

# Ensuring that folding box seams do not burst

## Pre-treatment of the bonding surfaces with zero-potential atmospheric pressure plasma

What is the point of the most beautiful visual presentation if the longitudinal seam of the box does not hold? If when erecting it or filling it the adhesive seams burst? At best the result is a complaint, but in the worst case it means loss of reputation and of the customer as well.

The demands to be met are constantly rising, but the problems remain the same: every new surface - whether printed, metallised, laminated, varnished or impregnated - requires secure adhesion during pre-gluing or in the erecting machine.

But how and with what can this effect be durably achieved given the great diversity of material surfaces? Which adhesive is suitable for which type of surface? Does each new surface really require a new super-adhesive? And does that have to be applied with a disk or a nozzle in the form of a smear, dots or be sprayed? Must it be hot or cold? What sticks better?

Faced with these questions most manufacturers start to experiment, but the effort involved is boundless and very expensive. The consequences in production are often changes of adhesive several times a day, costly adhesion tests as well as multiplying procurement and storage costs for the numerous different adhesives, and on top of all that a high element of risk still remains.



Photo: Plasmatreat  
Whether it's a longitudinal seam or a collapsible blank a folding box needs good adhesive strength

### Openair Plasma

Things can be done differently. The secure bonding of longitudinal seams in high-grade folding boxes is made possible by pretreating the bonding surfaces with Openair Plasma, a zero-potential atmospheric pressure plasma developed by the Westphalian system development company Plasmatreat based in Steinhagen. Ambient air, compressed air and electric power are needed for the process. For folding boxes with or without a crash lock bottom it is the case that depending on the amount of adhesive applied, tracks 4 mm to 8 mm wide can be pretreated at high speed subject to jet geometry and requirements. According to information from Plasmatreat the bonding seams or surfaces are activated by precision pre-treatment, cleaned of organic residues and rendered wettable. At the same time surface tension values rise to  $> 72 \text{ mN/m}$ .

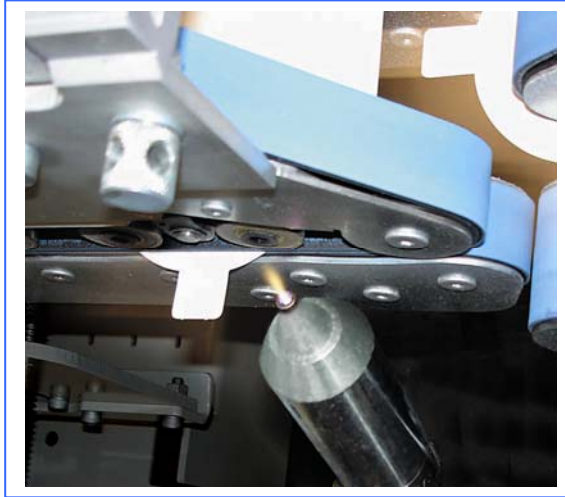


Photo Plasmatreat  
Longitudinal seam; pre-treatment with  
Openair- Plasma from below

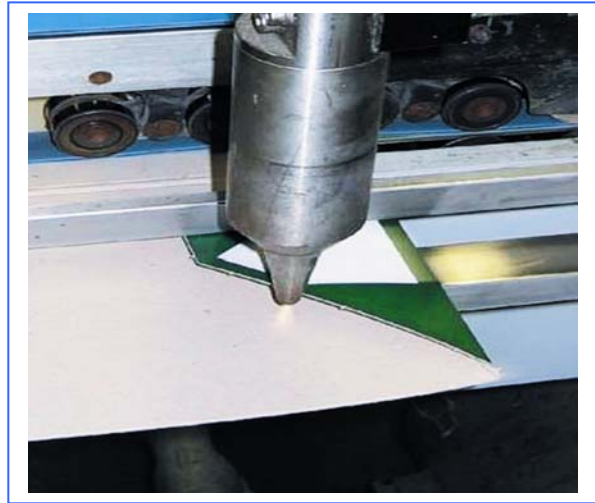


Photo Plasmatreat  
Automatic base boxes: pre-treatment with  
Openair-Plasma from above

The manufacturer claims that pre-treatment with Openair Plasma leaves no visible traces whatever on the surface. In the case of film-laminated blanks, they say, a really tight long-term joint is achieved even when standard adhesives are employed. Line speeds of up to 600 m/min and high cycle rates in set-up machines are attained by the plasma system using these same standard adhesives. The patented technology, which according to company sources has been tried and tested worldwide, can be used for longitudinal seams, in crash lock boxes, for gluing windows in place or in erecting machines.

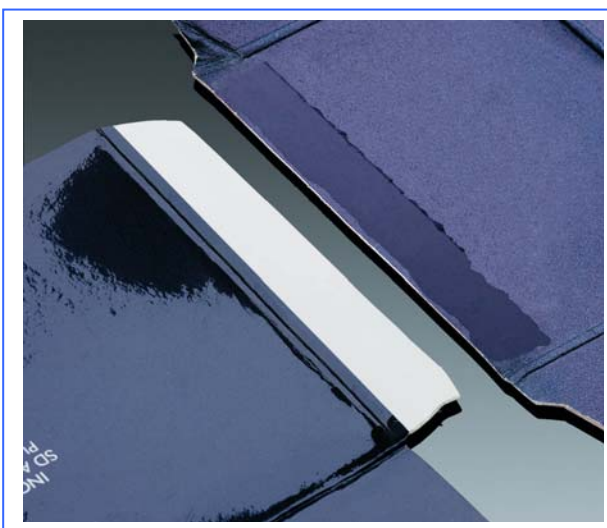


Photo Plasmatreat  
Fibre crack without pre-treatment

Even when up to now bonding has worked to some degree without plasma pre-treatment, there are numerous parameters at work which determine quality, whether it be the amount of adhesive applied, the age of the film when it is coated, the specialist knowledge of the staff operating the machine and so on. On the other hand, it is claimed that plasma treatment positively affects the quality of an adhesive joint even when negative factors are at work, and the processing window is expanded. A folding box manufacturer can at any time have the system installed in new machines or have existing machines retrofitted with it.

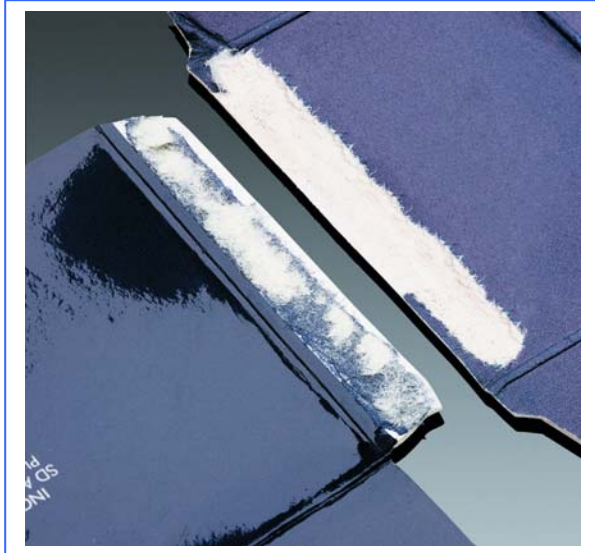


Photo Plasmatreat  
Fibre crack after pre-treatment with Openair -Plasma

If desired the plasma unit can also be supplied as a transportable device so that it can be employed universally for different pre-gluing or erecting machines.

Apart from the economic advantage, according to details from Steinhagen the environmental aspect should not be neglected: in use no harmful ozone is produced nor is any dust given off because no mechanical sanding down is involved.

Plasma is not a flame but rather a "cold beam", i.e. the surfaces to be treated are not exposed to heat and the user can largely make use of standard and degradable adhesives.

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