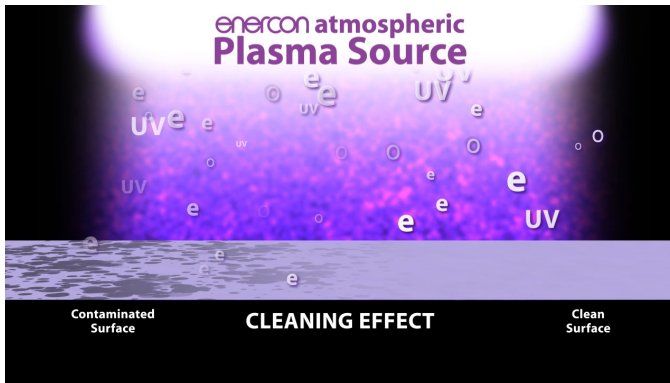
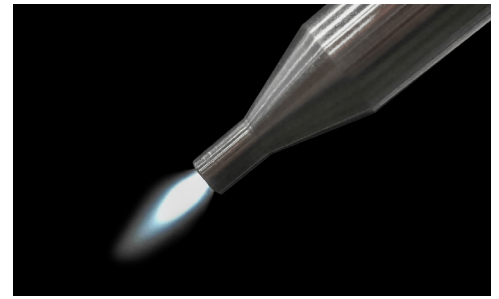


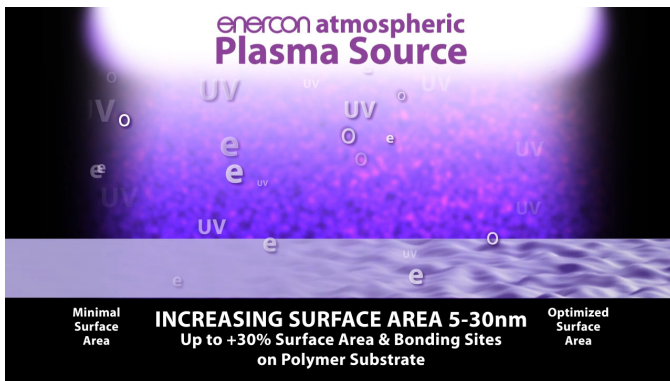
# What Plasma Does to a Surface to Improve Adhesion

Plasma surface treatment is used to improve a surface's receptiveness to adhesives, inks, paints & coatings. Three distinct surface modification processes occur simultaneously when exposing a surface to plasma treatment: Cleaning, Etching & Functionalizing.



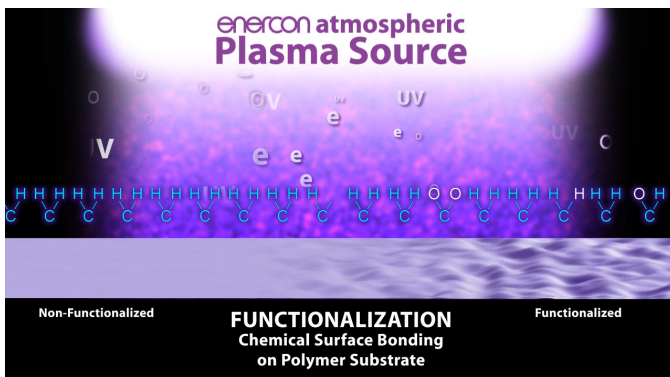
## CLEANING

Static charges are eliminated which removes statically held dust and other materials. Most organic & some inorganic contamination is also removed. Organics, Hydrogen & Oxygen ions in the plasma combine with the hydrocarbons of organics to produce CO<sub>2</sub> and water vapor. Removing inorganics can be more difficult and usually requires more aggressive treatment or longer cycle times.



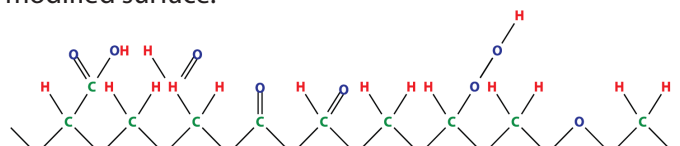
## ETCHING

There are many ways to increase the surface area for improved bonding such as laser ablation, sanding & sandblasting. Plasma etches surfaces to change a smooth manufactured surface into a surface with more bonding sites. This increases the usable bonding surface area which improves overall bond strength.



## FUNCTIONALIZING

Functionalization, sometimes called activation, describes the addition of hydroxyl or carboxyl groups to the outermost molecular layers of your surface. This is achieved as electrons from an ionized gas bombard a surface. Oxygen groups, OH groups and Hydrogen groups attach to the surface increasing the surface energy. By adding these polar groups, as shown below, you increase the overall surface energy and the ability for inks, coatings and adhesives to improve their bond to the modified surface.



[View video animation here.](#)



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