



Fraunhofer
Institut
Fertigungstechnik
Materialforschung

Atmospheric Pressure
Plasma Technology
AP Plasma Technology
Cleaning
Activation

Cleaning

Cleaning surfaces, for example removing release agents or lubricants, in order to guarantee optimum adhesion for adhesives, lacquers and paints is often problematical. The methods usually employed to achieve this involve the use of both solvents and aqueous systems. The result is high costs due to the consumption of large quantities of environmentally harmful chemicals.

Atmospheric pressure plasma technology is an efficient environmentally-friendly alternative method for cleaning surfaces. It involves subjecting the workpiece for a short period of time to AP-plasma from air or oxygen. The plasma removes organic contaminants from the surface with no significant thermal stress of the substrate. Coarse contamination, for example large particles and thick layers, cannot be efficiently removed in this way but should rather be removed in advance by other means (mechanical, compressed air, water-based cleaning agents).

Activation

The adhesion of lacquers and paints and the integrity of bonded joints are common problematic issues in the plastic processing industry. The incompatibility of the surface properties of many materials, in particular plastics, with lacquers, paints and adhesives often prevents the use of otherwise highly advantageous materials and constructions. The use of primers and common activation methods is often either too complex and costly or too unsuitable. AP plasma technology involves using a plasma to activate a polymer surface. The plasma is generally produced from air, but can also be generated from pure nitrogen or oxygen. The excited atoms in the plasma can be incorporated into the surface, so causing a change in the surface properties of the plastic due to the incorporation of new functional groups.

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Nozzle assemblies on an atmospheric pressure plasma unit

Adhesive Strength of Different Plastics with and without AP Plasma Activation

Examples from industry:

- Activation of grooves in polypropylene headlight units for bonding
- Preparation of EPDM-sections for flocking without roughening and solvent-containing primers

We offer:

- Consultancy
- Sample provision
- Process development
- Manufacturing and plant concepts
- Technology transfer

**Adhesive strength after pretreatment
 with AP-plasma**

