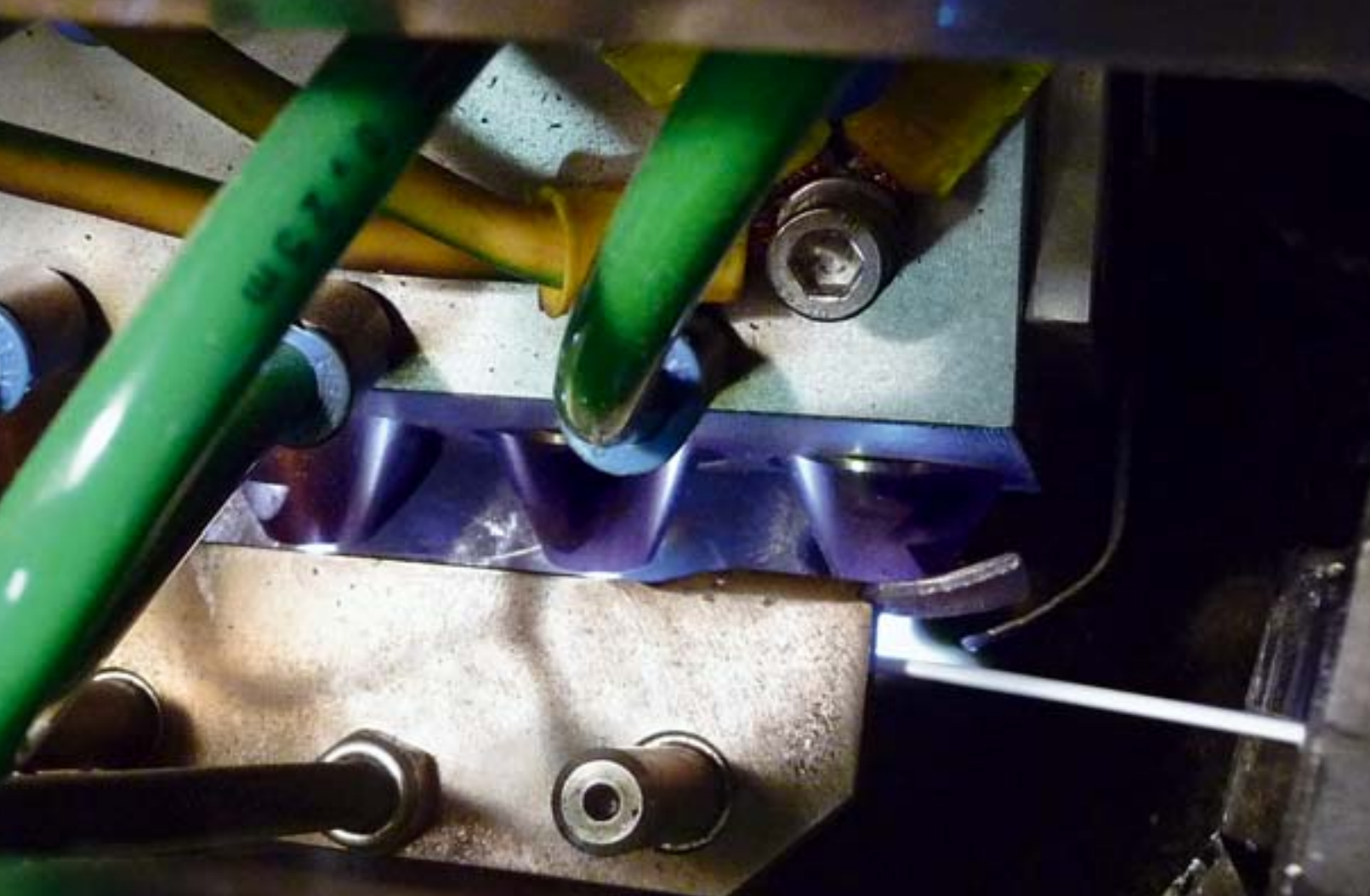


dds

das magazin für möbel und ausbau



Kante im Brennpunkt

Plasmatechnik bringt die Nullfuge

■ Dachausbau

dds im Detail: Innenausbau einer exklusiven Stadtwohnung über drei Halbgeschosse (S. 14)

■ Handmaschinen

Die neue »Zeta« von Lamello und andere Helfer für Werkstatt und Montage (S. 30)

■ Verkaufsgespräch

Was tun, wenn der Kunde eine Nacht über die Entscheidung schlafen will? (S. 66)



Melts the adhesive to the optimal temperature just before pressing-on: The Düstec plasma jet. (Photo: R. Schumacher)

Zero-joint now also with plasma technique

An almost joint-free abutting edge - Homag and Ima realize that with laser technique. A thin, meltable polymer film and precise temperature control make this possible. The new Düstec plasma process for new machinery or retrofits operates on a similar principle. It should be soon affordable to craftsmen as well.



The inventors of the plasma edge gluing technique: Reinhard Schumacher (on the left) and Wilfried Niemann (Photo: G. Molinski, dds)

The invention of the plasma edge gluing technique happened by chance. The senior manager of Niemann Möbelteile, Wilfried Niemann, and his head of development, Reinhard Schumacher, had been dealing with the then new laser technique in autumn 2008. Laser projectors heated a wafer-thin polymer layer on the rear side of the edge band just in front of the pressure-on roller. The exact temperature immediately before pressing-on brings about the excellent bonding feature, called "zero-joint" in the technical jargon. Whilst inspecting such a system, the two of them remembered an event back in 2006 to which they paid little attention at the time: Their plasma system which they had had in use for cleaning aluminium edge bands since 2001 was on overhaul. Upon re-commissioning the system, one of the aluminium edges caught fire. The plasma had heated the aluminium to a boiling point of almost 2500 °C. Reinhard Schumacher ascribed this reaction to an overdimensioning of the aggregate which could be easily corrected. When considering the laser gluing process, they realized all of a sudden that what the laser is capable of, namely the exact dosing of the heating of a polymer or adhesive film, can also be achieved with the plasma jet - and that at lower plant costs and with less energy

Service

The existing cooperation partners:

Düstec GmbH, www.duestec.de
Jowat AG, www.jowat.de
Ima Klessmann GmbH, www.ima.de
Plasmatreat, www.plasmatreat.de
Döllken GmbH, www.doellken-kv.com
Rehau AG, www.rehau.de

consumption. Apart from that, problems with varying edge design-dependent reflexions of the laser were not to be expected. Niemann and Schumacher made up their minds and pressed ahead with their own development.

Niemann invited the manufacturer of its plasma system, Plasmatrete, and the adhesive manufacturer, Jowat, to join them. Plasmatrete developed a matching plasma tool complete with generator and transformer that directs the plasma, reminiscent of a welding torch flame, toward the edge material. Jowat developed a thermoplastic polyurethane adhesive (TPU), an EVA adhesive and an APAO adhesive on a polyolefine base. The EVA adhesive is appropriate for high-velocity systems up to 90 m/min, the TPU for the zero-joint edge, and the presently not yet commercially available APAO for a medium quality.

Three pilot systems by the summer

Plasmatrete converted an existing edge gluing machine at Niemann's premises so that the gluing station can be exchanged for the plasma jet with a few minor steps. The machine, equipped with a plasma jet, is appropriate for a feed rate of 30 m/min and an edge band width of 22 mm. The retrofitting costs come up to distinctly less than 100 000 euros. Niemann and Plasmatrete are presently developing another solution for craftsmen's applications that is designed for 10 m/min only but expected to be clearly more favourable in price. Concurrently with this, a heavy-duty machine for 90 m/min is under production. Both systems



A standard edge gluing machine (Photo: G.Molinski, dds)



Looks and sounds like a welding torch: The plasma arc (Photo: R. Schumacher)



The dismantled plasma jet: Flames softening the adhesive of the hand-held edge (Photo: G.Molinski, dds)



Zero-joint, heat-resistant and humidity-resistant up to 140 °C: Plasma-abutted edge (Photo: R. Schumacher)

are intended to be complete by the summer. Moreover, the parties involved also have the conversion of BAZ gluing sections to plasma in mind. The plasma technique is equally suited for zero-joints and for high-velocity operation and is distinctly more cost-effective than the laser technique. Apart from that, it only consumes a current as low as 7.5 kW rather than the usual 17 kW for a hot-melt adhesive reservoir. Even varying material properties such as the type of material, degree of gloss, color, reflexion behavior or thickness are managed by the plasma technique with no problems occurring.

The Düstec brand

Niemann has filed a patent application for the

process/fixture engineering inventions. Plasmatrete provides the nozzle technique, Jowat supplies the adhesive components. The machine manufacturers and Plasmatrete will handle the new installations and the retrofits. Ima is going to present the Düstec process at the Xylexpo fair in Milan from 4th to 8th May. In order to establish this technology, Niemann founded the Düstec GmbH who are holding the worldwide marketing rights. Düstec acts as a brand for the process. The goal is to gain as many partners as possible from the machine building and edge manufacturing industries same as service providers and traders. The Düstec logo ensuring system compatibility is watched over by Düstec GmbH. *GM*

Background

The plasma process for the zero-joint edge

Plasma melts the bonding layer of the edge band just before pressing-on.

Energy supply changes the states of matter: From solid to liquid and from liquid to gas. If further energy is added to a gas it becomes ionized and is transformed into plasma (gas in an excited state), the so-called 4th state of matter. In the case of the plasma gluing technique, the air plasma emerging from a nozzle is directed toward the rear side of a coated edge material where the plasma energy acts on the molecules of the activatable (adhesive) coating to heat it and to make it sticky.

The plasma technique comes from Plasmatreat GmbH and is named "Openair" plasma technique. With the Openair plasma technology, the surface energy of plastics, metals or glass is usually increased by a significant multiple. In this way subsequent process steps such as coating, printing or bonding, are carried out in a highly rational, efficient and environmentally protective manner.