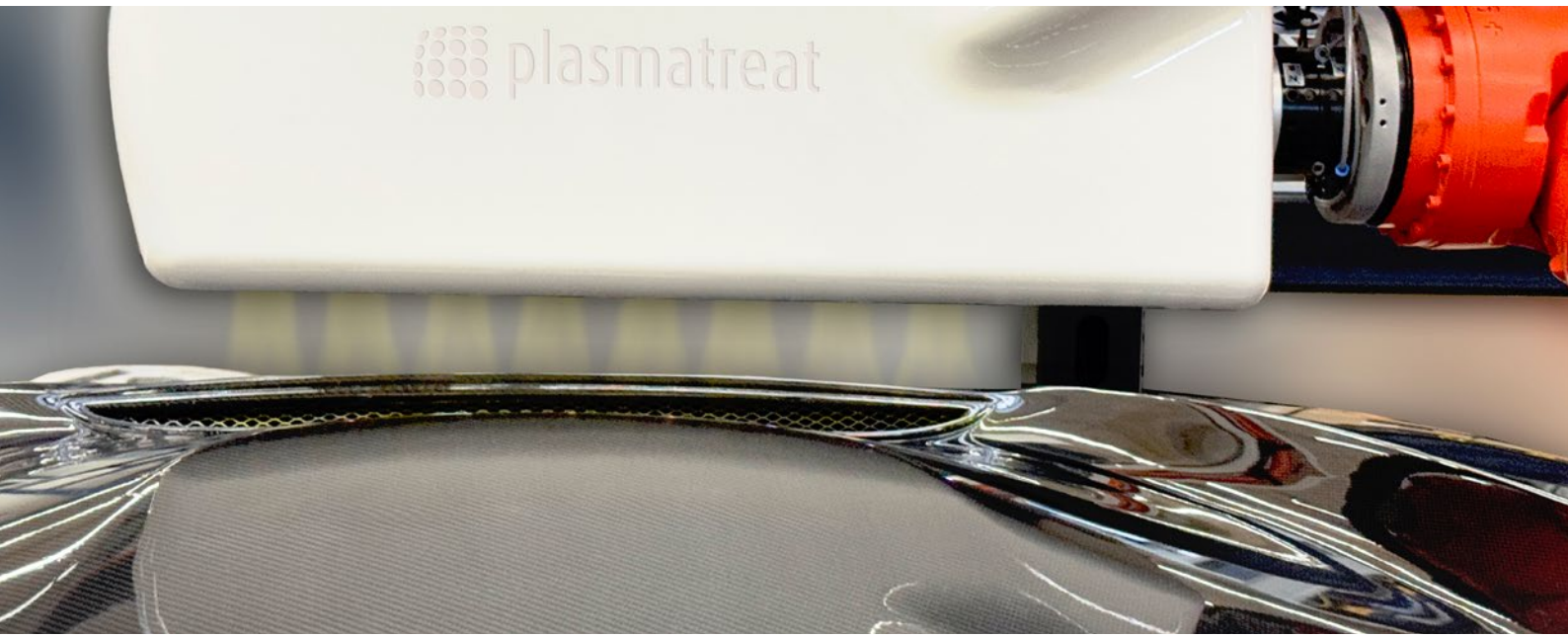
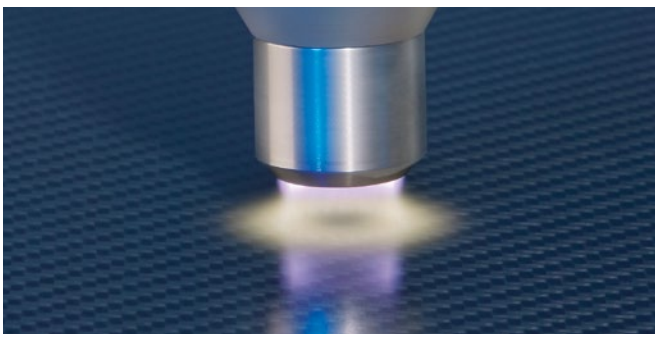


APPLICATION INFORMATION

Plasma Solutions for Clean, Adhesive Lightweight Surfaces

Reliable Adhesion Despite Additives and Release Agents

New lightweight materials such as CFRP, glass fiber reinforced thermoplastics or thermosetting composites enable high stiffness with reduced weight. At the same time, they pose major challenges for bonding and sealing technology. Their surfaces are usually non-polar, have a low surface energy and are frequently loaded with additives, release agents or layers from processing. These residues prevent reliable adhesion of adhesives, potting materials or coatings. Conventional pretreatments such as grinding or solvent cleaning are often inadequate, cannot be carried out inline and can impair occupational safety due to the formation of dusts or vapors.



Inline-capable activation: Plasma jet in use on composite components

Openair-Plasma®: Activation and Purification in One Step

Openair-Plasma® enables simultaneous ultra-fine cleaning and activation of plastic and composite surfaces without the use of wet chemistry. The treatment specifically increases surface energy and significantly improves wettability. This results in stable, long-term connections, even with demanding materials such as PE, PP, SMC or CFRP. Openair-Plasma® can be integrated inline into existing processes and is suitable for applications such as bonding, painting, coating, overmolding or potting.

HydroPlasma®: Reliably Remove Release Agents Without Residue

In many lightweight construction processes, silicone-containing or other stubborn release agents remain on the component surface after shaping. In principle, these residues can also be removed with grinding or solvents, but such processes are associated with health-related risks. HydroPlasma® offers a safe alternative: water is stimulated in the plasma and ensures extremely effective and gentle purification. This results in clean, activated surfaces that enable reliable adhesion for adhesives and coatings.

PlasmaSizing: Functionalized Fiber Surfaces

In the production of glass and carbon fibers, a sizing is traditionally applied that protects the fibers and serves as a bonding agent. However, these layers are usually only suitable for a specific resin system and can cause problems with changing matrix systems. PlasmaSizing replaces the conventional sizing with a plasma-based functionalization that takes place directly in the spinning process. As a result, the fiber surfaces are optimally adjusted to the respective matrix, which significantly improves the fiber-matrix adhesion and eliminates the need for additional wet chemical steps.

PT-Bond: Nanocoating for Structural Bonding

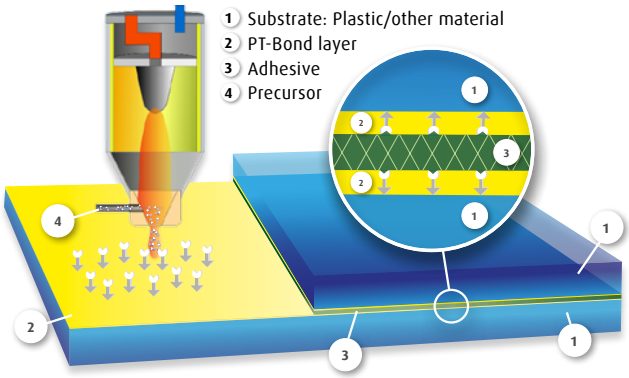
PT-Bond is designed for high-strength adhesive joints. The injection of a precursor into the plasma beam creates an ultra-thin functional layer that chemically bonds with the substrate and adhesive. This results in highly stable connections, even with difficult material combinations such as CFRP with aluminum, or when using more powerful 2K epoxy systems. PT-Bond also proves itself under extreme environmental conditions, such as wind power or automotive engineering with demanding validation tests for external bonding.

Advantages at a Glance

Openair-Plasma®
- Increased surface energy for reliable adhesion
- Safely removes additives and gases
- Dry, inline-capable, solvent-free
- No need for primers or wet chemical processes

HydroPlasma®
- Residue-free removal of silicone-containing release agents
- No mechanical pretreatment required
- Suitable for sensitive or complex components
- Environmentally friendly alternative to chemical solvents

PT-Bond
- Ultra-thin functional layer for strong adhesive connections
- Chemical bonding to substrate and adhesive
- Highly stable adhesives with 2K epoxy systems
- Permanent resistance, even under extreme environmental conditions



Functional layer with PT-Bond for highly stable adhesive bonds


Test setup for process validation: Ensuring adhesion when changing material

Support for Material and Supplier Changes

In practice, companies often switch to new materials or suppliers, whether for cost reasons or to improve sustainability and weight. This creates uncertainties in terms of bonding and adhesiveness. Plasmatreat supports with laboratory analyses, material characterization and process adaptation. This ensures that new materials are reliably qualified and creates robust process windows that guarantee reliable serial production.

Tap into the expertise of Plasmatreat for your lightweight applications. Our experts support you in analyzing new materials, qualifying new bonding processes and integrating plasma into your production.

Talk to us about your application and work with us to develop the appropriate solution.

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