plasmatreat

APPLICATION INFORMATION

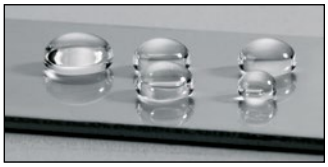
PlasmaPlus® Inline Coatings

Plasma polymerization on plastics

Functionalize plastic surfaces according to your requirements!

The high energy density of the Openair-Plasma® in combination with the specifically engineered precursors enables the application of ultra-thin layer coatings on a wide variety of substrate materials. This PlasmaPlus® technology completely changes surface properties to create materials with different characteristics and thereby open up new use-cases and new material combinations.

hydrophilic - wetting



hydrophobic - water-repellent

PlasmaPlus® coatings generate new surface properties by:

- Creating barriers against water, oxygen and CO_2
- Generating scratch-resistant layers
- Producing dirt-repelling surfaces
- Creating anti-fogging layers on transparent plastics
- Significantly enhancing diffusion characteristics of plastics
- Acting as anti-adhesion layers in injection molding processes

Plasma polymerization coatings as automotive sensor protection:

- Protect against demanding weather and environmental influences. The use of PT-Bond before the bonding process significantly improves functional reliability.
- When integrated inline, it is a cost-effective and environmentally friendly solution.

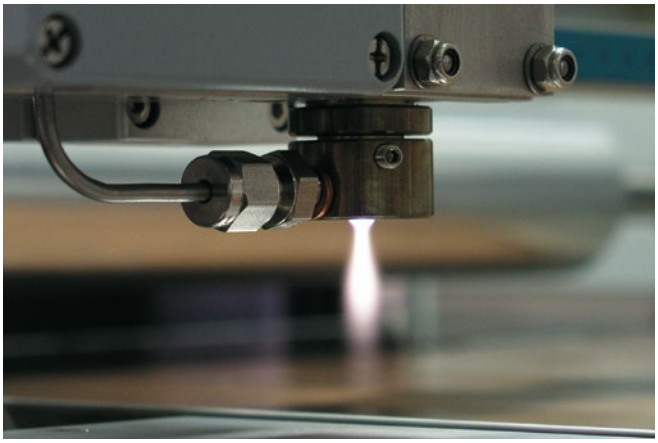
PlasmaPlus® coatings on metallized polymers:

- Enable corrosion protection on metallic surfaces e.g.: important for metallized plastics in a mobile phone.
- Greatly extend the range of applications that require metallized plastic surfaces.

PlasmaPlus® Inline Coatings

PlasmaPlus® coatings on plastic foils

- Through the use of PlasmaPlus® coatings, polypropylene foils can be rendered permanently printable while simultaneously improving the anti-fogging properties of the surface.
- The process of surface modification by using PlasmaPlus® coatings opens a whole new field of viable compound-material combinations (e.g.: the use of a higher ratio of recycled materials).



PAD10 - coating jet

Process technology

There are similarities between the Openair-Plasma® systems for cleaning and activation and the systems used for coating applications. Both technologies require a generator, a high voltage transformer and a Plasma-Jet. Additionally, the coating systems are equipped with the PlasmaPlus® technology to doze and vaporize the precursor fluid and feed it into the plasma stream. To ensure a clearly defined process window resulting in a consistent and reproducible coating layer, the plasma process parameters as well as the precursor feeding parameters need to be monitored at all times. The new S-generator series including microprocessor combined with the PCU-technology offers digital input and output control as well as detailed monitoring features tailored to these demanding processes.

Developing the future

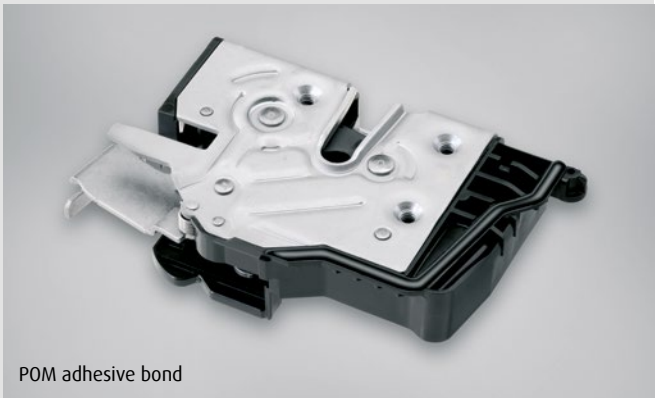
In the near future, plasma polymer coatings will greatly expand the range of applications for a wide variety of materials. For the first time, atmospheric Openair Plasma® technology provides a tool that can build up these layers very efficiently and selectively, to a much greater extent than was previously possible at low pressure. For the first time, it has been possible to integrate such layers into continuous processes. This was made possible in part by close collaboration with the Fraunhofer Institute for Manufacturing Technology and Applied Materials Research IFAM in Bremen.

PlasmaPlus® application:

Non-polar, water-repellent and/or fluorine-based polymers can pose a challenge to atmospheric plasma-activation processes. In such cases, the PlasmaPlus® technology provides a practical and environmentally-friendly solution. Small amounts of precursor fed into the Openair-Plasma® stream are used to create functional groups on the plastic surface to form covalent bonds with the adhesive. The following picture shows a POM adhesive bond using PUR adhesive.

Ecological POM bonding in car door locks

Door locks are a safety measure for both car owners and passen-gers in case of accidents; however, the thermoplastic POM – with its fantastic wear and gliding properties – is challenging to glue. Its non-polar surface with low surface energy and therefore poor wetting properties make pretreatment impossible. Thanks to the bonding agent PT-Bond, many car door locks around the world have a stronger and more durable bond compared to other fixing methods.



POM adhesive bond

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