

# *Technical Overview*

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## Introduction

The principles of electrostatic charging apply equally to liquid and powder coatings. In electrostatic coating, the fluid is atomized, then negatively charged to the object, thus having a less negative charge than the paint. Increased transfer efficiency is achieved, up to 95%. For instance, it is possible to spray paint a cyclone fence electro statically with fair transfer efficiency. Both sides of the fence can be painted from only one side due to the electrostatic attraction.

Atomized paint droplets are charged at the tip of the spray gun by a charged electrode; the electrode runs 30 to 140 kV through the paint at 0 to 225 microamperes. So, it is mean that the electrical force needed to guide paint particles to the work piece is 8,000 to 10,000 volts per inch of air.

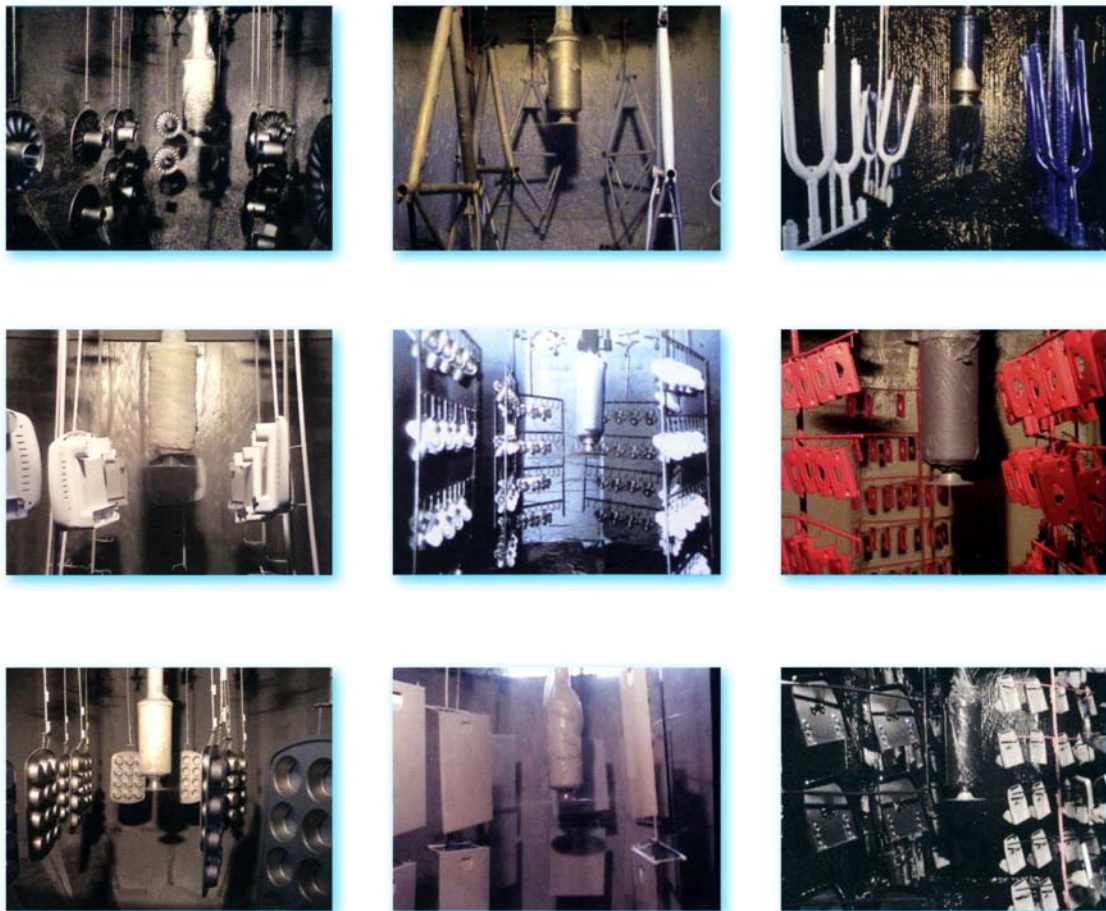


Figure 1 . Disk Electrostatic Automatic Coating system

OTSON focus on liquid electrostatic technology, we provide four liquid electrostatic equipments for customers. We also provide various nozzles and spray disks.



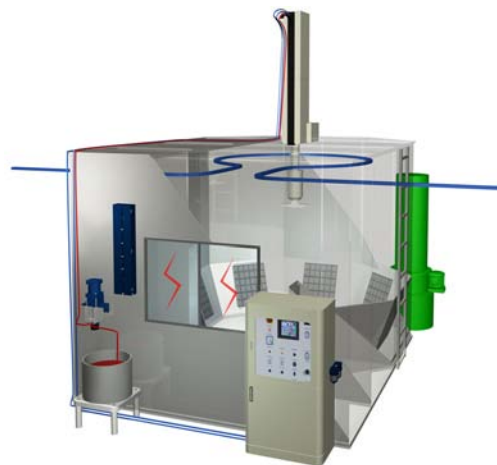
**Turbo Rotary Atomizer**



**Paint Dosing Pump**



**Manual Liquid Electrostatic Spray Gun**



**Disk Electrostatic Automatic Coating System**



**Special Nozzles**



**High Atomization Spray Disks**

## **The principle of Manual Liquid Electrostatic Spray Gun for Electrostatic Coating**

In using the liquid electrostatic spray gun, the high compressed air tends to throw the paint away when the paint passes through the special nozzle, the droplets pick up the charge from an electrically charged electrode at the tip of the gun by a charged electrode. The charged particles are given their initial momentum from the fluid pressure/air pressure. In this case, the expelling effect appears between the paint carrying electrostatic and the live particles as to cause further atomization of paint and thus, forming much finer thin fog. Due to the occlusion of electrostatic, the lost paints are sucked back to the workplace in generating a kind of surrounding electrostatic effect and the over spraying phenomenon is thus minimized. In this way, the machine has achieved the purpose of electrostatic coating.

## **The principle of Turbo Rotary Atomizer (DISK) for Electrostatic Coating**

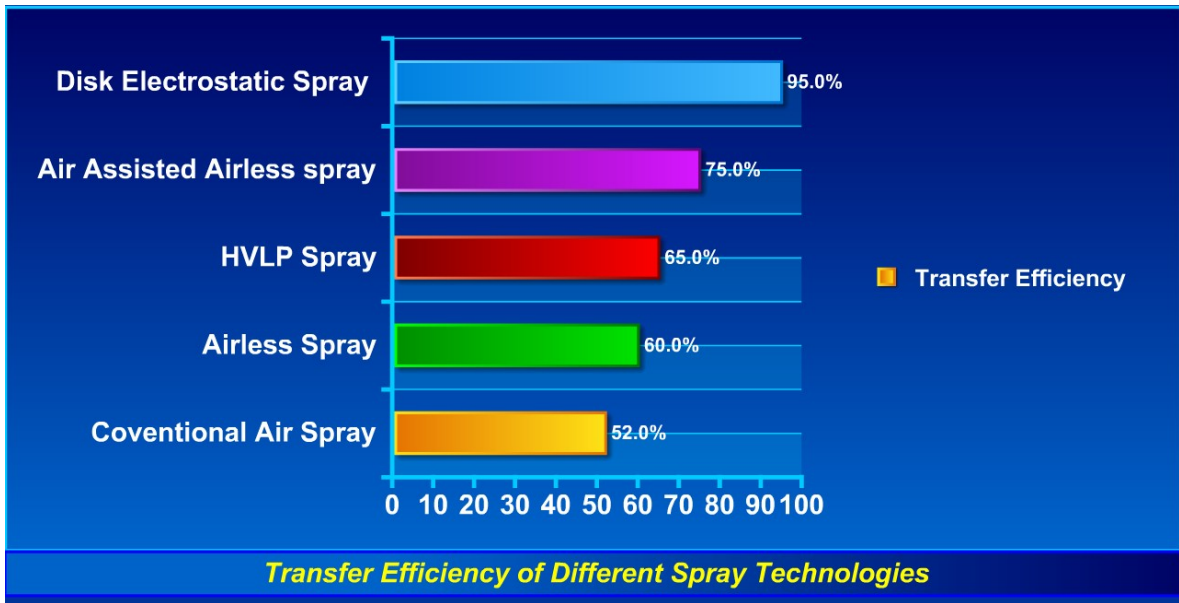
Rotary atomization is a variation of electrostatic spraying that uses centrifugal force generated by discs to atomize paint, which drives it from the spray disk. In this case, the expelling effect appears between the paint carrying electrostatic and the live particles as to cause further atomization of paint and thus, forming much finer thin fog. Due to the occlusion of electrostatic, the lost paints are sucked back to the workplace in generating a kind of surrounding electrostatic effect and the over spraying phenomenon is thus minimized. In this way, the atomization of this method is excellent as is the transfer efficiency. This method also can be used with paints of different viscosity. Therefore the machine has achieved the purpose of electrostatic coating.

## **Application**

Small parts, Bicycle, Computer Housing,  
Stationeries, Wooden Furniture, Hardware, Decorative Lamps,  
Electrical Home Appliances, Handcrafts, Sports Equipment,  
Car Accessories, Teflon Pot.

### Advantages of Electrostatic Coating

Improvements in transfer efficiency can lead to less paint waste and lower emissions of VOCs. Transfer efficiency depends on a large number of parameters. Some of these parameters are under the control of the operator, while others are not. For example, the Spray technology .We can see the chart that why electrostatic is better than others



**Chart 1.1 Transfer Efficiency of different Spray Technologies**

In the case, our products transfer efficiencies range from 70 % to 95 %( normal case), it means that you can save your money in paint cost. Meanwhile; Excellent edge coverage is achieved because electrons are attracted more strongly to edges than to flat surfaces, the attractive forces of electrostatics will to some extent draw paint droplets around to the back side of the parts, a phenomenon called wraparound or wrap.

As for coating thickness issue, it forms an electrically insulating layer. Additional paint droplets are attracted most strongly to areas on the part where grounding is best, that is, the spots where paint is thinnest, result in a more even film thickness.

## ROI for Using DISK Electrostatic Coating Equipment

A. Paint cost per gallon	\$ 9
B. Paint consumption per week	75 gallons
C. Paint cost per week (A x B)	\$ 675
D. Efficiency saved by using DISK Static Coating Equipment	50%
E. Paint saved (C x D = Cost saved per week)	\$ 337
F. Total paint cost saved per year (E x 52 weeks)	\$ 17,524

The cost spent on buying one set of DISK electrostatic Coating Machine is equivalent to the paint costs saved in each year. With some investment, you can cut off huge costs required for paint and the technician while increasing your production and improving product quality. Meanwhile it is to efficiently use the energy, improve the quality and protect the environment.

### Conclusion

Our equipments of liquid electrostatic coating can significantly improve the coating quality and production while reducing the paint consumption, the waste discharge and the maintenance cost. Because of the highly atomized live paint grains, the film is uniformly and smoothly coated on the workplace which has reduced the orange tissue effect and improved the coating layer quality.

## Further Information

For more information, go to [www.otson.com](http://www.otson.com)

For further information on OTSON 's electrostatic products, please contact:

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