

## **Press release: Optimised adhesive bonding with plasma**

**Relyon plasma GmbH, a subsidiary of TDK Electronics AG, based in Regensburg, Germany, will be presenting various atmospheric pressure plasma systems for the preparation of surfaces prior to bonding or encapsulation at Bondexpo in Stuttgart.**

**Regensburg/Stuttgart.** From the 7<sup>th</sup> to the 10<sup>th</sup> of October 2019 Bondexpo, the international trade fair for bonding technology, will take place at Messe Stuttgart. At booth 6437, relyon plasma will be presenting different plasma systems for the preparation of various materials before gluing, moulding, sealing and bonding. Our partner John P. Kummer will also be demonstrating the interaction of plasma activation with various adhesives and adhesive tapes at booth 6433.

### **Mechanisms of plasma for bonding**

If a surface is functionalized with plasma before bonding, the resulting joints show a significant improvement in adhesion. Animal Care Technologies GmbH describes its experience as follows: "Only with the relyon plasma piezobrush® PZ2 have we succeeded in producing a reliable and durable bond between our plastic housing parts. Both the ABS material of the plastic shells and the TPE intermediate ring show an almost inseparable bond with the used polymer adhesive due to the plasma treatment. Without the plasma treatment with the piezobrush, a sufficient adhesive bond for our quality requirements would be impossible." The surface functionalization caused by this "cold" plasma treatment is based on the accumulation of polar end groups on the molecules of the polymer surface under ambient conditions. These increase wettability, and also act as anchor groups for the subsequent bond between the adhesive and the component surface.

Plasma can be used on a variety of materials: Metal, glass, ceramics and even natural materials such as wood and textiles react very well to plasma functionalization. In addition, many polymers with poorly wettable surfaces can be successfully bonded after plasma treatment. Metals, on the other hand, can be cleaned of both organic films and hard oxides, restoring the pure metal surface. This significantly improves many subsequent joining processes such as gluing, coating, soldering, etc.

### **The perfect plasma system for every application**

The atmospheric pressure plasma systems are available in various designs, so that they are optimised for the respective application. The high-performance plasmabrush® PB3 system was specially developed for very high process speeds and integration into industrial production lines. As a counterpart it is also available as plasmatool, a high-performance hand tool for workpieces which cannot be machined due to their size or mobility. In addition, this system is also available as plasmacell, an independent and compact all-in-one system.

Since these plasma systems are often too large and too costly to purchase for small companies and start-ups, the plasma handheld device piezobrush PZ2 is available for processes from prototyping up to serial manufacturing. "For a start-up company such as ours, the use of a conventional industrial plasma system is hardly conceivable, but thanks to the innovative piezo technology from relyon plasma, professional adhesive bonding is also possible without large investments." summarizes Doris Hoffmann from Animal Care Technologies.

## Advantages in comparison to conventional processes

The relyon plasma atmospheric pressure plasma systems typically work with ambient or compressed air, in special cases also with industrial gases such as nitrogen or forming gas. Compared to the use of primers, atmospheric pressure plasma offers an enormous improvement in terms of economy, process reliability and environmental compatibility. Moreover, this type of plasma does not require expensive vacuum technology. Due to the extremely fast processing speed, atmospheric pressure systems are suitable for a variety of industrial applications.

At the booths of relyon plasma or John P. Kummer, the various plasma systems will be presented and demonstrated directly at the exhibition and can also be tested on-site.

## About relyon plasma GmbH

Relyon plasma GmbH, a subsidiary of TDK Electronics, based in Regensburg, Germany, develops innovative plasma systems. True to the motto "rely on plasma", relyon plasma GmbH is a professional supplier of plasma systems as well as a service provider for individual customer requirements. Parallel to its own products for plasma treatment for industrial and medical applications, it develops customer-specific, highly efficient process solutions for surface cleaning, surface activation and germ reduction.

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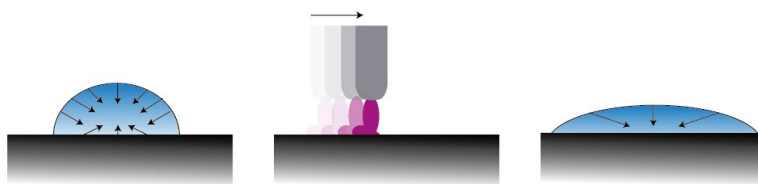
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## Picture credits:

**Bondexpo**



**Image 1:** Logo Bondexpo



**Image 2:** In the initial condition (left), plastic surfaces are difficult to wet. The plasma flame (center) can be used to achieve improved wetting behavior.



**Image 3:** Examination of surface energy using test inks before and after plasma treatment