ONTOS *CLEAN*

ATMOSPHERIC PLASMA SURFACE TREATMENT

INDUSTRIES:
- Semiconductor
- Automotive
- Aerospace
- Medical
- Optical

ONTOS
Equipment Systems

Helium & Argon Atmospheric Plasma R&D and Production Line Oriented

ONTOS CLEAN is a semiautomated system for Surface Preparation using a patented Atmospheric Plasma with a unique design enabling, without any modification, oxidizing or reducing chemistry.

Ontos performs Cleaning, Eliminates the Organic Contamination, Activates Surfaces and Removes Oxidation.

An Innovative Process applies a gaseous passivation that delays the re-oxidation of the metallic surfaces.
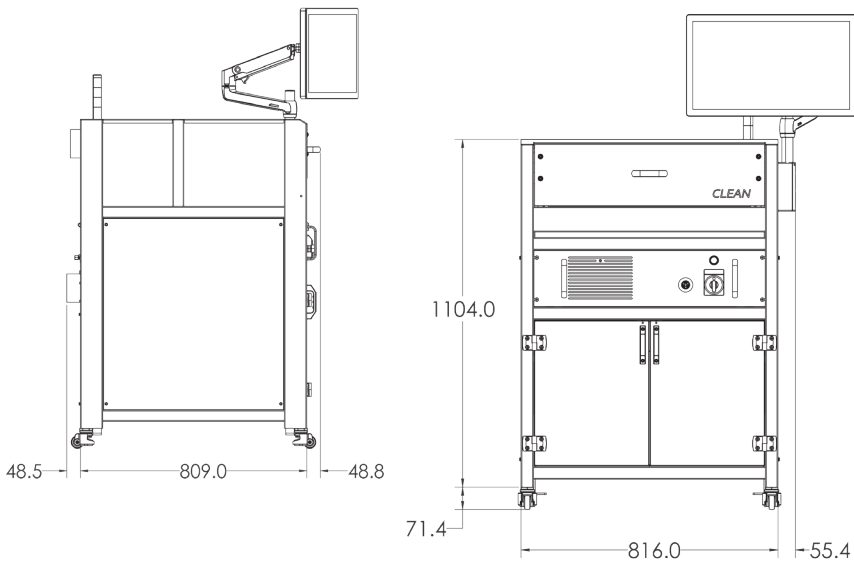
Applications

- Starting wafer cleanup
- Photoresist descum and activation
- Activation of photoresist for vias wetting
- Preparation for plating
- Removal of various organic materials
  - Polyimide on glass wafer
  - Implanted photoresist on processed silicon wafer
  - Implanted photoresist on bare silicon wafer
  - Amorphous carbon on silicon wafer
- General aqueous processes
- Dielectric wet etch
- Metal liftoff
- Passivation of delicate surfaces
- Photomask cleaning

- Metal-to-metal Bonding
  - Au - Au (as low as 100°C)
  - In - In (at RT)
  - In - metal pad (at RT)
  - In - Ag (at RT)
  - SnAg - Cu (at 175°C)
  - SAC - Cu (at 175°C)
  - SAC - SAC (at 175°C)
  - ... more
- Direct bonding
- Semiconductor-to-semiconductor (at RT)
- Oxide-to-Oxide (at RT)
- Oxide-to-Nitride (at RT)
- Oxide-to-Semiconductor (at RT)
- Surface activation
  - Preparation for deposition
  - Capillary underfill
  - Die attach adhesion
  - Medical module assemblies
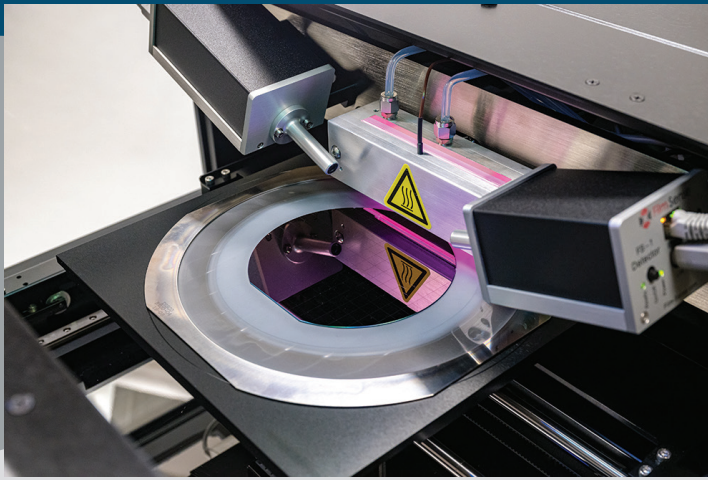
User Benefits:

- Removes native oxide from metallic and semiconductor surfaces
- Engineered surface termination inhibits re-oxidation
- Removes residual organic contamination films
- Fast, non-toxic, dry, atmospheric process
- Low-energy surface chemistry – CMOS safe
- Ideal surface preparation for direct bonding
- Compact configuration
- Automation compatible

System Description/Specifications:

- Uniquely-designed atmospheric plasma system with 25mm, 40mm or 105mm-wide standard process zone. The glow discharge-type plasma is entirely contained inside the source.
- Computer-controlled X-Y-Z stage. Standard vacuum chuck accommodates die or wafer from 2 to 300mm. Substrate thicknesses up to 20 mm (30mm without lift pins).
- The 13.56 MHz RF generator has a wide-range auto-tune matching network, system safety monitoring and computer control of forward and reflected power.
- Digital Mass Flow controllers provide precise digital control of gas flow to the plasma source.
- ESD-safe, interlocked enclosure; Exhaust for process gases (no scrubber required).
- Semi-automatic system controlled by Touchscreen Computer. Menu-driven interface with user-configurable recipe libraries.
- Lift-Pins enable eventual pass-through for automated handling.

Facilities Required:

- Power: Single Phase, 110/240 VAC, 8/4A, 50/60Hz.
- Gases: 6 channels of gas supply by 1/4" Teflon tubing; Swagelok compression fittings. (All gases are non-toxic, non-flammable.)
- Optional Oxygen plasma configuration available upon request
- Exhaust: 15~20 cfm (424~566 l/min), 3" connection.
- Lab vacuum: 0.85 ~ 0.95 bars (2 ~10 SLPM).

Industry Leading Features:

- 25, 40 and 105 mm Plasma Head
- 300 mm dicing frame
- Fleet of Gases (6 MFC's)
  - Helium
  - Hydrogenated Helium
  - Argon
  - Hydrogenated Argon
  - Oxygen
  - Nitrogen
- In-Situ Ellipsometry
  - Pre/Post treatment analysis
- In-Situ Goniometry
  - Pre/Post treatment analysis
- Heated Chuck
- Nitrogen environment
- CO2 Cleaning

Data, design and specifications depend on individual process conditions and can vary according to equipment configurations. Illustrations, photos and specifications in this datasheet are not legally binding. Specifications are subject to change without prior notice.

ONTOS
Equipment Systems

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