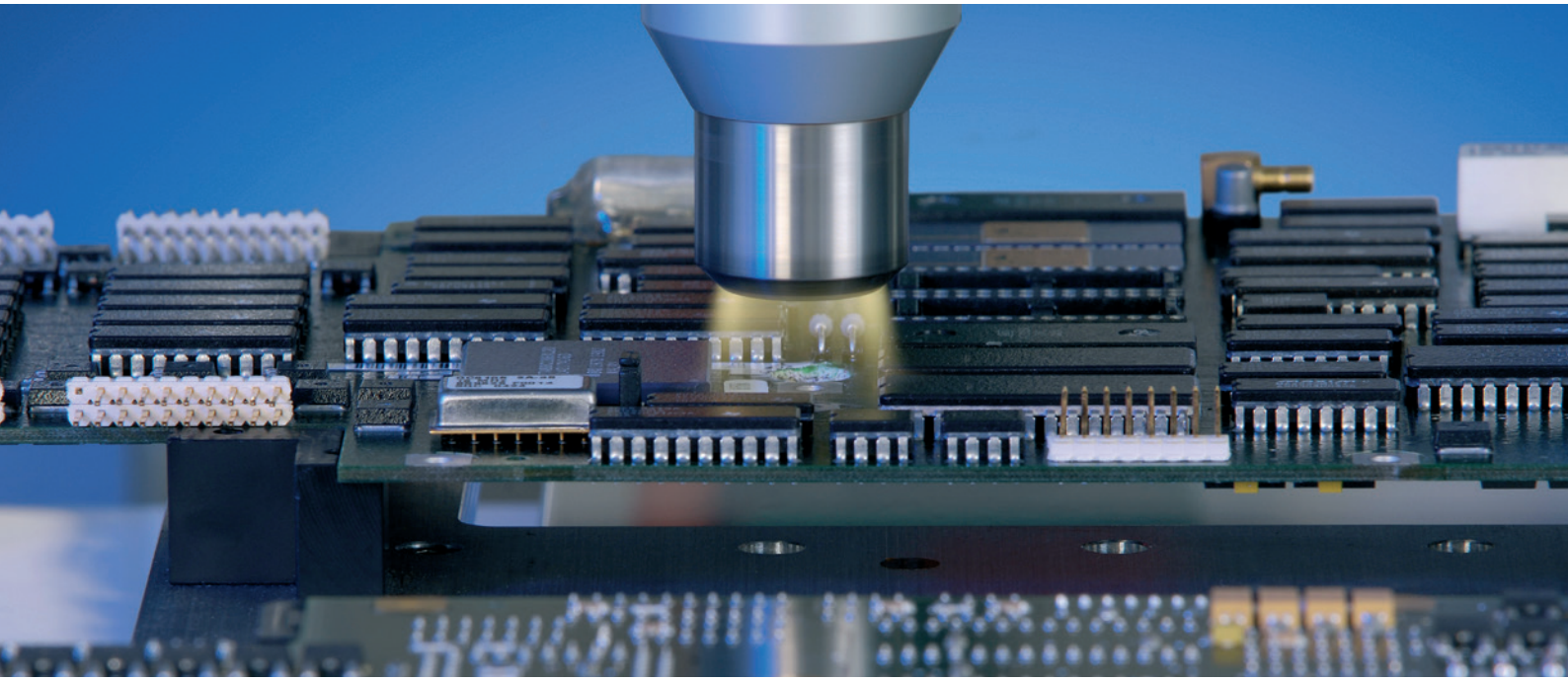
plasmatreat



APPLICATION INFORMATION

Openair-Plasma® before conformal coating

Extends the process window and ensures perfect quality

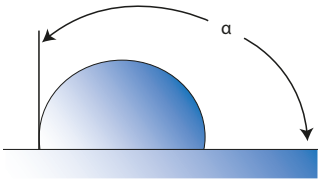
With electronic components increasingly being used in less controllable environments, the demand for (corrosion) protection is growing. From vehicle interiors and engine compartments in automotive to military and aerospace equipment – the use of a conformal coating to protect the electronics is now virtually imperative.

This is the only way to safely ensure the required performance and reliability for the entire life of the PCB and beyond. Pretreatment with Openair-Plasma® facilitates the complex process of conformal coating by extending the process window and increasing the quality of the coating.

Openair-Plasma® process

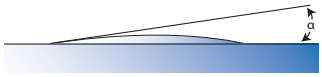
Openair-Plasma® is used to modify surface characteristics so as to enhance the adhesion of materials (such as coatings) to the substrate (PCB). It removes all organic and silicone-based impurities. Oxygen in the form of hydroxyl and ketone groups is incorporated into non-polar surfaces to bring about surface activation. The result is high surface energy (over 72 mN/m) and in most cases, complete wettability.

Before Openair-Plasma® treatment



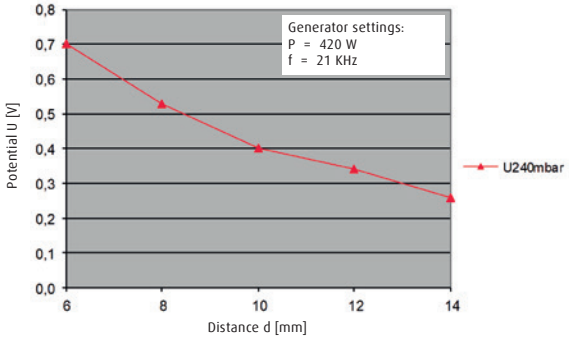
Low surface energy, higher contact angle (α > 90°)
approx. 20 mN/m

After Openair-Plasma® treatment



Higher surface energy, lower contact angle (α < 20°)
approx. 72 mN/m

Gently acting jets apply the potential-free plasma to the SMD assembly

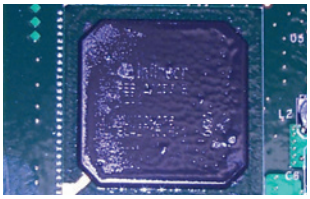


The PCU (plasma control unit) ensures that all parameters are monitored and that identical results are obtained for every treated part.

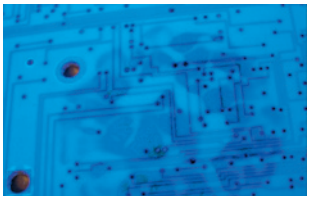
The specially developed potential-free nozzles allow Openair-Plasma® technology to be used in electronic applications without damaging the electronics.

Coating challenges

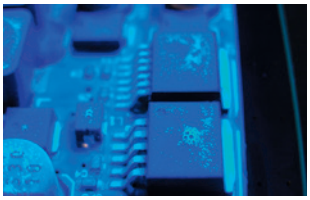
Common issues in the conformal coating process are orange peel, bubbles, delamination, uneven coatings and cracks. These may be caused by the coating material, the circuit board or component quality, the oven profile, impurities or even the application process.



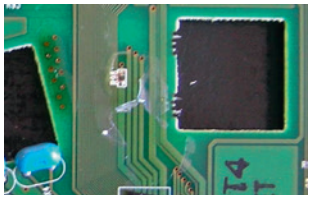
Orange peel



Dewetting



Bubbles

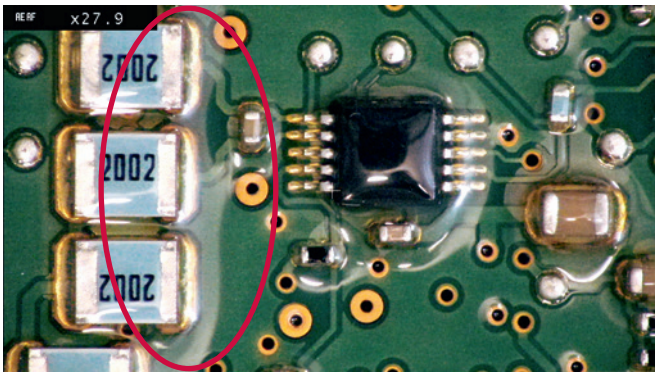


Delamination

The solution – Openair-Plasma®

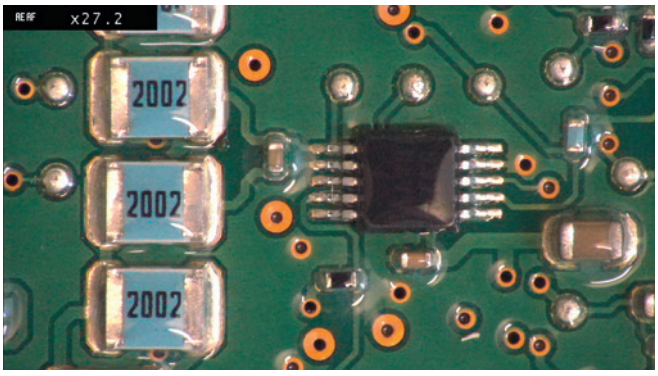
Pretreatment with Openair-Plasma® will help to eliminate these challenges and ensures a high quality and reliable end product. Increased surface energy allows the coating material to flow more evenly and prevents the formation of bubbles. Improved adhesion of the coating combined with plasma fine-cleaning safely prevents delamination or dewetting.

Without Openair-Plasma®

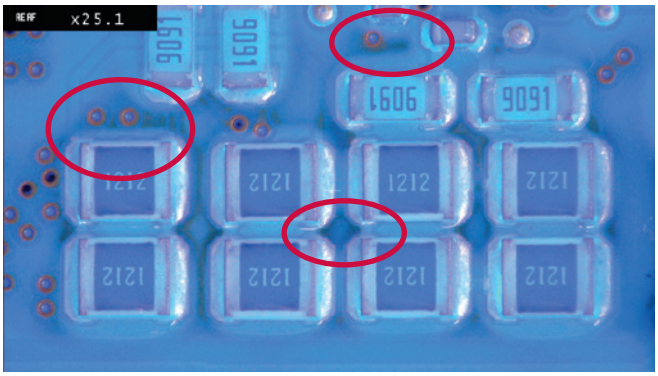


Delamination effect after thermal shock test

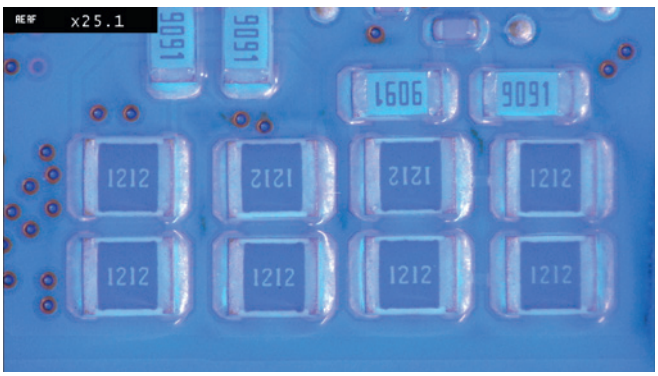
With Openair-Plasma®



No delamination effect after plasma pretreatment



Poor coverage



Complete coverage after Openair-Plasma® activation

Features and Benefits

- Area selective treatment
- High speed treatment, up to 1,5m/sec
- Potential-free: < 1V, can even be used on sensitive electronics
- Cost-effective: low capital and operating costs
- Flexible: can be configured to suit all surfaces (flat or 3D)
- Environmentally friendly: No solvents, no VOC's, CO_2 neutral

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AIDE184_2022_03_01 Before conformal coating