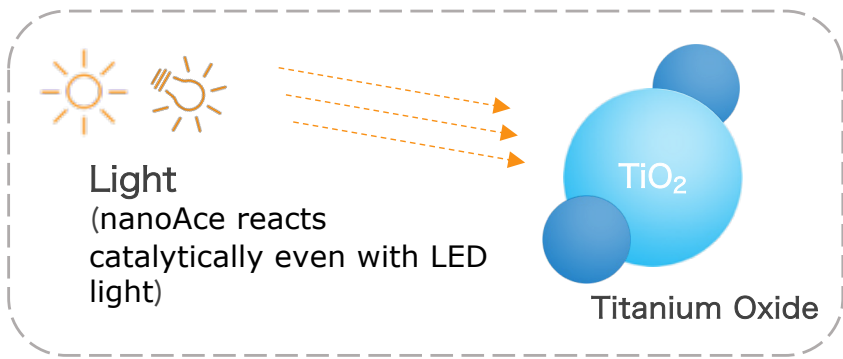
Strong oxidative decomposition takes place, decomposing viruses, germs and other substances (e.g. organic compounds) that come into contact with it converting them into water and carbon dioxide.

- Viruses and germs  
→ Inactivation and decomposition
- Stains  
→ Decomposed and non-deposited
- Smells  
→ Decomposed and deodorised

Anti-Mould  
Stain Resistant  
Deodorization  
Antiviral  
Antibacterial

Long-lasting protection

Safety and Security

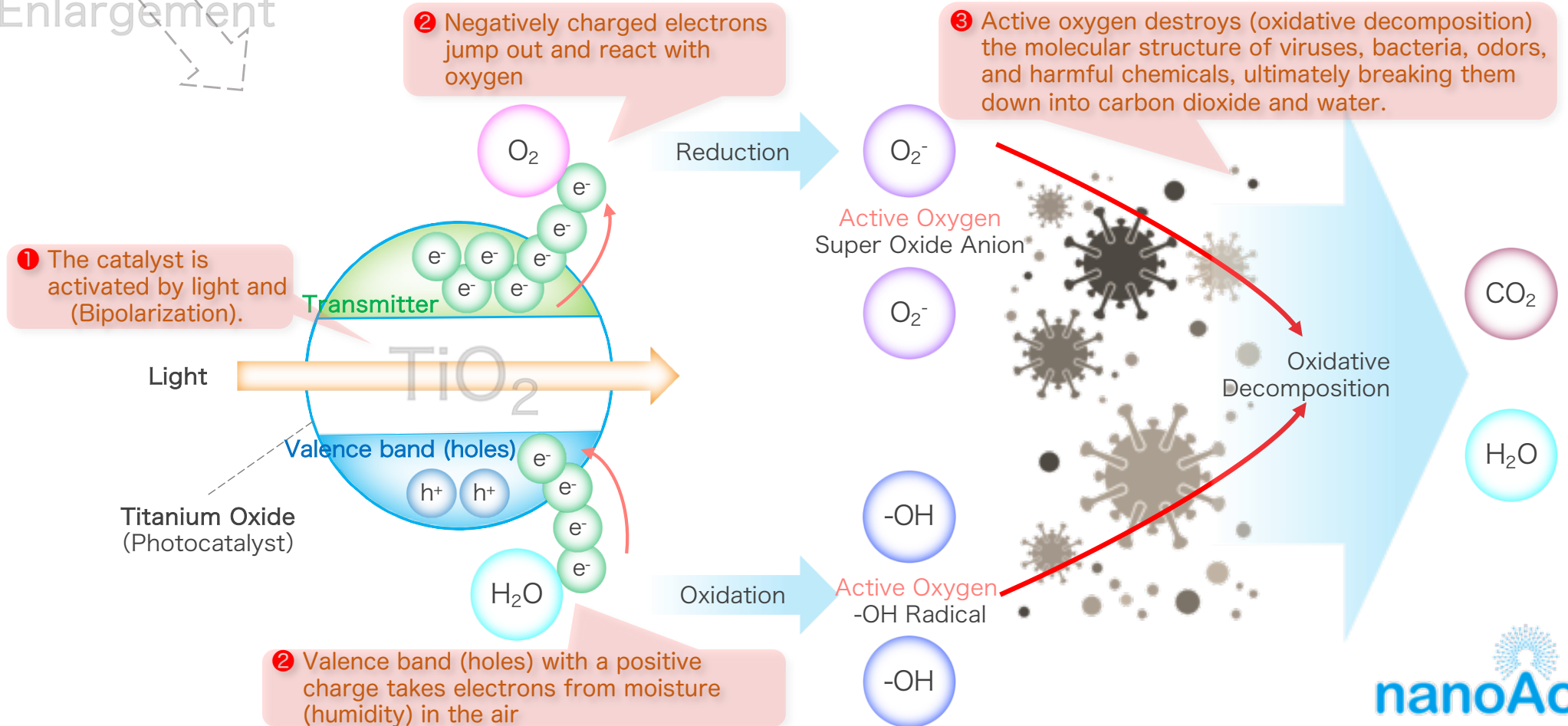


Photocatalytic reactions continue to clean the environment as long as there is light. It does not require other energy sources such as electricity.

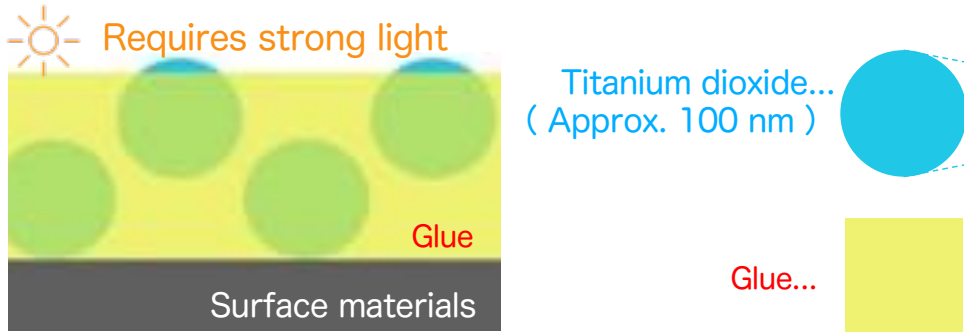
The nanoAce photocatalyst has a particle size of 2 nm, one-fiftieth the size of conventional photocatalysts. This makes it possible to realize a completely new photocatalyst that adheres strongly to the surface of the application by intermolecular force without the use of adhesives.

Using only water, alcohol, and titanium dioxide, it is an all-in-one environmental purification solution that is safe for the human body, environmentally friendly, and can provide **Anti-Virus, Anti-Bacterial, Anti-Mold, Anti-Odor, and decomposition of harmful chemicals such as formaldehyde and NOx** without running costs.

Enlargement

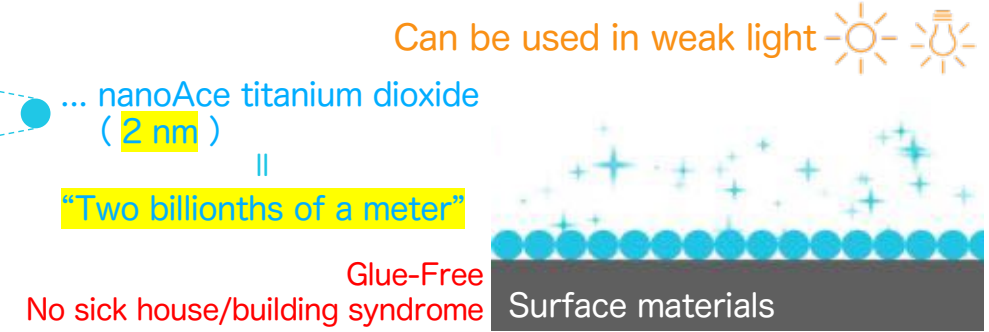


## Older type of titanium dioxide



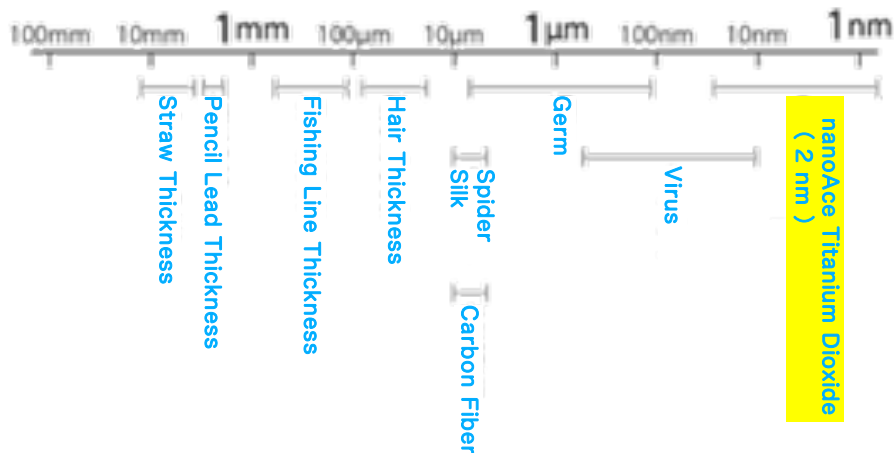
- Cannot bond to the construction surface on its own, glue is required.
- Titanium dioxide embedded in glue is ineffective.
- Requires stronger light due to the small surface area of the particles.

## nanoAce titanium dioxide



- No need for glue as it can bond to materials of surface by its own force (intermolecular force).
- **No sick house/building syndrome.**
  - No glue is used, so it does not generate formaldehyde.
  - nanoAce decomposes allergy-causing substances such as formaldehyde and PM2.5.
- The surface area of the particles is large, so even a small amount of light is effective.

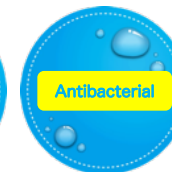
## What is the size of a Nano particle?



1mm = 1000µm  
1µm = 1000nm

- nanoAce titanium dioxide is 2 nano in size and ultra-small
  - Suitable for all materials and shapes (glass, stone, walls, metal, wood, leather, plastic, rubber, etc.)
- Effective even in low intensity light
  - Suitable for any location
- Colorless and transparent
  - Can be installed on colored and designed objects
- Glue-Free and safe
  - Many construction projects in medical facilities, nursing homes, childcare facilities, accommodation facilities, restaurants, etc.

Safety and security for a new world of cleanliness



## Anti-viral test

Haemophilus influenzae type A virus

Virus reduction rate

99.997%

[Testing method]

JIS L 1922:2016  
(ISO 18184:2014 Apply mutatis mutandis)

[Methods for quantifying viral titres]

Plaque method

[Viruses used in this study]

Haemophilus influenzae type A virus  
(H3N2) ATCC

[Host cell in this study]

VR-1679 (MDCK cells ATCC CCL-34)

## Anti-viral test

Feline calicivirus; FCV  
(Alternative to norovirus)

Virus reduction rate

99.974%

[Testing method]

JIS L 1922:2016  
(ISO 18184:2014 Apply mutatis mutandis)

[Methods for quantifying viral titres]

Plaque method

[Viruses used in this study]

Feline calicivirus  
(F-9) ATCC VR-782

[Host cell in this study]

CRFK cells ATCC CCL-94

## Gas removal performance evaluation test

Ammonia gas

Reduction rate after 2 hours

99%

[Testing method]

Methods specified in the SEK Mark textile product certification criteria (JTEK: Japan Textile Evaluation Technology Council)

\* The test material was 200cm<sup>2</sup>

[Test object]

Smart bag PA  
Manufactured by GL Science Inc

[Gas used in the test]

Ammonia gas



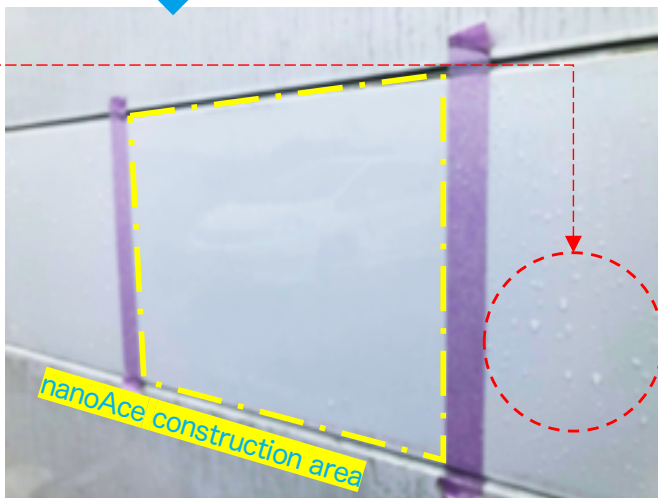
Demonstration test proving anti-staining and anti-mould due to super-hydrophilic effect

2020/05/02



After 3 months

2020/08/13



Dirt adheres to these remaining water droplets. Then, when the water droplets evaporate, the stain settles on the wall.

Ammonia gas removal performance evaluation test



99% reduction in 2 hours



Testing Organization  
TIRI  
(Tokyo Metropolitan Industrial Technology Research Institute)  
• Public testing and research institutes established by the Tokyo Metropolitan Government to conduct testing, research, dissemination, and technical support related to industrial technology.



Antiviral test for influenza A virus

**Virus reduction rate 99.997%**

Testing Organization

KAKEN  
(KAKEN TEST CENTER General Incorporated Foundation)

- An international testing organization accredited by the Japan National Laboratory Accreditation System (JNLA) under the Industrial Standardization Law, with ISO/IEC17025-compliant laboratories and ISO 9001-certified offices.



Evaluation of photocatalytic effect on human coronavirus

**99.999% inactivation rate**

Testing Organization

BMSA  
(Biomedical Sciences Association)

- Established with a focus on the utilization of research human resources, collaboration between basic and applied research in preventive medicine, and international cooperation.



Antiviral performance evaluation test using bacteriophages  
**ISO 18071**

**Result of the examination: Passed**

Testing Organization

AIST  
(National Institute of Advanced Industrial Science and Technology aka SANSOUKEN)

- Japan's largest public research institute under the jurisdiction of the Ministry of Economy, Trade and Industry, established as an independent administrative agency (national research and development corporation).



E. coli test (with and without nanoAce)

**No E. coli detected with nanoAce**





# Comparison of cleaning methods after nanoAce installation and conventional cleaning methods

Comparison Item	After installation of photocatalytic nanoAce	Conventional cleaning methods (alcohol, detergent, etc.)
<b>Durability of effects</b>	Long-lasting (several years)	Short term (a few hours to a few days)
<b>Sterilization effect</b>	High (continues to decompose bacteria and viruses)	High (bacteria and viruses are eliminated immediately after cleaning, but they re-grow over time)
<b>Anti-Dirt Effect</b>	High (dirt-resistant)	Temporary (will become dirty again after cleaning)
<b>Deodorizing effect</b>	High (decomposes odor sources)	Temporary (odor is reduced after cleaning or the fragrance in the detergent only temporarily masks the odor)
<b>Anti-mold effect</b>	High (inhibits mold growth)	Temporary (mold may grow again)
<b>Allergy Friendly</b>	Continues to break down allergens not only in the cleaning target but also in the space where it is installed	Temporary removal of allergens after cleaning
<b>Safety</b>	High (non-toxic, no chemicals)	Moderate (possible chemical influence)
<b>Time and effort</b>	Initial installation is required, but subsequent cleaning can be done less frequently or by wiping with water, etc.	Requires high frequency (daily to several times a week) daily cleaning
<b>Reduced use of detergents</b>	Almost eliminates the need for detergents and alcohol, does not damage cleaning objects, and prevents deterioration of materials	Frequent use of detergents and alcohol may damage surfaces to be cleaned and accelerate deterioration of materials
<b>Cost</b>	Initial cost is high, but low in the long run	Low cost in the short term but high cost in the long term
<b>Environmental Impact</b>	Low (Sustainable Methods)	Moderate (e.g., chemical use and disposal)
<b>Available Locations</b>	Interior and exterior	Mainly interior

## Specific example: comparison of spilled ice cream in a car

Conventional method (wiping with tissue, towel, sterile sheet, etc.)		For cars with photocatalytic nanoAce already installed	
Cleaning time and effort	<p><b>Immediate action:</b> If ice cream is spilled on the sheet, immediately wipe it off with a tissue or towel, but it tends to leave a sticky residue.</p> <p><b>Additional cleaning:</b> Even after wiping, it takes time to re-wipe the sheet with a sanitizing sheet or detergent, which may damage the surface.</p>	Cleaning time and effort	<p><b>Immediate action:</b> If ice cream is spilled on a sheet, simply wipe it up with a tissue or towel.</p> <p><b>No additional cleaning required:</b> Because photocatalyst is applied, there is little need to use sanitizing sheets or detergents. Residues on the sheets are also decomposed by the photocatalyst.</p>
Odors	<p><b>Short-term:</b> Insufficient wiping may leave a sweet or dairy odor.</p> <p><b>Long-term:</b> Over time, there is a risk of bacterial growth and more unpleasant odors.</p>	Prevention of odor	<p><b>Short-term:</b> After wiping, the photocatalyst decomposes odor-causing organic matter, leaving no unpleasant odor.</p> <p><b>Long-term:</b> The sustained effect of the photocatalyst inhibits the growth of bacteria, greatly reducing the risk of unpleasant odors.</p>
Mold growth	<p><b>High-humidity environment:</b> Mold can develop if sheets are left in damp conditions.</p> <p><b>Effects of mold:</b> Mold can not only make the product look bad, but can also be detrimental to health.</p>	Prevention of mold growth	<p><b>High humidity environment:</b> Photocatalyst inhibits the formation of mold, thus reducing the possibility of mold formation even in damp seats.</p> <p><b>Health effects:</b> Improved hygiene and reduced health risks in the vehicle interior due to reduced mold growth.</p>

## Place (Private) Interior & Exterior

House Residential

## Place (Commercial) Interior & Exterior

Business Building Office ATM

Shopping Mall Fresh Market

Cafe Restaurant Bar

Amusement Park Hotel

Spa Massage Beauty Salon

Casino Karaoke

Shops

## Place (Public) Interior & Exterior

Hospital Emergency & Critical Care

University Laboratory School Kindergarten Nursery

Church Temple

Concert Hall Museum Library Sports Facility

Administrative Building

## Interior & Exterior Production Site

Food & Drink Production Factory Kitchen

Pharmaceutical Production Plant Clothing Manufacturing Factory

Electronic Components & Appliances Plant

## Products

Home Electric Appliances PC/Tablet/Smart Phone

General Living Goods Stationery Clothes Shoes

Cosmetics Sanitary Goods Baby Goods

Product Packaging Solar Panel

## Interior & Exterior Mobility

Airplane Airport

Train Station

Car Taxi Bus

Ship Port

Traffic Signs Street Light



① Customer inquiry

② Understanding of requests and confirmation of current conditions

③ Confirmation of estimate and works schedule

④ Works



Kikkoman  
Lumitester SMART

(1)



ATP+AMP wipe test by "Lumitester SMART" made by Kikkoman, which is also used for medical purposes, is measured before the start of construction.

(2)



nanoAce Coating Operation

(3)



ATP+AMP wipe inspection by "Lumitester SMART" again after completion of application effectiveness is measured

⑤ Delivery of works completion report

**Q.** How long do the effects last?

**A.** As long as the applied surface is not scraped or peeled off together with the material, it will continue to adhere to the surface. However, for areas that are frequently touched, we note that the material itself be worn away and that it ought to be re-applied once or twice a year, whilst using LUMITESTER to inspect the surface.

**Q.** How will we know the effect after application?

**A.** ATP+AMP wipe test by "LUMITESTER SMART" made by Kikkoman, which is also used for medical purposes, will be conducted before and after application. We will provide you with a completion report so that you can confirm the effects before and after the installation in numerical values. We also keep your data under strict control so that your measured values will not be leaked to any outside parties.

**Q.** Is there a guarantee?

**A.** Basically, there is no guarantee. As with car coatings, the duration of effectiveness depends on the customer's usage and storage location. We recommend a separate periodic inspection.

**Q.** Does it work on exterior walls?

**A.** It is very popular. On sunny days, it decomposes organic matter while preventing ultraviolet rays, and when it rains, the hydrophilic feature, rather than water repellency, allows rainwater to wash away dirt and grime.



Chikusei Regional Fire Department Headquarters  
(11 Ambulances)



Otani University



Matsukura-Chuou Clinic



Daidai Miyabi Transportation  
(Tourist Bus)



TEPCO Memorial Foundation  
(Office)



Hounenn-mansaku  
(Japanese-style Inn)



Graceville  
(Courtesy Car)



Oarai Maiwai Market  
(Fish Market)



Kashima Jingu  
(Shrine)



World resort (Casino)



President of The Senate Office (Office)



MERAKEE (Dental Clinic)



Philippines National Police (Office)



Vio Granja Private Pool and Villa (Resort Hotel)



POEA (Deputy Administrator Office)



Vietnam Air Lines  
(Office)



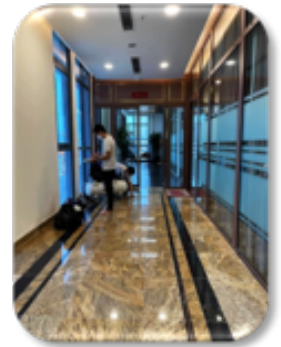
SHB BANK  
(ATM)



PV BANK  
(ATM)



Hanoi Mayor's Office  
(Office)



General Secretary's Office  
of the Communist Party



Hoa Binh Clinic  
(Hospital)



MONSTER LAB  
(IT Office)



CryptoPie Labo  
(IT Office)




NamHa Pharmaceuticals  
(Office)



**France**   
**Paris Louvre Museum**



**Japan**   
**Tokyo Yaesu Exit Grunroof**



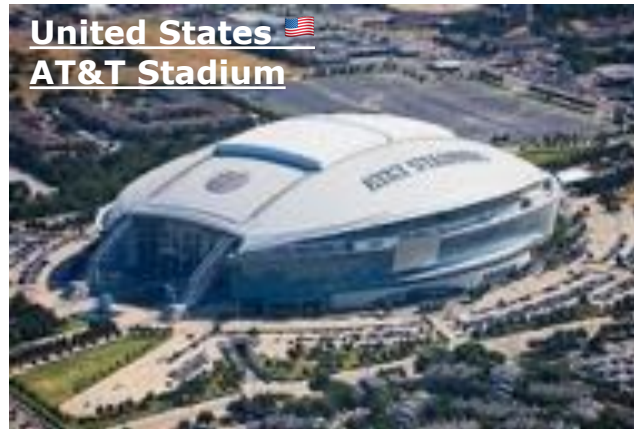
**Japan**   
**Central Japan International Airport (Centrair), Aichi**



**France**   
**Centre Pompidou-Metz**



**United States**   
**AT&T Stadium**



**Vietnam**   
**Hanoi Noi Bai Airport**





## Customers with nanoAce installed



Matsukura Clinic  
(Hospital)



Kids Dream Garden Nakaitabashi  
(Nursery School)



Hounenn-mansaku  
(Japanese-style Inn)



Gion Kinn no Yuri  
(Japanese Kappo Restaurant)

## Customers' Testimonials

Thanks to nanoAce, we used to spend a lot of time and effort only on antibacterial and sterilization matters with corona measures, but now we are able to develop new services such as take-out.

As a result, we have been able to save time, money, and manpower.

From a cafe/restaurant owner

As a nursery school, we have been taking hygiene measures for a long time, but after Corona, we needed to take more detailed measures. We were mentally exhausted by the frequent sterilization and antibacterial work while dealing with the sudden behavior of toddlers, but after installing nanoAce, we feel that our mental burden has been lightened.

From nursery school staff

After Corona, the number of patients coming to the clinic was extremely low due to the fact that they avoided unnecessary trips to the clinic, which was very difficult from a management perspective.

After introducing nanoAce, through word of mouth from those who came to our clinic and appealing to our hygiene measures shown on our website, we now have patients who come to our clinic and visit us with peace of mind. We feel that it was a good decision to introduce nanoAce.

From the Clinic Director



Masayuki Takamatsu

Specialty: Biological Sciences, Food Science (B.S., Kyoto University, 1974)

He specializes in food science research and development, biotechnology, surface chemistry, and industrial planning and development.

Researcher, Food Industry Research Laboratory, Adeka Corporation. (1974 ~1983)

During this time, he devised methods for producing artificial salmon eggs, three-phase emulsion, artificial whipped cream, and artificial feed for young fish.

Engaged in consultancy for development planning at the Wakayama Institute for Social & Economic Development.(1983~1994)

In 1990, he joined the Nagoya office of the United Nations Centre for Regional Development (UNCRD), where he worked full-time in the field of industrial development in Southeast Asia.

In 1994, he founded his own company, working in industrial development for local government and the private sector. He also serves as Managing Director of T&T Network Co. Developed nano-sized titanium dioxide photocatalytic solution "nanoYo".

Director of nanoYo Group Pte Ltd (Singapore) and nanoYo Japan Co.  
OEM products: nanoZone solution and nanoAce.



### **nanoAce Japan Inc.**

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Zip Code : 111-0036  
TEL : +81 (3) 6555-4626  
URL : <https://nanoace.jp>

### **nanoAce PH Inc.**

Address : Unit.2021 20/F Cityland Herrera Tower, 98  
V.A Rufino st Corner Valero st Salcedo Village Makati City  
TEL : +63 (917) 714-9090  
URL : [https:// nanoaceph.jp](https://nanoaceph.jp)

### **NANOACE VIET NAM COMPANY LIMITED**

Address : 01S16 - S4.02 building , Vinhomes Smart City, Dai Lo Thang  
Long street, Tay Mo, Nam Tu Liem, Hanoi, Vietnam  
Mail : [vn@nanoace.jp](mailto:vn@nanoace.jp)  
URL : <https://nanoacevn.jp>



Thank you for reading carefully to the end.

Our goal is to support you and your family, your loved ones, your company and the people who work there, your house, your building, your office, your products, and your assets through nanoAce.

We look forward to the opportunity to use nanoAce in your location.

Also, please let us know if you have any ideas for new services or products that would enhance the value of your business by using advantages of nanoAce's features.

We welcome such collaborations.

Thank you