EQUIPMENT AND SYSTEM FOR VACUUM COATING
METALLIZING, SPUTTERING, PLASMA and PECVD

Hybrid system KOLZER DGK 36
second hand proposal – year 2005
Hybrid second hand system KOLZERDGK36

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>chamber internal diameter</td>
<td>mm</td>
<td>1000</td>
</tr>
<tr>
<td>chamber length</td>
<td>mm</td>
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</tr>
<tr>
<td>number of satellites</td>
<td>n°</td>
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</tr>
<tr>
<td>diameter satellites</td>
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<td>Working length satellites</td>
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<td>plasma sources</td>
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<td>sources PECVD</td>
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<tr>
<td>empty time</td>
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<td>Pump flow ROOTS</td>
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<td>Command automatic cycle</td>
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<tr>
<td>Cooling water</td>
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<td>Installed electric power</td>
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<td>system weight</td>
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PLANT ENGINEERING

The plant Sputtering DGK 36 diameter 1000 mm was manufactured by Kolzer in the year 2005. Is composed out of:
- horizontal steel coating chamber for the vacuum
- Vacuum pumping unit
- Process chamber with the cathodes placing the energy required to generate the plasma
- Power supply and control of gas flow
- Electrical power supply system and control of the plasma
- Cabinets and software management and control systems that ensure the reproducibility of obtained results
- Security system and self-diagnosis

The plasma process zone is formed from cathodes that generate an electric discharge that sustains the plasma. The cathodes are essentially plates of stainless steel, aluminum or titanium to which is applied a power supply (radio-frequency, microwave or direct current). The treatment chamber, in steel, contains all parties participating in the process: cathodes, gas supplies, trolleys. The inside room is lined with a layer of Teflon. The door is hinged, allowing full access to the room.

The electrodes are adhering to the walls of the chamber.

To the vacuum chamber are connected to all other groups making up the system: the pumping unit, vacuum instruments, gas and power supplies. The vacuum chamber is
equipped with portholes for the visual control of the plasma.

It also equipped with plasma, PECVD, two carousels door frames, two carousels central tool suitable for chrome rims, target by 1000 mm (chromium, titanium, steel, copper, brass), air gun deionized water and essential chiller cooling.

The plant can also be used as a simple metallizer.

It's also equipped with plasma, PECVD, two rotating satellite-holders, two central rotating holder, specific tool suitable for chrome wheels, target by 1000 mm (chromium, titanium, steel, copper, brass), air deionized gun and essential cooling chiller.

WHAT IS THE SPUTTERING

In addition to be the cleanest technology than any other coating techniques, Sputtering provides a combination of benefits that no other: first Sputtering is a cost-effective method of production which generates the thinnest and most uniform coating possible. It's a dry process, at low temperature.

Builds an indestructible connection between the film and the substrate (because it binds them together at molecular level). Offers a great versatility compared to other coatings, since being a cold transfer, can be used to deposit conductive or insulating materials on any type of substrate, including metals, ceramics and plastic materials sensitive to temperatures. Moreover, the process has a deposition control automatically repeatable. day.

So this solution - adopted to create new materials stronger, lighter, cleaner and more economical - not only revolutionizes our industry but also the everyday life.

The processes of chrome adopted by Kolzer machines, in addition to being a zero emission, use metallic chrome, then "zerovalent". It is absolutely non-polluting organic chromium and fully complies with the new requirements of the RoHS directive and the directive on ELV automotive.

SPUTTERING PROCESS

Coating Sputtering is one of the most flexible methods to physically deposit "PVD" vapor (Physical Vapour Deposition).

Coating material is inserted in the vacuum chamber as a cathode in the form of metal plate. After the chamber is emptied from the air, through 4 pumps working under different conditions of emptiness, we introduce the process gas (argon is usually used because of its high atomic weight).

We apply a high voltage and we introduce the gas.

Positivs ions of argon undergo the process of acceleration on the negative cathode and then expel the atoms of the metal plate (evaporating material), which then fall onto substrates.
already in the chamber and condense them.

The impact of the atoms on the evaporating material produces "Sputtering" as result of the acceleration given by the incoming particle.

Unlike many other vacuum deposition techniques, there is no fusion of material, therefore all metals and alloys can be deposited with high efficiency and high control.

**PLASMA**

The plasma is a dry, clean process, carried out at room temperature that does not use washing products.

Increases the surface tension and then the wettability of the same surfaces and form a surface capable of active reacting with contact polymers (paints, adhesives, inks, etc)

**PLASMA PROCESS**

The plasma is a gas partially or totally ionized, that particular state of gas in which are simultaneously present neutral molecules, positive ions and free electrons.

Herein plasma means a low energy content: the higher or lower energy content defines a "cold" plasma with respect to a "hot".

The “cold” plasma that interests for the pretreatment step, cleaning and washing of a substrate of any material, is obtained at low pressure (vacuum). This condition allows that in a temperature range between 20 and 30 °C are carried out reactions that at atmospheric pressure are only possible at temperatures of several hundred degrees.

The purpose of the plasma is to clean the surface of any material, and to modify the chemical and electrostatic properties of the surfaces of objects.