

# Enercon Technical Bulletin

## Plasma & Flame Treatment for Automotive Part Adhesion



The automotive industry is at the forefront of using new materials and technologies to reduce cost and improve performance while striving for green manufacturing processes. Perhaps that's why the automotive industry is one of the most aggressive users of in-line atmospheric plasma and flame surface treatment technologies.

### Applications & Materials

Depending on the manufacturing processes being used, there's an application for surface treatment on virtually every part of a vehicle from bumper to bumper. Adhesion can be improved prior to glueing, painting, coating and printing on metallic and polymer surfaces such as PE, PP, TPO, POM, PUR and PTFE.

Plastic parts that are painted such as bumpers, dashboards, consoles, glove boxes and more, are pretreated with flame systems. The flame system creates a long lasting and uniform treatment, removing contaminants from the surface. Flame treaters are often integrated with robots for precise and efficient treatment patterns. Combustion control technology ensures modern flame treaters provide repeatable treatment results and a series of interlocks are used for safety.

Any part of an automobile that is exposed to the elements is normally protected with some type of coating and will benefit from surface pre-treatment. Parts of the vehicle that are exposed to high temperatures present challenges to all types of silicones and adhesives. Plasma surface treaters are used to increase the bond strength of adhesives used in head lamp assemblies, gaskets, mirrors, windshild wipers and filters.

Other items in an automobile such as vinyl and leather seating material, decorative films, steering wheels, air bags, and component assemblies are all candidates for in-line treatment.

### Surface Treating Technology Benefits

In addition to providing improved surface performance, using plasma and flame surface treaters can also lead to the elimination of hazardous chemical primers and solvent materials which is good for the environment and shop workers. Manufactures have also reported the ability to save on adhesive costs by switching from hot glue to cold glue. Enercon plasma and flame treaters are an inline solution that creates repeatable treatment results increasing product quality and productivity.



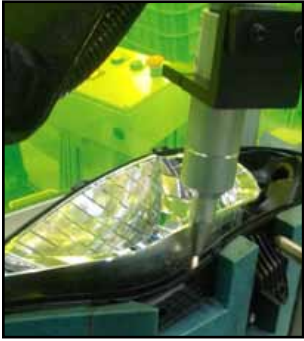
Watch this video to see Enercon's Dyne-A-Flame™ treat an EVA automotive dashboard prior to painting and the Dyne-A-Mite IT plasma treat an automotive headlamp prior to applying an adhesive.

<< Click on the image to the left to start the video.



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## Plasma Treatment Improves Automotive Headlamp Adhesion Strength



Manufacturing over 800 varieties of automotive headlamps, NEOLITE ZKW is one of the leading suppliers of automotive lighting in South Asia. They are also the largest exporter of automotive lighting in India, supplying over 80 countries across the globe.

NEOLITE and ZIZALA Lichtsysteme GmbH (ZKW), of Austria, recently opened a new joint venture plant in Bahadurgarh, Haryana to exclusively serve their OEM client base. The new venture was lead by group CMD, Mr. Rajesh Jain. He work alongside the development team to incorporate the latest manufacturing technologies. The facility features a state-of-the-art laboratory, a research & development department, and in-house manufacturing.

When NEOLITE was having difficulty getting their latest headlamp design's components to adhere, they turned to Enercon Asia Pacific for help. DGM Engineering's, Mr. Vineet Aroa under leadership of Mr. P.K Jain (CEO) and his team were in search of the most cutting edge technology to improve adhesion.

NEOLITE ZKW needed to increase the bond strength of their silicone adhesive being applied to secure a polycarbonate lens to a polycarbonate headlamp. Using silicone adhesive is becoming more common in the automotive industry because of its ability to withstand the heat generated by the light bulbs and other internal components.

Enercon application engineers analyzed NEOLITE ZKW's headlamp design and tested the material in their lab to identify which plasma treating technology would treat their application best. Enercon's Dyne-A-Mite™ IT blown ion plasma treater proved to be the most ideal.

The plasma treater discharges a steady stream of blown ions which micro-etches the surface creating a stronger bonding site between the adhesive and polycarbonate material. Pre-treatment alters the first few microscopic layers of the polymer to enable surfaces wettability. The adhesive's bond is then strengthened on troublesome materials such as polyolefins, silicones, and fluoropolymers.

The Dyne-A-Mite™ IT seamlessly integrated into their Yaskawa robot. It was then programmed to follow a precise glue track pattern prior to applying the adhesive. By integrating the plasma treater into a robot, NEOLITE ZKW is able to achieve consistent treatment and adhesion results by controlling the air gap and speed the headlamps are treated.

In addition to improving the adhesion strength between the adhesive and polymer, NEOLITE ZKW found that the dwell time became shorter which allowed them to increase their production speed and overall productivity. The NEOLITE ZKW was thoroughly impressed with the Dyne-A-Mite IT plasma treater, as it is simple to integrate, easy to operate, performs reliably and proves to be a tremendous value for their product quality and productivity

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surface treatment



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