

InoCoat

Plasmaplotter 3D

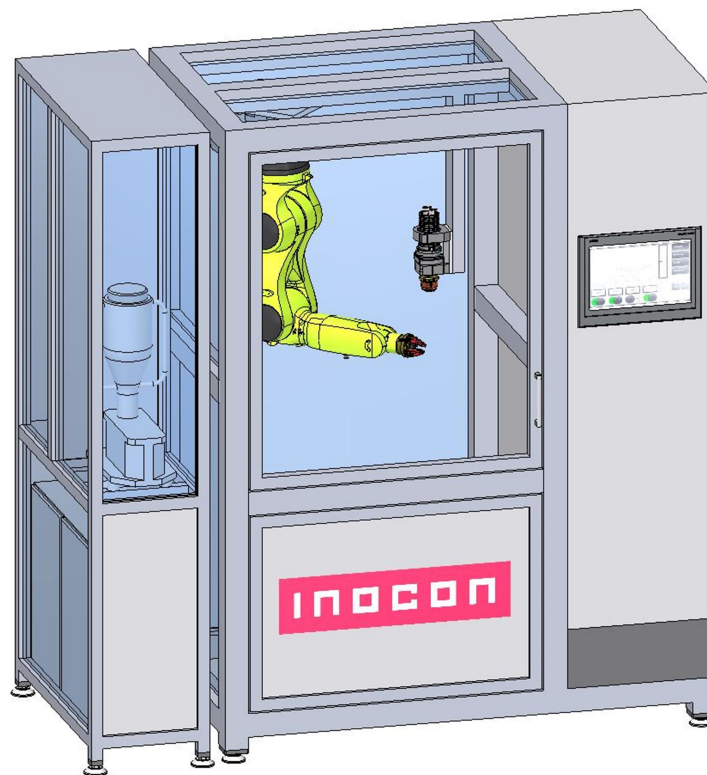
Coating sensitive
substrates in
atmosphere

Microlayers 5 to 300 μm

Nanolayers 5 to 300 nm

The Technology

The Plasmaplotter technology is the worldwide only equipment that can apply **micro- and nano- layers** on almost any surface. Microcoatings of powders as well as nanocoatings out of vaporized precursors are possible. One of the most impressive things the deposition of high melting powders or precursors on temperature **sensitive substrates** like paper, wood, textiles or any kind of plastic. If combining these new possibilities you can create new coatings which lead to absolute new coating-characteristics and products.



The Inocon plasma process operates under **atmospheric pressure** and doesn't need any vacuum installation. Highly flexible and easy for inline integration in processes are the most named advantages of our customers and enables you to do R&D with the newest state-of-the-art coating technology. This atmospheric process replaces vacuum processes and galvanic layers with no negative environmental effect. Several institutes for nanomaterials and surface technology are already using this technology.

Coating possibilities 1

Microparticle coatings

The Plasmaplotter makes powder coatings with a thickness between 5 and 300µm to generate a wide range of effects.

Powder coatings allow R&D with different materials and many market segments. Generating single conductive paths or a whole circuit board on thermal sensitive and even flexible substrates is just one possibility. The Cu coatings allow soldering processes even after storage.

The InoCoat Plasmaplotter also allows you to create coatings for corrosion resistance.

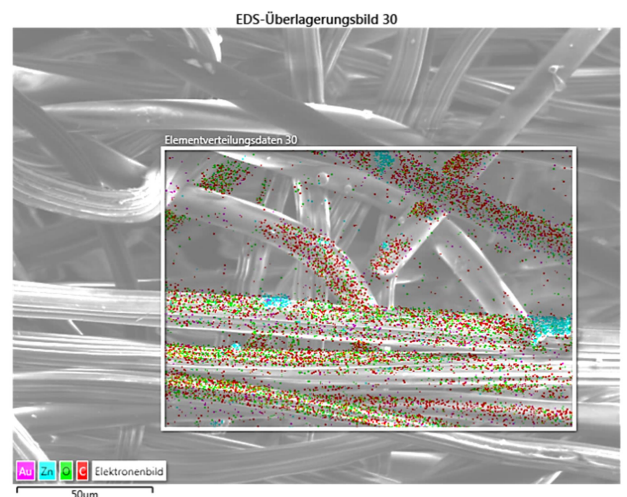


Picture 1: Structured conductive layer on composite

Biocidal layers

The possibility of depositing biocidal layers opens a wide range of R&D applications.

This coating can be used for medical products like implants or wound dressings as well as for consumer products like door knobs or light switches.



Picture 2: different particelles, deposited on wound dressing

Coating possibilities 2

Nanoparticle coatings

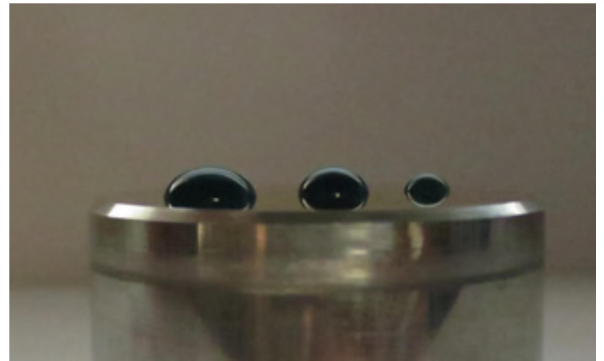
By evaporating precursors the Plasmaplotter generates layers with a thickness between 10 and 150nm. The most visible thing is to look at the effects that are generated. Creating silicon oxide(glass-like) layers for hydrophilic effects as well as silicon-like layers to obtain hydrophobic effects is done by simple adjustments and can be made with the same process and out of the same precursor material.

The hydrophilic layers are mostly used for pre-treatment before gluing and printing and are actually under investigation for the injection moulding industry.

These coatings lead to excellent results in washability tests. That means that these coatings are very resistant against abrasion. The coatings are also very resistant against high temperatures.

Plasma pre-treatment

You can also use the InoCoat Plasmaplotter technology for pre-treatments on nearly every substrate material to improve adhesion of following coating, printing, gluing or similar industrial processes.




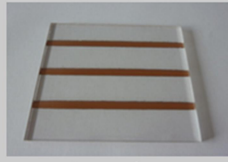

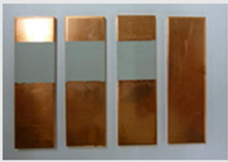

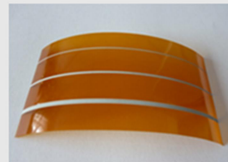

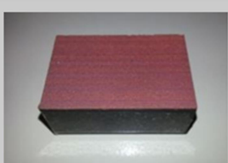




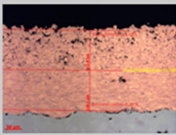


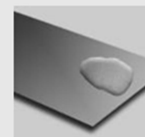
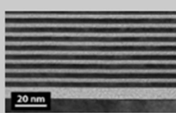
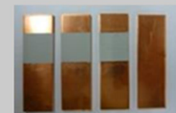
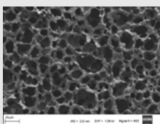
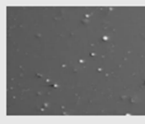

Picture 3: Antiadhesive surface



Picture 4: Much better adhesion on coated glass

Summary

Automotive	E-Mobility	Electronic	General
 Cu on graphit	 Cu on composite	 Cu on Si-wafer	 Cu on glass
 Plasmagrip®	 Sn on Cu	 Cu on plastics	 Cu/Sn on foil
 Cu on ceramik	 Cu on graphit	 Cu on PCB	 Sn on solar cell

Conductive layers	 
Layers in nano meter range - Adhesion improvement - Non adhesive properties - Barrier properties	 
Anticorrosive layers	 
Biocidal layers	 
Tribological layers	

Plasmaplotter 3D concept

The equipment is able to deposit either microparticle layers (powder coatings) or nanoparticle layers (SiO_x-coatings) or both on various substrates like metal, plastics, composites and wood. The workpiece is moved with the robot that enables you to make 3D coatings on various kinds of substrates.

InoCoat 3 Plasmajet

The InoCoat3 is the most effective Plasmajet when depositing various kinds of materials on several substrates. It combines high power with sensitivity and focusing power on the coating material and not on the substrate.

Input

Electrical supply (power source)

Plasmagas: Argon, Nitrogen, Argon/Hydrogen

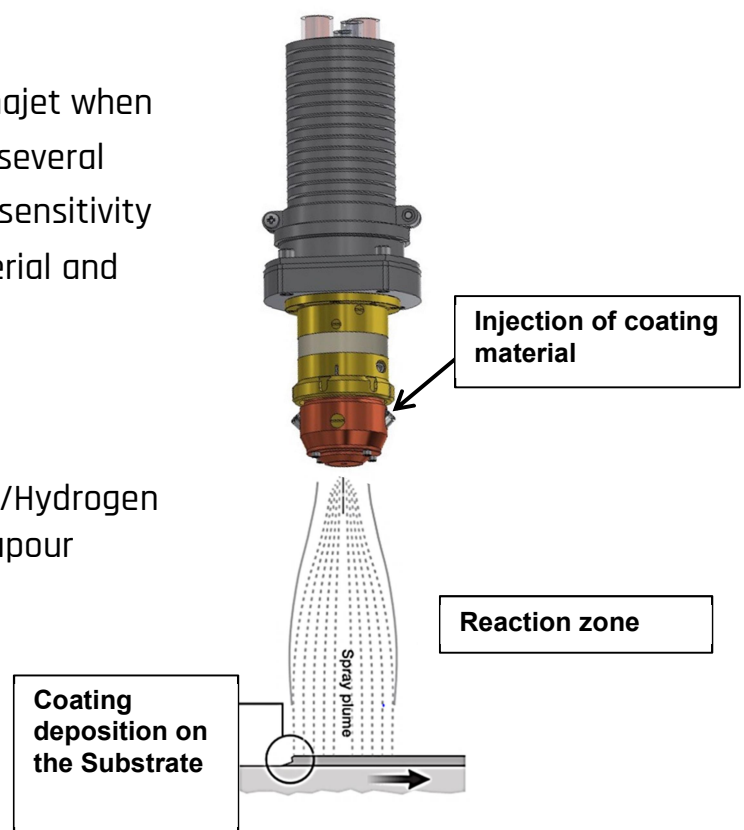
Coating materials: Powders and Vapour

Output

Plasma arc

Deposition of the coating

Power: 1-8kW



The coating materials are either injected by a powder feeder or by an evaporator. Both are included in the machine.

Equipment frame

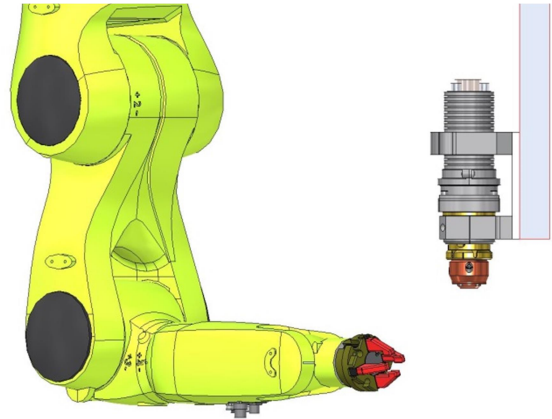
The several parts of the machine are mounted on a frame. The working area and the robot are protected by housing. An access door is located in the front area of the plant to provide access for the worker. The electric cabinet where the PLC and all the electric components are installed is mounted on the machine frame.

Manipulation of the substrate

We use an industrial robot with a payload of 7kg and a range from approx. 700mm for the movement of the substrate.

This allows a very flexible way of depositing the coating on the substrate.

The gripper for clamping the substrate can be changed very easy with a quick connector.



Exhausting system

The exhausting system depends very strong on the powder which gets injected in the plasma. If only the recommended powders Cu, Sn, Zn are used the standard exhausting system included.

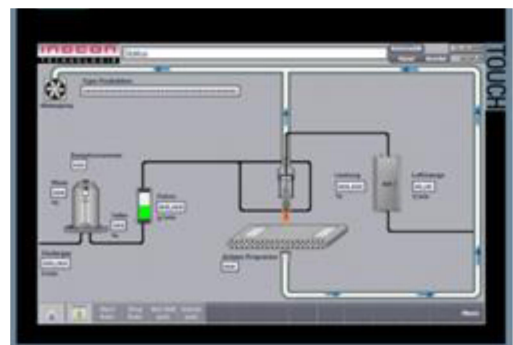
If materials with dangerous EX- specifications are used the specifications have to be adjusted.

The exhausting flow is controlled by a sensor to measure if everything is working correctly.



PLC and visualization

A visualisation to control the process and to save recipes for different parameters is also included in the machine concept. It is also possible to check the working parameters (e.g.: temperatures, current and voltage) and to save and export them via USB.



Technical Facts

Dimensions:	Max. 2,5m x 2m x 2,3m
Weight	approx. 1000 kilograms
Operating voltage:	3 x 400 V/64A
Pneumatic connection:	6bar DIN ISO 8573-1 class 3
Control voltage:	24V
Work piece material:	metal glass paper plastics, and many more
Coating material:	Cu, Zn, Sn, Ag Precursor(HMDSO)
Coating current	30-350A
Warranty	2 years (wear and tear parts excluded)

Pricing

Total Unit Price €280.000,-

Delivery time 26 weeks