Steinhagen, October 26th, 2023

**Plasmatreat at productronica 2023:**

World's first inline REDOX-Tool: Improving electronic reliability by reducing metal oxides under atmospheric pressure.

**For the pretreatment of highly sensitive electronic components, Plasmatreat GmbH, Steinhagen/Germany, will present a real innovation at productronica 2023 in Munich: The new REDOX tool safely and effectively reduces oxide layers on electronic components in an inline process. The company will be demonstrating how processes in the electronics industry can be made more efficient and environmentally friendly with plasma systems operating under atmospheric pressure from November 14 to 17, 2023 in Hall A2, Booth 445.**

**REDOX-Tool: Alternative process to the usage of flux**

Metals are an important part of electronics manufacturing. However, their surface oxidizes when it exposed to air and humidity and prevents the formation of a perfect solder joint in the production process. With the REDOX-Tool, Plasmatreat is presenting a game changing innovation at productronica that provides a remedy and can even make the use of flux redundant: The REDOX-Tool, a special production cell (Plasma Treatment Unit/PTU), removes oxide layers in an inline process. The innovative system uses only a combination of nitrogen and hydrogen, eliminating the need for environmentally harmful formic or citric acids. For treatment, components are heated in a single or dual lane tunnel flooded with inert gas (e.g. N2 or N2H2) and prepared for plasma reduction. Plasma nozzles, also operating with inert gas, reliably remove trapped oxygen molecules from the metal surface. Controlled cooling of the treated products under inert conditions stabilizes the reduction achieved for the next process step. The result of the plasma application is optimized surface adhesion and reliable adhesion in subsequent processes. This effectively reduces defects, delamination and product failure. The innovative REDOX-Tool also provides complete process control and product traceability.

**Overmolding: Overmolding of sensitive electronic components with thermosets**

In a joint project, the pre-treatment and overmolding of printed circuit boards with an epoxy molding compound (EMC) in a fully automated injection molding process will be presented at the Plasmatreat booth. For this purpose, the electronic components are subjected to gentle ultra-fine cleaning with Openair-Plasma. They are then coated with an adhesion-promoting coating in the PlasmaPlus process and finally overmolded with a temperature-resistant thermoset in an injection molding system. The plasma treatment and coating ensure reliable adhesion of the plastic to the circuit boards and protect them from environmental influences. In addition to Plasmatreat, the project partners include the machine manufacturer ARBURG GmbH (Lossburg), the toolmaker Siegfried Hofmann GmbH (Lichtenfels), the special machine manufacturer Barth Mechanik GmbH (Zimmern o.R.) and the plastics supplier Sumitomo Bakelite Co., Ltd. (Japan).

**Semiconductor PTU: Inline surface treatment for advanced semiconductor packaging**

With the Semiconductor PTU, Plasmatreat is also presenting a standard production cell for reliable cleaning processes in the semiconductor industry that can be seamlessly integrated into existing production lines. The system uses Openair-Plasma to effectively remove all organic and silicon-based contaminants as well as electrostatically charged dust. In addition, PlasmaPlus can be used to create various coatings that provide maximum protection for the treated products. For example, they prevent epoxy bleed out, reoxidation or corrosion in LED applications. The Semiconductor PTU is used prior to the following process steps: wire bonding, die bonding, pre-molding, thermocompression bonding, underfill, metal oxide reduction.

"Plasmatreat supports the increasing challenges in the manufacturing processes of the electronics industry with innovative and inline-capable plasma technology: The pretreatment of highly sensitive products with potential-free Openair-Plasma contributes decisively to higher product quality, more cost efficiency as well as increased process reliability and environmental friendliness," explains Nico Coenen, Global Market Segment Manager Electronics at Plasmatreat.

More information is available at: [www.plasmatreat.com](http://www.plasmatreat.com)

Visit Plasmatreat auf der productronica, in hall A2, booth 445.

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***Info box:***

**How Openair-Plasma and PlasmaPlus optimize industrial processes.**

When plasma with its high energy level comes into contact with materials, it changes the surface properties, for example from hydrophobic to hydrophilic. Plasma technology requires only compressed air and electricity for operation. Fine cleaning with Openair-Plasma gently and reliably removes dust, release agents, additives, plasticizers and hydrocarbons from surfaces. Especially with non-polar plastics, plasma treatment achieves surface activation. It supports the increase of surface energy by introducing hydroxyl groups and thus improves adhesion in subsequent processes such as bonding, printing, painting and sealing. Plasmatreat's PlasmaPlus technology can also be used to create targeted functionalized surfaces with defined properties by applying (depositing) nanocoatings, e.g. as an additional adhesion promoter layer.

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**About Plasmatreat**

Plasmatreat is an international leader in the development and manufacture of atmospheric plasma systems for the pretreatment of substrate surfaces.

Whether plastic, metal, glass or paper – the industrial use of plasma technology modifies the properties of the surface in favor of the process requirements.

Openair-Plasma® technology is used in automated and continuous manufacturing processes in almost every industrial sector. Examples include the automotive, electronics, transportation, packaging, consumer goods and textile industry, but the technology, cost and environmental advantages of the plasma technology are used in medical technology and in the renewable energy sector as well.

The Plasmatreat Group has technology centers in Germany, USA, Canada, China, and Japan. With its worldwide sales and service network, the company is represented in more than 30 countries by subsidiaries and sales partners.

More information is available at: [www.plasmatreat.com](http://www.plasmatreat.com)

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**Images:**



REDOX-Tool: Improve electronic component reliability by reducing metal oxides on the surface. (Copyright: Plasmatreat GmbH)

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In the Semiconductor PTU, Openair-Plasma is used to effectively remove all organic and silicone-based contaminants as well as electrostatically charged dust. (Copyright: Plasmatreat GmbH)