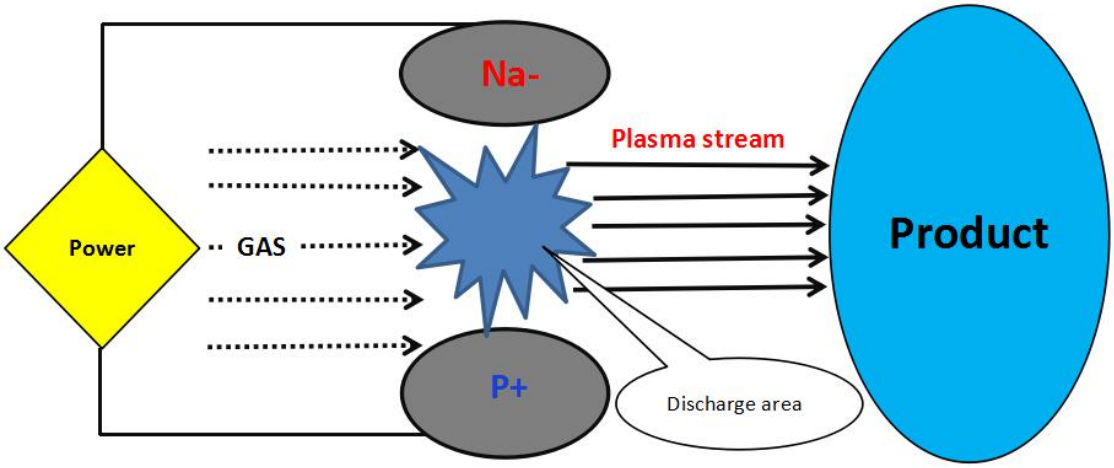
Plasma Surface Treatment Machine of AF-G40

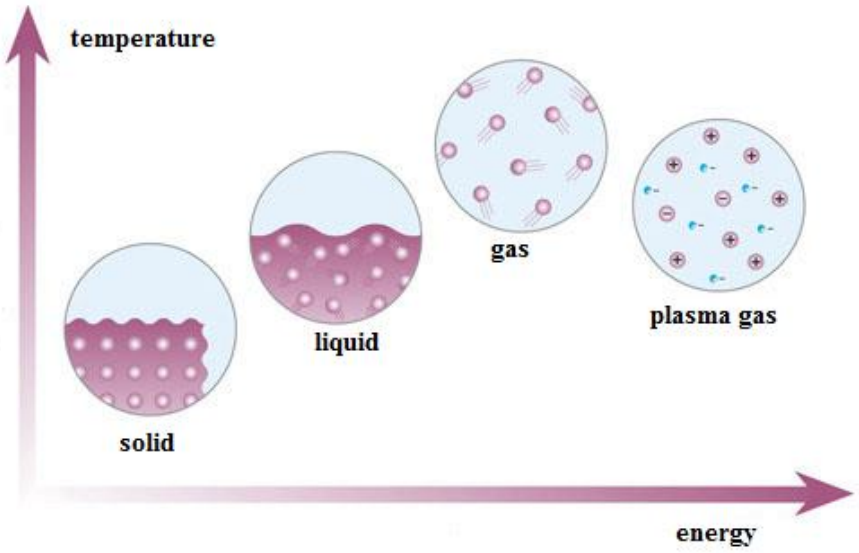
Principle of Plasma Surface Treatment Technology

The energy of particles in the plasma is generally about several to a dozen of electron volts, which is greater than the bonding energy of the polymer material (several to a dozen of electron volts), and can completely break the chemical bonds of organic macromolecules to form new bonds; however, it is much lower than that of the high-energy radioactive rays and only involves the material surface, leaving no influence to the performance of the matrix. Through the low temperature plasma surface treatment, a variety of physical and chemical changes occur on the surface of the material, making the surface rough due to etching, with dense cross-linking layers or incorporated with oxygen-containing polar groups, so that the hydrophilia, adhesion, dyeability, biocompatibility and electrical properties can be improved. The surface morphology of the material can be significantly changed and a variety of oxygen-containing polar groups can be introduced by treating the material under appropriate technological conditions, making the surface changed from non-polar to polar, hardly adhesive to highly adhesive and hydrophilic, which is conducive to bonding, coating and printing. Applying the high frequency AC voltage at both ends of the electrode causes the air between two electrodes to produce glow discharge, which results in the plasma. The electrons constantly collide with gas molecules in the movement, generating a large number of new electrons. When these electrons reach the anode, they will accumulate on the surface of the medium and then modify the surface.



Principle of Generating the Air Plasma

Matter generally has three states with temperature change, namely solid, liquid and gaseous. When energy is further added to the gaseous material, a chemical reaction occurs in the gaseous material, forming a mixture of electrons, ions and high-energy particles in a state known as plasma.



Principle of Applying the Air Plasma

Ionized air is generally used to obtain plasma in current science and technology. Since the plasmas are of 1-15eV energy generally, they can easily break the chemical bonds of other molecules to form new polar groups when they collide with other molecules, thus greatly improving the adhesion of the material surface. With this property of plasma, we will be able to develop many applications of the technology to modify the polymer surface.

Technical Parameter of AF-G40 Platform

- Rotation Mode: speed regulating motor + cylinder
- Platform Size：L×W×H=450mm ×400mm ×620mm；
- Platform Power ： 30W；
- Platform Power Supply ： AC220V（±10V）/50Hz /1.5KW
- Max Diameter：300mm；
- Running Speed：1lap-5lap/second
- Platform Weight：15kg；

Technical Parameters of Plasma Treatment Machine

- The device consists of a plasma generator, a plasma gun and a cabinet;
- Cabinet dimension: L×W×H=280x280x380mm
- Rated power: 1000W (adjustable);
- Number of matched nozzle: single;
- On-line function: supports online use with field equipment;
- Power supply: AC220V (±10V);
- Nozzle width: 3-5mm, 7-13mm, 15-18mm (optional);
- Frequency: 18-25kHz;
- Air source pressure: 2-2.5kg (external dry air source);
- Weight: 20kg;
- Range of operating temperature: -10℃～+50℃;
- Relative humidity: 20%<operating temperature<93% (non-condensate);

Application Fields

Plasma surface treatment before printing, spraying and bonding of household appliances;

Plasma surface treatment for regular round product;

Plasma surface treatment for auto parts printing and spraying

Plasma surface treatment for hardware parts;

Plasma surface treatment for electronic products;