Antistatic, Super Hydrophilic and Anti fouling coating series

Application Cases until 2017
Verification for outer wall of Greenfield in Philippines

Green field Area in Manila

Test application of Super Glass Barrier on outside wall in Oct.2014

Applying on the half of wall

Coated

Uncoated

Drawn of coating area is Dirty

Coated area =Clean

Coated area = Clean

Uncoated =Dirty

1year and 6months later On March 12th,2016

Coated : Clean

Clean

Dark

Water repellent State

Philippine Application Examination: Demonstration test of super hydrophilic self cleaning effect

◆ Location: Philippines, president of paint sales company’s home window glass
1 year test: Dirt is not conspicuous due to super hydrophilic effect, but the unapplied part becomes water repellent state in 1 month, and dirt is conspicuous.
Case) Application test of acrylic traffic mirror on Nagoya city in 2016, verification after one year

- Verification purposes ... acrylic traffic mirror had condensation, and further became a problem in poor visibility caused by getting dirt. In order to solve them, verification of antifouling effect and super hydrophilic effect by coating was carried out.
- Verification status after one year... The coating effect maintained in all of the places where it was applied.

At same verification day
= Condensation & fog
= Poor visibility for Car

Only half application, compared with uncoated

Test site Mirror

The coated surface is clearly visible because there is no irregular reflection due to condensation.
Case 1) TOKYO Big Site West Wing Roof Top

Application for antifouling coating and outer insulation paint

Purpose: Application to the glass for thermal barrier and heat shielding.
Apply: To compete with other companies for thermal barrier coating, and sketch is adopted after exposure demonstration. 2000 m² applied.

High reflective paint
Cool Life DX
+ antistatic antifouling
super glass barrier

Foryou Co., Ltd. At shield color coating

Exposure demonstration

Reflectance
Significant decrease

Two Months later

High reflective paint
Cool Life DX
+ antistatic antifouling
super glass barrier

Foryou Co., Ltd. At shield color coating

SKETCH applied 2000 m²

Still remain white
Color after application

Only high reflective paint. Discoloration to gray by exhaust gas and salt damage.
Case 2) Tokyo Mode College in Shinjuku

Aesthetic maintenance purpose

Purpose: Prevent dirt such as raindrops.
Application: Outdoor exposure demonstration, sketch is adopted.
Applied to Fluorine panels.

New panels which was non coated are noticeable dirt by the exhaust gas, compared to the panel that was coated with Super-Glass Barrier.

Before: Dirt of raindrop is noticeable

March 25th 2014.
Seven years after application

Traces of the raindrop is not noticeable

Coated

Uncoated

Dirt of raindrop is no longer noticeable

Outdoor exposure test with Super-Glass Barrier
Case 3) Airport in Japan. Passed the outdoor exposure test of window glass for 10 months

◆ June 23th, 2014

Before application
Strong water-repellent

Glass Cleaning

Challenge to the reduction of maintenance number and cost

Application

◆ Verification October, 2014

① To wipe off the dirt, check the dirt adhesion
= Antistatic effect

② Super Hydrophilic Test

Sprayed water

③ Spray water and check the water repellent
= Self Cleaning effect

Coated
Less dirty

Surface resistivity $10^9$ Ω/□

Uncoated
Dirty

Surface Resistivity Error

Coated
Super Hydrophilic

Uncoated
Water repellent

Coated
Less dirty

Uncoated
Dirty

A management company of the airport in Japan, they pay 210 million JPY (70 million JPY × 3 times) a year for the cleaning of windows. They would like to reduce the cleaning time to two per a year, then the cleaning cost becomes 140 million JPY. The maintenance cost reduction is more than 700 million yen if the coating can reduce the cleaning time in 10 years.
Case 4) June 2014 in Nanjing, China.
Applied 100,000 sq. meters
Base material: glass fiber concrete

China Tianjin: Xin gang Central Terminal
Even the dirt is noticeable after application of the fluorine and photo catalyst coating, finally problem solved with SKETCH antistatic antifouling coat. Applied 43000 m²

Aesthetic maintenance purpose

Uncoated

Coated
Case 5) Verification test of the super-hydrophilic self-cleaning effect in Philippine

- Location: President of paint sales company private home in Philippines.
- Application: At Mr. Jojo's home, after seven months of the application of the anti-fouling coat to outer window glass, antifouling effect was clearly compared with the uncoated places. Especially on the rainy day, the coated glass was clean, the rain drops at the bottom of the coated glass was noticeable. Obviously the dirt adhesion was difference between the uncoated and coated glass.
Case 6) Super-Glass Barrier outdoor exposure test at JB paint in South Korea

March, 2014  Antistatic super-hydrophilic self-cleaning effect (After 4 months)

When you spray water, you can see dirt's falling with super-hydrophilic effect. It proves clearly a super-hydrophilic self-cleaning effect.

January 27th, 2015 after 1 year and 2 months
Case 7) Exterior Verification

Case 8) Aquarium roof portion Kagoshima

The dirt of volcanic ash is noticeable only uncoated area
Case 9) Super Glass Barrier exposure test after 2 years
Case 10) For dirt adhesion by the exhaust gas, such as tile surface in the tunnel.

To shorten the traffic blockade period and to reduce the maintenance cost are challenge for the regular cleaning of the tunnel. It has been developing new cleaning methods such as more effective cleaning agents and cleaning machines. Nevertheless it is not possible to significantly reduce the traffic blockade period, and did not find the new cleaning method.

◆ Application Date: January 2013
◆ Verification Date: July 2013 (after 6 months) June 2014 (after 1 year and 5 months)
June 2014 (after 1 year and 5 months)

There are the differences of dirt adhesion as measured by resistance value meter and visual inspection, coating film and the effect are still remaining.

Expansion

Uncoated
Surface resistivity
10 to the twelve power

Coated
Surface resistivity
10 to the eleven power

Uncoated = Black
Coated = White

Since the coated surface has less adhesion of soot dirt, such as exhaust gas, it looks white than non-coated parts.
= Antistatic effect is maintained.
On March 13, 2015, The Final Verification of anti-fouling coating at West Japan Railway

Verification purposes) Although the side of the railway vehicle can be washed by machine, rear and front of the vehicle hand washing cleaning with deck brush. To verify if the number of regular cleaning maintenance is reduced by the antifouling coating.

Result) After one year and two months, the coating maintained. Dirt adhesion amount is small and easy to clean up.

Coated area

Uncoated

Less dirty

Dirty

The verification of dirtiness

The verification of Hydrophilic

Cleanness of the surface

-Coated

The amount of dirt is less

-Coated =Super Hydrophilic effect

-Uncoated

Much dirt on the surface

-Uncoated =Water repellent

Less dirty

Dirty

Coated area

Uncoated
Adopted antifouling coating on the body surface of Nishitetsu bus in March 2017

Purpose) Since the connected buses can’t enter inside the wash machine and can not be cleaned, the long-term aesthetic maintenance effect of the bus body surface was evaluated by the antifouling effect of our coating solution. 18 pcs of connected bus of Nishitetsu was tested, Finally they adopted not only connected bus, but also normal bus. Implementation on painted body surface and cutting sheet surface.
Case 12) Renewal & Beauty Maintenance business

Clear view with Water stain remover and super-hydrophilic self-cleaning coating
Case 13) Application of solar self maintenance coat

100 sqm in Ibaraki, Japan

310 sqm in Kagoshima, Japan

70 sqm in Kagoshima, Japan

162 sqm in Korea

1500 sqm in Osaka, Japan

1000 pc of panels

100 pc of panels

Applied in Thailand

Coated

Uncoated
Applied for 4000sqm in Tochigi, Japan

Step ① Glass Cleaning
Step ② Wash with water and wipe off
Step ③ Application
Step ④ Dry and storage

Applied for 198 pc panels (508.8 sqm)

Step ② Wash with water and wipe off
Step ③ Application
Step ④ Dry and storage
Confirmation of the thaw promoting effect after 3 days of 1,000 m² coating in China

**Reason**

Its function is effectively demonstrated and dust and the like in the air hardly adhere to the surface. In addition, even if it gets dirty, it is possible to self-clean the surface stain due to rainwater or the like due to the superhydrophilic function. When water is applied to the uncoated surface, it is in a water-repellent state, and the dirt becomes a water spot remaining in the polka dots. If this is repeated for a long time the surface becomes dirty, resulting in a decrease in power generation efficiency. Since the coated surface is in a superhydrophilic state with a contact angle of water of 5 degrees or less, it can easily wash away. Therefore, it is difficult for water spot to be formed, and reduction in power generation efficiency can be reduced.

**Accelerated dissolution test**

Prepare a glass with half of this product applied and half unapplied, put it in a freezer with water.

Freeze the coated surface as a thin film. → It is easy to dissolve.
The uncoated surface freezes as a lump. → hard to melt.

I could confirm the result.
Case 14) Coating for cars

Super Hydrophilic states

Snow removal effect
- No effect
- Effect

Thawing promotion effect
- No effect
- Effect

Application test to the wheel
One year later
- Uncoated

Application to the side mirror
One year after the application
- Uncoated