



**ELTECH ENGINEERS**  
**PVT LTD, MUMBAI**

*We treat anything...*  
*Since 1992..*

# **PLASMA SURFACE TREATMENT SYSTEMS**

**FOR IMPROVED**

**CLEANING | ACTIVATION |  
ETCHING | COATING**



[WWW.ELTECH.IN](http://WWW.ELTECH.IN)



Eltech is an innovative organization with a high level of know-how, continuously developing new Plasma and Corona equipment to help solving adhesion problems, and to meet high customer demands.

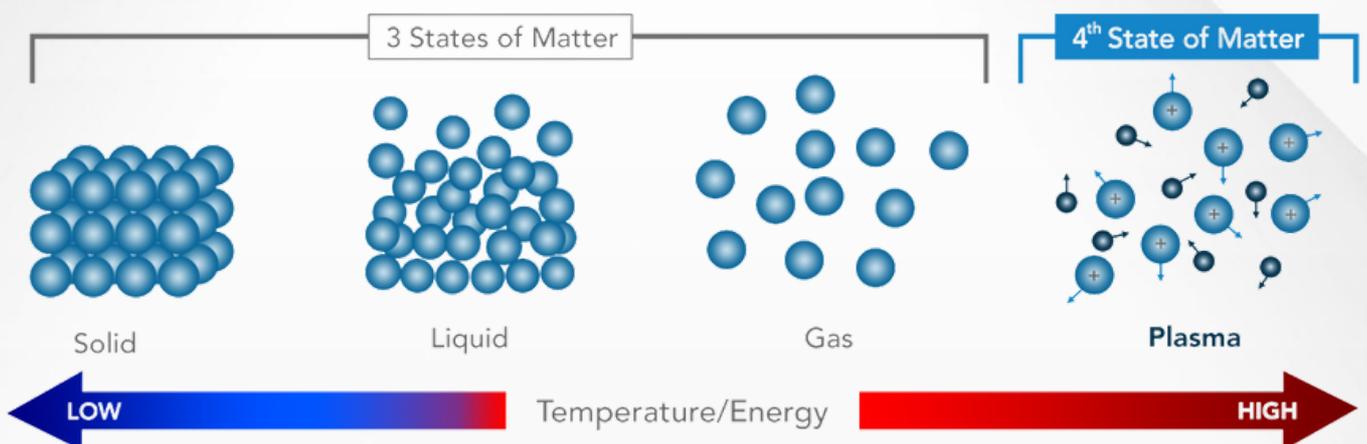
## Superior , Versatile Surface Treatment Solutions

- Eltech Engineers manufactures a complete line of highly reliable, innovative plasma surface treatment systems. Our systems improve adhesion on a wide array of plastics, composites cardboard , rubber , foam , glass and metal.
- Eltech Engineers system creates powerful bonding for printing, painting, coating,laminating and adhesion applications. Our technology is uniquely designed to treat moulded and extruded 3-dimensional parts, as well as many other applications requiring Improved surface energy and long-lasting activation.
- Eltech Engineers is a leader in the surface treatment industry because only Eltech provides truly custom design, continual technological advancement, exceptional customer service , and Reliable, long-lived systems made in INDIA.
- Eltech Engineers is your single source for design, manufacture, product handling, installation and service. With more than 30 years of experience, we offer the most advanced, adaptable and Dependable systems worldwide.

### What is Plasma ?

Plasma is a partially-ionised gas, in which the degree of ionisation fluctuates and may sometimes be very low. More than 99% of the universe surrounding us is in a plasma state. Examples of this include lightning, polar lights, sunlight or candlelight. As plasma is created by high energy input, it is considered the 4th state of matter and is typically in a gaseous state.

**solid ⇒ liquid ⇒ gas ⇒ plasma**



## WE PROVIDE SUPERIOR, VERSATILE SURFACE TREATMENT SOLUTIONS

- Eltech Engineers Pvt Ltd manufactures a complete line of highly reliable, innovative Corona surface treatment systems. Our systems improve adhesion on a wide array of plastics, composites cardboard, rubber, foam, glass and metal.
- Eltech Engineers Pvt Ltd system creates powerful bonding for printing, painting, coating, laminating and adhesion applications. Our technology is uniquely designed to treat 2-dimensional films, as well as many other applications requiring Improved surface energy and long-lasting activation.
- Eltech Engineers Pvt Ltd is a leader in the surface treatment industry because only Eltech provides truly custom design, continual technological advancement, exceptional customer service, and Reliable, long-lived systems made in INDIA.
- Eltech Engineers Pvt Ltd is your single source for design, manufacture, product handling, installation and service. With more than 25 years of experience, we offer the most advanced, adaptable and Dependable systems worldwide.

### TECHNICALLY

Plasma is generated through the creation of an electric field which ignites a gas flowing through (e.g. air or other gases) to form plasma. Plasma is quasi-neutral, but as it consists of free charge carriers or highly-reactive particles, it is energy-rich and can trigger various physical and chemical reactions. This characteristic is used in industry to generate various effects.

To be able to successfully bond, coat, print or paint polymers and metals, the surface must first meet a few requirements. It has to be very clean and has to be sufficiently active to form an adhesive bond with the coating material. Plasma pre-treatment takes care of both of these requirements: The reactive plasma species transform the finest organic layers to the gas phase during ultra-fine cleaning. And with polymers, the functional groups described above are bonded to the outer-most molecular layer, the surface polarity increases and the prerequisite for adhesive bonding with the applied material is fulfilled.



## PRINCIPLES OF SURFACE PLASMA TREATMENT

The ion and electron mixed in the plasma zone collide at high-speed on the surface of the substrate, which eliminates the contaminant ( dust & release oils etc. ) and helps the functional coating radical to stick on the surface. It is possible to get the rising effect and hydrophile effect on the surface through the above progress. This means the increase of surface energy. Plasma surface treatment system for 2D or 3D objective enhances surface energy and it leads enhancement of adhesion for those processes such as printing, coating, laminating, transforming and extrusion molding and so on.

### PROCESS WORK FLOW

- Plasma pre-treatment (ultra-fine cleaning / activation)
- Increase of substrate surface energy
- Good surface wettability
- Interaction between substrate and application
- Adhesive bonding of material to ink, paint, adhesive



## DIFFERENCE BETWEEN PLASMA TREATED & UNTREATED

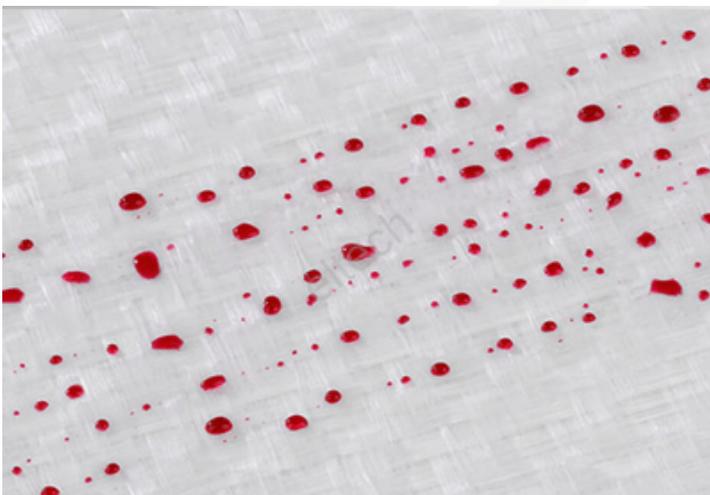
HYDROPHOBIC



HYDROPHILIC



## SURFACE WETTABILITY



- Figure helps to illustrate the difference between good and poor wettability.
- The higher the surface energy of the solid substrate in relation to the surface tension of the liquid, the better its wettability and the smaller the contact angle.
- In order for a proper bond to exist between a liquid and a substrate surface, the substrate's surface energy should exceed the liquid's tension by about 2-mN/m.



# PLASMA ION / VORTEX TREATMENT



## TECHNICAL SPECIFICATIONS

- Mains supply : 230 VAC,  $\pm 5\%$ , 1  $\emptyset$ , 3 Wire
- Input Frequency : 50 Hz,  $\pm 5\%$
- Output frequency : 20 - 40 KHz
- Output Current : 3-4 Amps
- App. Output Power : 1 / 2 KW
- Treating Head ( Area ) : 10 - 90 mm
- Line Speed : Suitable for all applications
- Max Ambient Temperature : 0 - 50 Degree Celsius
- Compressed Air Supply : 3 - 4 Bar, Dry, Moisture free, Oil free, Dust Free
- Material it can treat : Conductive / Non-Conductive
- Length of H.V Cable : 2.5 / 4 Mtr
- Treatment Inside Electrode : Ceramic
- MOC : Mild Steel Power Coated
- Dynes Level : Depends on Material to Material
- Plasma output :
  - Constant at same speed
  - No influence of supply voltage
  - Accurate Output Power
  - Ultra High frequency with IGBT technology
- Weight : 45 Kg Maximum
- Dimension : 470 mm X 310 mm X 770 mm
- Certifications : CE, ROHS, ISO

**BOTH MODELS AVAILABLE IN  
SINGLE & DOUBLE HEAD OPTIONS**



## FEATURES OF PLASMA

- Potential free discharge which can treat both conductive, non-conductive as well as semi-conductive surfaces.
- Easy operation by simple button ON/OFF and Start/Stop.
- Ultra-high frequency using the latest IGBT technology.
- Air-Cooled HV transformer for better efficiency & long life with high-speed cooling fans that can be used for long hours.
- Compact construction with maximum operator safety.
- Can be integrated with robotics or industrial automation.
- Potential free contact interlock for integrating with PLC for Start/Stop command.
- Fire-resistant conduits & other plastic components.
- Constant power for high & uniform surface treatment.
- Long Lasting, Uniform, High surface treatment levels.
- Auto / Manual Operation Switch.
- Ideal for high-speed lines.
- Reliable Industrial Design.

## BENEFITS OF PLASMA

- Forced cool convertor for longer life
- Easy to maintain
- Easy to install
- Cost efficient treatment process
- HV transformer is able to used for long hours and continuous work
- Maximum operator safety
- Soft start
- Compact simple construction

## APPLICATIONS & PROTECTION FEATURES OF PLASMA

- |  |                                |
|--|--------------------------------|
| • Folder Gluers ( Carton Bonding )               | • Overload Trip                |
| • Plastics, Packaging, Glass & Rubbers           | • Thermal trip for heatsink    |
| • Electronics                                    | • MCB protection               |
| • Painting, Coating, Lamination                  | • Under voltage / Over voltage |
| • Pad Printing, Screen Printing, Inkjet Printing | • No Air                       |
| • Life Sciences                                  | • Door open                    |
| • Medical & Pharma                               | • Under Current / Over Current |
| • Aerospace                                      | • Audio / visual alarm         |
| • Automotive                                     |                                |
| • Wire , Cables , Pipes & many more...           |                                |



## VACUUM PLASMA CLEANER

The Eltech Vacuum Plasma System is suitable for Plasma Cleaning, Plasma Activation, Plasma Etching & Plasma Coating.

The plasma cleaner can be used for modifying surfaces of various materials such as Polymers, Glass, Metals & Ceramics. Depending upon the material to be treated recommended gas/gasses, power & power supply should be used for higher efficiency and to achieve required results.

The system is able to work with multiple gasses like Air, Argon, Oxygen, Hydrogen, Nitrogen and many other with the help of rotameters or MFCs.

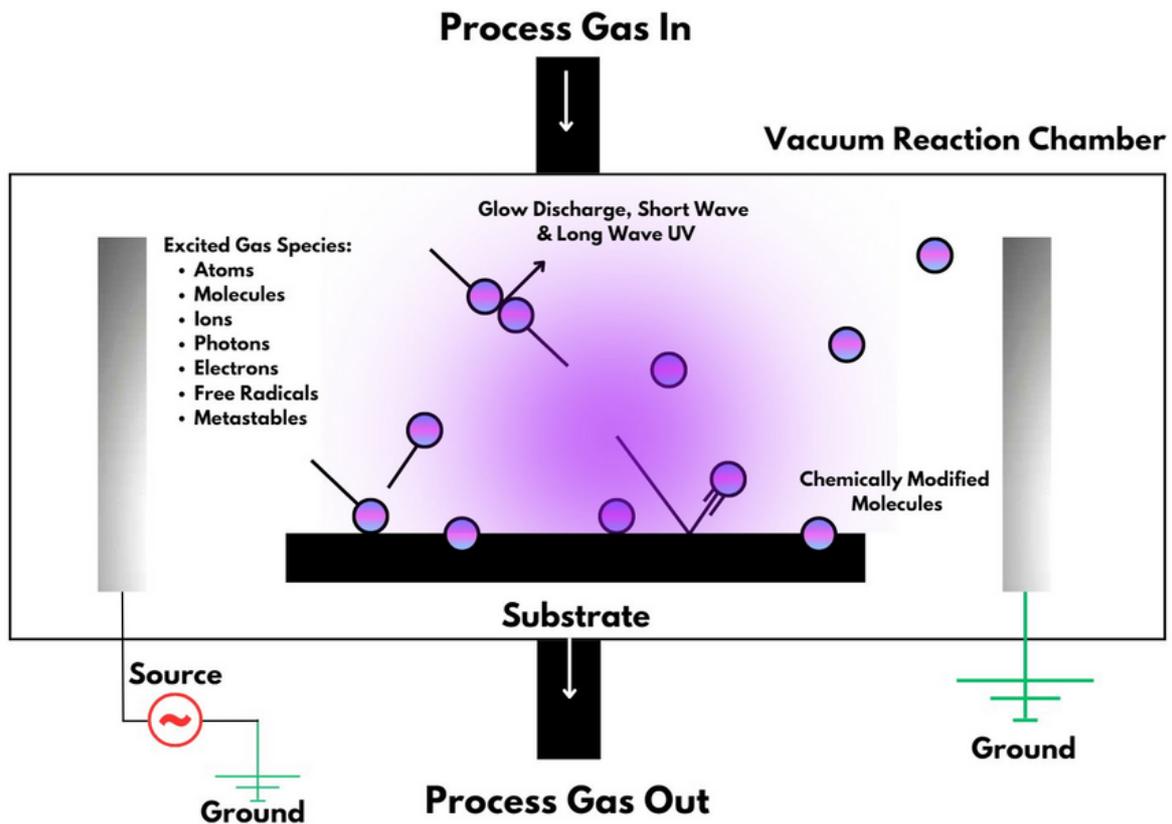
As with our inbuilt safety interlocks along with the various standard instruments the user can operate the system with ease.



## WORKING PRINCIPLE OF VACUUM PLASMA CLEANER

Plasma treatments is used to alter the surface properties of a wide range of materials to make them easier to bond, glue and paint. By treating parts we both clean and activate the surface, improving their adhesion characteristics.

It's useful to start by defining what a plasma is. Solid, liquid and gas are the three states of matter we are all familiar with. We can move between the states by adding or removing energy (e.g. heating/cooling). If we continue to add enough energy, gas molecules will become ionised (lose one or more electrons) and so carry a net positive charge. If enough molecules are ionised to affect the overall electrical characteristics of the gas the result is called a plasma. Plasmas are, therefore, quite rightly, often referred to as the fourth state of matter.



A plasma contains positive ions, electrons, neutral gas atoms or molecules, UV light and also excited gas atoms and molecules, which can carry a large amount of internal energy (plasmas glow because light is emitted as these excited neutral particles relax to a lower energy state). All of these components can interact with the surface during plasma treatment. By choosing the gas mixture, power, pressure etc. we can quite precisely tune, or specify, the effects of the plasma treatment.



# MAJOR APPLICATIONS OF PLASMA SURFACE TREATMENT

## Printing

Surface treating parts prior to printing enhances ink adhesion. It makes printing easier, and for others it makes printing possible.

## Painting

Injection molded or thermoformed parts are often treated prior to painting. Surface treatment allows the paint to adhere and also increases the life and durability of the paint on the object's surface.

## Bonding

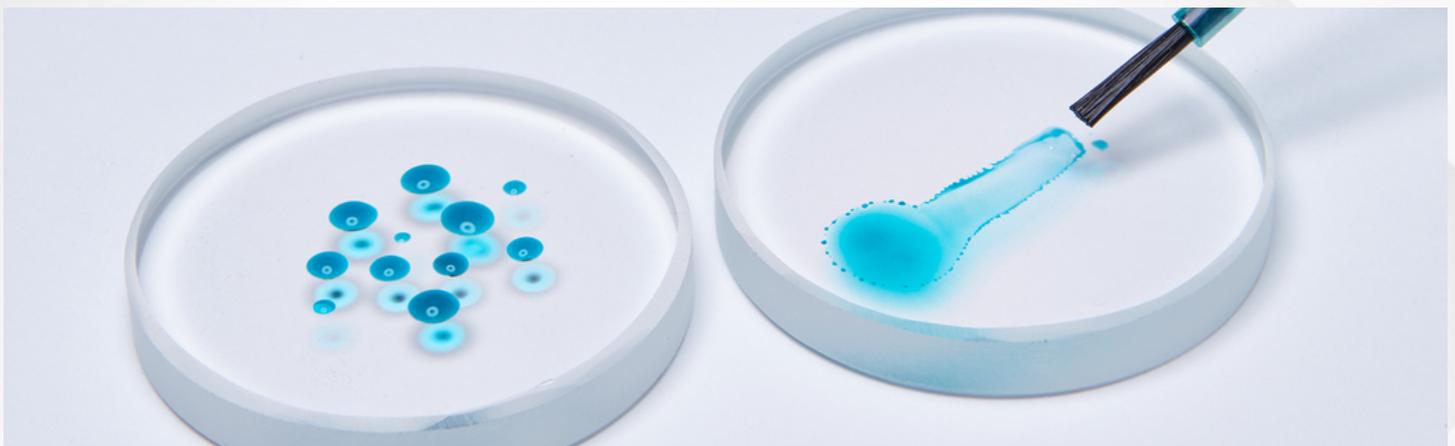
Bonding is primarily used to increase the strength of an adhesive. The medical and automotive industries rely on surface treating to remove contaminants such as dust, grease, oils, or mold to improve bonding. Typical cleaning solvents such as methyl ethyl ketone (MEK), trichloroethylene, toluene, or acetone may be used for this purpose, but cleaning agents that leave a film residue upon evaporation will retard bonding.

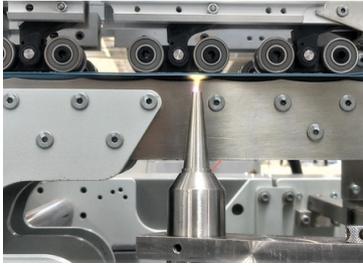
## Labeling

Surface treating caps, bottles and lids ensure that labels will not peel off before complete destruction of the label occurs. Air, flame and chemical plasma treatment of materials like HMWHDPE can effectively improve adhesion of labels.

## Coating

Products are coated to protect their surfaces from harsh environments or as decoration. Doors, frames, and extrusions/profiles are often coated. The medical industry uses surface treating to improve adhesion of antimicrobial/antibiotic coatings.





**On Folding Carton Box**



**On MCB Before Pad Printing**



**On EPDM rubber**



**On Boeing Components**



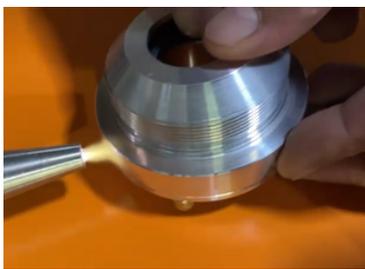
**On Pipe Before Inkjet Printing**



**On Wire Before Inkjet Printing**



**On Resin Cast Bush**



**On Aluminium Parts**



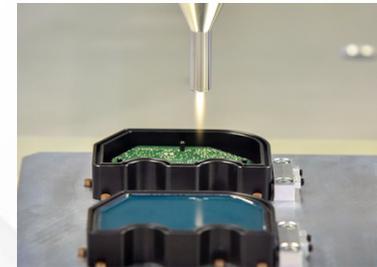
**On PCB**



**On Automotive Parts**



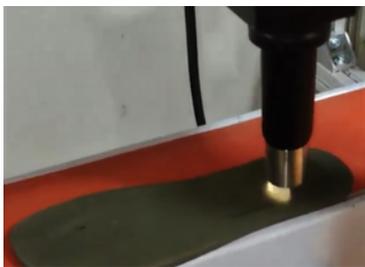
**On Rubbers**



**On Electronics Components**



**On Automotive Parts**



**On Shoe Sole**



**On Plastic Bottle**



**On HDPE Pipes**



**On Medical Components**



**On Cosmetic Components**

# FREQUENTLY ASKED QUESTIONS

## ▶ **How long can treated (activated) components be stored before further processing?**

The storage time of treated components is dependent on activation time and the material and ranges from a few minutes to several months. Therefore, it is often necessary to carry out tests on site.

Metals, ceramics, glass and elastomers: about 1 hour

Plastics (excluding elastomers): several days, weeks, months

## ▶ **How should treated components be stored?**

After plasma treatment, it is advisable not to store the parts in the open, as they attract dust, organic contamination and humidity.

Shrink-wrapped components have a substantially longer shelf life than those left in the open.

Components treated by us in the frame of surface treatment services are packaged in close consultation with the customer e.g. certified silicone-free PE bags, ESD packaging, or the customized packaging material provided to us.

## ▶ **Why should the treated parts only be touched with gloves?**

Plasma removes organic but not inorganic impurities. As skin contact from the fingers, for example, contaminates the surface with salts (inorganic contaminants), gloves must always be worn when handling components.

## ▶ **How do you measure a plasma activation?**

- Contact Angle / Wetting Angle
- Dyne Test Inks
- Cross-Cut Test

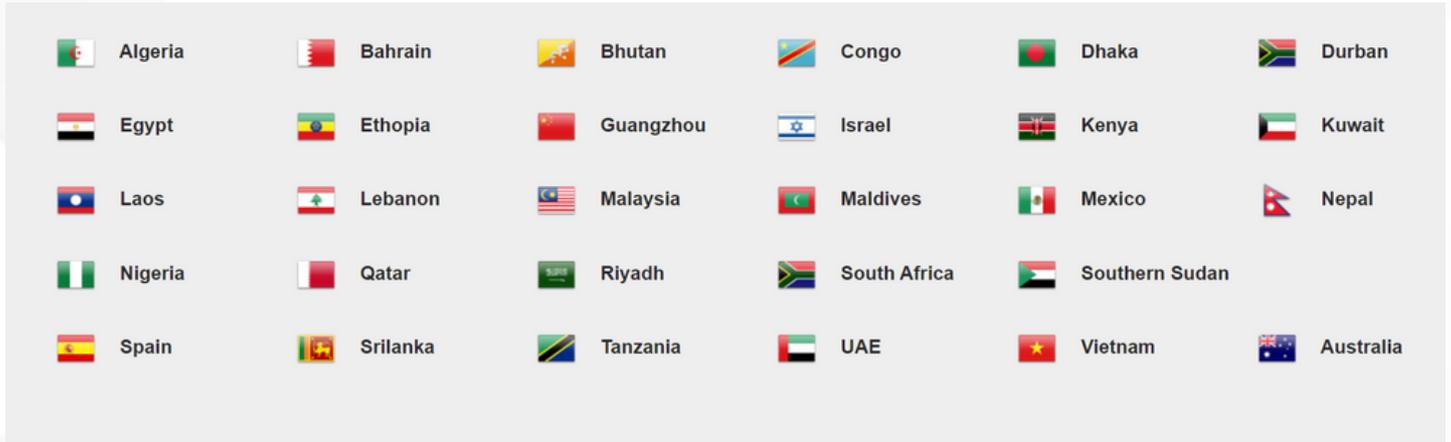


# GLOBAL NETWORK

Once a company that operated solely domestically, our company exports have grown from customers now expanding overseas and through direct interaction with overseas customers.

An organisation established in 1992, Eltech Engineers Pvt Ltd is one of the Leading Manufacturers and Exporter of a wide range of Corona Treatment, Plasma Treatment, Static Eliminators, Induction Cap Sealer, Ozone Generator and Static Chargers, Static Meters. In addition, we also participate in trade shows & capture the overseas customers on one-on-one bases as we are digitally very strong to lift the visibility of our products in a wide range of overseas markets. Along with the exchange of sales and technology, we continue to steadily grow more internationally with advance technologies.

## COUNTRIES WHERE OUR MACHINES ARE RUNNING



# Eltech Engineers Pvt Ltd MADE IN INDIA

Mfg's of : Corona Treatment Systems, Plasma Treatment Systems, Vacuum Plasma Cleaners, Static Eliminators & Ionizers, Induction Cap Sealers & Ozone generators.

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