Advanced Makerspaces for PiLot production by micro-Enterprises

Microwave Plasma

Low Pressure Plasma Chamber

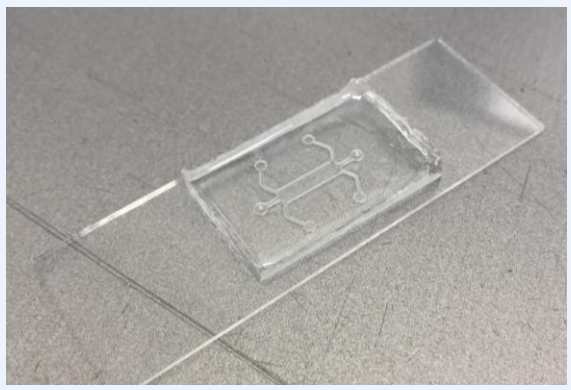
Introduction

The low-pressure plasma chamber is a versatile tool for surface activation, cleaning, and material modification at the micro- and nanoscale. By generating a controlled plasma environment, it enables precise surface treatment across a wide range of materials, making it valuable for research, prototyping, and industrial processes.

Diener plasma chamber

Applications

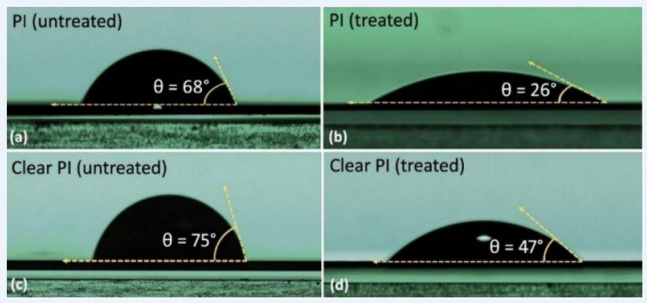
- Plasma Cleaning: Removal of organic contaminants and surface residues.
- Plasma Surface treatment: Improve surface energy and adhesion for bonding or coating.
- Plasma Etching: Controlled removal of thin material layers using reactive plasma



PDMS Microfluidic chip bonded using plasma process

How Does it Work?

Plasma is the fourth state of matter and consists of ions, electrons, radicals, and photons. In a low-pressure environment, these energetic species interact with a material's surface, enabling controlled cleaning, activation, or etching. Process parameters such as gas composition, pressure, and power are precisely regulated to tailor the surface modification to the desired application.



Contact angle before and after plasma treatment.

Technical Specifications

- Chamber capacity: 2.6-liter
- Dual gas channels
- Suction capacity: 3 m^3/h
- Automatic control mode
- Electrodes located outside the chamber

Close up of plasma

Interreg
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