

1. RTAS 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.

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

Wall, paint surface, marble, granite, building, glass, ceiling, ceramic, tile, carpet, paper and etc...

2. Handling Equipment

1. AC HVLP sprayer system

An AC (Air compressor) spray unit is the traditional paint spray system. It consists of a high pressure air compressor & fine nozzle sprayer (HVLP type is preferred). 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 using an HVLP spray gun will be very helpful to reduce the waste of the coating agent.

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	>3 Bar (43.5 Psi)
Working noise	<60 db

Key module of AC sprayer system

AC machine



Sprayer & Feed cup

High Pressure Pipe



2. Turbine HVLP sprayer system

An Turbine 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 sprayer system



HVLP Turbine

Sprayer &
Feed cup

High Volume Pipe

3. Setup AC Sprayer System

1. 1st time use setup

Step 1 Select the suitable high pressure pipe for the AC machine

The length of the 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. The caliber of the pipe should match with the air flow output connector of the AC machine and the input connector of the

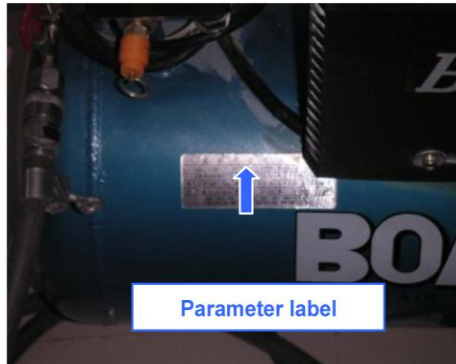
sprayer.



10-20m HP pipe

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

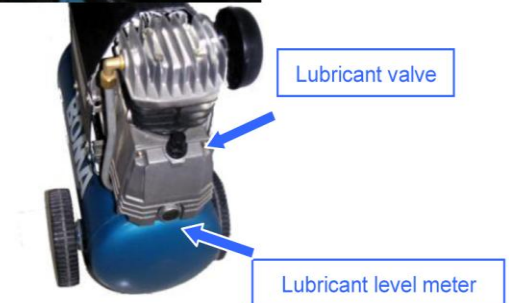
Turn off the output valve and then start the AC machine. See the pressure meter and insure the output pressure can reach the minimum pressure requirement. (50 psi)



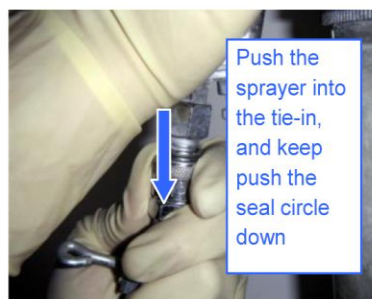
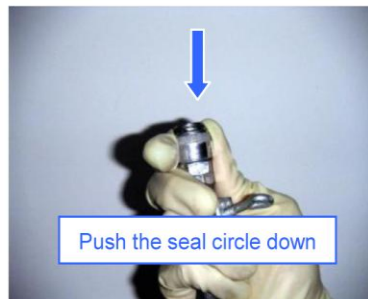
2. Before use setup

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.

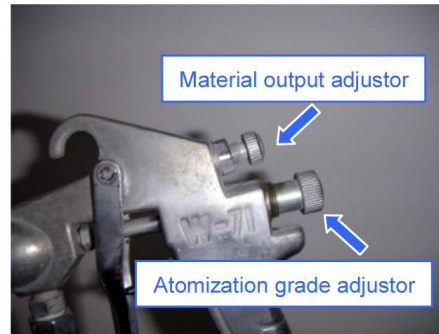


Step 2 Link the rube pipe to sprayer



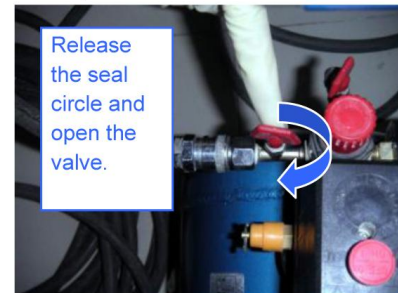
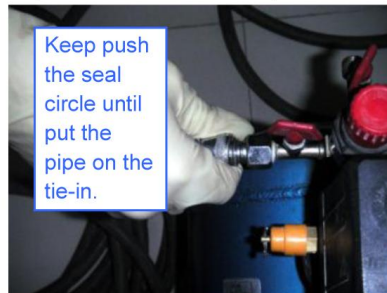
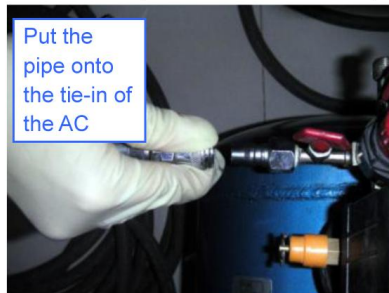
Step 3 Adjust the sprayer

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 4 Start the AC machine

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



3. After use maintance

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 demonstrate equipment, the practical setup process should follow operation manual of the device. This paragraph is only a reference of spray setup.

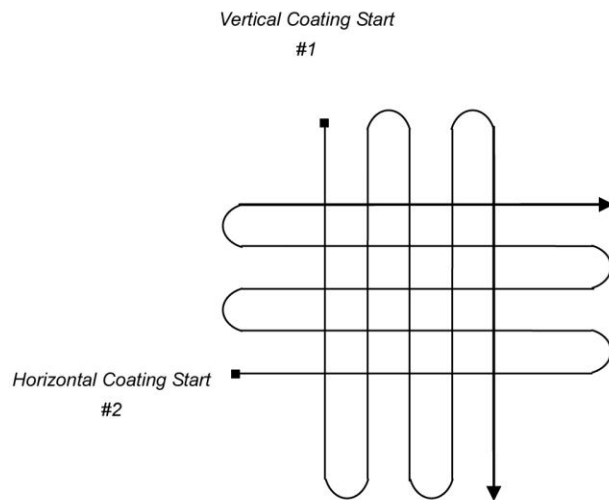
4. Spray Guidance

1. Before spray equipment calibration

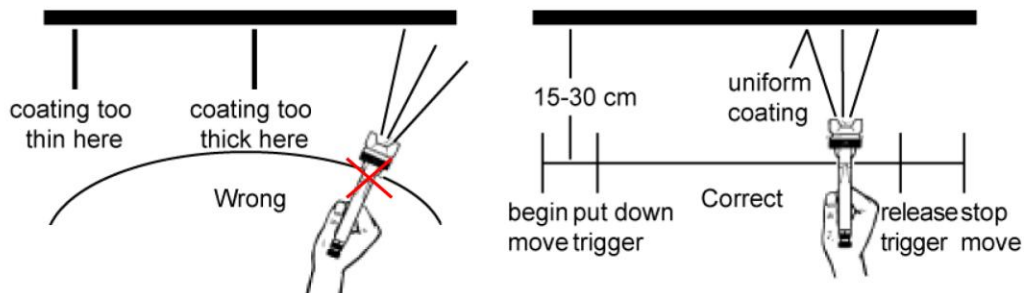
- Before the actual spraying, we suggest using water to calibrate the spray volume and coverage area.
- To achieve the optimal coverage area and effectiveness, test the spray pattern on a piece of glass or mirror. An even spray of fine mist appearance is strongly desired.

2. Spray pattern

- Apply the photocatalyst sol in interlaced spray-pattern to ensure an even and sufficient coverage of the coating.
- One Horizontal pass plus One Vertical pass is considered as one coat.
- If need coat more times, wait at least 10 minutes between each coat for better solution adhesion.
- Horizontal coating start from #1 & Vertical coating start from #2



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



5. 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 (PM).*
- *Drying with heating process can shorten the fixing time; the recommend temperature is 300-400°C.*
- *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 TiO₂ film is heated to more than 800°C, the photocatalyst activity will be decreased.*
- *When you have coated area by accident, wipe off the excess solution immediately. It is very difficult to remove the TiO₂ after it has dried completely.*
- *After coating on the surface, it will need an at least 8 hours protection step for prevent the coated surface from rain and human affect. After 8 hours, the normal rain situation will not affect the quality of the coatings.*

6. 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.*