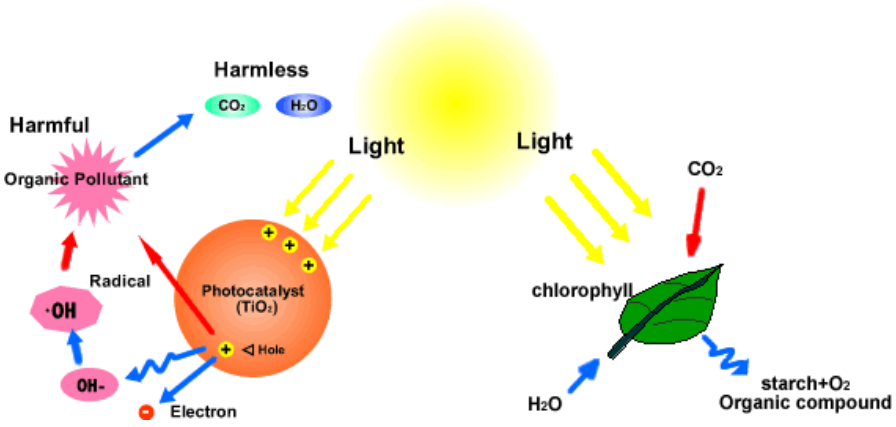
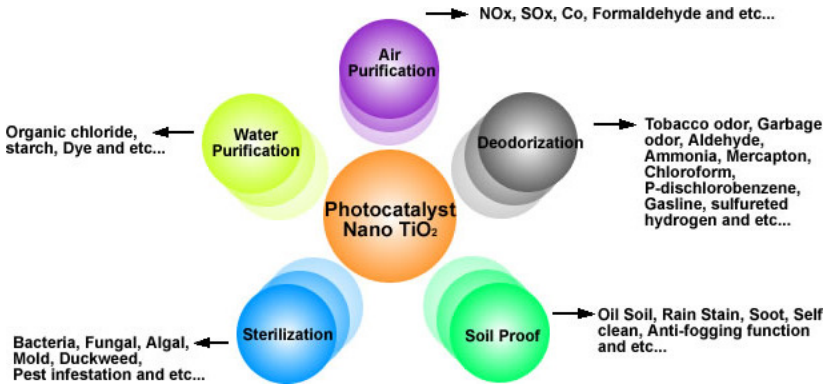
SM Nano Coat Agent C-series & X-series





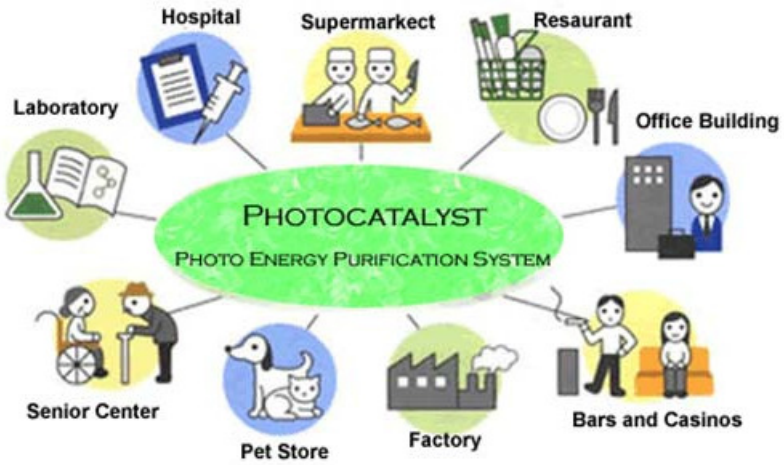
Photocatalysis is a reaction that uses light to activate a substance which modifies the rate of a chemical reaction without being involved itself. And the photocatalyst is the substance which can modify the rate of chemical reaction using light irradiation. Chlorophyll of plants is a typical natural photocatalyst. The difference between chlorophyll photocatalyst to man-made nano photocatalyst is, usually chlorophyll captures sunlight to turn water and carbon dioxide into oxygen and glucose, but on the contrary photocatalyst creates strong oxidation agent and electronic holes to breakdown the organic matter to carbon dioxide and water in the presence of photocatalyst, light and water.

Basic Functions of Photocatalyst

1. Sterilizing Effect
2. Deodorizing Effect
3. Air Purifying Effect
4. Anti fogging, Self-Cleaning
5. Water Purification

TiO_2 Nano Coat Photocatalyst

1. Self Cleaning
2. Air Purification
3. Water Purification
4. Anti-bacterial, antiviral and antifungal
5. Anti-mold
6. Gas decomposition
7. Decomposition of organic compound
8. Fog proofing
9. Deodorizing



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	HEPA	Electrostatic Filter	Ozone	Ultraviolet	Minus-Ion	Photocatalyst
Mold	***Good***	***Normal***	***Good***	***Good***	***Normal***	***Excellent***
Germs	***Excellent***	***Normal***	***Good***	***Good***	***Normal***	***Excellent***
Virus	***Normal***	***Normal***	***Normal***	***Normal***	***Normal***	***Excellent***
Dust Mite	***Excellent***	***Good***	***Normal***	***Normal***	***Normal***	***Normal***
Toxicant	***Normal***	***Normal***	***Good***	***Good***	***Normal***	***Excellent***
Odor	***Normal***	***Normal***	***Good***	***Normal***	***Good***	***Excellent***
Smoke	***Good***	***Good***	***Good***	***Normal***	***Excellent***	***Good***
VOCs	***Normal***	***Normal***	***Good***	***Good***	***Normal***	***Excellent***
Allergen	***Good***	***Good***	***Good***	***Normal***	***Excellent***	***Excellent***

UV Response Nano TiO_2 Sol Coating Agent (C-series)(C380)

High efficient room temperature coating products manufactured by advanced nano-hydrosynthetic technology are used for indoor air pollutant control, vehicle interior air pollutant control, mold prevention and anti-bacterial. It is a common use product for air purification. This product performance is highly active with UV light (wave < 380nm).

Visible Light Response modified Nano TiO2 Sol Coating Agent (X-series)(X500)

With the adoption of latest research result, successfully replaced part of titanium by special ions and have it doping in nano titanium dioxide. As the replaced special ion could change the crystallite structure, the upper and lower limits of transition level are changed, therefore the absorption photo spectrum is up lifted, which could fully utilize the energy in visible light, and the performance under visible light is 5 times of normal photocatalyst product.

[Material Data Sheet]	
Product Series	**VLR modified Nano TiO_2 Sol Coating Agent**
Main Compositions	Nano Titanium Dioxide
Crystallite Structure	Anatase[1]
Average Primary Particle Size	<8nm[2]
Coagulation Index	2-4[3]
Executing Criterion	Q /TDIT-01-2004 GB/T 19591-2004 GB/T 19619-2004
Appearance	Bluish white / yellowish transparent liquid
Smell	Odorless
Skin Touch	Harmless
Dispersant	Water-based
Origin	Shanghai
Storage Condition	Sealed/Avoid light/Room temperature
Packaging	Plastic / Metal Barrel 10L, 25L, 30L, 200L

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User Manual

Soma Nano Coat TiO_2-based Photocatalyst Sol User Manual

Application Overview

Application method includes air spraying, rolling, dipping, brushing or other coating methods. This user manual will include the most popular application method. The method not listed in this user manual does not mean that relevant method is forbidden.
**notes: The spray is the recommend handling method. The aerosol product can refer to this user manual, but please read the extra instruction with it.*

Essential Air Spray Guidance

The room temperature air spray method (named as RTAS-method) is the most popular & recommended application method of our TiO_2-based photocatalyst sol products. The RTAS-method is spraying the super fine drop which is atomized from the nano photocatalyst sol mixed with the high pressure or high volume air flow onto the surface to be treated. The air compressor sprayer or HVLP sprayer is the recommend tool to apply this method. Usually, this method can form even film of photocatalyst and provide the best balance between the cost and the effect.
The typical subjects recommended to apply this method are as follows: wall, paint surface, marble, granite, building, glass, ceiling, ceramic, tile, carpet, paper and etc…

For more information of this application method please refer to the "**User manual addendum-I air spray instruction**".

Essential Rolling & Brushing Guidance

The rolling is a simple & easy handled method to apply the photocatalyst sol product. You can roll the Photocatalyst sol onto the surface such as wall. User can apply the photocatalyst sol without the HVLP and the air compressor sprayer. Compared with the recommended RTAS method, this coating method is easy to apply and the film will be thicker. Of course, the method will need more sol. If the user wants to apply the sol by oneself and without the equipment like HVLP sprayer or air compressor sprayer, we recommend him to apply the product onto subject by this method.
The typical objects recommended to apply this method are as follows: wall, paint surface, granite, marble, tile, metal and etc…

For more detailed information of this application method, please refer to the "**User manual addendum-II rolling instruction**".

Essential Dipping Guidance

The dipping method is usually used in industrial application or small subject treatment like bulb. You can dip the subject to be treated into the photocatalyst sol directly and then dry it under ambient temperature or heat it below 200 Celsius degree. This coating method is easier to form an even film of photocatalyst than other application method, and also the film will be thicker than film coated by other method. We recommend this method for industrial process & the small subject which is hard to use the other application method. Also, we recommend the residential user to apply the product onto small subject by this method.

The typical subjects recommended to apply this method are as follows:

Air filter, water filter, key part of air / water purification system, bulb, fabric material, clothes, mop, rag, food container such as plate, etc…

*For more detailed information of this application method, please refer to the "**User manual addendum-III Dipping instruction**".*

User Manual

Air spray instructior

Overview

The room temperature air spray method (named as RTAS-method) is the most popular & recommended application method of our TiO2-based photocatalyst sol products. The RTAS-method is spraying the super fine drop which is atomized from the nano photocatalyst sol mixed with the high pressure or high volume air flow onto the surface to be treated. The air compressor sprayer or HVLP sprayer is the recommend tool to apply this method. Usually, this method can form even film of photocatalyst and provide the best balance between the cost and the effect.

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Handling Equipment

1. AC sprayer system

An AC (Air compressor) spray unit is the traditional paint spray system. It consists of a high pressure air compressor & fine nozzle metal sprayer. The advantage of the AC sprayer unit is the low setting up cost and popular. But the AC sprayer system will cause more material rebound, so increase the waste of the effective material. The noise of the AC sprayer system is also a disadvantage.

Recommend Specification

Properties	*Recommend Value*
Power	*>2 HP (1500W)*
Input voltage	*100-220 V*
Feed cup capacity	*500-2000ml*
Feed mode	*Siphon / Gravity*
Nozzle dimension	*0.3-1.0 mm*
Air flow	*>100L/ Minute*
Pressure	*>50 psi (350 Kpa)*
Working noise	*<60 db*

Key module of AC sprayer system

AC machine

Rubber pipe

Sprayer & Feed cup

2. HVLP sprayer system

An HVLP (High Volume Low Pressure) spray unit consists of a turbine motor that produces warm, low-pressure air. The HVLP spray equipment uses the concept of increasing the volume of air under reduced pressure to atomize the finish. Its high transfer efficiency increases the coverage and reduces the cost. The advantage of HVLP is the reduction of overspray which produces less air pollution and maximizes the finish material.

Recommend Specification

Properties	*Recommend Value*
Power	***>2HP (1500 W)***
Input voltage	***100-220 V***
Feed cup capacity	***500ml-2000ml***
Feed mode	***Siphon / Gravity***
Nozzle dimension	***0.3-1.0 mm***
Air flow supply	***>2500L / Minute***
Air flow consuming	***>60 L/ Minute***
Spray range	***>10 cm***
Spray distance	***>15 cm***
Transfer effect icy	***>65%***
Working noise	***<60 db***

Key Module of HVLP system

HVLP Turbine

Sprayer & Feed cup

Plastic pipe

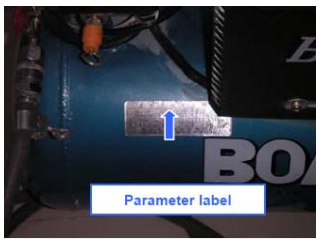
Setup AC Spraying Instrument

1. Before 1st time use setup

Rubber pipe

Step 1 Select the suitable long rubber pipe for the AC machine

The length of the rubber pipe should be 10-20 meters. This length parameter of the pipe will help you easily to spray all over a room without moving the AC machine. If the pipe is too long, it may cause the pressure declining phenomenon. The caliber of the pipe should match with the air flow output interface of the AC machine and the input interface of the sprayer.



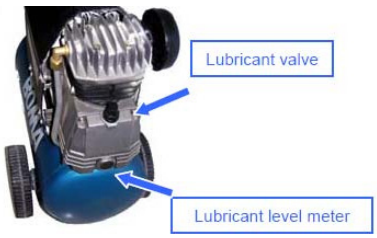
Step 2 Check the voltage parameter

Insure the input voltage match with the local electric power voltage. Usually we can get the input voltage parameter from label of the transformer or AC machine.

Step 3 Check the AC output pressure

Turn off the output valve and then start the AC machine. See the pressure meter and insure the output pressure can reach the minimum pressure requirement. (50 psi)

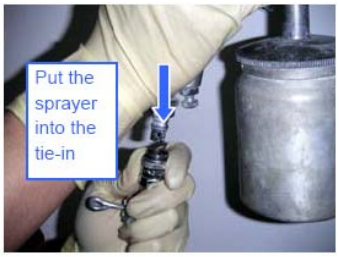
2. Before use setup

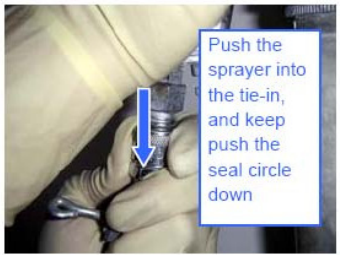


Step 1 Check the lubricant level of the AC machine.

The lubricant insure the well-working of the system. If the level of lubricant is low, please add special lubricant into the air compressor.

Step 2 Link the rube pipe to sprayer



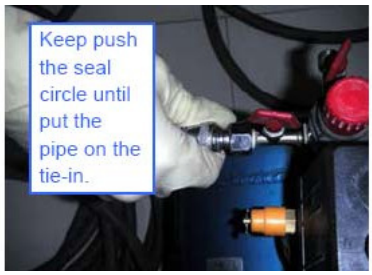


Step 3 Adjust the sprayer

There are 2 key adjustors on the sprayer. One of them controls the material output and another control the atomization grade. You should find the best balance of these 2 adjustors, it is very important for the next handling process and it need some experience.

Step 4 Link the rube pipe to AC machine

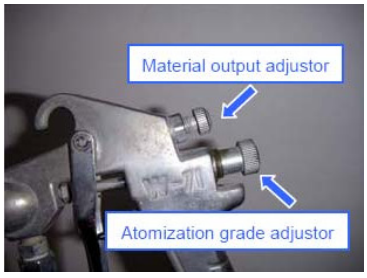
You should check the valve and keep it closed before the link operation. Then you can link the pipe onto the AC like you link it onto the spray. Open the valve when you finish the link operation.



Step 5 Start the AC machine

The final step before the spray working is startingthe AC machine. Usually we should turn around the switch and then pull it up.

3. After use maintance



3. After use maintenance

Step 1 Clean the sprayer and the system.

The sprayer and AC system must be cleaned by non-ion water (pure water) after every times use. This step is very important. You should add some pure water into the feed cup and spray it out for cleaning the nozzle. Nozzle is the key of spraying quality, so its cleaning is very important.

Step 2 Fix the sprayer

The nozzle of the sprayer is easy to be collided. Collision will cause the damage of the nozzle, so fix the sprayer can protect the sprayer better.

Note: The instruction in this paragraph is based on our demonstration equipment, the practical setup process should follow operation manual of the device. This paragraph is only a reference of spray setup.

Spray Guidance

1. Before spray equipment calibration

i. Before the actual spraying, we suggest using water to calibrate the spray volume and coverage area.

ii. To achieve the optimal coverage area and effectiveness, test the spray pattern on a piece of glass or mirror. An even spray of fine mist appearance is strongly desired.

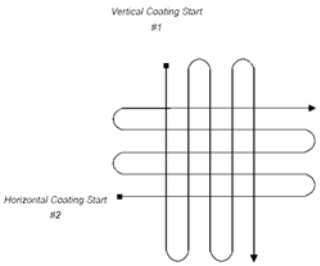
2. Spray pattern

i. Apply the photocatalyst sol in interlaced spray-pattern to ensure an even and sufficient coverage of the coating.

ii. One Horizontal pass plus One Vertical pass is considered as one coat.

iii. If need coat more times, wait at least 10 minutes between each coat for better solution adhesion.

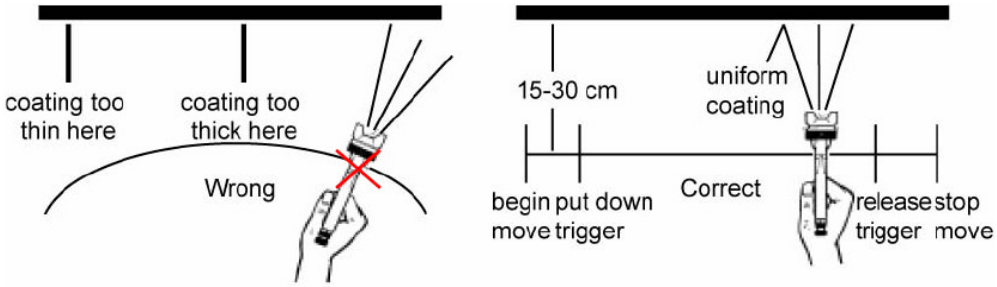
iv. Horizontal coating start from #1 & Vertical coating start from #2



v. A recommended distance between substrate and spray gun is 30 cm or one foot. It is very hard to produce fine mist of the solution on substrate surface if the distance is shorter than 30cm or one foot.

vi. Spray nozzle size should between 0.3mm (0.012 inches) to 1.0mm (0.039 inches). Nozzle size larger than 1.0 mm (0.39 inches) has difficulty to produce the even coat on surface.

vii. For a correct spray action please refer to the below spray guide figure.



Coat Drying

- There are two phases in the coat forming process, including the primary drying and the final setting. Primary drying is a procession, by which, photocatalyst are preliminarily coagulated by evaporation of the dispersant. After primary drying, the nano-particles of the photocatalyst coating are stabilized and which can be activated by light.
- The drying & final setting time of the photocatalyst coating please refer to the product manual.
- Drying with heat can effectively save the fixing time.
- Once solution is final set it becomes a solid film which never dissolves in water.
- For approximately two months after the finished application the hardness process will continue until it reaches a stability of 2H to 5H (equivalent to a pencil lead).
- In case of forced drying or heating, it should be conducted below 600°C. When the Ti02 film is heated to more than 800°C, the photocatalyst activity is decreased.
- When you have coated area by accident, wipe off the excess solution immediately. It is very difficult to remove the Ti02 after it has dried completely.

Safety Caution

- Refer to **Material Safety Data Sheet** (MSDS) and **Product Manual** (PM).
- Protective gear such as facemask, breathing apparatus, goggle, and protective clothing should be worn during coating procedure.