

Menschen und Lackiertechnik (People and Painting Technology)



Christian Buske

CEO
Plasmamatreat

Plasma as a lifetime passion



The result: having consistently developed the 'Openair' plasma rotary nozzle Christian Buske achieved his original goal.

In the beginning there was dissatisfaction with the still immature, yet fascinating technology. For young graduate engineer Christian Buske it was to become the basis for a global business.

Just as a house needs solid foundations to stand firm, a coating needs an immaculately prepared surface to bond reliably, fulfil its functions and satisfy visual requirements. When in the watershed year of 1989 the then 27-year-old Christian Buske started in the industry with a degree in cybernetics and automation engineering from the Leipzig University of Applied Sciences, he discovered that the surface treatment processes used were either environmentally harmful or very complex.

Complex processes

The plasma pretreatment of industrial components was especially complicated. At the time it was basically limited to two methods: the corona method for the pretreatment of plastic films and the low-pressure plasma

batch method for different material surfaces. In the low-pressure process the plasma is generated in a special vacuum chamber into which the components are inserted for treatment, usually manually, and subsequently removed. An effective pretreatment method, although unsuitable for large components, high volumes or continuous production processes due to the limited volume of the chamber, complex handling and interruption to the process flow.

Under atmospheric pressure

Buske could not rid himself of the thought that there ought to be an easier and better way. It should be possible to carry out pretreatments not only using the complex low-pressure process, but also under atmospheric pressure, in other words, under completely normal ambient air conditions, and on an industrial scale for fully automated and continuous series production. The aim was to develop a straightforward process compatible with robotic applications that was easy to use based on plasma generated so-

lently by air and high-voltage discharge. This could be implemented only by means of a nozzle system which would be integrated directly into an automated production line. But the first task was to invent a nozzle of this type and the plasma beam it required.

A spark of genius

To function correctly, a plasma beam needs to be adjusted very precisely to the surface to be treated. Buske quickly understands: "For this we need air, a targeted compressed air stream which guides the plasma and transports the jet through the nozzle head onto the surface to be treated with pinpoint precision." Together with his then partner Peter Förmel, he develops a plasma nozzle process and files a patent application for it in 1995. 'Openair' plasma is the name they give to their product, which they market through Plasmamatreat, the company founded specifically for this purpose. At the same time as applying for the patent, Buske succeeds in installing the world's first appli-

cation of atmospheric pressure plasma on an industrial scale at Hella in Lippstadt. Hella uses the technology in series production for the pretreatment of car headlamps. This is a breakthrough in both economic and technological terms. Shortly afterwards, Plasmamatreat patents a rotary nozzle system. Research institutions, and in particular the Fraunhofer IFAM, start to take an interest in this plasma technology, and a close partnership is born.

Pretreatment for painting technology

Painting technology also benefits from these developments: 'Openair' plasma technology using a 48-nozzle system replaces the entire wet chemical cleaning line in the pre-cleaning process of a new coil coating plant at Griesser AG (Switzerland). Leading car manufacturers such as Ford, Rolls-Royce and BMW as well as automotive suppliers such as TRW soon follow.

With atmospheric pressure plasma it is now possible to meet rigorous quality standards using

water-based paint systems. A major motorbike manufacturer uses Openair plasma before the complex multi-layer painting of a plastic part, enabling them to eliminate the entire primer process and reduce curing oven throughputs by 25%.

New areas of application

The aviation industry is beginning to test and use the process to increase corrosion protection and achieve long-time stable paint adhesion on aluminum sheets and composites. The packaging industry, too, has discovered this process. Pretreatment with atmospheric plasma, however, is not only of interest for plastic and metal applications, it is also suitable for high quality painted glass surfaces which are increasingly undergoing plasma treatment to optimize the paint finish. The process is also used in the electronics industry: Rohde & Schwarz, for instance, use Openair technology in their airborne communication systems to pretreat circuit boards fitted with several hundred individual surface-mounted devices pri-

or to conformal coating. This is only possible because Buske has developed the nozzle head of his plasma jets to the point where a virtually potential-free plasma can be generated which does not damage the sensitive electronics.

From start-up to corporate group

Within the last 20 years the original start-up has evolved into a medium-sized company group headquartered in Steinhagen, Germany operating in 35 countries and with 15 subsidiaries in 11 countries. For Christian Buske it has been worthwhile persistently pursuing his life's work.

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