



Introduction of our PVD Coating (Ion Plating) System and Services

1. Company Profile

Zhongshan Southern PVD Co., Ltd was established in 1991 and located in Zhongshan City, Guangdong, P.R. China.

We are an international manufacturer of PVD Ion Coating System, meanwhile we also provide PVD Ion Coating Service in our factory. We have been dedicated to the PVD Coating Industry for more than 10 years and we have abundant experiences in the machine manufacturing technology and in PVD coating technology. We are devoted towards maintaining our position as a leader in PVD coating technology in China.



2. Brief introduction of PVD Processing

The term PVD stands for Physical Vapor Deposition, which often just called Thin Film Process. PVD processes are atomistic deposition processes in which material is vaporized from a solid or liquid source in the form of atoms or molecules, transported in the form of a vapor through a vacuum or low pressure gaseous (or plasma) environment to the substrate where it condenses. PVD process belongs to the Science of Surface.

PVD processes can be used to deposit films of elements and alloys as well as compounds using reactive deposition processes. In reactive deposition processes, compounds are formed by the reaction of depositing material with the ambient gas environment such as nitrogen (e.g. titanium nitride).

The main categories of PVD processing are Vacuum Evaporation, Sputter Deposition, and Arc Ion Coating. Among them, Arc Ion Coating is the most advanced processing of all the PVD processes.

3. PVD coating systems



The STN series PVD coating machine, which was manufactured from the year 1998, has mature technology, convenient operation, simply maintenance, low running cost, high production without pollution. It is especially suit for door and window hardware, lock hardware, kitchen and shower hardware etc. to be ion-coated of Ti-Gold or Zr-Gold. We have abundant technicians and engineers who are in possession of abundant manufacturing and maintenance experiences. Depending on our excellent PVD coating equipment, perfect coating technology and after service, our PVD Ion Coating Equipments have been sold to many countries and areas.

The chambers of our machines have different sizes: the diameter of the chamber can be from 400 mm to 1800 mm, while the height of the chamber can be from 500 mm to 3500 mm. Along with the differences of the chamber sizes, the number of the arc cathodes, pumping systems and some other parameters of each coating system also has differences. We always design and manufacture the most proper PVD Arc Ion Coating Systems for our customers according to the outputs and some other factors of their factories.



The sinoarc (SOUTHERN-PVD) STN-10FD30 has been specially designed for decorative PVD hard-coating, for this purpose the unit is equipped with 12 arc evaporation sources. The extreme high rate of ionization in arc evaporation technology provides excellent adhesion properties of the coating to the substrate surface and dense, strong layers. For the required golden color the system is provided with Zirconium targets and Zirconium-Nitride process (ZrN). Other colors can be realized by choice of the right target material and appropriate process control. The advanced Controlled Arc system with controlled steering of the arc ensures a smooth and homogeneous layer. The controlled Arc-system also provides high coating uniformity and excellent target utilization efficiency.

The process is running fully automatically by a Programmable Logic Control-unit. Chamber, vacuum system, gas flow and controls are chosen of first class design and ensure reliability, reproducible production with high system availability.

The STN series PVD Coating Systems is also ideal for coating tools and components, such as cutting blades and drill bits. Due to the durability and increased hardness of a surface coated by our machine, tools



and components have a longer base life, reducing downtime and optimizing tool and machine utilization. This in turn means that our PVD Coating Machine help yield operational cost savings and deliver improved productivity.

Using coatings on metal components and tools is becoming increasingly popular and necessary, because these items are required to perform tasks that are beyond the capabilities of the base metal.

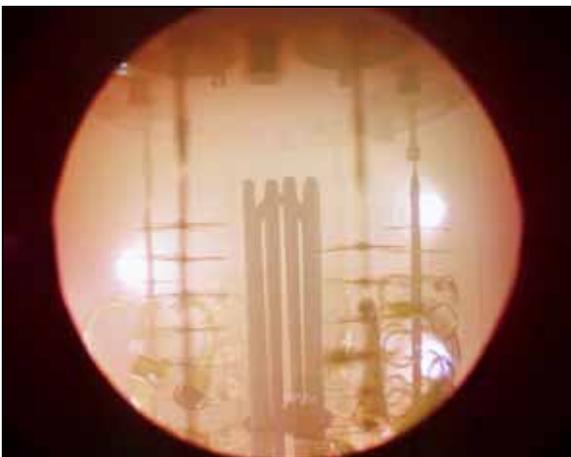
One of the main reasons for using coatings is to increase the surface hardness far beyond the ability of conventional heat treatment. This is where Physical Vapor Deposited (PVD) type coatings are particularly useful. Their hardness is typically 3~4 times harder than heat treated steel, and because the coating follows the shape of the component exactly and is only typically 3 microns thick, often no tolerance change is necessary to accommodate the coating.

Benefit of Our Coating System:

- High productivity
- High quality coating
- High process repeatability
- Automatic process controls
- Low labor cost
- Low production cost
- Most competitive price system

4. PVD coating services

So far, the PVD coating technology has been widely applied in the building materials, lock hardware, kitchen hardware, watches and clocks, cutting tools etc. The PVD coating technology has bring obvious economic benefit to the corporations and it also enhances the development potential of them. Today more and more engineers of manufacture, building and designing industries have recognized the effects and special characters of the PVD ion coating.





Typical PVD deposition rates are about 1~10 nanometers per second. For decorative coatings, the average thickness of our PVD coating is 0.1~2 microns. And for tool coatings, the average thickness of our coating is 2~5 microns.

At present, the application of PVD Ion Coating Technology is mainly divided into two kinds: Decorative Coating and Functional Coating (Tool Coating).

1. Decorative Coating - Looks better, longer

The purpose of decorative Coating is to improve the appearance decoration and color performance, meanwhile also make the substrates have better wear resistance, corrosion resistance and longer lifetime. The durability and scratch resistance is far superior to other conventional coating methods. The decorative coating is mainly applied on the following products: hardware for the door and window, lock hardware, kitchen and shower equipment hardware etc.

The PVD coatings create an attractive, modern surface in a comprehensive range of colors, and can be color-matched to existing metallic surfaces.



Several coatings and their colors of our normal product:

- TiN (golden yellow)
- ZrN (brass yellow)
- TiC (gray black)
- TiO (rainbow color)

Our measures for Quality Control of the Decorative coating products:

Eye survey of the surface appearance of the decorative products;

Do the ice water test, to measure the adhesion force of the coatings;

Do the sandblast test, to measure the abrasion resistance;

Color test: to measure the uniformity and accuracy of the color with color apparatus.





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2. Functional Coating (Tool Coating) - Works better, longer

The purpose of functional coating is mainly to increase the surface hardness and wear resistance of products, decrease the friction coefficient of the surface and prolong the lifetime of products. The functional coating is mainly applied on different kinds of knives and scissors, cutting tools (e.g. lathe tool, planer tool, milling cutter, drills etc.), hardware tools (e.g. screwdriver, pliers etc.), and different kinds of moulds.



The above coatings have high hardness and low coefficient of friction. They all can endure high temperature, abrasion and corrosion. The coatings not only make the products looked better, but also well increase the life time of those tools and moulds by 5-40 times. Meanwhile, the cutting speed and the fineness are also increased.

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